R·S·G·B AMATEUR RADIO

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOLUME 29 No. 12 JUNE 1954

PRICE 2/6

APPRECIATION . . .

GOODMANS

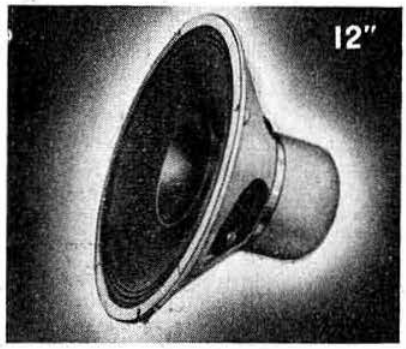
AXIOM 150 Mk II

(15 WATTS)

A 12-inch twin-cone, full range high fidelity reproducer, with a power handling capacity of 15 watts.

BRIEF SPECIFICATION

Frequency Coverage	30/15,000 c/s
Fundamental Resonance	35 c/s
Flux Density	14,000 gauss
Nett Weight	12 lb. 13 oz.
PRICE	£10.5.6 (tax free)



U.S.A.

"Your model Axiom 150 loudspeaker has provided me with tremendous pleasure, and its performance has never been short of perfect. In my opinion, I think it is the finest over innumerable other speakers.

"The purpose of writing to you is, of course, to thank your firm for the splendid enjoyment brought true to life by your Axiom 150 speaker. During the past few months, flaws have popped up in both amplifier and tuner, but the speaker has continued to perform brilliantly without mishap."

Clifton, New Jersey.

from

GOODMANS

AXIOM 22 Mk II

(20 WATTS)

A 12-inch twin-cone high-power P.M. loudspeaker combining generous bass handling capacity with full range high fidelity reproduction.

BRIEF SPECIFICATION

Frequency Coverage	30/15,000 c/s
Fundamental Resonance	35 c/s
Flux Density	17,500 gauss
Nett Weight	18 lb. 4 oz.
PRICE	£14.14.0 (tax free)

AUSTRALIA

"I have found your speaker to be the finest I have heard and ideal for reproducing the long playing discs which have been on sale for some time."

Launceston, Tasmania.

HOLLAND

"I am very pleased with my 12" 15 watt Goodmans loudspeaker I bought a year ago. The speaker has been shown to withstand a good 12 watt (2 by 6L6 push-pull A) with 40 ohms bass and treble lift without noticeable distortion."

Delft.

CANADA

"When I think of high fidelity I think of British goods, and when I think of speakers I think of Goodmans."

Moose Jaw, Sask.

Overseas

GOODMANS

HIGH FIDELITY

Output Transformer

MODEL **H6**

± 1 db. 10 c/s. — 20,000 c/s.

The primary and secondary windings are fully sectionalised (10 sections) ensuring extremely low self capacity and leakage inductance.

GOODMANS

GOODMANS INDUSTRIES LTD.

AXIOM WORKS, WEMBLEY, MIDDX.

Telephone: WEMbley 1200 Grams.: Goodaxiom, Wembley

R·S·G·B· BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Contents

Vol. 29 No. 12 — **JUNE, 1954**

R.S.G.B. BULLETIN

Published on or about the 15th of each month as its Official Journal by the Radio Society of Great Britain and issued free to Members.

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RADIO SOCIETY OF GREAT BRITAIN

NATIONAL CONVENTION—BRISTOL 1954

Programme of Events

HERE is the full programme of events for Convention. The July issue will contain an official application form for tickets.

In order to give the Convention Committee some idea of the support expected for the various events members are requested, **as a matter of urgency,** to advise the Honorary Secretary, Convention Committee, the period of their stay in Bristol and the number in their party. A postcard to Mr. D. F. Davies (G3RQ), 51 Theresa Avenue, Bristol, 7, without delay, please.

Friday, September 17th

10.00 a.m. *Amateur Radio Exhibition opens.

1.45 p.m. Visit to the Bristol Aeroplane Company Ltd., Aircraft Division, Filton
(Accommodation for 30—duration 2½ hours.)

2.15 p.m. Visit to W. D. & H. O. Wills' Tobacco Factory, Bedminster.
(Accommodation for 30—duration 2½ hours.)

2.50 p.m. Visit to Council House (City's Historic Relics and Regalia), Corn Street.
(1st Party, Accommodation for 25—duration 2 hours)

3.00 p.m. Visit to B.E.A. Control Room, Clifton.
(Accommodation for 40—duration 1½ hours)

3.00 p.m. Visit to B.B.C. West of England Studios, Control Room and Recording Department, Clifton.
(Accommodation for 12—duration 2 hours)

3.20 p.m. Visit to Council House, Corn St.
(2nd Party, Accommodation for 25—duration 2 hours)

3.30-6 p.m. *Informal Tea.

6.30 p.m. *Informal Reception by the President (Arthur O. Milne, Esq., G2MI).

7.00 p.m. *CONVERSAZIONE & BUFFET.

8.30 p.m. *Film Show and Demonstration of Large-screen Television, including TV Camera Equipment.

10.30 p.m. *Amateur Radio Exhibition closes.

Saturday, September 18th

9.45 a.m. Visit to Burden Neurological Institute, Stapleton.
(Accommodation for 20—duration 2¾ hours)

10.00 a.m. *Amateur Radio Exhibition opens.

10.30 a.m. *Technical Lecture by A. H. Radford, A.M.I.E.E. (G6YA).

10.30 a.m. Visit to B.B.C. Television Outside Broadcast Unit, Whitchurch (subject to B.B.C. commitments).
(Accommodation for 20—duration 2 hours)

10.45 a.m. Visit to G.P.O. Automatic Exchange and Repeater Station, Telephone Avenue.
(Accommodation for 20—duration 2¼ hours)

10.45 a.m. Visit to "Bristol Evening Post" Newspaper Offices, Silver Street.
(Accommodation for 15—duration 2¼ hours)

11.45 a.m. *Technical Lecture by F. J. H. Charman, B.E.M. (G6CJ).

2.00 p.m. Visit to B.E.A. Generating Station, Portishead.
(Accommodation for 30—duration 3 hours)

2.00 p.m. Visit to G.P.O. Radio Station, Portishead.
(Accommodation for 30—duration 3 hours)

2.00 p.m. Visit to Blaise Castle and Grounds.
(Duration 2¾ hours)

2.00 p.m. Visit to Cheddar Gorge, via Burrington Combe and the Mendips, with optional visit to Caves.
(Duration 3¼ hours)

2.30 p.m. *Technical Lecture by Louis Varney, A.M.I.E.E. (G5RV).

2.45 p.m. Visit to Council House, Corn St.
(1st Party, Accommodation for 25—duration 2 hours)

3.00 p.m. Visit to B.E.A. Control Room, Clifton.
(Accommodation for 40—duration 1½ hours)

3.05 p.m. Visit to Council House, Corn St.
(2nd Party, Accommodation for 25—duration 2 hours)

3.45 p.m. *Technical Lecture by Dr. W. Grey Walter, M.A.

5.45 p.m. OFFICIAL RECEPTION BY THE PRESIDENT at Victoria Rooms.

6.45 p.m. CONVENTION DINNER at Victoria Rooms. (8 p.m., Toasts, 9 p.m., Interval, 9.30 p.m., Draw for Free Prizes).

8.00 p.m. *Amateur Radio Exhibition closes.

Sunday, September 19th

9.30 a.m. *Amateur Radio Exhibition opens.

10.00 a.m. Visits to Electron Microscope at Royal Fort, Bristol University, commence.
(Duration 1 hour)

10.00 a.m. Conducted Tour of Bristol by coach.
(Duration 2 hours)

11.00 a.m. Morning Service at St. Mary Redcliff Church.

12.30 p.m. *Amateur Radio Exhibition closes.

2.30 p.m. Visit to Bristol Zoological Gardens (Tea may be obtained at the Restaurant in the Gardens if required).

Events marked thus * take place at the Royal West of England Academy, Queen's Road, Clifton, Bristol, 8.

Members attending the Convention are requested to Register at the Reception Desk in the Royal West of England Academy on arrival.

Current Comment...

Subscriptions and Membership

A MATTER of prime interest and importance to members is the question: How has the Society's membership been affected since the rise in the subscription last December? It is a question that received very full consideration at the recent meeting between the Regional Representatives and the Council. While the information given to the R.R.s has doubtless filtered through to a fair proportion of members many may not be aware of just how the position stands at the present time.

"The present time" is, as it happens, a rather appropriate one from which to look back over the five months that have elapsed since the subscription (for the majority of members) rose to 27s. 6d. per annum. It may be said straightaway that the picture is not nearly as black as many people forecast that it would be; indeed there are plenty of reasons for feeling encouraged at the way circumstances have shaped. Just a year ago—that is to say, on 30 June, 1953—the Society's membership was 11,190. At the Regional Representatives' Conference the report submitted to those present showed that membership at that date was 10,211. This reduction in membership was materially lower than the 10 per cent. that had been forecast before the subscription went up. Of those who did not renew their membership, by far the greater proportion were members outside the London area—in other words, those who felt the increase in subscription most keenly. For them the rise was from 15s. to 27s. 6d., while upon London members the increase bore less hardly—from 21s. to 27s. 6d.

A superficial glance at these figures might suggest that financial considerations were the most potent influence to account for the drop in membership. The more reasoned analysis shows that this is by no means entirely the case. Subscription or no subscription, membership of the Society has been steadily falling since those peak days just after the war—that "easy money" period when there was a quite artificial stimulus to the hobby of Amateur Radio.

Since then a dozen different factors have operated to hive-off large numbers of people who adopted Amateur Radio as a temporary hobby—and among these factors were such random circumstances as accommodation difficulties, increased "tightness" of money, inability to keep abreast of operating and technical standards, TVI, but probably more significant than any, the lack of that rather special psychological make-up that distinguishes the man proud to be called "a ham."

All of these factors would have resulted—and did result—in the lapse of many Society memberships coupled with the lapsing of many transmitting licences, too. It may surprise the more enthusiastic members to know that the number of transmitting licences which lapse in any one year is not far short of a thousand.

The actual drop in the Society's membership by nine per cent. since 1 July, 1953, cannot therefore be regarded as alarming. Moreover, the extra finance derived from the increased rate has more than offset those lost subscriptions. That, a heartening circumstance, may be capped by another, namely, *that probably 75 per cent. of British amateur transmitters are members of the Society*. We believe it to be true that in no other country in the world—or at any rate, in very few—does such a high proportion of licensed amateurs belong to the national society.

* * *

Upon this encouraging note it would be pleasant to end this comment, were it not for the fact that self satisfaction is a jejune state to be in. What are the chances, members may well ask, of increasing that figure of 75 per cent?

The answer to this particular question lies largely with the individual members themselves, and their ability to bring non-members in to the Society. Individual members of town groups could answer the question by asking themselves another: *How many new members have I personally signed up during the past year?*

Every effort is being made at Headquarters to retain the membership of those whose subscriptions lapse. The personal letter which goes out to them seeks to ascertain the reasons for the failure to renew and brings a great many back into the fold again.

In the discussion on the subscription increase that went on last year a remark sometimes heard was: Can I afford to belong to the R.S.G.B.? In the light of the many valuable concessions which the Society has directly negotiated in recent months the doubters ought to be asking: *Can I afford NOT to belong?* Let the individual member persuade the waverer in no uncertain terms that the answer is a decided "No"!—J. H.

The New Licence

AFTER prolonged negotiations between the General Post Office and the Society, there came into force on June 1, 1954, a new set of licence regulations for radio amateurs in the United Kingdom. Details of the provisions of the licence have already appeared in this journal.

Here, at last we have a licence devoid of petty restrictions and unrealistic requirements—a licence which gives to the licensee an outline of how he is expected to behave and leaves the details of how he is to do it to his own good sense and technical ability.

The R.S.G.B. Post Office Liaison Committee thought that the results of their labours would be greeted with almost universal acclaim and, to be fair, the Committee have received quite a few

letters of appreciation. What neither they nor the G.P.O. expected was the spate of letters which have arrived asking for rulings on this or that detail of the licence. Reading some of these letters, leads one to the conclusion that the Society has more than its fair share of "Sea Lawyers," who just cannot believe their own eyes!

We earnestly advise all members to regard the new licence as the liberal document which it really is and to refrain from any attempt to have restrictions re-imposed by asking for rulings and interpretations.

The way in which we think the licence conditions should be interpreted is from the approach of common sense. We shall send our call-sign at a speed of 12 w.p.m. every now and then, at reasonable intervals, not every time. We shall announce our position, when working /P or /A, occasionally, not before every "Over." We read the frequency control regulation to mean "Keep within the bands; how you do it is your own affair."

If members want a licence which is full of legalistic definitions and lays down a precise procedure, departure from which will mean automatic withdrawal, we have no doubt the Society could negotiate such a one. We do not believe, however, that anyone wants to be so circumscribed!

We suggest that members should take the new licence at its face value and observe it in the spirit, not bothering too much about the strict legal interpretation of each letter. Above all, if there are any queries, DO NOT write to the Post Office for a ruling; write to R.S.G.B. Headquarters.

When a Government Department is pressed for a ruling it has to be given by its legal branch. Lawyers have an unhappy knack of tying things up in red tape; much better to keep clear of such entanglements.

A.O.M.

Council Proceedings

Résumé of the Minutes of the Proceedings of a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, April 13th, 1954, at 6 p.m.

Present.—The President (Mr. A. O. Milne, in the Chair), Messrs. H. A. Bartlett, L. Cooper, C. H. L. Edwards, D. A. Findlay, F. Hicks-Arnold, J. H. Hum, L. E. Newnham, N. F. O'Brien, R. L. Varney and John Clarricoats (General Secretary).

Apologies.—Apologies for absence were submitted on behalf of Messrs. I. D. Auchterlonie, A. C. Gee and R. H. Hammans.

* * *

Membership

Resolved (a) to elect 26 Corporate Members and three Associates, (b) to grant Corporate Membership to 24 Associates who had applied for transfer.

Blind Members

Resolved unanimously to waive for a period of 12 months the subscriptions of Mr. J. W. Forsyth, G3HET, of Wooler, Northumberland and Mr. J. W. Birkbeck, G3IGV, of St. Austell, Cornwall, on the ground that they suffer from blindness.

Applications for Affiliation

Resolved to grant affiliation to the Liverpool and District Amateur Radio Club and the Norwich and District Radio Club.

National Radio Show

Resolved to appoint Mr. M. J. Frost, G3GNL, as Manager of the Society's stand at the National Radio Show.

Amateur Radio Exhibition

Resolved (a) to feature at the next Amateur Radio Exhibition transistors and emergency equipment for portable and mobile use; (b) to invite Mr. R. L. Royle, G2WJ, to stage a demonstration of Amateur Television; (c) to invite Mr. H. Faulkner, C.M.G., to open the Exhibition.

Convention

After considering a detailed report from the General Secretary it was

Resolved (a) to approve the following charges for tickets; 10s. for the Friday, 20s. for the Saturday, 30s. for both days; (b) to recommend the Committee to offer a double ticket (lady and gentleman) for the Saturday at a price of 35s.; (c) to authorise an expenditure of approximately £20 on the filming of Convention; (d) to authorise an expenditure of up to £20 on entertaining official guests (this sum to be a charge for meals); (e) to authorise an expenditure of approximately £5 on obtaining a photographic record of Convention; (f) that expenditure referred to in items (c), (d) and (e) above shall not be a charge against the Convention Account; (g) that any Council Member who attends Convention officially does so at the Society's expense; (h) that the President, Acting Vice-President and General Secretary be authorised to draw up a list of persons to whom invitations are to be extended; (i) that the President, Acting Vice-President and General Secretary be authorised to settle the formal and informal toast lists; (j) to authorise the President to claim on the Society for entertaining the distinguished guests.

Income Tax Rebate

It was reported that a rebate of £141 15s. 0d. had been received from the Commissioners of Inland Revenue in respect of the repayment of Income Tax for the year 1953/4.

TOPS Club

Resolved not to grant permission to the TOPS Club to incorporate the letters "R.S.G.B." and "R.A.E.N." in the design of their badge.

Employment of a Corporate Member on the staff of the Society.

After considering a letter from the Society's legal adviser it was

Resolved, as a matter of policy, to place on record that the Council raise no objection to employees of the Society remaining or becoming Corporate Members of the Society.

Historical Facts

Resolved to inform Mr. A. J. Forsyth (Editor, *The Short Wave Magazine*) that the Society will be glad to co-operate with him in the preparation and subsequent publication of an agreed Historical Note regarding the part played by radio amateurs in the development of the short waves for long distance communication purposes.

History of Amateur Radio

The Secretary reported that to date only seven of the 40 members approached had offered to supply information concerning the early days of Amateur Radio in the United Kingdom.

Pilot Officer Norman Keith Adams Trust

Resolved to authorise the General Secretary to convert the Society's present holding of 3 per cent. Defence Bonds (Third Issue) into 3½ per cent. Defence Bonds (Conversion Issue) January 1955.

"Radio Constructor"

The President reported that he had found it necessary to write a Letter to the Editor of *Radio Constructor* refuting certain statements made by "Centre Tap" in the current issue of that Journal regarding the Radio Amateur Emergency Network.

Cash Account

Resolved to accept and adopt the Cash Account for March 1954 as prepared by the General Secretary.

R.S.G.B. Account

The Secretary explained that, as a consequence of changing the name of the Society, it had become necessary for the Council, formally, to pass a resolution appointing Barclays Bank Ltd. the bankers of the Radio Society of Great Britain. *Resolved* that Barclays Bank Ltd. be appointed the Bankers of the Radio Society of Great Britain.

I.A.R.U. Region I Division

The Secretary explained that, as the result of correspondence between the Hon. Secretary, I.A.R.U. Region I Committee (Mr. Milne) and the Bank of England, it had been decided to set up separate accounts for Funds 2 and 3, and that as a consequence of that decision it had become necessary to appoint a firm of bankers to act as the bankers of both Funds.

Resolved that the Society's bankers (Barclays Bank Ltd.) be appointed the Bankers of the (I.A.R.U.) Region I Funds 2 and 3, and that the administration of the funds be undertaken by the Hon. Secretary I.A.R.U. Region I Committee and the General Secretary R.S.G.B. jointly.

REPORTS OF COMMITTEES

Finance and Staff

Resolved to receive, and adopt as a Report, the Minutes of a meeting of the Committee held on March 29, 1954, and to accept the recommendations contained therein.

(a) *Year Book*

The Committee recommended the Council to rescind its earlier resolution to publish, during 1954, and to give away to members a Year Book embracing the *R.S.G.B. Amateur Radio Call Book.*

In putting forward this Recommendation the Committee took into account the fact that the cost of producing, say, 12,000 copies of a 96 page publication would be at least £800 (less a certain amount of revenue received from advertising). The Committee also took note of the fact that a good deal of the general information which it was planned, originally, to include in the Year Book would now appear in the revised edition of *A Guide to Amateur Radio* which is due to be published just before the opening of the National Radio Show in August 1954. By postponing publication of the Year Book for one year the Council would be able to judge the demand for such a publication by taking note of the sales of *A Guide to Amateur Radio.*

The Committee expressed the view that it would be a mistake to lose the valuable revenue which now accrues to the Society from the sale of the *R.S.G.B. Amateur Radio Call Book.*

(b) *Handbook*

The Committee informed the Council that they had discussed the question as to whether or not the time is opportune to begin production of a new edition of the Handbook but had come to the conclusion, after receiving a report from the Secretary on probable costs and anticipated sales, that it would not be wise at this stage to risk an outlay of several thousands of pounds on the production of a book which might have only a limited sale. The Committee informed the Council that the retail price of the book would probably be between 15s. and 21s. for a 400 page production.

(c) *Technical Booklets*

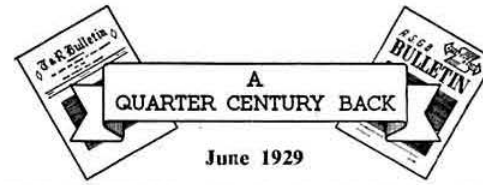
After receiving a statement from the Secretary regarding the sale of booklets generally, the Committee reported that they had come to the conclusion that it would be unwise to recommend the preparation of any new technical booklets for the time being.

Contests Committee

Resolved to receive, and adopt as a Report, the Minutes of a meeting of the Committee held on April 8, 1954.

The Report, which contained no recommendations, dealt with routine matters.

The meeting terminated at 9.5 p.m.



THE Editorial referred to complaints from members that foreign commercial stations were interfering with amateur stations. The leader also urged B.R.S. members to make their reports more useful. "There is a well-founded suspicion" wrote the Editor "that the usual reception report is a request for 'wall paper' and transmitters soon get tired of filling up their cards for unsought and valueless cards."

* * *

F. Rodman (VU2KT)—a pioneer worker on 28 Mc/s—contributed "A Few Notes on India."

* * *

W. F. Floyd (G5WF), described a breadboard type 5 metre straight receiver employing a pair of Cossor 610 P Valves. Good results were reported on local transmissions.

* * *

Contact Bureau Notes—an important feature of the BULLETIN 25 years ago—carried a photograph of a novel 5 metre transmitter. Group 6A reported on sunrise effects and Group 4A published a DX Forecast for June-July. A daily sked between G6LL and PK4AZ on 28 Mc/s had "clicked" successfully.

* * *

N. W. Wright (2BFA) described the construction of a Polariscope, a device for assessing the usefulness or otherwise of pebble lenses as a means for controlling frequency.

* * *

L. A. Lafone (G6ZA) showed how he had modified his new crystal controlled transmitter for telephony operation. Grid control of an LS5 valve had produced satisfactory results on 7 Mc/s.

* * *

The Small Advertisement columns carried an announcement to the effect that a number of young men, experienced in the construction of amplifiers, were wanted for talking films.

* * *

Volume IV—which was completed with the June 1929 issue—contained a total of 298 pages.

Society News

Zonal Boundaries

THE Council has determined, after consultations with the Regional Representatives, that for election purposes the six Zones shall be as follows:

Zone	Comprising Regions
A	1 and 2
B	3 and 4
C	5, 7 and 8
D	6 and 9
E	10 and 11
F	12, 13, 14 and 15

A list of the counties and areas forming the various Regions appeared on Page 130 of the September, 1953, issue of the BULLETIN.

For the purposes of the Zonal scheme the Isle of Man will be linked with Region 1 (Zone A) and the Channel Islands with Region 6 (Zone D).

An announcement will appear in the September 1954, issue of the BULLETIN inviting the Home Corporate membership to nominate persons to serve as Zonal Representatives on the Governing Body of the Society.

National Radio Show

THE General Secretary will be pleased to hear from any member who is prepared to lend a hand on the Society's stand during the period of the National Radio Show at Earls Court. The Show will open on Wednesday, August 25 and close on Saturday, September 4. Members willing to help are asked to state the date (or dates) and period of the day (or days) they will be free to undertake stand duty.

Because of the duration of the Show—a period of 10 days—a good many volunteer helpers are required.

R.S.G.B. Eighth Annual Amateur Radio Exhibition

MR. H. FAULKNER, C.M.G., Director, Telecommunication Engineering and Manufacturing Association, and until recently Deputy Engineer-in-Chief, G.P.O., has accepted an invitation from the Council to open the Eighth Annual Amateur Radio Exhibition at 12 noon on Wednesday, November 24, 1954.

The Exhibition will be held as usual at the Royal Hotel, Woburn Place, London.

Mr. P. A. Thorogood (G4KD) who is now General Manager of Electrical Engineers (A.S.E.E.) Exhibition Ltd., has agreed to act as Manager of the Exhibition in place of Mr. Horace Freeman who has retired from that position. Mr. Thorogood is a Past Member of the R.S.G.B. Council.

London Meetings

MEMBERS are asked to note that meetings of the Society will take place at the Institution of Electrical Engineers, London, W.C.2, on the undermentioned dates during the session 1954-5:—

1954

Friday, October 22	Ordinary Meeting and Lecture
Friday, November 19	Ordinary Meeting and Lecture
Friday, December 17	Annual General Meeting

1955

Friday, January 28	Ordinary Meeting and Lecture
Friday, February 25	Ordinary Meeting and Lecture
Friday, March 25	Ordinary Meeting and Lecture

Lectures will commence at 6.30 with buffet tea from 5.30 p.m.

Full details of the Lecture Programme will appear in an early issue of the BULLETIN.

The Murdoch Trust

THE late John Murdoch, who resided at Craiglockhart in the County of Midlothian, by his Will directed his Trustees to employ the residue of his Estate "in instituting and carrying on a scheme for the relief of Indigent Bachelors and Widowers, of whatever religious denomination or belief they may be, who have shown practical sympathy either as amateurs or professionals in the pursuits of Science in any of its branches, whose lives have been characterised by sobriety, morality, and industry, and who are not less than fifty-five years of age."

The Trustees carry out the terms of the bequest by granting donations or pensions to persons who comply with these conditions. Pensions are given from year to year only, and may be increased, reduced, or withdrawn altogether, as the Trustees see fit.

At a recent meeting of the Trustees it was decided to bring the Trust specially to the notice of the Radio Society of Great Britain in case any member or any other person known to the Council or the Secretary might be eligible for, and in need of, a grant therefrom.

Forms of application may be obtained on request from Shepherd and Wedderburn, W.S., 16 Charlotte Square, Edinburgh 2.

Visitors to Headquarters

DURING recent weeks a number of well-known European amateurs have visited Headquarters. On two occasions during the early part of May the President and General Secretary had the pleasure of meeting the Vice-President of S.S.A. Mr. Ivar Westerlund (SM5WJ) of Stockholm. Whilst in London Mr. Westerlund visited G2MI, 5RK and 6CL.

On May 8 the President met the President of S.R.J., Mr. Janez Znidarsic (YU1AA) of Belgrade. Because of his short stay in London it was not possible to arrange station visits.

On May 19 the President and General Secretary met Mr. Wolfgang Assmann (DL3DC) who is the Liaison Officer between D.A.R.C. and the German Post Office.

During these various meetings matters of mutual interest to R.S.G.B. and other Societies in Region 1 were discussed at length.

Past Council Members' Badges

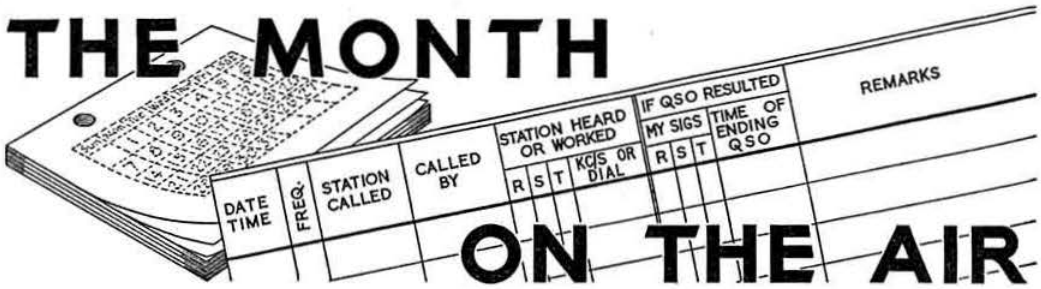
AT a recent meeting of the Council it was decided that any ex-Member of the Governing Body may apply to Headquarters for a Past Council Members' badge. Applications should be made in writing to the General Secretary.

Birmingham

BY mutual agreement between the various representatives concerned it has been decided that for the purposes of the Scheme of Representation, the Birmingham Postal District shall rank as an R.S.G.B. District.

Nominations for the office of Birmingham D.R.—a post which will be equivalent to that of a County Representative—should be made in prescribed style and sent to reach the General Secretary by not later than August 31, 1954.

THE MONTH ON THE AIR



By S. A. HERBERT (G3ATU)*

CONDITIONS during the month have been typical for this time of year with the DX bands yielding long skip, short skip and sometimes a mixture of both, and Gs coming in from all parts of the country, often with Far Eastern signals underneath. Twenty-one has produced rather more activity than usual, although mostly of a short skip kind, whilst on 28 Mc/s, Europeans and South Americans have been heard and worked.

The Sunspot Cycle

How long will it be before we can expect to work DX regularly on 28 again? The West Gulf Club's *DX Bulletin* reports that experts at the Mount Wilson Carnegie Observatory think the bottom of the cycle is past, so it may not be too long. Then we'll really know what QRM is!

G2RO in Asia

Bob Roberts (G2RO) started on the next leg of his monumental DX wanderings when he left London Airport on June 1, bound for Sarawak (VS4). He will be there from June 4 to 18; then on to British North Borneo from June 18 to 28. Next Hong Kong, from June 29 to July 8, followed by Singapore, July 8 to 18; Kuala Lumpur, July 18 to 24; Penang, July 24 to 31, Colombo, August 1 to 7 and New Delhi, August 7 to 12. He will then take some well-earned leave in France. The callsigns used throughout the tour will normally end in 'RO, although this may not be possible in all cases. Thanks are due to **G2MI, G2TR** and **VQ4ERR** for this information.

News from Overseas

ZS2AT (ex-G2AT and VQ5NTB) sends some news likely to make the country chasers sit up: W4COK (VP7NV) has designs on Navassa Island, a U.S. possession in the waters between Cuba and Haiti. He hopes to be there during June or July. The A.R.R.L. DX Committee has agreed to count the island as a separate country. The callsign is not yet known. Just listen for a colossal noise; he will be in the middle!

The West Gulf *DX Bulletin* says that the Clipperton Island gang are home—recuperating no doubt after their somewhat outsize adventure. They worked 1,108 stations: one European (OK1MB), two Africans and the rest in America. In fact, conditions hit the bottom just at the wrong time. From the same source we learn that XE4PK (Revilla Gigado Island) works 7 Mc/s phone; W6MUR is handling cards for VR3A; AB1US is ex-C3EA and may be QSLd via A.P.O. 63, c/o P.M., San Francisco. HK0EV, '0DE, '0DP and '0JH were active recently from San Andreas Island. They were heard in Europe on 14 phone. Country status is assured.

ZD4BS, active on 7, 14 and 21 Mc/s phone, is ex-D2CU, DL2CU and MF2AD. Cards should go to Ken Shaw, 89 Coy., W.A.A.S.C., Rangoon Camp, Accra. **G3IJU** is also licensed as ZB1EB. While in Malta, he concentrates on 3.5 as the other ZB1s do not use the band very much. **TA3MP** (H.A.L.F.S.E.E., Box 14, Navy Nr. 525, F.P.O., New York) enjoys working G stations and may be found on the low end of 14 and 21 on c.w. Difficulties in getting QSL cards have been overcome and the backlog is being dealt with in date order. Anyone who has worked TA3MP can be sure of getting a card eventually.

Twenty Metre News

G3JFF, now on a cruise taking in EI, GM, LA, SM and OZ, says that ZS6CJ and SV0 have brought his score to 60 countries so DXCC gets nearer. **ZC4FB** put up a ground-plane and promptly worked W6TZD for his first W. KL7FAK was another good one at 0930. GI has also been added to the list. '4FB mentions the DL three letter calls. During QSOs with DL3VIA and DL9UGA he learned that the final A indicates an alternative address. However, there are other three letter calls ending in different letters and '4FB wonders what they signify.

B.R.S. 7594 has found the mornings poor but the evenings have produced short skip and occasional openings to Africa and, somewhat later, to South America. On phone, the following were heard: CR5SP, DI9AA, EA9DF, EA0AC (14140-1745), FM7WO, F9UC (Corsica), KR6OY, (14270-1800), OA4BT, TG9FV, VP2DL, 2DN, VU2, ZD1DO and ZC7DO (in Jordan, despite the peculiar call). VQ8AR, heard recently is in Chagos, which gives '7594 208 countries heard on phone. He reports that **G3CMH** (Yeovil A.R.C.) worked CT2BO on c.w. and VP6WR, VU2RC and YV5AB on phone. **B.R.S. 18017,** during breaks in the fine weather, unearthed signals from ZC7DO, CP1FX, TI2SJ, 3A2AW, VQ5 and a particularly nice one—W6GAL/7 (in Arizona)—on phone. CR6CZ, HS1D (1520), MD5FH and FF8AC were heard on c.w.

H. J. Hill, nearly up to the century mark on phone this year, was pleased to hear KZ5HC, HR1SO, VS6CW, TF5TP, VP5AK, HI8WF, OA, KR6, 9S4BS and EI3Y—a new one for him! He heard KA2AK (ex-KJ6AY) describe his four 813s in parallel! Supper chips are cooked over this impressive p.a. and the remaining r.f. is removed via a 4-element rotary array on a 97 ft. tower! (Amusing story but scarcely *amateur* radio.—Ed.) Other phone DX heard was from HP1HO, MP4QAH, VP3HAG, VE8QY (1450) and the consistent ZC5CF. **Dick Poppi** (Associate) is the lucky owner of a 200ft. long wire which works well to the Far East, as witness such c.w. DX as AP2K, CR9AH, DU9JO,, JA, KA, KR6, KX6AF, VS1, VS2, VS6, VS9AH, VU, W6TNG/KG6, ZC5VR, 5VS, CR4AH and ZD6BX. **B.R.S. 20133** has been hearing VQ4AQ acting as a kind of control station for ZC7DO who has caused such a stir recently. Others heard include KAs, CO8MP, ET2XX, KL7BCX, KZ5, VP2DN and

* *Roker House, St. George's Terrace, Roker, Sunderland.*

VP9. **B.R.S. 19894** mentions c.w. signals from JA and KA around 1330 with KH6 coming through between 0800 and 1000. He heard KF3AB (Fletcher's Ice Island) talking about a heat wave —one degree below zero!

Other c.w. stations heard were VE8PF (1830), VU2, VS6CT, VS9AS and CR9AF (1740), FY7YC (2130) and maritime mobiles LU0AC and LU0BAX. VK2PA was heard at 2145.

B.R.S. 20106, who is a keen observer of propagation changes, found 14 Mc/s the best band during the month and believes conditions are improving. On phone, he heard YS1MS (a welcome re-appearance), CP5AB, ZC7DO, HI6EC, YK1AH, W6GZZ (0340!), SV0WG (Rhodes) and plenty of Far Eastern DX. On c.w. he logged many JAs and KH6s as well as CR9AH, ZD6BX, LB8YB, HS1D, TG3HV, VK9AU, 3A2BB and LU1ZL and LU7ZO, both in Antarctica. The best "catch" was FO8AJ, missed by most of us. '20106 has heard 175 countries this year.

B.R.S. 20104 heard KB6AQ (1130), VP2AD, CR8AI (1850), ZC5VS (1700), MP4QAJ (Qatar), EA0AC, ZD1SS (genuine) and ZD6BX (ex-G3DFI and VS1BX), all on c.w. using an S740 and a tilted Windom. His score for the year is now around the 100 mark. **P. M. Crawford** heard a station signing FO8AJ on March 28 but unless it was '8AJ/MM it can't have been the real thing. However, he often hears AC4NC (14135) on phone, usually working MF2AA. AC4NC, incidentally, seems genuine enough. ZL2QI was heard to say VK4BQ will soon be operating from Rabaul (VK9).

Fifteen Metres

Although **G2TR** finds 21 Mc/s open almost every day for Africa and the Near East, the band is seldom very good. 'TR's best contacts of late have been with VU2EJ (1220) and MP4BBL (1245). **B.R.S. 20106** heard CR6AI and CR7CK on c.w. and CR6, CR4AI, 4AJ, EL2X, CX5AF, VP6WR and CE3CZ on phone. **B.R.S. 7594** logged phone from CE, CP5EK, CT3AN, KP4, KZ5, LU, TI2BX, 2RC, ZD4BL and ZS3. A particularly interesting "catch" was OD5BG/MM —Capt. Carlsen aboard the *Flying Enterprise II*. Short skip on 28 has been in evidence lately and '7594 heard VQ4AQ (on 21 Mc/s) say that he had had a number of contacts with Gs on 28, so the band may well repay watching. On 21 Mc/s phone, **G3CMH** worked CE2AY, CR6AG, FF8AK, LU8DB, OD5, PY, VP6, VQ2HW, VQ4, 5 and ZD4BL, while **B.R.S. 20133,** using an S640 and a 40ft. high Windom, heard 4X4BL, 4X4BK, YI3WH, ZS9G and VQ2WH on phone as well as W2EEJ—rather uncommon for the band just now.

VOLUNTEERS WANTED

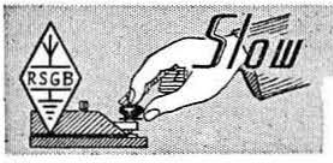
Can you spare 10 minutes of your time on the air each week for the benefit of newcomers? If so, you are invited to write —and write now—to C. H. L. Edwards (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex, giving full details of when you can transmit slow Morse on Top Band. Fifty volunteers are required immediately.

Forty Metres

Working DX on 7 Mc/s becomes more difficult than ever owing to the various extraneous noises, but there are some interesting signals to he heard nevertheless. **B.R.S. 19107** logged KG6AAY at 0750 while VS6CL, 6CT and 6CG were all good during the afternoons when working Europeans. **B.R.S. 20106** dug out VE7VE (0350), TI2PZ, LU7ZO, W5DJA, 5KWJ and 0WSM. **Dick Poppi** heard on c.w. both VK9AR and VU2AM. G3ATU was pleasantly surprised to be called by the latter at 2330.

Eighty Metres and Top Band

Only one report—from **B.R.S. 20106**—has been received on 3.5 Mc/s activities. Signals heard



Slow Morse Practice Transmissions

The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E. (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

†*Alternately.*

B.S.T.	*Call*	*kc/s*	*Town*
Sundays			
09.00	G3LP	1850	Cheltenham
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
22.30	G8TL	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
21.30	G3DBP	1915	Nottingham
Wednesdays			
19.00	G3GZA	1837.5	Bristol
22.30	G3FBA	1910	Bath
Thursdays			
19.00	G3NC	1825	Swindon
20.00†	G2CPS	1910	Hull, Yorks.
	G2CNX		
	G3GWT		
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3IIH	1900	Wirral
20.30	G3IMP	1920	Romford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED.

included those from ZL2FA and WN1ZYZ, 1YNP, 4EYZ, 4FBW and 9FJN. By the way, all WN calls are held by novices. After the first year, the N is dropped provided they pass the usual exams.

The 1.8 Mc/s band has now assumed its seasonal quiet, although **H. J. Hill** (Whitley Bay) did hear a new county in G3HEK (Salop.). Other good signals during daylight hours have been G3GGN, G8GI, G2BQC and G3GKV, all on an indoor aerial. **G3CMH** using both A1 and A3, has worked G, GD and GW.

DO NOT BE SORRY YOU MISSED NATIONAL CONVENTION —**BOOK THE DATES NOW!**

During a recent visit to London old timer HB9T showed G6CL his current log. It contained 17 pages of Top Band contacts—mostly with the U.K. HB9T uses a maximum of 10 watts. Incidentally he confirmed that the Swiss P. & T. department is prepared to grant Top Band licences on application. But apparently very, very few HB stations are interested in that band.

SV0WP (Crete)

Due to some misunderstanding, G3HLS, who originally agreed to handle U.K. cards for SV0WP, has received the complete log. After checking with A.R.R.L., who have assured him that they will accept the cards for DXCC purposes, 'HLS has generously agreed to provide confirmations for all contacts in the log.

Late News

G3ABZ sends news of "Chip" Chippendale, well known shortly after the war as ZP8AC while attached to the British Legation in Paraguay (he won the A.R.R.L. DX Contest (Telephony Section) in 1948). During his service in Brazil and San Francisco he was unable to operate but he is shortly joining the British Legation in El Salvador (as secretary to Capt. Holt of Korea fame) and hopes to obtain a YS call.

Middle Eastern DX is depleted by the return home of two well known operators. **YI3WH** is now G3WH once again but those needing **MP4QAH** have until the end of June to add Halul Island to their logs. The island is part of the Sheikdom of Doha which may eventually count as a separate country. So far as is known, there will be no amateur activity in that part of the world when 'QAH leaves. However, sometime after July 1, **G3BFC** (ex-MT2BFC and VQ6BFC) will be operating with a ZD3 call on taking up his duties at the Civil Airport, Bathurst, Gambia.

A station signing "VR6AC" has been working Ws and a few Europeans on 14 Mc/s. The West Gulf Club's *DX Bulletin* says that, as a result, W6MUR checked with ZK1AB who in turn cabled VR6AC on Pitcairn. The reply confirmed that '6AC is active but on 3924 kc/s phone only. He has never operated on 14 as his receiver only tunes up to 13 Mc/s!

A new station will be operating shortly from St. Mary's in the Scilly Isles on 3.5, 7 and 14 Mc/s c.w. using a B2 and a 136ft. long wire. At the moment the licence is awaited from the G.P.O.

* * *

And that is that for another month. Please send your reports for the July issue to arrive by June 20. Till then, good DX and 73.

New Amateur Licences

THE Society has been authorised by the G.P.O. to state that all first year licensees are now permitted to use input powers up to 150 watts on those bands where a maximum input of 150 watts is normally authorised. First year licensees will, however, continue to be restricted to A1 (c.w. telegraphy) operation.

Holders of an Amateur (Sound Mobile) Licence will also be permitted to use input powers up to 150 watts under the same conditions as those which apply to the Main Licence.

Whilst the G.P.O. do not at present propose to alter the terms of the new Amateur (Sound) Licence (it having just been printed) nevertheless they will not take action against a licensee who uses /P when operating a station in the open air.

Licence Examinations

THE G.P.O. announce that, provided there are sufficient candidates, Radio Amateurs' Examinations will be held on October 2, 1954, from 2.30 to 5.30 p.m. at the following centres:

Armour House, St. Martin's le Grand, London, E.C.1.

Radio Surveyor's Office, Custom House, Dock Place, Leith, Edinburgh 6.

Radio Surveyor's Office, Ministry of Transport and Civil Aviation Building, 2 Bute Place, Cardiff.

Applications, *which must arrive not later than September 4, 1954*, should be addressed to the Wireless Telegraphy Section, Radio and Accommodation Dept., Union House, St. Martin's le Grand, London, E.C.1, and must be accompanied by the entrance fee of £1 5s. in all cases. Postal orders and cheques should be made payable to the Postmaster General and crossed "a/c Payee."

If there are sufficient candidates, Morse tests will be held during the *first week in September* at the Head Post Offices in Birmingham, Cambridge, Derby, Leeds and Manchester. Application forms may be obtained from the Radio Branch, Radio and Accommodation Dept., Post Office Headquarters, London, E.C.1. Completed application forms, to which the entrance fee of 7/6 must be affixed in stamps, must be posted to arrive at Wireless Telegraphy Section, Radio and Accommodation Dept., Union House, St. Martin's le Grand, London, E.C.1, *not later than August 20, 1954*.

Careers in Radio and Electronics

A NEW illustrated booklet, "Careers in Radio and Electronics," can now be obtained from the Radio Industry Council, 59 Russell Square, London, W.C.1.

The booklet answers the question "What is electronics?" and shows diagrammatically the trainee's progress from school to the highest engineering and executive posts in the industry. In addition, useful information is given for young people who wish to be trained in electronics.

Volunteers are wanted to help man the Society's stand at the Earls Court Radio Show

The Rio de Oro Expedition

More than 100 Countries Worked in Twelve Days

By COUNT JUAN REPISO CONDE (EA2CA-EA9DE)*

FOR a long time, EA9DF and I had toyed with the idea of visiting Spanish Africa in order to give other radio amateurs throughout the world a chance to add cards from those territories to their DXCC collections.

The original intention was to make a start in November, 1953, but that plan had to be abandoned. At about this time EA9DF, who is a Lt. Colonel in the Spanish Air Force, was appointed to the Air Command of Spanish West Africa, Rio de Oro and Ifni. As my arrival actually coincided with this change in his status, all the arrangements had to be made single-handed. However, the change does ensure that Rio de Oro will be kept on the Amateur Radio map from Cabo Jubu because EA9DF is a first class c.w. operator.

As it was planned to use both phone and c.w. a Panda PR120V transmitter with its associated tuning unit, the ATU150, was purchased. The aerial was a 50 metres long wire. A Hallicrafters SX28 receiver completed the station. Owing to exceptionally strong signals from Europe on 14 Mc/s receiving conditions for DX were very bad —it seemed quite impossible to find a free kilocycle anywhere in the band!

Initially the station was on the air practically throughout the 24 hours with the result that by the end of the second day amateurs in more than 50 countries had been contacted on phone. When shortly afterwards 80 countries had been worked it became really difficult to add to the list! Even stations with exotic calls do not find it easy to make DXCC. Fortunately, 21 Mc/s helped—especially with African contacts, but 14 Mc/s was quite useless for this area.

Morning periods produced contacts with VK, ZL, VR4, KX and KG6. Signals from South America, particularly Argentina and Brazil, were very good on 14 Mc/s. Although Chile was difficult I was lucky enough to work CE2CC, 3AE, 3AG and 3AZ on 21 Mc/s. Asia was practically impossible on both 14 and 21.

Strange to relate, stations in the U.S.A. and Canada were extremely difficult to work and could only be raised between 2000 and 2200 G.M.T. This was a great disappointment as the trip had been delayed in order to coincide with the A.R.R.L. DX Contest. The first contact with U.S.A. was with W1MCW on 14 Mc/s phone on the first day. Ten other Ws were then worked on 21 Mc/s phone. However, conditions were never really good during the whole 12 days and as a result only 70 U.S. stations were worked on phone and 110 on c.w. The unlucky ones have the consolation that EA9DF is still a possibility.

I worked through one night on 7 Mc/s, mainly for the benefit of the Americans but generally speaking 14 and 21 provided most contacts. Europe was good, in fact *too* good on all bands! South America was good on 14 and 21, Africa bad on 14 but middling on 21, North America only fair and Oceania fair to good on 14 only.

Summing up, during the 12 days no less than

A view of the operating position. EA9DE is to the right of the picture, and EA9DF on the left.

102 countries were worked on phone and 110 on c.w.; 1,070 contacts were on phone including one solitary contact (with an Argentine station) on 28 Mc/s.

The coast of Rio de Oro is a paradise for the hunter and fisherman and I must admit I did not spend all my time on the air! One hunting expedition brought a bag of five gazelles and an antelope.

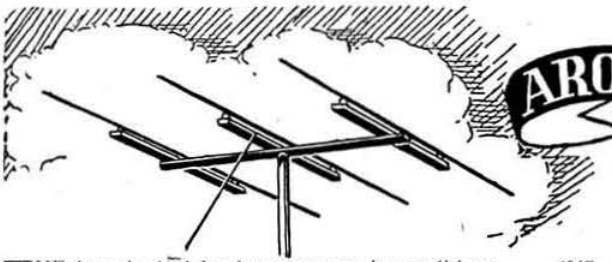
Now that the trip is over I should like to record my thanks for all the help received especially from the amateurs in Las Palmas, Canary Islands, who turned up in force at the airport.

All contacts will be QSLd on a card-for-card basis only. Cards may be sent *via* the Spanish Society, U.R.E., Box 220, Madrid.

A trip to Ifni, with the intention of trying to work 100 countries from there, is planned for the future; it is hoped that both EA9DD and EA9DF will be able to join the expedition.

(This article is based on some notes sent by Count Conde to Mr. George Webster, G5GK, of Panda Radio.—Editor.)

* *QSL via U.R.E., Box 220, Madrid, Spain.*



AROUND THE V.H.F.s

By W. H. ALLEN, M.B.E. (G2UJ)*

THE long looked-for improvement in conditions on the 2 m band had not materialised when this commentary was written, in fact for most of the period under review the results obtained were more like those to be expected in January than in May.

Admittedly things did improve between May 11 and 13, when there was a spell of warm weather associated with a high pressure system extending from Scandinavia to western France, but this improvement did not include the period set aside for the R.S.G.B. Two Metre Field Day (May 9), when conditions left much to be desired. Nevertheless activity in most parts of the country was satisfactory.

Several correspondents suggest that, owing to the prevailing tendency of operators to stay off 2 m until after TV hours, openings between 1930 and 2300 B.S.T. may well be going by unnoticed.

If, by care in the design of their transmitting equipment, 14 Mc/s enthusiasts can continue to operate during the ever-lengthening television hours then surely the majority of v.h.f. adherents should be able to do likewise, for the technical problems encountered are small in comparison. As mentioned more than once in this feature, the trouble is not TVI in the technical but in the programme sense which is depopulating our v.h.f. bands until the late evening. Again, why is a v.h.f. signal practically never heard in the day time? On the lower frequencies, Gs are on the air at any time of the day or night, but not on 2 m. As **G6LI** remarks, "Do you, personally, find it nice and handy to be anchored down to midnight as your only operating time? I don't. And another thing—read the old copies of *QST* and note when the longest DX contacts were made." We may well ask if all the pioneer work carried out by British amateurs on the v.h.f.s in the past —all the development of transmitters, receivers and aerial systems—is to be relegated to use only at contest times and to an hour or two around midnight.

Two Metre Station Reports

As a result of some intensive work with his new 50 watt transmitter and a 4-element w.s. Yagi **G3IUD** (Wilmslow, Ches.) has climbed well up the "Ladder" with 11 Regions, 112 stations and 4 countries to his credit, the two new countries being represented by GM2HCJ/P and EI6A. Some of the stations heard in Wilmslow, but which have not so far been worked, include G2BMZ, HIF, 3FIH, FRY, 5TZ/A, 6AG, RH and 8OU. GM3EGW was heard and called at midnight on May 10. G3IUD is on 144.48 Mc/s most evenings between 1830 and 2330 B.S.T. when conditions are good.

G3EMU (Canterbury) worked PA0BAL, 'CJP, 'NO and 'PAX on 'phone between 2200 and 2300 B.S.T. on April 29 with reports ranging from S5 to S8. All said that 'EMU was the only G station they could hear. During the second week of May he worked G2CZS, JF, 3ANB, BSU, HSM, INU, 4VP, 5MR, 8KW, F3LQ, ON4IE and PE1PL. ON4IE was an outstanding signal, closely followed by F3LQ who appeared to be unpopular locally as a female voice could be heard in the background complaining of TVI! G3FSD/P was worked several times recently from various places in south-east Kent.

The better conditions experienced in many parts of the country did not extend to the Channel Islands but several portables missed a GC contact on May 9 with **GC2FZC** who replied to G3BEX/P, 'EUQ/P, 'FRG/P and '4JJ/P without result, although G3FRG/P did answer and then apparently lost touch. On the 10th G3BNC and 'FIH were heard and on the 15th G6AG and '6NB. Apart from G5TZ/A, who is a terrific signal at all times, and the "locals" GC2CNC and GC3EBK, only G3JHM has been contacted recently.

B.R.S. 3003 (Coulsdon, Surrey), well known as an enthusiastic listener on other bands, is now on 2 m with an R.S.G.B. Converter made by G6JJ and a 3-element w.s. Yagi. Stations received in the nine days ending May 18 were G2AIW, 'HDZ, 'UJ/P, 3BEX/P, 'CWW/P, 'DIV/A, 'DVQ/P, 'FRG/P, 'FYY, 'GHS, 'GSM/P, 'HWJ, '4AU, 'HT, 5DS, 'NF, 'TP, 'TZ/A, 6AG, 'NB, 'RH and 8OU.

G8VN (Rugby) worked 33 different stations during the month. Among those whose signals were noticeably better were G2AIW, HIF, 3AOO, FAN and 5DS. EI2W was readable on May 11. It is pleasant to report the return to the band of **G3BJQ** (Rugby) after a long absence due to illness and to welcome **G3CRH** (nr. Lichfield).

A number of Belgian and French stations as far distant as Paris were heard by G6LI on May 12. A complete fade-out occurred at 2300 B.S.T. and no contacts were made. **G5BD** (Mablethorpe, Lincs.) was luckier with more French stations audible than for four years. Between 2100 B.S.T. and midnight he worked F3CA, 'DW, 'LQ, 8KF and 9MF and heard F8GH, 'JR and 'OB. G5BD's sked. with GM3EGW produced 21 contacts out of 21 attempts during the last month and now totals 125 QSOs with that station. On May 11 GM6KH (Hamilton, Lanarkshire) was worked, a station contacted by **G6XX** on April 28. **G3IOE** (Northumberland) is active on 144.3 Mc/s.

Apart from Field Day stations mentioned elsewhere, **G3WW** (Wimblington, Cambs.) worked G4GR (Monmouth) at 1900 B.S.T. on May 9 and G3BNC (Portsmouth) on the following evening. Also active were G3BKQ, 'CC, 'FAN, GGJ, 'IIT, 5TZ/A, 6RH and 6XM. A recent arrival on the band, G3FW (Market Harborough) was contacted on May 11 followed by the first QSO for some months with EI2W who was RS55/6 and gave 'WW RS57/9. Other stations active at the time were G2COP, 'FNW, 'HIG, 'HOP, 'IOO and 5MA.

G2CZS (Chelmsford) worked F3DW, F3LQ, F8KF and ON4IE on May 12 (all at S9) and G3GNJ (Bristol) and G5YK (Stow-on-the-Wold)

* *32 Earl's Road, Tunbridge Wells, Kent.*

on the 18th. In addition to his portable activities **G5MA** (Ashtead) has worked GW3GWA (Wrexham, Denbighshire) on two occasions and GW5BI (Cardiff) who has only recently arrived on 2 m.

G3FIH (Bath., Som.) worked 25 stations during the month and heard G2AIW, 'YB, 3BHS, 'EPW, 'HWF, 'IRA, 'YH, 4SA, 5MA, 'NF, 'TZ/A, 6NB, 'WF and GW8SU. EI2W and F8OB appeared during the good period from the 10th to 12th.

G5MR (Hythe, Kent) is now using a pair of stacked skeleton slots with reflectors, preliminary tests on which indicate that the gain is approximately that of the 4-over-4 w.s. Yagi beam previously employed but with the advantage of a wider forward lobe. A 12AT7 p.p. pre-amplifier now precedes and is link coupled to the converter and provides a worth-while improvement in signal to noise ratio. The 300 ohm feeder from the aerial is connected directly to the cathodes; the anode circuit consists of an 8 turn coil of 16 s.w.g. wire 7/16in. in diameter tuned by a split stator condenser. The cathode return circuit is through r.f. chokes to a bypassed 100 ohm resistor.

G3DO (Sutton Coldfield, Warks.) raised his score of countries worked to six by contacting EI2W and GW3GWA (Wrexham). **G2COP** is operating with a GW prefix from Caernarvon at week ends during the summer using 18 watts to a 4-element Yagi beamed mainly on the Midlands and London.

G3BW (Whitehaven, Cumbs.) is busy with an extensive rebuild of his station, but this has not prevented him from reaching 11 Regions, 53 stations and 4 countries in the Regional Ladder. His most distant contact this year has been G8OU; he is looking for stations in Cornwall and Suffolk.

A score of 359 stations worked in 14 Regions and 12 countries seems to belie **G5YV's** statement that he has not been so active this year due to pressure of business. So far the only Continental opening he has experienced was on March 17 when three Dutch and two Belgian stations were worked, a great contrast to the conditions which prevailed in 1953.

There should be three stations active shortly in the remote Shetland Isles—GM3ANG, 'HGA and 'HTH. **GM3ANG** expresses his gratitude to GM6WL and other amateurs who helped him and his colleagues to get on the band by donating 832-type valve-holders and in other ways. 3ANG will be on 144.18 Mc/s with an 829 final. **GM3BZG** (Wick) is building for 2 m and there is also a possibility of activity in Orkney. **GM3HGA** is trying, *via* 80 metre 'phone to persuade an OY station to come on the band.

G2XV hopes to operate portable from the summit of Snowdon towards the end of June or beginning of July on 2 m 'phone and c.w. with an input of 7 watts to a 3-element Yagi. Negotiations are still in progress and the exact date has not yet been settled.

News from Ireland

The period April 21 to May 12 showed some improvement in conditions although there were some poor patches. GM2HCJ/P was worked by **EI2W** on May 8, bringing his total of 2 m stations to 200. Excellent conditions prevailed on May 11-12, twenty stations being logged between 2210 and 0100 B.S.T. GC3EBK was heard but no contact was made. Among other stations worked by EI2W in the period mentioned were EI2A, 3L, 5Y, 6A, 9C, G2AK, BVW, COP, DCI, HGR, HIF, 3ABA/P, AGS/P, BW, CNY, CRH, CUZ, CVK, DO, FRY, GB/P, GWB/P, GZM, IER, IPH/A, IWJ, WW, 4SA, 5TZ/A, VN/A, YV, 6NB, WF, 8KL, ML, OU, SB, GI3GQB, 5AJ, GM3DIQ. G2BKQ and 3IUD were heard.

The R.S.G.B. Two Metre Field Day

The event was well supported in most parts of the country both by portable and fixed stations. In the London area, particularly, the band was alive with stations for the first two hours or so with considerable activity thereafter. Conditions were average with indications that they had been better between 0900 and 1100 B.S.T. In the north they improved towards the end of the contest.

Several long distance contacts were made with G2BAT/P (St. Agnes, Cornwall), this station figuring in the logs of G3AGS/P (nr. Rochdale), 265 miles, 2AHP, 3FIH, 3WW and GW2ADZ. G5MA/P (Rutland) worked G2DKH/P (Tow Law, Co. Durham) at 148 miles among 48 contacts.

G5ML/P (nr. Broadway, Glos., 1040 ft. a.s.l.) worked 35 stations of which 15 were portable, using an American Gonset transmitter with 5 watts output from a 2E26 into a pair of skeleton slots. He called G2HQ/P, UJ/P, 3BEX/P and DIV/P without success.

GM2HCJ/P (10 m. E. of Wigtown, Kirkcudbrightshire) assisted by SWL Frank Antley, made 15 contacts, three of which were over 200 miles. Most of these were with a six wave rhombic two wavelengths above ground and directed towards Liverpool and London which showed a worthwhile gain over the alternative 3-element Yagi for those stations in its line of shoot. G2AK, 3FSK, 4SA and 6NB were called without success.

GW3FKO/P operated for less than 4 hours and tried two sites near Cardigan. Only GW8SA was worked, G3APY/P, 'MA/P and GW8UH being heard on c.w. and G3HSD/P, 6NB and EI2W on 'phone. **G3AGS/P,** with G2ALN and 3RP, found conditions better than on previous Field Days. Their 8-element stack was damaged during erection and was replaced with a 2-over-2 with which they worked 19 portables including G3GOP/P (Corfe) from their site 1450 ft. a.s.l. No GM stations were heard apart from GM2HCJ/P who was extremely weak.

GM6WL/P, operated by members of the West of Scotland V.H.F. Group, had contacts with 15 of the 17 stations heard from an 800 ft. site, those outside Scotland being G3BW and GI5AJ. **GM3FGJ/P** was active near Bathgate.

G2UJ/P, manned by G4IB and G2UJ, was sited nearly 800 ft. a.s.l. near Woldingham, Surrey. G4JJ/P, G5YV and GW2ADZ were heard early in the contest but by midday conditions reverted to average. In all, 42 contacts were made, the best being with G5BM/P at 95 miles on 'phone. Input was about 5 watts and the receiver an R.S.G.B. type converter into a straight receiver. The beam was an Eddystone 4-element Yagi. **G3WW** worked 11 portables including G3EGW/P near Helmsley, Yorks. **EI2W** experienced good conditions in the morning and found GM2HCJ/P stronger than on the previous evening. There was a marked absence of signals from southern England.

G5YV worked GM2HCJ/P, 3DIV/P, 'HSD/P, 5BM/P and 6VX/P. G3BEX/P was called many times without result. Ten portables were contacted by **G8VN** but he failed to work G2HIF/P, 3GEI/P and 5MA/P. **G3FIH** succeeded in raising eight portable stations and heard G3APY/P, 'MA/P and 8QY/P.

Seventy Centimetres

G2XV (Cambridge) has heard or worked the following stations since January 1: G2BVW, 'FKZ, 'WJ, 3FUL, 'GDR, 'IOO, 5RD, 'UM and 'YV.

G2RD's report for the period April 22 to May

23 includes stations heard during the 420 Mc/s Contest: G2DD, 'DDD, 'FKZ, 'HDJ, 'HDY, 'HDZ, 'MV, 'RD, 'WJ, 'XV, '3BKQ, 'EOH, 'FP, 'FZL, 'GDR, 'HBW, 'IRW, 'JMA, 'JQN, 'MI, 4RO, 5CD, 'DS, 'DT, 'KH, 'RD, 'TP, 'UM, 6CB, 'NF, 8SK, 8SK/P, GW2ADZ and PE1PL.

GW2ADZ (Llanymynech, Mont.) recently received DL3FM on 435.24 Mc/s. The latter is using a QQV06-40 final and a 32-element stack. Comparative tests on 2 m and 70 cm have been carried out with G2FKZ who now has equal inputs on both bands. A 4X150A final is in use on the higher frequency. Conditions were not good at any time during the period April 18 to 30, with a maximum signal on 2 m of RST559 and considerable fading making communication difficult. On 70 cm the best signal recorded was RST589 with far less fading and an altogether more "solid" result. The times were 2000 to 2100 B.S.T. daily.

G5YV, employing a QQV03-20 tripler/final and a G2FKZ converter, has worked G2BVW, 3APY, BKQ, CCH, ITI, 5GX, GW2ADZ and GW5MQ and been heard by G2FKZ, 'XV, 3IOO and 6YP.

G2DD (Stanmore) worked PE1PL on sked on May 24 and 31, and G2DDD on phone during the 70 cm Contest.

At the Gauge and Toolmakers' Association Exhibition held recently in London, four well-known v.h.f. enthusiasts found themselves together from 10.30 a.m. to 7 p.m. each day. As their callsigns were G2DD, G2ADK, G2DBW and G3HNT it seems safe to assume that the most protracted v.h.f. meeting of all time took place! This item prompts us to ask who was the Midland v.h.f. worker who turned in early and slept blissfully unaware of "great goings on" at the Royal Hotel, Glasgow, on March 24?

The R.S.G.B. 70 cm Contest Preliminary Report

This report, based on observations by **G5CD** (Hendon, North London), does not purport to give a comprehensive view of the event. Activity was quite high at the commencement of the contest (2000 B.S.T. May 22), but by midnight most stations had closed down. The only apparently active stations outside the London area were G2XV (Cambridge) and G5TP (Stoke Row, Oxon.). Next morning G8SK/P (Dunstable) put in a good signal and activity, which was fair until lunch time, decreased in the afternoon and improved towards evening. By then few new stations were in evidence and most operators were making local contacts. G2DDD (Littlehampton), although inaudible to G5CD, was working all day. A number of stations were heard calling G3BKQ but few appeared to make contact. G2FKZ and GW2ADZ worked one another. G5CD had his new 4X150A final in operation running 100 watts input and would be interested to know if he was heard by any of the more distant stations.

* * *

There has been a most gratifying increase in the number of reports received this month and only lack of space has prevented some of them being quoted more fully.

It is particularly requested that reports for the July issue be sent as early as possible, and in any case by June 20, as the writer is commencing his vacation on June 24.

Moscow Press

A CORRESPONDENT informs us that English Press is transmitted from Moscow every evening on a frequency of 6740 kc/s at a speed of about 20 w.p.m. The transmissions, which are well received in the United Kingdom, are useful to those who wish to improve their Morse speed.

London Members' Luncheon Club

REAL DX, in the person of "Red" Fenton, who achieved fame a year or so ago by operating from Tristan da Cunha as ZD9AA, brought much added interest to the meeting of the London Members' Luncheon Club held at the Bedford Corner Hotel, Tottenham Court Road on Friday, May 21. Other visitors from abroad included H. E. F. Taylor (VU2AT), Melvin Litchfield (W6BGS) and Harry Wilson (EI2W). An especially warm welcome was also extended to Past President and Honorary Member W. A. Scarr (G2WS), who had just returned from India.

The Chair was taken by Stanley Vanstone (G2AYC), who had the support of the President (Arthur Milne, G2MI) and General Secretary.

With the approach of the summer season members of the Luncheon Club hope to welcome to their monthly gatherings many visitors from abroad. Next meeting—Friday, June 18, at 12.30 p.m. Reservations by card or telephone to May Gadsden at R.S.G.B. Headquarters (HOL 7373).

Medway Hamfest

THE annual Medway Hamfest will be held at the Franklin Rooms, Franklin Road, Gillingham, Kent, on July 18, commencing at 2.30 p.m. An excellent programme has again been arranged in addition to the usual monster raffle.

A steward will be on duty at Gillingham Station to direct visitors to the venue (two minutes walk from the station).

Tickets, price 1/6 (family tickets 2/6) may be obtained from W. E. Nutton (G6NU), 42 Richmond Road, Gillingham, Kent, or at the door. Refreshments, including drinks, free.

"Tops" Hamfest

MORE than 40 radio amateurs attended the Midland "Topsfest" held in Wolverhampton on April 24, 1954. An amateur station was in operation under the callsign G3IGK.

It is probably not generally known that the name of the Tops C.W. Club is derived from a shortened Lancashire dialect version of "The Operators," *i.e.*, "T'Ops."

Austrian Amateurs Licensed

THE first list of Austrian call signs to reach this country since licences were restored recently in that country shows that 27 had been issued up to May 7, 1954. The prefixes are OE1, 3, 6, 7 and 9.

Single Sideband Technique

Part III — Phasing-Type Equipment

By H. M. HUMPHREYS (GI3EVU)*

THE phasing system of generating a s.s.s.c. signal is a post-war development, and most of the credit for pioneering it for amateur communications purposes must go to Don Norgaard (W2KUJ). The system is based on a complicated mathematical theory which is not capable of satisfactory explanation in simple language, but fortunately the amateur is more likely to be interested in its practical application than in the theory itself.

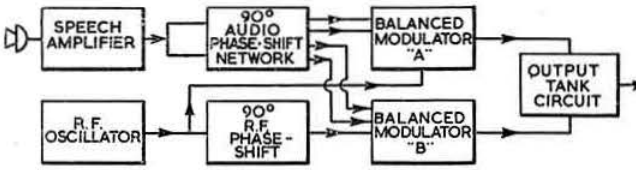


Fig. 15.—Block diagram of the phasing method of generating a single sideband signal.

A block diagram of a phasing-type exciter is shown in Fig. 15, from which it will be seen that the output of an r.f. oscillator is fed into a network in which it is split into two separate components, equal in amplitude but differing in phase by 90°. Similarly, the output of an audio amplifier is split into two components differing in phase by 90°. One r.f. and one audio component are combined in each of two balanced modulators. As was explained in Part I, the carrier is suppressed in both balanced modulators, and the sidebands alone appear at their anodes. The modulators are fed in parallel to a common tank circuit, where their outputs add. The relative phases of the sidebands produced by the two balanced modulators are such that one sideband is effectively balanced out, while the other is augmented, so that the resultant in the combined tank circuit is a single sideband suppressed carrier signal.

Balanced Modulator Design

In the phasing system, the choice of balanced modulators largely dictates the requirements of both r.f. and a.f. sections of the exciter, and will therefore be examined first. There is infinite scope for variety in balanced modulator design. On basic points alone, the input circuit can be in push-pull and the output in parallel or vice versa; the valves used may be anything from triodes to heptodes; and the modulators may operate at any desired power level, so that valves ranging from 6SA7s to 813s may, in theory, be used with equal success. It is patently impracticable to discuss the pros and cons of all possible variations in anything approaching detail, so the observations which follow will be confined to the conclusions drawn from a fairly extensive series of experiments on balanced modulators.

On the question of whether it is better to apply r.f. excitation to the grids in push-pull or parallel, it may at once be said that identical results can be achieved with both systems if they are properly adjusted. As there are two balanced modulators involved, however, it can be quite difficult with push-pull input to maintain the correct phase relationships at the grids and to ensure at the same time that each of the four valves receives identical excitation. In addition, the modulator with push-pull input appears to be slightly more difficult to balance initially. It is also more susceptible to drift caused by thermal and other stray effects than is its parallel-input counterpart. On the whole, the balanced modulator with parallel connected grids and push-pull anode circuit is to be preferred, as it gives greater stability and simplifies associated r.f. circuitry.

There is nothing to choose between the carrier balance obtainable with triodes and multigrid valves, so the final selection may be based principally on the power output desired from the balanced modulator. Such details as the convenience with which the push-pull audio signal may be fed in, or the facility with which matched pairs of valves may be obtained may also influence the choice. Very high gain pentodes are best left alone, as they are prone to instability, and it is advisable to use valves which require only a modest amount of r.f. excitation and audio input. On the other

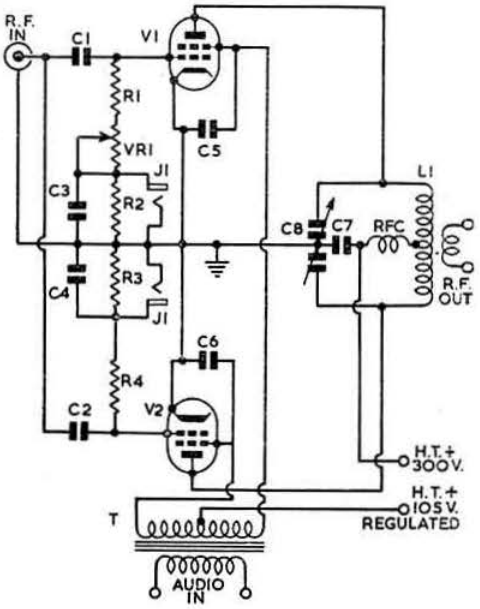


Fig. 16.—Tetrode Balanced Modulator. C1–7, 0.001 μF, mica; C8, 350 μμF per section, two-gang receiver type; J1, 2, open circuit jacks; L1, to resonate in desired band, centre-tapped; R1, 10,000 ohms; R2, 3, 100 ohms; R4, 15,000 ohms RFC, 2.5 mH r.f. choke; T, see text; V1, 2, 6BW6 or equivalent; VR1, 10,000 ohms variable.

* 94 *Locksley Park, Finaghy, Belfast.*

hand, valves such as the 6SA7, which need only a very small amount of r.f. excitation, may give rise to difficulties in measurement unless elaborate test equipment is available. With this type of valve in the balanced modulator, overdriving is disastrous to balance. Constructors will find that if nothing smaller than a 6J5 and nothing larger than a 6V6 is used, building a balanced modulator will be quite simple. As was said earlier, there is nothing to choose between triodes and tetrodes, but the fact that the screens may be used for audio input may be a point in favour of tetrodes, as it leaves the control grids free for r.f. alone.

A Practical Design

The tetrode circuit shown in Fig. 16 is the author's favourite arrangement. Although 6BW6s are suggested in the components list, the equivalents 6V6GT and 6AQ5 will work equally well. Indeed there is no reason why the circuit should not be just as satisfactory if any small pentode or beam tetrode were substituted. The audio transformer is not particularly critical, but it should have a good low frequency response so that it will not introduce unwanted phase shifts and thereby spoil the good work done by the preceding audio phase shift network. The ratio of the primary to each half-secondary should be approximately unity. The Woden DT1 is excellent; a "surplus" American component bearing the code number 901379 has been used with equally good results. There are no doubt many other transformers which would serve just as well.

R.F. excitation should be adjusted until a negative bias of approximately 10v is obtained at the grids of both valves. This corresponds to a grid current of 0.7 mA per valve, which may be measured by inserting a plug connected to a milliammeter in J1 and J2. If a valve voltmeter is available, the voltage may be measured directly at the grids, and the circuit simplified by the omission of R2, R3, C3, C4, J1 and J2. With excitation applied, and C8 tuned to resonance, the balance control VR1 should be adjusted for minimum output. The indicator shown in Fig. 13 (Part II of this series) is convenient for measurement.

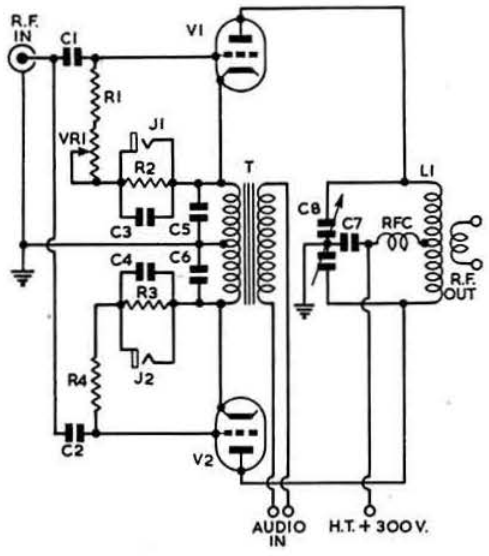


Fig. 17.—Triode Balanced Modulator. V1, 2, 6C4, ½-12AU7 or equivalent. All other values as in Fig. 16.

Provided that the valves match reasonably well, a null of at least 30 db below the maximum should be obtainable. If it is not, another pair of valves should be tried. Even with a good pair, it is unlikely that a perfect balance will be obtained, and some readers may care to see if they can improve things still further by experimenting with padding condensers across each half of C8. Mica compression trimmers are ideal. If padders are used, they should be adjusted differentially, and great care should be taken to ensure that the output circuit is always tuned to resonance, otherwise misleading results will be obtained Most amateurs will find it quite unnecessary to add padders, because the simple circuit can be relied upon to give as much carrier suppression as is required for practical transmitting purposes.

The author's stated preference for tetrodes does not imply that triodes cannot be used with equally good results. Indeed, if difficulty is found in obtaining matched pairs of tetrodes, it might be preferable to use twin triodes, as their individual sections appear to be inherently better matched than single valves It may be coincidence, but out of 14 twin triodes (6SN7s and 12AU7s) tested, only one failed to give adequate carrier suppression in a balanced modulator. The problem with triodes in the more common designs is to keep r.f. and a.f. circuits from interacting with one another. The circuit in Fig. 17 gets around this difficulty by feeding the audio in at the cathodes, leaving the grids free for r.f., thus obviating the need for r.f. chokes and several blocking condensers. Component values and excitation requirements are happily identical to those of the tetrode balanced modulator in Fig. 16, and the same adjustment instructions apply.

R.F. Phasing

With r.f. being fed into the balanced modulator grids in parallel, the problem of achieving exactly 90° phase difference between the exciting voltages becomes quite simple. The so-called "low-Q" network, which is really an application of one of the basic principles of a.c. theory, is ideal for amateur use. The theory is that when an alternating voltage is applied to a resistance and a reactance in series, the voltage at the junction of the components will lead or lag behind the applied voltage, dependent on whether the reactance is inductive or capacitive. If this verbal explanation leaves you cold, don't be discouraged; just have a look at the sketches in Fig. 18. The capacitive case is shown in Fig 18a, from which it will be seen that the angle of lag (α) depends on the ratio of reactance (Xc) to resistance. Looking at it trigonometrically,

$$\tan \alpha = \frac{R}{Xc}$$

Similarly, in Fig. 18b, the angle of lead (θ) is such that

$$\tan \theta = \frac{R}{X_L}$$

It is quite obvious that with this arrangement a 90° shift cannot be obtained with one pair of components. Let us therefore see what happens if we use two networks — a resistance-capacitance to cause a lag of 45°, and a resistance-inductance to cause a lead of 45°. This is shown diagrammatically in Fig. 19. It is clear that the voltages at A and B will be 90° out of phase with each other. Doing the job in two halves has another important advantage. As $Xc=R$, and $X_L=R$ also, it follows that Xc must equal X_L and therefore the amplitude at A will be exactly the same as at B. The applica-

tion of this in practice is quite simple The input is connected to an r.f. source of appropriate voltage, and points A and B are connected (*via* blocking condensers) to the grids of two balanced modulators. The input capacitance of the valves must not be forgotten, however. With triodes, Miller effect can cause this to be quite high. In the practical case, input and stray capacities must be compensated for by reducing C and by increasing L until a 90° shift is obtained and at the same time equal excitation is given to both modulators. A practical application of the low-Q network appears in Fig. 25. One word of caution should perhaps be sounded about this method of r.f. phasing. It becomes very tricky to adjust at high frequencies, and for really stable results the author recommends that it should not be used above 7 Mc/s. Bandswitching of L and C, which would otherwise seem to be an attractive proposition, is not really practicable. The subject of bandchanging in single sideband transmitters will, however, be dealt with more fully later.

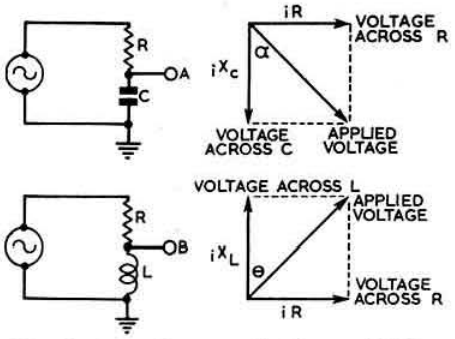


Fig. 18.—Reactance Diagrams: (a) RC case; (b) RL case.

It will now be clear that correct excitation voltage for the balanced modulators depends on the amplitude fed into the phase shift network. This may be adjusted by tapping the input lead of the network on to an r.f. tank circuit at an appropriate point. If the modulators do not draw enough grid current, the tapping should be moved by a few turns at a time until the optimum excitation is obtained. The tapping should be moved towards the earthy end of the coil if the original setting gives too much grid current. Fig. 20 shows how the connection may be made directly to an anode tuned circuit, but any of the commonly used systems, such as link coupling to a separate grid tank circuit, may be used equally effectively.

Audio Phasing

Unfortunately, it is not so easy to obtain the necessary phase shift over the total audio frequency range to be used. In practice, it is not necessary to obtain the ideal shift of 90° over the complete audio range, which is just as well, because it would be quite impossible. W2KUJ has shown[1] that if between 88° and 92° shift can be maintained over the desired frequency range, the resultant sideband suppression will be more than adequate for amateur communications purposes.

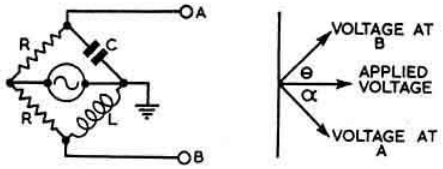


Fig. 19.—Low Q phase-shift network.

Many circuits have been published but these may be divided into the following two main classifications

(1) the "passive" type which employs resistances and condensers only, and

(2) the type in which valves are used as phase splitters and therefore play an essential part.

There is a third hybrid version, in which valves are used to isolate the various RC phase-shifting elements, but they neither play any part in the operation of the network nor facilitate its adjustment. If there is an advantage in this, it eludes the writer.

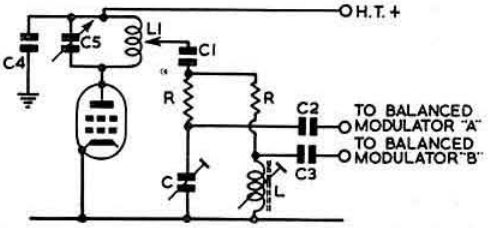


Fig. 20.—Practical method of feeding low Q network. C1, 4, 0.01 μF; C2, 3, 0.001 μF; R, 300 ohms; C5, L1, existing tank components to resonate at desired working frequency. C and L have to be selected to have a reactance of 300 ohms at the working frequency.

The advantages of the "passive" network are its cheapness and the fact that it may be set up with a minimum of test equipment. The network was originally described by Dome in 1946[2] and has not been significantly modified since. Perhaps the most suitable version of the system for the amateur constructor is that suggested by W2UNJ[3]. In this network, advantage is taken of the fact that ordinary resistors and condensers vary up to 20% from their nominal values. Using an accurate resistance/capacity bridge, components of suitable values may be picked from standard stock items. The circuit of the network is given in Fig. 21, and component values appear in Table II. The network proper consists only of the components inside the dotted enclosure; the valve,

TABLE II
COMPONENT VALUES – DOME PHASE SHIFT NETWORK

COMPONENT	NOMINAL VALUE	MEASURED VALUE
C53	·001 μF.	·00105 μF.
C54	·03	·0285
C55	·006	·0063
C56	·005	·00475
C57	·002	·0021
C58	·01	·0095
R53	100 k ohms	95·3 k ohms
R54	15 k	15·9 k
R55	15 k	15·9 k
R56	100 k	95·3 k
R57	47 k	50 k
R58	47 k	50 k

transformer and other components are, however, necessary for incorporating the network into the design of a complete exciter which appears later in this article. The nominal value of each of the network components is shown in column 2 of the table, and the actual value which has to be selected by measurement appears in column 3. In certain cases, the exact values required may have to be made up by connecting two or more components in series or parallel, but the important thing is to get as close to the figures in column 3 as is practicable. It is, of couse, realised that

good resistance/capacity bridges are not normally found in ham shacks — but most dealers have them. The moral is obvious: if you want to build this network, the very first step is to find a co-operative dealer—the kind who will let you loose amongst his stock of resistors and condensers with his bridge. The alternative is to order specially selected components from a dealer who offers that kind of service. Unfortunately, there are not many who do, and they have to charge for their help, which puts the cost of the parts up rather steeply.

may, of course, be substituted, or eight equivalent single triodes may be used instead, but high-μ valves with short-grid bases should on no account be used, as they cannot be relied upon to work satisfactorily in this application. Some so-called "simplifications" of this circuit have appeared in which R103, R105, R106, C102 and C103 were omitted. These components are most important, as they fix the standing voltages on the grids of V101, V102, V105 and V106 at such a point that these valves work on the straight portion of their characteristic curves. On no account should they

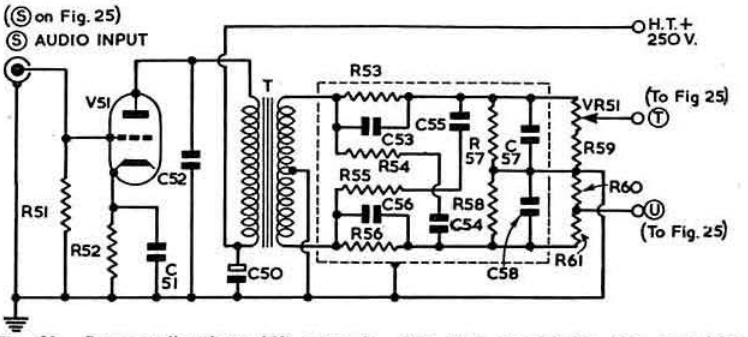


Fig. 21.—Dome audio phase-shift network. C50, 8 μF, electrolytic; C51, 5 μF 50 V, electrolytic; C52, 0.004 μF mica; R51, 59, 470,000 ohms; R52, 1,000 ohms; R60, 680,000 ohms; R61, 330,000 ohms; T, audio transformer, approximately 1 : 2 (Woden DTI or similar); V51, 6C4, 6J5, ½-12AU7 or ½-6SN7; VR51, 500,000 ohms, variable. For other component values, see Table II.

Obtaining the components is by far the hardest part of building the Dome network. The physical layout is immaterial, but really professional-looking results may be obtained by mounting the condensers and resistors on a tagboard or indeed on any piece of paxolin which will fit inside a large-size i.f.-type screening can. Colour-coded flying leads are ideal for input and output. When built, the network needs no adjustment, and will give first-class results over an audio range of approximately 150-3500 c/s. With a push-pull audio input of about 10 volts (that is, about 1 volt to the grid of the triode shown in Fig. 21) the output is sufficient to drive a pair of small audio valves such as 6BW6s and N78s These in turn will provide enough audio to feed 6BW6 or 12AU7 balanced modulator valves without further amplification.

It was stated in an earlier paragraph that the audio excitation to both balanced modulators must be equal in amplitude as well as 90° out of phase. This is taken care of by the fixed potentiometer R60 R61, and the variable one made up of R59 and VR51. Instructions for setting VR51 are included in the section on adjusting the complete exciter of Fig. 25.

If the frequency coverage of the simple RC network is not thought sufficiently wide, the valve-type phasing unit will have to be used. Many variations of this unit have appeared in print, but the best of them all is unquestionably that described by W2KUJ[4]. There are others which at first glance may appear cheaper or less complicated, but this is the only one which can be guaranteed to work well over quite a wide h.t. voltage range. Unlike most of the others, an elaborate electronically stabilised power supply is not called for. Properly adjusted, the W2KUJ network is capable of a minimum of 40 db attenuation of the unwanted sideband over a frequency range of 70-5500 c/s. This should satisfy even the most discriminating operator.

The circuit is given in Fig 22, from which it will be seen that four 12AU7s are used. 6SN7s be left out. The potentiometers R101, R102 and VR101, R104 are for the purpose of enabling audio amplitude balance to be obtained when aligning the completed exciter.

The values of the pairs of resistors in the anode and cathode circuits of each valve are fairly critical. A departure of up to 1% from the nominal values shown in Fig. 22 will not affect performance, but it is imperative that each pair should match as closely as possible. Certainly a mismatch greater than ½% cannot be tolerated. Matched pairs can easily be selected from standard high-stability close-tolerance components by means of a good bridge. High-stability components are, of course, essential for long-term stability. The inter-valve resistors R109, R112, R115, R121, R124 and R127 should also be high-stability components, and the associated condensers C104, C106, C107, C109, C111 and C112 should preferably be silvered mica, paralleled by mica compression-type trimmers. Although certain combinations are suggested, any suitable alternatives may be used as long as the correct values are finally obtained. All these condensers should be tested for leakage, and any which do not read infinity should be discarded as unsuitable for this particular application.

Construction should not present any particular difficulty, but anyone building one of these units for the first time might understandably have misgivings about the large numbers of components which have to be interconnected. These misgivings may be dispelled by adopting a symmetrical layout, by leaving a fair amount of space, and by mounting the trimmer condensers on a small panel on small pillars. The wiring should be solid and substantial, and above all none of the phasing components should be hung in the wiring so that it can move about and subsequently upset alignment. A particular layout is not important, the one really important point being to leave free access to the cathode socket tags of all four valves, because these will later be used as alignment points. It is also advisable to reduce the

possibility of hum pick-up by running the network and its associated a.f. pre-amplifier from a centre-tapped heater winding. This should be a separate winding from that serving the r.f. and balanced modulator valves.

The main drawback with this network is that it cannot be set up by component measurement, and access to good test equipment is necessary. An audio oscillator and an oscilloscope are required. The audio oscillator must be particularly free from harmonic distortion, and be capable of being adjusted very accurately to certain required

connected to the input of the network, and a signal of one or two volts amplitude inserted at a frequency of 10,840 c/s. *Both* oscilloscope leads should be connected to the point marked A in Fig 21. If the oscilloscope is free from phase shift, a straight line, canted at 45°, will then appear on the screen. The appearance of an ellipse indicates phase shift. In most cases this may be corrected by connecting a 1 Megohm variable resistor in series with one or other of the leads, and adjusting until the ellipse merges into a straight line. Should the shift be really bad,

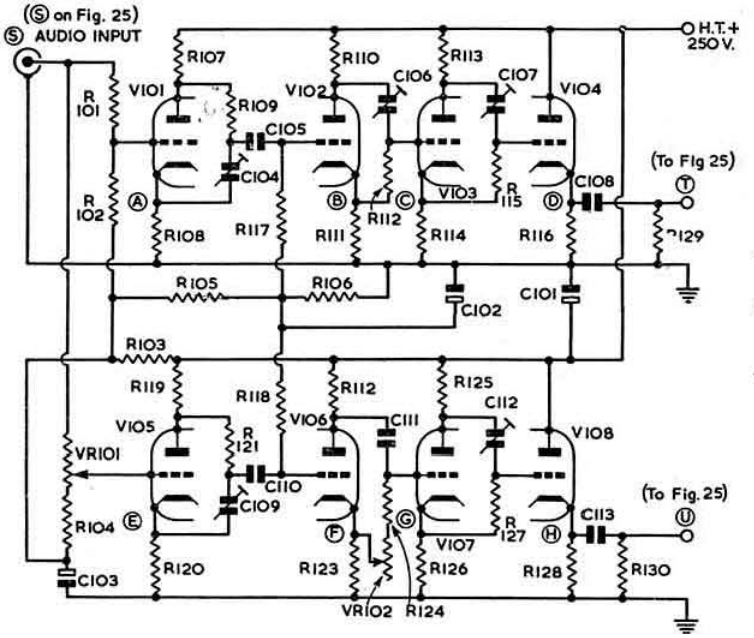


Fig. 22. — W2KUJ audio phase-shift network.

frequencies. Apart from this, the requirements are not exceptionally stringent, and a simple but effective oscillator which may be constructed quite cheaply will be described in Part IV of this series. If one is available, a really good commercial audio oscillator is ideal. Before being used for s.s.s.c. alignment purposes, however, it should be checked for wave-form purity at the l.f. end of the scale. Several fairly expensive instruments which the writer has handled could not pass the test. The oscilloscope should have high quality amplifiers, preferably in push-pull, in both vertical and horizontal circuits. The design of such an instrument is beyond the scope of this series of articles, but the simple instrument described by Tusting in the June and July 1952 issues of *Wireless World* can be confidently recommended.

The procedure for aligning the network is straightforward. The audio oscillator should be

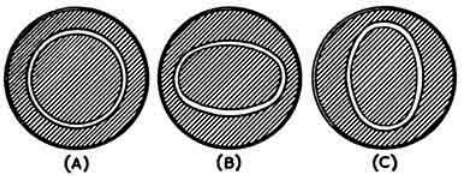


Fig. 23.—Oscilloscope patterns for 90° phase-shift conditions.

(a) X and Y amplification equal.
(b) Y amplification greater than X amplification.
(c) X amplification greater than Y amplification.

Components List for Fig. 22

C101	100 μF, 350 V, electrolytic
C102, 103	25 μF 25 V, electrolytic
C105, 108, 110, 113	0.1 μF paper.
C104	300 μμF adjustable (200 μμF 1% silver mica+200 μμF trimmer)
C106	2,200 μμF adjustable (2,000 μμF 1% silver mica+500 μμF trimmer)
C107	1,600 μμF adjustable (1,500 μμF 1% silver mica+200 μμF trimmer)
C109	600 μμF adjustable (500 μμF 1% silver mica+200 μμF trimmer)
C112	800 μμF adjustable (700 μμF 1% silver mica+200 μμF trimmer)
C111	9,000 μμF fixed (5,000 μμF+4,000 μμF 1% silver mica)
R101, 106	22,000 ohms, ½ Watt 20%
R102	82,000 ohms, ½ Watt 20%
R103	330,000 ohms, ½ Watt 20%
R104	47,000 ohms, ½ Watt 20%
R105	10,000 ohms, ½ Watt 20%
R117, 118	2,200 ohms, ½ Watt 20%
R129, 130	470,000 ohms, ½ Watt 20%
R107, 108, 113, 114, 119, 120, 125, 126	4,000 ohms 1% high stability
R110, 111, 122, 123	3,000 ohms, 1% high stability
R116, 128	5,000 ohms, 1% high stability
R109	50,000 ohms, 1% high stability
R112, 124, 127	500,000 ohms, 1% high stability
R115, 121	100,000 ohms, 1% high stability
V101-108	6J5, ½-12AU7 or equivalent
VR101, 102	50,000 ohms potentiometer

it may be necessary to supplement the resistor by a small condenser (50-200$\mu\mu$F) across the input. When phase shift is completely eliminated, *but not before*, one of the leads should be transferred to point B. C104 may then be adjusted

TABLE III		
OSCILLOSCOPE INPUT TO POINTS	AUDIO CHECK FREQUENCY	ADJUST
A and B	10,840 c/s	C104
B and C	140 c/s	C106
C and D	997 c/s	C107
E and F	2,710 c/s	C109
F and G	35 c/s	VR102
G and H	382 c/s	C112

to give a phase shift of 90°, which, if both oscilloscope amplifiers have equal gain, will be indicated on the screen by a perfect circle. If both amplifiers do not have equal gain, the pattern will be an ellipse, but as long as the major and minor axes are in the vertical and horizontal planes, that is just as good. This is clearly illustrated in Fig. 23. All three diagrams show patterns obtainable under 90° phase-shift conditions.

When C104 has been adjusted, the audio oscillator should be set to 140 c/s, and both leads placed on point B. If phase shift in the scope amplifiers is indicated by the presence of a narrow ellipse rather than a straight line at 45°, it should be corrected as previously described. One of the leads should then be moved to point C, and C106 adjusted until one or other of the patterns of Fig. 23 indicates the 90° shift which is wanted. By this time, the constructor will be getting the hang of the procedure, and should find no difficulty in making the remainder of the adjustments as indicated in Table III.

If the oscilloscope amplifiers have negligible phase shift, a final check may be made by connecting the leads to points D and H. The 90° indication should then be obtained over the total frequency range of 70-5500 c/s.

Amplitude balance is controlled by VR101, instructions for the adjustment of which are included in the section on the final alignment of the complete exciter of Fig. 25.

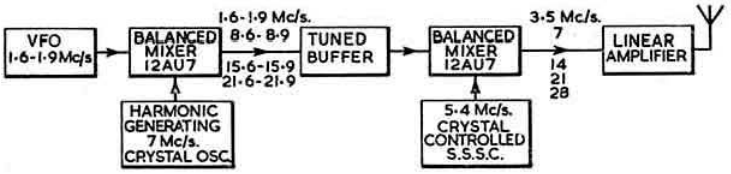


Fig. 24.—Block diagram of band switching system for use with s.s.s.c. exciter.

Band Changing

The foregoing paragraphs contain most of the information necessary to enable a first class single sideband exciter to be constructed, but there is one final point to decide. It concerns the frequency of output. The low-Q phase shift network will give good results over a range of about ± 1% on either side of its centre frequency; that is, a unit adjusted accurately to 3750 kc/s will show no appreciable deterioration of performance if it is used anywhere between 3700 and 3800 kc/s. If single band working only is required, the obvious thing is to simplify the rig by driving the exciter by a v.f.o. of limited range in the desired band. If, however, multiband operation is contemplated, the s.s.s.c. exciter is best designed with crystal controlled drive at a frequency somewhere in the region of 5.4 Mc/s. The 5.4 Mc/s output may subsequently be heterodyned to any required band by an arrangement on the lines of that shown in the block diagram in Fig 24. The exciter shown in Fig. 25 covers both contingencies; the only difference between 3.75 and 5.4 Mc/s output lies in the coil L, for which alternative values are given. The output circuit, L1 C8, will resonate at either frequency, and the phasing condenser C has sufficient range to allow it to cover both outputs.

Complete Exciter

The circuit diagram of a simple but effective exciter which incorporates the principles already described is given in Fig. 25. Tetrode balanced modulators are shown, but the substitution of triodes, on the lines of Fig. 17, should present no difficulty. The audio phasing network is shown in block form only, but the circuit of either Fig. 21 or Fig. 22 may easily be incorporated by reference to the coded points on the diagrams. The audio amplifier gives enough gain for any of the popular crystal microphones, and both high and low frequencies are suitably attenuated by selection of appropriate component valves. The writer has found the layout of Fig. 26 to be convenient, but this arrangement is not claimed to have any particular merit. Any logical placement of valves and components should give identical results. The switch S1 in Fig. 25 is the only control whose function has not been previously explained, and it simply reverses the phase of the audio excitation to one of the balanced modulators, thereby allowing the upper or the lower sideband to be radiated at will. The switch has, however, a third position, in which only one of the balanced modulators operates. This produced a double sideband suppressed carrier signal, which, although useless for communications purposes, is ideal for aligning linear amplifiers as will be shown in Part IV.

When the exciter has been wired up and the

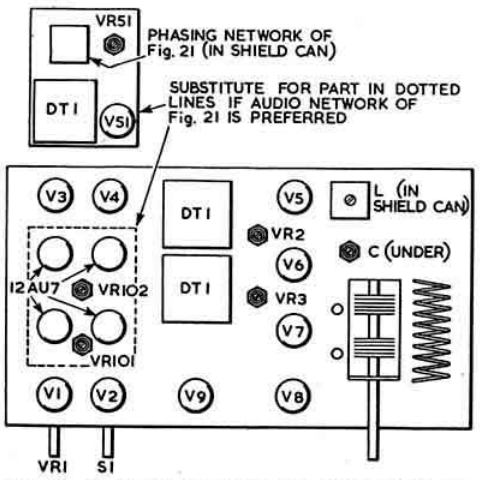


Fig. 26.—Suggested layout for the exciter of Fig. 25.

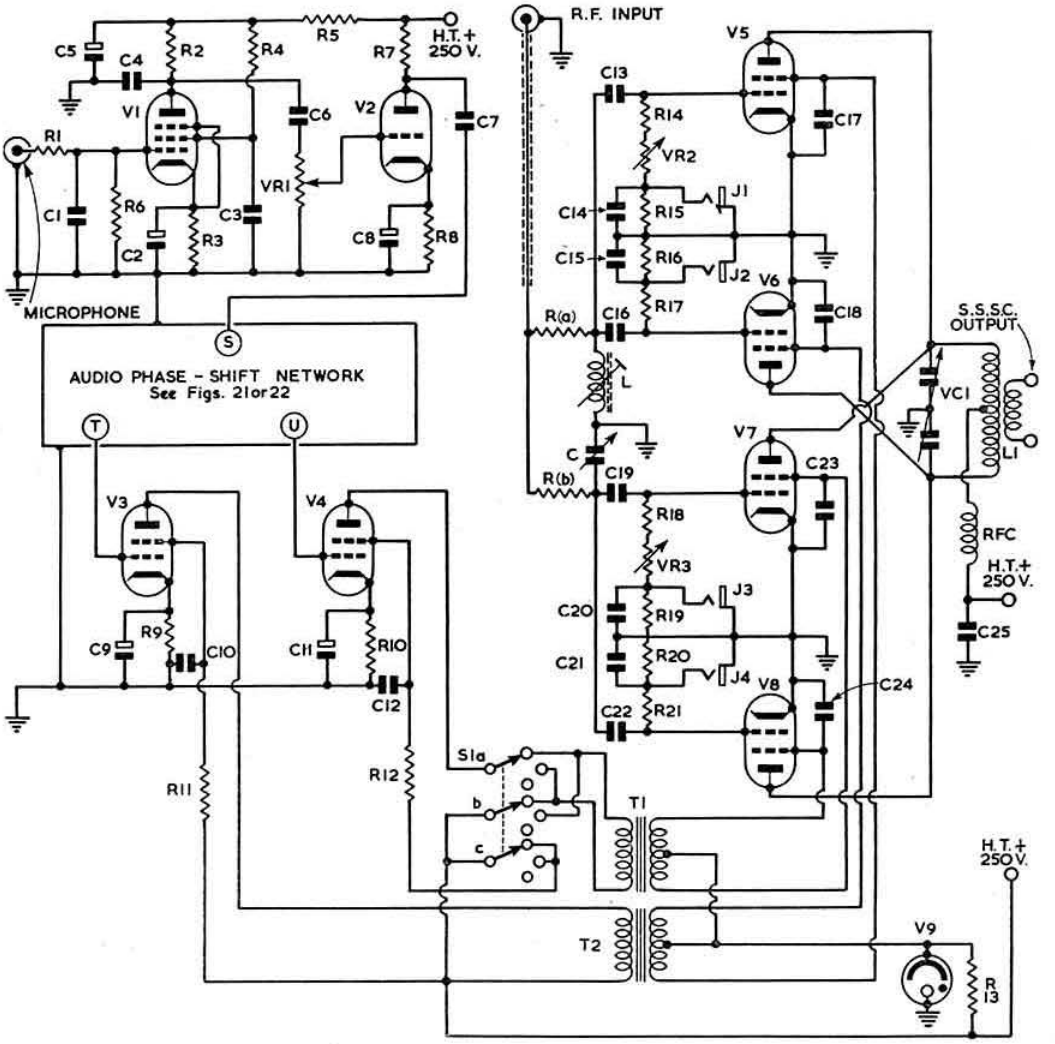


Fig. 25.—Circuit diagram of a practical single sideband exciter for multi-band operation.

Components List for Fig. 25

C	150 $\mu\mu$F air trimmer
C1	100 $\mu\mu$F mica
C2, 8,	5 μF, 50 V, electrolytic
C3, 10, 12	0.1 μF paper
C4	300 $\mu\mu$F mica
C5	8 μF 350 V, electrolytic
C6	0.002 μF mica
C7	0.005 μF mica
C9, 11	50 μF, 50 V, electrolytic
C13–25	0.001 μF mica or ceramic
L	**3.5 Mc/s:** 22 turns, 30 s.w.g. enam., closewound on $\frac{1}{2}$in. diameter former **5.4 Mc/s:** 18 turns, 30 s.w.g. enam., closewound on $\frac{1}{2}$in. diameter former
L1	24 turns, 18 s.w.g. enam., centre-tapped, wound 16 turns per inch, $\frac{1}{2}$in. diameter, 3 turn link
R(a)=R(b) ±1%	330 ohms, 1 watt
R1, 7	100,000 ohms, $\frac{1}{2}$ watt 20%
R2	220,000 ohms, $\frac{1}{2}$ watt 20%
R3	1,000 ohms, $\frac{1}{2}$ watt 20%
R4	1 Megohm, $\frac{1}{2}$ watt 20%
R5	22,000 ohms, $\frac{1}{2}$ watt 20%
R6	2.2 Megohms, $\frac{1}{2}$ watt 20%
R8	2,200 ohms, $\frac{1}{2}$ watt 20%
R9, 10	220 ohms, 1 watt 20%
R11, 12, 14, 18	10,000 ohms, $\frac{1}{2}$ watt 20%
R13	7,500 ohms, 10 watts
R15, 16, 19, 20	100 ohms, $\frac{1}{2}$ watt 20%
R17, 21	15,000 ohms, $\frac{1}{2}$ watt 20%
RFC	2.5 mH r.f. choke
S1a, b, c	3-pole 3-way rotary switch
V1	6BR7
V2	6C4 or $\frac{1}{2}$-12AU7
V3, 4, 5, 6, 7, 8	6BW6
V9	VR105
VC1	350 $\mu\mu$F per section, two-gang receiver-type
VR1	500,000 ohms potentiometer
VR2, 3	10,000 ohms potentiometer
J1–4	Open circuit jacks

audio phasing section checked, r.f. excitation should be adjusted to give about −10 volts at all balanced modulator grids in the manner described in the section on r.f. phasing. When VC1 has been tuned to resonance, and the carrier balanced out by adjustment of VR2 and VR3, the exciter is ready for final lining up. The only really satisfactory way of doing this is to use an oscilloscope. This need not be the elaborate affair which is required for adjusting the audio phasing network of Fig. 22, and the inexpensive instrument to be described in Part IV of this series will be adequate. With an audio oscillator injecting a sine wave of about 1000 c/s into the speech amplifier, the oscilloscope should be coupled to L and the pattern examined. It will probably look like Fig. 27a, which indicates both amplitude unbalance and incorrect r.f. phasing. The r.f. phasing controls L and C should then be adjusted until something like Fig. 27b appears on the screen. This shows that correct phasing has been obtained, but that amplitude balance is still not right. This should be corrected as far as possible by adjusting the a.f. amplitude balance control; VR51 of Fig. 21 or VR101 of Fig. 22. The r.f. phasing controls L and C should then be adjusted against each other, a little at a time, thus altering the relative amplitudes of the excitation to the two balanced modulators, but maintaining the

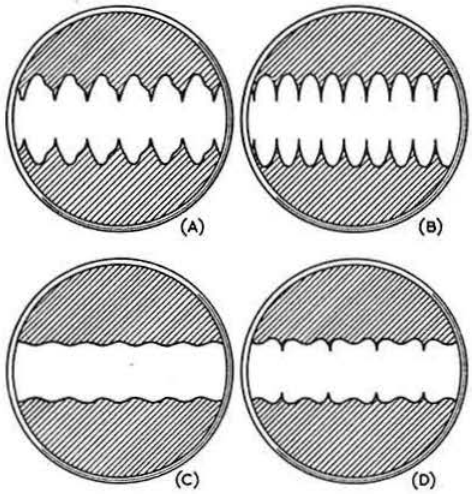


Fig. 27.—Oscilloscope patterns.
(a) Incorrect r.f. phasing; amplitude unbalance.
(b) Correct r.f. phasing; amplitude unbalance.
(c) Correct phasing and amplitude balance.
(d) Amplitude balance, but incorrect r.f. balance.

correct 90° phase relationship. It is, of course, possible to arrive at a setting which will give correct amplitude balance but incorrect r.f. phasing, and this will be indicated by the oscilloscope pattern of Fig. 27c. By adjusting L and C carefully and at the same time giving the audio amplitude balance control an occasional touch, it should quickly be possible to obtain a pattern something like Fig. 27d. If carrier and sideband suppression were infinite, the trace would be indistinguishable from that produced by pure c.w., but there is bound to be an irreducible minimum of ripple present. The constructor may rest content if he manages to reduce this to 5% or better before the next article in this series shows him how to add the linear amplifiers which will complete his single sideband transmitter.

References
[1] *QST*, June, 1948.
[2] *Electronics* (U.S.A.), December, 1946.
[3] *QST*, August, 1949.
[4] *G.E. Ham News*, November, 1948.

Ladies Beware!

The Tale of the Purloined Teastrainer

WHEN the writer decided that the quality provided by a G.P.O. carbon microphone was not all that it might be, a Cosmocord Mic 6-4 crystal insert was obtained. Then began the search for a suitable container.

At teatime, while idly watching the XYL pour out the cup that cheers, the idea of using a teastrainer for the job was born. Later, when the coast was clear, the article in question was stealthily removed from the cupboard and taken into the shack. It was just the right size to carry the crystal insert!

The neat housing for a Cosmocord Mic 6-4 crystal insert made from a sixpenny teastrainer.

A piece of aluminium the size of the circular rim of the teastrainer was cut to provide a back. The insert was then fitted into the strainer facing outwards, a piece of rubber placed on its back and the aluminium back plate pressed on and fixed in position with self-tapping screws. Ordinary television coaxial cable, brought out through a rubber grommet, was used for the microphone lead and bound to the handle as shown in the accompanying photograph.

Some days later, after an exhaustive search had failed to locate the missing strainer, the lady of the house saw it in the shack. Then the OM really learnt the names his parents had forgotten to give him! However, a visit to the local emporium secured another for sixpence, but unfortunately the bunch of flowers and the box of chocolates bought to "soothe the savage breast" made the whole job rather more expensive than expected! The moral for anyone who contemplates using a similar gadget for their crystal insert is—Go and buy one; it will be cheaper in the long run!

G8TL.

Radiation Patterns of Horizontal Aerials

Part 3

By W. H. SEGROTT (G8SI)*

THE procedure for deriving the radiation patterns of half-wave aerials has been described in some detail in previous parts of this article. It is now proposed to conclude the series with a number of graphs prepared on these lines. The purpose of the graphs is to illustrate the performance, in the presence of ground, of a number of aerials in general use for transmission and reception on the amateur bands.

The graphs have been derived from the modified versions of Equations 1 and 2 which, when used in conjunction with Equation 6, represent the diagrams in the presence of ground, having regard to the selected values of waveangle (Δ). For completeness, the equations applicable to the selected values of L are given below.

For $L=\lambda/2$, $3\lambda/2$,

$$F(\beta)(\Delta)=\left[\frac{\cos(\pi L/\lambda\cos\beta\cos\Delta)}{\sqrt{1-\cos^2\beta\cos^2\Delta}}\right]\times\left[2\sin(2\pi H/\lambda\sin\Delta)\right] \quad (10)$$

For $L=\lambda, 2\lambda, 4\lambda$.

$$F(\beta)(\Delta)=\left[\frac{\sin(\pi L/\lambda\cos\beta\cos\Delta)}{\sqrt{1-\cos^2\beta\cos^2\Delta}}\right]\times\left[2\sin(2\pi H/\lambda\sin\Delta)\right] \quad (11)$$

In this particular application, rectangular co-ordinates are preferred, since this method of presentation facilitates direct comparison between aerials of differing dimensions and heights above ground. Should diagrams be required in polar form, the necessary transposition is easily achieved, with sufficient accuracy for practical purposes, by plotting in each quadrant, values extracted from the appropriate graph.

* *30 Livingstone Road, Scarborough, Yorks.*

Curves for $H=\lambda/4$ have not been included, since the resultant waveangle (Δ) at this height is too high for effective long distance communication, whilst for short distances (*e.g.*, say inter-G working on 3.5 Mc/s or 7 Mc/s) the pattern is substantially omni-directional.

"Free space" values are also plotted on each graph for references purposes and clearly illustrate, when compared with the derived curves, the care that must be exercised in interpreting the probable operational performance of a particular aerial from its "free space" diagram (cf., Fig. 14B, $L=4\lambda$, $H=\lambda/2$, $\Delta=30°$).

It should be noted that on all graphs performance is indicated for two values of H, *i.e.*, $H=\lambda/2$ and $H=\lambda$. Where no curve is shown (*i.e.*, all graphs for $\Delta=30°$, $H=\lambda$), this signifies zero radiation at the particular value of Δ, due to the G.R.F. term in Equations 10 and 11 being zero.

It will be observed from these graphs that the $\lambda/2$ aerial (in the presence of ground) is the only one which has no clearly defined direction of zero radiation. The nulls, which exist in the diagrams of the longer wire aerials, may often be utilised to good advantage in the reduction of interference from undesired signals. The effectiveness of this particular characteristic will, however, depend, in practice, upon the relative field strengths and in some circumstances upon the respective waveangles (Δ).

Finally, it should be noted that, at the optimum waveangle (Δ), the long wire aerial provides a useful increase in the effective radiated power (relative to the half-wave aerial), concentration being for directions in line with the aerial.

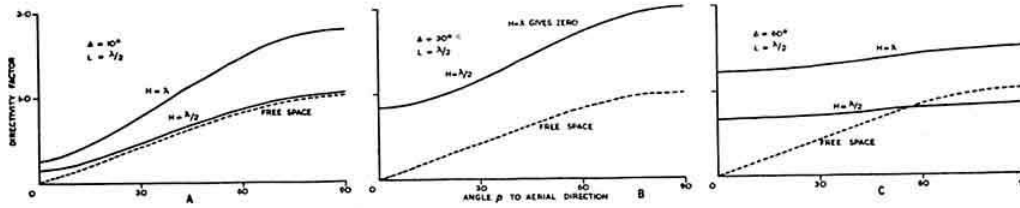


Fig. 10.—Directivity factors of horizontal half-wave aerials in the presence of ground.

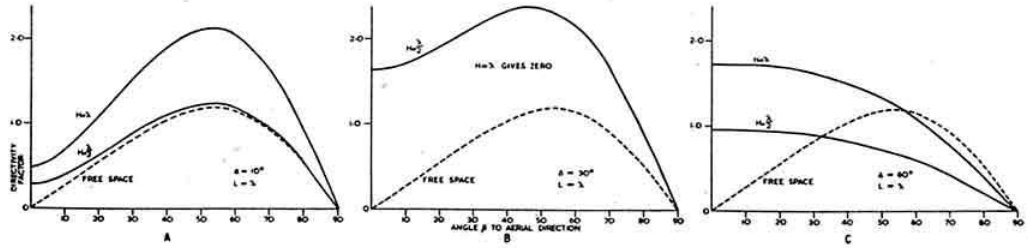


Fig. 11.—Directivity factors of horizontal full-wave aerials in the presence of ground.

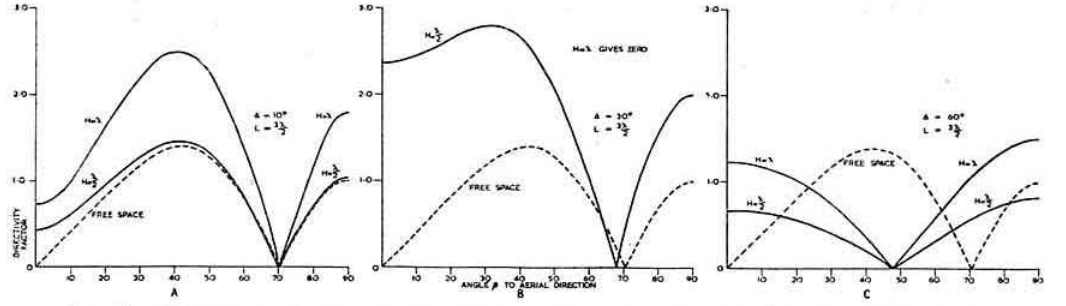


Fig. 12.—Directivity factors of horizontal aerials, three half-waves long, in the presence of ground.

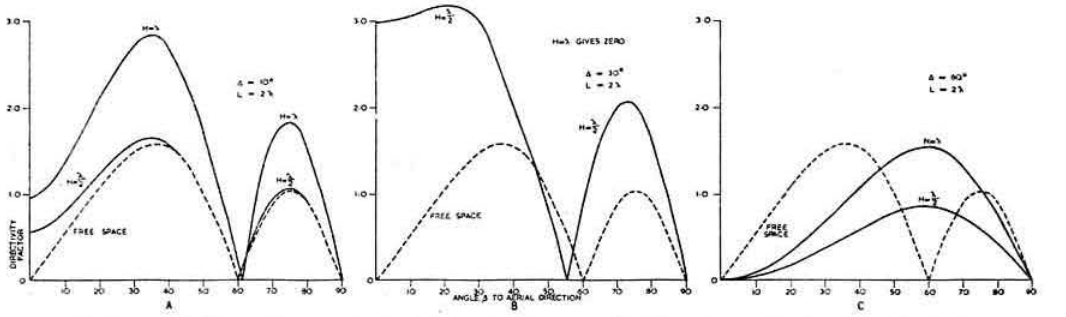


Fig. 13.—Directivity factors of horizontal aerials, two wave-lengths long, in the presence of ground.

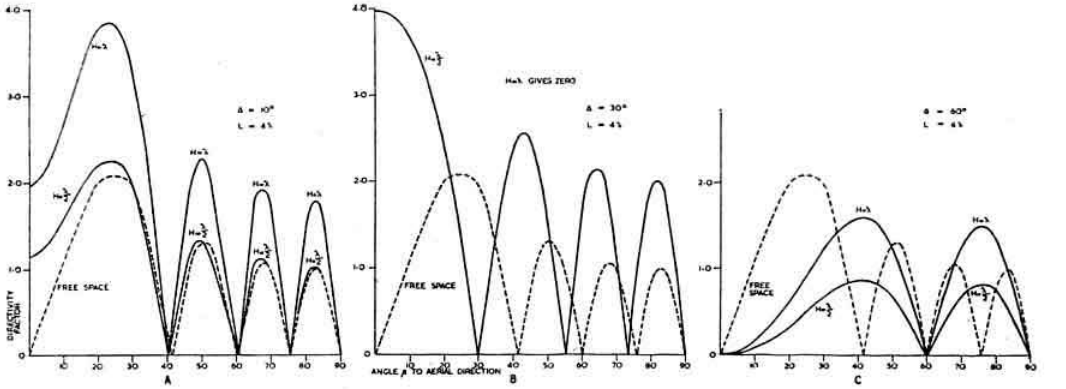


Fig. 14.—Directivity factors of horizontal aerials, four wave-lengths long in the presence of ground.

Mr. W. A. Scarr Home Again

HIS many friends in the Society will be glad to learn that Past President and Honorary Member W. A. Scarr, M.A. (G2WS) is back in England after a spell of duty with the British Council in India. Mr. Scarr is looking forward to participating once again in the activities of the Society.

Otfried Lührs

THOSE who were present at the Festival of Britain Convention and at the Lausanne I.A.R.U. Conference may like to know that Otfried Lührs, DL1FV (Vice President, D.A.R.C.) was married on May 8 at Wittorf über Lüneburg. We offer heartiest congratulations to Otfried and his wife.

Two Way All-Transistor QSO

AT midnight on May 4, C. L. Wright, G3CCA (Leicester), using a transistor transmitter and receiver, contacted Austin Forsyth, G6FO (Maids Moreton, Bucks.) on Top Band at a distance of 45 miles. A transistor transmitter was also in use at G6FO. G3CCA's transmitter was Clapp-v.f.o. controlled.

A full description of the equipment in use at G3CCA has been promised for future publication in the BULLETIN. Meanwhile, we offer congratulations to G3CCA and G6FO on a notable achievement.

British Amateur Television Club

WE have been asked to state that Mr. Douglas Wheele, G3AKJ, 56 Burlington Gardens, Chadwell Heath, Essex (Seven Kings 1051) recently succeeded Mr. M. W. S. Barlow, G3CVO, in the office of Hon. Secretary, British Amateur Television Club. Mr. Barlow is continuing his work as Hon. Editor of *CQ-TV*, official Journal of B.A.T.C.

The Art and Science of Sound Reproduction*

By F. H. BRITTAIN, D.F.H.

(Research Laboratories, The General Electric Company, Ltd.)

Introduction

THE aim of this lecture was to show the basic limitations, inherent in the reproduction of sound, which will always remain with us no matter how perfect the reproducing system may be, or what is the latest fashion in loudspeakers. The lecture fell into two parts; the first part being devoted to a short description of the actual apparatus used, whilst the second part was devoted to describing some of the limitations inherent in the reproduction of sound. These limitations apply just as completely to perfect apparatus as to actual equipment.

Description of Equipment used

The Tape Machine

Many of the demonstrations had been specially recorded on a twin track Wright and Weaire Tape Machine operating at 7½ inches per second. The two tracks were sometimes connected to loudspeakers on the right and left of the lecture hall, and sometimes to a series of loudspeakers arranged round the back of the lecture hall.

The Pick-up

For the reproduction of gramophone records, a Collaro Studio pick-up Type P was used. This is a crystal pick-up having a moderate electrical output, a good frequency response which can be easily corrected for the recording characteristics of modern recordings, low intermodulation, and very low record wear.

The Preamplifier

The preamplifier used Osram Z729 and B309 valves. Electrical correction circuits were provided to compensate for the recording characteristics. In this particular lecture, the pick-up gave complete correction, and only loudness and voice effort compensating circuits were actually used.

The Power Amplifiers

Four amplifiers were available, giving a maximum power of 120 watts. For most of the demonstrations two amplifiers were coupled to a pair of loudspeakers fed from one half of the tape and two were coupled to the other half of the tape to feed the effects channel of three loudspeakers. Alternatively, the amplifiers could be connected to the left-hand pair of loudspeakers for the stereophonic demonstrations.

Loudspeaker Cabinets

Three metal cone loudspeakers were mounted in each loudspeaker cabinet. They were wired in parallel without any cross-over network and were fed *via* a 600 ohm line from the amplifier. The cabinets were of the vented box or bass reflex type of enclosure, having a capacity of about 5 cu ft. and being tuned to approximately 50 cycles/second. They were heavily damped by curtains of cellulose wadding hung inside the cabinets immediately behind the magnet of the loudspeaker. This particular material was chosen after many tests because it has a very low coefficient of reflection to sounds reaching it.

The Metal Cone Loudspeaker

A short history of the development of the metal cone loudspeaker was given in order to acquaint the audience with the unusual conception of a low frequency loudspeaker or "woofer" with a small cone diameter.

By 1933 it had become obvious that the frequency response of a loudspeaker was not necessarily the only thing that determined its performance. At that time in the Research Laboratories of the G.E.C. at Wembley, we had made a large "woofer" unit for the reproduction of low frequencies and had been very disappointed with the quality of the note that it gave. Harmonic measurements were made and showed that the cone collapsed quite easily at frequencies much lower than had been expected. As a cross check on this finding, a small cone of very rigid construction was produced. The material used was duralumin. This cone could produce low frequencies with much less intermodulation than could the large paper unit and it was used for the low frequency end of a high quality system in use in the laboratories between 1937 and 1940.

Demonstration 1 showed the reproduction of a voice with organ accompaniment, stressing the good reproduction of very low frequencies.

No work was done on acoustics in these laboratories until the termination of the war. At that time a loudspeaker was required which had a better performance than those available on the market. At the same time it had not to be so costly as to preclude its use in conjunction with a suitable high quality amplifier in the home. Attempts were therefore made to modify the response of the early metal cone to remove the most serious defects. These consisted of a dip in the response curve at about 3,000 cycles/sec. and a very serious peak in the response at a frequency of 8,000 cycles/sec. The dip at 3,000 cycles/sec. was reduced in size by the addition of a "bung" to fill up the cavity formed by the metal sides of the cone. The major peak in the response at 8,000 cycles/sec. was found to be due to a major mode of vibration of the cone and it could be suppressed by making the frequency resonance of the sides of the cone dissimilar.

Demonstration 2 showed the reproduction of high frequencies and transients, and was made from a special recording by Decca. This demonstration concluded the first part of the lecture.

Science and Art

As our knowledge increases, science will give us more and more perfect microphones, amplifiers and loudspeakers, but it will still be true that sound reproduction is very seldom "sound recreation." Art is an essential addition to the science of sound reproduction, but its presence is often unsuspected. In the case of a picture, it is seldom mistaken for the original scene, and is not blamed because of this failure. Sound reproduc-

**A condensed version of a lecture delivered at a meeting of the Society held at the Institution of Electrical Engineers, London, on January 29, 1954.*

tion, on the other hand, is expected to be indistinguishable from the original and is blamed if it fails to reach this standard.

Limitations, in no way connected with imperfections of the system, enter at the mind of the performer and all through the chain of reproduction up to and into the mind of the listener.

The Mind of the Performer

Consider the case of an announcer or news reader: should he read in a soft voice for the couple on the settee, or in a high penetrating voice for the deaf old lady, or should he declaim the weather in a loud voice so that all the people in a youth hostel can hear him? Clearly he cannot use all these different voice efforts at one and the same time. Demonstration No. 3 showed the change did not occur when a volume control was used to alter the level of the reproduced voice. Finally, electrical circuits were used to simulate the change in the quality of the voice when the effort was increased. These corrections, which only give changes in frequency response, not in sibilants and enunciation as well, improve the quality of loud speech to a considerable extent.

The Mind and the Microphone

A microphone is usually considered to be only a transducer but it also has to be a part of the listener's mind. He can separate sounds by their position and choose which he will hear. A microphone can separate sounds but is not able to choose. Demonstration No. 4 showed two different nursery rhymes spoken simultaneously from two separate loudspeakers in the opposite corners of the room; it was quite possible to listen to either rhyme at will, separation being accomplished by space.

The test was then repeated with both rhymes coming over the same loudspeaker. It was quite impossible to separate out the two rhymes. In the third test, the rhymes were both reproduced by the single loudspeaker, but it was fed from two directional microphones, the microphones being changed during the rhyme. It was now quite easy to hear whichever rhyme the engineer in charge of the microphones chose; the listener had no such choice. The reason for stressing the importance of separation by position arises from the difficulties of reverberation and echo, which are treated by a microphone in quite a different way to the human ear.

The Amplifier

The principal limitation which is introduced by an amplifier is the degree of amplification. Just as difficulties were encountered with effort put into a speaking voice, so the ear changes with the loudness of the sounds that it hears. This means that there is only one volume level at which a reproduced sound could ever sound like the original. There seems to be some confusion as to that volume level which produces the same loudness at the ear of the listener as the original sound, when heard from an ideal position. Since different people have different ideas as to what constitutes an ideal position for hearing the original, it follows that the volume level required will also vary with the particular listener. The listener who prefers the front of a concert hall will want a greater loudness than one who listens from the back. Unfortunately, the listener at the back will expect to hear much more reverberant sound than the listener at the front. For the purpose of this lecture, sounds were reproduced as nearly as possible at their original level, but it should be pointed out that if this plan is adopted in a flat, neighbours may object as was shown in demonstration No. 6.

Just as it is possible to make a correction to the frequency response of reproduced speech in order to compensate for a change in voice effort, so also a change in frequency response can improve sounds, which for various reasons have to be reproduced at an abnormal level. Demonstration 7 showed first, an orchestral passage reproduced at the level it would have been heard in a concert hall. Second, the volume level was reduced and much of the realism was lost. Third, electrical frequency compensation was added and a more satisfactory result obtained. Do not confuse this correction for a loudness change with the correction for voice effort change; they are entirely separate phenomena and both must be corrected.

The Mind of the Listener

The listener has a preconceived idea of what he is going to hear. Since most listeners hear much more music through a radio set than direct from a concert hall, they reach the state when they expect a radio set to sound like a radio set rather than like a real orchestra. Consider an example of a small personal battery set. Most people have a fair idea of what it should sound like. In demonstration No. 8, such a set was switched on and played; it was then carried out of the lecture hall. By some mischance the sound did not accompany it and remained doggedly in its original position in the hall. At this stage the audience realised that the sound was being reproduced from the loudspeaker system and did not come from the small radio set at all. It is doubtful whether the audience then realised the implication; that they had heard reproduction so perfect that they were incapable of telling whether they were hearing the original sounds or not. Next, another example of what a listener might expect to hear in a tea shop contrasted with normal loudspeaker reproduction of the same thing. This was demonstration No. 9.

It is wrong to expect to find reproduced sound which is indistinguishable from the original, except in rare cases; just as a painting is seldom mistaken for the original. Great pleasure can be obtained from good paintings and from good sound reproduction, but the limitations of the system demand the co-operation of the listener and the viewer. The next demonstration, No. 10, indicated the pleasure that can be obtained from a good commercial long-playing record.

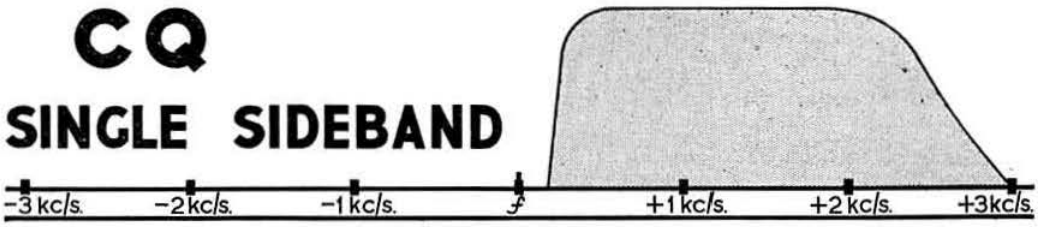
Position and Movement

In order to obtain greater realism, it is necessary to employ several channels at once. There can be more science, there must be less art; there can be more or less pleasure. The use of more than one channel can give the illusion of both position and movement. The final demonstration, No. 11, was recorded on two channels only, using a domestic tape machine. It illustrated both position and movement of sounds and concluded the lecture.

Congratulations

- to John Olive (G3HQO) who was recently elected a member of the Newbury (Berks.) Town Council.
- to Jim MacIntosh (GM3IAA), who has been elected an Honorary Member of the Malayan Amateur Radio Transmitters' Society in recognition of his past services to Amateur Radio in Malaya. Mr. MacIntosh was the Society's Representative in Malaya for many years prior to his retirement.

CQ SINGLE SIDEBAND



THE point concerning undermodulation effects on v.h.f. signals, raised by W. H. Allen (G2UJ) in *Around the V.H.F.s* in the April issue of the BULLETIN, is interesting. Theoretically, there appears to be no reason for the phenomenon but as the condition does exist (although not yet satisfactorily explained) it may be worthwhile finding out if single sideband is the answer.

By H. F. KNOTT (G3CU)*

It has been suggested that the system has little to offer over the more conventional modes of telephony for very high frequencies. From the point of view of simple communication, single sideband probably confers no advantage over c.w. On the other hand, if phone operation is essential, s.s.b. should be better than ordinary a.m. in which the undermodulation effect is often overcome by increasing the audio power to a point where the modulator is quite possibly supplying more power than the p.a. This cannot occur with s.s.b. as there is no carrier, all power being in the intelligence-bearing sideband. The received signal is therefore purely an envelope of speech frequencies which has to be demodulated with the aid of a suitable local carrier. Exhalted carrier reception can be used when the received signal is very weak. Other points worth consideration are the question of valve noise and any gain which may be had by the improvement in signal-to-noise ratio of s.s.b. over conventional a.m.

Notes and News

G3CYY (Newcastle), who has been active on s.s.b. for about four months, can be found on 3.5 Mc/s with a two section full lattice type transmitter. G3CCH (Scunthorpe), G3BWH (Rawtenstall), G2AD (Liverpool) and EI4E (Killarney) are also newcomers to 3.5 Mc/s s.s.b. G3MY is now operating from G3HEB's QTH with a filter rig on 14 Mc/s. On the same band G8OO has worked a number of Ws, the best being W2SQ and W2EB. Many YL operators in U.S.A. are now turning to single sideband, with W4VKL taking the lead.

In the U.K. much constructional work and rebuilding is taking place. G3FDG has completed a new filter exciter with all the essential parts on a chassis measuring only 6 in. by 5 in. Button-based valves and midget i.f. transformers are used throughout. A single valve speech amplifier precedes the balanced modulator and filter. Sideband switching is provided and the output frequency is 5.3 Mc/s, the unit therefore being suitable for both 3.5 and 14 Mc/s. G3FHL is putting the finishing touches to an s.s.b. receiver in which a filter for each sideband as well as for the carrier will be included. He hopes soon to carry out tests with stereophonic sound by using both sidebands and a pilot carrier for a.f.c. G6HV has built a panoramic analyser which greatly facilitates filter alignment. With the timebase speed adjusted to give one sweep of a long persistence cathode ray tube every one and half seconds, resolution of the pass-band characteristic is good even at between 40 and 50 db down on the peak sideband. G3COJ, now in Maidenhead, hopes to be operational again soon.

Those having difficulty wth the balanced modulator in the filter transmitter described in the January, 1954, issue of the BULLETIN may be interested in G3FD's experiences. He found that, with the original circuit, carrier suppression was practically non-existent despite valve selection. He suggests that a variable resistance in the anode circuit and a small amount of adjustable capacity from each anode to earth will prove helpful. G3FD has now re-designed his drive unit (using 6J6s for the first oscillator, balanced modulator and mixer) in order to feed a TT11-807 combination. The operating frequency is 1915 kc/s.

Technical Topics

Large or complicated power supplies are not necessary in order to take advantage of the maximum power limit permissible. The circuit shown in Fig. 1 has been used by G3FDG and others for several years and has been satisfactory for valves of the 813, 811 and HK254 class. The circuitry is not unusual but offers a simple approach to high power (s.s.b. having dispensed with the need for a large modulator) without the expense of a high voltage transformer. The rectifiers may be either

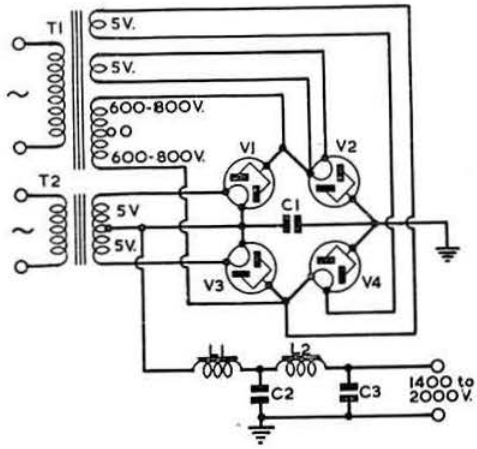


Fig. 1.—Simple high voltage power supply. C1, 0.5 μF, 2500 V wkg.; C2, 4 μF, 2000 V wkg.; C3, 24 μF, 2000 V wkg.; L1, 4.5–20 H swinging choke; L2, 15 H, 300 mA; T1, h.t. transformer, 250 mA; T2, 10 V, 5 A; V1, 2, 3, 4, 5U4 or 5R4GY.

* 5 Kevington Drive, St. Paul's Cray, Orpington, Kent.

5U4s or 5R4GYs. Type 83 mercury vapour rectifiers may also be used but some "hash" on the receiver may be experienced during standby periods. For voltages less than 1500 and currents of up to 250 mA, three valves only are required V1 and V3 being in one envelope, V2 and V4 are separate valves with their anodes strapped. In considering the load for this particular type of circuit it is important that the wattage rating of the transformer should not be exceeded, *i.e.* the product of the output voltage and current should not exceed the wattage rating of the transformer for full wave rectification.

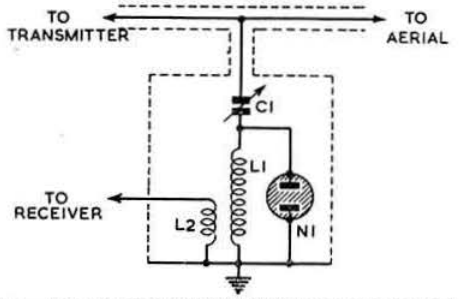


Fig. 2.—T.R. (Transmit/Receive) Switch for voice-controlled operation developed by GI3ZX. C1, 3–30 $\mu\mu$F trimmer; L1, series resonant with about 10 $\mu\mu$F to band in use; L2, 10% of turns on L1 (for 3.5 Mc/s, L1 is 80 turns on 1½in. former, and L2, 8 turns); N1, small neon without resistor.

With voice control it is essential to have some means of aerial change-over. Mechanical relays can be used but their inertia is an undesirable feature. In the electronic system this condition does not exist. The circuit developed by GI3ZX (Fig. 2) is a modification of Cronin's and is the best of three or four tested.

* * *

Reports for inclusion in this feature should reach the author by the 20th of the month preceding publication, *i.e.* by the 20th of July for the August issue.

D.S.I.R. Radio Research Station

WORK has now commenced on a new building at the Radio Research Station, Ditton Park, Slough, which will considerably increase the station's facilities. Every effort is being made to restrict the metalwork installed in the surrounding land (which is regarded as an extension of the laboratories for experimental purposes). For example, the waste outlet from the building will be conveyed in a non-metallic pipe to the main district sewer which itself is of non-reinforced concrete where it crosses one of the fields used for experimental work.

V.H.F. Network for Mines Rescue

VEHICLES attached to the Mines Rescue Service of North Western Division of the National Coal Board have been fitted with v.h.f. radio equipment supplied by The General Electric Co., Ltd. All collieries in the North Western Division, together with the licensed mines in Lancashire, Cheshire and North Wales—a total of 111—are covered by the new service, which greatly assists rescue work by keeping teams in constant communication with their headquarters.

World Wide DX Contest, 1954

THE International DX Club, organisers of the World Wide DX Contest, have announced that the 1954 event will be held on October 23 and 24 (Telephony section) and October 30 and 31 (Telegraphy section).

Radio Amateur Emergency Network

IT is believed that in certain areas formation of R.A.E.N. groups is being delayed pending more guidance from Headquarters. While it is the intention of the R.A.E.N. Committee to offer advice on frequencies and types of equipment to be used, it is not considered desirable to lay down any hard and fast rules. Final decisions should be made by local groups themselves who have intimate knowledge of conditions actually existing in their areas, knowledge which it is quite impossible for Committee members to have. Anyone, therefore, who is awaiting further published instructions should register forthwith. Queries will be gladly answered by the Hon. Secretary to the R.A.E.N. Committee, Mr. Cliff Fenton, 40 Fourth Avenue, Chelmsford, Essex.

News of the Groups

The **Holt** Group (E.C.O., G3HRK) is carrying out experimental work with 3.5 Mc/s walkie-talkie equipment using 1.4 valves operated from all-dry batteries. Preliminary results with an output of 0.5 watt to an 8ft. whip have been encouraging. Some excellent publicity for the Network in his local newspaper was secured by Associate Member D. S. Froome (39 Manor Way, Egham, Surrey) who is trying to arouse local interest.

In Dorset, efforts to start a group in the **Weymouth** area are meeting with some success—15 members have so far registered. A small working committee has been formed. The **Chadwell Heath** group (E.C.O., G3CNV) is also making progress and a practice net is in operation.

Members of the **Berwick-on-Tweed** group are concentrating on the production of combined transmitters and receivers, capable of working from rotary converters, vibrator packs or 120 volt h.t. batteries. Experiments with 28 Mc/s equipment are also in hand. G4LH, E.C.O. for the active **Hull** group, again asks new members of R.A.E.N. to contact their local E.C.O. as soon as they register. **Lichfield** group has now obtained its net crystals which will ensure that member stations are always on frequency. Continuing his good work, their E.C.O. (G3FZW) gave a lecture on R.A.E.N. at **Stourbridge** recently.

Calling Frequencies

It has been suggested that R.A.E.N. calling frequencies for use in emergencies should be specified for each band. All E.C.O.s are invited to submit their suggestions and views on this proposal direct to the Hon. Secretary.

G3JAM's Walkie-Talkie

In view of the great interest shown in the simple walkie-talkie described in the May, 1954, issue of the BULLETIN, members may like to know that Sampson's Surplus Stores, 169/171 Edgware Road, London, W.2, can supply transformers T1 (ZA17515), T2 (Radiospares personal set output transformer) and the twin ceramic trimmers, valve holders and various sundries. A small carbon microphone can be obtained from Premier Radio Co., 207 Edgware Road, London, W.2 and a 4 pole 3 way, single wafer switch from London Central Radio Stores, 23 Lisle Street, London, W.C.2.

Tests and Contests

R.S.G.B. D/F Qualifying Events

COMPETITORS are asked to note that the starting point for the High Wycombe D/F Qualifying Event, to be held on June 20, has been altered to a point 200 yards west of "The Full Moon" public house, Cholesbury Common (N.G.R. 42/933071).

* * *

DETAILS of the D/F qualifying event to be held on July 11, 1954 are as follows:—

Organiser: Keith Gasson (G3EPT), 21 Hankey Street, Peterborough, Northants.
Call-sign: G3EEL/P.
Frequency: 1915 kc/s.
Assembly Point: The village green, Elton, NGR 085939.
Map: Ordnance Survey, New Popular Edition, Sheet 134.
Assembly Time: 1330 B.S.T.

Intending competitors should notify the organiser by Monday, July 5, stating the number in their party requiring tea.

* * *

THE first of the 1954 series of D/F qualifying events, organised by The Slade Radio Society, took place on May 2. Sixteen competitors assembled at the starting point near Alrewas in pouring rain but happily this gave way to watery sunshine just before the first transmission at 1400 B.S.T.

The hidden transmitter (G3JBN/P), operated by D. J. Pye (G3EVC), was concealed among the roots of a rhododendron bush on Cannock Chase. Surrounding bushes provided good cover for the operator and his assistants, although they were all well soaked by a long journey through the woods with the transmitter and batteries.

The first competitor to arrive at the transmitter was G. C. Simmonds (Slade Radio) of Stourbridge at 1518, followed less than half a minute later by P. J. Evans (B.T.H., Rugby). At 1536 the transmitter party witnessed a friendly tussle through the undergrowth between Messrs. Reynolds (B.T.H., Rugby) and Drury (Romford) who arrived at the transmitter together, tying for third position. These four competitors qualify for the National D/F Final to be held on September 12. Nine others succeeded in locating the transmitter before the last transmission at 1630.

During tea at Tranters Cafe, Alrewas, near Burton-on-Trent, the organiser (T. A. Griffin, Slade Radio) announced the results, and thanked the competitors for their support. He also referred to the invaluable assistance given by Messrs. Pye and Wyatt at the transmitter and by Mr. Watson at the start. A vote of thanks to the organiser was proposed by G. C. Simmonds (Chairman, Slade Radio).

* * *

THE South Manchester Radio Club organised the second of the 1954 series of D/F qualifying events, which took place on May 23. Five competitors and their teams assembled at the Ladybarn House Boys' Club for the first transmission. One competitor did not hear the first transmission, but decided to continue and trust to luck on the subsequent transmissions.

The hidden transmitter (G3FVA/P) was located by only one competitor, T. C. Reynolds (B.T.H. Rugby), who arrived at approximately 1457. Of the other four competitors, the one nearest the hidden transmitter at the time of the last transmission was the one who had not heard the first transmission, despite later difficulties with his equipment. Mr. Reynolds used a superhet receiver with sense indication, all the other competitors employing either t.r.f. or 0-V-1 receivers.

During tea a discussion took place concerning the merits of various types of D/F receiving equipment. As a result the S.M.R. Club members present decided to organise another local D/F contest later in the year. Anyone interested in competing in this event is asked to contact the Hon. Secretary, M. Barnsley, G3HZM.

It was unfortunate that in spite of efforts made to publicise the event some difficulty was experienced by the competitors with interference on the frequency, and it is hoped to arrange a greater degree of co-operation in future.

Contests Diary

1954

June 20	D/F Qualifying (High Wycombe/Oxford)*
July 3-4	144 Mc/s Open§
July 11	D/F Qualifying (Peterborough)*
August 8	D/F Qualifying (Salisbury)*
August 15	144 Mc/s Field Day (No. 2)
August 29	D/F Qualifying (Romford/Southend)*
September 5	Low Power Field Day†
September 12	D/F National Final*
September 12	420 Mc/s
October 2-3	Low Power
November 13-14	"Top Band" (No. 2)

§ *For rules, see page 469, R.S.G.B. Bulletin, April, 1954.*
* *For rules, see page 328, R.S.G.B. Bulletin, January, 1954.*
†† *For rules, see page 469, R.S.G.B. Bulletin, April, 1954.*
† *For rules, see below.*

Low Power Field Day, 1954

AFTER careful consideration of several suggestions made by competitors in the 1953 L.P.F.D., the Contests Committee decided that the rules should again remain the same as in previous years.

Rules

1. The event will commence at 11.00 B.S.T. and finish at 18.00 B.S.T. on Sunday, September 5, 1954.

2. The event will be confined to fully paid up Corporate Members of the Society in the prefix zones G, GC, GD, GI, GM and GW. Such members may enter individually, or several may combine to enter a station.

3. Operation will be restricted to c.w. (A1) on the 3.5 and 7 Mc/s bands.

4. Only one contact with a specific station may be made on each band during the Contest.

5. Each contact shall include an exchange of RST and QTH.

6. Entrants receiving frequent tone reports lower than T8 may be disqualified.

7. Each transmission must include the letters LFD and the figure 3 or 7 according to the band in use, e.g. LFD 3 K.

8. Equipment shall be entirely independent of the electrical system of any vehicle, and of any supply mains.

9. The total weight of all equipment must not exceed 20 lb. The following items, if provided, must be included in this weight: receiver, transmitter, power supply, batteries, headphones, key, frequency meter, aerial wire, insulators, earthing device, and spares—in fact, all radio and electrical apparatus and accessories taken to the site.

10. Subject to the weight limit, there are no restrictions on the number, type or height of aerials that may be used.

11. Entrants must comply with the terms of their transmitting licences.

12. Scoring: FIVE points will be awarded for each contact with another portable station, and ONE point for each contact with a fixed station.

13. Proof of contact may be required, and competitors must be prepared to satisfy the Contests Committee that their equipment conformed to the rules.

14. Contacts with unlicensed stations will not be permitted to count for points.

15. Entries should be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, 28/30 Little Russell Street, London, W.C.1, and must bear a postmark not later than Monday, September 13, 1954.

16. Entries should be made in the form set out below, and the declaration must be signed.

17. The Houston Fergus Trophy will be awarded to the winning station, at the discretion of the Council.

Low Power Field Day
September 5, 1954

Name..... Call Sign.....

Home Address .....

Site of Station.....

Transmitter..... Receiver.....

Aerials..... Power Supplies.....

Other Equipment.....

Total Weight.....lb.

Time B.S.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Band Mc/s	Points claimed
1105	*G3—/P*	*569*	*559*	*Bath*	*3.5*	*5*
1118	*G2—/P*	*449*	*449*	*Slough*	*3.5*	*5*
1123	*G5—*	*579*	*449*	*Bristol*	*7*	*1*
					Total.....	

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest. I also declare that the weight of my apparatus as defined in Rule 9 was.....lb. I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.

Signed.....

Ham's Hamlet
or
The Non-QSLer

QSL, or not QSL, that is the question;
Whether 'tis nobler in the mind to suffer
The calls and v.f.o.'s of outrageous hamdom,
Or to take filters against a sea of QRM,
And by opposing, end them. To drift; to chirp,
No more, and by a sleep to say we end
The headache, and the thousand natural watts
That hams are heir to; 'tis a consummation
Devoutly to be wish'd, to QRT, to QRX;
To sleep; perchance to scream; ay, there's the rub;
For in that sleep of death what cards may come,
When we have detuned the receiver coil,
Must give us "break"; there's the postage
That makes calamity of so long DX:
For who would bear the chirps and charps of Morse.
The bad op's wrong, the proud man's disgrace,
The bins of despised cards, the post's delay,
The indolence of bureaux,† and the spurns
That patient merit of the unworthy takes,
When he himself might his century make
With a mere card or two?

I. S. DAVIES (A1182)

† *Not the R.S.G.B. QSL Bureau of course!*

The Oxford and Cambridge South African Expedition, 1954

FROM June to October this year, two teams of three men from Oxford and Cambridge will drive Land Rovers from London to Cape Town and back, a journey of about 25,000 miles.

Although no radio equipment will be carried it is hoped to be able to contact amateur stations along the route. The approximate time-table is as follows: London, June 16; Paris, June 17; Marseilles, June 18; Algiers, June 20; Tripoli, June 22; Benghazi, June 24; Alexandria, June 26; Cairo, June 27; Aswan, June 30; Wadi Halfa, July 1; Atbara, July 4; Khartoum, July 5; Asmara, July 7; Addis Ababa, July 10; Mega Ethiopia, July 15; Nairobi, July 20; Salisbury, July 25; Johannesburg, July 28 and Cape Town, July 31.

The co-ordinating stations in England are G2MI, 29 Kechill Gardens, Hayes, Bromley, Kent and G3HLS, 21 Park Avenue, Farnborough Park, Kent. Co-operation from stations along the route is invited and special watch by British amateurs during the period is requested.

Westmorland Expedition

PORTABLE stations, operated by members from the Wirral area, will be on the air from Westmorland during the weekend of August 13 to 15.

G2AMV/P and G2ART/P will operate in the bands 1.8 to 28 Mc/s and G3BOC/P and G2CUZ/P on 144 Mc/s. Those assisting will include G3CSG, G3EQE and G3HMR.

Members wishing to make "skeds" with these stations should write to H. Synge (G3BOC), "Gipsy Corner," Willaston, Wirral (144 Mc/s), or B. O'Brien (G2AMV) 1 Waterpark Road, Prenton, Wirral (1.8-28 Mc/s).

The "50P-50W" Certificate

THE Mexican Society, Liga Mexicana de Radio Experimentadores, has instituted an award to be known as the "50P-50W" certificate. In order to qualify, an amateur must submit proof of contacts with 50 countries (one of which must be Mexico) using a maximum input of 50 watts. The minimum report acceptable is RST438. Contacts may be on phone or c.w. A certificate confirming the power used must be submitted from the applicant's local radio club.

Applications, accompanied by the relevant QSL cards and seven international reply coupons should be sent to M. A. Ortiz (XE1SA), QSL Bureau, L.M.R.E., A.C., Liverpool 195 "A," Mexico 6, D.F.

Another One To Go For!

THE Amateur Radio Association of Trieste (A.R.A.T.) has instituted an award, known as the F.T.T. Certificate, which will be issued to any licensed amateur submitting confirmation of two-way communication with amateur stations in the Free Territory of Trieste. Contacts may be in any of the amateur bands from 3.5 to 144 Mc/s.

Full details can be obtained from A.R.A.T., P.O. Box 301, Br./U.S. Zone, F.T.T., Trieste.

Associazione Radiotecnica Italiana

THE following have been elected to office in the Italian Society A.R.I. *President*: Roberto Sesia (I1FA); *Vice-Presidents*: F. Silvano Orefice (I1FO) and Federico Faostini (I1LW); *Hon. Secretary*: G. Cesare Schiff (I1AXD).

"Narrow Band F.M. Unit for The Elizabethan"

MR. LOUIS VARNEY, A.M.I.E.E. (G5RV) has drawn attention to two small points in connection with his article *A Narrow Band F.M. Unit for The Elizabethan* published in the May, 1954, issue of the BULLETIN.

(1) In order to avoid the complication of a d.c. feedback effect while measuring the deviation characteristic of the reactance modulator (Fig. 2) the test battery should be a 6 V type with the positive terminal earthed. During the d.c. test the cathode resistor (R9) should be temporarily short circuited. Initially, the potentiometer should be set for a reading of −3 volts on the voltmeter in order to simulate the quiescent condition and then varied between −6 volts and zero, the changes in frequency being plotted as described in the original article. If this method is employed it is not necessary to reverse the polarity of the battery. In order to "stiffen" the screen voltage a 100,000 ohms, ½ watt, resistor should be connected between screen and earth.

(2) The capacity of both C4 and C5 in the components list for Fig. 3 (page 502) should have been shown as 0.0005 μF.

"Top Band Transistor Transmitter"

IN reply to a number of queries as to the function of C1 in the circuit diagram of the *Top Band Transistor Transmitter* described on page 409 of the March, 1954, issue of the BULLETIN, the author (Mr. A. Cockle, G3IEE) states that its purpose is to compensate for the phase difference between the emitter and collector currents which becomes appreciable at m.f. and higher. This phase difference reduces the real component of the collector current which is required for the maintenance condition of oscillation. At v.h.f. the capacity required is so small that strays are sufficient whilst at l.f. no phase compensation is necessary.

The original circuit is purely a negative resistance oscillator and C1 is not part of a t.p.t.g. circuit, which is of course in the feedback group.

According to Oser, Enders and Moore of R.C.A., phase compensation can increase the maximum frequency of oscillation by as much as twice.

"A Mobile Transmitter-Receiver for R.A.E.N."

MEMBERS building the transmitter-receiver described in the May issue of the BULLETIN may like to know that the Supply Unit No. 4 Mk. 1 (ZA10478) is a useful source of h.t. for equipment of this type. The unit is housed in a case 10 in. by 8 in. by 6 in. and comprises a transformer, a bank of rectifiers, a Mallory vibrator (type G629C) and the usual chokes and condensers for smoothing. A spare vibrator is included as well as indicator lamps and fuse wire.

The input is 12 V and the output 350 V at 200 mA. When used with the equipment in question a series dropping resistor would therefore be required. It is understood that the units can be modified for 6 V input if required.

The units may be obtained from Newbury Radio, 272 Romford Road, Forest Gate, London, E.7.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on June 18 and July 16, 1954.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Southgate Amateur Radio Exhibition

MEMBERS living within easy reach of the Borough of Southgate, North London, are cordially invited to visit the Amateur Radio Exhibition which is being staged by the Southgate and District R.S.G.B. Group in historic Broomfield House, Broomfield Park, during the period from June 26 to July 3. An amateur station will operate under the special call sign GB3SRA (Southgate Radio Amateurs).

The Exhibition will be opened by the Mayor of Southgate (Councillor R. C. Evans, J.P.) at 3 p.m. on June 26. The Chair at the opening ceremony will be taken by the General Secretary of the R.S.G.B. in his capacity as Chairman of the Parks Committee, Southgate Borough Council.

The Exhibition will be open daily from 10 a.m. to 9 p.m.

An account of the opening ceremony and a description of the exhibits will appear in the July BULLETIN.

Conventionally yours . . .
BRISTOL IN SEPTEMBER

Convention Post Office

MEMBERS who are philatelists may like to know that the G.P.O. were invited to set up a special Post Office at Convention Headquarters (the Royal West of England Academy), and to use a special date stamp on mail posted from that centre. Unfortunately the idea has had to be abandoned because the G.P.O. required the Society to bear the full cost of the special die—a matter of about £12.

No doubt the project could be put in hand if a group of interested members got together privately.

Convention Caravan Site

CARAVAN owners interested in attending Convention are invited to write to Mr. Stanley Vanstone (G2AYC), "Chandos Lodge," Fetcham, Surrey. If there is sufficient support, Mr. Vanstone will negotiate suitable site accommodation and organisation.

NAVAL OCCASION

Just before H.M.S. Vanguard—Flagship of the Commander-in-Chief, Home Fleet—left Portsmouth last month to meet the Royal Yacht Britannia, bringing home H.M. The Queen and H.R.H. The Duke of Edinburgh, K.G., from their Commonwealth Tour, the General Secretary was entertained on board by Captain Geoffrey Turner, R.N. (G5IH). In this picture, taken against the Vanguard battle honours' board, Capt. Turner is to the right and Lt.-Cmdr. Ted Ironmonger (G8PO) to the left of G6CL.

Regional and Club News

BRADFORD AMATEUR RADIO SOCIETY.—The Society held its Annual General Meeting on March 30 when new officers were elected. The *Hon. Secretary* is F. J. Davies, 39 Pullan Avenue, Bradford, 2.

BRIGHTON & DISTRICT RADIO CLUB.—Great interest was shown in a midget 2m portable transceiver recently demonstrated by Reg. Moores. The club station (G3EVE) is active on Top Band and 3.5 Mc/s. *Hon. Secretary:* T. J. Huggett, 15 Waverley Crescent, Brighton.

BRISTOL.—A visit to the National Smelting Co's works at Avonmouth is arranged for June 25. Seventy centimetre equipment will be described and demonstrated by G3IYW and G3JMY on July 16. Local members willing to loan home-built equipment for the Convention exhibition are asked to contact G3IFV.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—Recent activities have included operating G3ATZ/P on Hope Mountain during the 2m Field Day and lectures on TV converters and TVI filters. Prospective members are always welcome at meetings in the Tarran Hut, Y.M.C.A., on Tuesday evenings. *Hon. Secretary:* A. N. Richardson (B.R.S.19678), 23 St Mary's Road, Dodleston.

CHISLEHURST & SIDCUP.—The local R.A.E.N. group is now ready for immediate operation from static stations but mobile stations should be available soon. Meetings are held every month at "The Seven Stars," High Street, Footscray. *Town Representative:* Alan Swindon (G3ANK). 135 Station Road, Sidcup, Kent.

EAST LONDON.—At the last meeting of the Winter session held in the Town Hall, Ilford, and presided over by the East London D.R., G. W. Norris (G3ICI), Messrs. D. N. Corfield (G5CD), J. W. Mathews (G6LL) and L. Varney (G5RV) were the panel for a "Brains Trust" session. During the meeting the Junior and Senior "5 Ack R" trophies were presented. In the inter-town Top Band contest, the Ilford group were again winners and therefore retain the "Tobitsawood" Coronation Trophy.

WILL YOU LEND A HAND
ON THE SOCIETY'S STAND
AT EARLS COURT?

GLASGOW.—"Starvation Amplifiers" was the title of recent illustrated lecture by W. R. Eadie (GM4JO). Members have visited the B.B.C.'s Westerglen (Scottish Home Service) transmitting station. Forthcoming visits are to Renfrew Airport and Kirk O' Shotts TV station. The V.H.F. Group have arranged a lecture and demonstration for the meeting on June 30.

GRAFTON RADIO SOCIETY.—The Society's field day on Tumulus Hill, Hampstead Heath will take place during the weekend of June 19 and 20 when all bands from 1.8 to 14 Mc/s will be used. *Hon. Secretary:* A. W. H. Wengell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

HASTINGS & DISTRICT RADIO CLUB.—The club is again supporting Hastings Hobbies and Crafts Exhibition from July 3 to 10. The exhibition station (G6HH/A) will be active on 3.5 Mc/s (using a transmitter designed by G3BDQ) from 10 a.m. to 10 p.m. daily except Sunday, July 4. Schedules will be welcomed and those interested are asked to write to the *Hon. Secretary*: Bill Thompson, 8, Coventry Road, St. Leonards-on-Sea.

ILFORD.—More than 40 members attended the junk sale on April 29 when so much material was available that the auction did not end until nearly 11 p.m.! All members are welcome to attend group meetings which take place on Thursday evenings at the home of G2BRH, 579 High Road, Illford, Essex.

LANCASTER & DISTRICT AMATEUR RADIO SOCIETY.—At the A.G.M. the following officers were elected: *Chairman*: A. L. Thwaites (G3HHR); *Hon. Treasurer*: C. Bennett; *Hon. Secretary*: A. O. Ellefsen (G3FJO), 10 Seymour Avenue, Heysham; *Committee Members*: R. Cordingley (G3BAP) and G. Millray (G3JBL). The Hon. Secretary's report showed that the society is making excellent progress.

LEICESTER RADIO SOCIETY.—Interest in transistor equipment, encouraged by the success achieved by G3CCA (reported elsewhere in this issue), is now so great that several members are constructing their own transistors. In contrast to these experiments, G3GGK recently demonstrated his Elizabethan transmitter. An extensive library of books dealing with radio and electronic subjects is being built up under the direction of G3GVK. *Hon Secretary*: W. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.

LIVERPOOL & DISTRICT AMATEUR RADIO CLUB.—The name of the club was recently changed, the words "Short Wave" being replaced by "Amateur Radio." Meetings are held on Tuesdays at 8 p.m. in St. Barnabus Hall, Penny Lane, Liverpool, 15. The club station (G3AHD) is active on Top Band from 2100 on those evenings. *Hon. Secretary:* A. D. H. Looney, 81 Alstonfield Road, Knotty Ash, Liverpool 14.

DON'T forget—the last day for N.F.D. logs to be postmarked is June 28. NO late entries will be accepted.

NORWOOD & DISTRICT.—The Group did much planning in preparation for N.F.D. and an inquest on the results achieved during the event is arranged for June 19.

PORTSMOUTH & DISTRICT RADIO SOCIETY.—New Headquarters at the British Legion Club, Queens Crescent, Southsea, have now been obtained and are open every evening until 10 p.m. Members are providing a TV set and 2m rig. A club licence has been applied for.

READING RADIO SOCIETY.—"Power Supplies for Radio Equipment" and "Measuring and Test Instruments" were subjects of recent talks by C. Thomas and I. G. Benbough respectively. *Hon. Secretary*: L. A. Hensford (G2BHS), 30 Boston Avenue, Reading.

SOUTH MANCHESTER RADIO CLUB.—There will be a lecture on transistors by W. L. Robinson on June 18 and a junk sale on July 2 at the club's headquarters, Ladybarn House, Mauldeth Road, Fallowfield, Manchester 14. New members are always welcome. Full details may be obtained from the *Hon. Secretary:* M. Barnsley (G3HZM), 17 Cross Street, Bradford, Manchester 11.

SOUTHEND & DISTRICT RADIO SOCIETY.—The annual hamfest was held at the London Hotel on May 8 to mark the Society's 34th year. Recent talks have included "Marine Echo Sounding," by K. T. W. Jones (Marconi Development Group). "The Ferranti Electronic Computer" by C. Berners-Lee (Ferranti Ltd.), and a description of Fire Brigade v.h.f. equipment by Divisional Officer F. W. Anderson. The last meeting of the present session is on June 25. *Hon. Secretary:* J. H. Barrance, M.B.E., (G3BUJ), 49 Swanage Road, Southend-on-Sea.

STOURBRIDGE & DISTRICT RADIO SOCIETY.—At the May meeting, E. A. Matthews, G3FZW (E.C.O. for Lichfield) gave a talk on the R.A.E.N. *Hon. Secretary*: F. W. Meredith, 26 Gilbanks Road, Wollaston, Stourbridge.

SUTTON & CHEAM RADIO SOCIETY.—A local R.A.E.N. group is being formed. The Society meets at the Harrow Inn, Cheam Village. *Hon. Secretary*: F. J. Harris (G2BOF), 143 Collingwood Road, Sutton, Surrey.

TORBAY AMATEUR RADIO SOCIETY.—A TVI Committee consisting of the R.S.G.B. T.R. (G3JD) and five other members has now been formed. At the meeting on June 19 (7.30 p.m., in the Y.M.C.A.) there will be a lecture on "Mobile V.H.F. Operation". *Hon. Secretary*:—L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

WARRINGTON & DISTRICT RADIO SOCIETY.—A very fine demonstration of 2m portable equipment, given by Ralph Taylor (G2HCJ/P) at the Stretton Golf Links was much appreciated. Members are visiting Trentham Gardens on June 20. On July 6 there will be a number of lecturettes for beginners at the King's Head Hotel, Winwick Street, commencing at 7.30 p.m. *Hon. Secretary*: G. H. Flood, 32 Capesthorne Road, Orford, Warrington.

WEST LANCS. RADIO SOCIETY.—F. Carter (G3JND, ex-VQ3DM) has donated a T1154 transmitter and an R1155 receiver for use under the club's callsign G3JQA. It is hoped to install an improved aerial system shortly. *Hon. Secretary:* S. Turner, 5 Balfe Street, Seaforth, Liverpool 21.

Can You Help?

● S. Crossley (Associate), 27 Westbury Road, Crumpsall, Manchester 8, who requires the circuit and other details of Receiver Unit F.H.A. (B.71), Admiralty Pattern No. 5419? The unit covers 1 to 16 Mc/s and incorporates a 6in. cathode ray tube.

Silent Key

H. R. JEAKINGS (G5FO)

With sorrow we record the death on April 2, 1954, of Mr. H. R. Jeakings (G5FO), of Bedford. Mr. Jeakings was an active member prior to and again after the war until pressure of private business forced him to curtail his hobby interests. In more recent years his station was mainly active on 28 Mc/s on which band his call became familiar to many Canadian and U.S. stations.

Our sympathies are extended to Mrs. Jeakings at this time. G4OL

Forthcoming Events

REGION 1

Barrow.—Mondays, 7.30 p.m., Castle House, Walney Island, Barrow-in-Furness.
Blackpool.—June 22, 7.30 p.m., 161 Penrose Avenue, Marton, Blackpool.
Bury.—July 8, 7.30 p.m., 52 The Drive, Seedfield, Bury. (No meeting in August.)
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man.—July 7, Broadway House, Douglas.
Lancaster (L. & D.A.R.S.).—July 7, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 7.30 p.m., St. Barnabas Hall, Penny Lane, Liverpool 15.
Liverpool (M.R.S.).—June 26, July 10, 3 p.m., Larkhill Mansion House, West Derby, Liverpool.
Manchester (M. & D.R.S.).—July 5, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Preston.—June 18, July 2, 16, 8 p.m., St. Saviour's Parish Hall, Manchester Road, Preston.
Rochdale.—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester.—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport.—June 23, July 7, 8 p.m., Blossom Hotel, Buxton Road, Stockport.
Warrington.—June 15, July 6, 20, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
West Cumberland.—July 1, 7 p.m., Kell's Community Centre, Whitehaven.
Wirral (W.A.R.S.).—June 16, July 7, 21, Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—June 24, visit to Holme Moss; July 9, 7.30 p.m., "King George Hotel," Peel Street.
Bradford.—July 8, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—July 14, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—June 29, July 13, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, 3 Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle.—July 6, 7.30 p.m., "Barras Bridge Hotel," Sandyford Road.
Pontefract (P.A.T.G.).—June 24, July 8, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutlers' Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—June 23, 8 p.m., "Dog and Partridge," Trippet Lane; July 14, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—June 30, July 14, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—July 5, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. **(M.A.R.S.).**—July 20, 6.45 p.m., Imperial Hotel.
Coventry.—July 16, 7.30 p.m., Priory High School, Wheatley Street. **(C.A.R.S.).**—July 5, 19, 7.30 p.m., 9 Queen's Road.
Kenilworth, Leamington & Warwick.—July 15, 7.30 p.m., Dalehouse Lane.
Malvern.—July 5, 8 p.m., "Foley Arms."
Stoke-on-Trent.—July 28, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (S.A.R.S.).—July 6, 8 p.m., King Edward VI School.
Wolverhampton.—July 5, 19, 8 p.m., Stockwell End, Tettenhall.
Wrekin.—July 5, 8 p.m., Wrekin Services Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts and Crafts, Sub-basement, Green Lane.
Leicester (L.R.S.).—June 21, July 5, 7.30 p.m., "Hollybush Hotel," Belgrave Gate.
Lincoln (L.S.W.C.).—July 7, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—Summer Recess.
Newark.—June 27, July 11, 7 p.m., "Northern Hotel," Appleton Gate, Newark.
Northampton (N.S.W.C.).—Fridays, 7 p.m., July 2, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—June 18, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—July 7, 7.30 p.m., 21 Hankey Street.
Retford.—Summer Recess.
Worksop.—Summer Recess.

REGION 5

Cambridge (C. & D.A.R.C.).—June 18, 8 p.m., "Jolly Waterman", Chesterton Road. "Ionosphere Research at the Cavendish Laboratory", Basil Briggs (G2FJD).
Chelmsford.—July 6, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft & Beccles (L. & B.A.R.C.).—June 30, July 14, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—July 1, 8 p.m., Great Western Hotel, Clarence St.
Gloucester (G.R.C.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
Oxford (O. & D.A.R.S.).—June 23, July 14, 7.30 p.m., Club Room, "Magdalen Arms", Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m. British Legion Club, Queens Crescent, Southsea. (Club Room open every evening.)
Southampton.—July 3, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 Chiswick High Road, W.4.
Barnes, Putney & Richmond.—July 2, 7.30 p.m., 337 Upper Richmond Road, S.W.14.
Bexleyheath (N.K.R.S.).—June 24, July 8, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—July 2, 8 p.m., "Shortlands Tavern," Station Road, Shortlands.
Chingford.—June 22, July 6, 8 p.m., venue from G4GA, SIL 5635, or B.R.S. 19765, SIL 6055.
Chislehurst & Sidcup.—July 14, "Seven Stars," High Street, Foots Cray.
Croydon.—July 13, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
Dulwich & New Cross.—July 6, 7.45 p.m., "Walmer Castle," Peckham High Street.
East Ham.—Tuesdays, 8 p.m., June 22, July 6, 57 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
Enfield.—June 20, July 18, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—June 22, July 20, 7.30 p.m., 164 Albion Road, Stoke Newington, London, N.16.
Guildford & Woking.—Summer Recess.
Hayes & Uxbridge.—June 28, July 12, 7.30 p.m., Hillingdon Primary School, Uxbridge Road.
Hendon & Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill, N.W.7.
Hoddesdon.—July 1, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays and Fridays, 7.30 p.m., Grafton L.C.C. School, Eburne Road, Holloway, N.7.
Hounslow (H. & D.R.S.).—June 24, Grove Road Schools, Cromwell Road.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—June 19, July 17, 7.30 p.m., Windermere House, Weston Street, Crystal Palace.
Southgate & Finchley.—July 8, 7.30 p.m., Arnos School, Wilmer Way, N.14.
Sutton & Cheam (S. & C.R.S.).—June 15, July 20, "The Harrow," Cheam Village, Surrey.

REGION 8

Brighton.—T.R. at home, Wednesdays, 7.30 p.m., 27 Warren Avenue, Woodingdean. **(B.D.R.C.).**—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road, Brighton.
Chatham (M.A.R.T.S.).—June 21, July 5, 19, 7.30 p.m., "Services Rendered" Club, 14 High Street, Brompton, Chatham.
Hastings (H. & D.R.C.).—June 15, 22, July 6, 7.30 p.m., Saxons Cafe, Denmark Place, Hastings.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.A.R.C.).—July 12, 8 p.m., Adult Education Centre, Union Place, Worthing.

REGION 9

Bristol.—June 18, July 16, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Exeter.—July 2, 7 p.m., Y.M.C.A., St Davids Hill.
North Devon.—July 1, G2FKO, 38 Clovelly Road, Bideford.
Penzance.—July 1, Railway Hotel.
Torquay.—June 19, July 17, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—June 17, July 1, "Fifteen Balls", Penryn, near Falmouth.
Weston-super-Mare.—July 6, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—July 12, 7.30 p.m., "The British Volunteer", The Hayes, Cardiff.
Neath & Port Talbot.—July 14, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.
Edinburgh (L.R.S.). June 24, 7.30 p.m. 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—June 25, July 9, 7.30 p.m., The Temperance Cafe, High Street, Falkirk.
Glasgow.—June 30, 7 p.m., Institute of Engineers and Shipbuilders, 39 Elmbank Crescent, Glasgow, C.2. Lecture-demonstration by V.H.F. Group.

Representation

The following is an amendment to the list of County Representatives published in the December, 1952, issue :

Region 9—Somerset
W. J. Green (G3FBA), 82 Bloomfield Avenue, Bath.

* * *

The following are amendments to the list of Town Representatives published in the December, 1953, issue :

Region 1—Cheshire
Chester
S. H. Dutton (G3EXT), 35 Garrick Road, Curzon Park.
Region 3—Warwickshire
Nuneaton
E. G. Newcombe (G2FLU), 65 Bracebridge Street.
Region 9—Devonshire
North Devon
D. H. Jones (G3BO), Rosebank, Westcombe, Bideford.

Radio Amateur Invalid and Bedfast Club

THIS new club has been formed with the idea of helping radio amateurs who are invalids. Its officers—all members of R.S.G.B.—are as follows : *President and Book Manager*: John Gill; *Hon. Treasurer*: Jack Comben (EI5L), "Old Barn," Gordon Avenue, Foxrock, Co. Dublin, Ireland; *Hon. Secretary*: W. Harris, 25, Playford Lane, Rushmere, Ipswich; *Assistant Hon. Secretary*: W. Locke.

The Hon. Secretary will be glad to hear of any eligible licensed amateur or shortwave listener who would like to join the Club. There is no subscription, the only condition being that applicants must be invalids.

Books and magazines for distribution to members will be welcomed by Mr. Gill at 30 Sholebroke View, Leeds, 7. Surplus components may be sent to the Hon. Secretary for distribution.

The Story of "Twinkletoes"

IT was Gerry Kenyon (G3YK) of Middlesbrough who gave the name "Twinkletoes" to Peter Odell (A.1223). For Peter, totally incapacitated, is compelled to operate his receivers *by means of his toes*. As may be imagined, Amateur Radio is a supremely important part of his life, and indeed opens up for him a feeling of participation in the affairs of the outside world which he could not otherwise enjoy.

"I am not in bed, but in a special reclining chair," writes Peter from Redcar—or rather his mother writes for him, since his incapacity prevents his using a pen. He goes on to explain that he tunes his S640 and R1155 receivers with the toes of his right foot.

RADIO AMATEUR EMERGENCY NETWORK

630

MEMBERS HAVE VOLUNTEERED TO DATE. HAVE YOU? IF NOT, WILL YOU?

Aged only 24, "Twinkletoes" took up Amateur Radio as a listener about five years ago, and quickly became widely known to many who transmit on the 40 and 80 metre bands. Knowing of his disability, as the result of receiving his report cards, scores of amateurs have taken a great interest in him—and his record of "return QSLs" is almost 100 per cent. His collection of cards—nearly 500 of them—is contained in albums so that he can see them and turn the pages over with his toes. He has a fine photograph album, too, with more than 150 Amateur Radio pictures in it.

Total incapacity does not prevent Peter Odell from meeting in person a great number of the friends he has made through Amateur Radio, for he gets about a good deal in his parents' car.

All who know him—and the many who have yet to have the pleasure of making his acquaintance—will pay tribute to his indomitable spirit.

Incidentally, it was G3DLD who proposed Peter for R.S.G.B. membership. As would be expected he is a keen and close reader of the BULLETIN.

New Books

THE AMPLIFICATION OF SOUND (Third Edition). By A. E. Greenlees, A.M.I.E.E. 300 pages, page size 8½in. x 5½in., 114 illustrations. Published by Chapman and Hall. Price 35/-.

The object of this book is to present a general survey of the principles of sound amplification and distribution showing the practical considerations involved, together with sufficient technical detail to enable the reader to appreciate the fundamental principles. No advanced knowledge of mathematics is required to follow the text.

The present edition is a revision and enlargement of the previous edition including later developments and items which have come into more general use with the advance of the technique and extension of the applications of sound amplification.

The serious radio amateur with a flair for high fidelity reproduction will find this book of very great value.

* * *

APPLIED ELECTRONICS ANNUAL, 1953-54. Edited by R. E. Blaise, A.M.Brit.I.R.E. 256 pages, page size 9¼in. x 7¼in. Published by British-Continental Trade Press, Ltd., 222 Strand, London. W.C.2. Price 20/-.

In addition to information on trends in radio and television throughout the world, the 1953-54 edition of the Applied Electronics Annual contains reports on the applications of electronic equipment in industries as diverse as textiles, fishing and printing. For the first time a chapter on new devices and components of general interest has been included, together with a "Who's Who" for the Electronics Industry. The World Directory section classifies manufacturers, suppliers, importers, and trade marks and incorporates a revised Buyer's Guide.

* * *

TELEVISION ENGINEERS' POCKET BOOK. Edited by E. Molloy and J. P. Hawker. 240 pages, page size 6½in. x 4in. Published by George Newnes, Ltd. Price 10/6.

This book has been specially prepared to meet the growing need of engineers, dealers, service men and television enthusiasts for a handy compendium of practical information and technical data.

In addition to much useful reference data on cathode-ray tubes and valves the book contains particulars of more than 300 popular television models. Valuable guidance is given on installing, servicing and aligning receivers. Informative sections are devoted to basic circuitry, the sound channel, projection receivers, recent advances in receiver design, v.h.f. converters, the cure of interference and the British television network. A special section on servicing equipment will help the newcomer to this field to make the best possible selection of instruments.

The book is profusely illustrated and includes more than 70 pages of tabulated data.

A number of specialists have collaborated with the authors in producing what is, without question, a most valuable "vade mecum."

* * *

WIRELESS AND ELECTRICAL TRADER YEAR BOOK. Radio, Television and Electrical Appliances (1954). 25th Edition. 296 pages, page size 8½in. x 5½in. Published by Trader Publishing Co., Ltd. Price 10/6.

The Trader Year book is a valuable guide for everyone connected with sales and service and a recognised authority for overseas buyers anxious to contact British sources of supply. Features of the 1954 edition include condensed specifications of more than 250 current commercial television receivers and information on valve and cathode ray tube base connections, with more than 300 valve base diagrams.

A comprehensive list of the i.f. values of commercial radio receivers which have been marketed during the past six years has been revised and extended. Other data includes specifications of current radio receivers, legal and licensing information and a directory of trade associations.

The text of the wages agreement, covering radio and television service engineers, together with wage rates and details of the rates of pay of radio and television shop managers and assistants, is included.

* * *

RADIO RESEARCH, 1953. Published by H.M.S.O. for D.S.I.R. Price 1/9.

This important publication records the outstanding studies undertaken by the Department of Scientific and Industrial Research during the year 1953. These include work done at the Radio Research Station, Slough, in connection with ionospheric "weather" and its effect on long distance radio communication. A recent development has been the construction of special "British Zone" charts which forecast conditions for circuits terminating in the British Isles. The Station is also using a method of investigating ionospheric conditions by studying long-distance back-scatter (echoes).

The Report gives details of the work being done on germanium diodes.

Silent Key

J. E. NICKLESS (G2KT)

The death in his 76th year of Mr. J. E. Nickless (G2KT) will bring a sense of personal loss to many hundreds of radio amateurs in this country and overseas. The memory of his cheerful, genial personality will always remain in our hearts.

"Nick," as he was affectionately and universally known, was a real old-timer and a pioneer, not only of the Amateur Radio movement but of radio science itself. He obtained his first licence in 1911 and was associated with those who founded the London Wireless Club; for a number of years, in the early twenties, he was a member of the Council. He was a Corporate Member of the Institution of Electrical Engineers and a Vice-President of the Southend and District Radio Society.

In 1898, Mr. Nickless entered the service of a well known firm of insulator specialists (Messrs. Buller, Ltd.) and retired fifty years later in 1948. He was for many years their Technical Adviser on radio components, and right up to this year he was to be found on the company's stand at the Radio Components Exhibition.

A recent picture of Mr. J. E. Nickless (G2KT)

To many of those who remember the old days of 440 and 200 metres, "Two Kay Toc" was probably one of the first call-signs they ever heard and, most likely, one of the first stations they visited. "Nick" was ever the genial host, ready to welcome and help the newcomer. His distinctive voice was as characteristic as his sturdy individualism of outlook. One could possibly disagree with him. It was utterly impossible to dislike him!

In recent years, he returned to his old love, the "Top Band," and could be heard each morning, as regularly as clockwork on 1875 kc/s, acting as "Chairman" of the "Shaving Club"—a group of Thames-side amateurs who meet daily to exchange reports and local radio news.

A large gathering of radio amateurs attended the funeral at Southend-on-Sea on Saturday, May 8. The President and Council of R.S.G.B. were represented by Mr. Louis Varney (G5RV), and a floral tribute was sent on behalf of the membership.

Mr. W. J. Ridley (G2AJF), Region 5 Representative represented his own Region and the town of Chelmsford. The Gravesend, Medway and Southend Radio Societies were all represented as was the "Shaving Club." The Rev. D. Pett, of St. Mary's Church, Prittlewell, paid a moving tribute to 2KT at the service.

We offer our sincere sympathy to Mrs. Nickless and her family and also to "Nick's" son-in-law, Mr. Ron Horsnell (G2YI). A.O.M.

DONALD E. HILL (G3IRF)

It is with deep regret that we record the sudden death of Don Hill (G3IRF).

Although he was a radio enthusiast for some time prior to the last war it was not until about six years ago that Don turned his attention to Amateur Radio. He was a keen and active member of the Norwood and District Group and was always ready to lend a hand where a job of work needed doing.

His passing will be mourned by his many friends in South London. E.W.Y.

The Editor does not necessarily endorse the views and opinions expressed by contributors to this feature.

Curing TVI

DEAR SIR,—I have read with interest Mr. Whalley's contribution "TVI *can* be cured," and would like to make some criticisms which, I trust, Mr. Whalley will accept as rational.

Mr. Whalley has stressed, very rightly, the need for good screening and filtering of leads. Why, then, does he attempt to eliminate harmonics from the driver and earlier stages? Also, if his aerial filtering is going to be sufficiently effective to deal with the high-powered harmonics from his class C final, why should he bother about the low-power harmonics from his driver which will be very low after passing through the p.a. grid filter?

As I see this TVI problem, we can very quickly become lost in a maze of lesser-order matters and cause chaos where there need be none. This can be dangerous, particularly for the beginner, because of complexity. *Provided* there is effective screening to a transmitter, and *provided* all power, etc., leads are fully filtered, I suggest to Mr. Whalley there is only *one* source of harmonics that the amateur need worry about—that from the class C p.a. *via* the aerial—and that source can be effectively blocked by a suitable aerial filter.

My own transmitter, which I have run continuously on 14 Mc/s since a time before TV started up here, has five *separate* screened h.f. units (1, v.f.o. and doubler; 2, driver and p.a.; 3, modulator; 4, low-pass filter; 5, aerial tuner) The four power packs are external and unscreened. A television receiver has also run in the same house for the same time. My transmitter is *driven hard* yet there is no TVI on my TV screen.

I contend that there are only four "musts" for effective TVI elimination: (1) Full and efficient screening of all h.f. units. (2) Effective filtering of all incoming leads. (3) Effective filtering of aerial lead. (4) No TV receivers in the vicinity that respond to amateur frequencies.

Yours faithfully,
A. H. WICKHAM (GM3IAZ).

Rutherglen, Glasgow.

DEAR SIR,—I have no quarrel with Mr. Wickham's four contentions—indeed I pointed out in my article that, provided the screening means were really adequate, then the type of circuitry enclosed was unimportant from the TVI point of view. However, my article was an attempt to deal with all aspects of the reduction of TVI at the transmitter, so I can hardly be taken to task for not restricting myself to one particular approach, even though I might consider it to be the best.

Given a free choice, surely it is preferable to choose circuitry which reduces the generation of harmonics in all stages? After all, such circuits and methods are no more complex than their alternatives and in many cases they would be chosen for other reasons. Mr. Wickham mentions the difficulties of the beginner and these are, in fact, very real. Not least of these difficulties may well be the actual construction of really well screened units, particularly in view of the fact that well made screened boxes are now no longer easily obtainable on the surplus market. Because of this the beginner would be well advised to pay attention to circuit design as, by so doing, his shielding and lead filtering problem may be eased. In this imperfect world there is something still to be said for both belt and braces! That circuit design is not only of academic interest is born out by a case I have in mind where an unshielded Top Band transmitter (c.o./p.a.) was causing TVI. Correcting the p.a. tank circuit L/C ratio and changing the untuned c.o. to a tuned type cured the trouble—most of which was shown to have been due to the *driver* stage. These small changes in circuit details saved the complete rebuild which a slavish following of Mr. Wickham's advice would have necessitated.

Since the article was published I have been asked whether I have ever known a case where the shielding of meter holes was necessary. I personally have never known such a case, but I am prepared to believe that trouble can occur due to unshielded holes, especially if the box contains high-level frequency multipliers. Most cases where meter holes have had to be screened have been reported from the U.S.A., where not only are the average amateur power levels much higher than in the U.K., but also where TV channels on much higher frequencies are in use.

It is fairly safe to say that if all the advice given in any general article on TVI reduction is followed there will be no trouble from the transmitter, but it is unlikely that *all* the recommended measures will be necessary in any given case. Unfortunately one cannot be dogmatic about what is necessary and each case must be treated on its merits. Mr. Wickham's advice is very sound when contemplating a new transmitter, but many an existing transmitter *may* be given a new lease of life by slight circuit modifications and correct adjustment.

Yours faithfully,
H. WHALLEY (G2HW).

Sale, Cheshire.

More About F.S.K.

DEAR SIR,—I read with interest G3BTM's letter in the February issue, and although I agree with him that the key-click situation in the amateur bands is serious, I do not agree that an increase in the number of technical articles on, and official encouragement of, f.s.k. operation is the best way to deal with the problem.

From the amateur point of view, f.s.k. operation calls for more valves and additional circuitry to the normal c.w. transmitter. If the full 14 db "effective gain" is to be achieved an adaptor must be added to the receiver containing limiter, discriminator, and keyed a.f. oscillator, or mark and space filters, amplifiers, detectors and keyed a.f. oscillator. In either type of adaptor the additional circuits need careful adjustment and the receiver i.f. bandwidth must be modified to give flat-topped response and −3 db points at least 25% further apart than the maximum "shift" likely to be encountered.

By using normal c.w. reception technique, *i.e.* maximum selectivity and tuning to the mark frequency, an f.s.k. signal can, of course, be received without the use of an adaptor and also without the 14 db effective circuit gain. Fast acting a.g.c. and discrimination against a.m. noise and QRM are, however, lost by this method.

If f.s.k. were generally adopted the majority of amateurs would no doubt use this second (c.w.) technique for reception. How many operators possess n.b.f.m. or s.s.b. receiver adaptors?

I feel that the case for f.s.k. can only be argued on the ground that it reduces key clicks or, shall we say, that it increases the usability of our bands by reducing interference.

Key-click radiation from c.w. transmitters can be kept to an acceptably low level by the use of well established and frequently described techniques which do not involve the addition of so many valves, or increase circuit complexity to the extent demanded for f.s.k. As those who already radiate the cleanest c.w. signals are the people most likely to try out any new systems of keying, the over-all effect on the key-click situation would be negligible.

QRM is a major problem, and by QRM I mean key-clicks *and* powerful stations operating on adjacent frequencies. In the 14-14.1 Mc/s band, if receivers are used with a 500 c/s bandwidth at −6 db, and all signals are considered as equal in strength, it should be possible, theoretically, for 200 stations to operate simultaneously if each maintained exactly 500 c/s spacing and all were operating c.w. with low key-click levels. Using the same receiver i.f. bandwith and c.w. reception technique only 110 f.s.k. stations could operate in the same channel if 400 c/s shift was used. Is such reduction in the number of usable channels acceptable in return for more easily controlled key-click radiation?

Imagine the effect of f.s.k. operation on an expedition station trying to sort out the call sign of one f.s.k. station from thirty other f.s.k. stations all calling him within 5 kc/s each side of his own frequency! The pile up is bad enough and the queue is long enough with c.w. operation—I speak from personal experience of the first few days of operation after my call was changed from EK1RR to CN2AS!

Let us leave f.s.k. operation to the so-called "amateur" teletype nets who are mainly concerned with perfect copy of each character of their "traffic handling" messages. The energies of the technical press would be better directed to propagating the gospel of reduced key-click radiation from present-day c.w. transmitters.

Finally, I should like to voice disagreement with G3BTM's remarks regarding n.b.f.m. Surely the majority of operators who use this system do so first because it provides a cheap and less complex method of radiating telephony signals, and second because it allows operation during TV hours without the necessity for low- and high-level clipping and filtering.

Yours faithfully,
R. R. OLLETT (CN2AS).

Tangier, Morocco.

Message Handling Again

DEAR SIR,—In the May issue of the BULLETIN, Mr. O'Brien asks how traffic handling could benefit Amateur Radio.

Generally speaking, the main benefit would be the stimulus it would give to operating technique, particularly when using telegraphy. There is no doubt that although the standard of amateur c.w. operating is good compared with that of the average Service station, there is plenty of room for improvement. Any reader can test this by carrying out the following experiment on 3.5 Mc/s. During a QSO, after having given details of the equipment, etc., ask the other station what he does for a living or some other simple question not connected with the usual "rubber stamp"

contact. It will be found (unless the station worked is exceptional) that the reply will be " Pse rpt OM QRM vy hvy . . ." or " R fb copy OM must close nw . . ." Repeat this procedure with a few stations and it will be found that the number of operators who cannot read a simple question first time is about 60 per cent.

Now, to handle traffic is excellent practice in *reading* c.w. because the messages handled contain words not usually encountered in Amateur Radio. The operator is compelled to concentrate on what the other station is sending, instead of, as happens in so many cases now, just waiting for him to finish!

Yours faithfully,
J. WORTHINGTON (G3COI).

Birmingham.

Receivers for Single Side-band Reception

DEAR SIR,—Much useful information has appeared in the BULLETIN and in other publications regarding the technique of single-sideband transmission, but very little can be found about the reception of s.s.b. signals. This seems to me to be rather remarkable, as so many authors point out that a considerable improvement can be obtained by using an s.s.b. receiver. I know that such receivers can be complicated, expensive and difficult to construct, but surely someone of the s.s.b. fraternity has devised something which will give at least some of the improvement.

While on the subject, may I implore your writers to use the logical terms for the " old " method of transmission. This new system is amplitude modulation just as much as is the old one, so it seems most incorrect to differentiate between the two by the use of abbreviations such as " a.m." as opposed to " s.s.b." Surely the correct terms should be " d.s.b." and " s.s.b." as used commercially. I have to think for a moment when I read " s.s.s.c.," but the letters " s.s.b." are instantly read in full; the suppressed carrier indication is superfluous, as much of the improvement due to s.s.b. working would be lost were the carrier not suppressed; if not completely, then at least to a great extent.

Yours faithfully,
F. W. V. BUCKLAND, A.M.Brit.I.R.E. (G3DIR).

Baldock, Herts.

7 Mc/s C.W. Operation

DEAR SIR,—One is continually hearing it said that 7 Mc/s is useless nowadays, but to the stalwart it is still capable of plenty of DX.

I feel, however, that the " gentleman's agreement " to keep c.w. transmissions in the first 50 kc/s of the band is *now completely outdated*. I therefore suggest that the Society should recommend members to fully occupy the band so far as c.w. operation is concerned. If we do this, commercial interlopers finding interference to their traffic will eventually move out of the band, leaving us more space in the 300 kc/s assignment for which, let it be remembered, we are licensed.

Yours faithfully,
J. H. CANT (G6FU).

Farnborough, Hants.

Transistor Transmissions

DEAR SIR,—The writer has noted with interest the various articles on transistor transmitters that appeared in your magazine during March and April of this year.

Transistors of the OC50 type were made available to the writer, and using a modification of the circuit described by G3IEE, contacts have been made on the New Zealand Top Band. The unit was a self-excited v.f.o. operating on 1890 kc/s. Contact was first made on May 22 with ZL4GA, some three miles away. ZL3FM in Christchurch, 200 miles away, reported signals 339. Stations ZL2ACV—380 miles, ZL2AQB—450 miles, ZL1AFM—720 miles, reported signals heard. The transmissions were made using c.w. in code, and the distant stations all reported signals in some manner that was identifiable. ZL2ACV even zero beat the transistor transmission to check that the signals were the true ones emitted! The note was chirpy and had tone 8c locally, but this was T9 at a distance. Some slow drift was experienced during transmission.

ZL4GA, who is a member of the R.S.G.B., followed all the tests and can verify the above facts.

Yours faithfully,
R. S. POTTINGER, B.Sc., ZL4GP.
Editor, " *Break-In.*"

Dunedin, New Zealand.
May 24, 1954.

[U.K. amateurs will wish to offer congratulations to the New Zealand amateurs who have taken part in the transistor tests arranged by Mr. Pottinger.—ED.]

MARK THE SPOT :—31/578734

NOTE THE DATES :—17-18-19/9/54

National Convention, Bristol

Potty Poetry

or

Bringing Up Daughter

Daddy used to tell me,
When I was barely three,
The queerest fairy-stories,
As I sat upon his knee.

They differed from the ones in books,
In many little points,
Those tales I heard at Daddy's knee,
And other such low joints.

* * *

Little Miss Hector, sat studying a Vector,
All puzzled and worried and then,
Along came a spider and sat down beside her,
So causing some slight QRN.

Little Jack Horner,
Sat in a corner,
Creating a terrible din,
His set, one of the best,
He thought had gone West,
Till he found that it wasn't plugged in.

Little Bo-Peep has lost her sleep,
Through a midnight QSO,
But the band, don't you see,
Was as clear as could be,
And she couldn't resist it—you know—,

Boys and girls come out to play,
The QRM has faded away,
Come with a whoop and come with a call,
Come Q5R9 or come not at all.

Humpty Dumpty sat on a wall,
Cursing 20, 40, 80 and all,
For all the King's horses,
And all the King's men,
Couldn't get poor Humpty's rig,
Working again.

Wee Willie Winkie searching all the band,
'Phones on his ears and mike in his hand,
Trying every wave-length there on the dial,
Can't get a contact, isn't life a trial.

Old King Cole was a studious old soul,
And a studious old soul was he,
He called for his "dit,"
And he called for his " dah,"
And he called for his buzzer,
And his key.

GM3HLQ

Can You Help ?

● L. Hutton (B.R.S. 20074), 165 Southgate Road, Great Barr, Birmingham, 22A, who urgently requires information regarding the ex-A.M. T.1119-R.1120 transmitter-receiver ?

Volunteers are wanted to help man the Society's stand at the Earls Court Radio Show

New Members

Corporate Members, Home (Licensed)

G2PL †P. PENNELL, 122 Foresters Drive, Wallington, Surrey.
G3SD F. THOMPSON, 29 Sandringham Avenue, Forest Hall, Newcastle-on-Tyne.
G2DPQ C. W. PETTIFAR, 3 Greenway, Campton, Shefford, Beds.
G3GED B. BRACEWELL, 9 Peel Avenue, Blackpool, Lancs.
G3GWE *C. J. MEAD, 4 Mill Cottages, Little Parndon, Harlow, Essex.
G3IMJ *J. H. WEYER, 39 Gurney Road, Northolt, Middx.
G3IRA J. P. WREN, 330 Marlborough Road, Swindon, Wilts.
G3IZS W. H. SCOTTON, 20 Duchess Street, Belgrave, Leicester.
G3JDA C. C. PRICE, 5 Hornshurst Cottages, Rotherfield, Tunbridge Wells, Kent.
G3JDS H. STANIFORTH, 18 Birch Lane, Dukinfield, Cheshire.
G3JEB G. E. BARTLE, 6 Stoddart Road, Folkestone, Kent.
G3JHA †J. HOLT, 23 Brookfield Avenue, Sunny Hill, Derby.
G3JHS A. WILSON, 14 Crossland Road, Hathersage, Nr. Sheffield.
G3JHT J. F. WALLER, 106 Graham Gardens, Luton, Beds.
G3JHU C. W. E. PAVEY, 41 Fant Lane, Maidstone, Kent.
G3JIK P. ECCLESTON, 47 Rowley Grove, Stafford.
G3JIR J. A. HARDCASTLE, 38 Cedar Grove, Sefton Park, Liverpool 8.
G3JIV G. T. VALE, 6 Abbey Terrace, Abbey Wood, London, S.E.2.
G3JJG G. F. GEARING, 235 Streatham Road, London, S.W.16.
G3JJO M. J. TOOLE, 69 Highdown Road, Lewes, Sussex.
G3JJV *R. JOHNS, 32 Ladywood Road, Grimethorpe, Nr. Barnsley, Yorks.
G3JKA D. WHITE, 31 St. James Road, Kingston-on-Thames, Surrey.
G3JKB *D. E. SIMMONDS, 11 High View, Hitchin, Herts.
G3JLC A. STEVENSON, Officers' Mess, R.A.F. Wattisham, nr. Ipswich, Suffolk.
G3JMQ E. BIRCH, 89 Meadow Lane, West Derby, Liverpool 12.
G3JNT *N. TAYLOR, 135 Leicester Road, New Barnet, Herts.
G3JOT F. G. WHATLEY, 6 Crombey Street, Swindon, Wilts.
G3JPI P. E. HALE, 182 Grand Drive, Raynes Park, London, S.W.20.
G3JQC G. W. HAWKSWORTH, 12 Powell Street, Heckmondwike, Yorks.
G3JQN J. W. D. HOBBS, 51 Northcote Road, Croydon, Surrey.
G3JQP 4078038, S.A.C. BROWN, F., Box No. 8, R.E.U., R.A.F. Station, Henlow, Beds.
G3JTK G. T. ALLEN, 157 Walton Breck Road, Anfield, Liverpool 4.
G4LM †L. A. BRADSHAW, "Plymstock," 79 Wootton Road, Gaywood, King's Lynn, Norfolk.
G6DJ H. S. URCH, 10 Farington Road, Henleaze, Bristol.
G6XH C. C. STEVENS, Merryhill, Solesbridge Lane, Chorleywood, Herts.
GI3GGY J. A. PORTER, 22 Dungiven Road, Waterside, Derry, N. Ireland.
GI3HXH J. J. Cosgrove, Stacumnie, Culmore Road, Londonderry, N. Ireland.
GM3CZX †B. CANNELL, Carrol House, Brora, Sutherland, Scotland.
GM3JBM G. COCHRAN, 38 Succoth Street, Glasgow, W.3.
GM3JPK W. MCCLYMONT, 14 Braehead, Dalry, Ayrshire.
GW3HZ †T. BENTLEY, Gronant Villa, Abbey Drive, Upper Gronant, Prestatyn, Flintshire.
GW3ASW CAPT. C. R. MOUNTJOY, M.M., "Pant Villa," Cwmbach, Aberdare, Glam.

Corporate Members, Overseas (Licensed)

DL3SX O. T. POPP, Augustenstr.16/5 L; Munich 2 BZ/Germany.
DL4WZ E. G. HAAS, 8th Radio Relay Sqdn., A.P.O-208, U.S.A.F.E.
DL9VZ H. GRUBE (22c), Burghofstr 26, Beuel-Holtorf/Rhein, Germany.
EI5P P. FITZSIMONS, 67 Nephin Road, Navan Road, Dublin, Eire.
MD5DD MNE. (D) DOWDNEY, D., M.T. Section, 40 Commando, R.M., M.E.L.F. 29.
MP4BBN J. ENDACOTT, Box 34, Awali, Bahrain Island, Persian Gulf.
ST2JT J. L. TICKNER, c/o International Aeradio Ltd., Juba, Equatoria, Sudan.
VE2ACW †C. HALL, Room 1037, 1441 Drummond Street, Montreal 25, P.Q., Canada.
VE2ASW DR. W. C. STOCKWELL, 747 Buchanan Street, Ville St. Laurent, Quebec, Canada.
VP4LK D. C. GITTENS, 68 Honor Oak Road, Forest Hill, London, S.E.23.
VU2RB CAPT. B. K. RAI, Signals, Air H.Q., New Delhi 11, India.
W1LQQ C. E. GAGNON, JR., Post Box 397, South Hamilton, Massachusetts, U.S.A.
W4HYW T. M. MOSS, P.O. Box 644, Municipal Airport Branch, Atlanta, Georgia, U.S.A.
W6GGR LT.-COL. T. H. MONROE, American Embassy, Baghdad, Iraq.
W9IHN C. R. PENDL, Box 232, Suring, Wisconsin, U.S.A.
ZC4PB G. P. BATEMAN, Civilian Wing, 2 W.R.L.S. Regt., M.E.L.F. 3.
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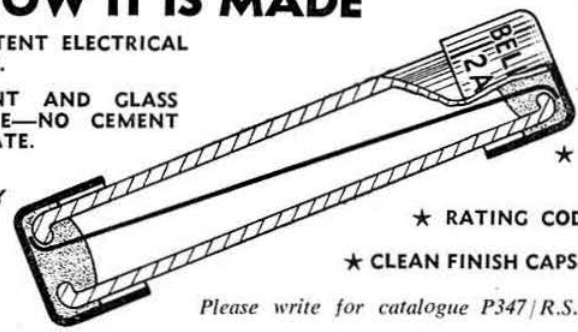

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(Continued on page 584)

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(Continued from page 583)

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