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BULLETIN

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JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOLUME 28 No. 5 NOVEMBER 1952

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PRICE 1/6

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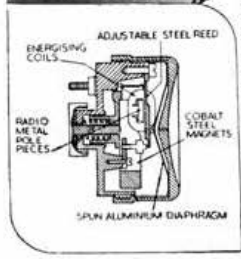

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19	.040	1/4	2/3	—	—	1/5	2/3	1/6	2/5
20	.036	1/5	2/4	1/5	2/4	1/5	2/4	1/7	2/8
21	.032	1/5	2/5	1/5	2/5	1/5	2/5	1/8	2/10
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24	.022	1/7	2/8	1/7	2/8	1/7	2/8	1/10	3/2
25	.020	1/8	2/9	1/8	2/9	1/8	2/9	1/11	3/4
26	.018	1/8	2/10	1/8	2/10	1/9	2/11	2/-	3/6
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25	1/10	2/2
26	2/-	2/4
27	2/-	2/4
28	2/-	2/6
29	2/2	2/6
30	2/2	2/6
31	2/3	2/8
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TRANSFORMERS & CHOKES: Primaries all 230 V 50 c/s, except where stated. 265–0–265 120 mA, 6.3 V 7 A, 4 V 2½ A, **20/-**. 275–0–275 100 mA., 4 V 5 A, 4 V 2½ A, **15/-**. 445–0–445 200 mA, **25/-**. 500–0–500 at 500 mA, **£2**. 1100–0–1100 at 450 mA, **50/-**. 2000–0–2000 at 200 mA, **75/-**. 2000–0–2000 at 450 mA, **110/-** 2000–0–2000 at 500 mA **£6**. 2000–0–2000 at 800 mA, **£7 10s**. 5800 V tapped 2000–3000–3500–4000 V at 800 mA, **£6**. **Chokes:** U.S.A. potted 8 H 100 mA, **6/-**. Ex-W.D. 8 H 50 mA or 10 H 50 mA, each **4/-**. 10 H 200 mA, potted, **12/6**. 15 H 275 mA, **20/-**. 15 H 450mA, **35/-**. 3.6 H 800 mA, **35/-**. 10 H 800 mA, **70/-**. **Swinging:** 5–15 H 450 mA, **20/-**. Parmeko, 13–23 H 500 mA, **40/-**. Kenyon, 9–60 H 450 mA, **60/-**. Parmeko, 10–23 H 800 mA, **70/-**. Speaker field replacements: 15 H at 150 mA, 1500, 1800 or 2000 ohms at **12/6** each. **Filament:** 4 V 7 A, 4 V 3½ A, **14/-**; 4 V 5 A, **7/6**; 4 V 2½ A, 5 kV test, **10/-**; 4 V 5 A, 4 V 5 A, **12/6**; 2½ V 10 A, 7 kV test for pair of 866s, **20/-**; 10 V c.t., 10 A for pair of 813s, **20/-**. **Vibrator:** Input 12 V c.t., Output 275–0–275 at 80 mA, **7/6**. **Drivers:** Parmeko, P.P. 6V6s or single 6L6 to 805 grids with split secondary, either at **12/6**. **Woden:** Immediate delivery from stock at pre-increase prices; Woden, UM1, **54/-**; UM2, **73/6**; UM3 (sold out new stock at **110/-**); UM4, **215/-**. Mains, DTM11, **39/-**; DTM12, **48/6**; RMS11, **30/-**; RMS12, **40/-**; DTM15, **75/-**; DTM17, **109/6**; Drivers DT1 (sold out new price, **40/-**); DT2, **39/6**; DT3, **34/-**; Filament DTF12, 2.5 V 10 A, **38/6**; DTF14, 5 V 4 A, **31/6**; DTF17, 7½ V 5 A, **37/6**; DTF18, 5 V 3 A, 6.3 V 4 A, **38/6**; DTF20, 10 V 10 A, **59/6**. **Chokes:** DCS14, 12 H 350 mA, **102/-**; DCS20, 20 H 350 mA, **140/-**; DCS17, 20 H 60 mA, **28/6**; DCS18, 20 H 150 mA, **41/6**; PCS13, 5–25 H, 350–50 mA, **58/6**. **Modulation:** Parmeko, 450 W, P.P. 805s to pair of 813s with additional winding for plate and/or screen modulation, **50/-**; G.E.C. P.P. TZ40s to P.P. 35Ts, **40/-**. **Auto:** 200–250 to 115 V 350 W, **35/-**; 500 W, **50/-**; 2½ kVA, **£6**; 5 kVA, **£6**; 6½ kVA, **£8**. **Primary Voltage Control Units:** Met.-Vik. Input 230 V 50 c/s. Output 57.5 V to 230 V at 21 A in 16 10-V steps, by rotary switch, weight 60lb, carriage paid, **£8**. The above transformers and chokes, etc., represent only a small selection from our comprehensive stocks. We have a large selection of heavy duty l.t. and high-voltage plate in either 230 V, 360–440 V single phase, and 360–440 V 3-phase. Comprehensive list on receipt of stamp.

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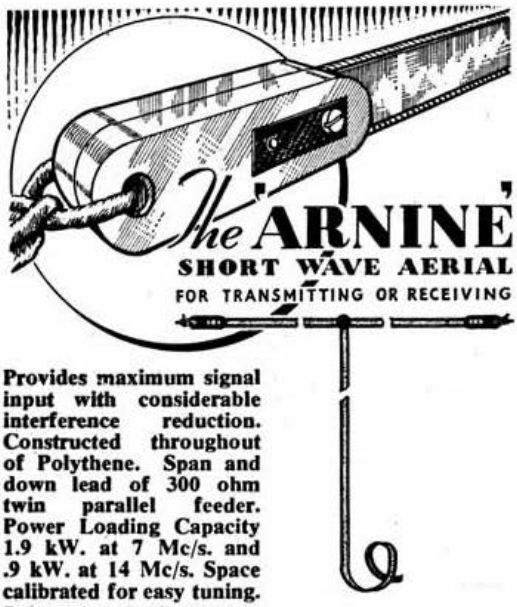

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R·S·G·B· BULLETIN

Vol. 28
No. 5
NOVEMBER
1952

PUBLISHED ON OR ABOUT THE 15th OF EACH MONTH AS ITS OFFICIAL JOURNAL BY THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN AND ISSUED FREE TO MEMBERS.

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H.R.H. THE DUKE OF EDINBURGH, K.G.

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Telephone: HOLborn 7373

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Advertising Office:
THE NATIONAL PUBLICITY CO., LTD., 36–37 UPPER THAMES STREET, LONDON, E.C.4

Telephone: CENtral 0473—6

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THE R.S.G.B. IS A MEMBER SOCIETY OF THE I.A.R.U. AND ACTS AS THE REGION 1 BUREAU OF THE I.A.R.U.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—November 25, 161 Penrose Avenue, Blackpool, and December 16, 33 Clarence Avenue, Cleveleys. Both at 7.30 p.m.
Bury.—November 13, December 11, 7.30 p.m., Y.M.C.A., The Rock, Bury.
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, Liverpool.
Darwen & Blackburn.—November 21, December 19, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Liverpool.—November 22, December 6, 2.30 p.m., Larkhill Mansion House, West Derby, Liverpool.
Manchester (M. & D.R.S.).—December 1, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Preston.—November 21, December 5, 19, 7.30 p.m., Three Tuns Hotel, North Road, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—November 17, December 1, 15, 29, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport.—Alternate Tuesdays, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.).—First and third Tuesdays each month at 7.30 p.m., King's Head Hotel, Warrington.
Wirral (W.A.R.S.).—November 19, December 3, 17, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—November 28, December 12, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—November 25, December 9, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick & Richmond.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—December 10, 7.30 p.m., Black Bull, Market Place.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, Whitehall Road.
Hull.—November 26, December 10, 7.30 p.m., R.E.M.E. Canteen, Walton Street.
Leeds.—November 19, 26, 7.30 p.m., Swarthmore Settlement, Woodhouse Square, 2.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne.—November 17, 7.30 p.m., British Legion Rooms, 1 Jesmond Road.
Pontefract.—November 27, December 11, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Scarborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.
Sheffield.—November 26, 8 p.m., Dog and Partridge, Trippet Lane; December 10, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—December 17, 31, 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).—November 16 (Surplus Sale), December 7 (A.G.M.), 21 (Brains Trust), 10.30 a.m., Stirchley Institute. (A.G.M. agenda from T.R.)
Coventry.—November 28, 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick & Leamington.—November 20, December 18, 7.30 p.m., Dalehouse Lane.
Malvern.—December 1, 8 p.m., Foley Arms.
Rugby.—December 2, 7.30 p.m., Public Library, St. Matthew Street.
Stourbridge (S. & D.R.S.).—December 2, 8 p.m., King Edward's School.
Worcester (W. & D.A.R.C.).—Thursdays, 7 p.m., City Library (basement), Foregate Street.
Wrekin (W.A.R.S.).—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington, Salop.

REGION 4

Alvaston (D.S.W.E.S.).—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston.
Chesterfield.—November 18, December 2, 16, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—November 19, 26, December 3, 10, 17, 7.30 p.m., Derby College of Arts & Crafts (sub-basement), Green Lane.
Leicester (L.R.S.).—November 17, December 1, 15, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Loughborough.—November 19, December 17, 7.30 p.m., Great Central Hotel.
Mansfield (M. & D.A.R.S).—December 7, 3 p.m., Swan Hotel.
Newark.—November 23, December 7, 7 p.m., Northgate House, Northgate.
Northampton (N.S.W.C.).—Fridays, 6 p.m., December 5, 7 p.m., Club Room, 8 Duke Street.
Nottingham.—November 21, December 19, 7.30 p.m., Trent Bridge Hotel.
Retford.—December 7, 3 p.m., Community Centre, Chapel Gate.
Worksop.—December 8, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—December 2, 7.30 p.m., Marconi College, Arbour Lane.
Ipswich.—November 26, December 10, 7.30 p.m., T.A. Drill Hall, Woodbridge Road.

REGION 6

Cheltenham (A.R.S. & R.S.G.B. Group).—November 21, December 5, 19, 7.45 p.m., St. Mark's Community Centre, Brooklyn Road.
Gloucester.—Alternate Thursdays, 7.30 p.m., Spreadeagle Hotel.
North West Wilts.—Fridays, 8 p.m., G3HXA, London Road Inn, Calne.
Petersfield & District.—November 27, 7.30 p.m., Market Inn, The Square, Petersfield.
Portsmouth.—Tuesday, 7.30 p.m., Signals Club Room, R.M. Barracks, Eastney.
Southampton.—December 6, 7.30 p.m., 22 Anglesey Road, Shirley.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.
Swindon.—December 20, 7.30 p.m., Connaught Rooms.
High Wycombe Group.—November 25, 7.30 p.m., G6JK, 17 New Drive, Totteridge.

REGION 7

Balham.—November 19, December 17, 7.30 p.m., Alexandra Hotel, Clapham Common, South Side, S.W.4.
Barnes & Richmond.—December 9, 7.30 p.m., 308 Upper Richmond Road.
Bexleyheath (N.K.R.S.).—November 27, December 11, 7.30 p.m., Congregational Hall, Clock Tower.
Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66-68 High Road, W.4.
Bromley, Kent (N.W.K.A.R.S.).—December 5, 7.45 p.m., Shortlands Tavern, Station Road, Shortlands.
Croydon (S.R.C.C.).—December 9, 7.30 p.m., Blacksmith's Arms, South End Croydon. January 13, Annual Dinner, Cafe Royal.
Dulwich & New Cross.—December 1, 7.45 p.m., Cliftonville Tavern, Ilderton Road, S.E.16.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East Ham.—November 25, December 9, 8 p.m., 57 Leigh Road.
East London District.—November 23, 3 p.m., Sir Noel Ashbridge, late Chief Engineer, B.B.C., on V.H.F., Town Hall, Ilford.
East Moseley (T.V.A.R.T.S.).—December 3, 8 p.m., Carnarvon Castle, Hampton Court.
Eltham & Sidcup.—November 17, December 1, 15, 7.30 p.m., Holy Trinity Church Hall, Hurst Road, Sidcup.
Enfield.—November 16, December 21, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—November 18, 7.30 p.m., 164 Albion Road, Stoke Newington.
Grays.—Apply the T.R., 68 Chestnut Avenue, Grays.
Guildford & Woking.—November 23, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Hendon & Edgware (E. & D.R.S.).—November 19, 26, December 3, 10, 8 p.m., St. Martin's School, 22 Goodwin Avenue.
Hoddesdon.—December 4, 8 p.m., "S.S.B. Technique," Salisbury Arms.
Holloway (G.R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.
Ilford.—November 20, December 4, 11, 8 p.m., "Junko," 579 High Road, Ilford.
Kensington & Shepherds Bush.—December 12, 8 p.m., Basement Flat, 38 Royal Crescent, W.11.
Kingston (K.D.A.R.S.).—November 19, December 3, 17, "Thermion," 7.45 p.m., Penrhyn House, 5 Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—November 15, 7.30 p.m., "Windermere House," Westow Street, Crystal Palace, S.E.19.
Purley (P.D.R.C.).—November 27, 7.30 p.m., "S.S.B.," G3CU, Railway Hotel, Purley.
Reigate (E.S.R.C.).—November 27, 7.45 p.m., 19 London Road, Reigate.
Slough.—November 20, 7.45 p.m., and every third Thursday each month, Golden Eagle, High Street, Slough.
Southgate.—December 4, 7.30 p.m., Arnos Secondary Modern School, Wilmer Way, New Southgate.
Sutton & Cheam.—November 18, December 16, 7.30 p.m., The Harrow, Cheam Village.
Uxbridge.—December 5, 8 p.m., Vine Hotel, Hillingdon.

(Continued on page 222)

R·S·G·B·
BULLETIN
Volume 28 No. 5 November, 1952

Current Comment . . .

Royal Patronage

IT was announced from Buckingham Palace on November 1st, 1952, that His Royal Highness, the Duke of Edinburgh, K.G., has been very pleased to extend his Patronage to the Incorporated Radio Society of Great Britain.

The announcement also stated that although His Royal Highness has lately undertaken a great number of additional responsibilities he will do his utmost to take a personal interest in the Society.

The news that the Society is once again under Royal Patronage will be received with great satisfaction and pleasure by all Members.

Input and Output

THE title of this editorial suggests technical things, but the subject is the Society's finances, though the title is apt. It is well enough believed in the technical sense that efficiency can never exceed 100 per cent., and that if the output attempts to overtake the input the machine will come to a standstill. The same law applies to our Society.

In these post-war years, when the nation is trying to recover the wealth which was scattered over the Earth, and spread on the bottom of the Sea, we struggle to find new ways to adjust the input-output relation. Our personal incomes, often inflated to twice the pre-war figure, will still not afford us the luxuries we had learned to expect. Costs rise steadily, and wages chase them.

The Society's income, per member, has not changed in 26 years. In 1926 it was half a young man's weekly wage. Today, in spite of Income Tax, it is quite a small part. It has been obvious for some years that the day would come when ends would no longer meet. Past Councils have agreed not to ask for more until it was patently necessary. That time has now come. Costs have been steadily rising ten to twenty per cent. year by year. In 1950-51 with an income of about £10,000 we just finished level. In the last year, for the same output, there is a deficit of over £2,000. This year the figure could easily be greater still.

One of the most obvious expenses is the BULLETIN, but only because it is a single big item; everything else goes the same way. Two years ago, by a change to machine typesetting, over £1,000 was saved. But printers' wages and other things all rose, and the gain was soon absorbed. The printed paper postage increase of ½d. costs us £300 per annum.

Let us try and see what we get for our money. First the BULLETIN. From last year's figures it would appear to cost about 8s. of our subscription, but there is an overhead charge, never shown, a fair porportion of the cost of running Headquarters, bringing it nearer twelve shillings.

Then there is Representation; that process which keeps us in touch with each other and enables us all to have a share in running the Society. It is in great demand and costs money. How much

it is difficult to say, but 10 per cent. of our income is visible in the accounts.

Thirdly there is a most important item, nearly always forgotten—the preservation of amateur rights, without which our hobby would vanish. The cost of maintaining amateur bands, licence facilities, and so forth, goes on continuously. Every few years, as a new international fight for kilocycles develops, it rises to an enormous figure. In the past the R.S.G.B. has contributed heavily on behalf of all amateurs; in the future we will receive more help, but nevertheless it is going to be worth a shilling or two per annum to every amateur.

These three things alone overspend the 15s. subscription and there is still more than half the Headquarters cost to meet. Any Annual Report will show the multitude of other services we receive—the world's best QSL Bureau; the work of a fine technical committee; G.P.O. liaison; contests for all tastes—to mention a few. With an army of voluntary helpers they still consume money. Now consider other journals comparable with the BULLETIN: none less than 30s. and all we get is the journal.

It may be asked, why double the Provincial subscription, and what about the London member whose subscription only rises by 9s.? The answers are that the 15s. has been quite heavily subsidised for some years from sources which are shrinking; that it is necessary to remain solvent for years to come without having to ask for another rise; and that there will inevitably be some members who cannot stay with us. The extra privileges of the London member are a myth; he does not use them, and his representation costs less than for others. He has, in fact, been part of the subsidy.

One may wonder, if we have kept going till now, how the money was spent say, fifteen years ago. The *monthly* BULLETIN bill now nearly equals the pre-war *annual* one, but the membership was very very much smaller, and with the increase in membership the income could be used more efficiently.

Council faces the difficult problem of next year's budget. Should it try and recover last year's and next year's estimated losses, a matter of some 40 per cent.? It is quite impossible to do this without heavy cuts in our BULLETIN and other services. Would it be wise to do this after the years it has taken to build them up? No! After long consideration of all aspects of the problem the simple truth stands clear. There is nothing wrong with the output; it is the input which is wrong, and the only possible move is to put it right quickly.

It may be that this could have been done more gently a few years ago, but it is difficult to go back and see things as they were then, and it should be no reflection on past Councils that they tried to ride the rough weather. It is no pleasure for your present Council to have to do it now, but they are asking you to face it, and are confident of your support. The first step to success is to believe in success. The equation INPUT = OUTPUT can be solved individually for the cost of less than two cigarettes a week.

F. Charman, G6CJ, President

Society Trophies

SOCIETY Trophies have been awarded by the Council for the current year to the following:—

Rotab: Mr. W. E. D. Parker, B.Sc., G6BY, for outstanding and consistent long distance work over a period of many years. (Mr. Parker has made more than 1,780 contacts with W1DQ of Rhode Island, U.S.A.)

Wortley Talbot: Mr. C. E. Newton, G2FKZ, for outstanding experimental work on 420 Mc/s and higher amateur frequencies.

Courteney Price: Mr. Paul Sollom, B.Sc., A.C.G.I., G3BGL, for outstanding technical developments, particularly in connection with aerial systems.

Founder's: Mr. V. M. Desmond, Past President and Honorary Member, G5VM, in recognition of long and distinguished service to the Society over a period of many years.

B.E.R.U. Senior Rose Bowl. Mr. C. S. Herbert ZL1MB*

B.E.R.U. Junior Rose Bowl. Mr. J. C. Van Wyk ZS6QF.*

B.E.R.U. Receiving Rose Bowl. Mr. R. S. Stott, B.R.S. 18013.

B.E.R.U. Senior Telephony Miniature. Mr. R. F. B. Featherstone, VQ4RF.

Col. Thomas Rose Bowl. Mr. W. E. Russell G5WP. Leading British Isles station in Senior B.E.R.U. Telegraphy Contest.

N.F.D. Shield and Replica: Bristol Group.

N.F.D. Shield Replicas: Bletchley and Slough Groups.

1930 Committee: Mr. W. S. Hall, G2AOL. Winner of Low Power Contest.

Somerset: Mr. D. E. Davies, GW3FSP. Winner of the 1st 1952 Top Band Contest.

Watts: Messrs. C. E. Newton, G2FKZ, G. M. C. Stone, G3FZL, and H. W. Parker, GW2ADZ. In connection with 70 cm. Tests. (To be held for 4 months each).

1950 Council: Mr. J. Walley, B.R.S. 18656 Winner of D/F Contest.

Edgware: Thames Valley Amateur Radio Transmitters Society. Winner of Affiliated Societies Contest.

Braaten: Mr. F. J. U. Ritson, G5RI. Leading English station in A.R.R.L. DX Telegraphy Contest.

Milne: Mr. J. Banner, M.B.E., GW3ZV. Leading U.K. station, other than English, in A.R.R.L. DX Telegraphy Contest.

Trophies and certificates will be presented at the Annual General Meeting on December 19th, 1952.

* *Due to the risk involved in sending the silver Rose Bowls abroad, miniatures only will be forwarded to the winners. Their names will, however, be engraved on the respective Bowls.*

London O.R.M.

APROPOS the Official Regional Meeting held on November 1st in London, the Regional Representative (Mr. W. H. Matthews, G2CD) and his Committee wish to express regret for any inconvenience caused by the last-minute decision of the British Film Institute not to allow organised parties to visit the Telekinema at the National Film Theatre.

Just over 100 of the visitors to the O.R.M. were, however, enabled to enjoy a programme of 3-dimensional and experimental films at the British Council Film Theatre in Hanover Street.

REMOTE CONTROL BY RADIO

By F. C. JUDD (G2BCX)*

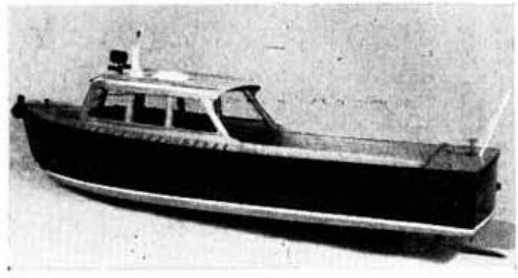
In the following article, the author surveys the basic principles and requirements of radio equipment for the remote control of models, and describes some circuits of practical value for those who wish to experiment in this fascinating field of activity.

THE remote control of models by means of a radio link has recently become popular with model-makers—particularly aero-modellers and model-ship builders. To the modeller, however, radio control is only a means to an end; he may not appreciate the circuits involved, and often buys his equipment ready-made, or builds it from pictorial diagrams, having it adjusted to frequency by a local amateur or radio dealer. His hobby is, of course, modelling, just as communication is the hobby of the radio amateur; but the two interests can be combined to open up a new field of experiment for the amateur, since satisfactory model aeroplanes or boats can be built with little or no experience of the art from comprehensive kits of which many different types are available.

A model boat is recommended as the starting point for experiments in radio control, since aero models require some knowledge of flying, and a failure resulting in a crash would cause severe damage to the radio control equipment in the aeroplane. A typical kit-built boat, constructed from pre-stamped material, is shown in Fig. 1; this took three weeks to make (working evenings only), and is representative of the type of kit stocked by most model shops. An electrically driven model is preferable, since the motor can be controlled in addition to steering.

Radio control equipment can be either simple or complex: it can consist of a single channel with one servo-mechanism for steering only, or it may be a multi-valve receiver with several channels plus a complex selector with a number of servo-mechanisms for carrying out a variety of functions. The beginner is advised to make a start with simple circuits controlling steering only, increasing the number of channels and controls as experience is gained.

Other possible applications include the remote control by radio of communications transmitting and receiving equipment: for example, the writer recently made some tests in which a transmitter and receiver operating on 1.7 Mc/s were switched on and off by means of a portable control unit. The sequence of switching is as follows: The 1.7 Mc/s transmitter is switched on from the radio-control receiver *via* the radio-control transmitter operating on 28 Mc/s; modulation is passed over the same radio-control link. On the receiver, the carrier from an incoming 1.7 Mc/s contact operates a relay (*via* the communications receiver) and switches on the 28 Mc/s low-power transmitter, passing the incoming signal to the remote receiver attached to the radio-control equipment. The writer was able to carry on a normal QSO while walking about at a distance of 500 yards from the main 1.7 Mc/s station.



[*Courtesy of Model Aircraft (Bournemouth) Ltd.*]

Fig. 1. Model of police launch (30in long) suitable for radio control, built from a kit of pre-cut material.

Receiver Circuits

Mains-operated remote control equipment is not restricted in size or complexity by considerations of weight or space, but for model control the receivers must be battery operated, compact, and light-weight (Fig. 2). Miniaturised valves and components should be used where possible (this applies particularly to receivers for model aircraft, where the weight must be reduced to a few ounces—including batteries!).

A typical simple receiver may comprise a single-valve self-quench detector and relay, or at the most three or four valves with tuned reeds reson-

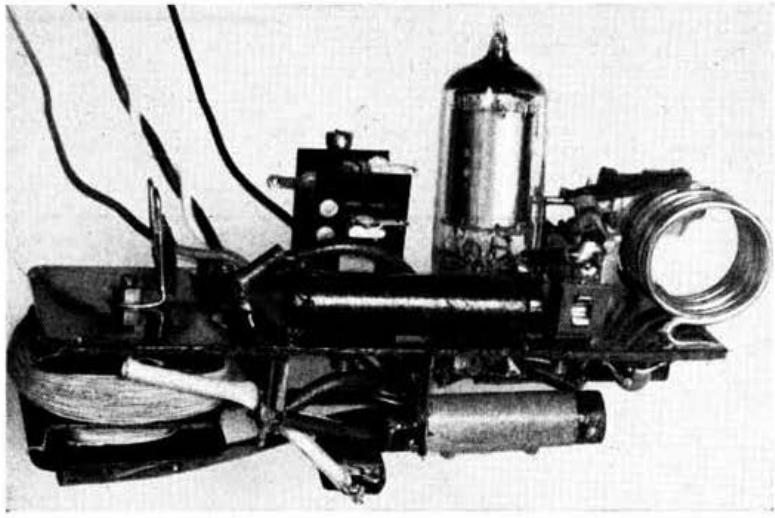


Fig. 2. Typical radio control receiver, comprising one valve in a super-regenerative detector circuit adjusted to produce a fall in anode current on receipt of signal.

* *111 Maybank Road, South Woodford, London, E.18.*

ant at pre-selected audio-frequencies used to modulate the control transmission. In the first case, the relay would operate a selector mechanism and servo-mechanism; in the second, the reeds would function as low-current switches controlling, in turn, relays for operating the various servo-mechanisms.

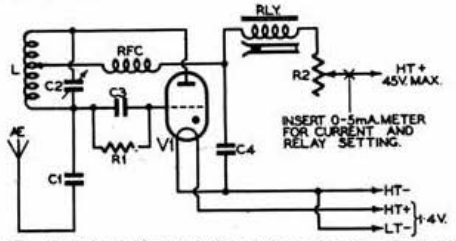


Fig. 3. Simple self-quenching super-regenerative receiver employing Hivac sub-miniature gas-filled triode (XFG1). C1, 10 μμF; C2, 30 μμF; C3, 100 μμF; C4, 0.05 μF; R1, 3–5 MΩ; R2, 50,000 Ω.

A simple radio-control receiver circuit is shown in Fig. 3. The valve used is a Hivac sub-miniature gas-filled triode (XFG1), connected in a circuit based on the ultraudion oscillator, tuned to 27 Mc/s. The self-quenching action of the valve is achieved by returning the grid to a point of positive potential. Super-regeneration is controlled by the value of the decoupling condenser; other circuit constants are not critical, but have some effect on the quench oscillation frequency, which should be as high as possible (about 5 kc/s).† When a signal is received, the standing anode current (which is adjusted initially to 1.5 or 2 mA by the variable resistor R2) falls almost to zero. Beyond the maximum range of about half a mile, however, the current drop obtained decreases until eventually the received signal is too weak to produce any change in anode current at all. The relay is adjusted to close when energised by a current of 1.5 mA or more, and to open when the current falls to about 1.2 mA. Thus, the relay can be directly controlled by the incoming signal, and may be used to operate a selector, escapement unit, or servo-mechanism for steering, etc.

Direct-Coupled Amplifier

In order to obtain a greater current change and maintain improved stability in the receiver, the circuit shown in Fig. 4 was developed by the writer. The first valve operates as a super-regenerative detector and is directly coupled to the second valve, which acts as an amplifier. A signal at the grid of V1 produces a current rise in the anode circuit of V2, the latter having a positive bias to produce an anode current of 0.5 mA in spite of the negative grid potential due to the quench oscillation developed by V1. The frequency of oscillation should be high enough to be inaudible, but of sufficient amplitude to provide greatest sensitivity and amplification. By inserting a pair of headphones in series with the relay, it should be possible to hear the thermal agitation noise in V1.

The quench frequency and amplitude are controlled by the 50,000 ohm variable resistor (R3), while the standing anode current of V2 is controlled by the one megohm variable resistor (R4). Note that the filament supplies to each valve are isolated. A switch should be inserted in the h.t. positive lead to V2 to prevent current drain when the receiver is not in use. With a signal present at the grid of V1, the anode current of V2 can be made to rise from almost zero to 5 or 6 mA, the relay being set to close when the current rises above 0.5 mA.

The transmitter is assumed to have an input of 5 watts using a quarter-wave vertical aerial, the receiver aerial being only a 20-inch rod. A small receiving aerial of this type is useful for scaled models of ships, when it may be disguised as a mast. For aircraft a trailing aerial is used and can therefore be a little longer.

There are many variations of the super-regenerative detector and amplifier circuit and the single-valve self-quench oscillator stage, but all are used in the same way, namely, to provide a current change to operate a relay.

In the case of the tuned-reed system, however, no current change is required, the reeds being controlled by demodulated tones; the receiver may, therefore, be more conventional in design, comprising a super-regenerative detector followed by a straight amplifier. Reed units are difficult to construct and are, for this reason, not very reliable, but at least one type can be purchased ready-made, capable of giving excellent results when used in a suitable circuit.

Radio Control Frequencies

Radio transmissions for model control purposes are permitted in the bands 26.96-27.28 Mc/s and 464-465 Mc/s, with a maximum d.c. input of 5 watts to the anode(s) of the valve(s) energising the aerial.

No licence is required provided single or two-way *communication* is not attempted.

† *Although this figure may seem low compared with quench frequencies used in normal reception, it is nevertheless necessary in order that the circuit may function correctly.*

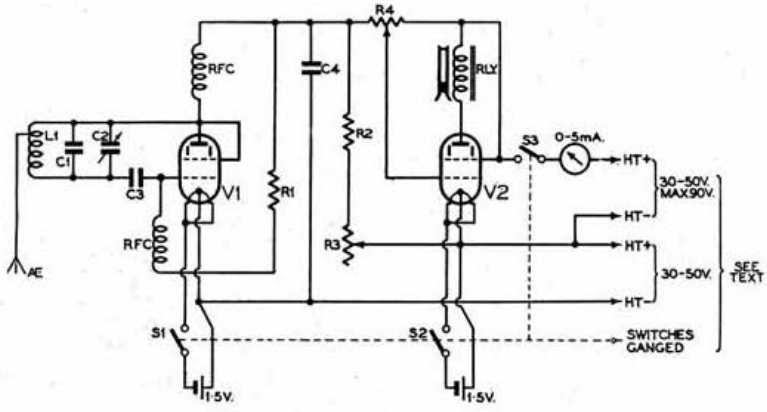


Fig. 4.

Circuit of super-regenerative model-control receiver with direct-coupled amplifier.

C1, 2, 30 μμF; C3, 100 μμF; C4, 0.1 μF; R1, 3.3 MΩ; R2, 47,000 Ω; R3, 50,000 Ω; R4, 1 MΩ; V1, 2, Brimar 3V4; RLY, relay; L1, 8 to 9 turns 16 s.w.g., ½in diam., winding length 1in, aerial tapped one turn from anode end.

Transmitters

The transmitters used for the radio control of models are normally self-excited oscillators of the Colpitts or T.A.T.G. types, while those used for reed control usually employ grid or anode modulation (with, no doubt, some frequency modulation too!). A typical circuit—that of a push-pull oscillator—is shown in Fig. 5, the complete unit being pictured in Fig. 6. Construction is straightforward, as for any self-excited oscillator, the usual precautions being taken to ensure frequency stability. The aerial should preferably be a quarter-wave vertical (8ft 6in long) link-coupled to the tank coil of the transmitter.

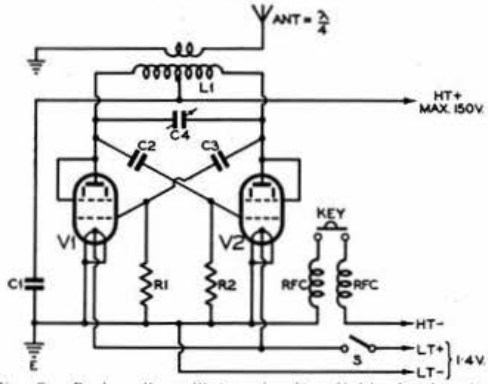


Fig. 5. Push-pull oscillator circuit suitable for input up to 5 W. R.F. chokes in the keying lead should be designed for 27 Mc/s.
C1, 0.1 μF; C2, 3, 50 μμF; C4, 30 μμF; R1, 2, 22,000 Ω; V1, 2, Brimar 3D6. L1, 8 turns 20 s.w.g., 1in long on ¾in diam. former.

Servo-Mechanisms

Suitable servo-mechanisms can be devised by the ingenious experimenter from war surplus equipment, clockwork mechanisms, parts from computors, etc., or may be turned and manufactured from raw material and operated by small electric motors or electromagnets. Simple steering escapements may be purchased ready made, and these are quite reliable. A typical clockwork powered escapement (or actuator) is shown in Fig. 7b. In practice, this could be mechanically coupled to the rudder of a boat or aeroplane by means of cranks and a loop attached to the rudder post.

Steering may also be effected by means of electrically-driven mechanisms, and engine speed controlled by use of a motor-driven variable resistance in series with the armature winding of the electric engine. With permanent-magnet motors direction may be reversed by changing the polarity of the supply to the armature of the motor *via* a relay-operated change-over switch.

The various servo-mechanisms may be selected by means of a motor-driven rotary selector switch with a delayed relay in circuit to prevent unwanted controls from coming into operation as the selector wiper-arm passes over the contacts. Delays of up to two seconds can be achieved by the use of shunt capacity and series resistance; for example, a relay having a d.c. resistance of 5,000 ohms with a 6,000-ohm series resistor and a 50 μF condenser would have a delay of about one second when operated at 45 volts.

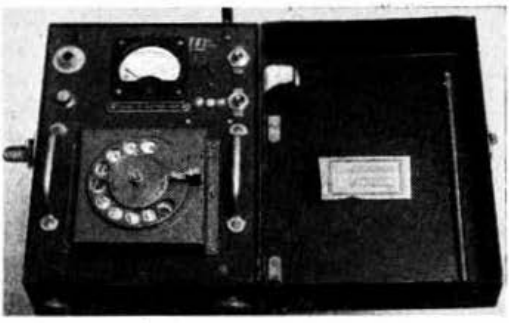


Fig. 6. Radio control transmitter constructed and used by the author. Note telephone dial for pre-selector keying. Circuit is similar to that in Fig. 5.

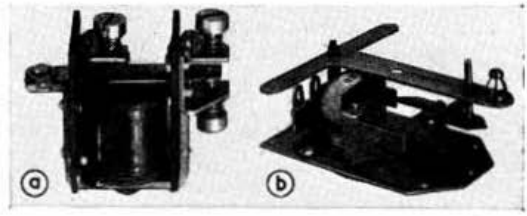


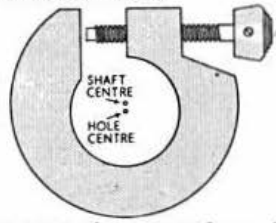
Fig. 7. (a) Miniature lightweight sensitive relay weighing only ½oz., suitable for radio control receivers; (b) a typical actuator for steering control, embodying clockwork driven 4-pawl movement (*Messrs. Electronic Developments, Ltd., Kingston, Surrey*).

There is no limit to the number of controls that can be operated by a suitable combination of selector and delay circuits and servo-mechanisms, even with a simple single-channel radio link. Apart from steering and engine control, lights may be switched on and off, flags raised and lowered, guns fired, tow lines released, and so on, depending on the size and nature of the model, and on the mechanical ingenuity of the constructor.

Gadget Corner

A USEFUL micrometer for checking crystal thickness can be made up from a piece of bronze shaft 2½-in. in diameter cut off about ¼-in. thick, with a 1⅛-in. diameter hole drilled off-centre to allow more metal on the side that will hold the screw. The ring thus formed is then cut and squared as shown in the diagram, after which it is drilled and tapped to take a ¼-in. stainless steel bolt. The bolt must be a tight fit in the tapped hole, a little metal polish being used to finish off as the bolt is screwed back and forth.

Method of construction of the simple micrometer described in text.



Next, with the screw open, the cut surface of the shaft below the end of the bolt is filed flat from all directions at right-angles to the bolt. In practice this will produce a slightly rounded surface, which is what is required. The end of the bolt is then filed flat, turning it periodically. Finally, a watchmaker's file is used to equalise both surfaces at the point of contact, the bolt being screwed up so that the file will just pass through the gap.

The job is finished by lapping with metal polish, the bolt being screwed carefully back and forth until the lapping mark is perfect. The large surface holds the crystal in alignment so that it can be slid to and fro to find the high and low spots.

VP1AA

By M. BARLOW (G3CVO)*

Television Transmission for the Amateur

Part 1 - Fundamentals

Although the construction of a complete television transmitter for use on one of the amateur bands assigned for that purpose is not a job to be lightly undertaken, nevertheless a great deal can be accomplished by using simple equipment in a closed circuit. In this series of articles, G3CVO will outline the principles of television transmission, and describe the construction of units which can eventually be used for the more ambitious project of "getting on the air with TV."

MOST readers will be familiar with the fundamentals of television transmission and reception, and, as it is not recommended that the construction of a television transmitter be undertaken by anyone who has not already had experience in building television receiving equipment, only a brief résumé of the basic principles will be given here.

The transmission of a picture by electronic means is not so simple as the corresponding case for sound transmission. A microphone will pick up sound waves, and convert them into an electrical waveform containing components proportional to the pitch (or frequency), amplitude, and harmonic content (or detail) of the original sound. A light-sensitive device such as a photo-cell, on the other hand, although it may be sensitive to changes in colour (or frequency) of incident radiation, and much more so to the intensity of light falling upon its surface, does not respond to visual detail; the cell output is a d.c. level corresponding to the mean level of illumination. In other words, the photo-cell cannot distinguish between two objects of different shapes if their light mean intensities are equal. Thus, any of the patterns shown in Fig. 1 will produce the

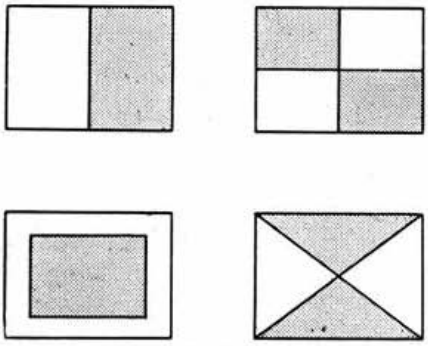


Fig. 1. Each of these patterns will be reproduced as a uniform shade of grey at the receiver in the absence of a scanning system, since each contains equal areas of light and shade.

same even shade of grey at the receiver, since each contains an equal proportion of black and white. This phenomenon is, incidentally, used as the basis of photo-electric exposure meters used in photography.

Since only the *average* intensity of illumination can be transmitted, it is necessary to break down the picture into a series of very small elements (or "dots," as in a newspaper half-tone photograph). The average intensity of each individual picture element in turn is then transmitted. This process of analysing the picture at the transmitter, and recreating it at the receiver is termed *scanning*.

Theoretically almost any scanning arrangement or system could be used, but in practice it is more convenient to adopt the conventional rectangular scan (from left to right, downwards, as in reading a book) produced by applying two saw-tooth waveforms to a deflection system suitable for the type of cathode-ray tube in use. A modified system, known as *interlacing*, scans only half of the picture at a time, the other half being filled-in during the following scan (Fig. 2). The advantages claimed for this

Fig. 2. (a) Sequential scanning; (b) Double-interlaced scanning.

method are chiefly a reduction in flicker, and economy in the bandwidth of the transmission (in closed-circuit work this is not of great importance).

The Transmitter

A complete television transmitter consists of certain essential units, varying in complexity with the amount of information to be transmitted. Obviously, a still-picture transmitter ("telestill" transmitter) will be much simpler than a full-colour live-subject camera unit. A typical transmitter schematic is illustrated in Fig. 3. The scene to be televised is scanned by the camera unit in the manner already described, while the amplifier, modulator and transmitter perform the same functions as in a sound transmitter. The synchronisation (sync.) unit is necessary to keep the transmitter and receiver in step, but can be omitted in simple installations, as will be shown later. For amateur purposes, it is more convenient to have the sound channel entirely separate; it can operate on any of the amateur bands for which the station is equipped, bearing in mind

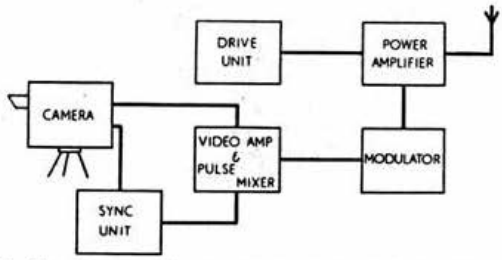


Fig. 3. Schematic diagram of the basic units required for a complete television transmitter.

* *Cheyne Cottage, Dukeswood Drive, Gerrards Cross, Bucks.*

that two-way communication with the receiving station is invaluable when carrying out final adjustments to the transmitter.

Since the equipment will almost certainly be used with standard television sets as receivers, monitors, etc., the transmitted pictures should be of a type capable of being resolved and displayed by such apparatus. Two standards are therefore immediately available: 405 lines 50 frames per second double-interlaced (as used by the B.B.C.); or 200 lines 50 pictures per second sequentially scanned. In practice, the simpler sequential system is capable of excellent results (as those who saw the demonstration of G2DUS's TV equipment at the 1950 R.S.G.B. Amateur Radio Exhibition will confirm), and the complications involved in producing an interlaced scan are not worth-while at this stage.

In a 200-line sequentially scanned picture, there are 200 vertical picture elements and (for equal horizontal and vertical definition) the same number of horizontal elements. The total number of individual elements in each picture is therefore $200 \times 200 = 40{,}000$. As the picture repetition frequency is 50 per second, then the total number of elements transmitted each second is 2,000,000. In order to reproduce these elements satisfactorily, the video amplifier stages usually have a linear frequency response extending from zero to 2 or 3 Mc/s, and preferably to 4 Mc/s. Care is required to avoid r.f. pick-up from transmitters in the lower frequency bands, or even medium-wave broadcast break-through on the vision channel. Because of the wide bandwidth required, the gain-per-stage of the amplifier is relatively low, so that a greater number of stages must be used, with consequent increase in noise. Any design is therefore a compromise, but with careful construction the results obtained from equipment built with surplus components are normally satisfactory.

Where To Start

The pulse generator unit is the starting point adopted by some constructors, the reason being that if the sync pulses can be transmitted so as to lock effectively the receiver in step with the transmitter, then the picture proper can be added to this foundation at a later date. Furthermore, by transmitting harmonics of the sync pulse repetition frequency, various patterns of black bars can be produced for test purposes, as in commercial television pattern generators. Thus, doubling the line and frame pulses produces the familiar black cross test pattern, which has the merit of being independent of the camera chain.

Most constructors, however, prefer to start with a picture, even if it is a little crude, and leave the pulse generator until later. Initially, the pulse generator can be omitted entirely by employing a common scanning circuit for both transmitting and receiving equipment. A typical arrangement is illustrated in Fig. 4. The "camera" is a flying-spot scanner, the raster on the face of the cathode-ray tube being focused on to a photographic transparency. The transmitted light from the "flying spot," varying in brilliance with the picture density of the intervening transparency, is picked up by a photocell, converted into a voltage waveform, and passed to the video amplifier. A switched phase-inverting stage enables either positive or negative transparencies to be used, the polarity of the video output being thus under control. Finally, the video voltage is applied to a cathode-follower stage, coupled to the monitor tube (or transmitter modulator, depending on the system used) *via* a length of coaxial cable.

A common line and frame time base feeds both the scanner and monitor cathode-ray tubes, and also supplies blanking pulses to suppress the flyback lines on the picture. Although simple, the arrangement works very well, and full constructional details will appear in the next article in this series.

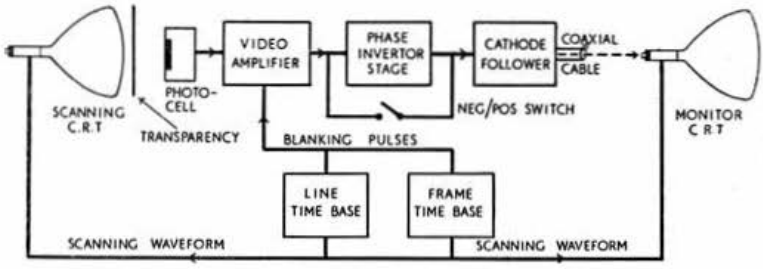
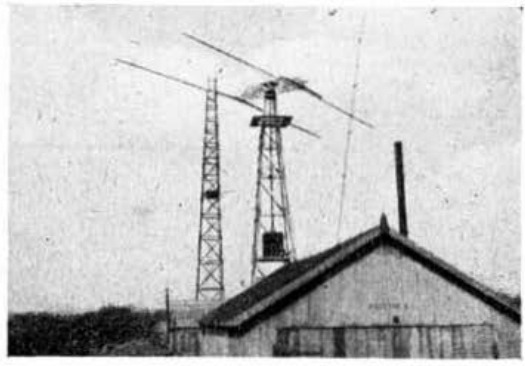


Fig. 4. Schematic diagram of a simple transparency transmitter operating on the flying-spot principle, capable of resolving 3 Mc/s definition bars.

The flying-spot system is not limited to the transmission of "still" transparencies, but can be used for cine film, or live subjects in a darkened room — an ideal method for a one-operator station requiring an inexpensive TV transmitter.

Camera tubes are not easily obtainable; until recently the RCA 5527 Iconoscope was available at about £28, but importation for experimental purposes is no longer permitted. Arrangements are in hand for the supply of a limited number of British camera tubes to bona-fide experimenters, but initially the reader is advised to make a start along the lines suggested, with the hope that, as conditions improve, camera tubes will eventually become more easily available.

(To be continued)



View of the 30-ft. high rotatable 20m beam at G2AVW. In the background can be seen the 50-ft. high tower for the 137-ft. dipole, using 600-ohm spaced feeders.

By F. TILLOTSON (G6XT)*

Behaviour of 300-ohm Feeder Lines in Wet Weather

AFTER using 300-ohm extruded feeder-line for feeding a three-element beam on 28 Mc/s., the writer became intrigued by its inconsistency of performance during periods of wet weather. This seemed to be a universal failing whenever an insulant other than air was used for the dielectric. During contacts with U.S. stations the subject was broached, and it transpired that the same trouble was also experienced over there. Arising from these discussions the suggestion was made that the impedance at the termination of the feeder was the root of the trouble, and that this changed considerably during wet weather. Many operators had achieved some measure of alleviation by using grease or dope as a protective coating on the feeder line.

An alternative reason was sought, however, with a view to finding the true cause and ultimate cure of this puzzling effect. Various tests to determine whether the impedance at the termination did actually vary in wet weather produced no conclusive results, but a constant check on ammeter readings during a long period of variable weather did at last suggest a new line of thought.

The first indication of trouble was that the loading and ammeter readings varied according to the amount of moisture present on the feeder line. At G6XT the standing-wave ratio has always been under observation as two ammeters, separated by a quarter-wave section, are permanently connected in one leg of the feeder, thus enabling a maximum and a minimum reading of the current to be noted at any time (care being taken to use the resonant frequency when making readings).

Wave-Shift

Eventually, it was noticed that the standing-wave ratio was changing along with the loading, and although this might have been due to a change of impedance at the termination, it was decided that the *real* reason was a movement of waveform in the feeder-line itself. Since the ammeter reads the total current in the feeder-line (*i.e.*, outgoing current and reflected current)—its position being fixed because the length of line is constant—it follows that any movement of the waveform must produce a change in reading, especially if the standing-wave ratio is of a high value (Fig. 1).

Possible reasons for any wave-shift are: (i) frequency variation; (ii) change of feeder length; and (iii) alteration in the velocity-ratio. The first two can be dismissed as they are obviously under the control of the operator, but the third indicates a potential source of the trouble. The characteristics of *Telcon* K25 and K35 feeder-line are given in the appendix, from which it will be noticed that the effective dielectric constant (K) appears in both the terminating impedance (Zo) formulæ and the velocity-ratio (V.R.) formulæ. Any alteration in K would therefore affect both.

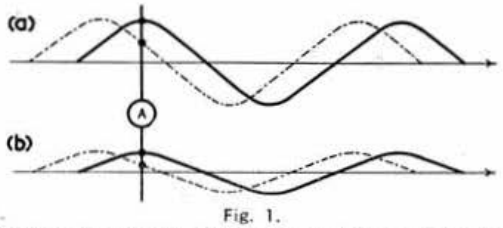


Fig. 1.

Diagram showing the effect of wave-shift on feeder-line ammeter readings (a) with high standing-wave ratio, and (b) with low standing wave ratio. Note that the change of ammeter readings in (b) is small as compared with (a).

From practical observation it was evident that the velocity-ratio was more affected than the feeder terminating impedance, so mathematical proof was sought. Four values of K were assumed, and the following results obtained :

K	1.45	1.5	1.6	1.7
V.R.	0.831	0.817	0.793	0.768
Zo	299.3	294.2	284.7	276.4

It will be seen that variation of K has more effect on the velocity-ratio than on the impedance, Zo.

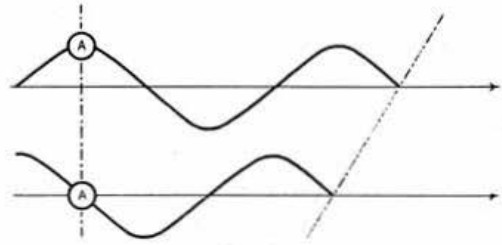


Fig. 2.

Variation of K, due to weather conditions, alters the velocity ratio, producing a wave-shift on the feeder-line. Frequency and physical length are constant.

Standing-Wave Ratio

This is an important finding, because most feeder lines which consist of extruded material are a few half-wave lengths long, and the velocity-ratio applies to the complete length. If this ratio is a constant in one part of the length, but a variable in the remainder, then a wave-shift will result. This was, in fact, what was happening (Fig. 2), and it will be seen that the only cure is to ensure a low value of standing-wave ratio. If there is little wave-form on the feeder (*i.e.* flat line conditions), then any alteration in the velocity-ratio will have negligible effect. This also applies to frequency variation, and at G6XT a shift of 1 Mc/s. makes very little difference to the meter readings both in the anode circuit and in the aerial, proving that the standing-wave ratio is of a low value.

Although the circular type feeder line, K35, is an advance on the flat type, K25, it will not be effective unless the standing-wave ratio is low. A table of readings made during dry and wet weather appears herein, from which it will be seen that the variation is not very great although the frequency coverage is more than 1 Mc/s. The ammeter and output link were the same for both tests to provide identical working conditions, the only variable factor being the weather.

If trouble is experienced in wet weather, a check on the standing-wave ratio can easily be made by

* 47 Watson Street, Morley Yorks.

taking readings over a number of frequencies. If there is a large variation, then the ratio must be high, and it should be investigated.

Appendix

Electrical characteristics of Telcon K25 and K35 feeder:

Nominal impedance = 300 ohms.
Capacity = 4 $\mu\mu$F./ft.
Attenuation at 1 Mc/s. = 0.125 db./100 ft.
Attenuation at 100 Mc/s. = 1.35 db./100 ft.
Power handling capacity = 550 watts (approx.) at 100 Mc/s.
Velocity Ratio = 0.83.

Feeder Terminating Impedance:

$$Zo = \frac{276}{\sqrt{K}} \cdot log_{10} \frac{4h}{k_1 d}$$

where K is the dielectric constant of the cable (1.45); h is the semi-spacing of the conductors; d is the diameter of the circumscribing circle which just embraces the conductors; and k is the stranding factor which has a value of 0.94 for a 7-strand conductor.

Velocity Ratio:

$$V.R. = 1/\sqrt{K}$$

where K is the dielectric constant of the cable.

Comparative Feeder Current Readings

Freq. kc/s.	DRY WEATHER			WET WEATHER		
	P.A. Input (mA.)	Feeder Ammeter Readings (A.)		P.A. Input (mA.)	Feeder Ammeter Readings (A.)	
		A1	A2		A1	A2
28000	150	0.8	0.4	150	0.72	0.42
100	150	0.78	0.4	150	0.7	0.42
200	150	0.76	0.4	150	0.68	0.42
300	150	0.75	0.4	150	0.65	0.42
400	145	0.75	0.4	150	0.65	0.42
500	145	0.72	0.41	150	0.65	0.42
600	145	0.71	0.41	147	0.62	0.42
700	145	0.7	0.41	145	0.6	0.42
800	145	0.69	0.42	145	0.6	0.42
900	145	0.69	0.42	145	0.6	0.42
29000	150	0.65	0.44	145	0.6	0.42
100	150	0.65	0.44	145	0.62	0.42
200	150	0.65	0.44	148	0.64	0.42
300	150	0.65	0.44	150	0.7	0.42

Resonant frequency 29,000 kc/s. Standing-wave ratio (dry weather) 1.4, (wet weather) 1.64.

The Two-Metre Beam Array at PE1PL

The call sign PE1PL will be familiar to many readers who have heard or worked this station on two metres. We are indebted to the Netherlands Physical Laboratory at The Hague for permission to publish this description of the aerial in use.

THE aerial consists of a reflector screen mounted vertically on a rotatable platform, and suitably guyed and reinforced against buckling. On one side of the screen are mounted ten half-wave radiators, arranged in two stacks of five, at a distance of 0.2 wavelength (38.5 cm) from the screen. The radiators are a half-wave in length (95 cm), fed in phase and driven from 72-ohm coaxial cable *via* an unbalance-to-balance transformer (balun), a matching box, a variable stub and a quarter-wave matching transformer. The overall length of cable at PE1PL is about ten metres from balun to transmitter; a special joint in the cable permits continuous rotation of the array.

The frame for the reflecting screen (Fig. 1) is 2.55 metres wide by 4.5 metres high, and is made from welded steel tubing of 19 mm o.d. It is strengthened by horizontal tubes so arranged that three of them are set closely behind each pair of radiators. Between the cross tubes are copper wires of 4 mm diameter (approx. No. 8 s.w.g.) spaced about 50 mm apart. The frame is braced to the four corners of the lower platform by a "rigging" of 16 stay wires, each fitted with a strainer.

The radiators are 95 cm long with a diameter of 12 mm and are centrally mounted on metal rods attached to the centre of each of the groups of three horizontal tubes. Each supporting rod carries a wooden block through which the radiator runs, thus insulating the latter from the metal framework. The inner ends of the radiators are spaced 40 mm apart and separated by short lengths of polythene rod; they are cross-connected by means of a transposed two-wire feeder line with polythene spreaders.

The Feeding and Matching System

The array is fed at the centre pair of radiators

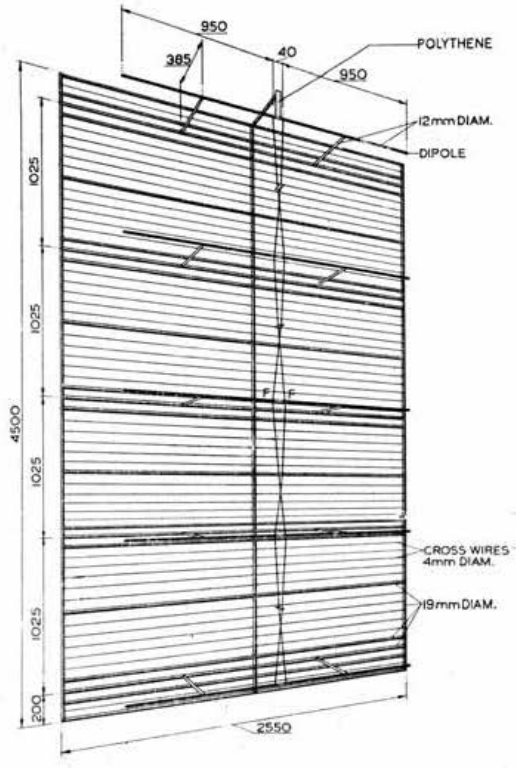


Fig. 1. Details of the stacked array. All dimensions are given in millimetres (1 mm. equals 0.0394 inches). Groups of three closely spaced bracing tubes are arranged behind each pair of radiators for improved reflection.

through the matching system shown diagramatically in Fig 2. The quarter-wave matching section EE, FF is made from 10 mm o.d. brass tubing spaced 30 mm centre to centre; at EE it joins the open end of a matching stub (S) constructed from similar tubing 58 cm long, shorted at the top, and provided with an adjustable shorting bar A. The spacing for the tubes in the stub is similar to that of the matching section.

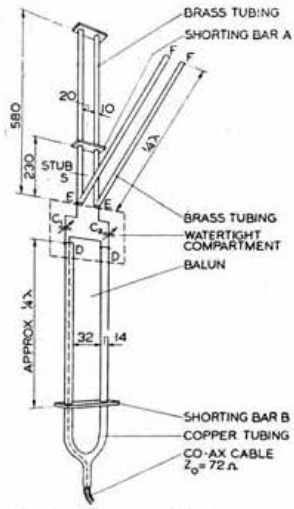


Fig. 2. The matching system.

Also at EE, connection is made to two variable condensers of 50 $\mu\mu$F. each. These are housed in a Plexiglass or Perspex box and may be adjusted through two holes which are normally sealed against the ingress of water.

At DD the condensers connect to the open end of the balun, which is constructed from copper tubing of 14 mm o.d. with a spacing of 46 mm between the centres of the two limbs. The length of the balun is one quarter-wave plus 10 cm, the effective length being determined by the position of the shorting bar B. The coaxial cable is led up one leg of the balun, its outer conductor joined to the point D on the copper tube and its inner conductor joined to the top of the opposite leg.

Adjustment

The output of a signal generator or other source of r.f. is fed into the feeder cable *via* a standing-wave indicator, the standing-wave ratio being adjusted to minimum by means of the shorting bar A and the two variable condensers which should —after tuning—be of equal capacity. Shorting bar B on the balun should be appoximately one quarter-wave length from DD, but may require slight adjustment to tune out possible reactance appearing across DD. The resulting s.w.r. over the band 144-146 Mc/s. is less than 1.5.

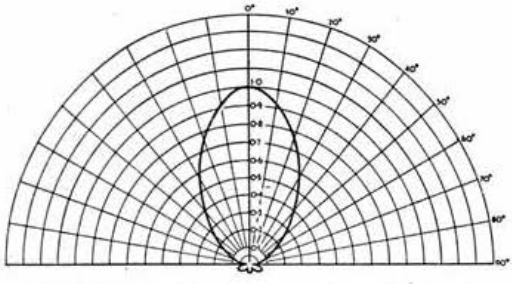
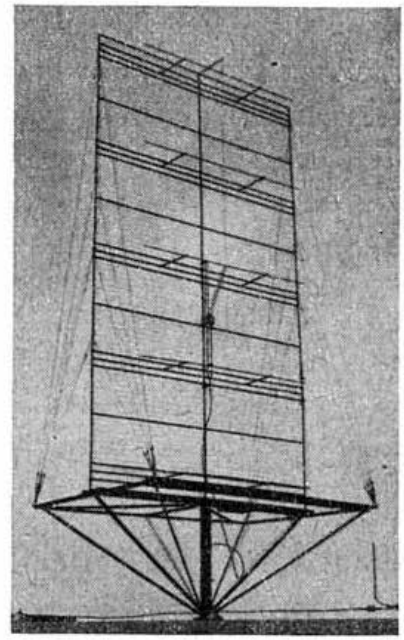


Fig. 3. Measured horizontal radiation pattern of the 10-element array.



General view of the 10-element-plus-reflector stack at PE1PL, at The Hague. Note the elaborate and strongly constructed reflector screen upon which the radiators and matching system are mounted.

Performance

A front-to-back ratio of approximately 25:1 in amplitude (or 28 db) is obtainable, with a forward gain of 15 db over an isotropic dipole. The radiation pattern is shown in Fig. 3.

Coincidence

ON February 17th, 1929, Ham Whyte, G6WY, then of London, worked SP3LM of Vilna, for his third QSO with Poland. The Poles had only just started using the prefix SP—previously they had used ET. During the 1930's G6WY made contact several times with SP3LM who later changed his call to SP1PM and just before the war to SP2LM. Even phone QSO's were made on 14 Mc/s which was rare, for few SP's used telephony in those days.

The scene changes to September, 1952, by which time G6WY had become VE3BWY. After a spell of good DX conditions with Europe a report was received from a listener living in the same street. Yes—the writer turned out to be the original TPLM, SP3LM, SP1LM, SP2LM, late of Vilna, now living in Canada!

T.V. Hi!

There was a time when we were told
By all the powers that be
To bias high, and drive 'em hard,
And this, they called "Class C."
Now times have changed: the order goes
To guys like you and me,
Keep that drive low—harmonics go,
You'll let a new "Class See!"

GM4JQ

ANNUAL REPORT OF THE COUNCIL

THE Council takes pleasure in submitting to the membership a Report covering the major activities of the Society during the year which ended on June 30, 1952.

Articles of Association

A great deal of careful thought was given to the task of revising the Articles of Association and several Special Meetings of the Council, to discuss the proposed amendments, were held during the year. Throughout its discussion the Council kept in mind that the revised Articles should be capable of enabling the Society to function effectively and efficiently for many years ahead. The final results of its deliberations were recently presented to the membership in printed form.

The R.S.G.B. Bulletin

Volume 27 contained 568 pages compared with 480 pages in Vol. 26, 442 pages in Vol. 25, 324 pages in Vol. 24 and 256 pages in Vol. 23. The increased number of pages; a substantial rise in the cost of paper; and a wages increase in the printing industry were, however, responsible for the very considerable increase in production costs compared with last year.

The standard of technical contributions again reached a very high level. The Norman Keith Adams Prize for the outstanding technical contribution was awarded to Mr. D. N. Corfield, D.L.C.(Hons.), A.M.I.E.E. (G5CD), for his papers entitled "A Compact 70 cm Receiver," and "A Survey of 70 cm Equipment." The first award of the Bevan Swift Memorial Premium was made to Mr. H. Whalley, M.Sc., A.M.Brit.I.R.E. (G2HW), for his paper entitled "Design of Pi-Network Tank Circuits." Other notable contributions included "Collins Coupler," by D. Woods, A.M.I.E.E. (G6OC-G5WV); "Design in Break-in Operation," by W. H. Segrott (G8PI); "High Efficiency Grid Modulation," by L. A. Moxon, B.Sc., A.M.I.E.E. (G6XN); and "Home-made Wide-Band Couplers," by R. H. Hammans (G2IG).

The Council is indebted to Mr. R. L. Varney, A.M.I.E.E. (G5RV), for three further important contributions on the subject of television interference suppression, namely: "An Improved Low-Pass Filter"; "An Improved 75 watt T.V.I.-proof Transmitter" and "A 5-Band T.V.I.-proof 150 watt Power Amplifier." In the same connection Mr. J. W. Mathews, Assoc.Brit.I.R.E. (G6LL), contributed an article entitled "A Sensitive Harmonic Indicator."

New features introduced during the year included bi-monthly notes on Amateur Television and Single Side-Band Operation; Messrs. M. Barlow, G3CVO, and H. F. Knott, G3CU, were the contributors.

Mr. W. H. Allen, M.B.E. (G2UJ), contributed monthly notes on v.h.f. conditions, whilst Mr. A. O. Milne (G2MI) reviewed radio conditions generally.

For the benefit of new members a series of articles entitled "The Helping Hand to Amateur Radio" was contributed by Mr. B. W. F. Mainprise, B.Sc.(Eng.), A.M.I.E.E. (G5MP).

Rules for, and results of, Contests, again occupied a good deal of space, as did Résumés of the Proceedings at Meetings of the Council, lists of New Members, and Reports from Groups and Affiliated Societies.

Volume 27 carried approximately the same number of pages of advertising as the preceding volume, an indication of the "pulling power" of the R.S.G.B. BULLETIN at a time when the rearmament programme prevented many manufacturers from continuing their full production of components and valves for domestic purposes. The Council places on record its thanks to all who contributed to that volume of the BULLETIN.

Membership

For the fourth successive year a fall in membership has to be recorded. The comparative figures for the past few years are given in the following table:

Grade	Sept. 30 1947	Sept. 30 1948	June 30 1949	June 30 1950	June 30 1951	June 30 1952
Corporate:						
Home	12,105	12,336	11,851	10,936	10,119	9,578
Overseas	546	651	672	672	700	775
Life	79	90	95	105	107	116
Honorary	8	8	8	7	7	8
Associates	1,132	1,354	1,412	1,303	1,201	1,148
Totals	13,870	14,439 (+569)	14,038 (−401)	13,023 (−1,015)	12,134 (−889)	11,625 (−509)

The Council hopes that the decline in membership will be checked and steady annual increases recorded. Serious as have been recent losses, newer members are reminded that in 1939 the total membership of the Society was only 3,500 and that in 1941 the figure had fallen to below 2,500. The spectacular growth from 1942 to 1948 was due to the peculiar conditions then applying. The present unsettled economic state of the country is the factor chiefly responsible for the decline in membership of most hobby-interest organisations.

The number of Amateur Wireless Transmitting licences in force in the United Kingdom as at June 30, 1952, was 7,757 compared with 7,677 as at June 30, 1951, and 7,487 a year earlier. It is believed that approximately 600 licences were not renewed during the year.

Affiliated Societies

During the year the Council granted affiliation to 30 local Societies and Clubs. At the end of the year under review 132 Societies and Clubs were in affiliation, a nett increase of 27 over the previous year.

Council Meetings and Attendances

From July to December, 1951, the Council met on 11 occasions and was in session for a total period of 44½ hours. From January to June, 1952, the Council met on nine occasions and was in session for a total period of 36 hours. In addition Members of the Council attended Regional and County Meetings, Committee Meetings and Conferences with the Regional Representatives.

Mr. H. A. Bartlett, G5QA, of Exeter, Devonshire, and Mr. Hugh McConnell, GM2ACQ, of Alloway, Ayrshire, Scotland, were elected to the Council in January, 1952. During the period from January to June, 1952, both members attended every meeting of the Council.

Mr. Bartlett travelled 350 miles and Mr. McConnell 830 miles on each occasion. Mr. McConnell is the first Member resident in Scotland to be elected to serve on the Council.

The following is a list of attendances at Council meetings for the period from July, 1951, to June, 1952:

Name	Possible Attendances	Actual Attendances
Allen, W. H.*	11	9
Amos, A. P. G.*	11	6
Bartlett, H. A.†	9	9
Charman, F.	20	16
Cooper, L.	20	19
Craig, W. N.*	11	11
Desmond, V. M.*	11	3
Edwards, C. H. L.	20	20
Findlay, D. A.†	9	9
Herdman, T. L.	20	19
Hum, J. H.†	9	6
Lambeth, F. G.†	9	7
Milne, A. O.	20	16
McConnell, H.†	9	9
Scarr, W. A.	20	17
Thorogood, P. A.*	11	7
Walker, R.†	9	9
Watson, A. J. H.*	11	2
Winsford, P. W.	20	20

* Retired, December 31, 1951.
† Took office, January 1, 1952.

Long Service Recognised

At the February meeting of the Council Mr. V. M. Desmond, G5VM (Past President), was elected an Honorary Member, and Mr. A. J. H. Watson, F.S.A.A., G2YD (Hon. Treasurer, 1942-1951) a Vice President, in recognition of their long and valued services to the Society.

Representation

During the year covered by this Report, Regional or County Meetings were held in twelve centres. Details of the various meetings are given below:

Region	Venue and Date	Approx. Attendance	Council Representatives Present
2	York June 15, 1952	85	Messrs. Hum, McConnell and Winsford. The General Secretary.
3	Birmingham May 24, 1952	60	The President (Mr. F. Charman), Messrs. Cooper and Herdman. The General Secretary.
4	Derby Oct. 14, 1951	55	The President (Mr. W. A. Scarr), Messrs. Allen and Cooper. The General Secretary and Miss Gadsden.
	Leicester June 29, 1952 Lincoln	55	Messrs. Findlay and Scarr. The General Secretary.
	May 18, 1952	95	Messrs. Cooper, Edwards and Milne.
8	Tunbridge Wells Sep. 30, 1951	30	The President (Mr. W. A. Scarr), Messrs. Allen, Cooper, Herdman, Thorogood and Winsford. The General Secretary.
9	Dorchester Sep. 23, 1951	40	Mr. Craig.
	Falmouth May 4, 1952	100	The President (Mr. F. Charman), Messrs. Milne and Edwards. The General Secretary and Miss Gadsden.
	Plymouth Oct. 7 1951	80	The General Secretary and Miss Gadsden.
11	Llandudno May 11, 1952	40	Messrs. Lambeth and Scarr. The General Secretary.
12	Aberdeen Sep. 16, 1951	60	Messrs. Cooper, Craig, Herdman and Milne. The General Secretary.
14	Glasgow Sep. 15, 1951	70	Messrs. Cooper, Craig, Herdman and Milne. The General Secretary.

Since July, 1952, meetings have been held in Region 1 (Liverpool), Region 6 (Southampton) Region 7 (London), Region 9 (Bristol) and Region 14 (Falkirk).

During the previous financial year meetings were held in only six centres. The total attendance at those meetings was nearly as great as that recorded at the twelve meetings held during the year 1951/2.

Approximately 100 local meetings arranged by town groups were held each month. Lectures, demonstrations, film displays, technical and Morse instruction featured in the programmes of most groups. Several groups co-operated in the organisation of local exhibitions. Regional and County contests were also arranged in certain areas.

The Council wishes to place on record its warm thanks to those who served as Regional, County, District, Area or Town Representatives during the year and to all others who helped to make the scheme of representation a success.

London Lecture Meetings

During the period from October, 1951, to April, 1952, five Lecture meetings of the Society were held at the Institution of Electrical Engineers.

A list of speakers and titles of papers follows:

October 26, 1951: J. R. Erskine (B.R.S. 12381) and R. Grubb (G3FNL). "Problems in Amateur Television Transmitter Modulator Design."

November 23, 1951: D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E. (G5CD). "Technical Aspects of the Amateur Sound and Vision Licences."

January 25, 1952: E. A. Dedman (G2NH). "Recent Developments in the Production of Quartz Crystals."

February 29, 1952: L. Bounds and C. W. Touch (Mullard, Ltd.). "Modern Valves for V.H.F. Work."

March 28, 1952: H. A. M. Clark, B.Sc.(Eng.), M.I.E.E. (G6OT). "Microphone Acoustics for the Radio Amateur."

Amateur Radio Exhibition

The Fifth Annual Amateur Radio Exhibition, organised by the Society, was held at the Royal Hotel, London, W.C.1, during November, 1951. The Exhibition was opened by Mr. Charles Ian Orr-Ewing, O.B.E., M.P., in the presence of a number of distinguished guests. As in past years the Exhibition was well supported by the radio industry and Government Departments—the Air Ministry exhibit being outstanding. A much-appreciated new feature was a display of home-constructed equipment loaned by members.

The Council records its thanks to all who helped to make the Exhibition a success.

Licence Matters

As the result of discussions between representatives of the Post Office and the Society it was announced in June that a portion of the 21 Mc/s band would become available to amateurs in the U.K. as from July 1st, 1952. From the same date the use by amateurs of frequencies between 14351 and 14400 kc/s was to cease. Thus, after a period of five years, the first really vital decisions affecting Amateur Radio reached at the Atlantic City Conference in 1947 were implemented.

During the year under review the Society was successful in obtaining a number of additional privileges for licensed members. These included

permission to use Frequency Modulation on frequencies within the band 144.5-145.5 Mc/s; permission to use Pulse-Amplitude and Pulse-Width Modulation within the bands 2350-2400 Mc/s, 5700-5800 Mc/s and 10050-10450 Mc/s; permission to transmit Amateur Television on frequencies within the band 425-455 Mc/s; new Portable and Alternative Address facilities; restricted Maritime Mobile facilities.

The Council, through its Liaison Committee, continued to press the Post Office to speed-up the release of the remaining portion of the 21 Mc/s band as well as the channel between 3635 and 3685 kc/s. Discussions also took place with the Post Office on a wide variety of other subjects associated with the issue of licences and the operation of amateur stations. (The remainder of the 21 Mc/s band was released to U.K. amateurs for c.w. operation on October 9, 1952, and the whole band for telephony operation as from November 15, 1952.—Ed.).

Commercial Stations

On several occasions during the year the Council protested to the G.P.O. about the presence of commercial stations in exclusive amateur bands. Whilst expressing concern the Post Office appeared to be unable to initiate steps to rid the amateur bands of this unwarranted interference. The Council hopes that when the Atlantic City Conference regulations are fully implemented the "intruders" will move to their correct frequencies.

Technical Committee

The Technical Committee, under the Chairmanship of Mr. H. A. M. Clark, B.Sc.(Eng.), M.I.E.E. (G6OT), again rendered yeoman service to the Council on a wide variety of matters. Individual members of the Committee also gave valuable assistance to the Editorial staff in connection with the BULLETIN.

The suppression of interference to television reception again ranked high among the many subjects considered and dealt with by the Committee. Unfortunately, presumably for reasons of policy, the appropriate trade organisations did not accept an invitation from the Committee to appoint delegates to attend a meeting to discuss the problem of T.V.I. in its widest aspects. A good deal of up-to-date technical information designed to help members to operate during television hours was published in the Society's Journal and sales of the Society's booklet "Television Interference" were satisfactory.

Technical Publications

The Council regrets that it was not possible to publish any new titles in the "Amateur Radio" series during the year. Preparatory work in connection with "Modulators and Modulating Equipment" was, however, completed so that production could be put in hand at an opportune moment. Throughout the year there was a steady call for other Society publications.

Radio Amateurs' Examinations

The number of candidates for the two examinations held during the year was rather less than in the previous year (584 compared with 673), but the percentage of passes remained about the same (80%). For the second year in succession the Post Office organised an examination (in October, 1951) for the benefit of those candidates who did not wish to wait until the next City and Guilds of London Institute examination took place (in May, 1952). As in previous years special courses of instruction in preparation for both examinations were held at a number of technical institutes and colleges.

The Society was again represented on the appropriate City and Guilds Committee by Mr. W. A. Scarr, M.A. (G2WS) and the General Secretary.

Slow Morse Transmissions

Practice transmissions for the special benefit of those endeavouring to obtain an Amateur Transmitting licence were radiated daily on advertised frequencies in the 1.8 Mc/s band. The organisation of this service was again undertaken by Mr. C. H. L. Edwards, A.M.I.E.E. (G8TL).

Frequency Measuring Test

The first Frequency Measuring test organised by the Society took place during May, 1952, on two frequencies in the 3.5 Mc/s band. The test was supported by 73 entrants. The leader had an average error of only 0.7 parts per million—a remarkable degree of accuracy for home-constructed equipment. Three other entrants had errors of less than four parts per million.

The Council records its thanks to Mr. W. N. Craig, B.Sc. (G6JJ), for organising the test and to those who participated.

Headquarters' Station

The Council regrets that it was not found possible during the year to re-establish the Headquarters' station.

Contests

Once again the Contests Committee organised a number of contests and field events designed to cater for a wide range of interests.

The 1952 Affiliated Societies' Contest attracted an entry of 21 and was won by the Thames Valley Amateur Radio Transmitters' Society; the 1951 Direction Finding Contest was won by Mr. G. T. Peck, B.R.S. 15402, of High Wycombe; whilst National Field Day resulted in a win for Bristol with East Molesey runners-up and Bletchley and Slough leading the A and B stations respectively.

Good support was given to the Low Power and Top Band Contests and to the Two Metre events. Society members also participated in the All-European DX Contest (organised during 1951 by the R.S.G.B.) and the European and North African V.H.F. Contest (organised during 1951 by V.E.R.O.N.). The 1952 B.E.R.U. Contests were well supported although it would seem that the intense enthusiasm which was associated with these Contests in pre-war days has largely disappeared. The 420 Mc/s tests again demonstrated marked technical progress from a somewhat depleted entry.

The difficult task of drawing up rules for, and subsequently judging, the Contests, again placed a great deal of responsibility on the members of the Contests Committee who are most cordially thanked for their services.

QSL Bureau

Although the number of cards passing through the Bureau was less than in the peak period just after the war, the grand total again reached a very high figure. The Council records its thanks to Mr. Arthur O. Milne, G2MI, and to all those associated with him in operating this important free service to members. The efficient manner in which the Honorary Sub-Managers deal with the despatch of cards has earned for them the warm praise of all who use the Bureau.

R.S.G.B. Amateur Radio Call Book

The success of the First Edition of the R.S.G.B. Amateur Radio Call Book prompted the Council to authorise production of a Second Edition and this was duly published in April, 1952. The new edition contained nearly 7,000 call signs, names and addresses.

The good support given to this venture by the membership resulted in a useful profit accruing to the Society at the end of the financial year.

The Council wishes to record its thanks to the Call Book Editor, Mr. John Tyndall, G2QI.

R.S.G.B. Operating Certificates

The number of claimants for operating certificates increases each year. The Empire DX Certificate is perhaps the most difficult of all in the world for which to qualify.

Special thanks are due to Mr. A. W. Watkins, G3CRK, who, on behalf of Headquarters, checked a very large number of certificate claims.

International Affairs

During the year the Society maintained a close liaison with other I.A.R.U. Societies. The ties of friendship between the amateurs of Great Britain and the Netherlands were still further strengthened when the President (Mr. W. A. Scarr) represented the R.S.G.B. at the V.E.R.O.N. Convention held in September, 1951.

I.A.R.U. Region I Bureau

The I.A.R.U. Region I Bureau Committee met on several occasions during the year for the purpose of carrying into effect decisions reached at the I.A.R.U. Conference held in Paris in May, 1950. Preparatory work was also undertaken in connection with the first issue of the "Region I Bureau News," which has now appeared. The Committee exchanged correspondence with other Societies in Region I on a wide variety of subjects. The Council wishes, once again, to emphasise that the European Societies in Region I look to the R.S.G.B. for guidance on licence and other matters of mutual interest.

Headquarters

The Council records with gratitude another year of faithful and devoted service from the Headquarters staff, under the direction of the General Secretary, Mr. John Clarricoats, with the Assistant Secretary, Miss May Gadsden.

In addition to the full-time work of managing the detailed business of the Society and the production of its publications, the two senior members of the staff have attended all twenty meetings of the Council outside normal hours, and the Secretary travelled the length and breadth of the country in his own time to attend all Regional Meetings and numerous other functions. With all the extra work in this busy year, the routine work at Headquarters has never been allowed to fall behind.

Conclusion

Members will appreciate that it is not possible within the compass of this Report to refer to all matters dealt with during the year.

For and on behalf of the Council.

F. CHARMAN,
President.

The Station behind the call
—G3CWW

STATION G3CWW, built by A. W. W. Timme, Hendon, London, N.W.4, is equipped for operation on all bands from 1.7 to 144 Mc/s, although activity is mainly confined to 1.7 and 14 Mc/s c.w. and 144 Mc/s c.w. and 'phone. Mounted in the left-hand rack is the RCA AR-88 receiver, above which can be seen the main unit of the electronic key used in conjunction with the converted *Vibroplex* key on the desk. This "El-bug," which has been continuously and successfully in use for about 18 months, closely follows the circuit developed by OZ7BO and described in a fairly recent issue of the BULLETIN.

Above the keying unit is a rack-mounted BC-221 frequency meter with stabilised power supply. A power unit for the crystal-controlled 144 Mc/s converter rests on the dust cover of the main receiver but cannot be seen in the photograph. The key-switches, mounted on the panel, control the 110-volt a.c. relays which in turn operate the main power supplies, aerial change-over, v.f.o. "spotting" and receiver muting. The top unit in the rack is the 144 Mc/s transmitter, using the valve line-up 6AG7-6V6-PP6L6s-815-829B, with a normal input of about 80 watts.

The bottom unit contains the two main power packs and a modified Wilcox-Gay v.f.o. Above this is the power and keying distribution panel, together with the v.f.o. power supply. A multiple-ganged switch in this unit enables one of the three transmitters to be selected instantly without changing plugs. The modulator occupies the next panel, using 6SJ7-6SC7-PP6L6s in conjunction with a Standard Telephones' ball microphone. The top unit is the bandswitched main exciter and transmitter for the 3.5, 7, 14 and 28 Mc/s bands, using 6SK7-6AG7-2E26-829B at about 100 watts input. Above the racks is the aerial coupler; aerials in use vary considerably from time to time.

This picture shows the neat and effective lay-out at G3CWW. Tony Timme not only operates regularly on several bands, but he finds time for many Society duties including those of West London D.R.

The filing cabinet on the right contains QSLs received and also a complete card index record of all stations contacted. Above this are a v.h.f. test set and a small transmitter used for 1.7 Mc/s, using QQV04-7 series-tuned Colpitts oscillator and QQV04-7 p.a. This transmitter, incidentally, has been used for N.F.D. by the Hendon and Edgware R.S.G.B. Group, and also for D/F contests.

Dynamotor power supplies are available for portable operation of all three transmitters up to the maximum inputs permitted for such operation. Well over 100 countries have been contacted by G3CWW, some 300 different stations having been worked either on 144 Mc/s or on the old 58.5 Mc/s band.

The Road to Monaco

By R. M. Herbert, A.M.I.E.E. (G2KU/3A2AL)*

The Mediterranean town of Monaco, looking eastwards from the Hotel Royal.

SINCE the war there have been a number of "DX-peditions" to places where amateur transmitting activity is either totally absent or at a low level. In Europe, especially, it is our G.I. friends who have been most active in this respect, and the principality of Monaco has become a favourite haunt, due chiefly to the benevolent outlook of Monagasque officialdom.

As the story of 3A2AL is a little unusual in several respects, it is hoped that the following account will interest those who worked the station, and may perhaps induce others to organise a more ambitious attempt at some future date.

First Steps

Peter Pollard and the writer, having decided to spend a short holiday in Monaco, the question of amateur operation came up. As our stay was to be for only five days, we agreed that any activity should be purely incidental, and would take place at odd moments. In consideration of these points, we felt that it would only be worthwhile to proceed with the scheme provided that the gear could be reduced to such dimensions that it would not prove an embarrassment during the remainder of the trip, and that it would not be necessary to enter into protracted correspondence with the powers that be.

A letter was accordingly despatched to the Ministere d'Etat with a request for permission to operate during the visit. A reply came by return of post, asking for full particulars so that the necessary facilities could be provided. Passport details were forwarded, and again a prompt and courteous reply was received, stating that the call 3A2AL had been allocated, and that the necessary documents would be available from the municipal offices on arrival.

Meanwhile, a resident amateur had appeared in the person of Henk Klaveren, 3A2AH; consequently, there was some doubt about the ethics of the expedition, since one of the reasons for it —the absence of local amateur activity—had now disappeared. However, after an exchange of correspondence with 3A2AH, it was evident that the local amateurs would be only too pleased to welcome us: in fact, they went to the trouble of locating a suitable hotel for us, and offered to erect an aerial and have it ready for use on arrival!

* 9 *Baldwin Avenue, Eastbourne, Sussex*

The Equipment

The transmitter employed a 25Y3 voltage-doubler, supplying a 25L6 crystal oscillator. The voltage-dropping mains resistor was designed to plug into an octal valve-holder so that, when the coil, valves and crystal were removed, a flat chassis remained, which could be easily stowed away. It had originally been planned to use a miniature battery superhet., but as it did not come up to expectations a B2 receiver and power pack were pressed into use. It was decided to concentrate on 7 Mc/s because 14 Mc/s was too erratic. The 3.5 Mc/s band was not expected to be of much use in that particular area due to prevailing conditions and static.

Accommodation had been booked in advance at the Hotel Royal and, as other previous visiting expeditions had stayed there, everything was found to be ready upon arrival. The management had most thoughtfully provided a serviceable operating table in a convenient room eminently suitable for the aerial system lead-in.

At first sight the outlook did not seem too bright as high mountains rise steeply on all sides except the sea. The hotels are built in terrace fashion, the roof of one being on a level with the ground floor of the one behind it; hence. it was difficult to arrange for the aerial to be high as well as in the clear. A 66 ft. dipole was eventually slung between the verandah and a nearby palm tree—an unsatisfactory arrangement, since the high end was to the north-east, and the feeder sloped down to the aerial proper.

Our stay coincided not only with very poor conditions, but also with exceptionally hot weather; this, coupled with the hospitality of the local amateurs, reduced the operating time to some ten hours only! It was found that the band was dead between 1000 and 1800 G.M.T. every day, while night operation was rendered impossible due to QRM from broadcasting stations. The best period was from 0700 to 0930 G.M.T. During the five days we were in Monaco, a number of British stations were worked (from whom average reports of RST 579 were obtained), while contacts were also made with DL, I, OK, 5A2, FA9, F and OZ. As the power input was less than nine watts, results were quite satisfactory.

Thanks are due to M. Passeron of the Ministere d'Etat's department, and to 3A2AH who went to considerable trouble to make sure everything ran smoothly.

Peter Pollard, G3DIV (centre) with two of the local amateurs—3A2AJ (left) and 3A2AH.

Amateur Television Topics

By M. BARLOW (G3CVO)*

AFTER the successful demonstration of Amateur TV at the Dagenham Town Fair, work has been proceeding on equipment for operation at the forthcoming R.S.G.B. Amateur Radio Exhibition, at which the British Amateur Television Club will be demonstrating for the first time since 1950. The equipment is somewhat involved, and is coming from many sources. For example, George Short is to provide the control equipment and Ian Waters the camera chain. The telecine and telestill units are already completed, and the camera coils are on the way. Old timer Ralph Royle, G2WJ/T, and son Jeremy of Dunmow, Essex, are to supply the 70 cm TV link, which has meant the miniaturisation of Ralph's transmitter. Jeremy's still picture scanner, using an ACR2X scanning tube with a 931A photocell, is giving extremely good results. This transmitter has been on the air for some weeks, and although the pictures when received at ranges up to a mile are perfect (and there appears to be no loss of definition in the process), there is apparently no-one with a 70 cm TV receiver or converter nearer than G6YP in London, about 35 miles away. At this range, the signal produced by the fraction of a watt output at G2WJ is only of the order of 3μV, and although the sync pulses can easily be resolved, there is insufficient signal to produce a picture. Any member living nearer to Dunmow than London, and who is willing to co-operate in some tests—not necessarily before the Exhibition—should write to Mr. Royle. Incidentally, G2WJ hopes to increase transmitter power in the near future by using a CV127 power doubler in place of the present CV53, although the problem of modulating such a stage with wideband video modulation may prove rather difficult. No trouble is anticipated over the path of 45 *feet* at the Exhibition !

Part of the backcloth of the B.A.T.C. stand at the Exhibition will be taken up by a map showing the location of Club members and active amateur TV transmitting stations. Present membership stands at 160. Blueprints of typical TV transmitting gear, such as that built by W4MS/TV, will also be shown. This circuit is rather unusual in that it employs almost entirely non-miniature valves in standard amplifier circuits.

It had been hoped to use a 13 cm Klystron link for carrying the sound channel, but pressure of other duties has prevented G3CVO and Tony Sale from bringing the plan to fruition. Among the many members of the Club due to attend the Exhibition will be Dick Grubb, G3FNL, who showed some of his own TV equipment last year. Dick has just completed a new 65 valves pulse generator. He, together with G2FKZ and G3IXL, recently paid a visit to Dunmow to see the G2WJ transmitter in action. In case readers are put off by the idea of using 65 valves, it is worth reporting that Mr. Sale has developed a simple circuit giving mains synchronised frame sync and blanking pulses to correct B.B.C. standards with just one *half* of a 6SN7 !

CU at the "Royal" Show !

* *Cheyne Cottage, Dukeswood Drive, Gerrards Cross, Bucks.*

Radio Amateurs' Examination

THE following particulars relate to the Radio Amateurs' Examination, held in May each year by the City and Guilds of London Institute.

The examination is designed to meet the needs of candidates in Great Britain and Northern Ireland who intend to apply to the Postmaster-General for the issue of an Amateur Radio transmitting licence. Success in the examination will be accepted by the Postmaster-General as evidence that the candidate possesses the requisite theoretical technical knowledge, but before a licence is issued, he will, in addition, be required to pass a Morse test to be conducted by the General Post Office, unless he possesses an exempting qualification.

The examination will be a pass examination, and will consist of a single question paper of three hours duration. The paper will be divided into two Parts; all questions set in Part I will deal with sections 7, 8, 9 and 10 of the syllabus, and *must* be attempted by all candidates.

A certificate will be awarded to those successful in the examination, which is open to all candidates, whether or not they have attended a course of instruction.

Where courses are provided the Institute recommends that theoretical lectures shall be accompanied wherever possible, by simple practical demonstration.

Syllabus:

1. Electricity and Magnetism.

The elementary theory of electricity: conductors and insulators; units including power; Ohm's Law; resistances in series and parallel.

Permanent magnets and electro-magnets and their uses in radio.

Self and mutual inductance; types of inductances used in receiving and transmitting circuits. Capacitance. Capacitors in series and parallel; construction of capacitors; electrolytic capacitors.

2. Radio Principles (Elementary treatment only).

Alternating currents; series and parallel a.c. circuits incorporating inductance, capacitance and resistance; impedance; resonance; acceptor and rejector circuits; coupled circuits.

3. Propagation.

Radio waves; wavelength, frequency, velocity; nature and propagation of radio waves; fading and its connection with frequency, length of path.

4. Thermionic Valves and Circuits.

Construction of valves; thermionic emission; principles and characteristics of diode and triode valves. Multi-electrode valves.

Use of valves; amplification, oscillation, frequency-changing, signal detection; the power stage; power rectification. Power packs for h.t. supply; smoothing.

5. Radio Receivers.

The essentials of a receiver. Typical receivers; principles and operation of t.r.f., superheterodyne and super-regenerative receivers. C.W. reception. Interference caused by receivers.

6. Aerials.

Simple types of receiving and transmitting aerials. Transmission lines. Simple directional aerials. Aerial couplings to lines and transmitters.

7. Low-Power Transmitters.

Oscillator circuits; frequency stability; use of quartz crystal to control oscillators; frequency multipliers; power amplifiers. Method of amplitude-modulation and keying.

8. Transmitter Interference.

Avoidance of harmonic radiation and interference by shock excitation; use of key-click filters and other means of preventing spurious emissions. Dangers of overmodulation. Use of wavetraps and other devices for reducing interference with nearby radio and television receivers.

9. Measurements.

Measurements of frequency and simple frequency meters (including crystal-controlled types). Use of verniers and other interpolation methods. Artificial aerials and their use for lining-up transmitters. Measurement of anode current and voltage. Power input to final stage.

10. Licence Conditions.

Conditions laid down by H.M. Postmaster-General for transmitting licences covering power and frequencies, frequency control and measurement, sending periods, avoidance of interference to other stations, log of sending periods, use of call-signs of calling and called stations, control in emergency, etc.

R.S.G.B. SIXTH ANNUAL

Amateur Radio EXHIBITION

at the Royal Hotel, Woburn Place, London, W.C.1

from Wednesday, 26th November, 1952

to Saturday, 29th November, 1952

THE EXHIBITION WILL BE OPENED AT 12 NOON ON WEDNESDAY, 26TH NOVEMBER, BY COL. SIR IAN FRASER, C.B.E., M.P.

Hours of Opening 11 a.m. to 9 p.m. Daily

ADMISSION 1/-

AIR MINISTRY
The Royal Air Force

VISITORS to the Royal Air Force stand will see a display of receiving valves from the Fleming diode to those used in modern radio. They may also listen to the "Radio Sonde Transmitter"—an airborne device used by the R.A.F. Meteorological Service to measure the temperature, pressure and humidity of the atmosphere.

Demonstrations of R.A.F. equipment include an interesting prototype multi-channel frequency generator and the latest radio altimeter. Modern radio engineering techniques are illustrated by the latest airborne instrument-landing equipment.

For those who are interested to know how radio is used in modern aircraft there is a pictorial representation of a typical installation.

There are big opportunities today for radio enthusiasts in the radar and radio branches of the Royal Air Force. Details may be obtained from the stand or from any R.A.F. Recruiting Centre. Those interested in spare-time activities may obtain details of the Royal Auxiliary Air Force from: The Officer Commanding, No. 3700 (County of London) Radar Reporting Unit, 77 Hallam Street, London, W.1. Telephone LANgham 5511 (Extn. 109).

AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
Winder House, Douglas Street, London, S.W.1.

THE "AVO" exhibit shows a complete range of radio and electronic testing instruments produced by the company, including the new "AVO" 95 range Electronic Multimeter. This instrument has been designed to replace several individual pieces of expensive test gear and has been built to operate successfully in any part of the world. The instrument has already passed the Armed Services' pan-climatic tests to Specifications K114 and R.C.S. 1,000.

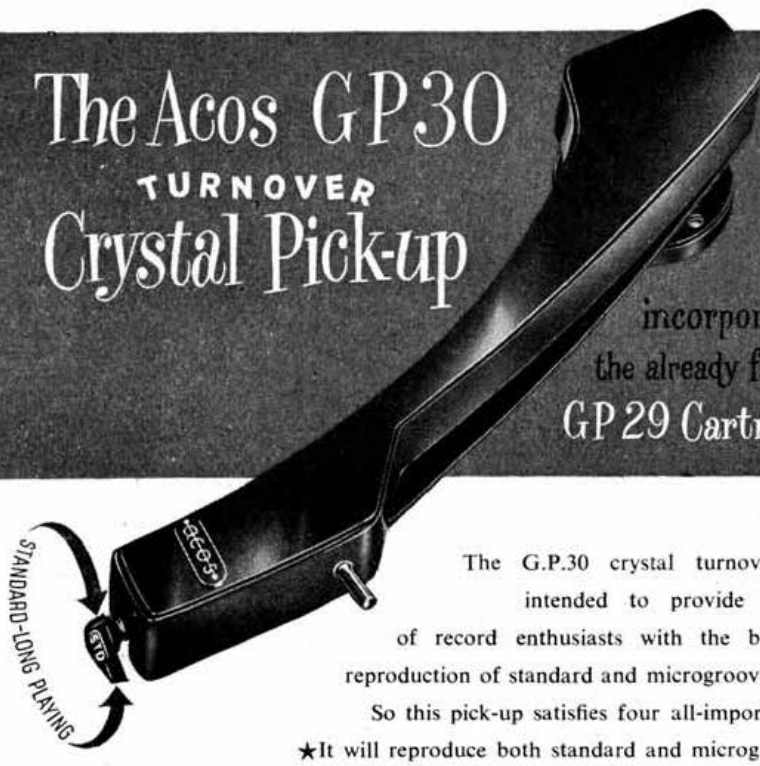
BRITISH AMATEUR TELEVISION CLUB

THE exhibit is arranged to show the advances in techniques and design since the Club last exhibited at the 1950 show. On the main stand will be seen a complete television studio control console, with 16mm telecine and slide scanning facilities, plus full monitoring equipment. A display of equipment will surround G2WJ's television transmitter, which will relay the pictures over a 70cm radio link to a receiving point near the Exhibition entrance. After the opening ceremony, the alcove will be used as a television studio, and one of the Club's new cameras will be in action. It is proposed

Here it is...

The Acos GP30 TURNOVER Crystal Pick-up

incorporating the already famous GP 29 Cartridge



The G.P.30 crystal turnover pick-up is intended to provide the largest number of record enthusiasts with the best possible reproduction of standard and microgroove records.

So this pick-up satisfies four all-important requirements:

★It will reproduce both standard and microgroove records.

★It is simple to operate; a turn of the front knob brings either stylus into use. ★The output characteristics give balanced, distortion-free reproduction with minimum surface noise when used in conjunction with commercial equipment such as the normal radio set. ★It is extremely kind to the record—giving long record life. The careful design gives exceptional tracking capabilities at the low stylus pressure of ten grammes.

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to show pictures all the time, whether they be test patterns, studio scenes, slides or cine films.

COSMOCORD, LTD.

Enfield, Middlesex

MAGNETIC and crystal type pick-ups are on display, together with a range of microphones. The GP6 and GP7 are examples of the magnetic type of pick-up. The former—specially suitable for tropical climates—has a range of 100 to 4500 c/s. The GP7 is a pick-up head for replacing the sound-box on acoustic gramophones. The GP10, GP20, GP29 and GP30 are examples of the crystal type of pick-up. The GP10 is a general purposes model incorporating the GP9 cartridge with patent unbreakable crystal assembly. Output 1.7 V at 1000 c/s, range 70 to 8000 c/s. The GP29 is a dual-purpose pick-up cartridge of the turn-over type incorporating two styli, one for long-playing and the other for standard records.

The MIC16, MIC22 and MIC30 are examples of microphones in current production. The MIC16 incorporates the well-known floating crystal sound-cell construction. Flat-response 30 to 10000 c/s. The MIC30 is a hand-stand model with high output and smooth response. Fitted with tripod stand and suspension loop.

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"Easibinders" are specially made for almost all radio journals, including *Electronic Engineering, Wireless World, Short Wave Magazine* and the *R.S.G.B. Bulletin.* They are supplied with titles and years in gold lettering.

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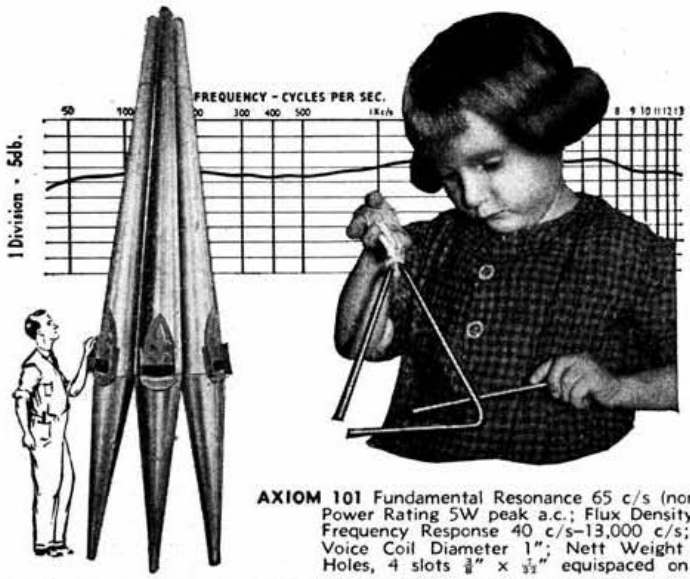
THE various high grade instruments produced by E.M.I. specially for the radio amateur are shown, together with a variety of sound-recording apparatus and service equipment of interest to such enthusiasts.

The range of E.M.I. amateur equipment includes wavemeters and grid dip oscillators for h.f. and v.h.f. operation, field strength meters, etc. Also on show is a new precision bridge for the measurement of resistive and capacitive impedances "in situ." Other items of service



40 to 15,000 c/s

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AXIOM 101 Fundamental Resonance 65 c/s (nominal); Voice Coil Impedance 3 or 15 ohms; Power Rating 5W peak a.c.; Flux Density 13,500 gauss; Total Flux 51,200 Maxwells; Frequency Response 40 c/s–13,000 c/s; Overall Diameter 8½"; Overall Depth 4½"; Voice Coil Diameter 1"; Nett Weight 2¾lb.; Finish, Grey rivelling enamel; Fixing Holes, 4 slots ⅜" x ⅓2" equispaced on a 7⅝" P.C.D. **£7 : 5 : 9** including Tax.

AXIOM 102 with increased sensitivity, has a higher magnetic flux and attendant improvement in the damping factor as follows: Flux Density 16,000 Gauss; Total Flux 63,000 Maxwells; Overall Depth 4 7/16"; Nett Weight 4lb. **£10 : 14 : 1** including Tax.

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- ★ *Magnetic focus and deflection (70° angle).*
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THIS Company has again confined its exhibits to those which are of particular interest to Amateur Radio enthusiasts.

The application of Osram valves to equipment designed for the radio amateur is typified in a 3-band 50 watt transmitter; a 2 meter converter and a television chassis, whilst examples from the wide range of Osram valves and G.E.C. germanium crystals are exhibited.

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ON display are current and recent issues of *Practical Television and Television Times*, edited by F. J. Camm. *The* magazine for all interested in television, designed to provide home-constructors and set-owners with an authoritative month-by-month analysis of trends and developments in this great new entertainment medium. Technical articles by television authorities; world television news; close-ups of T.V. personalities. Fully illustrated. Monthly, 1/-.

Practical Wireless, also edited by F. J. Camm, is packed with essential information for every radio enthusiast. Includes articles by experts on all phases of world radio; detailed articles

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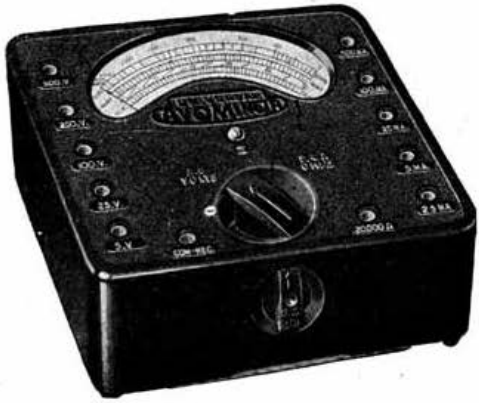

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0–75 millivolts	0–5 volts
0–5 volts	0–25 ,,
0–25 ,,	0–100 ,,
0–100 ,,	0–250 ,,
0–250 ,,	0–500 ,,
0–500 ,,	**Resistance**
D.C. Current	0–20,000 ohms
0–2.5 milliamps	0–100,000 ,,
0–5 ,,	0–500,000 ,,
0–25 ,,	0–2 Megohms
0–100 ,,	0–5 ,,
0–500 ,,	0–10 ,,

Size: 4¾in. x 3¾in. x 1¾in.
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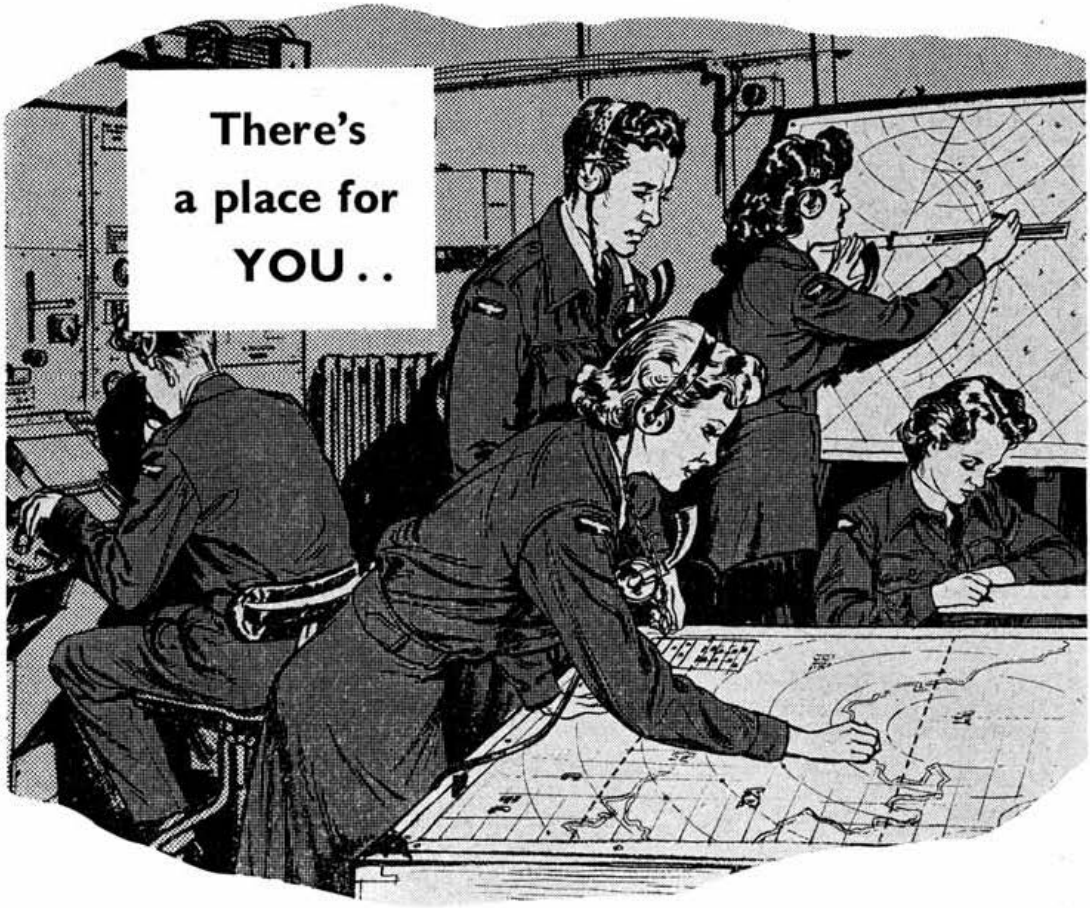

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and circuit diagrams for receivers and all essential equipment; special short-wave features; comprehensive blue-print service; free advice bureau. Monthly 1/-.

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INCLUDED amongst the display of single and double-cone loudspeakers are the well known 12in. Axiom 22 Mk.II and Axiom 150 Mk.II types. Both units are of the twin cone design with power-handling capacities of 20 and 15 watts respectively.

Of special interest to the high fidelity enthusiast are two recently-developed 8in. loudspeakers—the Axiom 101 and 102. These are of single cone design eminently suitable for use where the living space precludes the use of 12in. types.

Also on show is a range of output transformers including the type H6, which is a 30 watt output model specifically recommended for use with either the Axiom 22 Mk.II or 150 Mk.II.

G.P.O. ENGINEERING DEPARTMENT

THE Radio Branch of the G.P.O. Engineering Department are providing a Bureau at which advice on amateur licensing and radio-interference problems may be obtained.

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Wireless Engineer. Accepted by research engineers, designers and students as an international source of information for advanced workers. The editorial policy is to publish only original work, whilst the correspondence columns form a recognised debating ground.

There is also a wide range of up-to-date technical books selected from the comprehensive Iliffe list covering many aspects of radio and television.

PANDA RADIO CO.

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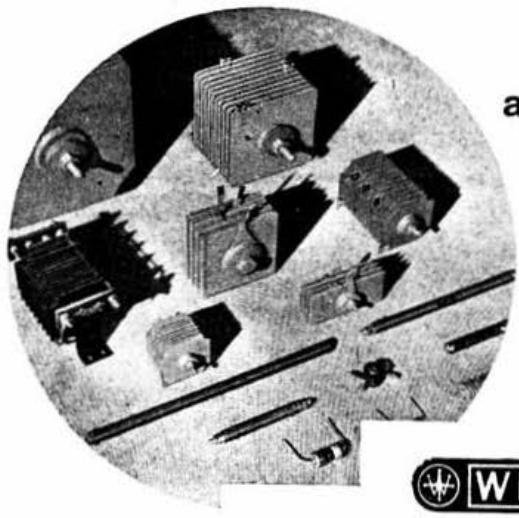
THE 1953 improved version of Panda's already well-known PR-120-V transmitter features a new style cabinet and contains several refinements which add to the pleasure of operating this fine piece of equipment. Netting on to the desired frequency is instantly obtainable at the flick of a switch, whilst operation during television hours, using 100% modu-

WESTINGHOUSE WILL BE ON STAND No. 18

at the R.S.G.B. Exhibition



. . . showing Westalite HT and LT rectifiers, single and double voltage type—approved units, copper-oxide instrument rectifiers and "Westectors," together with Germanium diodes, Westalite rectifiers for 70°C working and sealed tubular EHT units, making an altogether very comprehensive display of . . .

WESTINGHOUSE

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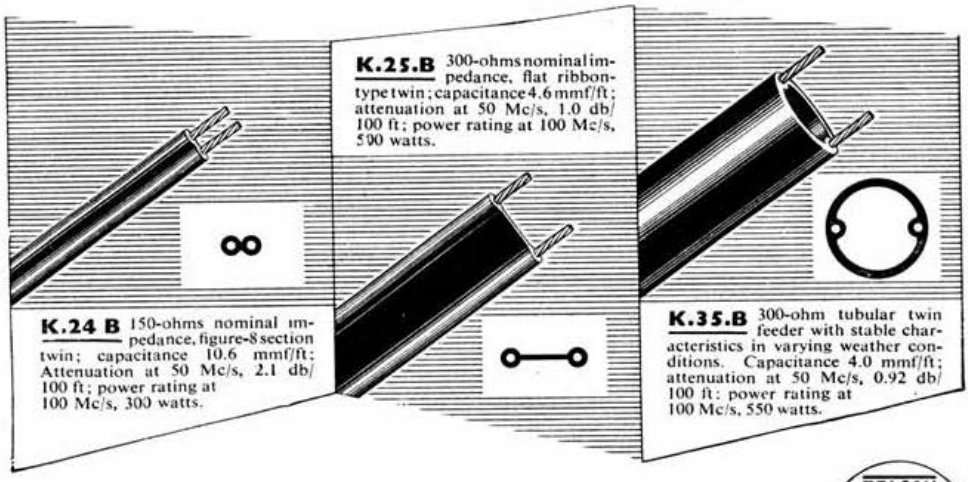
WESTINGHOUSE BRAKE & SIGNAL CO. LTD., 82 York Way, King's Cross, London, N.1.

TELCON *LOW-LOSS* TRANSMISSION LINES



K.25.B 300-ohms nominal impedance, flat ribbon-type twin; capacitance 4.6 mmf/ft; attenuation at 50 Mc/s, 1.0 db/100 ft; power rating at 100 Mc/s, 500 watts.

K.24 B 150-ohms nominal impedance, figure-8 section twin; capacitance 10.6 mmf/ft; Attenuation at 50 Mc/s, 2.1 db/100 ft; power rating at 100 Mc/s, 300 watts.

K.35.B 300-ohm tubular twin feeder with stable characteristics in varying weather conditions. Capacitance 4.0 mmf/ft; attenuation at 50 Mc/s, 0.92 db/100 ft; power rating at 100 Mc/s, 550 watts.

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TELCON YOUR GUARANTEE

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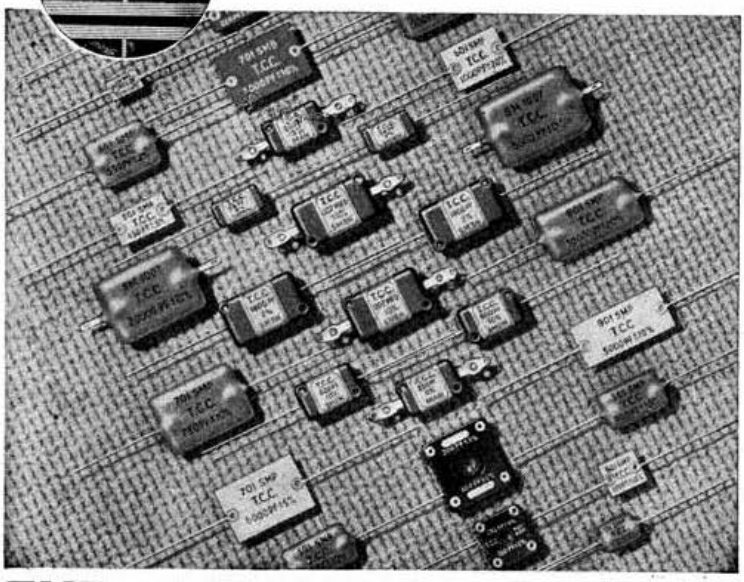

SOME of these condensers are wax protected, some are in moulded bakelite cases, and others are coated with synthetic enamel. This ensures that there are types to meet not only normal requirements, but also the demands of tropical and other severe conditions. All combine capacitance stability, low losses and accurate tolerances, with minimum dimensions.

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DESPITE pressure of defence orders, etc., the firm continues to give individual service to radio amateurs. Records show there is an increasing need for such services. Apart from the trend towards "table-top" equipment, there is very little in the way of new design to show; some cleaning-up of existing designs has, however, taken place and some new finishes are on view.

RADIO SOCIETY OF GREAT BRITAIN
New Ruskin House, Little Russell Street, London, W.C.1

Headquarters Stand

A FULL range of R.S.G.B. technical publications is displayed including the Second Edition of the *R.S.G.B. Amateur Radio Call Book* containing details of nearly 7,000 British Isles call signs. Of topical interest is the recently published booklet *Television Interference*.

R.S.G.B. pennants are on sale together with car plaques, badges and brooches. Orders may be placed for subscriptions to *QST*, *CQ* and *Audio Engineering*, and for a wide range of other U.S. short-wave publications. Limited quantities of the 1952 edition of the *A.R.R.L. Handbook* and the latest edition of the *A.R.R.L. Antenna Handbook* are on sale, together with the current issue of the *R.S.G.B. Bulletin*. Prospective members may purchase five recent back issues of the *Bulletin* at a specially reduced price.

Also displayed is a range of modern amateur-built equipment loaned by Members of the Technical Committee and other well-known amateurs.

Of topical interest is a low power harmonic-free 25 watt transmitter for use on 14 and 21 Mc/s; balanced and unbalanced 420 Mc/s pre-amplifiers; a plug-in noise generator and a valve voltmeter for the low frequencies.

Other items on show are: An amateur bands frequency meter covering 1.7, 3.5, 7, 14, 21 and 28 Mc/s; low pass filter for transmitter (balanced type for 93 ohm screened pair feeder); similar type but for 75 ohm co-axial feeder; high pass filter for television receiver feeder.

Members of Headquarters staff are on duty to answer questions concerning the work of the Society.

Amateur Constructors' Section

THIS section is devoted entirely to home-constructed apparatus loaned by London and Provincial members.

An amateur radio station is operating under the special call sign GB3RS/A.

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Royal Corps of Signals stand

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The terms during peacetime are :-

A. Liability for 15 days service a year. Pay and Allowances similar to the regular army during this period. A £9 bounty annually. The duration of service can be for 2, 3, or 4 years as you wish.

B. No liability, merely register your name and have a certain position to take up in the event of an emergency.

Facilities will be arranged for affiliation to permanent units for Reserve personnel to practice with army equipment.

Application forms and further details are available on

STAND 2

SALFORD ELECTRICAL INSTRUMENTS, LTD.

Peel Works, Silk Street, Salford, 3, Lancs.

THE exhibit includes a complete range of quartz crystal units for stable control at any frequency from 400 c/s to 16 Mc/s, as well as various types of amateur band crystals. Also displayed are a simple and accurate instrument specially designed to measure directly the "activity" of quartz crystals; a range of Gecalloy cores; selenium and copper oxide rectifiers and synthetic sapphire gramophone needles.

The range of Gecalloy cores is continually expanding and now covers a very wide field of applications in radio and television. The sapphire gramophone needles ensure maximum fidelity of reproduction and minimum record wear. Rectifiers covering various current and voltage ratings can be supplied from stock.

SIEMENS ELECTRIC LAMPS AND SUPPLIES, LTD.

38-39 Upper Thames Street, London, E.C.4

SIEMENS are showing typical examples from their comprehensive range of Full O' Power and Siemax radio batteries and Tungsram radio valves. Specimens of co-axial cables designed for special requirements are also shown, together with products emanating from their Woolwich works which are likely to prove of interest to Amateur Radio enthusiasts.

TAYLOR ELECTRICAL INSTRUMENTS LTD.,

419/424 Montrose Avenue, Slough, Bucks.

THIS Company are exhibiting Multirange Universal Meters, Television Pattern Generators, Television Wobbulators, Valve Testers, Circuit Analysers, Audio Oscillators and Insulation Testers. Panel instruments of the Moving Coil, Rectifier, Thermo-couple and Moving Iron types are also shown. Many of the exhibits are suited to the requirements of radio amateurs.

THE SHORT WAVE MAGAZINE, LTD.

53 Victoria Street, London, S.W.1.

SHORT WAVE MAGAZINE, LTD., are displaying not only *Short Wave Magazine* and *Short Wave Listener & Television Review*, but also a wide range of additional material either published by themselves or handled by them as agents.

The *Magazine* itself, now in its tenth year of publication, covers the whole field of Amateur Radio, and has regular readers in more than 50 countries. In addition to its own publications, a subscriber service will be operating at the stand for all foreign technical periodicals. A large number of technical and semi-technical books of direct interest to the amateur are also on sale.

WAR OFFICE

The Army

THE Army are exhibiting at this Exhibition for the first time. The use of radio in the Army, particularly in Royal Signals, will be demonstrated and some of the sets in current use together with prototypes of future models will be shown.

Four new field wireless sets are on view including two infantry sets, one of which is laid out on a display panel to show the progress of miniaturisation. The C42 is a new tank set. The B70 u.h.f. radio relay set is another example of the modern trend in miniaturisation and portability.

Miniature valves and new test gear are shown, whilst short-wave aerials will be demonstrated and a waterproofed set shown working immersed in water.

Photographs are displayed showing the history and activities of Royal Signals. Information is available on the Army Emergency Reserve Wireless Squadron and Wireless Pool.

WESTINGHOUSE BRAKE & SIGNAL COMPANY, LTD.

82 York Way, London, N.1

THIS Company are displaying a wide range of rectifier units, including newly-developed "Westalite" power rectifiers, which are capable of operation in ambient temperatures up to 70°C. These units show great efficiency and stability at this high temperature and are suitable for magnetic amplifier circuits. Type-approved single- and double-voltage "Westalite" rectifiers and ranges of h.t. and l.t. units are also on view, together with copper-oxide instrument rectifiers and "Westectors." Tropicality-sealed pencil type e.h.t. "Westalite" rectifiers, in 16HT and 36EHT ranges, are in the display, which also includes multi-purpose Germanium crystals.

AMATEUR RADIO EXHIBITION

VISIT

STAND No. 10

for

- **QUARTZ CRYSTAL ACTIVITY TEST SET**
- **RADIO & TELEVISION CORES**
- **QUARTZ CRYSTAL UNITS**
- **METAL RECTIFIERS**
- **SAPPHIRE NEEDLES**

SALFORD ELECTRICAL INSTRUMENTS LTD
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SPLIT STATOR transmitting condensers 60 $\mu\mu$F per section, 0.068 gap, 2,000 V, r.m.s. Beautiful job. Few only, **£1 2s. 6d.** each

KNOB and Dial with engraved scale, 2in diameter. New and boxed, black finished, **1/9** each, complete with index.

PLUG-IN v.h.f. Coils, silver-plated wire on ceramic base, 3-turn and 4-turn, set of 3 (2–3 turn and 1–4 turn), **2/-**

HEAVY Galvanised aerial pulleys **6d.** each, or **5/-** per doz.

COMPLETE NOISE LIMITERS: Wired on a small sub-chassis with 6H6 type valve, boxed, with circuit and instructions. Only **5/-**, post free.

TAPE RECORDING EQUIPMENT: Decks by Bradmatic, Tamsa, Lane and Qualtape. Ex-Stock Heads, Oscillator Coils, Tape and Reels always available.

TWIN FEEDER: 300 ohm Heavy Twin Ribbon Feeder **5d.** per yard. K24, 150 ohm **9d.** per yard. Co-ax. Cable, ½" 50 ohm **8d.** per yard; ¼" dia., 70 ohm, **1/-** per yard, or 12 yards **10/6**, post and packing 1/6. K35B Telcon (round) **1/6** yard. Post on above feeder and cable 1/6, any length.

Special Offer: 300 ohm flat twin 150 W rating, **6d.** yard, minimum 20 yards, post free.

JUST IN. Log books, 100 pages, with heavy bound cover **10/6** each, post and packing 1/-.

RACK MOUNTING PANELS, 19" x 5¼", 7", 8¾" or 10½", black crackle finish, **5/9, 6/6, 7/6, 9/-** respectively, postage and packing 1/6.

Complete Set of **14 VALVES,** new and boxed for AR88 Receiver, **£5 10s.** Set. Post free (limited quantity).

R.F. CHOKES: Pie wound, 2.5 mH., 100 mA., receiver type, **9d.** each, or **7/6** per doz.; 250 mA., transmitter type, **1/-** each, **10/-** per doz.

METERS: 2½" Flush Mounting M.C. 100 mA., **12/6** each. 2" Flush M.C. 5 mA., **7/6**; and 0.5 A. Thermo, and 4 A ditto, **5/-.**

TEST PRODS for Test Meters, Red and Black, **4/6** Pair.

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SPLIT STATOR TRANSMITTING CONDENSERS, 50 $\mu\mu$F: Per section. Ceramic insulation. Spacing .08. New and boxed. List over 25/-. Our price **10/-** each.

Ditto: 25 $\mu\mu$F: Per section with built-in nuet. conds. New and boxed. **10/-** each.

CONCENTRIC Neutralising Condensers, 1.5/4 $\mu\mu$F 2,000 V RMS on ceramic base, single hole fixing. List over 6/- pair. Our Price **2/6** per pair.

SHORT WAVE Plug-in **COILS:** 6-pin standard, 2 ranges only, 3.9–1.8 Mc/s and 21.4–33.3 Mc/s. Formers above listed at 6/-. Our Price, The Two, **3/-.**

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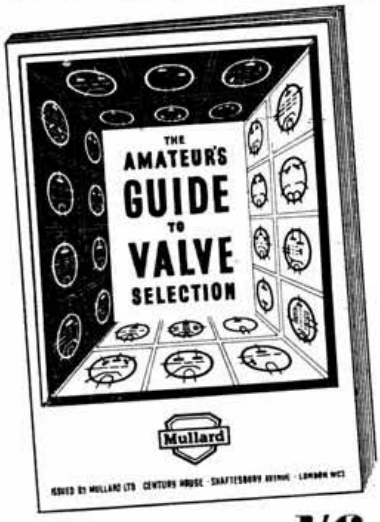

For the first time Mullard have compiled a Valve and C.R.T. reference specially for the amateur constructor. "The Amateur's Guide to Valve Selection" contains essential information on valves for AC, AC/DC and battery operated radio receivers, for television receivers, and for audio amplifiers:

1. Instructions for the correct use of the Mullard "Preferred" Range of Valves and of Mullard "Long Life" Television Picture Tubes.
2. Full operational data for each application.
3. Simple valve selection table for quick reference.
4. Mullard Valve and C.R.T. nomenclatures.
5. Typical circuit diagrams for the various applications.

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MVM 212

The Radio Amateurs' Examination

Model Questions and Answers

Part 4.—Alternating Current

Impedance

The total opposition of a circuit to the flow of current is called the *impedance* (denoted by the symbol Z) and takes into account the combined effect of resistance and reactance. The reactance X of a circuit must not be added directly to the resistance R, but must be added vectorially, *i.e.* the two quantities should be regarded as forming two sides of a right-angled triangle, the resultant Z being given by the hypotenuse.

$$Thus: \ Z^2 = R^2 + X^2$$

$$Therefore: \ Z = \sqrt{R^2 + X^2}$$

For example, if, in a given circuit, R = 3 ohms and X = 4 ohms, the impedance Z does not equal 7 ohms but is calculated from:

$$Z^2 = 3^2 + 4^2$$

$$Z = \sqrt{25} = 5 \ ohms$$

A further point to note is that if the value of the reactance of a coil is taken as positive, then the reactance of a condenser in series with it must be regarded as negative. The total reactance of the circuit is then the *difference* of the two quantities, so that: $X = X_L \sim X_C$, the smaller reactance being subtracted from the larger.

Phase Angle Between Voltage and Current

In a.c. circuits, both the current and voltage rise and fall between zero and their respective peak values many times in each second. If the circuit is adjusted so that it behaves as a resistance, the voltage and current will pass through their peak values simultaneously and are said to be *in phase*. Circuits do not normally behave as pure resistances, however; the voltage and current pass through their zero and peak values at different instants (Fig. 1). A complete cycle is designated by 360°, and the two quantities may be *out of phase* to any extent between 0° and 360°, though the amount is usually expressed by an angle between 0° and 90°, in which case the words *lag* or *lead* must be appended.

When an alternating current is flowing through a coil, whose resistance is negligible compared with its reactance, the voltage developed across the coil, due to the changing current, is proportional to the *rate of change* of the current, given by the slope of the current curve at any instant. Since the rate of change is greatest when the current is passing through zero, maximum voltage occurs at that instant. At the peak of the current curve, the slope is zero, and the voltage is correspondingly zero. These two instants are one-quarter of a cycle or 90° apart; the current is therefore said to *lag* the voltage by 90°.

In the case of a condenser, the current flowing (*i.e.*, the charging and discharging current), is greatest when there is no charge present (*i.e.*, when there is no voltage across the condenser plates) and it falls to zero when the plates are charged to their maximum voltage. Again there is a 90° phase difference, but the current now *leads* the voltage by 90°, the question of lag or lead being determined by mathematical considerations in the two cases.

By

B. W. F. MAINPRISE

*B.Sc. (Eng.), A.M.I.E.E. (G5MP)**

Resonance

Phase angle is of the greatest importance when considering the question of circuit resonance. Thus, in the case of a resistance, an inductance and a capacitance connected in series, the values of the latter two quantities can be so chosen that at a given frequency their reactances are equal. The voltage developed across the inductance will be opposite in sign to that across the condenser and the two will cancel. The current will be then limited only by the circuit resistance and, if this be small, the current per applied volt will be large. Such an arrangement is called an *acceptor* circuit as it can pass (or accept) a large current at resonance.

Since the condition for resonance is that the reactance of the coil equals the reactance of the condenser, then:

$$2\pi fL = \frac{1}{2\pi fC}$$

the quantities being in their basic values of cycles per second, henrys and farads. To determine the resonant frequency of a circuit of known inductance and capacitance, the expression can, by cross-multiplication, be written thus:

$$f = \frac{1}{2\pi\sqrt{LC}}$$

Find the value of the inductance which will tune to 5Mc/s with a capacitance of 0.0001 μF.

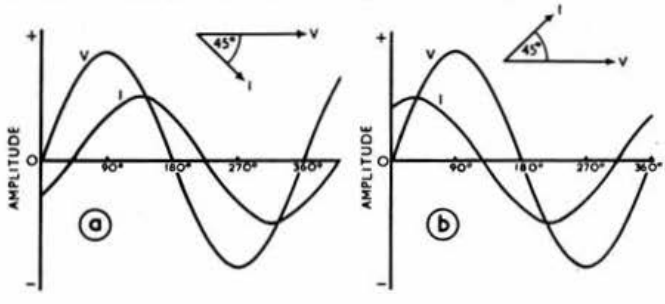


Fig. 1.

Current and voltage waveforms, with vector diagrams, illustrating (a) a current wave *lagging* the voltage wave by 45° (inductive circuit); and (b) a current wave *leading* the voltage wave by 45° (capacitive circuit). The fact that the phase angle is less than 90° is due to the presence of resistance.

(Continued on page 209)

* 48 Earlsfield Road, Hythe, Kent.

DX TOPICS

THE MONTH ON THE AIR

by A. O. Milne* G2MI

Notes and News

THE month of October was quite lively for DX work on several of our bands. There were one or two outstanding stations, such as ZD7A, and conditions were better than for some time.

G3GVC has forwarded preliminary results of tests made with TF5TP on the 1.7 Mc/s band. On the evening of September 27th, between 2210 and 2245 TF5TP heard G2YY, 589; G3GIO, 449; GM3HXT, 559; GM3AY, 459; and GM3HTH, 559.

GOOD NEWS

THE 21 MC/S BAND IS NOW OPEN FOR TELEPHONY

Bob Pybus has recorded some improvement on 28 Mc/s but says that conditions are still very much north-south. CX4CS was the loudest signal heard. VQ8AL was a good one on 14 Mc/s. We hear of another case—Aden—where amateurs are not being given the full bandwidth to which they are entitled. Here the unfortunate licensee is not allowed to use 14000-14100 kc/s. This is quite unreasonable and we hope enquiries which we are now making, will clear up the position.

VS9AW reports that he is also not allowed to use 14000-14100 in Oman. Let us state once more that the amateur band is 14000-14350, so that there should be no official mistakes in the matter. 'AW is the first VS9 to operate on 21 Mc/s and we hope soon to be able to announce that the A.R.R.L. have recognised Oman as a country separate from Trucial Oman. There is every hope of this coming off.

GM3CSM has kept up the good work by working FQ8AK, DU1MB, ZP9AW, OA4AQ, and MP4HBK who is at Sharjah, Trucial Oman. 4UAJ is in Kashmir which for DXCC purposes is still India. He comments on the quite extraordinary suggestions put forward by the F.C.C. for the establishment of "calling" and "working" frequencies for United States radio amateurs. We think it is very unlikely that they will be adopted, judging by the veritable torrent of criticism which has appeared both editorially and in the correspondence columns of *QST!* Personally, we think the whole scheme is idiotic. Whoever thought it up can have no idea how amateur contacts are made! GM3CSM says that MP4BAU is in Qatar—a new country.

G2VV has temporarily abandoned the DX bands for 1.7 Mc/s and says it has produced QSO's with such old-timers as G2LZ, G2KF, G2NM, G5YH, G6HB and G6NK. OH3NY has been worked with 8 watts to a 7C5. From the magazine of the "QRP Society," we note the details of an interesting three-way contact which took place on October 2nd between GM3JDR in John o' Groats, G3HRD at Lands End and G3CED at Broadstairs, the most easterly amateur station in the British Isles.

G5JL says 7 Mc/s has not been too good but around 0530 G.M.T. the following have been heard: ZD4AB, 7028; FM7WD, 7032; VP6JV, 7033; YV5FR, 7030. A very strong signal came from LU0AAW who was S9 at 1100 G.M.T. on 7 Mc/s recently; Argentine ship or pirate?

G3HMC of Yeovil has worked 33 countries on the three low frequency bands with an input which never exceeded 14 watts. He draws attention to the really great distances which are sometimes involved with apparently non-DX contacts. For example, there are SM stations well beyond the Arctic Circle, nearly 1,500 miles away and even

Bands Available

THE following is a summary of the bands in which amateur operation is now permitted. The table also shows the maximum power input and types of emission allowed to holders of unrestricted licences. In general, during the first year, power in excess of 25 watts is not permitted and on frequencies below 420 Mc/s operation is restricted to A1.

Frequency in Mc/s	*Maximum d.c. input (watts)*	*Types of Emission*
1.715-2.0	10	A1, A2, A3, A3a
3.5-3.635	150	A1, A2, A3, A3a
3.685-3.8	150	A1, A2, A3, A3a
7.0-7.3	150	A1, A2, A3, A3a
14.0-14.35	150	A1, A2, A3, A3a
21.0-21.45 (2)	150	A1, A2, A3, A3a
28.0-30.0	150	A1, A2, A3, A3a, F1, F2, F3
144-146 (1)	150	A1, A2, A3, A3a
144.5-145.5 (1)	150	F1, F2, F3
420-460 (2)	150	A1, A2, A3, A3a, F1, F2, F3
425-455 (2)	150	A5 & F5 (4)
1215-1300 (2)	150	A1, A2, A3, A3a, F1, F2, F3
1225-1290 (2)	150	A5 & F5 (4)
2300-2450	150	A1, A2, A3, A3a, A5 (4), F1, F2, F3, F5 (4)
2350-2400	25 (mean) and 2.5 kW peak (3)	P1, P2d, P2e, P3d, P3e
5650-5850	150	A1, A2, A3, A3a, A5 (4), F1, F2, F3, F5 (4)
5700-5800	25 (mean) and 2.5 kW peak (3)	P1, P2d, P2e, P3d, P3e
10000-10500	150	A1, A2, A3, A3a, A5 (4), F1, F2, F3, F5 (4)
10050-10450	25 (mean) and 2.5 kW peak (3)	P1, P2d, P2e, P3d, P3e

(1) *Subject to non-interference to Government Services in the band*
(2) *Subject to non-interference to other Services in the band.*
(3) *Under a 10-watt d.c. input licence, peak power is limited to 1 kW.*
(4) *An additional Amateur (Vision) Licence (£3 p.a.) is required for television.*

* *29 Kechill Gardens, Hayes, Bromley, Kent.*

a DL may be on the shores of Lake Constance or an EA near Gib.

VS1EV says 21 Mc/s has produced plenty of activity but very few G's. The B.B.C. on 21550 kc/s is a very useful pointer to the band being open. On many occasions he has picked up the F.M. police transmissions from Manila. He thinks that ZC5VR who claims to be in Sandakan, British North Borneo, may be genuine but wonders why he has not used the correct prefix, which is VS4. G3HEJ has worked 35 countries on 21 including VK9GW, VK4, KX6, VR1, and VR4 but has missed out on KG6 and KH6. G2BJY worked both ZD7A and ZD9AA on 21. ZS3K was another nice one. Others were CR7AF, KP4KD, EA9AA, 3V8AN, CN8BK and VK9GW. There must be nearly 100 countries active on this band now. At 1000 recently, after calling CQ on what appeared to be a dead band, he raised VK2ANN, VK2AWU and VK2LJ.

G3BAK has a three-wire folded dipole on 7 Mc/s and has worked OA4ED (QSL by air mail), KL7CL, K5FBB, W6DFY, VP7NV and numerous ZL's and VK's.

From W5KUC's *DX Bulletin* we learn that VK2QZ may operate from YJ in the near future, a country never worked from the U.K. to the best of our knowledge. VP2AJ in Antigua is on 14185 'phone and also on 21 and 28. ZS7D, 14083; FB8BI, 14080; LB6XD, 14017; FR7ZA, 14150; KM6BE, 14220 and YJ1AC are all worthy of attention. FB8ZZ operates daily on 14200 at 1315 G.M.T. VP5BF is on each Sunday from 1500 to 1600 G.M.T. 14020 or 14075.

G5MN has had two cards from ZD2LMF whose address is Nigeria Signal Sqdn., Lagos.

GM6MS who has been doing well on 21 says that in Scotland the band is open for VK from 0900 to 1030 and that the LU's are good from 1200 to 1630. G6BB recently worked ZL1AH and discovered that he is ex-G3AH with whom he served during the war. On 7 Mc/s OA4BG-0528-7032 was a welcome new one. Did anyone else hear JA1AB with a distinctive note call CQ on 7 Mc/s on October 1, followed a minute or so later by KC6RO with the same note? GM3HGA in Lerwick mentions SM5LF/2 who is at Kiruna, which is well north of the Arctic Circle and is therefore useful as one of the substitute countries for the WAE. He is on 7050 and was worked around midnight. FF8GP on 7020 at 2100, PJ2CB on 14030 and VK1EM (Mcquarrie Island) on 14020 are worth watching. 'HGA says he has to take his aerial down in the winter time to preserve it from the gales!

G6RH has worked ZD7A on both phone and c.w., besides KX6AI on 14095, FP8AP (14080) and VP8AJ (14010). GM2DBX has just contacted the 25th different operator at MB9BJ. G6XY, a new contributor, offers a few for whom to look:—FK8AI-14015-0920 Airport, New Caledonia, VK9FM-14100-1130, c/o D.C.A. Madang, New Guinea, FK8AB-14010-0830, VR2CG-14008-0905, Nandi Airport, Fiji and ZS8MK-14040-1735. BRS19486 of Oldham has heard FY7YB, ZD2HAH and ZS3Q.

Who's Who

G3FRB says his call is being pirated on 3.5 and 7 phone, the pirate giving his QTH as Liverpool. G2QP, G2TX and G2XJ are all pre-war calls which have not been re-issued but are also used by pirates.

G4JB has heard that VK6HM may soon be going to Cocos Island and will probably operate as VK1HM on all bands. We hope he will use the proper prefix ZC2. EQ3AL, FM, NA, 1WR and 3JR are all in Teheran but do not QSL. EQ3TT is also there and QSL's *via* R.S.G.B. G6ZO claims the first G-ZL contact on 21 Mc/s with ZL1AH at 0913 G.M.T. on September 27th. He worked ZL4GA at 0915 on the following day.

VS7MA and VS7TC (twin-brothers) are in Britain and would welcome the chance of meeting British amateurs. Write to P/O R.E.A. Cannon, R.I. Mess 55, H.M.S. Collingwood, Fareham, Hants. Jack Morrison, VK3JL arrived last month and will be working in London for a time.

ST2HK (ex-VQ4HK) states there have never been any ST1's. The only genuine Sudan calls are ST2GL, 2TC, 2HK, 2NW, 2EB and 2AM.

CE3AG is going to Easter Island from December to February and will probably use the call CE0AA. I1AHK will be in San Marino during December. FD8AA is now signing FD4AD (QTH, Box 185, Lome.) FQ8AR can be reached *via* Box 108, Brazzaville. All this from W2GT. G3HEH has been signing MP4BN in Qatar. VS9AP (ex-VQ4CM) and VP9AD are active from the RAF station in Aden. They hope also to work "Top-band" and 80. 5A2CB, 'CD, 'CF and 'CH are leaving Benghazi but three other amateurs will be taking their places. G6XY mentions that ZL2AL is George Merriman, ex-G6NC, ex-VS6AH. G2DPY has sent a further excellent report. Here are the plums therefrom:—VS9AW still active c/o RAF Salalah, Aden Command; C3IF on 14100 around 1530-1700, quite strong but very much sought after; FI1AO may be OK but why the FI1? 'DPY says G3EDW is now VQ2W, Box 249, Chingola, N. Rhodesia.

From G2AYQ we hear that G3ELW is going to Vera Cruz, Mexico, and will be active with an XE call using a B2 on crystal frequencies of 14028 and 14103. G3GAJ is again active as ZD2GAJ while VK6DX back home after a happy holiday in Britain sends his best wishes to the many friends he made over here. He wants information on Geiger counters; can anyone help?

G3AAT/OX

G2SC, and many others, including your scribe, have worked this station, which is with the British North Greenland Expedition. The operator is Lt. R. Brett-Knowles and the station is active on 14 Mc/s 'phone. Special QSL cards will be sent to confirm all contacts when the expedition returns to this country in 1954. During a contact with G2MI on October 25th, the operator gave the following list of British stations worked to date, in contact order:—G2SC, G3BUU, 'HRJ, 'HLS, 4ZU, GM3DHD, '3EST, '3DZB, G3HQD, BWZ, ABG, 2AOW, 5JZ, TN, 2AYQ, GM3CDL, G3BXI, 2MI, 8IG. He has worked PA0KC at S8 on S.S.B. on 3800 kc/s.

THE RADIO AMATEURS' EXAMINATION.—(Continued from page 207)

Equating the two reactances,

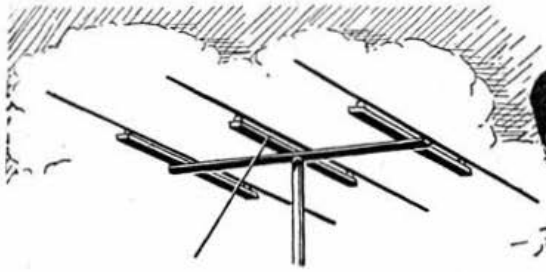
$$2\pi fL = \frac{1}{2\pi fC}$$

Therefore: $$L = \frac{1}{4\pi^2 f^2 C} = \frac{1}{4\pi^2 (5\times 10^6)^2 \times 0.0001/10^6}$$

$$= 10.1 \text{ microhenrys.}$$

Note the use of 10^6 to convert the megacycles-per-second to cycles-per-second, and to convert microfarads to farads. For checking purposes, it is useful to remember that π^2 is very nearly equal to 10.

Problems on reactances and resonance at radio frequencies entail the use of quantities preceded or followed by a large number of noughts; beginners should work through numerous examples to gain experience in the accurate handling of such quantities.



AROUND THE V.H.F.'s

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

Two Metres

CONDITIONS generally seemed to be average to poor in most parts of the country during the past month. G6XX (Goole, Yorks) found some good patches on October 5, 12 and 16/17 but with few stations to take advantage of them. G3EHY was audible on most evenings, but his best contact was with G6CI (Coventry). Commenting upon the Editorial in the October BULLETIN, 6XX says that there are plenty of stations working in the first 200 kc/s of the band.

The sked between G5YV (Leeds) and G2AJ has ceased—the latter is moving to Cheltenham—and has been replaced by one with G8OU (Ashtead, Surrey) at 2300 G.M.T. It appears that the 200-mile hop will be possible almost every night. G5YV finds that most stations do not look for the DX, being quite content to work over distances of 40 to 50 miles, unless the band is wide open.

G5MA made two portable expeditions to Wales recently, the first on September 20/21 to the summit of Bwich-y-Groes, Merioneth, 1,790 ft. a.s.l., followed, on October 18/19, by a trip to a site 1,600 ft. high near Blaenavon, Monmouth. From the first place 25 contacts were made including five with stations in Surrey. G2HOP, XV, 3AVF/P, BK and 5ML/P were heard. On the second sortie the score was 45 stations worked, including G3ANB (Brightlingsea, Essex) at 175 miles. Only two were heard but not contacted—G5YV and 6CI.

G5MR (Hythe, Kent) makes his first appearance on the 2 m "Ladder" and although it is rather hard going from his position at the south-east tip of the country, he is all in favour of a bit of harmless competition. Until recently his best contact on 2 m had been with GW2ADZ at 216 miles but on August 29 he raised DL6EP at 273 miles and on October 12 G5YV at 218 miles.

The regular sked between G3EHY and GI3GQB was completely successful on more than half the attempts made during the month ended October 7, solid contacts being obtained on 16 occasions. For most of the period the country was covered by a cold N.W. airstream, usually fatal to 2 m DX. 'EHY reports that, apart from GI3GQB, v.h.f. activity in Ireland is at a very low ebb. It is understood, however, that some 20 members of the new V.H.F. Research Society of Ireland are constructing gear and it is hoped that more will be heard from our neighbours in the near future.

Complaints of a lack of 2 m activity seem to be disproved by G3WW, who, in the three weeks ending September 22, worked stations in 40 counties, thus winning a certificate from the *Short Wave Magazine* for the first station to do so starting on September 1 this year. Just after working GW5MA/P in Monmouthshire at 2035 B.S.T. on September 18, G3WW put out a CQ on c.w. with his beam NE. Two unintelligible S4 'phone carriers were heard on 144.7 and 144.75 Mc/s, which would indicate stations in northern Germany or Denmark. Keyed, the carriers would have been fully readable—*verb sap!* 'WW now has a stack of 4 slots 58 ft. above ground, the same height as his "5 over 5," and comparative tests will be carried out. He reports that the Royston (Herts) Radio Club is now active on the band under the call G3GIT.

G8DM (Faringdon, Berks) has increased his input on n.b.f.m. to 45 watts to an 829B with a consequent increase in contacts and is active most evenings, mainly between 2100 and 2200 G.M.T. He, along with others, deplores the general lack of activity during T.V. hours and considers that the "Ladder" scheme has done nothing to remedy this state of affairs.

GW8UH (Cardiff) found conditions good for work up to 120 miles during the 2 m Field Day, when G3AVF/P and 3FD/P were worked. No portables were heard from either the Midlands or the north. For the remainder of the month the band was never more than fair and the best contact was with G2UN (Lancing, Sussex). GW4CG/A is now on 144.2 Mc/s from Port Talbot, but, due to a mountain between them, can only hear 8UH when the latter is firing well south of the true direction. GW8UH intends to operate on 2 m at week-ends during the winter and urges more activity between 1800 and 2200 G.M.T.

While on holiday in Cornwall in September, G3FKO and 3IWA visited G2BAT, whose station at Falmouth commands a fine view over the harbour to the east and north-east, and were surprised to find far more 2 m activity up to distances of 60 miles or so than is heard at their stations in Bath. 'FKO and 'IWA took part in the Field Day on September 20, but were put out of business after 3½ hours by battery failure. However, they worked G3EHY, 3YH and GW8UH as well as portables G3AVF, HSD, MA, 4FD and 5BM. G2HCG/P was heard. G3FKO and IWA claim to operate the only 2 m portable station in the country in which all the gear may be transported complete on a lightweight motor-cycle in two trips. G3IWA will shortly be active in the London area.

G3HAN, who is in the R.A.F., can only operate on 2 m at intervals from his home location at Wigston Magna, Leics. His transmitter consists of a 6AG7 c.o./tripler, EL91 tripler, QVO4-7 doubler and 832 p.a. The cascode converter employs a triode-connected 6F12 and EC91, a 6F12 mixer, 6C4 oscillator and 6C4 cathode follower. An indoor 3-element Yagi is in use. Some difficulty was experienced in obtaining a pure note from the oscillator in the converter, but this was eventually achieved by thorough bonding of the converter, BC312 i.f. amplifier and power pack by short lengths of copper braid.

G3HZK (Hayes, Middx.), despite severe screening of his indoor aerials, has worked 81 stations, the most distant being 80 miles. G2XV and G8AO/MM have been heard but not worked.

Active on the band since receiving his licence in June this year, G3IIT (Cambridge) worked 23 stations during the past month with 15 watts to an 832 on 144.8 Mc/s driven from an EL91 c.o./f.d.

* 32 Earls Road, Tunbridge Wells, Kent.

Regional V.H.F. Ladder

TWO-METRE BAND

To qualify for entry in the Two-Metre Regional V.H.F. Ladder, members must have worked stations in at least seven R.S.G.B. Regions since July 1, 1952. The rules, and a list of Regions and Counties or Areas forming them, were published on page 544 of the June, 1952, "Bulletin."

Psn.	Call & Location	Worked—Regions	Stations	Countries
1.	G3BW *Whitehaven, Cumbs.*	15	63	5
2.	G5YV *Leeds, Yorks.*	13	212	9
3.	G3WW *Wimblington, Cambs.*	13	209	9
4.	G2HIF *Wantage, Berks.*	13	109	7
5.	G4RO *St. Albans, Herts.*	11	136	4
6.	G3FAN *Ryde, I.O.W.*	11	115	4
7.	G2FNW *Melton Mowbray, Leics.*	11	78	3
8.	G6LI *Ludborough, Lincs.*	11	59	6
9.	G2YB *Caversham, Berks.*	10	141	4
10.	G3FD *London, N.14.*	10	80	7
11.	G3HBW *Wembley, Middx.*	10	69	4
12.	G6XX *Goole, Yorks.*	10	63	3
13.	G6YU *Coventry, Warks.*	10	46	3
14.	G2FJR *Sutton Bridge, Lincs.*	9	83	3
15.	GW8UH *Card.ff, Glam.*	9	60	3
16.	G2DKH/P *Stanley, Co. Durham.*	9	45	4
17.	G3AGS *Manchester 8.*	9	36	3
18.	G3BHS *Eastleigh, Hants.*	9	35	2
19.	G3GBO *Denham, Bucks.*	8	96	3
20.	G5MR *Hythe, Kent.*	8	54	5
21.	G3FIJ *Colchester, Essex.*	8	42	6
22.	G3BVU *Witney, Oxon.*	8	27	1
23.	G3GOP *Southampton, Hants.*	7	46	2

with 12 Mc/s crystal and two QVO4-7s as tripler and doubler. The aerial, at present a 3-element Yagi, is shortly to be replaced by a "3-over-3."

Listeners' Reports

G2HIF (Wantage, Berks.) brings up the question of listeners' reports on signals from 2m stations but most of the points he makes apply with equal force to reporting on other bands. While no one wishes to discourage budding amateurs, the fact remains that isolated reports from a listener situated 50 or 60 miles away from a station which is getting out well can contain little which is not already known by that station. 2HIF suggests that most stations operating regularly would appreciate details, say in the form of a graph, of their signals as received from day to day over a period of not less than a month, especially during the winter when propagation may be considered "standard" and not enhanced by patches of good conditions. To increase still further the value of such data mention should also be made of prevailing conditions as evidenced by the reception of other stations.

Cross Band Working

Referring to the note in the September BULLETIN regarding calls to be adopted for cross-band working, G3CJU (Newbury, Berks) points out that there may be those who wish to work cross-band from other frequencies, such as 1.7 and 3.5 Mc/s. He suggests "CQ/2" for c.w. and "CQ two-metre test" for 'phone operation. The call "CQ270" for those calling on 2 m. and looking for replies on 70 cm might be contracted to "CQ2X."

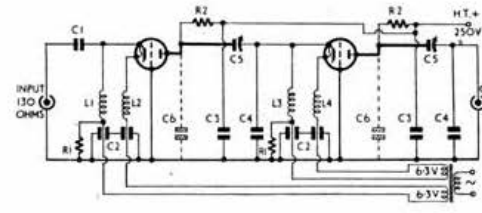
Experimental Work on 70 cm.

In September, 1951, an article entitled "A Survey of 70cm Equipment" by D. N. Corfield, G5CD, appeared in this journal. During the past year 5CD has continued his work in the same field and some of the results will be on view at the forthcoming R.S.G.B. Amateur Radio Exhibition.

Pre-amplifiers

As a result of experience gained in using the two receivers described in the July and September, 1951, issues of the BULLETIN, it became obvious that considerable improvement in signal-to-noise ratio was desirable and that this improvement could best be obtained by increasing the gain of the signal-frequency circuits. A number of pre-amplifiers were tried, the first being a 12AT7 neutralised earthed-grid arrangement similar to the existing r.f. stages. This gave a gain of 8db and a bandwidth of 23 Mc/s, but tended to be unstable when used in front of the existing receivers. A 6BQ7 was tried with similar results, the improvement in signal-to-noise being small. A second version employed an experimental double-triode designed for earthed-grid use, the S.T. & C. LS774 as described in the *Proc. Brit. I.E.E.* and *Radio Communications* for March, 1952. This gave similar gain and was quite stable without neutralisation, but the improvement in noise was not more than 2 db.

A third version used a single disc-seal triode, the Osram DET23 (CV354), mounted in a rectangular trough pipe 6½ in. long by 1½ in. square, with a series-tuned anode line designed for an input and output impedance of 130 ohms. Loop or "pi" coupling at this output gave similar results. A gain of 11db, a bandwidth of 17 Mc/s and a noise factor of 8db were achieved, giving a noticeable improvement in performance on the air, but it was still found that a good deal of the noise originated other than in the pre-amplifier, and it was decided, therefore, to attempt a two-stage version, the circuit diagram of which appears below. This employed two DET23 valves in cascade, mounted in a 1½ in. square trough pipe 12 in. long with "pi" coupling in both interstage and output, the impedances throughout being 130 ohms. The gain was 16-17db, bandwidth 7.5 Mc/s, and noise factor 4.5db. With this



Circuit diagram of the two-stage DET 23 pre-amplifier for 70 cm. The leads shown between the anodes of the two valves and C5 represent the centre conductor of the trough pipe. C6 is the anode–to–grid capacity of the valves, forming the input capacity for the two "Pi" networks.

C1, 47 $\mu\mu$F; C2, 0.001 μF (T.C.C. "lead-through"); C3, 0.001 μF (T.C.C. "lead-through"); C4, 20 $\mu\mu$F midget silvermica; C5, 3–8 $\mu\mu$F trimmers; R1, 220 ohm cathode bias resistor; R2, 1,000 ohms; L1, 2, 3, 4, heater chokes.

circuit 80 to 90 per cent. of the noise output of the receiver comes from the pre-amplifier, and it has been found excellent in operation, with no signs of instability.

Transmitters

For those who wish to take advantage of the new 150-watt licence on the 70cm band the S.T. & C. valve 3H/150J (equivalent of the U.S.A. 2C39), is rated for 100 watts anode dissipation at 500 Mc/s; it is hoped to describe a final amplifier using this valve at a later date.

Aerials

The helical beam aerial, an illustration of which appeared in the August BULLETIN, was based on information published in the *Proc. I.R.E.* for October, 1948. This aerial was tried because it was found that the conventional Yagi had too narrow a bandwidth for adequate band coverage, particularly for television which may be radiated at either end of the band—in fact, there was evidence of some discrimination between 432 and 436 Mc/s. The helical aerial has a gain of 10 to 14db, a frequency range of 1.67 to 1, and an impedance of 130 ohms more or less constant over this range. The dimensions were chosen to cover 350 to 580 Mc/s. Since polarisation is circular, the aerial will receive either vertically or horizontally polarised waves equally well.

The helix comprises six turns of ½ in. external diameter aluminium tubing wound right-handed to a mean diameter of 8¼ in., and measuring 42 in. overall including the attachment. The earth plane, 21 in. diameter, is constructed of 14 s.w.g. copper wire, the centre hub being a brass disc 6in. in diameter. The earth plane and helix are mounted on a standard circular electrical junction box fitted with a ½-in. Perspex lid. The inner conductor of the coax is connected to the helix and the outer to the earth plane, a resistor of 15,000 ohms being wired across the end of the feeder to facilitate a continuity measurement in cases of doubt arising on this point. Suitable sources of 130-ohm coaxial feeder are Telcon AS95M, B.I. Callenders T3044 and Transradio PC1-T.

The 70 cm. Band

Leicestershire 70 cm stations are active from 1900 G.M.T. on Mondays. G3FFC has a new 16-element stack and is a much improved signal. Thus encouraged, G3BKQ is going ahead with a 48-element job, while G3BVW and 'FNW are concentrating on the receiver side, G3ABA (Coventry) has been well received by all the above. Three stations are now regularly active in Cambridge—G2XV, 4MW and 5IG.

Using n.b.f.m., G3EUP and 4AP (Swindon) have been testing with G8DM. The latter feels that activity on the v.h.f.s would be considerably greater, and particularly so on 70 cm, if suitable valves were readily available at reasonable prices. There must be few amateurs able to afford a tripler and p.a. of other than "surplus" types, as the only alternatives are those in the QQVO6-40 class. G8DM also suggests that the c.c. portion of the band should not be more than 2 Mc/s wide owing to the near impossibility of searching thoroughly a greater frequency range.

The Mullard QQVO3-20

Readers will have noted the recent announcement of a new double tetrode v.h.f. transmitting valve, the QQVO3-20, the first samples of which were shown at a lecture to the Society in London last year. Somewhat similar in appearance to the 832, it has greatly improved characteristics and is claimed to have an upper frequency limit of 600 Mc/s, with 15 watts output for an input of 35 watts at 500 Mc/s. G5CD has tested this valve both at 144 and 435 Mc/s, with the following results. At the lower frequency, the drive is increased as compared with an 832 and is over 30 per cent. higher than an 829B under the same conditions. No difficulty was experienced in obtaining an output of 25 watts and with a suitable layout no neutralising was necessary. On 70 cm its operation compared more than favourably with the larger QQVO6-40 at the same input power. This may be because it is more efficient or the QQVO6-40 is less efficient at lower inputs. As a p.a., for similar driving power, the grid current is about 25 per cent higher and the lower anode capacity results in a linear tuned circuit being 1 to 1½ in longer than for the larger valve. As a tripler the output drive to a p.a. is about the same as for the QQVO6-40. It can certainly be recommended for inputs of the order of 25 to 40 watts. The price has not yet, to our knowledge, been announced.

* * *

Owing to the Amateur Radio Exhibition taking place from November 26 to 29, the writer would much appreciate receiving all reports for inclusion in the December issue by November 22 at latest.

The V.H.F. Research Society of Ireland

At a meeting of this society in Belfast on October 18 an attendance of 40, including nine from Eire, saw GI3GQB presented with the Irish Perpetual Trophy for his outstanding work on 2 m. Several lectures were given by well-known amateurs, including GI3BIL, 3GQB, 2FHN, 3AXD and old-timer GI6YW.

London U.H.F. Group

ABOUT 30 keen u.h.f. workers attended the inaugural meeting of the above Group at the Bedford Corner Hotel, Bedford Square, W.C.1, on October 2nd. Those present included G2RD, 2WJ, 3HT, 3FD, 4RO, 4KD, 4FB, 5CD, 5QL, 6NF, 6YP, 6QN, 3BPM, 3GSE, 3BVG, 3ENI, 3IEX, 3CGQ, 3ICL, 3HZK, 3CVO, 3GBO, 3ECA, 2DTO, 2FKZ, 3FSD, BRS. 18572. SM6BWE was a welcomed visitor.

During the evening, G2WJ, 5CD and 3CVO gave details of their 70 cm receiving equipment which was on display.

Following a discussion on best operating times for 70 cm work it was decided to concentrate activity around 1900, 2000 and 2100 G.M.T. daily and at 1100 GMT on Sundays. It was also agreed that those using the 2m band should come on or change-over at the same times for tests.

G2FKZ reported that he had successfully transmitted signals on 6000 Mc/s over a distance of 600 yards. An offer by G3BPM to display a calibrated cavity absorption wavemeter was accepted. The Group continues to meet on the first Thursday of each month.

Special Radio Amateurs' Examination

SIXTY-SIX candidates entered for and 48 passed a Special Radio Amateurs' Examination organised by the G.P.O. and held in London and Edinburgh on October 4th, 1952.

The average number of marks obtained by the successful candidates was 64 out of 100 and by the unsuccessful candidates 34 out of 100. A list of the questions and the examiners' comments will appear in a later issue.

OFFICIAL MEETINGS

Bristol Fashion !
All roads led to the Grand Hotel !

REGION 9 members must be excused if they appear to think that B-R-I-S-T-O-L spells "success" for—on record anyway—it would seem they are orthographically correct. National Field Day and then the Bristol County Meeting—both the result of long-term planning and hard preparatory work behind the scenes. Yes, pride in the Region runs high, yet even so the far-famed West Country blushes must have been much in evidence on October 5 when praises were sung so loud and long by Council members who should know.

First pointers to what was in store were provided by courtesy of the Automobile Association at all strategic entrances to the self-contained city and county and led directly to the Grand Hotel. The programme began at 11 a.m., when most of the 161 members attending were taken by coach to the Royal Fort Physics Laboratories, where Dr. F. H. Kay, of Bristol University, demonstrated the electron microscope. A diatom doesn't seem such small fry when magnified some 60,000 times, but this didn't put anyone off the lemon-sole course of the luncheon which followed back at the Grand.

Herbert Bartlett (G5QA), oscillating between his twin roles as Council member and Regional Rep., found himself in the chair as R.R. and sagely decided to zero beat in that position for the rest of the day. "Herbie" smiled happily as he rose to welcome the visitors from Headquarters to what he described as "the finest county meeting that has ever been staged in this country." The President, "Dud" Charman (G6CJ), in reply expressed surprise and pleasure at the size of the gathering.

There was a ripple of anticipation when the General Secretary began to discourse on the late "Billy" Andrews and the "G5FS Memorial Trophy" donated to his memory. This trophy is awarded annually for the most outstanding work done by a Bristol member during the year. The new recipient was named as Don Davies (G3RQ), the Bristol Group secretary, and if any endorsement were needed of the local committee's choice it was given in the roar of applause that followed the announcement.

Following luncheon—with every conceivable excuse that "Clarry" could think of to promote toasts of friendship—the tables were cleared for the serious business to begin.

Business Meeting

In his address from the chair, Mr. Bartlett congratulated the Bristol Group on winning National Field Day by a comfortable margin. He emphasised that team-work had produced this success and spoke of the support given to the Bristol monthly gatherings. He added that on many occasions he had passed on to Council criticisms and suggestions received from those meetings.

The President, in adding his own bouquet to Bristol for their efforts, asked what else could be expected in a city where, that very morning, he had seen a coach number plate bearing the legend: "HOT 807"! Speaking on the Society's role in international affairs, Mr. Charman stressed the importance of maintaining the foothold of

Luncheon Parties

A section of the large gathering assembled for luncheon at the County Meeting held at the Grand Hotel, Bristol, on October 5, 1952.

Amateur Radio in that sphere " so that the people who make the decisions on frequency allocations are fully aware of our needs and our rights." He emphasised that other societies in Europe look to the R.S.G.B. for guidance in these matters. Mr. Charman concluded with a summary of present-day T.V.I. problems and suggested that with modern techniques this need prove no more formidable than B.C.I. appeared to be in the early 1920's.

Mr. L. Cooper (G5LC), Vice-President and Chairman of the Finance and Staff Committee, outlined the financial structure of the Society and, explained the new subscription plan—a task he undertook so well that he presented an apparently unassailable case for the proposed increases.

some time in the future as the venue for a National Convention." He gave the first news of the release of the remainder of the 21 Mc/s band and forecast other concessions on which the Society was negotiating.

The speakers then sat back to be " shot at " and listened attentively to viewpoints from " the floor," although, for the purposes of the carefully arranged timetable, this " session " had to be kept rather short in order to fit in the mammoth raffle that followed with tea. Nearly 100 prizes of a total value exceeding £150 were disposed of at the rate of over one a minute with varying fortunes among the assembled members. A specially made revolving drum—with eccentric bearings to shake

At the express wish of the local members, the G5FS Memorial Trophy was presented to the 1952 winner — Don Davies (G3RQ)—by the General Secretary, a personal friend of the late Billy Andrews. In this group, taken at the Grand Hotel, Bristol, can be seen Council Members Herb Bartlett (G5QA), Les Cooper (G5LC), Fred Lambeth (G2AIW), the President (Frederick Charman, G6CJ), Richard Walker (G6QI), Bill Winsford (G4DC), and Past President Victor Desmond, (G5VM).

Mr. F. G. Lambeth (G2AIW) spoke on the scheme of representation and the running of local groups whilst Mr. R. Walker (G6QI), Chairman of the Contests Committee, left no doubt as to the fairness with which that body performs its duties.

The General Secretary spoke on a variety of current topics and made reference to meetings held at the Grand Hotel in the early days of the amateur movement. From those meetings sprang a new spirit of comradeship. Of Bristol's continued success in maintaining that spirit and enthusiasm, he said : " I would like to offer a suggestion to the West Country. For three years in succession you have organised excellent county meetings and I would like to think of Bristol at

The outstanding success of the Bristol County Meeting was due to first-class team work. Here are the leaders of that team. On the left, Herb. Bartlett (G5QA), Region 9 Representative. On the right, Roy Poeton (G3CTN), Bristol County Representative.

up the contents—held the tickets at one part of the hall, while slips bearing the identity of the prizes were drawn at the other.

After Proceedings

Following the screening of a film of Society activities in the early thirties—including a gathering at the Grand Hotel, Bristol in 1932—the President produced his now famous " aerial circus " and kept his audience in fascinated silence for the best part of an hour. Goodman's Industries, Ltd., then took over to demonstrate the purity of their high fidelity audio equipment. The day concluded with a visit to the B.B.C. West Region recording studios. Another long-awaited event had come and had gone—now to the next. Whether it be a National Convention or not, members may be sure of one thing—in Region 9 the Society's affairs will continue to be run " shipshape and Bristol Fashion."

In closing this account the local committee would like to record its thanks to all who supported the meeting and also to the many manufacturers and dealers throughout the country who so kindly donated the raffle prizes. G3ERQ

Hampshire County Meeting

A SMALL, but enthusiastic, company of 40 members gathered at the Polygon Hotel, Southampton, on Sunday, October 12, 1952, to welcome Council Members Richard Walker, G6QI, and Douglas Findlay, G3BZG, and the General Secretary (John Clarricoats, G6CL). Mr. C. H. L. Edwards, G8TL, also attended in an unofficial capacity. Also present were the Region 6 Representative (H. G. Hunt, G3ECV), the Hampshire C.R. (E. R. L. Bassett, B.R.S. 16075), the Portsmouth T.R. (J. Stephens, G8WC), and the Southampton T.R. (F. A. Russell, G3BHS).

Business Meeting

At the opening of the business meeting both the R.R. and the C.R. expressed their regret at the absence of members from areas other than Southampton and Portsmouth, with the single exception of G3FAN, who had made a difficult journey from the Isle of Wight.

Mr. Findlay spoke on the revised Articles of Association, and the administration of the Society, and indicated the measures which were being taken to close the widening gap between income and expenditure.

Mr. Walker emphasised the importance of careful election of representatives and referred to the proposed system of zonal representation. It was significant, he suggested, that the revenue derived from publications had largely enabled the increase in subscription rates to be delayed until now. He paid tribute to the fairness and impartiality of the Contests Committee.

The General Secretary drew attention to the comparative size and publishing costs of the BULLETIN in 1939, 1949 and 1952; he also stressed the value of submitting experimental data, however apparently insignificant. On the subject of T.V.I. he spoke of the Society's efforts towards co-operation with the R.I.C.

Questions put to the speakers were mainly on the topic of the proposed increase in subscription rates and it was confirmed that a statement, setting out the reasons which had necessitated this measure would appear in the BULLETIN.

A display of home-constructed equipment arranged by members of the Southampton Group, included a number of v.h.f. transmitting and receiving assemblies for both fixed and portable use (G2DSW, G3CGE and G3GOP); a communications receiver (G3TR), and a tape recorder loaned by the C.R., Ron Bassett. Photographs of outdoor events and activities in the area formed a "back-cloth" to the display.

After tea and the time-honoured "draw," a lecture on Navigational Aids was given by Mr. W. Holloway, by kind permission of *Messrs. W. H. Smith and Co.*, Radar Engineers. Although the meeting officially closed at 7.30 p.m., the venue provided opportunity for informal discussions to be continued in congenial surroundings until a late hour. G3BHS.

Scottish Regional Meeting

DURING the evening of the day prior to the official Region 14 Meeting (held on Saturday, October 18, 1952), the President (Mr. F. Charman, B.E.M., G6CJ) lectured on and demonstrated his miniature aerials. The meeting took place in the Temperance Café, Falkirk. A vote of thanks to Mr. Charman was proposed by Mr. N. Holden (GM4MF).

Just prior to the Regional meeting, the Council representatives (Messrs. Bartlett, Charman and Clarricoats), together with the Region 12, 13 and 14 representatives and the C.R.s and T.R.s from Glasgow and Falkirk (with ladies), were entertained to lunch by Mr. Hugh McConnell, GM2ACQ (Scottish Member of Council), at the Leapark Hotel, Grangemouth. The President thanked Mr. McConnell on behalf of those present for his hospitality.

The Regional Meeting was held on the premises of the Falkirk Ice Rink, when 68 members were present to hear the Council representatives speak on various aspects of the Society's work; later a number of questions were answered. The chair was taken initially by the R.R. (Mr. David Macadie, GM6MD), who, after welcoming the official party, invited the President to preside. Tea was served at the conclusion of the meeting.

Later in the evening a party 90 strong sat down to dinner under the chairmanship of the R.R. A toast to the Society was proposed by Mr. W. Peat (GM3AVA), to which the President replied. Mr. Charman reminded Mr. Peat of the good turn he (Mr. Peat) did for him whilst in India when, operating under the call VU2WP, he made it possible for a QSO to take place between AC4YN and G6CJ!

Mr. Clarricoats proposed a toast to the ladies and Miss May Rhodes (GM3IMR)—the first lady in Scotland to pass the City and Guilds Radio Amateurs' Examination—replied.

The highlight of the evening came when the President handed the Scottish N.F.D. Trophy to Mr. Syd Young (G2YY), representing the Berwick-on-Tweed Group. The proceedings ended with a raffle which included both a communications receiver and an unplucked fowl!

A vote of thanks to the Chairman was proposed by Mr. James Maitland (B.R.S. 16925).—GM6MD.

The South Western Hamfest

THE Third Annual South Western Hamfest was held at the Rougemont Hotel, Exeter on October 26th, 1952. Among those present were the Regional Representative, Herbert Bartlett, G5QA and Vice-President Walter Sydenham, G5SY.

A display of Amateur Radio equipment was greatly appreciated, as was the trade show. Phil Crouch, G3GBK (a member of the Post Office Radio Branch) lectured on "T.V.I.—its causes and cures." The Bartlett Cup was again won by the Torquay Group.

A grand raffle and a film show brought the programme to an end. Thanks are due to Gordon Wheatcroft (G3HMY), for his work in making all the arrangements. G3EFY

Region 14 Official Meeting, Falkirk, October 18, 1952.

Front row (left to right): Walter Baker (G3AFL, Region 13 Representative), Herb Bartlett (G5QA, Council Member and Region 9 Representative), the General Secretary, the President (F. Charman, G6CJ), David Macadie (GM6MD, Region 14 Representative), Hugh McConnell (GM2ACQ, Council Member), John Douglas (GM2CAS, Region 12 Representative).

Slade—M.A.R.S. Jubilee Dinner

THE Lord Mayor of Birmingham (Alderman W. F. Bowen, J.P.) and the Lady Mayoress were the chief guests at the Joint Jubilee Dinner of the Slade Radio Society and the Midland Amateur Radio Society held at The Imperial Hotel, Birmingham, on Saturday, October 25, 1952. The Dinner, which celebrated the 25th Anniversary of Slade and the Coming of Age of M.A.R.S. was attended by nearly 150 members of the two Societies and their ladies.

The toast to the City of Birmingham was proposed by Dr. C. E. Naylor Strong and responded to by the Lord Mayor who spoke of Amateur Radio as being of the greatest value in providing scope for leisure-time activities. Mr. John Clarricoats, General Secretary of the R.S.G.B., in proposing a toast to Slade and M.A.R.S. enlikened the development of the two societies to the growth of an acorn to a young oak. He spoke of the fine record of achievement standing to the credit of both societies and referred to the stalwarts of the past who had done much to further the cause of Amateur Radio in the Midlands. Mr. Clarricoats paid a tribute to Mr. Wilfred Butler, G5LJ, for his generous gift of badges of office donated recently to the Presidents of the two Societies. Mr. W. E. Chilvers (President of Slade) and Mr. C. A. Young (President of M.A.R.S.) responded.

A toast to the R.S.G.B. was proposed by old timer Howard Littley, G2NV, and the response was made by the President of the Society (Mr. F. Charman, B.E.M.). Mr. Barlow, G5IW, welcomed the ladies and Mrs. McGregor, wife of G3HMG, replied. Mr. C. N. Smart (Hon. Secretary) offered a toast to the Guests and Visitors, to which Mr. Dunkerley (Midland Regional Director, B.B.C.) responded. Mr. G. T. Peck thanked the Technical Press for long years of active support and Mr. H. F. Smith, Editor of *Wireless World*, replied.

The Chair was taken by the President of M.A.R.S. and the Master of Ceremonies was Mr. Frank Barlow.

A toast to Absent Friends was drunk at 9 p.m.

The "Wonders of Radio" Exhibition

A "Wonders of Radio" Exhibition, organised jointly by the North-East Amateur Transmitting Society, the Gateshead Amateur Radio Club, and the Newcastle branch of the International Radio Controlled Model Society, was held at the Chronicle Hall, Newcastle-upon-Tyne, from September 22 to 27, 1952.

Throughout the period of the Exhibition a 150 watt transmitter was in operation, using the call sign G2BDQ/A, and in spite of a very high noise level of interference, numerous contacts were established on all bands from 1.8 to 14 Mc/s., 'phone signals being received in Australia. Local amateurs monitored and maintained contact with the Exhibition station through the medium of 144 Mc/s links.

A complete amateur-built transmitting and receiving station in console form evoked much interest, as did an amateur-built television transmitter. Two tape recorders were kept busy continuously, recording the impressions of visitors to the exhibition and then playing them back. In addition an ingenious device for reproducing handwriting on a long-persistence cathode ray tube mystified everyone.

The W.I.A. Stand at the "All Models Exhibition" held in Melbourne during September. Left to right: v.h.f. corner, home constructed gear, 20-metre transmitter, 40/80-metre transmitter and novelty corner. Five miniature rotary beams surmounted the stand. Also on show was VK3LN's television demonstration. The exhibition station VK3WI had 623 contacts with amateurs in 28 countries.

A large number of radio-controlled models were displayed together with control equipment. The R.N.V.(W.)R. displayed automatic c.w. equipment and models of Signals School class rooms, while the R.A.F. exhibited a working model of radar detection.

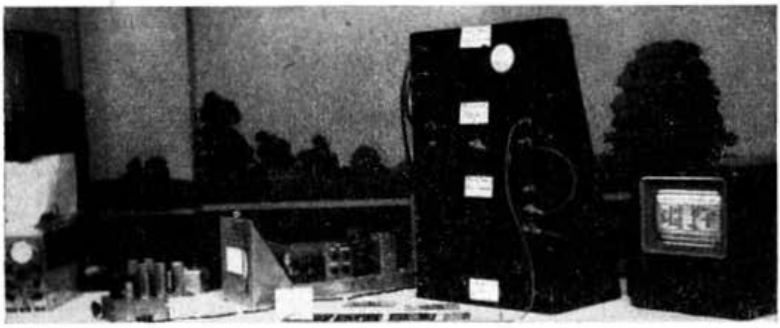
Teletype, telephoto and ancillary equipment was operated by Kemsley Press, Ltd., who also provided "walkie-talkie" equipment. Sound films on technical subjects were shown throughout the exhibition.

DEADLINE

Contributors are asked to note that the closing date for copy intended for the December Issue is November 28, 1952

Static displays consisted of a fine collection of QSL cards, and a mass of amateur constructed equipment covering 25 years of development.

The sponsoring organisations were most gratified at the public interest shown in this, the first entirely "amateur" radio exhibition held in Newcastle-upon-Tyne. It was visited by more than 2,000 persons in six days. G4LX



G3BLV–TV at the "Wonders of Radio" Exhibition held recently in Newcastle-upon-Tyne. The picture was scanned by the c.r. tube in centre; the rack houses the television transmitter, and the commercial set on the right received the picture.

SOCIETY NEWS

The 21 Mc/s Band

THE Society is pleased to announce that the whole of the 21 Mc/s band was released for A2, A3 and A3A operation as from November 15th, 1952, subject to the usual prohibition which applies to first-year licensees and to non-interference with existing services.

Although telephony is now permitted throughout the band, U.K. amateurs are urged to adhere to the R.S.G.B. and European Band Plan which recommends that frequencies between 21000 and 21150 kc/s should be used for telegraphy only and those between 21150 and 21450 kc/s for both telegraphy and telephony.

Council Ballot

NOTICE is given that at the Ordinary Meeting of the Society to be held at the Institution of Electrical Engineers, on November 21st, 1952, the members present will be asked to choose two or more scrutineers for the purposes of the Council Ballot.

HELD OVER

Due to extreme pressure on our available space the Reports of the D/F National Final, Second Two-Metre Field Day, Low Power Contest and the B.E.R.U. Contests have been held over from this issue. The reports will appear next month.

The Empire DX Certificate

MEMBERS will be sorry to learn that Mr. John Portway, B.E.M., who was responsible for producing by hand on vellum the beautiful Empire DX Certificate, passed away early in September. His son, in reporting his death to the Society, wrote "He really did enjoy doing the certificates. You would not believe the number of hours he spent on them. Towards the end I persuaded him to put his name and address on the back of each—and he received cards of thanks with amazing regularity."

With the death of Mr. Portway the Council has decided to obtain quotations for an engraved certificate in colour which will conform as closely as possible to those which were produced by hand.

For the record, Mr. Portway produced a total of 76 certificates.

Amateur Radio Exhibition

MANY Affiliated Societies and local R.S.G.B. groups are known to publish News-Sheets. In order to provide an opportunity for members to see examples of these interesting little publications, the Amateur Constructors' Sub-Committee would be pleased to receive copies for display at the Exhibition. Copies of recent issues should be sent to Mr. J. Hicks, 11 Essex House, Links Road, London, W.3.

Identify Yourself on the Road by Flying a

R.S.G.B. PENNANT

Large size **6/6**; *small size* **5/6**

(postage 3d. extra)

LONDON MEETINGS, 1952/3

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. Buffet Tea from 5.30 p.m. Meetings commence at 6.30 p.m.

Friday, November 21, 1952: **Paul H. Sollom, B.Sc., A.C.G.I., G3BGL.**
"THE SKY-BEAM PROPAGATION PROBLEM."

Friday, December 19, 1952: **Annual General Meeting.**

Friday, January 30, 1953: **R. H. Hammans, G2IG.**
"SINGLE SIDEBAND TRANSMISSIONS."

Friday, February 27, 1953: **F. Hicks-Arnold, G6MB.**
"OSCILLOSCOPES."

Friday, March 20, 1953: **F. Charman, B.E.M., G6CJ.**
"V.H.F. AERIAL DEVELOPMENTS."

Film Show at London Meeting

ABOUT 80 members were present at the first meeting of the season when technical films, and the National Field Day film 1952, were screened. The programme was arranged by Mr. C. H. L. Edwards, G8TL, with the assistance and co-operation of Messrs. Dorsett and Wenn. The Chair at the meeting was taken by the President—Mr. F. Charman, B.E.M., G6CJ.

N.F.D. Film

MEMBERS are asked to note that a 16 mm. print of the 1952 N.F.D. Film suitable for display at local meetings will be available early in the New Year.

Groups who wish to show the film are asked to write direct to the Hon. Film Curator, Mr. J. R. Wenn, 2 Parkway, Seven Kings, Essex, offering two dates.

ROTAB Winner

Here is a picture of W. E. D. (Bill) Parker (G6BY), of Weston-super-Mare, who has just been awarded the ROTAB Trophy for outstanding and consistent long-distance work. With the equipment pictured, G6BY has made more than 1,780 contacts with W1DQ of Rhode Island, 1,100 odd with W2BEI, and more than 1,000 with W2HFS.
Lower left, 20-metre Collins transmitter, on desk Super-Pro and B28 receivers. Diversity switching and indicator above Super-Pro. The 1131 Transmitter is used for 10 and 14 metres. Other equipment shown includes Shure crystal microphone, linear monitor, Meissner signal shifter. A Rhombic (terminated) $7\frac{3}{4}\lambda$ per leg, is used for 20-metre work (3,000ft of wire in all). Other aerials include a long wire and Bruce inverted "Vee."

NATIONAL FIELD DAY, 1953

NATIONAL Field Day is unquestionably the most popular and most important team event in the British Amateur Radio calendar; any changes in its structure are therefore rightly regarded as a matter of great concern both to the Contests Committee who plan, organise and judge it, and to the Council who are finally responsible for all major questions of policy. In introducing the Rules for the 1953 Event to be held on June 13—14—a week later than usual thus forming a fitting sequel to Coronation Week—it is felt that a few notes of explanation should be given of the several modifications that have been made to the Rules this year.

New Rules

First, then, what exactly are the changes? Although it is most strongly recommended that everyone should read and study the full set of rules, the major changes can be summarised as follows:

1. In place of the obligatory "A" (1.7/3.5 Mc/s) and "B" (7/14 Mc/s) groupings, a free choice is to be given to each Group who may elect either (1) to operate as previously; or, alternatively (2) to operate their "A" station on 1.7 and 7 Mc/s, and their "B" station on 3.5 and 14 Mc/s. The decision as to which of these two systems is to be used *must* be registered when making application to enter (closing date April 1, 1953) and no subsequent changes will be permitted.

2. There will be a flat rate of scoring for contacts between portable stations throughout the United Kingdom and Northern Ireland. The advantages accruing to the more isolated stations in GC, GM and GI from the new choice of frequency groupings should more than compensate for the disappearance of the slightly higher scoring rate that they previously enjoyed.

3 The contacts made on each band must be submitted on separate log sheets, *i.e.* the complete entry for a Group will comprise four instead of two logs. One result of this modification is to permit the award of certificates to the leading station on each band, in addition to the customary awards to the leading Group, and to the leading "A" and "B" stations.

4. Greater scope will be permitted in the choice of aerials. The unpopular restrictions on their length and adjustment during the event are swept away, but a new limit is placed on the total cross-sectional area of the aerial wire in order to prevent the use of self-supporting beam elements.

5. Either one or two transmitters may be used at each station, but with not more than one receiver. Attention of all participants is directed to the terms of the Amateur Transmitting Licence which prohibit the radiation of signals simultaneously on more than one frequency.

6. All times for the event have been moved forward one hour: work on the station may not commence until 1300 B.S.T. and the contest now runs for 24 hours from 1800 B.S.T. This innovation should help those members who work on Saturday mornings.

7. To facilitate administration, it is proposed to provide official Town Representatives with forms on which to make application to enter. It should also be noted that, this year, in no circumstances will late entries be accepted. You have been warned!

Why the Changes?

When, last year, the Contests Committee first announced that it had obtained the permission of the Council to change the grouping of frequencies, the first reaction of many members was a horrified "Why?" and although subsequently an increasing number of the regular participants have come to see the considerable advantages of the 1.7/7 and 3.5/14 arrangement—including more equalised night activity, thus avoiding the tendency in certain districts to regard one or other of the stations as a "passenger"; a better chance for those living in more isolated districts, where daylight activity on the lower frequencies falls to a very low level; a stimulus for technical improvements; and a desire to prevent planning, equipment and operating techniques from becoming "stale," etc.—it must be frankly stated that there are still many who would resent its compulsory introduction this year.

The 1953 arrangement, therefore, is admittedly a compromise between these two viewpoints: but a compromise that appears to possess all the advantages and few of the disadvantages of both systems, and one that should prove eminently successful. Those Groups who feel that the old system was the better one can operate the 1.7/3.5 and 7/14 combination; more venturesome Groups may be inclined to give the new system a trial: the choice is left entirely to the Town Representative and the members concerned. It has been truly said "Change, indeed, is painful; yet ever needful; and if Memory have its force and worth, so also has Hope."

Of particular interest to the very small, or relatively inexperienced, Groups will be the introduction of a certificate award for the highest total on each band; such a Group, by concentrating a station chiefly on one band, should be able to wrest these awards from the highly skilled teams who need to divide their attention more equally between the bands in order to stand a chance of winning one of the major awards.

Most of the other changes introduced this year stem naturally from the new frequency-grouping arrangements, or from the many useful suggestions put forward by members after the 1952 Field Day. All Groups and members who wrote on this matter may like to know that the most careful consideration has been given to their views and ideas; it is regretted that the number of letters received makes it impossible for the Committee to reply individually. To those whose suggestions have not been adopted, it should be said that in most cases this is not because the idea is a bad one, but usually because its adoption would have involved the introduction of Rules that could not easily be enforced.

There is one other point that arises frequently in correspondence and that suggests that there is still some confusion as to the basic purposes of N.F.D. This event is not regarded—and has not been so regarded for many years— as a "simulated emergency exercise," and no attempt is made to shape the Rules as though this were the case. This does not mean that N.F.D. serves no useful purpose. On the contrary, it is firmly believed that the administrative, technical, and operating experience gained in the planning, designing, and working of portable stations is of great value to the community.

Rules

1. The event will commence at 1800 B.S.T. (1700 G.M.T.) on Saturday, June 13, 1953, and conclude at 1800 B.S.T. (1700 G.M.T.) on Sunday, June 14, 1953.

2. Only properly constituted R.S.G.B. Town or Area Groups within the British Isles, which, for the purposes of the event, comprise the prefix zones G, GC, GD, GI, GM and GW, may enter for the contest.

3. Operators of portable stations competing in the event must be holders of a G.P.O. Amateur Transmitting Licence and must be fully paid-up Corporate Members of the Society at the time of the contest.

4. Each competing Group will be permitted to place two stations ("A" and "B") into operation. "A" stations may operate on 1.7 and 3.5 Mc/s or 1.7 and 7 Mc/s and "B" stations on 7 and 14 Mc/s or 3.5 and 14 Mc/s, provided that no "A" station shall work on the same band as its associated "B" station. Both stations may operate from the same site or from different sites, provided they are located within the agreed limits of the area covered by their Regional Representative. It will be permissible for two or more towns or areas within a single region to amalgamate for the purpose of the event.

5. Each station must be licensed to use a different call sign.

6. Applications for N.F.D. permits may be made only by properly appointed T.R.s and A.R.s as the case may be. Such applications, which must be sent to Headquarters, shall be set out in the following manner:—

National Field Day, 1953

On behalf of the members in.....(Town or Area), I submit this application for permission to operate portable stations for the duration of the above event, as follows:—

"A" Station Call Sign...../P Licensee.....

Frequencies.....

Site.....

"B" Station Call Sign...../P Licensee.....

Frequencies.....

Site.....

(If applicable) I desire to combine with..... (Town or Area) for the purpose of scoring.

Signed.....(T.R. or A.R.)

Call Sign..... Address.....

.....

This application is necessary both to obtain the permission of the G.P.O. and also to enter the event. Permission is normally sent to the licensee direct by the G.P.O. Frequencies chosen may not be varied after application has been submitted. Application forms will be sent to T.R.s and A.R.s by Headquarters.

7. Applications, duly signed, addressed to Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, must be postmarked not later than April 1, 1953. In no circumstances will late applications be accepted.

8. Stations must be operated from tents.

9. No apparatus may be erected on the site prior to 1300 B.S.T. on June 13, 1953. This rule includes aerials and aerial fittings as well as tented accommodation.

10. Any aerials may be used up to a total of three per station (including the receiving aerial) subject to the following limitations:—

(*a*) All aerials and feeders must be constructed from wire of total cross-sectional area not greater than that of 14 s.w.g.

(*b*) No part of the aerials shall exceed a height of 45 feet above ground level.

11. Equipment at any "A" or "B" station must not exceed two transmitters and one receiver. Reserve equipment may be kept available, but not connected.

12. The total d.c. input to the anode circuit of the valve or valves energising the aerial, or to any previous stage of the transmitter, shall not exceed 5 watts.

13. Power for any part of the station shall not be derived from supply mains.

14. The event is restricted to the use of c.w. (A1) only.

15. An exchange of reports must be made before points may be claimed. In the case of portable to portable contacts between stations located in the British Isles (G, GC, GD, GI, GM and GW), this report must include the first three letters of the operator's surname, *e.g.* RST 579 JON (station being operated by W. Jones). Proof of contact may be required.

16. Contacts with ships, or unlicensed stations located in countries where licences are obtainable, will not count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Contests Committee.

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

18. Points will be scored on the following basis:—

A.—Between competing stations and fixed stations:—

	Points
(*a*) Within the British Isles	1
(*b*) In the rest of Europe (including Eire)	2
(*c*) Outside Europe	3
(*d*) In the British Empire	6

B.—Between competing stations and portable stations:—

	Points
(*a*) Within the British Isles	3
(*b*) In the rest of Europe (including Eire)	4
(*c*) Outside Europe	6
(*d*) In the British Empire	12

19. An entry will only be valid if signed by the properly appointed T.R. or A.R., who will be solely responsible for the conduct of the event in his Town or Area.

20. Each station's entry shall consist of extracts from the station log, a separate extract being submitted for each band worked. Forms for this purpose will be supplied from Headquarters. Entries must reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, postmarked not later than June 29, 1953. In no circumstances will late entries be accepted.

21. In addition to the National Field Day Trophy and miniature replica which will be awarded to the Groups obtaining the highest combined score, miniature replicas will be awarded to the Groups with the leading "A" and "B" station scores. Should the winning Group also lead with the highest "A" or "B" station score, it will only be eligible for one replica; the other would not then be awarded. A certificate will be awarded to each of the following: (*a*) The leading Group on each band. (*b*) The chief operator of the British Empire or foreign portable station whose check log shows that he contributed the most points to competitors.

22. The N.F.D. Trophy will be held by the winning Group for one year and will be handed to the T.R. or A.R., who will be held responsible for its custody during the year.

The Story of G3JD

IN the days before the war the call G3JD—owned by Bill Baker of Torquay—was frequently heard on 14 Mc/s c.w. The rig was a simple one but results were well up to expectations.

In 1947, due to pressure of business and lack of suitable accommodation, Bill had to give up his licence. Then, four years later, he was laid low with cerebral thrombosis which resulted in the permanent paralysis of his right arm and hand.

Members of the Torbay Radio Society hearing of his illness decided to encourage him, as soon as he was able to get about again, to make application to the G.P.O. for the restoration of his licence under his old call. This was done with the happy result that G3JD is again an active call sign.

Bill is very grateful to those who have helped him to stage a come-back and especially to G2CWR, 2GK, 3AVF, 3FHI, 3GDW and 3ID and other members of the Torbay Radio Society.

The Television Society

MEETINGS of the Society are held at the Cinematograph Exhibitors' Association, 164 Shaftesbury Avenue, London, W.C.2, commencing at 7 p.m. Non-members of the Society are admitted to meetings on presentation of a signed ticket obtainable from the Hon. Lecture Secretary (G. T. Clack), 43 Mandeville House, Notre Dame Estate, S.W.4.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m., on November 21, 1952.

Visiting amateurs especially welcome.

Telephone table reservations to HOL 7373 prior to day of luncheon.

COUNCIL PROCEEDINGS

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, September 9, 1952, at 6 p.m.

Present.—The President (Mr. F. Charman in the Chair), Messrs. H. A. Bartlett, L. Cooper, C. H. L. Edwards, D. A. Findlay, J. H. Hum, F. G. Lambeth, H. McConnell, A. O. Milne, W. A. Scarr, R. Walker, P. W. Winsford and John Clarricoats (General Secretary).

Apology.—An apology for absence was submitted on behalf of Mr. T. L. Herdman.

* * *

Membership.

Resolved:—

(a) to elect 94 Corporate Members and 28 Associates;
(b) to grant Corporate Membership to 4 Associates who had applied for transfer.

Applications for Affiliation.

Resolved, subject to the receipt of satisfactory reports from the appropriate representatives to grant affiliation to:—

(a) Hull and District Radio Society;
(b) Western Short Wave Club.

London Headquarters' Club.

Resolved to defer, for one year, further consideration of the proposals put forward by Mr. A. L. Taylor to establish a London Headquarters' Club.

The view was expressed that it would be unwise to discuss the proposals until the new Articles of Association have been adopted and a decision reached in regard to subscription rates.

Region I Bureau News

It was reported that the first issue of Region I Bureau News had been distributed to I.A.R.U. Societies in the Region. Letters had been received from a number of European Societies thanking the Bureau Committee for producing the first issue.

E.D.R. Silver Jubilee.

The President and Secretary reported upon their recent visit to Copenhagen when they represented the Society and the I.A.R.U. Region I Bureau at the Silver Jubilee of the Danish Society E.D.R. They also reported upon a meeting they had had with representatives of the E.D.R. and other European I.A.R.U. Societies present, when many subjects of mutual interest had been discussed.

Cash Accounts.

Resolved to accept and adopt the Cash Accounts for July and August, 1952, as submitted by the Hon. Treasurer.

Articles of Association.

The Secretary submitted correspondence relating to matters which had been raised by certain County Representatives and outlined, verbally, the main points of contention.

After a lengthy discussion it was resolved:—

(a) to defer discussion of the points raised by the County Representatives until such time as the membership generally has had an opportunity of examining the draft proposals;
(b) to thank, personally, those C.R.s who had submitted views on the draft proposals.

Membership and Representation Committee.

Resolved to authorise the publication of a booklet, written by the Chairman of the Membership and Representation Committee (Mr. C. H. L. Edwards) designed to give advice to the Society's representatives on matters pertaining to educational training primarily directed to preparation for the Radio Amateurs' Examination.

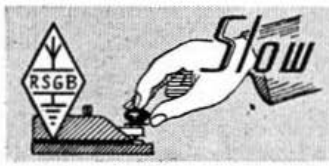
It was reported that a Member of the Council had offered to pay for the cost of printing the booklet. The President, on behalf of his colleagues, thanked the Member concerned.

Annual Accounts and Budget.

The Hon. Treasurer distributed copies of the draft Accounts for 1951/2 and a proposed Budget for 1952/3.

It was agreed to defer consideration of the Accounts and Budget until after they had been examined by the Finance and Staff Committee.

The Meeting terminated at 9.25 p.m.



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.

** Each station will operate in turn.*

G.M.T.	Call	kc/s.	Town
Sundays			
09.00	G3LP	1850	Cheltenham
10.00	G6MH	1990	Southend-on-Sea
10.30 *	G3AAZ	1780	Welwyn
	G3EPK		
	G5UM		
10.30	G3GIO	1915	Guildford
11.00	G2FXA	1900	Stockton-on-Tees
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
20.30 *	G6LX	1875	Croydon
	G3BLP		
21.00	G3BHS	1720	Eastleigh, Hants
21.00	G3BLN	1900	Bournemouth
22.00	G3GIO	1915	Guildford
22.15	G2BRH	1900	Ilford
22.30	G8TL	1896	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3IBL	1883	Derby
19.30 *	G3HGY	1830	Coventry
	G5PP		
	G5SK		
20.30	GW3BKP	1745	Wrexham
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2BND	1890	Dalston, E.
22.00	G3GIO	1915	Guildford
22.45	GM3GUS	1800	Dunfermline
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea
19.00	G3ADZ	1900	Southsea
Wednesdays *(continued)*			
19.30 *	G3HBX	1870	Warwick
	G6XA		
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3HXN	1850	Cambridge, Glos.
22.00	G3GIO	1915	Guildford
Thursdays			
19.00	G3NC	1825	Swindon
19.30	G3GRM	1815	Derby
	G2DOF	1830	S. Birmingham
	G3DTG		
19.30 *	G3ENH		
	G6KI		
	G8JI		
20.00	G3FVH	1920	Hull, Yorks
20.30	GW3BKP	1745	Wrexham
21.30	G6DL	1760	Birmingham
21.30	G3ICX	1900	Sutton Coldfield
22.00	G2NK	1730	St. Mary Cray
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
22.45	GM3GUS	1800	Dunfermline
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3CSG	1870	Wirral
21.00	G3BHS	1720	Eastleigh, Hants
	G3AUT	1785	Rugby
22.00 *	G3AUF		
	G3CBV		
	G3GTX		
22.00	G3GIO	1915	Guildford
Saturdays			
09.30	G3ICX	1800	Sutton Coldfield
13.00	G2FXA	1900	Stockton-on-Tees
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford

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

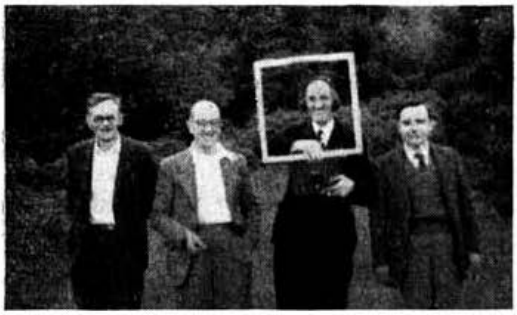
REGIONAL AND CLUB NEWS

ADMIRALTY ELECTRONICS SOCIETY.—Recent meetings have included an account of "secret" listening in a Japanese P.O.W. Camp by C. J. Manning, and a talk on Receiver Design by Messrs. Amos and Johnstone. *Hon. Secretary:* W. J. Green (G3FBA), Electrical Engineering Dept., Admiralty, Bath.

BRADFORD AMATEUR RADIO SOCIETY.—At the A.G.M., A. R Bradley, G3IBN ("Scarr Croft," Parkside, Bingley), was elected Hon. Secretary. Forthcoming meetings, to be held at 7.30 p.m. at Cambridge House, 66 Little Horton Lane, are November 25—R.S.G.B. Film Show, and December 9—Television Receiver Construction. All meetings are preceded by 30 minutes Morse practice.

BRIGHTON & DISTRICT RADIO CLUB.—The future programme includes "Aerial fundamentals," by L. H. Thomas (G6QB) on November 25, "Germanium Diodes," by the *General Electric Co. Ltd.* on December 2, and "Audio Equipment," by *Goodmans Industries Ltd.* on December 9. The Club transmitter is being rebuilt. *Hon. Secretary:* R. T. Parsons, 14 Carlyle Avenue, Brighton 7.

BRISTOL.—A representative of *Mullard Ltd.* recently lectured on modern methods used in the manufacture of valves and cathode-ray tubes; illustrations were provided with the aid of a film-strip projector. *Philips* television receivers will be demonstrated at the meeting to be held on November 21, when a representative of that company will discuss prominent technical design features. The receivers on show will include the large-screen front-projection model. The Region 9 Representative, Herb Bartlett, G5QA, hopes to attend the meeting on December 12 to answer any questions concerned with the proposed new Articles of Association.



Members of the South Manchester Radio Club's D/F team who successfully located the hidden transmitter in the club's recent "Top Band" D/F Contest. Included in the group are J. White, N. Aston (G3DQU) and A. Quinn.

CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB.—On November 21 at 8 p.m. K. N. Hawke will lecture on "High Quality Amplifiers" at the Jolly Waterman, Cambridge. Entries in the Mechanical Skill Contest will be judged on that evening. *Hon. Secretary:* T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge.

CAMBRIDGE UNIVERSITY WIRELESS SOCIETY.—The 1952 season opened with a lecture by Colin Washtell, G3CJY, of *Labgear Ltd.* on "Electronic Instrumentation in Nuclear Physics." Meetings are held on Monday evenings in the Cavendish Laboratory. Subjects for future lectures include "Particle Accelerators" and "Microwave Aerials." *Hon. Secretary:* B. H. Phillips (GW3GVB), Caius College, Cambridge.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—Three members have passed the R.A.E. The holder of one of the new calls—G3ITY—recently lectured on his crystal substandard and signal generator. Morse classes are held on Mondays and ordinary meetings on Tuesdays when the Club station G3GIZ is on "Top Band" and 3.5 Mc/s. *Hon. Secretary:* E. Yates (G3ITY), 38 Durham Road, Blacon.

COVENTRY.—The Group plans to hold its first dinner in the near future and the evening of January 16 is tentatively suggested. The T.R. solicits support for the function and would be glad to hear from those who propose to attend.

COVENTRY AMATEUR RADIO SOCIETY. — The Society's "Top Band" night now takes place on second Thursdays at 8 p.m. The next meeting, at the Y.M.C.A., Queen's Road, is on November 24. *Hon. Secretary:* K. Lines (G3FQH), 142 Shorncliffe Road, Coventry.

DERBY & DISTRICT AMATEUR RADIO SOCIETY.—The Club H.Q. is open on Wednesdays at 7.30 p.m. On November 19 W. Sudbury will lecture on "Quality reproduction for the Amateur." *Hon. Secretary:* F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

EAST SURREY RADIO CLUB.—At the October meeting H. Knowles *(Mullard Research Laboratory)* lectured on "Modern u.h.f. valves." The club is now licensed (G3ISR) and hopes to be on "Top Band," 80 and 2 metres shortly. *Hon. Secretary:* L. G. Knight (G5LK), "Radiohme," 6 Madeira Walk, Reigate.

EDINBURGH AMATEUR RADIO CLUB.—Meetings are held on Wednesdays at 7.30 p.m. in Unity House, Hillside Crescent. In addition to classes for the Radio Amateurs' Examination, the programme on November 19 includes a "Brains Trust." *Hon. Secretary:* D. B. R. Black, 16 Edina Place, Edinburgh 7.

EXETER.—The next meeting will be at 7.30 p.m. on December 5 at the Y.M.C.A., 41 St. David's Hill, when T.V.I. will be discussed. The Annual Dinner will be held at the Globe Hotel, Topsham, on December 19.

LEEDS AMATEUR RADIO SOCIETY.—Meetings are held on Wednesdays at 7.15 p.m. at the Swarthmore Settlement. In conjunction with the *Workers' Educational Association* a series of lectures, open to the public, on "Circuit Theory," has been arranged at 7/6 for the full course.

LEICESTER RADIO SOCIETY.—The first lecture of the winter session in the Club Room, Holly Bush Hotel, Belgrave Gate, was given by H. Turner *(B.T.H. Co. Ltd.)*, who described "Modern Cinema Sound Reproducing Equipment." Meetings, at which new members will be welcomed, are due to be held on November 17 and on December 1 when C. L. Wright will give his second lecture on "Frequency Modulation." *Hon. Secretary:* A. L. Milnethorpe (G2FMO), 3 Winster Drive, Thurmaston.

LINCOLNSHIRE HAMFEST.—A Hamfest, organised by N. Hodgson (G2ABK), and held at the George Hotel Shilsby, on October 5, was attended by Dr. Vance (G8SA), the Region 4 Representative, the C.R.s for Lincolnshire, Northamptonshire and Nottinghamshire, the T.R.s for Grimsby, Lincoln and Spalding and about 50 members. Dr. Vance opened the meeting and led a lively discussion on the new Articles of Association. Dr. O'Hagen (G2CR) followed with an interesting lecture on S.S.B. transmission and reception. An excellent tea and a sale of surplus equipment brought the proceedings to an end.

MIDLAND AMATEUR RADIO SOCIETY.—At the Sutton Coldfield and North Birmingham Model Engineering Society's exhibition a combined M.A.R.S./Slade Radio stand attracted much attention. The Lord Mayor and Lady Mayoress, who opened the exhibition, spent some time on the stand. Meetings are held on the third Tuesday in the month at the Imperial Hotel, Birmingham. *Hon. Secretary:* G. W. G. Smith (G3HDK), 84 Woodlands Road, Birmingham 11.

PURLEY & DISTRICT RADIO CLUB.—Meetings are held on the fourth Thursday in the month at the Railway Hotel. H. F. Knott (G3CU) will lecture on "Single-sideband" on November 27. New members will be welcomed. *Hon. Secretary:* A. Frost (G3FTQ), 18 Beechwood Avenue, Thornton Heath.

ROTHERHAM RADIO CLUB.—Meetings are held on Wednesdays at 7.30 p.m. at the Cutlers' Arms, Westgate. All local R.S.G.B. members are asked to attend the preliminary N.F.D. discussion on November 19. "The Varney T.V.I.-proof transmitter" will be demonstrated by S. Biggin (G3HFD) on December 17.

[Photo by G3BHF

North Kent Radio Society

Members of the N.K.R.S. at a recent meeting. Left to right (front row): G3FAM, G3CCG, G6VV, G3HOZ (Chairman), C. J. Leal (Hon. Secretary), G2YZ, G3HKX; (second row): Messrs. Heyes, Bathgate, Gemmel, Buckmaster, Pierce, Garret, Fox, Melloy, G2CCD; (back row): Messrs. Thew, Johnson, Thew, Usher, Clinch (Treasurer), Melloy. The club mascot (R. Pyman, age 12), is seated in front.

ROYSTON & DISTRICT RADIO CLUB.—The Club station G3GIT is now on 144 Mc/s 'phone every Tuesday from 1930 until 2400 G.M.T., using simple equipment. Reports will be welcomed. The l.f. transmitter is being T.V.I.-proofed and is off the air for the time being. *Hon. Secretary :* F. A. M. Ashton, 115 Melbourn Road, Royston.

SALISBURY & DISTRICT SHORT WAVE CLUB.—A junk sale will be held on December 1. The club is interested in the formation of a Scout 2-metre net in the Salisbury area. The Reading net (G3SAH) has promised technical co-operation but the hon. secretary wishes to hear from any other club similarly connected. *Hon. Secretary :* V. G. Page (G3IVP), 32 Feversham Road, Salisbury.

SLADE RADIO SOCIETY.—The A.G.M. will be held at Church House, High Street, Erdington, on November 21. G3GKZ, 3HHD and 3HKC will lecture to the Society on December 5. *Hon. Secretary :* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 33.

SOUTH MANCHESTER RADIO CLUB.—Future lectures include : " U.S.A. visit," by C. R. Plant (G5CP) on November 21, and " Power Packs." by H. Whalley (G2HW) on December 6. *Hon. Secretary :* F. H. Hudson, 21 Ashbourn Road, Stretford, Manchester.

The competing teams at the end of the Romford Nocturnal D/F Contest. The winner is seen bending over his receiver.

SOUTH SHIELDS & DISTRICT AMATEUR RADIO CLUB.—At the recent A.G.M the title of the Club was changed to include the words " and District." Meetings are held on Friday evenings at Trinity House, Social Centre, Laygate. *Hon. Secretary :* W. Dennell (G3ATA), 12 South Frederick Street, South Shields.

STOKE-ON-TRENT AMATEUR RADIO SOCIETY.—Meetings will be held on November 20—" Audio Amplifier Design," and November 27—" Application of the simple oscilloscope to transmitter measurements." In addition to lectures, facilities are available for practical work, Morse training and operation of the Club station G3GBU. Prospective members are invited to write to the *Hon. Secretary :* J. R. Brindley, 45 Rosendale Avenue, Chesterton, Newcastle, Staffs.

SURREY RADIO CONTACT CLUB.—Recent lectures have included one on *Avo* instruments and the future programme includes talks on modulation methods and direction finding. *Hon. Secretary :* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon.

WARRINGTON & DISTRICT RADIO SOCIETY.—The annual dinner will be held at the Fir Grove Hotel on November 21. Tickets are available from the *Hon. Secretary :* S. Woods, 12 Thelwall Lane, Latchford, Warrington.

WEST KENT RADIO SOCIETY.—Meetings are held on alternate Wednesday evenings at Culverden House, Culverden Park Road, Tunbridge Wells. The next is a " Bring and Buy " sale on November 26.

WEST LANCS. RADIO SOCIETY.—Meetings are held on Tuesday evenings over Gordon's, St. John's Road, Waterloo. In addition to weekly Morse classes, a programme of lectures and visits is planned for the winter session. Visitors will be welcomed. *Hon. Secretary :* B. J. Whitty (G3HWX), 46 Argo Road, Waterloo, Liverpool 22.

WIRRAL AMATEUR RADIO SOCIETY.—At the A.G.M. held on October 8, a healthy state as regards strength of membership and finances was revealed. Office bearers for 1952/53 are : *Chairman*, G2AMV ; *Hon. Treasurer*, G3FRT ; *Hon. Secretary*, G3EGX ; *Committee Members*, G2FNI, 3AKW and 3CSG. A recent lecture by a representative of *Goodmans* on " High Quality Reproduction " was much appreciated. The Society meets every other Wednesday at the Y.M.C.A., Whetstone Lane, Birkenhead. *Hon. Secretary :* L. Roberts, 18 Croxteth Avenue, Wallasey, Cheshire.

Representation

The following are additions to the list published in the February, 1952, issue :

Town Representatives

Region 1.—Lancashire.

Barrow-in-Furness & District.—J. G. Jackson (G3HQU), 40 James Street.

North-West Manchester.—H. G. Kimber (G3HAC), 29 Harold Street, Prestwich.

Region 4.—Nottinghamshire.

Nottingham.—A. E. Clipstone (G8DZ), 71 Melton Road, West Bridgford.

Region 6.—Oxfordshire.

Oxford.—J. Hickling (G3GCS), 47 Banbury Road.

Region 7.—London South-West.

Barnes, Putney & Richmond.—D. W. Robinson (G3FMT), 6 Kingsway, East Sheen, S.W.14.

London East.

Chingford.—F. H. Osborn (G2CVO), 13 Mount Echo Drive, E.4.

Vacancies

Messrs. J. Colebrook (G3BJD) and J. P. O'Brien (GW2BCH) have resigned as Representatives for the Area of West Cumberland and the Town of Llandudno respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by December 31, 1952.

Can You Help ?

• Mr. C. H. L. Edwards, G8TL, who needs a type 4AW371 microammeter (0-200 d.c.). The meter is urgently needed for lining-up local members' receivers. Sale or loan.

• Mr. C. A. Sharp, G6KU, 56 Moore Avenue, Wibsey, Bradford, Yorks, Region 2 Representative, who is in urgent need of a copy of the 21st Birthday number of the BULLETIN, issued in June, 1934.

FORTHCOMING EVENTS.—(Continued from page 178)

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. **(E.B.S.W.C.).**—Thursdays, 7.30 p.m., 27 Warren Avenue, Woodingdean.

Chatham (M.A.R.T.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.

Hastings (B. & H.R.C.).—November 18, December 9, 7.30 p.m., Saxons Cafe, Sea Front, Hastings.

Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.

Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.

REGION 9

Bath.—November 17, December 22, 7.30 p.m., Y.M.C.A., Broad Street.

Bristol.—December 12, 7.15 p.m., Carwardine's Restaurant, Bristol 1.

Exeter.—December 5, 7 p.m., Y.M.C.A., 41 St. David's Hill.

North Devon.—December 4, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Penzance.—December 4, Railway Hotel.

Plymouth.—November 15, Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.

Torquay.—November 15, 7.30 p.m., Y.M.C.A., Castle Road.

West Cornwall.—November 20, December 4, Fifteen Balls, Penryn.

Weston-super-Mare.—December 2, 7.30 p.m., Y.M.C.A.

Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—December 8, 7.30 p.m., The British Volunteer, The Hayes.

REGION 11

Holywell.—November 16, 4 p.m., Congregational Chapel School Room. Two metres. Talk by GW5MQ.

REGION 13

Edinburgh (L.R.S.).—November 25, December 9, 7.30 p.m., Edinburgh Chamber of Commerce, 25 Charlotte Square.

REGION 14

Falkirk.—November 28, December 12, 7.30 p.m., The Temperance Cafe, High Street.

NEW MEMBERS

The following have been elected to membership:—

Corporate Members (Licensed)

G2AFN †G. H. Wilkins, 24 Clapham Terrace, Leamington Spa, Warwickshire.
G2FQT Major P. Wolfendale, 14 Seafield Road, Friars Cliff, Christchurch, Hants.
G3ZN †F. B. Holt, 33 Gilhouse Avenue, Lea, Preston, Lancs.
G3EED J. H. Taylor, 15 The Broadway, Grindon, Sunderland.
G3EXW †A. S. Apperley, 32 Cutler Road, Uplands, Stroud, Glos.
G3GJN R. N. Barr, 27 Ranelagh Drive, Birkdale, Southport, Lancs.
G3HHZ W. S. Smith, 12 Kemble, Glos.
G3HUR D. W. Brough, 5 Beech Grove, Byrons Lane, Macclesfield, Cheshire.
G3HXQ *J. T. Jackson, 5 The Fortress, Dursley, Glos.
G3IBI R. G. Scutt, 121 Vauxhall Bridge Road, London, S.W.1.
G3IDD R. H. Lamb, 36 Lindum Avenue, Manchester 16, Lancs.
G3IDI S. J. Cakebread, 20 Lloyd Road, East Ham, London, E.6.
G3IER D. G. Martin, 23 Kipling Road, St. Marks, Cheltenham, Glos.
G3IGK W. W. Humphries, 4 McBean Road, Wolverhampton, Staffs.
G3IGL C. J. Lovelock, 361 Greenford Avenue, Hanwell, London, W.7.
G3IGZ D. W. Bruce, 39 Dunkery Road, Grove Park, London, S.E.9.
G3IJL A. F. Sephton, 16 Bloemfontein Avenue, London, W.12.
G8DN †G. E. Dakin, Russ Farmhouse, Aller, Langport, Somerset.
GI2DHB J. J. Hargan, 8 Epworth Street, Park Avenue, Londonderry, N. Ireland.

Corporate Members (Overseas)

DL2SN F. Clarkson, c/o Detachment, 1 Wireless Regt., R. Signals, B.A.O.R. 26.
DL4FC D. A. Berggren, 13b Furstenfekdbruck, Obb Fichenstr 2c, Germany.
F9AA F. Raoult, 32 Avenue Pierre 1-er de Serbie, Paris 8, France.
OD5AD A. Bellotti, P.O. Box 1202, Beirut, Lebanon.
OZ2CO K. Hvidberg, c/o 19 Roundwood Drive, Welwyn Garden City, Herts.
VK4TN A Harris, 15 Turner Street, Windsor N.3, Brisbane, Queensland, Australia.
VP9AX R. S. Pitman, Spanish Point, Pembroke, Bermuda.
VS1EU S. P. Shotam, 12 Orchard Road, Singapore.
W3AOP B. Boylan, 931 Swan Avenue, Miami Springs, Florida, U.S.A.
W9WEN W. C. Littlewood, 35 Glendale Avenue, Edgware, Middlesex.
4UAJ E. H. Gull, United Nations Headquarters, 216-d Sale Road, Rawalpindi, Pakistan.

Corporate Members (British Receiving Stations)

6969 †S. A Pearson, 88 Fentiman Road, London, S.W.8.
10069 †N. H. Green, 18 Northfield Drive, Coalville, Leics.
16606 †B. M. Johnson, 4 Durham Terrace, Bayswater, London, W.2.
19674 *T. J. Turner, 13 Park Road, Hounslow, Middlesex.
19675 *E. J. Brett, 1 Elgin Road, Seven Kings, Essex.
19676 *T. A. Taylor, Natone, Alstone Road, Highbridge, Somerset.
19677 A. Awerioghene, 34 Gough Road, Edgbaston, Birmingham 15.
19678 A. N. Richardson, 1 Victory Villas, Newton Lane, Upton, Chester.
19679 R. H. Yeend, 21 Newmarket Way, Hornchurch, Essex.
19680 T. Mapley, 70 Harpenden Road, Wanstead Park, London, E.12.
19681 N. H. Hyde, 96 Clive Road, Enfield, Middlesex.
19682 J. K. Harvey, 6 Belgrave Avenue, Belgrave Road, Balsall Heath, Birmingham 12.
19683 J. Murray, 6 Loganlea Gardens, Edinburgh 7, Scotland.
19684 A. J. McCafferty, 236 Todd Street, Glasgow, E.1.
19685 W. E T. Elliott, 16 Andover Road, Freemantle, Southampton, Hants.
19686 J. F. Smales, 7 Sunnybank, Cow Lane, Knottingley, Yorks.
19687 N. Clarke, 79 Palestine Street, Belfast, N. Ireland.
19688 E. Yates, 38 Durham Road, Blacon, Nr. Chester.
19689 P. O. Hooper, 10 Beach Street, Bare, Morecambe, Lancs.
19690 N. R. Pascoe, Lawhitton Village, Launceston, Cornwall
19691 W. Senior, 59 James Street, Coalville, Leicester.
19692 Major G. K. Field, Barston Towers, Barston Road, London, S.E.27.
19693 H. R. Millard, 38 York Road, Brentford, Middx.
19694 J. F. Hodgson, 4 Tarver Road, London, S.E.17.
19695 C. H. Marshall, 358 Woolwich Road, Charlton, London, S.E.7.
19696 D. J. Whines, 128 Barrowell Green, Winchmore Hill, London, N.21.
19697 G. A. Needham, 80 Kechill Gardens, Hayes, Kent.
19698 G. Evans, 2 Gladwyn Road, Little Acton, Wrexham, Wales.
19699 W. T. Milsom, Winrush, Heathway, E. Horsley, Surrey.
19700 *E. Charlesworth, 21 High Bank, Thurlstone, Penistone, Sheffield.
19701 *W. A. H. Lankshear, 36 Down Side, Belmont, Surrey.
19702 C. Emery, 11 Lidget Avenue, Lea, Nr. Preston, Lancs.
19703 A. G. Banyard, 7 York Road, Ipswich, Suffolk.
19704 D. G. Munroe, 3 Redcliffe Gardens, London, S.W.10.
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H. J. Enthoven & Sons Ltd. have formed a new subsidiary, *Enthoven Solders Ltd.*, to manufacture and market the group's solder and solder specialities, amongst which is "Superspeed," the well-known cored solder.

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Brimar announce a new high-slope miniature r.f. pentode —the 6BW7—designed for use in r.f., frequency changer, i.f., and video stages of television receivers and similar apparatus. It is fully screened, thus eliminating the necessity for external screening, and operates from 180 or 250 volts. Heater consumption is 6.3 V 0.3 A.

* * *

Panda Radio state that the price of the new PR-120-V "Table Topper" is £150 net, delivered in the U.K.

* * *

Mullard Ltd. offer a new B7G base valve, the EF95, which is similar to the American 6AK5. The EF95 is designed to improve the signal to noise ratio in receivers at frequencies up to 200 Mc/s. *Mullard Ltd.* also announce that a new tuning indicator, the DM70, for use in all-dry receivers, is now on the market.

* * *

A new double triode, the B309, is announced by *Osram*. It has indirectly heated separate cathodes and is similar to the American 12AT7. It has a B9A base.

Lucky Escape

OLD-TIMER Jimmy Catt, G5PS, of Kings Langley, Herts, was in the third coach from the rear of the Tring to Euston train which was involved in the disaster at Harrow-Wealdstone station last month. The only physical damage he suffered was a bruised leg and shoulder, but the effects of delayed shock kept him at home for a few days.

Jimmy's many friends in the Society will wish to congratulate him on a miraculous escape.

Silent Key

We record with sorrow the death, after a short illness, of Mr. H. Sear, G3CSH, of Chipping Norton, Oxford. A keen "Top Band" operator, he took part regularly in the local Sunday morning "net." Mr. Sear was on the staff of the G.P.O. Radio Station at Leafield.

Sympathies are extended to his wife and daughter and to his close friends.

HENRY'S

INDICATOR UNIT TYPE 182A. This unit contains VCR517 Cathode Ray 6in. Tube, complete with Mu-metal screen, 3 EF50, 4 SP61 and 1 5U4G valves, 9 wire-wound volume controls and quantity of Resistors and Condensers. Suitable either for basis of Television (full picture guaranteed) or Oscilloscope. Offered BRAND NEW (less relay) in original packing case at **79/6d.** Plus **7/6** carriage. "W.W." Circuit supplied Free.

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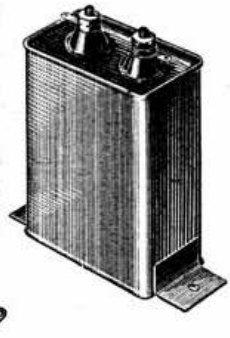

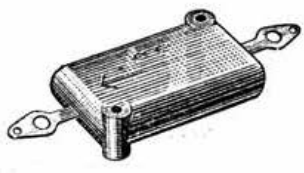

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A Q-MAX B.440 transmitter, all bands, 3.5/30 Mc/s, 40 W. Bandswitched, modern compact table topper, built for the critical ham. Excellent quality and condition, complete in every detail. New price £75; accept £36 quick sale. Delivered free. B.B.C. type C mobile disc recorder with 12 V d.c. motor and 230 a.c. motor. Electric scrolling. Amplifier rack mounting. Bargain, £36.—Details, 'phone evenings WAL 7999. Apply 29 Plough Lane, Wallington, Surrey.

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BC221 frequency meter, stabilised p.s.u., all accessories, £23 Send S.A.E. for full particulars.—BROCKLESBY, 47 Gregories Road, Beaconsfield. (667

BC.696 transmitter, complete, £5. BC.348 with p.p., £15. R.103A with 6V6 output and magic eye, £6. BC.454, BC.455, £2 each. 70 valves, £3 10s., all plus carriage. S.A.E. inquiries.—G3IDW, 136 Beech Avenue, Swindon. (722

BENDIX TA.12C transmitter, 100 W c.w., 40 W 'phone, less valves and few minor parts; full mod. data, 5 bands; £5.—Write details, Box 708, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (708

CNYI transmitter-receiver, absolutely complete with spares and manual. Complete amateur station, 160, 80, 40 metres; Lancashire area. Ham gone QRT.—Box 721, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (721

COMMUNICATIONS receiver by Vancouver Radio Laboratories; 19 valves; 1.4-28 Mc/s; crystal filter, crystal calibrator, b.f.o., noise suppressor, etc.; 230 a.c.; a really superb instrument; £50 o.n.o.—GRIFFITHS, 62 Lynn Road, Ilford. VAL 7593. (682

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G3ILS wishes dispose MR III portable transmitter/receiver, 1 6L6 oscilloscope CC, 3 V TRF in good condition, 10-14 W, suit beginner, £6 10s.—Offers to 80 Bowyer Road, Alum Rock, Birmingham 8. (712

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(Continued on Page 228)

EXCHANGE and MART SECTION

(Continued from Page 227)

R. 107 in excellent unmodified order, £10. Buyer collects.—Stears, 106 Saugatonhall Drive, Edinburgh 12. (673

R. 1116 receiver and eliminator, good condition; offers, or would exchange for Eddystone loudspeaker. — E. J. House, 409 Whitton Dene, Isleworth, Middlesex. (705

R. 1224A battery superhet., excellent condition, used only few times; £6 10s., carriage paid.—Morley, 91 Gravel Road, Bromley, Kent. (688

SALE.—Bendix 35 ft. tripod mast, £5. 19 in. rack, 5 ft., £1. Buyer collects. Romac personal receiver, as new, £7. Boxed 35Ts (8), £8. Guaranteed. 801Bs (2), boxed, £2. American IFF, new, £2. Wanted: R.C.A. 813.—Surman, "Lyncote," Coltstoot Drive, Burpham, Guildford. (704

SALE.—Comp.ete station, p.p. 813 transmitter and smaller rigs. AR.88LF, BC.221, test gear. Large quantity components, meters, valves, etc. Write for details.—Box 627, National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4. (627

SALE.—Eddystone 740, with speaker; used a few hours; offers over £26. UMI modulator transformer, new, 35s. 813s, with ceramic bases, £2 5s. each.—G. Clackson, 7 John Street, Duntermline. (672

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SALE.—S.640, expertly modified, crystal calibrator, "S" meter, audio filter, etc. Stamp details and photos.—Binns, 94 Harnham Road, Salisbury. (710

SELL or exchange. — Transformer, 1500-0-1500, 300 W, 230 V, £2, plus postage. Boxed TZ40s, £1; 832, £1; 829, 25s.; ECC91s, 5s.; EC91s, 5s.; EF91s, 5s.; PT15s, 5s.; crystal 7062. Wanted: UM1, American Bug key, transformers, 500 V 200 mA, 350 V 150 mA.—G3BJD, 33 Hollins Close, Mirehouse, Whitehaven, Cumberland. (687

SONAR v.f.o. type UFX.680 and 813 final with two 110 V power packs; reasonable offer. Wanted: v.h.f. frequency meter, also APN4 or APN9 indicator, or R65/AUR2e.—Box 709, National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4. (709

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TRANSFORMERS: 2000/1500 V 300 mA, impregnated, brand new, 230 V, £6, buyer collects; 250 V 60 mA, with two 4 V l.t., 7s. 6d.; 4 V 4 A x 2, 11s. Chokes: 10 H 300 mA, 15s.; 6 H 250 mA, 10s.; 4 H 150 mA, 6s. Condensers: 4 μF 500 V, 5s.; 4 μF 1000 V, 7s.; 0.002 μF 6kV, 6s.; 0.1 μF 4 kV, 7s.; 0.001 μF 5 kV for 7 A at 14 Mc/s, 12s. Two 866A rectifiers with bases, 10s. each. Eimac 4-125A transmitting valve with ceramic base, £1 10s. Transformer, 2.5 V 10 A, to suit, £1. 24 copies "QST," 1950-52, 17s. 6d. B.2 transmitter only, complete, £3. Valves: PT15, EK3, TP22, 6F7, 1C6, 15D2, 6J7, 6AG5, 12SG7, QP22B, 807, 6B8G, KT30, at 7s. 6d. each; SP41, KTW62, EF36, EF37, EF32, 36, 39/44, 77, 6A6G, VP23, H42, TT4, EL2, Pen. 13C, EL32, 41, 84/6Z4, at 5s. each; 6J5G, 6J5, 1V, 58, 45, at 3s. 6d. each. All perfect in emission. Postage extra in all cases.—Corbett, 17 Tudor Avenue, Bebington, Cheshire.

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WANTED.—BC.610 Hallicrafters, ET.4336 transmitters, SX.28s, AR.88s, receivers and spare parts for above. Best prices.—Write Box 864, Spiers Service, 21 Soho Square, London, W.1.

WANTED, buy or borrow.—Manual for Marconi CR.100 receiver.—Lewis, 46 Clydesdale Road, Romford, Essex.

WANTED.—Coil turret or pack for communications receiver. Price and particulars please to Straw, 142 Bucknall Old Road, Hanley, Staffs. Sale.—MCR.1, two power packs; requires four valves; offers. (716

WANTED.—Connecting cables and plugs for type 11 transceiver: complete set considered. Fair price paid.—L. Grout, 68 The Drive, Worthing, Sussex. (707

WANTED.—C.R. tube, 3API/906 PI 3 in. rectifier tube, 1V. "S" meter for AR.88LF.—Box 703, National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4. (703

WANTED. — H.R.O. coils, receivers, power packs, AR.88Ds, AR.88LFs, SX.28s, BC.348s, AR.77s, etc.—Details please to R.T. & I. Service, 254 Grove Green Road, Leytonstone, E.11. (LEY 4986.) (101

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WANTED.—Modification data for BC.348, also circuits for R.1124 and CR.100 coil pack. Can anyone please oblige?—Rowe, Met. Office, Hemsley, Norfolk. (699

WANTED.—Radiovision Commander receiver, unmodified. Corbett, 17 Tudor Avenue, Bebington, Cheshire. (690

WANTED.—R.C.A. speech amplifiers type MI-11220 J or K and aerial tuning units BC.939A, coils and tuning units for BC.610 transmitters.—Offers stating quantity and price to P.C.A. Radio, The Arches, Cambridge Grove, W.6.

WANTED.—R.C.A. 4331 transmitters.—P.C.A. Radio Cambridge Grove, Hammersmith, W.6. (Telephone RIVerside 3279.) (562

WANTED.—UM3 and DTI transformer, or would consider complete mod. including same or similar.—Details, price, to G3IIY, The Mansion, Harrold, Bedford. (698

WANTED.—UM3 transformer. For sale: Parmeko 4000-2000-0-2000-4000 V 400 mA, £5. Mullard RGI/240A, new, boxed, two at 15s. each.—Box 711, National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4. (711

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(Continued on Cover iii)

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APPOINTMENTS SECTION—(continued)

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WIRELESS STATION SUPERINTENDENT (TEMPORARY) required by the Gold Coast Government Posts and Telegraphs Department for two tours of 18 to 24 months in the first instance. Commencing salary, according to qualifications and experience in the consolidated scale £955 rising to £1,180 a year, with gratuity of £25 or £37 10s. 0d. according to salary, for each completed period of three months' service. Outfit allowance £60. Liberal leave on full salary. Free passages. Candidates must possess a Higher National Certificate in Electrical Engineering or equivalent, and have had practical experience in two or more of the following fields: V.H.F. link systems, H.F. communication network; Frequency shift keying and teleprinter maintenance; V.H.F. and H.F. direction-finding systems; Aeronautical navigation aids (ground); Manufacture of light engineering equipment. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29100.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration.

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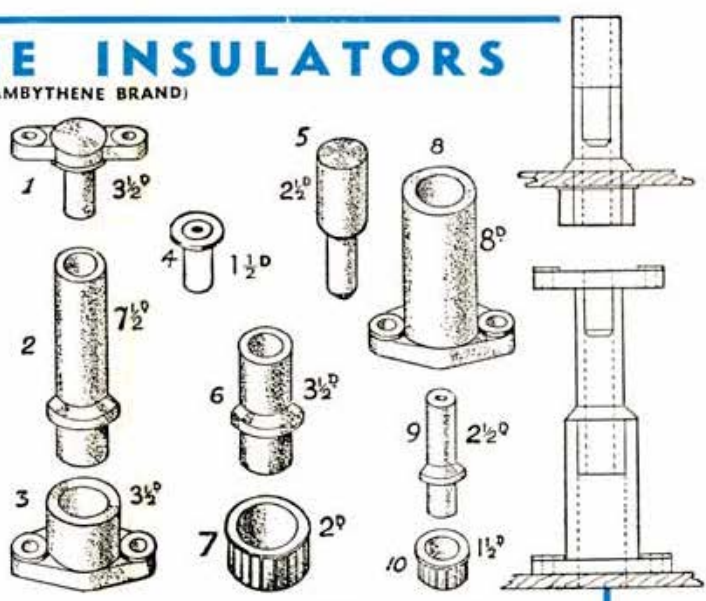

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