

April 1950

The original front cover for this edition was not available.



HENRY'S-

R.1355 RECEIVERS. We have been fortunate in securing a further limited quantity of these receivers. These are brand new and unused. Price 55/- (plus 5/- carriage).

R.1355 MAINS TRANSFORMER. 200/250 V. input. Outputs 250-0-250, at 120 mA., 6-3 V. at 6 A., 5 V. at 3 A. Fully shrouded top chassis mounting and guaranteed 100 per cent. Only 28/6.

No. 18 SET. RECEIVER PORTION. A four-valve superhet receiver operating from 6-9 Mc/s. (33 m.-50 m.). Valve line-up 3 ARP12 (VP23), and AR8 (HL23DD). Requires only 120 V. H.T., 9 V. G.B., and 2 V. L.T., in perfect condition, only 17/6, plus 1/6 packing and carriage. An absolute bargain. Suitable brand new headphones can be supplied at 3/6 per pair. N.B.-Each receiver is tested working, prior to dispatch. RECEIVER TYPE 25. The receiver portion of the T/R 1196. Covers 4-3-6-7 Mc/s., and makes an ideal basis for an all-wave receiver, as per "Practical Wireless," August issue. Complete with valves type EF36(2), EF39(2), EK32 and EBC33. Supplied

complete with necessary conversion data for home use. Only 22/6. Chassis only, 8/6.

RECEIVER TYPE 21. The receiver portion of the W/S 21 operating from 4·2-7-5 Mc/s. Double superhet from 18-30 Mc/s. Incorporating B.F.O. and noise limiter. Valve line-up Mc/s. Incorporating B.F.O. and noise limiter. Valve line-up 7-ARP 12 (VP23), and 2-AR8 (HL23DD), plus spare valve of each type, making eleven valves in all. Only 35/- complete. A.M. RECEIVER UNIT, TYPE 161. Comprising 2 EF50, EF54 and EC52. Coils, relay and many condensers and resistors. The whole in metal box, size 8½" x 6½" x 3½". New, a bargain at only 22/6, carriage paid. R1626 V.H.F. RECEIVER. Ex-A.M. Comprising 10 EF50 valves, 2 EB34, 24 V. rotary generator, relays and hundreds of condensers and resistors. Complete in grey metal case. Absolutely brand new. 75/- only. IGRANIC MAINS TRANSFORMER. A special purchase enables us to offer the following: 250-0-250, 70 mA., 6·3 V. 2 A., 5 V. 2 A., half-shrouded, drop-through type, with voltage adjuster panel. Absolutely brand new and guaranteed.

adjuster panel. Absolutely brand new and guaranteed.

15/- only, plus 9d. post.

MINIATURE MAINS TRANSFORMER. 250-0-250,
60 mA., 6 V. 3 A., 5 V. 2 A., fully shrouded, well finished,
size 3½" x 3" x 2½". Price 21/-.

size 3½" x 3" x 2½". Price 21/-.

E.H.T. TRANSFORMERS. Output 2,500 V. 5 mA., 4 V.

1-1 A., 2-0-2 V. 2 A. (for VCR97), 35/- only. Output 3,250 V.

5 mA., 6-3 V. 1 A., 2-0-2 V. 2 A. (for 5CP1), 39/6. Output
4,000 V. 10 mA., 2-0- V. 2 A., 48/-. Output 5,000 V. 10 mA.,

2-0-2 V., only 60/-. All input 230 V., and fully guaranteed.

POCKET VOLTMETER, Ex-Govt. Two range 0-15 V.,

0-250 V., D.C. Brand new and complete in Web carrying
case, only 10/6.

5KV ELECTROSTATIC VOLTMETER. 0-5 kV., panelmounting 3½" scale brand new 50/e each

mounting, 31" scale, brand new, 50/- each.

D.C. AVO MINORS. Special offer, limited quantity of these well-known instruments, brand new and boxed, but slightly soiled. Not ex-Govt., 55/- only.

SANGAMO-WESTON. Ex-Govt. 0-1 mA. M.C. meters. 24° panel-mounting. Absolutely brand new, 15/- each only.

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M.I. meter, 34° A.C./D.C. input plug and socket, 3 output sockets, 2 porcelain fuses. Total size 12" x 6". Brand new and individually boxed, 17/6 complete.

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and individually boxed, 17/6 complete. EX-GOYT. VALVES. The following brand new and guaranteed valves are in stock:
PEN46, 6L6 metal, at 10/- each. EF50, EF54, EF55, RL37, VUII1, VUI33, UI8, 574, SR4GY, RL18, 6F7, 6AG5, PM22A, all at 7/6 each. 5Z4, MUI4, 6K7GT, 617GT, 6K8GT, ML4, 12SR7, 12SI7, 12SK7, 6SL7GT, 6SC7GT, 6C6, 6V6G or GT, 7C7, 7T4, 7S7, 7B6, 7C5, 1299A, 9D2, VP23, P2, 12A6, 8D2, 15D2, EF36, EF39, EBC33, EK32, EL32, 6X5GT, 2X2, 6AC7, 6N7, 6SN6GT, 78, 9003, INSGT, 615GT, 6C5, KTW61, DH63, TDD2A, VP2B, all at 6/6 each. Also 9002 and ILNSGT, 8/6. 807, 7/- 4D1, 5/- EA50, SP61, 954, EB34, at 3/6 each. DI Diode at 2/6 only. And the midget range of 1-4 V. battery valves. IT4 and IS5, at 6/6 each. IR5 and IS4, at 7/6. 3S4, at 9/- each. Most of these valves are boxed.

OSMOR MIDGET Q' COIL PACKS. Size 3½" x 2½" x 1½". Amazing performance. Polystyrene formers with adjustable iron cores. One-hole fixing, only five connections. Eactory aligned complete with full receiver circuits, and instructions. S'het for 465 kc/s., 33/- only. L.M.5. also for TRF operation M. and L., W., 30/-. We can now offer the latest "Q" pack for S'het battery operation. Complete with circuits incorporating either IA7 or IT4 series. Valves. This pack is supplied with ready-wound frame aerial. Price 37/6.

37/6.

37/6.
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CHASSIS:—Standard rack size 17° × 10° × 2°′, 8/9. Diecast aluminium, 8½° × 5½° × 2½°, 8/6, or drilled for 145 Mc/s. Convertor with all screens and brackets, 25/-; 12° × 9° × 3°′, 18/6, or drilled for 145 Mc/s. transmitter with screens and brackets, 25/-. Diecast Box, 4½° × 3½° × 2°, with close fitting flanged lid, 6/-.

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RACK EQUIPMENT:—Set of 4 uprights, 63° long, 35/-.

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678 Modulation Level Indicator, £8 15s. Transmitting Condensers:
137 60 + 60 pF. split stator, flashover 2,000 V. R.M.S., 32/-; 533
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Brand new in original woodcase.

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Eight valves: 4/866-866A's, 5Z3, 6SJ7, 2/6A3's, plus I V. time delay, and VRI50/30 stabiliser.

components include: Power trans. Other components include: Power trans. 2,100–500–0–500–2,100 V.; Power trans. 450–0–450 V., 13 V. ct., 6·3 V. ct.,

The complete unit mounted in metal case with lid 2' 6" x 1' 6" x 1', finish olive-drab crackle with shock absorbing feet. Weight

Clydesdale Price only. Carriage Paid.

£I6

Ex U.S.A.S.C. Brand new in maker's carton. Crystal Multiplier, Type MI-19468.



A frequency multiplier to cover 2-20 Mc/s. with 807 and spare (2 valves) 0/10 mA., grid current meter, variable condenser, micrometer control, etc., cower supply required (no upplied). In metal case calibrated external power crystals supplied). In metal case 13" x 10" x 6". With instruction books. Clydesdale's Price only. 39/6 each. Carriage Paid.

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Receiver Units R-26/ARC-5 or BC-454. Frequency: 3.0-6.0 Mc/s., 100-49 metres. I.F. I,415 kc/s. 6 valves, I2SK7 R.F., I2K8 F.C., I2SK7 1st I.F., I2SF7 2nd I.F., I2SR7 det., B.F.O., I2A6 output. 3-gang tuning det., B.F.O., 12A6 output. 3-gang tuning condenser (remote controlled), complete unit (less dynamotor) in metal case 11° x 5½ x 5°. Input 24 V.

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Ex Royal Navy.

Sound Powered Telephone



No batteries required, gives long service without attention. Complete, with warning indicator lamp and generator, giving a high-pitched note, which can be heard through any noise. Where a number of units are used the lamp would indicate which one is being called. Dimensions: $7\frac{12}{8} \times 9^{9} \times 7\frac{14}{8}$ overall, for wall mounting. Designed for ships' use, but suitable for the home, office and factory.

Clydesdale's Price only. 27/6 each. Carriage Paid.

Inputs: 110 V. A.C., 50/60 c/s., 1·7 kVA. Outputs: 2,100 V. H.T., 375 mA.; 500 V. H.T., 400 mA.; 385 V. regulated; 450 V. H.T. line; 275 V. H.T. line; 415 V. neg. bias; 250 V. neg. bias; 150 V. neg. bias; 80 V. neg. bias.

The unit consists of 3 complete power supplies, one of which provides various stabilised L.V. supplies. All are fed via double choke, condenser input circuits,



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Enclosed type with knee straps, dimensions 51" x 2" x 2", with lead and jack-plug, easily removed from case. Key and Plug Assembly

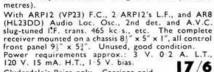
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WS-18 Receiver Unit.

wiring diagrams.

A 4-valve superhet chassis. Range 6-9 Mc s. (50-33-3



Clydesdale's Price only. Carriage paid.

Circuits for WS-18 Receivers: MK. I, II and III, available at 2/3, post paid.

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Snooperscope. The famous wartime "Cats-eye" tube used in "Tabby" for night sniping and observation. Provides

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Installation Kit for WS-No. 19.

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R.S.G.B. BULLETIN

INCORPORATED OFFICIAL AL JOURNAL (RADIO SOCIETY THE OF GREAT BRITAIN

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Forthcoming Events

REGION 1

Ashton-under-Lyne.—May 7, 3 p.m., New Jerusalem Schools. Birkenhead (Wirral A.R.S.).—April 26, May 10, 8 p.m., Y.M.C.A.,

Whetstone Lane.
Bolton.—May 2, 8 p.m., Y.M.C.A.
Bury.—May 11, 7.30 p.m., Atheneum, Market St.
Darwen and Blackburn.—May 5, 19, 7.30 p.m., Y.M.C.A., Limbrick,

Blackburn.

Blackburn.
Liverpool.—April 29, May 13, 2.30 p.m., 29 Derby Lane, Old Swan.
Manchester.—May 1, 7.30 p.m., Reynold's Hall, School of
Technology, Sackville St.
Oldham.—Alternate Weds., 7.30 p.m., Civic Centre, Clegg St.
Preston.—April 28, May 12, 7.30 p.m., Three Tuns Hotel, North

Rd.

Rochdale.—May 7, 3 p.m., Drill Hall, Baron St. Southport.—May 15, 8 p.m., 38A Forest Rd.

REGION 2

Barnsley .- April 28, May 12, 7.30 p.m., King George Hotel, Peel Street.

Bradford.—April 25, May 9, 7.30 p.m., Cambridge House, 66 Little Horton Lane.

Catterick and Richmond.—Tuesdays, 7 p.m., Loos Lines, Catterick Camp.

Camp.
Darlington.—Thursdays, 7.30 p.m., Club Room, British School Yard, Skinnergate.
Doncaster.—Wednesdays, 7.30 p.m., 73 Hexthorpe Road.
Hull.—April 26, 7.30 p.m., R.E.M.E. Barracks, Walton Street.
Leeds.—Fridays, 7.30 p.m., Swathmore Settlement, Woodhouse Square.

Middlesbrough.-Wednesdays, 7.30 p.m., Liberal Institute, South-

field Road.

Newcastle-upon-Tyne.—April 17, 8 p.m., British Legion Rooms, 1 Jesmond Road.

Sheffield.—April 26, 8 p.m., Dog and Partridge, Trippet Lane.
May 10, 8 p.m., Albreda Works, Lydgate Lane.
Spenborough.—April 26, May 10, 7.30 p.m., Temperance Hall,

Cleckheaton. Wakefield.—April 19, May 10, 7.30 p.m., Swan with Two Necks, 156 Westgate.

York.—April 26, May 17, 7.30 p.m., Rechabite Building, Clifford

Street.

REGION 3

Coventry.-April 21, 7.30 p.m., Priory High School, Wheatley Street.

Street.

Coventry (C.A.R.S.).—April 24, May 8, 8 p.m., B.T.H. Social Club, Holyhead Road.

South Birmingham.—April 16, May 7, 10.30 a.m., Stirchley Institute. Stourbridge.—April 21, Corn Exchange.

Stourbridge (S.D.A.R.S.).—April 24–29, Arts and Crafts Exhibition,

Halesowen.

REGION 4

Derby (D. & D.A.R.S.).—April 19, 26, May 3, 10, 17, 7.30 p.m., Club Room No. 4, School of Art, 119 Green Lane.

Loughborough.—May 10, 7.30 p.m., Science Lab., Limehurst School. Mansfield (M. & D.A.R.S.).—May 7, 21, 3 p.m., Swan Hotel.

Northampton (N.S.W.C.).—April 21, 28, 6 p.m., May 5, 7 p.m., May 12, 19, 6 p.m., Club Room, 8 Duke Street.

Peterborough.—May 2, 7.30 p.m., St. John's Ambulance H.Q., Cowate.

Cowgate.

REGION 5

Chelmsford.—May 2, 7.30 p.m., 184 Moulsham Street. Southend.—April 19, 7.45 p.m., G2BHA, 27 Park Road.

REGION 6

High Wycombe.—April 25, 7.30 p.m., BRS17415, 66 Havenfield Road, Booker.

Sberford.—April 21, 7.30 p.m., Wharf Building.

Contents Editorial ... The Design of Tank Circuits of Constant Q ... Poge 28 Mc/s. Communica-329 tions Receiver from the 332 R1132A Avoiding Harmonic Gen-In the Workshop ... 336 Stockholm Story ... International Distress Pro-338 ... 340 The Month on the Air 342 Around the V.H.F.'s ... 344 It's Topical ... 345 Two Metre Contests, 1950 352 ... 347 Headquarters Calling ... 349 354 RSGE

REGION 7

London.—April 28, 6.30 p.m., Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. Tea 5.30 p.m.
 Lecture: "Mobile V.H.F. Equipment" by Mr. J. R. Brinkley, A.M. Brit.I.R.E. (Pye Ltd.).
 Barnes and Richmond.—May 16, 7.30 p.m., 22 Lowther Road, Papers

Barnes.

Brentwood.—April 28, May 12, 8 p.m., Drill Hall, Ongar Road. Croydon (Surrey R.C.C.).—May 16, 7.30 p.m., Blacksmiths Arms, South End, Croydon.

South End, Croydon.

East London District.—April 16, 3 p.m., Town Hall, Illord.

"Amateur Magnetic Recording," E. J. Williams, G2AKY.

Edgware (E. & D.R.S.).—Every Wednesday, St. Michael's School,
Flower Lane, Mill Hill.

Enfield.—April 16, 3 p.m., George Spicer School, Southbury Road.

Finsbury Park.—April 18, 7.30 p.m., 164 Albion Road, Stoke
Newington, N.16.

Hayes & Uxbridge.—May 5, 7.30 p.m., The Vine Inn, Uxbridge
Road, opposite Hillingdon Church.

Hoddesdon.—April 20, May 4, The Salisbury Arms.

Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays,
7.30 p.m., Grafton School, Eburne Road, N.7.

Ilford.—April 26, 14 Ardwell Ave. May 4, QTH G3CNV. **

Lewisham.—April 17, May 15, 7.30 p.m., Anchor, Lewisham Road

(Nr. Station).

Lewisham.—April 17, May 15, 7.30 p.m., Anchor, Lewisham Road (Nr. Station).

Peckham.—May 8, 7.30 p.m., The Kentish Drover, Rye Lane.

St. Albans.—May 10, 8 p.m., The Beehive, London Road.

Slough.—April 20, 7.45 p.m., Golden Eagle Hotel, High Street.

Sutton & Cheam (S. & C.R.S.).—April 18, May 2, Sutton Adults' School, Benhill Avenue.

Welwyn.—May 2, 8 p.m., Council Chambers, Welwyn.

REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. Guildford—April 23, 3 p.m. Royal Arms Hotel, North Street. Southampton.—May 6, 7.30 p.m., 22 Anglesea Road, Shirley. Worthing.—Mondays, (7-8 p.m. Morse Class), Adult Education Centre, Union Place.

REGION 9

Bristol.—April 21, 7 p.m., Keen's Cafe, Park Row.
Exeter.—April 21, May 5, 7 p.m., Y.M.C.A., 41 St. David's Hill.
North Devon.—April 14, May 5, 7.30 p.m., Rose of Torridge Cafe,
The Quay, Bideford.
Plymouth—April 15, 7 p.m., Torkill Communications.

Plymouth.—April 15, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.
Torquay.—April 22, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—May 2, 7.30 p.m., Y.M.C.A.
Yeovil.—Every Wednesday, 7.30 p.m., Grove House, Preston Road.

(Continued on page 352)

MORSE CODE TRAINING

WITH a thorough knowledge of the Morse Code you have the means of communicating with or receiving messages from people who can neither read nor write the English language. Morse is truly International.

Competent operators add considerably to their pleasure by greatly increasing the number of interesting and informative world wide contacts they are able to make.

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NEW SCREENED H.F. PENTODES FOR THE TELEVISION FREQUENCIES

The 6F1 and 10F1 are two new screened H.F. Pentodes for AC and AC/DC mains operation respectively. Identical, apart from heater rating, they have twin cathode connections giving a considerable reduction in common anode and grid circuit H.F. impedance, thereby enabling a high input resistance to be obtained.

This high input resistance together with the high mutual conductance of these valves (9mA/V at 10mA Anode Current) makes them ideal for use in straight television receivers, particularly for operation at a carrier frequency of 61.75 Mc/s as used by the Midland (Sutton Coldfield) transmitter.

TYPICAL OPERATION

		6F1	10F1			6F1	10F1
Heater Voltage	Vh	6.3 volts	22 volts	Screen Current	1,2	2.6 mA	2.6 mA
Heater Current	I _b	0.35 amps	0.1 amps	Grid Voltage		—1.8 volts	—1.8 volts
Anode Voltage	Va	200 volts	200 volts	Mutual Conductance	gm	9 mA/V	
Screen Voltage	V.2	200 volts	200 volts	Innut lass at	***	- 3	
Anode Current	la	10 mA	10 mA	61.75 Mc/s (approx.)	rin	7500 ohms	7500 ohms

BASE BBA.

LIST PRICE: 15/6d



RADIO VALVES AND TELEVISION TUBES

THE EDISON SWAN ELECTRIC CO. LTD., 155 CHARING CROSS ROAD, LONDON, W.C.2

R·S·G·B

For the advancement of Amateur Radio

VOLUME XXV No. 10

APRIL 1950



THE BIRTH OF AN IDEA

Background to the Silver Jubilee of the International Amateur Radio Union.

TWENTY-FIVE years represents a big slice in the history of the Amateur Radio movement-Time enough for memories to grow dim, and for the sharp outline of important events to become blunted and obscure. Yet even the most superficial investigation into the past, reveals that the basic problems—and requirements—of our hobby have remained surprisingly unchanged. Nowhere is this more evident than in the administration and organising of international co-operation.

As we prepare to celebrate the Silver Jubilee of the International Amateur Radio Union, it is important that we should remember that the need for the closest possible international co-operation is as vital to-day as it was during the momentous Paris Congress of 1925.

With the rapid growth of international DX working during the years following the end of the First World War, it soon became apparent that some form of league or union to encourage mutual assistance between—and protection of—radio amateurs throughout the world was an urgent necessity. Many countries were still without official licences, while in others the regulations were extremely vague. Broadcasting had already begun to oust the amateur from the longer wavelengths, whilst commercial concerns were showing an acute interest in the remarkable results achieved by the pioneer experimenters on the short waves. These lengthening shadows foretold that the days were numbered when the amateur would be assigned "all wavelengths below 100 metres" or "all wavelengths that do not interfere with commercials." One of the secrets of successful DX consisted then of knowing on what wavelength to look for particular countries: 33, 37, 43, 80 and 110 metres were favourite spots—though few could measure them exactly. There were no official international prefixes, or standard abbreviations other than the Q code, signal strength reporting being confined to some such remark as "QRK." All these, and many other matters, called for immediate agreement between the rapidly increasing amateur fraternity if utter chaos was to be prevented.

Such was the background when, in March, 1924, a meeting was held in Paris on the occasion of a visit to Europe of the late Hiram P. Maxim, 1AW, President of the American Radio Relay League. General Ferrie and other leading members of the French Comité Intersocietaire de T.S.F. played an important role in these preliminary talks, which resulted in the setting up of a provisional committee for the organisation of an "International Union of Wireless Amateurs." Mr. Maxim was elected President and Dr. Pierre Corret of France, Secretary. Gerald Marcuse (2NM), Secretary of the T. & R. Section of the R.S.G.B., who had attended the meeting, was appointed a member of this committee. It was further agreed to convene an International Congress in Paris during Easter, 1925, to which would be invited delegates from all over the world.

The 1925 Congress

The response was most satisfactory, for on Tuesday, April 14, 1925, there assembled in one of the conference halls of the French Academy of Science—under the Presidency of M. Eduoard Belin of the Radio Club of France—representatives from no less than 24 countries, including Argentina, Brazil, Japan, New Zealand, Siam and the United States as well as from most European countries. Even Russia sent delegates although they had no power to act! The British delegation, headed by 2NM, comprised 22 members. Incidentally this was not to be the last important international conference for one of the youngest members of the British party; twenty-two years later Stanley Lewer (6LJ)—then President of R.S.G.B.,—was to represent the I.A.R.U. at the Atlantic City Conference.

The work of the Congress, which lasted for four days, can best be gauged from the five principal subjects discussed. These were: the proposal for the establishment of the International Amateur Radio Union, as it was now termed; arrangements for international tests; the allocation of definite wavebands for international work; the adoption of an auxiliary language; the use of "intermediate letters" (i.e. prefixes) in call-signs to indicate the country of origin, and the dissemination of call lists.

It was a worthy agenda, and much hard work was The draft proposals for the I.A.R.U. submitted by the A.R.R.L. representatives, who included Maxim and the late K. B. Warner (1EH), Secretary of the A.R.R.L., were adopted with certain modifications, notably that of individual membership; Esperanto was made the official auxiliary language (the only recommendation which later faded into obscurity); and a detailed schedule of wavebands was drawn up (Europe: normal working 115-95 and 75-70 metres; extra short wavelength (sic) 47-43 metres). International officials appointed included Maxim, President; Marcuse, Vice-President; Warner, Secretary and Treasurer; with Mezger (F8GO) and Frank Bell (Z4AA) as Councillors. Initially, Headquarters were to be at West Hartford, U.S.A., by invitation of the A.R.R.L. afterwards a British Section was formed, with the late E. J. Simmonds (20D) as President and W. G. Dixon (5MO) as Secretary.

of the Old World. It must have been difficult to convince the average A.R.R.L. member—who already had his own strong organisation to defend his rights of the need to contribute further subscriptions towards the Union. Overseas, the national societies showed only lukewarm approval of the independent I.A.R.U. sections whose activities often overlapped their own work. But commonsense and the amateur genius for compromise came to the rescue of the In December, 1926, important tottering Union. changes were announced, the forerunners of others. The individual one dollar subscriptions to headquarters were ended: funds collected by the sections thus became available for the building up of their own organisations, and the question of divided loyalties was partially solved.

During this latter period there was a new spirit abroad which slowly permeated the entire amateur field. A desire was growing to join the many small breaches which had occurred, largely due to the



Some of the delegates to the I.A.R.U. Congress in 1925. A historic photograph now in the possession of Past-President E. Dawson Ostermayer (GSAR), who appears on the extreme left.

But the value of a conference lies not only in its recorded recommendations; that year many close friendships were formed which were destined to play a most important part in the future development of Amateur Radio. Nation spoke peace unto nation, in an atmosphere of good humour and cameraderie.

Glancing through the files of musty journals, we catch a glimpse of many warm human personalities and delightful unrehearsed incidents: indefatigable Ken Warner, too busy to take time off for meals, munching innumerable sandwiches and thereby prompting certain delegates to present him with an enormous loaf wrapped in the national colours of the donors; Leon Deloy (8AB of France), first European amateur to work across the Atlantic, helping to unravel the knots of diverse languages; discussions between Polish, Japanese and Belgian delegates carried on in Esperanto; the visit to Belin's "teleautographic" plant; and always the never-to-beforgotten beauty of Paris in the spring, which perhaps prompted a few delegates to snatch brief respites from the dusty atmosphere of the conference hall in order to climb the Eiffel Tower, or glimpse the city's rooftops from the terraces of the Sacré Cœur.

Teething Troubles

So was the Union brought into being: but what of its early history? As many brave hearts have found, the formation of an organisation presents less difficulties than its subsequent survival. The Amateur Radio movement in particular has always contained a percentage of sturdily independent minds who find it difficult to work for long in close harmony with others. Reading between the lines of carefully worded comments which appeared in QST during 1926 and 1927, it is not difficult to sense that the I.A.R.U. officials were hard put to reconcile the hustling American outlook with the more leisurely approach

increasingly specialised needs of the radio amateur as opposed to the general radio experimenter. This attitude was reflected in the United Kingdom by the return to its parent body of the Transmitter and Relay Section of the R.S.G.B., and the merging into this organisation of the British section of the I.A.R.U. For the first time for several years British amateurs were united.

The New Constitution

The time was thus ripe for a far-reaching review of the work and organisation of the I.A.R.U. Through the medium of the I.A.R.U. Calendar, which for so many years has formed a tangible link between the amateur organisations of the world, the views of the different sections were solicited. Finally on October 30, 1928, by an official vote of the existing National Sections, the Union adopted an entirely new constitution, whereby it became an international federation of independent national societies. This concept of the Union has remained virtually unchanged to the present day. Its objects were then defined in the following terms:



The first officials of the I.A.K.U. Left to right: M. Mezger (18GO); Hiram Percy Maxim (wIAW), President; Gerald Marcuse (g2NM), Vice President; and Ken Warner (wIEH), Secretary.

The promotion and co-ordination of two-way radio communication between the amateurs of the various countries of the world; the effecting of co-operative agreements between the national amateur radio societies of the various countries of the world on matters of common welfare; the advancement of the radio art; the representation of two-way amateur radio communication interests in international communication conferences; the encouragement of international fraternalism; and the promotion of such additional activities as may be allied thereto.

PREMIER CONGRÈS INTERNATIONAL

DES

RADIO-AMATEURS

FIRST INTERNATIONAL RADIO-AMATEUR CONGRESS
UNUA INTERNACIA KONGRESO DE RADIO AMATOROJ

PARIS # 14-18 AVRIL 1925

This is a reproduction of the front cover of the official report of the Paris Congress, 1925, which was published in three languages: French, English and Esperanto. It included the names of more than 250 members who attended, representing the leading personalities of the technical press and the amateur world—many of whom are still active.

The Work of the Union

As the years have rolled by, the wisdom of those who foresaw the need for such an international organisation has become more and more evident. The encroachment of commercial interests upon the high frequency spectrum might easily have resultedas was the case earlier with medium wavelengthsin the complete eclipse of the amateur, had it not been for the efforts of the I.A.R.U.-notably supported by the R.S.G.B.—in ensuring that his voice was heard at the Madrid, Cairo and Atlantic City Conferences. I.A.R.U. Headquarters at West Hartford have consistently acted as a focal point for the collection and dissemination of information upon the international aspects of Amateur Radio; the close link with the A.R.R.L. has ensured that the great body of American amateurs has been kept aware of the activities and difficulties of their colleagues overseas, while the bi-annual circulation of the I.A.R.U. Calendar has provided a medium of common action by the national societies of the world.

The W.A.C. certificate, issued by the Union, has been recognised as a standard of amateur radio proficiency throughout the world and has proved to be the forerunner of many similar yard-sticks of operating ability. The establishment of official I.A.R.U.QSL Bureaux has been of inestimable value.

To-day the I.A.R.U. membership totals 40 societies, representing nearly 120,000 amateurs, in all the continents of the world.

So it is most fitting that in this issue of the BULLETIN (soon to celebrate its own 25th anniversary) we should salute the pioneers who gathered on April 14, 1925, at No. 12 Rue Cuvier. To them we owe much, perhaps indeed the very existence of our hobby as we know it to-day. But let us, in turn, look also to the future and resolve to cherish and strengthen the bonds which—through the I.A.R.U.—bind together the radio amateurs of the world.

Full acknowledgment is made to the Wireless World and QST, from which journals certain of the information and photograph contained herein has been obtained.

J. P. H.

PARIS, 1950

N May 18 next, in the Aero Club of France, representatives from perhaps as many as two dozen National Amateur Radio Societies will meet together to celebrate the 25th Anniversary of the formation of the International Amateur Radio Union.

The most important single task facing the Congress will be to consider what steps should be taken to ensure that the Union is adequately represented at the next International Telecommunications Conference scheduled to take place in Buenos Aires in 1952.

Now that the world of radio has been divided into three Regions it may well be that the Paris Congress will decide that the I.A.R.U. Societies in each Region shall appoint their own group of delegates to represent the interests of all the amateurs in that Region.

With the experience of Atlantic City to guide us, we can now see that the problems which will face the amateurs of a given Region may be quite different to those which will confront the amateurs of the other two Regions. At the forthcoming Paris Congress the delegates must face up to those problems and decide how best the future of Amateur Radio is to be safeguarded.

If the movement is to survive every amateur must be prepared to make a practical contribution towards the cost of representation. Within the pages of this issue the story is told of the effect which a short address on International Amateur Radio made on the 300-odd members of the Swedish National Society present at their recent Annual General Meeting. It is interesting to speculate how many other Societies would be prepared to accept an increase in subscription rates in order to ensure adequate representation at International Conferences?

The R.S.G.B. and the A.R.R.L. will accept their responsibilities in the future as they have done in the past but every other national society must, from now on, be prepared to play a more active part in the defense of the amateur cause.

The Stockholm gathering has paved the way for Scandinavian participation at Paris. Is it too much to hope that when the Congress opens every European I.A.R.U. Society will be represented? The presence too of representatives from the British Dominions and the U.S.A. would add great weight to the decisions which will be taken.

J. C.

Convention Plans

THE Council has had under discussion plans for forthcoming Conventions and has made tentative arrangements for holding a full-scale National event in London during 1951—the Festival of Britain year. In view of this, the Council felt it advisable not to attempt to stage a Convention this year.

An alternative suggestion for this year, the holding of a Technical Congress for two or three days in the Autumn, possibly in Birmingham, is now being considered. It is envisaged that such an event would provide members with an opportunity of hearing lectures and participating in discussions on many aspects of amateur work. It would also include an exhibition of home constructed apparatus of all kinds.

THE DESIGN OF TANK CIRCUITS of Constant Q

OR a variety of reasons, many amateurs prefer, or are compelled to use, one transmitter to cover all bands. With the aid of coil-switching or plug-in coils, most transmitters will give a fairly satisfactory performance from 1.8 to 30 Mc/s., but frequently, the extent to which the tank circuit Q must inevitably vary between these extremes of frequency, unless special precautions have been taken, and the disadvantages of these variations, are not fully realised.

By R. W. ROGERS*

Without a clear understanding of the derivation of the Q factor as applied to loaded tank circuits, it is difficult to appreciate such points as the difference in the optimum L/C ratios for plate neutralised and un-neutralised P.A. tank circuits and the reason why tank circuit Q is raised by lowering the L/C ratio, whereas in the tuned circuits of a receiver or a Clapp oscillator, for instance, the exact reverse holds true. It is proposed, therefore, to deal with the theoretical aspects of the matter, before proceeding to describe suitable means of providing a tank circuit of constant Q for all bands.

O of Resonant Circuits

A perfect parallel tuned circuit would have a condenser with no losses and a coil having no resistance. In practice, there are losses caused by the coil's resistance, condenser losses being so small as to be unimportant. Q is well-known as the measure of "goodness" of a coil, that is the relationship between its reactance and its resistance at a certain frequency.

This same Q factor can be used to indicate the "goodness" of a resonant tuned circuit and as the condenser is assumed to be perfect, will be the same as the Q of the coil at the resonant frequency, so that

$$Q = \frac{\text{The coil reactance } (2\pi f L)}{\text{The coil resistance } (R)}$$
(1)

Now a parallel tuned circuit has a very high impedance at its resonant frequency. In fact, a perfect circuit would have infinite impedance, but again the coil resistance is a limiting factor and the actual impedance bears a definite relationship to the Q of the circuit. In dealing with transmitter tank circuits, it is often convenient to deal in terms of impedance, and it can easily be shown (1) by derivation from the above definition, that

$$Q = \frac{\text{The circuit impedance } \left(\frac{L}{CR}\right)}{\text{The coil reactance } (2\pi f L)}$$
(2)

and as in a resonant circuit, the coil and condenser reactances are equal, we can use as an alternative

$$Q = \frac{\text{The circuit impedance}}{\text{The condenser reactance}} \tag{3}$$

It is well-known that a tuned circuit is capable of storing energy, and provided the coil has reasonably small resistance, as would be the case in practice, very short pulses of power applied to the circuit at its resonant frequency are sufficient to cause a heavy current to alternate between coil and condenser, in almost perfect sine-wave form. The unloaded tank circuit of a Class C P.A. behaves in this manner, the valve supplying pulses of power at the desired frequency and the tuned circuit is tuned to resonance at this frequency. The P.A. coil is of low resistance, so that the unloaded Q is high, probably between 100 and 200, and from definition (2) we can see that the impedance must be very high, causing the familiar pronounced dip in anode current at resonance.

Loaded Tank Circuits

To be of practical value, the P.A. must transfer power into an aerial via the tank circuit. Coupling a resonant aerial to the tank circuit has the same effect as shunting the tank with a resistance, the tighter the aerial coupling, the lower being the value of this apparent resistance.

In practice, this aerial loading is usually of the order of 2,000 or 3,000 ohms, which is much lower than the impedance of the unloaded tank, which may be 50,000 ohms or higher. The tank impedance when loaded, therefore, will be almost equal to the reflected aerial load, irrespective of fairly wide variations in the initial unloaded tank impedance.

The lowered impedance of the tank circuit, when loaded, causes the anode current to rise and normally the aerial load is adjusted to give the desired input.

Effect of Changing the L/C Ratio

If we have a P.A. which normally is loaded to say 150 watts input and we decide to double the value of capacity in the tank circuit and correspondingly reduce the inductance to half, the reactance of the condenser will be halved, but the impedance of the circuit, when loaded to 150 watts input will still be practically unchanged, as we have just indicated, so reference to definition (3) shows that the Q will have been doubled.

Comparing this with the behaviour of an unloaded tuned circuit, when the capacity is doubled and the inductance halved, were the coil resistance to be halved also, both the impedance and the reactance would be halved, leaving the Q unaltered. But actually, the number of coil turns and, therefore, the coil resistance, will not require to be reduced to half in order to halve the inductance and the impedance will, for this reason, be reduced to less than half, giving a fall in Q.

If it were not for other considerations, the obvious ideal at which to aim would be the maximum possible L/C ratio (very high unloaded Q) with a very low Q when loaded, as in this way, practically all of the available output would be transferred to the load and none dissipated in the tank circuit itself.

Effect of Q on Harmonics

It has already been mentioned that a Class C amplifier supplies power to the tank circuit in the form of pulses. This is due to the fact that the anode current is cut off by the application of a large value of negative grid bias and only flows during the period in each cycle that the grid is driven above the

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cut-off value. The period, during which the current flows, varies from 180 degrees for a Class B stage to 90 degrees for a very efficiently operated Class C

stage, 360 degrees representing a full cycle.

If these pulses were to be radiated, the waveform is such that a very high proportion of the total power would be in the form of harmonics, which, apart from being power output wasted, would cause serious interference on other frequencies. An important function of the tank circuit is to smooth-out the waveform to something like sine-wave form, so that the energy is concentrated on the desired frequency. If the energy stored in the tank per cycle is large compared with the energy dissipated in the load (large Q), this will occur, so that, from this point of view, the higher the Q the better.

Effect of Q on Telephony Quality

When telephony is used, too low a Q may cause some distortion of the audio component of the signal. Assuming anode modulation, the grid bias is fixed at say 2½ times cut-off for the anode potential in use. When modulation is applied, the instantaneous anode potential, for 100 per cent. modulation, alternately rises to twice the supply voltage and falls to zero, at the modulation frequency. When the instantaneous potential on the anode drops to a very low value, the grid-bias will then be the equivalent of many times cut-off, and the anode current flows during a smaller part of each cycle, so that the Q required, to maintain a sine-wave current in the tank circuit, will be necessarily higher. For absence of distortion at deep modulation levels, a higher Q than that needed for C.W. only, is often recommended.

From the foregoing remarks it will be seen that there are several conflicting ideals and a Q of 12 is normally regarded as about the best compromise figure. The Q should certainly not fall much below this, but by the use of low-loss coils and condensers, the figure may be doubled without causing too much

loss in output.

Methods of Changing the Tank Q

We have already shown that the circuit Q can be varied by altering the ratio of inductance to capacity for a given frequency, and also that by altering the

degree of aerial loading, the Q is affected.

The Q of the circuit may also be changed by altering the valve operating conditions. Normal procedure, when tuning a P.A., is to adjust the aerial coupling until the required input is obtained, say 150 watts, which in a typical case, may be obtained with an anode current of 150 mA. at 1,000 V. As the anode current consists of a series of spaced pulses, the mean value of each pulse must be considerably higher than the reading on the anode milliammeter. If we increase both the grid bias, and the grid drive from the previous stage, we may now still obtain 150 mA. on the meter, but the current pulses will be of higher mean value.

The valve load for a given input is related to the A.C. impedance of the valve and this in turn is related to the anode voltage and pulse current. A larger pulse current means a lower valve impedance and lower value of load for a given D.C. input. Obviously, therefore, with a lower reflected load resistance across the tank circuit, its Q must be reduced. The variations in Q obtainable in this way, however, are rather limited.

Valve-to-Tank Impedance Step-up

There remains one other way in which the tank circuit Q may be varied. In a normal single-ended P.A. circuit, as shown in Fig. 1 (a), such as is commonly used with pentodes, beam tetrodes, etc.,

the total impedance across the tuned circuit serves as the load for the valve.

If the anode is not connected to the end of the coil, but to a point somewhere along its length, as in Fig. 1 (b), so that only the turns between the anode connection and the H.T. end of the coil are in the anode circuit, there will be an impedance step-up between the valve and the tank circuit, proportional to the square of the ratio of turns. For example, if the anode is tapped half-way along the coil, the impedance presented to the valve is only one-quarter of the total tank impedance. With the aerial loading adjusted to give the normal input (i.e. normal impedance in the anode circuit), the tank impedance will be four times as large. Reference to definition (2), again, shows that the Q must also have been increased four times. Had we wished to double the Q only, the ratio of turns in the anode circuit to total turns would be 1 to 1.4, viz. the anode would be tapped on the coil at a point approximately one-third from the free end.

Fig. 1 (c) shows an alternative way of achieving the same results, and Fig. 1 (d) is its equivalent, where the step-up ratio is obtained on the capacitive side of the circuit. A split-stator condenser used in this way gives a four-fold increase in Q.

ANODE

ANODE

H.T. (a)

ANODE

ANODE

H.T. (b)

ANODE

(d)

Fig. 1. Normal and valve-to-tank impedance step-up circuits.

Figs. 1 (c) and 1 (d) will be recognised as the basis for plate neutralised circuits, and from what has been said, it will be apparent that when using those circuits in the ordinary way, for a given frequency, the capacity of the tuning condenser should be only one-quarter of the value used in circuit Fig. 1 (a) for the same circuit Q. This point is not always appreciated, it would seem, since not even all handbooks agree on the matter.

Optimum Tank Capacity

Nothing has yet been mentioned about the correct capacity to use on the different amateur bands to

obtain a Q of 12, the accepted optimum.

From what has been said in an earlier paragraph, the capacity clearly, must be related to the valve operating conditions, but for average Class C operation (with grid bias equivalent to between two and three times cut-off) most amateur handbooks give suitable values for the different bands, using the simplest tank circuit as in Fig. 1 (a). From these, the capacities for other arrangements can be calculated.

It should be noted that valves taking high current at low anode voltages require higher values of capacity than those using high anode voltage and low current. For example, an 813 operating on 7 Me/s. with an anode current of 100 mA. at 1,500 V. requires a capacity of only about 32 $\mu\mu$ F., whereas two 807's in parallel with 600 V. on the anodes and passing 200 mA. need about 160 $\mu\mu$ F. for the same Q.

Practical All-Band Arrangements

It has been shown how the tank Q may be varied on a given frequency, and a combination of any of these methods may be used to obtain a reasonably constant Q on all bands, with one P.A.

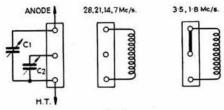


Fig. 2.

Practical method of bringing additional capacity into circuit on the L.F. bands. On left is the coil socket strip, with plug-in coils on right. C2 is the extra condenser.

With a normal type of tuning condenser, it is usually just possible to achieve a ratio of maximum to minimum capacity, taking into account the valve output capacity, etc., of about 4 to 1, so that if we design a tank circuit around a tuning condenser of sufficiently low minimum capacity to give a Q of 12 on 28 Mc/s., the 21, 14 and 7 Mc/s. bands can be covered by arranging the coil sizes so that the tuning condenser gives the correct capacity for each band. If, for instance, 15 μμF. is required for 28 Mc/s., 20, 30 and 60 μμF. will be necessary for the 21, 14 and 7 Mc/s. bands, respectively, and a 60 μμF. or 70 μμF. variable condenser would be a suitable choice. This leaves the 3-5 and 1-8 Mc/s. bands to be covered, and the following methods are available.

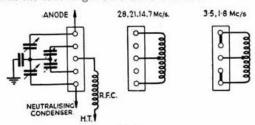


Fig. 3.

Balanced version of Fig. 2 for anode neutralised or push-pull amplifiers.

Switched Capacity Systems

A well-known method is to shunt the tuning condenser with additional capacity on the lower frequency bands. In the example we have just taken, the total capacity for 3.5 Me/s, will require to be brought up to $120~\mu\mu F$, and to $240~\mu\mu F$, for the top band.

The additional capacity may take the form of an extra variable condenser or of a fixed vacuum condenser and may conveniently be brought into circuit on the required bands, by the coil base arrangement shown in Fig. 2.

It should be noted that no single value of fixed condenser will give the correct total capacity for both 3.5 and 1.8 Mc/s., when used with a main tuning condenser which tunes to 7 Mc/s. at near its maximum, and for that reason, an additional variable condenser is to be preferred, although rather bulky.

Fig. 3 shows a suitable arrangement when plate neutralising or push-pull is used. Although not absolutely essential, it is advisable to use an extra split-stator condenser or two equal fixed condensers,

in order to preserve an efficient centre tap, otherwise the extra condenser, being of higher capacity than the original one, will tend to mask the centre tap.

Another interesting scheme, applicable to un-neutralised or grid neutralised single ended stages only, is depicted in Fig. 4. A split-stator condenser is employed and by suitable connections between the pins on the coil sub-bases, the two condenser sections are used in series on 28, 21, 14 and 7 Mc/s., one section only on 3·5 Mc/s. and the two sections in parallel on 1·8 Mc/s. A condenser of suitable value is chosen

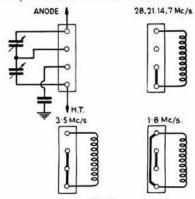


Fig. 4.

Various capacity combinations obtained from a split-stator condenser, for use with single-ended P.A. Note that the condenser rotor must be "earthed" on the L.F. bands only.

so that 7 Mc/s., when tuned near maximum with two sections in series, gives the required Q, and 28 Mc/s. tunes with the vanes nearly "all out." Both 3.5 and 1.8 Mc/s. should then tune near maximum.

As the writer has seen this system incorrectly applied, it should be noted that it is essential to incorporate means for transferring the earthy connection from the condenser rotor to the end stator, when using the two sections in series, as shown, otherwise the valve will be connected across one section only, giving an impedance step-up to the tank of four times and a fourfold increase in Q, thus more than counteracting the advantage of using the sections in series.

Impedance Changing Systems

A tank can be arranged to cover all the bands by suitable impedance step-up between the valve and tuned circuit on the lower frequencies. If we have a variable condenser of suitable value to cover from 28 to 7 Me/s., the same condenser can be used to cover 3.5 and 1.8 Me/s. by use of the basic circuits in

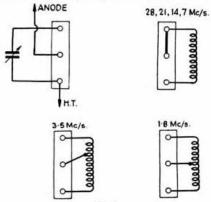


Fig. 5.

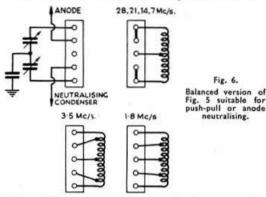
Tapped Coil used to obtain adequate Q on the L.F. bands. Anode tapping is one-third down on 3.5 Mc/s. and at the centre for 1.8 Mc/s.

Figs. 1 (b), 1 (c) and 1 (d). It has already been shown how, with these circuits, the Q may be increased four times on a given frequency and by the same reasoning, a tank circuit may be operated at one-quarter of the frequency, with the same tuning

capacity, to give the same Q.

Fig. 5 shows a suitable set of plug-in coils for a single ended un-neutralised stage. The 3.5 Mc/s. coil is tapped one-third from the top end and the 1.8 Mc/s. coil is tapped at the centre. The coil sizes should be arranged so that on both these bands, the condenser tunes at the same dial setting as for 7 Mc/s. and the Q will then be correct.

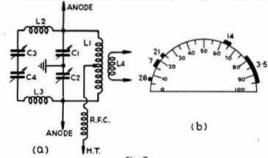
The system is not limited to un-neutralised stages and may be used with both anode neutralised and push-pull stages. Fig. 6 shows the practical arrangement for use with a split-stator condenser. In this case, two tappings on the coil are required, in addition



to the H.T. centre tap, to maintain the neutralising adjustment, and to balance the circuit in the case of push-pull. On $3\cdot 5$ Mc/s., the coil taps are located one-third of the distance between each end and the centre tap, and on $1\cdot 8$ Mc/s. are mid-way between the coil ends and the centre.

One possible disadvantage of this scheme is that the R.F. potential appearing across the tuning condenser increases in proportion to the amount by which the anode is tapped down, but in most practical cases, there will probably be a sufficient margin of safety on the condenser spacing to accommodate the rise in potential. This is especially true on 1.8 Mc/s. where the anode potential will almost certainly have to be reduced, in order to hold the input down to 10 watts.

In all the schemes outlined, it has been assumed that all bands from $1\cdot 8$ to 28~Me/s, are to be covered, but if the transmitter is not required to operate on $\cdot 81~Me/s$., in view of the small power permitted on



(a) Push-pull circuit for coverage from 3·5-30 Mc/s, without coil changing. 12 and L3 are on same former, mounted at right-angles to L1. Values are suitable for 807's at full rating. Fig. 7 (b) shows

C1, 2, 3, 4

4 sections, 110 µµF. per section.

L1

L2, 3

4 sections, diameter 1\(\frac{1}{2}\) in., length \(\frac{2}{2}\) in., spaced \(\frac{1}{2}\) in. apart.

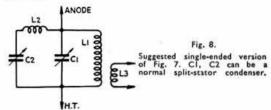
that band, the same principles can be used to cover from 3.5 Mc/s. upwards. In this case a possible improvement in efficiency may be obtained on the H.F. bands, by the use of a physically smaller condenser of just sufficient maximum capacity to obtain adequate Q on 14 Mc/s. in the ordinary way treating 7 and 3.5 Mc/s. as the two L.F. bands.

Continuous Coverage 3.5-30 Mc/s.

An article of this nature would not be complete without reference to a system, which although not designed primarily for constant Q, is interesting in that it provides continuous tuning from 3.5 to 30 Me/s, without any coil changing or switching(2),

Fig. 7 (a) shows the circuit in which L1 is considerably larger than L2 and L3, and C1, C2, C3 and C4 are all equal. The circuit will tune to two different frequencies at any condenser setting. At low frequencies L2 and L3 can be treated as rather long leads to C3 and C4, so that C3 and C4 are in effect in parallel with C1 and C2, all across L1.

On the other hand, L2 and L3, together with the four condensers all in series, form a circuit which resonates at a much higher frequency and at this frequency L1 tends to behave more like an R.F. choke and has a relatively small effect on the resonant frequency of the circuit. The output on all frequencies can be taken from L1 via the coupling coil L4.



The writer has been unable to test this circuit, as yet, but in the original design the values of components were as shown in Fig. 7. Fig. 7 (b) shows the position on the tuning dial (where all the condensers are ganged) at which the different bands resonate, and it should be noted that the tuning is arranged so that no two bands coincide, to avoid harmonic troubles.

The originator of this circuit claims that a reasonably constant Q is obtained. However, it would seem, that on the H.F. bands, i.e. 14, 21 and 28 Mc/s., the valve output, being connected across half of the total tuning capacity only—giving an impedance step-up—would tend to counteract the effect of the condensers being in series on those bands, and to increase the Q.

The original published circuit is for push-pull operation, but the logical single-ended version would seem to be as shown in Fig. 8, L1 being the large coil and L2 the smaller H.F. coil. The output can be taken from a coil L3 coupled to L1, and C1 and C2 can very conveniently be a conventional split-stator condenser.

Appendix

(1) By definition
$$Q = \frac{2\pi fL}{R}$$
At resonance $2\pi fL = \frac{1}{2\pi fC}$

$$\therefore Q = \frac{1}{2\pi fCR} = \frac{L}{2\pi fCRL} = \frac{L}{CR} \times \frac{1}{2\pi fL}$$

$$= \frac{L/CR}{2\pi fL} = \frac{\text{Circuit Impedance}}{\text{Coil Reactance}}$$

Reference

(2) "No Turrets—Just Tune," A. King, Jr. (W1CJL), QST, March, 1948, p. 59.

A 28 Mc/s. Communications Receiver from the R1132A

Whatever doubts may exist regarding the effectiveness of the readily-available R1132A as a V.H.F. receiver for amateur purposes, it can certainly be turned to good use on the 28 Mc/s. band. Here is a straightforward description of the necessary modifications to the R.F. and I.F. stages, and some notes on a simple noise-limiter circuit.

*HE 10-valve ex-R.A.F. receiver type R1132A was originally designed to cover the frequency range 100-124 Mc/s., with a band-width of 150 kc/s. Views on its possible use on 144 Mc/s. were expressed in the May and July, 1949 issues of the BULLETIN. In this article, however, it is intended to show that the receiver can easily be modified to cover considerably lower frequencies such as the 28 Mc/s. band.

Replacement of I.F. Transformers

It will be immediately obvious that the bandwidth of the receiver is entirely unsuitable for the lower-frequencies and that this can only be reduced by modifications to the I.F. stages which operate on approximately 12 Mc/s. Despite many hours spent in an endeavour to make use of the original I.F. transformers, it was ultimately found necessary to replace them with standard 465 kc/s. I. F. transformers which should preferably be of the iron dustcore trimmer type. This operation, however, is relatively simple. The screening cans should be

By H. E. SMITH*

loosened and removed from the chassis so that the coil assembly can be withdrawn, the unsoldering being carried out from above the chassis. When replacing the transformers it is advisable to fit short lengths of screened lead to both the anode and grid connections in order to prevent any tendency for the I.F. stages to burst into oscillation when peaked.

Next, the B.F.O. coil must be changed so that it will cover 465 kc/s. The beat oscillator is located on the top front of the chassis, complete in its own screening box. With care these modifications can

be effected after merely removing the cover and the B.F.O. valve. With the aid of a small soldering iron remove the three connections to the coil, remembering that the centre connection is the cathode tap. The two screws securing the coil former should be slackened-off so that the coil may be lifted from the box. Strip off all the wire from the former and rewind with 100 turns of No. 30 S.W.G. D.S.C. wire, double the end back and then wind on a further 30 turns still in the same direction. The tap thus brought-out becomes the cathode connection, while the start of the first winding connects to grid and the end of the 30 turn section goes to earth. The coil former should be replaced in its box and the leads re-connected as described. It should then be possible to tune this coil to the I.F. by adjusting the dust iron trimmer. This adjustment can be effected with the aid of a standard signal generator or on an actual signal when the complete modification has been carried out.

I.F. Mixer and Oscillator stages

The modifications to the R.F., mixer and oscillator stages can best be followed by reference to Fig. 1 which shows the basic circuit details of these stages before modification.

The changes necessary are:

(1) Remove the large screen from the R.F. section, and unsolder all four coils from their supporting

(2) Remove the 4700 ohms resistor (R1) from between the aerial socket and earth.

(3) Remove the 5 µµF. condenser (C1) from between the aerial socket and the coil pillar.

(4) Remove the 10 μμF. condenser (C2) from between the coil pillar and the grid of V1, and replace with a 40 μμF. type.
(5) Remove the 10 μμF. grid condenser (C3) from

V2 and replace with a 40 μμ.F. type.
(6) Remove all four *Philips* 8 μμ.F. trimmers from the top of the main tuning gang assembly, and replace with Philips 3-30 $\mu\mu$ F. trimmers.

• 176 Station Road, Hayes, Middlesex.

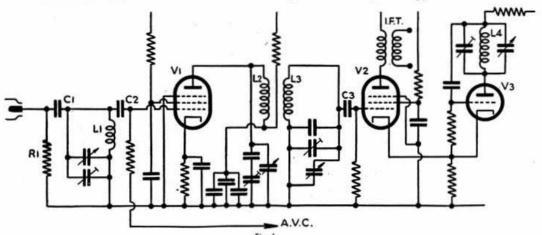


Fig. 1. Basic R.F., mixer and oscillator circuit of the R1132A before modification.

In order to improve band-spreading, it is advisable to remove at least one moving vane from each section of the four-gang tuning condenser. While an even greater degree of band-spreading is sometimes possible, too drastic changes will considerably increase the difficulties of correct tracking. The one plate from each section provides a satisfactory compromise.

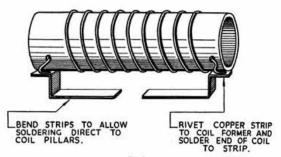


Fig 2.

System of mounting the 28 Mc/s. coils on the existing pillars.

Modifying the Coils

The four original coils L1, L2, L3 and L4 must be replaced by new ones which are wound as follows:

L1, L2 and L3. 12 turns of No. 20 S.W.G. tinned copper wire, wound on ½ in. diameter paxolin former with the turns spaced twice the diameter of the wire. The ends are secured by drilling small holes in the former through which the wires are threaded.

L4. Similar to the other coils but 10 turns only.

strips, the other ends of which are soldered directly to the coil pillars. This system of mounting keeps the coils sufficiently rigid. When mounting the coils reference should be made to Fig. 3 which shows the correct layout. Under the conditions shown no inter-coil screening will be necessary but any variation may result in stray coupling. L1 is mounted vertically with a short length of wire soldered to the second turn from the earthy end, and taken to the aerial socket.

The alignment follows normal procedure and little difficulty should be experienced. The oscillator is, of course, tuned to the low frequency side of the signal. With one vane removed from each section of the ganged condenser, the 28–30 Mc/s, band should occupy approximately 60 degrees of the tuning scale.

With the modifications described the receiver input will match satisfactorily into a 70-100 ohm feeder. If a high-impedance aerial input is required, the tap on L1 should be disconnected and a small-capacity condenser fitted in series with the grid of V1 and the aerial socket.

Noise Limiting

The original receiver does not possess any form of noise-limiter but most of the standard types can easily be incorporated. An extremely simple type of output limiter, which has been used with great success, consists of an ordinary intervalve push-pull transformer and a 6X5 rectifier valve. The primary of the transformer is connected directly across the output of the receiver while the outer terminals of the secondary winding are connected to the anodes of

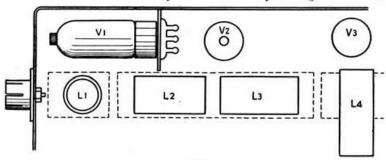


Fig 3. Layout of the colls viewed from above the chassis.

A convenient method of mounting the coils on the existing coil pillars consists of riveting short lengths of copper strip (approx. ½ in. × 1/32 in.) to each end of the coil former bent so as to fit the sparing of the coil supports (see Fig. 2). The coil windings are soldered to the riveted ends of the the rectifier, the cathode of which is connected to the centre-tap of the secondary winding. The heater supply for the valve can be obtained from the normal receiver power pack. This form of limiter has been found to be particularly effective against car-ignition interference.

New G.E.C. Microwave Tower

THE Research Laboratories of The General Electric Company, Ltd., are now actively engaged on research and development work in connection with long-distance point-to-point communication on centimetric wavelengths. Present commitments include the London to Birmingham television link, on behalf of the G.P.O., and radio communication systems for the export market.

In order to provide a long optical path from the Wembley Laboratories a tower, 200 feet high, is being erected which will be suitable as the terminal of experimental radio links. It will also be useful for work on many other U.H.F. and S.H.F. projects. The lattice steel tower stands on a base 45 feet square, each corner leg being set in a reinforced concrete foundation ten feet square and eleven feet deep. A passenger lift will give access to two cabins situated one above the other at the top of the

tower. When completed each cabin will be octagonal, about eleven feet wide and will have an external balcony on which the highly directional aerials can be mounted. The cavity walls of the cabins will be thermally insulated and electrically screened.

The Grape Vine

RECENT issue of the Telcon House Magazine publishes an interesting example of the amateur radio "bush telegraph." The firm, who introduced a new R.F. cable at Radiolympia, were surprised when a few days after the show opened an amateur, while inquiring about the new product, mentioned that he had heard of it from someone in Australia. It transpired that an early visitor to the exhibition had casually mentioned the cable to an Australian amateur who in turn, passed the information back to England. Amateur news travels fast.

AVOIDING HARMONIC GENERATION

By E. WILLIS (G60U)*

As the problem of TVI confronts an ever-increasing number of U.K. amateur radio operators, it is becoming clear that there is no simple all-embracing cure. Only by examining as many as possible case-histories of those who have successfully solved their difficulties can others determine the most effective method of tackling their own particular problem. The solution offered in this article will appeal chiefly to those amateurs whose activities are confined to the 28 Mc/s. band.

WITH a location on the fringe of the London television service area, it was to be expected that G6OU should view the mushroom-like growth of television aerials in his neighbourhood with some misgiving. The 100-watt transmitter, which was operated mainly on the 28 Mc/s. band, consisted of a three-stage 7 Mc/s. V.F.O., a 6L6 doubling to 14 Mc/s., an 807 doubler and a DET12 power amplifier. Enquiries showed that no interference was being caused to the nearest receiver—some 150 feet from the transmitter—and amateur activities continued without hindrance.

But there came a day when the dreaded H-aerial suddenly appeared twenty feet away from, and on the same level as the two-element beam at G6OU. It is not known whether the term "whiter than white" is in common usage amongst television experts: it could certainly have been applied to the results obtained on that receiver. So began a long series of experiments: the avoidance of a 14 Mc/s. stage by operating the V.F.O. on 9.4 Mc/s.; link-coupling all stages; separate aerial tuner earthed at the centre-tap; R.F. chokes in the mains leads; careful checks with a harmonic indicator; monitoring 30-150 Mc/s. . . . the well-trodden road to despair. It was only when it was discovered that the local oscillator of the monitoring receiver could cause almost as much interference as the transmitter carrier that it was appreciated exactly what a high order of harmonic suppression would be necessary if the problem was to be solved.

Operating Straight Through

Some new approach was obviously necessary. The harmonics which caused the trouble were not only unwanted but, it was felt, were also unnecessary. If only the fundamental frequency of the transmitter could be raised to the same figure as the required

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output—28 Mc/s.—then there would be no harmonics to worry about lower than 56 Mc/s.; sufficiently high to be clear of London TV frequencies.

Could a V.F.O. be made to operate satisfactorily on 28 Mc/s.? The idea was discussed with other amateurs but little encouragement was received. Perhaps the old self-excited V.H.F. transmitters of the '30's were still too clearly remembered. But modern 28 Mc/s. receivers can be made stable enough, so why not V.F.O.s? An experimental oscillator using a 6C5 in a Hartley circuit was built. Careful mechanical construction and a due regard to the accepted canons of V.F.O. design produced results which were at least promising. Stability was good but reports indicated that a certain degree of frequency modulation of the carrier existed on telephony.

This flaw was traced to excessive coupling between the oscillator and the buffer stage. The original system consisted of a one-turn link from the oscillator to the cathode of the 6L6 stage. It was found that unless this link turn was fairly tightly coupled to the oscillator tank coil the drive was insufficient. The 6C5 oscillator valve was therefore replaced by an 807 with screen and anode tied, and operated at approximately 60 mA. at 230 V. By this means the oscillator output was considerably increased so that only very light coupling was necessary. Under these conditions no further indications of frequency modulation have been received, while the stability—after the initial warming-up period—is more than adequate.

With this system no trace of interference was either visible or audible on the nearby television receiver, even in the absence of TV signals. Despite the fact that the video and sound receiver is a T.R.F., no trouble from blocking has been experienced. (While it is obvious that this sytem has considerable possibilities in the curing of difficult TVI cases, it must be stressed that the construction of a 28 Mc/s. oscillator requires great care in order to avoid instability.—Ed.)

Determination of Meter Resistance

By Donald Hughes, B.R.S. 17191*

T is frequently necessary to determine the internal resistance of a delicate milliammeter in cases where it is inadvisable to use a multi-range test meter to make the measurement, because of possible overloading and lack of accuracy. The following method can give accurate results and also safeguards the milliammeter from damage.

The milliammeter is connected in series with a resistance, R, and a source of constant E.M.F. of negligible internal resistance, such as an accumulator. (Fig. 1.) The meter readings are noted for different values of R and a graph plotted of the reciprocals of

meter readings against the corresponding values of R. (Fig. 2.) Suitable values of R are chosen to insure against overloading.

The graph so obtained—a straight line in the case of most instruments—is produced until it intercepts the R-axis at -r (say). The numerical value of this intercept is the internal resistance of the meter.

Four carefully-determined points are sufficient to draw the graph and these can be obtained by using two accurate resistors of different values, taking them

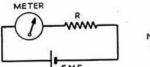


Fig. 1.
Milliammeter, resistance and battery in series.

singly, in parallel and in series.

The theoretical explanation for this method is as follows. At the point where the graph intercepts the

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R-axis, the reciprocal of the meter reading is zero. Theoretically the meter is then passing infinite current. The E.M.F. in the circuit is finite, therefore the total resistance of the circuit must be zero. From

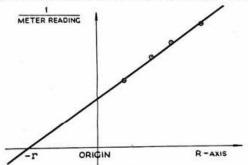


Fig. 2.

Reciprocal of meter reading plotted against corresponding values of R.

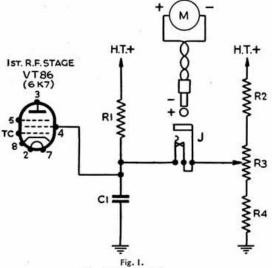
the graph, the value of R under these conditions is -r. The meter resistance must therefore be +r to bring the total resistance to zero.

If the source of E.M.F, has an appreciable internal resistance which is known, this can, of course, be added to the values of R when constructing the graph.

A Simple S-Meter for the BC 348

By A. J. Bayliss B.Sc. (G8PD).

THE S-meter circuit described in this article has been used with success on a BC348R, although there is no reason why a similar arrangement should not be adopted for many other types of receiver. The basic circuit diagram is shown in Fig. 1. While not original, it is very simple, comprising three fixed resistors, one potentiometer and a suitable meter. In practice it has been found that



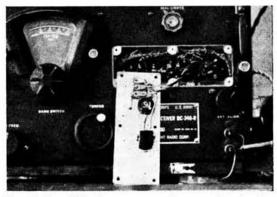
Circuit of Simple S-Meter.

RI 10,000 ohms.* R4 68,000 ohms ½-watt.
R2 10,000 ohms ½-watt. CI 0-01 μF.*
R3 5,000 ohms potentiometer. M See text.
J Closed circuit jack ((granic).

* These components already exist in the receiver.

either a 0-1 milliammeter of about 100 ohms internal resistance, or alternatively a 0-100 microammeter of about 1,000 ohms internal resistance, will give satisfactory results.

The method of operation is as follows. The potentiometer R3 is set so that with no signal input, and A.V.C. on, the meter reads zero current. When a signal is received the A.V.C. action applies a negative potential to the control grid of the R.F. valve. This causes the screen current to fall and the screen potential to become more positive with respect to earth. A current therefore flows through the meter, the current increasing with an increase in signal strength.



How the few additional components may be mounted on the subpanel of the BC348R.

In the case of the BC348R, the extra components can conveniently be mounted on the rectangular cover, to the right of the tuning dial, which gives access to the wiring of the R.F. valve. The photograph shows clearly how these components are mounted.

The meter scale can, of course, be directly calibrated in S-points. The following figures are given to indicate how the meter reading varied with signal input on the original model. These readings were taken at 14 Mc/s.

Input	Meter Reading				
(microvolts)	0-1 mA. meter	0-100 μA. meter			
	mA.	μA.			
1	0	. 0			
10	0.01	4			
100	0.34	47			
1,000	0.52	69			
10,000	0.62	84			
100,000	0.70	95			

Television Standards Agreement

NUMBER of British and European radio manufacturers have now reached agreement upon technical standards which it is hoped will be widely adopted by television services on the Continent. These standards include a 625-line picture definition, positive modulation on the video channel, 25 frames per second with 2 and 1 interlace, vestigial side-band operation, and a 6 Mc/s. total channel width. From an export point of view, perhaps the most important feature of the agreement is the decision to adopt positive modulation, similar to that already employed in Britain, in preference to the negative modulation favoured in the United States. The present 405-line system will continue to be used and extended in Great Britain.

In the Workshop

By "DONEX"

FURTHER TOOLS AND PROCESSES

Files and Filing

N radio construction work, generally speaking, accurate filing ability does not enter the picture to any important extent, being limited to a means of shaping or tidying-up a panel or bracket, or holes or recesses therein. However there is an art in filing properly, and although in many cases the result of the work is not visible, there is satisfaction in a job well done.

A useful selection of files has already been indicated (January issue), and it is desirable to have a separate handle for each. If necessary, however, one handle can serve a number of files. Most amateurs find it difficult to file "square"; others cannot file "flat," and achieve a curved surface on every occasion. There is a marked similarity in filing and sawing and proficiency in the one is generally indicated in

the other.

Operation .- Fix the work in the vice (if applicable), place the file flat on the work grasping the handle in the right hand with the palm downwards, place two or three fingers on the remote end and move the file across the work in long strokes, dividing the downward pressure equally between the two hands, and releasing the pressure on the return stroke. Do not impart a "see-saw" motion or try to tear off a greater quantity of metal by excessive downward pressure. As in sawing, a rhythmic movement of the body comes in time quite naturally. Observe that most flat files have a blank edge to enable square corners to be cleanly cut. If required, finish off the work with a fine file using steady transverse strokes to give a "machine" finish. Clean the files regularly with a wire brush or piece of "carding" and avoid allowing files to become rusty at all costs. Small "needle" files, as used by instrument workers and watchmakers, should be protected by inserting the sharp ends into a cork.

Sheet-metal.—One of the most frequent requirements in radio construction is the shaping of a piece of sheet, usually aluminium, of 12–16 S.W.G. for a panel or chassis. Saw out the piece as near to the required dimensions as possible and hold by one end in the vice, with the edge to be finished just clear of the top of the vice jaws. Take a milling file (having "radius-ed" teeth) and place it across the edge of the sheet at an angle of about 30°. Then with a steady action, as though using a plane, move it longitudinally along the full length of the edge. Transverse filing of sheet is generally ineffective and apart from a rough finish produces an earsplitting noise, with disastrous results to the peace of the household. With a little practice, it will be found that the metal can be removed in small shavings, leaving a clean sharp edge, as good as a "guillotine" would give.

Shears or Tinsmith's Snips

This tool does not play a very prominent part in the radio constructor's workshop but nevertheless it is necessary at times for cutting sheet metal of not more than 16 S.W.G. Improperly used shears can mutilate work and destroy the most placid temperament, in addition to giving the operator a severe pinch in the palm of the hand. As already indicated it is not policy to acquire a pair of less than 9in., as a pair of ordinary scissors will deal with quite heavy gauge foil.

Operation .- Hold the work firmly in the left hand supporting the remote end on the bench as necessary. Open the shears and apply to the correct marking on the work. Commence cutting, using the rear two-thirds of the blades. It will be noticed as the cut proceeds that the sheet on one side of the cut rises and that on the other side is depressed. Here considerable care must be taken to avoid skinning the knuckles on the sharp edges of the parted metal and also to avoid a permanent set or bend. If the cut is continued to the points of the blade they will come together with a snap and the palm of the hand may easily be pinched between the handles. At the same time hold the work and the shears as firmly as possible to avoid the metal being pinched between the blades-this will mutilate the job badly and make it difficult to start the cut again.

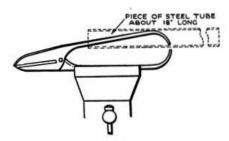


Fig. 1. Using Shears in a Vice.

A useful trick when cutting irregular shapes with shears is to grip one of the legs of the shears in the vice lengthwise (Fig. 1), place a piece of tube say 18in. long over the other and to operate by means of this tube. It will be found that the leverage achieved gives a remarkable control with little effort. It is obvious that care must be taken not to overstrain the tool.

Cutting Large Holes

A frequent requirement in radio construction is the cutting of holes up to 3½in. diameter in panels for meters, tuning drives, etc. Those skilled in the use of a fret-saw do this job in fine style by using metal-cutting saws, and this process is recommended as giving a clean and accurate solution. Others go the hard way by drilling a great number of holes round the periphery and afterwards cutting through with a chisel. This method must of course apply to non-circular holes.

Tank cutters. There is however a simple and inexpensive tool known as a tank-cutter (presumably used in plumbing for cutting holes in tanks, cisterns, etc.). When properly used this tool will cut holes up to the size mentioned, quite easily. It is used in a carpenter's brace, and the cutter arm is adjusted and locked by a set-screw, to cut the required diameter of hole. The usual variety has a ‡in. drill attached to cut an initial hole in which it rotates to form a bearing for the cutter arm. The tool is shown in Fig. 2.

To operate.—Put the cutter in the brace, having set the cutter arm (by measurement of radius to the centre-line of the drill) to give the correct size of hole, and locking it very securely by means of the set-screw. Drill a $\frac{3}{32}$ in. hole in the panel or chassis in the appropriate position and follow it with the $\frac{1}{4}$ in. drill in the cutter. Then, controlling the brace carefully, rotate it and lower it vertically so as to allow the cutter to come into contact with the metal. After the first circular scratch has been made, measure carefully to check the size. Afterwards proceed steadily, keeping the brace vertical and applying little more downward pressure than that provided by the weight of the brace.

When the cutter is about half-way through, reverse the work and start to cut from the other side. As soon as the cutter starts to break through, stop drilling and tap out the disc with light hammer blows following round from the break through. The hole should need little cleaning out but the sharp edges

should be eased with a half-round file.

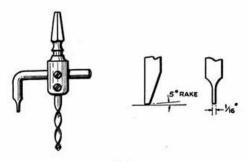
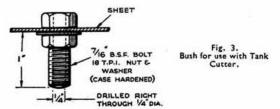


Fig. 2. (Left) Tank Cutter. (Right) Shape for cutter enlarged.

A simple bush (illustrated in Fig. 3) can be made up (and hardened) by any garage or workshop for a few shillings. It makes the use of the tank cutter very much simpler by providing a reasonable bearing for the ‡in. drill, instead of the mere hole in the chassis or panel.



Die Punches.—As already stated a luxury item for cutting holes up to 1½ in. diameter for valveholders etc. is a die-punch. Although much more expensive than a tank-cutter, it does produce professional results with remarkable ease. After all, the cutting of 12 or 14 valveholder cavities for a receiver chassis is a job of some magnitude with a tank-cutter, but with a die-punch, rather a pleasant experience.

A number are on the market, and one of the best which the writer has had the opportunity of trying out.* cuts 8 sizes of hole from §in. to 1½in. for the inclusive price of 26/-. It is a well designed tool and turns out splendid work.

Drilling Glass

As a tail-piece to the subject of "holes" here are a few tips for drilling glass, useful when bringing aerial leads or feeder lines into the shack. In general holes of \(\frac{1}{2} \) in. will suffice to take the centre bolt of a lead-through insulator and these can be drilled, with care, in a window pane in position.

In a window with small panes, if desired, one of these may be removed and drilled on the bench. Operation.—Obtain an old 3-cornered file of the requisite size and grind off the cuts on each face for a length of about 1½in.; bringing each face to meet in a very sharp point at the end. Heat in a gas flame to a bright cherry-red and plunge into cold water. Retouch again on the grinding wheel to give the sharpest point and the sharpest edges.

With this tool mark by hand the points where the holes are required on the window. Then on the outside, behind one mark, press a "cake" of soft putty or plasticine to a diameter of about 2in. and in. thick. Next put the tool in the brace firmly, with not more than 3in. projecting, and place the point carefully in the mark on the glass. Get someone to press firmly with the flat of the hand on the plasticine outside and commence to drill with minimum pressure and very steadily, lubricating the drill freely with turpentine applied by a wad of cotton wool. The glass should drill quite freely and emit a peculiar singing sound.

Very great care is necessary when the drill is just about to break through. When this stage is reached, cease drilling, and remove the cake of plasticine from the outside, replacing it on the inside. Repeat the drilling process, as before, from the outside until

a clean hole is achieved.

Extreme care and lack of haste are the supreme requirements, but there is nothing mysterious, or to fear, in drilling glass. If in any doubt, make a try-out on the bench with an odd piece of glass using the same technique. The secret is the damping out of vibration in the glass as in the old "gag" of cutting glass under water with scissors! Try it!

—Ten Minute Quiz=

A pot-pourri of questions for the radio amateur.

- In an audio frequency power amplifier what is known as the power efficiency?
- On what frequencies would you listen for WWV?
- 3. The input impedance of an EF54 at 60 Mc/s, is about 8,000 ohms. What happens to it at 144 Mc/s.?
- 4. If an S.1 signal indicates a receiver input of 0·5 μV. then, assuming the "S" meter is calibrated in 6 db. steps, what input would be indicated by an S.6 signal?
- indicated by an S.6 signal?

 5. How is the impedance of an open two wire transmission line calculated?
- 6. When is the next sunspot minimum due?
- 7. When drilling or cutting perspex what readily available lubricant can be used?
- 8. Is it permissible to tap an aerial or aerial feeder direct to the anode coil of a transmitter output stage?
- output stage?

 9. Which is "odd man out"—and why?
 VET. GD. ZB1. VS6. VU. VK6.

 10. What changes in the 7, 14 and 28 Mc/s. bands
- 10. What changes in the 7, 14 and 28 Mc/s. bands are contemplated in Region I under the Atlantic City plan?

Now turn to page 356 to discover if you have beaten the question-master.—H. E. B.

The March Quiz

Did you spot the errors in last month's Quiz? The current through a 230 V. 60 watt electric lamp is, of course, a few milliamps more than a quarter ampere (not less as stated). The answer to question (1)—calculation of bias resistors—was somewhat misleading as, strictly speaking, the formula given applies only to triodes. To cover all types, substitute mean cathode current in place of mean anode current. Full marks to G6JJ, BRS15332, and others for "beating" the question master.

The Speda cutter made by Speda Products, 106 Cleethorpe Road, Grimsby

rockholm story

N Wednesday, February 25, 1925, the Swedish National Amateur Radio Society was born. Twenty-five years later, to the day, Föreningen Sveriges Sändare Amatörer (S.S.A.)—to give it its full title-celebrated its Silver Jubilee with an impressive Amateur Radio Exhibition and banquet in Stockholm.

An invitation to the R.S.G.B. to participate in the celebration was accepted with cordiality by the Council who appointed the General Secretary (Mr. John Clarricoats, G6CL) and the writer as their delegates.

Outward Bound

No important incident occurred during our outward journey by Viking from Northolt although ice-hockey fans would, no doubt, have envied us, because from Kastrup (Denmark) to Bromma (Sweden) our travelling companions were the famous Canadian ice hockey team from Edmonton who were on a visit to Sweden to play a series of matches. Later in the month they won the World Championship.

W. H. Allen,* M.B.E.

Icing conditions between Kastrup and Bromma compelled the pilot to climb rather steeply with the result that we enjoyed the somewhat unusual experience of seeing the sun set twice on the same day-first at about 6,000 feet, and then shortly afterwards at 11,000 feet.

Flying in low over the City of a Thousand Lakes just after darkness had fallen we witnessed a scene of dazzling brilliance provided by what must surely be the most kaleidoscopic display of neon lighting in the world. Indeed a never-to-be-forgotten experience.

Our arrival in the Customs shed at Bromma was the signal for an outburst of shadow signalling from behind glass panelling. There awaiting us were representatives of the Council of S.S.A. as well as a number of other prominent Swedish amateurs. Salutations over we moved off to the City where accommodation had been booked for us at the Hotel Astoria on Vasagatan.

First Look Round

Our first evening in Stockholm was spent in the company of Karl Svenson, SM3ZF of Vigge, Ake Alseus, SM5OK (at that time S.S.A. QSL Manager), and Bengt Magnusson, SM5VL (V.H.F. Editor of QTC), who entertained us at the Restaurant Gillet. It was there that we experienced and enjoyed the world-famous Swedish Smörgasbord; it was there, too, that the Silver Jubilee banquet took place later in the week.

Later in the evening the party adjourned to the home of SM5OK where G6CL insisted on keeping us up late in order to hear the first results declared in the General Election-yes, we left England on

Polling Day!

On the morrow-although it was 2.30 a.m. before we finally got back to the Astoria-an opportunity was taken to visit the Radio Exhibition and to see something of the beauties of Stockholm, surely one of Europe's most lovely cities-under the guidance of SM3ZF and others. In the clear cold air and brilliant sunshine the Venice of the North was indeed an impressive sight.

W. H. Allen, M.B.E., 32 Earls Road, Tunbridge Wells, Kent.

I.A.R.U. Matters Discussed

Friday evening found the British delegates together with Mr. Bjorn Otzen, OZST (Vice-President of E.D.R.), guests of the President (Captain P.-A. Kinnman, SM5ZD) and other Council Members of S.S.A. at Berns Restaurant—famous in days gone by for its association with some of the great names in Swedish literature.

After dinner Mr. Clarricoats took the opportunity of raising the question of Scandinavian representation at the forthcoming I.A.R.U. Congress in Paris and amateur representation at the I.T.U. Conference in Buenos Aires in 1952. As a result of the discussion it was agreed that a meeting should be held on the following day between the representatives of Denmark, Norway and Great Britain and the Council of S.S.A.

During the subsequent meeting which was conducted in English, Mr. Clarricoats urged the importance of the Scandinavian Societies being represented at the Paris Congress. He also gave a brief account of how I.T.U. Conferences are conducted with particular reference to the one held in Atlantic City in 1947, at which Mr. S. K. Lewer and himself were present as the only two full time accredited I.A.R.U. Delegates.

Mr. Clarricoats urged, in the strongest terms, the vital necessity of close liaison between the Scandinavian amateur radio societies and their licensing

authorities, both officially and unofficially.

It was quite clear that a considerable impression had been made upon the meeting by the General The President of S.S.A. Secretary's remarks. agreed to refer to the matter and its implications at the Annual General Meeting to be held next day, and to discuss further with his Council the possibility of representation at the next Telecommunication Conference at Buenos Aires in 1952.

The Banquet

Members, their ladies, and distinguished guests sat down to dinner at Restaurant Gillet on the Saturday evening, some 250 strong. Cordially welcomed were a group of members from the Finnish National



Karl Svenson, SM3ZF, W. H. Allen, M.B.E., G2UJ, and John Lagercrantz, SM5SV.

Society (S.R.A.L.) who had just arrived from

Incidentally the true Scandinavian enjoys his food and sees no point in rushing through a good meal at break-neck speed just for the sake of getting the table clear. Instead, whether it be a friendly tête-à-tête between friends in a modest cafe, or a full scale banquet, time is taken between courses for drinks, talk and even a cigarette, with the result a meal which could easily become little more than a test of one's digestion develops into a pleasant social event and an end in itself.

Capt. Kinnman courteously delivered part of his opening speech in English, to which Mr. Clarricoats replied, conveying the good wishes of the Radio Society of Great Britain, and concluding by presenting to the President a pennant made specially for the occasion by Miss Hazel Lightfoot, of Headquarters Staff, as a token of the friendship which exists between R.S.G.B. and S.S.A.

There followed speeches by Mr. H. Sterky (Director-General of the Swedish State Telegraphs), Mr. E. Marguesson (Chief of the Radio Department), and the Director of the Science Museum, by whose courtesy the Amateur Radio Exhibition was being held. The last speaker disdained the use of the P.A. and delivered his speech by unaided personal audio to the evident amusement of those present!

Following the dinner, commemorative medals (which in S.S.A. take the place of trophies) were presented to each of the foreign delegations and to those members who had won them in competitions or in recognition of their services to the Society.

Dancing commenced at I a.m.!

When the proceedings finally terminated in the early hours of Sunday morning, those who had been present felt that they had participated in one of the most important events in the annals of Swedish Amateur Radio.

S.S.A. A.G.M. and a Surprise

The Annual General Meeting of S.S.A. took place on the Sunday and, in view of the extensive agenda, remained in continuous session for nearly six hours!

During the afternoon Mr. Clarricoats was granted the privilege of addressing the Assembly on the subject of International Conferences, pleading for the support of S.S.A. at the Paris I.A.R.U. Congress in May. The evident sincerity of his appeal so stirred those present that immediately he sat down a resolution was adopted unanimously to increase the annual subscription forthwith from 15 kroners (21s.) to 20 kroners (27s. 6d.); part of the money thus obtained to be devoted to I.A.R.U. purposes.

The Radio Exhibition

The Amateur Radio Exhibition was staged in the Stockholm Science Museum, and in its conception and execution reflected great credit on all concerned.

Part of the display traced the evolution of Amateur Radio from the earliest times up to the present day, and included many interesting examples of transmitters, receivers and valves made during the past three decades. The main hall was reminiscent of our own exhibition at the Royal Hotel, but on a somewhat smaller scale, and comprised apparatus and components of Swedish, British and American origin together with some examples of Swedish Service and Police communication systems and of aeronautical radio apparatus.

Four amateur stations occupied part of the third hall, and were the source of considerable interest to the many visitors. Operation was on 7, 14, 28 and 144 Mc/s., and many local and world-wide contacts were made during the period of the exhibition. The transmitters concerned showed evidence of excellent workmanship, and the "score-board," which took the

shape of a map of the world upon which each contact was marked with a coloured disc denoting the frequency employed, yielded ample proof of their effectiveness. The ability to erect efficient aerial arrays on the roof of the building no doubt contributed in no small measure in this respect.

The receivers employed were commercial models except for those used on the two higher frequency bands, and included a well-known double superhet of British manufacture. The home-constructed double superhet for 28 Mc/s., and the C.C. converter used in conjunction with it for 144 Mc/s, exhibited skill in design and construction of which any amateur

might be justly proud.

An exhibit which excited much interest was the last word in "haywire"—a transmitter built during a field day last year when several amateurs were cast away" on an island with a minimum of radio components but a good supply of corks, 3 in. nails and bare copper wire. Their instructions were to get in communication with the mainland, and although their efforts looked like a radio designer's delirium, there was the evidence of the log (inscribed on a plank of wood!) that several contacts did in fact take place.

The remainder of the apparatus on view included 2 metre transmitters and converters, a half kilowatt P.A. stage for SM5SSA, the H.Q. station and a television display working on closed circuit. As there is no public T.V. service yet operating in Sweden, and bearing in mind that the "legal" amateur limit is 500 watts, it is to be hoped that our SM friends appreciate their present good fortune!

S.S.A. Headquarters

Just before returning to England G6CL and the writer visited S.S.A. Headquarters in Sturegatan, where the routine work of the Society is in the very capable hands of Miss Sylvia Fabiansson. Incidentally Sylvia first became interested in Amateur Radio as the result of spending nine months recently in England where she stayed in the home of David Watkins, G3BGX. On returning to Stockholm she heard S.S.A. required an Assistant Secretary—she applied and got the job! Sylvia and her colleague speak excellent English, as do practically all the members of S.S.A. it was our good fortune to meet.

Finale

A pleasant evening was spent as guests of Capt. Kinnman at his home just outside Stockholm where an opportunity was taken of going on the air for a short time from his very neatly arranged and efficient station.

Contact was made by the writer with some of the V.H.F. fraternity, notably SM5VL, who has kept us informed from time to time of happenings of V.H.F. moment in his country, and it was interesting to compare at his station the trend of design and construction methods in Sweden.

In concluding this account we should like to say "thank you" to all our Scandinavian friends who did so much for our comfort and enjoyment during our short stay, and to express the wish that this visit may presage others destined to further the interests of International Amateur Radio.

MENTION THE BULLETIN

WHEN WRITING TO ADVERTISERS-IT HELPS THEM AND IT HELPS YOU

INTERNATIONAL DISTRESS PROCEDURE

By ANGUS D. TAYLOR (G8PG)*

Relatively few amateurs have had first-hand experience of dealing with distress traffic. Therefore in view of recent developments, these notes on international distress procedure should prove to be of general interest. They have been contributed by an experienced commercial operator who has handled many emergency calls from ships and aircraft.

THE editorial in the March issue of the BULLETIN stressed the opportunity now open to British amateurs to assist in aircraft distress working, and on the importance of ALL amateurs making sure that they are in a position to recognise and copy distress signals, whether made by W/T or R/T. As the radio amateur is in the unique position of being the only operator recognised by the G.P.O. whose qualifications do not include a thorough examination in international distress procedure, it is thought that some notes on this subject and on the action to take if a distress message is received may be of interest to those who are not familiar with this important branch of radio communication.

The Distress and Urgency Signals

The two signals normally used in cases of emergency are the distress and urgency signals. The distress signal, for W/T working, consists of the Morse symbols SOS sent as one group and repeated three times. This signal takes precedence over all other wireless signals, and any station hearing it must suspend working, copy any message following the distress call, and, if no other station is heard to establish communication with the station in distress, either establish communication or, if this is not possible, report the matter to the authorities. The telephony equivalent of SOS is the expression MAYDAY (contracted from the French MAIDER—"Help Me") repeated three times. This signal carries exactly the same priority as SOS.

The urgency signal consists of either the Morse group XXX repeated three times, or the word PAN repeated three times. This signal is next in priority to the distress signal. It is normally used where a vessel or aircraft, not itself in distress, sees another vessel or aircraft in difficulties; where a vessel or aircraft is in difficulties but there is no immediate danger to human life; or where urgent medical assistance is required. Messages in the first category are often of

particular importance.

It is interesting to note that the regulations emphasise that distress messages should normally be transmitted at a speed not exceeding 16 w.p.m.

Examples of Distress Signals

When an emergency occurs in an aircraft, time is usually a limiting factor, therefore the distress message is likely to be short, and may only be broadcast once. Where time allows the full procedure to be used a typical call and message would be as shown below:—SOS SOS SOS DE (or V) GABCD GABCD GABCD—(TWENTY SECOND DASH)—GABCD Followed by:—

(Civil Aircraft) SOS SOS SOS DE GABCD GABCD GABCD QTH 5123N 1214W ON FIRE DITCHING K

(Service Aircraft) SOS SOS SOS V GABCD GABCD GABCD QTH 10 MILES NE SWINDON LANCASTER ENGINES FAILED FORCED LANDING 1630Z K

The twenty second dash is for direction finding purposes and it will be noted that the position may be either in latitude and longitude or in bearing and distance from a known place. If time is short only the second message will be transmitted.

In marine distress cases there is usually more time available, and the original message will be broadcast until it is acknowledged, after which messages giving any change in the situation will be broadcast. Typical distress messages from ships would read as follows:—

By W/T:—SOS SOS SOS DE GBBC GBBC GBBC 2213N 3816W "ISLANDER" FIRE IN NUMBER 1 HOLD REQUIRE IMME-

DIATE ASSISTANCE K

By R/T:—MAYDAY MAYDAY MAYDAY COASTSHIP CALLING COASTSHIP CALLING POSITION 3 MILES TEN DEGREES FROM BLACKROCK LIGHTHOUSE. AGROUND IN HEAVY SEA AND REQUIRE IMMEDIATE ASSISTANCE.

It will be noted that the name of the ship in distress is always included in these messages.

How to Report

Our 1.8 Mc/s. band is at present shared with shipping, while aircraft distress calls may be heard on 3.5 or 7 Mc/s. when one least expects it. On the receipt of such a message, assuming that no other station has been heard to acknowledge, the next question is how to report the matter to the appropriate authorities in order that the very highly organised rescue service may be set in motion with the least possible delay. The first point is to make sure that your report contains every detail that can possibly be of help. Besides the distress message, give the date and time of receipt, frequency, method of transmission, strength of signals and any other relevant information i.e. transmitter operating intermittently, message broke off suddenly, etc.

All messages relating to AIRCRAFT distress should be immediately reported to the nearest Police Station. For MARINE distress, there are three possible reporting channels. If you live in the vicinity of a Post Office Coast Station, report by telephone direct to the station concerned. As a guide, these stations are located at Lands End, Burnham-on-Sea (Somerset), Seaforth (Liverpool), Portpatrick (Wigtownshire), Wick, Stonehaven, Cullercoats (Newcastle-on-Tyne), Mablethorpe (Lincs.), North Foreland (Thames Estuary) and Niton (I.O.W.). The telephone number of the station will be found in the directory for the appropriate area. Should there be no P.O. station in the area, but it is a coastal district, the message should be telephoned to the nearest Coast Guard station. In any area where there are neither of these agencies available, the message should be passed to the Police who will take the necessary action.

Obviously, where other stations are heard to acknowledge the message there is nothing to do but hold a watching brief and to avoid the transmission of any signals which could cause interference. If there is the least doubt about the message having been received, however, then REPORT IT IMMEDIATELY. More than one amateur in this country has been instrumental in saving lives by doing this. From personal experience, it can be stated that any distress report from an amateur station receives immediate and thorough investigation by the authorities concerned.

^{. 37} Pickerill Road, Greasby, Cheshire.

THE MONTH ON THE AIR

By ARTHUR MILNE (G2MI)*

"Spread a little happiness"

THE old musical comedy line came back to mind recently in connection with the rather vexed question of listener cards. Is it lack of courtesy or impatience (the old fashioned word is selfishness) which causes so many amateurs to treat their "lesser"—although sometimes better qualified technically—brethren with such contempt?

If we can give a fellow pleasure by sending him our card, surely it is a small thing to ask. If many ask, then are we not privileged by being able to give even more pleasure to others? There are far too many amongst us who are quite content to pocket a man's reply coupon but are "too busy"

to send him the card for which he asks.

Ordinary mortals seldom have the chance to affect more than their own immediate circle with their churlishness, we, who send our words far and wide, can advertise our ill-manners to all the world, or we can take just a few small moments off and "spread a little happiness." The man we work may or may not want our card; but the listener who writes for one must, otherwise why should he ask?

Thought for the Month

A QSL without details of date, time, frequency and mode of transmission is like a blank cheque without a signature.

Top Band

Details of his top-band activities have reached us from HZ1KE. On March 5 WWV was copied on 2.5 Mc/s. at S3, 0120 G.M.T. Two unidentified G stations were heard in contact on 1,780 kc/s. at 0150, one being a G2. HZ1KE called CQ off and on until 0200 and heard several unidentified stations calling him. Then came GM2H1K at 229 for the first QSO. This was at 0320 G.M.T. He gave HZ1KE 569. This was followed by contact with GD3UB who was 239 and gave 569. Many more stations could have been worked if they had refrained from calling on HZ1KE's frequency of 1844 kc/s. which was close to GLV despite repeated requests to "look L.F." A further contact was made with GM2HIK but dawn had broken in HZ and signals faded out at 0330 G.M.T. The equipment used at HZ1KE consisted of 6V6 C.O. 807 Buffer and 814 P.A. giving 50 watts input to an §th wave vertical with §th wave capacity top loading. Receiver was an S640.

G3PU (Weymouth) who has now worked W1 2, 3, 4 and VE1 on 1.8 Mc/s. reports an interesting contact with W2WFZ, Goshen, N.J. The American station was using a Top Band 3-element array supported by weather balloons. Signals peaked to kS. 589 between 0600 and 0700 G.M.T. W2WFZ will be carrying out tests on the band every Sunday morning until the end of April between 0100-0700 G.M.T.: replies should preferably be made between 1750-1800 kc/s. or 1825-1875 kc/s. Reception reports will also be welcomed providing that sufficient identification and

signal details are given. W2WFZ's frequency is $1810 \cdot 8 \text{ kc/s}$.

By the way the station referred to in the March issue as having got across the Atlantic on top-band should have been G5JU and not G5JO. Our apologies to both members for this misprint.

ZB1AR has worked a number of G's (mostly on March 12) between 0200 and 0500 G.M.T. G6AB has heard OE1AC and worked HB1CM. He needs Hereford and Westmorland for Worked all Counties.

On March 25 G2AOL, G6AB and GM3ATV worked UB5BK in Lwow at 2235 G.M.T. so keep

your ears open top banders!

What support would there be for a Worked all Counties certificate? Personally we should hate to see modern hunting tactics rampant on our one remaining civilised band!

Notes and News

CR5AM, (T6) worked by G6RH is in a different country from CR5UP. FB8AX is in Adelieland Antirctica. BR3 has had his card from EA9BB for 7 Mc/s. He recently heard G8OO calling W4OOO! Oh! EP3L has stated over the air that he is sending a log of contacts to R.S.G.B. ZD6JL is J. Lynn, c/o. P.O. Blantyre, Nyasaland. AC4RF heard G2PU, 55 at 0130 on Nov. 1 1949 and G2DPZ 56 at 0105 on Oct. 30—both on 7 Mc/s. 'phone.

GM3DHD has worked all States in one week under a year and has all the cards. Input 30 watts to an 807 into a folded dipole. He has also worked 100 countries and 33 zones. He draws attention to the YL-WAS offered to anyone proving contact with a YL operated station in each of the 48 States

of U.S.A.

BRS17991 wonders who is S9CC, heard on 28 Mc/s. G5MV sends the following list of "pirates":—AC4AK, FMISS, FR8LI, FY8R, HKINR, ON4WA, KP4AI, LZ1AA, OA4CJ, OY3BS, SUIST, YU7CL, YV1AI, ZA3BB and ZS4UH.

ZB2J reports that ZB2A, B, D, E, F, G and H are now QRT. G2BJY records FF8JC, P.O. Box 209, Dakar, 28 Mc/s. C.W. at 1030 G.M.T. and YU1AA, Box 48, Belgrade, 28 Mc/s. C.W. at 1130 G.M.T. ZC6jZ is now QRT; his station has been taken over by ZC6JM; QSL via R.S.G.B. Cards to ZC6JZ can go via the Bureau. G3CHP is now ZE3JJ. The Heard Is. expedition has now been relieved, so cards should be coming through soon. New calls are VK1HV and VK1WG.

G6XS has 99 countries confirmed and needs only another 14 more prefix zones on 14 Mc/s. for EDX. With an input of 35 watts this is pretty good going.

He has heard CR10AA on 14120 kc/s.

The new operator at VPSAP on Signy Island will be David Duke, G3DDV. He will be there for two years and will QSL—but have patience please! W5QL says VPSAM will also QSL.

BRS14675 has hooked PK4DA for a nice one on 28. BRS9661 says VESCR (G. J. Gray. Box 422, White House, Yukon) would specially like to contact stations in Bournemouth.

Most of us seem to work vast numbers of W's; G6OY collects ZS's instead! So far'he has worked 303 separate calls in 600 QSO's, but still needs a ZSS. VS9AL is on his way home; VS9AA and AH are still in Aden. G3WH, whose call is being pirated on 3.5 and 7 Mc/s. works only 28 Mc/s. 'phone. He recently had a spot of leave and added MP4BAB, BAO, CR5UP, HPIGR, YV4VN, VP5FR, HZ1AB, TA3FAS and another dozen or so new ones to his list.

 ²⁹ Kechill Gardens, Hayes, Bromley, Kent.

AP5B has been on 3.5 and 7 but complains of stations calling him zero beat. MP4BAD has shown us a card from AP2Y but the Pakistan Bureau says he is a pirate, so what? 'BAD will QSL all BRS, and SWL reports. Present QTH, 6 Alder Lane, Hollins, Oldham, Lanes.

W3JTC tells the sad story of DL4ND who, after driving nearly 1,000 miles and all set to go on the air in Monaco, found he lacked one signature on his authorisation papers! He hopes to try again later

in the year with a few signatures to spare.

MD4TH sends some news on Somalia. VQ4AR came up from Kenya and is now MD4AR using 100 watts. MD4GC is back in G. MD4TH will shortly be going to Kenya. BRS7594 says Americans in Austria are now being issued with OE13 calls. HC2JR will be operating from April 20 as HC8GRC on the Galapagos Is.—28450 kc/s. 'phone. PK4DA says QSL via Box 222, Soeralaya, Java. He QSL's. SV0AJ has left for home.

Never despair, BRS10663 has just had a card from

VR6AB

VS6AX who is on 7010-7020 kc/s, daily from 1620 G.M.T., hears plenty of G stations working one another.



Blurb No. 4

Tibet

Writing on January 24, AC4RF says conditions for G have been very poor. He also comments on the impatience of some of those needing his card. Some people, he says, seem to think there are two direct air mails to London daily! He received no fewer than five cards from one G station, all complaining that his card had not yet arrived, when in fact it was already on the way. The VP8's—few of whom have more than one mail annually—have made a similar complaint.

Talking of AC4, we recently overheard what seemed very much like an attempt to get a card from an AC4 for a contact which did not take place. A certain G so badly wanted a card from AC4 that another station who relayed his remarks undertook to get him a card although no direct QSO took place. What satisfaction can such a card give to anyone? In any case the AC4 concerned is not likely to fall for such subterfuge!

Spotlight on...

KEEPING THE LOG

THE following G.P.O. recommendations for log-keeping at all U.K. amateur stations should be studied carefully. Remember, it is the duty of Station Inspectors to report any failure to maintain an accurate and up-to-date record of transmissions.

- A record must be kept of the date, time, frequency and type of emission of every call made from the station, whether answered or not.
- The time of beginning and ending a contact must always be entered.
- The log book must not be of the loose-leaf type. Log entries must be made at the time of transmission, or immediately following the end of the call or contact; gaps must not be left between entries.
- No objection will be made to the entry of any additional information, to suit the individual requirements of the amateur concerned.

It Smells

Our attention has been drawn to the activities of an amateur who gives reports completely at variance with those from all other sources. Having thoroughly unsettled the recipient of same, he then sends by post printed details of equipment which he markets and which he claims will cure the trouble. We shall be glad to hear from anyone having experience of this sort of thing so that appropriate action can be taken.

Two Call Club

Among the "emigrants" and Forces personnel, we notice that a number have held two or more calls. The above club has been formed to band them together. A list of new members and notes will be circulated to members every six months and a QTH service will be available on receipt of a stamped addressed envelope. The Club is open only to British subjects. If you have held a G and an overseas call write to G. V. Haylock, G2DHV, 63 Lewisham Hill, S.E.13, for details.

Can You Help

OZ3WP wants the present QTH of D2IN now believed to be back in this country.

OUR FRONT COVER

THE front cover illustration depicts a set of modern "AVO" testgear being used to measure the "Q" of the secondary winding of the second I.F. transformer on a chassis of unknown characteristics.

A signal of predetermined frequency from the "AVO" Wide Range Signal Generator is being fed into the Electronic Test Unit where it is amplified and fed to the secondary winding of the transformer. The Electronic Testmeter is connected across the tuned circuit under test and from the readings obtained and the controls of the Electronic Test Unit, the "Q" of the receiver circuit can be determined.

The three instruments, shown as a team, cover a very wide field of measurement and form between them a complete set of laboratory testgear, ruggedly constructed to withstand hard usage.



N recording each month the V.H.F. activities of our members, the tendency is for these notes to become little more than a chronicle of current and past events rather than a source of information for those about to start operation on the V.H.F. bands. So at the risk of boring our more seasoned contributors it is proposed to deal from time to time with different aspects of V.H.F. work from the point of view of the newcomer, starting this month with some brief notes on aerials.

V.H.F. Aerials

There is no "best" aerial; whereas one type may be superior to another for certain applications, it may be inferior for general working. No one aerial has been found to be outstanding above all others, with the result that each type has its own adherents. Generally speaking, multi-element beams may be divided into two classes; the Yagi, and the Stacked The Yagi aerial consists of a radiating element, one or more reflectors and one or more directors. The polar diagram can be made very sharp indeed in the horizontal plane, and provided the length and spacing of the various elements are optimum the results will be according to theory. Adjustment is, however, difficult, inasmuch as variations of element length and spacing are interreactive, which fact is borne out by the quite widely differing dimensions for Yagi beams which have appeared in the technical press from time to time. The addition of parasitic elements to a dipole reduces the feed impedance, making matching more critical and reducing the band width of the aerial system. This can be offset to some extent by employing more than one conductor in the dipole itself-"folded dipoles"—but this leads to additional complications: considerable patience and experience are thus required to achieve first rate results. In addition rotation controllable from the operating position is almost essential for satisfactory band searching in view of the sharpness of the horizontal polar diagram.

The alternative type of aerial suitable for V.H.F. operation is the stacked array, an excellent example of which was described in the September, 1949 issue of the Bulletin. Here the aim is to obtain a sharp beam in a vertical direction (not to be confused with vertical polarisation), with a much broader horizontal coverage. The array will also be bi-directional unless reflecting elements or a reflecting screen are incorporated. Due to its much higher feed impedance, matching is facilitated and the band-width is much greater than that of a Yagi of similar forward gain. In its bi-directional form rather less than 180 deg. rotation is required, against a full circle sweep for the Yagi. Where rotation is impossible two similar arrays mounted at right angles, and arranged so that the feeder from either may be connected to the receiver and transmitter, will be found to give excellent all-round coverage.

Summing up, the Yagi, when expertly adjusted, is excellent for point-to-point work on a narrow

band of frequencies, while the stacked array will be more handy when signals are to be expected from random directions, and at the same time is easier to feed and adjust.

The Two Metre Band

February, apart from the 22nd, showed a great deterioration as compared with the previous month, according to the observations of G3EHY (Banwell, Som.). From the late evening of March 5 conditions became quite good and continued so for the next eight days or so. This spell appeared, as usual, to be dependant upon a high barometer reading of around 30 in. and high day and night temperatures. Further to point the connection between two metre propagation and weather it was noticeable that on the 18th, when the barometer fell to below 29 in. with gales and lower evening temperatures, only weak signals were heard and no contacts were made. G3EHY has now completed twelve months of almost daily activity on the band, and is of the opinion that autumn and winter operation is most definitely worthwhile. Conditions were often in every way the equal and sometimes better than those ruling in the summer months. Listener reports have proved that on many occasions when no contacts were obtainable due to lack of activity the band was, in fact, in good shape.

G2CPL (Lowestoft) is also celebrating twelve months on the band, his record of activity being on a par with that of the Somerset station: his conclusions are much the same. Conditions on the East Coast were particularly good over the period March 5-7, and on the 6th. GW2ADZ was worked at RST589. Other contacts made during the month included G3FIJ, VM, 4DC, 5MI, 6WU and 8QR. The main interest at 2CPL is the collection of data on conditions by means of long-term daily skeds. Work is also in hand for a partial rebuild of the station. A new receiver has now been completed: the lineup is 6J6 R.F.; push-pull EF91's in the second R.F. and mixer stages; and an oscillator operating 10 Mc/s. on the low frequency side of the signal. All circuits are gang tuned by split-stator condensers. The performance is far superior to the previous converter which employed the R.F. and I.F. stages of an SCR 522 receiver modified for variable tuning. The 150 watt P.A. stage in the transmitter will include a pair of HK257B's driven from the existing transmitter. All this, together with the intention to raise the aerial from 46 to 60 feet above ground should do much to make 'CPL even more successful in the ensuing twelve months.

Those interested in adding to their "bag" of counties will be interested to know that G2FNW is now active in Melton Mowbray, Leicestershire, nightly from 2200 on 144.45 or 145.12 Mc/s. He tells us that he will be carrying out tests with G3ALC in Oakham, Rutland shortly, so a contact with either could well lead to two new counties at one go! 'FNW, using a 4-element Yagi indoors, finds that the strongest southern stations are G3FXG, 6VX and 8TB. He expresses the view that

there too many skeds, are kept with the result that there is little chance of the odd contact.

G2ANT (Godalming), is situated in an unfortunate V.H.F. location with bad screening in the immediate vicinity with one gap to the N.N.E. through which all signals from West London, Bucks and Essex appear to come irrespective of their true direction. The equipment includes a 16-element stacked array of 8 half-wave radiators backed by reflectors 32 ft. off the ground, a transmitter built according to the design of G2NH which appeared in the August 1948 BULLETIN employing an 832 in the final with an input of 24 watts, and a C.C. converter with 6AK5's in both R.F. and mixer stages feeding an Eddystone 640 at 28 Mc/s. The best result so far has been a contact with G2XS (King's Lynn).

The Region 12 Newsletter reports that OY2RD in the Faroe Islands is listening every Sunday afternoon between 1600-1700 G.M.T. for U.K. 144 Mc/s. transmissions. He hopes to have a transmitter operating on the band shortly.

Operating Times

A suggestion has been made that during periods of low activity on the 2 metre and 70 cm. bands active stations should radiate calls at the hour and half hour so that other operators and listeners would know when to expect what activity there might be. Comments are invited.

Two Metre Contests

The Short Wave News announce a novel contest which they are arranging for the week-end April 22–23. The idea is unusual in as much as success will not depend upon points, the winner being decided upon the merit of his entry, taking into consideration the situation of his station, the height and type of aerial, transmitter and receiver employed, and the power input. Only one contact will be allowed with each station worked and no skeds, may be arranged prior to the contest. Operating times will be from 0800 clock time on Saturday April 22 to midnight on the following day. An exchange of consecutive serial numbers followed by the RS1' report and Q1'H will constitute a contact. Further details may be obtained from the organisers at 57 Maida Vale, Paddington, London, W.9.

Don't forget the R.S.G.B. contest on May 6-7, rules appear elsewhere in this issue.

Two Metres in Europe

Several Swedish stations intend using high power transmitters of between 250 and 500 watts input with high gain aerial arrays during the summer months. During recent discussions in Stockholm it was made clear to the writer that although there are only a comparatively small number of V.H.F. stations in Sweden, technical ability and enthusiasm will make them valuable colleagues—as well as formidable competitors for European DX records! It is hoped next month to give the call-signs, frequencies and times of operation of several stations anxious to Already G6UH (Hayes, contact this country. Mildlesex) has expressed his willingness to take part in any tests which may be arranged, and offers from other British stations will be welcomed. In view of the number of 144 Mc/s. DL stations, as mentioned last month, we would suggest that combined G/DL/ SM tests would be well worth while. The reactions of amateurs in Germany to this proposal would be

Seventy Centimetres

G2WS would like to see published full details of the geographical and climatic conditions under which long distance contacts on this band are made, as he feels that such information would be of assistance to other workers in forming some opinion of their own achievements. The South London V.H.F. Group will, it is understood, be giving a demonstration of modern 70 cm. apparatus at the London O.R.M. on May 14. This group has been working very hard for a long time on the development of high efficiency apparatus for this band. Having seen some of the gear we can vouch for the interest which such a demonstration will hold for the U.H.F. enthusiasts who attend.

Schedules

Mondays, 2000 hours. G3EIW (Plumstead, S.E.18) on 436 Me/s. approx. beaming north to G2BRH (Hford).

Mondays 2330 hours. G2BRH and 8TL (Ilford) and 3EIW on 436 Mc/s. approx. (crystal controlled). Fridays, 2000 hours. G3EIW beaming N.E. to G2FNL.

G3EIW is willing to arrange schedules with anyone on 70 cm. or cross-band.

All members mentioned above are cordially thanked for their letters; the closing date for notes for publication in the May issue will be April 24.

SUMMER IS COMING - - -

identify yourself in your travels

with a

CALL-SIGN BADGE

Five Characters 5/ADDITIONAL CHARACTERS 6d. each



Five Characters 5/R.S.G.B. SALES DEPT

Worked All America

THE March issue of the BULLETIN contained details of the "Worked All Africa" award instituted by the S.A.R.L. Now comes news of another W.A.A.—"Worked All America"—certificate to be introduced by the Brazilian Society, L.A.B.R.E. The similarity of initials seems likely to lead to much confusion and it is to be hoped that the societies concerned will find some way of overcoming this difficulty.

The W.A.A. (Mark II ?) requires confirmation of two-way contacts with amateur stations working in the authorised bands, or with other stations authorised to work amateurs (contacts with ships or aircraft will not be credited) in 45 or more different countries in the American area. Cards must be forwarded direct, by registered post, to L.A.B.R.E. Headquarters, P.O. Box 2353, Rio de Janeiro, Brazil, South America together with a list of claimed countries and sufficient return postage. Only contacts made after November 1945 with a minimum readability report of 3 and a tone report of 8 will be credited. All confirmations must be submitted exactly as received. According to the current A.R.R.L. Countries List, there are 57 countries comprising the American area (North and South America).

T.V.I.

TRANSMITTER INTERFERENCE

Price 1/6 post free

IT'S TOPICAL

Festival of Britain

THE Council has been considering for some time the possibility of operating an Amateur Radio station at the South Bank Exhibition during the 1951 Festival of Britain, but after protracted discussions and much correspondence with the Festival authorities on the question of manning the station, they have, with much regret, had to abandon the idea.

After being advised that the Exhibition would be open for 12 hours a day, for 7 days a week, for 6 months (May to October), the Council decided after careful consideration that they could not guarantee to man the station, over such a long period of time, for more than four hours a day from Monday to Friday each week. This decision was communicated to the authorities together with the information that it was hoped to keep the station in operation for 8 to 12 hours a day at weekends.

The Council realised that their offer might not be acceptable to the authorities but on the other hand they did not feel justified in guaranteeing that a large number of members would definitely be available for weekday duty at the Exhibition during the summer and autumn of 1951. The Council also had to keep in mind that only holders of 150-watt licences would be allowed to operate the station and that at least two operators would have to be on duty together.

After receiving the views of the Council, the Festival authorities decided that they could not afford to allocate space for the station in the Dome of Discovery—the projected site—unless a minimum operating period of six hours a day from Monday to Friday each week could be guaranteed.

The Council again considered the matter but finally decided that they could not commit the membership to these extensive requirements.

The possibility of employing paid operators was discussed but rejected on the ground that heavy expenditure would be involved in addition to being contrary to the best interests of the Amateur Radio movement.

The technical problem of providing the equipment had been solved, although some doubt remained about the successful operation of the station with aerials connected through hundreds of yards of underground cables and with the numerous sources of radio interference which included ionosphere recording equipment adjacent to the projected station.

The membership will share the Council's regret that it has not been found possible to have Amateur Radio represented at the Festival.

American Standard Frequency Transmissions

As a number of changes and extensions have been made recently in the services of the U.S. Bureau of Standards stations WWV and WWVH, members may like to note the latest schedule of transmissions which is set out below. Incidentally, WWVH (Hawaii), has frequently been heard in the United Kingdom by amateurs.

Radio Frequencies and Locations.

Station WWV (near Washington, D.C.) broadcasts continuously, night and day, on standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc/s.

Station WWVH (near Puunene, Hawaii) broadcasts on standard radio frequencies of 5, 10 and 15 Mc/s. Entire broadcast is interrupted for 4 minutes following each hour and half hour and for periods of 40 minutes beginning at 0700 and 1900 G.M.T. Audio Frequencies and Musical Pitch.

Two standard audio frequencies, 440 c/s. and 600 c/s. are broadcast on all radio carrier frequencies except 30 and 35 Mc/s. The audio frequencies are

given alternately, starting with 600 c/s. on the hour for four minutes, interrupted one minute, followed by 440 c/s. for four minutes, and interrupted one minute. The 440 c/s. is the standard musical pitch, A above middle C.

Time Signals.

The audio frequencies are interrupted for intervals of precisely one minute. They are resumed precisely on the hour and each five minutes thereafter. Universal Time (Greenwich Mean Time) is announced in telegraphic code each five minutes starting with 0000 at midnight. Time announcements are with reference to return of the audio frequencies. A voice announcement of Eastern Standard Time follows each telegraphic code announcement from station WWV. There is a pulse on each carrier frequency of 0 005-second duration which occurs at intervals of precisely one second and is heard as a faint tick when listening to the broadcast.

Accuracy.

Frequencies as transmitted from WWV and WWVH are accurate to within 2 parts in 10⁸. Time intervals, as transmitted, are accurate within ± (2 parts in 10⁸ + 1 micro-second). Frequencies received are as accurate as those transmitted for several hours per day during total light or total darkness over the transmission path at locations in the service range. During the course of the day errors in the received frequencies vary approximately -3 to +3 parts in 10⁷. During ionospheric storms transient conditions in the propagating medium may cause momentary changes as large as 1 part in 10⁶. Time intervals as received are normally accurate within ± (2 parts in 10⁸ + 1 millisecond). Transient conditions in the ionosphere at times cause received pulses to scatter by several milliseconds. Propagation Disturbance Warnings.

An announcement of radio propagation conditions is broadcast from WWV in code on each of the standard radio frequencies at nineteen and fortynine minutes past the hour. If a warning is in effect, the letter "W" (in International Morse Code) is repeated 6 times following the time announcement; if unstable conditions are expected, the letter "U" is repeated 6 times; if there is no warning, the letter "N" is repeated 8 times.

Television Plans for Scotland

THE B.B.C. is to build a high-power television station at Kirk o'Shotts near Harthill, where a site has been chosen and tested. Later on it is intended to build a lower-power television station in Aberdeenshire. High-power transmitting equipment has already been ordered for the Kirk o'Shotts station which will serve Central Scotland. This station should be ready for service about the end of 1951, but progress will depend very largely on weather conditions during the constructional period and upon the delivery by manufacturers of the necessary plant.

The Copenhagen Plan

THE B.B.C. announces that observations made at its frequency measuring station at Tatsfield show that more than 400 long and medium-wave broadcasting stations in the European area were re-tuned to new frequencies on March 15, in most cases with a high degree of accuracy. Departures from the original plan include Andorra, Luxembourg, the American Zone of Germany, Istanbul, as well as Spain whose government, not being a member of the United Nations, did not participate in the drawing up of the Copenhagen Plan. Early results suggest that the Plan may fulfil its object of arresting the steady deterioration in listening conditions in Europe which has been evident in recent years.

S.S.A. 25th Anniversary Celebrations

•HE following letter addressed to the Council has been received from Capt. P.-A. Kinnman, SM5ZD, President of S.S.A.

"It was with great pleasure we heard that your General Secretary (Mr. John Clarricoats) and V.H.F. Editor (Mr. Bert Allen) would attend the 25th anniversary celebrations of S.S.A.

"Now, when the celebrations are over, we note, that their attendance made the festivities to a great

success.

"Mr. Clarricoats has before the Council of S.S.A. and before the annual meeting in plain terms declared the imperative for the Scandinavian countries to be represented at the Paris I.A.R.U. and Buenos Aires I.T.U. conferences. LA, OH and OZ representatives were also present at those meetings. Due to those declarations it was easy for the Council of S.S.A. to carry through the proposed increase in the annual charge. The meeting actually allowed another 10 per cent. increase.

"With this letter we thank the Council of R.S.G.B. for its courtesy and hope that the collaboration between our Societies even in the future will be continued in the same good spirit, to benefit of the

radio amateurs of Region I.

London Members' Luncheon Club

 HIRTY-ONE members were present when the inaugural meeting of the London Members' Luncheon Club was held at the Kingsley Hotel, Bloomsbury Way, W.C.1, on Tuesday, March 14, 1950. The decision to form the Club as an independent association of members for the purpose of meeting monthly for an informal rag-chew, luncheon and a short talk was carried enthusiastically.

In accepting the office of Chairman, Mr. Kenneth Alford, G2DX, stressed his belief that the best traditions of the Amateur Radio movement were based on personal as well as "on the air" contacts. Other officers elected were : Secretary, Mr. W. E. F. Corsham, G2UV, and Treasurer, Mr. D. C. Jardine, G5DJ. Accommodation is available for approximately 50 members and any who are interested should write to Mr. Corsham at 143 Abbots Drive, Wembley, Middlesex.

> Ontario Phone Club Food Parcels for U.K. amateurs

OR some time past the Ontario Phone Club has been sending either food parcels or vouchers to radio amateurs in the United Kingdom. Unfortunately the department store from whom the vouchers were purchased omitted to quote the name and address of the donors, with the result that recipients have not known to whom their thanks should be addressed.

The Ontario Phone Club is most anxious to hear from the recipients of food parcels or vouchers so that their letters may be read at Club meetings. This stimulates interest on the part of members and enables the Club to obtain further donations.

The following is a list of those to whom parcels or vouchers have been sent:—G2AK, BXP, CNW, COP, FDR, FSS, LB, RL, RQ, 3AAH, UJ, 4CY, MJ, OI, PX, 5BJ, BR, IW, JU, LK, NI, 6XJ, 8WL, GM3AKK, 3PB, 6MD, 6MS, 8MJ.

Letters of acknowledgment should be sent to Ontario Phone Club, c/o Mrs. C. E. Lloyd, VE3DD/ XYL, 26 Dixon Avenue, Toronto, Canada.

R.S.G.B. Proficiency Certificates cQUARRIE ISLAND (VK1) has been added to the list of British Commonwealth and Colonial Empire Call Areas (Oceania) for the purposes of all R.S.G.B. awards.

Those applying for awards should enclose a list of cards submitted in connection with each claim to assist checking.

Lilver Jubilee Issue

THE Silver Jubilee of the BULLETIN will be celebrated next July. In connection with this historic event, Mr. B. W. F. Mainprise, A.M.I.E.E., G5MP, has agreed to prepare an article featuring the important technical developments which have been recorded in the Society's Journal during the past 25 years.

Mr. Mainprise will appreciate the loan of photographs depicting gear referred to in early issues of the BULLETIN, together with historic QSL cards, extracts from logs of pioneer DX contacts and details of regular schedules maintained day after day over any considerable period.

Material should be sent direct to Mr. Mainprise at 48 Earlsfield Road, Hythe, Kent, within the next

two or three weeks.

It is hoped that modesty will not restrain members from co-operating by forwarding details of their own achievements, and that they will also recall achievements and developments by their former colleagues who are no longer with us.

I.A.R.U. Congress-Paris

RINCE LOUIS DE BROGLIE (Permanent Secretary to the French Academy of Science) is to be President of Honour of the Congress.

The Reverend Lejay (Director of the French Ionospheric Bureau) and Colonel Brenot (President Director of S.F.R.), are members of the Committee of Patrons.

Mr. F. Charman, B.E.M., G6CJ (Executive Vice-President) and Mr. R. H. Hammans, G2IG (Vice-Chairman, Technical Committee) have been appointed additional members of the R.S.G.B. Official Delegation. Their appointment will strengthen the Society's technical representation at the Congress.

Official delegates will rank as Congressmen. Other visitors will be welcomed at the Plenary Sessions, but before they can attend they will be required to register their names with the Secretary to the Congress.

The venue for the Congress will be Aero Club de France, 6 Rue Galilée, Paris 16.

The opening ceremony will be at 10 a.m. on May 18 with the President of Honour presiding.

Reservations for the Congress Banquet (May 20) must reach R.E.F. Headquarters, 72 Rue Marceau, Montreiul s/s Bois (Seine), France, by May 10 latest. Cost 1200 francs (approx. £1 5s.).

Delegates and others will visit the French Television studios at 5 p.m. on May 19.

The full programme appeared in the March issue of the BULLETIN.

SHORT CONSTRUCTIONAL ARTICLES URGENTLY REQUIRED

MATEURS in the Middle East are wondering whether the recent political changes in Egypt will result in the restoration of transmitting licences in that country. The party now in power are pledged to end martial law. At least six service enthusiasts in the Ismailia area are only waiting for the word "go". . . . The familiar R.S.G.B. lapel badge served as an introduction when G2WI encountered G3ZJ in an Ismailia bookshop-their first meeting since 1938!

Novice and Technician classes of amateur licences are to be introduced in the United States as from January 1, 1951. After simple tests, the novice will be permitted to operate on C.W. in sections of the 3.5, 27 and 144 Mc/s. bands with a maximum input of 75 watts. At the end of one year, it will be necessary

to take the normal Class B examination.

Mr. D. W. Heightman, M.Brit. I.R.E. (G6DH) will lecture on "U.H.F. Propagation and Characteristics" to the London Section of the British Institution of Radio Engineers at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.

at 6.30 p.m. on April 20.

Amateur Television is gaining a firm foothold in Holland. In addition to the Eindhoven transmissions, already reported in the Bulletin, the latest issue of CQ-TV gives details of stations at Groningen and Haarlem both operating in the 144 Mc/s. band. Incidentally membership of the British Amateur Television Club has now risen to 36, including 13 U.K. amateurs.

12,209,700 broadcast receiving licences, including 285,000 television licences were current in Great Britain and Northern Ireland at the end of January. This shows an increase of 45,800 television licences during January and must represent quite a high proportion of those who bought sets! Corres-

ponding figure for February was 31,200. Newly licensed amateurs and those who have moved recently should make certain that their address is recorded correctly in the Call Book. If in doubt, drop a postcard (2d. stamp) to Radio Amateur Call Book Inc., 608 South Dearborn Street, Chicago 5, Illinois, U.S.A. with your call-sign and latest address

clearly printed in block capitals.

A well-known magazine has estimated that 33% of all boys between the ages of 15 and 18 are radio enthusiasts. Has your local group made certain that guidance and information on Amateur Radio is readily available to the rising generation in the area?

Have you ever wondered at the origin of 73? The generally accepted story is that in 1859 the U.S. telegraph concerns drew up a list of frequently-used expressions and gave to each of them a number so as to save transmission time—much in the same way as with our own war-time Forces telegrams. The complete list comprised 92 expressions but most of the symbols were soon discarded. However, 73 which meant "my compliments" survives . . .

· QUA " Here is news of . . . "

Silent Key

The Edinburgh group have suffered an unexpected and untimely loss with the passing of Mr. Willie McKenzie, GM6KZ, after an operation. Willie first operated his station in the early thirties, at which time he rendered valuable service to the Society as the D.R. of the old Scottish D. District. His quiet and pawky manner and his sincerity won for him many friends who constituted the largest gathering seen at a private funeral in the district for many a day. The Society was fully represented at the last rites and the sympathy of the members has been conveyed to the widow and her family in their irreparable loss.

GM6SR.

DEPENDABILITY

Reception conditions range from excellent to very poor, signal strength from strong to very weak, and to cope successfully with all such conditions you need a pair of highly sensitive and dependable headphones.



maximum reception For results, insist that your local dealer supplies you with a pair of the rightly famous S. G. BROWN Type "F" headphones. Sea, land and air W/T operators, serviceexperimenters and men, radio amateurs all vouch for their dependability.

> TYPE "F" (Featherweight)

PRICE 30 /- PER PAIR

YOUR LOCAL DEALER CAN SUPPLY

Send for descriptive Brochure "T.R.," gives details of full range. Prices from 30/-up to 105/- for Moving Coll Type K.

SHAKESPEARE STREET, WATFORD, HERTS

GOING PORTABLE?

If so, perhaps the power unit that you require is here

INPUT 2 V. D.C. DETAILS

DETAILS

A vibrator power unit designed for operation from a 2 V. accumulator. Originally used with the 58 Set, and giving outputs of 1·5 V. at ·5 A., and 90 or 135 V. at 25 mA., this unit is ideal for operating the receiver when at the portable location. Size 8 in. × 3½ in. × 4½ in. Wt., 7 lbs.

BRAND NEW, 35/- (Less accumulators). Carr., pkg, 2/6.

Designed for use with the 19 Set, and having the following outputs: 275 V., 110 mA.; 500 V., 50 mA.

Both input and outputs fully smoothed and suppressed. Just the job for both the TX and RX.

AS NEW, 12/6. Carr., pkg. 5/-,

Rotary power unit type 35A. Designed for use with the 1154/1155 combination. Outputs 220 V., 110 mA. and 7·2 V., 13 A. Both input and outputs fully suppressed and smoothed. Complete with all starter relay mechanism.

12 V. D.C.

18 V. D.C.

relay mechanism.

BRAND NEW, 20/-. Carr., pkg. 5/-.
Instruction sheet for converting to 1 H.P. motor given

with each 35A.

with each 35A.

Rotary power unit type 16. Designed for use with the R.1143 and having the following outputs:—300 V., 260 mA.: 150 V., 10 mA.: and 12 V., 5 A.

AS NEW, 12/6. Carr., pkg. 5/Power units for the MCR.1 receiver. Outputs 90 V. and 7.5 V.

107-250 V. A.C./D.C.

24 V. D.C.

24 V. D.C.

and 7.5 V.
BRAND NEW, 29/6. Carr., pkg. 1/6.
PORTABLE MOTOR ALTERNATOR TYPE 195
having an output of 230 V. 50 c/s. at 100 W.
Complete with plugs, lead and fitted with 3-pin
15 A. socket and switch.
BRAND NEW, £4 10s. SLIGHTLY SOILED,
£3 10s. Carr. paid.
MOTOR ALTERNATOR. A non-portable motor
alternator having its output metered. Rated loading
80 W. Complete with starter.
BRAND NEW CONDITION, £6. Carr. paid.

24 V. D.C.

Terms: Cash with Order

MAIL ORDER SUPPLY CO. The Radio Centre . 33 Tottenham Court Rd. London, W.I. MUSeum 6667

TWO METRE CONTESTS 1950

OPEN EVENT MAY 6-7 : FIELD DAY JULY 2

H.F. enthusiasts will find that several minor modifications have been introduced into the rules for the two 144 Mc/s. contests this year; largely as a result of the experience gained during the 1949 events. A new scoring system has been devised for the "Open" (fixed or portable) event which it is hoped will provide almost equal opportunities for stations located in areas of either high or low activity, during good or medium propagation conditions on the band.

In the case of the Field Day, where stations are able to choose good locations, the 1949 scoring system has been retained. Contests periods have been slightly adjusted to obtain maximum advantage of the early evening period, when temperature inversions are most frequent. Portable operation is permissible during both events providing that the necessary permits are obtained direct from the G.P.O. Operators using telephony are especially asked to keep emissions as narrow as possible and-in fairness to other competitors-to avoid over-modulation.

Every member who can work on 144 Mc/s. should endeavour to take part: check logs will be welcome from listeners as well as transmitting amateurs. Here is an excellent chance to find out exactly what your 144 Mc/s. equipment is capable of achieving during a period of country-wide activity!

- 1. The events are open to fully paid-up members of the R.S.G.B. resident in the British Isles (G, GC, GD, GI, GM and
- GW).

 2. Contacts may be made on telephony, C.W. or modulated C.W.

 3. Entrants must operate according to the terms of their licences; the input to any stage of the transmitter must not exceed 150 watts for the open event, and 25 watts for the field
- 4. The station must be operated from the same site for the duration of the event. Except for N. Ireland and Channel Islands entries, the National Grid Full Four Figure Reference wast be given.
- 5. Only one contact with a specific station will count for points.
- 6. Contacts with unlicensed stations will not be permitted to

eount for points. Proof of contact may be required.
7. Entries should be on lined foolscap or quarto paper, and must be set out in the form shown below:

TWO METER CONTEST MAY 6-7 1950

TWO METRE FIELD DAY, July	
Name	Call Sign
Home Address	
Site of Station	
National Grid Full Four Figure Re	ference
Transmitter	Receiver
Aerial System(s)	

Time (B.S.T.)	Call Sign of Station	Rep	port	Loca- tion	Estimated Distance	Points Claimed
	Worked	Sent	Rec'd.		Distance	
					TOTAL	

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute. Signed

Two Metre Contest (Additional Rules)

1. The event will start at 6 p.m. B.S.T., Saturday, May 6, and finish at 8 p.m. B.S.T., Sunday, May 7, 1950.
2. Points will be scored on the following basis:
10 pto 75 miles.
7 points for the first contact in this range.
7 points for the second contact. 5 points for the

6 points for the second contact, 5 points for the third contact and so on, until the seventh

contact, which will score 1 point. All further contacts will score 1 point.

10 points for the first contact in this range.

9 points for the second contact and so on until Over 150 miles. the tenth contact which will score 1 point. All

3. An exchange of reports (RST or RS) and location (Town and County or Town and Country) will be required before points for contact may be claimed.

contact may be claimed.

4. Entries, postmarked not later than May 15, 1959, must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1.

5. The Mitchell-Milling Trophy and a Miniature Cup will be awarded to the winning entrant. Certificates of Merit will be awarded to the entrants placed second and third.

Two Metre Field Day (Additional Rules)

- The event will start at 11 a.m. B.S.T. and finish at 8 p.m.
 B.S.T., on Sunday, July 2, 1950.
 Power supply must not be derived from public or private supply must.
- supply mains.

 3. No part of the station may be situated in any building existent on the site prior to the date of the event.
- 4. No apparatus may be erected on the site prior to the day of the event.
- An exchange of reports (RST or RS) and location will be required before points for contact may be claimed. The location given must consist of distance and direction from the nearest town or village, e.g. "RST 569 6 SE Caterham" (i.e. 6 miles southeast of Caterham).

6. Points will be scored on the following basis:

Distance	With Portable Stations	With Fixed Stations
Up to 50 miles	2	1
50 ,, 75 ,,	4	2
75 ,, 100 ,,	6	3
100 ,, 150 ,,	8	4
Over 150 ,,	10	5

7. Entries, postmarked not later than July 10, 1950, must be addressed to the Hon Secretary, R.S.G.B. Contests Counittee, New Ruskin House, Little Russell Street, London, W.C.I. S. A ministure cup will be awarded to the winning station, at the discretion of Council, and the runner-up will receive a Certificator Work.

Certificate of Merit.

Note: The National Grid Full Four Figure (or Full Kilometre) Note: The National Grid Full Four Figure (or Full Kilometre) reference specifies a point to the nearest kilometre. These figures and instructions will be found on the Popular Edition of the Ordnance Survey (one inch and quarter inch) maps. Stations located outside Great Britain should substitute latitude and longitude. These references are required for checking purposes since it is possible to verify distances by simple calculation. For example: the Grid Reference for Headquarters would be given as 51/3081.

The Te.hnique of Soldering

Multicore Soblers, Ltd. in a letter commenting on the article "Donex" in the February Issue explain that:—

(1) In modern cored solder manufacture high-speed multiple

- die drawing machines are used to supplement or replace the extrusion process,
 (2) Manufacturers of radio and television equipment are
- using finer gauges of cored solder, riz. 18 S.W.G.

 (3) Liquid resin-based fluxes are being abandoned by manufacturers.
- (4) Soldering irons should be "tried-out" by the prospective purchasers.
 (5) When using "Ersin" solder pre-tinning of components
- is unnecessary.

Correction

Clydesdale Supply Co., Ltd., point out that the price of their crystal multiplier type M11-19468, announced as 17s. 6d. in their advertisement in the March issue, is 39s. 6d. They regret any inconvenience this error may have caused readers.

Forthcoming Events - Cont. from Page 327.

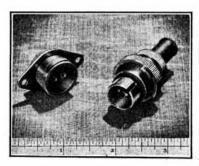
REGION 13

Edinburgh.-April 27, May 11, 7.30 p.m., Chamber of Commerce, 25 Charlotte Square.

REGION 14

Ayr.—April 26, 7.30 p.m., Royal Hotel. Prestwick.
Falkirk.—April 28, 7.30 p.m., femperance Cafe, High Street.
Glasgow.—April 26, 7 p.m., 39 Elmbank Crescent.

ONE OF THE NEW LINES AT THE R.E.C.M.F. EXHIBITION 1950 Stand No. 66



A	ssembly	Coaxial	2-pole	3-pole	
Flex plug Chassis socket Through chassis socket Flex socket		L722/P L722/S L723 L724	L625/P L625/S L689 L690	L715/P L715/S L716 L717	
Characteristic		Contact	Capacitance *		
Туре	Impedance ohms #	Resist-	Conductor/ conductor	Conductor	
Coaxial 2-pole 3-pole	75 100	Lees than 5 milliohms each	I pF	2.5 pF	

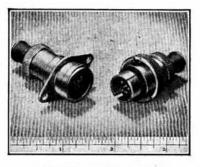
* At I Mc/s

This new range of screened connectors in light alloy is based upon the R.E.C.M.F. draft specification for a non-reversible screened plug and socket to load cables up to 0.24 in dia. over braid.

Design Features include:

(I) Interchangeability of single or multi-pole contact assemblies in the common housings. (2) High grade bakelite insulators. (3) Simple assembly and loading. (4) Positive quick action locking device. (5) Machined light alloy screen housings finished for instrument panel requirements.

List numbers and characteristics are shown opposite.



OTHER NEW LINES

We hope to show a reliable 10 mA. fuse; valveholders for B7G, B9A and Duodecal CR. tube base.

All "Belling-Lee" aerials will be represented.

BELLING & LEE LTD CAMBRIDGE ARTERIAL RD., ENFIELD, MIDDX., ENGLAND

H. WHITAKER G3SJ

10 YORKSHIRE STREET, BURNLEY. Phone: 4924

THERMADOR. Plate Transformer, 2,280/1.725/1,420/0/1,420/1,725/2,280 at 800 mA. to give 2,000 V. at 800 mA. with Choke input, plus 400 mA. at either of the available taps. Primary 210/250 V., 50 c/s. Secondary test volts 6,000. Porcelain stand-offs, and completely screened. Usual Thermador finish in Grey Cellulose. In original crates, net weight 150 lb. at £7 10s. 0d. Carr. paid.

THERMADOR. Plate Trans. Input 210/250 V., 50 c/s. Output 680/0/680 at 225 mA. 61 × 5" × 4", 50/-. Carr. paid.

THERMADOR. Fil. Trans. Input as above. Output 10 V. C.T. 8 A., 10 V. C.T. 10 A. 2,000 V. test. Size 7" × 5" × 4½", 30/-. As above, output 2½ V. C.T. twice at 10 A. each winding for a pair of 866's. Porcelain stand-offs. Sec. test volts 7,500. 6" × 4" × 4½" at 30/-. As above, Output 6-3 V. C.T. 6 A. plus 5 V. 6 A. C.T., 6" × 4" × 4½" at 25/-. As above, Plate trans. Output 350/0/350 at 150 mA. 5 V. 3 A., 6-3 V. 3½ A., 30/-. As above, Plate trans. Output 250/0/250 at 40 mA., 5 V. 3 A. Bias trans., 22/6.

THERMADOR. Driver Trans. 500 ohm line to Split Sec. 805 grids. Flat from 400/4,000 c/s., ratio 1 to 2-7 at 20/-. As above, output trans. Primary 5,030 ohms plate to plate load, Sec. 5, 7½, or 15 ohms, and 500 ohm line, 20/-. As above. Speech Input Trans. Primary 30, 250 ohms, split at centre with impedances symmetrically arranged either side centre, 25 mA. D.C. both halves of primary, Electro shielded level minus 65 db., 15/-.

THERMADOR. L.F. Choke, 10 H. at 225 mA., D.C. res. 84 ohms. $5^{\circ} \times 4^{\circ} \times 4^{\circ}$ at 20/-.

THERMADOR. Mod. trans 400 Watts. Prim. 6,700 ohms C.T. Sec. 4,500/5,000 or 5,500 ohms. Freq. + or — I db. 400/4,000 c/s. $7^{\prime\prime}$ × $6^{\prime\prime}$ × $5^{\prime\prime}$. Porcelain stand-offs, and completely screened, 50/-.

B.C.221's. New unused. Complete with spare valves. Mostly model AH and AC at £17 10s. 0d.

MICRO WAVE FREQUENCY METER. T.S.127/U. A high class laboratory instrument by Lavoi Laboratories, New Jersey. Covers the range 375/725 Mc/s. Individually calibrated with calibration chart for each instrument. Precision micrometer dial with 100 divisions to one division of the main dial. Modulation switch, gain control, phone jack for monitoring, 3 button base valves, operates from all dry 1-5 V. filaments. Time switch for batteries can be set from one to 15 minutes, 0/200-3" Westinghouse microameter for visual indication. In grey crackle steel cases 11" × 8" × 8" with carrying handle, 67 10s. 0d. Carr. paid.

R.C.A. CERAMIC TRANSMITTING SWITCHES. 5-bank 9-way each bank. 10½" overall length. 5" ceramic wafers with ½" ceramic spindle. Long shaft for ½" knob. Heavy silver plated contacts for up to 2 kW. of R.F. The last word in final tank switching, will switch anything up to 9 bands including link and centre tap. Brand naw and boxed. Another G3SJ special, at the record breaking price of 12/6. Post free.

AS ABOVE. Single bank 9-way, 7/-; ditto 5-bank 2-position, 8/-.

CRYSTALS. Marconi, etc. 500 kc/s. ½" pin spacing, 6/-. R.C.A. or Billey 100 kc/s, sub-standard, 17/6, Valpey, Billey or Somerset 1,003 kc/s. ½" pin spacing, 20/-. 21 Mc/s. band. Quadruple 5,327-5 or 5,295 kc/s., 7/6. FT4, ½" pin spacing, 7 Mc/s. to 7,300 kc/s. any freq., 12/6. 8 Mc/s. to 8,110 kc/s, any freq., 15/-.

SPECIAL OFFER for 28 Mc/s. band. Quadruple. 7,200, 7,225, 7,250 and up in steps of 25 kc/s. to 7,500 your choice of freq. & Ft 4 pin spacing, 7/6 each.

HEADQUARTERS CALLING

COUNCIL, 1950

President:

WILLIAM A. SCARR, M.A., G2WS.

Executive Vice-President: F. Charman, B.E.M., G6CJ. Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD. Hon. Secretary: J. W. Mathews, G6LL.

Hon. Editor: Arthur O. Milne, G2MI.

Immediate Past President: V. M. Desmond, G5VM.

Members: W. H. Allen, M.B.E., G2UJ, A. P. G. Amos, G3AGM, L. Cooper, G5LC, D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD, W. N. Craig, B.Sc., G6JJ, C. H. L. Edwards, A.M.I.E.E., G8TL, P. A. Thorogood, G4KD.

General Secretary: John Clarricoats, G6CL.

February Council Meeting

Resume of the Minutes of the Proceedings at the Meeting of the Council of the Inc. Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, February 14, 1950.

Present.—The Executive Vice-President (Mr. F. Charman) in the Chair, Messrs. W. H. Allen, A. P. G. Amos, L. Cooper, D. N. Corfield, W. X. Craig, C. H. L. Edwards, J. W. Mathews, A. O. Milne, P. A. Thorogood, A. J. H. Watson and John Clarricoats (General Secretary).

Apologies.—Apologies for absence were submitted on behalf of the President (Mr. W. A. Scarr), who was abroad, and Mr.

Amateur Radio Exhibition, 1950.
Resolved that Mr. H. Freeman be appointed Exhibition Manager on the same terms and conditions as last year.

Membership. Resolved-

(a) to elect 80 Corporate Members, 14 Associates and 3 Junior Associates. (Total elected 97).

(b) to grant Corporate Membership to 9 Associates who had applied for transfer.

(c) to grant Life Membership to Mr. K. R. Roberts, G3DKR,

of Southgate, London.

Applications for Affiliation.

Resolved to grant affiliation to the Aberdeen Amateur Radio Society, the Dorking & District Radio Society, the West Kent Radio Society, and the West Somerset Radio Society.

Representation

Resolved to appoint to the offices recommended by the respective Regional Representatives the members whose names had been listed by the Secretary.

Annual General Meeting

Annual General Meeting.

A letter was submitted from Mr. R. Walker in which he protested that the Minutes of the Proceedings at the recently held Annual General Meeting did not cover fully the various matters discussed under "Other Business."

After several members had expressed the view that the Minutes were a fair record of the business transacted at the

Meeting it was-

Resolved to advise Mr. Walker that his protest had been noted.

Resolved to accept an Estimate in the sum of £30 17s. 6d., plus £9 5s. 3d. Purchase Tax, for printing 500 W.B.E., 250 B.E.R.T.A., and 100 H.B.E. certificates.

Organisation or General Purposes Committee.
Mr. Thorogood suggested that an Organisation or General

Mr. Inforogood suggested that an Organisation of General Purposes Committee be set up.
Resolved that Messrs. C. H. L. Edwards and P. A. Thorogood be appointed to serve on the said Committee with power to co-opt, and that they be requested to report, with practical recommendations, to the Council.

The Secretary advised the Council that he would shortly be compelled to ask the Finance and Staff Committee to authorise the engagement of additional staff. The volume of clerical and editorial work (occasioned by larger issues of the BULLETIN) now falling upon Headquarters could not be dealt with by the oxistion ext.

Headquarters Accommodation.

Resolved to accept the offer of Museum Street Buildings Ltd., to grant a new lease (for five years as from June, 1950) of the premises the Society now occupies in New Ruskin House.

I.A.R.U. 25th Anniversary Congress.

The Secretary submitted a lengthy report covering his discussions in Paris with representatives of the R. E. F. concerning arrangements for the forthcoming I.A.B.U. Congress.

Resolved to adopt the Report and to place on record the thanks of the Council to the General Secretary for the effective manner in which he conducted the negotiations with the representatives of the R.E.F.

Resolved to accept and adopt the Balance Sheet for the quarter ended December 31, 1949, and the Cash Account for the month ended January 31, 1950.

Official Regional and other Meetings.

The Secretary submitted a list of dates and venues recommended by the Regional Representatives responsible for arranging O.R.M.'s during 1950.

Resolved to authorise the holding of O.R.M.'s in Regions 1, 3, 5, 7, 9, 11, 13 and 15 during 1950. (A list of the dates and venues appeared in the March issue of the BULLETIN).

Resolved to authorise the Secretary to accept invitations to attend meetings in Cranwell and Farnborough on April 23 and June 11 respectively.

June 11 respectively.

Resolved to authorise Messrs, Charman, Thorogood and Hawker to accept an invitation to attend the Hamfest of the Oxford and District Amateur Radio Society on February 26.

Regional Representatives' Conference.

Resolved to defer consideration until the June, 1950 meeting, of a suggestion that a Regional Representatives' Conference be held during 1950.

Convention, 1950.

After a lengthy discussion it was moved by Mr. Milne and seconded by Mr. Mathews that no Convention be held during Upon being put to the meeting an equality of votes was recorded. The Chairman ruled that the motion was not carried.

It was therefore—

Resolved to instruct the Secretary to enquire from responsible members resident in certain well known Southern resorts whethers in their view, it would be possible for local members to undertake the organisation of a Convention during 1950, if invited by the Council.

Convention 1951.

Arising from the previous discussion, Mr. Milne moved, Mr. Thorogood seconded, and it was
Resolved to invite the London Regional Representative (Mr. W. H. Matthews) to undertake the organisation of a National Convention in London during the Festival of Britain in 1951.

I.A.R.U. Calendar No. 38.

Proposal No. 68.
Resolved to record an "aye" vote in favour of admission to the I.A.R.U. of Union Congolaise des Amateurs de Radio.

It was reported that Proposals 65 and 66 (relating to Contest Serial Numbers and the use of a universal Phonetic Alphabet) had been adopted by a majority of votes.

Resolved to request the Contests Committee to give further consideration to the said I.A.R.U. Proposals and to report thereon to the Council.

It was agreed to accept the obligation outlined in Proposal 67 (Reporting on the results of International Contests) which had been adopted by a majority of votes.

Technical Committee.

Resolved to accept a Recommendation of the Technical Committee that a qualified person be commissioned to prepare a third edition of the Amateur Radio Handbook.

The meeting terminated at 9.40 p.m.

London Meeting

About 75 members were present at the meeting of the Society held on March 31, 1950, at the Institution of Electrical Engineers, London, when Mr. H. Andrews, B.Sc., A.C.G.I., M.I.E.E. (Technical Manager, *Dublier Condenser Co.*), lectured on "Radio Interference Suppressors." The lecture was illustrated by a number of slides and was followed by a demonstration showing the

ber of singes and was tonowed by a demonstration snowing the effect on television and broadcast reception of adequately suppressing various items of domestic machinery.

At the conclusion of the lecture Mr. E. L. Gardiner, B.Sc. (Past President) thanked Mr. Andrews. The Chair was taken by the President (Mr. W. A. Searr, M.A.) who extended a warm welcome to visiting amateurs from Sweden and Syria.

Mr. Andrews' paper will be published in a future issue of the BULLETIN.

Congratulations

To Mr. C. Ian Orr-Ewing, G5OG, on his recent election to the House of Commons. After a distinguished war career in the R.A.F., Mr. Orr-Ewing rejoined the B.B.C. Television Service in 1946, resigning last year to take up an appointment with a well-known radio company. He sits as Conservative Member for Hendon North.

Designing A RADIO AMATEUR'S



* * *

LIBRARY!

• WHEN a radio amateur designs an important piece of apparatus, he will—if wise—choose his components from the catalogues of firms which he knows from experience produce reliable goods. The same sound policy applies equally to the vital task of collecting, and keeping up-to-date, his sources of technical information and reference. That's why so many amateurs turn naturally to the books published by the two largest amateur radio organisations in the world: the R.S.G.B. and the American Radio Relay League. Behind each of their publications lies more than twenty years experience of what the amateur requires: no frills, but straightforward technical explanations, practical guidance and plenty of useful circuits. Written by radio amateurs, for radio amateurs . . . and at prices ganged to the average enthusiast's pocket!

Theory ★ Design ★ Construction

Ten Essential Titles:

THE TRANSMITTING LICENCE. (3rd revised edition.) A complete guide on how to obtain an Amateur Transmitting Licence in the United Kingdom, and other useful information. Price 9d. (by post 1/-).

SERVICE VALVE EQUIVALENTS. (3rd revised edition.) Gives the commercial equivalent type numbers of hundreds of British and American Service Valves and Cathode Ray Tubes. Price 1/- (by post 1/3).

TRANSMITTER INTERFERENCE. Invaluable advice on the cure of broadcast and television interference caused by amateur transmitters. 32 Pages. Price 1/3 (by post 1/6).

SIMPLE TRANSMITTING EQUIPMENT. This new 52-page book provides full constructional details of three simple but efficient transmitters, a stable V.F.O. unit and a crystal-controlled sub-standard. Information on simple transmitting aerials is also included. Price 2/(by post 2/3).

MICROWAVE TECHNIQUE. An excellent introduction to the design of communication equipment for frequencies above 500 Mc/s. 54 Pages. Price 2/- (by post 2/3).

RECEIVERS. A comprehensive guide to the design, construction and modification of straight and superheterodyne receivers for the amateur bands. A wealth of sound, practical information has been compressed within its 96 pages. Price 3/6 (by post 3/9).

V.H.F. TECHNIQUE. Much needed reference material on all aspects of the construction of amateur equipment for the frequency range 30-300 Mc/s. as well as detailed information on F.M.; V.H.F. propagation; aerial systems and frequency measurement. Price 3/6 (by post 3/9).

VALVE TECHNIQUE. Explains in a clear, logical manner what the radio amateur and short-wave enthusiast needs to know about the use of modern receiving and transmitting valves. Eleven chapters. Price 3/6 (by post 3/9).

RADIO AMATEURS' HANDBOOK.* (A.R.R.L., 1950, edition.) The standard manual on the design and construction of all types of latest amateur equipment, receivers, transmitters, auxiliary apparatus, V.H.F., aerials, etc. No wonder two million copies of the previous editions have been printed. Over 600 pages. Price 18/6 (post free).

ANTENNA HANDBOOK.* (A.R.R.L., revised 1949:) There are more than 270 pages in the greatly-enlarged 5th edition of this well-known publication covering the theory, design and construction of amateur transmitting aerials of all types. Price 11/- (post free).

* Orders for American publications can be accepted only from residents in the British Empire. Delivery approximately 4-6 weeks.

Also Recommended:

5/6

25/-

8/-

9/6

4/6

36/-

Radio Handbook* (Editors and Engineers Inc.).
Please specify 11th or 12th Edition
(N.B.—The 12th—all constructional—edition does not supersede the comprehensive
11th edition. Completely new material.)
Radio Amateur Newcomer* (Editors and
Engineers Inc.)

Radio Antenna Manual* (Editors and Engineers Inc.) 27/Surplus Conversion Manuals* (Vols. I and II)
(Editors and Engineers Inc.) ... per vol. 18/6

A Course in Radio Fundamentals* (A.R.R.L.) Hints and Kinks* (A.R.R.L. Vol. IV). T.V.I.—Its Causes and Cures* (Radio Magazines Inc.)

American Magazines:

QST*. Monthly journal of the A.R.R.L.
CQ*. Monthly publication of Radio Magazines Inc. per annum
Radio News*. Covers the entire field of
American radio development per annum
Audio Engineering*. Monthly Journal for
Sound Engineers per annum

 Orders for American publications can be accepted only from residents in the British Empire.

Sales Items:

Call Sign Lapel Badges (5 characters) 5/-(Additional characters 6d. each.) Car Plaque, R.S.G.B. Emblem 4/-Car Plaque, R.S.G.B. Emblem with Call Sign 5/-Car Plaque (De Luxe Type) ... 15/-Webb's Radio Great Circle World Map .. 4/6 R.S.G.B. Headed Notepaper per 100 sheets 5/6 Webb's Radio Log Books .. 3/10

Above Prices include Postage and Packing.



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ROUND THE REGIONS

Birmingham

The first "all Birmingham" R.S.G.B. meeting was held on March 21 at the Imperial Hotel through the courtesy of the Midland Amateur Radio Society. It was decided to hold similar combined meetings once every four months in addition to those organised by the "North" and "South" Groups. Mr. C. N. Strong, F.R.C.S. gave a most interesting lecture. The Chair was taken by the R.R.—Mr. D. Edwards (G3DO).

Bradford Amateur Radio Society

At a time of year when attendances often begin to flag the Society is to be congratulated on the support that is being given to its meetings. Since the turn of the year lectures have been delivered by a number of Society members, including the President, Mr. C. A. Sharp (G6KU), and Messrs. C. M. Cragg (G2HDU), H. Clegg (G3FX), H. V. Found (G2AKU), and A. W. Walmsley (G3ADQ). R.S.G.B. members are cordially invited to attend meetings of the B.A.R.S.

Bridlington Meeting

Arrangements are being made to hold a Yorkshire County meeting in Bridlington on Sunday, July 9, next. Lunch and tea will be provided at the Cosy Corner Hotel, Hilderthorpe Road, at an all-in-charge of 7s. 6d. a head.

Members not associated with Town Groups who wish to attend are asked to write to the Hull T.R., Mr. G. L. Fish, G3ADJ, 81 Park Street.



Happy faces were the order of the day at the recent Hamfest of the Bournemouth Radio and Television Society. In this group are: BRS9990, G2FIY, ex-ZB2B, G8DL, G2DBF, G6JW, G2ZB, BRS17735, G4MY, BRS17285 and G3BLN.

Brighton and District Radio Club

The wide variety of the Club's activities continues to attract a steadily increasing membership. Talks, demonstrations and Morse classes are held every week with a "Ragchew" evening once a month for the operation of the Club station, G3EVE. Dates of meetings are published in Forthcoming Events.

Cambridge and District Amateur Radio Club

A recent meeting at the "Jolly Waterman," included an illustrated talk on "Television in Four Countries" by Mr. D. Jackson of Pye Ltd. showing how British firms are keeping in the forefront of television development. The next meeting on April 28 will be devoted to a lecture "Panoramic Reception" by Mr. B. H. Briggs (G2FJD).

Coventry

Arrangements have been made for the R.S.G.B. Group to visit the Physics Laboratory of Birmingham University on Saturday, May 20 at 3 p.m. The Laboratory is known throughout the world as the birthplace of many far-reaching electronic discoveries, including the cavity magnetron.

At a recent meeting Mr. R. Palmer, G5PP described a universal indicator which he has designed and Mr. F. R. Clement demonstrated his home built tape recorder. It is reported that more than one well-known amateur was amazed at the sound of his own voice!

own voice!

Coventry Amateur Radio Society

Recent meetings of the Society have featured a talk on "Diceasting Methods," and a demonstration of the BRT400. Other activities have included a Morse proficiency test—for the "G2LU Trophy"—as well as receiving and transmitting

Devon Hamfest

A Hamfest for members residing in Devon will be held on Sunday, May 21 next, at the Royal Clarence Hotel, Exeter. The 1947 N.F.D. films will be shown during the afternoon. Full details can be obtained from the Devon C.R., Mr. E. G. Wheat-croft, 27 Lower Wear Road, Countess Wear Exeter. Lunch and buffet tea will be provided at 8s. 6d. a head.

Derby and District Amateur Radio Society

The Second Annual Dinner of the Society, held at the Irongate Hotel, Derby, on March 17 last, was supported by about 70 members and their ladies.

members and their ladies.

The President (Mr. A. G. G. Melville, F.R.C.S.), after extending a welcome to the guests, referred to the steadily increasing membership—the hundred mark having recently been passed. A major drawback, however, was the lack of suitable accommodation for the installation of the Society's station, G3ERD.

Mr. John Clarricoats, G6CL (General Secretary of the R.S.G.B.), in replying to a toast to Amateur Radio, reminded those present that the very first wireless society in the world was formed in Derby in the year 1911. With such a tradition behind it the present Society should aim to take its place as one of the leading radio organisations in the country. Other sneakers or the leading radio organisations in the country. Other speakers included Mr. W. A. Mead, G5YY, the Society's Chairman, and Mr. C. W. Swift, who extended a warm welcome to the ladies.

Among those present were Dr. E. S. G. K. Vance, G8SA, and Mr. R. Bonner Williamson, G5RW, the R.S.G.B. Regional and County Representatives respectively.

After dinner a short film show was screened by Mr. S. Bateman,

a member of the Society.

The organisation of the function was in the hands of the Committee, whose energetic Secretary and Treasurer is Mr. Fred C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby, The Society meets at the School of Art, Green Lane, and new members will always be made very welcome.

Grafton Radio Society

On April 19 at 7.30 p.m. Mr. J. S. Hizzey of the Telecommunications (Engineering Branch) G.P.O. will deliver a lecture and demonstration entitled "Amateur Transmitter Television Interference." R.S.G.B. members are cordially invited; visitors will be provided with refreshments free of charge. For venue see Eventuer Eventuer. Forthcoming Events.

Hereford

The Hereford Rotary Club are sponsoring a Hobbies Exhibition to be held at the Shirehall, Hereford from May 10 to May 13 at which it is hoped to organise an R.S.G.B. Stand and operate an amateur station. Local members who may be able to assist are invited to communicate with the T.R., Mr. T. B. Atkins, BRS7280. The Priory, Stretton Sugwas, Hereford (telephone BRS7280, T Burghill 52).

Leeds Amateur Radio Society

The Society is making good progress with a full programme of lectures, junk sales, demonstrations and organised visits to works and other places of interest. Club amenities include the apparatus room, open to members six days a week, and the reference library which is now being built up. Officers are President Mr. W. Ripley (G4AD), Chairman Mr. R. J. A. Kemp (G2FVP), Secretary Mr. L. H. King (G3CML), and Treasurer Mr. J. Hulbert (G3BDR). For details of meetings see Forthcoming Events. coming Events.

Ten Minute Quiz

Answers to the questions set on page 341.

- 1. The ratio of the audio power output to the D.C. anode (and screen) power input. (Normally expressed as a percentage.)
- 2. 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc/s. Audio modulations of 440 and 600 c/s., except on 30 and 35 Mc/s.
- 3. Input impedance drops to about 1,000 ohms.
- 16 μV. (i.e. double the input for each 6 db. rise).
- 5. $Z_0 = 276 \log 10 \frac{D}{R}$. Where D is the spacing of conductors and R is the radius of one conductor.
- 6. 1954-55.
- Water (an alternative is paraffin).
- 8. YES—but only when the power supply is NOT from the public supply mains. It's a poor technique anyway.
- 9. VK6 is south of the Equator.
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Lewisham

Monthly meetings are normally held on the third Monday of each month at the "Anchore," Lewisham Road, S.E.13 (near the Oblisk). Members who have not previously taken part in local activities will be warmly welcomed at these gatherings. A news-letter "Local QRM" is published monthly. Details from the T.R., Mr. G. V. Haylock, G2DHV, 63 Lewisham Hill, S.E.13. S.E.13.

Newark & District Amateur Radio Society

This newly formed Society meets fortnightly at the home of the Hon. Secretary: Mr. J. R. Clayton, BRS18352, 14c Barnby-gate, Newark from whom full details can be obtained. Current activities include a Morse class under the direction of the Chairman (G3ELJ) and the Treasurer (G3EVG). A programme of lectures and visits is being compiled. Membership stands at 12.

Rotherham & District Radio Club

A radio club is now flourishing in Rotherham, Yorks, thanks A radio club is now nourishing in Kotherham, Yorks, thanks to the excellent local press publicity which preceded and followed the inaugural meeting in January.

Chief officers for 1950 are:—President, E. E. Davies, G2LG; Chairman, J. H. Johnson, G3GCV; Hon. Secretary, R. A. Watson, G3AYS.

Meetings take place on Wednesday evenings from 7 p.m. at the Oddfellows Hall, Westgate. Refreshments are available. As the premises are unlicensed members of any age are welcomed. The Club has more than 40 members including 10 holding transmitting licences.

The Honorary Secretary will be pleased to send a copy of the current programme to prospective members.

Royal Air Force Amateur Radio Society

All members of the R.A.F.A.R.S. and the R.S.G.B., together with wives and friends, are cordially invited to attend a "Convention-Hamfest" at No. 1 Radio School, R.A.F. Cranwell on Sunday, April 23. Visitors should assemble at the "Radio Block," No. 1 Radio School at 1.45 p.m. The programme will include a tour of the Radio School, a visit to the club station GSFC, and a meeting which will include a talk by Mr. John Clarricoats, G6CL (General Secretary of the R.S.G.B.). High tea will be provided at a reasonable charge in the N.A.A.F.L. Club. In order to facilitate catering, please advise the Hon. Secretary, Royal Air Force Amateur Radio Society, No. 1 Radio School, R.A.F. Cranwell, Lines, if attending.

Scarborough Amateur Radio Society

Having found suitable accommodation the Society is looking forward to a period of renewed activity at the Boys XIX Club, St. Nicholas Street. Mr. P. B. Briscombe (GSKU), T.R. for Scarborough will be glad to meet visitors and prospective members at the meetings which are held every Thursday at 7 200 pc. 7.30 p.m.

Shefford and District Radio Society

Membership of this newly formed Society has now increased Gabush and a demonstration of mobile equipment by Chief Inspector Turton of the Bedfordshire Constability.

Slough—Change of Venue

As from April 20, 1950, meetings of the Slough Group will be held at the Golden Eagle Hotel, High Street, Slough (next to Century Cinema), commencing at 7.45 p.m. All members

South Manchester Radio Club

A panel of club members willing to give advice on combating TVI has been formed as a result of an excellent lecture on the subject by Mr. M. Smith (63YB) of the G.P.O. Radio Branch. Later it is hoped to extend the idea of mutual co-operation to such tasks as the erection of beams and masts. The rapid progress of the youngest member of the Morse class—about 10 years old—shows that it is never too soon to start. Meetings are held fortnightly at the Church Schools, Northenden: next meeting April 28.

NORTHERN IRELAND REGIONAL MEETING

SATURDAY, MAY 6th, 1950 Presbyterian War Memorial Hostel, Howard Street, Belfast

PROGRAMME

Rendezvou	15	***	***	***	***	2.30 p.m.
Business M	leeting		***	***	***	3 p.m.
High Tea	***	*	***	***	***	4.30 p.m.
Lecture	***	***	***			6 p.m.
Tickets (7/- ea 37 Cabinhill G 1950, latest.	ch) fro ardens,	m the Belfas	R.R. (Not), C.F	1r. N. I l.'s or	H. Lov	wden, GI2HLT s by April 26t

Spen Valley Radio and Television Society

Commencing on May 26 the Society will run a series of five fortnightly lectures on Television. The lecturer is Mr. Bernard Marsden of A. R. Sugden and Co. and the subjects to be discussed will include television principles and aerials; receivers; time bases and video amplifiers Visitors will be welcome. For details see Forthcoming Events.

Stourbridge and District Amateur Radio Society

At the recent A.G.M. it was disclosed that membership has now risen to 60. During the meeting, the Region 3 Representative—Mr. D. Edwards (G3DO)—spoke on R.S.G.B. activities. Officers elected for the forthcoming year included: President Mr. J. Timbrell (G6OI): Chairman Mr. H. Littley (G2NV); Vice-Chairman Mr. N. Harper (G4MI): Hon. Secretary Mr. W. A. Higgins (G8GF) and Hon Treasurer Mr. C. E. D. McLean (G2CLS). Due to illness the General Secretary was prevented at the last minute from attending.

Thames Valley

Recent meetings of the Thames Valley Amateur Radio Transmitters' Society have included lectures on "Microphones and Modulation" by Mr. G. Barrett (GSIP) and "The Cable-Ways of the World" by Mr. F. Binden (GSLX). Both speakers brought along many interesting exhibits.

West Somerset Radio Society

Considerable expansion of the Taunton section is announced: Considerable expansion of the Taunton section is announced; a recent meeting at the Castle Hotel resulted in 20 new members, and a local committee has been formed. Regular meetings are also held at Minehead. A monthly news-letter helps to maintain contact with the scattered membership while a local 1.8 Mc/s. net is under consideration. The Society is atfiliated to the R.S.G.B. and to the Minehead Arts Guild. Full information can be obtained from the Hon. Secretary, Mr. T. C. Bryant, GSSR 16 The Parks Minehead. G3SB, 16 The Parks, Minehead.

Subscriptions

 Please pay your subscriptions promptly when due. Failure to do so may result in the loss of valuable issues of the BULLETIN: high costs of production make it necessary to limit the number of extra copies printed each month.

Irish Radio Transmitters' Society

At the recent A.G.M. the following Officers were elected to serve during 1950: President, Dr. T. D. O'Farrell, E16F; Vice-President, Mr. R. Mooney, E12P; Hon Secretary, Capt. A. C. Woods, E13L; Hon. Treasurer, Mr. T. Green, E19N; Committee, E12W, E13N, E14Q, E16U, E17Y and E18P. The meeting approved a recommendation to increase the annual subscription to 20s. to 20s.

Good Neighbours

For many years the radio amateur and short wave listener, were the chief sufferers from motor-car ignition interference. But usually their complaints were drowned in a sea of indifference Since the advent of television, however, support for interference suppression campaigns has become much more widespread. Latest example is the publication by City Motors of Oxford and Reading of a leaflet appealing to motorists to show "Good Neighbourliness" by fitting suppressors to their vehicles. Other traders please copy!

LONDON REGIONAL MEETING

SUNDAY, MAY 14th, 1950

Denison House, Council Chamber, 296 Vauxhall Bridge Road, London (about 100 yards from Victoria Station)

PROGRAMME

Business Mee	ting			***	200		3 p.m.
Question Tim	ne			***			4 p.m.
Tea							5 p.m.
Practical den	nonstrat	tion	of ne	w			C. 108833410
amateur tech	hniques	tran	smitt	er			
and receiver	design						6.30 p.m.
Raffle Draw					***	8	p.m. (approx.)

Tickets (5/- each) from the London R.R. (Mr. W. H. Matthews, G2CD), D.R.'s and T.R.'s by May 10, 1950, latest.

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- 3,500 to 3,800 kc/s., for use on the fundamental frequency (3,500-3,800 kc/s.) and with frequency multipliers in the 7, 14, 21 and 28 Mc/s. bands.
- 7,000 to 7,425 kc/s., for use on the fundamental frequency (7,000-7,150 kc/s.) and with multiplier stages in the 14, 21 and 28 Mc/s. bands.

8,000 to 8,111 kc/s., for use with multiplier stages (x 18) in the 144 Mc/s. band.

8,987 to 9,093 kc/s., for use with a tripler stage in the 27 Mc/s. model control band.

12,000 to 12,166 kc/s., for use with a quadupler stage in the 144 Mc/s. band.

- 14,000 to 15,000 kc/s., for use on the fundamental frequency (14,000-14,400), and with a doubler stage in the 28 Mc/s. band.
- *12 and 14 Mc/s. ranges, £2. All other ranges, £1 17s. 6d.

†12 and 14 Mc/s. ranges, £1 15s. All other ranges, £1 12s. 6d.

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 E. BLACKTOP, 4 Hameway, East Ham, London, E.6.
 T. H. BOOKER, 57 Beaconsfield Road, Tolworth, Surbiton, Surrey.
 A. B. CHADBURN, Cassacawn, Blisland, Bodnin, Cornwall.
 R. H. CHILTON, 15 Norton Avenue, Lipson, Plymouth.
 T. E. COLE, 25 Causeway Road, Weaton, Workington, Cumberland

- land.
- land.
 J. E. COOTE, 56 Dinsdale Avenue, King's Estate, Wallsend-onTyne, Northumberland.
 J. P. EVERETT, 89 Victoria Road, Driffield, E. Yorks.
 R. FIXTER, 19 New Street, Helpringham, Nr. Sleaford, Lincs.
 A. L. FOWLER, 101 Ferry Road, Edinburgh, 6.
 B. E. FOX, 39 Galwally Park, Ormeau Road, Belfast, N. Ireland.
 S. FOXON, 41 Warren Road, Rugby, Warwicks.
 L/Tel. J. GLENCROSS, Kranji W/T Station, c/o B.F.M.O.,
 Singapore.
- Singapore.
 A. J. Hagon, 1 Purley Close, Ilford, Essex.
 A. Harvey, 26 Rosemary Avenue, Goldthorn Park, Wolver-

- hampton.

 A. HATFIELD, 35 Grange Avenue, Wallasey, Cheshire.

 R. H. HATFIELD, 175 Uxbridge Road, Hanwell, London, W.7.

 P. M. HUGHES, 2 Lindsay Road, Sheffield, 5.

 E. G. M. JEFFERIES, 34B, North Street, Downend, Bristol.

 R. JONES, Tatham Rectory, Wennington, Nr. Lancaster.

 A. B. LEONARD, 2 Wrottesley Road, Plumstead, London, S.E.18.

 D. LINTON, c/o Cable & Wireless Ltd., Muscat, Oman, Persian
- Gulf.
- G. B. MANNING, 8 Albert Road, Bolton, Lancs.
 D. MILLAR, 179 Merchiston Avenue, Falkirk, Stirlingshire.
 M. H. MITCHELL, Woodlands, Westgate, Ruskington, Nr. Sleaford, Lines.
- NICOL, 68 Killowen Avenue, Northolt Park, Greenford, В.

- J. B. NICOL, 68 Killowen Avenue, Notation 2 and Middx.

 Niddx.

 Niddx.
- Durham.

 M. RYAN, 31 Windermere Avenue, London, N.W.6.
 J. WALDEN, 2 Hamilton Road, Ilford, Essex.
 J. E. WALKER, 13 Burfield Street, London, W.6.
 G. R. WEST, Field Farm, Sulhamstead, Nr. Reading, Berks
 D. M. WILLIAMS, Hill Crest, Pleasant View, Ebbw Vale, Mon.
 - Denotes Transfer from Associate Grade.
 - † Re-elected to membership. (Continued on page 362)

COMMUNICATIONS RECEIVERS

H.R.O. SENIOR, in good condition, complete with crystal, "S" meter and all valves... Many coils in stock for purchasers of the above receivers.

H.R.O. SENIOR, as new, with 7 coils (4 covering the 10, 20, 40 and 80 metre bands) and power pack... ... £26/10/-£25

£12/10/-

100 kc/s. CRYSTAL, American sub-standard ... £1 MAGSLIPS, 2* transmitter type ... YALVES, 5U4G, 6K7G, 6F6G, 6SG7, 6N7GT, VRIOS, VRISO, 2X2 ... 5/6 £1 (inc. post)

VRISO, 2X2 ... 5/6, post 3d.

Carriage extra on all items unless otherwise stated. Many other items in stock, enquiries invited. Send stamp for bargain lists.

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RACK AMPLIFIERS TYPE 6. Uses two PX25 valves driven by M.L.4 with a M.H.4 pre-amplifier. The power supply gives 500 V, with delay switching and uses a I.W.4/500 rectifier valve. Variable bias is also derived from this pack. The amplifier is fitted with a plate meter and volume control and is built into two panels on the rack, the power supply is built into a further panel, sufficient room on the rack for a further three 10½" panels. Supplied brand new in standard 6' x 19" rack.

Less Valves.

Carr. paid 100 kc/s. QUARTZ CRYSTAL for Secondary Frequency Standard. Accuracy 01 per cent. Complete with coil, choke,

Standard. Accuracy '01 per cent. Complete with coil, choke, crystal holder and phasing condenser, requires wiring up only. Circuit diagram supplied with each kit. The complete kit, £1, post paid. Or built up on chassis, 4" x 4" x 2", with EF50 valve, wired and tested, £1, 12.6, post paid. RECEIVER/RECORDER TYPE R34/APR2. This instrument was used for detecting and recording time and frequency of enemy radar stations. It consists of a receiver continuously motor tuned between 90 Mc/s. and 1,000 Mc/s. The time (obtained from an 8-day clock movement which is fitted) and the frequency of signals are recorded on a continuously moving pages strip. Two crystal clock movement which is fitted) and the frequency of signals are recorded on a continuously moving paper strip. Two crystal detectors are used and the following valves: 7 type 6517, 2 type 6V6G/GT, 3 type 65N7, 2 type VR150/30, 1 type 884, 1 type 684, and 1 type 5U4G. The power supply is 115 V. 45-19-6 MO/2400 c/s.

RADAR TRANSMITTER TYPE APQ9. Less valves type 8012 but complete with the following valves: 931A (P.E.C. 65/-multiplier), 2 type 807, 2 type 6AC7, and 1 type 6AG7. Carr. paid INDICATOR UNITS TYPE ID—6B/APN4 (Loran) less Tube and Valves. These units are sold for components and contain the following: 26 octal valveholders, 22 potentiometers, 72 condensers, 110 resistors, 5 blocking oscillator transformers, also resistor boards, 3 multi bank yaxley switches C.R.T. base and munetal screen, etc. All contained on double deck chassis in black

metal screen, etc. All contained on double deck chassis in black crackled metal case, size 12" × 9" × 18", which is ideal for housing oscilloscope or T.V. A bargain at 17/6

Carr. paid RECEIVERS TYPE 46159A. 1,500 kc/s.-12 Mc/s. in 3 bands. Line-up: 125K7 R.F., 125K7 mixer, 12A6 osc., 125K7 I.F., 1 Carriage paid is required. All Post-paid. 21d. Stamp for List

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We will give you 25 per cent. Discount on your order for any selection of 12 or more valves from our list below, these may be all one type or mixed as you wish, but remember NOT LESS THAN 12.

TRANSMITTING TYPES. 813, 45/-; 832, 20/-; 807, 7/6; 15E, 10/-; 316A, 17/6; 8012, 17/6; 805, 30/-; 836, 17/6; 211, 20/-; 866A, 17/6; 723AB, 60/-; 872A, 40/-; 35T, 40/-; 830B, 22/6; 801A, 22/6; 304TH, 40/--

RECEIVING TYPES. 9002, 9003, 954, 955, 956, 6H6, 6SH7, 4/6; 6J5, 5Z4, 6SN7, 6J7, 6K7, 6K8, 6C5gt, 6Q7gt, 6S17, 6SK7, 6SK7gt, 6G6, 6SC7, 6SA7, 6AG7, 6SG7, 6SF5, 6N7gt, 6L7, EF50, 6D6, 6C6, 6F7, 6B7, UIO, VU39, 6V6, 6F6g, 6K6, 12SK7, 12K8, 12SQ7, 12A6, 7/6; VR150/30, OZ4, 6C4, 5U4, 1616, 5X4, 5Y4, 5Y3, 717A, EF55, R10, CV52, 9/-; ICS, 3Q5, ITS, 10/-; 6AKS, 11/-; 6J6, 12/6; 931A (Photocell/ Multiplier), 30/-

Please include 1/6 for postage and packing at these prices.

MOVING COIL HEADPHONES, 4/11.

MOVING COIL HAND MICROPHONES with switch,

Above two items together, 6/-, plus postage 1/-. Transformer for above, 2/-.

CO-AX CABLE 1" dia. with Pye plug each end, 13 ft., 2/6. CO-AX CABLE 1" dia. 70 ohms, 8d. per yard, postage 1/6.

TWIN FEEDER 80 ohms, 5d. per yard.

TWIN RIBBON FEEDER (Heavy) 300 ohms, 5d. per yard, post 1/6.

METERS 500 mA. scaled 0-15-600, 5/-.

POWER TRANSFORMERS. 320/320 V. 130 mA. 6.3 V. 5 A. C.T. 5 V. 3 A. Primary 200/250 V. 50 c/s. Drop through type, 22/6, post 1/6.

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VIBRATOR PACKS 6 V. input. Output 150 V. 40 mA. complete with all smoothing (metal rectifiers), 17/6.

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REPRESENTATION

Peterborough

N accordance with the wishes of the local membership, it has been agreed by the R.R.'s concerned that the town of Peterborough, the urban districts of Whittlesey and Fletton and the rural districts of Thorney and Norman Cross shall become part of Region 4. The Peterborough T.R. (Mr. L. Critchley, G3EEL, 36 Waterloo Road) becomes the Peterborough Area Representative.

The following are additions to the list published last month :-

County Representatives

Region	County	Name, Call-Sign (or B.R.S.) and Address			
2	Yorkshire (West)	J. P. FEATHERSTONE (BRS16417), 208 Psalter Lane, Ecclesall, Sheffield, 11.			
4	Northamptonshire R. E. DURBANT (G2AAA), The Pitsford, Northampton.				
5	Essex (Outside London Region)	J. H. BARRANCE, M.B.E. (G3BUJ) 49 Swanage Road, Southend-on-Sea			
9	Somerset Dorsetshire	F. A. H. WRIGLEY (G2BDO), Ball- mead, Pyrlands, Taunton. A. A. BARRETT (G5UF), Moigne Court, Owermoigne, Dorchester.			
14	Dumbarton- shire & Argyllshire	W. J. GREEN (GM3FBA), Oxford Bank, Sinclair Street, Helensburgh.			
15	Armagh, Tyrone & Fermanagh	L. LYSKE (G13CDF), 63 Church Street, Portadown, Co. Armagh.			

Town and Area Representatives

Region	Town	Name, Call-Sign (or B.R.S.) and Address
1	Burnley South-East Manchester Warrington, Widnes & Runcorn	A. GARRY (BRS14764), 49 St. John's Road. M. I. WILKS (G3FSW), 57 Longley Lane, Northenden. E. MALINGS (G3TM), 75 Liverpool Road, Great Sankey, Warrington.
2	Slaithwaite	R. W. H. BENSON (G8NF), 3 Dart- mouth Street.
4	Daventry Melton Mowbray Northampton	D. E. PASPIELD (G5NH), 25 Oxford Street. S. CLARK (G8CZ), 125 Thorpe Road. V. R. HARTOPP (BRS15304), 22 Purser Road.
5	Norwich	F. W. FISHER (G3VM), Keppel, Dereham Road, New Costessey.
6	North Beds.	I. HOWARD (G2DUS), 40 Regent Street, Stotfold.
7	Beaconsfield Cray Valley Dagenham Area East Ham Erith, Dartford & Bexley Kingston, Tolworth Area Ruislip & Eastcote St. Albans Walthamstow Walton, Weybridge	P. CUTLER (G3DAO), The Greyhound, 33 Windsor Road. P. LAMBERT (G3CYX), 9 Earlshall Road, Eltham, S.E.9. E. J. WILLIAMS (G3AKY), 77 Raydons Road, Dagenham. W. J. P. HAYES (G3CJQ), 129 Altmore Avenue, E.6. K. R. W. CHAPMAN (BRS17024), 327 Bexley Road, Erith. V. MAYFIELD (G2ACA), 2 Springfield Road, Kingston-on-Thames. J. W. UNDERWOOD (G3CIW), 67 Brixham Crescent, Ruislip. A. L. BROWNING (G8TK), 4 Cell Barnes Cottages, Tyttenhanger Lane. L. SUTTON (G3COF), 8 Cogan Avenue, E.17. G. SPENCER (G2KI), Widdecombe, Dale Road, Walton-on-Thames.

Region	Town	Name, Call-Sign (or B.R.S.) and Address
7	Wanstead & Woodford Watford, Woking	R. JAMES (BRS18519), 4 Grove Hill, E.18. R. T. YOUENS (G2HAR), 104 Baldwins Lane, Croxley Green, Rickmans- worth. D. WARNER (G3FZC), Sunnyside, Manor Road, Send Marsh.
8	Folkestone Isle of Wight Area Portsmouth Reading Thanet Area	F. J. GRUNDY (G2BGI), 25 Dolphins Road. H. J. BUCKETT (G3ARL), 22 Fitzroy Street, Sandown. J. S. K. STEPHENS (G8WC), 65 Ebery Grove, Copnor. F. HILL (G2FZI), 997 Oxford Road, Tilchurst-on-Thames. E. DoLMAN (G2DCG), 20 Canterbury Road, Westbrook, Margate.
9	Dorchester	C. E. BIGGS (G2TZ), Winterborne Abbas.
15	Belfast City	R. BARR (GI5UR), 4 Dunkeld Gardens, Oldpark.

Amendments

The following amendments should be made to the list published last month :-

Regional Representatives

Region 12.—Amend address of Mr. Douglas to read: 43 Abbots-well *Drive*, Aberdeen. Region 13.—Amend address of Mr. Baker to read: 4 Devon Terrace, Berwick-on-Tweed.

County Representative

Region 14.—Amend City of Glasgow to read: Lanarkshire, Renfrewshire and County of Glasgow, Mr. A. H. Mason (GM6MS), 390 King's Park Avenue, Rutherglen.

Town Representatives

Region 1.—West Cumberland. Amend address of Mr. Dawson to read: 19 Cusack Crescent, Workington.
 Region 7.—Lewisham. Add Postal areas: S.E.6, 8, 10, 12, 13, 16.
 Region 14.—Amend Glasgow (Postal Districts) to read: Glasgow (Postal Districts and Suburban Areas), Mr. W. R. Eadie (GM4JO), 51 Sutherland Avenue, Pollokshields, Glasgow, S.1.

New Members—continued from page 360.

Corporate Members (Overseas)

CE2EL
E13Y
CLARKE, O'Rahilly Street, Ballina, Co. Mayo, Eire.
M. W. JONES, c/o 15 Albemarle Road, East Barnet,
Herts. (Home address.)
DL40M/WJVI R. DECK, JUNR., c/o 51 Norman Street,
Birkenhead, Cheshire. (Home address.)
SM4YU
SM5WL
HANS F. ELIAESON, Norlindsvagen 19, Bromma,
Nr. Stockholm, Sweden.
AEF ALSEUS, Bersgatan 1, Stockholm, Sweden.
VE3KE
VE3KE
VE3MJ
G. ANDERSON, Lake Harbor, NWT, c/o Eastern
Arctic Patrol, Ottawa, Ontario, Canada.
VQ4SGC/33DFH S. G. CROW, c/o Cable & Wireless Ltd.,
Nairobi, Kenya.
VS7SE
S. E. DAVIES, 10 Essington Avenue, Morecambe,
Lancs. (Home address.)
U2GJ
WSIV
D. S. DHALLA, 640 Parsi Colony, Dadar, Bombay, 14.
A. GUSACK, 620 Prince Street S.E., Grand Rapids,
Michigan, U.S.A.
WSWZ
H. E. STRICKER, 247 W. 5th St., Marysville, Ohio,

H. E. STRICKER, 247 W. 5th St., Marysville, Ohio, U.S.A. WSWZ

W. MARRINER, 624 College Avenue, Dixon, Ill., U.S.A. C. HERBERT, 21 Haripaid Street, Remuera, Auckland, New Zealand. W9AND ZL1MB

New Zealand.
J. D. PARMINTER, Maclean Street, Wairoa, Hawkes
Bay, New Zealand.
R. H. Rowe, School, Fernside, Rangiora, New
Zealand.
REV. C. A. PAGE, 28 Cornwall Road, Walmer, Kent.
(Home address.)
I. QUARMBY, P.O. Box 14, Francistown, Bechuanaland ZL2OU ZL3GR

ZS5JT

ZS9D

Corporate Members (British Empire Receiving Stations)

745 W. G. LAMB, Trelawne Private Hotel, Maenporth Hill, Falmouth, Cornwall. (Home address.)
746 W. E. V. Palmer, H.B.M. Embassy, Athens, Greece.
747 D. DUMBLETON, H.Q. 2 Wireless Regiment (T/M Section),
R. Signals, M.E.L.F. 3.



Delayed A.V.C.

DEAR SIR,—One item in the Ten-Minute Quiz (What is delayed A.V.C.?) on page 301 of the March, 1950, issue of the BULLETIN prompts me to make the following observations.

"Delay," meaning "postponement," should only be used with reference to time. British Standard 204:1943, No. 4,423, lists "Biased Automatic Gain-Control" and deprecates "Delayed Automatic Gain-Control" and deprecates "Delayed Automatic Gain-Control". Automatic Gain-Control

Automatic Gain-Control."

If someone mentions Delayed A.V.C., you can make him look silly by asking him "How long is the delay?"

Careless talkers have here got themselves in difficulties by using for other purposes words which should apply to time.

A converse case is the term pulse-width (derived from the width of pulse seen on an A-display on a Cathode-ray tube).

I recently read of "a pulse equal in width to half a wavelength"!

The term should be pulse-duration or pulse-length (not quite so good, as it might refer to pulse amplitude).

Yours truly,

L. H. BAINBRIDGE-BELL, BRS2076.

Haslemere, Surrey.

Code Copying

SIR,—In regard to the comments by G3AEE in the February issue, I think there would be plenty of support for code copying and practice runs if arranged at reasonable hours and on a suitable frequency. One can benefit a lot by continuous practice at speeds up to 35 or even greater, and if it was not for the fact that the W1AW runs take place at such awkward times I should be copying them every night. Incidentally, I had to stay up until 3 a.m. in order to qualify for the 35 w.p.m. certificate and I can say I didn't feel like copying code at that time of the morning.

morning.

This is a fine opportunity for GB1RS to do some good instead of just a marker. The speeds could be varied between 10 and 35 or more (or less!). If I had the necessary perforator and auto I

or more (or less !). If I had the necessary periorator and auto I would be willing to transmit practice runs.

I do hope that something may be done about it, as I know some who could do with a little practice.

Yours sincerely,

DOUGLAS BRABNER, GM3CXE.

Cupar, Fife.

As has been explained on several occasions it is not at present possible to use GBIRS for any purpose other than that of a marker station.-Ed.

More Articles for the BRS. Wanted

DEAR SIR -Further to the correspondence concerning articles for the non-transmitter, it appears to me that the technical space

tor the non-transmitter, it appears to me that the technical space allotted to him is inversely proportional to the BRS membership. It must be obvious to every member that the BRS man gets a very raw deal in the BULLETIN as regards technical space. Admittedly, he has the "Band Notes" to read, and the Head-quarters' announcements; the adverts are also very good, but technical articles suitable for the bulk of the BRS membership are practically non-existent.

technical articles suitable for the bulk of the BRS membership are practically non-existent.

Why not circulate a questionnaire, find out what the BRS man wants, and give it to him? After all, the greater majority of the membership are BRS men. If this was carried out it would probably also result in a better attendance at district meetings. The BRS man would then feel that he is in the picture.

I think you would also find that at least 75 per cent. of the BRS membership are not in the least interested in Multi-element beams and transmitters. Furthermore, they don't all aspire to go on the air, not even after 30 years of service—commercial and amateur radio—such as:

Yours faithfully.

Yours faithfully, H. W. THOMPSON, BRS3852.

Romford.

Leave it to George

DEAR SIR,—I am becoming increasingly concerned at the apathy which has prevailed since the war in regard to local meetings. In Hampstead, which is typical of many districts, just about 10 per cent. of the local R.S.G.B. membership show

any interest.

Many and varied are the excuses given, but symptomatic is one letter received; a letter which was at least frank. It read:

Dear O.M.,
Please do not send me any more notices for local meetings.
I intend to spend all my spare time on the air.

P.S .- What are you fellows doing about getting 21 Mc/s. released 3

Well, of course, that's a very pretty way of living. Just let a few enthusiasts run local meetings and sort things out, with a handful giving up their time as Regional Representatives or Council Members, while the rest sit back and enjoy the spoils. If anything goes wrong, kick 'em; the apathetic gentry can never be wrong, because all they do is criticise.

Supposing every one adopted this attitude. Do the majority of amateurs honestly think that the G.P.O. and the various international authorities go into a huddle trying to think what nice presents we should like in the way of frequency allocations? Concessions are won by reasoned negotiations. They are won for every member of the R.S.G.B. land for non-members as

nice presents we should like in the way of frequency allocations? Concessions are won by reasoned negotiations. They are won for every member of the R.S.G.B. [and for non-members as well.—ED.]. In turn every member should realise his responsibility and help shape policy and give guidance by consulting other members in his locality.

Local meetings are a bore, too highbrow or too lowbrow, they should consist only of lectures and demonstrations, they should be limited to rag-chewing only. Those are the excuses of the more frivolous chatterers. Every member has the right to

attend local meetings, and if they're not run to his satisfaction, who but himself is to blame?

Let's be responsible beings, the hobby's well worth it.

Yours faithfully, BASIL WARDMAN, G5GQ, Hon. Sec. Hampstead R.S.G.B. Group.

London, N.W.3.



RADIO AMATEUR'S HANDBOOK (Twenty-seventh edition—1950).

By the H.Q. Staff of the A.R.R.L. 615 pages plus a catalogue section, 1,165 illustrations including 89 charts and tables; 414 valve base diagrams. Price 18s. 6d. through R.S.G.B. Delivery about 4 weeks.

Here is the "new Handbook"—and perhaps the most useful this for a religious to do in this case is 10 meetion the charges.

Here is the "new Handbook"—and perhaps the most useful thing for a reviewer to do in this case, is to mention the changes, and the new material; for the quality and standing of the Handbook are accepted everywhere. Amateurs really only want to know "What is new this time?"

Of course the text has been revised; a little bit of expansion being made on that treatment, and this little bit being omitted, but there is no drastic change in presentation. The changes are

mainly in the apparatus described.

The chapter on H.F. receivers has a capable treatment of the matching of receivers to co-axial and tuned feeders, and a brief description of S.S.B. reception technique. The treatment of parasitics, in the H.F. transmitter chapter, has been extended somewhat, and the pressing problem of harmonic reduction given recredictied treatment. more detailed treatment.

The constructional material on transmitters has many changes. The old QRP transmitter with crystal and two stages has been replaced by a QRP V.F.O. transmitter for 3·5 and 7 Mc/s. There is a new two-control 75 W. all-band plug-in-coil transmitter, which, in a care-free trans-Atlantic manner is also referred to as an exciter. The descriptions of transmitters for high-power are interesting examples of technique: there are several. There is also a 175 W. transmitter for 1·8 Mc/s. More interest will be taken by G's in a new gang-tuned V.F.O. exciter, or in the new P.P. 807 amplifier with multiple band tuners. There are also two designs for triode P.A.'s with elimination of parasities and reduction of V.H.F. harmonic radiation. A 20 W. mobile transmitter for 7 and 3·5 Mc/s. looks useful and interesting.

Turning to power supplies, it is found that there is more information about voltage doubling circuits with selenium rectifiers, and electronically-regulated bias supplies. The constructional material on transmitters has many changes.

information about voltage doubling circuits with selenium rectifiers, and electronically-regulated bias supplies.

In the radio-telephony section, the checking of 'phone transmitter operation has been much more extensively treated, and some illustrations of phase-shift as seen on the C.R.O. have been added. Also, a one-band S.S.B. exciter, and the C.R.O. diagrams for different adjustments have been included, and a useful section on the amplification of S.S.B. signals.

The V.H.F. man will find much to interest him; a low-noise converter for 144 Mc/s., a cascode converter for 220 Mc/s., a mobile converter for 28 and 50 Mc/s., a new 6J6 pre-amplifier for 28, 50 and 144 Mc/s., and a new mobile transmitter for 50 and 144 Mc/s. with quick-heating filaments.

For the U.H.F. enthusiast, there is a new simple 420 Mc/s. transmitter with a 6J6 oscillator and a half-wave line. The corresponding receiver has now a 6J6 instead of an "acorn."

The chapters on measuring equipment include new material

The chapters on measuring equipment include new material about frequency meters, including an additive type, a new grid-dip meter, a new section on audio-oscillators, and some new material on S.W.R. indicators. The T.V.I. treatment has been

revised.

This latest edition is well up to the very high standard we now expect from the A.R.R.L.

EXCHANGE AND MART SECTION

ments 2d. per word, minimum charge 3/-. Trade Advertisements 2d. per word, minimum charge 3/-. Trade Advertisements 6d. per word, minimum charge 9/-. (Write clearly. No responsibility accepted for errors). Use of Box number 1/6 extra. Send copy and payment to Parrs Advertising Ltd., 121 Kingsway, London, W.C.2. ADVERTISEMENT RATES. Members' Private Advertise-

ALTERNATORS. Two only available. 220 V., A.C. 50 cycles. 1.25 K.V.A. at £27 10s. each (sale due to getting mains).— Details, BRS17321, C. GREENWOOD, 176 Buxton Road, Stockport, Cheshire.

A MATEUR surplus. 10s. Postal Order secures large box useful parts. Post Paid.—G3HP, Hove Villa, Dyke Road, Brighton.

A R88D—less case. Excellent condition with instruction book. 220. Buyer collects.—41 Hadley Gardens, Norwood Green. Southall, Middx.

BC348L unconverted (P/P if required) £14 or near offer. E10L German receiver 300-600 kc/s., spare valves, £6 or near offer.—Box 177, PARRS, 121 Kingsway, London, W.C.2. [177]
BOUND to satisfy, BULLETINS bound 6s. 6d. volume, post free.—H. W. ROBINSON (G2BBT), 35 Forty Acres Road, [162

Canterbury.

Brand new gear. T1154 with spare set valves £10, R103A £9, BC433 G with flexible drive and control box, £6. Inspection invited Manchester area. 6050 ke/s. mounted crystals, 5s. American 100 ke/s. crystals, 3-pin mounting, 15s. S.A.E. for other items. Exchange H.R.O. 10 metre general coil for 80 metre bandspread or medium wave coil.—Box 161, PARRS, 121 Kingsway, London, W.C.2.

BULLS wanted. July, 1925—June, 1926; Aug., 1926; Feb., 1928; Nov., 1928—Oct., 1931; Dec., 1931; Jan., 1932; Feb. and Dec., 1933; Nov., 1944; Mar., 1945. Also S. W. Mag. Sept., 1938; QST Aug. and Nov., 1948; CQ July and Sept., 1948; Radio & Tele, News Jan., 1949.—BRS12474, 95 Ramsden Road, London, S.W.12.

Clores or

B², crystals, coils and key. T1154, spare PT15. Offers or exchange test equipment.—BRS8092, 176 Redecourt Road,

CABINETS. Reproductions of H.R.O., SUPER PRO, ARSS, SX28. Send for full details and prices. State requirements.—PHILPOTT'S METALWORKS LTD., Chapman St., Loughborough, 1778 CERAMIC switches 2-Bank, 6-Pos. 5s, 6d, for three, 19s, 6d, doz. Ceramic 807 valveholders, six for 4s, 9d, 12 for 8s, 6d, Post paid.—J. T. Anglin, G4GZ, 106 Cleethorpe Road,

COLLINS 18Q 12 V. Equipment complete—50W. Transmitter/ Receiver, power unit, remote control unit, aerial loading coil, cables, instruction book, £20 or will consider splitting.—Box 181, PARRS, 121 Kingsway, London, W.C.2.

COSSOR double beam scope, perfect, £26. 1,000 V./500 V. 500 mA, power pack £4. Offers, exchange.—Box 168, PARRS, 121 Kingsway, London W.C.2. [168

EDDYSTONE 8640 receiver, requires new dial driving cord on band set control but otherwise in new and excellent condition. Price £14 10s.—J. Main, BRS15517, 36 Newtoun St., Bo'ness., W. Lothian, Scotland.

FOR SALE. BC342 £12 10s.; BC348 £12 10s.; R208 £8 10s. All above with internal 230 V. 50 c./s. power packs.—R. TANNER, 744 London Road, High Mycombe, Bucks. [194]
FOR SALE "Eddystone 640" absolutely as new, used 3 months only. Also 750 V. 150 Mills P. Pack on Hardwood chassis, Parmeko Trans. Pair of 5746GYs rectifiers. Owner closing down. Best offer secures.—Box 173, PARRS, 121 Kingsway, London, W.C.2. [173]

Por Sale. Rack mounted RH55N. Separate W.W. power pack, E.M.I. gram. motor board and pick-up also mounted on rack. Complete with Rola S in. and Goodmans 3\frac{1}{2}\text{ in. speakers and mA. meter. Rack measurements 17\frac{1}{2}\text{ in. } 11\frac{1}{2}\text{ in. } 42\frac{1}{2}\text{ in. } Photograph on request. Also W./S. 19 MK II for sale. Will part exchange for AR88 in good condition with cash adjustment.—G. S. WARD, BRS18079, "Lyndene," Grindley Lane, Meir Heath, Stoke-on-Trent, Staff. G. S. WARD, BRS18079, " I Heath, Stoke-on-Trent, Staffs.

FOR SALE. Receiver type R1116A complete with 8 in. loud-speaker, headphones, H.T. eliminator/triple charger and 20 yards of coaxial cable, 25 or offer.—Box 179, Parrs, 121 Kingsway, London, W.C.2. [179]

FOR SALE. Surplus to requirements: unused valves as new, 805 (3) 9s. each, 830B (4) 5s. each.—Box 176, Parrs, 121 Kingsway, London, W.C.2.

FOR SALE. Transmitting and receiving components. H.F. chokes, condensers, coils, etc. by leading makers,—G2FCA 26 Northolme Gardens, Edgware, Middx.

Closes, contenses, Edgware, Middx.

[130] ToR SALE. 6·3 V. thermostatically controlled crystal oven, 12s. 6d., EDC 240 V. D.C. input rotary converter with transformer to give 200 V.A. output at 230 V. 50 cycles, 25. 230 V. A.C. power packs 1,500 V. 250 mA., £7. 1,000 V. at 250 mA., £5. 1,000 V. 250 mA. plus 350 V. 150 mA. plus 300 V. 150 mA. plus LT.'s incl. 10 V. 25 A. contactor controlled, £10. 350 V. 150 mA., £2. 350 V. 150 mA. plus bias and LT.'s in steel cabinet, £3. 53 transmitter 250W. output 'phone/C.W. 2 813 P.A., relay controlled. Offers please and for technical data handbooks for 12, 19, 33, 53 sets, ET4332, ET4750, HT1 transmitters; receivers types AR77, AR88D, SX27, HRO, R107, freq. meter SCR221.—G5CI, 1 Spring Grove Road, Richmond, Surrey.

FOR SALE. 7 R.C.A. 813's with bases, new, in makers cartons, 35s. each. New AR88LF with speaker, best offer over £25.—Box 196, Parrs, 121 Kingsway, London, W.C.2. [196]

Box 196, Parrs, 121 Kingsway, London, W.C.2. [196 C3APV offers: Superb BC348, 6AK5 1st R.F., S. meter, C3APV offers: Superb BC348, 6AK5 1st R.F., S. meter, A.N.L., etc., combined L.S./P.P. separate unit. Outstanding specimen. C.W. transmitter 70W. V.F.O./C.F./B.A./F.D./P.A., 10/20M. T9X keyed oscillator for B.K. T.V.I. treated, compact unit, worked 22 W6's in one day on 20. P.P. for above, 650 V. at 150 mA., 400 V. at 200 mA., 105 and 255 stab., variable stab. bias 0-100 V. 19 in. standard unit, very massive. 160M. phone/C.W. transmitter V.F.O./B.A./P.A., standard 19 in unit incorporating P.P., modulator, etc. incl. microphone and aerial tuner. Worked 10 countries top band. Will deliver Yorkshire. All seen working by appointment.—5 Mayo Road, Bankfoot, Bradford. Phone 23525. [200]

HALLICRAFTER SX25 Super Defiant, new with 14 in. matched speaker, Also BC312-M with power pack. What offers?—Write BRS17601, 52 Earls Court Road, London, W.S.

"OFFICIAL" log books (G.P.O. approved) 300 pages, heavy stiff cover, 12s. 6d. QSL's—largest block service—samples "G" or SWL.—G6MN, MARTIN, Printer, Worksop. [127]

OVER 100 Valves 807's, 6H6's, 68N7's, 6B8's, 6AC7's, 68L7's, and many others, also Ternans "Radio Technology," what offers, or will exchange for A.C./D.C. Receiver.—Box 167, PARRS, 121 Kingsway, London, W.C.2. [167]

PHILIPS P.C.R. communications receiver, R.F., F.C., 2IF., DDT., Pen. output, power pack, 16-50, 200-550, 800-2,500 metres. In mint condition £11 15.—G3LB, 7 Skellbank, Ripon, Yorks.

Ripon, Yorks. [184]

POWER unit Type 19. 12 V. input, 275 V., 500 V. output.
Instructions supplied for converting to A.C. Motor. Includes
two fuseholders, switch, condensers, chokes, etc. 7s. 6d. callers
or 12s. 6d. including carriage. Special quote for quantities.—
RADIO-AID LTD., 29 Market Street, Watford. [175]

QRO. Transformer 230 V. primary 2500-0-2500 V. conservatively rated 300W. 4 V. filament transformer. Both
wired to sockets suitable GU50's. Total weight 20 lbs. Less
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15s. pair. HV condensers 2sF, 2.500 V. 6s. each. Communications Receiver 1.4-23 Mc/s. £10 SAE details.—STANIER,
G3APU, 144 Middlemore Road, Birmingham, 31. [182]

QSL's and log books (P.M.G. approved); samples free; state
whether G or B.R.S.—ATKINSON BROS., Printers, Elland.[869]

OSL cards to your own design at reasonable prices. Just send

QSL cards to your own design at reasonable prices. Just send rough sketch and colour scheme.—G6CB, 7 Caxton Road, Wimbledon, S.W.19.

PLECEIVER APR4/TN16. 38 to 95 Mc/s., input 110/250 V. A.C. First class receiver, as new. Receiver BC966A and control unit, octal valves instruction book. Brand new in original packing. BULLETINS Vols. 8 to 22 (1932 to 1947). Hand bound red cloth (war years black cloth) gold lettering, and unbound BULLETINS up to this month. Stamp for details: no reasonable offers refused.—G5RL, 14 Market Hill, St. Ives, Huntingdonshire.

R.1155E, with power-pack, 8 in. Plessey M.C. speaker, output stage and 'phone jack in separate polished cabinet, complete and ready for working. With circuit and trouble location chart. £14 or near offer.—Write, CHAMPION, 16 Keats Grove, N.W.3.

SALE. R1155 "N" Complete coverage, good condition, converted, power-pack inc. for A.C. mains.—Offers, Robinson, 33 Sherwood Road, Birmingham 28.

SALE. 150W. transmitter, V.F.O. controlled, 813 P.A., 1,000 V. 400 mA. power supply, 3 stage modulator for screen mod. Coils for 80, 20 and 10 metres, £12. London area.—Box 198, Parrs, 121 Kingsway, London, W.C.2. [198]
TAYLOR 45. Valve tester. Perfect £11. C.R.M.91 C.R.T. New £7.—Wiskin, 25 Meadowside Rd., Upminster, Essex. [164]

WANTED. Communication Receiver. H.R.O. preferred, must be good on 10 M. Also want Class "D" Wavemeter, Details and prices please.—Box 165, PARRS, 121 Kingsway, London, W.C.2. [165]

Circuit diagram of "Trophy Eight." BRS14164. MILNE, 26 Bedford WANTED. Circuit diag Buy or MILNE, Road [169

WANTED—Class "D" MK II wavemeter complete with handbook.—Offers to Box 192, PARRS, 121 Kingsway, London W.C.2. London W.C.2.

WANTED—HRO coils, etc., state ranges, condition, quantity and price to:—R. T. & 1. SERVICE, 254 Grove Green Road, London, E.11. Ley. 4986.

WANTED urgently. Circuit and Handbook for SX.24. Buy or borrow.—BRS4537, 99 Charles Street, Cheadle, Stoke-on-Trent, Staffs. [183]

WESTINGHOUSE charger. New. Fully variable. Meter. 110-240 A.C. to 12 V. 20 A. Safety fused A.C. and D.C. Cost £25. My price £10. First secures.—G3APT, 4 Perfects Cottages, Tylers Green, High Wycombe.

150 Trader service sheets (100 postwar) never used. Pair matched MZ1-100's little used. Offers.—WARD, 44 Northgate, Barnsley.

358X with medium coil, good condition. £8 10s. ASBS new £4. APQ9 £4. Selwyn 10s. Many new valves and other items. S.A.E. requirements.—G3DZF, 23 Elmsleigh Road, East Hill, Wandsworth, S.W.18.