

March 1950

The original front cover for this edition was not available.



OUTSTANDING OFFERS

for the discerning buyer

A.C. at 3.5 A. Price £12 10s. 0d. Carriage 7/6.

RIJ32A RECEIVERS. II valves 100-126 Mc/s. Grey cabinet, 19" x 11" x 10". Brand new in original crates, £4 19s. 6d., plus carriage 5/-. 12 only available.

RII35 RECEIVERS. II valves. As specified for the Inexpensive Television Receiver. Brand new, 63/-, carr. 5/-. ABKI 10-VALVE IFF RECEIVERS. Have 6 of 65H7, 2 of 6H6, 2 of 7193, Motor Gen. with reduction gear, 3 relays, etc. New condition, 20/- each, carr. 5/-.

26/ARCS RECEIVERS (Similar to 454). 3-6 Mc/s. Brand new in sealed cartons less Dynamotor, 42/6. (Dynamotors available if required, 28 V., 17/-), carr. 1/4. BC433G RADIO COMPASS UNITS. Absolutely brand new and complete with 15 valves. 7 only £5 19s. 6d. each,

carr, paid.

AERIAL REELS TYPE R1142. Motorised; 1/13th h.p. motor; 28 V. 5 A. Detachable pulley, elaborate reduction gearing; instantaneous positive stop; works well on only 12 V. Ideal for rotary beams. Brand New in sealed cartons. Price 30/-. Post 1/-.

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MODULATOR UNITS. Type 64. 7 valves, 2 VR91, CV73, CV85, 2 VU133, VT604A, 3 relays, 4 · 5 2,000 V., I · 05 3,500, and many useful parts, 22/6 each, plus carr. 5/-. Brand New. CONDENSERS. SPECIAL OFFER 25, ·1 µF. 1,000 V. and 25, ·25 µF. 500 V. Brand new goods, 10/- the lot of 50, post paid. TU6B TUNING UNITS. Equal to Brand new (less outer case). 3-4-5 Mc/s., 10/-. Carr. 1/4. TU5B complete, 1-5-3 Mc/s., 22/6, carr paid.

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POWER UNITS PE94A. 28 V. input. Output 300 V. at 260 mA., 150 V. at 10 mA., 14·5 V. at 5 A., 40/- each, carr.

POWER UNITS. TYPE 10. Hoover manufacture. 24 V. input. Output 300 V. 120 mA., 150 V. 10 mA., 6 V. 5 A., each 40/-, carr. paid.

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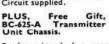
BC-624-A Receiver Unit Chassis, frequency 100-156 Mc/s. Complete chassis (less crystals) with 11 valves, I.F.T.'s,

relay, etc. Power requirements (external):
H.T. 300 V. D.C. 75 mA.,
L.T. 12V. D.C. 3 A.
Dimensions: 15½" x 7½" x 6"

Circuit supplied.

Partly stripped, but containing many useful parts, R.F. section is in good order, no valves, modulation trans..or crystal switch. Dimensions as receiver.

37/6 crystal switch. Dimensions as receiver. Clydesdale's Price only. Carriage paid.





Brand New, in maker's original carton.

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For 230 V. A.C. 50 cycles, output 600 V. at 200 mA. smoothed D.C., 6·3 V. A.C. 3 A. Complete power pack, with 5U4G rectifier, etc., built on metal tray $10\frac{1}{2}$ " x 9" x $1\frac{1}{2}$ ", with grey finish metal cover 11" x $9\frac{1}{2}$ " x $7\frac{1}{2}$ ". Two chromium handles, red indicator and inspection door, giving access to rect.

and pilot bulb.
Clydesdale's Price 59/6 With tranonly. Carriage Paid.

Ex Canadian Army. Brand New, in original

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Input: 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.

double choke, concenser input circuits.

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., 6·3 V.

(thermal starter). Chokes, 2/15 H.

375 mA., 15 H. 450 mA., 2/15 H. 110 mA.,

20 H. 162 mA., plus various H.V. condensers, resistors, etc.

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 420 lbs. Carriage Clydesdale's Price only. Paid.

Heavy Duty Variable Resistance E.170. 14 ohms 5 A. wire wound on tubular ceramic former, 11½" x 1½" dia. with cast metal fixing feet. Brass rod carriers, variable slider.
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Post Paid.

16-ft. Sectional Aerial with Base Comprising 4 lengths copper tubing, tapering from \$\frac{\pi}{2}\$ to \$\frac{\pi}{2}\$ each section sleeved into the other with insulated base.

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R1481 Rack Mtg. V.H.F. R/T Receiver Unit

Frequency 65-86 Mc/s. Frequency 65-86 Mc/s. A 10-valve superhet, with 4/VR53 (EF39), VR54 (EF34), VR57 (EK32), 2/VR65 (SP61), VR66 (P61), VR67 (6J5G), plus stabiliser VS70 (7475), "5" meter, screened R.F. section, B.F.O., etc., in enclosed chassis, size 19" x 10½" x 11", finish dark grey. Circuit supplied. Clydesdale's Price £4.19.6 each. only. Carriage Paid.

A.C. Mains Rack Mtg. Power Unit, type 3

For R1481 and R1132. Input: 0-200-220-240-250 V. Output: 200 V. 40 mA., 6-3 V. 3 A., 4 V. 1-5 A. Complete with 0/300 V. and 0/150 mA. meters, valve rectifier, fully smoothed, enclosed chassis, size 19" x 7" x 11", finished dark grey.
Clydesdale's Price £3.19.6 each.
only. Carriage Paid.

SPECIAL OFFER. Receiver and Power Clydesdale's Price £8. 8. 0 both only. Carriage Paid.

Ex Army.

WS-18 Receiver Unit

A 4-valve superhet chassis, range 6-9 Mc/s. A 4-valve supernet chassis, range 6-9 PIC/S. (50-33-3 metres). With ARPI2 (VP23) F.C. 2/ARPI2's L.F. and AR8 (HL23DD) Audio Loc. Osc., 2nd det. and A.V.C. slug-tuned I.F. trans. 465 kc/s., etc. The complete receiver mounted on a chassis 8½" x 5" x 1", all controls front panel 9½" x 5½", unused, good

condition. Power requirements approx.: 3V.0·2 A. L.T., 120 V. 15 mA. H.T., 1·5 V. bias.
Clydesdale's Price only.

Carriage Paid.



Carriage Paid. Brand New H.156. Moving Coil Mic/Headphone Assy.

Ex Canadian Forces. A few only.

nications Receiver Made by Vancouver Radio Lab.

set of spare valves.

V.R.L. Rack Mounted Commu-

Frequencies: 1-5-28 Mc/s. plus overlap (200-10-7 metres). For 110-115 V. A.C. mains operation, an auto transformer 230/115V. is supplied,

this 19 valve receiver is a double converter, with one R.F. stage, separate local oscillator,

I-5 Mc/s.- 465 kc/s. Valves: 6K7, R.F. 6L7, 6K8, mixers, 6SJ7 L.Osc., 2/6K7's, 6L7, 6H6, I.F.'s 6K7, 2nd det. 6H6, A.V.C. 6J7, B.F.O. 6SF5 Ist audio, 6K6 audio output, 655 tuning ind., 80 Rect., VRI50/30 stabiliser, 6K6G, 6C8G, 6K7, frequency std. All controls including B.F.O., separate A.F. and R.F. gain, 2 speed tuning, wavechange, etc., mounted front panel. Receiver mounted lower part of rack, 6" speaker/Power Unit mounted above, with 10-100-

Power Unit mounted above, with 10-100-1,000 kc/s. sub-standard. Also a complete

ose of spare valves.

Dimensions: Receiver, 17" x 15" x 11½",

with 19" rack panel; Power Unit,

17" x 8½" x 7½", with 19" rack panel.

Plus angle iron rack overall dimensions:

19" x 24" x 12".

Finish grey crackle with black and chrome control finger plates.
Clydesdale's Price only.

£30

B.F.O. and Noise Limiter, and 1.5 Mc/s.- 465 kc/s.

Comprising moving coil microphone (Hand No. 7) with pair of M.C. Headphones and 3 ft. lead with rubber 5-point socket. Imp. approx. 60 ohms per insert. 2/6 Clydesdale's Price only. Post Paid. Brand New

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Containing 2 wafer 3-pole 3-way, 1-way terminal boards, cartridge fuse and holder, 1/12-way plug receptacle, 7' 6" 6-way braided screen rubber covered cable, with flying leads tagged, 22' 6" lengths of 5-way flex with 5-point plugs fitted.

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H.160 Junction Distn. No. 3 (for WS-19)

Contains 4/4-way terminal st., and press button, 22' 6" lengths of 5-way flex with 5-point plugs, 10' 9" 6-way braid screen rubber covered cable, with flying leads and tags.

Clydesdale's Price only. Post Paid. 3/6

Jumper Lead Ass. (for WS-19) 60 ft. of 5-core tinsel flex, fitted at ends with a 5-way rubber 'plug-ZA-2994, and 5-way rubber socket. Clydesdale's Price only. Post paid. 7/6 each.

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R.S.G.B. BULLETIN

AL JOURNAL OF THE INCORPO RADIO SOCIETY OF GREAT BRITAIN INCORPORATED

Published on or about the 15th of each month.

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Forthcoming Events

REGION 1

Ashton-under-Lyne.—April 2, 3 p.m., New Jerusalem Schools.
Bolton.—April 4, 8 p.m., Y.M.C.A.
Bury.—April 13, 7.30 p.m., Atheneum, Market Street.
Darwen and Blackburn.—April 7, 21, 7.30 p.m., Y.M.C.A.,
Limbrick, Blackburn.

Limbres, Backburn.
Liverpool.—March 18, 2.30 p.m., 29 Derby Lane, Old Swan.
Manchester.—April 3, 7.30 p.m., Reynold's Hall, School of
Technology, Sackville Street.
Oldham.—Alternate Wednesdays, 7.30 p.m., Civic Centre, Clegg

Preston.—March 17, 31, 7.30 p.m., Three Tuns Hotel, North Road.

Rochdale.—April 2, 3 p.m., Drill Hall, Baron Street. Southport.—April 17, 8 p.m., 38 Forest Road. Wirral A.R.S.—March 29, April 12, Y.M.C.A., Whetstone Lane, Birkenhead.

Barnsley.—March 24, April 14, 7.30 p.m., King George Hotel, Peel Street.
Bradlord.—March 28, April 11, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., Club Room, British School Vard Skinnergate.

Yard, Skinnergate.

Doncaster.—Wednesdays, 7.30 p.m., 73 Hexthorpe Road.

Harrogate.—Wednesdays, 7.30 p.m., 7 Wetherby Road.

Hull.—March 29, 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, Southfield Road.

held Road.

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

Sheffield.—March 22, 8 p.m., Dog and Partridge, Trippet Lane. April 12, 8 p.m., Albreda Works, Lydgate Lane.

Spenborough.—March 29, April 12, 7.30 p.m., Temperance Hall, Cleckheaton.

Wakefield.—March 22, April 5, 7.30 p.m., Swan with Two Necks, 156 Westgate.

York.—March 29, April 12, 7.30 p.m., Rechabite Building, Clifford

REGION 3

Coventry.—March 17, 7.30 p.m., Priory High School, Wheatley Street. March 24, 7 for 7.30 p.m., C.A.R.S. Annual Dinner, Hare and Squirrel Hotel, Cheylesmore.

Birmingham (M.A.R.S.).—March 21, 6.30 p.m., Imperial Hotel.

South Birmingham.—March 21, 7.45 p.m., Imperial Hotel. April 2, 16, 10.30 a.m., Stirchley Institute.

Stourbridge.—March 24, Corn Exchange. April 4, King Edward's School. April 21, Corn Exchange.

REGION 4

Derby (D. & D.A.R.S.),—March 15, 7.15 p.m., Club Room No. 4, 119 Green Lane. March 17, Annual Dinner and Social, Irongates Grill Room, Irongate. March 22, 29, April 5, 12,

7.30 p.m., Club Room.

Loughborough.—April 12, 7.30 p.m., Science Lab., Limehurst School.

Mansfield (M. & D.A.R.S.).—April 2, 3 p.m., Swan Hotel. Northampton (N.S.W.C.).—March 17, 24, 31, April 7, 14, 6.30 p.m., Club Room, 8 Duke Street. Peterborough.—April 4, 7.30 p.m., St. John's Ambulance H.Q.,

Cowgate.

REGION 5

Chelmsford.—April 4, 7.30 p.m., 184 Moulsham Street. Southend.—March 21, 7.45 p.m., 29 Station Road, Leigh-on-Sea.



REGION 6

High Wycombe.—March 21, 7.30 p.m., at BRS.18263, Sandymount, New Road, Booker.

REGION'7

London.—March 31, 6.30 p.m., Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. Tea 5.30 p.m. Lecture: — "Radio Interference Suppressors," by Mr. H. Andrews, B.Sc., A.C.G.I., M.I.E.E.
 Barnes and Richmond.—April 11, 7.30 p.m., 22 Lowther Road, Barnes

Barnes.

Barnes.
Brentwood.—March 17, March 31, April 14, 8 p.m., Drill Hall, Ongar Road.
Croydon (Surrey R.C.C.).—April 11, 7.30 p.m., Blacksmith's Arms, South End, Croydon.
East London District.—March 19, 3 p.m., Town Hall, Ilford. "Station Design for Beginners," by Mr. J. W. Mathews, G6LL. Edgware (E. & D.R.S.).—Every Wednesday, St. Michael's School, Flower Lane, Mill Hill.
Enfield.—March 19, 3 p.m., George Spicer School, Southbury Rd. Finsbury Park.—March 21, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Grays.—March 24, April 14, 8 p.m., Baird's Cafe, Grays.
Hampstead.—March 17, 8 p.m., 1 Broadhurst Gardens, N.W.6 (behind John Barnes).
Harrow.—March 16, 8 p.m., Eastcote Lane Junior School.

(behind John Barnes).

Harrow.—March 16, 8 p.m., Eastcote Lane Junior School,

Hayes.—April 3, 7.30 p.m., The Vine, Uxbridge Road.

Hoddesdon.—March 16, April 20, The Salisbury Arms.

Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays,

7.30 p.m., Grafton School, Eburne Road, N.7.

Ilford.—March 23, QTH of G2BRH, April 6, QTH of G8TL.

Peckham.—April 3, 7.30 p.m., The Kentish Drover, Rye Lane.

St. Albans.—April 12, 8 p.m., The Beehive, London Road.

Slough.—March 16, 7.45 p.m., The Labour Memorial Hall, Chandos

Street

Street. Uxbridge.—April 14, 7.30 p.m., The Vine Inn, Uxbridge Road (opposite Hillingdon Church).
Watford.—March 21, 7.30 p.m., Cookery Nook, The Parade, High

Street. Welwyn.-April 4, 8 p.m., Council Chambers, Welwyn.

REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. Guildford.—March 26, 3 p.m., Cinema Cafe, Woodbridge Road. Reading (R.R.S.).—March 25, Annual General Meeting, 7 p.m., The Abbey Gateway.

Southampton.—April 1, 6, 8, 7.30 p.m., 22 Anglesea Road, Shirley. Worthing.—Mondays, (7-8 p.m., Morse Class), Adult Education Centre, Union Place.

(Continued on page 323)

REMIER RA O COMPAI

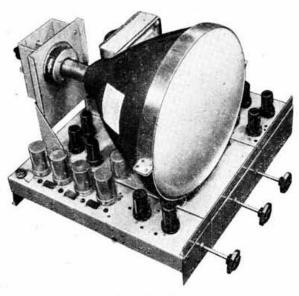
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PREMIER TELEVISOR KITS

FOR LONDON AND BIRMINGHAM

USING 9" OR 12" MAGNETIC C.R. TUBES

£19.19.0 including all parts, valves, and loud-(Carriage, etc. 15/-) speaker, but excluding C.R. TUBE



---- FEATURES----

- ★ Uses 9 in. or 12 in. Tubes. ★ P.M. Focusing.
- ★ Noise Limiter on Vision ★ Uses 21 valves. and Sound.
 - * Each Kit available
- ★ Non-Lethal E.H.T.
- separately.
- * Recommended for use in fringe areas.

CONSTRUCTION BOOK 3/-

Ready Approx. March 25th, 1950.

★ Delivery of Kits will commence soon after.

CIRCUIT DETAILS

The Vision Receiver consists of 4 R.F. stages (EF54's) which are followed by a Diode Detector and Noise Limiter (6H6) which is directly coupled to the Video valve (EF54).

Complete Kit with valves £3-16-0 Carriage 2/-

The Sound Receiver comprises 3 R.F. stages (6SH7's) followed by a Double Diode Triode (6Q7), which acts as Detector and L.F. Amplifier. A Noise Limiter (EA50) is also incorporated. The output valve (6V6) drives a 10" P.M. Moving Coil Speaker with closed field magnet, which is included in the Time Base.

Complete Kit with valves £3-1-0 Carriage 2/6.

The Time Bases; employ blocking oscillators on both Line (6SH7 and 807), and Frame (VR139 and 6V6). E.H.T. is taken from the Line Output Transformer through a voltage doubler employing two valves (VUIII). The Sync separators are 6H6 and 6V6.

Complete Kit with valves Carriage 5/-.

The Power Supply is from a double wound mains transformer completely isolating the receiver from the mains. The H.T. Rectifier is a 5U4G.

Complete Kit with valves £4-16-6 Carriage 5/-.

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R.S.G.B

For the advancement of Amateur Radio

VOLUME XXV No. 9

MARCH 1950



A DUTY TO THE COMMUNITY

HERE can have been few British amateurs who did not feel a touch of pride when they read the announcement, in the January issue of the BULLETIN, that the Air Ministry has now instructed R.A.F. radio operators, under certain conditions, to transmit distress calls in the 7 Mc/s. amateur band. This action underlines, once again, official recognition of the value of the radio amateur to the community. But in turn, it places on him an additional responsibility to attain a high standard of Morse operating efficiency. We can all of us form a mental picture of the crew of an aircraft, crash-landed in some remote spot, sending out a last desperate call for assistance. Are we quite certain that, in the stress and excitement of the moment, we should be able to read the message correctly, through heavy interference and with no chance of repeats. Remember, details of location cannot be guessed at, as—why not admit it?—amateur messages sometimes are. They must be copied, and copied accurately.

This matter of code ability is not just a revival of the hoary question of telephony versus C.W. 'Phone operation has a rightful place in the amateur spectrum. But whichever mode of operation is favoured for normal working, let us not forget that it is part of our duty as radio amateurs to be able, when required, to copy Morse efficiently. It is significant that one of the last editorials written by the late K. B. Warner, then Managing Secretary of the A.R.R.L., and published in QST shortly before his death in September, 1948, was entitled "The Importance of C.W." In it he regretted the tendency, then apparent in the United States, for newcomers to regard knowledge of the code purely as a necessary nuisance and to master it in just sufficient degree to obtain a licence. Few men have possessed the remarkable ability of Ken Warner to grasp the fundamental values in Amateur Radio, and we would be wise to pay heed to his warning that "C.W. is inescapably the basic form of amateur communication . . . every amateur ought to be proficient . . . the country has the right to expect it of each of us."

A similar warning was sounded by Lord Sandhurst at the opening of the third Amateur Radio Exhibition, last November. His lordship emphasied that the amateur movement represents the *one* important source of operators in the event of another National emergency. The changing requirements of the Post Office communications service means that the number of trained operators in this country is dwindling rapidly. Amateurs were, therefore, urged not to neglect the key for the microphone.

From time to time the suggestion is put forward that hand-operating is now old-fashioned and no longer technically necessary in these days of high-speed automatic senders and frequency-shift teletype systems. The weakness of this argument can be demonstrated by a simple analogy: no one has yet advocated the removal of simple arithmetic from the school curriculum on the grounds that a calculating machine can do the same job faster than the human being. Just as we cannot always carry one of these adding machines around with us, so there will always be a place in mobile and emergency communication networks for good hand-operating. We can be certain that the authorities have no illusions on this score and that many of our present privileges are due to this single fact.

But it would be unfortunate if we gave the impression that C.W. is just so much hard work, to be learnt simply as a duty to the community. Every amateur who has taken the trouble to become adept at fluent "brass-pounding" knows the very real enjoyment which comes from C.W. rag-chewing with its own peculiar sense of privacy.

To justify the confidence shown in us by the Air Ministry let us, if already licensed, make certain that we devote a sufficiently high percentage of our operating time to C.W. work to ensure that we shall all be capable of coping with aircraft distress traffic and other possible emergencies. Incidentally, it should be remembered that there is a subtle but important difference between reading and copying Morse: practice in recording messages will prove time well spent. While to those who have not yet passed the G.P.O. Test we would say: Stop thinking of the code as a necessary (or unnecessary) evil, it will bring you infinite pleasure and may help to save valuable lives!

J. P. H.

TELEVISION INTERFERENCE SUPPRESSION[†]

By LOUIS VARNEY A.M.I.E.E. (G5RV)*

Introduction

MUCH has been written about the serious problem of television interference, and an encouraging degree of success has been achieved by those amateurs who have pioneered the development of suppression devices. It is the purpose of this paper to review the work that has been achieved to date and to describe some recent improvements in technique in the hope that many of those who are at present reluctant to tackle the problem will see the urgent necessity for taking prompt action so that the good name of Amateur Radio shall not be jeopardised.

At the present time many Amateurs are inclined to regard television with a somewhat jaundiced eye! The fact that the frequency band chosen for the London (Alexandra Palace) station places the third harmonic of a 14 Mc/s. amateur transmission in the middle of that band, is to say the least, unfortunate.

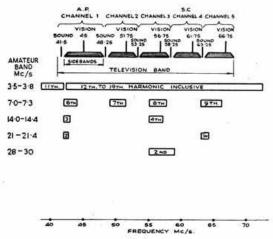


Fig. 1.

British television channel allocation chart showing the relationship of harmonics of all frequencies within the amateur bands from 3.5 to 28 Mc/s, inclusive.

It may be argued-by television interests-that, ideally, amateur transmitters should not radiate an appreciable amplitude of third harmonic, yet it is well known that the internationally agreed specification for permissible harmonic content in a commercial and service transmitter is quite inadequate to ensure interference-free television reception in the case of even a low power transmitter within a few hundred yards of a television receiver. Thus amateurs, are being asked to produce a performance from their transmitters many times superior in this respect to commercial equipment. To some, this may seem unfair and possibly unattainable. However, there is another aspect of the matter. Should we not regard it as a challenge to our oft-proved ingenuity as amateurs and experimenters and make it yet another occasion to contribute to the art of radio communication? We may be quite certain that commercial interests are by no means happy about the problem as it affects them to-day, and as it will affect them in the near future with the rapid growth of television throughout the British Isles.

The British Television Service and the Amateur Bands

Fig. 1 shows the proposed allocation of channels in the British television band (41-70 Mc/s.) and the relationship of the significant harmonics of the amateur bands from 3.5-28 Mc/s. A careful study of this diagram will enable the reader, according to his location, to assess his own particular television problem. For example, it will be observed that the high-order harmonics from the 3.5 Mc/s. band completely cover the 41-70 Mc/s. television band. With a 150 watt transmitter of conventional design these harmonics (the 11th to 19th inclusive) can cause quite serious television interference to sets located within a radius of some hundreds of feet of the transmitter at 30 miles from the television station. Thus, the 3.5 Mc/s. problem affects all U.K. amateur transmitters, although somewhat less seriously for those who live in areas to be served by television channels 4 and 5, since the amplitude of the harmonics fall fairly rapidly as they become higher in frequency.

The 7 Mc/s. band is also universally troublesome, since the 6th, 7th and 9th harmonics all fall in one or more of the television channels. However, when we consider the 14 Mc/s. band we find there will be some welcome relief for the luckier ones! This is because the lower order harmonics (in this case the 3rd and 4th) are more widely spaced in frequency than those of higher order. It will be seen from a study of the diagram that although very serious trouble may be caused in the London television area (channel 1) by an unsuppressed 14 Mc/s. 3rd harmonic, channels 2 and 5 will be completely unaffected by either the 3rd or 4th harmonic. Channel 3, and, to a much lesser extent, channel 4, will be affected by the 4th harmonic but this is relatively much easier to suppress than the 3rd.

The 21 Mc/s. band should only affect channels 1 and 5 with its 2nd and 3rd harmonic respectively, while the 2nd harmonic of the 28 Mc/s. band will affect channels 3 and 4 only.

In all cases where television interference is caused by an even order harmonic considerable relief may be obtained by using a carefully balanced push-pull final amplifier.

Bearing in mind that a number of amateurs living within about 30 miles of A.P. have succeeded in curing their television interference trouble by employing methods described earlier by the writer and others, and remembering that channel 1 presents the most difficult case, it is felt that those who live in the areas to be served by the remaining channels can take heart: there seems to be no reason why they should not be able to tackle the problem with reasonably well-founded expectations of success.

Successful Television Interference Cures

It can be said immediately that there exists, to date, no simple single device, circuit, or "magic" that will, in one fell swoop cure television interference from a normal amateur transmitter. The desired result can only be achieved by the careful observance of all the known and described precautions

[†] A synopsis of a paper read at a meeting of the Society held on October 1st, 1949, at the Institution of Electrical Engineers, London, W.C.1.

^{* 184} Galleywood Road, Chelmsford, Essex,

to limit the harmonic output radiated from the transmitter—determined by experiment in each case—to a level which must be sufficiently small as to have no observable effect on the nearest television receiver.

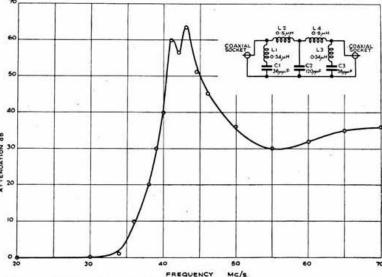
The following is a list of the salient points which should govern modern transmitter design for tele-

vision interference suppression :-

(a) Adequate circuit screening. Ideally the complete transmitter should be enclosed in a metal (preferably copper, brass or aluminium) box or cabinet. However, this may not be absolutely essential, especially in areas of high television signal field strength, but individual LC circuits (especially in frequency multiplier stages) should be properly screened.

ately before it leaves the R.F. chassis, keeps residual harmonics within the R.F. unit and avoids their troublesome re-radiation from the inter-unit cabling.

(d) R.F. by-passing. To be really effective at V.H.F., all by-passing or de-coupling of LC circuits, screen grids, etc., should be carried out with mica condensers especially designed for V.H.F. work, i.e. condensers having a very minimum of inductance. External connecting leads to such condensers must, of course, be of the lowest possible inductance. A lead 2 inches long made of 18 S.W.G. will render even a good condenser almost useless at frequencies above 40 Mc/s.; leads of absolutely minimum length must be used. Wherever possible copper strip should be used in place of the usual 16 or 18 S.W.G.



Attenuation curve and circuit diagram of a low-pass filter suitable for use in an 80 ohm coaxial line for harmonic suppression. (See text for constructional details of coils.)

(b) Screened leads in circuit wiring and inter-unit cables. The judicious use of screened wire for H.T., screen grid and grid bias circuits in each stage is very helpful and worth the trouble involved in their use. Screened cables between R.F. units and power units and feed meters likewise help.

(c) V.H.F. filtering of supply leads. The employment of simple V.H.F. filters (which may consist of a ·001 μF. postage-stamp type mica condenser followed by a normal V.H.F. choke) wired in each H.T., screen grid and grid bias supply lead immediates.

copper wire.

(e) Harmonic trap circuits. When correctly adjusted, and especially if used in conjunction with a harmonic by-pass condenser (1), trap circuits in buffer or power amplifier anode leads can be very effective. Measured harmonic attenuation of some 30-40 db has been observed by the writer when using a 3rd harmonic trap circuit in a 14 Mc/s. P.A. anode lead. It is perhaps necessary to add a warning here. Some positive means of indicating correct adjustment (2) must be employed when tuning an harmonic

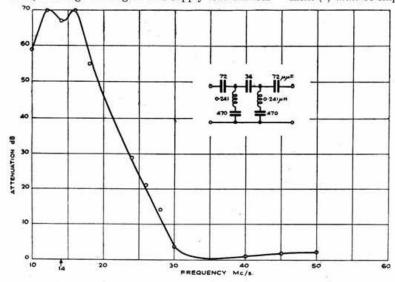


Fig. 3.
Response curve of a typica high-pass filter for use with a television receiver to reject 14 Mc/s. break-through from a nearby transmitter. For use in 80 ohms coaxial feeder of receiver.

trap. Incorrect adjustment can cause a serious increase in harmonic output from the P.A. The use of a suitable harmonic by-pass condenser in conjunction with the trap circuit renders the adjustment of the latter much less critical and more effective.

(f) Harmonic filters. The use of low-pass filters of correct design, preferably in a coaxial line between P.A. tank circuit and aerial tuning or impedance matching unit, can produce further most useful harmonic attenuation. Fig. 2 depicts the attenuation curve of a typical 3 section low-pass filter. It will be seen that an attenuation of some 30 db is obtained over the entire A.P. television band, while the insertion loss at 14 Mc/s. is quite negligible, about 0.25 db.

In this particular design the area of maximum attenuation (some 55 db) is arranged to coincide with channel 1 but could, of course, be arranged to occur at any one of the television channels as desired.

The use of harmonic filters has been found by the writer to be essential. It must, however, be remembered that if there is appreciable harmonic radiation direct from the R.F. stages of the transmitter a filter in the aerial system will be useless. In such a case, more effective screening is necessary.

If a transmitter can be worked into a reasonably non-radiating artificial load, e.g. a common electric lamp, without causing television interference, then if it occurs when the transmitter is connected to the radiating aerial, the use of a low-pass filter is indicated.

(g) High-Pass Filters. Where a television receiver is located quite close to a transmitter of very low harmonic output it may still suffer from "breakthrough" and consequent cross-modulation effects due to the impact of a very high R.F. voltage into its first tuned circuit from the local transmitter carrier fundamental frequency. The cure, in this case, is the use of a suitable High Pass Filter. Fig. 3 shows the characteristic of such a filter designed, by the writer (3), for use in the 80 ohm coaxial feeder to a television receiver.

(h) Low Level Frequency Multiplying. It has been proved good practice to arrange for all frequency multiplication to be carried out in low-power well screened stages and then to build up the power required to drive the P.A. at the carrier frequency by means of one or more buffer amplifier stages which may be run Class B with some advantage (i.e. about 6 db less harmonic output than from a comparable Class C stage).

While no great difficulty is experienced in achieving a high degree of attenuation of unwanted harmonics in a B.A. or P.A. stage, it is not practicable in frequency multiplier stages because of the abnormally high bias and R.F. drive requirements of such stages, as compared to even a Class C amplifier, which ensure an anode current very rich in harmonic content.

[During the lecture a 25 watt transmitter (or exciter unit) embodying the principles of television interference suppression technique outlined above was shown, together with a typical low pass filter and samples of harmonic by-pass vacuum condensers. The transmitter consisted of a 6V6-6L6-807 combination, the first two valves functioning as frequency multipliers and the 807 as a B.A. The lecturer explained that no provision had been made for coil changing or switching since a separate transmitter is always used for 3·5 Mc/s. operation at his station; for 28 Mc/s. operation the 14 Mc/s. output from the 807 B.A. is fed into a separate F.D.-P.A. unit instead of directly into the 14 Mc/s. P.A. unit. He recommended this practice(4) as being an excellent method of rapid and convenient band changing. Besides which it has the merit of considerably simplifying the design and construction of the individual exciter and P.A. units.

The effectiveness of the low-pass filter was demonstrated by means of a signal generator. An S27

receiver was used to show its attenuation characteristic.

After the lecture a harmonic trap circuit for Channel 1
and a harmonic monitor(5) were available for inspection.]

Quantitative Results

Generally, in dealing with television interference problems, much of the observation must be qualitative, since quantitative measurements at television frequencies are beyond the scope of most amateur equipment. However, it may perhaps be of interest to quote some actual figures, and to correlate them with qualitative observations.

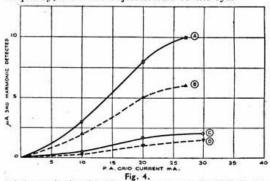
Table I gives a series of typical measurements made and results obtained at G5RV. The television signal level of 300 μ V, at the receiver input terminals is lower than that which would normally be obtained in the Galleywood area and is due to the use of an aerial array only 18 feet high. This is done deliberately so as to avoid producing "optimistic" results. In these tests, an S27 receiver was used in conjunction with the television aerial as an approximate method of measuring the various levels of interfering signal in relation to that of A.P.

Table I

Observed level db.	Freq. Mc/s.	S Meter	Effect on picture of local television receiver
0	45†	9+20	Good clear picture.
0	43 · 2*	9+20	Picture ruined. Sync. upset Screen white.
-10	43 - 2 •	9+10	Heavy lines on picture but sync, O.K.
-20	43 - 2*	9	Faint diagonal lines but good picture—slight "modula- tion bar" effect on R/T.
-40	43-2*	5 .	Good clear picture. Unable to detect interference. Per- fect cure.

† Alexandra Palace vision signal. • 3rd harmonic of 14 · 4 Mc/s, transmitter.

From Table I it will be seen that, in order to obtain a reasonably acceptable picture, the level of interfering signal with reference to the level of the television signal at the point of observation should be at least - 20 db for the frequencies quoted. As the frequency of the interfering signal more nearly approaches the television carrier frequency, the resulting picture interference becomes worse for a given level of interfering signal. This is because, as the television carrier frequency is approached, the interfering frequency produces beats which show up as thicker and thicker horizontal, vertical or diagonal lines which, though fewer in number than for frequencies further removed from the carrier frequency, are more objectionable to the eye.



Relative amplitudes of 3rd harmonic component of a 14 Mc/s. P.A. detected by an Harmonic Monitor at the P.A. grid and anode meter faces. Curves show 3rd harmonic radiation from (A) grid meter (no suppression), (B) anode meter (no suppression), (C) grid meter (full suppression), (D) anode meter (full suppression),

It will be noted that no reference has been made to interference to the sound channel. This is because, except in certain special cases where superhet receivers having direct I.F. pick up or second channel effects are concerned (a receiver fault), no trouble of this nature has been experienced by the writer. Provided therefore that radiated harmonics from the transmitter are reduced to a level where no picture interference results, there will be no sound interference.

As a further example of quantitative measurement, Fig. 4 shows, graphically, the effect of the correct adjustment of the harmonic trap circuit, together with the use of an harmonic by-pass condenser in a 14 Mc/s. P.A., upon the residual harmonic currents flowing in the anode and grid meter circuits. In this case, the harmonic monitor(6) coil was held against the meter faces with its axis parallel to them. In this example, the meter leads were unscreened. Since screened leads have been used to the meters, it has been impossible to detect any harmonic current at the meter faces.

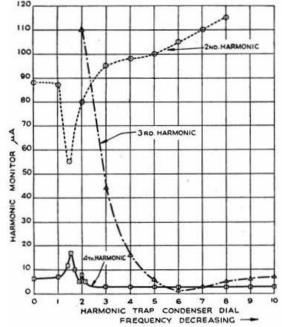


Fig. 5A.

Graph showing effect of tuning of harmonic trap circuit in anode lead of an 807 14 Mc/s. B.A.

Fig. 5A shows the effect of tuning an harmonic trap circuit in the anode lead of an 807 Buffer Amplifier stage operating on 14 Mc/s. The method of observa-tion was as shown in Fig. 6. The trap was tuned through resonance at the 3rd harmonic of the 14 Mc/s. stage and a rather asymmetrical curve obtained, due it is thought, to the tendency of the trap coil to act as an effective V.H.F. choke coil on the low frequency side of resonance of the trap circuit. However, the minimum value of 3rd harmonic The subsidiary resonance output is clearly seen. effects which produce minimum 2nd and maximum 4th harmonic are instructive. It is of interest to note that a very low value of 4th harmonic persists after the maximum is passed and is maintained right through the 3rd harmonic minimum. The great increase in 3rd harmonic which occurs when the trap circuit is far out of adjustment on the high frequency side of resonance is important to note. It represents a rise in 3rd harmonic output of some 34 db. above the optimum level and 23 db. above that of the 3rd harmonic obtained when no trap is used and clearly demonstrates the necessity for care in setting up and maintaining correct resonance in an harmonic trap circuit.

Fig. 5B shows the relationship of the 2nd, 3rd and 4th harmonic minima with respect to the 14 Mc/s. Buffer Amplifier tank circuit tuning. In this case, no harmonic trap was used. It will be noted that the harmonic minima do not quite coincide with minimum anode current (Ia). However, the increase in harmonic output when the tank circuit is tuned for maximum fundamental output in this case is so small that the special integral series trap circuit of Fig. 6 was not employed as the desired condition existed fortuitously. An increase of only 3.5 db. in the 3rd harmonic level occurred when the tank circuit was tuned for maximum 14 Mc/s. output as compared to minimum harmonic output in the present example. Such a small discrepancy may be ignored, but if tests had shown a greater increase of harmonic level at fundamental resonance it would have been advantageous to arrange the tank circuit lead inductance to produce series resonance at the 3rd harmonic frequency with the value of tank circuit capacity used to obtain normal parallel resonance at 14 Mc/s. as explained fully in Appendix II to this paper.

Comparing the minimum value of 3rd harmonic shown in Fig 5B (no trap circuit) with that in Fig. 5A, a ratio of 4 to 1 in harmonic current observed is found. This represents 12 db. of harmonic suppression due to the trap circuit in this example.

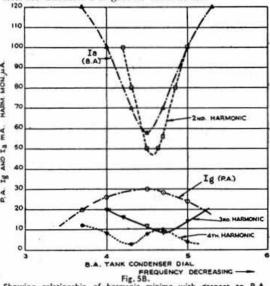
Conclusion

It is hoped that the foregoing remarks and results described will encourage many more amateurs to tackle their own television interference troubles successfully. In an early issue of the BULLETIN the writer proposes to describe the design and construction of a simple but completely "television interference proof" 75 watt transmitter embodying the principles outlined in this paper.

Appendix I

Details of a successful Low-Pass Filter.

An 80 ohm unbalanced L.P. filter composed of m-derived end sections (m = 0·6) and a centre constant K full T section has been designed to produce some 30 db of harmonic suppression over the *entire* television band of 40-70 Mc/s. The effective attenuation for Channel 1 is greater than 50 db.



Showing relationship of harmonic minima with respect to B.A. anode current, Ia, and P.A. grid current, Ig (B.A. output).

Note.—No harmonic trap in B.A. anode lead.

The circuit and attenuation curve is shown in Fig. 2. The design data is given below. The condensers may be normal single-spaced variable air dielectric, preferably having semi-circular rotor vanes (i.e. straight-line capacity type) so that they may be set approximately to the capacity values required, provided their maximum capacity is known, by "eye." Slight re-adjustment of C1 and C3 in order to obtain minimum S meter reading on the monitor receiver at the harmonic frequency concerned should be all that is required if the coils are constructed accurately and C2 is set reasonably near to 120 μμF. The mechanical layout of the filter should follow closely the theoretical diagram and should be built into a copper, brass or aluminium box measuring about 9 in. by 3 in. by 3 in. having a removable top and screening partitions between C1, C2 and C3.

This filter is designed for insertion in the 80 ohm coaxial cable between the P.A. link coil and the link coil in the aerial tuning unit and may be used-with negligible loss at the fundamental frequency-with transmitters on all bands from 1.7-30 Mc/s. inclusive.

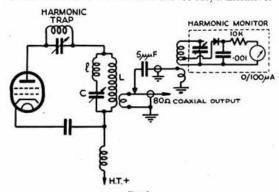


Fig. 6.

Showing tank circuit with integral series harmonic trap circuit and illustrating method of harmonic observation.

L + 1 = Lt and 1 = 9

When using a filter of this type the link coils should be arranged so as to give optimum output for a given P.A. input power, because, if the links are of normal size (i.e. 2 or 3 turns), this degree of coupling will automatically result in the 80 ohm cable being reasonably well terminated—a very essential condition for the correct operation of any filter.

Coil data for 80 ohm. unbalanced L.P. Filter

L1, L3 6 turns 16 S.W.G. tinned copper wire ½ in. I.D. Winding length § in. Lead length § in. Turns spaced approx. 16 in. Inductance 0.34 µH.

L2, L4 9 turns 16 S.W.G. tinned copper wire ½ in. I.D. Winding length 1 in. Lead length 1 in. Turns spaced approx. 1 in. Inductance 0.5 µH.

Appendix II

Note upon a method of obtaining increased harmonic suppression in R.F. tank circuits. The writer has obtained additional harmonic suppression in a B.A. or P.A. circuit to the extent of some 12 db by arranging for the valve anode lead to be effectively "tapped down" on the total tank circuit inductance by an amount which permits the tuning condenser to tune (a) the "branch" inductance l (Fig. 6), to series resonance at the unwanted harmonic frequency, and (b) the total circuit inductance. Lt. to parallel resonance at the fundamental frequency at the same setting. In order to reduce the normal inherent 42 Mc/s. third harmonic component in the output from the tank circuit of a 14 Mc/s. P.A., the inductance l (which may conveniently be the inductance

of the lead connecting the tuning condenser stator to the junction of the valve anode lead and the top of the tank circuit coil), is arranged to be one-ninth of the total inductance in the LC circuit. This is done by "cut and try" methods, whilst the relative amount of residual harmonic component, when the tank condenser is tuned for maximum fundamental output, is observed on the harmonic monitor unit coupled to the P.A. link coil by means of a 5 or 10 µµF. condenser(7).

When the correct "series" inductance value is achieved, a very marked reduction in third harmonic output from the P.A. will be found and this will materially help to make the transmitter "television interference proof." The series inductance, l, may consist of a few turns of 16 S.W.G. wire about $\frac{1}{2}$ in. diameter. The exact number of turns will depend upon the particular circuit layout and must be found

experimentally in each case.

Using a normal tank circuit, careful observation will show that, unless the above described condition exists fortuitously, a considerable increase in harmonic output may occur when the circuit is tuned for minimum anode current in the usual way. When correctly adjusted, it will be seen that the "series" inductance, l, and the tank condenser, C, form an effective low impedance trap circuit across the coil, L. This greatly assists the effectiveness of the normal parallel-tuned harmonic trap circuit used in the P.A. anode lead.

References

(1), (2), (3), (4), (5), (6), (7). "Further Improvements in T.V.I. Suppression," by Louis Varney, A.M.I.E.E. (G5RV), R.S.G.B. BULLETIN, May, 1949.

Those Surplus C.R. Tubes

 HE debate as to the relative merits for television reception of the VCR97 and VCR517, continues. Mr. R. Buckstone, G5JR, finds that with 2 kV. E.H.T. the VCR97 appears to give better contrast but poorer definition than the VCR517. On the other hand, the VCR97 shows up better in a lighted room. An important factor, hitherto unmentioned, is the light-sustaining properties of the VCR517 screen. After this screen has been exposed to strong light, particularly that from a fluorescent tube, it will glow in the dark for a considerable period. Under these conditions, the afterglow, even with 2 kV. E.H.T., can be objectionable. For this reason the tube should be covered with a cloth whilst not in use. Incidentally, G5JR is not an advocate of attempting to burn-off the long afterglow screen. A less drastic method of obtaining a more natural picture, he suggests, is to use a pale amber filter.

Are you in wool?

M. Francis Barthez, F9DF, 28 Rue de la Chevaliere Mazamet (Tarn) France, would like to correspond with any British amateur engaged in the wool trade or in the manufacture of wool.

LONDON MEETING

FRIDAY, MARCH 31st, 1950

AT THE INSTITUTION OF ELECTRICAL ENGINEERS, SAVOY PLACE. VICTORIA EMBANKMENT, W.C.I

LECTURE

"RADIO INTERFERENCE SUPPRESSORS" by

H. ANDREWS, B.Sc., A.C.G.I., M.I.E.E.

(Technical Sales Engineer, Dubilier Condenser Co., (1925) Ltd.) Tea 5.30 p.m. Lecture 6.30 p.m.

A "TWO OVER TEN" LIGHTWEIGHT ROTARY BEAM

By ERIC MARTIN (G6MN)*

Although a considerable amount of information has been published in this country on the design of beam arrays, the constructional aspects have been rather overlooked. This article gives a practical account of the construction of a dual 28 and 144 Mc/s. array which combines reasonable technical efficiency with sound mechanical design.

THERE comes a time when every amateur, no matter how satisfactory the results he may have achieved with a dipole or other simple aerial system, decides that it is essential to try a rotary beam—if only to satisfy himself that his friend round the corner must have been exaggerating when describing the improvement he obtained! Once this stage has been reached, then it is only a question of days before yet another dipole joins the 0-v-1 receiver in that amateur limbo from whence there is no returning!

The array which forms the subject of this article consists of a 4-element 28 Mc/s. Yagi beam employing one reflector and two directors, with a 12-element 144 Mc/s. stacked array mounted above. The 28 Mc/s. beam is constructed on what has become known as the "plumber's delight" principle i.e. with no insulation between the centre boom and the elements. The 144 Mc/s, system, which has been designed to give low-angle radiation with a relatively wide broadside coverage, also makes use of metal booms although in this case the elements are insulated from the booms by means of polystyrene blocks. Both arrays are mounted on the same shaft and are rotated by a 24 V. motor with selsyn control. It was originally intended to make the 28 Mc/s, beam "wide-spaced" but it was found in practice that the long boom resulted in considerable sag and the boom was therefore shortened to its present overall length of just under 14 ft. (·4λ). While the basic layout can best be gathered from the accompanying sketch and photographs, the following details of the materials used and the construction should prove of value to members contemplating the erection of similar arrays.

* Castlemount, Worksop, Notts.

The finished array ready for mounting.

The 28 Mc/s. Array

The 28 Mc/s. elements were constructed from 8 lengths of one inch diameter dural tubing. For a fundamental frequency of 28.5 Mc/s. the tubing was cut—with a hacksaw—to the following dimensions: 2 lengths of 8 ft. 4 in. (reflector); 2 lengths of 7 ft. 11 in. (radiator); 2 lengths of 7 ft. 8 in. (1st director); 2 lengths of 7 ft. 1 in. (2nd director). Three 6 ft. lengths of similar tubing were used for the boom (these were shortened when "close-spacing" was adopted later). Four-way and tee steel junction boxes intended for household electric 1 in. conduit were used to fashion the array; alloy junction boxes were tested but found too brittle. The ends of the junction boxes, which originally possessed screw threads, were turned-out to a diameter of approximately 15 in. with the exception of the end intended to carry the vertical shaft of the 144 Mc/s. array. The ends of the dural tubes were then thoroughly cleaned and driven into the junction boxes. This required the expenditure of considerable "brute force" but resulted in a very tight fit. To eliminate any possibility of twist, a nut and bolt was fixed through each junction box.

A "tee match" was adopted in order to allow the beam to be fed from 100-ohm balanced twin line. This consisted of two 3 ft. lengths of 1 in. diameter dural tubing clipped 3 in. underneath the driven element and connected to the feeder at the centre. The clips were made from 12 in. × 1 in. strips of dural moulded to shape round the elements and the matching tubes; fastened by four nuts and bolts. This system provides a joint of "like to like" metals and

thus greatly reduces corrosion from weathering and galvanic action. At the feeder ends the matching tubes are fastened to the radiator by 2 in. × 1½ in. strips of polystyrene, bolted each side of the dural tubes to provide a rigid insulated joint.

a rigid insulated joint. When the 28 Mc/s. array was completed, preliminary adjustments were made before commencing work on the 144 Mc/s. section. The beam was hoisted some 16 ft. above ground between two masts situated well clear of surrounding objects and the elements trimmed for 28.5 Mc/s. Afterwards a series of readings was taken or a field strength meter at a distance of about 100 yards; the position of the matching elips being varied to obtain maximum forward gain. With the type of construction employed, inter - element spacing cannot be easily varied and care should be

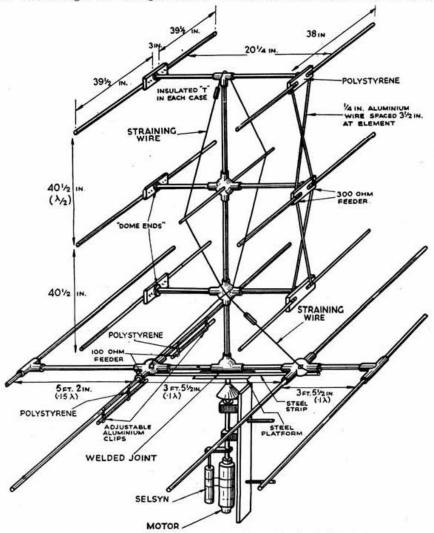
taken to ensure that these directions are made reasonably accurate. In practice however, spacing does not appear to be unduly critical.

The 144 Mc/s. Array

Whilst the construction of the centre support and cross booms for the 144 Mc/s. array is similar to that of the 28 Mc/s. array, it is necessary to insulate the elements from the booms, due to the voltage nodes at the inner ends of the $\frac{1}{2}\lambda$ elements. To give a more rigid structure the centre-upright was made of 1 in. steel conduit. This tubing is cut to length and the

driven elements; a "tee match" having been found

To give additional rigidity to the structure, steel straining wire was connected as shown in the diagram. A cross boom for the straining wire was provided by an 18 in. length of $\frac{1}{2}$ in. dural tubing pushed through a $\frac{1}{2}$ in. hole drilled in the centre junction box for this purpose. The wire was taken from the top centre tee junction box, through a hole drilled at the end of the 18 in. dural tube to the lower junction box and similarly back to the top junction box. A small turn buckle was fitted to allow the wire to be tightened.



Sketch of the dual-array showing main constructional detail and dimensions.

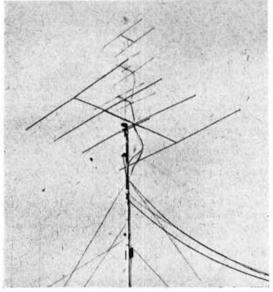
ends tapped so as to screw into the steel junction boxes. The cross arms were made of $\frac{3}{4}$ in. dural tubing with standard 1 in. to $\frac{3}{4}$ in. reduction fittings in the junction boxes. At the outer ends of each of the cross booms, a "dome-end" was attached. To these were fastened 5 in. \times 3 in. \times $\frac{1}{2}$ in. polystyrene sheets. On the sheets were mounted the $\frac{3}{4}$ in. dural elements by means of anodised nuts and bolts: two $\frac{1}{8}$ in. holes having been drilled in the elements and polystyrene sheets for this purpose. The cross-over feeders to the three sets of driven elements were made from solid $\frac{1}{4}$ in. aluminium wire, flattened at each end and drilled with $\frac{1}{8}$ in. holes. This array was fed directly from 300-ohm ribbon attached to the centre pair of

To prevent weathering of the dural tubing, a number of large corks were obtained from the local brewery. These were coated with red oxide paint and driven, while still wet, into the free ends of the elements of both arrays. In addition all metal work was given two coatings of red oxide paint followed by two coatings of aluminium paint.

Rotating Mechanism

Next came the mounting of the driving motor, which was fastened to a piece of hard timber, 3 ft. \times 3 in. \times 3 in., hollowed out on one side so as to fit closely to the curvature of the mast to which it was fastened by two 6 in. \times $\frac{1}{2}$ in. bolts. The motor

which operates from a 24 V. supply, and which incorporates a reduction gear of 2,000: 1, originally formed part of the searchlight control on a Sunderland aircraft. A selsyn master-motor driven by a chain and sprocket wheels, also obtained from surplus stores, was strapped to the driving motor by a steel band. The main motor shaft was extended three feet with the aid of a steel shaft mounted on two self-aligning thrust bearings. To protect the bearings from rain and snow, an inverted funnel shaped



The "Two over Ten" Rotary Beam Aerial System in position at G6MN—Worksop

cowling (with a flare diameter of one foot) was fashioned from tin plate and fastened near the top of the motor shaft. As with all other metal work, this cowling was treated with red oxide and aluminium paint. As a further protection two pieces of inner tubing from an old motor tyre were placed round the ball bearings and tacked to the wooden support. At one end of the shaft, a piece of steel strip, 12 in. \times 1 in. \times 1 in., was welded, and drilled with four equally spaced $\frac{1}{4}$ in holes. To this platform was fastened the 6 ft. \times 1 in. \times $\frac{3}{4}$ in. steel strip which supports the central dural boom of the 28 Mc/s. array. At the centre of this strip was welded the steel junction box which supports the central upright of the 144 Mc/s. array.

On the completion of the constructional work, the motor assembly was fixed into position on the mast, which had been lowered to about 10 ft. from the ground so as to give sufficient clearance for the elements. The 28 Mc/s. array was bolted to the steel strip by means of 3 in. bolts (\$\frac{1}{2}\$ in. diameter) through the centre of the junction boxes on the inner director and radiator. These bolts were fitted with large washers to avoid straining the walls of the junction boxes. The upright steel conduit of the 144 Mc/s. array was then screwed into the inverted tee junction box. Additional straining wire was fixed from the first cross-arm of the 144 Mc/s. array round the inner junction boxes on the 28 Mc/s. boom and tightened by means of turn-buckles. The entire assembly was then hoisted with the help of a ladder placed under the mast, and the stout-hearted efforts of four local amateurs.

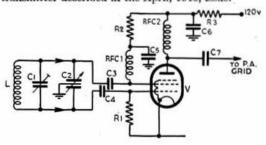
A V.F.O.

for Battery Valves

By V.G.P. WILLIAMS, M.A. (G3FYY*)

THE description by A. O. Milne (G2MI) in the December, 1949, issue of a portable transreceiver seemed to be just the thing for which the writer had been looking and work was begun on the construction of a set on similar lines. It was felt, however, that its usefulness would be greatly increased if a reliable V.F.O. could be added. This is not easy to achieve with battery valves, but after considerable experiment a circuit was developed which, although probably not original, has not been seen by the writer in published form.

The circuit is a development of the Ultra-Audion adopted by J. N. Walker (G5JU) for use in his battery transmitter described in the April, 1948, issue.



L 70 turns 28 S.W.G. enamelled on Eddystone former No. 537 (for 160 meter band).

RFC1, RFC2 Eddystone No. 1010. R1 50,000 ½ watt.
R2, R3 10,000 ½ watt. V 174.

C1 75 μμΓ. ceramic trimmer fixed inside top of coil former.

C2 Eddystone No. 584 34 × 34 μμΓ

C3, C5, C6 -001 μΓ. mica.

C4 100 μμΓ. ceramic. C7 50 μμΓ. ceramie.

In the present version the screen of the pentode is used as the anode of the oscillator, the output being taken from the anode proper, which eliminates the objectionable feature of imposing the load on the frequency determining circuit, normally the main cause of "chirp." The advantage of the circuit, which is absolutely chirpless when the P.A. screen is keyed, is that it works equally well when a crystal is plugged in to replace the tuned circuit L/C1.

The P.A. valve (3D6), which needs neutralising, takes a fairly heavy filament current (·22A. at 1·4 V. or ·11A. at 2·8 V.). A 3Q5 which has practically the same mutual conductance but which needs only ·1A. at 1·4 V. would seem to be more economical. Although the latter is designed for 90 V. on the anode it does not appear to object to 120 V. (90 V. on the screen) and gives the same R.F. output as the 3D6.

With an input of 1.5 watts, .5 watt R.F. output is obtained which seems well up to the usual standard of efficiency for such valves.

This circuit is extremely stable, and the writer would be interested to hear from anyone who has made tests along similar lines.

* 49 Melrose Avenue, N.W. 2.

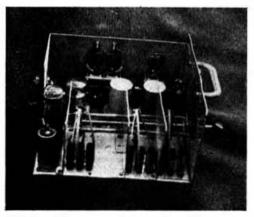
Around the Trade

A new pamphlet (issue No. 3) is available from The Telegraph Construction and Maintenance Co. Ltd., 22 Old Broad Street, London, E.C.2. It contains characteristics and dimensions of eleven types of R.F. cables for anti-static and television purposes and also details of three types of screened microphone cable.

A THREE-BAND CONVERTER from the R.F.27

BY A. BROWN (B.R.S. 15765)*

OST members will be familiar with the popular ex-Government R.F. units, type 26 and 27. Unfortunately since the loss of the 58 Mc/s. band, the original frequency coverage of these 3 valve converters (50-65 Mc/s. and 65-85 Mc/s.) is of comparatively little value for amateur purposes. Full details of the conversion of an R.F.27 for either 28 or 144 Mc/s. were given in the May, 1949, issue of the BULLETIN. It is not widely appreciated, however, that these units can equally well be adapted for the lower frequencies. The following brief account describes the modification of an R.F.27 into a switched three-band converter covering 7, 14 and 28 Mc/s. for use with any receiver which tunes to 6-8 Mc/s. Other bands, such as 21 Mc/s. could easily be substituted for the 7 Mc/s. range. The modifications described can be carried out in a few hours for an outlay which, even if the majority of the components cannot be found in the junk box, should not exceed about £1.



Side view of the converter showing position of the screens.

Circuit Modifications

The circuit alterations to the existing unit are of a simple nature. The original three coils in the R.F.27, i.e. R.F., mixer and oscillator coils, are replaced by a set of switched coils covering the bands chosen. Three coils must be wound for each band, making a total of nine in all. These coils are all wound with No. 22 D.C.C. wire on \(\frac{3}{2} \) in. diameter slug-tuned formers, as follows:

7 Mc/s.	 	32	turns
14 Mc/s.	 	18	turns
28 Mc/s.	 	8	turns

All coils for the same band are wound with a similar number of turns, alignment being carried out by means of the slugs. The coils are selected by the use of a three bank, treble throw, double pole, wave-change switch. The two leads to each of the original coils are unsoldered and taken instead to the two poles on the appropriate bank of the switch. Although it will be necessary to extend these leads they should be kept as short as possible and may be taken through the side of the additional coil chassis now to be described.

Additional Coil Chassis

A 4½ in. × 8½ in. × 1¾ in. chassis is constructed from aluminium sheets and three screens added. The photograph should assist in showing the location of these screens and the general layout of the components. Apart from the holes which must be drilled to accommodate the coils and the wave-change switch, provision should also be made to permit the adjustment of the tuning slugs from below the chassis. The original front panel of the unit is replaced by one measuring 6½ in. × 8½ in. To transfer the positioning of the bolt holes from the old to the new panel, the two panels are clamped together and a centre punch used to mark out the correct positions for drilling. The coil chassis is secured to the new front panel by means of three bolts.

In order to facilitate rapid coupling to the receiver, the stiff spring at the back of the original unit is removed and the hole so left is used to accommodate a co-axial cable socket. This can be connected to the R.F. output by a 3 in. length of screened cable. To improve frequency stability, the H.T. for the oscillator should be regulated by means of a VR150/30 which, with an associated 8 µF. smoothing condenser, may be mounted at the rear of the coil chassis.

Operation

The output from the converter is fed into the station receiver in the usual manner, the I.F. frequency being variable between approximately 6 and 8 Mc/s. with the aid of the tuning slug in the output coil. A signal generator will be useful in locating the bands, but by setting the variable tuning condenser to half-mesh, and then slowly adjusting the oscillator tuning-slug, the bands may be found fairly easily. In the model described, the 14 and 28 Mc/s. bands were located at 65 degrees on the dial with the oscillator coil slugs right out, while the 7 Mc/s. coil required the slug to be part way in. This converter has now been operating for more than six months and has given excellent results on all three bands. In fact within ten minutes of switching-on, the writer was listening to his first Chinese amateur station at R5 S8!

A Secret Disclosed

A S a postcript to the 6 o'clock news bulletin on December 31, 1949, Scottish Home Service listeners heard B.B.C. Variety Producer, Howard Lockhart, pay warm tribute to the world-wide friendliness of radio amateurs. Returning by air from a six months' stay in Sydney, Mr. Lockhart was astonished to find himself warmly greeted—by complete strangers—on arrival at Suva in the Fiji Islands and later in New York. The secret? One of his colleagues at the Australian broadcasting studios was an amateur who tipped-off friends along the route.

Just one of those human interest stories which are an everyday occurrence to amateurs—but which give to the general public a fine idea of the spirit of our hobby.

V.H.F. TECHNIQUE Indispensable to all V.H.F. Enthusiasts

PRICE 3/6 (By post 3/9)

FROM R.S.G.B HEADQUARTERS

NTERESTED IN 70 cm.

URING the question period following a recent R.S.G.B. meeting at the Institution of Electrical Engineers the subject of the shared use of the 70 cm. amateur band was under discussion. This resulted in several members tending to get hot round the collar at the so called intrusion of official radio stations into an amateur band and in the case of one particular member-vice versa.

To clear the air a little the writer has attempted in the following paragraphs to give a simple explanation of the "official radio stations" concerned. These are aircraft radio altimeters, using American equipment of wartime design, which will probably remain in use until the present stocks are exhausted or until new equipment, using higher frequencies, becomes readily available.

Theory of Operation

The aircraft radio altimeter depends on the fundamental principle that the velocity of electromagnetic waves is constant at 984 × 106 feet per second. Thus, if the time taken for a wave to travel an unknown distance can be accurately measured, the distance can be easily calculated. The transmitter part of the altimeter in common use is a frequency modulated C.W. oscillator with a power output of 0 · 1 watt. The electronic modulation is constant at 120 c./s. and the "swept" radio frequency is either from 420 to 460 Mc/s. (± 1 Mc/s.) or from 442 to 446 Mc/s. At any one instant of time a wave on a definite frequency within these bands is radiated from the transmitter aerial—a centre-fed half-wave dipole beneath the aircraft. This wave travels to the ground whereupon it is reflected and picked up by a receiver dipole—also under the aircraft—the frequency (neglecting the "Doppler" effect) still being the same. By this time however, the fre-quency being radiated will have moved—the amount it has moved depending on the lapse of time and the rate of sweep or modulation frequency. By combining the reflected signal and the current transmission frequency in a balanced detector circuit a heterodyne frequency is produced which varies directly as the time lag—i.e. the height of the aircraft. By the use of simple mathematics it can easily be calculated that the beat frequency will be either 19 or 1.9 c/s. per foot of height for the two radio frequency bands quoted above. This low beat frequency is made to actuate a meter suitably calibrated in feet to indicate directly the aircraft altitude. The whole process is of course continuous with the reflected frequency lagging the oscillator frequency all the time. In actual fact the altimeter sweeps the band 420 to 460 Mc/s. for heights up to 400 feet (low range) and 442 to 446 Mc/s. for heights between 1,000 and 4,000 feet (high range).

There is one other type of radio altimeter in current use for heights up to 40,000 feet. This high altitude meter utilises the familiar radar pulse technique on a radio frequency of 440 Mc/s. pulse recurrence frequency is supersonic at 98.356 kc/s, and the altitude is obtained from a C.R.T. indicator by the display of the radiated and reflected pulses. This means that audible reception on the ground would appear as C.W. whilst any interference experienced in the air would be easily identifiable as such, on the C.R.T. display. The fitting of this particular altimeter is restricted to comparatively few aircraft, mostly of American origin and a few British machines engaged in long range meteorological duties where accurate altitude measurements

are esential.

Conclusions

Following this simple treatise, two conclusions become apparent :-

(a) The 4 Mc/s, band between 442 and 446 Mc/s. is best avoided as it is only here that there is any real chance of mutual interference. Even so it is doubtful if the interference would be more than a very slight nuisance. As a point of interest, the balanced detector circuit in the F.M. altimeter is so designed that interfering signals are balanced out and thus have no effect on the performance of the altimeter.

(b) The times when the radio altimeter is used on "low range" are very few—mostly in the vicinity of airfields and even so mutual interference would appear as narrow 240 c/s. pulses. This would have no effect on the altimeter and an amateur would only obtain pick-up while an aircraft was virtually overhead at less than 1,000 feet—a condition which does not happen very often and

then only for a minute or so.

Thus although on paper it appears that both amateurs and radio altimeters share the 70 cm. band, the chances of one bothering the other are extremely remote. Finally it can be noted that the new frequency allocations for radio altimeters are 1,600 to 1,700 Mc/s. and 4,200 to 4,400 Mc/s. and it is simply a matter of time before the 70 cm. band is left exclusively to amateurs.

References

(1) Journal of the I.E.E., vol. 94, Part IIIA, No. 16 page 1,001, "Low Reading Absolute Altimeters," B. A. Sharp, Ph. D., A.M.I.E.E.

(2) Record of the 3rd Commonwealth and Empire Conference on Civil Aviation, July-Aug., 1945, page 121. H.M.S.O., price 5s.

H. E. B.

Future National Radio Exhibitions

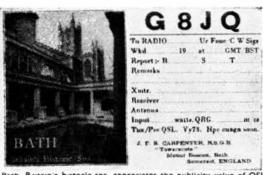
•HE National Radio Exhibition which is to be held at Castle Bromwich, Birmingham, from September 6 to 16 next, will be at Earls Court, London, in September, 1951, 1952 and 1953.

The Radio Industry Council in announcing this, stated that their earlier decision to hold the exhibition at Olympia in June instead of in the autumn had been changed, but this change came too late to secure convenient autumn dates and the necessary space at Olympia.

In view of the facilities offered at Earls Court, it was decided to go there rather than hold the exhibi-

tion at Olympia at a less convenient time.

The National Radio Exhibition before going to Olympia in 1926 was held at the Royal Albert Hall in 1924 and 1925, the White City in 1923 and the Horticultural Hall in 1922. Sixteen National Radio Exhibitions have been held in all. The one coinciding with the Festival of Britain will be the 18th.



Bath, Britain's historic spa, appreciates the publicity value of QSL cards. The example shown was prepared and distributed free of charge by the local authority.

In the Workshop

By "DONEX"

THE SIMPLER TOOLS

The Screwdriver

It would perhaps appear strange that there is a right way and a wrong way of using a simple tool such as a screwdriver, but since it is used more frequently than any other tool a few words of advice may prove helpful. As in the case of soldering, dealt with last month, the mis-use of a screwdriver leaves its mark of careless and slovenly application in mutilated screw-heads, and may spoil completely an otherwise praiseworthy effort of instrument making.

How often one sees a screwdriver being used as a sort of "gouge," tearing out the slot in the screwhead with never a thought of appearance, or of the time when it might be necessary to remove that

screw.

Firstly, let us look at the screwdriver blade—its function in tightening a screw is to fit closely in the slot and not tend to ride out when turned—in other words it is a spanner and should fit its job.

Fig. 1 shows the right and wrong shapes of the

blade.







BEST



Fig. I.

It will be seen that a "bad" screwdriver has a chisel-like edge with sharply bevelled sides—obviously such a screwdriver tends to ride out of the slot which it mutilates in the process.

A good screwdriver should have steeply sloping sides (or in the best case hollow ground) to the tip of the blade which should be ground off to give a square end of dimensions just sufficient to fit the slot of a screw snugly. In general, two screwdrivers should be available to fit 4 and 6 BA screws with a larger one for larger sizes. Watchmakers screwdrivers are necessary for those who aspire, say, to dismantle for repair, a moving coil meter. The smaller the screwdriver the better its condition should be.

The hardening and tempering of the blade is of course an important feature and will not generally arise if good quality tools are acquired in the first place, but information on this and other questions of

heat-treatment will be given later.

Using the screwdriver. For screws of 4 B.A. and smaller, the following method should be cultivated. Hold the screwdriver in the fingers with the blade parallel to the wrist, set the blade in the slot of the screw and place the index finger on the top of the handle, apply sufficient pressure by "pulling" the driver downwards towards the screw, and turn by manipulating the thumb, 2nd, 3rd and 4th fingers to give a rotary motion, the index finger acting as a steady all the time.

It will soon be seen how this "system screwdriving"

It will soon be seen how this "system screwdriving" gives a feeling of satisfaction and security in use, and how it supersedes the amateurish method of placing the handle of the driver in the palm of the hand and turning it with the whole wrist and forearm. In

restricted positions this procedure may be necessary but the correct method should be adopted wherever possible and as will be seen it avoids to a great extent the tendency of the blade to jump the slot when finally tightening (or loosening) and saves many a torn or lacerated knuckle on sharp adjacent corners.

Woodscrews, particularly the larger sizes, require greater downward pressure. The same technique should be adopted with the other hand applied to the

handle to give greater turning effort.

Saws and Sawing

Radio constructional work involves the fairly frequent use of a hacksaw, and its indiscriminate use results in mutilated work, bleeding knuckles and shattered saw-blades.

A saw-frame to take 12 in. blades is recommended, and should preferably have a "pistol-grip" type of handle. For small work a "splitting-saw" in a 6 in. frame is a most useful and inexpensive item. For small metal work, fine-tooth blades of reputable manufacture should be used. Cheap blades shed their teeth and are often indifferently hardened. If an adjustable frame is available, extend it just sufficiently to take a 12 in. blade. Set the blade carefully on the pins with, of course, the teeth facing away from the operator. Tighten the tensioning wing-nut so that the blade is rigid throughout its length. Over-tension is much safer than under-tension—provided the frame is not distorted—and saves blades.

Now, assuming we require to saw through say, a in. steel bolt. Fix it firmly in the vice with the requisite overhang—put a few drops of thin oil on each side of the blade and spread with the finger, guide the blade with the fingers of the left hand to the appropriate position and start the cut with a few short and gentle strokes. Then, with the left hand gripping the end of the frame—not the top—increase to full strokes, remembering the cardinal observance that great downwards pressure is not necessary, and tends to make the blade seize up and break.

The cutting force along the blade should be nearly equally divided between the hands, and a rhythmic action assisted by a movement of the whole body. If you have the opportunity of watching a skilful mechanic using a hacksaw, you will notice the ease and rhythm, and the fact that he uses the whole length of the blade and not a few inches in the centre.

When the severance is nearly complete, do not continue vigorous sawing so that the blade goes through with a crash and you skin your knuckles









MARKING REAMER (MADE FROM OLD 3-CORNERED FILE) Fig. 3.

on the vice-just continue quietly till the scrap bit bends away and can be removed.

Cutting Sheet. Steel or aluminium sheet up to about 8 in. wide can be cut with a 12 in. hacksaw but aluminium or dural sheet can be most readily cut with an old "tenon-saw" which is past its proper job and it is surprising how quickly the cut can be made.

Cutting various materials. Different materials are best cut with different coarseness of blade and with different lubricants-the following table may prove helpful.

Material		Blade	Lubrication
Brass Aluminium)	Normal	None
Duralumin	Í	Normai	None
Cast Iron		Normal	None
Mild Steel	*.*	Fine	Thin oil
*Bakelite	• •	Normal	Trace of vaselin on blade.
*Polystyrene, etc.		Normal	Paraffin

When using a new blade try and remember to saw a piece of brass with it before putting into normal service on other materials. It will cut more easily and last longer.

Drilling

(a) The Hand-drill. Another widely applied process in radio construction is the use of a handbrace or hand-drill for drilling holes up to 1 in. and of a breast-drill or brace for larger sizes. A hand-drill of good quality is an essential as, in the cheap varieties, loosely fitting bearings and badly cut bevels are an endless annoyance. The chuck should grip effectively all drills from 1/12 in. to 1/2 in. and should run perfectly true.

As the best hand-drill is only as good as the worst if indifferent twist drills are used, every effort should be made to invest in a really good set of drills, and

to maintain them always in good condition.

(b) The centre punch. In order to drill a hole in metal, it is necessary firstly to locate the drill accurately in the desired position by means of a "centre-pop" formed by a centre-punch. A quite usual method of doing this, which one sees only too frequently, is to move the punch vertically over the required position of the hole to be be drilled, and then to take a heavy "swipe" at it with a hammer, often missing the punch and hitting the knuckles After making three or more "pops" one may be After making three or more "pops found nearly in the right place.

The correct procedure is as follows (see Fig 2):-Hold the punch in the left hand at an angle of 45° to the work and move it up till the point reaches the appropriate position, press on fairly hard and raise to the vertical—give a gentle tap and observe the position of the "pop"—replace the punch and give a sharp controlled vertical blow.

Always place a block of wood under the surface of a chassis or piece of sheet metal when using the centre punch, otherwise a series of dimples may appear at every hole.

Many people use an old 3-cornered file ground off at its tip to form a sharp 3-sided cutter for opening

the "centre-pops" before drilling-This is particularly useful for aluminium (Fig 3).

(c) Drilling the hole. Having marked the position of the holes, the appropriate drill for clearance holes of 6 B.A. and smaller may be inserted in the chuck and the hole drilled in one operation. For holes of 4 B.A. and larger it is desirable to drill the hole in two operations, the first by running say, a 32 in. drill through and the second by opening the hole with the correct sized drill.

The drills should not be inserted in the chuck with its jaws gripping the fluted portion. The top circular portion is purposely left unhardened so that it can be gripped there, thus avoiding fracture.

Haste and furious rotation of the drill with the consequent crashing through the work is the stamp

of the bad mechanic.

Holes should be finally chamfered off slightly on each side by means of a larger drill rotated in the fingers. Finally, never try and force a drill which is not cutting. Change it for another and put away for sharpening in due course.

Mention the Bulletin when writing to Advertisers-it Helps them and us

An Inexpensive Log Book

O meet the need of amateur transmitting operators and short-wave listeners, Messrs. Webb's Radio have introduced a new Radio Station Log Book which is serviceable and inexpensive. With well over a hundred pages and twenty-five entries to a page, each book should last even the most active station for several months. The rulings, which meet G.P.O. licence requirements, include columns for: date; time (start); time (finish); frequency; station (called or heard); called by; telephony or C.W.; input; RST of station heard or worked; RST received; QSL sent; QSL received; operator's initials; and a 2½ inch column for remarks. These divisions should meet with general approval, although perhaps the space allotted to call-signs is a shade narrow for some of the six symbol calls now being issued. The finish to the paper is sufficiently smooth to permit entries to be made in ink while the card covers and saddle-wired binding should stand up to hard use.

Details of the R.S.G.B. Band Plan, the complete RST code and some suggestions for "Good Operating" have been reprinted on the inside of the front cover and provide an invaluable source of reference.

Local societies may obtain supplies in bulk at a trade discount. Individual copies can be obtained from Headquarters, price 3/4 (by post 3/10).

=Ten Minute Quiz=

A pot-pourri of questions for the radio amateur.

1. How is the value of a cathode bias resistor calculated if the intended working conditions of a valve are known?

2. To what does the "delay" in delayed A.V.C.

refer?

What is the approximate voltage drop across a mercury vapour rectifier valve:

4. State a British equivalent of the following well-known American type valves: 6J7G. 6L6G. 6J5G.

5. What allocations does the R.S.G.B. Band Plan suggest for the 7. Mc/s. band?

6. What is Deviation as applied to a radio technique?

7. What current does a 230 V. 60 watt electric lamp pass?

- 8. What are the two main disadvantages of using
- triodes in an R.F. power amplifier stage?

 9. What is the difference between a "Magnetic" and a "True" bearing from the U.K.?

 10. How many Empire call areas are there with
- which contacts count for an Empire DX certificate?

Now turn to page 317 to discover if you have beaten the question-master .- H. E. B.

[·] Saw very slowly. Always use a fine blade for tubing.

Bright Ideas

A New Monthly Feature Conducted

By L. M. GUNNELL (G8HB)*

Aerial Coupling Unit for 1.8 Mc/s.

HE difficulty of erecting a long wire aerial frequently deters amateurs from operating on the "top band," but a useful little coupling unit devised by Mr. R. Ellis, G3BKM, has enabled him to obtain satisfactory results with an end-fed aerial only 66 ft. long—a length that all except the most unfortunate can fit in somehow. The circuit diagram of the unit is shown in Fig. 1, and although its theoretical functioning seems obscure, G3BKM finds it gives excellent results for local telephony operation, and, incidentally, B.C.I. is non-existent. Most of the components will no doubt be to hand, and construction of the unit should present no difficulties. Tuningup procedure is the same as for more conventional aerial systems.

Current Overload Unit

The simple yet effective current overload unit shown in Fig. 2 was devised by Mr. P. J. Buchan, BRS17930. The unit is built around a Type 3000 telephone relay, which is open under normal condi-As soon as an overload occurs, the relay closes, breaking the circuit between supply and load: it is subsequently held in the closed position by the current flowing through R1. The "reset" control breaks this holding circuit, which then reverts to normal. The current at which the relay will operate is determined by the setting of R2 (which controls the percentage of the load current flowing through the relay), and can be varied between 6 and 250 mA. Other contacts on the relay serve to operate a warning light, and also to disconnect R2 from the circuit so as to allow the whole of the holding current to flow through the relay. This latter function is only necessary when the power supply is working at maximum output.

Coupling to Low Impedance Lines

One of the usual methods of obtaining the required degree of coupling between flat transmission lines and the transmitter is to adjust the length of the line to an odd number of quarter waves so that the required power is drawn by the feeder. This is often necessary

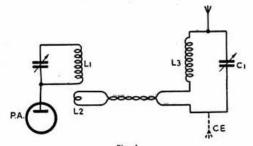


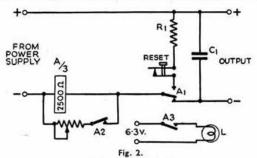
Fig. 1.

An Aerial Coupling Unit for 1.8 Mc/s. This unit will enable a short wire aerial to be loaded up satisfactorily on 1.8 Mc/s.

L1 P.A. tank coil. L2 2 turn link. L3 23 turns +8 S.W.G. D.C.C. close wound on a 2 in. former. C1 0-0005 μ F receiving type variable condenser.

79 Pollards Oak Road, Limpsfield, Surrey.

even when the standing wave ratio is as low as 2:1, but is frequently inconvenient. Mr. C. R. Hampton, G3BPP has submitted details of a scheme which will enable such an "untuned" line to be efficiently coupled to the transmitter without having to alter the length of the line. Basically the idea consists of connecting a capacity either in series or parallel with the line, depending upon whether the reactance presented by the feeder is inductive or capacitive. This can easily be determined by trial and error. G3BPP suggests that it is best to employ as few



A Current Overload Unit.

This useful device provides a means of protecting a power unit, and the equipment it supplies. The contacts AI must be adjusted to "make" before changeover, otherwise the relay merely chatters. A Type 3000 telephone relay.

RI Selected to hold the relay closed with voltage in use.

1,000 ohms wirewound resistance. This value will give control between 6 and 250 mA. 2 μF. decoupling condenser.

Visible warning of overload.

turns as possible in the link, and use either series or parallel capacity until the loading is satisfactory. The connections for series and parallel capacity are shown in Fig. 3 (a) and (b) respectively. The condensers used can conveniently be air dielectric trimmers of about 100 µµF. capacity, but good quality mica or ceramic fixed condensers may be used, the capacity required being found by experiment.

Storing Resistors

Most of us keep our resistors in one box, and when a reasonable store has been accumulated it is often a lengthy business to sort out the values required for building a new piece of equipment. Mr. G. E. Cockroft, G4FO, has overcome the difficulty by mounting six small boxes just above the work bench and labelling them as follows :-

Black	Brown	Red	Orange	Yellow	Green
Spot	Spot	Spot	Spot	Spot	Spot
XX	XX0	XX00	XX000	XX0,000	X,X00,000

Then when stripping any equipment, the resistors are placed in the appropriate box. This ensures that when a particular value of resistor is required, the time taken to find it is negligible.

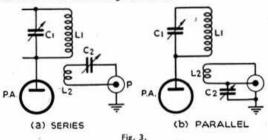
Using 24 Volt Relays

Many of the relays obtained from surplus equipment require 24 V. D.C. Such a supply is seldom available in the shack, with the result that the relays are often either thrown away, or put in the junk box and forgotten. Mr. L. J. Coupland, G2BQC, has found that the current needed to operate them is usually of the order of 20 mA., and that if connected in series with a high voltage supply bleeder resistance passing approximately this current, they operate quite satisfactorily.

It must be remembered, however, when relays are used in this manner, a severe or even fatal shock could be obtained, if for some reason the relay winding became open circuited, and investigation of the fault was being carried on with the high voltage supply switched on. The motto is "Be Careful."

Trimming Tools

Excellent trimming tools can be made from the plastic knitting needles which are now readily obtainable. Just sharpen the end to a screwdriver point with a file, and if necessary, make it somewhat narrower. The best gauge of needle for this purpose is No. 1 which is about 1 inch thick.



Coupling to low impedance transmission lines.

At (a) is shown the series connection, and at (b) the parallel connection. In each case L1 C1 is the P.A. tank coil, C2 a 100 $\mu\mu$ F, trimmer, and IP a co-axial or other type of plug.

Top Band Activity

LTHOUGH a careful check can be kept upon the number of amateur transmitting licences issued in the United Kingdom, comparatively little statistical information is available at the present time as to the extent of activity in terms of Older members will recall that band occupancy. before the war regular checks were made in order to discover the number of stations using the various bands at any given time. The enormous increase in activity has rendered the compilation of accurate information vastly more difficult, and few up-to-date

figures are available.

Thanks to the painstaking efforts of Mr. G. C. Allen, BRS250 (Thornton Heath, Surrey), however, much interesting light has now been thrown upon During 1949, BRS250 spent approximately 500 hours, usually between 2200 and 2330 G.M.T., listening on a home-built superhet to both telephony and C.W. stations on this band. He heard 1,149 U.K. call-signs, representing 1,116 different licensees, plus portable and alternate address operation. An analysis of this total shows that 259 G2, 514 G3, 52 G4, 69 G5, 86 G6, 74 G8, 6 GC, 2 GD, 10 GI, 42 GM and 35 GW calls were logged. Incidentally stations in all the counties of England, with the exception of Westmorland, were heard. figures, compiled as they are by only one listener, should do much to destroy the illusion that activity on this band is confined to a few "die-hards." When the number of additional stations who use the band purely for local daylight working is also taken into consideration, it can be seen that these low frequencies are by no means neglected.

It would be most interesting to examine the corresponding figures for other bands, including V.H.F. Such information may well prove essential in the preparation of the amateurs' case for the next International Telecommunications Conference at Buenos Aires in 1952.

"The Transmitting Licence"

HE Post Office have again revised the list, as published in the Third Edition of The Transmitting Licence, of officers and other ranks of the fighting Services with qualifications exempting them from technical or Morse examinations.

Certain Army war-time courses have been removed from the list whilst R.E.M.E. Leading Artisan Staff Sergeants Wireless and Radio and R.E.M.E. Electricians Signals (All Classes) can no longer claim exemption. In addition the following R.A.F. trades no longer carry exemption :-

Officer Wireless Operator (Air) Wireless Telegraphy Operator Wireless Operator (Air) Wireless Operator Mechanic Wireless Operator Mechanic (Air) Wireless and Electrical Mechanic. The Royal Navy list has not been amended.

W.A.A. Certificate

NEW DX proficiency certificate—the W.A.A. (Worked All Africa)—has recently been introduced by the South African Radio League. The award will be issued to members of member-societies of the International Amateur Radio Union who submit proof of two-way communication with amateur stations in all ZS call areas (ZS1—ZS9) plus 25 other countries on the Continent of Africa. The following is a short summary of the rules:

Contacts must have been made (1) since November, 1945, (2) with land stations, (3) from the same call area (or from within a radius of 150 miles of the initial location) and (4) with a minimum report of RST338 (C.W.) or R3 S3 ('phone). All applications must be sent direct to South African Radio League, P.O. Box 7028, Johannesburg, South Africa together with a list of claimed countries and stations and sufficient postage for the return of the confirmations. Applications from non-members of the S.A.R.L. must also be accompanied by a fee of 2/6. Certificates will be endorsed "Telephony" or "Telegraphy" where appropriate, and a special endorsement will be made when all (41) areas have been worked.

For the purposes of this certificate the countries comprising the Continent of Africa are: Algeria (FA); Angola (CR6); Anglo-Egyptian Sudan (ST); Basutoland (ZS8); Bechuanaland (ZS9); Belgian Congo (OQ5); British Somaliland (VQ6); Cameroons (French) (FES); Egypt (SU or MD5); Eritrea (16 or MI6); Ethiopia (ET); French Equitorial Africa (FQ8); French Morocco (CN8); French Somaliland (FL8); French West Africa (FF8); Gambia (ZD3); Gold Coast (ZD4); Italian Somaliland (MD4); Kenya (VQ4); Liberia (EL); Libya (MD1, 2 or LI); Mozambique (CR7); Nigeria (ZD2); Northern Rhodesia (VQ2); Nyasaland (ZD6); Portuguese Guinea (CR5); Sierra Leone (ZD1); South West Africa (ZS3); Southern Rhodesia (ZE); Spanish Morocco (EA9); Swaziland (ZS7); Tangier (EK or CN1); Tanganyika (VQ3); Togoland (FD8); Tunisia (FT4 or 3V8); Uganda (VQ5); Union of South Africa (5 areas: ZS1, ZS2, ZS4, ZS5 and

TECHNICAL ARTICLES

TWENTY-FIFTH ANNIVERSARY

of the formation of I.A.R.U. to be celebrated in Paris

•HE President and Council of the French National Society, Réseau des Émetteurs Français (R.E.F.), cordially invite members of the R.S.G.B. to attend the I.A.R.U. Congress to be held in Paris from May 17th to 20th next.

The Congress will mark the 25th Anniversary of the formation of the International Amateur Radio Union, and will be supported by representatives from

many National Societies.

Following a meeting in Paris last month between the General Secretary of the R.S.G.B. and Executive Members of the R.E.F., the following arrangements have been agreed.

Venue and Programme

The Congress will be held in the Aero Club of France, a building of great historic interest situated within easy reach of the centre of Paris.

The Congress will be opened by M. Georges Barba, F8LA (President of R.E.F.) at 10 a.m. on Thursday, May 18th. After welcoming the delegates he will ask for nominations for the position of President of

the Congress.

After the President has been elected the Congress will set up two Committees. No. 1 will deal with matters concerning licence regulations and will be called the Legislation Committee. No. 2 will deal with technical matters and will be called the Technical Committee.

Committee No. 1 will consider,

(a) Regulations affecting the issue of licences and how they vary in different countries.

(b) Participation in future International Telecommunication Conferences with special reference to the Buenos Aires Conference scheduled to take place in 1952.

(c) Band Planning, Operating Techniques and

Contests.

(d) Other problems that may be brought forward by Delegates. The R.S.G.B. will submit papers on Future Inter-

national Telecommunication Conferences, Operating

Practices and Contests to Committee 1. Committee No. 2 will consider,

(a) Scientific Observations, with special reference to co-operation with U.R.S.I.

(b) Television interference. (c) Interference generally. (d) V.H.F. propagation. (e) U.H.F. propagation.

(f) Other problems that may be brought forward by Delegates.

The R.S.G.B. will submit a paper on Scientific Observations to Committee 2.

The two Committees will work to the following time table :-

Thursday, May 18.
11 a.m. to 12.30 p.m. 2 p.m. to 5 p.m.

Friday, May 19.

9.30 a.m. to 12.30 p.m. 2 p.m. to 5 p.m.

The Chairmen of the two Committees will present reports to the full Assembly at a meeting called for 9.30 a.m. on Saturday, May 20th. The reports will summarise the work achieved and discussion on them will be invited. The reports will be printed later and distributed to the I.A.R.U. Societies.

The Congress will meet finally as a full Assembly at 2 p.m. on May 20th for the purpose of ratifying decisions reached at earlier meetings. A number of distinguished visitors will be present at this session and at the Congress Banquet which will be held later that day.

Visits and Entertainment

R.E.F. is organising an extensive programme of visits to places of technical and topical interest; in addition a number of Paris amateurs are to act as hosts to foreign Delegates. The Paris Fair will be in progress during the period of the Congress.

Reservations

R.S.G.B. members who wish to attend the Congress are asked to write without delay to the General Secretary indicating when they expect to arrive in Paris. Hotel accommodation can be arranged provided good notice is given. As the charges for hotel accommodation vary considerably members should indicate the maximum price they are prepared to pay per night. (The present exchange rate is about 960 Francs to the Pound Sterling.) Breakfast and other meals are normally charged separately.

Official R.S.G.B. Delegation

The R.S.G.B. will be represented officially at the Conference by Mr. W. A. Scarr, M.A., G2WS (President), Mr. V. M. Desmond, G5VM (Immediate Past President), Mr. S. K. Lewer, B.Sc., G6LJ (Past President), Mr. A. O. Milne, G2MI (QSL Manager), Mr. A. J. H. Watson, F.S.A.A., G2YD (Honorary Treasurer) and Mr. John Clarricoats, G6CL (General Secretary).

Philatelists Please Note

R.E.F. in collaboration with the French Posts and Telegraphs, are to produce a special Congress postcard which will carry in the top right hand corner a recently-issued French commemorative stamp (the subject chosen is M. Chappé, the inventor of an early form of signalling device) and in the lower left hand corner a sketch of a rotary beam aerial. The P. and T. will set up a Congress Post Office at the Aero Club and all mail posted from there will carry a special catchet.

-Did You Know?-

That the average time taken by radio signals to go round the world is .13778 seconds.

That there were 992 licensed British amateurs at the outbreak of war in 1914.

That microwave transmissions are subject to considerable rain absorption.

That military use was made of wireless telegraphy during the Boer War.

That the United States spent more money on communications and electronic equipment during the second World War than for "guns and fire control."

THE MONTH ON THE AIR

By ARTHUR MILNE (G2MI)*

Band Checking

PRIOR to the Cairo Conference in 1932, the Society made a survey of the 7 Mc/s. band and in particular kept a close watch on interlopers. There is an urgent need at the present time to form a group of listeners who will constitute themselves into a band check service for the purpose of identifying and reporting commercial and broadcast interlopers on our exclusive frequencies. Will anyone interested who is prepared to give a little time to this worthy cause please write to G2MI. A postcard please and mark it "Band Check." A few linguists would be invaluable, especially one or two who understand Spanish!

Top Band

The "top band" has continued to provide much of interest. G6ZN using his customary 3 watts from batteries heard WIBB come back to G6?N; hard luck but well done O.M. He has worked OK1DC, 1EA, 10PL, 1JX, 1AJB, 2OBR, and 2OL. OK1EA was contacted at 0900 G.M.T. GM8FM has worked W2BLA on 1800 kc/s.

Thought for the Month

When an inexperienced operator stumbles or sends slowly do you ever think that perhaps he is getting as much of a thrill from the contact as you used to get when you were an inexperienced operator?

VEIEA is one of the most consistent stations on this band. Here is a brief history of his DX. On Dec. 18th he heard G6BQ and G5JO. On Dec. 19th he worked GD3UB and on Jan. 8th G2PL and GD3UB. On Jan. 11th he heard G2PL and GM8UM and on Jan. 14th heard GD3UB and worked G8NF. His best night was Jan. 15th when he heard G2YS and worked G6BQ, G2PL, G3PU.

G3AGQ's list of OK's includes 10PL, 20L, 1VW, IFF, IAJB, IZB (who has QSL'd G2MI), also DL2CH, 2DV, GD3UB, GC2CNC, OZIW, and GC2BMU. A total of 45 counties and 9 countries. He says KV4AA is on 1995 kc/s, between 0600 and 0700 G.M.T. and has worked W4. W1BB has peaked to 589 around 0730. He has worked EK1AO receiving 579 and giving 589. G6BQ and G2PL have both received QSL's from EK1AO.

Notes and News

VSIBX hopes shortly to be on 3.5 Mc/s. G2BP of Chatham has been getting his 10 watts over to the U.S. on 7 Mc/s.

Eric Trebilock says VK9NR is now in New

Zealand, operating as ZL3OZ.

GSPL has worked VSSCE who claims to be on Bahrein Is, and to be licensed. He has also worked SM8AZX, a Swedish ship in the Persian Gulf. Another unusual one was W7EJU/AC who claimed to be in a plane over the Red Sea.

MC1BH has had difficulty in getting his cards

* 29 Kechill Gardens, Hayes, Bromley, Kent.

from the printers. He promises 100 per cent. QSL. He is the only station active in Cyrenaica at the present time. QTH, B.E. Hollands, Box 125, Benghazi.

G3DBF and G2GM worked OX3UE/3BR on 14078 kc/s. They are members of a Danish expedition of seven men to Pearyland near the North Pole, using a 25 watt transmitter. Everything was taken there by air last summer and they have not seen the sun for four months. A plane will take them off next September so no QSL's till then.

G3JW worked EQ3SAM who said he would QSL and gave QTH as Sam Morrison, 509 Weldon Ave.,

Oakland, Cal.

AP2X, 2Y and 5Z are pirates. AP4B does not QSL and all cards sent to him are returned marked not required." ZE2KL cards have been returned marked " in G " QTH please ?

Ian Cameron A1069 says SP5AB is genuine, QSL to Box 320, Warsaw, Poland. We have been officially informed by PZK, the Polish Society that

licences are now being issued.

G3CJM has his card from EA6AF, worked on 14 Mc/s. His 7 Mc/s. DX includes KV4AA, and KZ5DR. On 3.5 Mc/s. VK5KO, KV4AA, EK1AO, VO1W, F9QV Corsica, are some of the best.

VS7AB, AN, AX, DE, AL and HE are all "phoneys." VS7TL should soon be active, he is ex-G3AZD and will be using a B2. VS7BJ is on 'phone. VS7NX is the new QSL Manager.

Members who have worked Heard Is. may be

interested in an article which appeared in a recent issue of Wide World Magazine which gives a graphic account of life and conditions on this grim southern outpost.

We have heard from Dr. Dieminger of the Ionosphere Research Institute at Linden regarding the work of DI2BC. He tells us that the station was engaged in research work on scattered radiation on behalf of the German Post Office. 14000 kc/s. was chosen to give minimum interference to amateurs. The input was 800 watts.

G2HFC tells us that XZ2FK is shortly returning home. Judging by the number of cards we have handled we must be about the only G who did not work him !

G6RH worked FB8XX, (14010) on Ker Guelen Is. at 1723 G.M.T.

GC3GS suggests sending one's own call more often and CQ a little less. He has a schedule with ZBIAJX every fourth night on 7200 kc/s. on 'phone, between 2230 and 2300. Do not call ZBIAJX on his own frequency.

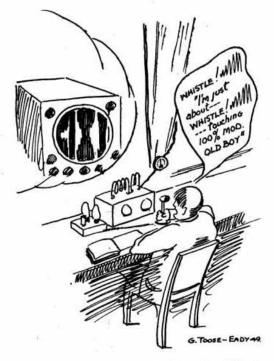
VS2CP will QSL all contacts but has only just received his cards. He is crystal controlled on 14046 and 14100 and is on daily between 1230 and 1400 G.M.T. VSICX is back in England. VSICW is ex-VK5SC and VS1DB is ex-G3CMP. G4RR is another one to come up with a new call. He is VK3AFK and wants contacts with Derby.

G2FAY has heard VE4GS/8 putting in a nice signal on 7 Mc/s. at 0700. He is at Alklavik N.W.T. with R.C.A.F. EASBC is now on 7 Mc/s. AP5B has been heard at 1750 G.M.T. others are CE3AS and AG2AG. M1B is active on 14 Mc/s., HP9FS/M with a peculiar note and fist is a bit of a problem. CR10AA at 0845 on 14060 has been heard working CE3.

In a recent letter G2FSR/VS6JH says he and VS6AX are compiling a black list. Those on the list will definitely not be QSO'd. CR9AM is now VS6AM. VS6JH received his card from AC3SQ in two days! Says C3MY in Formosa is O.K. and QSL's. VR4AA also QSL's.

BRS16857 of Yeovil who adds MD7WE to the 7 Mc/s. list has heard HR2RF and PJ5JR on 14 Mc/s. G3YY has received his card from FUSAA and counsels patience. BRS18017 gives EA6CU, 7150 at 2245 G.M.T. QSL to P.O. Majorca, Balearic Is.; SV1VS/MM 1830 on 14040; XZ2EM, 17, Link Rd., Rangoon, 14060; KV4AA, Box 403; St. Thomas, Virgin Is., 14020; EQ2AB, Box 60, Teheran Persia, 1845, 14030; CR4AU, Radio Club de Calso Verde Praia. Says CR5UP was heard making his last call and will soon be back in Portugal as CT1UW. All requests for cards should be addressed to Ruo Diaruo de Noticias 15–3 Lisbon.

G2BJY also remarks on HP9FS/MM's extraordinary note. The reason given was a storm waving the aerial about! He has worked FUS7AB Austrian



Tyrol! BRS7594 of Yeovil gives the following extracts from the A.R.C.I. call book:—AC3SQ, S. Sajah, P.O. Gantok, Sikkim. AC4RF, R. W. Ford, Lhasa via P.O. Gyantse. AC4YN, R. N. Fox, Lhasa. AC4NC, N. Chakrabarty, Lhasa. All these have "via Siliguri, N.W. Bengal, India," added to the address. AC5CS is Charles Sadger, British Political Agent, Bhutan, via Bengal, India.

F9QU/FM8 has been on 14390 at 0830, HSISS, 28495, at 1108. ZC6JM is c/o American Consulate, Jerusalem. MP4BAB is on daily at noon on 28240 and ZS9F on 28120. PK1UA, UH, 3MR, SJ, WH

and XA are all active about midday.

SV0AJ informs us that SV0AI and 'AL are now QRT. 'AI is returning home and 'AL is in Egypt. SV0WZ is no longer portable mobile. 'AJ has a Vee beam working nicely. He recently had a cross band duplex QSO with G5BS. G3CHP/ZE has been worked by G2BJY. VQ3BNU is ex-G3BNU. Yes YI3DYN is OK, QSL via R.S.G.B.

The Rarities Foregather

VQ5PBD mentions a memorable round table QSO on Oct. 9th, 1949. MP4BAE contacted him and ZD2S joined in. Then 'PBD heard KR6BV calling MP4 so brought him in. The party was then strengthened by the addition of VQ2DH and finally

PK5HL. Nearly all the stations concerned gave almost all the others a new country. Surely some kind of a record here: enough anyway to make the average DX man's mouth water!

Achievement

Doug Lamb, GM2UU has just added WAVE 'phone to his collection of firsts. Others are first ever EDX 'phone. First GM DXCC on 'phone. Good work O.M.!

Does a Beam Work?

There are some who tend to belittle the efforts of the man who takes the trouble to build and line up a beam aerial. The following figures from our own small effort in the A.R.R.L. DX contest are of interest. In 1947, 218 contacts in 34 zones; 1948, 184 contacts—32 zones. 1949, 3 element 20 and 2 element 10 beams brought into service, 481 contacts—44 zones. 1950, first weekend only, 305 contacts—45 zones. It is pretty obvious what made the difference.

Flash

On March 5, 1950, between 0240 and 0320 G.M.T., HK1KE had "top band" contacts with GM2HIK and GD3UB. Full details next month.

Slow Morse Transmissions

Call		kc/s.		Town
. G6NA		1840		Guildford
. G5XB		1950		Reading
. G2FXA		1900		Stockton-on-Tees
	6.			
. G3AXN		1870		Southend-on-Sea
		1825		Swindon
. G2AJU		1900		Stutton, Ipswich
		1750		Derby
CONTRACT TO				Tunbridge Wells
				Bournemouth
				London, S.E.2.
CONTRACTO		1820		Eastleigh, Hants
CLOUNT				Ilford
CO C CO C	- 22	1896		Chingford
G3AXN	2013	1870	1200	Southend-on-Sea
				Reading
				Belfast
				Southport
				Rotherham
CHARLES A				Stockton-on-Tees
CONTRACTOR				Salcombe, Devon
				Derby
CARE 4 4 35				Kirkealdy
		1000		1111 Actually
		1950		Preston
				Southampton
COARTA				Guildford
ATT AN INC. ME. AND				Grays, Essex
. Goda		1000		Grays, Hosek
001252		****		0
				Southend-on-Sea
Co. on the Million				Swindon
. Gant				Northallerton
				Stockton-on-Tees Wanstead
CALL PARTY				
COMPTO				Manchester Derby
. Golden, I	• •	1000	••	Derby
				0 11 1 0
47 14 WA W WW	**			Southend-on-Sea
			++	Bournemouth
. G2AJU				Stutton, Ipswich
				Wirral
				Gravesend
				Eastleigh, Hants
. G6JB				Salcombe, Devon
. G3ERD/P		1808		Derby
. GM4AN	2.5	1820		Kirkcaldy
. GM4AN				
. UMTAN				edrama es
. G3CHY	322	1800		Ashton-u-Lyne
	- G6NA - G5XB - G2FXA - G3AXN - G3NC - G2AJU - G2SLD - G2BLN - G2VR - G3BHS - G2VR - G3BHS - G3EA - G3AXN - G5XB - G12HLT - G3EFA - G2EA - G2FXA - G4JB - G2FXA - G4JB - G3AFD/P - GMAN - G3AFD/P - G3AXN - G3AFD/P - G3AXN - G3AXN - G3AXN - G3ASD - G3AXN - G3ASD - G3ASD	- G6NA - G5XB - G2FXA - G3AXN - G3NC - G2BLN - G3BHS - G3EFA -	. G6NA	G6NA 1840 G5XB 1950 G2FXA 1900 G3AXN 1870 G3NC 1825 G2AJU 1900 G3ASR 1750 G2CLD 1775 G2ELN 1900 G3BHS 1820 G3BHS 1820 G3BHS 1820 G3BHS 1905 G4GA 1896 G3AXN 1870 G5XB 1905 G3EHLT 1900 G3EFA 1855 G3EFA 1850 G3AXN 1870 G3AXN 187

Volunteers in districts not covered by these transmissions are invited to write to: Mr. C. H. L. Edwards, G8TL, 10, Chepstow Crescent, Newbury Park, Ilford, Essex.



The Sunspot

So far as amateur V.H.F.'s are concerned no news has reached us of any outstanding conditions having occurred following the appearance—in the third week of February—of a large sunspot with subsequent auroral displays and dislocation of radio communications on the lower frequencies. We understand, however, that the severe interference caused to London T.V. by commercial stations in distant parts of Europe was in some cases duly ascribed to amateur influence: several amateurs in fact had considerable difficulty in assuring dissatisfied viewers of their innocence!

The signals from Sutton Coldfield were well below their normal strength at the writer's station on February 21, and were accompanied by severe flutter fading. G6NB reported a definite increase in the noise level when his two metre array was turned towards the north, but generally conditions on this band seemed to be poor without any unusual

characteristics.

Two Metres

The following report, received from G3EHY (Banwell, Somerset), gives a very fair survey of condition ruling during the past few weeks January was exceptional for consistently good conditions and the daily 100 mile sked. with GW2ADZ produced S8/9 reports on 9 occasions, with the remainder S6/7. January 10 was particularly good from 1900 to 2000 G.M.T., and several stations in Lancashire were successfully contacted, while January 12, 13 and 14 yielded almost perfect east to west propagation from 2200 G.M.T. onwards, with many stations in the London area coming in at S9 on 'phone. G8SB (Horwich, Lancs.) worked on 'phone at S9 both ways between 1900 and 2000 G.M.T. on the 18th reported that he could hear the G3EHY/GW2ADZ sked. every evening.

Conditions deteriorated considerably in February, and for the first fortnight, with gales commonplace and the barometer reading around 29 in. or lower, the 100 mile path was distinctly difficult. On February 14 the barometer started to rise slowly and steadily, the temperature in the early evening went up to over 50 degrees, and on the 15th the band was wide open for east/west contacts from 2000 G.M.T. until after midnight. These conditions were repeated on the following day from 1900 to 2100 G.M.T., but fell off

later

The daily sked. to the south-east at 1430 G.M.T. (see January BULLETIN), has been maintained by G3EHY, but with the not unexpected low level of activity it has not proved possible to form any reliable opinion as to conditions ruling at that time. However, G6CB (Wimbledon) was worked on January 26 and G6NB (Aylesbury) on February 17, both at good strength. In future this sked. will take place approximately half an hour earlier, transmission, as before, being for five minutes on a frequency of 145:240 Mc/s.

The first and second weeks of February produced, in the opinion of GW2ADZ (Llanmynech), the worst

V.H.F. Achievements 144 - 146 Mc/s. W4JFV—W0EMS G3BLP—GI2FHN Sept., 1949 830 miles Aug., 1949 Dec., 1949 327 miles OH2OK heard by G5QA 1325 miles 420 - 460 Mc/s. W6VIX/6—W6ZRN/6 GM2JT/P—GW6DP/P G3AHB/A—G3FZL/A July, 1949 262 miles Aug., 1949 Aug., 1949 130 miles 63 miles 1215 - 1300 Mc/s. W10FG/1—W1MZC/1 G6CW—G8DD/P July, 1949 37 miles Nov., 1949 4.5 miles 2300 - 2450 Mc/s. W6IFE/6—W6ET/6 G3CBN—G8IH/P G6CW/P heard by G8DD/P Oct., 1947 150 miles Oct., 1948 24.4 miles Nov., 1948 45 miles 10000 - 10500 Mc/s. W4HPJ/3—W6IFE 3 July, 1947 Jan., 1950 7.65 miles G3BAK-G3LZ/P 1.75 miles

conditions so far experienced this winter, enlivened only by fairly good results during the evenings of the 15th and 18th and the morning of the 19th. G5PY (Clapham) has been heard, but so far has not

responded to calls.

G3VM (Norwich) finds the band very quiet at present, and apart from regular daily skeds. with GW2ADZ and G2CPL (Lowestoft), has worked only half a dozen stations since last November. He quite often hears—as is the case at G2UJ—quite loud carriers on the band, presumably indicating local QSO's in progress, but owing to the very low level of modulation employed speech is completely unreadable. G3GLA and 8QR (both of Norwich) have been testing gear and should be regularly active by the time these notes appear.

From G3AVF (Torquay) we learn that G2BMZ, of the same town, worked PA0EO on 'phone recently —a distance of approximately 384 miles—but full information on this achievement is lacking. Could we have some details please? It would appear that signals from the Dutch station have so far been received only on the south-west coast, as reports of his reception have reached us from both 3AVF and BRS17448 of Bournemouth, the latter has a card from PA0EO confirming that his report was the

first received from this country.

G6YP (Camberwell) is active on 144.96 Mc/s. on most evenings, and is carrying out some tests with a rhombic aerial. He cites some recent differences of opinion with his landlord regarding the erection of aerials, and from bitter experience urges those amateurs who live in rented premises to obtain legal permission for such erection. Whatever the outcome of his present negotiations 6YP does not intend to retire from the band, and is prepared, if necessary, to operate with 150 watts into an indoor array. Offers

of co-operation are made by G3APX (Grimsby), who employs a modified SCR 522 for both receiver and transmitter. His address is Carlton House, 267 Hainton Ave. Others active in that area include

G3AXS (Grimsby) and 6LI (Judborough).

G2JU (West Wittering, Sx.), who is only able to get on the band on Saturday evenings between about 1700 and 2030 G.M.T. on 145·21 Mc/s. is anxious to get in touch with stations from his new location. Right alongside the sea, he has a rotary 4-element beam 36 feet high. A regular sked. is kept with G6UH (Hayes, Middsx.) at 1930 G.M.T., but the results are much dependent upon conditions. Notes are being compared with G2NM (Bosham, Sx.), with a view to correlating the effects of barometric pressure on two metre propagation.

Upon moving to Aylesbury, Bucks., from Chertsey, G6NB had serious doubts as to whether he would be able to maintain his two metre DX from his new location surrounded by hills rising in some directions to over 700 feet. but after raising 30 stations in 18 counties with an input of 35 watts he takes a rather less pessimistic view of his prospects. His 16-element beam at a height of 40 feet doubtless has much to do

with these excellent results.

G2ANT will be working portable near Godalming, Surrey, on 145·148 Mc/s. at the following times:

Saturday, March 18 1830–2030 G.M.T. 2230–0100 G.M.T. Sunday, March 19

0800-1230 G.M.T. 0230-2200 G.M.T.

Two Metre Activity in Germany

The number of stations in Germany working regularly on this band is considerably greater than was the case a year ago, according to DL4XS (Wiesbaden) who states that more than 50 DLs have the necessary equipment at the present time, with signs of nearly four times that number being operational in a couple of months' time. The Wiesbaden stations have adopted a local "net" frequency of 144·652 Mc/s. and transmit nightly. Generally speaking receivers are up-to-date in design with low noise factors, and aerial arrays of eight or more half-wave elements are most favoured. The majority of stations are c.c., and although a power of 25 watts input is employed by many, there are some stations running considerably more. The following stations, together with their frequencies and inputs, are listed by DL4XZ, and may be of interest to readers:—

DL1BZ, 1XP, 3KE, 3JO, 3WP, 3WQ, 4SJ, (all using 144-652 Mc/s. 25 watts).

3NQ Weinheim 144 · 016 Mc/s. 70 watts 4CK 144 · 996 , 25 ,, 4DD Friesing 145 · 00 ,, 300 ,, 4XS 144 · 136 ,, 140 ,,

DL4XS adds that from his experience DL/G contacts should be possible during April, particularly if barometric pressures of 1020 millibars (30-1 inches) or better prevail. We are indebted to G3AOO (Denton, Manchester) for the above information.

Some Experiments with T.V.I.

G3WW forwards details of some experiments recently carried out at his station at Wimblington, Cambs. with various transmitters feeding aerials close to a normal "H" T.V. aerial connected to a standard Pye 18 T receiver. Alexandra Palace is due south of the station, and between that direction and the T.V. aerial—only 10 ft. away—is the eastern end of a rhombic (144 ft. per leg) which is fed at that point. To the east of the T.V. aerial, 20 ft. distant, and at the same height of 35 ft., is the 5-element Yagi 2 metre aerial fed with 300 ohm ribbon feeder. With the latter connected to the SCR 522 transmitter the picture was completely wiped out even if only the keyed 8 Mc/s. c.o. was running. However, no T.V.I. was apparent with another transmitter using 60

watts input to an 829 P.A. although this also employed an 8 Mc/s. crystal drive. 140 watts fully modulated on 28 Mc/s. could be fed into the rhombic without any visible effect upon the T.V. receiver, but only when the transmitter was so arranged that no stage produced harmonics within the T.V. band. Operation of the 3.5 Mc/s. transmitter (813 P.A.) on the rhombic resulted in an entire failure of T.V.

Seventy cm. Activity

We understand from G2XV that activity on this band is growing in and around Cambridge, and that an attack on the existing record may be expected in the near future. Among those known to be on the band are G2AIQ, FJD, XV, 4MW and 8PB. A "Calls Heard" feature has been suggested, and in view of the comparatively small number of active stations on 70 cm. we feel that this feature might be of real service.

G3AVF (Torquay) has been spending much time with 70 cm. gear, and has been testing with 2BMZ (Torquay) and 5BY (Bolt Tail, Devon). The distance to the latter station is 22 miles, and despite intervening hills rising to 650 feet there has been little difficulty in obtaining signal strengths of S7/8 on phone in both directions. Transmitters at all three stations have 832 tripler finals, although it has been found that these valves object strongly to 25 watts of continuous input on this frequency. After a few weeks they usually pass out to the accompaniment of a brilliant blue glow! This is hardly to be wondered at considering that the recommended figure is of the order of 12 watts! 3AVF's array consists—gales permitting—of a stack of three 7-element Yagis, and the superhet. receiver is an RF 115 unit comprising a CV82 oscillator and crystal mixer. 70 cm. signals appear to be adversely affected during and after rain, but whether this is due to propagational considerations or aerial leakage has not yet been ascertained. 3AVF intends to undertake some portable operation this summer, and would be interested to hear from other participants in field events whether they are planning to use s.e.o. or c.c. transmitters and superhet. or super-regen. receivers.

A late report received via G3CU and G2MR gives news of excellent conditions on March 5 when G5BY received signals from G3EJL (Southampton) over a distance of approximately 119 miles. Following a cross-band contact, G3EJL also heard G5BY on 70 cm. but before two-way contact could be established the 832 P.A. at G3EJL failed. The distance is almost double the existing British "fixed location"

Paris Television

record.

Further to our note "Another Use for T.V.?" in the January Bulletin we have received from F9HG via G3SB, details of the Paris T.V. service which may be of interest to readers. Sound and vision on 42 and 46 Mc/s. respectively are radiated daily from 1145 to 1245 and 2000 to 2130 G.M.T. The 440-line interlaced system employs amplitude modulation with a band width of 3 · 5 Mc/s. In addition to the times stated, programmes are also transmitted on Wednesdays, Thursdays and Saturdays from 1630 to 1730, and on Sundays from 1000 to 1100, 1630 to 1730 and 2000 to 2130 G.M.T. Experimental 819-line programmes are transmitted on 185 · 25 Mc/s. (vision) and 174 · 1 Mc/s. (sound) usually between 1330 to 1530 G.M.T., Tuesdays to Fridays.

3 and 12 cm.

Anyone in the vicinity of Birmingham who desires co-operation in tests on either of these bands is invited to get in touch with G8JI (Northfields) who has some gear available. He is at present engaged upon the lathe work for a 12 cm. coaxial cavity oscillator.

Top Band Contest

A LMOST four hundred operators spent at least part of the night of February 4-5 in fierce competition on the 1.8 Mc/s. band. Comment to the effect that "a good time was had by all" is becoming well worn in the accounts of these contests, but it is repeated time and time again in the letters accompanying logs. Activity was at a higher level than in the November contest, causing even further increases in the scores, although the percentage of stations who submit logs is still too low.

Again the contest was favoured with good conditions. The increased number of stations outside G, GM and GW added considerably to the interest of the event. Two GC, a GD, three GI, two EI, three DL and no less than six OK stations took part. GC2CNC/P reports a contact, as yet unconfirmed, with W1AFU. W1BB was heard by G6HD.

Leading Stations

Mr. H. J. M. Box, G6BQ, of Gravesend, Kent, is to be congratulated on winning the event. His call appears regularly near the top of 1.8 Mc/s. contest lists, and he won the corresponding contest twelve years ago. His score of 559 points (152 contacts) was amassed with the aid of his gang-tuned three stage transmitter, home-built double superhet, and two aerials.

Second place is shared by Messrs. J. C. Foster, G2JF, of Ashford, Kent, and B. H. Lagden, G3GX, of Whetstone, N. London, with 530 points. G2JF used a four stage transmitter to feed a half-wave aerial, whereas G3GX used three stages and a toploaded 120 ft. wire. Both employed HRO receivers.

Posn.	Call Sign	Reg.	Pts.	Posn.	Call Sign	Reg.	Pts.
1	G6BQ	07	559	44	G3AHB	07	319
1 2	G2JF	08	530	45	G3CTN	09	313
$\left\{\begin{array}{c}2\\2\end{array}\right.$	G3GX	07	530	46	G3FRV	07	311
4	GSNF	02	521	47	G3DKO	02	308
5	G6ZN	02	518	48	G2HOX	07	307
6	G3AGQ	06	516	£49	G2BGU	08	291
57	G3FAB	03	509	1 49	G3ATU	02	291
1 7	G6HD	07	509	51	G2CV	07	290
9	GD3UB	01	508	52	G3CKX	07	289
10	G4AU	07	505	53	G3CWW	07	279
rii	G3AFZ	04	490	54	G6UT	05	254
111	G3EDW	05	490	55	G5MN	02	249
13	G2YS	01	489	56	G3EPV	07	248
14	G4DC	07	472	57	G2KF	08	239
15	GZAOL	07	466	58	G2AJU	05	227
16	GSTR	01	456	59	GI6YW	15	224
17	G2HPF	05	449	f 60	G3GDW	09	223
18	GM2HIK	12	442	1 60	G6YJ	08	223
19	G4NB	03	441	62	G2PT	07	210
£20	G5ZX	03	438	63	G3WA	03	208
1 20	GW3CDH		438	C 64	G3CHY	01	202
22	G3CBU	07	434	64	GIZHLT	15	202
			415	64	GI5SJ	15	202
23	G6FB	07	407	67	G5YN	09	197
24	G2BOI				GW3CBY	10	187
25	G3YF	07	406	68		08	
- 26	G8VR	07	400	69	G5FN	05	184
27	G3AMO	08	398	70	GC2BMU	00	182
28	G6VC	07	388	\ \ \ \ 71	G2CIL G2PS	08	$\frac{163}{163}$
29	G5MP	08	379		G5HS	06	155
30	GM3EHI	14	359	73			151
31	G8KP	02	352	74	G3BTO	01	149
32	G5JL	07	351	75	G5UF	04	
33	G2DAN	03	347	76	GSQZ		148
J 34	G3BTP	07	340	77	G2UJ	08	139
134	GM8MJ	14	340	78	G6NA	08	122
36	G3ERN	07	335	79	GC2CNC/F	-	116
37	G3EJF	01	334	80	G5IJ	07	104
38	G2MJ	01	333	f 81	G3AHY	08	92
39	GSBM	01	331	181	G6TS	08	92
40	G3AKY	02	330		GSLN	07	82
41	G3ABG	03	328	84	G3NA	03	42
542	GSIP	07	327	100000			
1 42	GM2DRD	12	327				

Overseas Posn.	Logs. Call sign	Pts.	Posn.	Call Sign	Pts.
1	OK2OL	181	3	OK1VW	46
2	OK1FF	143	4	OK1AJB	32

Check Logs are acknowledged with thanks from the following: G2QX, 3AED, APV, DHH, DJD, DRC, EIO, FIO, 5MR, 6IO, JJ, LB, WH, WO, 8TN, GW3FSP, BRS250 and DL1IX.

N.F.D., 1950

To All T.R.s:

- I. Please submit entries by April 3rd, 1950.
- Provide adequate descriptions of your proposed sites.
- Make sure that all participating members fully understand the new rules.

To All Operators:

- Always send the time of contact when working other portable stations (see Rule 12).
- Sign off each transmission with an indication of your frequency (see Rule 11).

Enter " in the spirit " of the contest.

The winner of the November contest, Mr. K. Willis, G8VR, was well in the running at 0330 G.M.T., when he had the misfortune to lose his aerials in the gale.

The geographical distribution of leading stations is interesting. No less than eight R.S.G.B. Regions are represented in the first twelve places. Regions 7, 2, and 1 are most prominent as is to be expected, since, between them, they produce about half the entries and activity.

Comments

A number of entrants remark on the good operating, good signals and sportsmanship evidenced by the contest. One, who had no intention of spending the whole night on the band, found it impossible to close down! This was the first contest experience of an unusually large number of entrants. Each remarks that he is looking forward to the next. Several stations—frequently heard in pre-war 1·8 Mc/s. events—put in a welcome reappearance after some years' absence.

The peak scoring rates of the leading stations are of interest. G6BQ made 14 contacts in the first half-hour and 24 in the first hour. The average rate of the twelve leading stations for the first three hours was 17 contacts per hour.

Once more it was necessary to disqualify a few entrants for failure to complete their entry or to sign the declaration. These points may well appear to be of little importance, but are necessarily included either for the protection of other entrants or to ease the arduous task of the Contests Committee in checking logs.



An efficient amateur listening post has been established by Cyril A. King, BRS18405 at Herford in the Western Zone of Germany. Apart from the modified "Sky Champion," Eddystone 640 and R1155 seen here, the equipment in use on 3.5, 14 and 28 Mc/s., also includes an AR88 and HRO. BRS18405 hopes to obtain a DL2 call shortly.

REPRESENTATION

The following Corporate members have been duly appointed to serve as Regional, County, District, Town or Area Representatives.

Regional Representatives

Region	Name, Call-Sign (or B.R.S.) and Address
1	G. Webster (G5GK), School House, Simonstown Burnley, Lanes.
2	C. A. SHARP (G6KU), 56 Moore Avenue, Wibsey Bradford, Yorks.
3	D. A. G. EDWARDS (G3DO), 25 Pilkington Avenue Sutton Coldfield, Warwickshire.
4	Dr. E. S. G. K. VANCE (G88A), 43 Blackwell Road Huthwaite, Nr. Mansfield, Notts.
5	R. F. G. THURLOW (G3WW), North House, Wimblington, Nr. March, Cambs.
6	Vacancy
7	W. H. MATTHEWS (G2CD), 7 Beddington Road Seven Kings, Essex.
8	Dr. W. P. CARGILL (G5LR), 125 Hill Lane, Southampton, Hants.
9	H. A. BARTLETT (G5QA), Lendorie, Birchy Barton Hill Exeter, Devon.
10	D. A. DYER (GW8UH), 29 Ladysmith Road, Penylan Cardiff.
11	F. G. SOUTHWORTH (GW2CCU), Samlesbury, Holywell Flintshire.
12	J. DOUGLAS (GM2CAS), 43 Abbotswell Road, Bridge of-Dee, Aberdeen.
13	W. BAKER (G3AFL), 31 North Terrace, Berwick-on Tweed.
14	D. MACADIE (GM6MD), 154 Kingsacre Road, Glasgow S.4.
15	N. H. LOWDEN (GI2HLT), 37 Cabinhill Gardens Belfast.

County Representatives

Region	County	Name, Call-Sign (or B.R.S.) and Address
1	Cheshire Cumberland Lancashire (West) Lancashire (East)	J. B. RUDKIN (G3CDW), White Knoll, St. Margaret's Road, Hoylake. C. E. WILLIAMS (G8DP), 3 Coronation Avenue, Seaton. S. M. SUGDEN (G3GSS), Loretto, Gores Lane, Formby. W. CLEGG (G8RP), 127 Radcliffe New Road, Whitefield, Manchester.
2	Durham Northumberland Yorkshire (East) Yorkshire (North)	T. ORR (G3IV), 31 Grange Park Avenue, Sunderland. L. G. SPENCER (G4LX), 31 Harley Terrace, Gosforth, Newcastle-on- Tyne, 3. A. BELL (G2XA), 22 Orchard Road, Anlaby Park, Hull. G. A. KENYON (G3YK), 32 Emerson Avenue, Middlesbrough.
3	Herefordshire Shropshire Warwick- shire Worcester- shire	M. CONU (BRS15036), 5 Orchard Gardens, Putson, Hereford. E. R. WESTLAKE (G6KR), Ardlui, Wenlock Road, Shrewsbury. E. G. Brown (G5BJ), 94 Sunnymead Road, Birmingham, 26. J. TIMBRELL (G6O1), Englefield House, White Hill, Kinver, Nr. Stourbridge.
4	Derbyshire Leicester- shire and Rutland Lincolnshire Nottingham- shire	R. BONNER WILLIAMSON (G5RW), 18 Burns Street, Ilkeston. L. Fisher (G4MK), 20 Iris Avenue, Birstall, Leics. W/Cdr. W. E. DUNN, O.B.E. (G2LR), 9 Bristol Wood, R.A.F., Cranwell. A. GOODE (G2DTQ), 128 New Victoria Street, Mansfield.

Region	County	Name, Call-Sign (or B.R.S.) and Address
5	Cambridge- shire Norfolk	F. W. CRABTREE (G3BK), 28 Regent Avenue, March. D. J. BUDDERY (BRS2999), 67 South down Road, Great Yarmouth. E. J. R. COWLES (G2AJU), Post Office Farm, Stutton, Nr. Ipswich.
6	Buckingham- shire Oxfordshire	B. HAYES (BRS9600), 8 Althorp Crescent, New Bradwell, Bletchley F. A. JEFFERIES (GSPX), 1 Lovelace Road, Oxford.
7	London (North) London (South) London (South-east) London (South-west)	R. JARDINE (G5DJ), 77 King James Avenue, Cuffley, Herts. C. E. NEWTON (G2FKZ), 105 Underhil Road, London, S.E.22. G. MILES (G2CXO), 33 Silverdale Road Petts Wood, Kent. F. G. LAMBETH (G2AIW), 21 Bridg. Way, Whitton, Twickenham, Middx
	London (East) London (West)	J. HUNTER (G6HU), 63 Aintree Crescent, Barkingside, Essex. S. F. SHARPE (G3CKX), 64 Windson Avenue, Hillingdon, Middx.
8	Hampshire Kent* Surrey*	 K. D. Jackson (G3KJ), 153 Bishop. Road, Woolston, Southampton. W. G. Rowlands (G6KT), 487 Canterbury Street, Gillingham. Vacancy
	Sussex	G. W. MORTON (G3DRC), 42 Southfarn Road, Worthing.
9	Cornwall Devon Gloucester-shire	D. J. BEATTIE (G2WW), Suffolk House Lidden, Penzance. A. G. WHEATCROFT (BRS13968) 27 Lower Wear Road, Countes Wear, Exeter. A. BARBER (G5WA), Nanpanton Windmill Road, Minchinhampton Stroud.
10	Glamorgan- shire	E. A. HAYWARD (GW2UH), 6 Kenfig Road, Gabalfa, Cardiff.
11	Caernarvon- shire & Anglesey Denbigh & Flintshire	A. Evans (GW4MZ), Bloomsbury Rhuddlan Avenue, Llandudno Caerns. E. G. FOULKES (GW5FU), 19 Kinare Drive, Rhyl, Flints.
12	Aberdeen- shire, Banffshire & Kincar- dineshire Angus & Perthshire Morayshire, Nairnshire, Inverness- shire, Ross-shire, Sutherland, Caithness, Orkney & Shetlands	B. McK. DAVIDSON (GM3ALZ), 4: Smithfield Drive, Aberdeen. G. W. Robertson (GM3FEU), Eden Bank, New Road, Forfar, Angus. A. STUART McNicol (GM3UU), Inch stellie House, Alves, Morayshire.
13	East, Mid &, West Lothian Fifeshire & Kinross	 W. BLYTH (GM5YX), 17 Elgin Terrace Edinburgh 7. C. A. M. CLACKSON (GM8KR), 24 Blak Street, Brucefield, Dunfermline, Fife
14	Ayrshire, Bute, Dumfries Kirkeud- bright & Wigtown Clackmannan and Stirlingshire City of	T. ELLIOTT (BRS10053), 98 Portland Street, Troon. B. B. FULTON (GM4JQ), Kerton Burnbrae Road, Falkirk. A. H. MASON (GM6MS), 390 King
	Glasgow	A. H. Mason (GM6MS), 390 King' Park Avenue, Rutherglen.
15	No	nominations up to February 21st. 1950

Town or Area Representatives

Region	Town or Area	Name, Call-Sign (or B.R.S.) and Address
1	CHESHIRE Northwich	G. HINDLEY (G3CRE), 24 Town- field Lane, Barnton.
	Wirral	H. M. SYNGE (G3BOC), Ardwyn, Border Road, Heswall.
	Cumberland Carlisle	J. R. Huggon (G3HJ), Balla- chree, Dunmail Drive.
	West Cumberland	C. DAWSON (G3SY), 16 Markhouse Road, Workington.
	LANCASHIRE— EAST	
	Bolton	C. GORE (BRS17251), 8 Daffodil Road, Farnworth. J. E. HODGEKINS (G3EJF), 43
	Bury	holme Road.
	Darwen and Blackburn Manchester—	W. LISHMAN (G2AKK), 10 Pine Street, Darwen.
	North-west	B. A. WILBRAHAM (G2ATU), 1 Rochester Avenue, Sedgeley Park, Prestwich.
	South-west	E. SAYER (G3ELT), 7 Verdun Avenue, Salford 6.
	LANCASHIRE— WEST	
	Liverpool	A. BEL (G3FBH), 20 Craigside Avenue, West Derby.
	Preston	A. BELL (G3FBH), 20 Craigside Avenue, West Derby. H. Woods (G2AXH), 13 Merrick Avenue, Farrington Park. F. H. P. Cawson (G2ART), 113
	Southport	Waterloo Road.
2	DURHAM—COUNTY Darlington	E. C. SUTTON (GSIA), 37 Davison
	South Shields	Road. J. ORR (GSJO), 22 Pembroke
	Sunderland	J. BATES (BRS12907), 22 Ewesley Road.
	YORKSHIRE—EAST Hull	G. L. FISH (G3ADJ), 81 Park Street.
	Scarborough	P. B. Briscombe (G8KU), 31 St James Avenue.
	York	P. S. Robson (G3FYP), 7 Galtros Grove, Shipton Road.
	YORKSHIRE— WEST	
	Barnsley	C. T. Malkin (G5IV), 5 White Hil Terrace.
	Bradford	J. H. MACDONALD (G4GJ), May- field, Wagon Lane, Bingley. A. R. GLOYER (G2HNL), 16 Finkle
	Catterick and Richmond Cleckheaton	A. R. GLOVER (G2HNL), 16 Finkle Street, Richmond. J. Clegg (G3FQH), 15 Victoria Avenue.
	Doncaster	H. FLINTHAM (BRS193), 50 Burton Avenue, Balby.
	Harrogate	E. P. INMAN (G2DRA), 27 Harlow Crescent.
	Keighley	J. J. PLATT (G2VO), Purlea, Bar House Lane.
	YORKSHIRE —	W. Hudson (BRS18081), 25 Clark Road, Pontefract Lane, 9.
	North Middlesbrough	H. W. WALKER (G3CBW), 64 Ayresome Street.
3	HEREFORDSHIRE Hereford	T. B. ATKINS (BRS7280), The Priory, Stretton Sugwas.
	WARWICKSHIRE Birmingham— North	W. J. BUTLER (G5LJ), 32 Pilking
	South	W. J. BUTLER (G5LJ), 32 Pilking ton Avenue, Sutton Coldfield. T. F. Higgins (G8JI), 391 Redna Road, Northfield.
	Coventry	H. J. CHATER (G2LU), 10 Middle march Road.
	Worcestershire Malvern	F. E. WINGFIELD (G2AO), 1 St. Margaret's, Imperial Road.
	Stourbridge	
	Worcester	Kingsley Road, Kingswinford Nr. Brierley Hill, Staffs. J. Morris-Casey (G8JC), c/o Post Office, Fernhill Heath.
-4	DERBYSHIRE Derby	C. DRINKWATER (G3FNK), 307
	Tolonton	Burton Road.
	Leicester	L. MILNTHORPE (G2FMO), 3 Winster Drive, Thurmaston.

Region	Town or Area	Name, Call-Sign (or B.R.S.) and Address
4 contd.	Loughborough	L. Philpott (G4BI), Rectory Cottage, Walton-le-Wolds.
commu.	LINCOLNSHIRE Boston	A. OUGHTON (G8BQ), 49 Fydell
	Cranwell	Street. A. E. SEYMOUR, M.B.E.(ex ZB1Q).
	Grimsby and	No. 1 Radio School, R.A.F. C. W. B. STIMPSON (G3APX), 267
	Cleethorpes Lincoln	F. B. TRAVIS (G3BCA), 202
	NORTHAMPTON-	Monk's Road.
	SHIRE Northampton	R. E. DURRANT (G2AAA), The
	NOTTINGHAMSHIRE	Lodge, Pitsford.
	Nottingham	B. H. SINGLETON (G3CZV), 13 Tithby Drive, Sherwood.
	Mansfield	J. BEWLEY (GSH X), 116 Westfield
	Worksop and Retford	E. R. MARTIN (G6MN), Castle- mount, Worksop.
	Peterborough	L. CRITCHLEY (G3EEL), 36 Water- loo Road.
5	CAMBRIDGESHIRE Cambridge	T. A. T. DAVIES (G2ALL), Mea-
	Essex	dowside, Comberton.
	Chelmsford	W. J. RIDLEY (G2AJF), Gable- hays Lodge, Springfield.
	Southend-on-Sea	P. F. CLARKE (G3CQL), 29 Station Road, Leigh-on-Sea.
	Norfolk Great Yarmouth	P. J. C. Harrison (G3CFK), 63 Southtown Road.
	Ipswich	S. G. KEEBLE (G2AN), 139 Sidegate Lane.
B H	BEDFORDSHIRE Luton	J. PLOWMAN (G3AST), 119 Farley Hill.
	BUCKINGHAMSHIRE High Wycombe	M. TAPSON (G61F), 5 Squirre Lane, Booker.
	OXFORDSHIRE OXFORD	D. COLLINS (BRS17378), 5 Elles- mere Road.
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	Enfield	R. WALKER (G6QI), 7 Potters Lane, New Barnet, Herts, H. T. MACFARLANE (G8SK), 13 Rotherfield Road, Enfield
	Finsbury Park Area (N.1, 4, 5,	Middlesex. R. C. HARRIS (G2BAB), 9 Queens Drive, Finsbury Park, N.4.
	7, 16 and 19)	H. Jones (G4HJ), 99 Stanstead
	Welwyn Garden	Road. J. H. B. Hum (G5UM), Wyldes,
	City	Bulls Green, Datchworth, Kneb- worth.
	Wood Green and Southgate	S/Ldr. R. A. EVENETT (G3AGZ), 231 Albert Road, N.22.
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	Croydon	122 St. Andrew's Road. R. L. GLAISHER (G6LX), 279 Addiscombe Road.
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		P. F. Jobson (BRS9195), 13 Brandon Street. G. V. HAYLOCK (G2DHV), 63
	Lewisham, Lee and Catford	G. V. HAYLOCK (G2DHV), 63 Lewisham Hill, S.E.13.
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6½" with Transformer 25/- 5" less Transformer 20/- 10" with Transformer 37/6 10" less Transformer 20/- Grampian 9" less Transformer, 2 ohms or 15 ohms 40/-

PAXOLIN TUBING

First grade for coils, I", 7", 1" diam. ... I/- per foot

VARIABLE CONDENSERS 3-gang 500 pF., 7/6

TRANSMITTING VALVES

Type 832, 22/6. 100TH, 30/-. 4061A, 12/6. 4074A, 12/6.

COPPER AERIAL WIRE

7/22, 6/6 per 100 ft. 3/3 per 50 ft.

Postage extra on above items please.

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SPARES FOR CLASS 'D' WAVEMETERS

The many hundreds of R.S.G.B. members who availed themselves of our offer of Class "D" Wavemeters in December last, will be pleased to learn that we can now offer the undermentioned items, IN LIMITED. QUANTITY ONLY :—

COMPLETE WAVEMETER CHASSIS IN METAL CASE (no valves, vibrators or crystal) 50 /- (postage, etc., 2 /6).

VALVES ARTH2, 10 /- each (postage 6d.).

6 V. VIBRATORS, 5 /- each (postage 6d.).

6 V. MAINS TRANSFORMER for converting wavemeter to A.C. use, 7/6 (post 9d.).

For those who desire to purchase a Complete Wavemeter, with 2 valves, 2 vibrators, and crystal, we have some still available at 79/6 (plus 2/6 carriage, etc.).

Please send Cash with Order and print Name and Address clearly.

The Radio Corner 138 GRAYS INN ROAD, LONDON, W.C.1

Open until 1 p.m. Saturdays, we are 2 minutes from High Holborn, 5 minutes from Kings X.

(Telephone: TERminus 7937)

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.

John Clarricoats, G6CL. General Secretary:

January Council Meeting

Resume of the Minutes of a Meeting of the Council held at New Ruskin House, Little Street, London, W.C.1, on Tuesday, January 17, 1950, at 6 p.m.
Present,—The President (Mr. W. A. Scarr, in the Chair), Messrs. W. H. Allen, A. P. G. Amos, F. Charman, L. Cooper, D. N. Corfield, W. N. Craig, V. M. Desmond, C. H. L. Edwards, J. W. Mathews, A. O. Milne, P. A. Thorogood, A. J. H. Watson and John Clarricoats (General Secretary).

and Join Charles (Schedul Schedul) and Join Charles as well as well one to the two new Members (Messrs. L. Cooper and C. H. L. Edwards) and explained that in general the proceedings at meetings of the Council are confidential until the appropriate Resume has been approved for publication.

Membership.

Resolved (a) To elect 83 Corporate Members, 24 Associates and 5 Junior Associates. (Total elected 112.) (b) To grant Corporate Membership to 11 Associates who had

applied for Transfer.

Affiliation.

Resolved to grant affiliation to the Northampton Short Wave Club.

Television Interference.

It was reported that a letter had been addressed to the Engineer-in-Chief of the Post Office asking him to convene a meeting to discuss the question of television interference. (The meeting has now taken place.—Ed.).

The Technical Committee were instructed to give consideration

to a proposal to set up a sub-committee to produce for publication technical information for the guidance of members on matters relating to television interference.

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

Resolved to authorise the Secretary to visit Paris as soon as possible in order to discuss with representatives of R.E.F. matters relating to the forthcoming Congress and to grant him full discretionary power to make decisions on behalf of the Council. (The visit has now taken place.—ED.).

South Bank Exhibition, 1951. A letter was submitted from the Council of Industrial Design stating that it had been found impossible to proceed with the original proposal that the Society should be invited to instal and

original proposal that the Society should be invited to instal and operate an Amateur Radio Station in the Homes Section of the South Bank Exhibition, 1951.

Resolved to inform the Council of Industrial Design that in view of the information given in their letter, the Society proposes to take no further action. (See Footnote.)

Town and Country Planning Act (1948).

The Secretary reported upon his attendance at the hearing of the appeal by Mr. C. H. Young, G2AK, to the Ministry of Town & Country Planning. (This matter was reported upon in the January issue.—Eb.). Aerial Masts.

Aerial Masts.

The Secretary reported that he had consulted the Society's legal advisers in regard to the refusal of a County Borough Council to permit one of its tenants to erect aerial masts in his garden. Advice had been sent to the member in question.

Letters were read from two members who had read the press reports on the appeal lodged by Mr. C. H. Young.

The replies sent by the Secretary were approved.

The replies sent by the Secretary were approved.

Television Interference and Press Publicity.

The Secretary reported that members in the Uxbridge area of Middlesex had recently convened a meeting to discuss television interference problems with local viewers. (This matter was reported upon in the February BULLETIN.)

Letters were submitted from three members dealing with television interference and press publicity.

The revolues and by the Secretary were approved.

The replies sent by the Secretary were approved.

Stourbridge and District Amaleur Radio Society.

The Secretary was authorised to accept an invitation to attend the Annual General Meeting of the above mentioned Society.

Resolved to negotiate a new lease for the premises occupied by the Society on the top floor at New Ruskin House.

by the Society on the top floor at New Ruskin House.

R.S.G.B. Bulletin.

The Secretary submitted a letter from Sir Joseph Causton and Sons, Ltd. (Printers of the R.S.G.B. BULLETIN), stating that printing charges would be increased by a further 5 per cent. as from January, 1950.

Resolved to accept, under protest, the increased charge of 5 per cent. for printing the R.S.G.B. BULLETIN.

The Secretary reported that the effect of this new demand would amount in a full year to a net increase of approximately £250, assuming that 36-page issues continue to be printed.

The printing charges for the December, 1949, issue (36 pages) amounted to £474—the new charge would be approximately £500.

Constitution of Committees,
The Committees of the Council were constituted for the year
1950. (The names of the members appointed to serve on the
Committees appeared in the February BULLETIN).

Resolved-

Not to reconstitute the Codes of Practice Committee for the present.
To rename the Membership Committee the Membership

and Representation Committee.
That the President shall be an ex-officio member of all Committees except the G.P.O. Liaison Committee of which Committee he is a member.

Amateur R'dio Exhibition.

Resolved to hold the Fourth Amateur Radio Exhibition at the Royal Hotel, London, from November 22 to 25, 1950.

Convention, 1949.

It was reported that the deficit on the 1949 Convention and Exhibition held in Manchester amounted to about £17. To this sum must be added the expenses incurred by the Council and Headquarters' staff in attending the Convention.

The Council expressed the view that the financial results of the

Convention were very satisfactory.

Cash Account.

Resolved to accept and adopt the Cash Account for the month of December, 1949, as submitted by the Hon. Treasurer.

Redemption of Stock.

Resolved to redeem at par the Society's holding of £2,000
1½ per cent. Exchequer Bonds (1950) and to execute the application for redemption under seal.

The meeting terminated at 9.40 p.m.

Note.—Since the January Meeting of the Council took place the Festival of Britain organisers have advised the Society that they hope to authorise the setting up of an Amateur Radio Station in the Dome of Discovery on the South Bank Site. (Discussions are proceeding.—ED.)

London Meeting

Mr. E. L. Gardiner, B.Sc., G6GR (Past President) was in the Chair at the meeting of the Society held at the Institution of Electrical Engineers on Friday, February 24, 1245, when Mr. B. H. Briggs, M.A., Grad.L.E. (G2FJD), lectured to about 80 members on "Panoramic Reception." During the evening Mr. Briggs demonstrated a converter for 144 and 420 Mc/s., which provides a visible display of activity over the entire 144 Mc/s. band or a 6 Mc/s. section of the 420 Mc/s. band. At the conclusion of the discussion a vote of thanks to the lecturer was proposed by Mr. W. B. J. Hackney (G6YP).

Official Regional Meetings

The Council has authorised Official Regional Meetings to be held in Regions 1, 3, 5, 7, 9, 11, 13 and 15, during 1950. The following is a list of venues and dates so far arranged:—

Region.	Date.			Venue.
1	Not yet fixed		**	Not yet fixed.
3	April 16		**	Birmingham.
5	July 9			Cambridge.
7	May 14			London.
9	September 23	or 24		Plymouth.
11	Not yet fixed	***	1000	Llandudno.
13	October 22			Edinburgh.
15	May 6			Belfast.

The Top Band

Pending the complete adoption of the Copenhagen plan for the various countries concerned, the following spot frequencies will be used temporarily (for about 18 months) for the British Lighthouse, Lifeboat and Coastguard services:—

1,852 ke/s. 1,856 kc/s. 1,861 kc/s.

In their own interests members using the Top Band are advised to avoid interfering with these vital services.

Radio G200 Announces

METAL RECTIFIERS. Conservatively rated at 0.6 A, 12 V-Ideal for battery chargers, D.C. relays, etc. Price 4/6.

BUILD YOUR OWN H.T. Battery with inert cells! The cheapest way. Just fill them up with water. 60 V., 12/6, plus 2/6 carriage; 120 V., 20/-, plus 5/- carriage. Sample 1-5 V. cell 7ad. 5 for 2/6.

12 V. VIBRATOR UNITS. (Ex No. 22 set.) Rated 12 V. D.C. input, 325 V., 80 mA. out. Ideal car radio. Sound equipment supplies, etc. Price 19/6.

VOLTMETER MOVEMENTS Calibrated 0-15, 0-600, 5,000 ohm per volt, 4/6 each, 6 for 20/-.

14 S.W.G. enamelled copper wire. 140 ft., only 10/-. High Resistance Headphones: new, 4,000 ohm, 5/6 pair.

ARTHUR HOILE

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A new consignment allows us to offer these units at the low price of 25/- each

TRANSMITTER DRIVER UNITS TYPE I

Standard Rack Units. Crystal Oscillator (5 to 7·3 Mc/s.), two tripler stages and one doubler, output frequency approximately 120 Mc/s. Fully metered by cathode switching. Coils easily modified for 145 Mc/s, or would make an excellent 7, 14, 21 and 28 Mc/s. Driver Unit. PRICE 25/- less valves. Callers only.

OUTPUT UNITS TYPE I

Standard Rack Unit. Line up, two 834's in push-pull, and one 6J5 monitor tube. Tunes approximately 120 Mc/s. 0/100 mA, and 0/30 mA. 2½ meters. Simple coil modification will convert to an excellent Ham Band. P.A. PRICE 25/- less valves. Callers only.

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ELECTRADIX BARGAINS

METERS. D.C. Moving Coil Voltmeters 2" panel type 30 V., 4/-. Ammeters 50-0-50 A., 5/-. 2½" Voltmeters 100-0-100 V., 6/-. Post 9d.

RECTIFIER UNITS. Westinghouse, ex. G.P.O. 230 V. A.C. to 24 V. 6 A. in ven. metal case, £8.

VARIABLE Wire Wound Resistances, lab. type laminated Brush gear 300 ohm ½ A., 15/-. Isenthal geared resistances 2-8/1-5 A., 60 ohms., 25/-.

DIMMER RESISTANCES, small totally enclosed 100 ohms 4 A., 2/-, 50 ohms ½ A., 2/- post 6d.

HAND MAGNETO GENERATORS. P.M. Steel Magnet, wound armature, driven by gearing in handle, output approx. 75 V. 25 mA. A.C., useful for A.C. experiments, bell circuits, shocking coils, etc., 8/6 ea., postage 1/6. Few only mounted in polished wood boxes, 10/- ea., postage 1/6.

TRANSFORMERS. Foster 100 W. 230 V., 50 c/s. to 50 V. 2 A., 15/-, postage 2/-. Double wound Transformer 220 V. 50 c/s., input 53 V. 15 A., 30 and 60 V. I A., 6 V. 5 A., output, 45. 900 W. Booster Transformer 200/250 V. in 10 V. steps, £5.

SWITCHES. Dewar Key switches 7-pole C.O., 3/6. Yaxley 3-pole 3-way or 1-pole 8-way, 2/6. Lucas 8-way Switchbox, 3/6. D.P.C.O. toggle Switch, 3/-. G.P.O. Lab. Reversing Switch, 2/6.

IRONCLAD SWITCHGEAR M.E.M. & Berry 500 V. D.P. 60 A. Switchfuse, 35/-. 500 V. 60 A. D.P. Fuses, 25/-. 500 V. 60 A. D.P. C.O. Switch, 27/6. 30 A. D.P.C.O. Switch, 15/-. 15A. D.P. Fuses, 3/6. Write for special list "T.R." of I/C Switchgear.

TRENCH TRANSMITTERS in carvas covered case 12" x 9" x 8\frac{1}{2}" ebonite panel fitted 10-way Rotary Switch with laminated brush gear, litz wound variometer coil, coupling, valve holder folding morse key, etc., useful for breakup, 3/6 each. Carriage 2/6 extra.

ELECTRADIX RADIOS

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G2AK

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G2AK

BC306A AERIAL UNITS. These consist of a very fine black crackle cabinet 16" high, 8" wide and 8" deep. Front panel only two controls, both in useful positions. The top one is a pointer knob controlling a three-bank, five-position low capacity, all ceramic switch, and the bottom one is a very smart looking engraved 2½" dia. slow-motion dial (3-1 reduction) driving through a ceramic flexible coupler a variometer type coil. On the top of the cabinet are a pair of large stand-off insulators. These cases would make excellent V.F.O's. Low Power transmitters, etc., as when coil is removed there is a stack of room to build. Also plenty of room on front panel for meters, switches, condensers, etc. These are all brand new and in original cartons. Price only 17/6 post free. (Eire 3/6 extra).

STATION LOG BOOKS. 200 pages, printed one side only, size 8½ × 11°. First class paper and bound with heavy cover like a ledger. We are so confident that if you see one you will buy, that we offer to send one to you on approval against cash. If not satisfied, return within 7 days as received, and we will return money plus postage. Price 17/6 post free.

(Do not confuse these with the exercise book type we have seen about).

H.T. DRY BATTERIES. These are heavy duty 157 V. plus 5-2 V. in hermetic sealed metal cases. $10\frac{1}{2}$ " x $4\frac{1}{8}$ " x 4^{2} ". Weight 11 lbs. These are special mercury type batteries and are first class value at 8/6 plus 1/6 postage.

B.C. 610 TUNING UNITS Nos. 47, 48 and 51, 5/- plus 1/- postage.

T.U. UNITS. All brand new. T.U.5, 15/-. T.U.6, 7, 8, 9, 10 and 26, 10/- each. Or the set of seven for £3. Carriage 2/6 each, 10/- the set (Eire double carriage charges).

MOVING COIL HAND MICROPHONES with switch, 3/11. Transformer for above, 2/-.

MOVING COIL HEADPHONES with Moving Coil Hand Microphone. The set for 6/-, plus postage 1/6.

13 ft. ½" dia. Coax fitted two Pye Plugs, 2/6. Postage 1/6. 70 ohm ½" dia. Coax only 8d. per yard, plus 1/6 postage any length.

70 ohm Twin Feeder, 5d. per yard, plus 6d. postage. 300 ohm Twin Ribbon Feeder, 5d. per yard, plus 1/6 postage.

High Resistance Headphones, 8/6 per pair.

Low Resistance Headphones, 4/6 per pair.

500 MICROAMP METERS, scaled 0-600, 5/- each.

VIBRATOR PACKS. 6 V. in 150 V. 40 mA output. Complete with all smoothing (metal rectifiers). Price 17/6, plus 1/6 postage.

12 V. VIBRATOR PACKS. 300 V. at 100 mA. output. Fully smoothed. Price 19/6, plus 1/6 postage.

SPECIAL VALVE OFFER

MAIL ORDERS TO :

6J6 ... 12/6 each or £1 per pair. 6AK5 ... 10/- each or 17/6 per pair. 807 ... 4 for £1

All above new and boxed.

Kit of spare valves for B.C.221. 6K8, 6SJ7 and 6SJ7Y (special), £1 post free.

Carriage paid on all orders over £1 except where stated. Please include small amount for orders under £1.

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HIC ET UBIQUE

Babcock and Wilcox Staff Association Radio Society

Formed in June, 1949, this Society seeks to introduce Amateur Radio to the staff of Babcock and Wilcox Ltd. throughout their world-wide organisation. There are already members in London, Scotland and South Africa. During the past few months London members have visited the L.C.C. Fire Brigade Headquarters to inspect the V.H.F. equipment and the studios of British National Films Ltd. to view the sound equipment. Lectures, designed to assist the newcomer to radio, have also been arranged thanks to the co-operation of GSIP, G4OO, G2CRD and G3BSU. A Club station is under construction and will operate under the call-sign G3GKM. The Society, which will be happy to co-operate with other groups, asks any member of the staff of Babcock and Wilcox Ltd., or Associated Companies, to write to the Secretary, Mr. L. E. J. Manders, G2CRD, Babcock and Wilcox Staff Association Radio Society, Babcock House, Farringdon Street, London, E.C.4.

Cambridge and District Amateur Radio Club

The newly-formed Cambridge and District Amateur Radio Club cordially invites the support of members interested in all branches of Amateur Radio. Meetings are held on the third or fourth Friday in the month, depending upon the availability of the room, at The Jolly Waterman, Chesterton Road, Cambridge, at 7.30 p.m. The next meeting will be on March 17. Prospective members should get in touch with the Hon. Secretary, Mr. T. A. T. Davies, G2ALL, Meadow Side, Comberton, Cambridge. Cambridge.

City and Guilds College Radio Society

On Monday, February 20, the City & Guilds College Radio Society held their Annual Dinner, which was preceded by the Presidential Address. The Society, which was founded in 1921, has as its President this year Mr. T. E. Goldup, Technical Director of the Mullard Radio Valve Company, and his address was devoted to "The Problem of the Graduate Entering Industry, and the Factors Effecting his Ultimate Success." A lively discussion ensued, in which Sir Archibald Gill, Engineer-in-Chief of the Post Office, and Mr. C. E. Strong, O.B.E., Chief Engineer of Standard Telephones & Cables, participated. Afterwards, the guests visited the Shack, where G5YC has recently been rebuilt During the visit the General Secretary of the R.S.G.B. (Mr. John Clarricoats, G6CL), told many stories about the operators behind the QSL's dating back to 1927, which covered the walls.

R.S.G.B. (Mr. John Charicoats, Gol.D.), told many stories about the operators behind the QSL's dating back to 1927, which covered the walls.

At 7.30 p.m., over 80 sat down to dinner in the Dining Hall of the Imperial College Union. The many distinguished guests were bade welcome and a toast proposed to their health by the Student Chairman, Mr. P. M. S. Hedgeland, M.B.E. (G2DBA), and the Chief Engineer of the B.B.C., Mr. H. Bishop, C.B.E., replied. The toast to the Society was proposed by Dr. R. L. Smith-Rose, Director of Radio Research, D.S.I.R., who mentioned the valuable work contributed to the advancement of radio by amateurs in the early days, and referred to the work which could be done now if the R.S.G.B. Scientific Observation Groups were well supported. Replying to a toast to Amateur Radio, Mr. Claricoats stressed the need for the thorough investigation of Television Interference from all sources at the highest possible level, stating that there was little point in using money and materials in expanding the television service whilst everyday machinery of all types was being manufactured which was capable of ruining reception on all television receivers in its vicinity.

was capacie of runing temperature vicinity.

In addition to those already mentioned, the Society was honoured by the presence of Sir Frederick Brundrett, Director of the Naval Scientific Service, Mr. F. S. Barton, Director of Communications Development, Ministry of Supply, Prof. H. E. M. Barlow, of University College, and Prof. Willis Jackson, Head of the Electrical Engineering Department of the City & Guilds College, and many members of his staff.



At the recent Rugby R.S.G.B. Town Group Dinner G3GG (third from left at rear) received the T.R.'s Challenge Cup from the T.R., G3BLB. Seated (left to right): G3AUF, 3BDC, —, SBJ (Warwickshire C.R.), 3BLB. Back row (left to right): G3AZT, 3CMB, 3GG, —, 3BDK, 3AUT, 4KK, Mr. Homer (Post Office Engineering Dept), G3ABA.

Kingston and District Amateur Radio Society

Recent meetings have included a lecture on "Transformers by Mr. Trefor Williams of the Partridge Transformer Co., and a talk on aerials by G3GDG, the first of a series. An instructional class has been formed for those members taking the Radio Amateurs' Examination in May. Details of all meetings can be obtained from the Hon. Secretary, Mr. R. S. Babbs, 28 Grove Lane, Kingston-upon-Thames.

Loughborough

Local members will be warmly welcomed at the meetings of the Loughborough R.S.G.B. Group held at the Limehurst School on the second Wednesday of each month at 7.30 p.m. Mr. K. Roulston, BRS16219, 28,29 Church Gate, Loughborough (telephone 3535) will be pleased to answer any enquiries.

Northampton Short Wave Club

Meetings of the Northampton S.W. Club, which was recently affiliated to the R.S.G.B., are held each Friday evening at 6.30 p.m., in the clubroom, 8 Duke Street. On behalf of the Club, the Town Representative (G2AAA), extends a cordial invitation to all R.S.G.B. members to attend these meetings. Full information can be obtained from the Hon. Secretary, Mr. V. R. Hartopp, B.R.S.15304, 22 Purser Road, Northampton.

Oxford and District Amateur Radio Society

Oxford and District Amateur Radio Society
The second "Hamfest" organised by the Oxford and District
Amateur Radio Society was held at the Carfax Assembly Rooms,
Oxford, on Sunday, February 26. More than 100 members,
wives and guests, were present. The very full and enjoyable
programme included lecture demonstrations on "Some aspects
of communication receiver design," by the President, A. M.-M.
Payne, M.D., in which emphasis was placed on filter design
and noise factor measurements and "Ions," by K. T. McNeill,
B.A. Several ingenious items of home-constructed equipment,
of high standard, were entered for the Challenge Cups, awarded
annually. R.S.G.B. representatives included Council Member,
Mr. P. A. Thorogood, G4KD, and Mr. J. P. Hawker, G3VA,
(Assistant to the General Secretary). During the afternoon a
number of the visitors were conducted around the University
Buildings by Mr. J. B. Roscoe, M.A. (G4QK).

Peterborough

Monthly Imeetings of the Peterborough R.S.G.B. Group, are held on the first Tuesday of each month at the St. John Ambulance H.Q., Cowgate, at 7.30 p.m. All members are cordially invited to attend. Full details may be obtained from the Town Representative, Mr. L. Critchley (G3EEL), 36 Waterloo Road.

Ten Minute Ouiz

Answers to the questions set on page 301.

- 1. Resistor (ohms) equals required bias voltage (volts) times 1,000 divided by mean anode current (milliamps)-in other words-apply Ohms Law.
- 2. The fact that the A.V.C. does not come into action (i.e. it is delayed) until the signal voltage level reaches a predetermined level. (It does not refer to time delay.)
- About 15 V. (irrespective of type).
 6J7G = KTZ63 or Z63. 6L6G = KT66. 6J5G = L63.
- C.W. only between 7,000 and 7,050 kc/s. C.W. or telephony above 7,050 kc/s.
- 6. The term used to denote the radio frequency "swing" in a frequency modulated trans-
- A few milliamps less than a quarter ampere.
- 8. Triodes require neutralising. More drive and grid bias is needed than with tetrodes or
- 9. A magnetic bearing is about 10 degrees more than a True bearing owing to the fact that the Magnetic North Pole is that angle west of the True North Pole.
- 10. 107.

Have you a copy of the R.S.G.B. Band Plan in card form? If not, send a S.A.E. to-day to Then you will always know the Headquarters. answer to No. 5.

FUNNEL COOLED SELENIUM RECTIFIERS. S.T.C. No. H8420. Rating 230 V. 3 A. List price £5. OUR PRICE 20/-.

WESTINGHOUSE OIL-FILLED E.H.T. SETS. Comprising of transformer with rectifier mounting. Primary tapped 105 to 125 V. Output 15 to 18 kV. at 15–20 mA., also 2·5 V. at 5 A. Complete with separate · 1 µF. at 25 kV. Brand New. £5 the pair.

No. 18 Set Transmitter chassis. Partly stripped by M.O.S. Ideal for conversion to an M.O. P.A. QRP Transmitter for any band. Contains 2–150 $\mu\mu$ F. S.M. condensers, Westector, audio rectifier and a host of useful components. A bargain at 3/6 each, post free.

AMERICAN POTENTIOMETERS, 2-gang with switch. (a) $25_4k \times 15_4k$. (b) $30_4k \times 24_4k$. at $2/6_4k$ each. 2-gang without switch Short spindle, $2/6_4k$ each.

WIRE WOUND POTENTIOMETERS, 1,000 ohms, 4 W. at 1/9 each. 10,000 ohm potentiometer with switch (1 A. 250 V.), at 2/6 each.

SPECIAL OFFER. BC375E TRANSMITTER

Complete with valves and TU6, TU7 and TU8 tuning units. In good condition.

ONE ONLY. £15

PRESET AIR-SPACED TRIMMERS. 25 $\mu\mu$ F., 50 $\mu\mu$ F. and 100 $\mu\mu$ F. at 6/- per doz. (Assorted if needed.)

WILCOX GAY 50 μ F. TUBULAR CONDENSERS 5,000 V. wkg. at 1/6 each.

SPAGUE .05 μF. at 1,500 V. D.C. 2 for 2/6.

TUBULAR CONDENSERS, ·01 μ F. 5,000 V. wkg. at 1/3 each. GETPYRANOL CAPACITORS, ·25 μ F. 1,000 V. 2 for 2/6. Postage stamp trimmers. 3 to 30 μ pF. at 2/9 doz.

SPECIAL OFFER OF 6B8 VALVES at 4/6 each.

AMERICAN TUNING CONDENSERS, 5-gang, 500 $\mu\mu$ F. Ceramic insulation, at 7/6 each.

TERMINAL STRIPS with 7 terminals at 6 for 4/6.

All above items are obtainable from:-

C. MARKS & CO.

ALSO AT 25 WYNDHAM ARCADE, CARDIFF Tel. 4711

OUR FRONT COVER

OUR front cover this month shows 12 in. Ediswan Mazda Cathode Ray Tubes being tested in the factory. The tube in the centre of the board is under test; that on the operator's-right is warming up ready for test. The smaller tube is a colour standard for comparison.

Tubes are given a visual test for general performance, with special emphasis on the quality of the screen. At the same time they are checked electrically by means of the meters on the test board.

CARLTON COIL WINDING CO.

"A Name to Note and Remember"

The following mains transformers are specially manufactured by us for use in ex-Government surplus equipment. All with tapped primaries and filament windings designed to suit existing wiring.

existing wiring.
BC348, 30'-. BC453/454/455, 31/6. BC221, 26'-. R1355, 31/6.
E.H.T. for VCR97 CRT. 52'6. Smoothing Choke, 7/6. Medium Wave
Coil Units for BC453/454/455 with connection data, 10/-. State
which model required. Small Filament Transformer. Output
0-4-5-6-3-12-6 V., 2 A., 12/6.

Auto Transformers, 230/115 V., 50 watt, 18/-. 100 watt, 22/6.

Please enclose sufficient to cover Postage.

Mains and Audio Transformers manufactured to specification.

Trade inquiries invited. Send 3d. for latest Catalogue.

CARCO WORKS
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CHURCH ROAD, BIRKENHEAD

3585

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Application Boiler gauge light connections. Thermocouple leads. Connections for rheostats, furnaces, flue motors, electric ranges, stoves, electronic equipment and commercial radio apparatus. Turbo-jet engine leads. Film projector connections. Insulating sleeves for radio.

Write for Publication No. 261 V.



SILICONE RUBBER INSULATED CABLES

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Reading Radio Society

After a talk on the industrial applications of the cathode ray oscillograph had been given by a representative of Mullard Electronic Products, Ltd., a presentation of a communications receiver was made to a blind member. On February 9 the Ekco 10,000 Mc/s. cloud and collision warning radar was described and its presented positive between the collision of the collision warning radar was described and its presented positive between the collision warning radar was described. and its uses discussed. Particular interest was taken by members in the construction of the high gain 45 Mc/s. I.F. strip associated with the receiver.

South Birmingham

Members resident in South Birmingham are asked to note that the callsign of their area representative, Mr. T. Higgins is G8JI not G8TI as printed last month. Mr. Higgin's new telephone number is KINgs Norton 2575.

Spen Valley Radio & Television Society

At the Annual General Meeting on February 20, officers for At the Annual General Meeting on February 20, officers for the year, September, 1950, to September, 1951, were elected as follows: Chairman, Mr. P. Denison (G8OK): Vice-Chairman, Mr. F. J. Popplewell (G6PL): Treasurer, Mr. L. A. Metcalfe; Secretary, Mr. N. Pride. A visit to Cranwell has been planned for April 23 and arrangements are in hand for an outing to Bridlington for members, wives, children and friends on Sunday, July 2. The Secretary's address is: 100 Raikes Lane, Birstall, Leeds. For dates of meetings see Forthcoming Ecents.

WEST MIDLANDS REGIONAL MEETING

SUNDAY, APRIL 16th, 1950

IMPERIAL HOTEL - -BIRMINGHAM

Business Meeting 2.45 p.m. *** Tea 5 p.m. *** ***

Tickets (price 5/-) from the R.R. (Mr. D. A. G. Edwards, 25 Pilkington Avenue, Sutton Coldfield), or the C.R.'s

Stourbridge and District Amateur Radio Society

The Society which is participating in a local exhibition to be The Society which is participating in a local exhibition to be held at Halesowen, from April 24 to April 29, is to operate the station G3BMY/A on 1·8, 7, 14 and 144 Mc/s., during the evenings. Mr. J. F. Collett, G3BUR, recently gave a lecture on "Matching and Feeder Systems." Society membership now includes 28 licensed amateurs.

Torbay Amateur Radio Society

Owing to indisposition, the demonstration of aerial radiation patterns by G5SY had to be postponed until the next meeting on March 18. Plans are already being made for field events during the summer months. G2BMZ was congratulated upon his recent 384 mile tropospheric contact on 144 Mc/s. with a Dutch station.

Wakefield & District Amateur Radio Society

This recently formed society has got away to a fine start judging by the excellent attendance on February 22 when Mr. C. A. Sharp (66KU), N. E. Regional Representative addressed the meeting on "Getting Going on the Amateur Bands." Though covering a very wide field, the lecturer gave numerous practical hints and tips to those starting up on the air. There followed half an hour's discussion on matters of R.S.G.B. interest. The Secretary, Mr. G. Farrar (G3ESP), Holeroft, Durkar, will be glad to welcome new members at the meetings which at present are held fortnightly. are held fortnightly.

Watford and District Radio and Television Society

The 1950 season of the Watford and District Radio and Television Society was inaugurated at the Annual General Meeting held at the Club Rooms, the Cookery Nook, The Parade, Watford. A comprehensive programme for the Spring session was arranged to include lectures, demonstrations, competitions and station visits. The Hospital Service which involves maintenance of the headphones and R/T. equipment in the Watford Peace Memorial Hospital has gone ahead steadily and is much appreciated. Prospective members are cordially invited to get in touch with Mr. R. W. Bailey, 32 Cassiobury Drive, Watford.

Harold and Leslie Wilkins Bereaved

Many members—especially those in West London—will be grieved to hear of the death of Mrs. Wilkins, mother of Harold and Leslie Wilkins. Mrs. Wilkins will always be remembered for her kindness and hospitality to visitors during the time that Harold (G6WN) was West London D.R.

New Books

ELECTRONIC ENGINEERING MASTER INDEX, 1947–1948. Edited by John F. Rider. Published by Electronics Research Publishing Co., Ltd., 480 Canal Street, New York 13, N.Y. 339 pages, plus xiii. Size 64 in. × 94 in. Price \$19-50. A subject index to the contents of electronic and allied engineer-ing publications printed throughout the world from January 1947

to December 1948.

to December 1948.

The present volume contains more than 18,000 new entries and almost three times the number of publications listed in the two previous volumes which covered the period from 1925 to 1946.

The cumulative cross index of subjects has been greatly expanded and serves as a guide to the present and the two

expanded and serves as a guine to the previous compilations.
For the first time the R.S.G.B. BULLETIN is included in the list of major international, scientific journals to be indexed.
The high price will restrict the sale of this valuable book in the United Kingdom but it should be available for consultation in technical and possibly public libraries.

Fundamentals of Vacuum Tubes (Third Edition). By Austin V. Eastman. McGraw Hill. 644 pp. Well illustrated. Page size 4 in. × 6½ in. Price 47s.

The treatment employed by Professor Eastman in this timely revision of a popular book is elementary yet thorough. The author has attempted to provide a text midway between those of purely descriptive and those of a purely mathematical nature. In this he has well succeeded. The material is largely confined to the treatment of basic fundamentals and of those circuits in which a particular class of valve is commonly used.

New material has been included on video amplifiers, cathode follower amplifiers, cathode-coupled amplifiers, R-C oscillators, earthed-grid amplifiers, pulse modulation and demodulation. A feature of the book is the inclusion of a number of practical problems.

problems.

The author is Professor of Electrical Engineering at the University of Washington, D.C.

New Country List

A new country list in alphabetical order of prefixes, available from *Short Ware Manazine Ltd*, price 6d, provides a useful source of reference. The list also gives details of a system of "points value" allotted to each country by the publishers for the purposes of competitions etc.

Ham Hospitality

A Danish amateur, OZ1P, would like to have accommodation and board in England for the period July 4–16 in exchange for accommodation and board in Copenhagen for 10 days at any other period of the year. He would prefer to stay near London. Offers should be sent to OZ1P, c/o Mr. F. G. Hoare, G2DP, 6 Dunheved Close, Thornton Heath, Surrey.

Welcome Bob!

Mr. R. H. (Bob) Cunningham, VK3ML, prolific DX worker of yester-year, prominent W.I.A. official and successful Australian business man was a welcome visitor to Headquarters recently when he was entertained by the Executive Vice-President, the QSL Manager and General Secretary. Bob's enthusiasm for British Empire Amateur Radio is as keen today as when he was a leading British Empire link station.

LETTER OF THE MONTH

The Canadian Market

Dear Sir,-I am sure that it is unnecessary to mention the extent to which I enjoy the Bulletin; I am impressed too by the high standard of manufactured equipment, particularly receivers, which British manufacturers are making available to the British "hams." In view of the fact that Canadians are prohibited from importing American-made receivers it would appear that your manufacturers are missing a good thing by not making some effort " to sell" the Canadian market. It seems to me that the " Denco DCR19," for example, could be put on the market here at a very attractive price.

Yours, most sincerely,

Colin Dumbrille, VE2BK.

Lachine, P.Q., Canada.

HENRY'S

IGRANIC MAINS TRANSFORMERS. 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. IGRANIC MAINS TRANSFORMERS. adjuster panel. Absol 15/- only, plus 9d. post.

EX-GOVT. VALVES. The following brand new and

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guaranteed valves are in stock:
PEN 46, 616 metal at 10/- each. EF50, EF54, EF55, RL37,
VUI11, VUI33, UI8, ST4, SR4GY, RL18, 6F7, 6AG5, PM22A,
all at 7/6 each. 5U4, 5Z4, MUI4, 6K7GT, 6J7GT, 6K8GT,
ML14, 12SR7, 12SJ7, 12SK7, 6SL7GT, 6SC7GT, 6C6, 6V6G or
GT, 7C7, 7T4, 757, 786, 7C5, 1299A, 9D2, VP23, P2, 12A6,
BD2, 15D2, EF36, EF39, EBC33, ER32, EL32, 6X5GT, 2X2,
6AC7, 6N7, 6SN7GT, 78, 9003, INSGT, 6J5GT, 6C5, KT33C,
KT61, KTW61, DH63, TDD2A, VP2B, all at 6/6 each. Also
9002 and ILN5GT, 8/6. 807, 7/-. 4D1, 5/-. EA50, SP61, 954,
EB34, at 3/6 each. D1 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.
R.1355 RECEIVERS. We have been fortunate in securing 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).

RECEIVER R.3084. Another ideal unit for conversion to TV. Contains a 30 Mc/s. I.F. Strip, 2 valves EF54, I of EC52, 7 of EF50, I of VU39A, I of HVR2, and I of EA50. BRAND NEW IN MAKERS' CASES. ONLY 75/- (carriage I0/-).

NEW IN MAKERS CASES. ONLT 75/- (carriage 10/-).

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

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

5 mA. 6·3 V. I A. 2-0-2 V. 2 A. (for 5CPI), 39/6. Output
4,000 V. I0 mA. 2-0-2 V. 2 A. 48/-. Output 5,000 V. I0 mA.

2-0-2 V. only 60/-. All input 200/250 V. and fully guaranteed.

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6" CATHODE RAY TUBES. VCR 97, electrostatic, nonpersistent, individually boxed, ready for transit, 35/- each only. Postage and packing free. Side contact base for above, 2/-. 6 in. Masks for above. Not ex-Govt, but specially manufactured to give rectangular picture. Black, 6/6. Stone colour, 7/6. TUBE ENLARGING LENS. For VCR97 or 5CP1. Double your picture area without distortion. Easy fixing. Really amazing in performance. Only 25/-. (Plus 2/6 postage and

METER DISTRIBUTION BOARDS. Comprising 0-300 V. M.I. meter, 3½ in. A.C./D.C. input plug and socket, 3 output sockets, 2 porcelain fuses. Total size 12in x 6in. Brand new and individually boxed, 17/6 complete.

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amplifier, with a Sin, speaker in the Output of the Power Amplifier stage.

We shall be pleased to supply a complete kit for the construction of the above, right down to the last nut and bolt, for the low price of £3-18-6. Concise instruction and circuits are supplied. If preferred, circuit and instructions only can be supplied for 1/6 post free. All items may be purchased separately. This is a highly efficient instrument, and a MUST for every radio man.

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. Please send stamp for current list. Probably the most comprehensive in the trade.

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5 kV. ELECTROSTATIC VOLTMETER. 0-5 kV., panelmounting 31" scale, brand new, 50/- each.

12 in. P.M. SPEAKERS. Special offer. TRUVOX 3 ohm, 37/6 each, and a few only VITAVOX TYPE K12/10, at £5-9-6 each. Definitely brand new, and perfect, in original sealed

TRANSMITTING VALVES. Westinghouse 813 at 50/-, 832 at 20/-, 866A at 15/-, Klystron 723A/B at 82/6, 3E29 (829B) at 59/6. All brand new and boxed.

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CERAMIC SWITCHES, 3 bank 2 way, easily modified to 12 way, make fine ISO W. PA turret, 5/-. 3 pole 4 way, 100 W., 4/-.

METERS. ½ A. TC, 2", 4/6. 120 A. oil meters, 2/3. 350 mA. TC 2", 4/9. 2½ A. TC 2", 4/-. 40 V. MC 2", 4/-.

CHOKES. Midget 1½" x 1" 5 H. 2/6. 5 H 200 mA., 5/6. Swinging 3·6/4·2 H. 150 mA., 6/6. Micro Switches, 1/3.

1225 Chassis, 4/6. REV Counters, 2/3. CO-AX relays twin S.P. 70 ohms, 12/24 V., 6/6. B'ham. View Master instructions, 5/-.

RIBBON FEEDER, 300 ohms HD, 70 ohms 50 W., 5d. per yd. Please see January issue for Dural Tube and Copper Wire.

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Simple Equipment

DEAR SIR,—May I add my support to the views expressed by BRS11291 in the January issue of the BULLETIN. In particular it would seem to me that the tendency towards the use of factory manufactured receivers has led inevitably towards an undue concentration upon transmitting equipment in the pages of our journal to the detriment of the BRS member who seeks information on such topics as receivers, test gear, amplifiers, etc. How many members realise that the construction of a reasonably good enversebred were receiver for the ametaria bands is by no morne.

many members realise that the construction of a reasonably good superhetrodyne receiver for the amateur bands is by no means beyond the skill and pocket of the average constructor? Especially is this true since complete coil units became available. I welcome such new features as "In the Workshop" and "Bright Ideas"—both of which have great possibilities—but could we not have a section devoted entirely to matters of interest to the BRS whose interest, unless studying for his licence, will not be principally concerned with actual transmitting gear.

memee, will not be principally concerned with actual transmitting gear.

"How to Wind Receiver Coils"; "Q-Code and Operating Procedures Explained"; "How to Assess 'S' Readings"; and even "When and Where to Listen "are just a few suggestions which might prove interesting to those of us who are not yet in a position to think in terms of thousands of megacycles or single-sideband modulation.

[Could I then appeal to the licensed members and RRS members.]

Could I then appeal to the licensed members and BRS members who take a serious interest in constructing receivers to assist by contributing suitable articles and the former not to grudge a little space to the BRS?

Cambridge.

Yours faithfully, JOHN CARTER (BRS6174).

DEAR SIR,—I think there would be a great interest in simple equipment and that our hobby would become much more attractive to newcomers, if the input to the P.A. was limited the world over.

Over.

I have been a QRP fan and made a lot of nice QSO's with 8 to 10 watts in the years 1937-8, but, after the war, having lost months and months in calling CQ with low power in overcrowded bands, being jammed time after time by the kilowatts of W people and by the hundreds of watts from the big G guns, I decided that medium power and a good superhet are a must, and still, not always sufficient!

Would you please tell me how to work DX on 20 or 40 metres.

still, not always sufficient!
Would you please tell me how to work DX on 20 or 40 metres, at the present, with 10 watts input and an ordinary 1-v-1?
Yours faithfully,
W. E. GUTKNECHT (ON4WG),
(Member R.S.G.B.).

Brussels.

Band Planning

DEAR SIR,—I am in complete agreement with the views expressed by Mr. Douglas. It is not uncommon to find telephony stations operating below 3600 ke/s, when the remainder of the band is by no means full. The blame for this state of affairs must however be shared by the C.W. operators as few stations ever try to use this section of the band. One often finds clear channels with no C.W. occupation and I feel that if more C.W. operators fought through the QRO 'phone, the Band Plan would be more effective.

The 'phone stations must find it very tempting when they hear little or no C.W. activity. May I therefore appeal for more

hear little or no C.W. activity. May I therefore appeal for more and more C.W. operators to swing their V.F.O.'s into the 3550-3600 kc/s. section and have a go at moving these persistent offenders, by showing that the section assigned to C.W. is being

used.

Yours sincerely, JOHN E. HODGKINS, G3EJF. (T.R., Bury.)

DEAR SIR,—Mr. John Douglas (GM2CAS) is too gentle in chiding telephony operators for penetrating below 3600 kc/s. into the C.W. section of the 3·5 Mc/s. band. Unless firm language and action are used now the position will, as Mr. Douglas surmises, get worse rather than better. Many of the new licensees come to amateur radio through having their interest whetted by the 'phone on the S.W. bands on their broadcast sets; they want to "broadcast" in the same way, and when they get their licences they regard the C.W. twelvemonth as an irritating superfluity to be left behind and forgotten as quickly as possible.

Those who operate C.W. and telephony in reasonably equal proportions cannot fail to be alarmed at the growth of this

"'phone only" mind that regards C.W. as a nuisance and sees nothing wrong in poaching in C.W. sections because "a quiet spot" can be found there. Telephony—at any rate, conventional a.m. telephony—is an inherently selfish method of communication for to-day's crowded amateur bands and should therefore be used briefly, circumspectly and with airline procedure, and above all, should confine itself to the recommended R.S.G.B. hands.

In the 80 metre band it is a "natural" for C.W. to use the lower half and 'phone the upper half. Phone operators are fortunate to have those 35 kc/s. below 3635 kc/s. as well. But if they do not halt at 3600 kc/s. it is only a matter of time before they will dominate the whole band and unfairly elbow out the product C.W. mere the for cuttomber them. modest C.W. men who far outnumber them.
Yours sincerely,
JACK HUM (G5UM).

Near Knebworth.

Around the Trade

Around the Trade

In a review of recent progress, the G.E.C. underline the increasing importance of radio links as integral parts of telecommunication networks, yTests are in progress to assess the performance of a 12/24 channel V.H.F., F.M. system extended to include radio repeater stations. Much experience has been gained on the Coventry to Wembley link. An F.M. pack set has been added to the range of mobile V.H.F. equipment, having a \(\frac{1}{2}\) watt output and a highly sensitive receiver operating on any single crystal controlled frequency in the range 66 to 108 Mc/s. Total weight is 24 lbs. and normal range 2 to 3 miles.

Two selective calling systems have been developed enabling an individual station in a common frequency V.H.F. system to be called without attracting the attention of the remainder. The crystalline qualities of synthetic quartz grown under optimum conditions are now up to the standard of the best natural quartz. In the investigation of substances other than quartz, filter crystals for use in multi-channel carrier telephony are being made using ethylene diamine tartrate. Advances have been made in the development of silicon and germanium point contact rectifiers. In the new type silicon mixer crystal the rectifying element is shielded from external fields. An experimental design of "Transistor" has been developed which overcomes many of the difficulties hitherto encountered. Units have been made which operate with about 20 volts H.T. and which have a mutual conductance in excess of 10 mA./V, at a current of about 2 mA. The properties of these crystals are very similar to those of thermionic triodes. They can be used as oscillators, amplifiers and cathode followers at frequencies up to about 10 Mc/s.

During last year a great advance was made in controlling the ion burn associated universally with high efficiency cathode

During last year a great advance was made in controlling the ion burn associated universally with high efficiency cathode ray tubes for television. This has been achieved without loss of brightness and the tubes give a picture with much better con-trasts. Deflection defocussing of television tubes has also been improved by redesign of the gun without any increase of tube

length.

Of particular interest to U.H.F. workers is the new disc seal triode, type ME1003. This valve is the second in the series of Mullard U.H.F. valves, the first of which was the 10-watt type ME1001, extensively used during the war for radar.

The ME1003 is indirectly-heated and is intended for use as a common grid, earthed anode, concentric line oscillator or power amplifier. In a coaxial line circuit the power output is approximately 6 watts at 1,500 Mc/s. (20 cm.) rising to 20 watts at 430 Mc/s. (70 cm.). The valve will operate at an input of 24 watts with 300 volts on the anode. The lower limit of operating is a wavelength of approximately 13 cm. The principal characteristics are as follows: are as follows:

... 6.3 V. Heater voltage Heater current ... 1 A.
Max. anode voltage ... 500 V.
Max. anode dissipation
with convection cooling 25 W.

Max. anode current ... 200 mA. Max, peak anode current 500 mA. Amplification factor ... 30 Mutual conductance 20 mA./V.

Silent Kep

It is with sorrow that we record the passing at the early age of 36 of Mr. C. E. Adams, BRS3412, of St. Albans, Hertfordshire. Mr. Adams had been an invalid for 12 years and bedridden for the last two but despite this handicap he continued to practise as a Member of the Institute of Surveyors.

Mr. Adams joined the Society in 1938 and became one of its most enthusiastic supporters. He founded an R.S.G.B. Group in St. Albans during the war years and gave every encouragement to those who were associated with him in that venture. He was an ardent listener and a keen constructor.

constructor.

The heartfelt sympathies of all who knew him are extended to his parents, relatives and close friends. Incidentally most of his books and radio equipment have been donated to the St. Albans Amateur Radio Club. This kindly gesture by Mr. Adams, Senior, has been warmly appreciated by the members of that Club who are seeking to be affiliated to the R.S.G.B.

A SURE WAY TO ACHIEVE SUCCESS!

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The following extracts from letters sent us by Candler students, give definite proof of the excellence of the Candler method of training.

STUDENTS OF THE JUNIOR COURSE SAY:

Ref. No. 5529. "I could not read a word of Morse Code before I started your Junior Code course. . . . I took the G.P.O. test for an Amateur Transmitting Licence and passed very comfortably. I sent a faultless eighteen words per minute without effort and received at fourteen words per minute without enor and received at fourteen words per minute with no errors; my numerals were also on the right side, sending twelve and receiving fourteen groups in the allotted one and a half minutes. I am now full of confidence as a result of this success and delighted with the progress I have made. ... I have done all my practising alone. I feel I have really achieved something and would like to thank you for a very fine course."

Ref. No. 6408. "I was really amazed at the results which I secured from Lesson one and two.

Ref. No. 5848. "May I add that I have passed my G.P.O. Test for the Amateur Licence after only three months learning under your instructions. I passed the Test quite easily receiving solid at 15 w.p.m., sending without error at 18 w.p.m.

Ref. No. 2709. "I would like to say how pleased I am with the course; I can send a comfortable I6 w.p.m., and receive I2 to I4 w.p.m. (After completing only first five lessons) which I think you will agree is fairly good as I was a beginner at the start of the course."

Ref. No. 3048. "I am pleased to report excellent progress, and many Hams have said with what ease they can copy my sending."
S. T. L. Ref. No. 2245. "I am glad to announce that I recently passed the P.M.G. Special Exam., and as you will see on my report, my speeds are now far ahead of the speeds needed in the examination. I therefore walked through the telegraphy part."

A. R. I.

STUDENTS OF THE ADVANCED COURSE SAY:

Ref. No. 3116. "I have now completed the Lessons I to 5 with excellent results."

Ref. No. 6160. "Many thanks for your letter regarding my son. I will pass your letter on to him, and ask him, to reply to you. I will pass your letter on to him, and ask him to reply to you. He told me quite definitely that he had derived great help from your course. You will be pleased to know that he was successful in passing his First Class P.M.G. He had to leave home at short notice to take up a position under Marconi Co., and is now at sea

Ref. No. 3207. "I can now read 5 words behind, can take commercial stations at 35 w.p.m. and send code at 35 w.p.m. without tiring. I have passed the G.P.O. Morse Test. I have made numerous contacts with all Counties in England and all over Europe, U.S.A. contacts with all Counties in England and all over Europe, U.S.A. and Canada and all the Stations have given me good reports on my sending with no repeats. When I passed my Morse Test, the G.P.O. Telegraph (op.) who passed me out gave me an excellent report. I will be pleased to recommend your Course to all interested in Morse training. You can hear me on 7048-5 kc/s. any evening. Wishing you all success.

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Fortheoming Events—Cont. from Page 287.

REGION 9

Exeter.—April 6, 7 p.m., Y.M.C.A., 41 St. David's Hill. Plymouth.—March 18, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.

Torquay.—March 18, 7.30 p.m., Y.M.C.A., Castle Road.

REGION 13

Edinburgh.—March 30, April 13, 7.30 p.m., Chamber of Commerce, 25 Charlotte Square.

REGION 14

Ayr.—March 22, 7.30 p.m., Royal Hotel, Prestwick. Glasgow.—March 29, 7.30 p.m., Engineers' Institute, Elmbank Street, Glasgow. Falkirk.—March 31, 7.30 p.m., The Temperance Cafe, High Street.

EXCHANGE AND MART SECTION

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BATTERY chargers 2-6-12 V. 1 A., in neat steel case with annmeter, for 200/250 V. A.C. mains. Exceptional value, 42s. 6d.—THAMES VALLEY PRODUCTS, 28 Camden Avenue, Feltham, Middx. [976]
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BC348. Perfect condition. 230 V. 50 c/s. internal power pack.
48. Blomfield Road, W.9. [123]
BULLETINS: May, 1946, to January, 1950; 2 missing.
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NEW Denco DCR.19 receiver. List £49. Less than ten hours use. Test report January issue Wireless World. Sacrifice, £30 or near.—NUNN, 8 Blinco Grove, Cambridge, Tel: 87024. [151]
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