MAY, 1962

RSGB BULLETIN

VOL. 37, No. 11

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Volume 37 No. 11

May 1962

2/6 Monthly

R.S.G.B. BULLETIN

CONTENTS

EDITOR:

John Clarricoats, O.B.E., G6CL

DEPUTY EDITOR:

John A. Rouse, G2AHL

EDITORIAL OFFICE:

R.S.G.B. Headquarters, New Ruskin House, Little Russell Street, London, W.C.1.

Telephone: HOLborn 7373

ADVERTISEMENT MANAGERS:

Sawell & Sons Ltd., 4 Ludgate Circus, London, E.C.4

Telephone: FLEet Street 4353

The R.S.G.B. Bulletin is published on or about the 15th of each month as its official Journal by the Radio Society of Great Britain and issued free to members. Closing date for copy is the 22nd of the month preceding publication.

THIS MONTH'S BARGAINS

AERIAL EQUIPMENT

TWIN FEEDER: 300 ohm twin ribbon feeder, similar K25, **6d.** per yard. K35B Telcon (round), **1/6** per yard. Postage **1/6** any length. 75 ohm Twin Feeder, **6d.** per yard.

COPPER WIRE: 14G H/D 140 ft., **17/-**; 70 ft., **8/6.** Post and packing 2/-. Other lengths *pro rata.*

RIBBED GLASS, 3" aerial insulators, **1/9** each. P. & P. 1/6 up to 12.

CERAMIC FEEDER SPREADERS, 6" type F.S., **10d.** each. P. & P. 2/- up to 12.

CERAMIC "T" PIECES, type A.T. for centre of dipoles, **1/6** each. P. & P. 1/-.

2 METRE BEAM 5 ELEMENT W.S. YAGI. Complete in box with 1" to 2½" mast head bracket. **PRICE 49/-.** P. & P. 3/6.

SUPER AERAXIAL CABLE. 75 ohm, 300 watts, very low loss, **1/8** per yard. P. & P. 2/-. **50 ohm, 300 watt** coax, very low loss, **1/9** yd., P. & P. 2/-.

TOUGH POLYTHENE LINE, type MLI (100 lbs.), **2d.** per yd. or **12/6** per 100 yds. Type ML2 (220 lbs.), **4d.** per yd. or **25/-** per 100 yds., post free. Ideal for Guys, L.W. Supports, Halyards, etc.

NEW MOSLEY POWER BEAMS *Write for details.*

BAND CHECKER MONITOR

This new, sensitive, absorption wavemeter is fitted with a 0-500 microammeter and is also a most useful phone monitor. Covers 3·5 - 35 Mc/s. in 3 switched bands. **A "MUST" AT ONLY 3 Gns.**

SCREENED MICROPHONE CABLE, 1st grade, 9d. yard. Plus postage.

12 CORE SCREENED CABLE 2/- yard.

10 CORE (5 PAIRS) SCREENED CABLE 1/8 yard. All plus 1/6 P. and P.

GELOSO V.F.O. UNITS Type 4/102 with new dial and escutcheon. Output on 80, 40, 20, 15 and 10 metres. For 2-807 or 6146 tubes. Only **£8 . 5 . 0.** Set of valves **24/-** post free.

ABSORPTION WAVEMETERS: 3·00 to 35·00 Mc/s in 3 Switched Bands, 3·5, 7, 14, 21 and 28 Mc/s Ham Bands, marked on scale. Complete with indicator bulb. **A MUST** for any Ham shack. **Only 22/6,** POST FREE.

ROTARY TRANSFORMERS, 12v Input, 490 v, 65 mA, Out. **17/6** each. P. & P. 3/-.

AMERICAN 807 VALVES. Ex W.D. **7/6** each or 4 for **25/-** P. & P. 2/-.

SHADED POLE MOTORS, 230 v or 110 v operation, ideal for fans, blowers or models. Single Unit **12/6** plus 2/- P. & P. or Pair **£1** plus 2/6 P. & P.

RACK MOUNTING PANELS: 19" × 5¼", 7", 8¾", or 10½", black crackle finish, **5/9, 6/6, 7/6, 9/-** respectively, postage and packing 2/-.

VARIABLE CONDENSERS. All brass with Ceramic end Plates and Ball Race Bearings, 50 pf, **5/9**; 100—**6/6**; 160—**7/6**; 240—**8/6**; and 300 pf, **9/6.** Extension for ganging. P. & P. 1/-.

★ *PLEASE PRINT YOUR NAME AND ADDRESS*

CHAS. H. YOUNG LTD.

DEPT. 'B', 110 DALE END, BIRMINGHAM 4

Telephone (all depts.) : Central 1635

BENTLEY ACOUSTIC CORPORATION LTD.

THE VALVE AND TRANSISTOR SPECIALISTS

38 CHALCOT RD., LONDON, N.W.1

Nearest tube, Chalk Farm. *PRImrose 9090*

Fixed condensers, 0·001 to 0·1 mfd. 9d. each. Any size blse electrolytic, 1/6. Resistors, ½ watt 5d., 1 watt 6d. Hyntab, 1/-. Midget ceramics, any size, 9d. Volume controls, less switch, 3/-. With D.P. switch 4/6.

ANY ORDER UP TO £10 INSURED AGAINST DAMAGE IN TRANSIT FOR ONLY 6d. EXTRA. PARCELS OVER £10 ARE INSURED FREE.

OA2	17/6	6AC7	4/0	6LI	23/10	10C2	27/2	20L1	27/2	90AV	67/6	DM70	7/6	EF22	14/0	EY51	9/0	PCC89	11/6	SP42	12/6	UF41	9/0
OB2	17/6	6AG5	5/6	6L6G	8/0	10F1	27/2	20P1	27/2	90C1	16/0	E80F	30/0	EF36	4/0	EY86	9/0	PCF80	8/0	SP61	3/6	UF42	12/6
OZ4GT	5/0	6AG7	7/6	6L7GT	7/6	10P13	15/0	20P3	23/10	90CG	37/6	E83F	30/0	EF37A	8/0	EZ40	7/0	PCF82	10/6	8U25	27/2	UF80	10/6
1A5	6/0	6AK5	8/0	6L18	13/0	10P14	19/9	20P4	27/2	150B2	18/0	EA76	9/6	EF39	5/6	EZ41	7/0	PCF84	17/0	T41	9/0	UF85	9/0
1A7GT	12/0	6AQ5	7/6	6N7	8/0	11E3	15/0	20P5	23/10	185BT	34/0	EABC80	9/0	EF40	15/0	EZ80	7/0	PCF86	15/0	TP25	15/0	UF86	13/6
1C5	12/6	6AT6	7/0	6P28	27/2	12A6	5/0	25A6G	10/6	807	7/6	EAC91	4/6	EF41	9/0	EZ81	7/0	PCL82	10/0	U12/14	8/6	UF89	9/0
1D6	10/6	6AU6	10/0	6Q7G	6/6	12AC6	15/8	25L6	11/6	956	3/0	EAF42	9/0	EF42	10/6	FW4/800	8/6	PCL83	10/6	U16	10/0	UL41	10/6
1G6	17/6	6B8	5/0	6R7G	10/0	12AD6	17/9	25Y5	10/0	4033L	12/6	EB34	2/6	EF50(A)	7/0	GZ30	9/0	PCL84	9/6	U18/20	8/6	UL44	27/2
1H5GT	10/6	6BA6	7/6	6SA7GT	8/6	12AE6	14/4	25Z4G	9/8	5763	12/6	EB41	8/6	EF50(E)	5/0	GZ32	10/0	PCL85	12/6	U19	48/6	UL46	14/6
1L4	3/6	6BE6	6/0	6SC7	7/6	12AH7	8/0	25Z5	9/6	7193	5/0	EB91	4/0	EF54	5/0	GZ34	14/0	PCL86	17/0	U22	8/0	UL84	8/6
1LD5	5/0	6BG6G	23/10	6SG7GT	8/0	12AH8	12/6	27SU	20/5	7475	7/6	EBC33	5/0	EF73	10/6	HL23DD	7/6	PEN25	4/6	U25	18/5	UM34	17/9
1LN5	5/0	6BH6	8/0	6SH7	8/0	12AT6	7/6	28D7	7/0	9002	5/6	EBC41	8/6	EF80	6/0	HN309	25/3	PEN45	19/6	U26	10/0	UY21	17/0
1N5GT	10/6	6BJ6	6/0	6SJ7	8/0	12BA6	8/0	30C1	8/0	9006	6/0	EBC81	8/0	EF83	13/6	HVR2	20/0	PEN46	7/6	U31	9/6	UY41	7/6
1R5	6/6	6BQ7A	15/0	6SK7GT	8/0	12BE6	9/0	30F5	6/0	AC6PEN	7/6	EBF80	9/0	EF85	6/0	HVR2A	6/0	PL33	19/9	U33	27/2	UY85	7/0
1S4	9/0	6BR7	12/6	6SL7GT	8/6	12BH7	21/10	30FL1	10/0	ATP4	5/0	EBF83	14/4	EF86	10/6	KT33C	10/0	PL36	15/0	U35	27/2	VP13C	7/0
1S5	8/0	6BW6	8/6	6SN7GT	5/6	12E1	30/0	30FL12	19/1	AZ31	10/0	EBF89	9/6	EF89	9/0	KT36	30/7	PL38	27/2	U37	27/2	VP23	6/6
1T4	3/6	6BW7	8/0	6SQ7GT	9/0	12J5GT	4/6	30L1	8/0	B36	15/0	EBL31	23/10	EF91	4/6	KT41	23/10	PL81	10/6	U50	6/6	VP41	6/0
1U5	6/0	6C4	5/0	6S87	8/0	12J7GT	9/6	30L15	11/6	BL63	7/6	EC52	5/6	EF92	4/6	KT44	12/6	PL82	7/6	U52	6/6	VR105	8/0
2D21	15/0	6C5	6/6	6U4GT	12/6	12K5	18/5	30P4	15/0	CK506	6/6	EC54	6/0	EF97	13/7	KT63	7/0	PL83	9/0	U76	6/0	VR150	7/6
2X2	4/6	6C6	6/6	6U5G	7/6	12K7GT	5/6	30P12	7/6	CL33	19/9	EC70	12/6	EF98	13/7	KT66	15/0	PL84	13/0	U78	5/0	VT61A	5/0
3A4	6/0	6CD6G	37/5	6U7G	8/6	12K8	14/0	30FL1	10/6	CV63	10/6	ECC32	5/6	EF183	19/1	KT88	43/0	PX4	10/6	U251	14/0	VT501	5/0
3A5	10/6	6CH6	9/0	6V6G	7/0	12Q7GT	5/0	30PL13	12/6	CY31	11/0	ECC33	8/6	EF184	12/6	KTW61	6/6	PY31	17/0	U403	17/0	W76	5/6
3B7	12/6	6CW4	24 0	6X4	5/0	12SA7	8/6	33A/158M	30/0	DAC32	10/6	ECC34	25/3	EF80	423/10	KTW62	7/6	PY32	12/6	U404	8/6	W81M	6/0
3D6	5/0	6D6	6/6	6X5GT	6/0	12SC7	8/6	35A5	21/10	DAF91	6/0	ECC35	8/6	EK32	8/6	KTW63	6/6	PY80	7/6	U801	30/7	X61(c)	12/6
3Q4	7/6	6E6	12/6	6/30L2	10/0	12SG7	7/0	35L6GT	9/6	DAF96	8/6	ECC40	28/10	EL32	5/0	KTZ41	8/0	PY81	8/6	U4020	19/1	X65	12/6
3Q5GT	9/6	6F1	27/2	7B7	8/6	12SH7	8/6	35W4	7/6	DF66	15/0	ECC81	6/0	EL33	12/6	KTZ63	7/6	PY82	7/0	UABC80	9/0	X66	12/6
3S4	7/0	6F6G	7/0	7C5	8/0	12SJ7	8/6	35Z3	19/1	DF96	8/6	ECC82	6/6	EL34	15/0	MHD4	12/6	PY83	8/6	UAF42	9/6	X76(M)	14/0
3V4	7/6	6F13	11/6	7C6	8/0	12SK7	6/0	35Z4GT	6/0	DF97	9/0	ECC83	7/6	EL37	25/3	MHL4	7/6	PZ30	20.5	UB41	12/0	X78	23/10
5R4GY	17/6	6H6	3/0	7H7	8/0	12SQ7	11/6	35Z5GT	9/0	DH76	5/0	ECC84	9/0	EL38	27/2	MHLD6	12/6	QP25	14/6	UBC41	8/6	X79	23/10
5U4G	6/6	6J5	5/0	7S7	9/6	12SR7	8/6	43	10/0	DH77	7/0	ECC85	8/6	EL41	9/0	MU14	8/0	QS150/15		UBF80	9/0	XD(1.5)	6/6
5V4G	10/0	6J6	5/6	7V7	8/6	12Y4	10/6	50C5	10/0	DK40	21/9	ECC88	18/0	EL42	10/6	N37	23/10		10/6	UBF89	9/6	XFG1	18/6
5Y3	6/6	6J7G	6/0	7Y4	7/6	14S7	28/6	50L6GT	9/6	DK91	6/6	ECF80	10/6	EL81	17/0	N78	23/10	RG1-240A		UCC85	9/0	XFY12	9/6
5Z3	20.5	6K7G	5/0	8D2	3/6	19AQ5	10/6	53KU	20/5	DK92	9/0	ECF82	10/6	EL84	7/6	N339	15.0		54/0	UCH42	9/6	XFY34	18/0
5Z4G	9/0	6K8G	6/6	9BW6	15/8	19H1	10/0	72	4/6	DK96	8/6	ECF80	427.2	EL86	17.9	PCC84	8/0	RK34	7/6	UCH81	9/6	XH(1.5)	6/6
6A7	10/6	6K25	20/6	9D2	4/0	20D1	15/8	78	6/6	DL53	9/6	ECH35	6/6	EL91	5/0	PCC85	9/6	S130	22/6	UCL82	11/6	Y63	7/6
6A8	9/0	6LD20	16/4	10C1	13/0	20F2	27/2	80	9/0	DL66	17/6	ECH42	9/6	EL95	10/6	PCC88	18/0	SP41	3/6	UCL83	19/9	Z66	17/6
								83	15/0	DL68	15/0	ECH81	9/0	EL822	19.6								
								85A2	16/0	DL92	7/0	ECL80	9/0	EM34	9/6								
								90AG	67/6	DL94	7/6	ECL82	10/6	EM80	9/0								
										DL96	8/6	ECL83	19/9	EM81	9/0								
										DL810	10/6	ECL86	17/0	EN31	53/0								

Terms of business. Cash with order or C.O.D. only. Post/packing charge 6d. per item. Orders over £5 post free. C.O.D. 2/6 extra. We are open for personal shoppers Mon.-Fri. 8.30 to 5.30. Sats. 8.30 to 1 p.m. All goods advertised actually in stock.

All valves boxed and subject to makers' full period guarantee. First grade goods only. Please enquire for any type not listed.

Complete catalogue of valves, holders, metal rectifiers, volume controls, electrolytics, transistors, germanium diodes. Hivac miniature valves, resistors, condensers, speakers and microphones, with terms of business, price 6d.

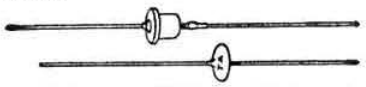
CRYSTALS & COMPONENTS. LTD

TEL: TEM. 1189 2. 4. EARLHAM STREET W.C.2.

Near Cambridge Circus, a few minutes walk from Leicester Square or Tottenham Court Road Underground Stations

SILICON RECTIFIERS

Miniature silicon power diodes at new prices. Made by one of England's greatest manufacturers. Type (1) 400 P.I.V. 250 mA. d.c. output. Price **3/6**. Type (4) 1,000 P.I.V. 0·45 amp. Price **8/6**.



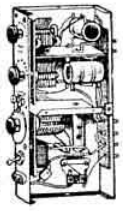
MODULATOR UNITS

Type (1) Ex the 1985/1986 Aircraft T/X. 7 watts class B output. Crystal or low impedance input. Output matches TT 15. Complete with valves. **10/-**, p.p. 3/-.

I.F. AMPLIFIER STRIPS

Three-stage I.F. amplifier strips ex the TR 1985/1986 series transmitters. Frequency 9·72 Mc/s. Widely used as an F.M.I.F. amplifier, etc. Price complete with valves. **10/-** each, p.p. 3/3.

BC610 TUNING UNITS



These compact units (size 9 × 4 × 2 in.) were used as plug-in tuning boxes with the BC610 TX. They contain miniature variable condensers of 140 pf and 100 pf, a standard size 50 pf ditto. A 1¾ in. dia. 0-100 graduated knob/dial, a D.P.D.T. toggle switch and several other components. Coverage is 5-6·35 or 6·35-8 Mc/s. Price 6/6 each. P.P. 3/-.

COLLINS

28V. Co-axial relays **25/-**.

RELAYS

U.S.A. P.O. type Relays. Type A.P.H.C. 6,500 ohms, 12V. 2 Ma. S.P.C.O. **2/6**. Type A.P.L.C. 3,500 ohms, 6 Ma. S.P.C.O. **2/6**. G.E.C. Sealed, 1 pole changeover 24V. **5/-**.

IMPORTED METERS

IMPORTED METERS. Square flush mounting meters—brand new.

2½ in. Square	**4½ in. × 4½ in.**
50 micro-amps at **49/6**	50 micro-amps at **95/-**
100 micro-amps at **42/6**	100 micro-amps at **69/6**
500 micro-amps at **32/6**	500 micro-amps at **55/-**
1mill. micro-amps at **29/6**	1mill. micro-amps at **49/6**

SPECIAL VALVE OFFER

6J4 W.A.	10/-	TTII	2/6
QVO4/7	5/-	VR150/30	5/-
717A	2/6	6AG7	5/-

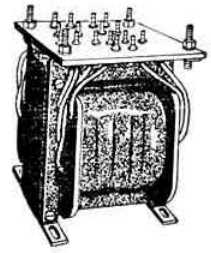
FLUORESCENT TUBE KIT

Contains choke, starter, holder and condenser **17/6**

TERMS OF BUSINESS

CASH WITH ORDER. Handling charge of 1/6 on all orders under 20/-, where P. & P. is not otherwise stated.

MAINS TRANSFORMER BARGAINS



Type (26) input 230v., output 250v. 60 mA. (H.W.) and 80v. at 0·1 amp. **5/-**, p.p. 2/-. Type (350/120), 350-0-350v. 120 mA. 6·3v. 3½ amp. 5v. at 2 amp. **16/6**, p.p. 3/6. Type (5K) 350-0-350v. 350 mA. 5v. 3 amp. tapped at 4v., 2v. 2 amp. 10 kV. ins. 20v. 1 amp. 7.5v. 1 amp. 5 kV. 5 mA. Price **25/-**, p.p. 6/-. Type (6V4A) 6·3v. 4 amp. Price **8/-**, p.p. 2/-. Csssor 339A Scope Transformer **£4. 10. 0** post paid. 50v. 6 amp. **55/-**.

I.F. TRANSFORMERS

Good quality iron-cored 465 Kc/s. Type (1) size 1¼in. × 1in. × 2¼in. Type (2) 1in. × 1in. × 2¼in. Price **2/6**. Half or fully potted 465 Kc/s size ¾in. × ¾in. × 1¾in. **3/6** each, **6/6** pair.

OUTPUT TRANSFORMERS

Single ended 3,000 ohm primary, 5 ohm secondary. Price **3/6**, p.p. 1/9.
PUSH-PULL. 5,000 ohm to 3 ohm. Price **4/-**, p.p. 1/9.
PUSH-PULL. 7,500 ohm primary, 3 ohm secondary. Price **12/6**, p.p. 2/6.
"COLLINS" POTTED. 7,500 ohm primary, 500 ohm secondary, 2·5 watts. Price **12/6**, p.p. 2/6.

CRYSTALS

IT IS VIRTUALLY IMPOSSIBLE TO ADVERTISE OUR COMPLETE RANGE OF CRYSTALS. WE HAVE NOW COMPILED A NEW LIST OF CURRENT STOCKS. PLEASE SEND S.A.E. FOR LISTS BY RETURN POST.

WHEATSTONE BRIDGES

Originally intended to test bomb demolition wiring. Contains 11 step stud switch 0-10 ohms, ditto 0-100 ohms, 3 step ditto 0-100-∞ and a 2·5-0-2·5 Ma. Galvanometer **35/-**, plus P. & P. 5/-.

DISC CERAMICS

Available in ·001, ·002, ·005 and ·01 mfd, 500 V.W. **4/-** per doz., your selection, P. & P. 6d.

CERAMIC SWITCHES

1 P 11 W 2 bank **7/6**
2 P 6 W 4 bank **8/6**

MINIATURE POTS

Short spindle 1K, 10K, 50K, 100K, 1 Meg. any 3 for **4/6**.

CALLERS ONLY

ART 13 Less valves	**50/-**
1475 Receivers 2-20 Meg.	**£8**

THIS MONTH'S SPECIAL OFFER

TF 144 G Signal Generators
85 Kcs—25 Mc/s £38

Blue Enamelled STEEL CABINETS

24" × 8½" deep × 8" high, fitted with slip rails. Ideal for TX, RX etc. **12/6**. Few only 19" RACKS, various types from **15/-**.

BARGAINS IN ELECTROLYTIC CONDENSERS

	40 mfd.	150v.	1/6	1 mfd.	15v. 1/9
	50 ,,	150v.	1/6	2 ,,	15v. 1/9
20 +	20 ,,	150v.	2/-	5 ,,	15v. 1/9
50 +	30 ,,	150v.	2/-	8 ,,	15v. 1/9
40 +	40 ,,	150v.	3/-	10 ,,	15v. 1/9
50 +	50 ,,	275v.	3/-	16 ,,	15v. 1/9
	500 ,,	25v.	2/6	32 ,,	15v. 1/9
	50 ,,	30v.	1/9		

CRYSTAL FREQUENCY STANDARDS

10X type, ¾" fitting

500 Kc/s	**7/6**	1 Mc/s	**15/-**
2 Mc/s	**7/6**	5 Mc/s	**5/-**

Bases 9d. each.

CABLES

80 ohm twin feeder 6d. yard.
80 ohm Co-ax 6d. yard.

STOP PRESS!

JUST ARRIVED

AR88D's

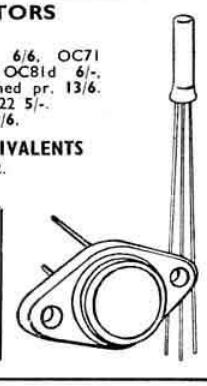
Rack mounting, with 'S' meter
GOOD CONDITION

£27. 10s. CALLERS ONLY

TRANSISTORS

MULLARD
OC44 **7/6**, OC45 **6/6**, OC71 **4/6**, OC75 **6/6**, OC81d **6/-**, OC81 **6/-** or matched pr. **13/6**. Sub-miniature OC622 **5/-**. NKT 452 (OC26). **9/6**.

TRANSISTOR EQUIVALENTS
OC44, OC71, OC72.
3/6 each.



2" MAGSLIPS
50V. 50c.
17/6 P. & P. 2/3.

Radio Society of Great Britain

(Incorporated 1926)

PATRON

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

COUNCIL 1962

President

E. G. INGRAM, GM6IZ

Immediate Past President

Major-General E. S. COLE, C.B., C.B.E., G2EC

Executive Vice-President and Honorary Treasurer

N. CAWS, F.C.A., G3BVG

Ordinary Elected Members

C. H. L. EDWARDS, A.M.I.E.E., A.M.Brit.I.R.E., G8TL R. C. HILLS, B.Sc.(Eng)., A.M.Brit.I.R.E., G3HRH A. O. MILNE, G2MI
L. E. NEWNHAM, B.Sc., G6NZ R. F. STEVENS, G2BVN G. M. C. STONE, A.M.I.E.E., A.M.Brit.I.R.E., G3FZL
J. W. SWINNERTON, T.D., B.Sc.(Econ.)(Hons.), A.I.L., G2YS

Zonal Representatives

F. K. PARKER, G3FUR A. D. PATTERSON, GI3KYP P. H. WADE, G2BPJ
A. C. WILLIAMS, GW5VX E. W. YEOMANSON, G3IIR

General Secretary and Editor

JOHN CLARRICOATS, O.B.E., G6CL

Deputy Editor

JOHN A. ROUSE, G2AHL

Assistant Secretary

MAY GADSDEN

REGIONAL REPRESENTATIVES

Region 1.—North Western. B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

Region 2.—North Eastern. J. R. Petty (G4JW), 580 Redmires Road, Sheffield 10, Yorkshire.

Region 3.—West Midlands. W. A. Higgins (G8GF), 28 Kingsley Road, Kingswinford, nr. Brierley Hill, Staffs.

Region 4.—East Midland. F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

Region 5.—Eastern. S. J. Granfield (G5BQ), St Luke's, 47 Warren Road, Cambridge.

Region 6.—South Central. L. W. Lewis (G8ML), 34 Cleevelands Avenue, Cheltenham, Gloucestershire.

Region 7.—London. P. A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

Region 8.—South Eastern. Norman D. Mattock (G2DFG), 70 Bouverie Road West, Folkestone, Kent.

Region 9.—South Western. R. E. Griffin (G5UH), 13 Alexandra Road, Uplands, Bristol 3.

Region 10.—South Wales. C. H. Parsons (GW8NP), 90 Maesycoed Road, Heath, Cardiff, Glam.

Region 11.—North Wales. Robert Jones (GW3JI), Beirut, Albert Drive, Oeganwy, Caernarvonshire.

Region 12.—East Scotland. A. G. Anderson (GM3BCL), "Helford," Pitfodels, Aberdeen.

Region 13.—South-East Scotland. G. P. Millar (GM3UM), 8 Plewlands Gardens, Edinburgh 10.

Region 14.—West Scotland. D. W. R. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4.

Region 15.—Northern Ireland. J. William Douglas (GI3IWD), 54 Kingsway Park, Cherryvalley, Belfast.

Region 16.—East Anglia. P. J. Naish (G3EIX), 6 Mildmays, Danbury, Chelmsford, Essex.

Region 17.—Southern. M. P. Nicholson (G2MN), 80 South Leigh Road, Warblington, Havant, Hants.

The annual subscription rates to the R.S.G.B. are as follows: Home Corporate Members—30/-; Overseas Corporate Members—28/- ($4 U.S. or Canadian). Associate Members under 21 years of age—15/-. Application forms may be obtained from Headquarters on request.

SEE and HEAR

the imaginatively designed MOSLEY CM-1 receiver

- *First low priced receiver with double conversion and crystal controlled first oscillator.*
- *First receiver with 5 dual-purpose valves of one type and 4 semi-conductor diodes which perform all functions usually requiring 12 or more valve sections.*
- *First low priced receiver with selectivity, sensitivity and stability that equals receivers selling for UPWARDS OF £50 MORE.*

FEATURES and PERFORMANCE:

Diode detector for a.m. and product detector for s.s.b. and c.w.

Calibration every 5 kc. WWV reception at 15 Mc.

Sensitivity: 2.5 kc. at -6 db. Automatic noise limiter.

Selectivity: ½ microvolt for 10 db. signal-to-noise ratio on ten metres.

Stability: Less than 500 cycles drift after one-minute warm-up.

Less than 200 cycles change for 10% line voltage change.

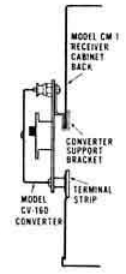
Image and i.f. rejection: 35 db. minimum.

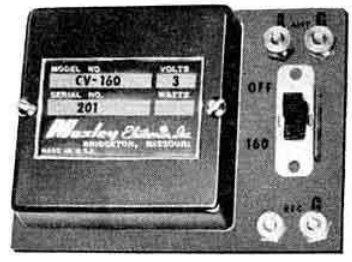
Power consumption: 33 watts. (230 volts a.c., 50 to 60 c.p.s.)

Rear chassis accessory facilities: Transmitter relay terminals, accessory power socket, external speaker/ VOX terminals.

Write for complete descriptive brochure and the name of the dealer handling the CM-1 in your area.

Net Price £86. (All crystals included).





New! MOSLEY 160 METRE CONVERTER Model CV-160

Converts the 160 metre band, 1750-2000 kc. for reception on most 80 metre band receivers.

Transistorized, crystal controlled, printed circuit and self powered.

Designed to attach directly to rear of the Mosley CM-1 and adaptable to most other receivers.

Net Price £7. 10. 0.

Mosley Electronics Ltd.
15 Reepham Rd., Norwich, Norfolk

"Worlds Leading Manufacturer of Amateur Radio Aerials"

Current Comment

discusses topics of the day

Headquarters Fund

SINCE the President's appeal to establish a fund for new Headquarters was published in the September 1961 issue of the BULLETIN many pertinent questions have been asked by members and many useful suggestions have been received.

The questions have chiefly centred around three major points—

(i) Where will the new Headquarters be situated?

(ii) What type of accommodation is envisaged?

(iii) How much will it cost and how will the cost be met?

At the Conference held in London last November between the Council and the Regional Representatives consideration was given to the President's appeal and from the discussion it became clear that all of the Regional Representatives were of the opinion that the new Headquarters should be situated either in Central London or within easy reach of the centre. This viewpoint has been confirmed by letters from many members, although, as was to be expected, a few consider that Headquarters should be either in the Midlands or in the Northern part of England.

The choice of London should be obvious in view of the fact that the Society is governed by a Council consisting of members drawn from all parts of the British Isles. For the benefit of provincial members of the Council and to help Committee members it is essential that access from main line stations shall be reasonably easy and, where it is necessary for those members to stay overnight, hotel accommodation must also be easily accessible. Insofar as the Council and Committee members who live within the London Region are concerned it is equally important that access to Headquarters shall be easy.

Current Comment in the March issue of the BULLETIN made reference to the Committees of the Council. Bearing in mind that during an average year about 100 Council and Committee meetings are held at Headquarters it will readily be appreciated that those who attend meetings, as well as the permanent staff, must be able to reach Headquarters in a reasonable time and without too much travelling, especially late at night. Any step to establish new Headquarters in the suburbs of London must take this point into consideration.

As an example of a suitable position for Headquarters, reference can now be made to the property mentioned by Major-General Cole in his appeal. The property—a large house in its own grounds—was situated in Wembley, Middlesex, within a few minutes of Wembley Central station on the Bakerloo line, only a few minutes' walk from Alperton station on the Piccadilly line and within a short bus ride of Hanger Lane station on the Central London line. Ealing Broadway main line station on the Western Region from Paddington was within about 20 minutes by bus, of which there were three routes running past the door. The house was within a few minutes drive by car from the North Circular Road and Western Avenue and was more or less situated on the Harrow Road. Unfortunately the price asked for the property was far more than the Society could afford.

What type of accommodation is envisaged? Essentially the building must contain adequate accommodation and facilities for the permanent staff, space for membership records, stencil plates and addressing equipment, storage space for stationery and Society publications. In addition there should be a waiting room and library, a room suitable for Council and Committee meetings and a room which could be used for conferences, lectures and small meetings. Reasonable parking facilities, either at or near to the premises, are essential. It would be a further advantage if a room could be set aside as an experimental workshop and as a permanent site for a Headquarters station. Finally, a small flat to provide accommodation for a resident caretaker would be highly desirable. To achieve these facilities a building having an area of at least 4,000 sq. ft. would be needed.

An important point that has emerged from correspondence and discussions is that some provincial members would not be in sympathy with any form of club house facility. They argue that only London members could regularly use facilities of this type but the argument is not very sound because members living on one side of London seldom visit those on the other side or even those living but a few miles distant.

How much will it cost to establish new Headquarters and how will the cost be met?

It is the considered view of the Society's Finance and Staff Committee that a sum of at least £20,000, will be required in order to establish new Headquarters in the London area. The property should, of course, be freehold.

A method of financing the project would be to borrow, say £15,000 on a mortgage on the property, the Society finding the balance from the Headquarters Fund and its holding of £3,000 Defence Bonds, repayment of the mortgage being made over 15 years. In order to provide for this repayment the Society's investments (of a nominal value of approximately £15,000) could be deposited as additional security, and as each investment was redeemed the funds would be used to reduce the amount borrowed. In this way the

(Continued on page 526)

Radio Frequency Transformers using L-C Networks

By R. C. HILLS, B.Sc.(Eng.), A.M.Brit.I.R.E. (G3HRH)*

A FREQUENT requirement in radio frequency circuits is the ability to transform some particular value of resistance to some other value, without introducing a significant power loss in the process. An example of this is the matching of the effective r.f. anode load of a valve into the grid of the succeeding stage. One of the easist ways of

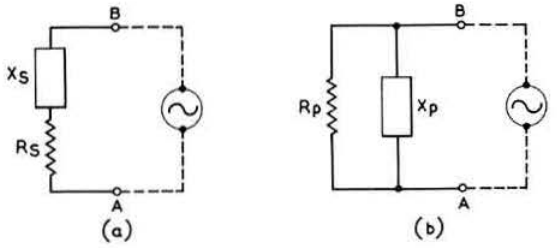


Fig. 1. Equivalent impedance circuits.

achieving this transformation is by the use of inductance and capacitance in a single network, using entirely reactive elements in the transformer. Clearly if such elements are perfect, then the power losses will be zero and the transformation will occur at unity efficiency. Since in practice, radio frequency inductors and capacitors can be made to a relatively high quality or high-Q, the losses in a practical arrangement are quite small, resulting only from the dissipation in the d.c. resistance of the coil due to the passage of current, and the dielectric loss in the capacitor due to the leakage current, which is in turn proportional to the voltage across it.

Consider two elementary networks in series and shunt elements respectively as shown in Fig. 1. Now for these two networks to be identical, that is to present the same load to a generator connected across the terminals AB, the admittance seen at these terminals must be the same in each case.

$$\frac{1}{Rp} + \frac{1}{jXp} = \frac{1}{Rs + jXs} \qquad \ldots . \text{(i)}$$

From this it is simple to derive the following two identities (Appendix 1) which are the key to all network problems:

$$Rp = Rs \left(1 + \frac{Xs^2}{Rs^2}\right) \qquad \ldots . \text{(ii)}$$

$$Xp = Xs \left(1 + \frac{Rs^2}{Xs^2}\right) \qquad \ldots \text{(iii)}$$

Using these basic formulae it is possible to convert a network of series elements to its equivalent network of parallel elements (and conversely). Consider next the circuit shown in Fig. 2. From an inspection of Fig. 1 and equation (ii) above, it can be seen that it is possible to select a value of Xs to put in series with the resistance Rs, such that the shunt equivalent resistance is equal to Rp, but has in parallel with it a residual reactance Xp. If now a reactance of value $-Xp$ is placed across the terminals AB, the net effect will be to produce at those terminals a pure resistance equal to Rp, which is the requirement of the transformer. Then the basic form of the transformer is an L network comprising only reactive elements as shown in Fig. 3. This also meets the terms of the original specification. If the ratio $R_2/R_1 = p$, then it can be shown (Appendix 2) that:

$$X_1 = \pm R_1\sqrt{(p-1)} \qquad \ldots \text{(iv)}$$

$$X_2 = \mp pR_1/\sqrt{(p-1)} \qquad \ldots \text{(v)}$$

Then X_1 and X_2 must have opposite signs in all cases, or in more general terms, the network must consist of one inductive and one capacitive element. It is more usual in practice to make the series element inductive and the shunt element capacitive for reasons which vary with individual circumstances (e.g. a series d.c. path to the anode of a valve), but there is no basic objection to the reversal of this practice in cases where it may be more suitable.

Using the fundamental equations (iv) and (v) it is now

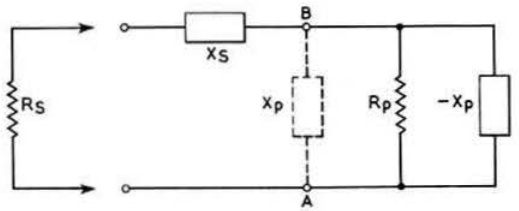


Fig. 2. Transformation : stage 1.

possible to design any required network by a process of arithmetic as the following example will show:

Example

A single wire short aerial for 3·6 Mc/s has a base impedance of 15-j200 ohms. It is required to match this to a feeder with a characteristic impedance of 75 ohms (Fig. 4 (a)). This aerial is equivalent at its terminals to a resistance of 15 ohm in series with a capitance of 220 pF. The steps of the calculation are as follows:

(a) Connect an equal and opposite reactance $+j200$ in series to tune out the aerial capacity and leave only the resistive term of 15 ohms: the transformation required is then from 15 ohms resistive to 75 ohms resistive (Fig. 4 (b)).

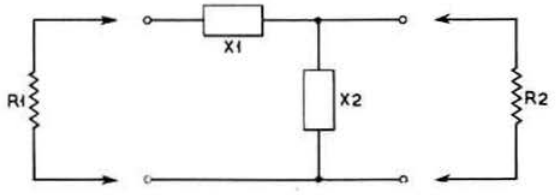


Fig. 3. Transformation : stage 2.

*73 Warren Way, Digswell, Welwyn, Herts.

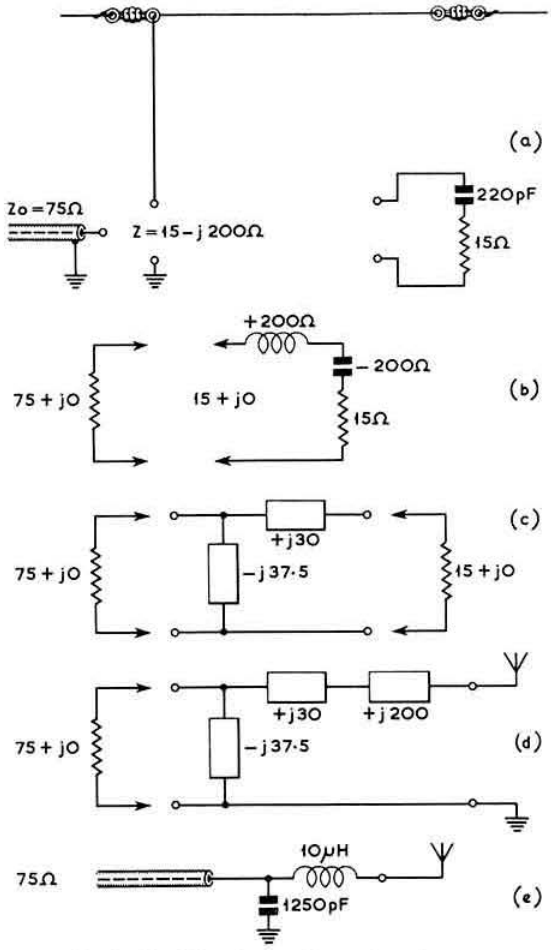


Fig. 4. Matching of two arbitrary impedances.

(b) From equation (iv), X_1 (series term) $= \pm 15\sqrt{5-1}$
$= \pm 30$ ohm

(c) From equation (iv), X_2 (shunt term) $= \mp \dfrac{5 \times 15}{\sqrt{5-1}}$
$= \mp 37{\cdot}5$ ohm

Thus the transformer section required is as shown in Fig. 4 (c) and the complete arrangement in Fig. 4 (d). To convert the reactance into physical components, since $X_L = 2\pi fL$ and $Xc = 1/2\pi fC$:

$+ j230$ is the reactance of 10 microhenries at 3·6 Mc/s.

$- j37{\cdot}5$ is the reactance of 1250 pF.

The complete network is then shown in Fig. 4 (e). By making each element variable over a convenient range, it is possible to correct for any inaccuracies in the original figure taken for the aerial base impedance, and also for variations in the working frequency.

A more complicated example of the use of *L*-*C* transformers is to be found in the familiar pi-coupler anode circuit encountered in transmitters. This is essentially a transformer of variable ratio, which can be used to adjust over a wide range the coupling between the valve anode and a fixed load represented by the aerial. The latter may be the actual aerial itself, although it is better practice to provide a permanent aerial coupler (or transformer) at the base of the aerial downlead to reduce the aerial feed impedance to 75 ohms resistive, and to connect this coupler to the output socket of the transmitter with 75 ohm co-axial cable. This has two immediate advantages in favour of TVI suppression:

(i) the connection between the transmitter and the radiating aerial proper is an unbalanced low impedance, i.e., not only is it in an earthed screened cable, but due to its low impedance the voltages and hence the radiated field will inherently be low.

(ii) low-pass TVI filters can be inserted in the co-axial line, and will be well terminated each end by 75 ohms, which is a necessary factor for the efficient use of such filters.

The pi-tank itself may be considered as two transforming networks back to back as shown in Fig. 5. In practice

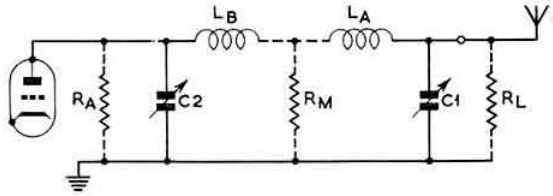


Fig. 5. Theoretical pi-coupled amplifier.

L_A and L_B are coalesced into one single coil. The " loading " capacitor *C1* is usually a variable condenser of fairly high maximum value: the reason for this is clear from an inspection of equations (iv) and (v). For a fixed value of load R_L, it will be seen that, as the reactance of the shunt element *C1* is reduced, the value of the mid-shunt resistance R_M also falls. This is equivalent to saying that for a low value of X_1 (i.e. a large value of *C1*), the value of R_M approaches zero or a short circuit, and to all intents and purposes the value anode tank circuit becomes L_B and *C2* in parallel, i.e. virtually no load resistance R_A appears in circuit, and the stage is completely uncoupled. Now as *C1* is decreased in value, R_M increased in value by the transformer action of *C1* and L_A, and consequently R_A increases in value, due to the upwards transformation of *C2* and L_B, and an increasing load is reflected into the value anode. As the value of R_M changes from equation (v), the value of *C2* must be adjusted to obtain the maximum value of R_A, i.e. this is equivalent to the " tuning " of a

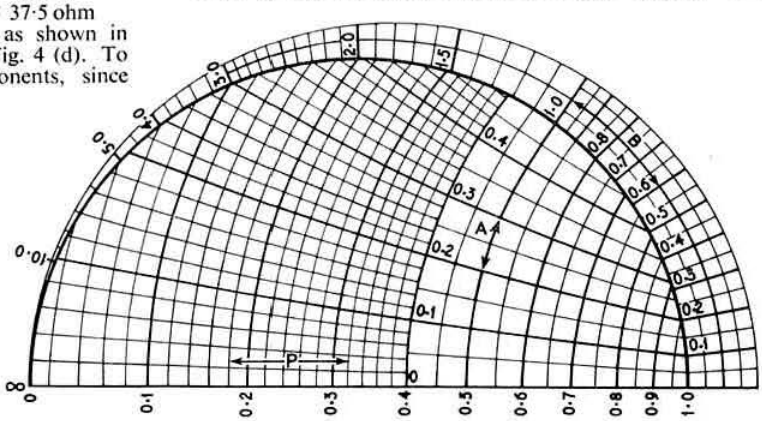
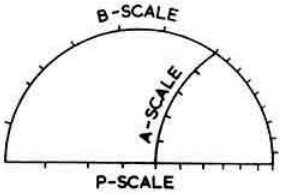


Chart for the design of L-C matching networks.

conventional parallel tuned circuit anode tank. Obviously the values of *C1*, *C2* and $L\,(=L_A+L_B)$ are quite critical for optimum performance of a given network and it is a laborious business to use the arithmetical calculation for the resistance transformations involved. However it is possible to develop a simple chart from the Smith polar



Identification of Scales A, B and P.

impedance diagram which enables the calculations to be carried out more easily, and also enables the effect of changes in one of the variables to be rapidly assessed by inspection, which is not always obvious from the formulae.

The chart is illustrated at the foot of page 525, and the following simple rules describe its use.

To Match R1 and R2 using L and C

(i) Derive $p = R1/R_2$ (or R_2/R_1) such that p is less than 1.

(ii) Move from this point on the p axis along a constant A line to the edge of the semi-circle.

(iii) Note the A and B scale readings of this point.

If $R1 > R2$: X_L in series with $R2 = R1 \times A$
X_C in parallel with $R1 = R1 \div B$

If $R1 < R2$: X_L in series with $R1 = R1 \times B$
X_C in parallel with $R2 = R1 \div A$

Note that the shunt reactance X_C is *always* in parallel with the larger resistance.

Using the example of the 3·5 Mc/s aerial as before:
$R1 = 15 \quad R2 = 75 \therefore p = 0{\cdot}2 \therefore A = 0{\cdot}4 \quad B = 2{\cdot}0 \therefore X_L =$ 30 ohms and $X_C = 37{\cdot}5$ ohms.

Bibliography

[1] " H.F. Aerials," *Amateur Radio Handbook*, p. 368.
[2] " Simplified Design Procedures for Pi-Network Tank Circuits," G. C. Fox, R.S.G.B. BULLETIN, June 1961.
[3] " Mobile Antennas," *A.R.R.L. Antenna Handbook*, p. 283.
[4] " Matching with the L-C Network," *A.R.R.L. Mobile Handbook*, p. 270.

Appendix 1

For Fig. 1 (a) and Fig. 1 (b) to be identical at terminals AB:

$$\frac{1}{Rp}+\frac{1}{jXp}=\frac{1}{Rs+jXs} \qquad \ldots\ldots \text{(i)}$$

$$=\frac{Rs-jXs}{(Rs+jXs)\,(Rs-jXs)}$$

$$=\frac{Rs-jXs}{Rs^2+Xs^2}=\frac{Rs}{Rs^2+Xs^2}-\frac{jXs}{Rs^2+X^2}$$

Equating real and imaginary parts:

$$\frac{1}{Rp}=\frac{Rs}{Rs^2+Xs^2} \qquad \frac{1}{Xp}=\frac{Xs}{Rs^2+Xs^2}$$

$$\therefore Rp=\frac{Rs^2+Xs^2}{Rs}=Rs\left(1+\frac{Xs^2}{Rs^2}\right) \qquad \ldots\ldots \text{(ii)}$$

$$Xp=\frac{Rs^2+Xs^2}{Xs}=Xs\left(1+\frac{Rs^2}{Xs^2}\right) \qquad \ldots\ldots \text{(iii)}$$

Appendix 2

From equations (ii) and (iii)—Appendix 1:

$$Rp=\frac{Rs^2+Xs^2}{Rs} \qquad Xp=\frac{Rs^2+Xs^2}{Xs}$$

Then $Xs^2=(RpRs-Rs^2)=Rs^2\left(\frac{Rp}{Rs}-1\right)$

If $\frac{Rp}{Rs}=p$ then $Xs=\pm\,Rs\sqrt{p-1}$ $\qquad \ldots\ldots \text{(iv)}$

Also substituting for Xs:

$$Xp=\frac{Rs^2+(RpRs-Rs^2)}{\pm\sqrt{(RpRs-Rs^2)}}=\frac{RpRs}{\pm\sqrt{(RpRs-Rs^2)}}$$

$$=\frac{RpRs}{Rs\pm\sqrt{(p-1)}}=\frac{Rp}{\pm\sqrt{(p-1)}}=\frac{pRs}{\pm\sqrt{(p-1)}}$$

Then $Xp=\dfrac{\mp pRs}{\sqrt{p-1}}$ $\qquad \ldots\ldots \text{(v)}$

Round Britain Quiz

IN the B.B.C. All Britain Quiz broadcast on April 11, 1962, the London team was asked, " If I am an XYL listening to my OM sending 73 to GI and GM what am I? " It says much for Amateur Radio that the team gave a correct answer to the question immediately it was asked.

The question was sent in by Mrs. Mier, wife of Mr. P. D. Mier (G3KKK) of Hertford.

Current Comment **(Continued from page 523)**

capital loss which would result from the sale of these investments at the present time would be avoided. It is known that the rate of interest on a scheme of this kind would be 1 per cent over Bank Rate with a minimum of 6½ per cent.

In considering the cost of establishing new Headquarters it must be borne in mind that the rent being paid at present for the top floor at New Ruskin House amounts to £550 a year, and when the lease expires in 1963 it is possible that this figure may be increased. At the present time the total income received from investments, less the rent paid, leaves a net amount of about £100 a year in hand. Assuming the interest on the mortgage of £15,000 averaged 7 per cent throughout the 15 years—the amount borrowed being reduced as each security matured—and taking into account the amount of income from investments remaining, the difference would be an average net cost to the Society of about £350 p.a. At the end of the 15 years the mortgage would have been paid off and the Society would be in possession of freehold premises in place of investments. It must be remembered, however, that the Society would be directly responsible for the maintenance and upkeep of its own premises. This then is the position as it is today.

Those who have made a donation to Headquarters Fund have already been thanked by the President. This opportunity is now taken of thanking them on behalf of all members for their generosity. Those who have not yet made a contribution may rest assured that their support will be no less appreciated.

One final point: since the appeal was launched last September, approaches have been made directly to the Nuffield Trust for the Forces of the Crown and the Royal Commission for the 1851 Exhibition and unofficially to the Ministry of Education with a view to obtaining grants or donations, but so far the results have been disappointing. It would be of great assistance to the Council if any member has knowledge of a trust which might be in a position to make a grant to the Society. N. C.

Simple Transmitting Aerials

By F. G. RAYER, Assoc.Brit.I.R.E. (G3OGR)*

The notes which follow are primarily intended for those who will soon be obtaining an amateur transmitting licence, but who have not yet decided on the type of aerial with which to get started.

SIMPLE wire aerials, correctly used, can give good results from 1·8 Mc/s right up to the 28 Mc/s band, and offer a quick, easy and inexpensive means of getting on the air. Fig. 1 shows how various aerials operate, and the reason for different methods of feeding them. When the aerial is about a half-wave long, current will be large at the centre, but practically zero at the ends. Voltage, however, will be high at each end, and low at the centre. Fig. 1 (a) illustrates this current and voltage distribution.

The transmitter has to be coupled to the aerial at some point (identified as TX in Fig. 1). If the aerial is a half-wave, centre fed, as at Fig. 1 (a), there will be high current and low voltage at this centre feed point—that is, the aerial needs a low impedance feeder.

If the transmitter is connected at the end of the half-wave, as in Fig. 1 (b), there is high voltage but low current—thus the aerial has a high impedance feed point, and a low impedance feeder could not be used. This type of aerial is described as a Hertz. A quarter-wave end-fed aerial is low impedance at the feeder, and is called a Marconi. Low impedance means that there is high current, but not much voltage, while high impedance means that there is high voltage, but not much current.

A simple aerial for one band, sure to succeed, is the centre fed half-wave. Its length is cut to suit the required band while the feed line may be twin-lead or co-axial cable of any length.

The end-fed half-wave may be easier to run from the shack to a support, but the fed end may be near the transmitter, causing trouble from stray r.f. The aerial works well on harmonics of the frequency for which it is cut. This means that it can be used on higher frequency bands—but it may also help to cause television interference. An aerial tuning unit (Fig. 3) will help reduce the TVI. This arrangement makes the simplest " all band " aerial.

If the same length of wire is used on the next higher frequency band, it will be about two half-waves long so that if it is centre fed, there will be a half-wave from the centre to each end (Fig. 1 (c)). It will be seen that the feed point has changed from low impedance (high current point) as at Fig. 1 (a), to high impedance (low current point). This is why the centre-fed half-wave (Fig. 1 (a)) with its low impedance line will be practically useless on higher frequency bands: the aerial needs a low impedance feeder on its original frequency, but requires a high impedance feeder on twice this frequency.

If an open wire tuned line is used, the centre fed aerial can be employed on other bands. Fig. 1(c) shows the current distribution in the two half-waves in phase, assuming that the feeder and aerial tuning unit make up electrically an odd number of half-waves.

Each half-wave section can be considered as two quarter-waves, shown by thick and thin lines in Fig. 1 (d). Closing the aerial up gives the doublet of Fig. 1(e). If *Y* to *Y* and *Z* to *Z* each total a half-wave, the transmitter end of the feeder will be high impedance.

On higher frequency bands there will be more than a half-wave each side, but this is no disadvantage. The aerial works well on that frequency where the top, *Y* to *Z*, is a half-wave long, and on higher frequencies. When *Y* to *Y* plus *Z* to *Z* total only one half-wave, the transmitter feed point is low impedance. This is the lowest frequency on which the aerial will be very effective. Nevertheless, the tuned dipole is a good " all band " aerial.

If the two half-waves were end-fed, current could be shown as at Fig. 1 (f). End-feed would thus be high impedance. But if the feed point is moved a quarter-wave along, as shown in Fig. 1 (f), it would be low impedance (exactly as in Fig. 1 (a) with another half-wave joined on one end). If the thin lines are drawn down, these two quarter-waves

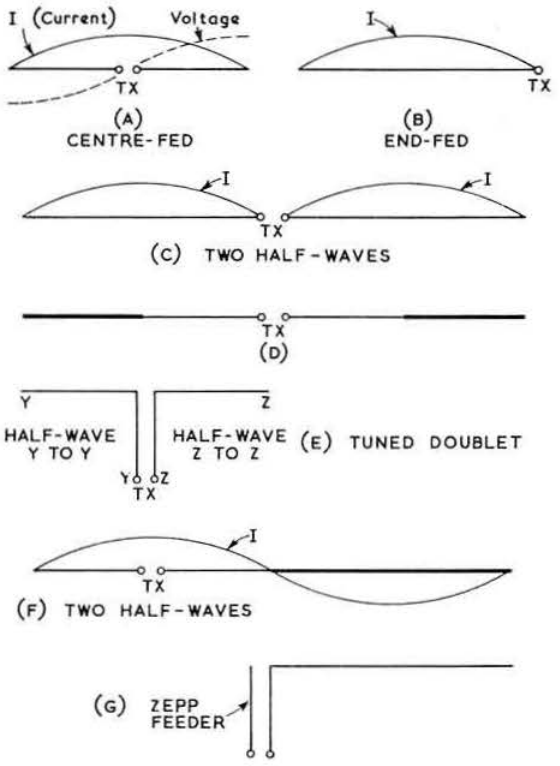


Fig. 1. Various types of simple wire aerials.

form the Zepp feeder, while the thicker line is the Zepp top (Fig. 1 (g)). The transmitter point will still be low impedance, as it was in Fig. 1 (f).

When a tuned circuit is connected to a tuned dipole or Zepp feeder, it is possible to couple effectively at almost any impedance. This allows the tuned dipole or Zepp to be used on other bands.

Practical Aerials

Hard drawn 14 s.w.g. enamelled copper or similar wire is suitable for the construction of aerials, although stranded wire, such as 7/26, is easier to handle when making open wire twin feeders. One or more ribbed glass or similar insulators are needed for each suspension point. An insulator, or preferably a dipole centre piece, can be used at the point where a co-axial or 75 ohm twin feeder is attached. Polythene cord is excellent for fixing up the aerial.

An open wire line can be made from the same wire as the

* *Longdon Heath, Upton-on-Severn, Worcs.*

aerial, but hard drawn wire is difficult to handle. Soft copper wire is easier to deal with, and will result in a neater feeder. A stranded wire is more flexible still, and 7/26 has a similar outside diameter to 12 s.w.g. Stiff wire, such as hard drawn, will require spacers at closer intervals than will suffice for a more flexible wire.

Ceramic 6 in. spreaders are readily available, and this spacing gives a line impedance of about 600 ohms, with 12 s.w.g. wire. With 14 s.w.g. the impedance is a little higher, but this is unimportant with a tuned feeder. Spreaders can also be made from $\frac{3}{8}$ in. or similar dowel. Ceramic spreaders may have a notch each end, with a small hole about $\frac{1}{4}$ in. away, and this can be copied when making wooden spreaders. The wires forming the line can rest in the notch, and be secured by a twisted loop of wire through the adjacent hole. Wooden spreaders should be well varnished after drilling to keep out moisture.

Sufficient spreaders should be used to keep the two wires of the line equally spaced throughout. If the wires are flexible, and not too slack, spreaders at 2 ft. 6 in. to 3 ft. intervals will suffice. Stiffer wires will need spreaders at about 18 in. intervals; greater spacing will make the width variable and the line untidy. The whole line should be reasonably taut, if possible. Adequate insulation should be provided at the lead-in points.

Half-wave Dipole. This is actually 0·95 of a half-wave long, as indicated in Fig. 2. The required length in feet can be found by dividing 468 by the frequency in Mc/s. This gives about 128 ft. for 3·65 Mc/s, 66 ft. 4½ in. for 7·05 Mc/s, 32 ft. 11 in. for 14·2 Mc/s, 22 ft. for 21·2 Mc/s, and 16 ft. for 29 Mc/s. These lengths can be used for the band concerned or the lengths may be calculated for the c.w. or phone section in each case. The aerial is not intended for other bands, but only that for which it is cut.

The feeder can be any length and is generally 75 ohm co-axial cable or twin feeder. This can go straight to the pi-output of most transmitters. If co-axial is used, the outer sheath should be connected to the chassis (earth).

End-fed Hertz. This is about a half-wave long at the lowest frequency and is end-fed. Part of the wire usually forms the down lead, as in Fig. 2, and the wire is lengthened to compensate for the bend. About 138 ft. will be satisfactory for the 3·5, 7, 14, 21, and 28 Mc/s bands. It is nearly two half-waves long on 7 Mc/s, and so on.

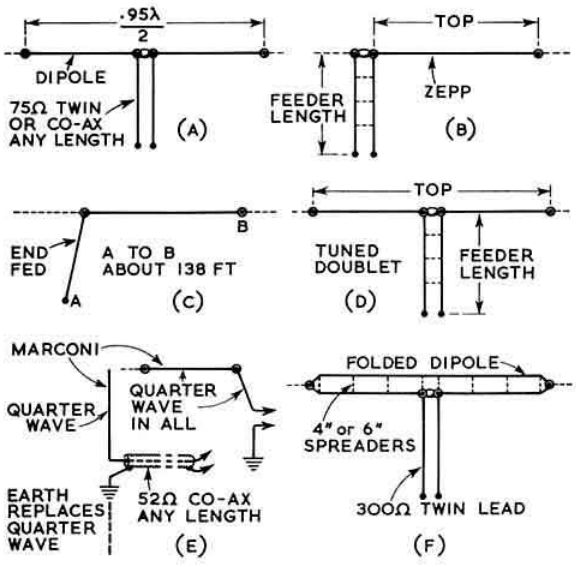


Fig. 2. Practical arrangements of simple aerials

When the aerial is about a half-wave or multiple of a half-wave in length on the band in use, the feed point impedance may be too high for some transmitters. The p.a. cannot then be loaded to draw full anode current, and the pi-output aerial capacitor may spark over. This can be overcome by using an aerial tuning unit (Fig. 3). It is in fact a good policy to use an a.t.u. with all aerials.

Tuned Dipole. When the length from one end of the top to the transmitter end of the feeder is about a half-wave or multiple of a half-wave, the end of the feeder is high impedance, and a parallel tuned circuit (Fig. 3) is used. When this length comes out near a quarter-wave or odd number of quarter-waves, the end of the feeder is low impedance, and series tuning must be used. A tuned dipole with a 136 ft. top and 68 ft. feeder will give parallel tuning on the 3·5, 7, 14 and 28 Mc/s bands.

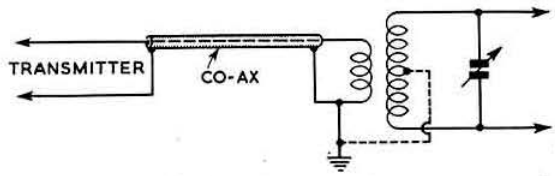


Fig. 3. Aerial tuning unit.

It is easy to experiment with the coil and capacitor at the transmitter end of the feeder to tune the aerial to resonance. The open wire line described earlier should be used, not a low impedance co-axial cable or twin feeder. A top length 0·95 of a half-wave on the lowest frequency band is excellent, but other lengths will work.

Zepp. This aerial can be coupled like the tuned dipole. A 137 ft. top and 68 ft. feeder will require parallel tuning on 7, 14 and 28 Mc/s, and series tuning on 3·5 Mc/s. As with the tuned dipole, series tuning is used when the transmitter coupler comes at or near a quarter-wave point, while parallel tuning is used if the point is a half-wave or multiple of a half-wave. A wide range of top and feeder lengths can thus be used.

Marconi. This is easily recognized as a vertical centre fed half-wave in which the earth replaces the lower quarter-wave section. Often the quarter-wave wire will have part of its length horizontal. A really good earth is needed because the low impedance feed point means high current, so that power is easily lost in the earth resistance.

A Marconi may be used when there is not enough space for a half-wave on the lowest frequency band. For example, about 67 ft. would do as a half-wave on 7 Mc/s (end-fed Hertz) but would be about a quarter-wave (e.g., Marconi) on 3·5 Mc/s.

Folded Dipole. This variation permits a 300 ohm or similar line to be used as the feeder. The actual top length should be 0·94 of a half-wave, but 0·95 can be used, so the lengths previously quoted may be employed. Twin lead can be used for the top, joined at the ends, one conductor being cut in the centre for the feeder.

Aerial Tuning Units

A method of coupling a tuned dipole or Zepp feeder, for parallel tuning, is shown in Fig. 3. The coil and capacitor will be about the same values as these used for the transmitter p.a. tuning, for the same band, so a wide-spaced capacitor is needed except for low power. A tapped coil can be used to cover all bands from 3·5 to 28 Mc/s. The

(Continued on page 547)

Transistor Circuit Design Made Easy

PART 2

By M. C. HATELY, B.Sc.(Eng.), A.C.G.I., A.M.I.E.E. (G3HAT)*

IN the first article in this series† a method of designing transistor voltage amplifiers was described. Amplifiers of this type are intended to work from a low resistance source into a load with a high resistance. To obtain appreciable power gain and low distortion, a voltage amplifier must therefore have a fairly high input resistance and a reasonably low output resistance. In circuits already described amplifier input and output resistances of about 10K ohms are easily possible with germanium transistors while values of 100K ohms can be achieved with silicon transistors using the same design methods. Silicon transistors are available from at least one manufacturer at prices similar to those of germanium transistors.

The present article contains design methods and examples of current amplifiers and push-pull amplifiers. Current amplifiers are not easy to produce in valve designs, so the use of transistors here considerably widens the scope of the designer. Push-pull circuits are useful for mixers (audio variety: really " adders ") and for low hum pre-amplifiers.

Current Amplifier Design

A current amplifier has a low input resistance and a high output resistance and operates most efficiently from a source of high resistance into a load of low resistance. A typical amateur application might be from a high impedance dynamic microphone into a low impedance tape recorder head.

A typical circuit is shown in Fig. 8 and will be seen to be almost identical to the general voltage amplifier described in Part 1. It should be noted, however, that the single stage includes the collector resistance of one transistor and the emitter resistor of the next. Design steps are as follows:

(i) Decide the current amplification or gain needed overall.

(ii) Break this up into stages of equal gain as for voltage amplification, allotting a gain of not more than 15 per stage.

Steps (iii) to (ix) inclusive are as for voltage amplifiers.

(x) Calculate R_e from: *Current Gain of one stage* $= R_c/R_e$ or $R_e = R_c/$*Current Gain*.

Note this is also independent of β and so, as with voltage amplifiers, almost any transistor can be used to get calculable current gain.

Steps (xi) to (xiii) inclusive are as for voltage amplifiers.

(xiv) Check the power dissipation in the collector of last transistor in the amplifier. This is obtained by (I_c) $\times$ (V *collector-to-emitter*) or $W_c = I_c V_{ce}$

Such dissipation must be less than the rated dissipation for the transistor in the condition of use. (Ambient temperature, and cooling fin arrangement, etc.)

The design of Fig. 8 is complete for all intermediate stages. The last stage should have a collector resistance (R_o) at least 10 times higher than the load impedance, provided this is not making R_o greater than R_c. A large value is unwise since the voltage swing that R_o causes the collector to undergo, may rise to the base voltage on peaks of signal, and distortion will be caused. If a load of more than 300 ohms impedance is to be current fed, it is necessary to use a reasonably high supply voltage.

The current gain of the first stage depends on the ratio of source resistance (or impedance) and emitter resistance R_{e1}

$$\textit{Current Gain} = R_s/R_{e1}$$

If the source impedance at working frequencies is not known, it can be made fairly high by means of an added series resistance, say 10K ohms. If R_{e1} is made 1K ohms, then this stage will give a current gain of at least 10 and more if the source resistance is high. Capacitor values are chosen in the manner described in Part 1 for voltage amplifiers.

Worked Example

A dynamic microphone of 10K ohms output impedance is to feed a 30 ohms impedance recorder head. The peak output of the microphone is 5 mV and the recorder head requires a peak current of 4 mA.

An output of 5 mV from a 10K ohms source represents a current of 5 mV/10K ohms $= 5 \times 10^{-3}/10^4 = 5 \times 10^{-7}$ A $=$ 0·5 μA. This may seem a ridiculously small signal to amplify, but it is perfectly feasible to do so. The data for the GET106 low noise transistor shows that 20db signal-to-noise ratio may be obtained with an input current of 2 millimicroamps; an ordinary transistor such as the GET103 is only 5db worse.

Working through the steps already described:

(i) The current gain required is 4 mA/0·5 μA
$= 4 \times 10^{-3}/5 \times 10^{-7} = 8 \times 10^3 = 8{,}000$

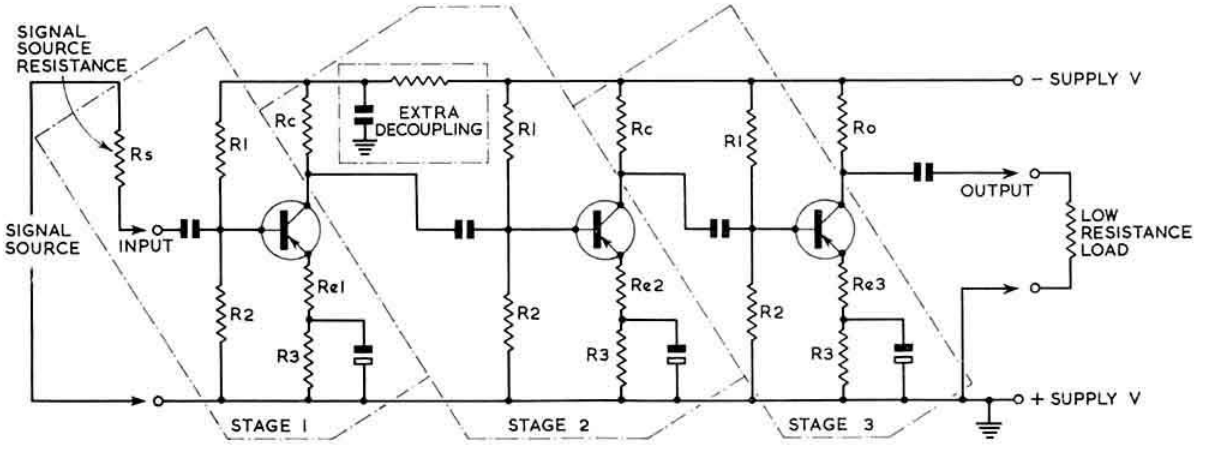


Fig. 8. The general schematic of a current amplifier

* *87 Warden Avenue, South Harrow, Middlesex.* † *April 1962.*

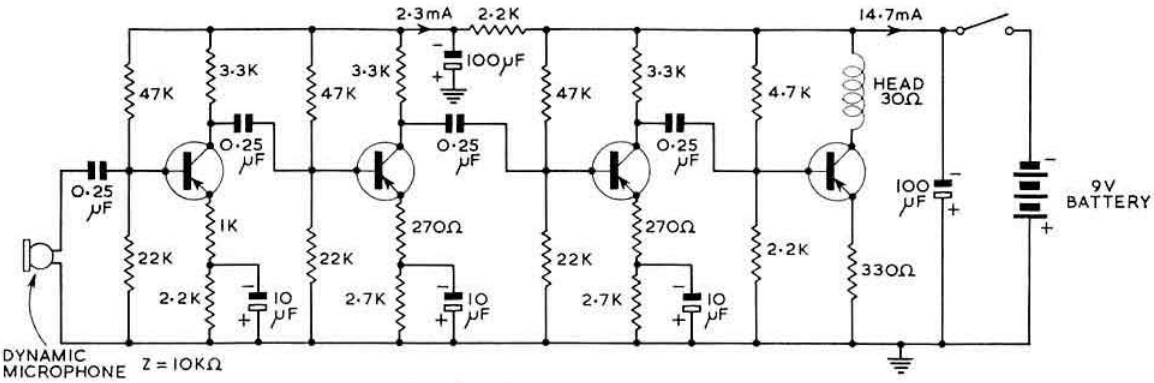


Fig. 9. Full circuit of the current amplifier worked example.

(ii) The fourth root of this is 9·5, so four stages of current gain of 9·5 each are required. The last stage much be capable of carrying 4 mA peak current without distortion so should be set to pass 10 mA as a steady current. (A more sophisticated design would employ negative feedback over the whole amplifier but this will serve for an example.)

(iii) A 9V supply can be chosen.

(iv) The collector current chosen I_c = 1 mA except for the fourth stage which takes 10 mA.

(v) Base current $I_b = I_c/\beta$
= 1/60 = 13·3 μA for the first three stages
= 10/60 = 133 μA for the fourth stage.

(vi) Potentiometer current
= 133 μA for stages 1-3
= 1·33 mA for stage 4.

(vii) Emitter voltage = 9V/3 = 3V

(viii) R_e + R3 = 3V/I_c
= 3/1 mA = 3K ohms for stages 1-3.
3/10 mA = 300 ohms for stage 4.

(ix) Collector resistance R_c = 9/3 × 1 mA = 3K ohms (use 3·3K ohms) for stages 1-3. R_c of stage 4 to be 10 times load impedance, i.e. 300 ohms so use 330 ohms; or use the tape recorder head alone in the negative h.t. line.

(x) Emitter resistance $R_e = R_c/GAIN$
= 3K/9·5 = 316 ohms (use 270 ohms).

(xi) From (viii) R3 = 3K − 270 = 2·73K ohms (use 2·7K ohms) for stages 1-3. For stage 4, R3 = 300 − 316 ≏ zero ohms.

(xii) R2 = 3V/I_b
= 3V/133 μA = 22K ohms for stages 1-3.
3V/1·3 mA = 2·2K ohms for stage 4.

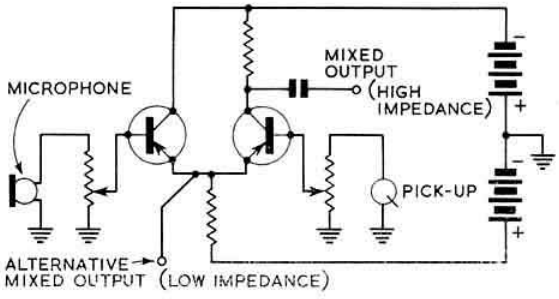


Fig. 10. An audio mixer using emitter coupled pair.

(xiii) R1 = (9 − 3)/I_b
= 6V/133 μA = 45K ohms (use 47K ohms) for stages 1-3.
= 6V/1·3 mA = 4·5K ohms (use 4·7K ohms) for stage 4.

(xiv) $W_c = I_c V_{ce} = 10 \times 10^{-3} \times 3 = 30$ mW for GET103.

The first stage emitter resistor should be a value so that

$$R_s/R_e = 9{\cdot}5$$

that is R_e = 10K/9·5 = 1·04K ohms (use 1K ohms).

So from (viii) R3 = 3K − 1K = 2K ohms (use 2·2K ohms).

The full circuit is shown in Fig. 9.

Push-pull Amplifier Design

Besides the uses for mixing two audio signals to produce an added output, push-pull amplifiers find many other applications. They can be employed as phase splitters for driving a push-pull circuit from a single-ended source—e.g.

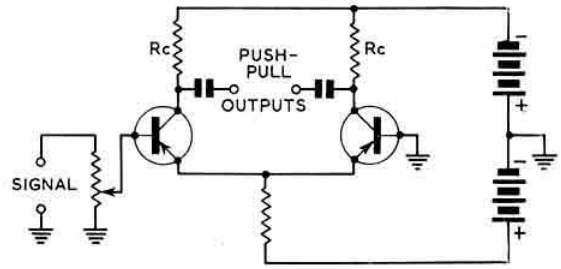


Fig. 11. A phase splitter using emitter coupled pair.

a power amplifier for a modulator in mobile equipment. Push-pull amplifiers also find application in discriminating in favour of out-of-phase signals in the presence of in-phase voltages, e.g. a weak microphone signal on a long twin cable travelling through a hum field.

In all these applications, the use merely determines the connection of the input and output, and not the individual design method. Block schematics are shown in Figs. 10, 11 and 12.

With two batteries as shown, or a grid bias battery with the centre tap earthed, direct connected earth level inputs can be employed for these amplifiers which is another useful feature.

The general one stage push-pull amplifier is shown in Fig. 13 in which the wording of the input and output terminals should be noted. This is to show which way the amplification phase is shifted. A negative going signal on

the lefthand base produces a positive going change on the lefthand collector and vice versa.

Stages may be coupled together to obtain the desired gain as follows:

(i) Decide the overall gain required. (Note that with a transition from push-pull to single ended output only half the possible stage gain is obtained in the last stage.)

(ii) Break up the gain into equal stages by taking a root.

(iii) Decide on a negative supply voltage, and use the same voltage for the positive line (to the emitters via " tail " resistors).

(iv) Decide on an economical current drain I_T and use this for the " tail " current which will be shared by the transistors. A value of 2 mA is ideal for germanium types.

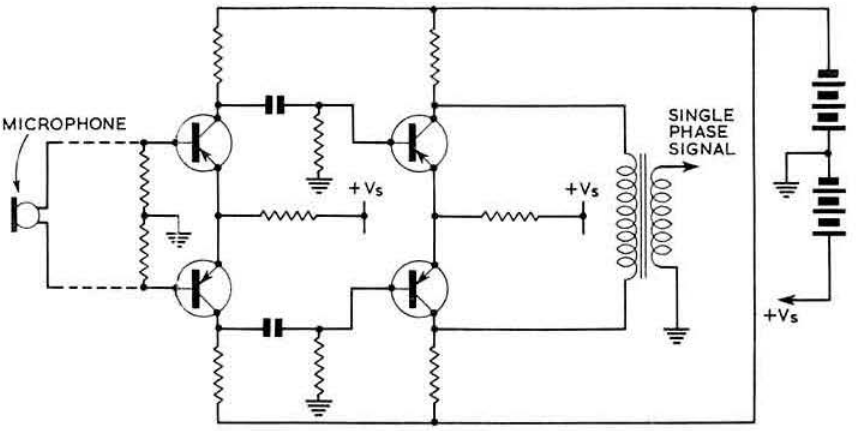


Fig. 12. An anti-hum amplifier using emitter coupled pairs.

(v) Calculate the value of collector resistor R_c so that R_c = Neg. V_s/I_T (use the nearest value higher or lower).

(vi) Calculate the value of R_T, the tail resistor, so that R_T = Pos. V/I_T (use the next value higher).

(vii) Calculate the maximum value of $R_b = R_T\beta/5$ or if β unknown, R_b may be made equal to $6R_T$

R_b may be less than this provided it does not load the previous R_c (or source resistance) too much.

If there *is always* a d.c. connection to earth through the push-pull source, or the circuit is being used as a phase splitter, R_b is unnecessary. It is merely a d.c. path for the base current.

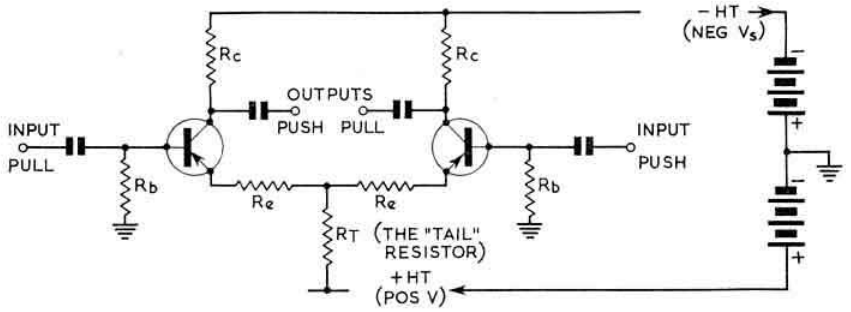


Fig. 13. One stage of a push-pull amplifier. The emitter coupled pair. (Sometimes called the long tailed pair)

(viii) Calculate the value of R_e.
R_e = R_c/*Stage Gain* (use nearest value lower).

(ix) Fit capacitors where necessary to isolate d.c. potentials. Capacitors between stages may be 0·25 μF.

Decoupling capacitors are not often necessary since balanced signals flow in the h.t. lines.

(x) If currents are 10 mA or more, check to ensure collector dissipation is not excessive. The dissipation in the tail and collector resistors should also be checked. Make use of formulae $W = VI$, V^2/R, or I^2R.

Worked Example

Suppose a signal of 3 mV from a dynamic microphone is to be amplified to provide a 2 volt push-pull input signal for a transistor push-pull modulator GET103, transistors are available.

(i) Gain required = $2/3 \times 10^{-3} = 666$.

(ii) Using three stages, the gain of each must be 8·75.

(iii) A 9V battery is to supply the positive and negative h.t. lines (the 2 volt swing required demands about 4 volts for the collector resistance drop).

(iv) The tail current (I_T) can be 2 mA. (It may be wise to use 4 or even 8 mA for the last stage if it has to drive a low impedance.)

(v) R_c = *Neg.* V/I_T = 9V/2 mA = 4·5K ohms (use 4·7K ohms).

(vi) R_T = *Pos.* V/I_T = 9V/2 mA = 4.5K ohms (use 4·7K ohms).

(vii) R_b = 4·7K $\times$ 60/5 = 56K ohms (use 47K ohms).

(viii) R_e = 4·7K/8·75 = 537 ohms (use 470 ohms).

(ix) Use 0·25 μF capacitors between the transistors.

(x) Power in the tail resistor is $I_T^2 \times R_T = (0{\cdot}002)^2 \times 4{\cdot}7$K ohms = 0·08 W which is less than the smallest type of resistor can stand satisfactorily.

The full circuit is shown in Fig. 14.

The arrangement in the emitter circuit of the last part of transistors provides single knob control of amplification which will give a 5 to 1 change of output voltage in both sides. If full control is needed, the 47K ohms resistor following the microphone may be made a potentiometer (log or linear).

Appendix

Step (x) of Current Amplifier Design.

(x) Current gain of a single stage, e.g. stage 2 (Fig. 15).

As before, $Z_{in} = \beta R_e$

$$i_2 = \beta i_1$$

But $\dfrac{i_1}{i_0} = \dfrac{R_c}{Z_{in}}$ or $i_1 = i_0 \dfrac{R_c}{Z_{in}}$

So $i_2 = \beta i_0 R_c/Z_{in}$

$= \beta i_0 R_c/\beta R_e$

$= i_0 R_c/R_e$

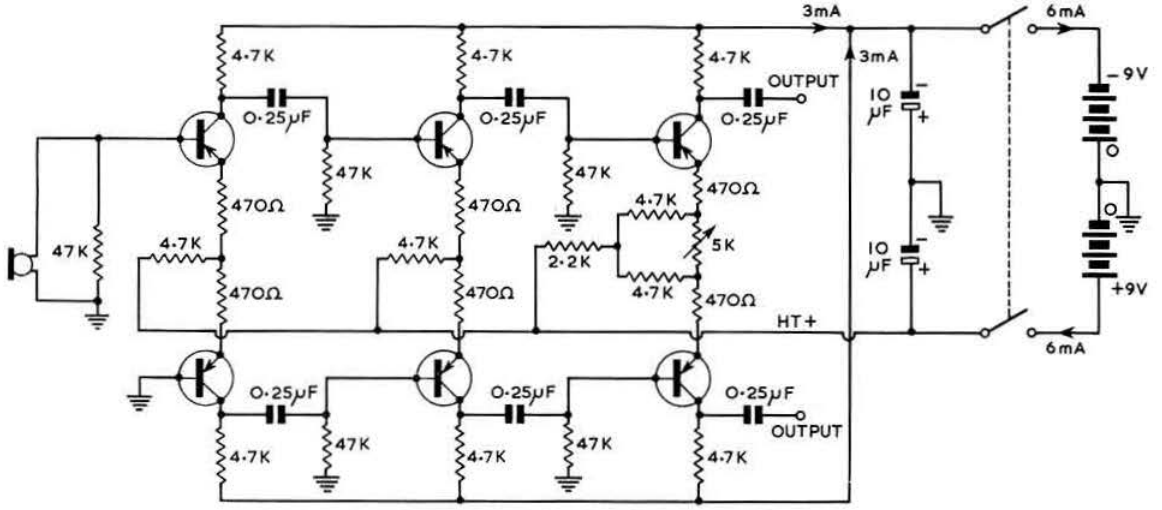


Fig. 14. Three stage push-pull amplifier. Complete circuit of the worked example.

Therefore, current gain for that stage is $\frac{i_2}{i_0} = \frac{R_c}{R_e}$

Steps of Push-Pull Amplifier Design (see Fig. 16).

(v) $\frac{1}{2}$ *Neg.* $V = \frac{1}{2} I_T R_c$

So R_c = Neg. V/I_T

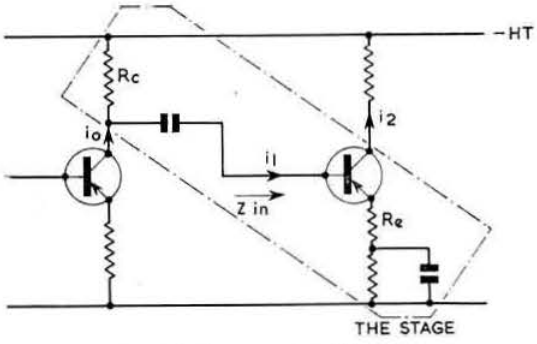


Fig. 15. Basic current amplifier stage.

(vi) For base and emitter potentials to be about earth

$R_T = Pos.\ V/I_T$

(vii) $V_{base} = R_b . \frac{1}{2} I_T . \frac{1}{\beta}$

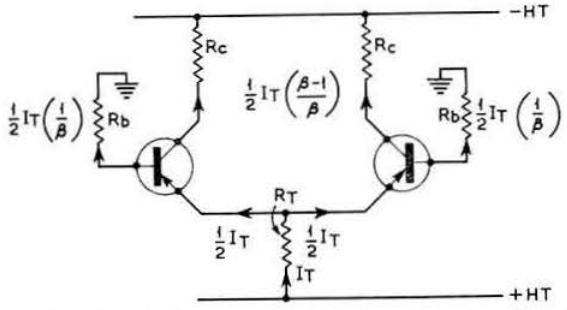


Fig. 16. Biasing for the emitter coupled pair. R_e may be neglected as its value is small.

But $V_{base} + V_{emitter} = Pos.\ V$

V_{base} should not be more than say $\frac{1}{10}$ *Pos.* V in order that the true long tailed pair effect is retained, so

$$R_b . \tfrac{1}{2} I_T . \frac{1}{\beta} = \frac{1}{10} Pos.\ V$$

$$= \frac{1}{10} . \frac{10}{9} I_T R_T$$

So $$R_b = \frac{2\beta}{9} . R_T$$

$$= \frac{\beta R_T}{4{\cdot}5} \text{ or approximately } = R_T \beta / 5$$

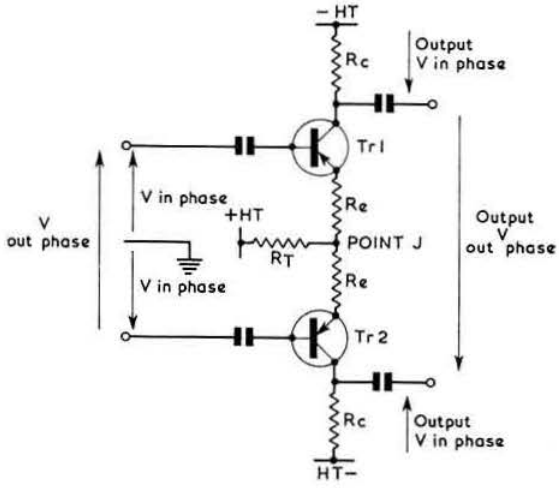


Fig. 17. Out phase signals of the emitter coupled pair. R_b is not shown. The h.t. lines are well decoupled.

(viii) Push-pull signals (out-of-phase) are fed in between the two bases and appear across the two collectors as shown in Fig. 17. For true out-of-phase signals there is no current change through R_T, since the increase of current in Tr1 is

(*Continued on page 547*)

An 18 Watt Transistor Transmitter for 7 Mc/s

By M. V. BOND (G3NWF)*

UNTIL recently, transistors capable of giving high power output on amateur frequencies have not been available but the transmitter to be described makes use of a new range of silicon h.f. power transistors made by Standard Telephones and Cables Limited. The circuit uses the TK202A and the lower power TK252A, both of which are *n-p-n* types, and, as the collector is internally connected to the case, it is desirable for the case to be grounded. This is achieved by operating the driver and output stages in the common

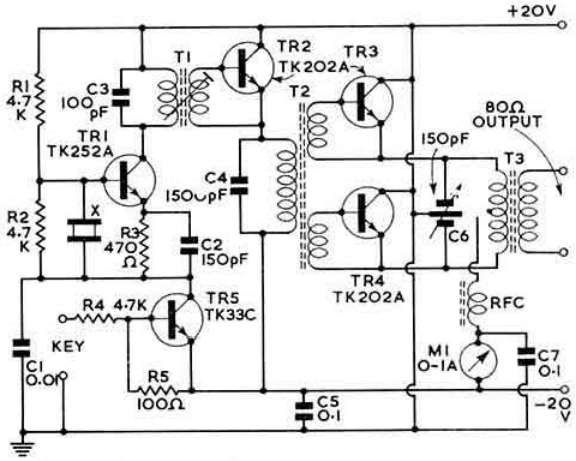


Fig. 1. Circuit diagram of an 18 watt transistor transmitter for 7 Mc/s. RFC, 20 turns 24 s.w.g. enam. copper wire on Stanferite ring type WP/3809/SF7; T1, pri. 15 turns/sec. 5 turns 28 s.w.g. enam. on ⅜ in. diam. former with dust-iron core; T2, pri. 4 turns/sec. 2 + 2 turns 18/47 s.w.g. Litz wire on Stanferite ring type WP3810/SF6; T3, pri. 8 turns centre tapped/sec. 8 turns 36/47 s.w.g. Litz wire on Stanferite ring type WP3809/SF7; TR1, S.T.C. type TK252A *n-p-n* silicon epitaxial planar; TR2, 3, 4, S.T.C. type TK202A *n-p-n* silicon epitaxial planar; TR5, S.T.C. type TK33C *n-p-n* germanium alloy transistor; X, 7 Mc/s crystal.

emitter mode and moving the grounded point of each stage to the collector.

The line-up of the transmitter comprises a crystal oscillator, class B driver, and push-pull class B output stage. Since a transistor in class B passes only a very low current without drive, appreciable current will only be drawn from the supply when transmitting.

The Output Stage

Considering, in the first case, the output stage which is designed to give 10 watts of r.f., it is found that the collector load for the transistor is of the order of 15 ohms. At such a low impedance as this, tight coupling in a transformer is difficult to achieve, but the required degree of coupling has been obtained by bifilar winding the transformers on ferrite rings. To match the output transistors to a load of 80 ohms, the transformer consists of eight turns centre-tapped on the primary and eight turns on the secondary. The collector efficiency of the output stage is about 56 per cent at the full output of 10 watts. The d.c. input to the collectors is then 18 watts. At the maximum rated collector voltage of 20 volts, a mean current of 0·9 amp must be drawn; this is within the maximum mean collector current rating for a pair of transistors, being 0·5 amp per transistor. This current must *not* be exceeded.

* *8 Crescent Road, Sidcup, Kent.*

Driver and Oscillator Stages

For 10 watts power output, the p.a. stage requires approximately 500 mW of drive. The driver transformer is again bifilar wound and consists of four turns on the primary and only two turns on each secondary. The low number of turns is due to the very low input impedance at this power level.

The driver stage itself requires about 50 mW of drive from the crystal oscillator which is of the negative-resistance type. The emitter bypass capacitor is chosen to produce a negative resistance at the base of the transistor. Keying is by means of an *n-p-n* germanium transistor, this method producing a good keying characteristic.

Construction

Practices to be adopted in the construction of the transmitter are normal for h.f. circuits, i.e. keeping short leads carrying r.f. The output stage should be kept as symmetrical as possible to retain the balance of the push-pull circuit. Decoupling should be applied directly at the points indicated in the circuit diagram because of the high currents flowing.

Alignment

Lining-up procedure is as follows:

(i) Detune T1 as a safety precaution against excessive current in the output stage.
(ii) Check that T2 is resonating at 7 Mc/s (the output stage collector current should peak at this frequency).
(iii) Tune the output stage collector capacitor for a dip in collector current.
(iv) Retune T1 until the output stage is drawing 0·9 amp.

It should be noted that the power supply used should have good regulation so that the off-load voltage is not excessive.

Results

The transmitter has been in use on 7 Mc/s in conjunction with a dipole aerial and even during the short time of operation, good contacts have been made with amateurs in the U.K. and Europe. Reports compare favourably with those obtained with the 90 watt transmitter in normal use at this station.

During his Presidential Address, Mr. Ingram discussed various "bottles" in use by Police Radio Services. Among those described were the MZ2-250 shown in the left hand of the bonny lass from Aberdeen. The bottle in her right hand is alleged to produce a degree of instability on such occasions as New Year's Day and Burns Night.

Mobile Column

By C. R. PLANT (G5CP)*

LAST month the technical section of *Mobile Column* was devoted to describing means of reducing interference developed by the car equipment, but did not take into account extraneous forms of noise such as that encountered from the ignition systems of nearby cars, atmospherics and from power cables or telephone lines. Whilst in some cases such noise is often too severe for anything to be done, the inclusion of a simple suppressor of the type shown in Fig. 1 will help to reduce noise and will also assist in the

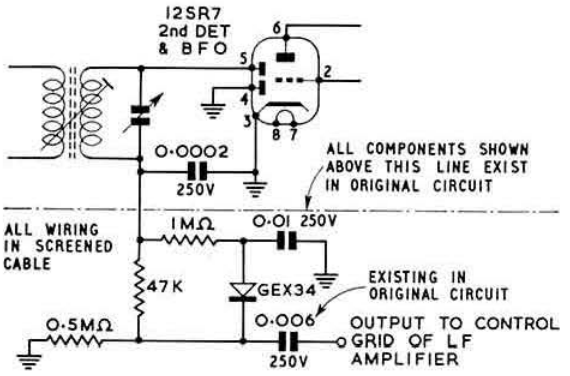


Fig. 1 Simple noise limiter for use with Command and similar receivers

reduction of interference produced in the parent vehicle. It was primarily designed for the popular Command receivers but may be used with equal efficiency in any good receiver.

The more elaborate full wave limiter shown in Fig. 2 forms what is possibly one of the most efficient noise limiters yet designed but has only two controls. Its operation is very simple and relies on squelch action to give a silent, or near silent, background, the incoming signal acting as the trip mechanism. With a fine adjustment of the squelch potentiometer it is possible for even very weak signals to be quickly located. The method of operation is as follows: Switch on the receiver and tune to a quiet point in the band where no signals are to be heard, advance the volume control until the desired background noise has built up and then adjust the squelch control until the background noise disappears again. Upon tuning over the band it will be found that a carrier will trigger the squelch and modulation will be heard. Under severe noise conditions the unit not only eliminates the background but enables weak signals to be more easily heard. In company with most noise suppressors a fairly high i.f. signal level is needed to give optimum performance but it is also important that the signal is not too strong or the a.v.c. will become overloaded.

Both units are designed to remain in circuit permanently; switching could, no doubt, be arranged to cut the limiter out of circuit should a component fail in service. The circuit of Fig. 2 was taken from the *Mobile Handbook* published by *CQ Magazine* and a similar circuit is shown in the R.S.G.B. *Amateur Radio Handbook*. Both publications are recommended as sound textbooks for any mobile or would-be mobile enthusiast and may be obtained from R.S.G.B. Headquarters.

* "*Lynton*," *12 Nottingham Drive, Wingerworth, Chesterfield. Derbyshire*

Mobile Rallies

Further information is now available concerning the R.S.G.B. National Mobile Rally to be held at the U.S. Air Force Station, Wethersfield, Essex, on Whit Sunday, June 10. The Society's Mobile Committee has gone to considerable trouble to make this a really fine event and the U.S. authorities have agreed to do everything possible to assist. Wethersfield is an operational station and by courtesy of the Officer Commanding the radio station will be open for inspection and aircraft will be on view. In addition mobile canteens will dispense hamburgers, tea and beer. Arrangements have also been made to entertain the juniors. The station is sufficiently near to London to attract a large number of visitors and a plea is made to support this event so that it may become an annual affair. Finchingfield is the nearest village and the airfield is located on B1053 about 11 miles from Great Dunmow.

The Hunstanton Mobile Rally and Bucket and Spade Party, organized by Peterborough Amateur Radio Society, will take place on Sunday, May 20. A car park has been arranged near to the railway station and the work-in stations will be G3ANM on Top Band and G3FUR on 145 Mc/s. A D/F Contest will take place at 2.30 p.m. Bring the family for a day's outing at the seaside. There are good facilities for food and other forms of refreshment!

The Chiltern Amateur Radio Club is holding a Mobile Rally on Sunday, July 15, in the grounds of West Wycombe Park, Bucks, the home of Sir John Dashwood. The house will be open to visitors as will the famous church tower

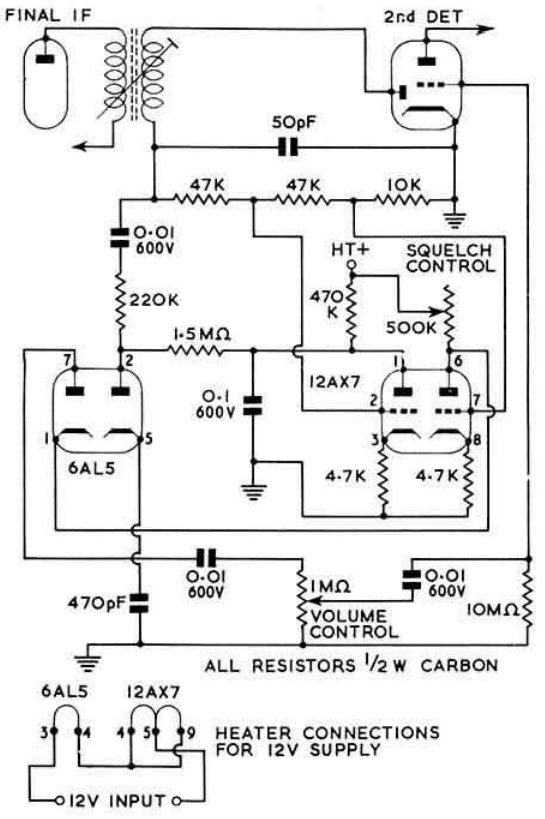


Fig. 2 Combined full wave noise limiter and squelch circuit often referred to as the twin noise squelcher (TNS)

with the golden ball and there will be trips to the Hell Fire Caves. West Wycombe is situated about three miles west of High Wycombe.

Luton and District Amateur Radio Society Mobile Rally will take place on Sunday, May 27, at Stockwood Park, Luton. The opening will be at 2.30 p.m. and work-in stations on Top Band and 144 Mc/s will be operational.

The West of England Mobile Rally under the sponsorship of the City & County of Bristol R.S.G.B. Group, will take place on Sunday, June 17, at Longleat House, near Warminster, Wilts., the home of Lord Bath. An area for parking has been sited near to the house where various events will take place, including a *concours d'elegance* and field strength tests. Prizes will be awarded for the mobile making the longest journey to the Rally and to the stations with the longest contact with the control stations on both frequencies. The work-in stations will be G3CHW on 1880 kc/s and G3GYQ on 144 Mc/s. Mobiles are requested not to use the frequencies of the Longleat stations when approaching the area. A small charge for admission will be made at the entrance. Refreshments will be available as usual at the restaurant in Longleat House.

The Southern Counties Mobile Rally which takes place on Saturday, July 14, will form part of the Great Southampton show. A special parking site has been arranged and refreshments will be available without prior booking. A display by local amateur groups entitled "The A to Z of Amateur Radio" together with Show Jumping and a host of other attractions should cover every interest.

MOBILE RALLIES
1962

May	20	M.A.R.T.S. Hamfest & Mobile Rally, Rochester Airport, Kent.
May	20	Hunstanton Bucket & Spade Party & D/F Contest, Hunstanton, Norfolk.
May	27	Luton & District Amateur Radio Society Mobile Rally, Stockwood Park, Luton, Beds.
June	10	R.S.G.B. National Mobile Rally, U.S.A.F. Station, Wethersfield, Essex.
June	17	Longleat Mobile Rally, Bristol R.S.G.B. Group, Longleat House, nr. Warminster, Wilts.
June	24	A.R.M.S. Rally & A.G.M., U.S. Air Base, Barford St. John, Oxon.
June	24	East Yorks. Coast Mobile Rally, Spa Royal Hall, Bridlington, E. Yorks.
July	8	South Shields & District Mobile Rally, Bents Park Recreation Ground, South Shields, Co. Durham.
July	14	Southern Counties Mobile Rally, Southampton Common, Southampton, Hants.
July	15	Harlow & District Mobile Rally, Harlow New Town, Essex.
July	15	Chiltern Amateur Radio Club Mobile Rally, West Wycombe Park, Bucks.
August	19	Derby Radio Societies Mobile Rally, Rykneld School, Derby.
August	26	Stockport Radio Society Mobile Rally, Pavilion Gardens, Buxton.
Sept.	2	Thames Valley Amateur Radio Transmitter Society Mobile Rally.
Sept.	16	Lincoln Radio Society Mobile Rally, North Kesteven Grammar School, North Hykeham, Lincoln.
Sept.	16	R.S.G.B. National Mobile Rally, Woburn Abbey, Beds.
Sept.	22	Region 9 Mobile Rally at Weston-super-Mare.

Operating News

An interesting letter has been received from VE3CXW/W4 (ex-G2KB of Rugby), who is attached to the U.K. Scientific Mission in Washington, D.C., who says that for mobile working he uses a 144 Mc/s Heathkit transceiver with a halo aerial. He travels around quite a lot and always uses this rig, transferring it to his hotel room when putting up for the night, often in skyscrapers! From these lofty elevations he has worked all W districts except W1 and 5, the normal maximum range being 60-70 miles. When away from the car he uses a photographic tripod to support the halo; this may prove to be a useful tip to other v.h.f. enthusiasts.

G3MBL (London, N.12) would like to hear from anyone who has modified a BC454 to cover both 3·5 Mc/s and Top Band. G2CVO (London, E) reports that he will shortly be operating /M using a Topband transmitter with a 5763 in the output stage, generally as shown on page 420 of R.S.G.B. *Amateur Radio Handbook*; the modulator line-up will be 12AX7, ½ 12AX7 followed by a pair of 12A6 in push-pull.

A detailed description of the /M equipment used by G2HQ (Sheffield, Yorks) shows that he is one of the few British amateurs using s.s.b. in his car. The transmitter is a phasing type of sideband generator driving two 6146s in parallel as a linear final. The receiver consists of a crystal controlled converter feeding into a BC453 which makes an excellent combination for receiving either a.m. or s.s.b. signals. All power supplies are transistorized and are home-built using toroid-type transformers. G2HQ says that the saving of power has well proved their worth. The aerials are either of the continuously loaded type or the more usual coil loaded whip with a small motorized capacitor located at the aerial base to tune the circuit. Best DX to date on 14 Mc/s has been a contact with VQ5FS (Owen Falls, Uganda) when signals were reported as S9 for part of the time.

G3GNN (Doncaster, Yorks.) is mobile on 70 Mc/s using a modified B44 MkII with an input of 4 watts and a quarter wave vertical aerial. The B44 receiver section is a double superhet and the second stage has been modified from crystal control so that the 70 Mc/s band may be continuously tuned. During a recent trip into Yorkshire G5PW and G3NAN, both of Leeds, were worked for a distance of 16 miles during the homeward journey—this might easily have been exceeded but for a heterodyne which blotted out the mobile signal. G3NAN has mobile equipment for this band but says that all he needs is a car!

G3FUR (Stamford, Lincs.) has rebuilt his 144 Mc/s mobile equipment, the new set-up providing greater output than that used previously. Care has been taken to increase the modulation percentage. The transmitter line-up is EF82 c.o. on 24 Mc/s, b.a. on 24 Mc/s, tripler to 72 Mc/s, QV04-7 doubler driving a QQV03-20A at 25 watts, modulated by a transistorized outfit terminating in a pair of V60-30P transistors in class B. The aerial is a halo mounted a half wavelength above the car roof. The receiver front-end comprises a 6CW4-E88CC cascode and ECF82 mixer to give increased gain and greater stability. G3FUR will operate on 145·0 Mc/s when mobile and will appreciate any reports on the reception of his signals.

G2HAP (Manchester) reports that he has not been very active during the winter months but has several ideas for the summer including replacing the rotary converter with transistorized packs and the construction of an all-band transistorized converter for use instead of the existing RF26 units. Since July 1958 G2HAP has worked some 50 countries while mobile including HH2, FM7, VP3, VP9, VS9, UA9,

(Continued on page 537)

Single Sideband

By G. R. B. THORNLEY (G2DAF)*

IN *Single Sideband* in the October 1961 issue of the BULLETIN the basic passive grid circuit was shown. Since then, many amateurs who are not familiar with this method of operating a power amplifier have been waiting for further details.

The term " passive grid " is used to define a method of operating a linear power amplifier in which the grid input circuit is " passive " in regard to frequency, i.e. the normal coil and tuning capacitor are omitted and replaced with a non-inductive resistance.

The linear amplifier in use at G2DAF uses two parallel 4-125A valves in passive grid and ten months' experience with this equipment has confirmed the writer's opinion that this

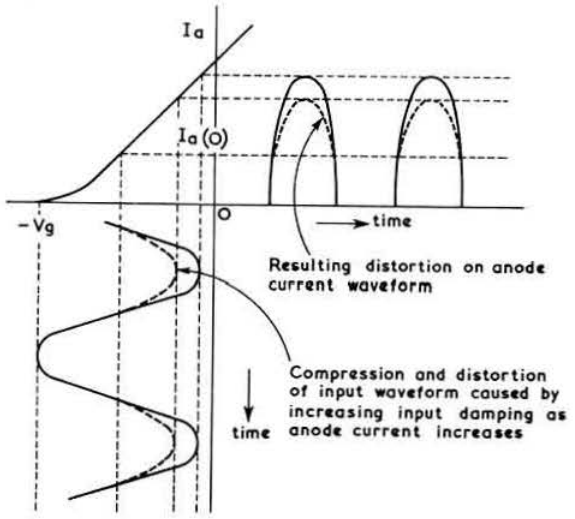


Fig. 1. Linear amplification characteristics showing how variation of input damping causes distortion of the input waveform.

method has a number of advantages making it particularly suitable for the requirements of many sideband workers.

Variation of Input Damping

Before considering the actual circuitry of a passive grid amplifier it is of interest to consider the basic problems that are common to the normal grid driven method. The first is the variation of input damping. Throughout the drive cycle, in a radio frequency amplifier biased to class AB1, the input damping changes and these changes are reflected back to the driver valve, as shown in Fig. 1.

The changes in input damping are caused by the change of input capacity of the valve with increasing anode current. As the anode current starts to flow, electrons move away from the cathode and pass through the grid on their way to the anode. The proximity of this increasing stream of electrons to the grid wires modifies the grid cathode capacitance. The increased capacitance requires additional current to charge it from the driver source and as there is always some resistive loss associated with the capacitance, more power is required.

* *5 Janice Drive, Fulwood, Preston, Lancashire*

† This is the value recommended in the Mullard publication *The Operation of R.F. Power Valves as Linear Amplifiers and Single Sideband Applications*, by K. Bounds and P. Giles, Application Research Laboratory.

As well as this difficulty there is the grid circuit detuning effect—well-known in receiver i.f. amplifiers.

A method of overcoming this distortion is to make the driver impedance as low as possible. This can be accomplished by connecting a swamping resistor across the grid circuit. The value of this resistor depends on the valve being used, the operating conditions, and the possibility of grid current, but is usually of the order of 2,000 ohms. The characteristics of certain valve types are such that is advantageous to drive the valve slightly into grid current. In this instance a swamping resistor will assist in masking the effects of input impedance change when grid current starts to flow†.

Amplifier Stability

The second problem is that of amplifier stability. It is vitally important that there is no positive feedback in a linear power amplifier and most tetrode and pentode valves used for amateur sideband use require neutralizing. Because of the high power gain it is more difficult to correctly neutralize a class AB amplifier than a class C one. Additionally, the variation in grid cathode capacity can cause an amplifier that is perfectly stable and correctly neutralized under static conditions to become imperfectly neutralized and go unstable under voice peak conditions.

Now, suppose that the usual grid input tuned circuit is omitted and replaced by a non-inductive resistance of a few hundred ohms, the heavy grid damping will prevent any feedback due to the grid/anode capacity of the valve being of sufficient amplitude to cause instability, without any necessity to incorporate neutralizing circuits, and in addition the low grid resistance will provide a constant load on the driver valve and will effectively damp out the effect of variation of input damping during the driving cycle caused by input capacity change, and the further effect caused by the onset of grid current flow.

The Passive Grid Linear Amplifier

While it is possible to stabilize a triode amplifier by making the passive grid resistor of low enough value it is likely that in practice the required value would be so low, an excessive amount of driving power would be necessary in order to develop the necessary grid driving voltage across it. The passive grid method is therefore particularly recommended for tetrode and pentode amplifier valves.

The lowest value of grid resistor that will normally be used is 75 ohms—this would be an exact match to an exciter with a pi output network usually working directly into a 75 ohm aerial load. The highest possible value of grid resistor will be that at which the amplifier becomes unstable due to positive feedback; this will vary from valve to valve but is estimated to be around 1,000 ohms.

As a low value will give a greater measure of stability and a more constant load on the driver valve, its value in ohms will be determined by the required maximum signal grid driving voltage and the available power output from the driver valve. This is determined by the formula $R = V^2/P$, where V is the maker's value for the peak r.f. grid driving voltage and P is the p.e.p. output rating of the driver valve in use. It should be noted that as p.e.p. is an r.m.s. value, the value of V used in the formula should also be an r.m.s. value. However, the use of the peak voltage figure normally given in valve data ensures that in practice the required drive voltage is developed using only half of the available driver output. This gives a very desirable two to one margin of safety and ensures that the driver stage can never be overrun at any time, and that the level of intermodulation distortion products from this stage is always less than the distortion product level from the linear power amplifier.

A number of sideband operators are now using passive grid amplifiers, two known to the writer being G3NSN and G5TP. In both cases the exciter is based on the G2DAF

design using a single 6146 valve in the output, and this gives adequate drive. The excellence of the signal from both these stations is not only very creditable to their owners but also a fine example of what is possible with the passive grid amplifier arrangement.

G3NSN has kindly made available the circuit and component values of his own amplifier using two 4X150A valves and these are given in Fig. 2. The calculated value for R_L (anode load) is 1,600 ohms and the values of C1, C2 and L in the pi tank are obtained by using the tables given in *Simplified Design Procedures for Pi-Network Tank Circuits*, by G. C. Fox, A.M.I.E.E. (G3AEX) in the June 1961 issue of the BULLETIN.

The circuit is equally applicable to other valve types, subject to modifications to the value of R and the values in the pi tank circuit to accommodate the different peak grid drive voltage and the different value of R_L. As an example, 813s and 4-125As require a peak r.f. grid drive of approximately 100 volts. A single 6146 valve with a p.e.p. output of 50 watts could not develop this across 80 ohms and R will need to be increased in value to 200 ohms. The calculated value for R_L is 3,250 ohms for two 813s in parallel and 3,750 ohms for parallel 4-125As—both with an h.t. supply of 2,000 volts and 600 volts on the screens for operation in class AB1.

Finally, the passive grid method is equally applicable for class AB2 operation. The driving requirement is then the sum of the power dissipated in the passive grid resistor plus the driving power as given in the manufacturers' valve data. As will be seen from Fig. 2, the circuitry is inherently simple with only the pi network requiring tuning. The absence of the normal grid input tuned circuit and the usual neutralizing bridge makes for a particularly neat and compact layout. Any existing pi output circuit on the exciter—provided it has a variable capacity on the output side—will load satisfactorily into the passive grid load. If there is no pi tank, but a parallel tuned circuit arrangement, an output link winding with the link turns adjusted to give the maximum drive into the p.a. will be required.

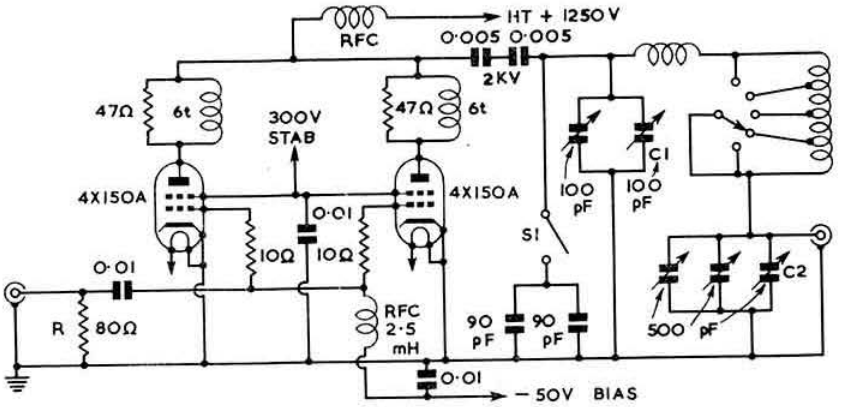


Fig. 2. The G3NSN passive grid linear amplifier.

C1 is a two-gang capacitor with 0.05 in. air gap (ex-T.1154 transmitter suitable). C2 is a standard three-gang 500pF per section capacitor. R comprises 15 one watt 1.2 K ohms carbon resistors in parallel. For 80m operation, S1 is closed. The 90pF mica capacitors were obtained from a TU5 tuning unit. The anode r.f. choke must be a type suitable for pi-network tank circuit operation—see page 189, *Amateur Radio Handbook*. It should be noted that the 4X150A valves require forced air cooling even without h.t. applied and the blower circuitry must be interlocked with the heater supply.

Operating Conditions

D.C. anode voltage	1250 volts
D.C. screen voltage	300 volts
Zero signal d.c. anode current	100 mA
Maximum signal d.c. anode current	400 mA
Maximum signal d.c. screen current	25 mA
D.C. grid voltage	—50 volts
Anode load	1600 ohms
P.E.P. output (calculated)	300 watts
P.E.P. output (measured)	270 watts*

* Including tank circuit losses

Mobile Column (Continued from page 535)

9K2, 9M2 and ZL1. G2HAP had an amusing experience recently: he had parked his car in Deansgate, Manchester, and on returning to it found no less than four police officers around it. Instead of a ticket for extended parking he found that they were merely interested in the strange looking aerial and the equipment visible through the windows. After an explanation had been given there was a momentary silence and then one of the officers remarked "Oh I see, Ten Four, eh?"! It would appear that our local police get tips from *Highway Patrol*.

W0UYC (Webster Groves, Missouri) who uses an Elmac mobile transmitter and a Gonset converter in his automobile will be visiting this country during June. G5CP spent a lot of time at his home during a three months' stay in St. Louis, Mo. in 1952, and looks forward to the opportunity of returning the hospitality so freely given to him ten years ago.

Held Over

DUE to pressure on space, a number of *Letters to the Editor* and other technical and topical features have been held over.

Help for Deaf Children

MEMBERS willing to donate off-cuts of aluminium or discarded photographic gear are asked to write to R. H. Lamb (G3IDD), School for the Deaf, Tunmarsh Lane, Plaistow, London, E.13. Mr. Lamb can arrange collection if required.

Mobile Rally Stickers

WINDOW stickers incorporating the R.S.G.B. emblem and the words "Mobile Rally" are available from Headquarters, price 5s. per 100, plus 1s. postage and packing.

LONDON S.S.B. DINNER

It is proposed to hold a dinner for single sideband enthusiasts in London during the early autumn. Those interested are invited to write to either J. A. Steele (G3KZI), 12 Broadwalk, Woodford, London, E.18, or to R. F. Stevens (G2BVN), 51 Pettits Lane, Romford, Essex, in order that the likely support for such a function may be judged.

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

THERE have been recent comments, not all of them favourable, on the activities of QSL managers, and in some cases it appears that the good intentions behind the original idea are not now being carried out. Undoubtedly the existence of QSL managers has given many operators a chance of contacting a rare country, for the transfer of the work involved in writing out large numbers of QSLs has encouraged many DX stations to operate more frequently than they otherwise would have done. Many of these managers have performed valuable service in distributing cards and W2CNT comes to mind as an example. Unfortunately, others have not been so conscientious and G3HDA mentions several who have not replied to his QSL requests despite the inclusion of reply stamps or I.R.C. This lack of response is very disappointing and even if, for some reason, the QSO for which the QSL was sent does not appear in the log it would surely be a courtesy to acknowledge the incoming request if reply postage is included.

Further evidence that the system of QSL managers is not foolproof comes from the experience of the writer who, after a contact with a station in Southern Rhodesia in June last, sent a card to his QSL manager. This was returned in April last with a slip saying "not in log," but during the interim period a QSL had been received direct from the operator in question! There would seem to be something radically wrong with a system that produces these apparent contradictions. In the same way as other innovations, QSL managers are ideally an asset but the system is capable of abuse and dissatisfaction.

The present sunspot cycle continues its downward path and the predictions for the current month and June and July are 36, 35 and 33 respectively. For those interested in an up to date bulletin on the progress of the sunspot numbers the Swiss Broadcasting Corporation transmit this information to the U.K. on the first Friday in every month at 19.10 G.M.T. on wavelengths of 41·61 and 31·43 metres. The source of the predictions is the Zurich Observatory.

News from Overseas

VR2EA, who was worked by many stations during the B.E.R.U. Contest, was located on Wailangalala Island off the coast of N.E. Fiji. In all, 230 contacts were made using a ground plane for 14 and 21 Mc/s and a 360 ft. long wire, one end of which was connected to a lighthouse. G3JFF will be returning to the Gilbert and Ellice Islands between May 28 and June 4 for a spell of operation as **VR1M.** This station will again be set up at the Government Wireless Station, and the frequencies used will be 14,050 and 21,050 kc/s. *H.M.S. Cook*, the home of G3JFF/MM, will be leaving Fiji for Singapore on June 12, arriving there on July 4. From Singapore G3JFF will be flying back to the U.K. and a spell of operation using a less exotic call-sign.

From **5N2JKO** it is learnt that **5N2HHT** (G3KDW) will be returning to Nigeria in the near future, ex-**5N2DPD** is now VS9ADD and ex-**ZD2NWW** is now VS9ANW. Angus Murray-Stone **(5N2AMS)** and his wife will be leaving the U.K. for the U.S.A. on about May 15, and after holiday in North America will return to the U.K. around July 6. Both **5N2BRG** and ex-**ZD2GWS** are now in the U.K., and we wish them both a speedy recovery after a period of illness.

ZB1RM provides the latest information on the current happenings in amateur circles in Malta. ZB1RF has returned to the U.K. where he now signs G3PJA, and ZB1OKV is en route to Singapore, with ZB1HC leaving in June. ZB1s BJ, CR, GJ, JF, JM, NZE and PN are all active at the present time, and from the Government wireless school ZB1MNC may be heard on 7 and 14 Mc/s c.w. ZB1A has carried out repair work on his beam after gale damage and is again active on s.s.b., whilst G3PEU plans activity on this mode for a three month spell. ZB1RM himself hopes to be active on s.s.b. and possibly mobile in the near future.

G3TA is now back in the U.K. after a spell on location in Jamaica during which time he signed **VP5TA.** Due to poor conditions and heavy interference from North American stations contacts with European countries were not made, but on the next occasion G3TA hopes that better aerials and more time will enable him to remedy this deficiency.

VP3MC, after a period of leave spent in touring the Caribbean area, returned to British Guiana only to become the victim of a thrombosis from which he has now made a complete recovery During the disturbances in Georgetown during February, VP3FM and VP3MC were engaged in handling emergency traffic. Unfortunately during the height of this operation an army truck crashed into the aerial supports and work continued with the radiator 3 ft. above the ground. However, the poles formerly used by

VS9APH, who was a member of the 1961 DXpedition to Kamaran Island, seen in his home station in Aden.

* *Please send all reports to R.S.G.B. Headquarters to arrive not later than May 18.*

A view of GD6UW, the station operated by members of the Cambridge University Wireless Society from Douglas, Isle of Man. From left to right, G3OYW, G3NHL, G3MZM, G3PIT, and G3MDR. Equipment included Labgear LG300 and Topbander transmitters and an Eddystone receiver.

VP3RW were secured and erected in time for participation in the B.E.R.U. Contest. VP3YG and VP3HAG were also on duty during the period of the disturbances, the latter at Mackenzie City.

EP2BD has moved QTH to a location in the midst of a high mountain range and about 2,600 ft. a.s.l. As soon as the necessary permission comes through Iain will again be active on 14 and 21 Mc/s. The new address will be found in *QTH Corner*.

ST2AR, Eric Dowdeswell, is again active after a long period off the air, and in addition to his usual spells on c.w. hopes that at some future time it may be possible to operate from some of the new republics such as TL, TR and TT. At the present time ST2AR does not have any sideband equipment but this deficiency may be rectified before too long.

VR2BC, a recent guest at the London Members' Luncheon Club, is leaving the U.K. at the end of May for a spell in VP2K, from where he will leave for Fiji via W6 and KH6 arriving home at the end of June.

The annual change of editorship of the *West Gulf DX Club Bulletin* has taken place and the new editor, K5ADQ, Nikki Boyd, can be reached at P.O. Box 589, Los Alamos, New Mexico. She is believed to be the first XYL editor of a DX magazine.

The **South Orkneys** are currently represented by **VP8GQ** (ex-G3LET) who is very active on all bands: 14 and 7 Mc/s have provided reasonably consistent DX, with 3·5 Mc/s occasionally of interest. The 1·8 Mc/s band has not come up to its earlier expectations although a number of "firsts" with American stations have been recorded. Recently the B.B.C. Light programme on 1214 kc/s was heard at 05.30. The base at Signy Island is now settling down to the winter schedule after the recent departure of the last ship for six months, and there are a total of eight persons staying over the winter period. VP8GQ had to curtail a recent QSO owing to some seal steaks which were approaching the burnt offering stage during his turn of duty as cook.

DXCC News

The A.R.R.L. have adopted an alternative method of determining the top positions in the **DXCC Honor Roll,** and the April issue of *QST* shows the positions after the deletion of countries which cannot now be contacted, e.g. ZD4 and Trieste, and others which do not now count separately, e.g. UN1. There have been comments that this method is a more realistic approach to the real status of an operator in so far as DX is concerned, but a comparison of the listings on the original and revised basis shows that there is but little alteration in the relative positions of the stations at the top of the Honor Roll. PY2CK remains in first position with new/former totals of 306/318 followed by KV4AA with 305/318. Of the U.K. stations **G4CP** is the leading contender with 298/310 with **G2PL** close behind at 297/309. It should be noted that endorsement stickers will still be issued on the basis of overall totals.

The U.S. Government has been advised that **Thailand** has never withdrawn its objection to international communications by its amateurs and therefore this country (prefix HS) has been put back on the banned list w.e.f. March 23, 1962. The remaining prefixes on the banned list are FI8, PK, XU, XV, YB/YH and 3W. In so far as U.K. stations are concerned the practical effect of the banned list is that contacts with the countries named will not count towards the DXCC total.

DXpeditions

The trip sponsored by the Amateur Radio Society of India to **Bhutan** materialized when **VU2US/AC5** was first heard on April 16. Operation took place on c.w. and a.m. on 7, 14 and 21 Mc/s, and an unusual feature was the allocation of QSL numbers to each station contacted. Conditions were variable, but on at least three of the days on which the DXpedition was active, signals were heard in the U.K. as late as 22.45. It is asked that QSLs should be sent through the A.R.S.I. Bureau.

The operation from the **Isle of Man** by the Cambridge University Wireless Society under the call **GD6UW** took place from March 28 to April 4. The main station in Douglas was used on 1·8 Mc/s and the h.f. communication bands and the 144 Mc/s equipment was located in the Snaefell Radio Station. Altogether 113 QSOs were made on Top Band and 700 on the h.f. bands using a 264 ft. long wire, a G5RV multiband aerial and a Mosley V3 vertical. Operation was mainly on 14 Mc/s c.w. and under the care of G3s MDR, MZM, NHL, OYW, PIT, PNC and s.w.l. Kershaw. QSL cards have already been despatched through the Bureau.

Although delayed by bad weather at Dickson Island the operation planned by **UA3CR** took place from **Franz Josef Land** and 2300 QSOs were made with stations in 101 countries, practically entirely on two way s.s.b. QSLs are

QTH Corner

AP5CP	Dacca Signals, Dacca 6, East Pakistan.
CP5EQ	P.O. Box 940, Cochabamba, Bolivia.
EA8DO	Box 215, Tenerife, Canary Islands.
EP2BD	I. Dunbar, Telecomms. Dept., Iranian Oil Exploration and Producing Co., Gach Saran, via Abadan, S. Iran.
EP2BK	Box 502, Springfield, Missouri, U.S.A.
HH2OT	via K0GZN, Harper, Kansas, U.S.A.
KB6CL	Box 38, Canton Island.
K8YUW/KJ6	1615 Orchard Grove Ave., Lakewood 7, Ohio, U.S.A.
KP6AM	via KH6AAJ, 617 Pamaele St., Kailua, Oahu, Hawaii.
MP4MAH	C. A. Thomas, Yibal, c/o P.D.(O) Ltd., Muscat, via Bahrain, Arabian Gulf.
OX3UD	via W2CTN
TU2AE	G. Laire, Centre Emetteur PTT, Abidjan, Ivory Coast Rep.
VK9LA	via VK6 Bureau, 15 The Grove, Wembley, W. Australia.
VP2MV	c/o Cable and Wireless, Montserrat, B.W.I.
VQ1CJ	P.O. Box 1283, Zanzibar.
VS4RM	R. Maull, Tanjong Lobang School, Miri, Sarawak.
XZ2VK	P.O. Box 800, Rangoon, Burma.
ZB2AD	via W3AYD
ZS6BS	P.O. Box 7251, Johannesburg, S. Africa.
4S7EC	Box 907, Colombo, Ceylon.
5N2ATU	B. Wilbraham, Box 144, Lagos, Nigeria.
5N2AMS and 5N2DMS	via 5N2JKO
6W8BL	J. Bonnafous, Boite Postale 3020, Dakar, Senegal Rep.
6W8CB/MM	via K0GZN

* * *

R.S.G.B. QSL Bureau: G2MI, Bromley, Kent.

being printed and should be available shortly after this is being read.

The weekend trip by **UA1CK** to **Zone 23** produced 500 QSOs in 40 hours of operation, contacts being made with 73 countries in 30 zones. Propagation conditions were not good, but it is hoped that operators still looking for a contact with Zone 23 will soon be accommodated by **UA0YA** who will shortly be on the air with s.s.b. equipment and operating permanently from Kyzyl City.

VS1DO will be visiting North Borneo from where he hopes to be active as **ZC5DO.** This activity will, it is believed, take place using s.s.b.

Referring to rumours of a possible trip to Dahomey, **5N2RDG** states that whilst he would like to visit that country, he has no plans at the present time for a definite journey.

The trip to **San Marino** undertaken by **IISVZ** and **IIPGM** gave many stations a new country on s.s.b. during the week-end of the *CQ* S.S.B. Contest. The Miniphase equipment feeding dipoles radiated potent signals to all parts of the world and 649 QSOs with 121 prefixes were made, QSLs have already been received by the majority of the stations contacted.

The **Aldabra Is.** should have now been reached by **W4BPD** if the present schedule is maintained, and VQ7 c.w. and s.s.b. activity may have materialized. QSLs to go to W4ECI. Combined with this is projected operation from Agalega under the call-sign VQ9HBA. Owing to the approach of the bad weather season these trips must take place in the very near future or be delayed until later in the year.

HK0AB and KS4BF fulfilled their planned operation from **Baja Neuvo** and **Serrana Bank,** and were worked from the U.K. on 14 and 21 Mc/s c.w. and s.s.b. QSLs should go to W4DQS.

Contests

Members of the **Certificate Hunters' Club** will be taking part in the annual **CHC/HTH QSO Party** from 23.00 Friday, June 1 to 06.00 Monday, June 4. All bands from 3·5 to 28 Mc/s may be used and operation is on all modes. Contest logs should be submitted within 30 days to K6BX.

The results of the **1961 VK-ZL Contest** show that the poor conditions prevailing over the contest weekends affected the number and quality of the logs received. The leading European station in the c.w. section was DL6EN with 1,260 points, and the highest scoring U.K. operator was G5WP with 648 points.

The three leading stations in the **Tops Club 80 metre test** were KH6QH (1606 pts.), K9KDI (1455 pts.) and G5JU (1422 pts.). The winner of the Hester Trophy was G3LWS. In future the 80 metre test will be held annually on the third weekend in December.

The results of the **Second All Asian DX Contest** show that the European winner was UA3CR with 7980 points. The leading U.K. stations were G5RP (1876), G3EYN (1242) and G2DC (1224). Copies of the rules for the third contest of this series to take place during the last weekend in August may be obtained by sending a s.a.e. to G2BVN.

DX Briefs

MP4TAO is now active from 13.00 to 19.00 daily usually on s.s.b. using a KWM-2 with a ground plane aerial.

ZB2AD is now active on s.s.b. from Gibraltar using a G2DAF-type transmitter, and promises to be on the air consistently during the next three months. QSLs should go to W3AYD.

VK9LA may now be heard from **Cocos Keeling** on c.w., usually on 14 Mc/s during the early afternoons. It is believed that s.s.b. equipment may soon be available. QSLs should go via the VK6 Bureau.

The **U.S Armed Forces Day** will be celebrated on **May 19** this year, and amateur stations may be heard working service stations, the latter on frequencies outside the amateur bands, and using call-signs such as WAR, NSS and AIR

W4NMK/MM is the call used by a submarine, the *U.S.S. Cutlass*, which has been worked by G6UT whilst 15 ft. below the surface 75 miles off the coast of Virginia, the insulator of the mast being just above sea level.

Following enquiries regarding **VP8AA** active in 1954 it has been ascertained that G3JFD does not handle QSLs for this station. The operator is believed to have visited Kenya, but there is no definite information available.

VS4RM (ex-G3OEF) is at Miri, Sarawak, engaged in teaching for one year. His full address will be found in *QTH Corner.*

The monthly bulletins of the **Ex-G Radio Club** continue to be edited and distributed by W3HQO, and a list of the members of the Club can be obtained by sending a s.a.e. to **G3NUY.**

FO8AN has been active on s.s.b. and c.w. from Tahiti, and promises operation from Flint Island in the near future. QSLs should go to **W8EWS** who will be pleased to accept subscriptions to the Yasme Foundation.

MP4MAH has moved from Afar to Yibal and is now regularly active on 14 Mc/s c.w. and a.m., using a 75A-3 receiver and 100 watt transmitter feeding a dipole aerial.

Both CR10JS and CR10AB worked on c.w. recently by a number of stations are reported to be hoaxers. The W7 QSL manager quoted has no knowledge of either operator. From CR9AH it is understood that **CR10AE** is now on Timor with equipment, but so far he has not had the time to go on the air.

Around the Bands

The contacts made by **EP2BK** and **HC1AGI** on **1·8 Mc/s** have undoubtedly been the highlights of activity on this band recently. Following several unsatisfactory QSOs, the first solid EP/W contact was made with W2SIU followed by W1BB as No. 2, giving the latter his 60th country on Top Band. EP2BK contacted W0VEH/VP9 for another " first." EP2BK also worked many European stations using an 813 running at 100 watts input feeding a 21 Mc/s Lazy H aerial at a height of 75 ft. EP2BK has now returned to the U.S.A. and his address will be found in *QTH Corner.* The first ever QSO between HC and G on this band took place on March 11 between HC1AGI and G6BQ, when the latter was RST449 in Ecuador. Congratulations to both stations concerned. **ZC4PB** was active during the 1·8 Mc/s contest

The certificate awarded to the Kamaran Island DXpedition by the Niagara Frontier DX Association "in recognition of noteworthy efforts to further international radio amateur DX activity" during October 1961.

and offers the following list of stations worked between 21.00 and 04.30: EP2BK, G2BMY, G3IGW, G3FPQ, G3LHJ, OK1NR, OK1ZZ, W0VEH/VP9, G3ORH, W4YHD, W1BB, W3GQF, K8HBR, W1PPN, W8HGW, and W1ME. The aerial in use at ZC4PB was a 200 ft. wire only 20 ft. above the ground and surrounded by telegraph and power lines.

The **7 Mc/s** band has yielded the usual third layer DX and one can only surmise as to what would be possible in the absence of the jammers and other unnecessary noises. C.w. activity from **G3LPS** produced KP4CC (08.53), PY7TJ (02.07), VK2AGH (07.40), VP6GC (01.03), VP8AI (03.10), VP8GQ (02.45), VP9BO (01.15), ZL1CK (07.26), YV5BLA.

The band on which most of the DX has been worked has again been **14 Mc/s.** Generally the early mornings have been rather disappointing, but there have been some good openings to the Pacific around 09.00/10.00. Far East stations have been heard in the afternoons and the evenings have produced signals from all parts, including some excellent openings to Australia. On c.w. **G6XL** (Leeds) records FB8YY (08.22), FO8AN (07.00), VR2DK (07.52) and UA0KYA (06.30 Zone 23). **G3LPS** (Blackburn) worked CR7IZ (19.27), EL4YL (20.18), HK7BE (20.13), KH6BLX (17.40), VP7NQ (21.42), VR2EA (18.37), VS9AAC (16.03), ZD9AD (19.45), 5H3HZ (19.42), 5R8AG (18.44), and 6W8DF (19.09). From nearby Burnley **G2FFO** worked AP5CP (18.45), DU1RTI (16.42), EP2BQ (18.17), VP2LD (20.30), VP2MV (21.56), VP2VJ (20.45), VR2AB (10.00), VR4CV (11.00), UA0EQ (09.50) and others on Sakhalin Is., and 4S7NE.

G8PL (London N.W.3) confines his activity to the mornings and supplies this worked/heard listing: **05.00/06.00** CT3AV, DL9VZ/SV0 (Rhodes), EP2BQ, HK3LX, K5CDA/MM (in the Red Sea), KC6BD, OA4ED, ST2AR, SU1IM, SV0WZ (Crete), UA9s, UA0s AZ, BN and TC, UD6AX, UF6s, UH8BO, UI8s, UM8FI, VP5MJ, ZLs, and 9K2AN. **06.00/07.00** CX2BT, CP5EZ, EL4YL, HZ1AB, KH6s AC, AHQ, COB, and IJ, KL7s, KW6CP, KX6DB, SV0WT (Crete), UA9s, UA0s AZ, BN, IK, KAR, KCC, KSB and RK, VKs, VR2DK, ZLs, 4X4s, 5As and 7G1A. **07.00/08.00** CR7LU, CX2BT, KH6s DLW and IJ, OY7ML, UA9s, UA0s KFC, KUA, LL, RB, RK, RV, UH8s, UI8s, UJ8s, UL7s, UM8KAA, VE8BC, VKs, VR2DK, ZLs and 5A3BC. **08.00/09.00** EA8DO, FO8AN, KH6ACC, JT1KAA, UA9s, UA0s BN, JJ, KAR, RK and SH, VEs, VKs, VR2AB, ZB2I, ZC4TX, 4X4HK and 5A1TW. This list gives a most useful cross section of what may be heard and worked on an indoor aerial. **5N2JKO** reports that this band has fallen off badly, with Europeans heard in the daytime and early evening and the W. Hemisphere later at night. The Pacific stations have been conspicuous by their absence. **G3HDA** (Stratford-on-Avon) spent a profitable period on the band unearthing CO8RM (21.25), CP3CN (22.20), DL9VZ/SV0 (19.16), FY7YF (20.58), HK0AA (20.30), HS2M (18.48), KR6LJ (17.01), ST2AR (19.30), TT8AA (17.47), UA1KED (07.03), VP2MV (19.40), VP6LN (09.45), VP8FX (20.35), VQ5IG (18.40), VK9LA (Cocos 18.35), VR2AB (08.20), VU2US/AC5 (22.25), ZD1JWC (18.47), 4S7EC (17.40), 5R8AB (18.25), 5T5AD (10.05), and 9Q5AAA (17.38). Heard were BV1USA (12.10), VK9RO (Papua 07.45), ZD8JP (22.00 to 23.50) and ZM6AC (07.25). **G3POI** (S.E. 22) using 100 watts to a half-size G5RV aerial worked EL4YL (19.24), HK1AAF (21.40), KR6BQ (18.57), KZ5MQ (21.28), HP1LM (20.59), OY1R (14.19), VP9EP (19.59), VR2EA (18.51), VS6EC (18.20), 4S7RN (18.04) and 7G1A (18.15). **G3AAE** (Loughton) had a good month on this band as the following will prove: AP5CP (19.00), DU1RTI (18.35), DU1NL (16.15), CP5EQ (22.30), FO8AN (09.00), HH2RC (22.05), KX6AJ (10.06), KH6ACC (20.00), VP2MV (21.55), VR2AB (08.15), VR2DK (08.55), VR4CV (14.45), VQ9HB (18.15), ZD1JWC (18.35) and 6O1MT (21.50). There appears to have been a resurgence of activity on a.m. on this band and **G3AAE** provides examples of what has been workable recently: BV1USS (18.15) at S9 and using a dipole, DU1s AN, EH and MR (15.00/18.00), HM1AE (18.30), TA2AR (19.05), VK8AU (16.45), VU2US/AC5 (17.00), XZ2VK (15.40), and 4S7DC (18.30).

Sideband continues to produce numbers of rare countries on 14 Mc/s and **G6XL** mentions QSOs with KH6EEM/KB6 (06.30), KC4USV (07.00), K6CQV/KS6 (06.53), K3GAD/KJ6 (06.07), W0AKV/KJ6 (07.20), UA3CR/UA1 (06.00) and VQ1CJ (17.45). After a long time with very little activity from Johnston Island a number of stations have now made their appearance. A feature of their operation has been that signal reports of RS51 to RS53 have been given when the KJ6 signals have been S8 in the U.K. The reason for this discrepancy is not known but it is to be hoped that the operators are not pinning their faith in that most unreliable indicator, the S meter. **MP4BBW** (Awali) continues to sample a little of almost all that is to be heard. In the *CQ* Sideband Contest Ian made 449 QSOs and achieved a total score of just under 141,000. Signals from the following produced audio at Bahrein: CE2AN (14.04), CR7CI (16.14), CR9AH (14.08), CT3AV (17.27), CX2CO (20.46), EA9AZ (14.52), DL9VZ/SV0 (Rhodes 15.16), ET2US (09.50), FA2VX (13.06), HH2P (11.39), HS1B (14.50), HL9KT (13.53), KG6IJ (Iwo Jima 15.51), KH6DUY (13.37), K8YUW/KJ6 (13.57), KZ5CG (22.18), M1/SVZ (10.28), PY6CN (18.53), SM5ZS/ZC6 (20.00), TI2HP (12.58), UA3CR/UA1 (10.39), UA0KAR (13.51), VQ1CJ (17.53), VS6AE (13.26), XE1ZE (13.25), XT2Z (06.32), XW8AS (13.36), XZ2SY (15.44), ZB2AD (15.14), 3A2BW (13.48), 5H3GC (18.05), 5N2JAH (17.35), 9M2FX (13.11) and 9Q5US (17.32). Nearer home **G3BID** (London N.W.3), worked CR9AH (14.55), LA1LG/P (Jan Mayen, 14.36), MP4TAO (16.32), UA3CR/UA1 (13.46), UA0VQ (14.16), VK4FJ (14.33), VQ1CJ (20.10), ZB2AD (10.20), and 5H3GC (16.55). **A.2825** (Barnet) logged KB6BZ (08.00), KM6CE (07.35), SM5ZS/ZC6 (18.30), VP1WS (07.45), VP2AB (20.15), XW8AS (18.05) and ZK2AB (07.50). A comprehensive log coming from **A.1622** (Bootham School, York) includes most of the stations already listed with, in addition, CO2CT (a.m., 19.26), HC1FN (21.24), HZ1AB (20.25), KP4s CK and WD (20.30), OX3KM and OX3KC (15.00 and 19.00), OA4CV (08.03), VU2s CQ and NR (16.00), PJ2CE (21.50), UL7HB (10.48), VP2GAC (20.38), 5H3HH (17.28), 9K2AY (19.55).

Conditions on **21 Mc/s** are not consistent, although the band has produced strong DX signals on some occasions. **G3AAE** worked 5T5AB (10.30) and VU2US/AC5 (10.22) on a.m. and 5T5AD is known to be also active on this mode. **5N2JKO** also reports sporadic conditions somewhat alleviated by working in a period of one hour (21.00 to 22.00) three PZs, VP2LA, VP2LS, VP5BB (Grand Turks), VP4VS, and PJ, YV and CO stations. **G3NAC** (Wellingore), shortly on his way to VS9A, records EL8C, EP3RO, LU8FAO, HC2RM, KZ5MS, MP4BDC, PJ3AO, TI2HK, TU2AH, VP7MP, VS4RS, ZD6s HK and RM, 5H3PBD and 6W8CE, all on a.m. S.s.b. brought forth EP2AT, HZ1AB, KV4CM, PZ1AX, VP8GQ, VS9APH, VS6CL, XT2Z, ZB2AD, and 9G1GM. Fellow Kamaran DXpeditioner, **G3OLV** (Wallington), lists CR7IZ (16.50), EP2AF (10.35), JA5LW (10.18), DL9VZ/SV0 (17.20), ST2AR (12.50), VS9MB (Gan 12.50), VP1WS (16.45) together with 5N2s, Ws and VE stations, all on c.w. **G3BID** lists a.m. stations EP2AR (13.05), HK7YB (21.24), TI2OB (21.20) and 6W8CY (16.22).

Acknowledgement of information and reports is made to the numerous correspondents and to the *DX'press* (PA0FX), *DX Magazine* (W4KVX), the *West Gulf DX Club Bulletin* and the *160 meter Bulletin* from W1BB. Unfortunately a number of reports were received too late for inclusion in this issue.

FOUR METRES AND DOWN

New 144 Mc/s Beacon Station — V.H.F. Conventions

By F. G. LAMBETH (G2AIW)*

A NEW v.h.f. beacon transmitter commenced operation on Monday, April 9, 1962, using the call-sign GB3CTC. Located at the Cornwall Technical College, Redruth, and organized and run by members of the College, the beacon is radiating for 24 hours a day on a frequency of 144·10 Mc/s, beaming north-east. The signal comprises two minutes of unmodulated carrier, a single station identification in c.w. and a 20 second break.

Excellent signals are reported in Plymouth and Bristol, and the station was audible in the London area during the partial opening to the south-west over the Easter weekend.

This beacon is sponsored by the R.S.G.B. as part of a programme of v.h.f. propagation studies organized by the Scientific Studies Committee. Reports of DX reception will be very welcome at Society Headquarters, or may be sent direct to the organizer, Mr. W. D. Old (G3CZZ), Cornwall Technical College, Redruth, Cornwall. It is hoped to publish a more detailed description of the station in a later issue of the BULLETIN.

Scottish V.H.F. Convention

There was a record attendance of 44 at this year's Scottish V.H.F. Convention held at the Brabloch Hotel, Paisley, on April 28. The programme in the afternoon included two Mullard films illustrating the manufacture and use of transistors on the railways and in radio receivers. An excellent dinner in the evening was followed by a draw in which all those present received gifts.

Practically all active v.h.f. operators in Scotland were present and the Society was represented by the Zonal Representative A. D. Patterson (GI3KYP) and F. G. Lambeth (G2AIW), V.H.F. Manager. A notable absentee, owing to illness, was L. F. Benzies (GM3DDE), whom it is sincerely hoped will soon be fit again.

The arrangements were once again in the hands of W. C. Bradford (GM3DIQ) who is to be congratulated on a most enjoyable event.

International V.H.F./U.H.F. Convention

An innovation at the Eighth International V.H.F./U.H.F. Convention to be held at the Kingsley Hotel, London, on May 19 is the presentation for the first time of a challenge trophy, recently donated to the Society by members of the 1962 V.H.F. Committee. This trophy, shown in the accompanying photo, is to be awarded annually to the winner of the competition for the best piece of home constructed v.h.f./u.h.f. equipment shown during the Convention Exhibition. The only requirements are that the equipment shall be amateur constructed, and shall not have won a prize in the same competition in previous years.

It is hoped that many more people will be persuaded to bring with them items for exhibit, both large and small. A note to Headquarters (to arrive before Wednesday, May 16) giving brief details of the exhibit will ensure that a printed card is available on the exhibition stands when the equipment arrives.

The 1962 V.H.F. Committee Cup.
This trophy will be awarded at the V.H.F./U.H.F. Convention on May 19 to the winner of the competition for amateur constructed equipment.

Successful EME Tests

On April 22-23, a mixed German-Swiss Group successfully carried out EME (Earth-Moon-Earth) experiments on 1296 Mc/s. The group included DJ3EN, DJ4AU, DL9GU, HB9RF and HB9RG.

The transmitter used an R.C.A. 7650 in the final and the receiver comprised a parametric amplifier using an MA45OC diode in the converter, feeding into a Collins 75A4 with a 100 c/s audio filter.

Two Metre Openings

The 2 metre band showed signs of lifting out of the winter decline during the Easter Holiday period.

On Easter Sunday evening signals from the West of England were received in the London area at good strength. Stations known to have worked into London include G3OSA (Wimborne), G5ZT (Plymouth), G3NAE (Bournemouth), G3MDH (Southampton) and G6GN (Bristol). Signals from the new Cornish beacon GB3CTC were peaking

* *R.S.G.B. V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports to arrive by May 18.*

to RST559 at G3HRH (Digswell, Herts.) and it is understood that they were also received by G3EGK (nr. Manchester) at weaker strength. GC2FZC was also heard in London at 589.

During the evening of Tuesday, April 24, signals from Continental stations were received in South East England at quite good strength but subject to QSB. However, on the following evening, April 25, conditions had improved to provide excellent contacts between stations in S.E. England and F, ON, PA, DL and DJ. Most prominent were many ON stations at quite outstanding signal strengths and another popular station was PA0IB running 200 watts p.e.p. to a QQV06/40 providing s.s.b. of very high quality. At one stage G3HRH received a report of S9+30db from ON4VN in Brussels, who was equally strong in Hertfordshire.

Dutch stations were heard to complain of cross-modulation between British stations due to the exceptional signal levels. As far as is known, the scope of the opening did not extend beyond the countries mentioned, and stations in the Midlands and North have reported hearing no signals at all from the Continent during this period.

The opening had finished by the evening of Thursday April 26, although stations from the North and Midlands were worked and heard in London at above average signal levels, including G2XK (Harrogate), G5YV (Leeds), G3ASC (Oswestry) and G2AOS (Manchester).

The good spell of Continental conditions was due to the presence over the English Channel and part of the North Sea of a dry high pressure zone.

Two Metre News and Views

G3VI (near Braintree, Essex) lost his aerial system during a recent storm; he is, however, operational again. **G3KPT** (Rainham, Kent) has a halo in the roof space of his house for general search purposes. He runs 22 watts and for actual contacts has an 8-over-8 at 10 ft. which he hopes to put up to a higher level eventually. **G3PDG** (Welling, Kent), another indoor aerial enthusiast, runs 20 watts to an 832 and recently worked F9NJ in Lille, no mean feat when one considers the almost poor conditions experienced recently. Another new station worked by G3PDG is GW2HIN.

F9LI just across the Channel is a newcomer to 2m and is using a 21 Mc/s dipole with an input of 12 watts. He should be a good signal once he gets his aerial system arranged.

G3HQ (Essex) is using a 6-over-6 system in lieu of his previous 5 element array and appears to be doing quite nicely. **G6WU** (North London) appears to have some success with his 1½ watt portable and was recently worked by G2JF (Wye, Kent). **G6GM's** signal is a bit more apparent now that he has increased his input power up to 90 watts or so. He mentions a number of new stations on 2m in his vicinity still to be heard in the London area.

G3CVI reports working 20 different stations in seven weeks. **G5OX** (Kent), with his 72 Mc/s v.f.o., is always a regular station to be heard and if only he would put his indoor aerial system outside a lot more people would be able to appreciate his very fine signal. **G3ABZ** of Maidstone, another of the v.f.o. exponents, is planning a change to crystal control.

G3EMU and **G5MR** recently had a contact with G3LMG/M who was journeying through the county to Rye, having gone up from the West Country. The only highlights during the month were April 11/12 when there was an appreciable rise in temperature which coincided with good conditions to the Continent. **G2JF** (Wye) made quite a few contacts and wonders if G3EMU heard PA0LX calling him from the German border? **G3LCK** hopes to spend a few days in Holland and is hoping to contact PA0COB among other amateurs. A new station in the South East is **G3NES** (Canterbury) who should be in a position to do well on 2m once the inevitable snags are ironed out.

G3OJY (Penzance) advises that he is "at last" in a position to put out a 2m signal (8/10 watts r.f.) most evenings and weekends. Static mobile operation is planned using the mobile rig, a Heathkit "Pawnee" transceiver, and five element Yagi from high ground nearby. Much work will be necessary at the shack before the high power rig is ready again.

G3OYW has reported on the recent **Cambridge University Wireless Society's** trip to the Isle of Man. GD6UW was operative from March 28 to April 4, and the 2m part of the operation was situated in the Snaefell Radio Station by permission of the Ministry of Transport and Civil Aviation. The equipment was a Withers TW2 10 watt transmitter on 145·32 Mc/s and a nuvistor converter feeding into an i.f. of 24-26 Mc/s. The aerial was a J-Beam 6-over-6 slot fed array. Conditions were very poor, but 62 QSOs were made with five countries (EI, G, GW, GM and GI). It is amazing that at this time no Midlands stations were heard or worked —the lack of stations from the Home Counties was more to be expected in view of the overall poor conditions. The best DX was G2XK (Harrogate) at 130 miles. The operators who shared the work were G3MDR, G3MZM, G3OYW, G3PIT, G3PNC and S.W.L. Kershaw. They hope to do it again next year. All contacts have been QSLd via the Bureau.

G3NBQ (Coventry) reports that the month was a very poor one as regards conditions, but that activity was good. On March 3 signals heard at S7-9+ included G5MA, G2HIF, G2HOP, G5DF, G3GHI, G2JF, G3KEU/P, G3HS, G3KEQ, G5UM, G3JMA, G3BLP, and G3OSS. Conditions were not quite rock bottom! March 17-18 found conditions well above usual with G2XK at 58, G2JF 59 and G3HRH 58. On these two days strange things were happening as the weather was very poor—howling wind, rain, low pressure. This also applied on the 19th when G3JHM/A was 58 and G2HOP 59+. On March 23-24 G2JF was 56/9 and 54/8 in very poor conditions indeed. From these two QSOs and keeping in mind the very poor conditions, they decided they could make contact in any

EIGHTH INTERNATIONAL V.H.F.-U.H.F. CONVENTION

Saturday, May 19, 1962

Kingsley Hotel, Bloomsbury Way, London, W.C.1

Programme:

Convention and Exhibition of V.h.f./U.h.f. Equipment opens	10 a.m.
Lectures and Technical Discussions commence	2 p.m.
Convention Dinner	7 p.m.
Presentation of Awards and Prizes ...	9 p.m.
Convention closes	10.30 p.m.

Tickets may be obtained by post from F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex, at the following prices: Convention only—3/6; Convention and Dinner—24/6. Bookings for the Dinner cannot be guaranteed if received later than Wednesday, May 16, 1962.

Tube Stations: Holborn and Tottenham Court Road.

Organized jointly by the R.S.G.B. V.H.F. Committee and the London U.H.F. Group.

conditions. As a result of the activities between April 5-19 it appears that it is possible to work the following stations from Coventry in any conditions with 100 per cent reliability: G3FD, G8SK, G3JHM/A, G3KEQ, G3JDN, G6AG, G3OSS, G3JMA, G2JF, G6GN, G3EHY and G3FAN who was heard at 56 several times. By the way **GB3VHF** (" the most useful station on the band ") never went over S7/8 and mostly was S3/4 which is its lowest recorded strength at G3NBQ.

G4OU also reports on GB3VHF which is always a good steady signal at Sheerness. It is an excellent marker for calibration and is " old reliable " whatever the state of the band. This QTH is 4 ft. *below* sea level!

G3OSA (Wimborne, Dorset) now has a 12AT7-5763-QV04/7 exciter/mobile rig, with a QQV06/40 p.a. unit on the same lines as the *R.S.G.B. Handbook* design, running about 60 watts. The p.a. is series gate modulated. The 5 element Yagi in the loft still seems to bring in most signals with the aid of the A.2521 pre-amp. On April 10 G3IEA (Torquay) was worked for the 200th station in 14 months on 2m. Included in the total are six GW, one GM, one GC, one EI, three DL/DJ, eleven F one ON, three PA, and SM6ANR. G3OSA reports that G5ZT goes mobile to Haytor, Devon, on Wednesday evenings from about 18.30/21.30 G.M.T. 70 cm gear is also available. G5ZT and G3IEA are on 2m at 13.00 G.M.T. each day looking for DX. Also operative are G6XD (Plymouth) and G3LMG (Tavistock). G3OSA would like to hear more c.w. and to find out to whom those weak and tantalizing carriers belong (mostly from the North).

GM3LTJ (Aberdeen) is making regular contacts with GM2FHH and with GM3GUI (Friockheim) who puts in a fair signal from 40 miles away. Other stations in the Aberdeen neighbourhood are preparing gear, and more activity is expected soon.

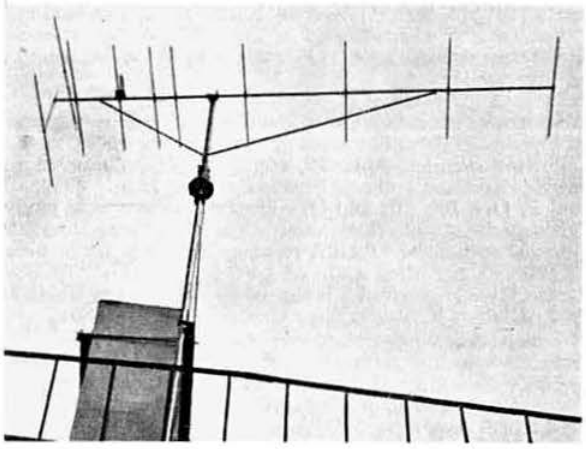
GI3OFT (Belfast 5) repeats that the new Co. Tyrone station, GI3NFM, is very active with a fine signal and reports that his nuvistor pre-amp has made all the difference. Another new station doing a grand job is EI7D (Baldoyle, Co. Dublin) who puts a very good signal into Belfast. Two more new ones are GI3PKY (Belfast), going great guns with a 6-over-6 slot, and GI3OYG (Ballymoney, Co. Antrim) who worked six stations on his first evening on the band. On April 2 GI3OFT had a fine phone QSO lasting about four minutes with G3BOC (Wirral, Cheshire) via reflection from a Manchester/Belfast B.E.A. Viscount. Signals built up to 58/9 before fading down into the noise. G3BOC has confirmed the QSO which was also heard by GI3FJA. Conditions at the time were at their lowest! GI3OFT thinks it might be a good idea to keep a B.E.A. timetable as well as a *Call Book*! In addition to the welcome GD expedition, which incidentally appeared to have the most atrocious luck in picking times of poor conditions, most GIs have worked GD3IWP (Castletown, I.o.M.) who operates from time to time from Snaefell. Long may he continue. GB3VHF was heard on April 10 at 56 via aurora, with QSB to about S3. Nothing else was heard, however, after an hour's calling and searching. At about 15.00 GB3VHF faded and was not heard again. Recently GI3NFM has been hearing signals from EI6AI (Killybegs, Co. Donegal)—surely the loneliest and farthest place in these islands for 2m operation. May he have good DX, for surely anything worked will be just that.

R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s).

Date	Time	Error
April 3, 1962	11.05 G.M.T.	1,650 c/s high
April 10, 1962	12.46 G.M.T.	1,430 c/s high
April 17, 1962	10.45 G.M.T.	1,460 c/s high
April 24, 1962	13.48 G.M.T.	570 c/s high

The station is in operation from 06.30-23.59 G.M.T. daily, but may be on for the full 24 hours for test purposes from time to time.



CT1CO's 10 element array for 144 Mc/s.

All 2m operators are asked to look out for the **EI0AB** expedition which is visiting the Arran Islands (off the West Coast of Ireland). Among the party going are GI3FJA and GI3KYP who are taking high power 2m gear. The dates are Whitsun weekend, June 9, 10, and 11. More details and frequencies will be available later and if received in time will be broadcast over GB2RS. EI0AB will be pleased to arrange skeds with any interested station.

The following is a list of the really active 2m stations in both GI and EI:

GI3FJA nr. Belfast, Co. Down.
GI3OFT Belfast.
GI3NFM Pomeroy, Co. Tyrone.
GI3PKY Belfast.
GI3GXP Kilkeel Co. Down.
EI2A Navan, Co. Meath.
GI5AJ Bangor, Co. Down.
GI3ONF Portadown, Co. Armagh.
GI3OMQ Belfast.
GI3OYG Ballymoney, Co. Antrim.
EI2W Dublin.
EI7D Baldoyle, Co. Dublin.

An interesting letter from **CT1CO** (Lisbon) reports there are some 15 amateurs active on 2m in Portugal. Most stations work regularly in the evenings exclusively on phone, although two or three (including CT1CO) can and do work c.w. Powers are between 30-80 watts and aerials are principally horizontally polarized Yagis. The **CT1** amateurs are very interested in contacting Gs and ask all interested stations to look southwards especially during periods of Sporadic *E*. CT1CO has been interested in v.h.f. for many years and during the I.G.Y. made about 100 QSOs with U.S.A. and Canada on 6m. Before the war many tests were made on 5m under the call CS3VA.

The Spanish National Society, U.R.E., is planning a 144 Mc/s propagation experiment for this summer. It is hoped that U.K. amateurs will be able to participate.

Four Metres

G2AIH (Epsom Downs) had a contact on April 15 with G3JHM/A (6m north of Worthing) on 70·26 Mc/s. The transmitter at G2AIH was transistorized, the power input to the 2G110 p.a. stage being 250mW. G3JHM received the c.w. signals 599X at a distance of 30 miles. On April 18 phone contact was made with the same transmitter. The report received was RS58.

G5CP was on 4m recently and on April 1 worked G3GNN (Doncaster) for a new one. Two new stations in Lincoln

(Continued on next page)

Project Oscar

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

NO further news is to hand at the time of going to press as to when *Oscar II* may be operational. According to a letter dated April 16 from the Project Oscar Association, official approval was obtained on April 2 for the second satellite to be launched. This is a step in the right direction, and it is understood that the United States Air Force was favourably impressed by the great interest aroused throughout the world by *Oscar I*, not only among radio amateurs but, thanks to extensive press and broadcast coverage, among members of the general public also.

As stated in the March BULLETIN, it is by courtesy of the U.S.A.F. that *Oscar* launchings are effected as part of their *Discoverer* series of research rocket firings, and this being the case, Air Force security regulations apply to the extent that the date and time of launch is regarded as secret until the rocket actually lifts off the pad. This restriction prevents a definite announcement being made prior to the event, but the Oscar Association are hoping that they may be permitted to issue an alert to their co-ordinators approximately one week before the anticipated launching date. Every effort will be made to get this news to interested parties so that as many reports as possible on the early passages of the satellite may be obtained. *Late News.* It is now expected that *Oscar II* will be launched either in early June or early July.

Bill Browning (G2AOX) of Hendon, who did such sterling work on observations on *Oscar I*, will again, it is hoped, be in a position to provide data to the Department of Scientific and Industrial Research which will undertake the preparation of predictions of the satellite's later whereabouts. Details from these predictions will be made available to the Society and be included in the Sunday morning broadcasts from GB2RS.

The Project Oscar Association have amended their previous request in regard to the forms on which reports should be made and now ask for:

(i) reports written on the station QSL card simply stating when *Oscar II* is heard, together with the signal strength, or

(ii) reports concerning Doppler shift, time of closest approach, etc., as set out on the new report form, copies of which may be obtained by sending a foolscap-size s.a.e. to the writer at the address given below this article.

Readers will notice that the use of the *Oscar I* report form has been discontinued. Whichever form of report is made care should be taken to ensure that the relevant times are accurate *and in G.M.T.* The frequency will again be a nominal 145 Mc/s and the signal a series of " HI " in Morse, the " HI-rate," details of which should be noted on the Type-2 form, being the time in seconds for the transmission of ten " HIs." What information the HI-rate will convey on this occasion has not yet been stated.

Echo A12

Although nothing to do with Project Oscar, this seems to be as good a place as any to mention that the second American balloon satellite, *Echo A12*, should be placed into orbit towards the end of June this year.

With a diameter of 135 ft. and constructed so as to have a good reflecting surface for radio waves, there would appear to be a strong possibility that powerful 2m. signals should be capable of reflection with sufficient strength for their reception at great distances. This was not possible with the original *Echo I* balloon (which is, incidentally, still orbiting the earth and visible on a clear night), owing to its smaller diameter and poorer reflecting surface.

* *R.S.G.B. Project Oscar Co-ordinator, 24 Arundel Road, Tunbridge Wells, Kent.*

The Ex-G Radio Club

OLD timers, and especially those resident in Bristol, will be interested to learn that Leslie Hill (ex-G5WI) is now a member of the Ex-G Radio Club. The aims and purposes of the Club, which had a membership of about 65 at the beginning of 1962, are to promote the welfare and mutual interests of Amateur Radio; to establish contact with British-born people domiciled abroad; to maintain and promote these contacts and assist each other where need be; and to cherish and perpetuate the love and respect its members hold for Great Britain and all that that country stands for.

To be eligible for membership a person must have been born within the British Isles and be currently domiciled abroad. An applicant must be resident abroad for at least six months a year.

Further details of the Club's activities, including details of the Ex-G Radio Certificate, which is offered by the club, can be obtained from the Hon. Secretary, M. F. Thompson, (W8YHO), 1368 Roslyn Avenue, Akron 20, Ohio. The President and Editor of the Club's *News Bulletin* is R. H. Cherrill (W3HQA), 8005 Palmette Street, Philadelphia 36, Pa. Leslie Hill's address is 1675 Grant Road, Los Altos, California.

Four Metres and Down (Continued from page 544)

will shortly be appearing—G3MSB and G3OSS. Stations in Lincs and Yorks say it is better to come on 4m than on 2m because there is always something on 4 and 2 is usually very quiet. G5CP is still calling GI3HXV every Sunday at 11.00 G.M.T. on 70·35 Mc/s with the GI on 70·29 Mc/s but no luck yet. **GI3HXV**, the only active station in Northern Ireland, is using a cascode nuvistor converter and a four element J-Beam at 40 ft.

Seventy Centimetres

G2XV (Cambridge) has had a lot of correspondence trying to open up the path to Scandinavia on 70cm. It appears that Scandinavian activity is generally in a low state, and the only operational stations seem to be very low power and mostly on phone. SM6ANR is an exception and even he has said that almost the only way to get a contact is to work a G! SM6ANR is in Italy at present, but will return shortly.

Apparently the only SM5 actually active at present is SM5LZ, but SM5BQR, SM5BDQ and SM5BQO are pressing on with equipment. Activity in Denmark appears to be purely local net working, with little attention paid to DX. SM3AKW is keenly working on equipment and hopes to be operating soon. G2XV himself is hoping to find enough time to proceed with a rather ambitious converter which will include two ceramic planar triodes as grounded grid stages in cascode, probably followed by an EC88 mixer. G2XV is regularly monitoring the beacon signal GB3GEC on 431·5 Mc/s which is very consistent at about RST569.

QRA Locator

In spite of what was said on the subject last month it would be best to determine the letter after the square number in a QRA location. Some may consider the subsquare as marked for " noughts and crosses " (Fig. 2, page 490 April BULLETIN) but the letter goes into its own square naturally and the centre square does not have a final letter.

V.H.F./U.H.F. BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3CTC	Redruth, Cornwall	144·10 Mc/s	A1	North East
GB3VHF	Wrotham, Kent	144·50 Mc/s	A1	North West
GB3GEC	Hammersmith, London	431·5 Mc/s	A1	East

R.A.O.T.A Reunion

SIXTY members attended the fourth Annual Reunion of the Radio Amateur Old Timers' Association held at The Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, April 6, 1962, when the guest of honour was Captain C. F. Booth, C.B.E. (Deputy Engineer-in-Chief of the G.P.O).

R.S.G.B. Past Presidents in attendance were Ernest Gardiner (G6GR), Victor Desmond (G5VM), "Dud" Charman, B.E.M. (G6CJ), Leslie Cooper (G5LC), Arthur Milne (G2MI), Dr. R. L. Smith-Rose, C.B.E. and Major-General Eric Cole, C.B., C.B.E. (G2EC).

The Chair was taken by R.S.G.B. Vice-President Harry Clark (G6OT). Other R.S.G.B. Vice-Presidents present were Horace Freeman (Honorary), T. A. St. Johnston (G6UT), W. H. Allen, M.B.E. (G2UJ), J. W. Mathews (G6LL) and D. N. Corfield (G5CD).

During the evening a telegram was read from H.R.H. The Duke of Edinburgh, K.G. thanking those present for the loyal greetings which had been conveyed to him earlier in the day.

The traditional feature Nostalgia was presented by W. E. Russell (G5WP), E. S. Shackleton, M.B.E. (G6SN) and C. H. Young (G2AK). Arthur Milne proposed the health of Captain Booth, who in his reply referred to the current U.K. Space Communications programme and to the past and recent achievements of amateurs. Captain Booth also spoke of the splendid work done at the Geneva Radio Conference by the representatives of the R.S.G.B. and I.A.R.U. and of the cordial relations which exist between the G.P.O. and the R.S.G.B.

The Founder-Secretary (John Clarricoats, O.B.E., G6CL) reported that the Association now had a membership of 120. His proposal that Captain Booth should be elected an Honorary Member met with unanimous approval.

The Chairman referred to the Marcuse Memorial Fund and announced that a commemorative plaque was due to be unveiled on the following day (April 7) at the house in Caterham, Surrey, from which Gerald Marcuse (G2NM) made his pioneer broadcasts to the British Empire. A teak seat was also to be placed outside Bosham Church, Sussex, to commemorate G2NM's association with that village for the last 30 years of his life and the balance of the fund would be used to provide an annual Marcuse Memorial Prize. (The rules governing the award of the Marcuse Memorial Award are reproduced on page 547.)

Leslie Cooper proposed a toast to The Spirit of Amateur Radio to which, by tradition, there was no response.

Old Timers' All

Bill Mead, G5YY (Leicester), Bob Palmer, G5PP (Coventry), Ron Plant, G5CP (Chesterfield), Ernest Gardiner, G6GR (Wolverhampton), Bill Bartholomew, G8CK (Watford), with May Gadsden at the R.A.O.T.A. Reunion on April 6, 1962.

R.A.O.T.A. Reunion 1962

Capt. C. F. Booth, Deputy Engineer-in-Chief of the G.P.O. (second from left), guest of honour at the 1962 R.A.O.T.A. Reunion, is seen in this photograph with, from left to right, Harry Clark, G6OT (Vice-President and Chairman for the evening), Dr. R. L. Smith-Rose (President 1959), Leslie Cooper, G5LC (President 1953), Eric Cole, G2EC (President 1961), Arthur Milne, G2MI (President 1954), Ernest Gardiner, G6GR (President 1944-46) and Vic Desmond, G5VM (President 1948). "Dud" Charman, G6CJ (President 1952) is behind G6GR. Bert Allen, G2UJ (Vice-President) is on the left behind G6OT.

Silent Keys were remembered at 9 o'clock.

At the end of the evening the Chairman expressed the thanks of all present to G6CL and to May Gadsden for arranging the Reunion and for their voluntary work in administering the affairs of the Association during the four years of its existence.

Roll Call

The following were present at the Reunion: G2AK, 2BZ, 2DC, 2DX, 2EC, 2HQ, 2JF, 2KI, 2LD, 2MI, 2MR, 2NG, 2NH, 2NN, 2UJ, 2UV, 2WJ, 3HT, GW5BI, G5BV, 5BZ, 5CD, 5CP, 5DJ, 5GR, 5LC, 5LJ, 5MA, 5ML, 5MM, 5PP, 5VM, 5WP, 5XB, 5YY, 5ZK, 6CJ, 6CL, 6FI, 6GR, 6HR, 6IF, 6IO, 6JI, 6JQ, 6LL, 6MN, 6OT, 6PA, 6PR, 6QM, 6RB, 6SC, 6SN, 6UT, 8CK, 8KW, Dr. R. L. Smith-Rose, Mr. H. Freeman, Captain C. F. Booth, May Gadsden (G1YL).

Gerald Marcuse (G2NM) Remembered

IN the presence of many members of his family, and of others who knew and loved him, a plaque in memory of the late Gerald Marcuse (G2NM) was unveiled at Caterham, Surrey, during the afternoon of Saturday, April 7, 1962.

The eulogy was delivered by John Clarricoats, O.B.E. (G6CL) who recalled that it was from "Coombe Dingle" (now 14) Queens Park (Road), Caterham, that Gerald Marcuse made his pioneer broadcasts to the British Empire during the year 1927, having previously learned from his Amateur Radio contacts around the Empire that there was a nostalgic desire abroad to hear programmes of music and song from England. Gerald Marcuse encountered many difficulties before the Post Office granted him the necessary permission to begin the broadcasts but once they had started there was world-wide demand for a regular service, which the B.B.C. eventually agreed to provide. Mr. Clarricoats spoke of the unique character of the present ceremony which had no precedent in Amateur Radio circles within the United Kingdom.

The Chairman of the Caterham and Warlingham Urban District Council (Councillor Peter Blair, J.P.) referred to the interest with which residents of Caterham had heard of the intention to commemorate Gerald Marcuse whose name

was well remembered by many of those present at the ceremony. He then unveiled the plaque which had, up to then, been covered by the black and gold call-sign flag which G2NM flew from his house at Bosham, Sussex.

A close-up of the commemorative plaque placed on the outside of the house in Caterham, Surrey, from which the late Gerald Marcuse made his pioneer broadcasts to the British Empire.

Harry Clark (G6OT) thanked the Chairman of the Council for performing the unveiling ceremony and on behalf of Mrs. Irene Marcuse and her family, as well as on behalf of all those who had contributed to the Marcuse Memorial Fund, he thanked Mr. A. P. Bodiley, the present owner of "Coombe Dingle," for his kindness in permitting the plaque to be fixed to the wall of his house. Mr. Clark also thanked Mr. and Mrs. Bodiley for their hospitality in providing tea for those who had assembled for the ceremony.

Among the very large company present were Alan Fawcett (G2HQ), Arthur Milne (G2MI), W. E. F. Corsham (G2UV), Victor A. Sims (G5VS), Stanley Cook (G5XB), John Vaughan (G3DQY), J. Sharples (G3FJ) and May Gadsden.

The Gerald Marcuse Memorial Award

AT the fourth Annual Reunion of the Radio Amateur Old Timers' Association held in London on April 6, 1962, the Chairman (Mr. H. A. M. Clark, G6OT) gave details of the Gerald Marcuse Memorial Award. The terms of the award are as follows:

(1) The Award shall be made annually in April (beginning 1963) to the United Kingdom licensed radio amateur under 21 years of age on December 31 previously who shall have submitted to the Radio Amateur Old Timers' Association the most meritorious article describing a piece of equipment which he shall have constructed and used in his station, or a journey which he shall have made during the previous twelve months to a Commonwealth or foreign country where he met and visited other licensed radio amateurs. Entrants must be Corporate members of the Radio Society of Great Britain.
(2) The manuscript of the article shall be either typed, using double spacing, or written legibly on lined foolscap.
(3) All manuscripts shall be judged by a panel consisting of three members of the Association.
(4) The closing date for entries shall be January 31.
(5) The winner of each Award will be invited to attend the Annual Reunion of the Association as a guest of the Association.
(6) The Award will take the form of books or book tokens to a value of not less than two pounds.
(7) The winning manuscript will be offered to the Editor of the R.S.G.B. BULLETIN for publication.

Simple Transmitting Aerials (Continued from page 528)

coupling loop can be a few turns wound over the centre o the coil.

Any convenient length of co-axial cable may be used to connect the transmitter to the tuner. The same circuit will enable a half-wave end-fed aerial to load the transmitter. There is then only one lead from the tuner to aerial, instead of the two shown in Fig. 3. This lead (the TX end of the aerial) can be tapped along the coil, if necessary, to secure correct loading of the transmitter. The centre of the coil (dotted line) should be earthed; alternatively a two-gang or split stator capacitor with the moving plates connected to earth, and one set of fixed plates connected to each end of the coil, can be used for the end-fed aerial.

For series tuning a Zepp feeder or tuned dipole feeder, place the capacitor in one lead, instead of in parallel with the coil. Note the number of turns found best, or fit a switch or tags, for easy selection.

It need scarcely be added that increasing the height of the aerial, and keeping it clear of walls, buildings, and other earthed objects, will help to improve signal radiation.

Transistor Circuit Design Made Easy (Continued from page 532)

obtained from a corresponding decrease in Tr2. Thus point *J* does not change in voltage.

Then by an argument similar to the single ended voltage amplifier

$$\textit{Out-of-phase gain} = \frac{\textit{Output } v}{\textit{Input } v} \simeq \frac{2R_e}{2R_e} \simeq \frac{R_c}{R_e}$$

Hence $R_e = R_c/\textit{Out-of-phase gain}$

However, for unwanted in-phase signals, the circuit may be redrawn as in Fig. 18 where

$$\textit{In-phase gain} \simeq \frac{\frac{1}{2}R_e}{R_T + \frac{1}{2}R_e}$$

Since R_e is small compared with R_T

$\textit{Gain} \simeq R_e/2R_T$

Since R_T may be equal to or larger than R_e, there can be fractional gain to in-phase signals, while still having large gain to out-of-phase signals. This discriminates against in-phase signals to the benefit of out-of-phase signals.

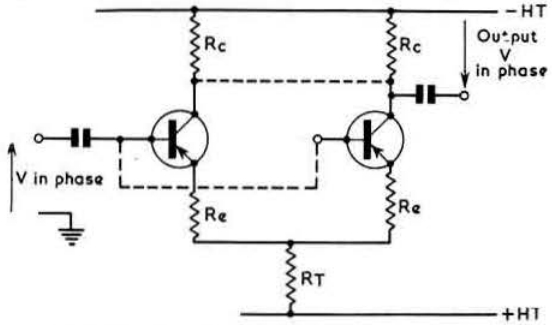


Fig. 18. In-phase signals of the emitter coupled pair.

(To be concluded)

When writing to the Author of an article published in the BULLETIN please enclose a stamped addressed envelope for reply.

Society News

New Region 8 Representative

MR. NORMAN MATTOCK (G2DFG), 70 Bouverie Road West, Folkestone, Kent, has accepted an invitation extended to him by the Council to take over the duties of Region 8 Representative. Region 8 comprises the county of Sussex and those parts of the county of Kent which are outside the London Region.

Members in Region 8 who may be interested in the organisation of an Official Regional Meeting during 1962 are invited to write to Mr. Mattock. No meeting has been held in the Region for many years.

New Region 16 Representative

MR. PETER J. NAISH (G3EIX), 6 Mildmays, Danbury, Chelmsford, Essex, has been appointed Region 16 Representative in succession to Mr. H. H. Lowe (G2HPF), who has resigned owing to pressure of business.

Mobile Operation

NOW that the mobile season has commenced members may like to be reminded that where an amateur station has been established in a vehicle, in accordance with the conditions laid down in the Amateur (Sound Mobile) Licence, the station may also be operated by a person who holds only an Amateur (Sound) Licence but not an Amateur (Sound Mobile) Licence. This authority is, however, subject to the provisions of the latter licence and in particular to Clause 1(2)(c) of the Main Licence incorporated in it. This stipulates that such operation shall only be in the presence of, and under the direct supervision of, the licensee of the mobile station.

Headquarters Fund List No. 8

THE following is the eighth list of those who had contributed to the Headquarters Fund up to April 30, 1962.

Dorking and District Radio Society, F. H. Hearnden (G3IAM), J. E. Greenwell (G3AEZ), R. E. Penn (G3PKE), R. P. R. Sparks (G3PIQ), W. R. Steverson (G3JEQ), A. J. Matthews (G6QM), E. J. O. Cole (G3IIS), M. Williams (GW3LCQ), A. Matthews (B.R.S.22788), A. C. Wilberforce (G2IY), Ex "G" Radio Club (U.S.A.), A. H. B. Bower (G3COJ), P. W. Dennett (G3OUS).

Total amount contributed to date: £1,399 0s. 4d.

R.A.E.N. Committee

MESSRS. R. Ferguson (G4VF) and J. D. Kingston (G3VK) have been appointed to serve on the R.A.E.N. Committee.

Subscription Rates

In order to enable the Society to publish larger issues of the R.S.G.B. BULLETIN the Council has decided that the annual subscription to be paid by Corporate Members (Home and Overseas) shall be increased as from July 1, 1962, to £1 15s. This represents an increase of 5s. in the case of Home Corporate members and 7s. ($1.00) in the case of Overseas Corporate members.

A Banker's Order form to cover the new subscription rate is included in each copy of this issue of the BULLETIN. It is hoped that as many members as possible will place a standing order with their Bank.

Coventry Cathedral Festival

IN connection with the celebrations following the Consecration of Coventry Cathedral, Coventry and District R.S.G.B. Group will be operating GB3COV on all bands from 70cm to 160m for 10 days commencing May 25. In addition, there will also be an exhibition of manufacturers' products. The station and exhibition will be sited immediately beneath the City Architect's Dept. Offices, High Street, Coventry.

Posting Certificate

ALL copies of the April issue of the R.S.G.B. BULLETIN were posted on Friday, April 13, 1962, and the Society holds a certificate to that effect from the Letchworth, Herts, Post Office.

R.A.E.N. Rally 1961

IN the results of the R.A.E.N. Rally published in the April issue of the Bulletin, the call-sign GM3OWV/P should have read "GM3OW*U*/P."

Receipts

RECEIPTS for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested. Receipts are drawn, however, and kept on file at Headquarters for six months.

QRA Locator Maps

COPIES of the British Isles QRA Locator Maps are now available from Headquarters, price 2/6 post paid.

Dutch News Bulletin

THE headquarters station of the Dutch national society V.E.R.O.N., PA0AA, transmits on Friday evenings in accordance with the following schedule: 19.00 G.M.T.—news in Dutch (phone); 19.15 G.M.T.—news in English (phone); 19.30 G.M.T.—Morse exercises for beginners; 20.00 G.M.T.—advanced Morse exercises; 20.30 G.M.T.—R.T.T.Y. news bulletin in English; 21.00—news in Dutch (phone); 21.15 G.M.T.—news in English (phone).

On the last Friday in each month, Morse proficiency tests are given at 15, 20, 25, 30, 35 and 40 w.p.m., commencing at 21.30 G.M.T. The frequency is 3625 kc/s.

Bridlington Mobile Rally and Hamfest

TICKETS for the Mobile Rally and Hamfest to be held at the Spa Royal Hall, Bridlington, on Sunday, June 24, 1962, are available price 7s. 6d. each from I. C. Purves, Hon. Secretary, Bridlington and District Radio Society, 10 Meadow Road, Bridlington. The final date for applications, which must be accompanied by a remittance, is June 12.

The talk-in stations, G3GBH/A on Top Band and G3FKV/A on 144 Mc/s, will be on the air from 11 a.m.

Silent Keys

D. A. E. SAMSON (GM3EQY)

It is our sad duty to record, with deep sorrow, the death at the early age of 39 years of Dave Samson (GM3EQY) on April 8, 1962. A comparative newcomer to the City of Aberdeen he was, nevertheless, exceedingly well liked by all who knew him. Friendly, always cheerful and ever ready to lend a helping hand his familiar voice will be greatly missed on the amateur bands, and in particular on 40m phone.

To Mrs. Iris Samson and her two children we extend sincerest sympathy in their grievous loss. GM3HTL

Representation

THE following are additions to the list of Regional Representatives published in the December 1961 issue:

REGION 8
N. D. MATTOCK (G2DFG), Flat 1, 70 Bouverie Road West, Folkestone, Kent.

REGION 16
P. J. NAISH (G3EIX), 6 Mildmays, Danbury, Chelmsford, Essex.

The following are additions to the list of Town Representatives published in the December 1961 issue.

REGION 2—CO. DURHAM
HARTLEPOOLS AREA
A. R. DONALD (G3TO), 77 Granville Avenue, West Hartlepool.

REGION 6—GLOUCESTERSHIRE
STROUD
S. H. HEAVEN (G3MGF), 1 Sunnyside, Horsley, nr. Stroud.

OXFORDSHIRE
OXFORD
P. G. TANDY (G2DU), 4 Harboard Road, Oxford.

REGION 7—LONDON SOUTH EAST
GRAVESEND
P. F. JOBSON (G3HLF), 41 The Avenue, Gravesend, Kent.

LONDON WEST
EDGWARE
E. R. RADFORD (G2IM), 1 Gibbs Green, Edgware, Middlesex.

REGION 9—DEVONSHIRE
PLYMOUTH
Lt. Cdr. L. S. DIGGLE (G3LSD), Collingwood House, Stoke Damerel.

REGION 10—MONMOUTHSHIRE
PONTYPOOL
J. PHILLIPS (GW3LDC), 19 Avondale Road, Pontrhydyrun, Cwmbran.

Vacancy

Mr. R. H. Smart (G3MMC) has resigned as Town Representative for the Chingford Group.

Nominations for his successor should be made in the prescribed form and sent to reach the General Secretary not later than June 25, 1962.

Change of Address

The address of Mr. K. Barrett (G3BZM), Town Representative for High Wycombe, is now St. Andrews, Church Path, Nairdswood Lane, Prestwood, nr. Gt. Missenden, Bucks.

Affiliated Society Representatives

THE following is an addition to the list of Affiliated Society Representatives published in the December 1961 issue.

OXFORD AND DISTRICT AMATEUR RADIO SOCIETY
J. Hickling (G3GCS), 33 Chestnut Road, Botley, Oxford.

Correction

The call-sign of Mr. O. F. Simkin, Affiliated Society Representative for Norwich and District Radio Club, is G3HYJ, and not G3AYJ as published on page 502 of the April issue.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the August 1961 issue.

B.B.C. (EVESHAM) CLUB—St. Ecgwins, High Street, Evesham, Worcs.

ILMINSTER GRAMMAR SCHOOL AMATEUR RADIO SOCIETY—Ilminster, Somerset.

SOUTH YORKSHIRE AMATEUR RADIO SOCIETY—c/o Mrs. M E. Brailsford, 15 Ayrsome Walk, Cantley 4, Doncaster, Yorks.

* * *

The address of the Hon. Secretary of the Grantham and District Amateur Radio Society is now 30 Beechcroft Road, Grantham.

R.S.G.B. NATIONAL MOBILE RALLY

U.S.A.F. Station, Wethersfield, Essex

(By kind permission of the Commanding Officer, 20th Tactical Fighter Wing, United States Air Force)

SUNDAY, JUNE 10, 1962

The Wethersfield U.S.A.F. Base is actively operational and aeroplanes will be on view both on the ground and in the air. The radio station will also be open to visitors. A number of radio firms will be displaying their products. It is expected that U.S. amateurs at present serving in the United Kingdom will attend the Rally.

TALK-IN STATION

GB3RS on 2 and 160 metres

Organized by the R.S.G.B. Mobile Committee

The Hon. Secretary of the Babcock and Wilcox Radio Society is now Mr. P. A. DEANE, 209 Euston Road, London, N.W.1.

The Hon. Secretary of the Bury Radio Society is now Mr. F. STOCKS, 5 Waingate, Rawtenstall, Rossendale, Lancs.

Television and Broadcast Interference

MEMBERS with television or broadcast interference problems are invited to write to Headquarters for a copy of the TVI/BCI Committee's interference questionnaire. This form is designed to give the Committee a comprehensive picture on which to base their advice to a member.

CONTESTS DIARY

May 19	–	OE Contest (C.W.)
May 19-20	–	OZ-CCA Contest (telephony) (for details, see page 487, April 1962)
May 26-27	–	First 420 Mc/s Open Contest (see page 505, April 1962)
May 26	–	OE Contest (Phone)
May 27	–	D/F Qualifying Event (South Manchester) (see page 551)
June 1-4	–	CHC/HTH Party
June 2-3	–	National Field Day (see page 359, January 1962)
June 2-3	–	U.S.K.A. Field Day
June 16-17	–	70 Mc/s Contest
June 24	–	D/F Qualifying Event (Newbury) (see page 551)
		1250 Mc/s Tests
July 7-8	—	V.H.F. National Field Day. (For rules, see page 504, April 1962)
July 15	—	D/F Qualifying Event (Wirral).
August 10-11	—	European Fox-Hunting Championships (Ankaran, Yugoslavia)
August 11-12	—	W.A.E. DX Contest (C.W.)
August 18-19	—	W.A.E. DX Contest (Phone)
August 25-26	—	All Asian DX Contest.
September 1-2	—	Region 1 I.A.R.I. V.H.F. Contest.
September 9	—	D/F National Final.
September 15-16		Scandinavian Activity Contest (C.W.).
September 16	—	Low Power Field Day.
September 22-23		Scandinavian Activity Contest (Phone).
October 6-7	—	VK/ZL DX Contest (Phone).
October 7	—	R.A.E.N. Rally.
October 13-14	—	VK/ZL DX Contest (C.W.).
October 20-21	—	Second 420 Mc/s Contest.
October 27-28	—	R.S.G.B. 7 Mc/s DX Contest (Phone).
November 3-4	—	R.S.G.B. 7 Mc/s DX Contest (c.w.).
November 10-11	—	Second 1·8 Mc/s Contest.
December 1-2	—	R.S.G.B. 21/28 Mc/s Telephony Contests.
December 9	—	OK DX Contest.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, March 19, 1962, at 6 p.m.

Present: The President (Mr. E. G. Ingram in the Chair), Major-General E. S. Cole, Messrs. N. Caws, C. H. L. Edwards, R. C. Hills, A. O. Milne, L. E. Newnham, F. K. Parker, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, P. H. Wade, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apologies for Absence were submitted on behalf of Messrs. F. A. Russell and A. C. Williams (Mr. Williams was absent on doctor's orders due to a smallpox outbreak in South Wales).

* * *

TVI/BCI Committee
Resolved to appoint Mr. Newnham to serve on the TVI/BCI Committee.

Membership
Resolved (i) to elect 69 Corporate members and 25 Associates; (ii) to grant Corporate membership to five Associates who had applied for transfer.

Applications for Affiliation
Resolved to grant affiliation to the Winnipeg (Canada) DX Club.

V.H.F. Convention
Resolved to authorize Mr. F. G. Lambeth to attend the Scottish V.H.F. Convention on April 28, 1962, as the official representative of the Council and the V.H.F. Committee.

Mr. F. A. Russell
Resolved to receive with regret the resignation of Mr. F. A. Russell from the office of Zone D Representative.

The Secretary was instructed to write a suitable letter to Mr. Russell expressing the Council's regret that he had been compelled to resign as Zonal Representative, and thanking him for his past services to the Society.

(The casual vacancy created by Mr. Russell's resignation was advertised in the April issue of the R.S.G.B. BULLETIN—Editor.)

Amateur Radio Call Book
Resolved to accept an estimate from Bentley & Co. Ltd., for printing 7,000 copies of the 1963 edition of the R.S.G.B. *Call Book*.

Radio Amateurs' Examination Manual
Resolved to accept an estimate from Bentley & Co. Ltd., for reprinting 5,000 copies of the *Radio Amateurs' Examination Manual*.

Radio Data Reference Book
Resolved to accept an estimate from Loxley Bros. Ltd., for printing 5,000 copies of a new publication provisionally titled *Radio Data Reference Book*

During the discussion on the foregoing resolution several members expressed the opinion that the Council should not authorize the expenditure of Society money on a publication primarily of value to professional radio engineers.

Zone F Representation
It was reported that as no other nomination had been received Mr. A. D. Patterson (GI3KYP) had been elected to fill the casual vacancy on the Council created by the resignation of Mr. E. G. Ingram from the office of Zone F Representative.

Reports of Committees

The Minutes of meetings of the following Committees were submitted as Reports:

V.H.F.	February 12, 1962
Scientific Studies	February 19, 1962
Mobile	February 21, 1962
Finance and Staff	February 24, 1962
Contests	March 1, 1962

Resolved to receive the Reports and to accept and adopt the various recommendations contained therein.

The Recommendations dealt with the 1961 meeting of the I.A.R.U. Region I V.H.F. Managers (confirmation of Minutes), the appointment of Mr. W. H. Allen as Project Oscar Official Co-ordinator, the News Bulletin Service on 145.1 Mc/s in the London Zone, the licence for GB3CTC (Beacon) and various contest matters.

As a matter of urgency the Council also dealt with three recommendations of the Mobile Committee concerning raffle prizes for the National Mobile Rally at Belton House, the provision of stickers for use on windscreens and an R.S.G.B. stand at the Trentham Gardens Rally.

The meeting terminated at 10.15 p.m.

R.S.G.B. QSL Bureau Sub-Managers

THE following is a list of the R.S.G.B. QSL Bureau Sub-Managers showing the call-sign groups for which they are responsible:

G2 and DL2 calls:	**G. Verrill (G3IEC), 10 Seahorse Street, Gosport, Hants.**
G3, 4 and 5 two-letter calls & GC	**E. G. Allen (G3DRN), 65a Melbury Gardens, London, S.W.20.**
G6 and G8 calls:	**A. J. Mathews (G6QM), 62 Ashlands Road, Hesters Way Estate, Cheltenham.**
G3AAA-BZZ:	**C. C. Olley (G3AIZ), 157 Wanstead Park Road, Ilford, Essex.**
G3CAA-DZZ:	**C. A. Bradbury (B.R.S. 1066), 13 Salisbury Avenue, Cheltenham.**
G3EAA-HZZ:	**W. J. Green (G3FBA), 790 Rochester Way, Sidcup, Kent.**
G3IAA-KZZ, B.R.S. and A numbers	**T. D. J. Miles (G3NXR), 7 Hampden Road, Wantage, Berks.**
G3LAA-MZZ:	**C. Harrington (B.R.S. 2292), 91 Brabazon Road, Hounslow, Middlesex.**
G3NAA-NZZ:	**C. R. Emary (G5GH), 133 Fairlands Road, Thornton Heath, Surrey.**
G3OAA-PZZ:	**F. Ellesmere (G3LGP), 244 Portland Street, Southport, Lancashire.**
GD calls:	**T. R. Moore (GD3ENK), "Glyn Moar," St. John's, Isle of Man.**
GI calls:	**W. H. Martin (GI5HV), "Swallow Lodge," Greenisland, Co. Antrim, Northern Ireland.**
GM calls:	**D. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4.**
GW calls:	**J. L. Reid (GW3ANU), 28 Waterston Road, Gabalfa, Cardiff.**

Envelopes for the *collection* of cards may be sent direct to the Sub-Manager concerned or to the QSL Manager (Mr. A. O. Milne). **Outgoing cards should NOT be sent to the Sub-Manager** unless they are in the call-sign group for which he holds envelopes. For example, the holder of a G3J-call may send cards for calls in the series G3IAA-G3KZZ to his own Sub-Manager, together with envelopes for the collection of cards, but he should not send to him cards in any other call-sign series. Sending cards for general distribution to the Sub-Managers only involves the cards in delay and the Society in needless expense.

Mr. Milne's address is 29 Kechill Gardens, Bromley, Kent.

LONDON U.H.F. GROUP

will meet at the Whitehall Hotel, Bloomsbury Square, London, W.C.1.

at 7.30 p.m. on Thursday, June 7 and July 5, 1962

All v.h.f. and u.h.f. enthusiasts welcome.

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12.00	North East Scotland
145·3 Mc/s	11.15 a.m.	Beaming north east from Sutton Coldfield
	11.30 a.m.	Beaming north west from Sutton Coldfield
	11.45 a.m.	Beaming south west from Sutton Coldfield
145·1 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

CONTEST NEWS

RESULTS — REPORTS — RULES

Affiliated Societies' Contest 1962

LAST year the report on the Affiliated Societies' Contest began " For the *third* time in *six* successive years Stourbridge and District Radio Society won . . ." Add one to each of the italicized words and you have the result of the 1962 event. Stourbridge take the title by two contacts (6 points) from Gravesend Amateur Radio Society who were also second in 1961. In third position, 16 points behind, are the Dorking and District Radio Society who improved on a joint sixth place last year.

Mention must be made here of the fourth club in the table, Stockport Radio Society. After an absence of three years they take the highest position for a northern club for a very long time. Maybe this could create more northern activity next year?

Confusion reigned unfortunately, especially on the first day, with the sending of " AFS " to denote a society station. In several cases the letters were not sent at all and as a result a little rescoring has had to be done. Some 15 clubs will find they are credited with more points than they originally claimed. Some have come down too, mainly because a few non-affiliated society operators decided to send " AFS " not realizing its significance.

Owing to a lack of comments with the logs it is difficult to obtain a picture regarding conditions though they could not have been too bad as two or three Continental call-signs appear in the logs. An increase in the number of entries was welcomed by the Contests Committee, being up 10 on last year, though several clubs who have supported the event regularly in the past seem to have fallen by the wayside. The return to extra points for society stations appeared to please the majority of entrants though to recognize an affiliated society on the air is still a problem.

Thanks are due to all those who came on to give contacts to the point-hungry clubs and to G3LWS and G3OIT who submitted check logs.

RESULTS

Posn.	Society	Call-sign	Points
1.	Stourbridge & District Radio Society	G8GF	469
2.	Gravesend Amateur Radio Society	G6BQ	463
3.	Dorking Radio Society	G3JEQ	447
4.	Stockport Radio Society	G3FYE	443
5.	Oxford & District Radio Society	G3KLH	440
6.	Harlow & District Radio Society	G3ERN	420
7.	Mitcham & District Radio Society	G3OCT	413
8.	Reigate Amateur Transmitting Society	G3FM	409
9.	R.A.F. Amateur Radio Society (Locking)	G8FC	402
10.	Medway Amateur Receiving & Transmitting Society	G2FJA/A	388
11.	Crawley Amateur Radio Club	G3TR	378
12.	Surrey Radio Contact Club	G3KXT	373
13.	Bury Radio Society	G3BRS/A	372
14.	Sheffield Amateur Radio Club	G4IJW	370
15.	Amateur Radio Club of Nottingham	G3EKW	368
16.	Ariel Radio Club (Langham)	G3AYC	363
17.	Halifax & District Amateur Radio Society	G3IGW	358
18.	Wirral Amateur Radio Society	G3NWR	357
19.	Thames Valley Amateur Radio Transmitters' Society	G3IKC	348
20.	Wolverton & District Radio Club	G3LCS	343
21.	Standard Radio Club (Harlow)	G3NIS	336
22.	Cheltenham Amateur Radio Society	G5BK/A	328
	City & Guilds College Radio Society	G5YC	328
	Courtaulds Amateur Radio Group	G3CQD	328
25.	A.E.R.E. (Harwell) Amateur Radio Club	G3PIA	322
26.	Sutton & Cheam Radio Society	G2BOF/A	310
27.	Scarborough Amateur Radio Society	G4BP/A	300
28.	Paddington & District Amateur Radio Society	G3PAD	297
29.	Ainsdale Radio Club	G2CUZ	282
30.	Albright & Wilson Amateur Radio Society	G3OXD/A	278
31.	Barnsley & District Amateur Radio Club	G2AFV	277
32.	Purley & District Radio Club	G3FTQ	276
33.	Clifton Amateur Radio Society	G3GHN	274
34.	Catterick Amateur Radio Club	G3CIO	263
35.	Southport Radio Society	G3FJG/A	256
36.	Leeds University Union Amateur Radio Society	G3LUU/A	254
	South Birmingham Radio Society	G3OHM	254
38.	Grimsby Amateur Radio Society	G3NJF	227
39.	Ravensbourne Amateur Radio Club	G3HEV/A	226
40.	York Amateur Radio Society	G3HWW/A	225
41.	South Shields & District Amateur Radio Club	G3DDI	222
42.	A.E.I. Rugby Recreation Club Amateur Radio Section	G3BXF	220
	Burnham-on-Sea Amateur Radio Club	G3FWW	220
44.	Torbay Amateur Radio Society	G3NJA	216
45.	Portsmouth & District Radio Society	G3DIT	204
46.	North Kent Radio Society	G3ENT/A	201
47.	Cambridge University Wireless Society	G6UW	194
48.	Reading Amateur Radio Club	G5HZ/A	193
49.	Derby & District Amateur Radio Society	G3ERD/A	188
50.	Guildford & District Radio Society	G3OXI	181
51.	Blackpool & Fylde Amateur Radio Society	G3NJN	176
52.	Ariel Radio Group (Bush House)	G3GDT	172
53.	Rotherham & District Radio Club	G3HFD	154
54.	Thanet Radio Society	G3DOE	142
55.	Acton, Brentford & Chiswick Radio Club	G3IIU/A	113
56.	Conway Valley Amateur Radio Club	GW3JI	110
	Stoke-on-Trent Amateur Radio Society	G3GBU	110

G3FM operating on behalf of the Reigate Amateur Transmitting Society during the Affiliated Societies' Contest in February, 1962. G3NKS also operated while G3NKT and G3PIJ acted as logkeepers. The equipment included a CR100 receiver, v.f.o./buffer/807 p.a. transmitter and a half-wave aerial at 40 ft.

D/F Qualifying Events

DETAILS of forthcoming qualifying events are as follows:

SOUTH MANCHESTER

Sunday, May 27, 1962

Organizer: J. Elliot (G3KIQ), 2 Pennine Close, Higher Blackley, Manchester 9, on behalf of the South Manchester Radio Club.
Frequency: 1820 kc/s
Call-sign: G3FVA/P
Map: Ordnance Survey, New Popular Edition, Sheet No. 101.
Assembly Point: Grid reference 746010 (off A575, ½ mile from the end of M62 Motorway at Worsley).
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the organizer by first post May 25, stating the number in their party requiring tea.

NEWBURY

Sunday, June 24, 1962
Organizer: H. J. Fenn (B.R.S.2515), 6 Church Street, Great Bedwyn, Marlborough, Wiltshire.
Frequency: 1875 kc/s.
Call-sign: G3LLK/P.
Map: Ordnance Survey, New Popular Edition, Sheet 168.
Assembly Point: Combe Gibbet, south-south-east of Inkpen, Berkshire. (N.G.R. SU366622).
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer as soon as possible, stating the number in their party requiring tea, the venue or which will be announced at the start.

R.S.G.B. 21/28 Mc/s Telephony Receiving Contest 1961

THE Receiving Section of the R.S.G.B. 21/28 Mc/s Telephony Contest attracted good support from home listeners, in fact there was an increase of nearly 50 per cent compared with 1960 with 55 logs entered. Overseas listeners provided eight entries which is one fewer than the previous year.

The Metcalfe Trophy was won by D. S. Kendall (B.R.S.24643) with 1750 points, a margin of 269 points over B. M. Crook (B.R.S.21008) who earns a certificate with 1481 points. D. S. Kendall is a newcomer to the competition while B. M. Crook has been a regular competitor, being second in 1960 and third in 1959. D. G. Rumsby, who was 15th last year, improved his position to third with 1411 points while E. F. J. Hoare, another newcomer, was fourth with 17 fewer points.

The leading overseas entrant was Karl-Heinz Engel of Germany with 1480 points.

RESULTS

Entrant		Points	Home Position
D. S. Kendall	B.R.S.24643	1750	1
*B. M. Crook	B.R.S.21008	1481	2
D. G. Rumsby	B.R.S.22844	1411	3
E. F. J. Hoare	B.R.S.23425	1394	4
N. Bethune	A.2825	1335	5
D. J. Hawkins	A.2792...	1295	6
A. P. Hewitt	A.1902	1270	7
C. H. Shilley	B.R.S.23378	1250	8
A. Griffiths	A.2106	1245	9
K. W. Whitehouse	A.2273	1215	10
G. Wyatt		1190	11
W. J. C. Pinnell	B.R.S.21624	1085	12
H. M. Davison	A.2122	1060	13
C. J. Gilroy	A.2946	1055	14
D. Gray	A.2498	1040	15
R. Hart	A.2404	990	16
B. V. Marshall	A.2707	975	17
D. Myddleton-Evans	A.2389	925	18
N. D. Collins		925	
J. Reynolds	A.2524	920	20
B. Curnow	A.2340	905	21
R. W. L. Limebear	A.2432	895	22
A. Clarke	A.2327	845	23
L. Margolis	A.2111	840	24
P. Hart	A.2452	810	25
M. Harrington	B.R.S.20249	795	26
H. T. H. Cromack	A.1623	775	27
M. F. Scanbridge	A.1543	770	28
R. N. Biggs		725	29
E. F. Shield	A.2127	725	
L. J. Cleggett	B.R.S.2834	715	31
L. L. Lumsden	B.R.S.22359	715	
J. Farrar	B.R.S.24641	710	33
S. H. Jesson	A.2966	655	34
D. S. B. Naylor	B.R.S.23115	655	
G. E. Ritchie	B.R.S.22357	650	36
I. Goulding	A.2667	630	37
N. Penketh	B.R.S.22100	625	38
F. C. Powell	B.R.S.18461	590	39
G. B. Shucksmith	A.2501	590	
G. W. Reid	A.2668	555	41
A. T. James	A.2588	550	42
T. Richardson	B.R.S.24628	545	43
J. K. Harvey	B.R.S.19682	505	44
J. F. Gentry	A.2019...	470	45
P. Whipps	A.2917	470	
A. Newton	B.R.S.23152	465	47
B. Grose	A.2703	425	48
M. Harrison		425	
M. J. Kirkham		425	
J. Adkin	A.2717	300	51
J. S. Alderton	A.2230	300	
B. Collins	A.2549	300	
P. Bullivant	A.1931	250	54

An incomplete, and therefore unclassified, entry was received from H. N. Bagby.

Overseas

Karl-Heinz Engel	Germany	1480*	1
Ingemar Svensson	Sweden	1230*	2
Marcel Tschuden	Switzerland	650*	3
Stig Nyman	Sweden	515	4
Kurt Wetter	Switzerland	375	5
Hans-Martin Leibfried	Germany	320	6
Gerald G. Gill	Libya	260*	7
N. W. F. van der Byl	Holland	35*	8

* *Certificate winners.*

On the whole the logs were very satisfactory though several competitors had trouble with the scoring with the result that a few entries had to be rescored.

70 Mc/s Contest 1961

THE rules for this year's 70 Mc/s Contest organized by the R.S.G.B. are as follows:

When: From 17.00 to 23.59 G.M.T. on June 16 and from 07.00 to 19.00 G.M.T. on June 17, 1962.

Locations: Stations, fixed and portable, must be operated from the same site throughout the contest.

Eligible Entrants: Only fully paid-up Corporate Members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used (see R.S.G.B. General Rules for Contests, Rule 7).

Contacts: The entrant may transmit only on his licensed frequencies between 70 and 73 Mc/s. Contacts may be made on A1, A3, A3a or F3.

Scoring: Will be on the basis of one point per mile.

Contest Exchanges: RST (RS) reports followed by the contact number (starting with 001) followed by the location (e.g. RST579001 5NE Oxford).

Entries: (*a*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The N.G.R. of the site must be stated. The location transmitted for each contact must be given on the Cover Sheet. (This location must be identifiable on the Ordnance Survey 10 mile to the inch map.)

(*b*) Logs must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of Station Worked," " My report on his signals and serial number sent," " His report on my signals and serial number received," " Location of station as received," " Points Claimed."

(*c*) Entries must be postmarked not later than Monday, July 2, 1962.

Awards: At the discretion of the Council, a **certificate of merit** will be awarded to the winner. A **certificate of merit** may also be awarded to the member submitting the best check log in the opinion of the Contests Committee.

The General Rules for the R.S.G.B. Contests published on page 361 of the January 1962 issue of the BULLETIN apply to this contest.

R.S.G.B. 1250 Mc/s Tests 1962

THE Council and the Contests Committee hope that the seventh series of R.S.G.B. 1250 Mc/s Tests will again attract the support of u.h.f. workers. The rules are as follows:

Rules

The event will have few fixed rules, other than the duration, which will be from 17.00 G.M.T. on Saturday, June 23, to 22.00 G.M.T. on Sunday, June 24, 1962, and the provision that all entries must be from fully paid-up Corporate Members of the R.S.G.B. and accompanied by the declaration set out below. Entries can be accepted only on behalf of an individual station, though no limitation is placed on the number of operators or assistants. Entries from receiving stations will be welcome and will be eligible for the award.

The entries will be required to include details of stations heard or worked (with distances) and general observations on the band. A full description of all equipment used should be included and this information and any other evidence submitted of work carried out on the band will be taken into consideration when judging the event. The Contests Committee reserves the right to abstract information for the purpose of preparing a report on the Tests. The entrant submitting the best entry in the opinion of the judges may be recommended to the Council for the award of the ***Arthur Watts Trophy.***

Entries must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, and be postmarked not later than July 9, 1962. Entries must contain the following declaration.

I declare that my station was operated strictly in accordance with the rules and spirit of the Tests and I agree that the decision of the Council of the Radio Society of Great Britain shall be final in all cases of dispute.

Date..... Signed .....

QRA Locator Maps

COPIES of the British Isles QRA Locator Maps are now available from Headquarters, price 2/6 post paid.

Can You Help?

● F. Wright (B.R.S.22765), 1 Fox Covert Rise, Misterton, via Doncaster, Yorks, who wishes to borrow or purchase a copy of the circular dealing with the B2 equipment which was issued to R.S.G.B. members in October 1947? He also wishes to borrow or purchase a copy of the September 1947 issue of the *T & R Bulletin* which contained information about the B2 power pack.

● F. F. Whitehead (B.R.S.22761), 91 Blackpool Road, Ansdell, Lytham St. Annes, Lancashire, who wishes to know the i.f. of the Reception Set R.206, Mk. 1? Information on modifying the receiver for s.s.b. reception would also be appreciated.

A leaflet giving details of the **new oscilloscope** model 391 may be obtained from Dartronic Ltd., 3-7 Windmill Lane, London, E.15. The bandwidth of the main *Y* amplifier is d.c. to 10 Mc/s while the time base has 18 ranges.

Tayler Electrical Instruments Ltd., of Montrose Avenue, Slough, Bucks., are introducing a new **contemporary styled panel meter** to be known as the Model 70. The instrument has a scale length of 6½ in. and is fitted with a centre pole moving coil movement.

R.E.E. Telecommunications Ltd., Crewkerne, Somerset, have recently introduced a completely **transistorized portable transmitter-receiver** for single channel a.m. operation in the range 50-100 Mc/s. Another new product of the same firm is a transistorized **v.h.f. signal generator** available in a number of models covering 71 to 175 Mc/s. Each model has two ranges. Power is derived from mercury batteries.

The 1962 edition of the *G.E.C. Semiconductor Device Guide* is available on request from The General Electric Company Ltd., Semiconductor Division, Broadstone Works, Reddish, Stockport, Cheshire. The *Guide* includes information on parametric amplifier diodes, silicon zener diodes and the GET53 range of a.f. transistors.

An application report on the **A.2521 grounded grid triode** may be obtained from the M-O Valve Co. Ltd., Brooke Green London W.6. The report gives information on the use of this valve in transmitters as well as in receivers.

Mosley Electronics Ltd., 15 Reepham Road, Norwich, Norfolk, have introduced a **receiving aerial**, type RD-5, covering the amateur bands from 10-80 metres. A similar aerial, the SWL-7 is intended for use on the 11, 13, 16, 19, 25, 31 and 49 metre broadcast bands. For reception of standard frequency transmissions on 2.5, 5, 10, 15, 20 and 25 Mc/s, the Type WWV-D aerial is available. For users of receivers which omit Top Band, a **transistorized converter** Model CV160 has been produced which converts 160 metre signals to the 80m range. Leaflets on these products may be obtained on request.

PLEASE HELP US...

- *When writing to Headquarters do not include* BULLETIN *items, queries, changes of address and publication orders, etc., on the same sheet of paper. Only one envelope is necessary, but a separate sheet for each subject please.*
- *Always use block letters, or write clearly, your full name and address. Christian names, call-signs and illegible signatures cause much unnecessary checking.*
- *Notify Headquarters of impending changes of address several weeks before you move. Alterations to subscription reminders, etc., are not sufficient unless definite instructions are given. Include your B.R.S. number and/or call-sign, your present address and, if possible, the date your subscription falls due. Remember that* BULLETIN *wrappers are prepared up to three weeks before the publication date.*
- *When forwarding your subscription please return the reminder card sent to you from Headquarters, or, if this has been lost, indicate the date your subscription fell due.*

...TO HELP YOU!

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

May 20.—Hunstanton "Bucket and Spade" Party with mobile D/F contest. Station car park 2 p.m.
July 1.—Worthing "Bucket and Spade" Party.
September 2.—G6UT's Ham Party.
September 8—B.A.T.C. Amateur Television Convention, Conway Hall, London, W.C.1.
September 22.—Region 9 Mobile Rally at Weston-super-Mare.
September 23.—Region 9 O.R.M. at Weston-super-Mare.
September 23.—Surrey Radio Contact Club 144 Mc/s D/F Hunt.
October 20-21.—Jamboree-on-the-Air.
October 31-November 3.—R.S.G.B. Exhibition, Seymour Hall, London.
December 15.—Annual General Meeting, Overseas House, London S.W.1.

Details of Mobile Rallies are given in *Mobile Column*.

REGION 1

Ainsdale (A.R.S.).—May 16 ("Setting and Checking Transmitters," by G2CUZ). May 30 (N.F.D.), 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Pontins Holiday Camp, Squires Gate.
Bury (B.R.S.).—June 12 (Annual Junk Sale), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—May 15, 29, June 12, 26, 42 Jordongate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, Manchester, 10. **(S.M.R.C.).**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester, 14.
Morecambe.—June 6, 125 Regent Road.
Preston (P.A.R.S.).—May 22 ("DX Working with Indoor Aerials," by G2HFC), June 26 (Illustrated Tape Lecture "Semi-Conductors"), 7.30 p.m., St. Paul's School, Pole Street. June 12—No meeting.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—May 23, June 6, 20, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—May 16, June 6, 20, 7.45 p.m., Harding House, Park Road West, Claughton.

REGION 2

Barnsley.—May 25 (Debate), June 8 ("Relays in a station," by D. W. Heath, G3ABS), 7.30 p.m., King George Hotel, Peel Street.
Bradford.—May 22 ("Amateur Television," by L. A. F. Stockley, G3EKE), June 12 (Treasure Hunt), 66 Little Horton Lane.
Halifax (H. & D.A.R.S.).—May 22, June 19, 7.30 p.m., "Beehive and Crosskeys." June 5, visit to Ferranti Ltd., Manchester (meet at "Beehive and Crosskeys," 6.30 p.m.).
Halifax (Northern Heights A.R.C.).—May 16 ("Converters for 2 and 4," by G3OGV), May 30 (Visit to Holme Moss Television Station), 7.30 p.m., Sportsman Inn, Ogden.

REGION 3

Birmingham (M.A.R.S.).—May 15 ("A Simple Transmitter," by Naylor Strong, G2RQ), June 19 ("Your Receiver and You," by George Brown, G5BJ), 7.45 p.m., Midland Institute, Paradise Street, Birmingham. **(Slade)** Meetings held second and fourth Fridays in each month, 7.45 p.m., The Church House, High Street, Erdington. **(South)** May 17 ("S.S.B.," by George Brown, G5BJ), 7.30 p.m., The Friend's Institute, 220 Moseley Road, Birmingham 12.
Cannock (A.R.S.).—June 7, 7.30 p.m., White Lion Hotel, Bridgtown.
Coventry (C.A.R.S.).—Mondays, 7.30 p.m., R.A.F.A. Club, Holyhead Road, Coventry. **(Group)** May 25/June 3, GB3COV at the Coventry Cathedral Festival.
Stourbridge (S. & D. A.R.S.).—June 5, 8 p.m., Library, Foley College, Stourbridge.
Sutton Coldfield.—May 24 (D/F Event in Sutton Park), June 2, I.C.I. Centenary Celebrations at Witton. June 14 ("Receiver Design"—discussion), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton (W.A.R.S.).—May 21 (Station Visits), June 4, 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Chesterfield (C. & D.A.R.S.).—June 13, 7 p.m., Newbold Observatory Lecture Room, Chesterfield.
Derby (D. & D.A.R.S.).—May 16 (D.F. League Fixture), May 23 ("Receivers," by F. K. Parker, G3FUR), May 30 (Open Evening), June 6 (Surplus Sale), June 13 ("The Listener," by B. J. C. Brown, G3JFD), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W. Exp. Soc.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Rooms (rear of Manners Arms Hotel), London Road, Grantham.
Grimsby (G. & D.A.R.S.).—June 7, 21, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—Fortnightly Wednesdays, 7.30 p.m., Club Room, Lincoln Technical College, Cathedral Street, Lincoln.
Melton Mowbray (M.M.A.R.S.).—May 24 (S.S.B. Discussion, opened by K. Pugh, G3KES), June 21, 7.30 p.m., St. John's Ambulance Hall, Asfordby Hill, Melton Mowbray.
Nottingham (A.R.C.N.).—Tuesdays (R.A.E. Classes), Thursdays (Lectures), 7.15 p.m., Room No. 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham.
Northampton (S.W.C.).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—June 1 (N.F.D.), July 6 (Interference Suppression), 7.15 p.m., Peterborough Technical College, Eastfield Road, Peterborough.
Retford & Worksop (N.N.A.R.S.).—Tuesdays (Beginners), Thursdays (Club), 7.30 p.m., Victoria Institute, Eastgate, Worksop, Notts.

REGION 5

Cambridge (C. & D.A.R.C.).—May 25 ("Demonstration of Army Radio Equipment," by Major R. J. Hughes, G3GVV).
March (M. & D.R.A.S.).—Tuesdays, 7.30 p.m., Police Headquarters, High Street.
Shefford (S. & D.A.R.S.).—Thursdays, 7.30 p.m., Digswell House, Shefford. May 17 (Quiz, arranged by "John and Dave"), May 24 ("Morse Proceedure," by G. R. Cobb), May 31 (N.F.D. Preparations).

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.

REGION 7

Acton, Brentford & Chiswick (A.B.C.R.C.).—May 15 (N.F.D. Briefing), 7.30 p.m., A.E.U. Club, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—May 24 (N.F.D. Arrangements), 8 p.m., Congregational Hall, nr. Clock Tower, Bexleyheath.
Dorking (D. & D.R.S.).—May 22 (N.F.D. Plans), 8 p.m., Wheatsheaf, High Street, Dorking.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East Ham.—Tuesdays, fortnightly, 8 p.m., Leigh Road, East Ham.
Edgware and Hendon (E. & D.R.S.).—Second and fourth Mondays in each month, 8 p.m., John Keeble Hall, Church Close, Deans Lane, Edgware.
Harlow.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A. E and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, Holloway, N.7.
Hounslow (H. & D.A.R.C.).—Mondays. 7.30 p.m., Isleworth Town School, Twickenham Road, Hounslow.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (nr. Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse Classes, weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at: 2 Sunray Avenue, Tolworth).
Mitcham (M. & D.R.S.).—May 18 (High Quality Headphones, by S. G. Brown Ltd.). Lectures alternate Fridays, Morse classes 7 p.m., "The Cannons," Madeira Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays, 11.30 a.m., Wednesdays (Morse Practice), 8 p.m., 225 New Cross Road, S.E.14.
Norwood and South London (C.P. & D.R.C.).—May 19 ("Oscilloscopes and Associated Equipment," by G. M. C. Stone, G3FZL), June 16 (Junk Sale), 8 p.m., Windermere House Annexe, Westow Street, Crystal Palace.
Paddington (P. & D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Sidcup (C.V.R.C.).—May 22, 8 p.m., Station Hotel, Sidcup.
Slough (S.A.R.S.).—First Wednesday in each month, 8 p.m., United Services Club, Wellington Street, Slough. June 16 (Junk Sale).
Sutton & Cheam (S. & C.R.S.).—Every third Tuesday, The Harrow, High Street, Cheam. May 15 (N.F.D. arrangements).

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, at 12.30 p.m. on Friday, May 18, June 15 and July 20, 1962.

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

REGION 8

Crawley (C.A.R.C.).—May 23 (N.F.D. Arrangements), 8 p.m., West Green Centre, Crawley. June 13—informal, for details contact G3FRV.

REGION 9

Bath.—June 18, 7.30 p.m., Committee Room, Bath Technical College, Lower Borough Walls, Bath.
Bideford.—First Thurday in each month, 7.30 p.m., alternately at T. G. Ward (G2FKO), 38 Clovelly Road (Phone: Bideford 964), and D. H. Jones (G3BO), Rosebank, Westcombe (Phone: Bideford 550).
Bristol.—May 18, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Burnham-on-Sea.—June 12 (A.G.M.), 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
Exeter.—June 5, 7.30 p.m., Y.M.C.A., St. Davids Hill, Exeter.

Falmouth (C.R. & T.C.).—First Wednesday in each month, Y.M.C.A., Falmouth.

Plymouth (P.R.C.).—First Tuesday in each month, 7.30 p.m., Guild of Social Service Building, Plymouth. Other Tuesdays, Virginia House Settlement, St. Andrews Cross, Plymouth.

Torquay.—June 9, 7.30 p.m., Y.M.C.A., The Castle, Torquay.

Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.

Weymouth (S.D.R.S.).—June 1, 7.30 p.m., Waverley Hotel, Westham, Weymouth.

Yeovil (Y.A.R.C.).—Wednesdays 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—Wednesday, June 13 ("Why Not 2 Metres?"—discussion and exhibition), 7.30 p.m., T.A. Centre, Park Street, Cardiff.

Port Talbot.—June 5, 7.30 p.m., 8-10 Jersey Street, Velindre, Port Talbot.

REGION 13

Edinburgh (L.R.S.)—May 10 ("Commercial Test Gear," by GM3NXX), May 24 (N.F.D. Briefing), June 14 (Constructional Competition), June 28 (A.G.M.), 7.30 p.m., Y.M.C.A., South St. Andrews Street, Edinburgh.

REGION 16

Chelmsford (C.A.R.C.).—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.

REGION 17

Newbury.—May 25 (N.F.D. Arrangements), 7.30 p.m., The Canteen, Elliotts of Newbury, West Street, Newbury.

Southampton.—Second Saturday in each month, 7 p.m., Lanchester Building, University of Southampton, University Road, Southampton.

Regional and Club News

Bradford Radio Society.—At the A.G.M. the following were elected: *President*—G. Dean (G3NPO); *Vice-President*—D. M. Pratt (G3KEP); *Hon. Treasurer*—D. Tovey (G3OVU); *Hon. Secretary*—M. T. Powell (G3NNO), 28 Gledhow Avenue, Roundhay, Leeds 8; *Public Relations Officer*—P. G. Gregson (G3OTZ). At the meeting at Cambridge House, 66 Little Horton Lane, Bradford 5, on May 22, a talk on "Amateur Television" is to be given by L. A. F. Stockley (G3EKE/T).

Cambridge and District Amateur Radio Club.—At the A.G.M. the following were elected: *President*—S. J. Granfield (G5BQ); *Chairman*—F. A. E. Porter (G2CDX); *Hon Treasurer*—J. B. Foster (G3IIT); *Hon. Secretary*—H. L. Lowe (G3PEI), 34a Verulam Way, Cambridge; *Committee Members*—A. W. Tomalin (G3PTB), D. C. Free (G3NBP), F. W. Crabtree (G3BK), J. N. Carter (G3OWB), M. Bowman (G3PSA), E. Warner (G3PTK) and F. Taylor.

Clifton Amateur Radio Society.—In the first round of the Inter-club Quiz the society leads Crystal Palace A.R.S. by 76 points to 66. The questions were devised by G. M. C. Stone (G3FZL) and C. Godsmark (G3IWL). The Morse Practice and Reading Room is almost complete and it is hoped to start work on improvements to the workshop soon. *Hon Secretary:* C. Godsmark (G3IWL), 211 Manwood Road, London, S.E.4.

Cornish Radio and Television Club.—At the A.G.M. the following were elected: *President:* E. Bowden (G2AYQ); *Chairman:* W. Locke (G3NKE); *Vice-Chairman:* G. Hubber (G3NVJ); *Hon. Secretary:* C. Pitman (G3PEP); *Hon. Treasurer:* K. Ledsham. Until the end of May, W. J. Gilbert, 7 Poltair Road, Penryn, will continue to act as secretary.

Crawley Amateur Radio Club.—Recent events have included talks by D. J. A. Stevenson, Communications Manager of the A.A., who gave a talk on the Association's Radio Network and by W. H. Allen, M.B.E. (G2UJ) on "Project Oscar." On May 23, arrangements for N.F.D. will be discussed. The club is planning to take part in the V.H.F. National Field Day on July 7-8. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

This picture was taken at the Annual Dinner-Dance of the Thanet Radio Society at which there was an attendance of 92. From left to right, Jim Barnes (G3BKT), Norman Cramp (B.R.S.16556), Arthur Milne (G2MI), Tony Chapman (G2IC), Fred Lambeth (G2AIW), Paul O'Brien (G3DNR) and W. E. Nutton (G6NU).
Photo by Vogue Photographic Service, Margate.

Cray Valley Radio Club.—At the A.G.M. the following were elected: *Chairman*—W. J. Green (G3FBA); *Hon. Treasurer*—D. F. Owen (G3MCA); *Hon. Secretary*—S. W. Coursey (G3JJC), 49 Dulverton Road, London, S.E.9; *Committee Member*—N. B. Reeves (B.R.S.23199). Meetings are held at the Station Hotel, Sidcup, on the fourth Tuesday in each month, commencing at 8 p.m. On May 22, there will be a talk on V.H.F. Operation. Visitors will be most welcome.

East London.—There was a good attendance at the April meeting when Messrs. Kirkpatrick and Turner of the G.P.O. continued their talks on the "Log and Licence" and "BCI/TVI." The first meeting of the new session will be held on September 23. Full details of the programme may be obtained from the *District Representative:* M. McBrayne (G3KGU), 25 Purlieu Way, Theydon Bois, Essex.

Harrow, Radio Society of.—The judging of entries in the annual Constructional Contest will be held on May 25 while a post mortem on N.F.D. is arranged for June 8. Meetings on alternative weeks are devoted to practical work. R.A.E. instruction is given every week and Morse practice on practical evenings. *Hon. Secretary:* A. C. Butcher, 95 Norval Road, North Wembley, Middlesex.

Lincoln Short Wave Club.—At the A.G.M. the following were elected: *Chairman*—J. R. Charlesworth; *Hon. Treasurer*—Mr. Dellar; *Hon. Secretary*—3038232 Cpl. Tech. Russell, J. S. (G3PMT), Royal Air Force Scampton, Lincoln; *Committee Members*—Major D. Hollander (W0CJW), U.S.A.F., A. Clarke (G3MZB), D. Draper (G4BU) and Brian Otter.

London Region.—A giant junk sale in aid of R.S.G.B. Headquarters Fund will be held at the Drill Hall, 79/85 Worship Street, City Road, Finsbury Square, London, E.C.2 (by kind permission of the Officer Commanding 65th Signal Regiment, T.A., Lt. Col. Eric Milner) on Saturday, May 26, 1962, from 2.30 p.m. to 5.30 p.m. Admission charge 2/-. The Sale is being organized by the London R.R. (Mr. P. A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex) from whom information can be obtained about the space available. Space must be reserved in advance at the rate of 1/- sq. ft. (minimum two sq. ft.) and complete trestle tables (6 ft. × 2 ft.) hired for 12/- . Unsold surplus left behind at the Drill Hall will be donated to 65th Signal Regiment (T.A.).

Manchester and District Amateur Radio Society.—G3HOX/P will be operated during the society's outing to Westmorland on May 20. Those wishing to make Top Band skeds should write to the *Hon. Secretary:* A. B. Langfield (G3IOA), 2 Rowland Street, Moston, Manchester 10.

March and District Radio Amateur Society.—As a result of a lecture and demonstration of Amateur Television by G3KKD/T there is now lively interest in 70cm. A 64 element aerial has been erected at the Headquarters and two members have built converters. A transmitter is being designed. A series of visits during the summer is being arranged.

Newbury and District Radio Society.—At the A.G.M. the following were elected: *Chairman*—J. Gale (G3LLK); *Vice-Chairman*—R. Bates (G3OJF); *Hon. Treasurer*—E. Reynolds, *Hon. Secretary:* G. T. Allen (G3JTK); *Newsletter Editor*—C. Povey (G3MWB).

Northern Heights Amateur Radio Society.—Meetings at the Sportsman Inn, Ogden, are arranged for 7.30 p.m. on May 16 ("Converters for 2 and 4 metres," by D. Millard, G3OGV)

and June 6 (" Printed Circuitry " by J. Davidson, G3JKD). On May 30 members are to visit the Holme Moss Television Station. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Peterborough and District Amateur Radio Society.—At the April meeting J. W. Hewlett gave a lecture on the latest techniques in radio direction finding while a practical demonstration of Top Band D/F was due to be given on May 4. A D/F Foxhunt is to be held at the Hunstanton Bucket and Spade Party on May 20. R.S.G.B. Zonal Representative F. K. Parker (G3FUR) is to demonstrate his homebuilt 40 valve receiver on June 1. *Hon. Secretary:* D. Byrne (G3KPO), Jersey House, Eye, Peterborough.

Reading Amateur Radio Club.—" How to become a radio amateur " will be the subject of the lecture to be given at a meeting at the Palmer Hall, West Street, Reading, on May 26, at 7.30 p.m. Visitors will be most welcome. Recent talks have been on simple equipment by G3OLA, on workshop practice by G3GKH and on receivers. *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—An appreciative audience, including visitors from Crawley and Purley, attended a recent talk by G6QB entitled " Forty Years in Amateur Radio." On May 19 at 7.30 p.m. at The Tower, Redhill, G3FM will lecture on " Crystal Grinding." Five members were due to sit the R.A.E. earlier this month. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Slough Amateur Radio Society.—This society is being re-formed and meetings are to be held at the United Services Club, Wellington Street, Slough, at 8 p.m. on the first Wednesday in each month. Further information may be obtained from F. J. Tuckfield (G2HOX), 13 Quaves Road, Slough.

Southampton.—A D/F Hunt is to be held on May 20, starting at 2.15 p.m. from the Mayflower Park near the Royal Pier. The first transmission will be at 2.30 p.m. on 1·81 Mc/s. Ordnance Survey Map Sheet No. 170 (Solent Area) will be required. Visitors will be most welcome.

Stourbridge and District Amateur Radio Society.—At the A.G.M. the following were elected: *President*—F. A. Bills (G3CLG); *Vice-President*—D. Barlow (G3HGI); *Hon. Treasurer*—J. Hogg (G2OG); *Hon. Secretary*—A. K. Davies. At the April meeting V. Whitaker (G3UK) gave an excellent talk on the G2DAF receiver. Meetings continue to be well supported.

Stroud.—Meetings are held on the first and third Wednesdays in each month at Erinoids Works, Stroud. Visitors are always welcome. Recent events have included a Mullard Film show and a lecture on transistors by Mr. Howe of the Sperry Co.

Thames Valley Amateur Radio Transmitting Society.—At the April meeting W. E. (" Rusty ") Russell (G5WP) gave a talk entitled " The Gay 20's," in which the problems of obtaining a licence and getting on the air in the early days were described. On May 2, G. A. Bird (G4ZU) was due to give a talk on the F.B.5 multiband aerial. A mobile rally is to be held on September 2.

Torbay Amateur Radio Society.—The following were elected at the A.G.M. last month: *President*—W. B. Sydenham, B.Sc. (G5SY); *Chairman*—E. J. Hayman (G3ABU); *Vice Chairmen*—F. D. Cawley (G2GM), F. Wadman (G2GK), L. Webber (G3GDW); *Hon. Treasurer*—H. Cockrem (G3ZC); *Hon. Secretary*—Mrs G. Western (G3NQD), 118 Salisbury Avenue, Barton, Torquay; *Hon. Auditor*—A. Bullock (G3IEA); *P.R.O.*—B. E. Symons (G3LKJ), *Committee Members*—D. Webber (G3LHJ), R. D. Luscombe (G3MEP); R. Pavey and R. Western; *Contests Manager*—D. Webber (G3LHJ). The A.S.R. is B. E. Symons (G3LKJ). Meetings are held at the Y.M.C.A., Castle Road, Torquay, on the second Saturday in each month at 7.30 p.m.

Verulam (St. Albans) Amateur Radio Club.—The club took part in the St. Colombus College Science Fair on March 29-30 when an exhibition station was in operation on Top Band and 14 Mc/s using equipment loaned by G3LVP and G3JWZ. *Hon. Secretary:* Brian Cockell (A.2598), 119 Gurney Court Road, St. Albans.

Wessex Amateur Radio Group.—The Bournemouth Amateur Radio Group was recently dissolved and reformed as the Wessex Amateur Radio Group. This was done in order to bring Poole and other East Dorset localities associated with the Bournemouth area into the new Group and to make the Group more flexible in operation by requiring fewer officers and with fewer restrictions that being a Society bring. Meetings will continue to be held at the " Cricketers Arms," Windham Road, Bournemouth, on the first Monday in each month commencing at 7.45 p.m. The new Group is open to all interested in Amateur Radio. The Chairman is T. Baerselman (G3FPV). *Hon. Secretary:* G. J. Fowle, 138 Surrey Road, Branksome, Poole, Dorset.

Wirral Amateur Radio Society.—Meetings are now held at the Boy Scout Headquarters, Harding House, Park Road West, Claughton, Birkenhead, on the first and third Wednesdays in each month. Junior meetings commence at 6.30 p.m. and ordinary meetings at 7.45 p.m. There was an attendance of about 100 at the Annual Dinner at which the prizes awarded in connection with the Constructional Contest were presented. On May 16, arrangements for N.F.D. will be discussed and an inquest on the event will take place on June 6. A D/F Contest is due to take place on June 17, while J. A. Jones will give a talk on Top Band s.s.b. on June 20. *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington.

Yeovil Amateur Radio Club.—Meetings are held at the British Legion HQ on Wednesdays at 7.30 p.m. Recent lectures have been on " Army Radio Procedure " by G3OMH, and on the " Cubical Quad " by G3OJH. A field day is being planned. Information on other activities may be obtained from the *Hon. Secretary:* D. L. McLean (G3NOF), 9 Cedar Grove, Yeovil.

York Amateur Radio Society.—The programme of lectures and activity evenings is running well. Some good 14 Mc/s contacts have been made by the club station G3HWW. Future activities include a number of R.S.G.B. recorded lectures, a talk on the Class D Wavemeter and plans for N.F.D. *Hon. Secretary/Treasurer:* N. Spivey (G3GWI), 80 Melton Avenue, Clifton, York.

Hong Kong Amateur Radio Transmitting Society

THE Council of the Hong Kong Amateur Radio Transmitting Society for 1962 is as follows: *President:* J. W. Lucas (VS6CV); *Hon. Secretary:* C. O. Soltau (VS6EO); *Hon. Treasurer:* L. T. Sanders (VS6ET); *QSL Manager:* J. E. Gregory (VS6EC); *Council Members:* P. J. O'Brien (VS6AE) and L. S. Drakeford (VS6EK). The society's address is P.O. Box 541, Hong Kong.

Can You Help?

● D. Byrne (G3KPO), Jersey House, Eye, Peterborough, who requires information on the Cossor 343 ganging oscillator and the Bendix BC639A?

● E. J. Kelly (GM3POK), 101 Cluny Gardens, Edinburgh 10, who requires the instruction manual for the Hallicrafters SX24 receiver?

● A. W. de Lima (F.R.S.252), 4 Harbour Park, Waltair Uplands, Visakhapatnam 3, India, who requires the manual for the R.1155A receiver?

● B. Page (A.2545), Martin Croft, Ivington, near Leominster, Herefordshire, who requires the circuit diagram for the ex-A.M. receiver type 81A and its associated power supply?

● H. J. H. Perry (GM3KXS), 9124 Bloomington Avenue, Minneapolis 20, Minn., U.S.A., who requires the manual for the R.C.A. AR88LF receiver? Mr. Perry will return the manual after making a photostat copy.

● W. Schofield (VK6WS), 40 Irvine Street, Peppermint Grove, West Australia, who urgently requires the circuit diagram, instruction book and any other information on the Panda Explorer transmitter?

● D. V. Walters (G3MXO), 160 Yardley Fields Road, Stechford, Birmingham 33, who urgently requires information on and circuits for the R.209 receiver and the crystal calibrator unit from the Canadian Marconi 19 set?

● A. Richard West (B.R.S.3744), " Hill Side " Penmachno, Betws-y-Coed, North Wales, who requires the manual and any information on modifying the R.206 Receiver?

COPY DEADLINE

TO enable the R.S.G.B. BULLETIN to be printed in time for bulk postings to take place by not later than the 14th day of the month, the closing date for editorial copy, the 22nd day of the preceding month, must be strictly adhered to. Society Representatives and Club Secretaries will greatly assist the Editorial staff by posting copy to reach Headquarters by not later than the 20th of the month whenever possible.

Copy received after the 22nd day of the month will be held over for future use if still topical.

PLEASE MENTION THE R.S.G.B. BULLETIN WHEN WRITING TO ADVERTISERS

CLASSIFIED ADVERTISEMENTS

OFFICIAL APPOINTMENT

ANTARCTICA

Vacancies exist for WIRELESS OPERATOR MECHANICS to serve with the BRITISH ANTARCTIC SURVEY in the Antarctic for 2 years. Salary is at the basic rate of £500 a year. Whilst in the Antarctic everything is provided free of charge including quarters, food, clothing, cigarettes, etc. Generous cash payment on completion of service.

Candidates, between 21 and 30 years of age and single must be able to transmit and receive morse at 20 w.p.m. (plain language or code) and be capable of elementary maintenance of wireless transmitting and receiving equipment.

Successful candidates will be required to leave U.K. in October/November.

Apply to CROWN AGENTS, 4 Millbank, London, S.W.1, for application form and further particulars, stating age, name, brief details of qualifications and experience and quoting reference M2/51683/RC.

SITUATIONS VACANT

DIPLOMATIC WIRELESS SERVICE

Vacancies exist in the Industrial grade for Electrical Inspectors in the Test Section of a Government factory at Boreham Wood, Herts., and at Hanslope Park, Bucks. Applicants should be conversant with all types of radio and associated equipment. Men with experience of radio and television servicing can be considered as possessing suitable experience. Rates of pay, merit awards and conditions of service are those of Industrial Civil Servants.

Applications in writing, quoting B.W.1, to the Personnel Officer, Diplomatic Wireless Service, Hanslope Park, Bucks.

ELECTRONIC MAINTENANCE/TEST ENGINEER required for the maintenance and further development of equipment used for the analysis of power supply problems, including A.C. Network Analyser, Transient Analyser, and associated electronic equipment. Maintenance of small transistorised digital computer will also be part of duties. Previous experience with electronic equipment and instruments, with fault-correcting ability essential. Qualifications H.N.C. or equivalent an advantage.

Applications giving particulars of experience, qualifications, etc., should be sent to the Power Systems Engineer, Systems Engineering Department, Associated Electrical Industries Ltd., Neasden Lane, Willesden, N.W.10.

ENTHUSIASTIC AMATEUR

We require a technician for operational acceptance testing of Transmitting Valves. Work involves setting up, some maintenance, and design of self oscillator and P.A. test circuits in frequency range 20-500 mcs. and of 100 watt to 100 kw power rating. Qualifications not essential but experience in the construction and operation of transmitters would be of great advantage.

Applications giving details of age and experience to the

Personnel Officer,

THE M-O VALVE CO. LTD.,

Brook Green, W.6. RIV. 3431.

(a subsidiary of the G.E.C.)

SITUATIONS VACANT (continued)

AIR MINISTRY have vacancies for Civilian Radio Technicians at R.E.U. Henlow, Bedfordshire and R.A.F. Carlisle, for the servicing, repair, modification and testing of air and ground radio and radar equipment. Commencing salary (according to age) is £630 to £810 p.a. maximum salary £930. Apply to Air Ministry, C.E.3h/(SJ), Princes House, Kingsway, London, W.C.2., or enquire at any Employment Exchange quoting City 2427/(SJ).

TESTERS

Required for interesting work on L.F. and H.F. Transmitters. Previous fault finding experience essential. The positions available would be of special interest to persons employed in the fault finding and repair of television, who are keen to establish themselves in a position that offers:

★ **SATISFYING EMPLOYMENT**
★ **5 DAY WEEK**
★ **GOOD PROSPECTS OF ADVANCEMENT**
★ **STAFF STATUS**
★ **SICK PAY**
★ **GENEROUS SALARY**

Apply:

MULTITONE ELECTRIC CO. LTD.

12-20 Underwood Street, London, N.1
(Close Old Street Underground Station)

PERSONAL

QSL CARDS. G.P.O. approved log books, cheapest, best, prompt delivery. Samples.—Atkinson Bros., Printers, Looe, Cornwall.

PATENTS and TRADE MARKS. Booklet on request. Kings Patent Agency Ltd. (B. T. King, G5TA, Mem. R.S.G.B. Reg. Pat. Agent).—146a Queen Victoria Street, London, E.C.4. (Phone: City 6161.) 60 years' refs.

WANTED

WANTED.—All types of communication receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R.T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11. (LEYton 4986.)

WANTED FOR CASH.—Good clean communication receivers and s.s.b. equipment. Please state price.—Short Wave (Hull) Radio, 30-32 Princes Avenue, Hull. (Telephone 18953).

WANTED. L.G. 300 TX. Complete with companion power pack and Mod. Must be in first class condition and at a fair price. GW3AX, Belle Vue House, West Cross Lane, Swansea, Glam.

WANTED. 2M. portable/mobile rig. exchange t/recorder or cash. Sale CR100RX £15. G3MEW, 5 Testcombe Road, Alverstoke, Gosport, Hants.

WANTED SX28 speaker and/or mains transformer or scrap SX28 for spares, price and details to:—GW3ACF, 22 Smallwood Road, Baglan, Port Talbot, Glam.

DENCO DCR 19 Communications receiver wanted. Will collect 50 miles radius Cambridge. Details and price to:—Miller, 29 Hertford Street, Cambridge.

SERVICES OFFERED

GO ONE BETTER. Have your cabinets, panels, etc., stove-enamelled and lettered to your own or original specification.—For by-return quotations, contact: The Universal Productions (Enamellers) Ltd., 22 Aston Road North, Birmingham 6. (Tel.: Aston Cross 2987)

FOR SALE—PRIVATE

MOHICAN Communications Receiver for sale, mint condition; factory-tested and aligned; £33 cash.—J. C. Rhind, ZS5RM, 157 Cromwell Road, London, S.W.5.

FOR SALE—PRIVATE (continued)

813s (2) unused in maker's boxes. Offers over 30s. each. Box No. A.7050, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

PANDA CUB £30. In manufacturers condition, no ham mods., as good as new. Owner Q.R.O. G3GQV, 284 Verdant Lane, London, S.E.6. HIT. 2860.

BRAND NEW, boxed with all spares R-109 Receiver £4 15s. Also A.P.R.-4, S-36A, S-27CA, URR-13A, 27 Mc/s-1,000 Mc/s. BC-221. S.A.E. List. Wright, 4a Nepal Avenue, Atherton, Manchester. Tel.: 991.

CR 100 RECEIVER in very good condition with noise limiter, 60 Kc/s-30 Mc/s in six ranges. £20 o.n.o. Delivered London area. Box No. A.7051, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

VERY WELL KNOWN. Minimitter Transmitter, 120 watt, phone/cw. £50 o.n.o. Buyer collects, going S.S.B.—G3JBL, 6 Durham Avenue, Scotforth, Lancaster.

EDDYSTONE MODEL 888, complete with matching S Meter, and matching speaker. Recently overhauled, perfect working order—£55 o.n.o. Hayward, "Torbay," Shingle Road, Shoreham-by-Sea, Sussex. Phone: Shoreham 3634 (after 7 p.m.).

SPY RX for sale M.C.R.1. complete with mains unit £6. Unused TT21 20/-. FX1308 beads for FB5 50 for 10/-. CR100 manual 15/-. Offers invited. Box No. A.7053, c/o R.S.G.B. Bulletin, 4 Ludgate Circus, London, E.C.4.

FIRST REPLIES SECURE, AR88D table £29 10s., also AR88LF rack with tuning meter £27, sound working order. No haggling, carriage paid. Findlay, 42 Hanover Street, Stranraer, Scotland.

A HALLICRAFTERS S.38 receiver in very good condition; with line cord and manual. Offers. Apply, A.2646, S.C. Haigh, Wiston Rectory, Nr. Steyning, Sussex.

2 SECTIONAL 45 ft. duralumin masts in canvas containers £7 pair ideal for NFD. HRO, power supply, 9 coils. £15. BC348 £8, B2 receiver never used no PS £2. Buyer collects. 46 High Green Road, Altofts, Normanton, Yorkshire.

MINIMITTER TX almost mint condition. Labgear Wide Band Couplers, set of five. What offers? Buyer collects. GM3FPG, Drill Hall, Elgin Street, Dunfermline, Fife.

£200 OFFERED for Collins R-390-A Receiver. For Sale, R.C.A. AR-88 Receiver v.g.c. £25. R-109 Receiver with spares, brand new, £5. BC-221 £14. Mr. Wright, 4A, Nepal Avenue, Atherton, Manchester. Tel.: 991.

AR88 CABINETS £3 carriage paid. Elizabethan TX £3 carriage paid. 6 foot TX Cabinet (American) £2 carriage extra. G3GVV 65 Harlands Road, Haywards Heath, Sussex. (Telephone 2461.)

CASCODE TWO METRE CONVERTER, Crystal controlled, ready for use, with valves, crystal, and built in power supply, output for 15.3—17.3 Mc/s, £8. Also several others, send for details. Jeapes, 165 Cambridge Road, Great Shelford, Cambridge.

FOR SALE: HQ170 including extra noise silencer and special amphenol antenna inputs and auto transformer. 1 year's use. £150 or nearest offer. Box No. A.7054, c/o R.S.G.B. Bulletin, 4 Ludgate Circus, London, E.C.4.

CLEARING at bargain price 170 QST's etc., modulation meter type 2, tuned fundamental 2400-6250 Kc/s (nice job), 3 moving coil meters, 4 transformers, 3 co-axial relays, 150 ft. 9G and 100 ft. ¼ in. new steel plough wire, numerous mica paper and electrolytics, P.O. type relays with bi-metal contacts, tx coils and 15 variable condensers, rectifiers, aly sheet, rod and tube, dozens of other items £8. Good condition. Car needed deliver 50 miles radius, petrol. TV valves U801, 20P1, 20F2, 10P13, 2-20D1, 4-10F1, 10P13, 6F15, 6L18, £2 10s. lot or separately. 50 others all types many new and unused 2/6-5/- or £7 10s. lot. A30-A35 workshop manual and Melco wheel spanner new 8/6 each. S.A.E. G6CB, 7 Caxton Road, Wimbledon.

FOR SALE—TRADE

METALWORK.—All types of cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street, Loughborough.

SILICON RECTIFIERS 400 PIV. ½ amp. 3/9; 70 PIV ½ amp 3/-. Transistors Red Spot, White Spot 2/3; Mullard OC71, 6/-; OC72, 7/6; OC44, 9/6. Newmarket V30/20P matched pairs 27/6; V30/30P, 47/6 pair. BM3 Mike and Stand 48/-, R109 brand new £3 (carriage £1). Cash with order. Post extra (excess refunded). Moore's Experimental Supplies, Dept. R. 8/10, Granville Street, Sheffield 2.

MINIMITTER MERCURY TRANSMITTER, 150 watt Phone/CW, with Crystal microphone, Eddystone model 680X, 17 Valve Communication Receiver with matching speaker, both as new, Minimitter Beam Array, complete £145, also Taylor Wide Range R.C. Oscillator type 91a, £10, Channel Wave Form Generator type 2, £10, Avo Electronic Test Meter type ETM £22, all in showroom condition. Box No. A.7052 c/o R.S.G.B. Bulletin, 4 Ludgate Circus, London, E.C.4.

LONDON REGIONAL
GIANT JUNK SALE
SATURDAY, MAY 26th

AT 65th Signal Regiment T.A., City of London DRILL HALL 79/85 WORSHIP STREET, CITY ROAD, FINSBURY SQUARE (nearest Tube Stations: Moorgate and Old Street)

Doors open 2.30 p.m. to 5.30 p.m.

ADMISSION: 2/- All in aid of new H.Q. Fund

SELLING SPACE:

1/- square foot (Minimum 2 square feet) Space in multiples of 1 foot frontage. Trade entries 2/- square foot.

For reservation of space Apply to
P. A. Thorogood, G4KD,
35 Gibbs Green, Edgware.

INDEX TO ADVERTISERS

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell Street, London, W.C.1
by Loxley Brothers Limited, Letchworth, Hertfordshire

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET W.C.1