THE

Wireless Weekly

CALL SIGN

BOOK and TECHNICAL REVIEW.

1/-

Call Signs—

ALL AUSTRALIAN STATIONS
NEW ZEALAND STATIONS
OVERSEAS BROADCASTERS
WORLD SHORT-WAVE STATIONS
AUSTRALIAN AND N.Z. AMATEURS
ALL YOU WANT TO KNOW!

Technical Articles—

A 5-METRE SUPERHET.
A 3-STAGE AMATEUR TRANSMITTER
THE 2JU 10-VALVE AMATEUR SUPERHET.
1937 PENTAGRID FOUR
THE DUPLEX SINGLE
AN 8-VALVE ALL-WAVE SET

"WIRELESS WEEKLY"

CALL SIGN BOOK

AND

TECHNICAL REVIEW

★

A "WIRELESS WEEKLY" PUBLICATION

WHAT'S IN IT . . . AND WHERE

Call Signs

Technical Articles

National and Commercial Broadcasting Stations In Australia as at June 1, 1937

NATIONAL STATIONS

MEDIUM WAVE SERVICES

NEW SOUTH WALES

Call Sign.	STATION.	Freq. Kilocycles.	Wave Length Metres.	Aerial Power Watts.
2BL	Sydney—National No. 2.	740	405	3000
2CO	Riverina Regional (Corowa), Relays 3AR and 3LO.	670	448	7500
2CR	Central Regional, N.S.W.	550	545	2000
2FC	Sydney—National No. 1.	610	492	3500
2NC	Hunter River Regional (Newcastle), Relays 2BL and 2FC.	1230	244	2000
2NR	Northern Rivers Regional (Lawrence, near Grafton), Relays 2BL and 2FC.	700	429	7000

VICTORIA

3AR	Melbourne—National No. 2.	630	476	4500
3GI	Gippsland Regional (Longford, near Sale), Relays 3AR and 3LO.	830	361	7000
3LO	Melbourne—National No. 1.	770	390	3500
3WV	Western Regional Dooen, near Horsham, Vic.	580	517	10,000

QUEENSLAND

4QG	Brisbane—National.	800	375	2500
4QN	North Regional (Clevedon, near Townsville).	600	500	7000
4RK	Rockhampton Regional (R'hampton), Relays 4QG.	910	330	2000

SOUTH AUSTRALIA

5CK	North Regional (Crystal Brook), Relays 5CL.	640	469	7500
5CL	Adelaide-National.	730	411	2000

WESTERN AUSTRALIA

6GF	Goldfields Regional (Kalgoorlie).	720	417	2000
6WF	Perth—National.	690	435	3500
6WA	South West Regional (Minding, near Wagin).	560	536	10,000

TASMANIA

7NT	North Regional (Kelso, near Launceston), Relays 7ZL.	710	423	7000
7ZL	Hobart—National.	620	484	1000

EXPERIMENTAL SHORT-WAVE SERVICE

3LR	Lyndhurst, Victoria.	9580	31.32	1000

COMMERCIAL STATIONS

Call Sign.	Licensee and Location of Station.	Freq. Kilocycles.	Wave Length Metres.	Aerial Power Watts.
FEDERAL CAPITAL TERRITORY				
2CA	A. J. Ryan B'casters Ltd., Canberra. Location of Station: Canberra.	1050	286	500
NEW SOUTH WALES				
Metropolitan				
2CH	N.S.W. Council of Churches' Service, 77 York St., Syd. Location: Dundas, Sydney.	1190	252	1000
2GB	Theosophical B'casting Stn. Ltd., 29 Bligh St., Sydney. Location: Mosman, Sydney.	870	345	1000
2KY	The Labor Council of N.S.W., 424 George Street, Sydney. Location: Brookvale, Sydney.	1020	294	1000
2SM	Catholic B'casting Co., Australia House, Wynyard Square, Sydney. Location: Pennant Hills.	1270	236	1000
2UE	Radio 2UE Sydney Ltd., 296 Pitt St., Sydney. Location: Near Cronulla, Sydney.	950	316	1000
2UW	Commonwealth Broadcasting Corp., Ltd., 49 Market St., Syd. Location: Sydney City.	1110	270	750
Country				
2AD	New England B'casters Ltd., Armidale. Location: Armidale.	1080	278	100
2AY	Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. Location: Albury.	1480	203	100
2BH	Radio Silver City Ltd., P.O. Box 143A, Broken Hill. Location: Broken Hill.	1060	283	100
2BS	Bathurst Broadcasters Ltd., Keppell St., Bathurst. Location: Bathurst.	1500	200	100
2DU	Central Western Radio Services Ltd., MacQuarrie St., Dubbo. Location: Dubbo.	660	455	100
2GF	Grafton B'casting Co., Ltd., 47 York St., Sydney. Location: Grafton.	1210	248	100
2GN	Goulburn B'casting Co., Ltd., Auburn St., Goulburn. Location: Goulburn.	1390	216	200
2GZ	Country B'casting Services Ltd., 12 Spring St., Sydney. Location: Orange.	990	303	2000
2HD	Airsales B'casting Co., Maitland Rd., Sandgate. Location: Sandgate, nr. N'castle.	1140	263	500
2KA	Radio Katoomba Ltd., Commonwealth Bank Chambers, Katoomba. Location: Kat.	1160	259	100
2KO	Newcastle Broadcasting Co., Ltd., 57 Hunter St., Newcastle. Location: Sandgate, near Newcastle.	1410	213	500
2LM	Richmond River B'casters Ltd., P.O. Box 44, Lismore. Location: Near Lismore.	900	333	500
2LV	Northern B'casters Ltd., Otho St., Inverell. Location: Inverell.	820	366	100
2MO	2MO, Gunnedah, Ltd., Marquis St., Gunnedah. Location: Gunnedah.	1370	219	100
2NZ	Northern Broadcasters Ltd., Inverell.	1170	256	2000
2QN	Deniliquin B'casting Co., Ltd., End St., Deniliquin. Location: Deniliquin.	1440	208	50
2RG	Irrigation Area Newspapers Ltd., P.O., Box 388, Griffith. Location: Griffith.	1470	204	50
2TM	Tamworth Radio Development Co., Peel St., Tamworth. Location: Tamworth.	1300	231	50
2WG	Riverina Radio B'casting Co., Ltd., 16 Fitzmaurice St., Wagga. Location: Near Wagga.	1150	261	1000
2WL	Wollongong B'casting Co., Cnr. Church and Edward Sts., Wollongong. Location: Wollongong.	1430	210	300

VICTORIA

Metropolitan

3AK	Melbourne B'casters Pty., Ltd., 480 Bourke St., Melb., C.1. Location: Balwyn, Melb.	1500	200	200
3AW	3AW B'casting Co., Pty., Ltd., 382 Latrobe St., Melb., C.1. Location: Melb. City.	1280	234	600
3DB	3DB B'casting Co., Pty., Ltd., 36 Flinders St., Melb., C.1. Location: Melb. City.	1030	291	600
3UL	Warrigal, Vic.	1000	300	
3KZ	Industrial Printing and Publicity Co., 24-30 Victoria St., Carlton, N.3. Location Melbourne City.	1180	254	600
3UZ	Nilsen's B'casting Service Pty., Ltd., 45 Bourke St., Melb. C.1. Loc.: Melb. City.	930	323	600
3XY	Station 3XY Pty., Ltd., 4 Bank Place, Melbourne, C.1. Location: Melbourne City.	1420	211	600

Country

3BA	Ballarat B'casters Pty. Ltd., 56 Lydiard St., Ballarat. Location: Near Ballarat.	1320	227	500
3BO	Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. Location: Near Bendigo.	970	309	200
3GL	Geelong B'casters Pty. Ltd., National Mutual Buildings, Moorabool St., Geelong. Location: Geelong.	1350	222	100
3HA	Western Province Radio Pty. Ltd., 37 Gray Street, Hamilton. Location: Near Hamilton.	1010	297	300
3LK	3DB Broadcasting Co., Pty., Ltd. Location: Lubeck.	1090	275	2000
3MA	Sunraysia B'casters Pty., Ltd., 22 Deakin Avenue, Mildura. Location: Mildura.	1350	221	100
3MB	Mallee B'casters Pty. Ltd., Cumming Avenue, Birchip. Location: Birchip.	1490	201	100
3SH	Swan Hill B'casting Co., Campbell St., Swan Hill. Location: Swan Hill.	1330	226	100
3TR	Gippsland Publicity Pty. Ltd., Raymond St., Sale. Location: Near Sale.	1240	242	500
3SR	The Argus Broadcasting Services Pty Ltd. High St., Shepparton. Location: Near Shepparton.	1260	238	500
3YB	The Argus Broadcasting Services Pty. Ltd., 430 Lit. Collins St., Melbourne, C.1, Location: Warrnambool.	1210	248	100

QUEENSLAND AND PAPUA

Metropolitan

4BC	J. B. Chandler and Co., 43 Adelaide St., Brisbane. Location: Oxley, Brisbane.	1120	268	1000
4BH	B'casters (Aust.) Ltd., Parbury House, Eagle St., Bris. Location: Bald Hill, Bris.	1380	217	1000
4BK	Brisbane B'casting Pty. Ltd., King House, Queen St., Brisbane. Location: Bris.	1290	233	500

Country

4AK	Brisbane B'casting Pty. Ltd., King House, Queen St., Brisbane. Location: Oakey.	1220	246	2000
4AY	Ayr B'casters Pty. Ltd., Ardmillan Rd., Ayr. Location: Ayr.	860	349	300
4BU	Bundaberg B'casters Pty. Ltd., 117 Bourbong Street, Bundaberg. Location: Bundaberg.	1480	203	100
4CA	Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. Location: Cairns.	1390	216	100
4GR	Gold Radio Service Pty. Ltd., 43 Adelaide St., Brisbane. Location: Toowoomba.	1000	300	500
4IP	Ipswich B'casting Co., Pty. Ltd., Brisbane St., Ipswich. Location: Ipswich.	1440	208	100
4LG	Central Western B'casting Co. Pty. Ltd., Longreach. Location: Longreach.	1100	273	300
4MB	Maryborough B'casting Co., Ltd., 43 Adelaide St., Bris. Location: Maryborough.	1060	283	100
4MK	Mackay B'casting Service, 64 Nelson St., Mackay. Location: Mackay.	1080	278	100
4PM	Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. Location: Port Moresby, Papua.	1360	221	100
4RO	Rockhampton Broadcasting Co. Pty. Ltd., 43 Adelaide St., Brisbane. Location: Rockhampton.	1330	226	50
4TO	Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. Location: Townsville	1170	256	200
4VL	Charleville B'casting Service Pty. Ltd., Burke St., Charleville. Location: Charleville.	1430	210	50
4WK	Warwick B'casting Co. Pty. Ltd., Cnr. King and Albion Sts., Warwick. Location: Warwick.	1340	224	100

SOUTH AUSTRALIA

Metropolitan

5AD	Advertiser Newspapers Ltd., Waymouth St., Adelaide. Location: Adelaide City.	1310	229	500
5DN	Hume Broadcasters Ltd., 29 Rundle St., Adelaide. Location: Adelaide City.	960	313	500
5KA	Sport Radio B'casting Co. Ltd., Richards Buildings, Currie St., Adelaide. Location: Adelaide City.	1200	250	500

Country

5MU	Murray Bridge Broadcasting Co., Ltd. Bridge St., Murray Bridge. Location: Murray Bridge.	1450	207	100
5PI	Midlands B'casting Services Ltd., Advertiser Bldg., Waymouth St., Adelaide. Location: Crystal Brook.	1040	288	2000
5RM	River Murray Broadcasters Ltd., 29 Rundle St., Adelaide. Location: Renmark.	850	353	1000

WESTERN AUSTRALIA

Metropolitan

6IX	West Australian Newspapers Ltd., St. George's Terrace, Perth. Location Perth City.	1240	242	500
6ML	W.A. B'casters Ltd., Lyric House, Murray St., Perth. Location: Perth City.	1130	265	500
6PR	Nicholson's Ltd., 86-90 Barrack St., Perth. Location: Applecross, near Fremantle.	880	341	500

Country

6AM	6AM Broadcasters Ltd., St. George's House, St. George's Terrace, Perth. Location: Northam.	980	306	2000
6KG	Goldfields B'casters (1933) Ltd., 209 Hannan St., Kalgoorlie. Location: Kalgoorlie.	1210	248	500
6WB	W.A. B'casters Ltd., Lyric House, Murray St., Perth. Location: Katanning.	1070	280	2000
6PM	6PM Broadcasters Ltd., St. George's House, St. George's Terrace, Perth. Location: Fremantle.	1390	216	100

TASMANIA

Metropolitan

7HO	Commercial B'casters Pty. Ltd., 82 Elizabeth St., Hobart. Location: Hobart.	860	349	100

Country

7BU	Findlays Pty. Ltd., Wilson St., Burnie. Location: Burnie.	660	455	100
7LA	Findlay and Wills B'casters Pty. Ltd., 67 Brisbane St., Launceston. Location: Launceston.	1100	273	300
7UV	Northern Tasmania Broadcasters Pty. Ltd., 480 Bourke St., Melbourne. Location: Ulverstone.	1460	205	300
7HT	Metropolitan Broadcasters Pty. Ltd., 44 Elizabeth St., Hobart. Location: Hobart.	1080	278	300

Australian and New Zealand Broadcasters

Call Sign	Dial No.	Kilo-cycles	Address
2YA		570	National Station, New Zealand Broadcasting Board, Wellington.
2CR		550	Regional Station, N.S.W., Relays Sydney Programmes.
3WV		580	Regional Station, Vic., Doven, near Horsham.
3AR		580	National Station, 120A Russell Street, Melbourne.
7ZL		590	National Station, Elizabeth Street, Hobart.
2FC		610	National Station 96-98 Market Street, Sydney.
5CK		640	Regional Station, relaying 5CL, Crystal Brook, S.A.
1YA		650	New Zealand Broadcasting Board, Auckland.
2CO		670	Regional Station, relaying 3LO and 3AR, Corowa, N.S.W.
6WF		690	National Station, Hay Street, Perth.
2NR		700	Regional Station, relaying 2FC, Lawrence, near Grafton, N.S.W.
7NT		710	Regional Station, North Tasmania, Relaying 7ZL and 3LO.
3YA		720	New Zealand Broadcasting Board, Christchurch.
5CL		730	National Station, Hindmarsh Square, Adelaide.
2BL		740	National Station, 96-98 Market Street, Sydney.
3LO		770	National Station, 120A Russell Street, Melbourne.
4QG		800	National Station, State Insurance Bldgs., Brisbane.
2LV		820	Northern Broadcasters Ltd., Inverell, N.S.W.
3GI		830	Regional Station, relaying 3LO and 3AR at Sale.
5RM		850	Commercial Station, Renmark, S.A.
7HO		860	Commercial Ltd., 82 Elizabeth Street, Hobart.
2GB		870	Theosophical Station, 29 Bligh Street, Sydney.
6PR		880	Nicholson's, Ltd., Studio, Barrack Street, Perth.
3MA		900	Sunraysia Pty., Ltd., 22 Deakin Avenue, Mildura.
4WK		900	Warwick B'casting Co., Pty., cor. King and Albion Sts., Warwick, Q.
4RK		910	Regional Station, relaying 4QG, Rockhampton, Qld.
3UZ		930	Oliver J. Nilsen and Co., 45 Bourke Street, Melbourne.
2UE		950	Radio House, 296 Pitt Street, Sydney.
5DN		960	Hume Broadcasters, Ltd., 29 Rundle Street, Adelaide.
3BO		970	Amalgamated W'less (A'sia), Ltd., Kangaroo Flat, Bendigo, Vic.
4AY		980	Ayr Broadcasting Service, Airdmillan Road, Ayr, Qld.
6AM		980	Northam Broadcasters, Ltd., 23 William St., Perth—at Northam.
2GZ		990	Hosking House, Hosking Place, 84½ Pitt Street, Sydney.
3UL		1000	Warrigal, Vic.
4GR		1000	Gold Radio Service, Studio, Ruthven Street, Toowoomba, Q.
3HA		1010	Western Province Radio Co., 37 Grey Street, Hamilton, Vic.
2KY		1020	Trades and Labor Council, The Block, George Street, Sydney
3DB		1030	3DB B'casting Station Pty., Ltd., 36 Flinders Street, Melbourne.
5PI		1040	Midland B'cast Services Ltd., Relay Unit of 5AD, Crystal Brook, S.A.
2CA		1050	A. J. Ryan, Kingston, Canberra, F.C.T.
4MB		1060	Maryborough Broadcasting Co., Wynne's Stn., Maryborough, Q.
2AD		1080	Northern Broadcasters Ltd., Armidale, N.S.W.
3SH		1080	Swan Hill Broadcasting Co., Swan Hill, Victoria.
7LA		1100	Findlay and Wills, Broadcasters, 67 Brisbane St., Launceston, Tas.
4LG		1100	Central Western Broadcasting Co., Longreach, Qld.
2UW		1110	C'wealth B'casting Corp., Ltd., State Bldg., Market St., Sydney.
4BC		1120	J. B. Chandler and Co., 43 Adelaide Street, Brisbane.
6ML		1130	W.A., Broadcasters, Ltd., Lyric House, Murray Street, Perth.
2HD		1140	Airsales Broadcasting Co., P.O., Box 123, Newcastle, N.S.W.
2WG		1150	Riverina Broadcasting Co., 16 Fitzmaurice St., Wagga, N.S.W.
2KA		1160	Radio Katoomba Ltd., 80 Market Street, Sydney.
4MK		1160	Mackay Broadcasting Service, 64 Nelson Street, Mackay.
6BY		1160	Bunbury Broadcasters Ltd., Bedford Hall, Bunbury, W.A.
4TO		1170	Amalgamated W'less (A'sia), Ltd., Townsville, Qld.
2NZ		1170	Northern Broadcasters Ltd., Inverell, N.S.W.
3KZ		1180	Industrial Printing Co., 24 Victoria Street, Carlton, N.3.
2CH		1190	2CH Broadcasting Co., 77 York Street, Sydney.
5KA		1200	Sports Radio B'casting Co., Ltd. Richard Blgs., Currie St, Adelaide.
2GF		1210	Grafton Broadcasting Co., 47 York St., Sydney. Station at Grafton.
6KG		1210	Goldfields Broadcasters Ltd., 86 Palace Chbrs., Kalgoorlie, W.A
4AK		1220	Commercial Station, Oakey, Queensland.
2NC		1230	Regional Station, relaying 2FC and 2BL, at Newcastle.
3TR		1240	Gippsland Publicity Pty., Ltd., Raymond Street, Sale, Vic.
6IX		1240	W.A. Broadcasters Ltd., St. George's Terrace, Perth.
3WR		1260	Goulburn Valley and N.E. B'cast. Pty., Ltd., High St., Shepparton, V.
2SM		1270	Catholic Broadcasting Co., Australia House, Carrington St., Sydney.
3AW		1280	Vogue Broadcasting Co., Ltd., 218 Exhibition St., Melbourne.
4BK		1290	Brisbane Broadcasting Co., 47 Charlotte Street, Brisbane.
2TM		1300	Tamworth Radio Dev. Co Ltd., Peel Street, Tamworth, N.S.W.
5AD		1310	Advertiser Newspapers, Ltd., Weymouth Street, Adelaide.
3BA		1320	Ballarat B'cast. Pty. Ltd., cor. Armstrong and Dana Sts., Ballarat, V.
2BH		1330	Radio Silver City Ltd., 10 O'Connell Street, Sydney; at Broken Hill.
4RO		1330	Rockhampton Broadcasting Co., Studios in Rockhampton, Q.
2XN		1340	G. W. Exton, P.O., Box 138B. Lismore, N.S.W.
5MU		1340	Murray Bridge B'cast Co., Regional Unit of 5AD, Murray Bridge, S.A.
3GL		1350	Geelong B'casting Pty., Ltd., National Mutual Blg., Geelong, V.
2MO		1360	M. J. Oliver, P.O., Box 78, Gunnedah, N.S.W.
3HS		1370	Wimmera Broadcasting Co., 84 Wilson Street, Horsham.
4BH		1380	Broadcasters (Aust.), Ltd., Parbury House, Eagle Street, Brisbane.
4CA		1390	Amalgamated Wireless, Cairns, Queensland.
7BU		1390	Finlays Pty., Ltd., Wilson Street, Burnie, Tas.
2GN		1390	Goulburn Broadcasting Co., Auburn Street, Goulburn, N.S.W.
2KO		1410	Newcastle Broadcasting Co., 57 Hunter St., Newcastle N.S.W.
3XY		1420	Efflee Broadcasters Pty., Ltd., Princess Theatre, Spring St., Melb.
2WL		1430	Wollongong B'cast Co., cor. Edward and Church Sts., W'gong, N.S.W.
4VL		1430	Charleville Broadcasting Service, Burke Street, Charleville.
4IP		1440	Ipswich Broadcasting Service, Brisbane St., Ipswich, Qld.
2QN		1440	Deniliquin Broadcasting Co., Ena Street, Deniliquin.
7UV		1460	Northern Tasmanian Broadcasters Pty., Ltd., Ulverstone, Tas.
3MB		1470	Mallee Broadcasting Pty., Cumming Avenue, Birchip, Vic
2BE		1470	Bega District News, Box 4, P.O., Bega, N.S.W.
4BU		1480	Bundaberg Broadcasters Ltd., Bourbon Street, Bundaberg.
2AY		1480	Amalgamated W'less (A'sia) Ltd., Pool's Hill, Albury, N.S.W.
3AK		1500	Melbourne B'casting Pty., Ltd., 116 Queen St., Melbourne, C.1.

NEW ZEALAND B'CAST STATIONS

IN ORDER OF WAVE-LENGTH

New Zealand broadcasting is on a differet basis from that in Australia. "A" class stations are the normal National Stations as we have them in Australia. "B" class stations are privately owned stations, subsidised by the Government, but cannot gather revenue from outside advertising. "C" class stations are owned by the Government, and are permitted to accept advertising from revenue.

Call	Location	k.c.	Type	Power w.	Address
2YA	Wellington	370	A	60,000	National Broadcasting Service
4ZP	Invercargill	620	B	500	National Broadcasting Service
1YA	Auckland	650	A	10,000	National Broadcasting Service, Box 390, Auckland
3YA	Christchurch	750	A	10,000	National Broadcasting Service, Christchurch
2YB	New Plymouth	760	B	100	New Plymouth
4YA	Dunedin	790	A	10,000	National Broadcasting Service, Dunedin
2ZH	Napier	820	B	65	Napier
2YC	Wellington	840	A	200	As 2YA
1YX	Auckland	880	A	150	As 1YA
2ZP	Wairoa	900	B	250	128 Queen Street, Wairoa, H.B.
2ZR	Nelson	920	B	50	Nelson
3ZR	Greymouth	940	B	400	Greymouth
2ZF	Palmerston N.	960	B	250	Palmerston North
2ZJ	Gisborne	980	B	75	Gisborne
4ZB	Dunedin		B	35	Dunedin
4ZM	Dunedin	1010	B	60	Dunedin
4ZO			B		25 The Octagon, Dunedin
1ZB	Auckland	1090	C	200 (soon to 1000)	Nat. Comm. Broad. Service, Box 1934, Auckland
2ZB	Wellington	1120	C	1000	Nat. Comm. Broad. Service, Wellington
4YO	Dunedin	1140	A	150	As 4YA
2ZM	Gisborne	1150	B	15	Gisborne
2ZD	Masterton	1170	B	5	Masterton
3YL	Christchurch	1200	A	500	As 3YA
4ZL	Dunedin	1220	B	100	Dunedin
2ZL	Hastings	1240	B	20	Hastings
1ZM	Manurewa	1260	B	150	W. W. Rodgers, Manurewa, Auckland
4ZC	Cromwell	1280	B	20	Cromwell, Otago
1ZJ	Auckland	1310	B	68	Johns Ltd., Chancery Street, Auckland
4ZR	Balclutha	1340	B	10	Balclutha, Otago
2ZO	Palmerston N.	1400	B	100	Palmerston North
3ZM	Christchurch	1470	B	60	Christchurch

Special note should be taken that New Zealand time is 2 hours ahead of Sydney time. Thus their programmes commence and conclude 2 hours before our own. This adjustment must be made when checking programme times.

ADD TWO HOURS TO SYDNEY TIME

THRILLS AND JOYS ON THE SHORT WAVES

By R. N. SHAW

"WHENEVER I listen-in to London a lump comes into my throat," remarked a clerical gentleman of our town, who came out from England some years ago. Our friend's parents are still in the land of the living in the Old Country, and he found his thoughts wandering back to the land of his birth. In imagination he sees his old parents listening to the same identical programme at the same moment, whilst parents and son are meantime separated by over 12,000 miles of ocean. Are there not thousands in Australia to-day whose minds are similarly exercised? And what a real thriller is it to the person who has left the land of his nativity, probably to never again set foot thereon, to sit by his short-wave receiver, and hear the voices of his or her countrymen, to say nothing of the charmed music, coming over so clear and distinct from the other side of the world. What a joyful and valuable link does radio provide in such instances! We know just what it does mean, for seated by our own receiver we have witnessed the spectacle of good folk, not of the English race, eagerly and joyously imbibing every word which the loud-speaker conveyed to them in their own tongue from many thousands of miles away. Ours has been pleasure of seeing Germans, folk from the Dutch East Indies, far-away Czechoslovakia, and similar countries, exuberant with joy as they drank in the music and talks of the Fatherland. To folk such as these short-wave radio is not merely an amusement; it is a God-given utility, which enables them to keep almost personally in touch with the people and the things they love so dearly. This is what may be termed the personal side of short-wave radio, but there are many others.

OTHER COUNTRIES

There are many other type of thrills, and thrills that our broadcast listening friends can never experience. Ask our friends who have listened to the fiery declamations of Signor Mussolini, the dictatorial and commanding rhetoric of Herr Hitler, the denunciations of a leading light in Soviet Russia! What feelings of wonder and amazement are created in the breasts of interested listeners as they hear these voices direct from the scene of action, and of men who shape the destinies of millions of their subjects, and veritably make and unmake nations. Listeners to these famous broadcasts can quite easily picture a realistic mental picture of the scenes being enacted as the impassioned appeals move the huge crowds to display their fervent patriotism by vocal demonstration. Then, who amongst the fortunate listeners can forget that memorable morning last year

The Short Wave Notes of our "Wireless Weekly's" regular correspondent, Mr. R. N. Shaw, are one of the highlights of issues. Mr. Shaw has handled these notes for 10 years, and is probably the best known authority in the country. This article here, and the list of stations he has compiled, can be accepted as accurate and authentic.

when Italo-Abyssinian war was at its height, and the picturesque Haile Selassie made his world-wide appeal from the seat of his Government in the land of biblical memories.

From these spectacular broadcasts we can come down to those of a more utilitarian character, those which embrace broadcasts of world news, and those of international events and sporting fixtures. Who can deny the enthusiasm generated in the breast of a tennis fan as he listened to actual descriptions of the battle being waged on a tennis court on the other side of the world by men like Crawford and Quist? So technically fine were some of these that the listener could almost hear the ping of the ball on the racquet! Then, what of the famous cricket Tests, Cambridge v. Oxford University boat races, an English Derby, an international football match, international polo, and so on.

Broadcasts which probably evoke more universal interest than any other are those in which our own beloved King and members of Royalty take part. Probably the most popular of all these were the broadcasts to his millions of subjects by the late King George, whose voice was so admirably suited for broadcasting. Then came the memorable sad farewell address by King Edward on the eve of his departure. And fresh in memory of all were the memorable broadcasts of the various Coronation ceremonies this month.

From the every-day point of view, one of the most important features of overseas broadcasting is the wonderful opportunity presented of obtaining world news of the utmost importance from practically every quarter of the globe. This constitutes for the listener a real "stop press" edition. To-day it is found that practically every country which provides broadcasting facilities incorporates in its schedules a news session in English. Most of these, by the way, are also of a lengthier and more comprehensive nature than that supplied even by our own A.B.C. But, apart from the fact that news of a late nature is very often heard, the short-wave listener is treated to news which he cannot hope to find in his daily paper. Then, again, he has the opportunity of hearing the viewpoint of the "other fellow." This very often proves quite enlightening and at times entertaining. Every reader knows only too well the seething cauldron which Europe presents to-day, but it falls to the lot of the short-wave listener to hear in the Australian vernacular, right from the "horse's mouth," just what the contending factions really think of each other. And, gentle reader, let us tell you ever so quietly that some of these folk do not romance in expressing their opinions of one another. Such terms as barbarians, murderers, liars, and other kindred epithets are thrown about with careless abandon.

SO EASY

Having thus delivered ourselves of what we find short-wave radio to provide and represent, let us say in all sincerity and calmness that this is no far-fetched, colorful picture conceived in the mind of some over-enthusiastic radio fanatic, as the keen enthusiast was wont to be described by our friends of the "doubting Thomas" variety. Gone are the days when the burner of the midnight oil hastened to his office or other official domicile to proudly proclaim his radio feats of the past night. Doubtless, the painstaking enthusiast even to-day secures from his receiver more than does the casual twirler of the short-wave dial. But only a nodding acquaintance with a dual or all wave receiver is necessary to-day to enable anyone, from a child upwards, to tune in such countries as Germany, England, Paris, Russia, America, and many others. Gone also the days when it was necessary to employ the ubiquitous headphones to hear overseas stations. The present-day trend in receiver de-

sign has reduced listening to simplicity itself, with the result that the ordinary listener can safely purchase any receiver supplied by reputable manufacturers, and proceed to enjoy the pleasures of overseas listening.

To become a contented short-wave listener there are several facts which we must digest. We must first of all realise that the hands of the clock point to a different time in other parts of the world as compared with Australia. Consequently, it naturally follows that there are certain hours during which overseas stations are off the air during our listening hours. The listener should make himself conversant with a world chart, an eminently suitable one of which will be found elsewhere in this booklet. Evidence of this might be very briefly summarised by pointing that the clock in the following countries is behind Sydney, thus: Great Britain 10 hours (reduced by one hour, daylight saving time, in British summer—our winter), Berlin and Rome 9 hours, Moscow 7 hours, Paris 10 hours, New York 15 hours, Central America 16 hours, California 18 hours, Holland 10 hours, Japan 1 hour, Java 2½ hours, and so on. In future our panel in "Wireless Weekly" of overseas stations will contain most of the stations audible, whether the programmes are known or not.

SEASONAL CONDITIONS

The successful listener will also need to realise that seasonal conditions control short-wave signals in every part of the world. As a consequence, signals on certain wave-lengths will be at better strength, say, in summer than in winter, whilst stations audible in Australia in daylight in winter will comare such as 19 and 25 metres. Listeners will find from present experience that daylight reception rapidly improves as winter sets in in earnest, whilst there will be a corresponding decrease in the number audible at night. What is generally referred to as "skip distance" plays an important part in the propagation of short-wave signals, which are very often inaudible or of poor quality within a certain radius of the transmitting station. As a general rule, stations located 1500 miles away will be heard quite satisfactorily, but reception within that distance is uncertain. Stations on very low wave-lengths, such as 13 metres, need to be transmitted through very long stretches of daylight to be effectively received, and the distance for goood reception is usually over 2000 miles. On 25 metres good reception is usually available from stations distant over 1000 miles, whilst on 31 metres 700 or 800 miles is usually necessary for consistent night reception. In winter-time even much greater distances are required. For this reason listeners in the eastern States will find that the Melbourne stations in winter will suffer from this "skip distance" effect, but 6ME (31.28), across the continent at Perth, will probably provide us with good signals. Reception of the 31 metres signals will be found effective at much closer distances in daylight. Different conditions prevail when we operate stations on 49 or 50 metres, when the effective distance is reduced to 200 or 300 miles. Conversely, it will be found that to receive these stations over very long distances the signal will need to travel a very substantial part of the journey through total darkness. pletely disappear as summer advances. The bands most affected in this way

TYPE OF SET

As in the early days, would-be listeners are rather naturally still very much troubled about the type of receiver they should purchase. We cannot, of course, presume to advise on the merits of respective makes, but we cannot help advice which applies to any article we wish to buy. And that is, buy the best that the owner's purse will permit. Certain receivers will give results of a kind, but there comes a time when the owner will feel a sense of disappointment. Therefore, make your purchase from a reputable firm or dealer. And there is an abundance of these nowadays. To many inquirers we have from time to time for the last year or so recommended would-be purchasers to buy an all-wave receiver, which to-day is little dearer than the ordinary broadcast machine, and gives the very best of results and performance equally on broadcast and short-wave bands. Personally, we think the day is not far distant when manufacturers will be but little concerned with turning out ordinary broadcast sets. Short-wave stations are increasing in such numbers and strength, as well as quality, that the popular demand will be for a receiver that will give overseas reception. So intending purchasers need have no qualms or fears in purchasing a dual or all wave receiver. The advantages of the latter are that all short-wave and broadcast bands can be covered. This advantage is probably more noticeable in winter when various stations become audible on 49 metres and higher and higher wave-lengths, which are spoiled by static in the summer months. Some manufacturers are now paying more attention also to the wave-lengths below 19 metres, which is all to the good, as Daventry and other centres are making increased use of the 16 and 13 metres bands.

LEARN THEIR LANGUAGE

IT is rather an interesting phase of D.X. and Short Wave listening, that one can in time get to know quite a bit about the languages of the countries from which broadcasts can be heard. It is not at all hard to pick up words here and there which are well known, and from these anyone with a flair for languages can in time, and particularly in German and French, understand a good deal of what is being said. Frequent references to world figures will often be noticed, particularly in the news services on the Short Wave bands. Often these people address the nations as a whole on a big scale, and one can often tune-in to terrific addresses by Hitler, Goering, etc.

Every overseas station runs a news session in English, at different periods of transmission, and it is an absorbing experience to listen to these and gain the viewpoint of the foreigner on world affairs. Russian stations particularly are very keen to answer questions and letters from correspondents dealing with problems of the Soviet, and these also are most enlightening. Truly, the man who is keen to listen-in to the world with his radio set gains a new angle on the international character of radio.

As Mr. Shaw has pointed out in his article, the B.B.C. stations are a constant source of amusement and pleasure. One has the opportunity of hearing many world-famous people from these stations from time to time. These take the air in talks, lecturettes, and, in the case of musicians, recitals. We well remember a series of lectures on music given by Sir Walford Davies, which was one of the best and most interesting we have heard. It was illustrated by Australian musicians—a pretty compliment to the land for whom the broadcasts were mainly intended.

One, of course, need hardly mention such events as the Coronation broadcast, University boat races, and other events which have their own national interest and appeal—events which invariably have their place in the overseas programme.

Many fine orchestras are also to be heard in recitals from the Continent. We first heard such combinations as the Comedy Harmonists from Berlin, and we liked them so much that we went out and bought some of their records! Rather a big step, to actually buy gramophone records on an audition from Berlin!

And don't forget the amateur stations which are to be heard chatting amongst themselves, and with their friends overseas. Many of these stations operate phone transmitters, and, particularly on 20 metres, are likely to be heard over amazing distances. One can be sure of hearing American amateurs any afternoon or evening on this band, and others appear, according to conditions, from South America, South Africa, India, England, and, in fact, from all over the globe. Apropos of our heading, we have actually heard a station in the Dutch East Indies conversing with an Australian amateur, and, night by night, teaching him a few words of Dutch. Most of these overseas amateurs know a good deal of English, but others are very valiant in their efforts to make themselves understood in our tongue.

It's great fun, this short wave listening. It brings the world to our feet.

Westinghouse Radio

THIRD DIMENSION—

"HANDS ACROSS THE SEA"
WESTINGHOUSE owners make friendly contacts throughout . .
THE WORLD

This unsolicited letter is one of the many continually being received from Westinghouse owners.

36 Hansard Street,
WATERLOO.
24th March 1937.

E.F. Wilks & Co., Ltd.,
124 Castlereagh Street,
SYDNEY.

Dear Sirs,

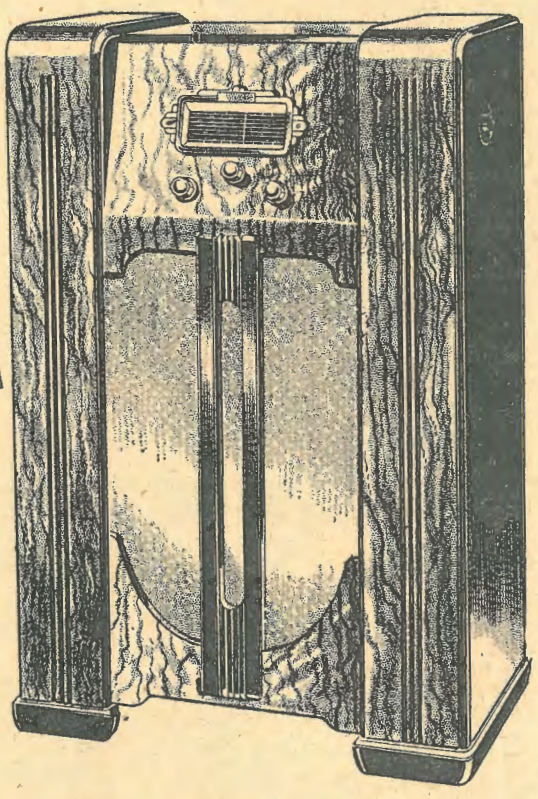
I take this chance to thank you for recommending a Westinghouse Radio to me. In the nine months I have used the set, the service has been unapproachable; I think in fairness to the Westinghouse I should let you know how useful the set is.

I will say without fear of contradiction that there is no Over-Sea Station that I cannot receive. I have made friends in America by receiving them on the Westinghouse and then writing to them. I think one of my best radio pals is James Troyer (W9.G.I.C.) Berwyn, Illinios U.S.A. I only have a 15 foot outside aerial - if any one doubts my statement I will only be too glad to demonstrate my set at the above address. It would be useless for me to count how many stations I have received.

Thanking you for past service,

I remain,

P. Neal



83 SHORT WAVE STATIONS LOGGED and VERIFIED on a **WESTINGHOUSE**

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SHORT WAVE STATIONS OF THE WORLD

It must be emphasised that the stations shown on this list cannot be heard each time the short waves are covered by the listener. They are, however, compiled from observations of stations which from time to time are to be heard in Australia. The list includes a note as to the best time of day to listen for the stations, some of which are audible only at certain times of the year. "T" stands for "telephone" stations, while "B" indicates that the station radiates broadcast programmes.

W/L	CALL	LOCATION
13.92	W8XK	Pittsburgh, U.S.A., 10 p.m. to midnight. B.
13.94	W2XE	Wayne, New Jersey, 10.30 p.m. to 4 a.m. B.
13.97	GSH	Daventry, 9 p.m. to 11.45 p.m., and in summer for periods midnight to 3 a.m. B.
14.27	LSN	Buenos Aires. 'Phone with GAA and PSF, 11 p.m. to 4 a.m. P.
14.72	GAA	Rugby, England. Around midnight. T.
14.99	DHO	Nauen, Germany. Late evenings. T.
15.28	VQG	Nairobi, East Africa. 'Phones London 10.30 p.m. to 11 p.m. T.
15.50	FTM	St. Assise, France. 1 to 5 a.m. T.
15.62	ORG	Brussels. Late evenings. T.
15.68	LSM	Buenos Aires. 'Phones EAQ, DHO, GAA evenings. T.
15.77	HS8PJ	Bangkok, Siam. Mondays, 11 p.m. to 1 a.m. B.
15.77	PLE	Bandoeng, Java. 'Phones, Holland, irregular, 9 p.m. T.
16.11	GAU	Rugby. Late evenings. T.
16.22	HBH	Geneva. Experimental station. Irregular. B.
16.30	PCK	Kootwijk, Holland. 'Phones, Java, around 10 p.m. T.
16.35	WLA	New Jersey. 'Phones, Rugby, 11 a.m. to 7 p.m. T.
16.38	GAS	Rugby. 'Phones, U.S.A., evenings. T.
16.44	FTE	St. Assise, France. Late evenings. T.
16.50	PMC	Bandoeng, Java. Irregular, 6.10 p.m. to midnight. T.
16.55	LSY	Buenos Aires. Experimental Station. Irregular. B.
16.82	PCV	Kootwijk, Holland. 'Phones, Java, 9 p.m. to midnight. T.
16.86	GSG	Daventry. 4 to 6 p.m. and 9 to 11.45 p.m. B.
16.87	W3XAL	Bound Brook, New Jersey. Midnight to 8 a.m. B.
16.89	DJE	Zeesen, Germany. 4 to 8.15 p.m. and at times 9 p.m. to 2 a.m. B.
16.90	ZBW5	Hongkong. Experimental, evenings, irregular. B.
16.91	HSP	Bangkok. Irregular. Broadcast and 'phones. Evenings. B.
17.52	WOO	Ocean City, New Jersey. Ship 'phones, late evenings. T.
18.38	ITK	Italian Somaliland. 'Phones, Rome, late evenings. T.
18.44	WLK	New Jersey. 'Phones, Rugby, mornings. T.
18.47	KTO	Manila. 'Phones, Tokio, 8 a.m. to noon. Irregular. T.
18.51	FZR	Saigon, Indo-China. 'Phones, Paris, between 9 and midnight. T.
18.71	KKP	Hawaii. 'Phones KWU 4 to 10 a.m. T.
18.89	FTK	St. Assise, Paris. 'Phones, Saigon, 11.30 p.m. to 2 a.m. T.
18.99	XOJ	Shanghai, China. 'Phones, Tokio, 8 a.m. to 3 p.m. T.
18.91	CEC	Santiago, Chile. 'Phones, OCJ, 2 p.m. and 4 a.m. T.
19.02	LSL	Buenos Aires. 'Phones, GAA, 11 p.m. to 1 a.m. T.
19.15	JVE	Nazaki, Japan. 'Phones, Java, 6 to 8 p.m. T.
19.20	JVF	Nazaki, Japan. 'Phones, New York, between 8 p.m. and 8 a.m. T.
19.52	HAS3	Budapest, Hungary. Sunday, midnight to 1 a.m. B.
19.54	KWU	Dixon, California. 'Phones, Honolulu, 2 to 10 a.m. T.
19.56	DJR	Berlin. Daily, 11 p.m. to 1 a.m. B.
19.56	W2XAD	Schenectady, U.S.A. Daily, 1 to 6.45 a.m. B.
19.58	OLR	Podebrady, Czechoslovakia. Experimental, late evenings. B.
19.62	LRU	Buenos Aires. Irregular, usually 10 p.m. to 8 a.m. B.
19.63	DJQ	Berlin. 3 to 5 p.m., 9 p.m. to 2 a.m., 7.50 a.m. to 1.45 p.m. B.
19.64	W2XE	New Jersey. Daily, 4 to 9 a.m. B.
19.66	GSI	Daventry. Daily, 3.15 to 6.45 a.m. B.
19.68	RIM	Tashkent, Russia. 'Phones, RKI, 10 p.m. T.
19.68	W1XAL	Boston, U.S.A. Sunday, from 2 a.m., and occasionally other mornings. B.
19.68	TPA2	Paris. Daily, 9 p.m. to 2 a.m. B.
19.69	OLR	Podebrady, Czechoslovakia. Experimental, usually morning. B.
19.71	PCJ	Hilversun, Holland. Tues., 7.30 to 9 p.m. Wed., 11 p.m. to 2 a.m. B.
19.71	W8XK	Pittsburgh, U.S.A. Relays, KDKA, midnight to 10 a.m. Be heard well winter, late mornings. B.
19.74	DJB	Berlin. Daily, 3 to 8.15 p.m., 9 to 2 a.m., 7.50 a.m. to 1.45 p.m. B.
19.76	GSO	Daventry. At present 4-6 p.m. and 9.11.55 p.m. and 7-9 a.m. Changes according to season. B.
19.76	RV96	Moscow. Mondays, 4.30 to 5.30 a.m. B.
19.76	ZBW4	Hongkong. Experimental and irregular. Evenings. B.
19.79	JZK	Tokio, Japan. Irregular, usually about 5 to 7 a.m. B.
19.80	YDC	Bandoeng, Java. Daily, 8.30 p.m. to 1.30 a.m. B.
19.82	GSF	Daventry. 7 to 9 a.m., noon to 2 p.m., and 9 to 3 a.m. B.
19.84	HVJ	Vatican City. Mornings, about 1.30 to 1.45 a.m. B.
19.85	DJL	Zeesen, Germany. 2.35 to 7.30 a.m., 3 to 5 p.m., and 11 p.m. to midnight. B.
19.89	RKI	Moscow. Mondays, 1 to 2 a.m. B.

W/L	CALL	LOCATION
20.03	KAY	Manila. 'Phones, Germany, 8 to 10 p.m., and America, 10 to 11 a.m. T.
20.07	PSE	Rio de Janeiro, Brazil. Occasionally around 7 a.m. B.
20.08	HJB	Colombia. 'Phones, New York, late evenings. T.
20.08	HJA3	Colombia. 'Phones, New York, morning and evening. T.
20.20	LZA	Sofia, Bulgaria. Sun., 3.30 to 11 p.m. Other days, 4 to 6 a.m. and 8 to 10 p.m. B.
20.29	ROU	Omsk, Siberia. 'Phones, Moscow, around 10 p.m. T.
20.37	IQA	Rome. Irregularly, around 11 p.m. T.
20.45	GBL	Rugby. 'Phones, JVH, between 4 and 10 p.m. T.
20.55	JVH	Nazaki, Japan. Usually 3 to 4 p.m., and occasionally early evening. B.
20.65	LSN	Buenos Aires. 'Phones, New York, late nights. T.
20.65	HBL	Geneva. Irregular, but occasionally late afternoon. T.
20.75	DZH	Zeesen. Heard 7 to 10 a.m., but irregular. B.
21.46	PZ1AA	Dutch Guiana. Early morning. B.
21.58	WQP	Rocky Point, New York. Experimental, late evenings. B.
21.70	SUZ	Cairo. 'Phones, Rugby, 10 p.m. to 1.30 a.m. T.
21.91	KKZ	Bolinas, California. Experimental, late afternoons. B.
22.00	SPW	Warsaw, Poland. Tues., Thurs., Sat., 2.30 to 3.30 a.m. B.
22.09	GBB	Rugby. 'Phones, Canada, late nights. T.
22.58	CGA3	Drummondville, Canada. 'Phones, late evenings. T.
22.70	IRJ	Rome. Irregularly 'phones Japan, 8 to 11 p.m. T.
23.36	WOO	Ocean Gate, New Jersey. 'Phones, irregularly, mornings. T.
23.38	CNR	Rabat, Morocco. 'Phones, Paris, from 8 p.m. T.
23.45	IAC	Pisa, Italy. 'Phones, late evening. T.
23.47	GBC	Rugby. Irregular; usually works ships. T.
24.20	DAF	Norden, Germany. Late evening. T.
24.40	PLM	Bandoeng, Java. Irregular; usually after 9 p.m. T.
24.41	GBU	Rugby. 'Phones, America, early morning. T.
24.52	TFJ	Reykjavik, Iceland. Mondays, 4.40 to 5.30 a.m. B.
24.69	GBS	Rugby. 'Phones, New York, morning. T.
24.73	DZE	Berlin. Experimental and irregular. Usually late evening or around 8 a.m. B.
25.00	RNE	Moscow. Sun. and Wed., 9-10 p.m. Winter, 7-9 a.m. also. B.
25.02	FZS	Saigon. 'Phones, Paris, late evenings. T.
25.09	IUC	Addis Ababa. 'Phones, Rome, after midnight. T.
25.11	KKQ	Bolinas, California. Tuesday, 2.30 p.m. Also experimental at other times. B.
25.12	FTA	St. Assise, Paris. 'Phones, Canada, 7 p.m., and Buenos Aires, 1 p.m. T.
25.21	XEWI	Mexico City. Noon to 3 p.m. B.
25.23	TPA3	Paris. Daily, 3.15 to about 8.20 a.m. and 7 to 8 p.m. in summer; 5 to 7 p.m., winter. B.
25.26	OLR	Podebrady, Czechoslovakia. Experimental, early morning. B.
25.27	W8XK	Pittsburgh, U.S.A. Mornings until about 1 p.m. B.
25.34	OLR	Podebrady. Daily, 5.30 to 7 a.m., when changes to 31.41 or 49.92 metres. English News at 6 a.m. Schedule changed frequently. B.
25.36	W2XE	Wayne, New Jersey. Audible around 8 a.m. B.
25.40	2RO4	Rome. 9.43 p.m. to 1.30 a.m., and usually in winter 2.30 to 9 a.m. B.
25.42	JZJ	Tokio, Japan. Schedule yet uncertain, but usually from about 5 a.m. to 6.30 or 7 a.m. B.
25.45	W1XAL	Boston. 6 to 8 a.m., and Sun., 4.15 to 5.30 a.m. B.
25.49	DJD	Zeesen, Berlin. Daily 2.35 to 7.30 a.m., 7.50 a.m. to 1.50 p.m. B.
25.53	GSD	Daventry. Daily, 3.15 to 9 a.m. and 11 a.m. to 2 p.m. Also afternoon in summer. B.
25.57	PHI	Hilversum, Holland. Daily, except Tues. and Wed., 11.30 p.m. to 2 a.m. in summer, but wavelength of 16.88 in winter. B.
52.58	Radio	Saigon, Indo-China. Experimental, usually around 9 p.m. B.
25.60	CR7BA	Lourenco Marques. About 12.30 a.m. to 7 a.m. B.
25.60	CJRX	Winnipeg, Canada. Daily, 9 a.m. to 3 p.m. B.
25.60	CR7BH	Mozambique, Africa. Heard after midnight. B.
25.63	TPA4	Pontoise, Paris. Daily, winter, 9 a.m. to 11 a.m. and 12.45 to 3 p.m., and to 4 p.m. in summer. B.
25.63	SM5SK	Stockholm, Sweden. Thursdays, 8 to 9 a.m. B.
25.63	KIO	Hawaii. Occasionally late mornings in winter. B.
26.09	PMK	Bandoeng, Java. Irregular, evenings, experimental. B.
26.09	XAM	Merida, Yucatan. Irregular, late evenings. B.
26.10	COCX	Havana, Cuba. Late mornings, early afternoons, and late evenings. B.
26.31	HBO	Geneva. Irregular, late afternoon, occasionally with Melbourne. B.
27.17	CSW	Portugal. Daily, 6.30 to about 8 a.m. B.
27.15	ZLT	Wellington, N.Z. 'Phones with VLK and S.S. Awatea, late afternoon and evening. T.
27.25	PLP	Bandoeng, Java. Daily, 8.30 p.m. to 1.30 p.m. B.
27.86	GBP	Rugby. 'Phones with VLK, late afternoon or evening. T.
27.93	JVM	Tokio, Japan. Late evenings and about 5 to 6.30 a.m. B.
28.09	WNB	New Jersey. 'Phones Bermuda late evenings. T.
28.12	CEC	Santiago, Chile. Daily, 10-11 a.m., and Fri., Mon., 11.30 to noon. B.
28.14	JVN	Tokio. Daily, 6.45 to 11 p.m. English news, 7.55 p.m. Also mornings 7.0 to 8.0. B.
28.51	2ME or VLK	Sydney. 'Phones with BBP afternoons. T.
28.79	XGW	Shanghai, China. 'Phones Tokio around 3 p.m. T.
28.00	PDK	Kootwijk, Holland. 'Phones Java around 10.30 a.m. T.
28.5	KEZ	Bolinas, California. Experimental, irregular. B.
28.93	EAJ43	Canary Islands. 5.15 to 6.50 and 9 to 11 a.m. B.
29.04	ORK	Brussels, Belgium. 4.30 to 6 a.m., occasionally 7 a.m. B.
29.13	LSQ	Buenos Aires. Experimental. B.
29.15	DZC	Zeesen, Berlin. Experimental and special broadcasts. B.
29.25	PMN	Bandoeng, Java. 8.30 p.m. to 1.30 a.m. B.
29.27	LSL	Buenos Aires. Experimental; occasionally 8.30 a.m. B.
29.33	CED	Antofagasta, Chile. Experimental, around 10 a.m. B.
29.45	PSH	Rio Janeiro. Late mornings. T.
29.50	RIO	Baku, Russia. Irregular, between 1 p.m. and 1 a.m. T.
29.83	SUV	Cairo. 'Phones Rugby around 6.30 a.m. T.
29.88	DZB	Zeesen, Berlin. Experimental, and for special broadcasts. B.
30.15	GCU	Rugby. 'Phones New York late mornings. T.
30.18	CSW	Lisbon, Portugal. Daily, about 7 to 10 a.m. and 3 to about 4 p.m. B.
30.40	JYS	Kemikawa-Cho, Japan. Experimental, late evenings. B.
30.40	EAQ	Madrid. Mornings about 8.15, and Sun., 4 to 6 a.m. B.
30.52	IRM	Rome. 'Phones Cairo early mornings. T.
30.77	COCQ	Havana, Cuba. 10 p.m. to 4 a.m. and around 7 a.m. B.
30.96	TI4NRH	Heredia, Costa Rica. 12.10 to 2.30 p.m. B.

W/L	CALL	LOCATION
31.06	LRX	Buenos Aires. 8 a.m. to 2 p.m. daily. B.
31.08	DGU	Nauen, Germany. 'Phones Cairo late mornings. T.
31.09	CT1AA	Lisbon, Portugal. Wed., Fri., Sun., 7.30 a.m. to 10 a.m. B.
31.34	YDB	Sourabaya, Java. Daily, 8.30 p.m. to 1.30 a.m. B.
31.13	HH3W	Port-au-Prince, Haiti. Daily, 4 to 5 a.m. B.
31.13	2RO3	Rome. Daily, 2.30 a.m. to 9 a.m. Probably change to 25.4 metres in winter. B.
31.17	HJ2ABD	Colombia. Experimental and irregular. B.
31.20	HJ1ABP	Cartagenia, Colombia. Daily, 10 p.m. to 4 a.m. and 8 a.m. to 2 p.m. B.
31.22	HP5J	Panama City. Daily, 2.45 to 4 a.m. and 9.30 a.m. to 2 p.m., and also around 10 or 11 p.m. B.
31.25	RAN	Moscow. Daily, 10 to 10.30 a.m. B.
31.27	HBL	Geneva. Sun., 8.30 a.m., and often afternoon with 3LR. B.
31.28	6ME	Perth. Daily, except Sunday, 9 to 11 p.m. B.
31.28	W3XAU	Philadelphia. Daily, 3 to 11 a.m., and Sunday, to 10 a.m. B.
31.28	VK2ME	Sydney. Sun., 4 to 6 p.m. and 8 p.m. to midnight. B.
31.28	PCJ	Eindhoven, Holland. Tues., 7.30-9 p.m.; Wed., 4.30 to 6 a.m. and 11 p.m. to 2 a.m. B.
31.32	GSC	Daventry. Daily, noon to 2 p.m. B.
31.34	3LR	Melbourne. Daily, 6.30 to 11.30 p.m., except Sunday, when close 10.30 p.m. Also Sat., 1.30 to 5.30 p.m. B.
31.35	HJ2ABC	Cucuta, Colombia. 2 to 3 p.m. and 9 a.m. to 12.30 p.m. B.
31.35	CQN	Macao, China. Irregular, 10 p.m. Also varies wavelength. B.
31.35	W1XK	Boston. Daily, 9 p.m. to 4 p.m. next day. B.
31.36	VUB	Bombay, India. Thurs., Fri., Sun., 2 to 3.30 a.m. B.
31.38	DJA	Zeesen, Berlin. Daily, 3-8.15 p.m., 9 p.m. to 1.45 a.m., and 7.50 a.m. to 1.45 p.m. B.
31.38	HJ1ABB	Barranquilla, Colombia. 3 to 9 a.m. and early afternoon, and from 11 p.m. B.
31.41	VPD2	Suva, Fiji. Daily, except Sun., 8.30 to 10 p.m. B.
31.41	OLR3	Praha, Czechoslovakia. Between 5.40 and 7.30 a.m. B.
31.45	DJN	Zeesen, Berlin. 7.50 a.m. to 1.45 p.m., 3 to 8.15 p.m., and 9 p.m. to 1.45 a.m. B.
31.48	JZI	Nazaki, Japan. Experimental, irregular. Usually midnight to 1 a.m. B.
31.48	LKJ1	Jeloy, Norway. About 7.30 or 8 a.m. daily, and evening to about 11 p.m. B.
31.48	W2XAF	Schenectady, New York. Daily, 7 am. to 3 p.m., and in special broadcasts around 10 p.m.
31.49	ZBW3	Hongkong. Nightly from about 7 to midnight. B.
31.50	HJ4ABH	Colombia. 10 a.m. to about 3.30 p.m. B.
31.55	3ME	Melbourne. Except Sun., 7 to 10 p.m. B.
31.55	HJU	Colombia. Tues., Thurs., Sat., 3-5 a.m. and 11 a.m.-2 p.m. B.
31.55	GSB	Daventry. Daily, 3.15 to 9 a.m., noon to 2 p.m., 3 to 5.15 p.m., and midnight to 2 a.m. B.
31.56	PRF5	Rio de Janeiro. Irregular, but heard around 7.30 to 9 a.m. and in late afternoons. B.
31.58	HJ1ABE	Cartagena, Colombia. 10.30 p.m. to 12.30 a.m. B.
31.65	EAQ2	Madrid, Spain. Daily, 5.45 to 7 a.m. English sessions Wed. and Sat. B.
31.68	XTV	Canton, China. Heard late evenings. B.
31.75	TGWA	Guatemala City. 11 a.m. to 3 p.m., Sunday to 9 p.m. B.
31.75	EAH	Madrid. Irregular. Music and 'phones early morning. B.
31.82	COCH	Havana, Cuba. Daily, 10 p.m. to 4 a.m. B.
31.86	PLV	Bandoeng. Wed. and Sat., 1 to 1.30 a.m. B.
32.09	HS8PJ	Bangkok, Siam. Thurs., 10.30 p.m. to 1 a.m. Irregular, and liable to change wavelength. B.
32.15	OAX4J	Box 1166, Lima, Peru. Sunday afternoon till 4.0. B.
32.88	HAT4	Budapest, Hungary. Mondays, 9 to 10 a.m. B.
33.3	TPA2	Paris. Music and Talks between 5 and 6 p.m. B.
33.29	KEJ	Bolinas, California. Experimental. B.
33.34	S.S. Awatea.	'Phones when at sea between Auckland and Sydney. T.
33.52	W2XBJ	Rocky Point, New York. Experimental, irregular. B.
34.10	HKV	Bogota, Colombia. Experimental, heard around 8.30 a.m. B.
34.62	CO9JQ	Camaguey, Cuba. 8.30 to 9.30 a.m. and 11 a.m. to noon. B.
34.68	WVD	Seattle, Washington. Experimental. B.
35.02	YNLG	Nicaragua. 3 to 4.30 a.m., 9.30 to noon. B.
36.36	HC2CW	Ecuador. 11 a.m. to 2.30 p.m. B.
36.63	XEME	Mexico. 1.30 to 6 a.m. and 9.30 a.m. to 2 p.m. B.
36.95	KTP	Manila. 'Phones and occasional broadcasts after midnight. B.
38.06	SUX	Cairo. 'Phones London and Rome late mornings. T.
38.08	HC2JSB	Ecuador. 3 to 5 a.m. and 9 a.m. to 2 p.m. B.
31.15	PGA	Holland. 'Phoning Dutch stations after midnight. T.
38.47	HBP	Geneva. Sundays, 8.30 to 9.15 a.m. B.
38.50	PSZ	Rio de Janiero, Brazil. Around 9 a.m. to about 2 p.m. B.
39.42	KWX	Dixon, California. 'Phones late mornings. T.
39.68	KWY	Dixon, California. Experimental, around 1 p.m. B.
39.74	TI8WS	Punta Arenas. Experimental, irregular from 10.30 a.m. B.
39.89	HCK	Quito, Ecuador. Around 10 and 11 a.m. B.
40.65	XECR	Mexico City. Mondays, 4 to 6 a.m. B.
40.71	KEQ	Hawaii. 'Phone and experimental. Irregular. T.
41.55	HKE	Colombia. Mon., 9.10 a.m.; Tues., Fri., 6-7 a.m. B.
41.67	YNAM	Nicaragua. Irregular, 11 a.m. to 2.30 p.m. B.
41.80	CR6AA	Angola, Africa. Thur. and Sun., 5.30 to 7.30 a.m. B.
42.25	FO8AA	Papeete, Tahiti. Wed. and Sat., 2 to 3 p.m. B.
42.35	PI1J	Dordrecht, Holland. Sunday, 1.10 to 2.10 a.m. B.
42.78	EA8AB	Teneriffe, Canary Islands. Tues., Thur., Sat., Sun., 6.15 to about 7.15 a.m. B.
42.88	PZH	Dutch Guiana. 5.40 a.m. to 12.40 p.m. Irregular. B.
43.00	XBA	Mexico. 12.30 to 4 a.m. and 10 to 11.30 a.m. B.
43.48	HI2D	Trujillo, D.R. Occasionally 10 a.m. to 1 p.m. B.
43.99	XGOX	Nanking, China. About 8.30 p.m. to 12.30 a.m. B.
44.12	HI7P	Trujillo, D.R. Around 10.30 a.m. to 1 p.m. B.
44.58	HI3C	La Romana, D.R. 3.10 to 5.10 a.m. and 9.10 a.m. to 10.30 a.m. B.
44.84	TIEP	San Jose, C.R. 8 a.m. to 2 p.m. B.
44.96	YVQ	Maracay, Venezuela. 10 to 11.30 a.m. B.
45.18	HC2RL	Guayaquil, Ecuador. Friday, noon to 2.30 p.m. B.
46.77	HJA3	Barranquilla, Colombia. Experimental, early morning. B.
46.80	TIPG	San Jose, Costa Rica. 3-5 a.m. and 9 a.m. to 2.40 p.m. B.
47.24	HRP1	San Pedro, Honduras. 4-6 a.m. and 11.45 a.m. to 2 p.m. B.
47.24	HRY	Honduras. Experimental, around 10 a.m. to 12.30 p.m.
47.32	HIX	Trujillo, D.R. 7.40 to 8.40 a.m. Sun., 10.40 p.m. to 1.40 a.m. B.
47.39	JZG	Tokio. Experimental, occasionally 8 p.m. to 10 p.m. B.
47.50	HIZ	Trujillo, D.R. 2.30-5.45 a.m., 5.45-noon. B.
47.77	COHB	Cuba. Midnight to 1 a.m., 3-4 a.m., 7-9 a.m., noon to 2 p.m. B.
47.92	OAX4G	Lima, Peru. 10 a.m. to 1 p.m. Wed., 9 a.m. B.
48.08	HIB	Trujillo, D.R. 2.40-7.10 a.m., 10.10 a.m. to 12.10 p.m. B.
48.11	HRD	Honduras. 11 a.m. to 2 p.m. Sun., 7 to 9 a.m. B.
48.39	COKG	Santiago, Cuba. 11.30 p.m. to 2 a.m. B.
48.50	HI1A	Santiago de los Caballeros, D.R. 2.40 a.m. to 4.40 a.m. B.
48.55	XEXA	Mexico City. 9 p.m. to midnight and 4 to 5.45 a.m. B.
48.60	HJ2ABA	Hunja, Colombia. 4-5 a.m., 10 a.m. to 1 p.m. B.

W/L	CALL	LOCATION
48.78	HJ4BU	Pereira, Colombia. Midnight to 3 a.m. and 9 a.m. to 1 p.m. B.
48.80	HI5N	Trujillo, D.R. 9.40 a.m. to 12.10 p.m. B.
48.80	CJRO	Winnipeg, Canada. 9 a.m. to 3 p.m. B.
48.80	ZEB	Bulawayo, Rhodesia. Sun., 6 to 8 p.m. Wed. and Sat., 4.15 a.m. B.
48.83	W8XK	Pittsburgh. 1 p.m. to 4 p.m. B.
48.86	HJ4BD	Medellin, Colombia. 11 a.m. to 2.30 p.m. B.
48.92	ZGE	Kuala Lumpur. Sun., Tues., Fri., 9.40 to 11.40 p.m. B.
48.92	CR7AA	Mozambique, Africa. Heard after midnight. B.
48.92	VP3BG	British Guiana. Around 6 to 11.45 a.m. B.
48.92	COCD	Havana, Cuba. Between 9 p.m. and 4 p.m. B.
49.02	XEFT	Vera Cruz, Mexico. 2.30 to 7 a.m. and 10.30 a.m.-noon. B.
49.02	W2XE	Wayne, New Jersey. 1 to 2 p.m. B.
49.30		Radio Burma, Rangoon. Heard from midnight. B.
49.10	HJ1ABB	Colombia. 7.30 a.m. to 1 p.m. B.
49.10	VUC	Calcutta. 12.30 to 3 p.m. B.
49.05	OLR	Podebrady, Czechoslovakia. Experimental. Usually 7 a.m. B.
49.10	GSL	Daventry. Empire station. Probably from 9 to 11 a.m. B.
49.18	——	Belgrade. 4 to 6 p.m., 9.30 to 11.15 p.m., and 3 to 8 a.m. B.
49.18	W9XF	Chicago. Daily, except Sun., 2 to 5 a.m., and occasionally around 4 to 5 p.m. B.
49.18	W3XAL	Boundbrook, U.S.A. 9 a.m. to 2 p.m. B.
49.18	HJ4ABE	Medellin, Colombia. 2 to 3 a.m. and 9 a.m. to 2.30 p.m. B.
49.20	ZTJ	Johannesburg, Africa. 6.30 to 10 p.m., midnight to 7 a.m. B.
49.26	ZBW2	Hongkong. Experimental. At present not in use. B.
49.30	HJ5ABD	Colombia. 10 a.m. to 1 p.m. B.
49.30		Radio Burma, Rangoon. From about midnight. English at midnight. B.
49.31	7LO	Nairobi, East Africa. 2 a.m. to about 6 a.m. B.
49.34	W9XAA	Chicago. Usually heard around 4 p.m. F
49.34	HP5F	Colon, Panama. 2.45 to 4.15 p.m. and aroun 10.45 a.m. B.
49.34	ZHJ	Penang, Sumatra. 9.40 to 11.40 p.m. B.
49.50	OXY	Denmark. 4 to 9 a.m. B.
49.50	W8XAL	Cincinnati, U.S.A. 2 to 5 a.m. and 9.30 to 11 p.m. B.
49.50	W3XAU	Philadelphia. 11 a.m. to 2 p.m. B.
49.55	HJ3ABD	Bogota, Colombia. 10.30 a.m. to 2 p.m. B.
49.67	XECW	Mexico City. Noon to 3 p.m. B.
49.67	W1XAL	Boston. Tues., Wed., Sat., 10.30 a.m. to 12.30 p.m. B.
49.83	PRA8	Brazil. 6 to 11 a.m. Irregular. B.
49.83	DJC	Zeesen, Berlin. 2.35 to 7.30 a.m. and 7.50 a.m. to 1.40 p.m. B.
49.85	HJ3ABH	Bogota, Colombia. 2.30 to 5 a.m. and 9 a.m. to 2 p.m. B.
49.90	COCO	Havana. 11 a.m. to 2 p.m. Occasionally weekends to 6 p.m. B.
49.92	OLR	Podebrady. Experimental, irregular. Around 6.30 a.m. B.
49.92	ZHI	Singapore. Mon., Wed., Thur., 8.40 to 11.40 p.m. B.
49.98	9MI	S.S. Kanimbla. Ship station. Evenings at 10 a.m. B.
50.00	RV59 or RNE	Moscow. Summer, 7 to 8 a.m. B.
50.00	XEBT	Mexico City. 9 a.m. to 4 p.m. Irregular. B.
50.26	HVJ	Vatican City. 5 to 5.15 a.m. Occasionally Sunday 8 to 8.30 p.m. B.
50.42	HJN	Bogota, Colombia. 9 a.m. to 2 p.m. B.
50.51	TG2X	Guatemala City. Tues., Fri., Sun., 7 to 9 a.m. B.
50.90	ZNB	Bechuanaland. Daily, except Sunday, 4 to 5 a.m. B.
58.30	PMY	Bandoeng. 9.40 p.m. to 2 a.m. B.
60.00	ZUD	Radio Pretoria. About 11 p.m. and 4 a.m. B.
70.20	RV15	Khabarovsk. U.S.S.R. About 8 p.m. to midnight. B.
98.6	YDA	Bandoeng. 8.30 p.m. to 1.30 a.m. B.

GETTING RESULTS!

How to Make the Home-built Receiver Do Its Best

THIS article has been written expressly for the owner who is a considerable distance from a serviceman, and, being thrown upon his own resources, must use his discretion in servicing his receiver.

Servicing a superheterodyne receiver requires a certain amount of experience, and in this article we will point out what we consider the main difficulties which may arise under certain circumstances. This should give experimenters hints enabling them to get the best results.

The general procedure in locating faults is to first determine under what category they fall:—No signals, distortion, fading, intermittent reception, weak signals, hum, noisy reception, whistles and squeals.

WEAK SIGNALS

Aerial and earth making bad contact.—Check grid bias on each tube with a voltmeter in case the bias resistance has altered its value.—Faulty valve.—Incorrect tuning alignment.—Defective resistors.—Speaker out of adjustment.—Batteries exhausted.

DISTORTION

This complaint can generally be traced to the audio amplifier.—Incorrect grid bias.—Incorrect plate voltage.—Rusty grid clips.—Faulty valve.—Faulty grid coupling condenser.—If distortion and rattling appear when the speaker field heats up it is almost certain the cone of the speaker is warped or out of alignment.

INSTABILITY

Insufficient bias on I.F. valve, also an open circuit by-pass condenser.—It might be necessary to add capacity to various condensers in the I.F. circuit.—Valves not shielded.—Instability can be introduced by radio frequency getting through to the audio circuit. Try a paper by-pass condenser from B plus to earth. Another way of ensuring that stray radio frequency in the audio circuit does not cause trouble is to place a small paper by-pass condenser, .001 mfd., across the speaker input transformer.—Keep plate and grid leads at right angles to each other and as short as possible.—If grid or plate leads are long, it might be found necessary to shield them.—Valve shields making bad contact to the chassis.

NOISY RECEPTION

Defective voltage divider.—Sparking over, punctured condenser.—Defective resistor.—Aerial parallel to power lines, or electrical devices.—Aerial too long, picks up stray noises.—Loose or corroded ground connection.—Audio transformer breaking down static.

HUM

Power transformer badly centre tapped.—Filter chokes too small to carry the current.—Insufficient capacity in filter condenser.—Set not earthed.—Faulty valve (rectifier).—Broadcast station.—Make certain the audio transformer is at right angles to power transformer or chokes.

WHISTLES AND SQUEALS

Open circuit A.V.C. condenser.—Set out of alignment.—Insufficient bias on I.F. tube.—Oscillator voltage too high.—Heterodyne whistle from two stations nearly on the same wavelength.—Experiment with screen voltages.

DEAD SPOTS

Faulty oscillator valve.—Incorrect oscillator voltages.

POOR SELECTIVITY

Aerial too long.—Try a .0001 fixed condenser in series with the aerial.—Try a wave trap.—Grid leads too long.—Set out of alignment.

(Continued on Page 48)

DX MEANS DISTANCE

A LIST OF STATIONS IN OTHER COUNTRIES

By ALAN McGREGOR

SOME time ago when radio was very young we became accustomed to our radio friends waxing enthusiastic over the reception of some little station located some thousands of miles away, and not to be outdone we invariably sought to better our friend's result. At times we were able to do this, but as time went on it became like the proverbial fisherman's story, and it became apparent that the station themselves would like to hear from their distant listeners. And, moreover, why not get positive proof of reception from the station in question? Then at least we would be enabled to provide our doubting friends with definite facts of our reception. And so DX as we understand it to-day was born.

DX is the telegraphic expression used to denote long distance, and thus our DX reception is almost solely confined to overseas transmitters, though due consideration is always given to the output power of the station concerned, and so we may find it more difficult to receive in Eastern Australia distant low powered locals than an Asiatic station. Nevertheless, we are always more pleased to have confimation of some overseas station than we are to have that of an Australian station.

LOCATION IMPORTANT

At times we have been asked what is necessary to embark upon a successful DX career, and we would say that location is probably one of the most important features. This however, is not to be construed as meaning that a country location is essential, for we know of one enthusiast whose location, not more distant than one mile from the G.P.O., has proved excellent. Concentrated efforts must be made by the would be aspirant to track down and eradicate power noises. The receiver to be used, should possess both selectivity and sensitivity. The aerial system must be no haphazard affair, but should be carefully insulated, and possess reasonable height, and length. (Approx. 40 x 100ft.). Headphones are a very desirable part of the equipment of the would be successful. They permit reception of much weaker signals than the speaker.

EFFECT OF SEASONS

The actual reporting of signals received is very easy, and if due care be taken a readily identifiable can be supplied to the station authorities. This report should give exact details of reception over a period of approximately thirty (30) minutes. Details of the receiver used, type of aerial system, weather conditions, atmospherics, and signal strength should be reported. If at all possible compare the signal strength of the station being reported with another located in the same country. Never exaggerate the strength of the signal strength of the station being reported, for the authorities are readily able to recognise any deliberate distortion of fact. In reporting to a station, no matter in what country it may be located, use the simplest sentence construction, and be as brief as possible. Moreover, be very careful to convert to the country's standard time from which the programme originated the time of reception of each item reported. A good, accurate time chart may be purchased for a few pence, and saves much time, and bother.

SENDING REPORTS

Though it is not possible to submit any fixed rules regarding the period of the year best suited to reception from different quarters of the globe, it will be noted that whilst Asian stations are audible throughout almost the whole year, stations from Europe are usually best received during March, and between July and October. The Asian stations are heard late at night when our locals close, and the Europeans before sunrise. During winter months American stations will be heard until (usually) 6.0 p.m., but as interference is so rife at this time, we find that after midnight during summer is better suited. New Zealand stations will be heard through clear channels during our early evenings. African broadcasters are heard during the early mornings at the same period of the year as Europeans.

A list of stations all of which are well heard in Australia are given, together with information regarding the period, and time of their reception. This list is by no means complete, but we assure our readers that any request for identification will be readily met. A careful following of the above hints will soon result in even the novice having a log of DX stations well worthy of merit.

OVERSEAS BROADCAST STATIONS

AFRICA

AFRICAN stations are commonly audible at the same time of the year as those from Europe. As with Europeans they are best received prior to sunrise.

Location	Frequency	Power
Grahamstown	560	10
Capetown	600	10
Rabat (Morocco)	601	30
Johannesburg	645	10
Pietermaritzburg	698	10
Durban	749	1
Bloemfontein	776	0.75
Algiers (Algeria)	941	12
Nairobi (Kenya)	858	0.6

NEW ZEALAND

NEW ZEALAND stations are audible during our early evening and early morning. By early morning, we mean, from 5 a.m. to 6 a.m.

Call	Frequency	Location	Power
2YA	570	Wellington	60
4ZP	620	Invercargill	0.5
IYA	650	Auckland	10
3YA	720	Christchurch	10
2YB	760	New Plymouth	0.1
4YA	790	Dunedin	10
2ZH	820	Napier	0.65
2YC	840	Wellington	0.2
IYX	880	Auckland	0.15
2ZP	900	Wairoa	0.25
3ZR	940	Greymouth	0.4
2ZF	960	Palmerston North	0.25
2ZJ	980	Gisborne	0.075
4ZO	1010	Dunedin	0.025
4ZM	1010	Dunedin	0.06
1ZB	1030	Auckland	0.15
4YO	1140	Dunedin	0.15
2ZM	1150	Gisborne	0.025
2ZD	1170	Masterton	0.005
3YL	1200	Christchurch	0.5
4ZL	1220	Dunedin	0.1
2ZL	1240	Hastings	0.02
1ZM	1260	Manurewa	0.15
1ZJ	1310	Auckland	0.088
4ZR	1340	Balclutha	0.001
2ZO	1400	Palmerston North	0.1

N.B.—In the lists given it is to be noted that the frequency is expressed in kilocycles and the power in kilowatts.

AMERICAN BROADCAST STATIONS

AMERICAN broadcasters are audible during two definite seasons of the year. During our autumn and winter we hear them during the early evening, closing their transmission. During our summer months they are best received towards midnight, and after when they are beginning their transmission for the day.

Call.	Frequency	Location	Power.	Closing Time.	Opening Time.
K.L.Z.	560	Denver	1	5.00 p.m.	11.30 p.m.
K.F.S.O.	560	San Francisco	1	7.00 p.m.	1.30 a.m.
K.M.T.R.	570	Hollywood	1	5.30 p.m.	12.45 a.m.
K.M.J.	580	Fresno	1	6.00 p.m.	1.00 a.m.
K.H.Q.	590	Spokane	1	6.00 p.m.	12.45 a.m.
K.F.S.D.	600	San Diego	1	6.00 p.m.	1.00 a.m.
K.F.R.C.	610	San Francisco	1	6.00 p.m.	12.00 p.m.
K.G.W.	620	Portland	1	6.00 p.m.	1.00 a.m.
K.F.I.	640	Los Angeles	50	6.00 p.m.	12.45 a.m.
W.M.A.Q.	670	Chicago	50	5.00 p.m.	11.00 p.m.
K.G.U.	750	Honolulu	2.5	7.00 p.m.	3.00 a.m.
W.B.B.M.	770	Chicago	50	6.15 p.m.	10.50 p.m.
K.G.O.	790	San Francisco	7.5	6.00 p.m.	1.30 a.m.
K.O.A.	830	Denver	50	5.00 p.m.	12.00 a.m.
X.E.R.A.	840	Villa Acuna	150		12.45 a.m.
W.L.S.	870	Chicago	50		12.00 p.m.
K.L.X.	880	Oakland	1	5.00 p.m.	2.00 a.m.
K.O.M.O.	920	Seattle	1		1.00 a.m.
K.R.O.W.	930	Oakland	1		12.0 p.m.
K.J.R.	970	Seattle	5	6.00 p.m.	1.30 a.m.
K.F.V.D.	1000	Los Angeles	0.25	6.00 p.m.	12.30 a.m.
X.E.B.	1030	Mexico City	10		
K.N.X.	1050	Hollywood	50	6.15 p.m.	12.30 a.m.
K.M.O.X.	1090	St. Louis	50		9.30 p.m.
K.S.L.	1130	Salt Lake City	50		11.30 p.m.
W.C.A.U.	1170	Philadelphia	50		11.00 p.m.
K.Y.A.	1230	San Francisco	1		2.00 a.m.
K.F.O.X.	1250	Long Beach	1	6.00 p.m.	11.30 p.m.
K.O.L.	1270	Seattle	1	6.00 p.m.	12.45 a.m.
K.D.Y.L.	1290	Salt Lake City	1	6.00 p.m.	11.20 p.m.
K.G.B.	1330	Dan Diego	1	7.00 p.m.	1.00 a.m.
K.O.M.A.	1480	Oklahoma City	5	5.00 p.m.	11.00 p.m.

ASIATIC BROADCAST STATIONS

ASIAN stations are heard to best advantage late at night after our local stations close. They are audible throughout almost the entire year under favorable conditions. The index of stations given is not a complete list of Asian stations, but are those which are best received.

Call	Frequency.	Power	Location	Closure.
M.T.C.Y.	560	10	Hsinking, Manchu-Ko	12.30 A.M.
J.F.C.K.	580	1	Taichu, Formosa	12.00 P.M.
X.Q.H.A.	580	0.25	Shanghai, China	2.00 A.M.
J.O.A.K.	590	150	Tokyo, Japan	11.00 P.M.
X.M.H.A.	600	1	Shanghai, China	2.30 A.M.
J.O.J.K.	610	3	Kanazawa, Japan	11.00 P.M.
K.Z.R.M.	618.5	50	Manila, Phil. Is.	1.00 A.M.
J.O.K.K.	630	0.5	Kanazawa, Japan	11.00 P.M.
J.O.U.K.	650	0.3	Akita, Japan	11.00 P.M.
X.G.O.A.	660	75	Nanking, China	1.00 A.M.
J.O.T.K.	670	0.5	Matsue, Japan	11.00 P.M.
M.T.F.Y.	675	3	Harbin, Manchu-Ko.	1.30 A.M.
J.O.V.K.	680	0.5	Hakodate, Japan	11.00 P.M.
J.O.B.K.	690	10	Osaka, Japan	11.00 P.M.
J.O.C.G.	700	0.3	Asahigawa, Japan	11.00 P.M.
X.M.H.C.	700	0.5	Shanghai, China	12.00 A.M.
V.P.B.	700.5	1.75	Colombo, Ceylon	2.30 A.M.
J.O.D.K.	710	10	Seoul, Korea	11.00 P.M.
J.F.B.K.	720	1	Tainan, Formosa	12.00 P.M.
J.O.C.K.	730	10	Nagoya, Japan	11.00 P.M.
J.O.S.K.	740	1	Kokura, Japan	11.00 P.M.
H.S.7.P.J.	750	10	Bangkok, Siam	3.30 A.M.
J.F.A.K.	750	10	Taihoku, Formosa	12.00 A.M.
X.G.O.K.	750	1	Canton, China	2.00 A.M.
J.Q.A.K.	760	0.5	Dairen, Manchu-Ko	12.30 P.M.
J.O.H.K.	770	10	Sendai, Japan	11.00 P.M.
V.U.M.	770	0.2	Madras, India	11.30 P.M.
J.O.P.K.	780	0.5	Shizuoka, Japan	11.00 P.M.
J.O.G.K.	790	10	Kumamoto, Japan	11.00 P.M.
J.O.I.K.	810	10	Sapporo, Japan	11.00 P.M.
V.U.C.	810	3	Calcutta, India	2.00 A.M.
J.B.B.K.	820	0.5	Heijo, Korea	11.00 P.M.
X.M.H.D.	840	1	Shanghai, China	12.00 P.M.
Z.B.W.	845	2	Hong Kong, China	12.40 A.M.
V.U.B.	855	3	Bombay, India	2.30 A.M.
H.S.P.1.	855	2.5	Bangkok, Siam	1.30 A.M.
J.O.A.K.	870	150	Tokyo, Japan	11.00 A.M.
X.H.H.V.	870	0.1	Shanghai, China	5.00 A.M.
V.U.D.	882	20	Delhi, India	3.30 A.M.
J.O.L.G.	890	0.5	Tottori, Japan	11.00 P.M.
M.T.B.Y.	890	1	Mukden, Manchu-Ko	12.30 A.M.
J.O.L.K.	910	0.5	Fukuoka, Japan	11.00 P.M.
X.H.H.X.	920	1	Shanghai, China	4.00 A.M.
J.O.B.K.	940	10	Osaka, Japan	11.00 P.M.
X.H.H.E.	940	1	Shanghai, China	3.00 A.M.
X.G.O.P.	950	0.3	Hopei, China	2.00 A.M.
J.O.D.K.	970	10	Soeul, Korea	11.00 P.M.
X.M.H.B.	980	1	Shanghai, China	12.00 P.M.
J.O.C.K.	990	10	Nagoya, Japan	11.00 P.M.
X.G.O.W.	1010	5	Hankow, China	12.30 A.M.
X.H.H.G.	1020	0.1	Shainghai, China	3.15 A.M.
X.H.H.H.	1040	0.1	Shanghai, China	2.30 A.M.
X.H.K.A.	1050	0.1	Teintsin, China	3.30 A.M.
X.H.H.S.	1100	0.1	Shanghai, China	2.00 A.M.
X.L.H.N.	1120	0.2	Shanghai, China	12.30 A.M.
V.U.L.	1200	0.1	Lahore, India	3.00 A.M.
X.H.H.Y.	1240	0.1	Shanghai, China	3.30 A.M.
X.Q.H.C.	1300	0.5	Shanghai, China	1.30 A.M.
X.G.O.E.	1350	1	Shanghai, China	12.00 P.M.
X.Q.H.D.	1370	0.2	Shanghai, China	3.00 A.M.
F.F.Z.	1400	0.25	Shanghai, China	12.00 P.M.
X.Q.H.E.	1460	0.25	Shanghai, China	2.00 A.M.
V.U.P.	1500	3	Peshawar, India	2.30 A.M.

In the list of Asian stations given it is to be noted that many Japanese transmitters are omitted, for there is too much interference from local stations on channels on which they operate.

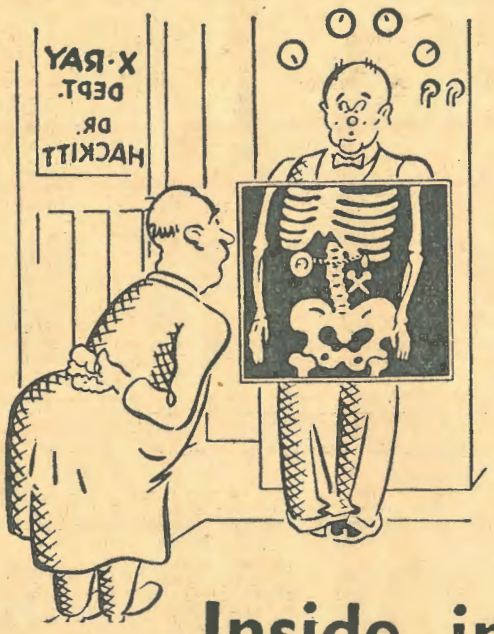
EUROPEAN BROADCAST STATIONS

EUROPEAN signals are heard to their best advantage during March, and between July, and October. Efforts should be made to tune these stations just prior to sunrise.

Location	Power (In K/ws.)	Frequency (In K/cs)
Budapest	120	546
Vienna	120	592
Prague	120	633
Belgrade	2.5	686
Paris	120	695
Stockholm	55	704
Rome	50	713
Katowice (Poland)	12	758
Leipzig	120	785
Milan	50	814
Bucharest	12	823
Moscow	100	832
Berlin	100	841
Hamburg	100	904
Toulouse	60	913
Brno (Szecholovakia)	32	922
Breslau	100	950
Bratislavia (Czecholovakia)	13.5	1004
Cracow (Poland)	2	1022
Konigsberg	100	1031
Bari (Italy)	10	1059
Horby (Sweden)	10	1131
Turin (Italy)	10	1140
Kosice (Czechoslovakia)	2.6	1158
Monte Ceneri (Switzerland)	15	1167
Copenhagen	10	1176
Prague	5	1204
Juan Les Pins (France)	1	1276
Austrian Common Wave		1294
Warsaw	2	1384
Paris	5	1456
Miskole (Hungary)	12.5	1438

Other transmitters worthy of note are: Beromunster (Switzerland) 556 K/cs. Cologne 658 K/cs, Sottens (Switzerland) 677, Kiev (U.S.S.R.) 722 K/cs, Lwow (Poland) 795 K/cs, Graz (Austria) 886 K/cs, Paris 959 K/cs, Hilversum (Holland) 995 K/cs, Bordeaux (France) 1077 K/cs, and Frankfurt 1195 K/cs.

THE purpose of this brief index is not to list a number of stations, and assert that they alone are to be heard by the average listener. To list every broadcaster which may quite easily be heard in Australia would take many pages of space. The list given will be found to comprise those stations which have proved to be consistently received. Moreover, several new stations are listed, and these will be of additional interest.



Inside information is best

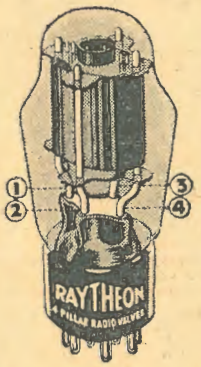
There's nothing like an X-ray for diagnosing defects in the human mechanism.

The metal age has deprived us of our X-ray of valves. A simple thing, with glass valves, merely to look inside and SEE its workmanship.

Metal stops you SEEING—More important than ever, now to ask "Is it a Raytheon?" . . . product of the greatest organisation in the valve industry.

Stands to reason, too, that the four pillars in a Raytheon support the fragile elements inside the tube more sturdily than the two of ordinary valves, and affords stronger protection against jolts and vibration.

Don't leave it to guesswork. ASK for Raytheon and don't be put off with pretenders! Raytheons cost no more, and they're the only 4-pillar valve on the market.



RAYTHEON

THE MAKERS OF

4-PILLAR VALVES

If, unobtainable from your local dealer write to Standard Telephones & Cables (A/asia) Ltd., 258-274 Botany Road Alexandria.

This patented container allows your Raytheon to be tested before you buy, without breaking the carton or the guarantee seal.

THE WIRELESS INSTITUTE

AN AMATEUR'S ORGANISATION

Every worth-while movement must have an organisation if it is to prosper. The Wireless Institute of Australia is the Australian amateurs' organisation, and extends throughout Australia. It is an active movement, and has built up an excellent record of work and achievement. Mr. W. M. Moore, the Federal President, has written this article explaining some of the W.I.A. activities.

FORMED originally in 1910 in New South Wales, and at a later date in the other States, the Wireless Institute of Australia is an organisation that is run entirely by the amateur experimenters for their mutual benefit.

The politics of the Institute are divided into three spheres, namely, international, Federal and State. Considering the Federal aspect:—

First, each year a Federal Convention is conducted at a Capital City with a representative of each State attending, and it is there the Federal policy is discussed and decided. At each convention a committee of three, known as the Federal Executive, is elected, and it is to this executive that the duty of directing the following year's international policy falls.

In each State is a Division of the Institute, and it is these Divisions that conduct the actual general business meetings of the Institute, run lectures, contests, etc., and generally give service to members.

So much for the politics. We can consider now the actual value of the Institute to the amateur.

An organisation is very necessary to the well-being of the amateur movement for several reasons.

Firstly, to place before the governing body their views and reactions to the regulations, etc.; secondly, as amateur radio is an international affair, to co-operate with other international societies; thirdly, to supply to members lectures and other technical services, and to arrange competitions, contests, etc.

So much for why it is necessary; now to its actions.

Each year the Wireless Institute Q.S.L. Bureaus throughout the Commonwealth handle for members and non-members over 100,000 Q.S.L. cards.

In October of each year the V.K.Z.L. Dx. contest is conducted jointly with the N.Z.A.R.T., and during the winter the Fisk Trophy is run, besides many contests arranged within the State by the various divisions.

Field days, special U.H.F. tests, are often organised by the divisions, and do much to improve portable operation and give knowledge.

Each division invariably has rooms, and in many cases a special technical section is run for members. Meters and other forms of measuring apparatus are available.

W. M. MOORE (VK2HZ), Federal President of the Institute, who contributes "Ham Notes" to "Wireless Weekly."

Standard frequency transmissions are conducted, and each month the official organ, "Amateur Radio," published in Victoria, appears.

Pay their share for a representative of the amateurs to attend the Bucharest Conference.

The work of the Institute does not close here, we could continue for pages.

Quite the majority of active amateur transmitters are members, and the membership approached 900 throughout the Commonwealth.

For the Short Wave Listener there are special sections, and there is a scheme under which the more advanced of these listeners will be issued with official numbers to cover their receiving experiments and reports.

If you are anxious to join, we might suggest not only are you doing yourself a good turn, but also the amateur movement in Australia.

The following are the addresses of the various State divisions. Write to the Secretary, care these addresses, and he will only be too pleased to give you all the information available.

DIVISIONAL ADDRESSES

Federal Headquarters, Box 2127L, G.P.O., Sydney.

New South Wales, Box 1734JJ, G.P.O., Sydney.

Victoria, Box 2611W, G.P.O., Melbourne.

Queensland, Box 1524V, G.P.O., Brisbane.

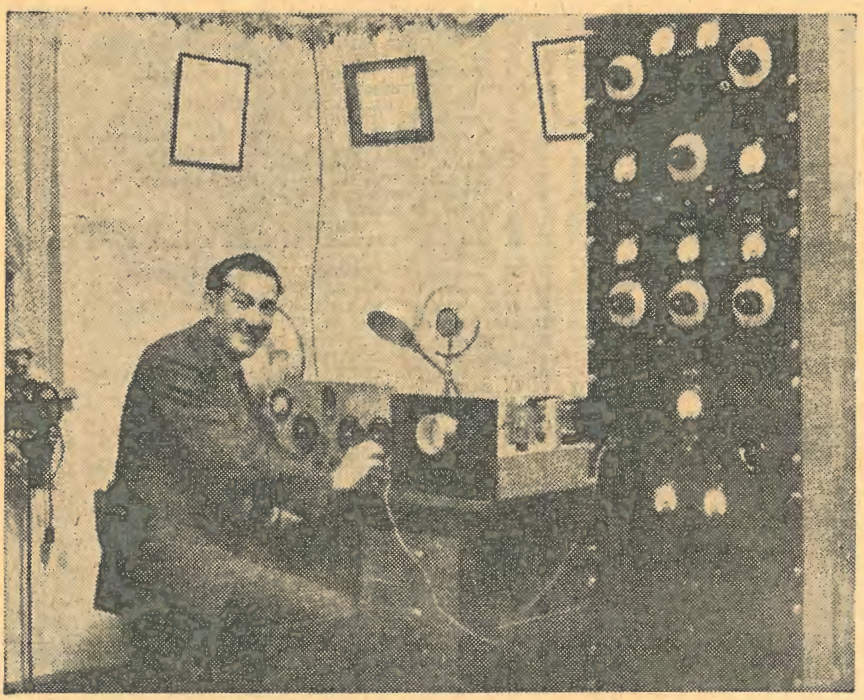
South Australia, Box 284D, G.P.O., Adelaide.

Western Australia, 62 Subiaco Road, Subiaco.

Tasmania, Box 547E, G.P.O., Hobart.

Just another activity is that of running an Exhibition devoted to a display of amateur apparatus. It is a very necessary activity, that of showing to you the work and activities of the amateur, and his value to the community.

A TYPICAL "HAM" STATION



W. G. RYAN (VK2TI), N.S.W. Secretary of the Wireless Institute.

AUSTRALIAN AMATEUR STATIONS

Scattered throughout the world, from the heart of almost every city, to the outposts of Greenland, and the heart of Burma, are some 60,000 amateur stations. These operate on set wave-bands and may often be tuned in by the short-wave listener. Australia has about 1700 amateurs, each with his own call sign. All commence with VK, meaning Australia, then a number, meaning the State, and up to three letters to identify the station. There are the nine "districts" into which Australia is divided.

AMATEUR WAVE-LENGTHS

VK1—Not allotted.
VK2—New South Wales.
VK3—Victoria.
VK4—Queensland.
VK5—South Australia.
VK6—West Australia.
VK7—Tasmania.
VK8—Central Australia.
VK9—New Guinea.

Amateurs all over the world operate only on the wave-lengths or frequencies allotted to them by International agreement. The average Dual-wave receiver will cover only two of these bands, at 20 and 40 metres. On these bands 'phone stations can often be heard. Here is a list of the wave-lengths which are given exclusively to amateurs.

WHERE TO LISTEN

175-150 metres or 1715-2000 kilocycles.
85.7-75 metres or 3500-4000 kilocycles.
7000-7300 kilocycles or 21.43-20.83 metres.
42.9-41.1 metres or 14,000-14,400 kilocycles.
10.71-10 metres or 28,000-30,000 kilocycles.
5-5.3 metres or 56,000-60,000 kilocycles.

As we have said, 20 and 40 metres are of most interest to the listener because he can take in these bands on his set. The 20-metre band is a wonderful band for 'phone working between different countries. During the course of an evening or afternoon, one might hear amateurs in U.S.A., India, S. America, Canada, England, S. Africa, and in fact almost anywhere, talking amongst themselves or to Australia. Much, of course, depends upon conditions prevailing. The 40-metre band is often used for interstate 'phone work, particularly in the daytime, and abounds with Morse signals. Another popular 'phone band is 80 metres, mainly used for interstate and linking with N. Zealand amateurs.

VK2 — AMATEUR STATIONS IN N.S.W.

CARDS FOR VK2 AMATEURS MAY BE SENT TO BOX 1734—J.J., G.P.O., SYDNEY

Call Sign.	Licensee. Address.
	FEDERAL CAPITAL TERRITORY
VK 2ET	E. A. Tormey, Cowper Crescent, Ainslie, Canberra.
VK 2GY	A. J. Higgs, Mt. Stromlo, Canberra.
VK 2RR	Radio Research Board, Mt. Stromlo, Canberra.
VK 2YN	A. J. Ryan, Kingston, Canberra.
	NEW SOUTH WALES
VK 2AB	A. V. Badger, 19 Cecily St., Leichhardt.
VK 2AC	A. C. Edwards, 83 Old South Head Rd., Waverley.
VK 2AE	D. J. H. Adams, 1658 Pacific Highway, Wahroonga.
VK 2AF	A. F. Williams, "Moseley," Argyle Avenue, Ryde.
VK 2AG	A. H. Gray, 35 Middle St., McMahon's Point.
VK 2AH	A. H. Llewellyn, 6 French St., Artarmon.
VK 2AI	H. R. Carter, Yarraman North Station, Quirindi.
VK 2AJ	B. C. Brown, 1 Toyer Street, Tempe.
VK 2AK	K. J. Claffey, "Yarrandale," Deniliquin.
VK 2AL	A. S. Littlejohn, 3 Emmerick St., Leichhardt.
VK 2AN	W. E. Gardner, Central Mine, Broken Hill South.
VK 2AO	A. O. Friar, Bent St., Grafton South.
VK 2AP	A. P. Reynolds, 37 Orange Road, Parkes.
VK 2AQ	J. Duffy, 1 Wilfield Avenue, Rose Bay.
VK 2AR	W. H. Hudson, 1 Terrace Road, Dulwich Hill.
VK 2AS	A. C. Freeman, 51 Park Road, Burwood.
VK 2AT	L. Altman, 18 Myee St., Lakemba.
VK 2AU	J. P. Cureton, 30 Church Street, Burwood.
VK 2AV	A. W. Thurstan, 33 Stoney Creek Road, Penshurst
VK 2AW	A. W. Dye, 44 Martin Road, Centennial Park.
VK 2AX	H. Kerr, 86 Darling Point Road, Darling Point.
VK 2AZ	H. L. Day, 2 Robinson Street, Kogarah.
VK 2BA	B. A. Chapman, 1 Edgar Street, Chatswood.
VK 2BB	Eastwood Radio Club, 134 Rowe St., Eastwood.
VK 2BC	N. S. Taylor, Upper Bay View St., McMahon's Point.
VK 2BD	A. E. Behrmann, 97 Rangers Avenue, Cremorne.
VK 2BF	L. E. Forsythe, Sydney Training Depot, Snapper Island.
VK 2BG	B. L. Glassop, 10 Carlingford Road, Epping.
VK 2BI	R. J. Stick, 27 Wyrallah Road, Lismore.
VK 2BJ	J. K. Burnett, 4 Park Avenue, Chatswood.
VK 2BK	J. F. Edwards, 18 Smith Street, Parramatta.
VK 2BM	B. Martin, 81 Ben Boyd Road, Neutral Bay.
VK 2BN	R. F. J. Flood, 32 Park Road, Hurstville.
VK 2BQ	F. W. S. Easton, 33 Latimer Road, Bellevue Hill.
VK 2BR	Rev. W. H. L. Brooke, The Rectory, Dora Creek.
VK 2BT	A. J. Gibbens, 87 Carrington Road, Randwick.
VK 2BU	C. Butterworth, 83 Nelson Street, Wallsend.
VK 2BV	Waverley Radio Club, 13 MacPherson St., Waverley.
VK 2BW	A. S. Moye, 1 Roma Street, Wagga.
VK 2BX	H. T. Brunsden, 64 Hill Street, Leichhardt.
VK 2BY	E. C. M. Olds, 225 Jamieson St., South Broken Hill.
VK 2BZ	H. E. Davies, 44 Bryant St., Tighe's Hill, Newcastle.
VK 2CB	G. A. Rutter, 28 Muttama Road, Artarmon.
VK 2CC	University of Sydney, Sydney.
VK 2CD	C. W. Drew, 7 Roscrae Avenue, Randwick.
VK 2CE	A. J. Barnes, 87 Murriverie Road, North Bondi.
VK 2CF	C. J. F. Collard, King St., Lorn, West Maitland.
VK 2CG	H. E. Chinner, 117 Darley Road, Randwick.
VK 2CI	G. Kempton, 10 Clapton Place, King's Cross.
VK 2CJ	W. C. Johnston, Moonee Street, Coff's Harbor.
VK 2CK	G. A. Warner, Willyama, Wyong.
VK 2CL	I. H. Taylor, 45 Hardy St., Ashfield.
VK 2CM	C. D. Maclurcan, "Namanula," Agnes St., Strathfield.
VK 2CN	C. K. Moginie, "Chezales," Jacobson Avenue, North Brighton, N.S.W.
VK 2CP	O. E. Cooper, 51 Glenview Street, Paddington.
VK 2CS	L. T. Swain, 6 Frederick Street, Waratah.
VK 2CT	E. J. Kerkin, 221 Victoria Road, Drummoyne.
VK 2CU	D. D. Campbell, Ulmarra, Clarence River.
VK 2CV	R. J. Ferrie, 171 O'Sullivan Road, Rose Bay.
VK 2CW	W. Pearce, 30 High Street, Cessnock.
VK 2CX	J. T. Evans, "Aberteifi," Adelaide Street, Paxton.
VK 2CY	J. G. Alsop, 59 Ernest Street, Lakemba.
VK 2DA	H. W. S. Caldecott, 77 Seaview Street, Manly.
VK 2DB	H. A. Davies, 139 Lyons Road, Drummoyne.
VK 2DC	D. C. Sellenger, 9 Cecil Street, Hurstville, N.S.W.
VK 2DD	D. Dawson, 307 Marius Street, Tamworth.
VK 2DE	W. P. Renshaw, "Waimea," Lord Street, Roseville.
VK 2DF	L. S. W. J. Cocks, 20 Stewart Street, Eastwood.
VK 2DG	K. Rudkin, Lismore St., Abermain.
VK 2DH	W. C. Hammer, 99 Francis Street, Bondi.
VK 2DI	G. F. Cole, 20 Ewos Parade, Cronulla.
VK 2DJ	F. B. Cooke, 28 Central Avenue, Mosman.
VK 2DK	E. Clunne 35 Brunswick Street, Merrylyands.
VK 2DL	W. J. Phelps, 14 Watkin Street, Canterbury.
VK 2DM	D. Maclaren, 83 Hawthorne Parade, Haberfield.
VK 2DN	J. E. Parris, George Street, Deniliquin.
VK 2DO	R. H. Rayner, Adele Street, Yass.
VK 2DP	M. Webb, 98 Duntroon Street, Hurlstone Park.
VK 2DQ	J. C. D. Nourse, 218 Pell St., Railway Town, Broken Hill.
VK 2DR	D. W. Reed, 8 The Avenue, Waitara.
VK 2DS	R. R. Davis, "Dumar Court," Dumaresq Rd., Rose Bay.
VK 2DT	A. R. Harrison, 49 Harrow Road, Stanmore.
VK 2DV	F. A. Hodder, 411 Old South Head Road, Rose Bay.
VK 2DW	D. J. Wilson, 38 Lancelot Street, Five Dock.

VK 2DX K. A. W. Blair, Com'l Bank of Aust., Ltd., Marrickville.
VK 2DY D. G. Lindsay, 36 Alt St., Ashfield.
VK 2DZ J. Clark, 287 Clarence Street, Sydney.
VK 2EA E. F. Fitzgerald, 161 Victoria Road, Bellevue Hill.
VK 2EB G. H. Bryden-Brown, 14 Wright's Road, Drummoyne.
VK 2EC E. C. Crouch, 7 Spencer Road, Mosman.
VK 2ED W. J. Bell, 5 Second Avenue, Campsie.
VK 2EE J. L. Llewellyn, 9 Allison Avenue, Lane Cove.
VK 2EF E. T. Fisk, 16 Beaconsfield Parade, Lindfield.
VK 2EG D. C. Dunn, 9 Centennial Avenue, Randwick.
VK 2EH E. P. Hodgkins, 24 Hillcrest Street, Punchbowl.
VK 2EI L. J. West, 19 Dalton Street, Parkes.
VK 2EJ G. H. Branson, 2 Anderson Road, Concord.
VK 2EK E. F. Kenny, 13 Good Street, Granville.
VK 2EL E. L. Colyer, 47 Towns Road, Rose Bay.
VK 2EM A. F. Sutton, "Warrani," Thornton St., Darling Point.
VK 2EN E. C. Hulme, 42 Kennedy Street, South Kensington.
VK 2EP Pastor E. Watson, 80 Stanley Street, Burwood.
VK 2EQ J. S. McNamara, 35 Woronora Parade, Oatley.
VK 2ER F. A. Adams, 26 Neil Street, Carlingford.
VK 2ES E. M. Simpson, 128 Bellevue Road, Bellevue Hill.
VK 2EU A. R. A. Phibbs, 410 Townsend Street, Albury.
VK 2EV E. S. McCredie, 219 Burwood Road, Burwood.
VW 2EW W. Webster, 126 Pittwater Road, Gladesville.
VK 2EX A. H. Outtrim, Windsor Street, Richmond.
VK 2EY G. P. Junk, 103 Napoleon Street, Sans Souci.
VK 2EZ R. A. Green, 1 Britannic Mansions, Raglan St., Mosman.
VK 2FD W. F. Davidson, 29 Scott Street, Croydon.
VK 2FE J. M. Retallick, Mary Street, Bellingen (Portable).
VK2FF L. C. Bracken, 8 Parradeen Street, Cremorne, N.S.W.
VK 2FG E. C. Medhurst, 393 Illawarra Road, Marrickville.
VK 2FH F. L. Henriques, "Alwood," Mount St., Hunter's Hill.
VK 2FI A. J. Wells, 45 Bon Accord Avenue, Waverley.
VK 2FJ J. Ferguson 111 Hewlett St., Waverley.
VK 2FK K. P. C. Welzel, 123 Clovelly Road, Clovelly.
VK 2FL F. H. S. Lee, 47 Albyne Road, Strathfield.
VK 2FM F. A. Murray, 21 Reginald St., Cremorne.
VK 2FN G. C. Young, 131 March Street, Orange.
VK 2FO H. T. W. Griffiths, 20 Garfield Street, Five Dock.
VK 2FP E. J. Baker, 13 Skelton St., Hamilton, Newcastle.
VK 2FQ C. H. Collinge, 123 Murray Street, Wagga Wagga.
VK 2FR F. R. Bassett, 71 George Street, Singleton.
VK 2FS A. C. Smith, 177 Burwood Road, Burwood.
VK 2FU E. A. Catt, 37 Robey Street, Maroubra Junction.
VK 2FV J. C. Fairweather, 14 Gordon Street, Mosman.
VK 2FW G. H. Martin, 224 Cowper Street, Waverley.
VK 2FX F. J. Cross, 41 Vernon Avenue, Mascot.
VK 2FY D. E. Vaughan, 3 Hampden Street, Lakemba.
VK 2FZ G. W. Reid, de Boos St., Temora.
VK 2GA Mrs. F. V. McKenzie, 26 George St., Greenwich Point.
VK 2GC G. B. Charles, Richard Ave., Bishopscourt, Coogee.
VK 2GD G. H. Edgecombe, 64 Clanville Road, Roseville.
VK 2GE G. J. Edwards, 13 Nicholson St., West Maitland.
VK 2GG J. Gue, 12 Llewellyn St., Lindfield.
VK 2GH R. L. Gibson, Alstonville, Richmond River.
VK 2GI C. K. Blanch, Woodford Leigh, Clarence River.
VK 2GJ G. E. Jones, 5 Oakley Road, North Bondi.
VK 2GK O. C. Le Cornu, 64 Spring St., Lismore.
VK 2GL Richmond River Listeners' League, 83 Orion St., Lismore.
VK 2GM G. McDowell, 97 Rookwood Road, Bankstown.
VK 2GO C. S. Mackay, High Street, Coff's Harbor.
VK 2GP G. J. W. Partridge, 1 Llewellyn Street, Marrickville.
VK 2GQ E. Barlow, Flat No. 2, 51 Spit Road, Mosman.
VK 2GR A. Robinson, 218 Hawthorne Parade, Haberfield.
VK 2GS A. G. Simmonds, James Street, Murwillumbah.
VK 2GT G. T. Bruce, Capper Street, Tumut.
VK 2GU E. H. Cox, Barkly Crescent, Forest.
VK 2GV A. S. G. Fenton, 26 Muttama Road, Artarmon.
VK 2GW W. L. Woolnough, 31 Ordnance Avenue, Lithgow.
VK 2GX Woollahra Amateur Radio Club, Rear 47 Queen St., W'lahra.
VK 2HA E. B. White, 221 Greenwich Rd., Greenwich Point.
VK 2HB G. H. Choules, 38 Wentworth Road, Homebush.
VK 2HC H. R. Carter, Yarraman North Station, Quirindi.
VK 2HF J. A. Furze, Edgecliffe Esplanade, Seaforth.
VK 2HG J. F. Mackel, "Alster," Devonshire Street, Chatswood.
VK 2HE H. E. Miller, 7 Kent Street, Belmore, N.S.W.
VK 2HH O. Sandel, 248c Oxford St., Woollahra.
VK 2HJ N. J. Hurll, 46 Northcote Avenue, Killara.
VK 2HK E. G. Powell, 3 Wilfield Avenue, Vaucluse.
VK 2HL H. C. Lapthorne, 1 Bowen Street, Chatswood.
VK 2HM H. A. Marshall, 94 Francis Street, Bondi.
VK 2HN H. A. J. Nottingham, Lane Cove Road, North Ryde.
VK 2HO H. Hart, 70 Lord Street, Roseville.
VK 2HP H. F. Peterson, "St. Mena," Hamilton Street, Coogee.
VK 2HQ N. C. Pottie, 6 Veret Street, Hunter's Hill.
VK 2HS E. M. Fanker, 11 Rosslyn Street, Bellevue Hill.
VK 2HT H. K. R. Thomas, 2 Kahibah Road, Mosman.
VK 2HU R. M. Huey, "Taranaki," Parramatta St., Cronulla.
VK 2HV H. V. J. Hutton, Henderson Street, Inverell.
VK 2HW R. A. Holt, corner Market and Fraser Sts., Tahmoor.
VK 2HX E. W. Jinks, 144 Gaffney Lane, Railway Town, Broken Hill.
VK 2HY R. Stacey, 14 Hume Street, Crow's Nest.
VK 2HZ W. M. Moore, 137 Middle Harbor Road, Lindfield.
VK 2IA K. F. Handel, 16 Culwulla Street, Hurstville.
VK 2IB A. L. Sproule, Henry Street, Werris Creek.
VK 2IC A. F. K. Clarke, 76 Fricourt Avenue, Earlwood.
VK 2ID S. J. F. Brinkman, Bougainville St., Griffith.
VK 2IE P. Cox, Lidsdale, via Wallerawang.
VK 2IF R9 Radio Club (C. Winch), 281 Victoria St., Drummoyne.
VK 2IG R. W. Ross, 673 David Street, Albury.
VK 2II M. J. Moore, 70 Church Street, Dubbo.
VK 2IJ A. H. Gray, 5 Flat, "The Maples," Killara.
VK 2IK A. J. Brown, 12 Gretchen Avenue, Earlwood.
VK 2IL R. A. Brown, Lucasville Road, Glenbrook.
VK 2IM J. D. MacLean, Farm 444, Leeton.
VK 2IN J. A. Ayres, 112 Jersey Road, Woollahra.
VK 2IO A. E. Barlow, 21 Ewart Street, Marrickville.
VK 2IP G. W. Thornton, 8 Fredben Avenue, North Sydney.
VK 2IQ R. F. Treharne, 5 Waimea Street, Burwood.
VK 2IR H. W. Hannam, 34 Seymour Street, South Hurstville.
VK 2IT G. B. Free, 42 Robert Street, Willoughby.
VK 2IU A. T. Brown, 36 Pacific Highway, St. Leonards.
VK 2IW R. I. G. Wallace, "Craigielea," Campbell St., Hunter's Hill.
VK 2IX B. H. Green, 62 Bay Road, Waverton.
VK 2IY J. G. Meyers, 128 Wycombe Road, Neutral Bay.
VK 2IZ G. A. Wood, 11 Waimea Street, Woollahra.
VK 2JA J. A. J. Mitchell, 169 Morgan Street, Wagga Wagga.
VK 2JB F. R. Bradley, 17 Ryrie Street, Mosman.
VK 2JC J. H. Wall, Maitland Street, Narrabri.
VK 2JD J. B. Davies, c/o 20 Elphinstone Street, Cabarita.
VK 2JE N. R. Martin, 1 King Street, Enfield.
VK 2JF T. I. Newport, 49 Northbrook Street, Bexley, N.S.W.
VK 2JG F. S. Maynard, 80 Brighton Street, Croydon.
VK 2JH J. V. Hutchison, 25 Holbrook Avenue, Kirribilli.
VK 2JJ J. W. Jennison, "Wallaroo," Mathoura.
VK 2JK J. H. S. Brown, Chelmsford Avenue, Botany.
VK 2JL J. L. Young, Cowabbie, Coolamon.
VK 2JN J. P. J. Keane, 42 Stoney Creek Road, Bexley.
VK 2JO R. C. Caldwell, 5 Woods Avenue, Woollahra.
VK 2JP J. H. A. Pike, 14 Sarner Road, Greenwich.
VK 2JQ Rev. G. A. M. Neil, The Rectory, Binda.
VK 2JR J. G. Reed, 24 Kenilworth Street, Croydon.
VK 2JS T. C. Kitto, c/o Airsales Broadcasting Co., Newcastle.
VK 2JT C. F. A. Luckman, 66 Chandos Street, Ashfield.
VK 2JU J. M. Moyle, 882 Pacific Highway, Chatswood.
VK 2JV C. D. Roberts, 49 Greenwich Road, Greenwich.
VK 2JW E. J. Williams, 51 Ocean Street, Edgecliffe.
VK 2JX P. H. A. Adams, Oakleigh Avenue, Thornleigh.
VK 2JZ A. S. Mather, 14 William Street, Singleton.
VK 2KB A. Fairhall, 86 Bruce Street, Cook's Hill.
VK 2KC R. H. Fry, 45 Kembla Street, Wollongong.
VK 2KD A. W. Pearson, 111 Baker Street, Temora.
VK 2KE W. Watson, cor. Lang and Gillies Sts., Kurri Kurri.
VK 2KF C. J. Field, 29 Leichhardt Street, Katoomba.
VK 2KG K. N. Greenhalgh, 20A Gregson Avenue, Mayfield West.
VK 2KH W. P. Nelson, 5 Magill Street, Randwick.
VK 2KI A. V. Pickering, "Ocean View," Blair Street, Bondi.
VK 2KJ W. H. Cramond, 59 Bridge Street, Lane Cove.
VK 2KK J. W. M. Dodds, 1 Maitland Street, Kurri Kurri.
VK 2KL E. N. Maguire, 146 The Boulevarde, Dulwich Hill.
VK 2KN A. E. Driscoll, jun., Abbott Street, Quirindi.
VK 2KP A. Fox, 28 The Avenue, Rose Bay.
VK 2KQ J. H. Early, 11 View Street, Temora.
VK 2KR C. A. Hardman, Elgin Street, Gunnedah.
VK 2KS L. S. Meyers, 289 Wardell Road, Marrickville.
VK 2KT L. M. Seccombe, 4 Haybourn Avenue, Rockdale.
VK 2KU T. W. Archibald, 49 Fraser Street, Dulwich Hill.
VK 2KV H. B. Bodkin, 290 Unwin's Bridge Road, St. Peters.
VK 2KW A. Grant, Taylor's Arm Roadside, Macksville.
VK 2KX A. T. Gray, 35 Hill Street, Manly.
VK 2KZ E. M. Austin, Stanford St., Kurri Kurri.
VK 2LA L. K. Adams, 37 McClelland Street, Willoughby.
VK 2LB A. J. Hackney, Bradman Street, Cootamundra.
BK 2LC N. Glasscock, 9 McMahon Street, Willoughby.
VK 2LD L. H. Dodds, 3 Anthony St., Chatswood.
VK 2LG J. W. Wallace, 87 Faithfull Street, Goulburn.
VK 2LH D. St. J. P. Soraghan, 2 Spencer Street, Rose Bay.
VK 2LK K. L. Harkness, 25 Carlotta Road, Double Bay.
VK 2LJ J. Rayner, 8 Edison St., Belmore.
VK 2LL L. S. Lane, Weethalle.
VK 2LN A. LeNevez, 289 Annandale Street, Annandale.
VK 2LO C. S. Higgins, 44 Ettalong Road, Pendle Hill.
VK 2LP L. P. R. Bean, "Rochester," Orana Avenue, Pymble.
VK 2LQ D. R. Millen, 22 Hume Street, Wollstonecraft.
VK 2LR Lakemba Radio Club, 334 Old Cant'b'y Rd., Canterbury.
VK 2LS L. V. G. Todd, 117 Denison Street, West Tamworth.
VK 2LU E. T. Prentice, Sydney Radio Centre, Carlingford.
VK 2LW L. W. Waugh, 6 Park Avenue, Waitara.
VK 2LX H. C. Crisp, 91 Curranulla Street, Cronulla.
VK 2LZ W. E. C. Bischoff, 180 Chandos Street, Crow's Nest.
VK 2MA A.W.A., Limited, 47 York Street, Sydney.
VK 2MB A.W.A., Limited, Parramatta Road, Ashfield.
VK 2MC A.W.A., Limited, Beaconsfield Parade, Lindfield.
VK 2MD A.W.A., Limited, 47 York Street, Sydney (Portable).
VK 2ME A.W.A., Limited, Pennant Hills.
VK 2MF A.W.A., Limited, La Perouse.
VK 2MG A.W.A., Limited, 12 Muston Street, Mosman.
VK 2MH L. E. Sinclair, 19 Griffith Street, Hurlstone Park.
VK 2MI A.W.A., Limited, Elizabeth Bay Road, Elizabeth Bay.
VK 2MJ A. J. T. Crisp, 46 Rawson Avenue, Bexley.
VK 2MK L. Elphinstone, cor. Wrexham and Main Roads, Thirroul.
VK 2ML W. R. McLaughlin, 16 Cliff Street, Watson's Bay.
VK 2MM R. H. Long, 1 Jeffrey Street, Canterbury.
VK 2MN H. E. Burke, 174 Bland Street, Haberfield.
VK 2MP M. H. Winkler, 158 Morgan Street, South Wagga.
VK 2MQ W. E. C. McGowan, 120 Queen's Road, Five Dock.
VK 2MR Manly District Radio Club, 2 Fairy Bower Rd., Manly.
VK 2MS M. Spitzkowsky, 65 Everton Street, Hamilton.
VK 2MT C. Hedley, 7 Gordon Street, Mayfield.
VK 2MU J. Nangle, Observatory, Sydney.
VK 2MV R.C.S. Radio, 21 Ivy Street, Darlington (Portable).
VK 2MX D. E. Holmes, 33 Tamworth Street, Dubbo.
VK 2MY J. F. McGregor, 120 Queen's Road, Five Dock.
VK 2MZ Hurstville Radio Club, 27 Neirbo Avenue, Hurstville.
VK 2NA A. T. Callaghan, 45 Cottenham Avenue, Kensington.
VK 2NB N. T. O. Buchanan, 206 Sydney Road, Manly.
VK 2ND N. L. Dahl, 29 Cleveland Street, Wahroonga.
VK 2NE M. S. Nunn, 62 Merlin Street, North Sydney.
VK 2NF J. Musgrave, 28 Brighton Street, Petersham.
VK 2NG N. Gough, "Remuera," Martin Street, North Manly.
VK 2NH W. E. Gibbings, 31 Tupper Street, Marrickville.
VK 2NJ A. K. Johnson, 10 Duncan Street, Punchbowl.
VK 2NK C. W. Ball, 520 Railway Parade, Hurstville.
VK 2NL L. L. Squire, Thornton.
VK 2NM H. W. Milton, 100 Church Street, Mudgee.
VK 2NN B. Cortis-Jones, 62 William Street, Roseville.
VK 2NO D. B. Knock, 14 Yenko Avenue, Bronte.
VK 2NP C. F. L. Fryar, 113 Tennyson Street, Gladesville.
VK 2NQ N. S. Pieremont, "St. Elmo," Dodson Avenue, Cronulla.
VK 2NS T. F. Evans, 193 Rockett Street, Bathurst.
VK 2NT N. S. Tomkins, "Fredalma," Hammers Road, Northmead.
VK 2NU D. B. Knock, 14 Yanko Avenue, Waverley (Portable).
VK 2NV R. P. Truman, 48 Milner Crescent, Wollstonecraft.
VK 2NW E. D. Austwick, Holbrooke Avenue, Kirribilli.
VK 2NX D. D. Brooks, 14 Fitzwilliam Road, Vaucluse.
VK 2NY R. J. Berry, 54 Bacon Street, Grafton.
VK 2OA R. M. Winch, 35 Hermitage Road, West Ryde.
VK 2OB L. W. Mashman, 12 Halley Avenue, Bexley.
VK 2OC O. G. Chapman, Rankin Street, Wyong.
VK 2OD T. M. O'Donnell, Commonwealth Bank, Hurlstone Park.
VK 2OE W. M. Allworth, Cooma St., Yass.
VK 2OF J. W. Francis, 337 Beryl Lane, Broken Hill.
VK 2OG G. J. Menon, 11 Macartney Avenue, Chatswood.
VK 2OH N. B. O'Brien, 81 Brook Street, Coogee.
VK 2OI G. G. Bower, 346 Homer St., Earlwood.
VK 2OJ E. N. Arnold, Forrest Hill Avenue, Albury.
VK 2OL H. L. Watson, Tallagala Street, Unanderra.
VK 2OM A. J. Springett, Red Cross Farm, Exeter.
VK 2ON R. L. Douglas, "Aloha," Murray Street, Tamworth.
VK 2OO G. F. Lovering, 11 Allibone Street, Ashfield.
VK 2OP A. B. Roy, 8 Bronte Street, Waverley.
VK 2OQ H. Capsey, 33 Gordon Street, Brighton-le-Sands.
VK 2OR M. A. Brown, 15 Rawson Street, Epping.
VK 2OS I. N. C. Young, Rockleigh Street, Thornton.
VK 2OT M. D. Sobels, Hogarth Avenue, Dee Why.
VK 2OU S. W. L. Wardle, Imperial Bldgs., Beardy St., Armidale.
VK 2OW B. L. Dimmock, 9 Canterton Street, Hurlstone Park.
VK 2OY M. H. Harrison, 168 Paddington Street, Paddington.

VK 2OZ J. D. Olle, 17 Eccles Avenue, Ashfield.
VK 2PC Proving Radio Club, 29 Blairgowrie St., Dulwich Hill.
VK 2PE J. P. Perooz, Hope Street, Bourke.
VK 2PF F. A. Carruthers, cor. Smith and Keswick Streets, Cowra.
VK 2PG R. Gosnell, 234 Alt Street, Haberfield.
VK 2PH J. R. F. Petith, 1 Loftus Crescent, Homebush.
VK 2PK P. T. Hainsworth, "Roselea," Castlereagh St., Penrith.
VK 2PM N. J. McLeod, 107 Artarmon Road, Artarmon, N.S.W.
VK 2PN R. Weeden, "Clifford," Capper St., Tumut.
VK 2PP J. P. C. Phillips, 22 East Crescent, McMahon's Point.
VK 2PS P. G. Stephen, 144 Croydon Road, Croydon.
VK 2PT C. A. Richardson, 78 Kings Road, Five Dock.
VK 2PV J. P. Vosper, Jnr., 779 Military Road, Mosman.
VK 2PW W. G. Wise, 44 Nowranie St., Summer Hill.
VK 2PX H. D. Ackling, 76 Market St., Bankstown.
VK 2PY R. S. Nancarrow, 46 St. Mark's Road, Randwick.
VK 2PZ C. Cowan, 106 Aberdare St., Aberdare.
VK 2QA G. J. Russell, Nyngan, N.S.W.
VK 2QB R.C.S. Radio, 21 Ivy St., Darlington.
VK 2QC G. B. Best, 64 Western Road, Parramatta.
VK 2QD R. H. Dixon, 477 Olive St., Albury.
VK 2QE A. A. Fietz, 641 Young St., Albury.
VK 2QF G. H. Shelley, 10 Berry Road, Crow's Nest.
VK 2QG R. C. B. Lillie, 17 Beresford House, Belgrave St., Manly.
VK 2QH E. A. Moore, 92 Prince's Highway, Arncliffe.
VK 2QI L. E. Davies, 10 Russell St., Vaucluse.
VK 2QJ E. A. Peppercorn, 33 Regent Street, Bexley.
VK 2QK C. Preston-Smith, "Winchcombe," Violet St., Balgowlah.
VK 2QL F. T. Hine, 19 Albert St., Campsie.
VK 2QM C. E. Light 79 Beach St., Coogee.
VK 2QO T. C. Dale, 17 Richmond Avenue, Cremorne.
VK 2QP L. W. Hughes, 69 The Broadway, Punchbowl.
VK 2QR J. E. R. Burstall. 7 Wandeen Avenue, Beecroft.
VK 2QS E. G. Small, 35 Church St., Mayfield, Newcastle.
VK 2QT A. H. Mutton, 31 Stafford St., Stanmore.
VK 2QU G. A. Waldock, 17 Park Parade, Lithgow.
VK 2QV E. J. Pickles, Edward St., Fennell's Bay.
VK 2QW A. Shipley, 82 Brighton Boulevarde, North Bondi.
VK 2QX J. C. Warren, 50 Arthur St., Punchbowl.
VK 2QY A. M. L. Moss, 45 Oxford St., Paddington.
VK 2QZ R. H. Black, 16 Alice St., Harris Park.
VK 2RA R. A. Priddle, 18 Park Street, Marrickville.
VK 2RB R. A. Brown, 174 Park Road, Auburn.
VK 2RC R. Chilton, Chilton Avenue, Wahroonga.
VK 2RD R. Longworth, 9a Marshall Ave., Nth. Wollstonecraft.
VK 2RE A. Middleton, Wembley House, Railway Sq., Sydney.
VK 2RF R. J. Glassop, 5 Stewart Ave., Hamilton East.
VK 2RH R. P. Reynolds, Fitzmaurice St., Wagga.
VK 2RJ R. J. Fagan, Sunnyridge, Mandurama.
VK 2RK N. D. Carpenter, Austral Building, Murwillumbah.
VK 2RL A. R. Litchfield, "Springwell," Cooma.
VK 2RM R. A. MacFarlane, Wakaden St., Griffith.
VK 2RN P. R. Hentze, 14 Stanhope Road, Killara.
VK 2RO R. W. Turnbull, 2 Ethel St., Burwood.
VK 2RP R. R. Purdie, Mileham St., Windsor.
VK 2RQ J. P. Foley, Port Hacking Road, Port Hacking.
VK 2RR W. H. Hudson, 1 Terrace Road, Dulwich Hill.
VK 2RS W. H. Jones, 1 Hastings St., Marrickville.
VK 2RT W. R. Felton, 319 Prince's Highway, Kogarah.
VK 2RV R. W. Huband, c/o Railway Station, Werris Creek.
VK 2RU M. E. Collett, Excelsior Road, Lisarow, N.S.W.
VK 2RW R. W. Cusiter, 38 Victoria St., Lewisham.
VK 2RX H. C. St. John, 82 Gibbes St., Rockdale.
VK 2RY I. L. Brown, 7 Day St., Drummoyne.
VK 2RZ J. M. Atkinson, 46 Cowper Street, Glebe.
VK 2SA W. E. Salmon, La Paloma, Frederick St., Nth. Bondi.
VK 2SB S. W. Banks, 19 Arcadia St., Coogee.
VK 2SC Sydney County Council, Oxley St., Crow's Nest.
VK 2SD 2nd Div. Sigs. Radio Club, Engineers' Depot, Park Rd., P'ton
VK 2SE A. E. Wright, Louth, via Bourke.
VK 2SF D. A. Jones, Mountain Road, Austinmer.
VK 2SG S. G. Tonkin, 10 Third Avenue, Lane Cove.
VK 2SI R. J. Scholtz, 23 Stapleton Street, Wentworthville.
VK 2SJ S. Jacobs, 20 Horton St., Marrickville.
VK 2SK S. D. Kaufman, 23 Isabel St., Belmore.
VK 2SL P. M. Hoare, 17 Cathcart St., Lismore.
VK 2SN S. S. Nelson, 4 Albion St., Marrickville.
VK 2SO G. Cowell, 117 Mitchell Street, Merewether.
VK 2SP S. T. Pemberton, 58 Bowden St., Ryde.
VK 2SQ S. D. Inglis, 63 Cambridge St., Stanmore.
VK 2SR A. E. Emmelhainz, 251a Pitt St., Sydney.
VK 2SS R. M. Fussell, 39 Tulloh St., Willoughby.
VK 2ST S. E. Tatham, 160 Castlereagh St., Sydney.
VK 2SU A. Middleton, 96 Spencer Road, Cremorne.
VK 2SV C. W. Peters, 7 Highgate Road, Lindfield.
VK 2SW C. L. Southwell, Baroona Avenue, Church Point.
VK 2SX C. W. Slade, "Rockleigh," Lang St., Croydon.
VK 2SZ N. S. King, 43 Bent St., North Sydney.
VK 2TA A. M. Thackeray, Wootoona, via Young.
VK 2TB J. Knight, 14 Mary St., Lakemba.
VK 2TC H. J. Taylor, Bonnie Doon, Monteagle.
VK 2TE A. Boyd, 27 Bridgewater St., Rozelle.
VK 2TF R. F. Cohen, Malton Road East, Beecroft.
VK 2TG A. T. Goldie, 18 Kintore St., Dulwich Hill.
VK 2TH T. R. Heimann, 36 Gurwood St., Wagga Wagga.
VK 2TI W. G. Ryan, 21 Tunstall Avenue, Kingsford.
VK 2TJ R. N. Torrington, 21 Dellview St., Bondi.
VK 2TK T. L. Croke, 73 Bridge St., Lithgow.
VK 2TL T. W. Watson, 70 Calero St., Lithgow.
VK 2TN T. Ballue, "Glamis," Pitt Street, Randwick.
VK 2TO L. C. Ansell, 115 Grafton St., Woollahra.
VK 2TP A. N. Wickham, 50 Burra Road, Artarmon.
VK 2TQ K. H. Sherlock, 41 Thompson St., Earlwood.
VK 2TR R. E. Conrad, 6 Connemarra St., Bexley.
VK 2TS H. R. Scotney, 48 Hay St., Leichhardt.
VK 2TT T. A. Todd, "Loloma," Vimiera Road, Eastwood.
VK 2TU A. T. Bosher, 324 West Street, North Sydney.
VK 2TV R. J. Lenon, Fitzroy St., Cowra.
VK 2TW T. R. W. Bushby, 2, "Davellin," Oakley Rd., Nth. Bondi.
VK 2TX P. Levenspiel, "Braeside," Rankin St., Wyong.
VK 2TY R. W. Best, 57 Hunter St., Newcastle.
VK 2TZ Tamworth Amateur Radio Club, Tamworth.
VK 2UA C. J. Heathers, 40 Raymond St., Bankstown.
VK 2UB G. C. Bastow, 105 Sutherland Street, Paddington.
VK 2UC K. A. Maloney, 29 Hindmarsh Street, Lismore.
VK 2UD R. W. Archer, 7 Fulbourne Avenue, Pennant Hills.
VK 2UF F. Tarrant, 7 Tooke St., Cook's Hill, via Newcastle.
VK 2UG Dr. C. W. George, 2 Edwards Bay Road, Mosman.
VK 2UH F. L. Scott, 16 Bangalong St., Naremburn.
VK 2UI A. L. Wallbridge, 17 Henson Avenue, Mayfield East.
VK 2UJ H. W. Unger, "Rocky View," Alectown, via Parkes.
VK 2UK L. J. Freeman, 122 Francis St., Lidcombe.
VK 2UL S. V. Broomhead, 29 North Parade, Campsie.
VK 2UM G. C. Colton, 97 Clarendon Rd., Stanmore (Portable).
VK 2UO Wagga Amateur Radio Club, Wagga Wagga.
VK 2UP J. W. London, "Palomar," West St., Manly.
VK 2UQ P. J. Manley, 15 Princess Avenue, Vaucluse.
VK 2UR C. J. Henry, Bridge St., Uralla.
VK 2UU E. M. Waddle, Nimbin.
VK 2UV W. J. McElrea, 7 Jacka St., Daceyville.
VK 2UX F. M. Goyen, 2 Brucedale Avenue, Epping.
VK 2UY H. V. Clay, 255 Blaxland Road, Ryde.
VK 2UZ B. B. Browne, 62 Clifford St., Goulburn.
VK 2VA A. V. Bennett, 14 Park Avenue, Concord.
VK 2VB R. E. Wood, 483 Anzac Parade, Sth. Kensington.
VK 2VC W. B. V. Cahill, 4 Woodford Road, Rockdale.
VK 2VE N. J. Smith, 26 Reserve Road, Artarmon.
VK 2VG R. Corthorn, 39 Ronald Avenue, Greenwich.
VK 2VH S. V. Colville, 8 Small St., Broadway.
VK 2VI V. J. Gay, 30 Archer St., Chatswood.
VK 2VJ V. J. E. Jarvis, c/o Station 2BS, Keppel Street, Bathurst.
VK 2VK H. J. Fuller, 573 Englehardt St., Albury..
VK 2VL J. T. Nutman, 24 Cleland Road, Artarmon.
VK 2VN M. H. Meyers, 96 Cabramatta Road, Mosman.
VK 2VO C. J. McPherson, 3 Sparke St., West Maitland.
VK 2VP G. W. Morris, 31 Hotham Parade, Artarmon.
VK 2VQ J. W. A. Paton, 260 Pacific Highway, Artarmon.
VK 2VR A. R. Wheeler, "Winston," Malton Road, Epping.
VK 2VS V. E. Stanley, Radio Station, Carlingford.
VK 2VT J. G. Calvert, 27 Neirbo Avenue, Hurstville.
VK 2VU G. D. Partridge, 16 Hunter St., Singleton.
VK 2VV O. Lofberg, 30 Albyn St., Bexley.
VK 2VW V. Worswick, 67 Consett St., West Concord.
VK 2VY A. Hartley, 33 Sproule St., Lakemba.
VK 2WA J. T. Dwyer, "Beulah," Young.
VK 2WB A. M. McKenna, Henley Marine Drive, Five Dock.
VK 2WC C. H. Norville, 11 Hollywood Crescent, Willoughby.
VK 2WD G. W. Dukes, 43 Arundel St., Forest Lodge.
VK 2WE S.T.C., 71 York St., Sydney.
VK 2WF R. W. Faulks, 9 Modern Avenue, Canterbury.
VK 2WG W. R. Gronow, 2 Anthony Street, Glen Iris, S.E.6, Vic.
VK 2WH W. H. R. Stitt, "Kywong," Marsden Road, Forbes.
VK 2WJ W. J. Peell, 49 Alma Road, Maroubra, N.S.W.
VK 2WI Wireless Inst. of Aust., 2 Brucedale Ave., Epping.
VK 2WK Rev. W. D. Kennedy, 62 Lennox St., Rockdale.
VK 2WM W. L. Piggott, 45 The Promenade, Sans Souci.
VK 2WN M. M. Lusby, 10 Leeton Avenue, Coogee, N.S.W.
VK 2WQ R. T. Wilkins, 108 Henry St., Werris Creek.
VK 2WR A. Shipley, 34 Palmer St., Vaucluse.
VK 2WS T. A. Small, Austral Building, Murwillumbah.
VK 2WT C. R. Watt, Warrenfels, Tenterfield.
VK 2WU L. Macdonald, 10 Ada St., Waratah, Newcastle.
VK 2WV W. H. Pacey, 28 Canberra St., Lane Cove.
VK 2WW W. R. C. Nash, 255 West St., Crow's Nest.
VK 2WX R. M. P. Wray, "Esma," Jellicoe St., Hurstville.
VK 2WY W. L. Butters, Karoola St., Brooklyn, Hawkesbury River.
VK 2WZ E. V. Maddison, 22 Denman Parade, Normanhurst.
VK 2XA H. K. James, Flat 4, "Branxton," Arden St., Coogee.
VK 2XD K. J. W. Williams, Commercial Bank of Aust., Tamworth.
VK 2XG G. Gray, 41 Kissing Point Road, Turramurra.
VK 2XH W. H. Manley, 16 Gladesville Road, Gladesville, N.S.W.
VK 2XI W. A. Craig, 22 Irrara St., Croydon.
VK 2XJ F. M. Broome, Beach House, The Entrance, Tuggerah Lakes.
VK 2XK J. A. Heavey, 221 Boyce Road, Maroubra.
VK 2XO J. N. Retallick, Mary St., Bellingen.
VK 2XP J. Thompson, "Moorabinda," Wyong Creek.
VK 2XQ R. J. Traill, 47 Regent St., West Maitland.
VK 2XR A. T. Halloran, "The Kraal," Whitton and Sutherland Roads, Chatswood, N.S.W.
VK 2XS B. C. Gillanders, 62 Bellevue Road, Bellevue Hill.
VK 2XT W. C. Hall, Hay St., Abermain.
VK 2XU G. Pollock, "The Chalet," Medlow Bath.
VK 2XV R. M. Cameron, "Chyandra," Richmount St., Cronulla.
VK 2XW A. J. Voysey, "The Gables," 85 Alt St., Ashfield.
VK 2XX B. Dale, 8 Gladstone St., Kogarah.
VK 2XY S. W. Maguire, 138 Hastings Parade, North Bondi.
VK 2XZ E. C. Delmar, 175 Victoria St., Ashfield.
VK 2YA R. C. Black, "Esperanza," Lansdowne St., Greenwich.
VK 2YB W. J. Lewis, c/o J. B. Corbin, 39 Mitchell Street, McMahon's Point, N.S.W.
VK 2YC J. B. Corbin, 39 Mitchell St., McMahon's Point.
VK 2YD W. S. B. Pettitt, 26 Cropley St., Rhodes.
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VK 2YK R. E Abbott, Telegraph Point.
VK 2YL H. Hawkins. 27 Comfort Avenue, Cessnock.
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VK 2YO G. H. Younger, Wallsend St., Pelaw Main.
VK 2YP C. D. Hutchison, 1 Togo St., Penshurst.
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VK 2ABD C. C. Galbraith, 42 Bulkara Road, Belevue Hill, N.S.W.
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VK 2ABJ T. Evans, 193 Rocket St., Bathurst (Portable).
VK 2ABK G. H. Shelley, Foam Crest Avenue, Newport Beach.
VK 2ABM J. I. Jenner, Chichester St., Maroubra Junction.
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VK 4EI P. L. Belstead, 2 Park Lane Hyde Park.
VK 4EL E. J. Lake, 47 William St., Kangaroo Point.
VK 4EM E. B. Mars "Lorraine," Burke St., Charleville.
VK 4EN E. D. Neale, Emu St., Longreach.
VK 4ER E. H. Reilly, Ryan St., Hill End, Sth. Brisbane.
VK 4ES H. E. Sprenger, 32 Burnett St., South Bundaberg.
VK 4EW E. H White, Vowles St., Red Hill.
VK 4FB F. S. Beech, Bennetts Road, Coorparoo.
VK 4FE A. R. Burton, 33 Leichhardt St., Brisbane.
VK 4FH H. W. Hansen, Forest Hill.
VK 4FJ S. R. Baxter, Old Cleveland Road, Camp Hill.
VK 4FK V. F. Kenna, 41 Allen St., Hamilton.
VK 4FM F. P. Moody, 34 Lake St., Cairns.
VK 4FN F. M. Nolan, 25 Park Road, Wooloowin, N3.
VK 4FO F. Hoe, Killarney St., Yeronga.
VK 4FW L. R. Woolley, 22 George St., Newtown, Ipswich.
VK 4GA G. A. Shearer, State School, Quamby, via Cloncurry.
VK 4GE E. G. Ginn, 26 Macrossan St., Townsville.
VK 4GF E. G. Foreman, Airdmillan Road, Ayr.
VK 4GG G. Heilbronn, "Euroa," Clayton St., Chinchilla.
VK 4GH G. N. Harley, "Erooklyn," Didcot, Gayndah Line.
VK 4GJ C. J. G. Arthur, Dayboro.
VK 4GK A. H. MacKenzie, Fire Station, Wynnum.
VK 4GS G. Strofeldt, cr. Guthrie and Isaac Sts., Paddington.
VK 4GU R. H. Chadwick. "Te Whare." Clifton St., Wilston.
VK 4GW G. W. Ham, 248 Cavendish Road, Coorparoo, S.E.2, Qld.
VK 4GX F. Barraclough, Gail St., Kedron, N3.
VK 4HA H. B. Angel, Sisley St., St. Lucia.
VK 4HB H. F. Bremerman, 51 Wellington St., Wooloowin.
VK 4HF R. Shortt, c/o Post Office, Camooweal.
VK 4HG H. G. Brown, cr. Fifer St. and Menzies Lane, Ipswich.
VK 4HJ A. A. MacKenzie, Jericho, via Rockhampton.
VK 4HK H. C. Kinzbrunner, Tully.
VK 4HL H. J. Lynch, 198 Wickham St., Valley.
VK 4HM H. J. Murphy, Post Office, Ilfracombe.
VK 4HN H. G. Nicholson, Paga Hill, Port Moresby, Papua.
VK 4HR H. Scholz, c/o Gladstone Meatworks, Gladstone.
VK 4HS H. G. Scott, cr. Lindsay and Argyle Sts., Toowoomba.
VK 4HT A. H. Todd, Graham St., Ashgrove.
VK 4JO S. L. Fittell, City Buildings, Mary St., Gympie.
VK 4JP G. H. B. Gray, 18 Henry Street, Ascot, NE2.
VK 4JT J. G. Boileau, Port Moresby, Papua.
VK 4JU F. W. Nolan, 110 Wharf St., Brisbane.
VK 4JX J. F. Heine, 267 Main St., Kangaroo Point.
VK 4JA J. E. F. Abbiss, Wilson St., Morningside.
VK 4JB O. E. Alder, 16 Old Sandgate Road, Albion.
VK 4JC J. H. Bailey 18 Thomas St., Redhill.
VK 4JE J. M. Edgar, 57 George St., Kangaroo Point.
VK 4JF J. C. Files, 43 Rialto St., Coorparoo.
VK 4JG C. J. Grant, Victoria Parade, Wooloowin.
VK 4JH Mrs. I. J. L. Humphry, Poopoonbah, via Giru, N.C. Line.
VK 4JJ J. Jordan, c/o Wyper Bros., Bundaberg.
VK 4JK J. L. Humphry, Poopoonbah, via Giru. N.C. Line.
VK 4JL J. P. Love, "Glen edron," 1st Avenue, Kedron.
VK 4JM J. W. McDermott, Rosemount, via Nambour.
VK 4JN G. G. Augustesen, Sussex St., Mitchelton.
VK 4JW H. P. C. Larsen, off Cambridge St., Charters Towers.
VK 4HX A.W.A. Limited, Radio Station, Pinkenba.
VK 4KH W. S. Argaet, Kingsley Terrace, Wynnum South.
VK 4KK A. K. Bradford, "Bonville," Bringallly, via Millmerran.
VK 4KL I. U. Johnson, 197 Esplanade, Cairns.
VK 4KO N. V. Hart, 67 Glebe Road, Newtown.

VK 4KR H. J. and Oliver Edward, Willis Island.
VK 4KX M. R. Cran, 228 Boundary St., West End.
VK 4KY M. Martin, Panton St., Wood End.
VK 4KZ C. C. Mc. Couchman, Kaimkillenbun, via Dalby.
VK 4LA S. D. P. Smith, Arthur St., Corinda.
VK 4LB J. L. Bowen, 33 Nudgee Road, Hamilton.
VK 4LC J. L. Currie, 133 Bourbon St., Bundaberg.
VK 4LD K. C. Gunn, "Inverness," Patrick St., Laidley.
VK 4LE G. A. Greenhill, 39 Whynot St., West End.
VK 4LH L. F. Hitchcock, 128 Kedron Park Road, Wooloowin.
VK 4LI N. P. Morse, 89 Russell St., Clayfield.
VK 4LJ L. J. Feenaghty, Aloomba Road, Ashgrove.
VK 4LK V. L. Kerr, Post Office, Box 103, Cloncurry.
VK 4LL L. J. Lumb, Devonshire St., Ashgrove.
VK 4LM L. H. McMahon, Old Sandgate Road, Toombul.
VK 4LN J. L. Grey, "Birkhill," Agnew St., Norman Park.
VK 4LO Mrs. V. E. Nolan, 110 Wharf St., Brisbane.
VK 4LQ R. W. Johnston, 23 Bell St., Petrie Terrace, Brisbane.
VK 4LR R. H. Thomas, Vine Street, Bulimba, N.E.1, Qld.
VK 4LS L. S. B. Williams, Toogoolawah.
VK 4LW C. R. Morris, Exeter St., Ashgrove.
VK 4LX E. E. Grey, 18 Circe St., Ascot.
VK 4MA F. G. Bull, "Cozycell," River Park, Fairfield.
VK 4MC A. D. MacPherson, "Cluny," Old Sandgate Rd., Nundah.
VK 4MI T. W. Goford, Radio Hut, South End, Mt. Isa.
VK 4ML L. G. Merchin, Hillier St., Richmond.
VK 4MM M. M. O'Brien, Villa St., Annerley, S3.
VK 4MR J. E. Stewart, "Braemar," Rode Road, Nundah.
VK 4NC N. Thuge, Parsons Point, via Gladstone.
VK 4ND N. L. Dahl, Airdmillan Road, Ayr.
VK 4NF J. H. Dangerfield, 36 Wills Street, Townsville.
VK 4NL N. G. Dangerfield, Pioneer Estate, Lower Burdekin.
VK 4NP R. W. Phillips, 93 Nicholas St., Ipswich.
VK 4NR N. H. Richards, Wooloowin Avenue, Wooloowin.
VK 4NW T. W. Starkie, "Langthorne." Rode Road, Nundah.
VK 4OL F. P. O'Loughlin, 37 Kennedy Terrace, Red Hill.
VK 4OO W. H. H. Bright, 52 Hume St., Toowoomba.
VK 4PC P. C. L. Chapman, Palm Avenue, Babinda.
VK 4PH P. Hardgrave, 285 Montague Road, South Brisbane.
VK 4PJ P. F. Jessop, Hambledon, via Cairns.
VK 4PK S. McIntosh, "Kia Ora," O'Sullivan St., Woodend.
VK 4PN R. F. Roberts, "Deeander," Ipswich Road, Annerley.
VK 4PW P. Wood, Nicholas St., Ipswich.
VK 4PX A. Johnson, Croker Avenue, Hendra, N.E.2, Qld.
VK 4PY P. F. Clarke, "Jarvisfield," Ayr.
VK 4QL The Queensland Listeners' League, 157 Enoggera Ter., P'dgton.
VK 4RA R. A. Atkinson, King St., Annerley.
VK 4RC R. Campbell, 30 Prospect Terrace, Kelvin Grove.
VK 4RD R. D. G. Moffett, Northside, Mackay.
VK 4RF F. J. Lubach, 90 Prince St., South Brisbane, S3.
VK 4RG G. E. Ryan, 15 Russell St., South Brisbane.
VK 4RH R. Howe, Perry St., Bundaberg.
VK 4RJ Rev. R. J. R. Delbridge, Glebe Road, Booval, Ipswich.
VK 4RL Central Technical College, George St., Brisbane.
VK 4RM R. C. Meadows, 60 George Street, Mackay, Qld.
VK 4RP R. L. Carne, Goondi Mill, Innisfail.
VK 4RQ R. W. Rose Eagle St., Longreach.
VK 4RS R. E. Stacey, Main St., Proserpine.
VK 4RT R. Thorley, c/o Irving Bros., 310 Stanley St., Sth. Brisbane.
VK 4RV R. M. Vickary, 59 Palmerin St., Warwick.
VK 4RW W. Rohde, "Maranoa," McCook St., Red Hill.
VK 4RX R. A. Blades, Hursley Road, Glenvale, Qld.
VK 4RY W. L. Marston, 72 Riverton St., Clayfield.
VK 4SA A. S. Smith, "Winalar," Burns St., Indooroopilly.
VK 4SD A. H. Sharland, Boondall, N.E.6, Sandgate Line.
VK 4SL T. S. Luckman, cr. Shaw and Lodge Roads, Kalinga.
VK 4SM A. Smart, Willow St., Barcaldine.
VK 4SR T. S. Shoring, Burnett Club, Quay St., Bundaberg.
VK 4ST S. H. Tumbridge Post Office, Stanthorpe.
VK 4SU E. G. Sherriff, "Maricia," Russell St., Fairfield.
VK 4TA T. M. Alexander, Murray St., North Ward, Townsville.
VK 4TH T. G. Hewitt, 8 MacKenzie Street, Cairns.
VK 4TK R. P. C. Stack, Owen St., Innisfail.
VK 4TS E. W. Shorten, 11 Wilden St., Paddington.
VK 4TW A. W. Tarling, Henry Street, West End, Townsville.
VK 4TY N. R. W. Tyas, Kingaroy.
VK 4UJ P. L. Dubois, 55 Baroona Road, Rosalie.
VK 4UK H. V. Herschel, Westminster Road, Indooroopilly.
VK 4UL L. P. Hubsher, 98 Comme cial Rd., N.1.
VK 4UR J. L. Bates, 233 Arthur St., Teneriffe.
VK 4UU W. N. Chitham, 32 Doggett St., Valley.
VK 4UW M. B. Ferricks, 23 John St., Valley.
VK 4UX C. P. Singleton, Theodore.
VK 4UZ A. H Buzacott, 44 Campbell St., Toowoomba.
VK 4VD V. S. Bell, 200 West St., Rockhampton.
VK 4VH H. M. Wooster, 144 Mitchell St., Townsville.
VK 4VJ V. Jeffs, 170 Bowen Terrace, Brisbane.
VK 4VR L. D. Rickaby, 57 Shakespeare St., Coorparoo, S.E2.
VK 4VW V. J. Wilson, 58 Newstead Terrace, Newstead.
VK 4VZ R. Garth, Mackay.
VK 4WA W. J. Goldsworthy, 27 Brunswick St., Valley.
VK 4WB W. J. Berry, Wingarra St., Yerongapilly.
VK 4WD W. D. Hepton, 115 Milton Road, Milton.
VK 4WG W. G. G. Clayton, Benwell St., East Innisfail.
VK 4WH W. E. Hagarty, Crane St., Longreach.
VK 4WI Wireless Inst. of Aust., Celtic Chambers, Brisbane.
VK 4WJ J. H. Farrell, "Braeside," Palmer St., Windsor.
VK 4WL C. L Irving, Bower St., Annerley.
VK 4WM R. W. E. McNicol, 37 Florence St., Teneriffe, N1.
VK 4WO H. Tilse, Avoca St., Yeronga.
VK 4WS W. J. Sebley, 3 Birdwood St., Ipswich.
VK 4WT W. T. Wishart, cr. Long and Dan Sts., Graceville.
VK 4WU W. P. Grant, Ward St., Indooroopilly, S.W2.
VK 4WV W. D. Radford, Elimatta Drive Ashgrove, W3.
VK 4XF J. P. T. Mantle, Norman St., Ascot.
VK 4XK G. Richards, Burnett St., Ipswich.
VK 4XL F. W. Chapman, "Lotus," Park Road, Yeronga.
VK 4XM L. A. Worrall, c/o Bank of N.S.W., Cairns.
VK 4XN E. L. Nisson, Condamine St., Dalby.
VK 4XU M. C. Laurie-Rhodes, c/o T. Warren, Zillman Road, Hendra.
VK 4XW G. Harmer, Ashton St., Coorparoo.
VK 4YA A. A. Kemp, Yangan.
VK 4YG I. H. Young, 212 Sandgate Road, Albion.
VK 4YJ R. H. Sainsbury, "Warrego," Franz Road, Clayfield.
VK 4YL Miss F. M. MacKenzie, Fire Station, Wynnum.
VK 4YM D. Cohen, City Hall, Brisbane, Qld.
XK 4ZL T. E. Pembleton, 167 Denham Street, Rockhampton.
VK 4ZO J. Hillhouse, Collinsville.
VK 4ZT W. N. McDonald, 267 Main St., Kangaroo Point.
VK 4ZX A. F. W. Bullock, 20 Primmer St., Coorparoo.
VK 4ZY C. E. J. Burns, Knight St., Kingaroy.

VK5 — AMATEUR STATIONS IN S. AUSTRALIA

VK 5AC V. R. P. Cook, 86 Windsor Avenue, Kilkenny.
VK 5AF C. A. Ives, 12 Ramsgate St., Glenelg.
VK 5AG W. Smith, 23 North St., Henley Beach.
VK 5AI E. D. Reilly, 53 Stanley Street, Woodville.
VK 5AK K. A. Lawrie, 3 Gertrude Street, Lockleys.
VK 5AM P. Kennedy, 77 Edmund Avenue, New Parkside.
VK 5AP B. J. M. Morrissey, 40 Ballville St., Prospect.
VK 5AQ Sacred Heart College, Glenelg.
VK 5AR A. K. Richardson, 11 South Road, Everard Park.
VK 5AT A. W. Taylor, 22 Mary Elie St., Port Pirie.
VK 5AW A. W. Kelly, Lindale Winery, Lyndoch.
VK 5AX A. H. Traeger, 61 Cuthero Terrace, Corryton.
VK 5AY T. A. J. Haynes, 408 Cross Road, Black Forest Est., Adelaide.
VK 5AZ A.W.A., Ltd., Radio Station, Rosewater.
VK 5BC H. F. Lloyd, 5 Mary St., Hindmarsh.
VK 5BD D. R. Briggs, Iona St., Broadview, Walkerville.
VK 5BF F. G. Miller, Eleanor Terrace, Murray Bridge.
VK 5BH L. W. Blunden, 58 Shelley Street, Firle.
VK 5BJ R. A. Bruce, 1 Henry Street, Glenelg.
VK 5BK J. Grivell, cr. 3rd and 5th Streets, Gladstone.
VK 5BM E. L. Willoughby, Knight Street, Penrhyn.
VK 5BP A. B. Caldwell, 53 Hughes Street, North Unley.
VK 2BR Blackwood Radio Club, c/o G. Ragless, South Rd., St. Marys.
VK 5BU F. F. Bourne, 8 Edmund Avenue, Unley.
VK 5BW J. G. Phillips, Madge Terrace, Somerton.
VK 5BY D. R. Whitburn, 77 Wattle St., Fullarton.
VK 5CB C. C. Brimble, 27 Scarborough Street, Somerton.
VK 5CH C. L. H. Haines, Post Office, Box 34, Millicent.
VK 2CM R. M. Anthony, 3 High Street, Unley Park.
VK 5CP C. P. Laver, Cape Borda Lighthouse, Kangaroo Island.
VK 5CR C. R. Cheel, 40 Clifton Street, Maylands.
VK 2CX C. E. Moule, 146 Young Street, Parkside.
VK 5CY R. C. Henry, Cook.
VK 5DA S. R. Buckerfield, 38 Queen Street, Knoxville.
VK 5DB L. D. Berry, 24 Moulden St., Norwood.
VK 5DC A. E. Shepard, 33 Queen Street, Norwood.
VK 5DI 5AD-PI Radio Club, 313 Young Street, Wayville.
VK 5DK T. F. Robbins, 11 Moorhouse Avenue, Fullarton Estate.
VK 5DL D. C. Linklater, Railway Terrace, Pinnaroo.
VK 5DP H. E. E. Brock, 2A Marlborough Street, Malvern.
VK 5DR P. W. Deer, 9 Arundel Road, Brighton.
VK 5DX D. G. Taylor, 67 Victoria Street, Forestville.
VK 5EM J. E. Mann, 149 Military Road South, Semaphore.
VK 5FA F. B Anderson, Elizabeth St., Tanunda.
VK 5FB B. F. Brandon, Post Office Box 80, Wilmington.
VK 5FC C. H. J. Collins, 12 Hackett Terrace, Marryatville.
VK 5FG B. S. Rogers. c/o F. R. Radestock, Blackwood.
VK 5FI A. H. Giddings, 39 Second Avenue, Nailsworth.
VK 5FL R. C. Harris, 9 Giles Avenue, Glenelg.
VK 5FM H. N. Bowman, 24 Lambert Road, Royston Park.
VK 5FW E. T. Halliday, Wonga Avenue, Rectorville.
VK 5GA G. R. Anderson, Baulderstone Road, Myrtle Bank.
VK 5GC G. T. Burgess, 39 Airlie Avenue, Prospect.
VK 5GF M. G. Farmer, 134 LeStrange Street, Knoxville.
VK 5GK F. P. Carter, 59 Roebuck Street, Mile End.
VK 5GL C. D. L. Tilbrook, 24 Cecilia Street, Brighton.
VK 5GM A. R. Anderson, 16 Hauteville Terrace, Eastwood.
VK 5GP R. G. Pitts, 65 Carlton Parade, Torrensville.
VK 5GR G. B. Ragless, South Road, St. Marys.
VK 5GU R. W. Gregory, Hutchinson St., Mount Barker.
VK 5GW W. G. Huppatz, McCoy St., Naracoorte.
VK 5GX A. W. A. Phillips, 3 Anzac Highway, Golflands, Glenelg, S.A.
VK 5HB H. B. Johnson, 429 Esplanade, Henley Beach.
VK 5HD W. E. Lloyd, 5 Mary St., Hindmarsh.
VK 5HG H. M. Cooper, 51 Hastings St., Glenelg.
VK 5HK E. L. Backler, Kingston.
VK 5HL H. V. Lunn, 10 Morphett Road, Morphettville.
VK 5HM G. W. Goldsmith, 15 Goldfinch Avenue, Cowandilla.
VK 5HR W. L. Heinrich, Post Office, Box 9, Bute.
VK 5HW H. W. Wheeler, Wiepena St., Eden Hills.
VK 5IT I. Thomas, 15 Eynesbury Av., Kingswood Park, Mitcham.
VK 5IV P. R. Dennett, Coneybeer St., Berri.
VK 5JA P. J. Brewer, 21 Douglas St., Parkside.
VK 5JB J. T. Bergin, 11 Sefton St., Largs Bay.
VK 5JC E. J. Cawthron, 18 Flinders St., Kent Town.
VK 5JD J. Georgeson, 67 Moseley Street, Glenelg.
VK 5JH V. Chennell, 37 Hounslow Avenue, Cowandilla.
VK 5JK I. M. Kidman, Robertson St., Naracoorte.
VK 5JN S. A. Henderson, 19 North East Road, Walkerville.
VK 5JO A. A. Reimann, 26 College Road, Kent Town.
VK 5JR J. Smith, 19 Flora St., St. Peters.
VK 5JS J. Strafford, 71 Ann St., Stepney.
VK 5JT J. Kilgariff, 70 Stanley Street, Burnside, S.A.
VK 5JU H. A. Berry, 38 William St., Norwood.
VK 5JW J. W. Wilkin, North Walderville.
VK 5JX J. C. Golley, 15 Pier St., Glenelg.
VK 5KB H. K. Bowen, 44 Augusta St., Maylands.
VK 5KD R. W. Davey, 199 Torrens Road, North Croydon.
VK 5KG A. H. Brooks, 13 Surrey Street, Grange, S.A.
VK 5KH K. M. Ring, 8 May Terrace, Kensington Park.
VK 5KL C. H Castle, 21 Harrington St., Prospect.
VK 5KO J. E. DeCure, 25 Farrell St., Glenelg.
VK 5KR L. K. Ireland, Chute Street, Mount Gambier.
VK 5KW K. Wadham, 96 Piri St., Adelaide.
VK 5KX W. J. Bulling, 617 Esplanade, Grange, S.A.
VK 5KY J. W. Stapleton, 125 Commercial Rd., Port Adelaide.
VK 5LA L. M. Atkins, 16 Lockwood Rd., Erindale.
VK 5LB J. H. L. Badenoch, 43 Hereford Avenue, Trinity Gardens.
VK 5LC L. E. Catford, Gladstone.
VK 5LD L. A. Deane, 21 Davenport Terrace, Hazelwood Park.
VK 5LF L. F. Sawford, 107 Wills St., Largs.
VK 5LG L. Cotton, Post Office, Iron Knob.
VK 5LJ R. R Davies, 8 Gurr St., Goodwood Park.
VK 5LL G. F. Lucas, 19 Wilpena Terrace, Kilkenny.
VK 5LN A. J. Drew, 19 Dimboola St., Kensington.
VK 5LO H. E. Loeser, 2 Clifton St., Goodwood.
VK 5LP L. V. Phillis, 5 Luhrs Road, South Payneham.
VK 5LR J. Lester, 15th St., Renmark.
VK 5LY C. W. Hodder, 72 Porter St., Parkside.
VK 5MC J. M. Coulter, 36 Brighton Road, Glenelg.
VK 5MD E. Barbier, Stockade Reserve.
VK 5MF A. C. Smythe, 15 Northcote St., Torrensville.
VK 5MH R. Baty, Addison Rd., Pennington.
VK 5MK F. E. Bentley, 20 Neil St., Cowandilla.
VK 5ML G. S. Coombe, 6 Manton St., Hindmarsh.
VK 5MV S. G. Barber, 505 North Esplanade, Henley Beach, S.A.

VK 5MW K. J. Atkins, 29 Park Avenue, Semaphore South.
VK 5MX C. R. White, 69 Curran St., Kilkenny.
VK 5MY H. M. Roberts, 58 Fourth Avenue, Alberton East.
VK 5MZ J. H. Lawrence, 17 Sheffield St., Malvern.
VK 5NR N. W. Roberts. 11 Ninth Avenue, St. Peters.
VK 5NW R. H. Bailey, Mitchell Street, Crystal Brook.
VK 5OJ H. R. Green, 5 Dudley Avenue, Prospect.
VK 5OP L. A. Brown, 16 Park Terrace, Eastwood.
VK 5PB W. P. Burford, Foster St., Naracoorte.
VK 5PN W. L. Pearn, 20 Oxford Terrace, Sturt Park.
VK 5PS W. W. Parsons, Esplanade, Henley Beach.
VK 5QP K. M. Theel, Caulfield Avenue, Clarence Park.
VK 5QR R. V. Galle, 56 Olive St., Prospect.
VK 5RB R. Bedford, Cottage Hospital, Kyancutta.
VK 5RC A. R. Cameron, 330 Kensington Road, Leabrook.
VK 5RD R. D. Elliott, Farr Terrace, DaCosta Park.
VK 5RE H. Hobcroft, Ral Ral Avenue, Renmark.
XK 5RG R. C. Gurner, 11 Strathspey Avenue, Linden Park Gardens.
VK 5RH R. G. Haskard, 9 Austral Terrace, Malvern.
VK 5RI S.A. Railways Inst., North Terrace, Adelaide.
VK 5RJ D. M. Hancock, 86 Taylor St., Kadina.
VK 5RK R. K. Deane, 121 Wattle St., Fullarton.
VK 5RL R. L. Paech, 14 Fernleigh Street, Underdale.
VK 5RO E. R. Easter, Port Elliot.
VK 5RP R. Parasiers, 138 Anzac Highway, Glandore.
VK 5RT R. T. Manuel, 59 Gordon Road, Prospect.
VK 5RX G. W. Luxon, 8 Brook St., West Mitcham.
VK 5RY R. C. Yates, c/o B.H.P. Co., Ltd., Whyalla.
VK 5RZ O. L. Nestrom, 11 Ninth Avenue, St. Peters.
VK 5SL L. V. Fiedler, Blyth Terrace, Moonta.
VK 5SM South Australian School of Mines and Indust., N. Terr., A'laide.
VK 5SP L. W. Finn, Simpson Street, Seaton Park.
VK 5SU F. M. Gray, 52 Ormond Grove, Toorak Gardens.
VK 5TR R. R. Turner, 122 Seaview Road, Henley Beach.
VK 5TT Thebarton Junior Tech. School Club. Ashley St., Thebarton
VK 5TW T. Welling, 106 Hill Street, North Adelaide, S.A.
VK 5TX J. Foster, 11 York St., North Kensington.
VK 5UK T. J. Coakley, 10 Thomas St., Unley.
VK 5UX L. W. Wallbridge, 20 Wattlebury Road, Lower Mitcham.
VK 5WA W. K. Adamson, 46 Woodfield Avenue, Fullarton.
VK 5WB H. B. Wilson, 313 Young St., Wayville.
VK 5WD D. A. Wilkinson, 23 Main Avenue, Frowville.
VK 5WG W. N. Govan, 39 Esmond Road, Port Pirie.
VK 5WH W. H. Barbor, 46 Cottell St., Port Pirie.
VK 5WI Wireless Institute of Aust., 176 Rundle St., Adelaide.
XK 5WJ W. J. C. Wiseman, Port Lincoln.
VK 5WK A. E. Prince, 23 Warwick St., Walkerville.
VK 5WP W. S. Pitchford, 10 Clarence St., Hyde Park.
VK 5WR W. M. Richards, 32 Charlbury Road, Medindie Gardens.
VK 5WS West Suburban Radio Club, 44 King St., Mile End.
VK 5WW W. S. Walker, 20 King St., Alberton.
VK 5XA H. K. Stacey, 55 Gwynne St., Firle.
VK 5XB J. Sutherland, Gower St., Dunleath, Glenelg.
VK 5XJ C. A. Pryzibilla, 19 Leicester St., Parkside.
VK 5XK A. J. Hewitt, 233 Henley Beach Road, Torrensville.
VK 5XR C. Patterson, Peake St., Naracoorte.
VK 5YK Eastern District Radio Club, 56 Statenborough St., Burnside.
VK 5YL Miss B. A. Geisel, Charles Street, Murray Bridge, S.A.
VK 5YQ E. A. Charles, 193 Young St., North Unley.
VK 5ZC M. C. Clayton, 15 Lindfield Avenue, Edwardstown.
VK 5ZL J. A. Weddell, 26 Kandahar Crescent, Reade Park.
VK 5ZU A. M. Phillips, 68 Kintore Avenue, Prospect.
VK 5ZX A. H. Heath, 7 Clifford St., Prospect Park.
VK 5ZY A. K. Mutton, 4 Burke St., Tusmore.

VK6 — AMATEURS IN WEST AUSTRALIA

VK 6AA A. E. Grey, 40 Archdeacon St., Nedlands.
VK 6AB A. C. Buckie, 14 Kinninmont Avenue, Nedlands, W.A.
VK 6AE A. Curedale, 74 Palmerston St., Perth.
VK 6AF A. Foxcroft, 108 Carnarvon St., Victoria Park.
VK 6AG W. E. Coxon, 38 Fifth Avenue, Mt. Nawley.
VK 6AK University of West Australia, Perth.
VK 6AL A. G. Lathwell, 60 Spencer St., Bunbury.
VK 6AR A. C. Russell, Perth Road, Albany.
VK 6AS A. D. Wood, "Kia Ora." Ormond Road, Mount Barker.
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VK 6BA W. H. R. Arnold, Alexander Street, Wembley.
VK 6BB J. C. Park, 29 Suburban Road, Hill Point, Sth. Perth.
VK 6BC B. Congdon, 75 Gloster St., Subiaco.
VK 6BF F. H. Burrows, Queen St., Beverley.
VK 6BL A.W.A. Limited, Radio Station, Applecross.
VK 6BN A. E. Stevens, 27 Strickland St., South Perth.
VK 6BW A. J. H. Wyle, 23 James St., Shenton Park.
VK 6CA C. A. Bold, 13 Solomon St., Beaconsfield.
VK 6CB C. W. Brown, 11 May Avenue, Subiaco.
VK 6CN J. Canavan, 196 Bulwer St., Perth.
VK 6CP C. R. Cooke, 35 Beechboro Road, Bayswater.
VK 6CR C. H. Reeves, 3 McMillan St., Victoria Park.
VK 6CX C. Quin, 54 Williams Road, Nedlands.
VK 6OY C. A. Young, 73 Marine Terrace, Fremantle.
VK 6DA F. W. Saw, 31 Maynes St., North Perth.
VK 6DC C. D'Evelynes, Uduc Road, Harvey.
VK 6DF M. A. J. Du Feu, 110 Heytesbury Road, Subiaco, W.A.
VK 6DH D. C. Hardisty, 2 Duncan St., Victoria Park.
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VK 6FJ F. J. Kemble, Richardson St., Katanning.
VK 6FL F. C. Lambert, 9 Gregory St., Wembley.
VK 6FM F. May, Post Office, Esperance.
VK 6FO N. F. Ollivier, 26 Merriwa St., Hollywood.
VK 6FR F. H. Wright, 18 Palmerston St., Bucklan Hill.
VK 6FT F. Tredrea, 43 Weld St., Northam.
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VK 6JT J. Treloar, Canning Road, Melville.
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VK 6LY R. Collis, 19 Murray St., Bayswater.
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VK 6MO Magnetic Observatory, Watheroo.
VK 6MS J. H. Sander, 79 Eleanor St., Geraldton.
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VK 6RS R. S. Trew, King St., Harvey.
VK 6RT R. L. Trunfull, Baldivis, via Peel Estate.
VK 6RW R. W. Muir, Johnston St., Wagin.
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VK 6SG S Hogg, Gibb St., Harvey.
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VK 6WO J. C. F. L. Pelling, Trimmer Road, Moojebing.
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SHORT-WAVE AERIALS

WHAT is the best aerial to use for short wave reception? This is a question which comes to the minds of many readers who are interested in hunting D.X. from overseas, and who want to get the most they can from their sets.

The answer is, of course, the aerial that works best. This isn't as silly as it sounds. It is almost impossible to say which is the best aerial for all conditions—it is only possible to indicate some of the points to be watched when considering them.

Extreme length is not a good feature in short wave aerials, if it can be avoided. Height is much more important. An aerial 40ft. long and 40ft. high should be excellent for short wave work. A longer aerial tends to load up the first tuning circuit, broaden the tuning, and even upset the alignment. Therefore, the simplest aerial is just a 40ft. flat top, and a direct down lead-in, if possible, to the set's aerial terminal. The earth lead also should be of heavy gauge, and as short as it can be made. The lower the wave-length, the more important this length of earth lead becomes.

A better aerial still is one which uses a double-wire lead-in. This can consist of a twisted flex line, or two wires spaced and transposed with transposition blocks. The idea of the two wires is to prevent the lead-in itself from picking up signals, by cancelling out the impulses received by it. Thus, the aerial is the only source of signal gathering.

Naturally, such an aerial will probably pick up less total signal, but remember that the lead-in comes down into the house, and its network of A.C. wiring. Often electrical noises and hash are picked up by the lead-in, and by making it a twin wire no signals are picked up by the lead-in, and none, or very little, of the noise, either. So that the total ratio of signal-to-noise is often improved very much, and the signals heard will therefore be clearer. After all, this is what we want, as loud signals are of little use unless the noise accompanying them is small.

This type of lead-in can be used with a plain aerial, by connecting one wire to the aerial, and leaving the other open. Even better results may be obtained by breaking the aerial in the centre, and connecting each half to one of the lead-in wires.

With doublet connection, it is necessary to disconnect the earth from one side of the aerial coil of the set, and connect the two wires one to each end. Many sets have this provision for connection to a doublet aerial. Naturally, the higher and farther the aerial is from the house or nearby wiring, the less chance it has of picking up electrical noises. In bad cases, special aerial kits may be purchased which carry this principle still further. Some of these may cut signal strength somewhat, according to type, but, in all cases, the signal to noise ratio is improved.

If, as in country houses, there is no chance of electrical interference, the doublet aerial is not so valuable, as it does not, as a rule, increase signal strength.

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VK 8AC Portable call of VK 8AB.
VK 8AD C.A.M. Hermansbury.
VK 8AE C.A.M. Arltinga, N.T.
VK 8AF C.A.M., Maryvale.
VK 8KM F. Kempster, Port Darwin.
VK 8XT Portable of VK 5AX.

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VK 4KC W. A. Bock, Pandora Crescent, Port Moresby, Papua.
VK 9AW J. K. Twycross, Rabaul.
VK 9BA A. H. Gray, Bulolo.
VK 9DK C. E. Davis, Kavieng.
VK 9GM G. M. Hill, Rabaul.
VK 9KO H. W. Blue, Rabaul, New Guinea.
VK 9LW N. L. White, Rabaul, New Guinea.
VK 9MC W. MacGregor, Kavieng.

INTERNATIONAL PREFIXES

AC4 .. TIBET
AR .. SYRIA
CE .. CHILE
CM .. CUBA
CN .. MOROCCO
CO .. CUBA (fones)
CP .. BOLIVIA
CR4 .. CAPE VERDE
CR5 .. PORTUGUESE GUINEA
CR6 .. ANGOLA
CR7 .. MOZAMBIQUE
CR8 .. PORTUGUESE INDIA
CR9 .. MACAO
CR10 .. TIMOR
CT1 .. PORTUGAL
CT2 .. AZORES
CT3 .. MADEIRA
CX .. URUGUAY
D4 .. GERMANY
EA .. SPAIN
EA8 .. CANARY ISLANDS
EI .. IRISH FREE STATE
EL .. LIBERIA
EP, EQ .. IRAN (ex-Persia)
ES .. ESTONIA
F3 .. FRANCE
F8 .. FRANCE
FA .. ALGERIA
FB8 .. MADAGASCAR
FD8 .. TOGOLAND (French)
FE8 .. CAMEROONS (French)
FF8 .. FRENCH WEST AFRICA
FG8 .. GAUDELOUPE
FI8 .. FRENCH INDO-CHINA
FK8 .. NEW CALEDONIA
FL8 .. SOMALI COAST
FM8 .. MARTINIQUE
FN8 .. FRENCH INDIA
FO8 .. FRENCH OCEANIA, TAHITI
FP8 .. ST. PIERRE & MIQUELON
FQ8 .. FR. EQUATORIAL AFRICA
FR8 .. REUNION
FT4 .. TUNIS
FU8 .. NEW HEBRIDES
FY8 .. FRENCH GUIANA
G .. GREAT BRITAIN
GI (see G) .. NORTHERN IRELAND
HA .. HUNGARY
HB .. SWITZERLAND
HC .. ECUADOR
HH .. HAITI
HI .. DOMINICAN REPUBLIC
HJ, PK .. COLLUMBIAN REPUBLIC
HP .. PANAMA
HR .. HONDURAS
HS .. SIAM
HZ .. HEDJAZ
I .. ITALY
J .. JAPAN
K4 .. PORTO RICO, VIRGIN ISLANDS
K5 .. CANAL ZONE
K6, GUAM, HAWAII, MIDWAY ISLAND, SAMOA (U.S.), WAKE ISLAND.
K7 .. ALASKA
KA .. PHILIPPINE ISLANDS
LA .. NORWAY
LU .. ARGENTINA
LX .. LUXEMBOURG
LY .. LITHUANIA
LZ .. BULGARIA
MX .. MANCHUKUO
N, U.S. NAVAL COMMUNICATION RESERVE STATIONS.
NY .. CANAL ZONE
OA .. PERU
OE .. AUSTRIA
OH .. FINLAND
OK .. CZECHOSLOVAKIA
OM .. GUAM
ON .. BELGIUM, BEL. CONGO
OX .. GREENLAND
OY .. FAROE ISLANDS
OZ .. DENMARK
PA .. NETHERLANDS
PI .. NETHERLANDS (schools)
PJ .. CURACAO
PK .. NETH. INDIES
PX .. ANDORRA
PY .. BRAZIL
PZ .. SURINAM
SM .. SWEDEN
SP .. POLAND
ST .. SUDAN
SU .. EGYPT
SV .. GREECE
TA .. TURKEY
TF .. ICELAND
TG .. GAUTEMALA
TI .. COSTA RICA
U, UE, UK, UX .. U.S.S.R.
VE .. CANADA
VK .. AUSTRALIA
VO .. NEWFOUNDLAND
VP1 .. BRITISH HONDURAS
VP2, DOMINICA, GRENADA, ANTIQUA, ST. KITTS-NEVIS.
VP3 .. BRITISH GUIANA
VP4 .. TRINIDAD & TOBAGO
VP5, CAYMAN ISLANDS, JAMAICA, TURKS & CAICOS ISLANDS.
VP6 .. BARBADOS
VP7 .. BAHAMAS
VP8, FALKLAND ISLANDS, SOUTH GEORGIA.
VP9 .. BERMUDA
VQ1 (*VR3) .. FANNING ISLAND
VQ2 .. NORTHERN RHODESIA
VQ3 .. TANGANYIKA
VQ4 .. KENYA
VQ5 .. UGANDA
VQ6 .. BRITISH SOMALILAND
VQ8 .. MAURITIUS
VQ9 .. SEYCHELLES
VR1 .. GILBERT & ELLICE ISLANDS
VR2 .. FIJI ISLANDS
VR3 .. FANNING ISLAND
VR4 .. BR. SOLOMON ISLANDS
VR5 .. TONGA ISLANDS
VR6 .. PITCAIRN ISLAND
VS1, VS2, VS3 .. MALAYA
VS4 .. BORNEO
VS5 .. SARAWAK
VS6 .. HONGKONG
VS7 .. CEYLON
VS8 .. BAHREIN ISLAND
VS9 .. MALDIVE ISLANDS
VU .. INDIA
W .. UNITED STATES
XE .. MEXICO
XT, XU .. CHINA
YA .. AFGHANISTAN
YI .. IRAQ
YJ (**FU8) .. NEW HEBRIDES
YL .. LATVIA
YM .. DANZIG
YN .. NICARAGUA
YR .. ROUMANIA
YS .. SALVADOR
YT, YU .. JUGOSLAVIA
YV .. VENEZUELA
ZA .. ALBANIA
ZB1 .. MALTA
ZB2 .. GIBRALTAR
ZC1 .. TRANSJORDANIA
ZC2 .. COCOS ISLANDS
ZC3 .. CHRISTMAS ISLAND
ZC4 .. CYPRUS
ZC5 .. PALESTINE
ZD1 .. SIERRA LEONE
ZD2 .. NIGERIA, CAMEROONS (British)
ZD3 .. GAMBIA
ZD4 . GOLD COAST, TOGOLAND (British)
ZD6 .. NYASALAND
ZD7 .. SAINT HELENA
ZD8 .. ASCENSION
ZE1 .. SOUTHERN RHODESIA
ZK1 .. COOK ISLANDS
ZK2 .. NIUE
ZL .. NEW ZEALAND
ZM .. WESTERN SAMOA
ZP .. PARAGUAY
ZS, ZT, ZU .. SOUTH AFRICA
*ZU9 .. TRISTAN DA CUNHA

*Suggested by the British Empire Radio Union.
**Official, by French Govt.

INTERNATIONAL PREFIXES—BY COUNTRIES

AFGHANISTAN (A) .. .. YA
ALASKA (NA) K7
ALBANIA (E) .. .. ZA
ALGERIA (AF) .. .. FA
ANDORRA (E) .. .. PX
ANGOLA (AF) CR6
ANTIGUA (NA) VP2
ARGENTINA (SA) .. .. LU
ASCENSION (AF) ZD8
AUSTRALIA (O) .. .. VK
AUSTRIA (E) .. .. OE
AZORES (AF) CT2
BAHAMAS (NA) VP7
BAHREIN ISLAND (A) VS8
BARBADOS (NA) VP6
BELGIAN CONGO (AF) .. .. ON
BELGIUM (E) .. .. ON
BERMUDA (NA) VP9
BOLIVIA (SA) .. .. CP
BORNEO (O) VS4
BRAZIL (SA) .. .. PY
BRITISH GUIANA (SA) VP3
BRITISH HONDURAS (NA) VP1
BR. SOLOMON ISLANDS (O) VR4
BRITISH SOMALILAND (AF) VQ6
BULGARIA (E) .. .. LZ
CAMEROONS (British) (AF) ZD2
CAMEROONS (French) (AF) FE8
CANADA (NA) .. .. VE
CANAL ZONE (NA) .. .. K5, NY
CANARY ISLANDS (AF) EA8
CAPE VERDE (AF) CR4
CAYMAN ISLANDS (NA) VP5
CEYLON (A) VS7
CHILE (SA) .. .. CE
CHINA (A) .. .. XT, XU
CHRISTMAS ISLAND (O) ZC3
COCOS ISLANDS (O) ZC2
COLOMBIAN REPUBLIC (SA) .. HJ, HK
COOK ISLANDS (O) ZK1
COSTA RICA (NA) .. .. TI
CUBA (NA) .. .. CM, CO
CURACOA (SA) .. .. PJ
CYPRUS (E) ZC4
CZECHOSLOVAKIA (E) .. .. OK
DANZIG (E) .. .. YM
DENMARK (E) .. .. OZ
DOMINICA (NA) VP2
DOMINICAN REPUBLIC (NA) .. .. .. HI
DUTCH E. IND. (see Neth. Ind.)
ECUADOR (SA) .. .. HC
EGYPT (AF) .. .. SU
ELLICE ISLANDS (see Gilbert).
ESTONIA (E) .. .. ES
FALKLAND ISLANDS (SA) VP8
FANNING ISLAND (O) VR3
FAROE ISLANDS (E) .. .. OY
FIJI ISLANDS (O) VR2
FINLAND (E) .. .. OH
FRANCE (E) F3, F8
FR. EQUATORIAL AFRICA FQ8
FRENCH GUIANA (SA) FY8
FRENCH INDIA (A) FN8
FRENCH INDO-CHINA (A) FI8
FRENCH WEST AFRICA FF8
GAMBIA (AF) ZD3
GERMANY (E) D4
GIBRALTAR (E) ZB2
GILBERT and ELLICE ISLANDS (O) . VR1
GREAT BRITAIN (E) .. .. G
GREECE (E) .. .. SV
GREENLAND (NA) .. .. OX
GRENADA (NA) VP2
GUADELOUPE (NA) FG8
GUAM (O) .. .. K6, OM
GUATEMALA (NA) .. .. TG
HAWAII (O) K6
HAITI (NA) .. .. HH
HEDJAZ (A) .. .. HZ
HONGKONG (A) VS6
HONDURAS (NA) .. .. HR
HUNGARY (E) .. .. HA
ICELAND (E) .. .. TF
INDIA (A) .. .. VU
IRAN (ex-Persia) (A) .. .. EP, EQ
IRAQ (A) .. .. YI
IRISH FREE STATE (E) .. .. EI
ITALY (E) I
JAMAICA (NA) VP5
JAPAN (A) .. .. J
JUGOSLAVIA (E) .. .. YT, YU
KENYA (AF) VQ4
LATVIA (E) .. .. YL
LIBERIA (AF) .. .. EL
LITHUANIA (E) .. .. LY
LUXEMBOURG (E) LX
MACAO (A) CR9
MADAGASCAR (AF) FB8
MADEIRA (AF) CT3
MALAYA (A) VS1, VS2, VS3
MALDIVE ISLANDS (A) VS9
MALTA (E) ZB1
MANCHUKUO (A) .. .. MX
MARTINIQUE (NA) FM8
MAURITIUS (AF) VQ8
MEXICO (NA) .. .. XE
MIDWAY ISLAND (O) K6
MOROCCO (AF) .. .. CN
MOZAMBIQUE (AF) CR7
NETHERLANDS (E) .. .. PA, PI
NETH. INDIES (O) .. .. PK
NEW CALEDONIA (O) FK8
NEWFOUNDLAND (NA) .. .. VO
NEW HEBRIDES (O) .. .. VJ (**FU8)
NEW ZEALAND (O) .. .. ZL
NICARAGUA (NA) .. .. YN
NIGERIA (AF) ZD2
NIUE (O) ZK2
NORTHERN IRELAND (E) .. .. GI
NORTHERN RHODESIA (AF) VQ2
NORWAY (E) .. .. LA
NYASALAND (AF) ZD6
OCEAN ISLAND (see Gilbert).
PALESTINE (A) ZC6
PANAMA (NA) .. .. HP
PARAGUAY (SA) .. .. ZP
PERSIA (see Iran):
PERU (SA) .. .. OA
PHILIPPINES (O) .. .. KA
PITCAIRN ISLAND (O) VR6
POLAND (E) .. .. SP
PORTO RICO (NA) K4
PORTUGAL (E) CT1
REUNION (AF) FR8
ROUMANIA (E) .. .. YR
SAINT HELENA (A) ZD7
ST. KITTS-NEVIS (NA) VP2
ST. PIERRE and MIQUELON (NA) .. FP8
SALVADOR (NA) .. .. YS
SAMOA (O) (U.S.) K6
SARAWAK (O) VS5
SEYCHELLES (AF) VQ9
SIAM (A) .. .. HS
SIBERIA (see U.S.S.R.).
SIERRA LEONE (AF) ZD1
SOMALI COAST FL8
SOUTH AFRICA .. .. ZS, ZT, ZU
SOUTH GEORGIA (SA) VP8
SOUTHERN RHODESIA (AF) ZE1
SPAIN (E) .. .. EA
STRAITS SETTS. (see Malaya).
SUDAN (AF) .. .. ST
SURINAM (SA) .. .. PZ
SWEDEN (E) .. .. SM
SWITZERLAND (E) .. .. HB
SYRIA (A) .. .. AR
TAHITI (O) F3 (**FO8)
TANGANYIKA (AF) VQ3
TIBET (A) AC4
TOGOLAND (British) (AF) ZD4
TOGOLAND (French) (AF) FD8
TONGA ISLANDS (O) VR5
TRANSJORDANIA (A) ZC1
TRINIDAD and TOBAGO (SA) .. VP4
TRISTAN DA CUNHA (AF) ZU9
TUNIS (AF) FT4
TURKEY (E & A) .. .. TA
UGANDA (AF) VQ5
UNITED STATES (NA) .. .. W
U.S. NAVAL COMMUNICATION RESERVE STATIONS (NA) .. .. N
URUGUAY (SA) CX
U.S.S.R. (E, A) .. .. U, UE, UK, UX
VENEZUELA (SA) .. .. YV
VIRGIN ISLANDS (NA) K4
WESTERN SAMOA (O) (British) .. .. ZM
ZANZIBAR (AF) VP1

*Suggested by the British Empire Radio Union.
**Official, by French Government.

NA—North America.
SA—South America.
E—Europe.
A—Asia.
AF—Africa.
O—Oceania.

CLASSIFIED REPORTS

READABILITY—(Q.S.A. or R.)

1—UNREADABLE.
2—BARELY READABLE—OCCASIONAL WORDS DISTINGUISHABLE.
3—READABLE WITH CONSIDERABLE DIFFICULTY.
4—READABLE WITH PRACTICALLY NO DIFFICULTY.
5—PERFECTLY READABLE.

TONE (T.)

1—EXTREMELY ROUGH, HISSING NOTE.
2—VERY ROUGH A.C. NOTE—NO TRACE OF MUSICALITY.
3—ROUGH, LOW-PITCHED A.C. NOTE—SLIGHTLY MUSICAL.
4—RATHER ROUGH A.C. NOTE—MODERATELY MUSICAL.
5—MUSICALLY MODULATED NOTE.
6—MODULATED NOTE—SLIGHT TRACE OF WHISTLE.
7—NEAR D.C. NOTE—SMOOTH RIPPLE.
8—GOOD D.C. NOTE—JUST TRACE OF RIPPLE.
9—PUREST D.C. NOTE.
IF THE NOTE APPEARS TO BE CRYSTAL CONTROLLED, SIMPLY ADD AN X AFTER THE APPROPRIATE NUMBER.

AUDIBILITY (R. or S.)

1—FAINT—SIGNALS BARELY PERCEPTIBLE.
2—VERY WEAK SIGNALS.
3—WEAK SIGNALS.
4—FAIR SIGNALS.
5—FAIRLY GOOD SIGNALS.
6—GOOD SIGNALS.
7—MODERATELY STRONG SIGNALS.
8—STRONG SIGNALS.
9—EXTREMELY STRONG SIGNALS.

NEW ZEALAND AMATEUR STATIONS

The 80 metre 'phone transmissions of the New Zealand stations are very well received in Australia, but N.Z. amateurs are not permitted to use 'phone on the 40 or 20 metre bands. Cards etc. should be sent to the N.Z.A.R.T. Q.S.L. Bureau, Box 374, Dunedin, N.Z.

ZL1—STATIONS LOCATED IN AUCKLAND DISTRICT

The calls in this list are prefixed by the letters ZL (except the two in the Cook Islands.)

ZK 1AB E. J. Wood, Titikaveka, Rarotonga.
ZK 2AA J. Lonsdale, Niue Radio.
ZL 1AA C. N. Edwards, 26 Meola Rd., Pt. Chevalier, Auckland.
ZL 1AB S. G. Waite, 54 Marlborough St., Dominion Rd., Auckland, SW1.
ZL 1AC L. S. Spackman, 29 Faulder Ave., Westmere, Auckland, W2.
ZL 1AD J. P. Kenny, 10 Prospect Terrace, Ponsonby, Auckland, S2.
ZL 1AE R. W. Duffin, 40Meadowbank Rd., Remuera, Auckland, SE2.
ZL 1AF V. G. Penny, 6 Wallace Street, Papatoetoe.
ZL 1AG C. R. W. L. Pope, 58 Ulster St., Hamilton.
ZL 1AH Messrs. Hartle and Gray, 7 Alten Rd., Auckland.
ZL 1AI C. McLean, "Bird Grove," Waipu.
ZL 1AJ New Lynn Radio Club, 11 Folkes St., New Lynn, SW4.
ZL 1AK W. H. Claxton, Hill St., Thames.
ZL 1AL R. G. Bartram, 17 Wellington St., Hamilton.
ZL 1AM J. C. Isherwood, 17 Clyde St., Whangarei.
ZL 1AN H. B. M. Arthur, 268a Gt. South Rd., Greenlane, Auck., SE4.
ZL 1AO R. G. White, 1388 Dominion Rd., Mt. Roskill, S3.
ZL 1AP N. J. Winch, Brady St., Te Awamutu.
ZL 1AQ A. A. Somerville, 66 Wairiki, Rd., Mt. Eden, Auckland, S2.
ZL 1AR L. M. Mellars, 24 Rangitoto Ave., Remuera, SE2.
ZL 1AS I. H. McCrae, Winstone's Bldgs., Queen St., Auckland, C4.
ZL 1AT G. S. Swain, Mangapiko St., Te Awamutu.
ZL 1AU M. L. Spackman, 27 Merivale Ave., Epsom, Auckland, SE3.
ZL 1AV F. C. Reardon, 20 Cooper St., Auckland, W2.
ZL 1AW R. R. Lyons, 4 Coronation Rd.,Epsom, Auckland, SE3.
ZL 1AX R. J. Orbell, 5 Mt. Royal Ave., Mt. Albert, SW2.
ZL 1AZ J. R. Sherson, Radnor Street, Hamilton.
ZL 1BA R. J. Taylor, 68 View Rd., Mt. Eden, C3.
ZL 1BC W. E. F. Mickelborough, 58 Moa Rd., Pt. Chevalier, W2.
ZL 1BD W. H. Wadham, 22 Sefton Ave., Grey Lynn, Auckland.
ZL 1BE E. K. McKay, 17 Windsor St., Parnell, C4.
ZL 1BI C. McArthur, John Street, Pukekohe.
ZL 1BF A. L. Partelow, New Zealand Air Force Base,, Hobsonville.
ZL 1BG Dr. B. G. Thompson, 11 Stanfield Rd., Bournemouth.
ZL 1BH A. H. Hudson, 32 Ranui Rd., Remuera, Auckland.
ZL 1BJ A. V. Jury, Onewhero.
ZL 1BK R. J. E. Long, "Tatsfield," Mt. Well'n Highway, Otahuhu, SE7.
ZL 1BL J. S. Lynch, 31 Colombo St., Frankton Junction.
ZL 1BN D. W. M. Tapp, Tutanekai Street, Rotorua.
ZL 1BO T. M. Paterson, Ngaruawahia.
ZL 1BP J. D. Surman, 38 King's View Road, Mt. Eden, S1.
ZL 1BQ M. W. Coutts, Great South Rd., Otahuhu.
ZL 1BR T. C. Sweetman, 16 Arcadia Rd., Epsom, Auckland.
ZL 1BS R. E. Grainger, 65 Beresford St., Bayswater, Auckland.
ZL 1BV A. Evans, Railways, Ohaupo.
ZL 1BW A. R. Seacombe, 12 Te Aroha St., Claudelands, Hamilton.
ZL 1BX Druleigh Business College, Tasma Bldg., Anzac Ave., Auckland.
ZL 1BY C. Yeats, Whitford.
ZL 1BZ J. H. Gault, 5 Murdoch Rd., Grey Lynn, Auckland, W2.
ZL 1CA H. Jakeman, Main Street, Huntly.
ZL 1CB J. Nobles, Young St., Te Amamutu.
ZL 1CC W. H. Potter, 67 Pah Road, Epsom, Auckland, SE3.
ZL 1CD J. Baxendale, 532 Manakau Road, Epsom.
ZL 1CE T. A. Sargent, 34 Bellwood Ave., Mt. Eden.
ZL 1CF H. M. McLean, Leith St., Te Awamutu.
ZL 1CH H. A. Boyd, 40 Ranfurly Rd., One Tree Hill.
ZL 1CI C. A. Wight, Puke Rd., Paeroa.
ZL 1CJ R. A. Danrell, Hill Street, Te Kuiti.
ZL 1CK G. McB. Salt, 32 Pukeora Ave., Remuera.
ZL 1CL I. D. Shearer, Box 22, Rotorua.
ZL 1CM A. E. Humphrey, 37 Montrose St., Pt. Chevalier.
ZL 1CN A. E. Ireland, Mutu St., Te Awamutu.
ZL 1CO W. L. W. Lee, Awhitu.
ZL 1CP W. G. Ward, c/o Te Aroha Radio Service, Te Aroha.
ZL 1CR W. E. Hunter, Archibald Rd., Glen Eden.
ZL 1CS J. H. Williams, 54 Church St., Devonport, Auckland, N1.
ZL 1CT A. H. Pickmere, Yacht "Arethusa," Whangarei.
ZL 1CU H. Gray, Main St., Ohura.
ZL 1CV L. H. Wood, Kenrick St., Te Aroha.
ZL 1CX J. Johnson, Riverhead Plantation, Forest Service, Waimauku.
ZL 1CY W. A. Johnson, c/o Mrs. A. Cook, Raynors Rd., Huntly.
ZL 1CZ J. Pooley, Post Office, Raglan.
ZL 1DA L. G. Quigg, 4 Enfield St., Mt. Eden, Auckland.
ZL 1DB F. R. Dugmore, Fifth Ave., Tauranga.
ZL 1DC R. G. Townsend, 79 Kiwi Rd., Pt. Chevalier, Auckland.
ZL 1DD E. B. Foster, 20 Rowan Rd., Mt. Roskill, Auckland.
ZL 1DE G. O. Adshead, 58 Airedale St., Auckland, C1.
ZL 1DF P. P. Gordon, 20 Haverstock Road, Mt. Albert, SW1.
ZL 1DG R. J. Grant, 226 Hobson St., Auckland.
ZL 1DH T. C. McDonald, Arapuni.
ZL 1DI G. S. Lindegreen, 3 Calgauy St., Auckland, S2.
ZL 1DJ Leonard I. Piesse, 29 Harbutt Ave., Mt. Albert, Auckland.
ZL 1DK G. Glucina, Shaw Road, Oratia.
ZL 1DL M. J. W. Larking, George St.. Waiuku.
ZL 1DM S. L. Cottam, 102 Grange Rd., Auckland.
ZL 1DN C. B. Appleyard, 11 Folke St., New Lynn, Auckland.
ZL 1DP N. J. Volkner, 47 Wembley Rd., Auckland.
ZL 1DQ C. Warden, 25 Maxwell Ave., West Lynn, Auckland.
ZL 1DS H. F. W. Day, 1449 Great North Rd., Avondale, Auckland.
ZL 1DT C. E. Grey, Cape Brett, Russell.
ZL 1DV S. B. Gibbs, Halsey Rd., Manurewa.
ZL 1DW F. R. S. McNamara, 20 Cambrai Ave., Auckland.
ZL 1DY J. L. Crickett, Park St., Morrinsville.
ZL 1DZ H. N. Elliott, 36 Kingsland Ave., Kingsland, Auckland.
ZL 1FB N. G. Gulde, Church St., Opotiki.
ZL 1FF B. Gifford, Sloane St., Te Awamutu.
ZL 1FD J. F. Davidson, Morgantown, Te Aroha.
ZL 1FE A. F. Wood, 32 Peach Grove Road, Claudlands, Hamilton.
ZL 1FG N. C. Pawley, Willow Street, Tauranga.
ZL 1FH C. T. Cross, 10th Ave., Tauranga.
ZL 1FI C. S. Goodwill, Jellicoe St., Te Puke.
ZL 1FJ W. J. Sexton, 14 Ethel St., Sandringham.
ZL 1FK S. M. Y. Hamlin, Mt. Wellington Highway, Ellerslie, Auckland.
ZL 1FL A. J. Wark, Box 99, Rotorua.
ZL 1FM J. E. B. Warn, Katikati.
ZL 1FN W. A. McDivitt, 32 Bannerman Rd., Morningside, Auckland, S.W.1.
ZL 1FO E. R. Cooper, 60 Meadowbank Rd., Remuera, Auckland.
ZL 1FP G. S. Anchor, 8 Queens Ave., Frankton Junction.
ZL 1FQ A. F. Smith, 5 Westminster Rd., Mt. Eden, Auckland.
ZL 1FR L. W. Harris, 5 Fitzroy St., Papatoetoe.
ZL 1FS L. R. Dickson, 3 Gorrie Ave., Epsom, Auckland, SE3.
ZL 1FT N. N. Walding, 31 Edwin St., Newton, Auckland, C2.
ZL 1FU G. D. White, Bridge St., Opotiki.
ZL 1FV A. Evans, Wairoa Rd., Papakura, Auckland.
ZL 1FW E. Whiteley, 1 Halston Rd., Dominion Rd., Auckland.
ZL 1FX J. H. L. Trenwith, 19 Fairlands Ave., Avondale, SW3.
ZL 1FY N. C. Curtis, 5 King Edward St., Mt. Eden, Auckland.
ZL 1FZ Auckland Grammar School, Mountain Rd., Mt. Eden, Auckland.
ZL 1GA R. W. Hogg, 33 Curran St., Herne Bay, Auckland.
ZL 1GB L. G. Wilson 152 Great South Rd., Remuera, Auckland.
ZL 1GC W. Illingworth, Te Atatu.
ZL 1GD C. K. Branigan, Lighthouse, Cape Maria van Diemen.
ZL 1GE R. K. Wilton, Tamaki Drive, Kohimarama.
ZL 1GF J. F. Fish, 29 Hepburn St., Auckland, C2.
ZL 1GH L. S. Spackman, 29 Faulder St., Westmere, Auckland.
ZL 1GI A. D. Smerdon, 7 Claude St., Epsom, Auckland.
ZL 1GK J. J. Laskey, Hinemoa St., Whakatane.
ZL 1GL J. F. Talbot, Pererika St., Rotorua.
ZL 1GM J. Steel, Earnoch Ave., Takapuna, Auckland.
ZL 1GP E. Merriman, 12 South Road, Auckland, C2.
ZL 1GO L. A. Tattersfield, 3 Hemi St., Devenport, Auckland
ZL 1GQ W. L. Brewer, 19a King Edward Ave., Bayswater, Auckland.
ZL 1GR G. H. Robins, 4 Ascot Ave., Devonport, Auckland.
ZL 1GS G. H. Scull, 8 Ethel St., Sandringham, Auckland.
ZL 1GT H. C. Smith, 6 Amohia St., Rotorua.
ZL 1GU E. Pratt, 26 Station Rd., Claudelands.
ZL 1GV B. C. Spackman, Seabrook Ave., New Lynn, Auckland.
ZL 1GW P. R. Ross, Public Works Dept., Arapuni.
ZL 1GX F. L. Hawthorn, 10 King Edward St., Mt. Eden, Auckland.
ZL 1GY G. C. Hart, 33 Allan Rd., Grey Lynn, Auckland, W2.
ZL 1GZ A. M. Amos, 7 Halesowen Ave., Auckland.
ZL 1HA R. C. Miller, Arawa St., New Lynn, Auckland.
ZL 1HB T. N. Dahl, View Rd., Kaurilands, Titirangi.
ZL 1HC A. C. Boulton, 257 Campbell Road, Ellerslie, Auckland.
ZL 1HD H. B. Harrison, Rayners Rd., Huntly.
ZL 1HE H. H. Matthews, Otorohanga.
ZL 1HF E. L. Fitton, Manukau Road, Pukekohe.
ZL 1HG A. R. St. Clair, 13 North Ave., Devonport.
ZL 1HH A. E. Smith, The Esplanade, Blockhouse Bay, Auckland, SW3.
ZL 1HI C. J. R. Holloway, 56 Normans Hill Rd., Onehunga.
ZL 1HJ A. N. H. Snow, Wallace St., Whangarei.
ZL 1HK J. H. Metcalf, 13 Haig Ave., Mt. Roskill.
ZL 1HL H. F. Garland, 10 Ethel St., Sandringham, Auckland.
ZL 1HM C. Simpson, 8 Grattan Street, Auckland.
ZL 1HN W. J. Service, Marine Parade, Herne Bay, Auckland.
ZL 1HO A. W. Jarman, Willoughby Road, Hamilton.
ZL 1HQ H. W. Batty, Onewa Road, Birkenhead, Auckland.
ZL 1HR L. W. Goodwin, 433 Coronation Road, Paeroa.
ZL 1HS L. A. Crowhurst, 10 Williamson St., Epsom, Auckland.
ZL 1HT A. W. Bettany, Beale St., Hamilton East.
ZL 1HU H. R. W. Bunn, Ngatai Street, Taumarunui.
ZL 1HV T. W. B. Auckram, 57 Princes St., Otahuhu, SE7.
ZL 1HW G. Evans, Railway Hut A111, on line, Sth. Auckland District.
ZL 1HY D. Brown, Seddon St., Waihi.
ZL 1HZ J. Dodds, Rayners Road, Huntly.
ZL 1IA G. A. Petty, 77 Portland Road, Auckland.
ZL 1IB B. L. Blair, 12 Weona Place, Auckland.
ZL 1IC W. B. Fitzwilliam, 19 Springleigh Ave., Auckland.
ZL 1ID R. A. Gooch, 32 Esplanade Road, Mt. Eden, Auckland.
ZL 1IE C. K. Eyre, 11 Wicklow Road, Auckland.
ZL 1II H. R. Skinner, 75 Arthur St., Onehunga, SE5.
ZL 1IK W. E. Smith, Second Avenue, Tauranga.
ZL 1IL A. E. Bennett, St Patrick's Presbytery, Wyndham St., Auck.
ZL 1IM D. B. G. Sutcliffe, 20 Albert Road, Pt. Chevalier, Auckland.
ZL 1IN R. M. Pearce, 27 Epsom Ave., Auckland.
ZL 1IO H. C. Callander, 32 Royce Ave., Auckland, S1.
ZL 1IP E. Merriman, 73 Nelson St., Auckland.
ZL 1IQ T. K. Stewart, Tara, Mangawai, North Auckland.
ZL 1IR S. J. Turtley, Te Kawana Road, Te Aroha.
ZL 1IS C. M. Olsen, Cranley St., Dargaville.
ZL 1IT S. W. Boon, Roberts St., Tauranga.
ZL 1IU E. Cameron, McGregor's Road, Morrinsville.
ZL 1IV C. C. Thompson, 44 College Hill, Ponsonby.
ZL 1IW T. Burley, 8 Goldie St., Auckland.
ZL 1IX B. C. Day, Aumoe Ave., Auckland.

ZL 1IY J. L. Barlow, 10 Edwin St., Auckland.
ZL 1IZ J. P. McDonald, Arapuni.
ZL 1JA J. H. Sager, Pakura St., Te Awamutu.
ZL 1JB G. F. Piesse, 6 Francis St., Grey Lynn.
ZL 1JC F. H. Hayward, c/o Radio House, Waihi.
ZL 1JD D. C. Colmore-Williams, Victoria Rd., Dargaville.
ZL 1JE H. W. Gaukrodger, Victoria St., Dargaville.
ZL 1JF G. L. Hardcastle, 13 King St., Frankton Junction.
ZL 1JG D. L. Wishart, 26 Brixton Rd., Mt. Eden, S2.
ZL 1JH V. G. Penny, 19a Wynyard St., Auckland.
ZL 1JI J. R. Smith, 34 Kingsland Ave., Auckland.
ZL 1JJ C. C. Brady, 7 Violet Crescent, Parnell, Auckland.
ZL 1JK J. R. Schofield, 202 Heaphy Terrace, Hamilton.
ZL 1JL A. A. Lockie, c/o Bowen and Co., Clarence St., Thames.
ZL 1JM F. Acton, 81 Seddon St., Hamilton.
ZL 1JN W. Walker, 25 King St., Hamilton.
ZL 1JP E. E. Le Prou, Mahoe St., Melville, Hamilton.
ZL 1JQ A. E. Allen, 1720 Great North Road, Avondale, Auckland.
ZL 1JR K. C. Sanderson, Simpson Rd., Swanson, Auckland.
ZL 1JS M. W. S. Jones, 35 Speight St., Kohimarama, Auckland.
ZL 1JT J. F. Taylor, 11 Nottingham St., Grey Lynn, Auckland.
ZL 1JU E. C. Morrin, King St., Fukekohe.
ZL 1JW V. H. Wilson, 5 Stanley Point Rd., Devonport.
ZL 1JX C. A. Hayward, 147 Campbell Road, One Tree Hill, Auck., SE4.
ZL 1JY E. A. L. Doyle, 25 Mangere Rd., Otahuhu.
ZL 1JZ C. S. Robertson, 12 Dedwood Terrace, Ponsonby, Auckland.
ZL 1KA R. M. Kay, 10 Tui St., Mt. Eden, Auckland, C3.
ZL 1KB D. D. Thomson, 36 Byron Ave., Takapuna, N2.
ZL 1KC K. T. McCallum, 32 Allandale Rd., Mt. Albert, SW2.
ZL 1KD C. E. Dodd, Mont Clare, Massey Rd., St. Heliers.
ZL 1KE L. W. Lockie, 31 Bond St., Grey Lynn, Auckland.
ZL 1KF J. Cournane, Grange Rd., Henderson.
ZL 1KG R. C. Needham, Patumahoe.
ZL 1KH N. C. Shepherd, Percy St., Whangarei.
ZL 1KJ R. S. Harvey, 9 Pah Ave., Epsom, Auckland, S.E.3.
ZL 1KI J. F. H. Harper, Air Force Base, Hobsonville.
ZL 1KK N. A. W. Carter, 11th Ave., Tauranga.
ZL 1KL H. M. Luxford, 37a Te Aroha St., Claudelands, Hamilton.
ZL 1KM D. R. Gardner, Ranolf St., Rotorua.
ZL 1KN K. G. Alexander, 23 Coolidge St., Auckland, SW1.
ZL 1KO R. Barlow, Banks Rd., Matamata.
ZL 1KP G. Sutherland, Okauia, Matamata.
ZL 1KR G. Crocker, 23 Edinburgh St., Newton, Auckland, C2.
ZL 1KS S. J. Murray, 22 Sheridan St., Auckland, C1.
ZL 1KT G. A. Sadler, 15 Ardmore Rd., Ponsonby.
ZL 1KU T. N. Witham, Bollard Ave., New Lynn, Auckland, SW4.
ZL 1KV J. E. Pelmer, 28 Stewarts Road, Mt. Albert, SW2.
ZL 1KW W. A. Williams, c/o Illingworth, Te Atatu.
ZL 1KX E. N. Mobberley, 11 Challinor Terrace, Mt. Albert, Auckland.
ZL 1KY H. R. D. Browne, 40 Milton Rd., Mt. Eden, Auckland.
ZL 1KZ E. W. D. Bell, Rata St., New Lynn, SW4.
ZL 1LB G. J. Thrower, Railway Cottage, Waihi.
ZL 1LC G. H. Diedrichs, 12 Ascot Ave., Remuera, Auckland.
ZL 1LE E. J. Jacobson, Whakapara.
ZL 1LF A. K. Neilson, Railway Settlement, Helensville.
ZL 1LG G. S. Morgan, Glendon Ave., Avondale.
ZL 1LH N. S. Jenkin, c/o Mrs. J. Fulton, Calliope Rd., Auckland.
ZL 1LI G. A. Bice, 696 Manukau Rd., Epsom, Auckland.
ZL 1LK F. W. Kennedy, 34 Barnley Terrace, Auckland.
ZL 1LL S. Cook, 24 Millais St., Auckland.
ZL 1LM K. Wellington, 1 Pencarrow Ave., Mt. Eden, Auckland.
ZL 1LN R. A Egan, 208 Ponsonby Rd., Auckland.
ZL 1LO W. R. Edelsten, 14 High St., Otahuhu, SE7.
ZL 1LP D. H. Davis, 8 Waitoa St., Parnell, Auckland.
ZL 1LQ W. G. Ball, Mt. Wellington Highway, Otahuhu.
ZL 1LR A. J. Whiteley, 7 Seymour Square, Ponsonby, Auckland, W1.
ZL 1LS L. G. Sharman, 9 Taumata Rd., Sandringham, Auckland.
ZL 1LT R. S. Thain, 29 Castle St., Auckland.
ZL 1LU E. P. Williams, 43 Marau Crescent, Mission Bay, Auckland.
ZL 1LV G. E. McCurdy, School, Matapihi, Tauranga.
ZL 1LW G. Thomson, Waharoa.
ZL 1LY E. J. Nutsford, 1 Rothesay St., Remuera, Auckland.
ZL 1LZ C. R. Mingins, 32 Pencarrow Ave., Auckland.
ZL 1MA Nth. Shore Radio Club (D. D. Thomson), 103 Lake Rd., T'puna.
ZL 1MB C. H. Herbert, 49 Violet St., Parnell, Auckland.
ZL 1MC J. H. Inder, 30 Aldred Road, Remuera, Auckland.
ZL 1MD A. G. Reid, 407 Mt. Eden Road, Auckland.
ZL 1ME M. Cowan, 2 Edinburgh St., Newton, Auckland.
ZL 1MF V. H. Bennett, 22 Mary St., Thames.
ZL 1MG E. Parkin, 4 Haronui St., Whangarei.
ZL 1MH A. R. H. Shove, Dudley Ave., New Lynn, Auckland.
ZL 1MI A. L. Dunsford, Victoria Ave., Dargaville.
ZL 1MJ R. Ryan, 13 King St., Grey Lynn, Auckland.
ZL 1MK A. H. Dawson, c/o Artillery Barracks, Narrow Neck, Devenport, Auckland.
ZL 1ML J. D. Gall, 35 Eldon St., Mt. Eden, Auckland.
ZL 1MM J. T. Taylor, 28 Westview Rd., Grey Lynn, Auckland.
ZL 1MN A. C. Bettany, Pukekohe.
ZL 1MO L. J. Goodwin, Western Ave., Matamata.
ZL 1XB E. C. Cage, 25 Windmill Rd., Mt. Eden, Auckland.
ZL 1XC G. H. Robins, 4 Ascot Ave., Devenport, Auckland.
ZL 1XD G. H. Scull, 8 Ethel St., Morningside, Auckland.
ZL 1XI Auckland University College, Princes St., Auckland.

ZL2—STATIONS LOCATED IN WELLINGTON DISTRICT

ZL 2AA A. S. Brown, 14 Grant Street, Dannevirke.
ZL 2AB D. Wilkinson, Schoolhouse, Rangiotu.
ZL 2AC I. H. O'Meara, Bushmere Road, Gisborne.
ZL 2AD P. R. Stevens, 258 Gladstone Rd., Gisborne.
ZL 2AE R. J. Patty, 55 Salisbury Road, Gisborne.
ZL 2AF J. B. Sutton, 184 Cobden Street, Gisborne.
ZL 2AG M. Ludwig, 112 Ormond Rd., Gisborne.
ZL 2AH R. V. Roberts, Rogers St., Blenheim.
ZL 2AI H. D. Sandford, Ballance Street, Raetihi.
ZL 2AJ V. H. Parminter, 2 Oak Grove, Wellington, C1.
ZL 2AL J. B. Chew, Woodlands Rd., Johnsonville.
ZL 2AM Dr. W. F. Buist, Cnr. Collins and High Streets, Hawera.
ZL 2AN M. L. Weston, Norsewood.
ZL 2AO T. Mathewson, 7 Cargill St., Karori, Wellington.
ZL 2AP A. Eade, 1 Camden Street, Fielding.
ZL 2AR A. M. McBey Rennie, 35 Nelson Street, Wanganui.
ZL 2AQ C. K. Branigan, 21 Pirie St., Wellington.
ZL 2AS V. G. Whiteman, Cape Campbell Lighthouse, Seddon.
ZL 2AT E. W. Beale, 405 Grays Road, Hastings.
ZL 2AU W. H. Fever, 66 Rotherham Terrace, Wellington.
ZL 2AV R. G. Chatfield, 42 Raroa Road, Kelburn.
ZL 2AW C. R. Clarke, 111 Apu Crescent, Lyall Bay.
ZL 2AX J. V. Kyle, 50 Waldegrove Street, Palmerston North.
ZL 2AY Corps of Signals Central Depot, Garrison Hill, Wellington.
ZL 2AZ F. E. Duggan, 196 Sydney Street, Wellington.
ZL 2BA C. E. Ellsmore, 260 Ferguson Street, Palmerston North.
ZL 2BB N. Murray, 8 Maria Place, Wanganui.
ZL 2BC S. H. Perry, 89 Tiber St., Island Bay.
ZL 2BD W. G. Hollis, 39 Nairn St., Wellington, SW1.
ZL 2BE J. Mills, 331 W. Queen Street, Hastings.
ZL 2BF J. Clark, Lemon St., New Plymouth.
ZL 2BG J. G. Tinney, 74 Kainui Road, Hataitai, Wellington.
ZL 2BH W. M. Hall, 1 Hutt Road, Petone.
ZL 2BI C. G. Liddell, 16 Lerwick Terrace, Lyall Bay, E3.
ZL 2BJ New Plymouth Aero Club, New Plymouth.
ZL 2BK E. Firth, 43 Roy St., Wellington South.
ZL 2BL I. A. Sanders, 6 Beach Road, Kaiti, Gisborne.
ZL 2BM W. H. Griffiths, Rangiuru Road, Otaki.
ZL 2BP W. N. Macklin, 75 Waipapa Road, Hataitai, Wellington.
ZL 2BQ J. Dacre, Kawatiri Ave., Wanganui.
ZL 2BR K. A. Lambert, 147 St. Hill Street, Wanganui.
ZL 2BT R. A. Tanner, Karere Road, Longburn.
ZL 2BU J. F. Donald, 20 Inglis Street, Wellington.
ZL 2BV H. W. Ching, Spring Grove, Nelson.
ZL 2BW J. B. Smith, Harrison Street, Featherston.
ZL 2BX R. G. Black, 31 Karepa Street, Brooklyn, Wellington.
ZL 2BY C. T. Berry, 20 Reta Street, Wanganui.
ZL 2BZ O. W. Gillion, 71 Church Street, Palmerston North.
ZL 2CA W. G. Turnbull, 39a Tinakori Rd., Wellington.
ZL 2CB F. J. Huggard, Smart Road, Fitzroy, New Plymouth.
ZL 2CC F. R. Beech, Kenepuru Head, Picton.
ZL 2CF S. Speedy, "Pipi Bank," Herbertville.
ZL 2CG R. J. Franklin, Porangahau.
ZL 2CH M. McKelvie, 17 Mulgrave Street, Wellington.
ZL 2CI W. A. Wilson, "Crow's Nest," Milne Terrace, Island Bay.
ZL 2CJ G. E. Upchurch, 113 Wallace St., Wellington.
ZL 2CK J. W. Black, Duke of Edinburgh Hotel, Porangahau.
ZL 2CL E. Autridge, 89 Fitzherbert Ave., Palmerston North.
ZL 2CN E. A. Bradley, 5 Louis Avenue, Gonville, Wanganui.
ZL 2CO C. G. Hamilton, 76 Ellice Street, Wellington.
ZL 2CP J. B. B. Cormack, 64 Tilley Road, Paekakariki.
ZL 2CR R. J. H. Scott, 308 Nelson Street, Hastings.
ZL 2CS R. E. Miller, 17 Tennyson Street, Petone.
ZL 2CT J. Parsons, 3 Marama Cres., Wellington, C.2.
ZL 2CU J. A. Murray, 2 Kennedy Street, Wellington, E1.
ZL 2CV P. W. Blakeley, 26 Balgownie Ave., Wanganui.
ZL 2CW W. H. E. Jensen, 18 Mills Road, Wellington, SW1.
ZL 2CX G. P. Patchett, 264 Rintoul Street, Wellington.
ZL 2CY L. G. Francois, P.O., Spring Grove, Nelson.
ZL 2DA G. B. Newlands, 35 Adelaide Street, Petone.
ZL 2DB C. W. Morrison, 71 Dundas Street, Seatoun, E5.
ZL 2DC W. P. Chisholm, 9 Palm Grove, Wellington South.
ZL 2DD L. R. L. Redshaw, 6 North Esk Street, Nelson.
ZL 2DG C. R. H. Taylor, Kereru Bend, Tawa Flat.
ZL 2DF J. K. Watson, 77 Brougham St., Wellington, E.1.
ZL 2DH D. L. Bedingfield, 123 Jackson Street, Petone.
ZL 2DI P. R. McMahon, Kendall's Road, Linton, Palmerston North.
ZL 2DJ E. A. Petersen, 175 Queen's Drive, Wellington, E3.
ZL 2DK B. Barclay, 43 McGrath Street, Napier.
ZL 2DL R. A. J. Carr, Totara Terrace, Miramar, Wellington.
ZL 2DM C. H. Smith, 558 Childers Road, Gisborne.
ZL 2DO M. A. Wiffen, Okaramio, Blenheim.
ZL 2DP J. H. Stretch, 249 Ohiro Road, Wellington.
ZL 2DQ J. H. Hooker, 11 Standen Street, Karori.
ZL 2DR A. R. Cooke, Railway Ave., Upper Hutt.
ZL 2DS K. R. Kirkcaldie, Ohau.
ZL 2DT E. C. Johnson, 10 Brandon Street, Wellington.
ZL 2DU A. W. Duffield, 49 Ferguson Street, Palmerston North.
ZL 2DV N. C. C. Shepherd, Harrison Street, Featherston.
ZL 2DW W. J. Hughes, 10 Sievwright Lane, Gisborne.
ZL 2DX P. Daniells, Main Street, Tahunanui, Nelson.
ZL 2DY G. W. Smithson, Seddon St., Raetihi.
ZL 2DZ H. M. Griffiths, Tokomaru.
ZL 2FA G. B. Butler, 46 Winter St., Gisborne.
ZL 2FB W. E. Bullivant, Ormond Road, Gisborne.
ZL 2FC E. A. Perry, 128 Queen Street, Wairoa.
ZL 2FD H. E. Sheldon, 420 Ormond Road, Gisborne.
ZL 2FF C. T. C. Hands, Gladstone Road, Gisborne.
ZL 2FG H. R. D. Browne, c/o Mrs. Williams, 1 Railway Terrace, Johnsonville.
ZL 2FH T. M. F. Fitzgerald, Nolan St., Hawera.
ZL 2FI A. A. Knight, Emano Street, Nelson.
ZL 2FJ L. C. Bates, Seymour Ave., Nelson.
ZL 2FK R. A. Tanner, Motor Launch, "Haumoana," Tangimoana.
ZL 2FM J. C. Hogan, 30 Hungerford Road, Wellington.
ZL 2FN J. L. Jackson, 188 Sydney Street West, Wellington, C1.
ZL 2FO J. S. Savell, 6 Burns Ave., Palmerston North.
ZL 2FP P. R. Hoare, 166a Abel Smith St., Wellington.
ZL 2FQ A. W. Crabtree, 177 Vigor Brown Street, Napier.
ZL 2FR N. D. Dyett, 8 Duthie St., Karori.
ZL 2FS G. C. Wastney, Alfred Street, Blenheim.
ZL 2FT F. J. K. Lane, 87 Ferguson St. Palmerston North.
ZL 2FV J. E. McCann, Benzine Ave., Upper Hutt.
ZL 2FW H. G. Etheridge, 87 Wellesley Road, Napier.
ZL 2FX H. G. G. Fownes, 1 The Parade, Island Bay, Wellington. S2
ZL 2FY H. R. Roberts, Ikanui Road, Hastings.
ZL 2FZ D. Reid, 11 Murphy Street, Wellington.
ZL 2GA J. Johnson, St. James Ave., Lower Hutt.
ZL 2GB J. R. W. Trenbath, c/o W. Cornish, Broadway, Picton.
ZL 2GC A. Howarth, 12 High Street, Dannevirke.
ZL 2GD B. R. Adair, 385 Clifford St., Gisborne.
ZL 2GE G. E. Tyler, 155 Vigor Brown St., Napier.
ZL 2GF D. C. Shaw, 19 Barker Street, Wellington.
ZL 2GG C. H. Brown, 61 Ross St., W llington.
ZL 2GH A. R. Cross, King St., Nelson.
ZL 2GI E. W. L. MacGregor, Windsor Hill, Waipawa.
ZL 2GJ K. L. Elliott, 92 West Street, Feilding.
ZL 2GK S. R. Perkin, 42 Puru Crescent, Lyall Bay.
ZL 2GL M. T. Gabriel, The Mansions, Ghuznee St., Wellington.
ZL 2GM G. T. King, 80 The Parade, Island Bay, Wellington.
ZL 2GN E. H. Humphrey, Queenswood Road, Levin.
ZL 2GO H. G. G. Fownes, 110 Riddiford Street, Wellington.
ZL 2GP W. G. Ashbridge, 40 Sussex Street, Wellington.
ZL 2GQ F. I. R. Hunt, Clyde Road, Napier.
ZL 2GR W. S. Green, 114 Ohiro Rd., Wellington.
ZL 2GS H. E. H. Green, Clifford Road, Johnsonville.
ZL 2GT E. J. Hancock, 19 Endeavour Street, Wellington.
ZL 2GU F. R. Beech, Wairua, Picton.
ZL 2GV A. R. C. Claridge, 13 Rawhiti Street, Dannevirke.

ZL 2GW S. G. Taylor, Beach Road, Levin.
ZL 2GX J. M. White, Ngatapa, Gisborne.
ZL 2GY L H. Wass, 3 Napier Road, Wairoa.
ZL 2GZ A. J. McKenzie, Rainbow Station, Awatere, Marlborough.
ZL 2HA H. C. McCabe, 42 Adams Terrace, Wellington.
ZL 2HB V. J. Clinch, 176 Tinakori Road, Wellington.
ZL 2HC H. Cassey, Garden Road, Northland, Wellington.
ZL 2HD A. H. Buchanan, 42 Cambia Street, Nelson.
ZL 2HE L. J. Elliston, Main Road, Karori, Wellington.
ZL 2HF D. F. Jenkins, 8 Pembroke Road, Northland, Wellington.
ZL 2HG G. W. Marston, Creswick Terrace, Northland, Wellington.
ZL 2HH E. V. B. Simpson, 3 Dalrymple Road, Gisborne.
ZL 2HI L. E. Birch, 626 Devon Street, New Plymouth.
ZL 2HJ J. H. Hampton, 95 Orangi-Kaupapa Road, Wellington.
ZL 2HK W. F. C. Whiteman, 7 Moana Avenue, Lower Hutt.
ZL 2HL C. P. Hill, 115 Creswick Terrace, Northland, Wellington.
ZL 2HM W. Marsh, 5 Mills Street, Lower Hutt.
ZL 2HN A. E. Hayward, Chatham Islands.
ZL 2HO J. McLaughlin, Chatham Islands.
ZL 2HP P. J. May, Charlotte Street, Takapau.
ZL 2HQ L. White, Ladies Mile, Eltham.
ZL 2HR W. A. W. Stevens, Manawapou Street, Hawera.
ZL 2HS C. V. Shennan, 35 Queen Street, Wellington.
ZL 2HT A. G. S. Bradfield, Te Awe Awe Street, Palmerston North.
ZL 2HU A. J. Anderson, 29 Volga Street, Island Bay.
ZL 2HV A. K. Bennett, 93 Powderham Street, New Plymouth.
ZL 2HW T. H. Megann, 299 The Parade, Island Bay.
ZL 2HX A. T. Mitchell, 15 Naughton Terrace, Wellington.
ZL 2HZ T. S. Eckford, Park Terrace, Blenheim.
ZL 2IB P. W. Benson, 244 Featherstone St., Palmerston North.
ZL 2IC E. S. Austin, Mill Street, Nelson.
ZL 2IE W. J. Wainwright, 21 Waikato Street, Island Bay, S2.
ZL 2IF E. G. Rolle, 96 Hanson Street, Wellington.
ZL 2IH I. N. Dodds, R.M.D. Upper Motuere.
ZL 2II A. W. Bird, 86 Lytton Road, Gisborne.
ZL 2IJ F. R. W. Andrews, White House, Taihape.
ZL 2IK L. D. McMillan, 32 Queen St., Petone.
ZL 2IL J. F. Gabites, 52 Glen Road, Kelburn, W.1.
ZL 2IM G. L. Budd, 2 Lyndhurst St., Gisborne.
ZL 2IN H. Perkins, 6 Elmira Ave., Palmerston North.
ZL 2IO E. S. B. Collins, Kawai St., Nelson.
ZL 2IP L. C. Vincent, Kaka Road, Taihape.
ZL 2IQ R. Cassey, 131 Elizabeth St., Wellington, E1.
ZL 2IR C. M. H. Thevenard, Sandon Road, Feilding.
ZL 2IS J. L. Martin, c/o Nicholl Bros., Taihape.
ZL 2IU R. G. Purdy, 11 Akatea Street, Wellington.
ZL 2IW W. S. Bovnes, 141 South St., Hawera.
ZL 2IX C. H. Parker, Hukanui.
ZL 2IY W. D. Gorman, 34 Garden Road, Wellington.
ZL 2JA D. H. Chisholm, 1 Calus Avenue, Wanganui.
ZL 2JB E. J. S. French, Lyndhurst Road, Hastings.
ZL 2JC Clinton J. Way, Manchester Street, Feilding.
ZL 2JD W. Abbott, 1 Dee Street, Island Bay, Wellington, S.2.
ZL 2JE J. W. Ramsden, 66 Maupuia Road, Wellington.
ZL 2JF Mrs. T. M. Souper, 147 Moxham Ave., Hataitai, Wellington.
ZL 2JG J. Thompson, 55 Miro Street, Miramar.
ZL 2JH R. G. Law, Orlando Street, Stratford.
ZL 2JI W. J. Rean, Station Rd., Ohakune Junction.
ZL 2JJ K. B. Gilby, 4 Vogel Street, Wellington.
ZL 2JL D. R. Prime, Taoroa Road, Taihape.
ZL 2JN A. R. Down, Rira Street, Marton Junction.
ZL 2JO J. Parsons, Ormond Road, Gisborne.
ZL 2JP R. A. H. Bradley, Russell Street, Nelson.
ZL 2JQ J. R. Shirley, "Burnside," Bay View.
ZL 2JR J. D. S. Fahey, 45 Harbour View Road, Northland, Wellington.
ZL 2JS H. B. Johnson, Kensington Private Hotel, S. Wellington, S1.
ZL 2JT H. T. Hutana, Manguoropa, Porangahau.
ZL 2JU J. K. L. Fanthorpe, Mamari Street, Kilbirnie.
ZL 2JV C. A. H. Crawford, Ohakune Junction.
ZL 2JW R. D. Davies, 22 Ferry St., Seatoun, Wellington, E5.
ZL 2JX R. W. Culpitt, Tui Street, Taihape.
ZL 2KA A. Littlejohn, Richardson St., Nelson.
ZL 2KB L. M. Wood, Rangiwahia.
ZL 2KC C. R. Moess, Rangiwahia.
ZL 2KD C. J. C. Simpson, 204 Lascelles St., Hastings.
ZL 2KE W. A. D. Smith, Smith's Garage, Urenui.
ZL 2KF A. G. Gould, Tasman Street, Nelson.
ZL 2KG K. O. Sharland, Cleveland St., Nelson.
ZL 2KI R. H. King, Riverbend Road, Napier.
ZL 2KJ M. F. Pettifer, 99 Shakespeare Road, Napier.
ZL 2KK L. T. Young, 1032 McGrath Street, Napier.
ZL 2KL N. A. Steele, Devon Street, Picton.
ZL 2KM G. A. Robertson, Pakowhai Road, Hastings.
ZL 2KN H. Millward, Box 142, Wanganui.
ZL 2KO S. C. Davidson, c/o N.Z. Loan and Mercantile Agency, Box 94, Palmerston.
ZL 2KP F. J. Henskie, 46 Glenmore Street, Wellington, N1.
ZL 2KR A. P. Gregg, Lewer Street, Karori, Wellington.
ZL 2KS J. S. Furness, Roger Street, Blenheim.
ZL 2KT J. G. O'Neill, 702 York St., Hastings.
ZL 2KU T. Ward, 54 Calabar Road, Miramar, Wellington.
ZL 2KV T. W. Ward, Rugby Road, Tariki, Inglewood.
ZL 2KW P. C. Stannard, 141 Trafalgar St., Nelson.
ZL 2KX C. G. Wickstead, 44 Norway Street, Wellington, W1.
ZL 2KY H. D. Simonsen, 134 Totara Rd., Wellington, E4.
ZL 2KZ A. H. Dawson, Military Camp, Trentham.
ZL 2LB W. Fouhy, 99 Washington Avenue, Brooklyn, Wellington.
ZL 2LD E. N. Westwood, 171 Onepu Road, Lyall Bay, Wellington.
ZL 2LE J. Pinhey, 72 Dundas St., Seatoun, Wellington.
ZL 2LF W. A. Guthrie, Dalziell Road, Eltham.
ZL 2LH R. T. Sharland, c/o Mrs. A. Lee, Parker's Rd., Tahunanui, N'son.
ZL 2LI C. S. Munro, 3 Tasman Street, Nelson.
ZL 2LJ Nelson College Radio Club, Nelson.
ZL 2LK W. E. Dance, Warwick Street, Blenheim.
ZL 2LM Western Electric Co., Ltd., Wellington.
ZL 2LN A. W. Keyes, 26 Rongotai Terrace, Wellington.
ZL 2LO W. G. Leatham, 136 Dixon St., Wellington.
ZL 2LQ C. R. Ambury, Paynter's Ave., New Plymouth.
ZL 2LR K. Edwards, 24 Rex Street, Miramar, Wellington.
ZL 2LS L. H. Steel, 27 Farm Road, Northland, Wellington.
ZL 2LU R. F. Wildash, Charles St., Blenheim.
ZL 2LV C. Barltrop, 61 Rakau Rd., Wellington.
ZL 2LW H. C. S. McLennan, Raroa Road, Johnsonville.
ZL 2LX D. G. McCaul, Cashmere Avenue, Wellington, N5.
ZL 2LY W. C. Masters, 174 Jackson Street, Petone.
ZL 2LZ E. Irvine, 51a Halifax Street, Nelson.
ZL 2MA P. D. Hight, Tahunanui, Nelson.
ZL 2MB C. M. Glading, 71 Herald Street, Wellington.
ZL 2MC S. C. Lawson, 13 Binham Street, Wellington.
ZL 2ME M. R. Parsons, 34 Roseneath Ter., Roseneath, Wellington.
ZL 2MF B. J. O'Leary, Waikupa Road, Okoia, Wanganui.
ZL 2MG H. Wiggins, c/o Stratford Bros., R.D., Waipukuran.
ZL 2MH A. C. Walker, Konini, Pahiatua.
ZL 2MI C. B. Parsons, 5a John Street, Wellington, S1.
ZL 2MJ L. G. Smith, "Hili View," Guppy's Rd., Greenmeadows, Napier.
ZL 2MK J. A. Adams, Stansell Ave., Tahunanui.
ZL 2ML C. Banks, 111 Wainoni Rd., Gisborne.
ZL 2MM H. F. Adcock, 39 Opaki Road, Masterton.
ZL 2MN L. E. Pole, High St., Hawera.
ZL 2MO R. W. Johnston, 16 Duigan Street, Wanganui.
ZL 2MP W. H. Powell, Gloag St., Waverley.
ZL 2MQ P. G. Crook, 102 MacLean Street, Hastings.
ZL 2MR D. I. Blair, Te Horo.
ZL 2MS L. H. Thomasen, Rewa, Feilding.
ZL 2MT W. Taylor, 37 Kennedy Road, Napier.
ZL 2MU S. M. Bell, Mangoihe, Raetihi.
ZL 2MV T. Harte, Baring Head Lighthouse, via Eastbourne.
ZL 2MW F. V. Wiggins, 17 Konini St., Wanganui.
ZL 2MX I. E. L. Smith, Ames St., Paekakariki.
ZL 2MY F. W. Sellens, 7 Randwick Road, Northland, Wellington, W2.
ZL 2MZ C. R. Castles, 6 MacDonald Crescent, Wellington, C1.
ZL 2NA L. H. Hooker, 6 Fortunatus St, Wellington.
ZL 2NB A. Sword, 2 Waione Street, Petone.
ZL 2NC J. Henderson, Central Police Station, Wellington.
ZL 2NF R. E. Bullivant, 109 Nelson Crescent, Napier.
ZL 2NG J. R. Wintringham, Muller Road, Blenheim.
ZL 2NH A. E. Sowerby, Rewa, Palmerston North.
ZL 2NI J. W. E. Peacock, 9 Andrew Young St., Palmerston North.
ZL 2NJ H. D. Ross, 30 Miro Street, Palmerston North.
ZL 2NK L. F. Copp, Cnr. Maxwell and Muller Road, Blenheim.
ZL 2NL G. T. Reeves, 30 Kirkcaldie Street, Petone.
ZL 2NM G. Stubbs, Burnside, Takapau.
ZL 2NN A. C. Reilly, Seddon.
ZL 2NO J. McLaughlin, 123 Jackson Street, Petone.
ZL 2NP A. King, 5 Huia Street, Petone.
ZL 2NQ E. H. Fairbrother, 605 Maddison St., Hastings.
ZL 2NR W. N. Taylor, 11 Harbor View Rd., Northland, Wellington, W2.
ZL 2NS R. B. Glassey, Main Street, Pahiatua.
ZL 2NT C. H. Sutton, Richmond, Nelson.
ZL 2NU J. M. Martin, Alfred Street, Nelson.
ZL 2NV E. H. Stallard, Tasman Street, Collingwood.
ZL 2NW A. I. Le Seuer, 35 Richmond Avenue, Karori, Wellington.
ZL 2NY W. G. Mace, 199 Barnard St., Wellington.
ZL 2OA Ian Breere, Marlborough Road, Silverstream, Wellington.
ZL 2OB J. A. D. S. Sword, 4 Waione St., Petone.
ZL 2OC W. C. Hutchinson, 53 Stout Street, Gisborne.
ZL 2OD W. D. Barnes, 8 Second Street, Masterton.
ZL 2OF C. P. Davies, 42 Koromiko Road, Wanganui.
ZL 2OG E. B. Lough, Manuka Road, Stokes Valley, Wellington.
ZL 2OI L. G. Bell, 2 Hornsby Road, Napier.
ZL 2OJ W. J. Inge, Louis Street, Hastings.
ZL 2OK E. V. Moir, 535 Ormond Road, Gisborne.
ZL 2OL D. M. Cuthbert, 9 Hereford Street, Palmerston North.
ZL 2OM R. P. Cameron, 27 Ngaio Street, Kelburn, Wellington.
ZL 2ON J. S. O'Brien, Chatham Islands.
ZL 2OO N. W. Burrell, 151 Bridge Street, Nelson.
ZL 2OP G. E. Scambury, 23 Onepu Road, Lyall Bay, Wellington.
ZL 2OQ P. Cronin, Bengal Street, Khandallah, Wellington.
ZL 2OS F. H. McKernon, Portland Island Lighthouse.
ZL 2OT J. R. Girling, 95 Leach Street, New Plymouth.
ZL 2OU J. D. Parminter, McLean Street, Wairoa.
ZL 2OV L. G. Petrie, 127 Coromandel Street, Wellington.
ZL 2OW W. D. Forbes, 19 Buckingham Street, Wellington, N3.
ZL 2OX A. W. Keys, 17 Queen's Drive, Lyall Bay, Wellington.
ZL 2OY O. W. Martin, R.M.D. Papatawa, Woodville.
ZL 2PA J. B. Leete, 108 Bentley Street, Masterton.
ZL 2PB H. B. McLaren, jun., 144 Collingwood Street, Nelson.
ZL 2PC G. W. Mitchell, 6 Gladstone Road, Napier.
ZL 2PD W. Vinten, Waipawa.
ZL 2PE H. E. Roatz, 17 Te Whiti Street, Kilbirnie, Wellington.
ZL 2PF Thomas King, 489 Aberdeen Road, Gisborne.
ZL 2PG J. D. Ferguson, 5 Hume St., Lower Hutt.
ZL 2PH N.Z.A.R.T. (Marlborough Branch), High Street, Blenheim.
ZL 2PI A. R. Treleaven, 9 Manawaroa Street, Palmerston North.
ZL 2PJ L. D. M. Barns, 2 Ashton Terrace, Castle Cliff, Wanganui.
ZL 2PK R. Yorke, 28 Highway Road, Wellington, W1.
ZL 2PL N. B. Johnston, 78 Tinakori Road, Wellington.
ZL 2PM J. L. M. Norman, 13 Tinakori Road, Wellington.
ZL 2PN W. J. Briden-Jones, 190 Ferguson Street, Palmerston North.
ZL 2PO R. E. Tout, Rocks Road, Nelson.
ZL 2PP J. D. J. Sinclair, 502 Grove Road, Hastings.
ZL 2PQ L. Angelini, Main Road, Pahiatua.
ZL 2PS B. V. P. Fisher, 21 Imlay Crescent, Ngaio, Wellington.
ZL 2PT L. W. Coker, Parker Street, Blenheim.
ZL 2PU S. A. Tucker, St. Leonards, Lower Wairau, Blenheim.
ZL 2PV M. Moloney, Ward.
ZL 2PX M. F. W. Taylor, Ballance Street, Shannon.
ZL 2PY H. G. Heslop, 26 Waimea Road, Nelson.
ZL 2PZ K. D. Randerson, Mount Street, Nelson.
ZL 2QA A. W. Bailey, 48 Main Street, Palmerston North.
ZL 2QB J. Shortall, Colyton, Feilding.
ZL 2QC H. F. Johnson (R. J. H. Scott, op.), Orchard Rd., Hastings.
ZL 2QE H. L. T. Byrn, 17 Macara Street, Masterton.
ZL 2QF F. H. Hay, 26 Durie Hill, Wanganui.
ZL 2QG L. McGahan, Maxwell Avenue, Wanganui.
ZL 2QH C. J. Barnes, Fox St., Featherston.
ZL 2QJ F. J. Dawson, 102 High Street, Blenheim.
ZL 2QK F. W. Bolwell, c/o V. A. Scanlon, Wingrove Factory, Stratford.
ZL 2QL L. A. Lawlor, 180 Aro Street, Wellington, C2.
ZL 2QM O. J. Stevens, 43 Coromandel Street, Wellington.
ZL 2QP A. V. Bornholdt, 14 Buick Street, Petone.
ZL 2QO R. Hanford, 96 Riddiford St., Wellington.
ZL 2QR R. Nolan, 257 Clifford St., Gisborne.
ZL 2QS N. B. Padman, 222 The Parade, Island Bay, Wellington.
ZL 2QT A. J. Hilkie, 34 Wade Street, Wellington.
ZL 2QU M. J. Hitchins, 22 Derwent Street, Island Bay, Wellington.
ZL 2QV W. R. Haynes, c/o W. Clark, Waipawa.
ZL 2QW E. R. Pratt, 44 Heretaunga Street, Petone.
ZL 2QX N. Ryder, 148 Jackson Street, Petone.
ZL 2QY J. McCarthy, 22 Oriental Street, Petone.
ZL 2QZ N.Z. Short-wave Club (A. B. McDonagh), 4 Queen St., Wel'ton.
ZL 2RA B. J. N. Petrie, 21 Upland Crescent, Wellington, W2.
ZL 2RB J. B. O'Donnell, 31 Marama Crescent, Wellington, C2.
ZL 2RC R. J. Coakley, 5 Percy's Avenue, Petone.
ZL 2RD N. A. Andrews, Poole Street, Motueka.
ZL 2RE N. A. Steele, Picton.
ZL 2RF T. J. G. McSweeney, 118 Creswick Terr., Northland, Wellington.
ZL 2RH C. R. Munro, 122 Shakespeare St., Hastings.
ZL 2RI B. E. Savell, Coley St., Foxton.
ZL 2RJ W. I. Inglis, 87 Hutt Road, Lower Hutt.
ZL 2RK K. McKenzie, 2 Devon Street, Wellington, C2.
ZL 2RL J. D. Ferguson, 11 Mulgrave Street, Wellington, C1.
ZL 2RM K. W. Kebblewhite, 196 Hutt Road, Petone.

ZL 2RN W. V. Macauley, c/o Chief Telegraph Engineer's Lab., G.P.O., Wellington.
ZL 2RO J. W. Ashford, Farewell Spit Lighthouse.
ZL 2RP B. E. Graham-Goodyear, Russell Street, Waipukurau.
ZL 2RQ I. L. Jones, 7 Vera Street, Karori, Wellington.
ZL 2RR W. G Turner, 40 Ingestre Street, Wanganui.
ZL 2RS W. R. Schroski, 218F, Oriental Terrace, Wellington.
ZL 2RT J. F. Murphy, Cafe de Paris Hotel, Palmerston North.
ZL 2RV C. J. Grant, Charlotte Ave., Takapau.
ZL 2RW E. G. Gibbs, 2 Ruapehu Street, Castle Cliff, Wanganui.
ZL 2RX R. B. Robins, Bulls.
ZL 2RY E. B. Hayward, 60 Heads Road, Wanganui.
ZL 2RZ G. R. B. Bowman, 8 Copeland St., Lower Hutt.
ZL 2SA Hawera Radio Society (T. M. Fitzgerald), Hawera.
ZL 2SB J. A. McIntosh, Lighthouse, Cape Campbell.
ZL 2SC G. C. T. Smith, Griffin Street, Napier.
ZL 2SD J. S. Oxley, 26 Tiber Street, Island Bay, Wellington.
ZL 2SE B. V. Daws, Karaka Street, Castle Cliff, Wanganui.
ZL 2SF G. G. Sandford, Kings Private Hotel, Wakefield St., Well'ton.
ZL 2SG C. R. Ainsworth, 67 Herald Street, Wellington, S1.
ZL 2SH W. Boardman, 6 Norma Crescent, Wellington, W1.
ZL 2SI W. J. Barker, 10 Lochiel Road, Wellington, N5.
ZL 2SJ T. D. Wilson, Korokoro, Petone.
ZL 2SK J. N. Teehan, 6 London Street, Dannevirke.
ZL 2SL E. H. Earl, Karioi, Ohakune.
ZL 2SM D. A. Jenkins, Riverside Drive, Lower Hutt.
ZL 2SN S. K. Forsyth, Ward Street, Lower Hutt.
ZL 2SO B. Alexander, 28 Konini Road, Wellington, E2.
ZL 2SP C. C. Langdale, 35 Adams Terrace, Wellington.
ZL 2SQ S. W. Ford, 44 Jones St., Wanganui.
ZL 2SS P. C. Weaver, Whitehead Road, Hastings.
ZL 2ST M. A. Carver, 196A Oriental Bay, Wellington.
ZL 2SU C. J. Gould, 23 Lorne Street, Wellington.
ZL 2SV C. H. O'Hara, 7 Barrack Street, Hawera.
ZL 2SW L. W. Nicholls, 6 Colombo Street, Palmerston North.
ZL 2SX F. G. Bell, 111 Regent Street, Hawera.
ZL 2SY J. R. Ensoll, c/o Public Works Department, Wanganui.
ZL 2SZ R. Bolton, 51 Mantell St., Wellington, E5.
ZL 2TA Corp. R. R. Mace, Defence Dept., Wellington.
ZL 2TB D. O. Rush, 7 Mills Road, Eltham.
ZL 2TC B. R. Page, Cook St., Tologa Bay.
ZL 2TD W. G. Sullivan, 55 Alma Rd., Wanganui.
ZL 2TE E. M. Foster, Lighthouse, Farewell Spit.
ZL 2TF F. A. Moffatt, 17 Turnbull St., Wellington, N1.
ZL 2TG T. G. I. McGinity, 2 Highbury Cres., Wellington.
ZL 2TH H. Weenink, c/o Mrs. March, Koro Koro, Petone.
ZL 2TI A. G. Papworth, 55 Wi Pere St., Gisborne.
ZL 2TJ C. R. Ambury, 133 Devon St., New Plymouth.
ZL 2TK H. A. Coleman, 25 Trafalgar Square, Nelson.
ZL 2TL M. A. Jillings, c/o H. F. Cook, Te Aute Rd., Havelock North.
ZL 2TM E. S. Borthwick, 8 Glasgow St., Wellington, W1.
ZL 2TN K. G. Alexander, 23 Coolidge St., Brooklyn, Wellington.
ZL 2TO G. C. Read, Schoolhouse, Manutahi, Patea.
ZL 2TP C. A. Borman, 3 Athol Cres., Wellington, C1.
ZL 2TQ E. D. N. Miller, 5 View Rd., South Houghton Bay, Well'ton, S2.
ZL 2TR G. Laurie, 2 Empire St., Dannevirke.
ZL 2TS H. W. J. H. Nixon, 58 Hobson St., Wellington, N1.
ZL 2TT I. L. F. Farlen, 34 Normanby St., Wellington.
ZL 2TU A. K. McMillan, 17 Queen St., Dannevirke.
ZL 2TV J. P. Boyer, Bainham.
ZL 2TW A. J. Cunniffe, 6 Taft St., Brooklyn, Wellington.
ZL 2TX V. A. Scanlon, Wingrove Factory, R.D., Stratford.
ZL 2TY E. M. Goffe, 402 Ormond Road, Gisborne.
ZL 2XC Victoria University College, Salamanca Rd., Wellington.
ZL 2XY Collier and Beale, Ltd., 66 Ghuznee St., Wellington.
ZL 2TZ C. J. Alexander, 16 Hudson St., Island Bay, Wellington.
ZL 2UA E. R. Vickers, 43 Rotherham Terrace, Miramar.
ZL 2UB H. R. W. Bunn, Tutururu Rd., Hawera.
ZL 2UE E. N. Williams, Rangiuru Rd., Otaki.
ZL 2UF Martin Ludwig, 18 College St., Masterton.
ZL 2UG M. W. C. Riddle, 66 Calabar Rd., Miramar.
ZL 2UH D. A. Leslie, 122 Sheehan St., Gisborne.
ZL 2UK C. G. Murray, 10 Maire St., Lower Hutt.
ZL 2XE L. H. Steel, Farm Rd., Northland, Wellington.
ZL 2XG E. H. R. Green, 14 Moana St., Kelburn, Wellington.
ZL 2XH C. P. Hill, 115 Creswick Terr., Northland, Wellington.
ZL 2XI G. W. Marston, 115 Creswick Terr., Northland, Wellington.
ZL 2XJ J. H. Hampton, Upper Orangi, Kaupapa Rd., Wellington.
ZL 2XK Same as ZL 2HA.
ZL 2XL Same as ZL 2HE.
ZL 2XM W. Marsh, Mills Rd., Melling, Wellington.
ZL 2XN H. Cassey, Radio ZLW, Wellington.
ZL 2XS Standard Telephones and Cables, Ltd., 24 Ballance St., Wellington.
ZL 2XW W. F. C. Whiteman, Moana Ave., Lower Hutt.
ZL 2XX Western Electric Co. (N.Z.), Ltd., Hope Gibbons Building, Wellington.
ZL 2ZP See ZL 2FC.

ZL3—STATIONS IN CANTERBURY DISTRICT

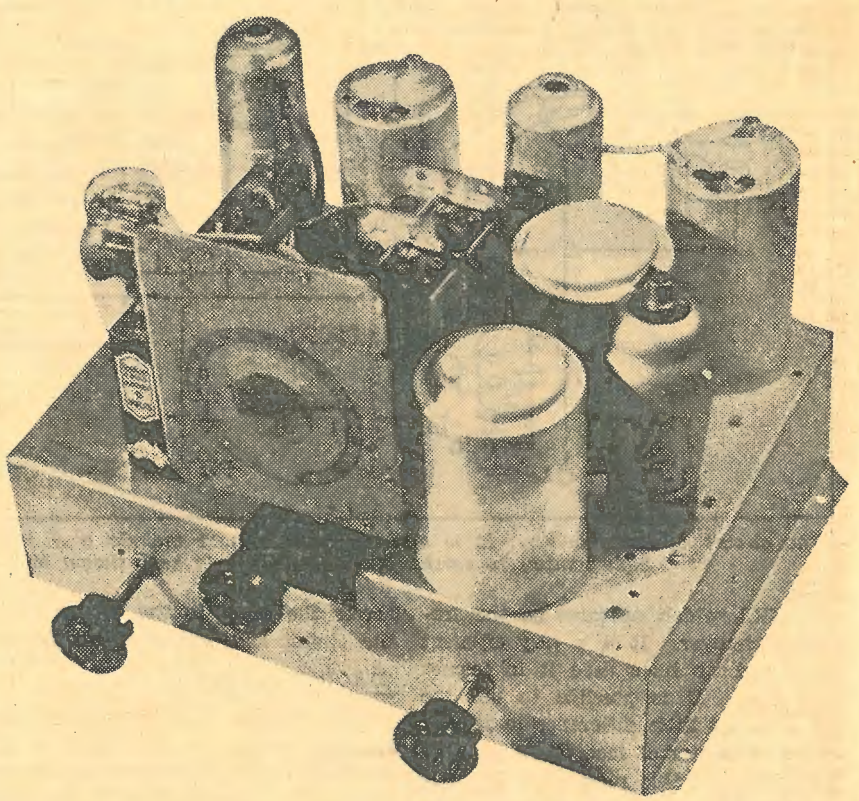
ZL 3AB L. C. Evans, 77 Ayres St., Rangiora.
ZL 3AC Radio Soc'y of Christchurch, 139 Manchester St., Christchurch.
ZL 3AD C. J. Banwell, 9 Chelsea Street, Linwood.
ZL 3AE H. C. Lawson, 119 Canon St., St. Albans, Christchurch, N1.
ZL 3AF G. G. Sandford, Moncks Spur, Redcliffs.
ZL 3AG L. J. Byrne, 14 Bretts Rd., Ashburton.
ZL 3AH H. B. Courtis, 69 Grey Road, Timaru.
ZL 3AI J. E. Strachan, East Belt, Rangiora.
ZL 3AJ R. G. F. Blake, South Belt, Rangiora.
ZL 3AK S. W. Lane, 19 Bridle Path Road, Lyttelton.
ZL 3AL G. C. Beattie, 66 Ashley Street, Rangiora.
ZL 3AM R. E. Kirk, 263 Kilmore Street, Christchurch.
ZL 3AP H. C. Tomlinson, Motunau.
ZL 3AQ V. P. Lovett, 130 Alford Forest Road, Ashburton.
ZL 3AR D. W. Buchanan, 74 Wills Street, Ashburton.
ZL 3AS L. F. Copp, 2 North Avon Rd., Chch., N.E.1.
ZL 3AT L. J. Marquet, 46 Shakespeare Street, Christchurch.
ZL 3AU J. L. Byrne, 26 Trafalgar St., Timaru.
ZL 3AW G. R. Gilbert, 48 Queen Street, Westport.
ZL 3AX F. P. Earland, 1 Hamilton Street, Christchurch.
ZL 3AY G. E. Mason, Hawarden.
ZL 3AZ R. Stanton, 17 Martin Ave., Beckenham, Christchurch.
ZL 3BA E. B. Buckhurst, Jnr., 98 Office Rd., St. Albans.
ZL 3BB W. T. Smith, 28 Derby St., Christchurch.
ZL 3BC J. Harrison, Scargill.
ZL 3BD H. F. Vincent, George Street, Waimate.
ZL 3BE Boys' High School (Mr. H. E. Dyer, Master in Charge), Straven Road, Riccarton.
ZL 3BF E. Prince, 76 Cobham Street, Christchurch.
ZL 3BG L. W. Hurrell, 480 Cashel Street, Christchurch.
ZL 3BJ L. C. Hunter, 62 Colombo Street, Christchurch.
ZL 3BK T. L. Danks, 27 Cashel Street, Christchurch.
ZL 3BM D. Cook, 125 Opawa Road, Christchurch, SW1.
ZL 3BN N. A. Field, 16 Campbell Street, Timaru.
ZL 3BO F. H. Zanders, Norwich Quay, Lyttelton.
ZL 3BP F. E. Merrin, 148 Ensons Road, Christchurch.
ZL 3BQ C. Griffiths, Runanga, Westland.
ZL 3BR V. Savage, 70 Wildberry Street, Christchurch.
ZL 3BS W. C. Rose, 39 Heywood Terrace, Christchurch, NE1.
ZL 3BT W. L. Smith, Ludstone Estate, Karkowra.
ZL 3BU W. Docherty, Ward Street, Runanga.
ZL 3BV L. M. Schaef, Marsden Road, Greymouth.
ZL 3BW F. A. O'Connell, 77 Ferry Road, Christchurch.
ZL 3BX F. Vincent, 6 Brittain St., Linwood, Christchurch.
ZL 3BY F. Whiteley, 41 Lonsdale Street, New Brighton, Christchurch.
ZL 3BZ W. H. Jackson, Raukapuka, Geraldine.
ZL 3CA C. A. Hughes, 149 Huxley Street, Christchurch.
ZL 3CB L. G. Whitlock, 28 Ryan St., Linwood, Christchurch.
ZL 3CC J. B. Elliott, 25 Frankleigh Street, Spreydon, Christchurch.
ZL 3CD F. A. McNeill, Progress Junction, Reefton.
ZL 3CE B. G. Henderson, 100 Rugby Street, Christchurch.
ZL 3CF A. E. H. Simpson, 99 Abberley Road, Christchurch, N1.
ZL 3CG H. P. V. Brown, 10 Merivale Lane, Christchurch, NW1.
ZL 3CH S. McKnight, 8 Dover Street, St. Albans, Christchurch.
ZL 3CJ A. E. S. Hanan, 78 Beverly Rd., Timaru.
ZL 3CI F. S. T. Mulholland, 189 Blighs Road, Christchurch, NW2.
ZL 3CK E. G. Shipley, 2 Puriri Street, Riccarton, Christchurch.
ZL 3CL L. P. Gerity, 20 Fitzgerald Street, Christchurch.
ZL 3CM W. T. Toon, 73 Canon Street, Christchurch.
ZL 3CO G. S Kellaway, Waikari.
ZL 3CP C. W. Parton, 69 Hackthorne Road, Cashmere, Christchurch.
ZL 3CS J. Hill, 178 Church Street, Timaru.
ZL 3CT J. R. Tabley, 113 Milton St., Christchurch, SW1.
ZL 3CU S. Schofield, Akaroa Heads Lighthouse.
ZL 3CV S. J. Gilligan, Ranfurly Street, Runanga.
ZL 3CW West Coast Radio Society 5 Cowper Street, Greymouth.
ZL 3CX J. D. Stewart, 112 Alford Forest Road, Ashburton.
ZL 3CY W. Hughes, 190 Waltham Road, Christchurch.
ZL 3CZ F. L. Rose, 39 Heywood Terrace, Christchurch, NE1.
ZL 3DA B. C. Warren, 15 Sarah Street, Timaru.
ZL 3DB S. Marks, 35 Haast St., Christchurch, E1.
ZL 3DC E. H Travis, 43 Papanui Road, Christchurch.
ZL 3DD A. Lemin, 104 High Street, Greymouth.
ZL 3DE L. K. W. Dale, Maungati, Timaru.
ZL 3DF H. W. Morgan, c/o H. Pilbrow, Midlands, Oxford.
ZL 3DG B. T. Claydon, 58 Stewart Street, Christchurch.
ZL 3DI K. Taylor, 10 Norton Street, New Brighton.
ZL 3DJ F. W. Walter, 99 Briggs Road, Mairihau, Christchurch.
ZL 3DK C. E. Holmes, 74 Wychbury Street, Christchurch.
ZL 3DM R. Calvert, 99 Hinau St., Christchurch, W1.
ZL 3DN E. Reynolds, Cox Street, Ashburton.
ZL 3DO R. P. Hunter, 30 Randall Street, Christchurch, N1.
ZL 3DP A. P. H. Sweeney, 192 Moorhouse Ave., Christchurch.
ZL 3DQ R. F. Goldsborough, 371 Hereford St., Christchurch, C1.
ZL 3DR E. W. Hullett, 259 Fitzgerald Ave., Christchurch, C1.
ZL 3DS A. J. Farquhar, Mt. Hutt R.M.D., Rakaia.
ZL 3DT J. T. Thompson, Good Street, Rangiora.
ZL 3DU V. J. Wilson, 33 Roseberry Street, Christchurch.
ZL 3DV C. E. Zohrab, 18 Aitken Street, Ashburton.
ZL 3DW Mrs. M. H. Blake, 66 Sth. Belt., Rangiora.
ZL 3DX R. H. Ripley, 52 Hopkins Street, Christchurch.
ZL 3DY H. V. Firman, Talbot Street, Geraldine.
ZL 3DZ F. W. Moyle, 61 Ruskin St., Christchurch.
ZL 3FA T. Gates, 48 Diamond Ave., Christchurch, SW1.
ZL 3FB J. F. Freeman, 228a Linwood Avenue, Christchurch.
ZL 3FC M. W. Guthrie, 32 Westminster St., St. Albans, Christchurch.
ZL 3FD S. V. Willmott, 146 Jubilee Avenue, North Brighton.
ZL 3FE M. H. G. Ellwood, 89 Westminster St., Christchurch.
ZL 3FF C. H. Turner, 60 Patten Street, Avonside, Christchurch.
ZL 3FG L. M. Wickham, Arney St., Greymouth.
ZL 3FH Dr. L. C. Mail, Wilson St., Geraldine.
ZL 3FI J. H. Roscoe, 4 Saltaire Street, North Brighton.
ZL 3FJ V. E. Robinson, 21 Queen's Avenue, Christchurch.
ZL 3FK L. D. Hepburn, 247 Fifield Terrace, Christchurch.
ZL 3FL A. B. W. George, 16 Stafford St., Riccarton, Christchurch.
ZL 3FM J. H. Knowles, 171 River Road, Christchurch.
ZL 3FN D. P. Harnett, Peel Street, Cobden, Greymouth.
ZL 3FO W. V. Blackmore, Northbrook Road, Rangiora.
ZL 3FP J. A. M. Reid, 3 Cain Street, Timaru.
ZL 3FQ E. M. Walker, 50 Jerrold Street, Christchurch.
ZL 3FR C. P. Lilly, 173 Bealey Avenue, Christchurch.
ZL 3FS D. A. F. Smith, 106 Bletsoe Avenue, Christchurch.
ZL 3FT C. D. Cunnold, 51 Church Street, Timaru.
ZL 3FU S. W. S. Strong, Greymouth.
ZL 3FV J. C. East, 20 Alymer St., Spreydon, Christchurch.
ZL 3FW H. W. Mitchell, Culverden.
ZL 3FY L. C. Evans, 64 Ryan Street, Linwood.
ZL 3FZ A. F. Gledhill, 43 Severn St., St. Albans, Christchurch.
ZL 3GA W. T. Gale, 113 Petrie Street, Christchurch.
ZL 3GC W. J. Perry, Wild St., Hokitika.
ZL 3GD S. G. Kingan, Mayfield, Christchurch.
ZL 3GE N. Isaac, 5 Wai-iti Road, Timaru.
ZL 3GG C. Roberts, Dobson, Brunnerton.
ZL 3GH C. H. J. Voss, Willowbridge, Waimate.
ZL 3GI C. T. Ballantyne, 26 Nelson Terrace, Timaru.
ZL 3GJ T. R. Hall, 25 Ilam Road, Riccarton, Christchurch.
ZL 3GK F. T. Jacobs, 25 Bordesley St., Linwood, Christchurch.
ZL 3GL T. J. Keast, Lincoln.
ZL 3GM R. A. Andrews, 304 Gloucester Street, Christchurch.
ZL 3GN A. M. Dacombe, 186 Pages Road, Bromley, Christchurch.
ZL 3GP A. W. Eddy, Lake Road, Irwell.
ZL 3GR R. H. Rowe, Springbrook, St. Andrews.
ZL 3GS M. H Nelson, 16 Pratt St., New Brighton, Christchurch.
ZL 3GT A. H. Summer, Hampden Street, Hokitika.
ZL 3GU J. R. Keys, 60 Huxley St., Sydenham, Christchurch.
ZL 3GV W. G. Edwards, 89 Domain Terrace, Spreydon, Christchurch.
ZL 3GW A. R. Gourley, McDonald Street, Methven.
ZL 3GX W. F. Barbour, 8 Templar St., Avonside, Christchurch.
ZL 3GY P. N. M. Perry, St. Michael's Vicarage, Oxford Ter., Ch'church.
ZL 3GZ A. E. Berry, 18 Marlborough St., Linwood, Christchurch.
ZL 3HA H. F. Arnold, 165 Olliviers Road, Christchurch.
ZL 3HC S. L. McCallum, 50 Sullivan St., Opawa, Christchurch.
ZL 3HE D. McWha, Brougham St., Westport.
ZL 3HD L. E. C. Johnson, 57 Francis Avenue, Christchurch.
ZL 3HF C. M. Robb, 195 Bealey Avenue, Christchurch.
ZL 3HG L. W. Naylor, 42 Queen Street, Westport.

ZL 3HH R. J. Griffen, Trevor's Road, Ashburton.
ZL 3HI K. A. Hepburn, 104 Oxford Street, Ashburton.
ZL 3HJ J. Steel, Otira.
ZL 3HK P. R. Harvey, 6 Windsor Terrace, Christchurch.
ZL 3HL E. W. Clutterbuck, St. Albans Fire Station, Christchurch.
ZL 3HM C. E. Evans, 3 Drain Rd., Fernside, Rangiora.
ZL 3HN A. C. Bray, 108 Tancred Street, Ashburton.
ZL 3HO E. C. Philpott, 127 Westminster Street, Christchurch.
ZL 3HP D. E. Hildebrand, Seddon Terrace, Runanga.
ZL 3HQ C. A. Rodda, 71 Springfield Rd., Christchurch.
ZL 3HR C. Allred, "Our Boys," Main Rd., Methven.
ZL 3HS R. G. Holmes, 124 Nayland St., Sumner, Christchurch.
ZL 3HT S. A. Shrimpton, 44 Beverley Road, Timaru.
ZL 3HU C. R. Lawn, Pareora East, Timaru.
ZL 3HV J. F. L. Johnson, 3 Poulson Street, Ashburton.
ZL 3HW Miss M. Stringleman, 28 Kononi St., Riccarton, Christchurch.
ZL 3HX H. T. Perkins, Fire Station, Woolston, Christchurch.
ZL 3HY E. K. Watkins, 174 Baker Street, New Brighton.
ZL 3HZ North Beach Rover Scouts' Radio Soc., 23 Berry St., North.
ZL 3IA S. J. Langrope, William Street, Akaroa.
ZL 3IB R. B. Higgs, Charles St., Kaiapoi.
ZL 3IC I. A. G. McCulloch, 38 Retreat St., Christchurch.
ZL 3ID W. L. Pettigrew, 281 Fitzgerald Ave., Christchurch.
ZL 3IE L. G. Hopkinson, Fraser St., Temuka.
ZL 3IF H. E. Higgins, Gresson St., Greymouth.
ZL 3JA H. J. Rowe, Southbridge.
ZL 3JB J. W. Burtenshaw, Thornycroft St., Fendalton, Christchurch.
ZL 3JC H. W. Millard, 29 Weka St., Christchurch.
ZL 3JD A. E. Lyes, 155 King Street, Christchurch.
ZL 3JE C. E. Fechney, Rose Hill, Methven.
ZL 3JF H. P. Henderson, 201 Fitzgerald St., Christchurch.
ZL 3JG J. R. Gibbs, Wigram Aerodrame, Sockburn.
ZL 3JH H. Weenink, Pareroa.
ZL 3JI J. D. Hart, 31 High Street, Greymouth.
ZL 3JJ T. N. Lowry, 95 Osborne Terrace, Nth. Brighton, Christchurch.
ZL 3JK L. A. Elliott, 40 Mays Road, Christchurch.
ZL 3JL G. F. Mason, 14 Hillview Street, Christchurch.
ZL 3JM D. V. B. P. White, 27 St. Martin's Rd., Christchurch.
ZL 3JN D. H. Ashby, Princess Street, Waimate.
ZL 3JO J. O. Milne, 138 Russell St., Westport.
ZL 3JP E. W. Langley, 136 Huxley Street, Christchurch.
ZL 3JQ Navy League Sea Scouts, Kilmore St., Christchurch, C.1.
ZL 3JR J. A. Stuart, 127 Innes Rd., Christchurch.
ZL 3JS H. C. L. Pruden, 89 Retreat Rd., Christchurch, NE1.
ZL 3JT D. H. Birbeck, 435 Barbadoes St., Christchurch.
ZL 3JU D. W. Anderscn, 105 Office Rd., St. Albans, Christchurch.
ZY 3JV R. S. Hill, Dunsandel.
ZL 3JW R. A. Anderson, 262 Lincoln Rd., Addington, Christchurch.
ZL 3JX T. E. Rowlands, R.M.D., Kaiapoi.
ZL 3JY Rev. J. Maguire, 136 Barbadoes Street, Christchurch.
ZL 3JZ West Christchurch Dist. High School, Hagley Ave., Ch'church.
ZL 3KA E. J. Slack, 60 Peel Street, Westport.
ZL 3KB J. R. Burch, 256 Fitzgerald Avenue, Christchurch.
ZL 3KC W. E. Davey, St. Andrews.
ZL 3KE R. E. McGrath, 183 Richmond Tce., New Brighton, Ch'church.
ZL 3KF E. R. Pettitt, High School, Methven.
ZL 3KG G. E. Billson, Jnr., 75 Gardiner's Rd., Harewood, Ch'church.
ZL 3KH W. J. Service, 25 Ilam Rd., Riccarton, Christchurch.
ZL 3KJ K. J. Rogers, 75 Frankleigh Street, Christchurch.
ZL 3KK H. H. Lublow, 16 London Street, Lyttelton.
ZL 3KM R. T. Woodfield, 44 Canon St., Christchurch, N1.
ZL 3KN W. C. Lee, 116 St. Albans Street, Christchurch.
ZL 3KO R. H. Lindsay, 170 Durham Street, Christchurch.
ZL 3KP K. D. Green, 24 Severn Street, Christchurch.
ZL 3KQ D. D. Innes, Springfield.
ZL 3KR R. C. Cox, 66 Neville Street, Christchurch.
ZL 3KS J. F. Broadmore, 854 Colombo St., Christchurch.
ZL 3KT R. B. Grey, 75 Barbour St., Christchurch.
ZL 3KU W. J. Condon, Adderley Head, Lyttelton.
ZL 3KV T. A. Duxbury, Pigeon Bay.
ZL 3KW A. S. Phillips, Duvauchelle.
ZL 3KX G. W. Heslop, 17 Kitchener Square, Timaru.
ZL 3KY A. D. Talbot, Pleasant Point.
ZL 3KZ J. M. Eadie, 28 High St., Greymouth.
ZL 3XB Canterbury University College, Christchurch.

ZL4—STATIONS LOCATED IN OTAGO DISTRICT

ZL 4AA F. D. Bell, Waihemo (Shag Valley Station).
ZL 4AB P. W. Hunt, Joseph Street, Gore.
ZL 4AC R. E. Robinson, 3 Chatham Avenue, Dunedin.
ZL 4AD A. E. Jordan, 41 Venus Street, Invercargill.
ZL 4AE G. E. Crown 32 Ardwick Street, Gore.
ZL 4AF J. M. Strachan, 2 Lawrence St., Gore.
ZL 4AG H. L. Homer, Cromwell.
ZL 4AH F. J. O'Grady, Dunedin.
ZL 4AJ H. W. Austen, 443 Leith Street, Dunedin.
ZL 4AK J. H. Hobbs, Lighthouse, Puysegur Point.
ZL 4AL A. H. McL. Grubb, Gore.
ZL 4AM L. Gibb, Luggate, Central Otago.
ZL 4AO H. N. Shrimpton, 17 Cliffs Rd., St. Clair, Dunedin.
ZL 4AN Otago Brancn, N.Z.A.R.T., Box 517, Dunedin.
ZL 4AP L. R. Stroud, 118 Stafford Street, Dunedin.
ZL 4AQ G. T. Edgar, 24 Pine Hill Road, Dunedin.
ZL 4AR H. W. Natta, 41 Richardson St., St. Kilda, Dunedin.
ZL 4AS C. C. Morris, 17 Hope Street, Dunedin.
ZL 4AT J. Stone, 34 Grove Street, St. Kilda, Dunedin.
ZL 4AU G. D. Gerken, Knapdale.
ZL 4AV J. L. Milnes, 9 Warden Street, Opoho, Dunedin.
ZL 4AW A. W. Head, Awarua Radio Station, Awarua.
ZL 4AY L. W. Budd, 11 Agnes St., Mornington, Dunedin, NW1.
ZL 4AZ T. K. S. Sidey, Telcarne Avenue, Dunedin, NW1.
ZL 4BA J. G. Smith, 7 Crosby Street, Dunedin.
ZL 4BC J. L. Ferris, Box 29, Alexandra, Central Otago.
ZL 4BB W. T. Smith, 10a Alva St., Dunedin.
ZL 4BD A. Swann, 27 Oakland Street, Dunedin, E1.
ZL 4BE N. H. Shepherd, 31 Warden St., N.E. Valley, Dunedin.
ZL 4BF L. Smith, 24 Mitchell Street, Invercargill.
ZL 4BQ W. Marshall, 24 Cutten St., St. Kilda, Dunedin.
ZL 4BI S. R. Hitchcock, 63 Hunt St., Andersons Bay, Dunedin.
ZL 4BJ E. P. Cameron, 44 Cargill Street, Dunedin.
ZL 4BK J. W. Booker, 41 Argyle St., Mornington, Dunedin.
ZL 4BL Mrs. Nellie Kennedy, Derwent St., Oamaru.
ZL 4BM J. A. McIntosh, Pugseear Point, Southland.
ZL 4BN T. C. Middlemiss, Majestic Mansions, St. Clair, Dunedin.
ZL 4BO A. Richardson, Lighthouse, Cape Saunders.
ZL 4BP W. G. Collett, 40 Cargill Street, Dunedin.
ZL 4BQ F. E. Frame, 251 Melbourne Street, Dunedin.
ZL 4BR H. G. Thompson, 6 Albion Street, Mataura.
ZL 4BS L. A. Burnby, Waikaka Valley, Gore.
ZL 4BU R. W. Cook, 61 Shetland Street, Dunedin.
ZL 4BV J. R. McConnell, 157 Tweed St., Invercargill.
ZL 4BW R. E. Dawson, 3 Irwell St., Gore.
ZL 4BX P. O. Smith, Lighthouse, Puysegur Point.
ZL 4BY J. W. Winefield, 5 Dundas Street, Dunedin.
ZL 4BZ D. Masterton, 40 Brighton Street, Dunedin.
ZL 4CA A. R. Harris, 52 Peter Street, Dunedin.
ZL 4CB R. A. Caliander, 54 Broughton St., Gore.
ZL 4CC L. H. Frapwell, c/o Misses McPhee, Owaka.
ZL 4CD F. A. Sims, 169 Andersons Bay Road, Dunedin.
ZL 4CE J. H. Searle, 193 Ettrick Street, Invercargill.
ZL 4CF A. D. McLaren, 36 Driver Street, St. Kilda, Dunedin.
ZL 4CG R. O. Boyens, 92 Duke Street, Invercargill.
ZL 4CH A. W. Hyndman, Milford Sound.
ZL 4CI R. D. Stewart, 59 Easther Crescent, Kew, Dunedin.
ZL 4CJ H. Jupp, 36 Pitcairn Street, Dunedin.
ZL 4CK W. F. Self, 12 School Street, Roslyn.
ZL 4CL M. E. Cameron, 102 Princes St., Dunedin.
ZL 4CM M. A. Mathie, 16 Rother Street, Oamaru.
ZL 4CN A. McN. Peterson, 148 Melbourne Street, Dunedin.
ZL 4CO A. V. Crocker, 34 Chalmer Street, Oamaru.
ZL 4CR M. O. Johnstone, Balclutha.
ZL 4CS A. R. Wilkinson, 158 Main St., Gore.
ZL 4CT J Allen, 52 Prince Albert Road, Dunedin.
ZL 4CU D. M. R. McEwan, 20 Mitchell Street, Invercargill.
ZL 4CV A. Wareham, c/o National Broadcasting Service, Dunedin.
ZL 4CW J. C. Leckie, 29 John St., Dunedin.
ZL 4CX Miss N. O. McFarlane, Cromer Street, Balclutha.
ZL 4CY E. C. Morrison, 24 Elm Row, Dunedin, C2.
ZL 4CZ F. M. McFarlane, English Ave., Mornington, Dunedin.
ZL 4DA B. C. Warren, 595 George St., Dunedin.
ZL 4DB K. H. Barron, 48 Queen Street, Dunedin.
ZL 4DD D. W. Sargeant, Kurow.
ZL 4DG N. C. Gilchrist, Waiareka Junction, Oamaru.
ZL 4DH A. C. Hanlon, 16 Pitt Street, Dunedin.
ZL 4DI D. A. C. Shepherd, 4 Belleknowes Terrace, Dunedin.
ZL 4DJ A. J. Austin, Riversdale.
ZL 4DK S. T. Hunter, 75 Herbert Street, Invercargill.
ZL 4DL A. J. Leslie, 25 Royal Terrace, Dunedin, C2.
ZL 4DM W. H. Wylie, Arthur St., Oamaru.
ZL 4DN A. W. I. McBryde, 128 Tennyson Street, Dunedin.
ZL 4DO A. C. L. Fooks, P.W. Department, Lauder.
ZL 4DP J. Grant, Otiake.
ZL 4DQ W. R. Hamilton, 50 Islington St., Dunedin.
ZL 4DR J. R. Mutch, Ann St., Bluff.
ZL 4DS B. Renton, Inchclutha.
ZL 4DT Miss K. Kirby, 40 Cargill Street, Dunedin.
ZL 4DU D. Wilson, 10 Douglas Street, St. Kilda.
ZL 4DV J. W. N. Simpson, Central Fire Station, Invercargill.
ZL 4DW A. Wallace, Radio Station, Awarua.
ZL 4DX W. R. Taylor, 12 Nottingham Crescent, Dunedin.
ZL 4FA T. H. Miles, Murchison Street, Dunedin.
ZL 4FB H. F. Gardiner, 7 Bellevue Street, Roslyn, Dunedin.
ZL 4FC J. Johnson, 48 Fulton St., Invercargill.
ZL 4FD F. Denford, 16 John Street, Caversham, Dunedin.
ZL 4FE G. R. Kennedy, School House, Waimahaka, Southland.
ZL 4FG C. A. Ellis, 319 Herbert Street, Invercargill.
ZL 4FH C. H. Freeman, 29 Ravenswood Rd., St. Clair, Dunedin.
ZL 4FI J. H. Gault, 77 Spottiswoode Street, Dunedin.
ZL 4FK Dr. R. B. Dodds, 110 St. David Street, Dunedin.
ZL 4FL J. N. Jocelyn, Bannickburn.
ZL 4FM P. G. Shave, 23 Coquet Street, Oamaru.
ZL 4FO S. T. Hudson, 30 Tweed Street, Roslyn, Dunedin.
ZL 4FQ L. A. Nichol, Barrow Street, Bluff.
ZL 4FR J. G. Howard, 24 Erin Street, Dunedin.
ZL 4FS P. Clark, Main Road, St. Leonards, Dunedin.
ZL 4FT G. L. Mitchell, 36 Roseberry St., Belleknowes, Dunedin.
ZL 4FU R. Y. Hodge, 5 Queen Street, Dunedin.
ZL 4FW R. D. Phillips, 60 Royal Terrace, Dunedin.
ZL 4FY E. R. Brain, Waipounamu R.D., Gore.
ZL 4FZ C. S. Findlay, 54 Russell Street, Dunedin.
ZL 4GB M. Chapman, Rosebank, Balclutha.
ZL 4GC A. S. Hayward, North Balclutha.
ZL 4GD A. Melville, Milton.
ZL 4GE G. A. Anderson, 94 Victoria Ave., Invercargill.
ZL 4GF J. Borthwick, 62 Cutten St., Dunedin, S.1.
ZL 4GG H. W. Boddy, 64 Belgrave Cresc., Roslyn, Dunedin.
ZL 4GH D. K. Woodbury, Moa Creek, Oturehua.
ZL 4GI J. C. Burnby, Gore-Ferndale R.D., Gore.
ZL 4GJ C. T. Bowie, Cromwell.
ZL 4GK R. G. Kitto, 106 Bowmont St., Invercargill.
ZL 4GM D. D. Jackson, 46 Islington Street, Invercargill.
ZL 4GN W. E. Baird, 56 Arthur Street, Invercargill.
ZL 4GR G. S. Ridgwell, Stirling.
ZL 4GT J. R. W. Bowen, Gordon Road, Mossgiel.
ZL 4GU J. B. B. Cormack, Government Hostel, Milford Sound.
ZL 4GV F. E. Broom, Radio Station Awarua.
ZL 4GW H. J. Chapman, c/o 4YA Transmitting Station, Highcliffe.
ZL 4GX H. Sutton, 63 Dublin Street, Invercargill.
ZL 4GY E. E. A. Brown, 471 George Street, Dunedin.
ZL 4GZ G. Applegarth, 29 Rawhiti Street, Andersons Bay, Dunedin.
ZL 4HF F. Hazlett, 100 Melbourne Street, Invercargill.
ZL 4XA Awarua Radio Station, Southland.
ZL 4XB Otago Radio Association, Otago.
ZL 4XC F. J. O'Grady, Telegraph Dept., Dunedin.
ZL 4XD N.Z.A.R.T., Otago Branch, 3 Stafford St., Dunedin.
ZL 4XE A. R. Harris, 52 Peter St., Caversham, Dunedin.
ZL 4XO Otago University (Dr. Jack), Dunedin.
ZL 4XP Southland Amateur Radio Club, Invercargill.

ANOTHER GRAND RECEIVER!



Thousands of Pentagrid Fours are operating all over Australia. Our readers have supplied the evidence that this set has been, in its several versions, the most popular of all "Wireless Weekly" battery receivers. Here we present the latest 1937 Pentagrid Four — still simple, straightforward and economical—and a better performer than ever.

A front view of the chassis shows that in appearance it is similar to other Pentagrid 4 receivers.

THE 1937 PENTAGRID—4

THE "Wireless Weekly" range of Pentagrid receivers is probably the most famous among Australian battery sets. Originating in 1934, just three years ago, they commenced with the Pentagrid 4—still the simplest 4-valve battery set ever described. As time went on and the Pentagrid sets "went over" others were produced—the A.V.C. Pentagrid Four, the Dual Wave Pentagrid Four, the Pentagrid Six, and the De Luxe Pentagrid Six—built before the days of diode-triode valves. Then followed the Dual Wave Pentagrid Six, which so many of our readers in the country are using.

The name Pentagrid, associated with these "Wireless Weekly" circuits, refers, of course, to the use of the pentagrid converter type of valve used as the mixer valve. But the name where "Wireless Weekly" is concerned really stands for an ideal which was so successful with the original set, and which has persisted through all these designs. It is the ideal of simplicity of circuit and construction, with maximum performance. Although the later Pentagrids were of necessity a little more complicated than the ultra-simple original, they all retain this straightforward design, which makes them so easy to build and so successful on the air.

The set to be described here is the latest of the Pentagrids—the 1937 Pentagrid Four, for broadcast work. It is the most satisfactory solution to the problem of the man who wants a small and inexpensive receiver, which costs little to run, and which is sensitive enough to give him good daylight and night-time reception.

Naturally, having only four valves, it is not quite a six-valver in performance. But it comes as close to it as one can expect a four-valve set ever to come close to a six. We are confident that it will give the fullest satisfaction to every owner, and keep him happy in its modest requirements in battery consumption. It is wonderful just what this little set can do.

PARTS LIST

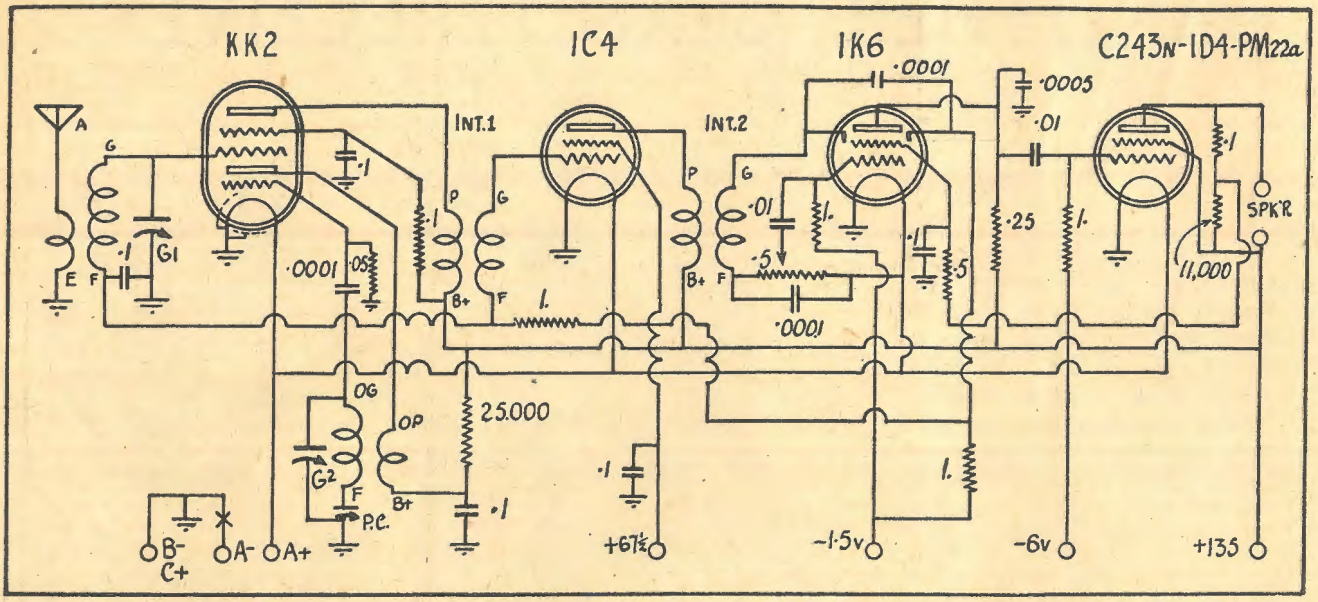
1937 PENTAGRID FOUR

1 Base, 11½ x 9 x 3.
1 2-Gang condenser.
1 Tuning dial to suit.
1 465kc. superhet. coil kit for KK2 (aerial coil, r.f. coil, 2 intermediates).
1 Battery switch.
1 .5 Meg. volume control.
5 .1 Mfd. tubular condensers.
2 .01 Mfd. tubular condenser.
3 .0001 Mfd. mica condenser.
4 1 Meg. resistors.
1 .25 Meg. resistor.
2 .1 Meg. resistors.
1 50,000 Ohm. resistor.
1 25,000 Ohm. resistor.
1 11,000 Ohms resistor.
1 "P" type socket (or 7-pin), 1 6-pin, 2 5-pin, 2 4-pin.
Valves—KK2, 1C4, 1K6, 1D4, or C243N, or PM22a.
Batteries—3 45-volt H.D. B batteries, 1 6-volt C battery, 1 2-volt accumulator, or Air-cell.
Speaker—Permagnetic, matched for pentode.
3 Valve cans, battery plug, hookup wire, 2 terminals, nuts and bolts, etc.

THE CIRCUIT

The circuit of the set is very similar to the A.V.C. Pentagrid Four, which was described some time ago. The differences in the circuit are such as to conform with the latest developments in design, without altering very much the general outline of the set. In other words, the owner of an old A.V.C. P.-4 can, if he chooses, rebuild his set to the new design without very much trouble and expense. His reward will be better sensitivity and probably lower battery consumption.

The first valve in the set is the Oc-



The circuit of the receiver. It is often a good idea to include a .5 mfds. tubular condenser from the 135 volts high tension to earth. The A.V.C. line is here shown with a bias of 1.5 volts. See text.

tode KK2, which operates as the frequency changer. It is a very efficient valve, and we have used it in former Pentagrids. It is possible to use the 1C6 with but little difference in results, and, as a matter of fact, there is a kit-set put up for this receiver which uses the 1C6. The constructor, however, need not worry over this point, both valves operate very well. Beyond specifying the coil kit to suit the particular valve used, and, of course, changing the socket connections to conform with the alteration, there is nothing much to it.

A single stage of I.F. amplification is used, the I.F. amplifier being the Australian 1C4 R.F. pentode. This feeds into another Australian type of valve, the 1K6, which is interesting because it is also a pentode with a pair of diode plates. The result is that we can get diode detection and A.V.C. using these diodes, and also obtain the extra gain which the pentode gives when used as an audio amplifier.

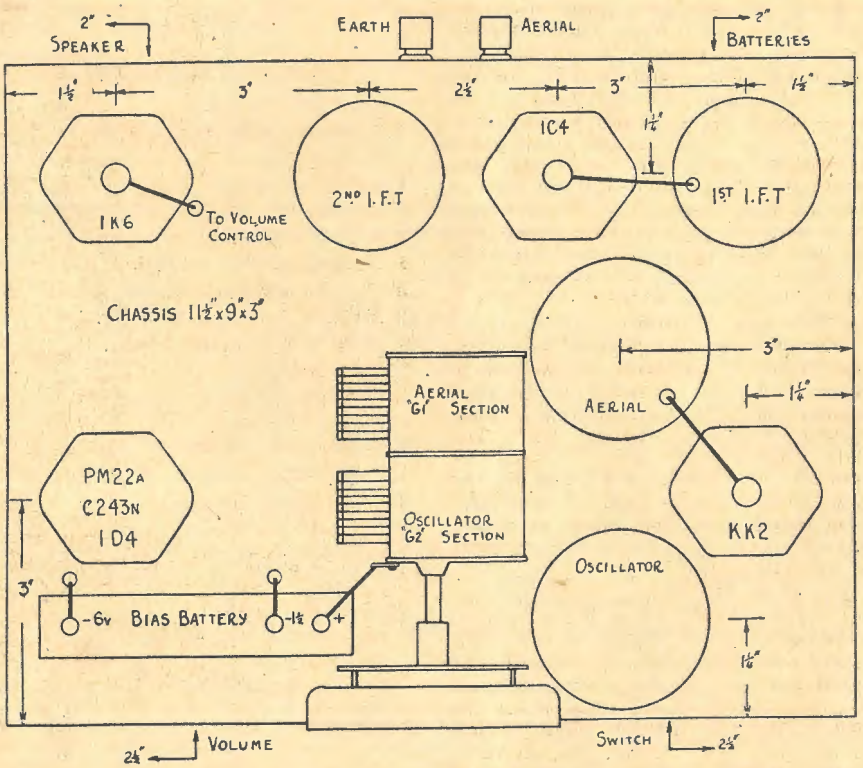
The output valve is a 1D4 pentode, equivalents of which are the PM22a and the C243N. Any of these velves may be used without alteration to the circuit. The latest of these output pentodes—the 1F4—is also suitable, but not so generally available. It has the advantage of slightly less filament current, but uses slightly higher plate current.

As will be seen from the circuit, "Inverse Feed-back" is used in conjunction with the output valve and the 1K6. This circuit has the effect of lowering the harmonic distortion which follows in the wake of the ordinary pentode, and allowing better effective output with less battery drain. The alterations to the circuit are small, and really consist of two extra resistors which are shown across the input to the loudspeaker in the circuit and wiring diagrams.

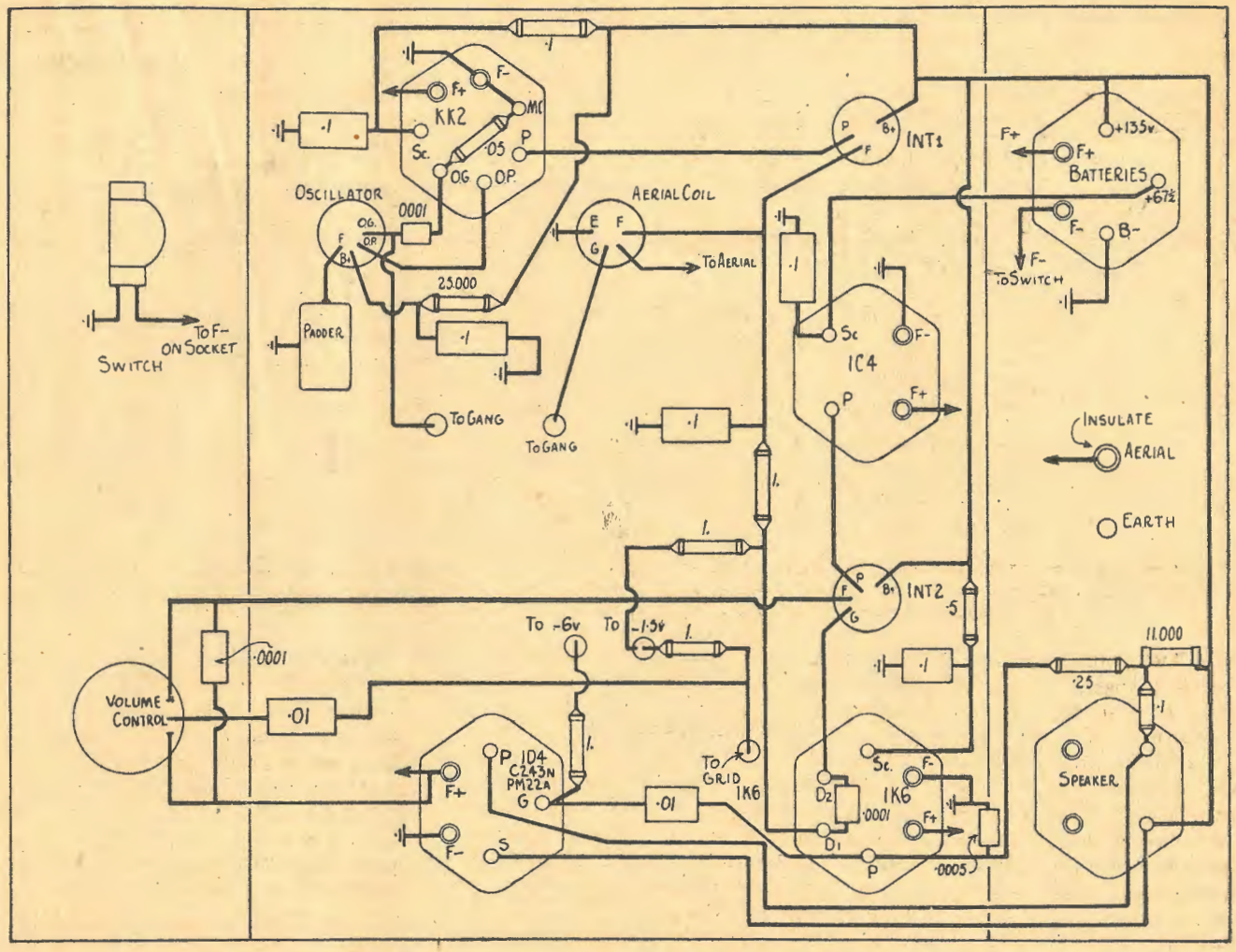
CIRCUIT POINTERS

Now we come to a few matters dealing with the circuit which call for some comment. It will be noted that the voltages for the oscillator plate and the screen of the KK2 are shown as obtained from resistors connected across to the high tension. This is done for two reasons. One is to avoid having more leads to the batteries than are necessary, and the other is that, as the batteries drop in voltage, there is a better chance of maintaining these somewhat critical voltages in proportion to the plate voltage, than there otherwise would be. It is, however, quite permissible to run leads for these points direct to the batteries should the constructor care to do so, and save a few components. In the case of the KK2, the makers advise up to 135 volts for the oscillator plate, and 45 volts for the screen. Slightly better sensitivity may be obtained by running the screen volts at 60 volts.

There is nothing much to be said about



This drawing gives an idea of how the chassis is laid out. If possible, always check up with actual components before finally drilling the chassis.

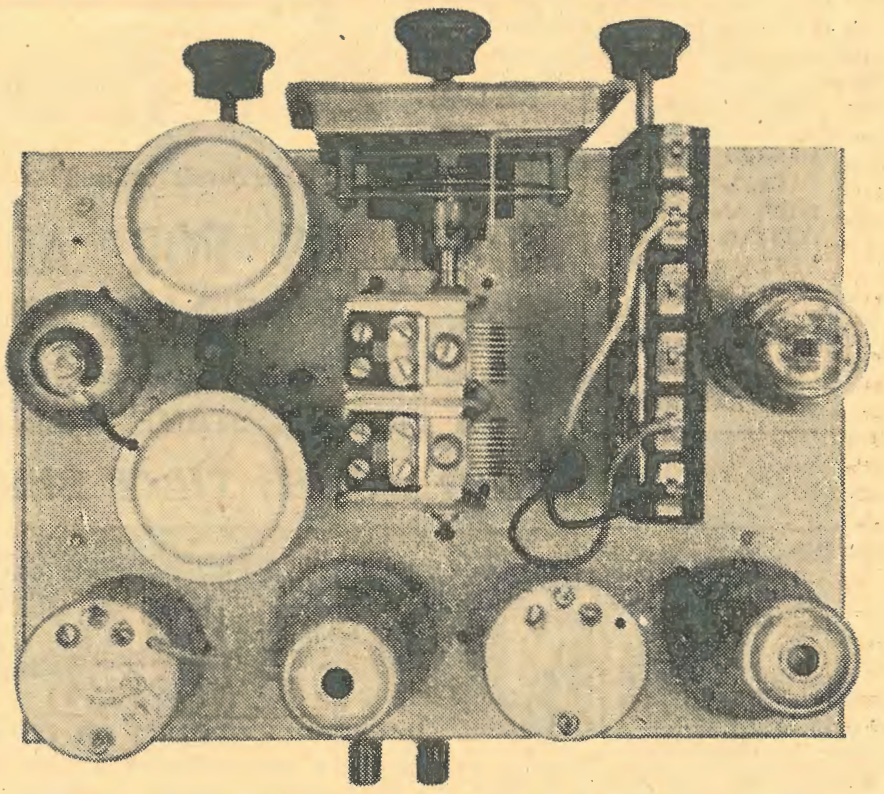


A point to point wiring diagram of the set, drawn approxi mately to scale. Again we have shown the A.V.C. line connected to 1.5 volts. The alternative connection for this lead is to the chassis.

the 1C4 I.F. amplifier. Both the KK2 and the 1C4 are zero bias valves—in other words, they do not need a standing negative bias under any conditions. The A.V.C. line therefore does not return to the C battery, and need not do so except in special cases where intermediate oscillation might be present, due to rather high gain, or a bit too much gain throughout the set. As a rule, a standing bias of 1½ volts, obtained by running the A.V.C. load resistor to the bias battery, will decrease the gain, but improve stability should this be in doubt. Operating properly, the bias is not generally required.

The 1K6, being a pentode amplifier, has, of course, a screen as well as a plate. The screen is fed from the high tension tapping through a .5 meg. resistor, bypassed with a .1 mfd. condenser. The plate resistor is .25 megs., making the most of the high gain allowed by the 1K6. Note that the plate of this valve is bypassed with .0005 mfds. as a precaution against unwanted R.F. currents in the output circuit.

The feedback coupling from the output valve to the 1K6 is via a pair of resistors across the output of the valve. The values are standard, .1 megs. and 11,000 ohms, and to the junction of these is connected the plate resistor for the 1K6. There is nothing more or less to it than that. The output valve, under the inverse feedback conditions, is biassed back to 6 volts. This in itself



A plan view of the chassis. Note the position of the "C" battery. A 9-volt battery was used, tapped in 1½-volt steps. Compare with layout diagram.

allows a saving in battery drain, and is one reason why the set draws so little current.

CONSTRUCTION

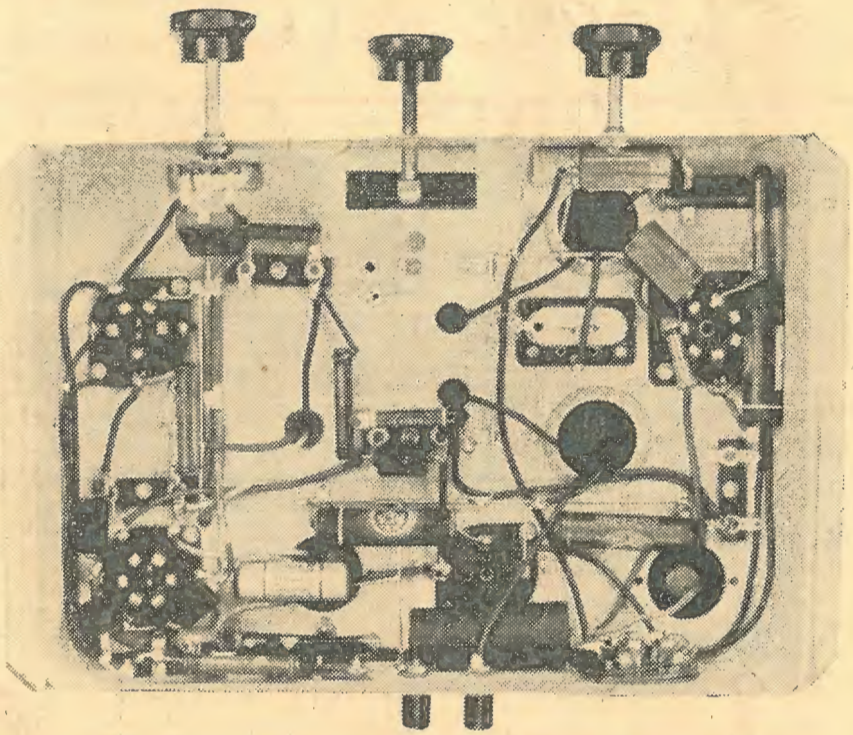
The chassis used in the original measured 11½ inches by 9 inches, and was 3 inches deep. These measurements should be approximately taken as a guide, if the various coils, etc., are to have room on the chassis. Do not make the chassis smaller than this, if it can be avoided, or unless midget coils are used. The circuit incidentally is quite suitable for use with such coils—we sometimes get requests for a circuit that can be built up in a small space. Should this circuit be used for such a set, naturally the exact size of the base will be determined by the dimensions of the coils used.

In our diagrams we have allowed for full-sized cans, and we don't think there are coils generally sold now with bigger cans than those shown.

For convenience sake, the oscillator coil is placed first on the chassis, and is tuned with the front section of the gang. The centres for the coils we used are given in our above base diagram, but take these as a guide only, and don't imagine that they must be slavishly followed. If you can, get your components together first before cutting the base, to be sure they will fit. A ready-drilled base, of course, should be quite all right when used with standard type coils.

When mounting the gang make sure that the dial will fit snugly before making fixtures—it is very annoying to find that the dial can't be fitted without removing the gang condenser after all the wiring has been completed.

We have shown the C battery on the chassis, as with other Pentagrids. It can, of course, be included at the bottom of the cabinet with the other batteries, but we have always found it more convenient to place it on the chassis out of the way, and thus reduce the number of leads out the back, which often tend to become confusing.



Under the chassis. This picture gives a very clear idea of the actual wiring.

Although we have drawn the battery parallel with the front of the chassis, it might fit better placed parallel with the side.

After mounting all the coils, valve sockets, etc., the wiring should be commenced, keeping an eye on our point-to-point diagram if necessary. There is nothing much to the wiring—just a straightforward connecting up of points with insulated hook-up wire. Where a lead in the circuit is to be connected to earth, it may be soldered to a lug firmly screwed under a nut on the chassis. In our set you will notice a network of heavy gauge tinned copper wire connecting all such points together, and the whole to the earth terminal. This is to guard against a poor earth at one point on the chassis, and also to prevent eddy current losses which might occur, particularly with a steel chassis. This precaution is not so necessary with an aluminium chassis.

Note also that where a component is to be connected so that its own leads are not long enough, an insulated strip is used with lugs at each end—we cut these from one of the terminal strips sold for mounting miscellaneous components in radio sets. They are held down between nuts on the bolts, which, for instance, mount the valve sockets in place. By this means no one component is left in such a position that it can be shaken loose or flop about under the chassis.

From our photograph nearly all the parts under the base can be seen quite plainly. Note that the leads to and from the volume control are encased in copper braid, which is earthed, and forms an effective shield and precaution against audio feedback. Insulated wire ready braided can be bought for this purpose, and only about one foot is needed.

Incidentally, see that the filament switch is a good one, and actually has a negligible resistance. This applies also to the valve sockets—they must make good contact with the filament pins of the valves if these are to get their full two volts—so necessary for good operation. Note that the batteries and the speaker both make contact through valve sockets and plugs at the rear of the chassis. It is a good idea to see that these have a different number of pins, to avoid confusion. Thus the speaker should have four pins and the battery plug five pins. Now you cannot plug the speaker in the battery socket by mistake.

BATTERIES

We advise that this set be operated at all times from 135 volts, such as would be supplied by heavy duty batteries. This voltage will ensure maximum efficiency at all times, as well as maximum output. Should it be necessary to work the set from 90 volts, performance will suffer somewhat, mainly by a drop in output. The bias will have to be reduced probably to 3 volts on the output pentode, and, incidentally, the battery consumption will drop considerably. Battery figures are given elsewhere in this article.

The bias battery is a 6-volt type, or possibly a 9-volt battery tapped at 6 volts, should a straight 6-volt battery be unobtainable. A 4.5-volt battery could be used, with slightly better quality, but the advantage of the feedback circuit in giving output with lower drain would not be realised.

The A battery for the set may be either a 2-volt accumulator of whatever size is most convenient (say, between 30 and 60 a.h.), or it may be one of the new Air-cells, which need no recharging, and run over 1000 hours at practically constant voltage.

If an air-cell is used, a resistance must be included in series with the negative lead to the air-cell of half an ohm in value to carry .6 amps., which is the drain of the set. Save for the occasional addition of tap water, the air-cell needs no attention until worn out.

ADJUSTMENT

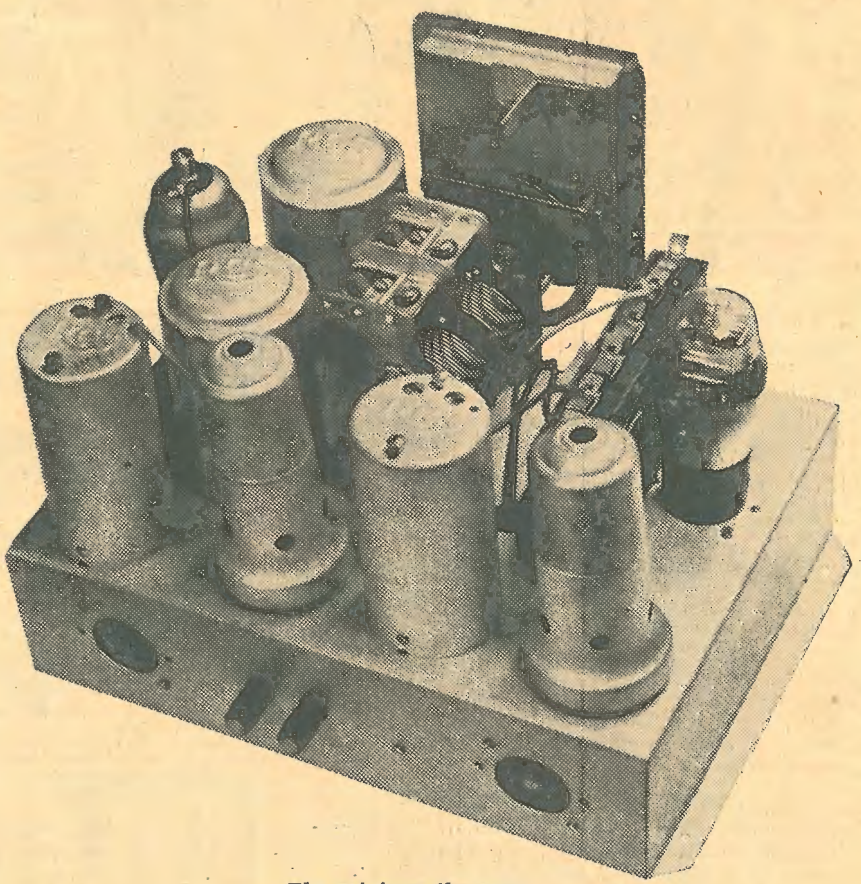
Assuming that the set has been correctly assembled, and is ready for work, connect up the batteries. Connect the A battery first and make sure that the filaments are alight (they will glow dimly) before connecting the B batteries. It is a good idea to include in the negative lead to the B battery a small torch globe to act as a fuse. Should a short circuit occur it will burn out before the valves.

Having connected the batteries, and received some kind of life from the set, slacken the padder about 3 turns, and the gang trimmers nearly all out. Now tune to a station low on the dial, such find the spot where the station is loudest. If you can't screw in the oscillator trimmer try again until you do.

Now turn to the top of the dial, and tune in a station up there, such as 2FC, keep rocking the dial across the station, as 2SM, and see if you can line the aerial trimmer (rear trimmer) until you and adjust the padder until it also is received at best strength. Now return to the lower end of the dial, and retune for fine results on a weak but steady station. All being well, these instructions should be sufficient to get the set going.

It is permissible to reline the intermediate trimmers with a wooden screwdriver, to see that they are peaked properly. Do not touch the padder or gang trimmers while doing this, and mark the original position of the intermediate trimmers so that you can return to them if necessary. The trimmer across the secondary of the second I.F.T. is probably the one which will need the most adjustment, as it is damped by the diode circuit of the valve. If any but this trimmer needs more than a fractional adjustment, suspect something wrong, and return it to its first position, to check over the set again. Remember that if you lose the intermediate adjustment, you will probably have to send these back to the factory to be relined.

Use this set with a good aerial, although don't make it too long. Height is far more important. A good ground is also essential. An old kerosene tin punched full of holes sides and bottom, filled with ashes, and buried in damp soil, is an excellent earth. Solder a heavy wire to the can first, of course, and keep the spot damp.



The set from the rear.

PARTS LIST OF SETS DESCRIBED IN THIS HANDBOOK

THE DUPLEX SINGLE PARTS LIST

1 Base, 8½ x 5½ x 2½
1 Vernier dial (dual-wave type).
1 Standard broadcast condenser, single gang.
1 3-Plate midget condenser.
1 Audio transformer.
1 250,000 Ohms carbon potentiometer.
1 2 Meg. resistor.
1 .25 Meg. resistor (optional).
2 .00025 Mfds. mica condensers.
1 .5 Mfds. tubular condenser.
1 R.F. choke (short-wave type).
1 Filament switch.
Sockets—1 6-pin, 2 5-pin.
4 Terminals.
4 Knobs.
3 Coils (see article).
1 19 Valve.
2 45 Volt light duty B batteries (see article).
1 2 Volt accumulator (20 a.h.).
1 1.5 Volt torch cell for bias.
Connecting wire, etc.
1 Pair headphones.

THE 2JU SPECIAL TEN

1 Base, 20in. x 12in. x 3in.
1 Front panel, 21in. x 12in.
1 Shield panel.
1 Straight-line dial.
1 3-Gang condenser (see text).
4 465kc. Interemdiates (low gain).
3 23-Plate midget condensers.
1 13-Plate midget condenser.
1 3-Plate midget condenser.
4 .5 Mfds. tubular condensers.
8 .1 Mfds. tubular condensers.
6 .01 Mfds. tubular condensers.
1 .002 Mica or tubular condenser.
5 .0001 Mica condensers.
1 1 Meg. resistor—1 watt.
2 .5 Meg. resistors—1 watt.
1 .5 Meg. potentiometer.
1 50,000 Ohms potentiometer.
4 .1 Meg. resistors.
6 50,000 Ohms resistors—1 watt.
1 20,000 Ohms resistor—1 watt.
1 3000 Ohms bias resistor.
4 2000 Ohms non-inductive resistors—1 watt.
1 200 Ohms 100 mills. resistor.
1 300 Ohms 100 mills. resistor.
2 500 Ohm bias resistors.
2 5000 Ohms potentiometers.
2 25 Mfds. potentiometers.
2 8 Mfds. 600-volt electrolytics.
1 25,000 Ohms voltage divider.
3 Switches.
9 Octal sockets (if metal valves used).
1 4-Pin socket.
2 4-Pin, 1 5-pin sockets (for coils).
1 Power transformer, 385 volts 100 mills., with suitable filament winding.
1 Tuning meter (optional).
Coil formers—6 4-pin, 3 5-pin.
Valve clips, knobs, extension shaft, couplei, hookup wire, mounting lugs, etc.

8-VALVE ALL-WAVE SET

1 Base, size 8½ x 14½ x 4, or larger.
1 All-wave coil kit with intermediates and gang.
1 Dial to suit.
1 Power transformer—385v. 150ma., 6.3v. 4a., 5v. 3a.
2 8 Mfd. electrolytic condensers.
2 .3 Mfd. tubular condensers.
7 .1 Mfd. ditto.
2 .001 Mfd. mica condensers.
1 .0005 ditto.
1 150 Ohm 150 ma. resistor.
1 50,000 Ohm 1 watt grid-leak.
5 100,000 ditto ditto.
2 500,000 ditto ditto.
2 1 Megohm ditto.
1 500,000 Ohm volume control.
1 15,000 Ohm voltage divider.
Sockets—3 octal, 1 small 7-pin, 3 6-pin, 1 4-pin, 1 5-pin.
Valves—2 6D6, 1 6A7, 1 6H6, 2 6L6, 1 80, 1 5Z3.
Speaker—750 ohm field, 5000 ohm plate to plate load, push-pull input.
Sundry hardware, wire, screws, solder, valve cans, power lead, etc.

5-METRE SUPERHET.

1 Base, about 15 x 10 x 3, and front panel.
2 Vernier dials.
3 3-Plate midget condensers.
3 Special intermediates, 2600kc.
2 25 Mfds. electrolytics
10 .01 Mica condensers.
1 .006 Mica condenser
1 .001 Mica condenser.
3 .0002 Mica condensers
2 1 Meg. resistors.
1 .25 Meg. resistor.
2 .1 Meg. resistors.
1 .5 Meg. resistor.
1 50,000 Ohms resistor.
1 15,000 Ohms resistor.
3 10,000 Ohms resistors.
1 2500 Ohms bias resistor.
1 500 Ohms bias resistor.
1 400 Ohms bias resistor.
1 100 Ohms resistor.
1 50,000 Ohms potentiometer.
1 500 Ohms potentiometer.
2 .5 Meg. potentiometers.
2 Small coupling condensers for aerial and r.f. coupling. Twisted hookup wire about 1 inch would do. Or 3-plate padders.
Valves—3 6D6, 1 6C6, 1 76, 1 75, 1 42.
Sockets——6 6-pin, 1 5-pin.
5 Coil cans, knobs, hookup wire, nuts and bolts, etc.

POWER UNIT

1 Transformer, 385 volts at 80 mills., 6.3v. at 3 amps., 5v. at 2 amps.
1 80 Rectifier.
2 8 Mfds. electrolytics.
Speaker—2500 ohms F.C., matched for pentode.

1937 PENTAGRID FOUR

1 Base, 11½ x 9 x 3.
1 2-Gang condenser.
1 Tuning dial to suit.
1 465kc. superhet. coil kit for KK2 (aerial coil, r.f. coil, 2 intermediates).
1 Battery switch.
1 .5 Meg. volume control.
5 .1 Mfd. tubular condensers.
2 .01 Mfd. tubular condenser.
3 .0001 Mfd. mica condenser.
4 1 Meg. resistors.
1 .25 Meg. resistor.
2 .1 Meg. resistors.
1 50,000 Ohm. resistor.
1 25,000 Ohm. resistor.
1 11,000 Ohms resistor.
1 "P" type socket, 1 6-pin, 2 5-pin, 2 4-pin.
Valves—KK2, 1C4, 1K6, 1D4, or C243N, or PM22a.
Batteries—3 45-volt H.D. B batteries, 1 6-volt C battery, 1 2-volt accumulator, or Air-cell.
Speaker—Permagnetic, matched for pentode.
3 Valve cans, battery plug, hookup wire, 2 terminals, nuts and bolts, etc.

TRANSMITTER EXCITER STAGE

1 Base, 12 x 7 x 2½.
2 Midget condensers, .0001 mfds.
2 Dials.
1 Suitable crystal and holder.
2 R.F. chokes (S.W. type).
2 Coil sockets and 4-pin formers.
1 .01 Mica condenser.
1 .002 Mica condenser.
1 .0001 Mica condenser.
1 50,000 Ohms 2-watt resistor.
1 400 Ohms W.W. bias resistor.
4 Terminals.
1 6A6 and 7-pin socket.

BUFFER STAGE

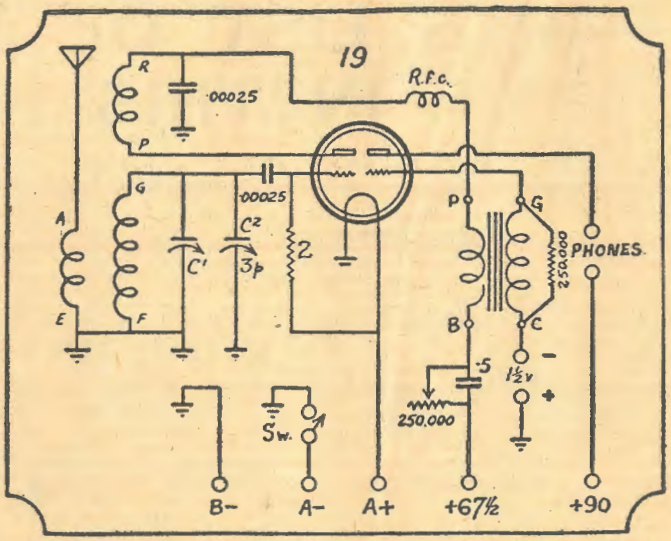
1 Base, 12 x 7 x 2½.
2 Midget condensers, .0001 mfds.
2 Coil sockets and 4-pin formers.
2 Dials.
1 .01 Mica condenser.
2 .0002 Mica condensers.
1 50,000 Ohms 2-watt resistor.
1 6P6 and 6-pin socket
4 Terminals

FINAL STAGE

1 Base, 12 x 7 x 2½.
1 Midget condenser, .0001 mfds.
1 Split-stator condenser, about .0001 total.
2 Dials.
1 R.F. choke (S.W. type).
1 Coil socket and 4-pin former.
3 .002 Mica condensers.
1 25,000 Ohms voltage divider.
2 Midget condensers (5-plate)
2 45 Type valves and 4-pin sockets.
4 Terminals.
2 Stand-off insulators for tank coil.

A DUPLEX-SINGLE

Here is a short, yet comprehensive article dealing with the construction of a single-valve all-wave receiver, which can be built for a very reasonable cost, yet will give the most remarkable results for a set of its size.



The circuit diagram. C1 is the main tuning condenser, an ordinary single-gang of .00035, .000385, or .0005 mfds. capacity.

BUILD this wonderful little two-in-one valve set! It packs a marvellous punch, and costs only six pounds! Just as efficient on short waves as on the broadcast band. And, in good localities, will even work a loudspeaker!

This tiny receiver will go straight to the hearts—and the pockets—of hundreds of our readers. It has just about all the things they have been asking for in a set of this type, and at the same time it costs little to build, and is absurdly economical to operate.

It works just as well on the short-waves as it does on the broadcast band, and for a head 'phone receiver, we have never worked with anything of its size which came anywhere near its results.

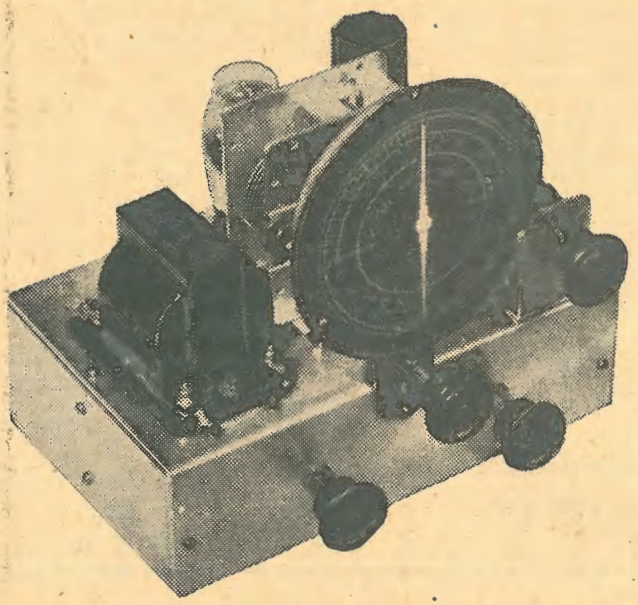
Perhaps the best way to introduce it would be to make a list of the things that make us so enthusiastic.

As far as the circuit goes, it is more or less standard. There is nothing in it which has not been tried and proved. Most of the features of this set are contained in the application of ideas destined to iron out the snags which in the past have handicapped a single-valve set which tried to be everything at once.

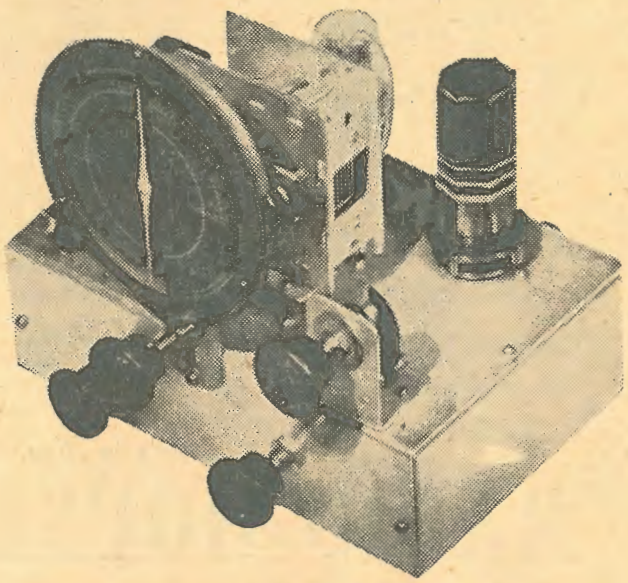
> When the Duplex Single first was described in "Wireless Weekly" it became, as we anticipated, immediately popular. We have received numerous reports from readers in town and country, who have built it with complete success, amazed at its simplicity and all-round performance. "Getting fine results—on short waves a winner—mighty selective," says a Redfern reader.
>
> "Just the radio companion I have been wanting," writes another in the country. For these reasons, we could not consider this publication complete without including the Duplex Single.

1. THE CIRCUIT

The circuit is built round the 19-type valve. This is a 2-volt valve originally built for B-class amplification in battery sets. Actually, it is two valves in the one envelope, both being triodes with a high amplification factor. Although the two sections were meant to work in push-pull, there is no reason at all why they should not be regarded as two separate valves, and wired accordingly. This is just what we have done. Each section of the 19 has its own filament, grid, and plate. One we use as a triode detector with reaction, and the other as an audio amplifier. So that, although there is only one valve in the set, actually it is a genuine double-purpose type, and actually works as two valves. Transformer coupling is



Front view of the set, with the audio transformer in the foreground.



Another photograph of the original set with the S.W. coil.

used between the two sections to get the utmost gain.

2. REACTION CONTROL

One of the things to watch when using reaction is to see that the control has the least possible effect on tuning. The ordinary reaction condenser circuit is very good, but, particularly on short waves, affects the tuning quite a bit. We have used a different method, by employing a reaction winding, untuned, and varying the plate voltage on the detector to give us control. This is a much better idea. The effect of reaction is much more constant, and tuning is hardly affected at all, even on short waves. There is only one thing to watch and that is that there are not too many turns on the reaction coil. This would make the valve oscillate before there was enough plate voltage for best gain. We suggest using as few turns as possible on the coil, and if our coil winding data is followed everything should be fine. About 40 volts should be on the detector plate before oscillation. Control will be found very smooth in operation.

3. TUNING CONDENSER

We have used a full-sized gang condenser, the same capacity as used in the ordinary broadcast sets. We did so, first of all, in order that the broadcast band should be covered without changing coils, as would be necessary with a smaller capacity. Secondly, calibrated dials are obtainable for the standard types of gang condensers, and the marking will be found approximately correct for our little set, at least for the local stations.

On the short waves, the large gang will make tuning very sharp, and so we have provided a vernier control in the shape of a small 3-plate midget condenser wired across the main gang. We even pulled one of the plates out, leaving one moving and one fixed plate, which gives even finer tuning control. This control overcomes the disadvantage of the large condenser for short waves, and allows easy tuning anywhere on the dial.

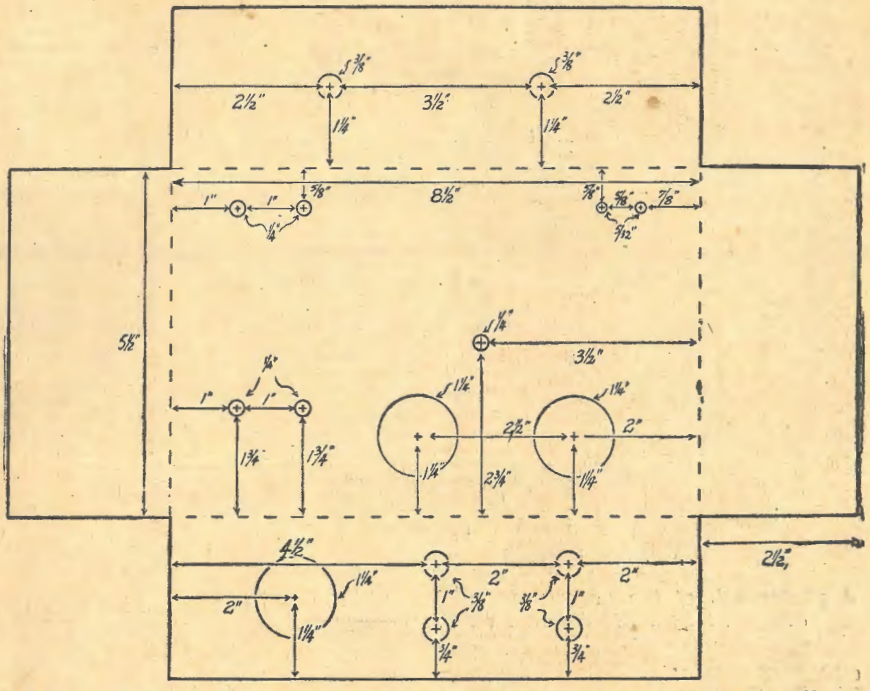
One of our surprises was to find that only one coil was needed to tune from about 16 to 50 metres, exactly as marked out on the dual wave dial, as designed for an ordinary dual-wave set. Over the full range, there was plenty of reaction and excellent results were obtained from the 19 metre overseas stations, the 20 metre amateurs, the 25 and 31 metres short-wave stations, and also the amateurs again on 40 metres.

Naturally, the efficiency of the set was not as good at 40 metres as at 19 metres, because of the high tuning capacity, so we wound up another coil which started off at 40 metres, and covered also the 80 metre amateur band with about half its capacity. At the same time, it is perfectly practicable to use the first coil over the full short-wave range, just as in the case of a big set, and the advantage of having the wave-lengths marked on the dial is, of course, considerable to the average listener. For best results over the 40 metres band, the second coil can be used.

4. PERFORMANCE

We are most enthusiastic about the performance of the set. In the first place, it is a real winner on the short waves. The overseas 19 metre stations were loud enough in the evenings to be heard with the 'phones on the table, as were many of the 20 metre amateurs. The same was true on the 25, 31, and 40 metre bands. Many other weaker stations were heard by a little careful searching, the smooth reaction being a great help in this regard. For reception of Morse signals, the set was found to be wonderfully quiet and flexible.

On the broadcast band, we were able to receive quite good results on a loud-speaker. Many people who will build this set will have an old-type horn speaker somewhere, which experience has shown to be very sensitive. We have one at home, and heard a political speech clearly in every part of the house. By judicious selection of aerial lengths, we could separate all the local stations, and in the country there should be dozens of stations waiting to be picked up. Naturally, we intend this set to be used primarily with headphones, although on strong stations it is possible to get worth-while results on a speaker, even of the permagnetic type. But don't worry about a loud-speaker unless you have at least one very strong local, and, in any case, rely on headphones for most of your listening.



A diagram to show the actual drilling of the original base. The mounting holes for the gang and the valve sockets have not been shown, as these will vary with individual components.

THE DUPLEX SINGLE PARTS LIST

1 Base, 8½ x 5½ x 2½.
1 Vernier dial (dual-wave type).
1 Standard broadcast condenser, single gang.
1 3-Plate midget condenser.
1 Audio transformer.
1 250,000 Ohms carbon potentiometer.
1 2 Meg. resistor.
1 .25 Meg. resistor (optional).
2 .00025 Mfds. mica condensers.
1 .5 Mfds. tubular condenser.
1 R.F. choke (short-wave type).
1 Filament switch.
Sockets—1 6-pin, 2 5-pin.
4 Terminals.
4 Knobs.
3 Coils (see article).
1 19 Valve.
2 45 Volt light duty B batteries (see article).
1 2 Volt accumulator (20 a.h.).
1 1.5 Volt torch cell for bias.
Connecting wire, etc.
1 Pair headphones.

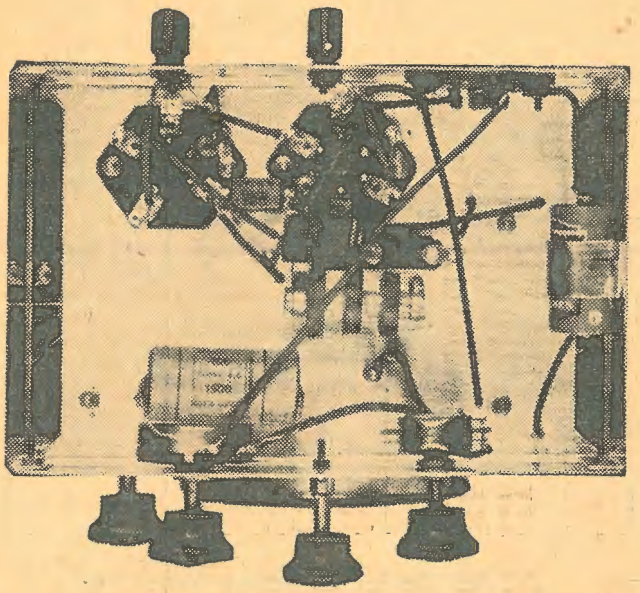
5. BATTERY CONSUMPTION

While the loud speaker was booming forth, we picked up a meter and measured the plate current. Exactly three milliamps! The total high tension we were using was 120 volts from light duty batteries. For average use with headphones, we suggest 90 volts as the best voltage, although 135 would be better if signals were reckoned loud enough to work a speaker. The minimum should be 60 volts if good volume and adequate reaction are desired. We have, however, obtained quite good results on 45 volts. Below 60 volts, the set would probably work best without the bias battery. A bias of 1½ volts we found to be plenty.

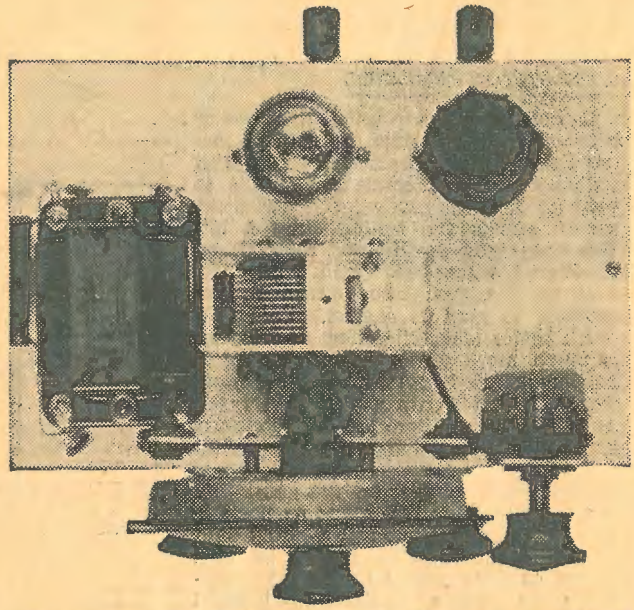
The A battery current is .24 amps at 2 volts, and is most satisfactorily obtained from a small accumulator.

The 1.5 volt torch cell used for bias can be seen mounted under the base. See that the metal can does not connect to the chassis.

So much for the set and its features. It's an ideal little job for the lad who wants to build himself his first set, for it will get him short wave stations as well as broadcast, and is so cheap and economical. If he should live in the country, so much the better. Where expense must be considered, plenty of people could wish for nothing better in a small set. It has possibilities as a small portable sets, and, in fact, will fill the bill wherever a little set is required.



A photograph of the under-panel wiring, which can be compared with the diagram on the next page.



Plan view of the chassis, which should also be compared with the plan photograph.

CONSTRUCTION

The first thing you will need is the chassis. You can make this yourself, or buy it ready punched. It measures 5¼x8½x2½, and the position for the holes, etc., will be found in one of the diagrams. You can cut the socket holes with a 1¼in. centre-bit lubricated with pure turps., provided the metal is aluminium. That's how we made our chassis. The gang and the dial are next mounted. We found it handy to mount the gang on four 1in. by 1-8in. bolts, so that the dial mechanism could clear the front of the chassis. Don't drill the holes to support the condenser until you have made sure of their position by trial and error.

Now screw down the transformer and the valve sockets. Our transformer has terminals, so we brought the connecting wires through holes in the chassis.

The wiring is so simple that even the novice should have no trouble with it.

Note that the grid condenser is wired so that it mounts directly from the valve socket grid terminal to the grid terminal of the coil socket. If your valve sockets are of different make, don't let that worry you. Ours just happened to be that way.

Incidentally, the 19 has a 6-pin socket. There are two filament terminals, the plate and grid pins for each section being arranged in pairs, and in that order, on each side. Watch the wiring diagram carefully to see that this point is clear.

The R.F. choke in our set was mounted on an insulated strip with solder lugs at each end, to make a firm assembly. This is a good type of choke, although a plain single winding type would be almost as good.

We mounted the vernier midget on a small metal bracket for convenience. It could be mounted on a front panel if care is taken to earth the moving plates to the chassis.

The only connection above the chassis is that from the fixed plates of the midget condenser to the fixed plates of the larger condenser. This connection is best made to the lug underneath the big condenser, obviously to keep the leads short.

A five-pin socket is used for battery connection at the rear of the chassis. There are also four terminals mounted there—two for 'phones and two for aerial and earth. Only the earth terminal should be connected to the chassis—the others must be insulated.

Coil Winding Data

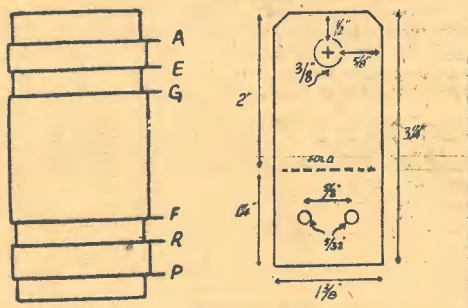
Wave-length	16-50	40 up	B'cast
Aerial	3	5	15
Grid	5	15	100
Reaction	5	7	25

All windings close wound turns, with three-sixteenths gap between reaction and earthed end of grid winding, and a similar gap between grid end of secondary and start of aerial coil. S.W. coils—26 S.W.G., with d.s.c. or d.c.c. wire. Broadcast coil wound, with 32 S.W.G. enamelled wire. All formers, 1¼in. diameter.

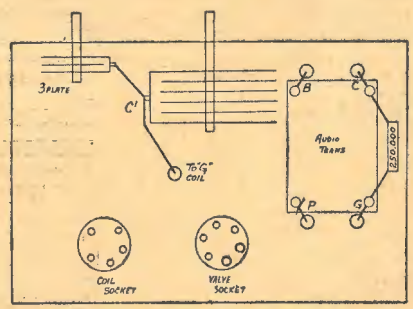
WINDING THE COILS

The coils may be bought as a ready-made set, in which case you need not worry about them. You can wind them yourself, however, if you wish. Five-pin formers are used, and by studying the connections to the coil socket in our diagram, you will see how to connect the pins.

A photograph of the original coils.



Left: Diagram showing coil connections. Right: The mounting strip for the trimmer condenser.



A rough schematic to show the wiring above base and the lay-out.

AS we go to press we have received a letter from a reader in Nyngan reporting reception on his Duplex Single. The list of stations is too long to print here, but the total is 56. Forty-six of these stations are in Australia, and included are all the principal broadcasters in the Commonwealth. In addition, others are logged in Norfolk Island, Barcelona, America, Mexico, and Hongkong. A great log for any set.

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YOU save pounds and get more value for your money if you assemble a new 1937 RADIOKES KIT-SET in your spare time. Better, more selective, more sensitive than most commercial sets of equal size. On their own for quality. Unbeatable in performance. Easier than ever before to assemble.

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Build the Pentagrid Four described in this issue!

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A.V.C. Broadcast Pentagrid Four .. .. **6 Gns.**

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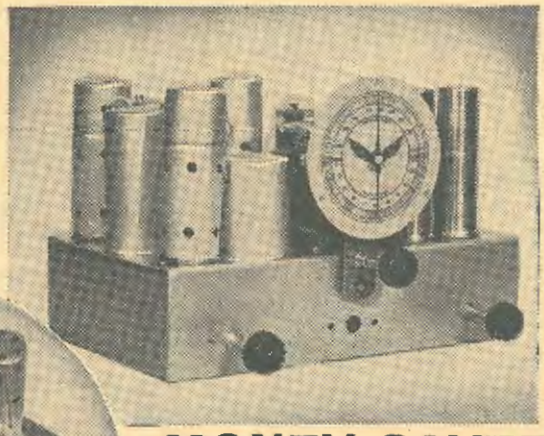

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1 *TD Tri-wave Dial* £1/10/-
2 *AD-465 I.F. Transformers, ea.* 19/6
1 *Acorn Special Metal Chassis* .. £1/3/6
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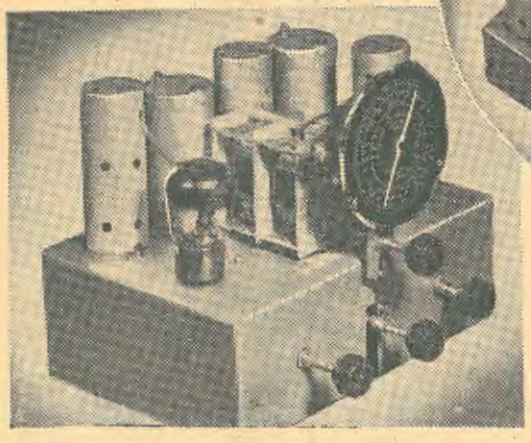

MONEY-SAVER

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Radio Dealers—write to Radiokes for full information on Radiokes Kit-Sets, and how to sell them.

In all cases, the bottom winding is the reaction. It starts at the Plate pin of the former, and ends at the pin connecting to B plus 67½ volts. The next is the grid winding commencing with the Earthed end and ending with that connected to Grid. Lastly comes the aerial coil, commencing with the end connected to Aerial, and finishing also to the pin which is Earthed. Thus, there are two ends connected to the earthed pin. Incidentally, the pins are hollow, and after holes have been drilled in the former through which to pass the wire, insulation is stripped, and the ends passed through the hollow pins. A drop of solder holds them in place, and the excess wire is snipped off. Make sure the pins are afterwards cleaned of any flux which would spoil contact.

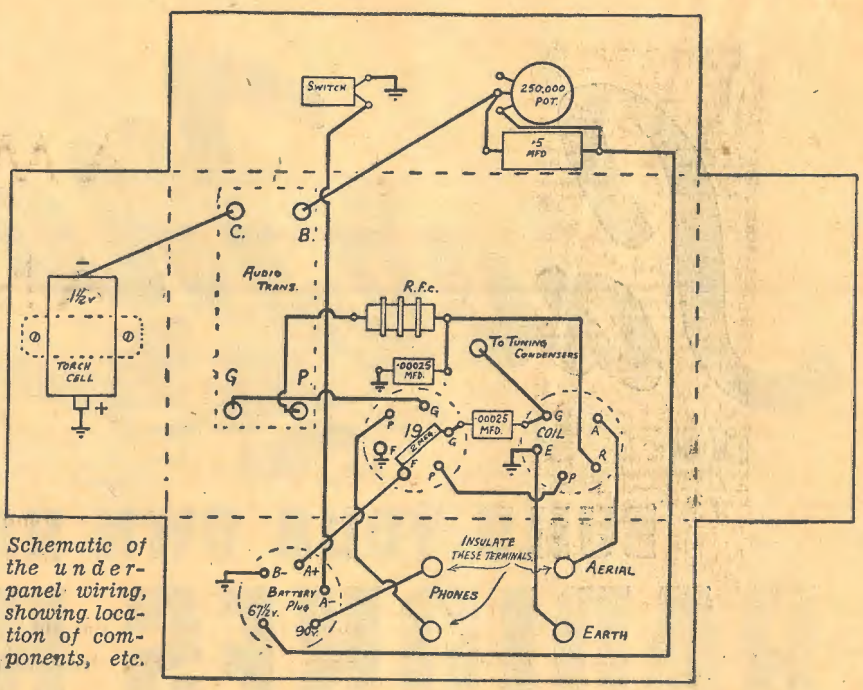
There is little danger of failure with the set as it is so simple. Failure to obtain oscillation is generally due to reversed connection of the reaction coil, or too close coupling between the aerial and grid coils. Too large an aerial can also make oscillation difficult. Although 67½ volts is applied to the end of the regeneration control, rarely will it be necessary to use this full voltage to obtain oscillation.

We are confident that this little set will be a great success, and will be pleased to answer any questions regarding its construction or operation through our query services.

AERIALS AND EARTHS

A good aerial should be used with this receiver, height being more important than length. Too long an aerial is not desirable for short waves, as it tends to load up the grid circuit and make oscillation difficult. About 35ft. or so should be ample, strung up as high as possible. Ordinary bare 3/20 aerial wire will serve, well insulated at the ends.

A good earth is also particularly important with a battery set. Our favorite earth is a kerosene tin punched full of holes (particularly the bottom), filled with ashes, and buried about a foot below the surface. The earth wire is soldered to this in several places. Throw a bucket of water over the spot occasionally. A piece of pipe reaching down into the ashes will make sure that the water actually reaches the can.



Schematic of the under-panel wiring, showing location of components, etc.

GETTING RESULTS!

(Continued from Page 16)

NO SIGNALS

Aerial not making contact.—Valve socket making bad contact with valve pins.—Set wrongly wired.—Faulty valve.—Open primary circuit audio transformer or put transformer.—Gang condenser plates shorting.—Valve can shield shorting control grid cap to earth.—Open circuit voltage divider.—Open circuit I.F. transformer.—Plates of rectifier red hot indicates condenser broken down.

INTERMITTENT RECEPTION, FADING

Aerial and earth making bad contact.—Faulty valve.—Broken down condenser.—Dirty valve socket contacts.—Broken down grid coupling condenser.—Voice coil leads making bad contact.

INTERCHANGEABLE VALVE TYPES.

It is fairly safe to consider glass, G type and metal valves as interchangeable if the correct types are considered. For example the 57, 77, 6C6 and 6J7 can be considered as identical so long as the filament voltage is considered. But on the other hand it is very unwise to consider the pentagrids as interchangeable with the octodes. The 6A7 and the AK2 and the EK2 are all very different from each other and require different coils, as well as different potentials on the elements. Even the AK2 and the EK2 are not interchangeable in any given circuit.

DRILLING ALUMINIUM

To drill holes in aluminium it is found that a drop of pure turpentine (not the synthetic painter's turps) will help the bit through and also make the edges clean.

This is particularly important when cutting large holes, such as those for the sockets of a chassis. These can be cut quite well with an ordinary centre-bit, with the flat flange hammered back, so long as the turps is used and the metal is placed on a flat piece of hard wood.

All small holes in any metal base, whether aluminium or iron, should have the roughness cleared away before the screws are fitted through them, otherwise the screw will tighten up against the ragged edge only, and loosen up after the receiver has been in service for a while.

EFFICIENT EARTHING

Proper earthing is essential in the tuning circuits of a short-wave receiver and very good practice in any receiver. Always make a point of connecting up all the earthing lugs with a run of bare copper wire and finish it at the earth terminal in the back of the chassis.

If there are any of these faults upon which you would like further information, you can write to our Radio Information Service.

FORWARD THIS COUPON

To the "Wireless Weekly" Radio Information Service, Box 3366PP, G.P.O., Sydney.

PLEASE ANSWER THE ACCOMPANYING QUERY:

(a) Free of charge through the columns of "Wireless Weekly."

(b) In a special letter. I enclose one shilling in stamps / postal note / money order

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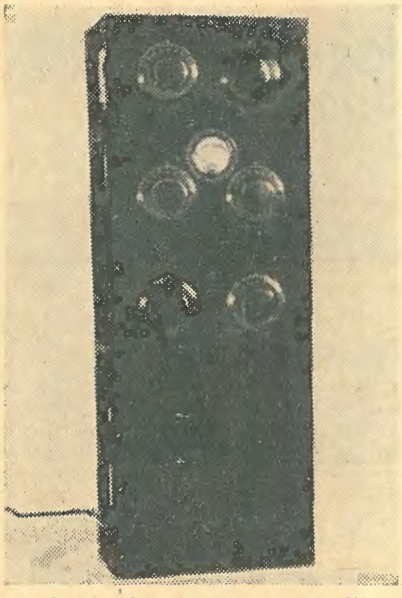


A front view of the transmitter, showing the three units in position. Note the milliameter wired in the plate circuit of the final valves.

AN AMATEUR TRANSMITTER

FOR 'PHONE OR C.W. OPERATION

Amateur transmitting is a grand hobby—probably the most fascinating of them all. A simple little transmitter, such as described here, is capable of communication with other amateur stations located in all parts of the world. We are confident that it will appeal to hundreds of amateurs looking for just such a transmitter, and may encourage other radio enthusiasts to sit for their "tickets."

IT is not often that we include technical articles dealing with transmitters in "Wireless Weekly," or in a "Wireless Weekly" production. This particular handbook, however, has a special interest to the amateur transmitter, and the job here described is in many ways an ideal design for the operator of a low-powered station, as prescribed by the 25 watts input limitation set out by the P.M.G's. regulations. It has been subjected to exhaustive tests in actual operation, and can be recommended as a thoroughly efficient design, easy to build, and easy to operate.

The original transmitter was built for operation on 20 metres both as a C.W. and also a plate-modulated transmitter.

It has put a good signal into most parts of the globe, and has demonstrated its relish for hard work.

Another good point is that all the parts are "receiving set" parts. In other words, there is no need to worry about high-voltage condensers or transformers—standard equipment obtainable at any radio store is used throughout. A few refinements are included which don't cost very much money, in the way of Isolantite tuning condensers and Steatite valve sockets, but more modest types will work quite well with very little difference in efficiency.

YOU NEED A LICENCE

It should be superfluous for us to point out that the first requirement for anyone operating an amateur transmitter is a licence. This is obtained, as explained elsewhere in this issue, after the necessary examination has been passed. There is no place on the air, or in the hearts of the authorities who control these matters, for any unlicensed transmitter. We hope that many of our readers who have not yet joined the ranks of licensed amateurs will read this article, and become enthused over the idea of owning such a transmitter themselves. To them we say—start in at the right end of the picture, and lose no time getting to work studying for the licence. It's not a hard job for anyone with average intelligence, and above all, with plenty of enthusiasm.

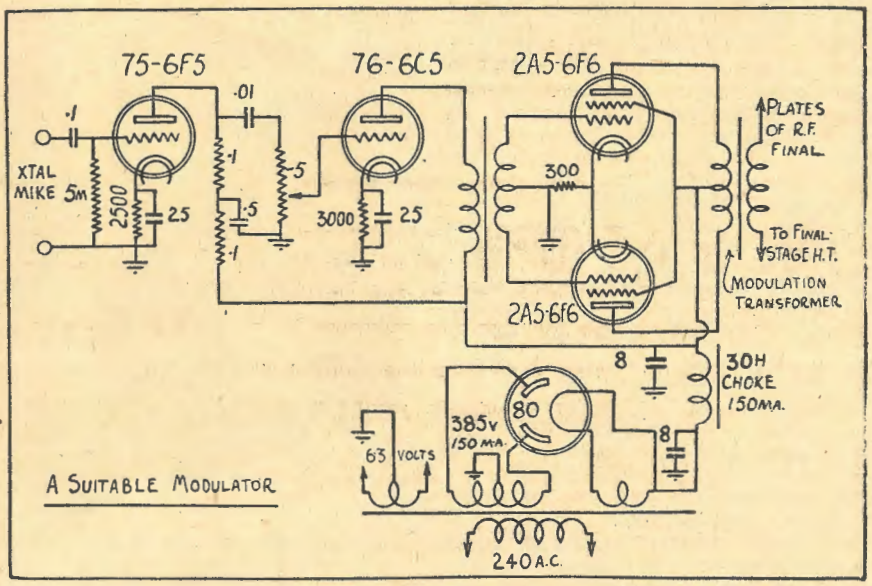
THE EXCITER STAGE

The transmitter is built on three little bases each measuring 12in. x 7in. x 2½in. These are mounted in a rack, the remaining shelves being taken up with the power supplies. They can, of course, be built up on one large base if desired, but the unit construction allows a very simple and neat-looking job to be made of the transmitter as a whole.

The first of these stages is the exciter. This generates the initial radio frequency energy, and sets the actual frequency of the transmitter. This is determined by the natural frequency of the crystal employed, as the transmitter itself is "crystal controlled."

In common parlance, the exciter is called the "Jones" exciter, after the man who popularised it in the States. The idea is to use one section of a 6A6 or 53 as a crystal triode oscillator, and the second section as a frequency doubler, being capacity-coupled to the oscillator. The valve employed is a good one for the job, having a high-mu for both sections, and is capable of excellent output. The grid circuit of the first section includes the crystal, and the plate circuit, a coil-condenser combination tuned to the crystal's frequency.

A small mica condenser (.0001 mfds.) couples the plate to the grid circuit of the second section, in which are an R.F. choke as a grid stopper, and a grid leak to supply the valves with "grid-leak" bias. The plate circuit of the second section is tuned to the second harmonic of the crystal, and will supply almost as much energy at this double frequency as supplied to it from the

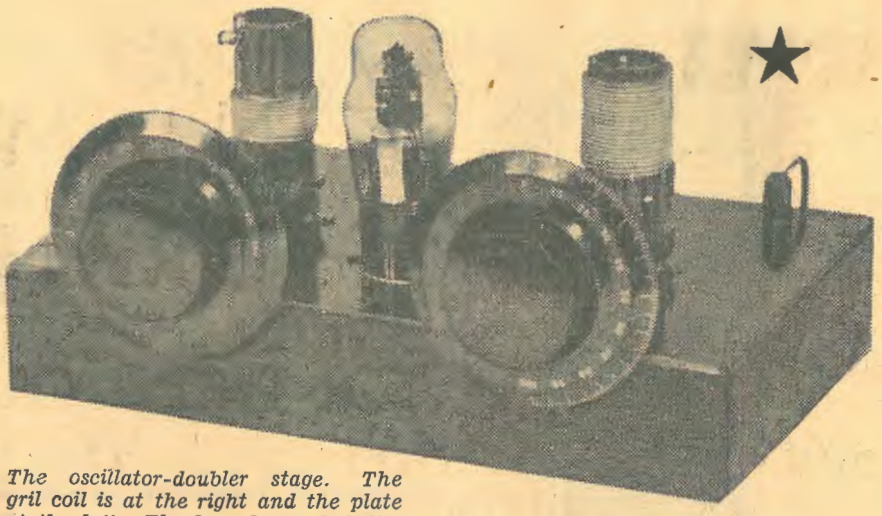


Here is the circuit of a suitable modulator which may be used with the transmitter for 'phone operation. It is merely a straightforward, high-gain amplifier.

oscillator. As the plate and grid circuits of this section operate at different frequencies, there is no need for neutralising to prevent self-oscillation.

In the original transmitter, the crystal had a fundamental inside the 40-metre band, so that the output of the doubler section was inside the 20-metre band. The exact position in this band was, of course, the main consideration when selecting the 40-metre crystal.

Should the transmitter be required for 40-metre operation, an 80-metre crystal would be used. Operation of the transmitter on the fundamental frequency can be obtained by arranging a switch to cut out the doubler section altogether, so that the oscillator section drives straight through into the next stage. It is not practicable to leave this section acting as a buffer, because oscillation would set in through lack of neutralisation.



The oscillator-doubler stage. The gril coil is at the right and the plate at the left. The base has a bakelite top and wooden sides.

THE BUFFER STAGE

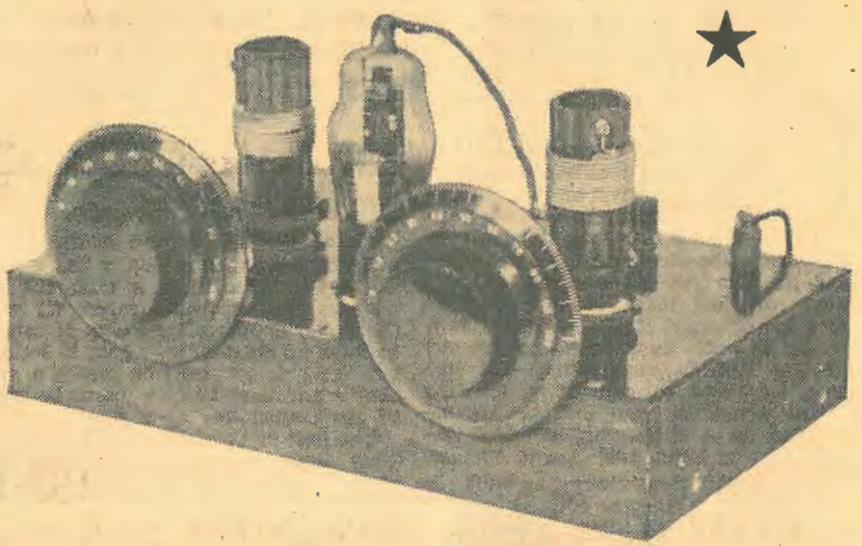
The second section of the transmitter is the "buffer" stage. This is simply an amplifier wired to take the output of the exciter, amplify it, and hand it on to the final stage which then supplies the aerial with power.

The buffer stage is a straight amplifier for R.F. energy, and is quite simply constructed. The valve used is the Australian-made 6P6, a pentode valve of good efficiency, with the added advantage that as a rule, it does not need to be neutralised. We can, therefore, feed into it a signal at the same frequency as we take out. In the original transmitter, the output of the exciter at 20 metres was used to drive the 6P6.

Coupling between the exciter and the oscillator is of the method known as "link-coupling." A tuned circuit is included in the grid circuit of the 6P6, and, of course, it will be tuned to the same frequency as the plate circuit of the exciter. A coupling lead of insulated "hook-up" wire is looped round the bottom of the exciter plate coil, twisted into a lead long enough to connect the two units, and looped again around the bottom of the buffer grid coil. We now have a coupling link between the two stages, just as in audio practice, we have step-down "line" transformers when two circuits must be connected together over some distance. The distance the loops are placed from the bottom of the coils determines the amount of coupling. In this transmitter, single loops of wire are quite enough to provide good coupling.

Note that the plate of the 6P6 is connected to the cap of the valve. The suppressor is connected to the cathode which is earthed.

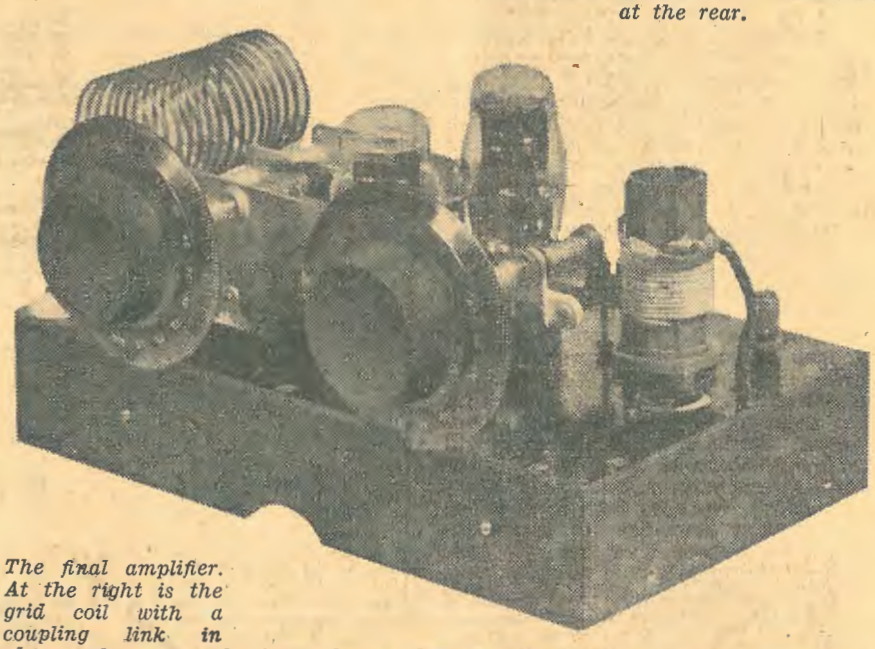
There is nothing more to be said about the buffer construction—it is particularly simple and straightforward.



The buffer stage. The grid coil is at the left and the plate coil at the right. Filament and high tension connections are made to terminals at the rear.

THE FINAL STAGE

The third and last section of the transmitter is the final amplifier. Just as in many audio amplifiers, we use a pair of valves in push-pull for best results, we here use also two valves in push-pull. Such a practice reduces harmonic radiation by cancelling the even harmonics, and allows us to get the output we desire without overloading the valves. We use here the well-tried type 45's, and they are splendid valves for our purpose.



The final amplifier. At the right is the grid coil with a coupling link in place. Then come the two valves and the split-stator condenser. The plate "tank" coil is on the extreme left of the picture, mounted on stand-off insulators.

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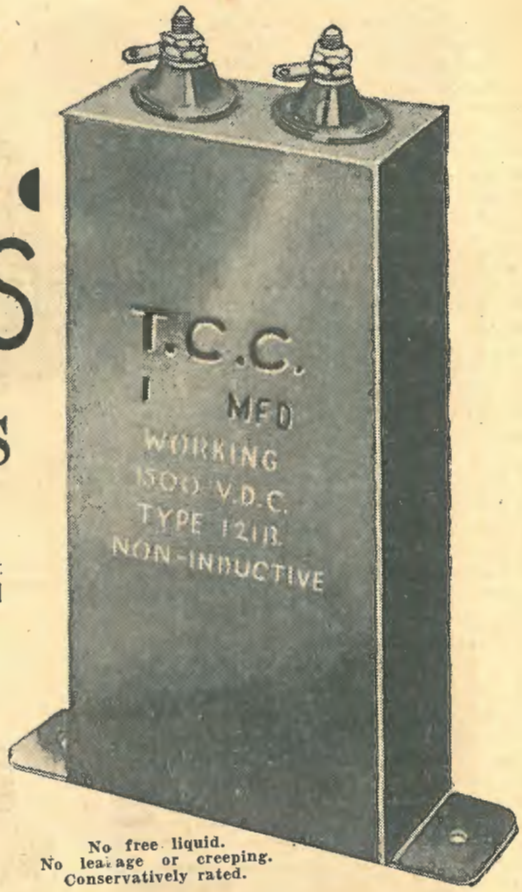

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	2	1,500	4¾in.	3in.	1¼in.	29/6
	4	1,500	4¾in.	3in.	2½in.	50/-
131	1	2,000	4¾in.	2½in.	1½in.	30/-
	2	2,000	4¾in.	2½in.	2½in.	45/-
	4	2,000	4¾in.	4¾in.	2½in.	80/-
141 B	1	2,500	5¼in.	3¼in.	2½in.	57/6
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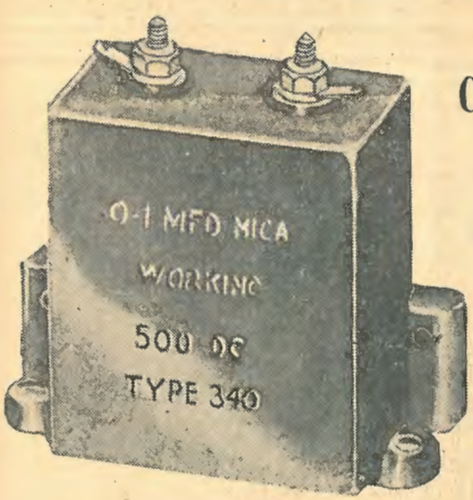

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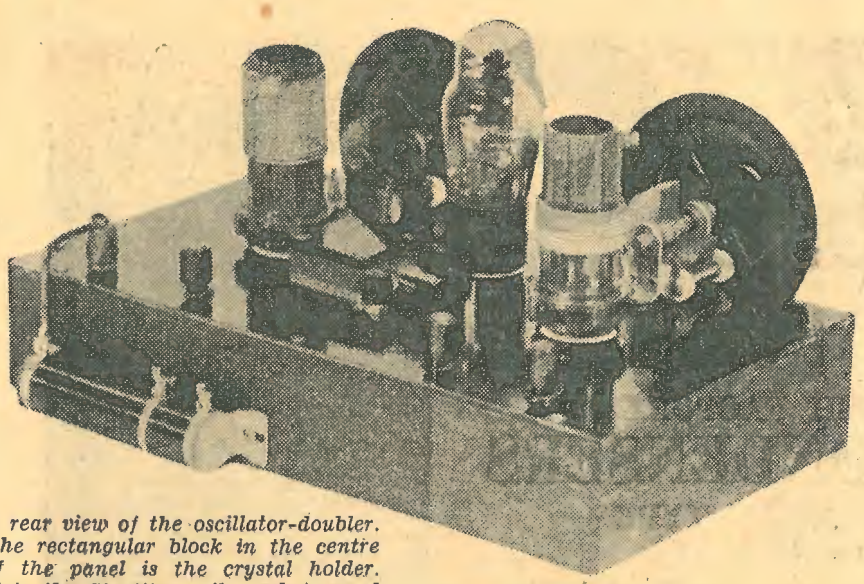
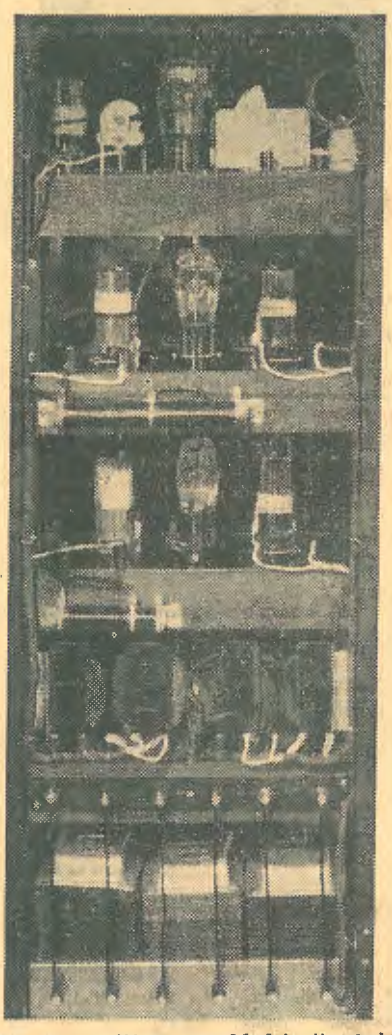


A rear view of the oscillator-doubler. The rectangular block in the centre of the panel is the crystal holder. Note the Steatite coil sockets and Isolantite condensers.



The transmitter assembled in its rack shown from the rear. The final stage is at the top and the power equipment at the bottom.

As will be seen, the grids of the valves are connected together through a centre-tapped coil, tuned to 20 metres. Link coupling is again employed between the final stage and the buffer. A condenser

COIL DATA

For 1¼in. coils throughout.

Gauge wire, 16 d.c.c.

Band.	Turns.
10m.	6
20m.	13
40m.	21
80m.	35

For final tank coil use 14 gauge copper wire. For 10 and 20 metres use 8 and 24 turns 2in. in diameter. For 40 and 80 metres use 24 and 54 turns 4in. in diameter.

right across the coil takes charge of the tuning.

The output circuit of the stage has another centre-tapped coil (note again the similarity between a push-pull audio circuit), and the plate voltage is fed through an R.F. choke to its centre. It is also tuned, this time by what is termed the "split-stator" method. This scheme has many advantages which we need not discuss here. Such a condenser is easily made by ganging two transmitting types, or by double-spacing an ordinary two-gang receiving condenser.

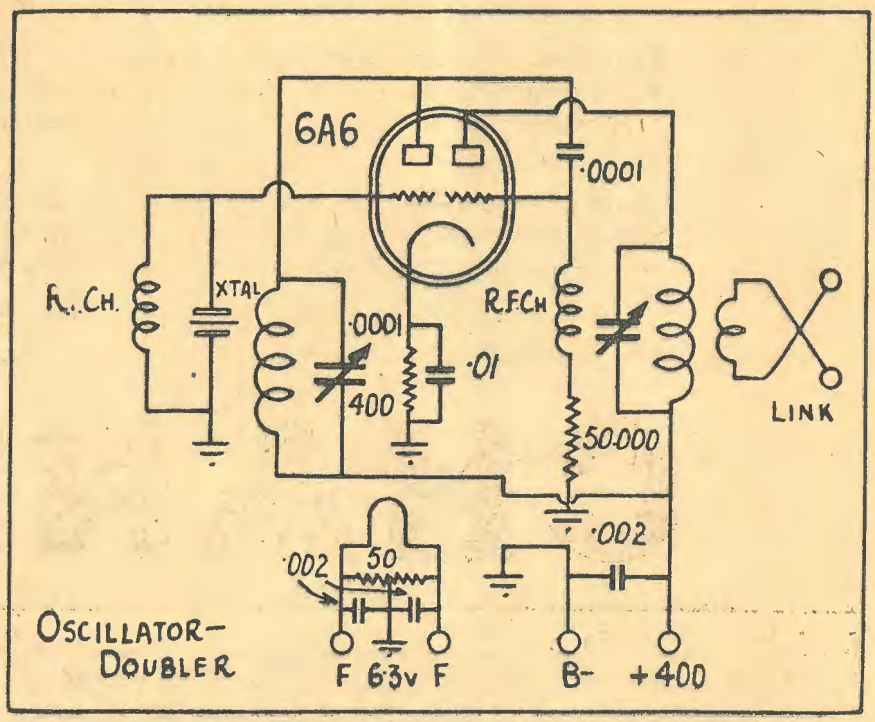
The plate coil of the stage is made rather heavier than those preceding, since we are handling comparatively high power in it. Consequently we use gauge 14 bare copper wire, which can accommodate a fairly high R.F. current flowing through it. It has an internal diameter of 2 inches.

As with all the other coils, the grid coil is wound on a plug-in former. All the sockets in the transmitter are Isolantite or Steatite, although plain wafer sockets may be used with very little loss of efficiency.

NEUTRALISING

It is essential to neutralise the valves in the final stage, otherwise they are certain to start oscillating on their own, due to the internal feedback through the capacity between the valve elements. Neutralising is done by connecting small variable condensers from the plate of each valve to the grid of the other. The condensers are so adjusted that enough energy is fed back through them to exactly balance out the amount being passed through the valve self-capacity. Under these circumstances, of course, the valves cannot oscillate, and are able to do their job of amplifying with the best efficiency.

These are the three main units of the



The circuit of the oscillator-doubler stage. The filament bypass condensers are not strictly necessary. Maximum voltage is 400, and excellent operation is obtained with 250-300v.

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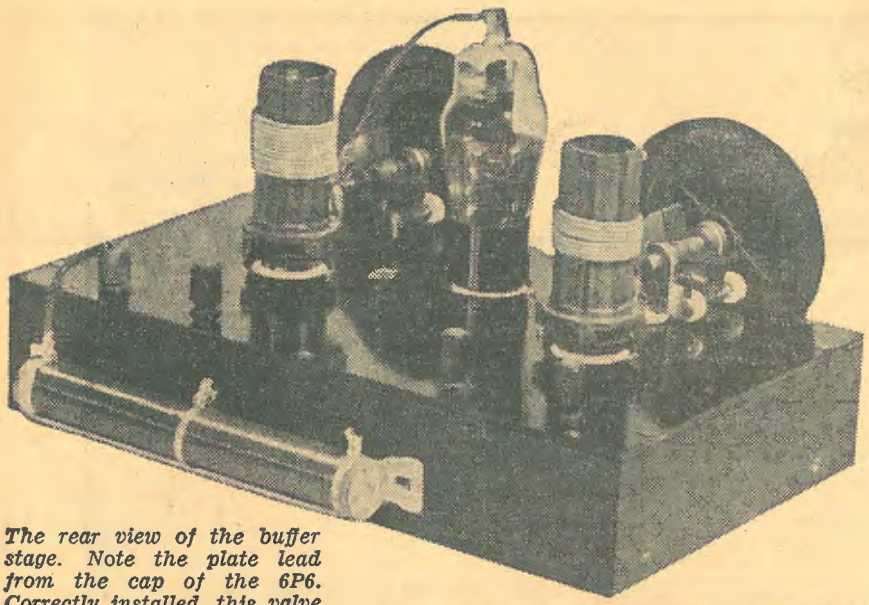


The rear view of the buffer stage. Note the plate lead from the cap of the 6P6. Correctly installed, this valve needs no neutralising.

transmitter. On their efficient adjustment lies success or failure.

GRID BIAS

The transmitter as a whole obtains bias from the use of grid resistors in the grid circuits. This is a simple method, and very effective for an amateur transmitter. As long as one takes care to see that the oscillator section does not go out of oscillation, and remove the drive from either of the following stages, bias is automatically provided by the R.F. current flowing to the grid circuits, and setting up a D.C. potential across the grid resistors.

POWER SUPPLIES

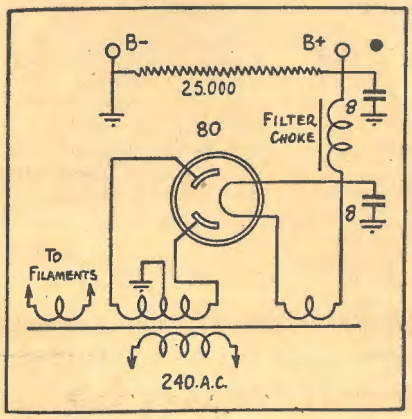
The original transmitter had two power supplies for the high tension—one to feed the oscillator-doubler and buffer, and the other for the final stage. A third transformer supplies the filament windings—these are accommodated on the lowest shelf of the rack. Above these will be seen the filter chokes, and modulation transformer.

We suggest that two supplies be built similar to that outlined in the circuit diagram. One will supply high tension and 6 volts filament for the first stage, and the second will serve the same purpose for the final stage. In this case, it must have a 2.5 volt winding. In each case, standard 385 volt power transformers could be used, each to supply 150 mills. The same rating should apply to the 30 henry chokes. Alternatively, special transformers may be obtained with tapped high tension windings—say at 250, 300, 400, 500, and 600, in case the power should be increased later on when a special permit has been obtained.

We have shown on our diagrams centre-tapped resistors and bypass condensers at the filament sockets of all valves. Strictly speaking, these are necessary only in the final stage, but there is no harm in including them.

COMPONENTS

As we have pointed out, the transmitter may be constructed of receiving parts



Circuit of a typical power supply suitable for this transmitter. Standard 385 volt 150 mill. transformers are used.

throughout. The chokes we used were all of the sectionalised type, although single winding chokes may be used instead.

All coils except the final plate coil are wound with 16-gauge B. and S. wire on plug-in formers, which will allow easy band changing if desired. Isolantite tuning condensers also were used, but these are not essential.

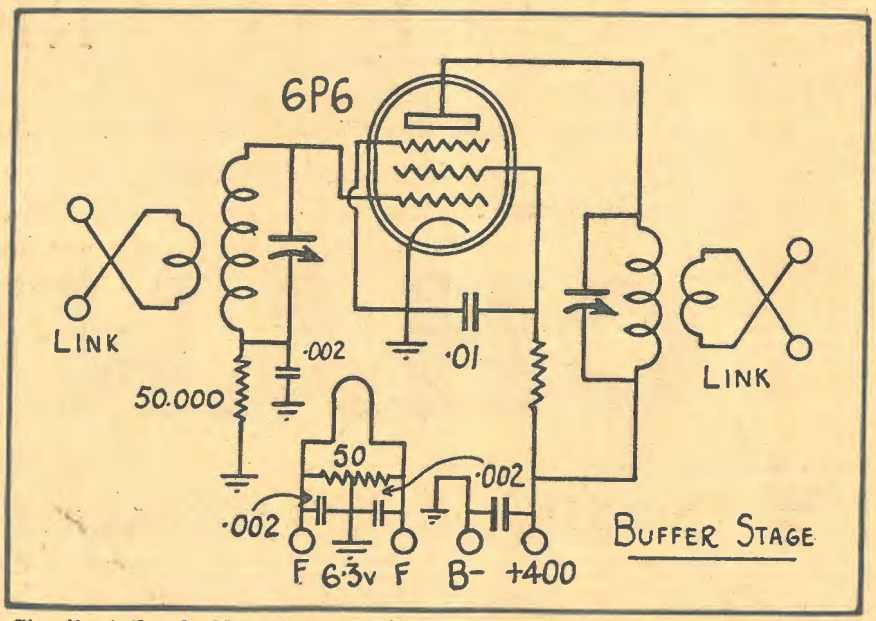
The terminals at the rear of the chassis are for connecting the filament and high tension voltages, the leads running down the side of the rack. The large resistors shown in the photographs are dropping resistors placed there during some experiments with different voltages. They are not included in the transmitter as outlined here.

ADJUSTMENT.

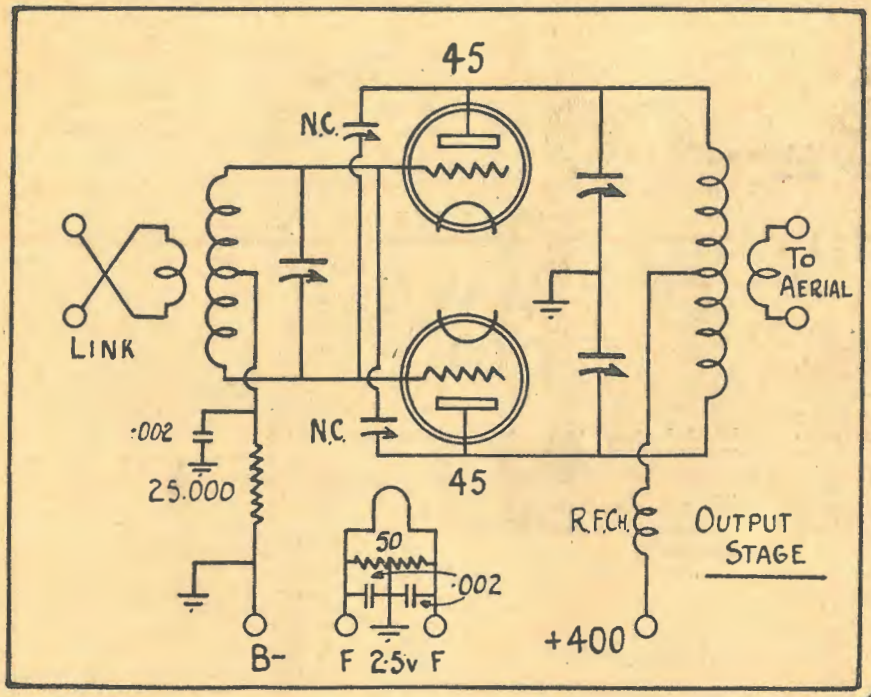
We are assuming that the transmitter has been correctly built and connected. We now proceed to get it going stage by stage. The crystal oscillator is the first, and our pick-up coil, a single turn of wire connected to a pea-lamp, is our main test equipment for the moment. We switch on the high tension to the oscillator section of the 6A6, and rotate the first condenser until we can obtain a glow from the pick-up lamp, a sign that the oscillator is oscillating. As we increase the tuning to a certain critical point, the lamp will glow more brilliantly, and then suddenly go out as the valve stops oscillating. Leave it just backed off a little from this critical point.

Now put the juice through to the doubler plate of the 6A6, and quickly tune its condenser to resonance, as indicated by R.F. in the coil. You will now have both oscillator and doubler in working order, ready to carry on. Turns may be added or removed from the coils in order to ensure satisfactory tuning of the circuits.

Now turn off the oscillator, and connect the link between the two coils. Switch on the oscillator, and tune the grid condenser of the buffer until R.F. can be picked off the grid coil. Now switch the plate current on the buffer, and quickly tune its plate condenser until R.F. is indicated here also. Grid and plate condensers should be tuned so that the maximum indication is picked



Circuit of the doubler stage. Again the filament bypassing is not strictly necessary.



The circuit of the push-pull final amplifier. In C.W. work the key is inserted between the filament centre top and earth. A separate diagram shows just where this should be placed.

up with the indicator lamp. If a milliameter is connected in the plate circuit of the buffer, this will show the smallest reading when such a condition is present.

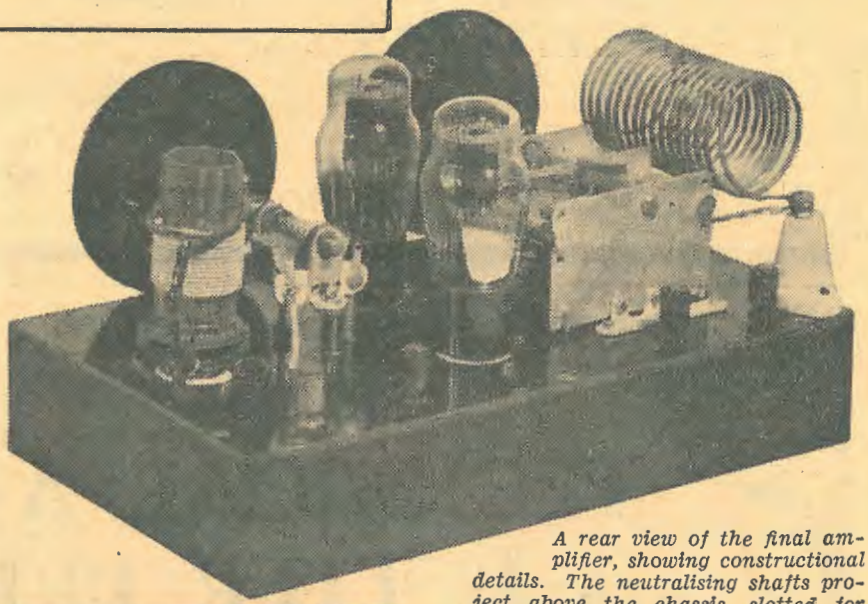
Exactly the same procedure is followed with the final. The link is placed in position, and the grid circuit tuned till R.F. is indicated in the grid coil. At this stage, the final amplifier must be neutralised.

Assuming there is R.F. in the grid circuit, place the pick-up coil close to the plate coil and rotate the plate condenser. You will find a position, providing the neutralising condensers are unmeshed, where there will be quite a strong R.F. indication, although there is no plate voltage on the 45 valves. This is getting through by reason of the inter-electrode capacity of the valves themselves.

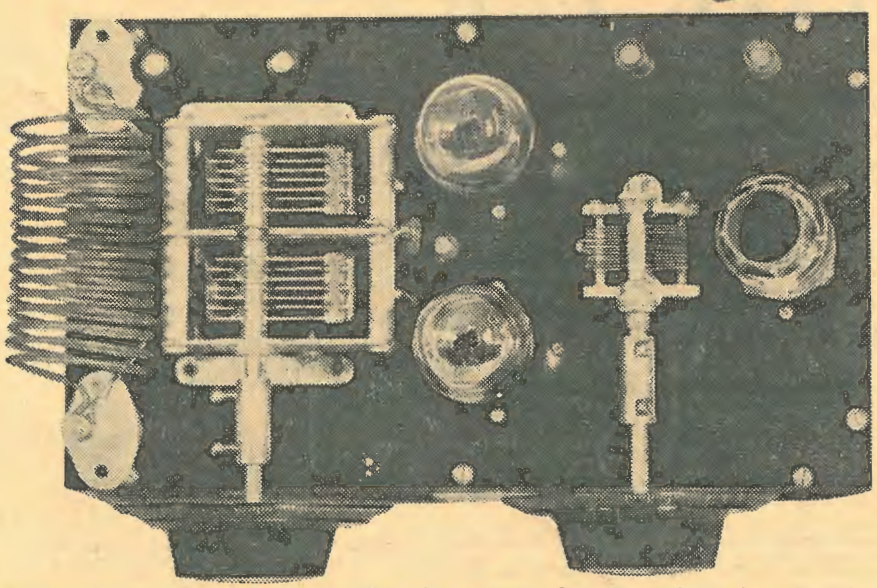
Now we get to work on the neutralising condensers. Keeping them in step, we gradually turn them so that their plates begin to mesh, rocking the plate tuning condenser to keep the indicator lamp alight. The more we increase the N.C. capacities, the dimmer will glow the indicator lamp, until it will eventually go out altogether, and no matter how closely we couple it to the plate coil, it will not light. If we were to continue turning the neutralising condensers, the lamp would begin to light again, as the N.C. capacities become greater than those of the valves.

In addition to adjustments to the plate condenser, during this operation, keep the grid condenser also adjusted so that it supplies the most R.F. possible into the plate circuit.

A final check for neutralising is to couple the indicator lamp to the 45's grid coil, and tune the plate coil through



A rear view of the final amplifier, showing constructional details. The neutralising shafts project above the chassis, slotted for adjustment.



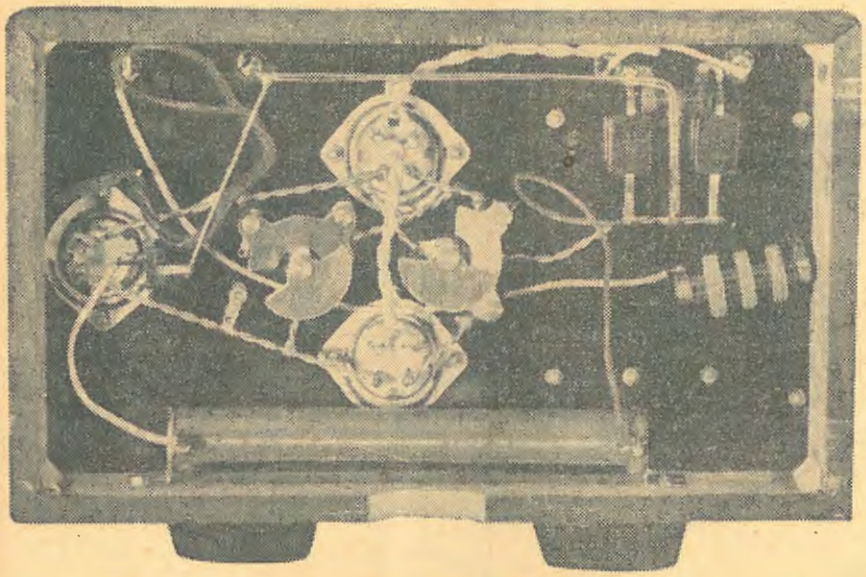
This plan-view of the final amplifier gives an excellent idea of the layout. The neutralising condensers are mounted under the base in front of each valve on the grid coil side.

its resonance point. There should be no variation in the brilliance of the indicator lamp when perfectly neutralised. Take care to see that each neutralising condenser has, as near as you can judge, the same amount of plate mesh.

It is now in order to switch on the plate voltage to the 45's and bring the plate condenser to exact resonance. This will be indicated by maximum radiation from the tank coil.

USING A METER

You will notice that we have included a plate milliameter in the transmitter rack. While not absolutely essential, it is almost essential for correct adjustment. It is almost impossible to judge when a circuit is exactly in tune, if we have no meter to register the plate current of the valve concerned. It is also very useful to be able to measure the grid current particularly of the final stage, to make sure that it is receiving its correct amount of excitation for proper operation. Elsewhere we are



A view taken from beneath the chassis of the power amplifier, showing the neutralising condensers and valve sockets. The filament bypasses are necessary in this stage.

giving a list of current readings which may be regarded as a standard when adjusting the transmitter.

A MODULATOR

The modulator for this transmitter may be almost any suitable amplifier with an output of about 10 watts. A very effective job can be built as shown in our circuit. The final valves are a pair of 2A5-6F6-42 type pentodes in push-pull, run with a rather high plate voltage. These valves are given a maximum plate and screen voltage rating of 315. If we allow for a drop of 30 volts in the filter choke, and another 25 for bias, that leaves us with about 330 volts on the output valves.

Our experience has shown that this will not hurt them, and, of course, their output is greatly increased. We should estimate the amplifier as capable of about 12 watts audio output without undue distortion.

The preceding stages are conventional, and should provide plenty of gain for a crystal microphone. With a high output carbon microphone, it would be possible to dispense with the first stage altogether.

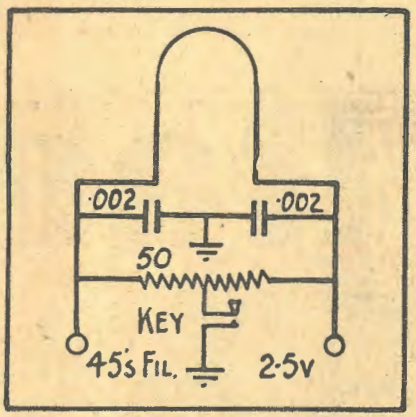
The modulation transformer, through the secondary of which passes the plate current to the 45 output stage of the transmitter should be specially built for the job. A variable-ratio transformer is a very handy thing to have, and enables the best impedance matching to be obtained. This modulator should be capable of fully modulating the transmitter up to about 30 watts of input.

When using the meter note that in the case of the 6A6, the oscillator section will draw least current when the grid condenser is adjusted to give maximum output. The same is true of the doubler section.

The idea is to adjust the controls, while the transmitter is operating, of course, so that the valve draws the least current, for a fixed amount of coupling into the buffer. Naturally, to increase this coupling by moving the link further up the coil will cause a general rise in 6A6 plate current. The coupling should never be close enough to prevent the resonance dip from remaining quite definite, although it will tend to flatten out as the load is increased with extra coupling.

The same in general is true of the buffer stage. It should always be tuned to draw the least current possible with a fixed amount of coupling into the final stage.

Again in the final stage, adjustment is made till the plate current is lowest. Various types of aerial coupling may be used with the transmitter, but whether coupling is by tuned line or matched impedance line, the coupling should never be so close that the plate circuit cannot be tuned with a definite dip to minimum plate current corresponding with maximum output. Over-coupling will probably produce a double resonance peak or flatten it out altogether.

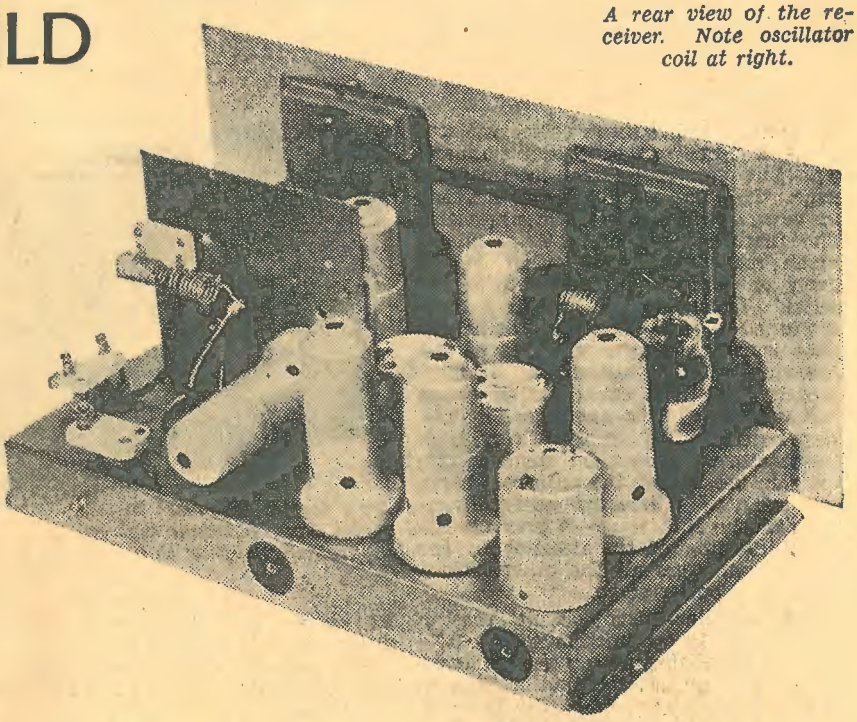


Showing the position of the key in the final stage, when the transmitter is to be used for C.W. work.

The coil data given in this article is standard, and should be suitable for replicas of this transmitter, as it was for the original. Slight differences in condenser capacities, etc., as might occur when the builder desires to use gear he has on hand, might necessitate slight adjustments to the number of turns, to obtain resonance with a reasonable amount of capacity in circuit. Such differences will not affect the general layout of the transmitter or the circuits, and, of course, are always to be considered when building any transmitter.

When making adjustments to transmitters, particularly when first switching on, it is a good idea always to use a fairly low voltage in order to prevent damage. One is not likely to ruin valves, etc., if for a start a voltage divider is included in the high tension leads, as a dropping resistor, so that not more than about 250 volts is applied initially. Then when things are straightened out and the various resonance points found for the various circuits, the full voltage may be applied. It is also possible, when initially testing, that the oscillator may cease oscillating. With full voltage applied this would mean no bias for the succeeding valves, which use the resistor-bias method, and possible harm due to excessive plate current. The tuning of the various stages will not be affected seriously on the low voltage, and the bias will more or less adjust itself to suit, owing to its dependence on the grid current flowing. It's a good point to remember with all transmitters, and may save you from damaging valves while getting the rig on the air.

HOW TO BUILD A 5-METRE SUPERHET.



A rear view of the receiver. Note oscillator coil at right.

It is generally agreed that the ultra-short waves are destined to be of utmost value as they become fully explored. The 5-metre amateur band provides an endless field for experiment. Here is an excellent 5-metre superhet. Ideal for receiving all stations on this band.

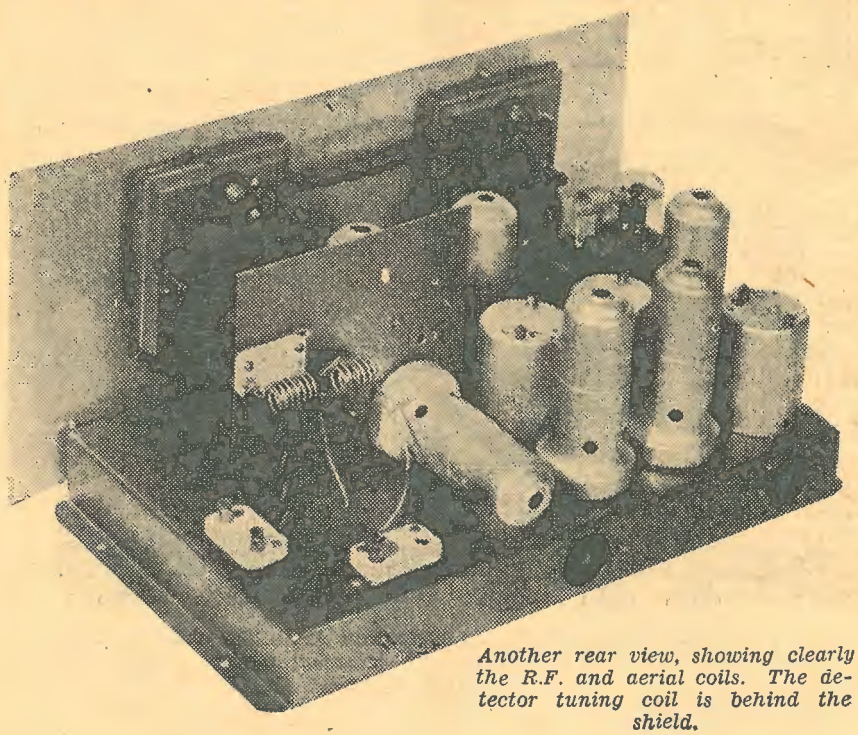
ONE of the most interesting of all amateur bands is that known as the five-metre band. By this is meant that band of ultra-high frequencies from 56-60 megacycles (millions of cycles), which is set aside for use by amateur transmitters.

In characteristics, this band is very different from those which are lower in frequency—for instance, bands about 40 and 20 metres. On these bands, it is possible regularly to send signals all over the world at good strength. On the five-metre band the range of transmission is largely optieal, and, as a general rule, the path of the radio waves follows the same laws as govern the passage of light.

This is the same thing as saying that unless communication is desired between elevated points the range of operation is restricted to about 25 miles or so.

If a light beam were to be operated from a high mountain it could be seen very much further than if it were operated from ground level. Similarly, if a five-metre transmitter is operated from the top of such a mountain its signals also may be picked up over a considerable distance. Should another mountain between the light and the observer prevent the beam from reaching the observer, he would see nothing—similarly, if a mountain were to be in the way in the case of the transmitter on five-metres, signals in all probability would be prevented from getting through.

While these principles are general, there are exceptional conditions which have led scientists to the belief that it is not impossible to span greater distances on the ultra-short waves, if they knew how to do it. Under certain sets of conditions signals have been heard, as a rule, for a few moments only, over thousands of miles, fading out as quickly as they came. Recently signals were heard right across the Atlantic on five-metres. Just why these periods should occur is not known, and, as a result, there is a tremendous field for experiment in observing such things.



Another rear view, showing clearly the R.F. and aerial coils. The detector tuning coil is behind the shield.

THE SUPERHET ON ULTRA SHORTS

This preliminary survey is really quite a good argument in favor of the superhet for use on five-metres. As we have said, it is possible to cover short distances very well on this band, and very simple apparatus will serve. If, however, one wishes to have everything in his favor when listening for stations more than a few miles away, he must take advantage of circuits and apparatus which has shown itself to be capable of the best results.

From the amateur's point of view, simple apparatus has been popular and useful. Transmitters have been mainly modulated oscillators, and, as a result, receivers have been of a type capable of receiving such unstable signals—generally, super-regenerative types. The trend these days is towards better and more stable transmitters, and this is another reason why amateur transmitters, and listeners, too, should get interested in better and more stable receivers.

The receiver described here is almost identical with one described by Frank C. Jones, author of a radio handbook published in America. The circuit is straightforward, and is one which has been tested, and in the case of the receiver illustrated, worked out wonderfully well. It uses six valves and rectifier, and its special features, which make it suitable for reception of ultra-short wave signals, do not make it any

harder to construct or to operate. The only operation which does call for intelligent care is the actual lining up of the receiver.

THE CIRCUIT

The receiver has seven valves and rectifier—in other words, it is a standard type but for the extra intermediate stage. This has been added to increase the gain, as will be covered in a moment. The first valve is an R.F. amplifier, which may be coupled either inductively or through a condenser, to the aerial. It is coupled through a form of "tuned-anode" circuit, in which the plate runs straight to the grid of the following valve through a variable capacity, the R.F. choke acting as an R.F. stopper. This gives good gain—very necessary, as on these very high frequencies we cannot get anything like the gain possible on the broadcast band, for instance. There are other advantages of the R.F. stage—it prevents excessive loading of the detector by the aerial, and offers all the other advantages of a buffer stage.

The detector-mixer circuit uses a 6C6-57 type in conjunction with a 6C5-56 type, operating as a separate oscillator. The oscillator output is injected through the suppressor of the first detector, a method popular and quite effective in this case.

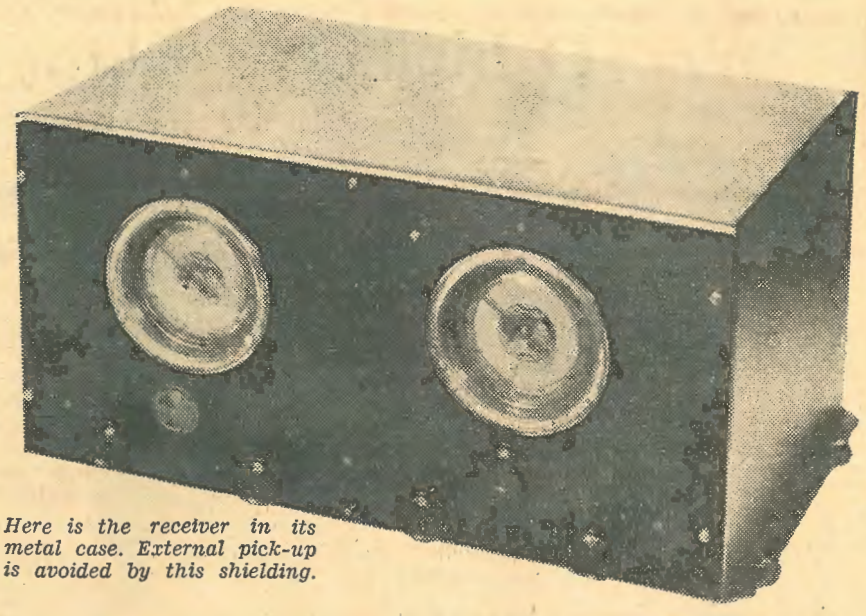
The detector valve is wired in a circuit which allows us to make it regenerative. This is done in the standard way with short wave sets, by returning the cathode circuit through portion of the grid coil. A potentiometer varying the screen voltage allows the detector to be brought into oscillation, although, of course, it is never run in this condition. When approaching oscillation its sensitivity greatly increases, and we, therefore, obtain considerable extra gain without materially affecting the valve in its capacity as a mixer.

THE INTERMEDIATE CHANNEL

Although the wiring of the intermediate channel is conventional, it does not use the conventional frequencies—465 kc. or 175 kc. The main reason for this is found in the very high signal frequency of the set. Remember first of all that the signal and oscillator frequencies must be separated by an amount equal to the intermediate frequency. Now 465 kc. is a very small amount when we are tuning at 56 million, in fact, considering the inaccuracies which must be introduced in components and building, it leaves us with no margin at all. Consequently, we find it much better to use a higher frequency in the intermediate stage so that the separation is greater. This set employs an I.F. of 2200 kc., which is a long way better than 465 kc. Remembering that the 465 kc. would make the tuning almost impossibly sharp at least from an experimental point of view, we are much better off with the 2200 kc. intermediate, and, at the same time, have as much selectivity as we can handle, and as much as we really need.

The two I.F. stages are there to give plenty of gain, in the first place to compensate for the lack of it with our equipment, and also because we can't get as much intermediate gain at 2200 kc. as we can at lower intermediate frequencies.

The second detector and audio amplifier are similar to those for the ordinary broadcast set.



Here is the receiver in its metal case. External pick-up is avoided by this shielding.

A.V.C. CIRCUIT

The two I.F. stages are there to give one of the second detector diodes, which is arranged to give an A.V.C. voltage. There is also a variable resistance in their cathode circuits to allow manual control as well. The A.V.C. circuit is mainly for the control of sudden very strong local signals, although it will operate normally on weak signals as well.

TUNING AND CONTROLS

The best idea of the set's layout is obtained from the photograph taken from the top of the chassis. On the right hand side are the R.F. and mixer tuning circuits. It is quite feasible to gang these circuits, and by judicious spacing of coils, turns, etc., one can obtain good tracking over the full 5-metre band. The valve mounted on its side is the R.F. amplifier—this construction has been used in order to keep leads as short as possible. There is a vertical metal screen on which the valve and its grid coil are mounted, which shields the two stages.

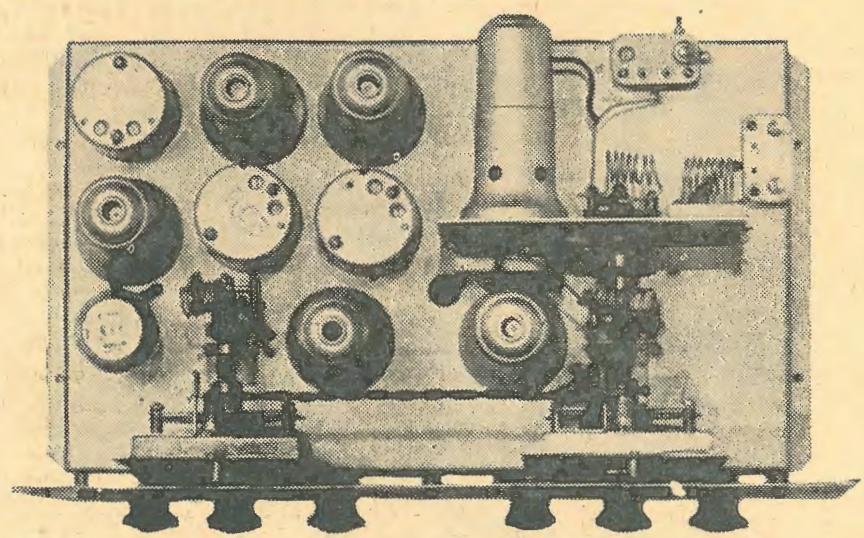
The second dial controls the oscillator tuning. This obviates the necessity for padding devices, and simplifies the tracking of the two sections of the receiver.

The respective positions of the I.F. coils and valves are quite obvious, the detector and audio valves being at the left-hand rear corner of the chassis.

A separate power supply is used with this particular set, using standard components, and a standard 2500 ohm field dynamic speaker.

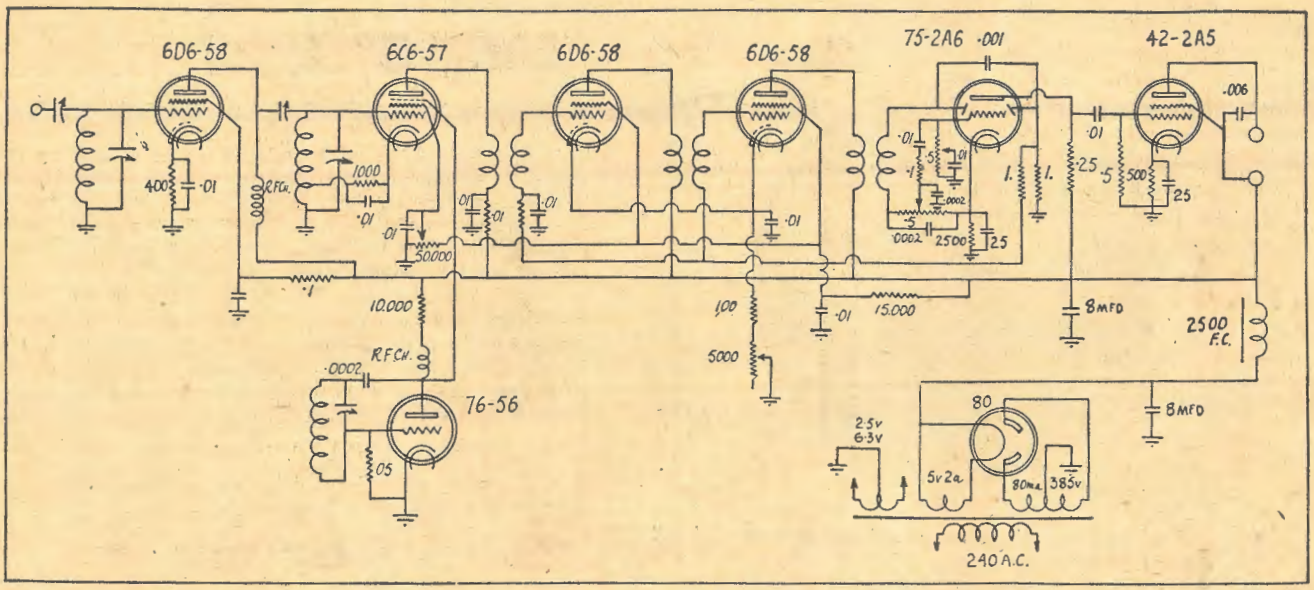
CONSTRUCTIONAL

In a set of this type, there are many things which can be discussed from a constructional point of view. Taking them in their logical order, we consider first of all the matter of insulation. At these high frequencies, insulation is very important. One would prefer to



This plan photograph shows every component above the chassis. Note that the tuning condensers are operated with extension shafts, mainly for convenience.

CIRCUIT OF 5-METRE SUPERHET.



Here is the circuit of the receiver. Note that either 2.5 volt or 6.3 volt valves can be used. Metal types should also be suitable, but present no advantages. The aerial may be capacitively or inductively coupled.

use Isolantite wherever possible to get best results. Valve sockets, coil mounts, tuning condensers, etc., for best efficiency should be of some high-grade material, such as Isolantite. At the same time the set will work, as the original proved, when using perfectly standard and humble gear. The tuning condensers in the original set were ordinary 3-plate midgets with bakelite ends, and the valve sockets were ordinary wafer types. So don't be discouraged into thinking that the set will not work with them. It will, and moreover, it will work very well.

As the photographs show, Isolantite padder bases were used as component supports in the original receiver. Any good grade bakelite would serve to make these little coil mounting platforms. In the case of the tuning coils, these were mounted directly across the tuning condensers as being the most convenient spot for them. Mounted on a padder base can be seen the aerial coil for inductive coupling to a doublet aerial. At the rear of the chassis is a small coupling variable condenser for capacity coupling a single wire aerial should this be necessary. Either or both can be included in your own receiver.

THE VALVES

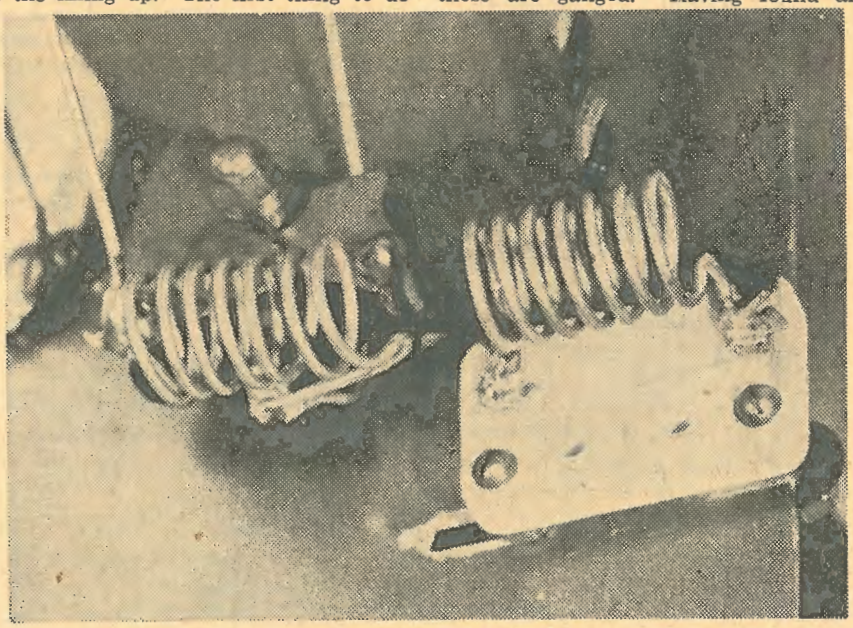
A good deal of experimental work has been done by many people to determine how efficient are standard valves on the 5-metre band. The general conclusions are that they are pretty well as satisfactory as any other valves for this work. In other words, it would probably be very much worth while to use, say the "Acorn" type valves for higher frequencies than 60 mc., but on anything lower, which, of course, means the 5-metre band, these standard valves are quite effective.

The set being well illustrated in our photographs we have not included anything elaborate in the way of wiring diagrams. The components under the chassis are not particularly critical as regards position, and the layout allows all important wires to be made as short as possible. Most of the by-pass condensers are non-inductive mica types, and these should be grounded to chassis at the nearest possible point. It is important to see that heavy gauge busbar should connect all the earthing points on the chassis, and finally connect to the earth terminal, which also should be connected to the chassis. This will guard against the earth return network setting up any undesirable loop circuits on its own.

LINING UP

A job which calls for care and patience is the lining up. The first thing to do is to see that the three coils are wound exactly the same, and mounted securely in place. If possible the lining should be done on some fairly strong station which will give an opportunity to make aural tests on signal strength for each test. The oscillator tuning being separate from the other circuits, the first job is to tune in a station mainly on the oscillator condenser, keeping the second dial in step with it. The readings on the dials may not be the same for the moment, but that does not matter.

The coils are lined by the simple expedient of springing the turns closer together, or further apart, until they track. This applies in the first instance to the R.F. detector coils, as these are ganged. Having found an



A close-up of the aerial coupler. Note the slotted hole which enables the aerial coil to be moved for correct coupling. Seven turns spaced of 18 gauge wire, ¼in. diameter, were used in the original.

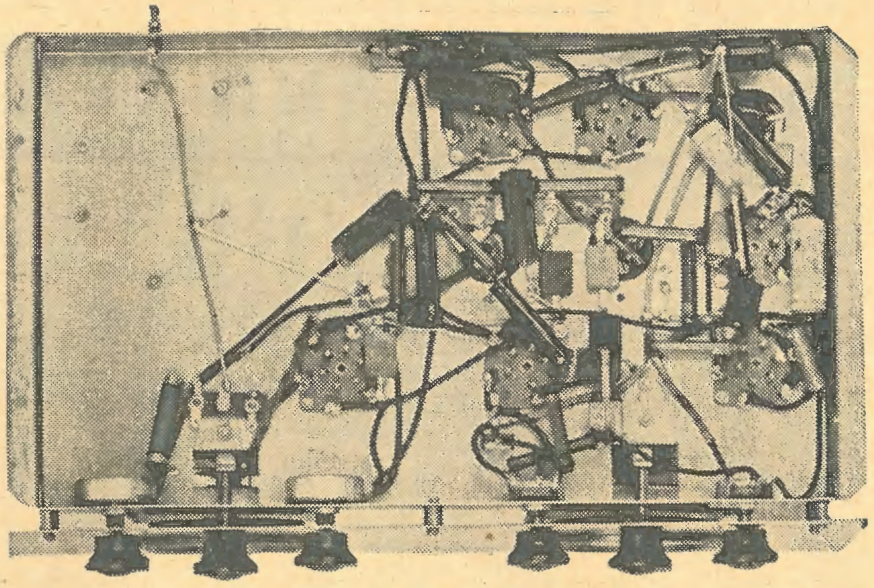
5-METRE AERIALS IMPORTANT

adjustment which enables these two circuits to track reasonably well over the full band, the same method can be adopted with the oscillator coil to see that both condensers will tune over the complete band, and if desired, read approximately the same in doing so. They will not keep accurately in step, but will be somewhere near it.

As we have already stated, some patience and practice will be needed here, but it should not be beyond the ability of any intelligent builder once he has "found his feet" in handling the set.

When finally completed, the receiver will be found vastly superior in sensitivity to the average super-regenerative set so often used. It will be very much more selective, but not so much that modulated-oscillator transmitters cannot be followed, unless, of course, they are very badly adjusted. Its main value will be realised when working with multi-stage transmitters with good stability, on which stations, it will behave very much as does the ordinary short-wave superhet.

As a rule, a proper 5-metre aerial system will work best with the set, although it is good enough to perform well on a straightforward single wire aerial. Probably the best all-round aerial is a vertical half-wave doublet (8ft. in length) fed either with a 600 ohm line, or with twisted pair feeders.



A sub-base view of the set. Note the free use of mica condensers, and the short leads.

When using the doublet type aerial, the feeders are connected to the aerial coil, which should be mounted in slots so that its distance from the grid coil may be varied. Experiment will enable the best position to be found. It will be easier to line the two ganged stages, in all probability, with the coupling rather loose than tight. The photograph shows the position found satisfactory with the original set.

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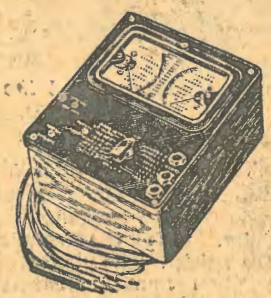

TRIPLETT VOLT-OHM-MILLIAMMETER (1200-A Unit) has two instruments, A.C. and D.C. in moulded case. Can be tilted to any reading angle. Resistance measurements have individual zero adjustments. Selector Switch for all readings includes 22½ volts and 1½-volt batteries. Price £8. (Twin Instrument and complete kit of parts to build this unit—Price £6/5/–.)

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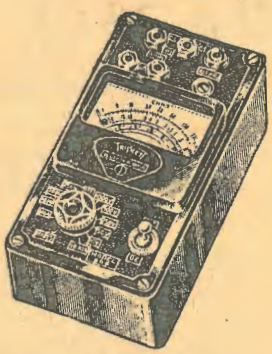

TRIPLETT D.C. MOVING COIL INSTRUMENTS are of the D'Arsonval type with an extra light moving coil and reinforced strong parts. Sapphire jewel bearings. Accuracy within 2%. Permanent magnets. Supplied in sizes from 2⅜in. diam. to 5¼in. diam. (flange). Model 421 (at left) 4¼in. x 4 in.

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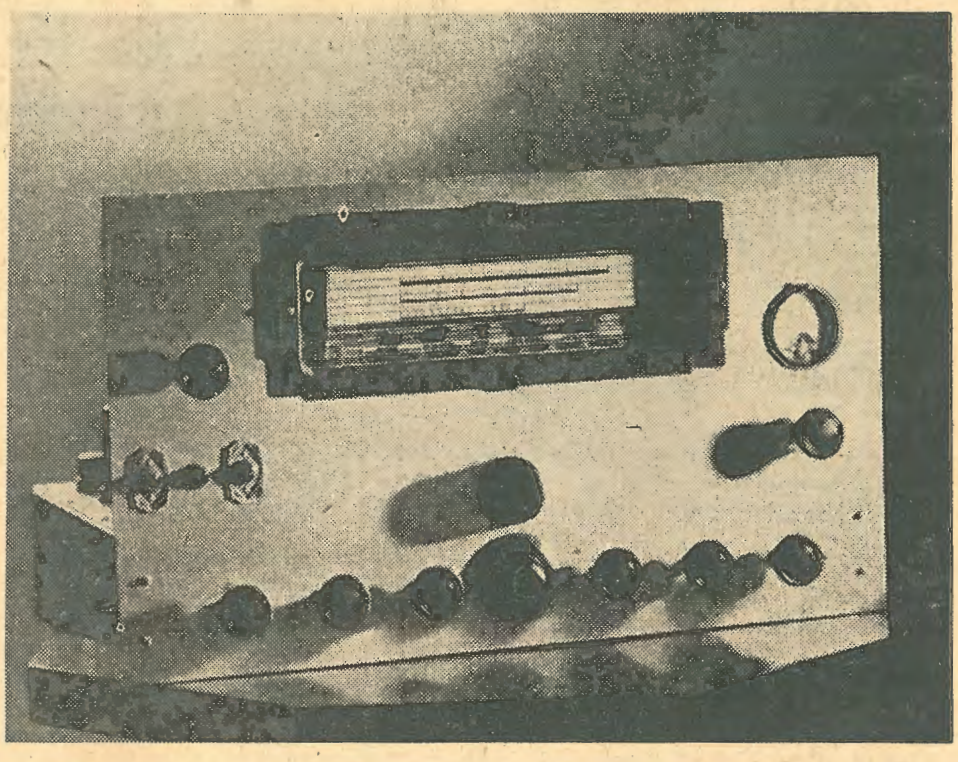


A front view of the receiver. Controls, left to right, are: Noise silencer adjustment, audio gain, aerial coil trimmer, oscillator band-set, R.F. coil trimmer, regeneration, I.G. gain. Immediately above the last is the aerial loading condenser and tuning meter. The switches are: Beat oscillator, noise silencer, and A.V.C. Above them is the pitch adjustment for the beat oscillator.

A NEW AMATEUR—BAND SUPERHET

This receiver represents an attempt to provide a circuit design which everyone can build, which is easy to operate, and which gives a first-class performance. It is equally useful as a short wave receiver for overseas broadcasts, or as an amateur superhet complete with band-spread, noise silencer, and exceptional sensitivity. The dial may be hand-calibrated on a piece of graph paper, which, when worked out for the various bands and stations, may be slipped between the glasses on the dial. The broadcast markings on the glass may be removed with a razor-blade.

EVERY year, for some time past, we have sat ourselves down with a pencil and paper, in order to work out the circuit of a short wave set which should include all the latest ideas on short wave sets. Each one of these has been better than the last, and during the months that followed the completion of each we have found ways and means of improving things.

When this year arrived, and a short wave set automatically was indicated, we decided to take some time and trouble and build one which would not allow of much improvement for some time to come. The set was required immediately for amateur use exclusively, but the design was intended to be equally suitable for a straight-out short wave set to receive the standard overseas broadcast stations on 19, 25, 31 metres, etc.

So we got to work with the aforesaid pencil and paper, and mapped out what we considered a pretty good set. Having done this, we went ahead and built it up, and, as hoped, it was a very good set indeed. Then we got to work making improvements. Many hours were spent in trying almost every conceivable stunt and circuit, taking the set stage by stage. The final result is pictured here, and, as a matter of fact, it bears a very close resemblance to the original idea. However, while the experience is fresh in our mind, we intend to go ahead and tell the story of the set itself. In this way we can cover many points which are bound to present themselves to the constructor, who may then be interested to know just why we finished up as we did.

THE PROBLEM

First of all, we wanted a set which would make a particularly sensitive combination, especially on phone transmissions, speaking now from an amateur viewpoint. Taking the 20 metre band as a standard, we started out to make it "hot-stuff" on this band, realising that equal performance would be found on the other bands as well.

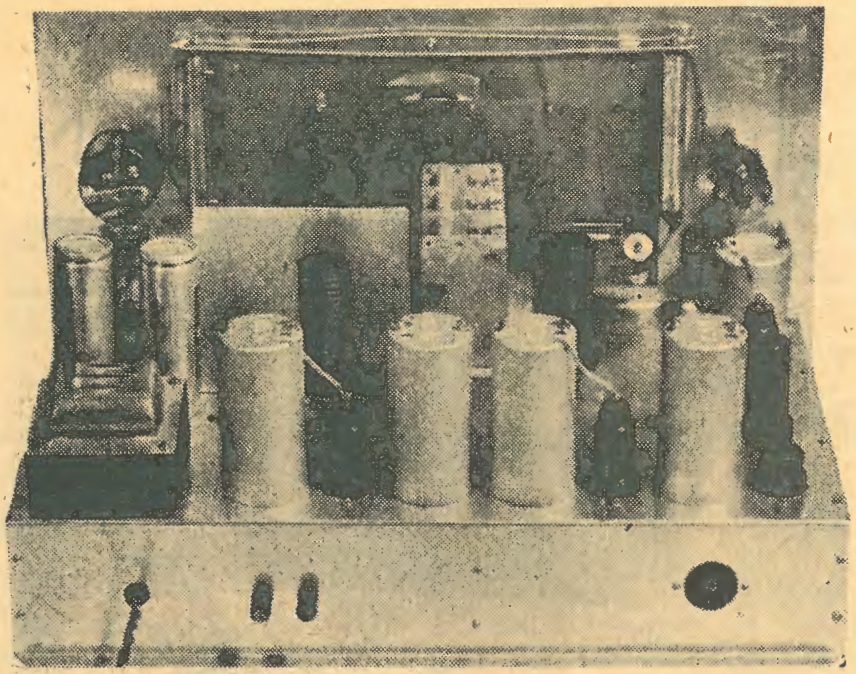
Real sensitivity is, after all, not much use unless the noise level is low. Therefore we had to have a set which had low noise level. These two points indicated a fairly large number of valves, and plenty of R.F. gain. The matters of sensitivity and noise level are almost entirely in the hands of the R.F. amplifiers, and the mixed combination, the set, of course, being a superhet. One can get plenty of sensitivity by building up intermediate gain, but if the initial noise to signal ratio is unfavorable for a start, nothing is gained, and, in fact, the noise level merely aggravated.

This being so, we concentrated on the R.F. amplifier and mixed circuits for a start.

THE R.F. STAGE

It was obvious that at least one R.F. stage must be used, for several reasons. Firstly, it isolates the mixer valve from the aerial, and greatly increases sensitivity. Next, we had to decide how many R.F. stages to use. The first thing we considered was the use of two such stages.

That's a very fine idea, but consider for a moment the idea in practice. We will need four tuned circuits—four plug-in coils, and four sections of the gang. As we must use hand-trimmers on each section for best performance, we are running into considerable complications. And, further, four-gang condensers are



The set from the rear. Many constructional points are visible here, notably the I.F. channel, and screen between the aerial and R.F. coils.

pretty hard to obtain, and the ganging and mechanical mounting of four separate condensers, keeping all in line, is a very expensive and awkward business.

REGENERATION

So we regretfully ruled out the idea of two R.F. stages, thus reducing our tuned circuits to three. Now we have already proved to ourselves that a spot of regeneration on either the mixer or the R.F. stage is a wonderful help in increasing sensitivity. In fact, we consider that the absence of the extra R.F. stage is easily made up for by the use of regeneration, which not only bumps up the gain tremendously, but also increases the selectivity of the stage.

So we included regeneration as part of our scheme. Initially, it was placed on the mixer, a 6L7, as in previous sets, but further experiment decided us that it is more useful when applied to the R.F. stage.

There are several reasons for this. Firstly, the mixer valve is there to do a job of mixing. That's its chief aim in life, and the efficiency of its conversion largely sets the noise ratio of the set. Now when we use regeneration we control it with a potentiometer in the screen lead. It is important that this screen voltage never be below about 70 volts, but many have trouble in getting smooth control with more than about 40 volts. It is too much to expect the valve to do its job with this voltage on the screen. Further, regeneration here makes the mixer grid circuit tune very sharply. The oscillator circuit also tunes very sharply, which means that slight mistune in the mixer grid will mean greatly reduced gain, and we have constantly to keep adjusting the hand trimmer. Without regeneration, this stage is not nearly so critical, and the mistuning over the complete 20 metre band, without touching the trimmer, is not enough to allow us to miss anything. The R.F. stage will now take on very sharp tuning, but it is all "extra" gain, and its final adjustment is simply a matter of bringing the signal up to its full strength, no matter how weakly it was heard originally. Truly, we have to use a potentiometer in the screen again, but we have another element which enters into the picture, and that is aerial loading.

THE AERIAL LOADING

Here we have a circuit using a 6K7 valve. With no aerial attached, the R.F. stage will oscillate very easily. When we attach an aerial, the loading effect it has will prevent the valve from oscillating so easily, and we either increase the reaction control or tighten reaction coupling, or loosen the coupling to the aerial.

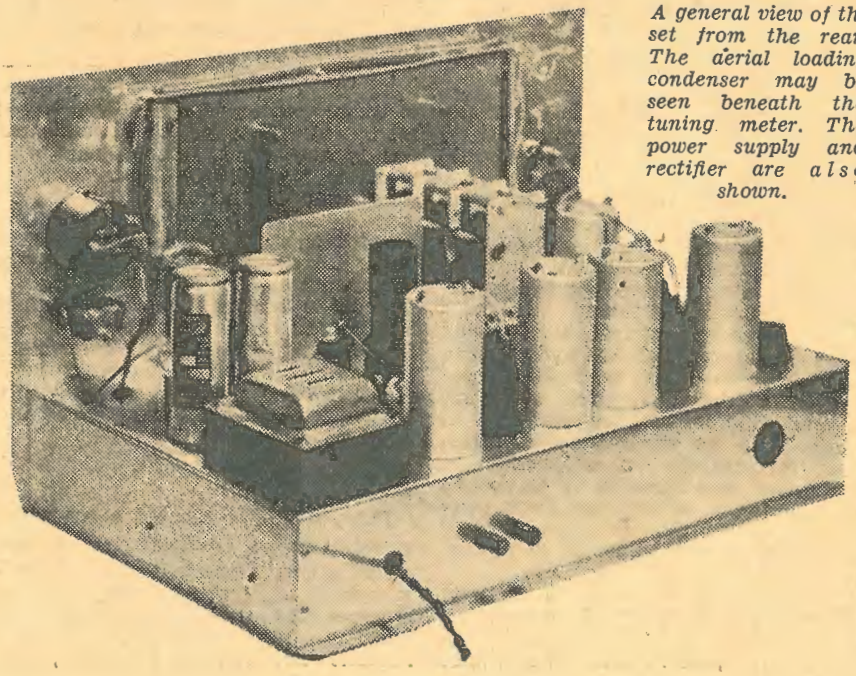
What we have done in our set is to adjust the reaction tap on the coil until, with 100 volts on the screen and the aerial coupled just nicely (by using a correct aerial coil), the R.F. valve will just not oscillate. Now we have inserted a small variable condenser of about 13 plates in series with one of the leads to the aerial (assuming a doublet is used). By unmeshing these plates we in effect decrease the loading effect of the aerial and allow the R.F. valve to oscillate with, say, 70 volts on the plate. With the condenser turned all out it is almost equivalent to removing the aerial altogether.

So that for ordinary work with fairly strong stations, we can leave the aerial condenser all in, without worrying about fine adjustment to the regeneration. When we want exceptional sensitivity, we slacken off the aerial condenser until the valve will just oscillate, and work on the screen voltage potentiometer. There is a slight amount of hand-capacity in this aerial condenser, but it is placed where the hand doesn't approach it, and all is well from this angle. Anyhow, it is quite the best solution to the regeneration problem we evolved in our experiments.

Incidentally, another factor which will increase the tendency of the R.F. valve to oscillate, is the amount of coupling to the 6L7. A too large plate coil will allow too easy regeneration. Moral—don't over-couple in the coil. In passing, we might mention that the bias resistor for the R.F. valve of 500 ohms, also comes into the picture. Don't make it less than this. You can increase sensitivity a trifle, but the valve will be naturally so near oscillation with the reduced bias, that the set may become uncontrollable. After all, no sensitivity is worth while unless it is controllable.

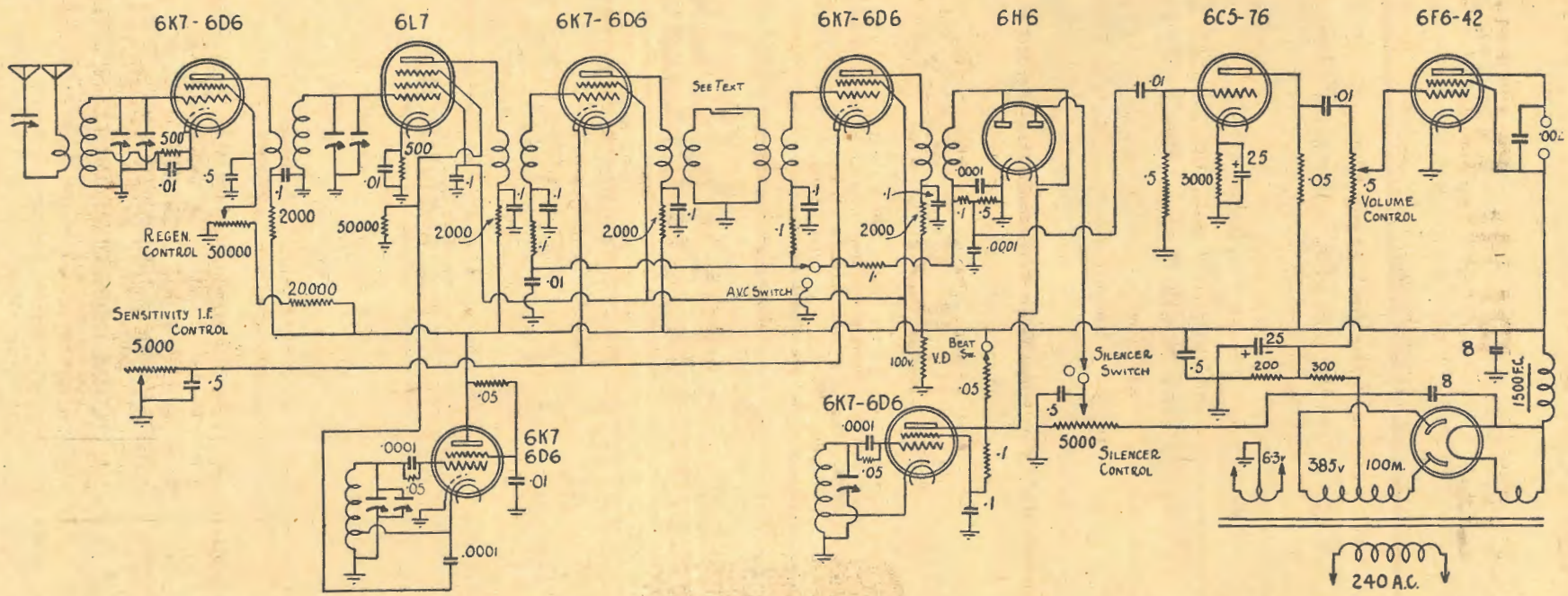
THE R.F. COIL

Before leaving this section of the set, we would like to say something about the R.F. coil. You have everything to lose by overdoing the coupling between plate and grid windings. There is a certain optimum coupling beyond which it does not pay to go. Remember that in overcoupling these coils, we



A general view of the set from the rear. The aerial loading condenser may be seen beneath the tuning meter. The power supply and rectifier are also shown.

CIRCUIT OF THE 2JU SPECIAL TEN AMATEUR SUPER



PARTS LIST

1 Base, 20in. x 12in. x 3in.
1 Front panel, 21in. x 12in.
1 Shield panel.
1 Straight-line dial.
1 3-Gang condenser (see text)
4 465 kc intermediates (low gain).
3 23-Plate midget condensers.
1 13-Plate midget condenser.
1 3-Plate Midget condenser.
4 .5 mfds. tubular condensers.
8 .1 mfds. tubular condensers.
6 .01 mfds. tubular condensers.
1 .002 mica or tubular condenser.
5 .0001 mica condensers.
1 1 Meg. resistor—1 watt.
2 .5 Meg. Resistors—1 watt.
1 .5 Meg. Potentiometer.
1 50,000 ohms potentiometer.
4 .1 Meg. resistors.
6 50.000 Ohms resistors — 1 watt.
1 20,000 Ohms resistor — 1 watt.
1 3000 Ohms bias resistor.
4 2000 Ohms non-inductive resistors—1 watt.
1 200 Ohms 100 mills. resistor.
1 300 Ohms 100 mills. resistor.
2 500 Ohm bias resistors.
2 5000 Ohms potentiometers.
2 25 Mfds. Potentiometers.
2 8 Mfds. 600-volt electrolytics
1 25,000 Ohms voltage divider.
3 Switches.
9 Octal sockets (if metal valves used).
1 4-Pin socket.
2 4-Pin, 1 5-pin Sockets (for coils).
1 Power transformer — 385 volts, 100 mills., with suitable filament winding.
1 Tuning meter (optional).
Coil formers—6 4-pin, 3 5-pin.
Valve clips, knobs, extension schaft, coupler, hook-up wire, mounting lugs, etc.

COIL CHART

AERIAL COIL

BAND.	AERIAL.	GRID.	TAP.
10-20	1½	3	½
20-40	6	8	¾
40-80	10	20	1

R.F. COIL

	PLATE.	GRID.
10-20	2	3
20-40	6	8
40-80	12	20

OSCILLATOR

	GRID.	TAP.
10-20	3	1½
20-40	6	3
40-80	15	4

Aerial coils wound 1-8in. from earthed end of grid coils. R.F. plate coils interwound half way with grid coils. Ten and twenty metre grid coils wound with 18 gauge tinned copper wire to cover 1¼in. Other coils wound with 26 gauge enamel, spaced about 2 diameters. Formers are 1¼ inches diameter.

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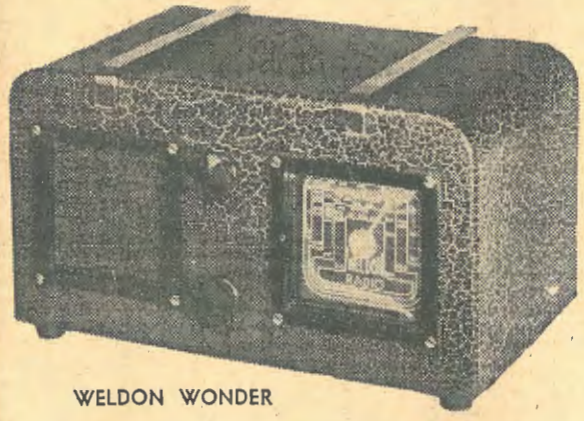

WELDON WONDER

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Australian Reception

MODEL		DESCRIPTION
Weldon Wonder	5V	B/c Mantel
Weldonette - -	5V	B/c Mantel
Weldon Mystic	5V	B/c A.C./D.C. Mantel
5/37 - - - - - -	5V	B/c Console
8/37 - - - - - -	5V	B/c Console (Magic Eye)
7/37B - - - - -	7V	Batt. B/c (B Batts.)

World Wide Reception

5/37M - - - - -	5V	D/w Mantel
5/37D - - - - -	5V	D/w Console
5/37DE - - - -	5V	D/w Console (Magic Eye)
6/37DE - - - -	6V	D/w Console (Magic Eye)
8/37DE - - - -	8V	D/w Console (Magic Eye)
7/37VD - - - -	7V	Batt. D/w (Vibrator)
7/37VD - - - -	do	In "Coronation" Cabinet
7/37BD - - - -	7V	Batt. D/w (B Batts.)
7/37BD - - - -	do	In "Coronation" Cabinet
5/37BD - - - -	5V	Batt. D/w (B Batts.)
5/37VD - - - -	5V	Batt. D/w (Vibrator)

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are virtually placing the plate impedance of the R.F. amplifier across the grid circuit of the 6L7, thus spoiling our efforts to get a high Q. in this circuit. Secondly, we broaden our selectivity, so that nearby stations may tend to show up over the band in a series of blurts, and modulate themselves on other stations. In making some experiments of this nature with a nearby amateur, we finally ended up with a close wound plate coil spaced about ¼ inch away from the grid end of the secondary. With this coil, we had practically no interference from the transmitter working only a few hundred yards away, whereas with a tightly coupled coil, although the interfering transmissions were themselves not to blame, considerable blurting and general interference was experienced.

The overall reduction in gain was not very great, bearing in mind that the coil undoubtedly was under-coupled, and every other aspect of the reception was improved.

As a compromise in coupling, we suggest that the R.F. plate coil be wound so that about half the turns are interwound with the 6L7 grid coil. In the coils for the higher frequencies, the grid turns are well spaced out, and it is important to see that the plate coil windings are spaced exactly in the centre of the space between the grid turns. This is done to prevent too much capacity coupling between the two windings, as would take place if the plate windings were allowed to lie right against the grid windings.

THE OSCILLATOR CIRCUIT

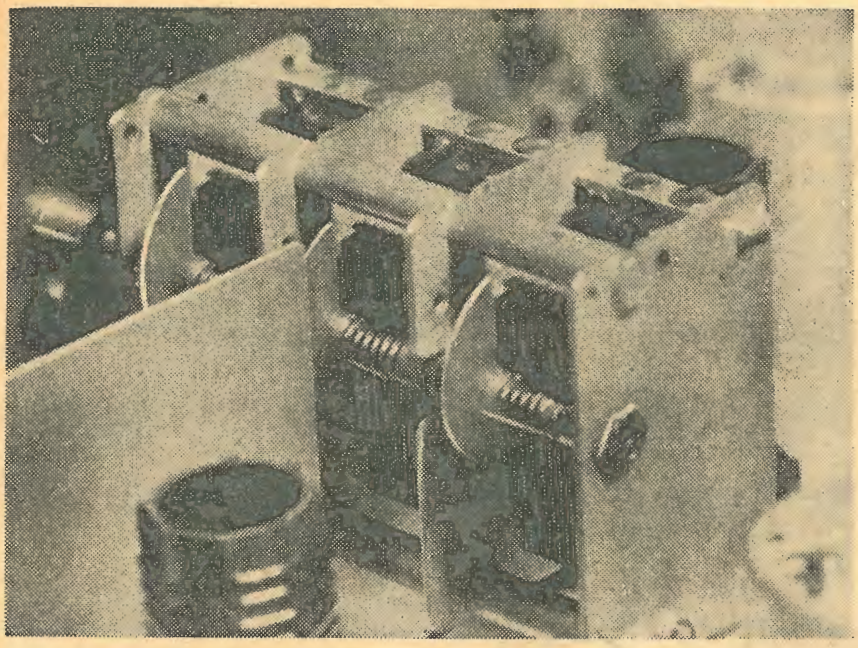
Next we come to the matter of the high frequency oscillator. This portion of the set we found in practice to be straightforward, and several types and circuit worked out very well. The original circuits for the 6L7 valve were given with a 6C5 valve used as an oscillator, in a plain plate feed-back circuit. The

Here is an exact size drawing of the little condenser plate, of the shape we used. It is not particularly straight-line anything, but an easy shape to handle, and spreads the band quite well. Paste it on a piece of thin card, and use as a template. Trace it on to another sheet of paper if it is not desired to mutilate your copy.

injector grid of the 6L7 was connected straight to the grid of the oscillator.

We used this oscillator for a long time, and found it quite good. There is, however, a certain amount of interaction between the oscillator and mixer circuits, particularly when regeneration is used, despite the design of the 6L7 to prevent it. This is due evidently to the very close tie-up between the oscillator circuit and the mixer, the connection being made right at the grid of the valve.

To overcome this, several forms of oscillator circuit were tried, including electron coupled devices, all with the



A close-up of the tuning gang, showing the cut-down plates of the tuning condenser. It is only necessary to do this for amateur work. As a general short-wave set, use a regular 3-gang .00015 capacity (approx.) gang condenser.

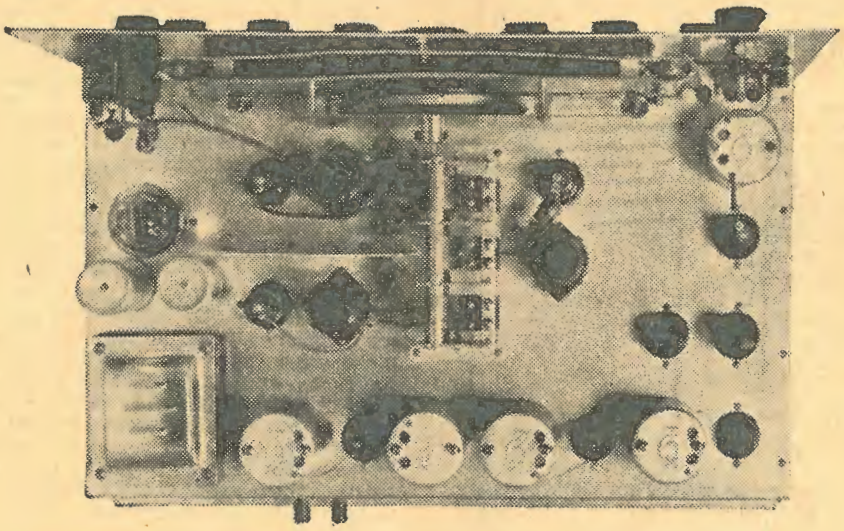
idea of coupling from the oscillator at less critical points.

The circuit we finally used is really an R.F. pentode used as a triode oscillator with the plate of the valve connected straight to high tension. This oscillator appears to have a high output, and is very stable. Connection to the 6L7 is made not from the grid, but from the tapping on the grid coil, to which the cathode is connected. There is now no noticeable "pulling" between the oscillator and mixer stages, and, although we have not measured it, the actual noise level of the mixer stage appears to be definitely lower than with other methods due to better conversion. In addition, it is a very simple circuit to wire, the oscillator coil having only one winding.

Another advantage of using this type of valve (6K7 in our case) as an oscillator, is that the grid circuit is above the base of the set, and therefore well isolated from any embarrassing wiring. Incidentally, when connecting the grid leak and condenser to this valve, use small components and make the lead with bus-bar, so that it is rigid. Changes in the position of this unit will alter the calibration of the receiver.

THE R.F. SECTION LAYOUT

It will be noted that the lay-out of the R.F. part of the set is just the same as that used in our last year's super. We couldn't see any reason for varying it. As it is, the coils are not likely to interfere with each other, and yet are not enclosed in cans which, in our opinion, are best avoided. There is a single screen between the R.F. and mixer coils, but the possible coupling here is not very great, and we have worked the set very well without the screen, although it should always be in-



A plan view of the set. From this photograph, all the details of layout may be seen clearly. Note that the oscillator circuit is spaced well away from other components.

cluded. The oscillator coil is well out on its own on the opposite side of the gang. Incidentally, the centre section is used to tune the oscillator coil, as being the most conveniently placed for this purpose.

TUNING CONDENSERS

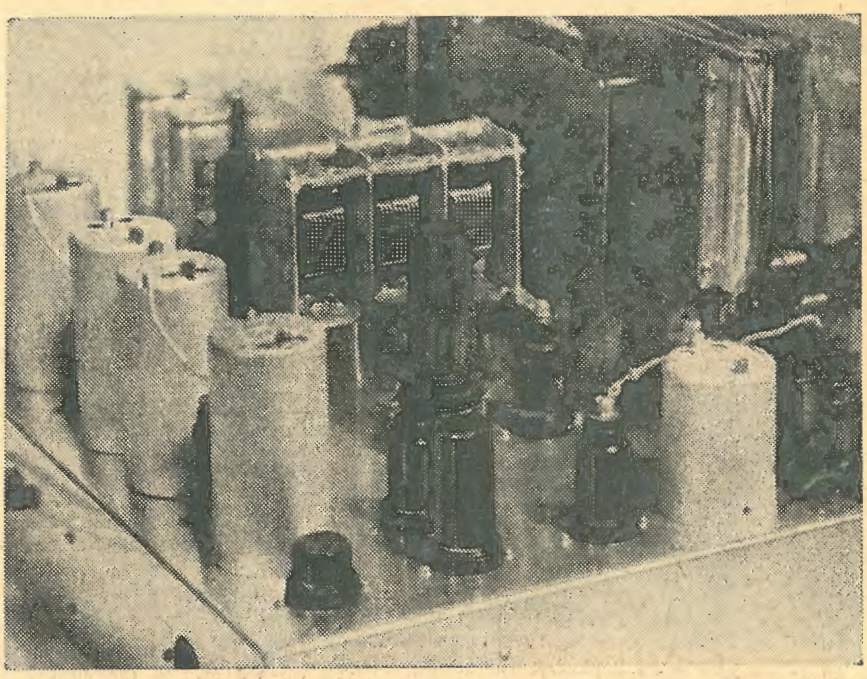
Should this receiver be desired mainly for a short wave set, we suggest that the tuning condenser be a .00015 mfds. three gang. No oscillator band-set condenser would be used, and 23 plate midget trimmers be placed in parallel with the aerial and R.F. sections as at present.

In effect, this means that the tuning capacity is equal to about .00025 mfds., and that allows an excellent coverage on one coil. In fact, it is possible to cover the 19, 20, 25, 31, and 40 metres bands on one single coil, another set taking the tuning from 40 to 80 metres.

This is the tuning combination we recommend to anyone who wants the set mainly for overseas broadcast stations. It will give a performance very much better than the ordinary dual-wave receiver.

Now we wanted this set for amateur work. Therefore this large tuning range to us was a disadvantage. What we wanted was a means of setting the required band, and doing the tuning with a small capacity to spread the amateur bands over most of the dial.

To save ourselves the time and trouble of buying three separate tuning condensers, mounting and lining them, and so on, we removed the rotor from a standard broadcast gang condenser, and removed all but one plate in each section. Using the template printed with this article, pasted on a piece of thin card, an outline was drawn on the plates, which were then cut down to this size. We now have a rotor which will give us a very small tuning capacity with approximately straight line frequency characteristics, and just the thing for our band-spreading ambitions. The rotor is then reassembled, and the gang is ready. It is a simple matter to straighten out the rotor plates should they have become distorted while cutting. The whole job should not take more than twenty minutes. The insulation used on the modern condenser gang is quite good enough for wavelengths down to 20 metres, and even below, so no doubts need be entertained on this score.



A close-up picture of the audio section of the set, which illustrates further details of layout. The can at the extreme right houses the beat oscillator coil and its grid leak and condenser. One lead from the top runs to the 6K7 grid, and another from the same point runs to the 3-plate midget.

The bandsetting condenser for the oscillator section is mounted on a bracket under the chassis, and controlled by an extension shaft through the front panel. This shaft carries a small 2-inch tuning dial, so that its position can be marked, and returned to when the same set is required. We select a marker station for each band—preferably a strong Morse station, and always bring it back to its proper place on the dial before we start. Thus the marker for the 20 metres band we make JNJ on 13,945 kc. This is near enough to the 14,000 end of the amateur band, and this station always seems to be transmitting.

When we turn the band-setter so that JNJ comes on his calibrated mark all the other stations must fall into line.

The band-setter for the oscillator section, and also the aerial and R.F. trimmers, should be 23-plate midgets.

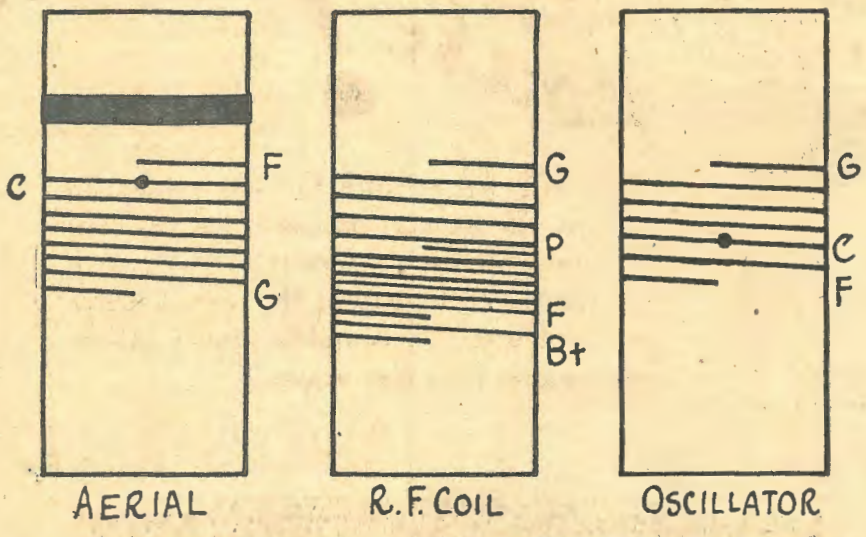
THE INTERMEDIATE STAGES

The I.F. amplifier is also interesting for several reasons. As mentioned in the beginning, our desire was for some good selectivity. For this reason we have used two intermediate stages. We would stress the point that these stages are not here to give gain, but selectivity. Therefore, low gain intermediates are used, and most of the time they are backed off to drop the gain still further. We have taken trouble to see that the R.F. section of the set is working hard all the time, as this is the amplification we need the most.

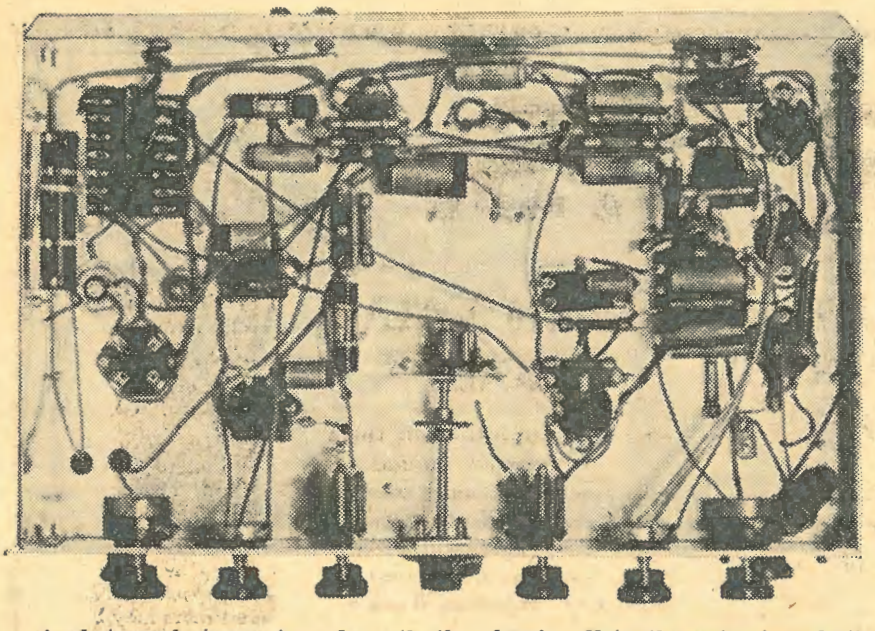
In order to still further improve general selectivity, we have included between the two I.F. amplifiers two transformers instead of one. These are fed, the secondary of one into the primary of the other. Originally, our idea was to provide a system of band-pass coupling, with a switch to vary the selectivity in steps. This, however, we found not so effective as we had hoped, and finally we abandoned it. The constructor can make some experiments of his own, if he cares, and will certainly find the matter interesting. We finally ended up with the two low potential ends of the coils earthed, and connection made between the grid and plate ends by twisting them together for a few inches, to provide very loose coupling.

When the whole I.F. system was lined up it proved to be very selective and gave ample gain when required.

Both the valves are hitched to the



This drawing shows the relative connections for the coils. The black band on the aerial coil represents the aerial coil itself. Connections to it are brought out to two insulated terminals at the rear of the chassis for doublet connection. We advise such an aerial. If a plain aerial is used, the end of the coil nearest F of the grid coil is earthed. Note the partial interwinding of the R.F. plate coil. The dot opposite "C" indicates the tapping.



A photograph taken from beneath the chassis. Note the extension shaft which allows the band-set condenser to be mounted under the centre section of the gang. Many of the components are grouped and mounted on insulated mounting strips. An old headphone jack bearing may be used to carry the extension shaft.

A.V.C. line—as a matter of fact, they are the only valves to be controlled in the set. The A.V.C. is useful in a set of this type mainly as a means of preventing uncomfortable roars of volume as one passes over a strong station. We have never agreed with controlling the mixer valve, particularly in a set where we want some accuracy of calibration and freedom of drift, and we could not control the R.F. valve and retain reaction. In any case, our theories of R.F. gain at all costs is dead against the use of the A.V.C.

So the I.F. valves take the whole of the control, which they handle quite well. We have a milliameter wired in the cathode returns which indicates plate current, and serves as a means of comparing carrier strengths. More of this later.

Incidentally, the A.V.C. may be switched out when not needed, and therefore there is a variable resistor in the cathode circuits of the I.F. valves to act as a sensitivity control. It is useful anyhow, because we make a practice of backing off the I.F. gain wherever possible, with a distinct improvement in signal-noise ratio. The idea is to make the R.F. section do its work all the time, the I.F. channel supplying extra gain only when required.

THE SECOND DETECTOR AND NOISE SILENCER

The second detector valve is a 6H6 double diode, which performs three different functions—Detection, A.V.C., and Noise Silencing.

The detector circuit is quite straightforward, and has a decoupling resistor of .1 meg. in series with the diode load, to keep R.F. currents out of the audio system. The A.V.C. line is coupled to the "hot" end of the diode load through a decoupling resistor of 1 meg. The far end of this resistor is switched to earth when A.V.C. is not required, a panel switch being used for this purpose.

The Noise Silencer is a really interesting part of the set. As will be seen, the second of the diode sections in the 6H6 is connected so that the second cathode is wired to the detector diode, and the second diode to the moving arm of a potentiometer, wired across a "back bias" source of about 50 volts negative.

Now it will be obvious that when the potentiometer arm is moved to the earthed side the two diodes are connected together in opposite directions, so that the noise silencing section short-circuits the detector section. In this position no signals can get through to the audio system, and the detector ceases to function. Now as we rotate the arm of the potentiometer towards the other end we place a gradually increasing bias negative on the silencer diode. Assume that we adjust the silencer control so that there is a negative bias of 10 volts applied. Now the short-circuiting action of the detector will not take place until a signal arrives strong enough to cancel out this negative 10 volts. When such a signal does arrive, the detector once more ceases to function, and will continue to do so for any signal stronger than 10 volts, although it will allow to pass any which are below this 10 volts.

This then is the theory of the noise silencer. If we were listening to a weak signal which developed only a volt or two across the detector diode load, we would set the silencer control so that all stronger signals were eliminated. We might mention that the silencer, like all other types, is only really effective on sharp sudden noises, such as car ignition impulses. The split second of time during which the detector is deadened is so quick that the ear cannot really notice it. In other words, instead of noise peaks, we have silent "holes."

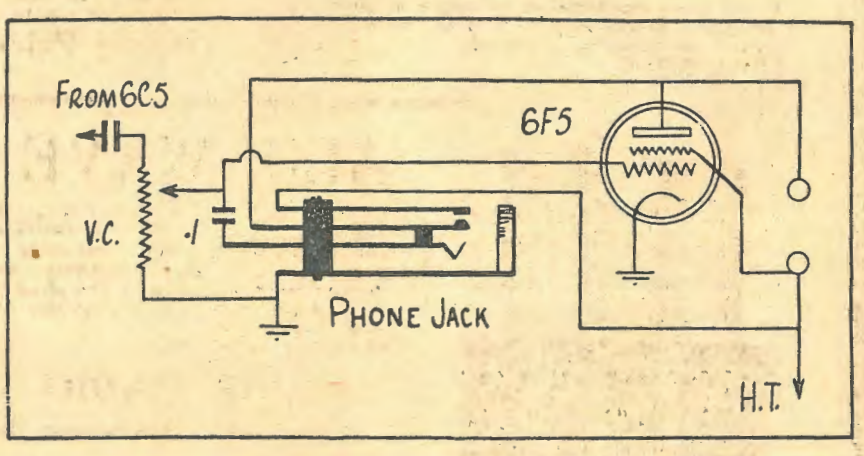
If the interference is a steady hash, no silencer can do any good. It is one thing to deaden the set for a split second on motor car interference, but where there is a steady hash the silencing action would, of course, be practically continuous.

In action, on weak C.W. signals the silencer is able to completely eliminate car interference, no matter how strong. Scraping a screw-driver along the chassis with the silencer in action creates no noise whatever, although without the silencer both types of interference may be unbearable. On phone signals it is not so successful, although, with careful handling, it definitely does help, particularly where the interference is bad. Unfortunately, a fading signal, should it beat the silencer voltage, will naturally tend to silence itself, unless the operator makes use of the control to readjust the silencer voltage. Considering the negligible expense incurred to install it, the the silencer is really indispensable, particularly for amateur C.W. work.

A switch is fitted to cut out the silencer when not required.

The final stages of the set are the driver valve, a 6C5, and the output pentode, the 6F6. This combination provides plenty of audio gain to rattle the average speaker. A headphone jack is included to plug in following the 6C5, and one section of it short-circuits the speaker transformer input to quieten the loud-speaker.

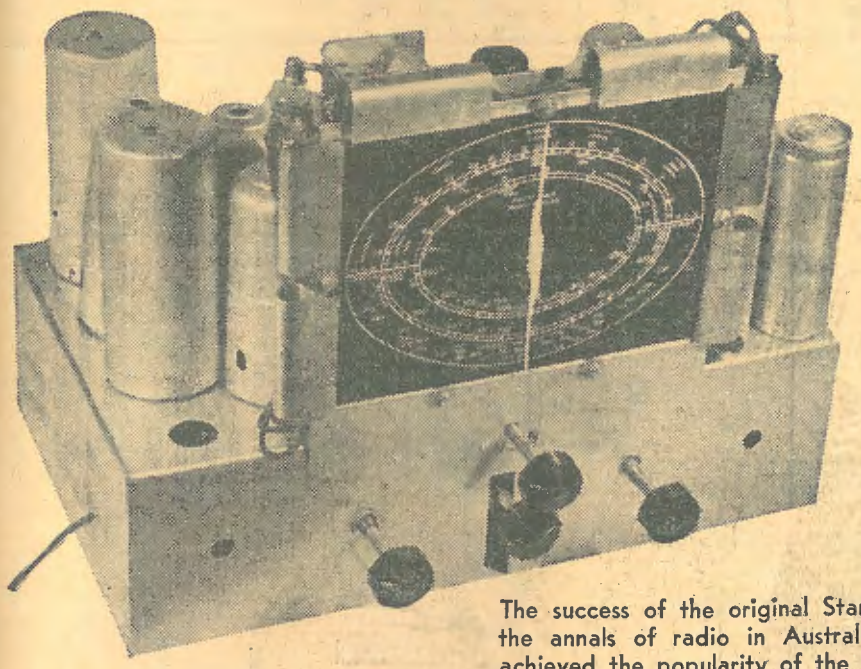
The volume control operates on the headphones as well as on the loud-speaker.



The circuit showing how to use headphones with the set. The jack need not be insulated from the panel. When the plug is inserted, the speaker is silenced, but the volume control still operates.

See Page 55 for further Special R.C.S. Offers!

THE ALL-WAVE STANDARD!



A front view of the receiver. The controls include a tuning knob, wave-change switch, sensitivity control, and volume control. The dial is specially calibrated for the three bands over which the set will tune.

The success of the original Standard Circuit is something recorded in the annals of radio in Australia. No receiver before or since has achieved the popularity of the 1933 Standard. Here is a receiver retaining all the features of simplicity and performance of the original set, plus many others which bring it right up to date. A set we can advise with confidence.

THIS receiver was the result of an attempt to build up a set having many of the things our readers have been requesting for quite a while, and which we are now able to give them. It seems that there are plenty of people who want to build themselves big sets. Here we have given them a big set, which, for all its eight valves, is an easy one to build, and which doesn't cost as much as one would imagine at first glance. Considering its features, it isn't an expensive receiver.

It is of course meant for the man who has advanced somewhat on the road of home construction. He will, on referring to the circuit, find it as simple in essentials as was the original Standard, which caused such a furore in 1933.

In many ways, that old Standard has never been excelled. Certainly, for simplicity, performance, and output, we have never been able to think up anything which bettered it. We didn't commence to build this set as a Standard at all, but after trying out many circuits and various arrangements of apparatus, it won out on its merits. We couldn't see where the extra components and more elaborate circuits really assisted in results.

AN ALL-WAVER

However, we will run through the circuit, and explain the various points as we go along. The first thing to mention is that it is an All-wave set. In other words, it covers the band from 13 to 80 metres. Ever since the days of the first dual-wave sets, we have regretted, publicly and privately, the passing of the all-wave feature. At the time the dual-wave phase commenced, sets were not what they are now, and it was fairly easy to build a set covering two bands, without costing too much money. There was nothing much to be done about it, so we just had to accept what was offering and use the kits which ran over the broadcast band, and covered the short waves from about 19 to 50 metres.

Now, however, manufacturers have been able to produce very good sets which will go lower in wavelength, without sacrificing too much efficiency, and which will stand a reasonable chance of maintaining accuracy in manufacture and service. Therefore we have taken the opportunity given by the appearance of the all-wave tuner, to build it into this set. The constructor, of course, doesn't have to worry much about this all-wave feature, as the number of connections to the set are not made any more complicated thereby. It merely means that to him there are three switch positions instead of two.

To the listener, however, it means that he is now able to listen over a greater range, going down to the 13 and 16 metre bands as well as the others to which he has been accustomed, on 19, 25, 31, &c. Thus the entertainment value of his set is definitely increased.

STANDARD AUDIO

Secondly, there is the Standard audio system, which has been so well tried, and which has delighted so many of our readers in the past. It is there in its original form, and all its simplicity. We have even retained the diode biassing used in the original set. The valve types have been changed to keep step with modern practice—thus we have an 85 detector and driver, and a pair of 6L6 valves in the output stage.

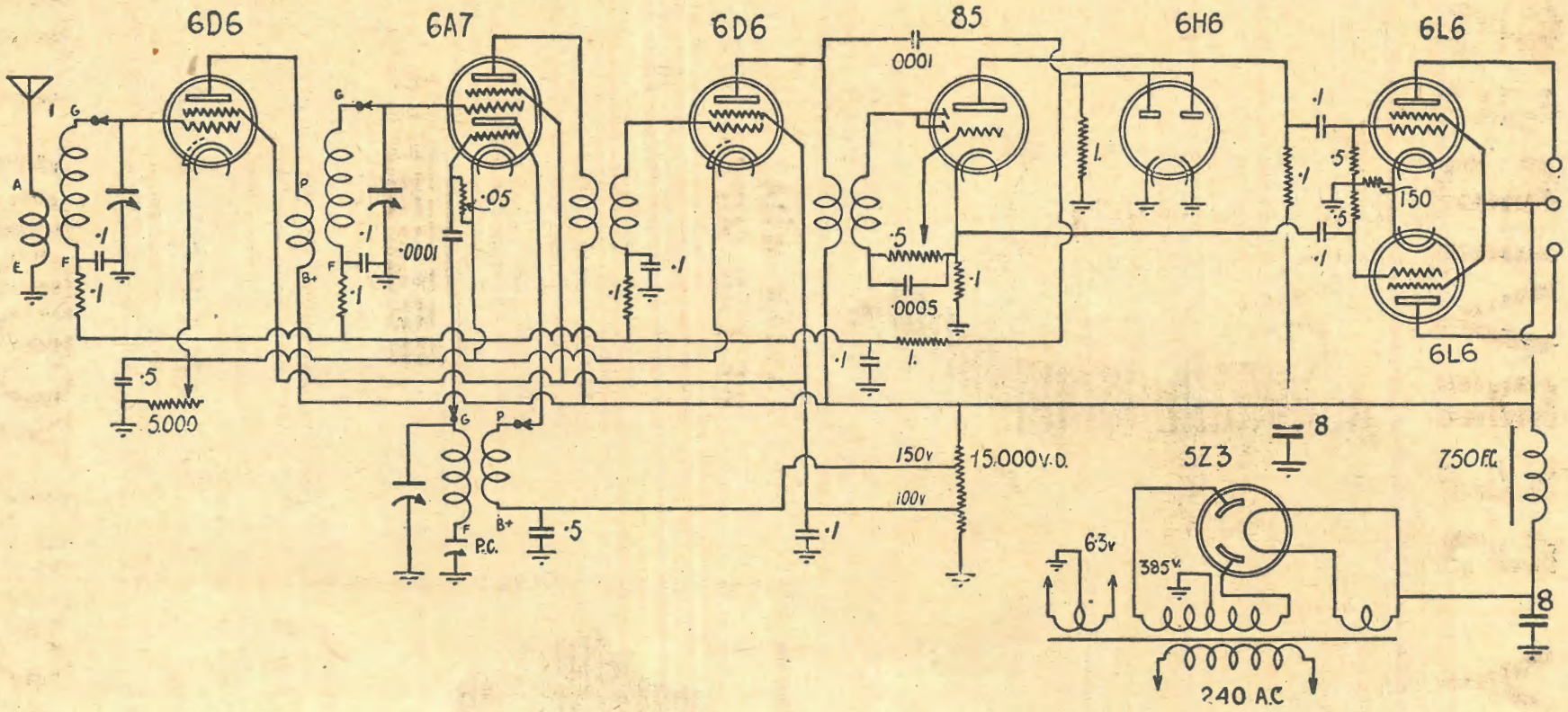
This combination is more sensitive than the original idea, using the straight pentodes, and also is capable of more output. However, the gain of the audio system is not so high that the diodes are working with insufficient input on strong signals, as so often is the case. The set is beautifully balanced in this respect, and used with a good speaker is a pleasure to hear on locals, as old Standard enthusiasts will readily imagine.

The same general values of components are used, except that the bias resistor for the output valves has been changed to 150 ohms to suit the 6L6 valves.

The speaker field of 750 ohms is still kept as the filter choke. There need be no fear these days that speaker fields will overheat with the wattage, as was sometimes the case in the old days when speakers were small, and not as good as to-day. We suggest, of course, that a good speaker be used, and there are a number of these selling from about £3 3s to £6 6s, and even higher, which are quite suitable. The better the speaker, the better for the set. If smaller types are used, see that they have a rating of about 8 watts in the field, and will stand the same amount of output.

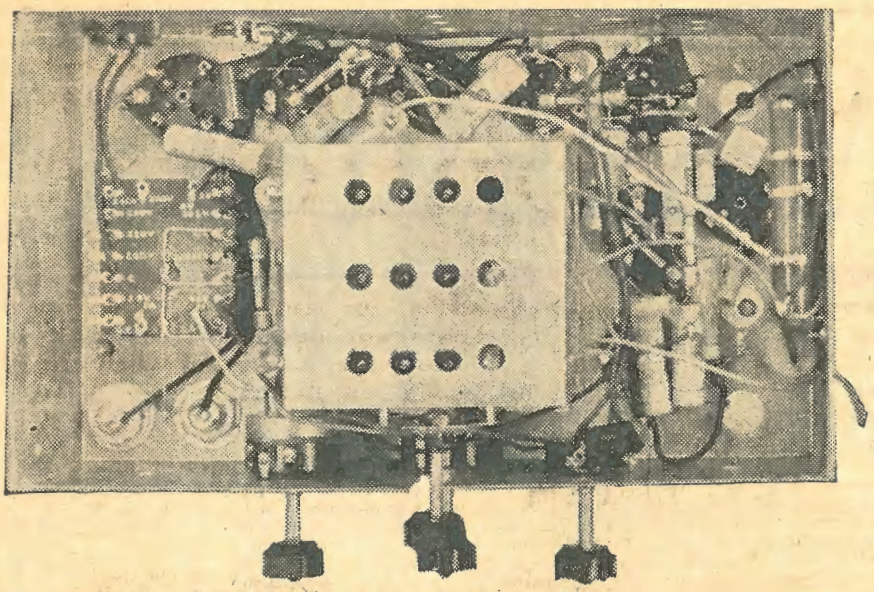
The old Standard circuit did not use A.V.C. In those days, opinion was divided as to whether A.V.C. was desirable or not. Anyhow, to use it with the

THE CIRCUIT OF THE ALL-WAVE STANDARD



PARTS LIST

1 Base, size 8½ x 14½ x 4, or larger.
1 All-wave coil kit with intermediates and gang.
1 Dial to suit.
1 Power transformer—385v. 150ma., 6.3v. 4a., 5v. 3a.
2 8 Mfd. electrolytic condensers.
2 .5 Mfd. tubular condensers.
7 .1 Mfd. ditto.
2 0001 Mfd. mica condensers.
1 0005 ditto.
1 150 Ohm 150 ma. resistor.
1 50,000 Ohm 1 watt grid-leak.
5 100,000 ditto ditto.
2 500,000 ditto ditto.
2 1 Megohm ditto.
1 500,000 Ohm volume control
1 15,000 Ohm voltage divider.
Sockets—3 octal, 1 small 7-pin, 3 6-pin, 1 4-pin, 1 5-pin.
Valves—2 6D6, 1 6A7, 1 6H6, 2 6L6, 1 85 1 5Z3.
Speaker—750 ohm field, 5000 ohm plate to plate load, push-pull input.
Sundry hardware, wire, screws, solder, valve cans, power lead, etc



A picture taken from beneath the chassis. Note the trimming condensers on the box, and the small number of parts.

Standard circuit meant an extra valve, and we didn't use it.

With this set, however, things are rather different. A.V.C. is a help on short waves, in tuning, and also in helping to keep signals steady when fading occurs. So we have included a diode valve, the 6H6, the sole duty of which is to provide A.V.C. It is an ideal way of getting it, and its operation is excellent.

There is another advantage in using the 6H6 as an A.V.C. valve. Many constructors have trouble in lining up their sets which are fitted with A.V.C., because it is hard, without some indication, to find the exact peak of a station. It is much easier if one has a manual control to set the volume while lining up.

Now if we pull out the diode valve, the grid returns of the controlled valves are in effect earthed through the diode load, and there is no A.V.C. because there is nothing to rectify the voltage picked up from the I.F. amplifier.

A glance at the circuit will show that we have fitted a manual volume control as well, it being dubbed a sensitivity control. The set is now lined up using this manual control, and when all is O.K. the 6H6 is plugged back into its socket. The lining of the circuits is not upset in any way by removing the 6H6. In fact, should A.V.C. not be desired, omitting the 6H6 would bring this about, with no alteration whatever to the remainder of the wiring, although, of course, the decoupling resistors in the grid returns are quite useless and can just as well be left out.

This sensitivity control has several aims in life. In the first place, it can be used to tone down the strength of local stations if desired, when listening on the broadcast band. As it is turned on, it gradually increases the sensitivity of the set until, when right on, the set is "flat out" and may even oscillate, as there is no limiting resistor in the cathode leads. This is a valuable feature, as no two sets, when home-built, are likely to have exactly the same sensitivity figures. This control allows one to compensate for too much or too little overall gain, and, in effect, bring each set right up to its limit of performance. One soon learns the maximum point to which the control should be adjusted for best results, and it is never turned past this point. The sensitivity control will be found just as useful in bringing up the gain on short waves as it will in reducing it on strong locals.

(Continued on Page 84)

ALL-WAVE STANDARD

(Continued from Page 82)

OUTPUT STAGE

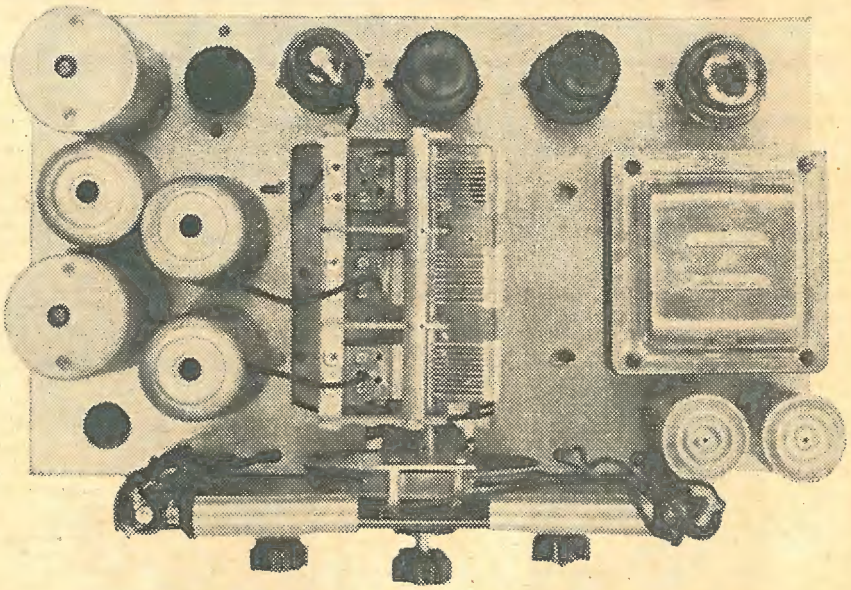
We have used the 6L6 valves in the output stage because of their sensitivity, good tone, and ability to give more volume than the older pentodes. Of course, it would be possible to use 6F6's or 42's or 2A5's or 47's in the output stage if desired, on using a 250 ohms bias resistor. The set, however, has a superior performance when using the 6L6 valves, and we advise you to use them.

CONSTRUCTION

So much for the circuit. There is really nothing left of it to discuss any further. In fact, we doubt whether we have described a set with so many features, which has such a small parts list!

Constructionally, the set should present no difficulties. As usual, the parts are all obtained, the valve sockets, coil box, &c., are mounted in their place on the chassis. The chassis we have used is, if anything, on the small size; but it is a standard type, and being deep, there is plenty of room for everything. It does make the circuit diagram very difficult to draw, however, and for that reason we are relying on the simplicity of the circuit, and the photographs, to guide the constructor here. He will find our claims of simplicity are not overrated, and will have no trouble at all to make a good job of the wiring.

Different coil boxes made by different firms will, of course, have different color codes, unfortunately, and so we have simply marked the circuit diagram "G," "P," &c., as we usually do, as a guide. Every box will have the color code marked against some such lettering, and no one should be troubled here. The same is true of the intermediates—they are always color-coded or numbered against a slip of paper included with the article itself.



A plan view of the chassis, which illustrates the layout of parts.

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A GLOBE WILL HELP YOU!

ONE of the handiest things the listener for overseas stations can possess is a globe. A globe, of course, is really a model of the world, correct in shape, and showing correctly the characteristics of the land and sea on the earth.

The average man obtains his visual idea of the earth from flat maps. These are valuable in many ways, for, obviously, one cannot go round with a globe in his pocket. But a map is at best a compromise with the real thing, and in order to gain a method of projecting a curved surface on a plane one, many things naturally must be distorted.

The globe is really the only method of showing correctly the comparative sizes of the various countries and continents, the areas of the oceans, and their geographical relationships. Its advantage here over the flat map is most pronounced at the Poles, where the distortion becomes greatest.

For instance, Greenland, on the conventional map (Mercator's projection), is shown to be about the same size as South America, whereas actually it is only less than one-fifth of the size. Canada in actual fact is about the same size as the United States, but on the flat map it appears to be about the same size. Alaska is only one-fifth as large as the U.S.A., but on the map it appears about one-half as large.

So the average man can be pardoned if he has rather a wrong impression in his mind's eye, when he conjures up a picture of the world, and the relationships between the area of its countries.

One of the most deceiving things about a map is that what appears to be the shortest distance between two places is in effect not the shortest distance at all. For instance, it might surprise many to realise that if a line drawn on the globe from New York to Sydney is continued, it will land somewhere over South Africa! This is certainly not the impression one would gain from a flat map.

Comparative distance and directions on flat maps are equally misleading. Steamships following greater circle courses, known to be the shortest, appear curved instead of straight. One measuring distances at the top of a map would be led to imagine that they were comparative with those at the centre, which, of course, is not the case. The Arctic circle is about one-sixth the length of the Equator, but, from a map, one would not think so.

For the listener to overseas stations, the map has a value and fascination peculiarly its own. We can vouch for the fact that it will teach him his geography! He can measure distances quickly, and has a quick and easy reference when working out directions for the various stations he hears.

The amateur transmitter will also find it valuable when working out problems dealing with directional aerials. It is this point which is possibly the most valuable, and, of course, it applies also to the mere listener, to whom directional aerials are almost as valuable as the transmitter.

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