

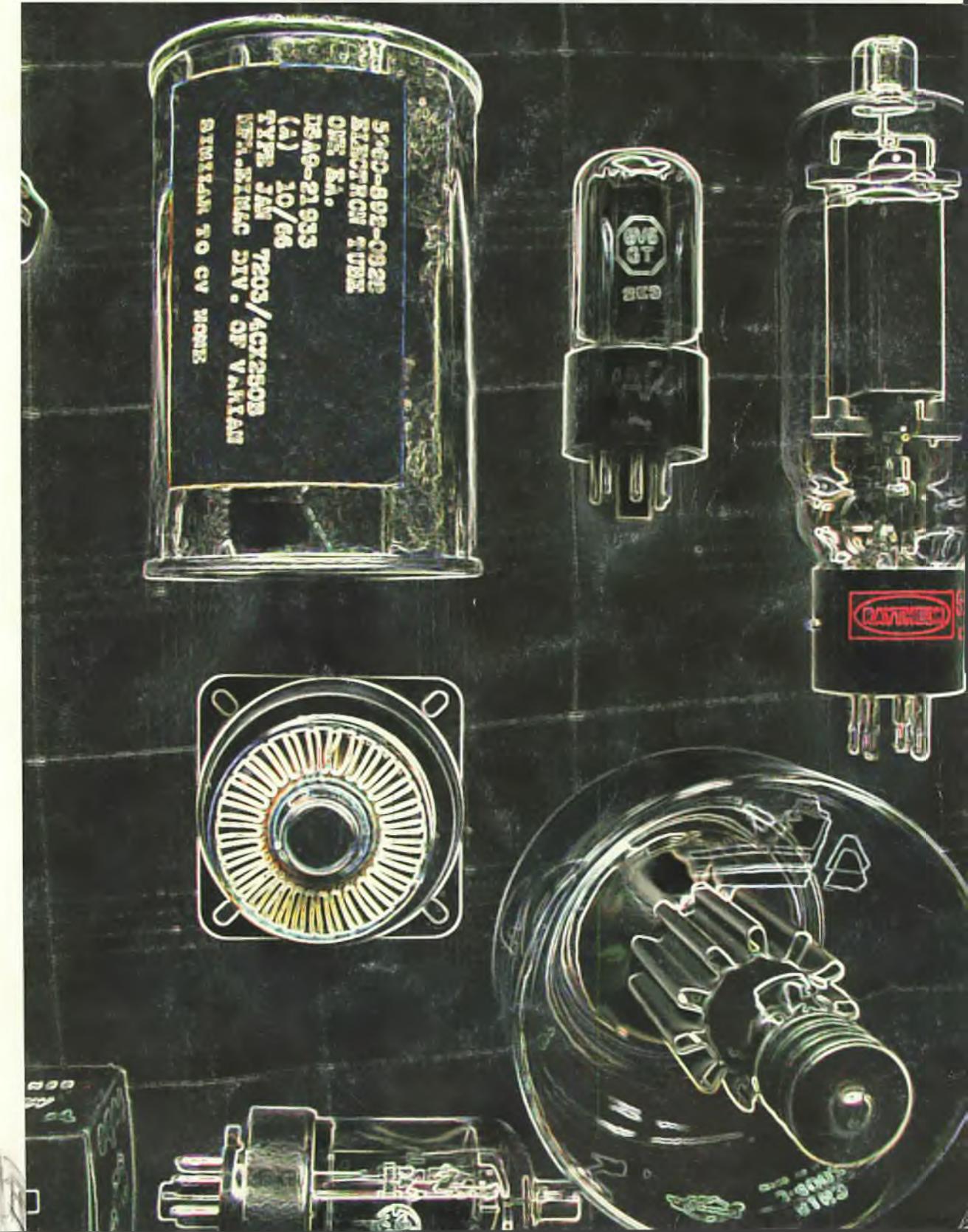


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NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS INC



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ZL1HUE	HUG, E K, PAGODA LODGE, PA ROAD, KERIKERI	ZL1JOE	TILLEY, K J, PO BOX 585, OPOTIKI
ZL1HV	GODFREY, A G, 882 EAST COAST RD, BROWNS BAY	ZL1JON	BARE, J A, 6 ROSE PLACE, KAMO, WHANGAREI
ZL1HW	DICKINSON, R, 135 GREENHITHE RD, GREENHITHE, AUCKLAND 1450	ZL1JP	BUCKTON, J V, 103 DRAYCOTT LANE, KNIGHTSBRIDGE RETIREMENT VILLAGE, MAIRANGI BAY, AUCKLAND
ZL1HY	EDWARDS, M B, 1031 PIAKONUI ROAD, WALTON	ZL1JR	JONES, J W W, PO BOX 39 403, HOWICK
ZL1HZ	CURTIS, C E, 5 ARGYLE RD, BROWNS BAY, AUCKLAND 10	ZL1JRJ	JONES, J R, PO BOX 181, OPOTIKI
ZL1IA	PIVAC, I G, 4271 GREAT NORTH RD, HENDERSON, AUCKLAND	ZL1JRL	LOTHROP, J, P O BOX 1709, WHANGAREI
ZL1IAG	MARSH, M D, 28 CHELVERTON TERRACE, RED BEACH, AUCKLAND 1461	ZL1JRR	Reece, John Robert, 3a Westney Road, Mangere, Auckland
ZL1IAN	HONEY, I, 68 SHAKESPEARE ST, LEAMINGTON, CAMBRIDGE	ZL1JS	MOYNIHAN, E N, 24 TAIKATA RD, TE ATATU NORTH, AUCKLAND 1008
ZL1IB	NZART TE PUKE BRANCH INC, C/- S.J. ROWE, 223 State Highway 33, RD 9	ZL1JSM	MACKINNON, J S S, 10 WILLIAMS CRESCENT, POINT WELLS, R D 6 WARKWORTH
ZL1IBM	Mosely, I B, Rockell Rd, R D 1, Hikurangi	ZL1JSS	SMYTH, J, C/- P & J SMYTH, 855, NO 1 ROAD, RD 2, TE PUKE
ZL1IC	HOLDSWORTH, R, SEXTON RD, RD 1, HAMILTON	ZL1JT	TURNWALD, J B, 29 CLIFF VIEW DRIVE, GREEN BAY, AUCKLAND
ZL1ICU	Mathews, Laurence, P O Box 17183, Greenlane, Auckland	ZL1JU	TEVIOTDALE, B M, PO BOX 7051, ROTORUA
ZL1ID	GRAHAM, N L, 75 CAMPBELL RD, MT MAUNGANUI	ZL1JW	PALTRIDGE, J S, 3 TUTERIE RD, PAPATOETOE
ZL1IE	HEYWOOD, B, 41 Memman Place, Barks corner, TAURANGA	ZL1JWF	FARMER, J W, 3 MATILDA PLACE, KAITAIA
ZL1IF	NORLING, LARS, PO BOX 1266, WHANGAREI	ZL1JYM	MOORE, J B, 37-A KIMBERHALL AVE, MT ROSKILL, AUCKLAND 1004
ZL1IG	MONKS, J, FLAT 2, 9 ABELIA PLACE, PAPATOETOE	ZL1JZ	DAVISON, P W, 59 BEERESCOURT RD, HAMILTON
ZL1IH	INTEMANN, R H D, 22 HIKUTAIA RD, OPOTIKI	ZL1KA	ADDIS, B G, 21 CLARK RD, R D 1, KARAKA 1750
ZL1II	GREEN, G P C, 248A OTIPUA RD, TIMARU	ZL1KAC	MCMURRAY-CATHCART, K A, PO BOX 2555, SHORTLAND STREET, AUCKLAND 1015
ZL1IJ	DAVISON, J G, 19 THOMPSON TCE, MANUREWA, AUCKLAND 1702	ZL1KAG	GOULD, T M, 7 PLUNKET STREET, DARGAVILLE 0300
ZL1IM	CARTER, E W A, 3 HAINES TCE, TE KUITI	ZL1KAN	LEES, M J, 30 FOUNDRY ROAD, SILVERDALE, HIBISCUS COAST AUCKLAND 1462
ZL1IMP	PRATT, I M, 25 SMITH ST, RAGLAN	ZL1KB	NEILL, P S, 11 TAUHARA STREET, GREEN BAY, AUCKLAND
ZL1IOY	YOUNG, I, 146 THE DRIVE, EPSOM, AUCKLAND	ZL1KCA	AW, K C, 80 SUMMERLAND DRIVE, WESTERN HEIGHTS, HENDERSON, AUCKLAND
ZL1IP	HILDRETH, D N, 1550 STATE HIGHWAY 16, WOODHILL, R D 2, HELENSVILLE	ZL1KCJ	LEWIS, Karen, 10a Anthony Cres, Fitzroy, Hamilton
ZL1IR	DOUGLAS, L M, 29 CHARLES CRES, HAMILTON	ZL1KD	FAIRWEATHER, A W, 69 BURWOOD RD, MATAMATA
ZL1IS	NZART BRANCH 81, PO BOX 606, HAMILTON	ZL1KE	PEDERSEN, K W, PO BOX 207, MANGONUI 0557
ZL1IS	CLARK, S P, 79 PARKHILL RD, BIRKENHEAD, AUCKLAND 1310	ZL1KEV	DOVE, K N, 64 MORROW AVENUE, PO BOX 20337, HAMILTON 2035
ZL1ISM	Mayhew, Christopher, 2 William Street, Waihi	ZL1KF	COLE, L J, 22 NEWCASTLE RD, DINSDALE, HAMILTON
ZL1IST	SCHNABL, I, PO BOX 690, YACHT IDEMO, TAURANGA	ZL1KFM	MITCHELL, K, 129 RIVERTON DRIVE, RANDWICK PARK, MANUREWA AUCKLAND 1702
ZL1IU	WALLACE, N L, SIGNALS RD, R D 1, OKAIHAU 0455	ZL1KG	RAMSAY, R J, 2A KING ST, WHANGAREI
ZL1IV	IRVING, G W, 50 GLASS RD, MT ROSKILL	ZL1KHN	Roberts, G, P O Box 39 631, Howick, Auckland
ZL1IVO	PABBRUWE, I, 99 BRADBURY RD, HOWICK	ZL1KI	HORWOOD, E W, 233 KING ST, WHAKATANE
ZL1IW	WATSON, I B, KOHINUI RD, RD1, ONERAHI, WHANGAREI	ZL1KIV	KIVELL, G J, PO BOX 145, KAWAKAWA 0291
ZL1IY	CLELAND, D E, 52 ALFRED ST, HAMILTON	ZL1KJW	BOWERS, D, 19 HOLLAND GROVE, RICHMOND HEIGHTS, TAUPU
ZL1IZ	WAITOMO BRANCH 55 NZART (INC), 3/49 HINEWAI STREET, OTOROHANGA 2564	ZL1KJ	COLE, GARY J, 25 MATANGI TERRACE, SNELLS BEACH 1241
ZL1JA	BERENDS, J M, 74 QUEENS AVE, WAIKUKU, RD 3, RANGIORA	ZL1KJU	ULMER, K J, YACHT MEHITABEL, C/- TOWN BASIN MARINA 37 QUAYSIDE, WHANGAREI
ZL1JAM	MACCALLUM, J, 128 GILLS ROAD, BUCKLANDS BEACH, AUCKLAND	ZL1KK	HARRISON, I A, 242C RAWHITI ROAD, RD 2, TE AROHA
ZL1JAQ	GOODENOUGH, J M, 754 EAST COAST RD, BROWNS BAY, AUCKLAND 1310	ZL1KL	COOPER, H G T, 5 GRAHAM PLACE, OTUMOETA, TAURANGA
ZL1JAT	TEHOAKI, J A, 13 SUTTON ROAD, DRURY, AUCKLAND	ZL1KLC	CARY, K L, P O BOX 92, GREENHITHE, AUCKLAND 1330
ZL1JAW	WEST, J A, 4 CRADOCK ST, AVONDALE, AUCKLAND	ZL1KLP	LUOSTARI, R P S, 69 HIGHRIDGE ROAD, CLEVEDON, AUCKLAND
ZL1JAZ	STIRLING, B T, 46 HARROWFIELD DRIVE, FLAGSTAFF, HAMILTON	ZL1KM	PETERSEN, K, 30B WILLOWBROOK LANE, R D 8, HAMILTON
ZL1JB	NALDER, C H, 403 b Woodstock Rimu Road, RD3, Hokitika	ZL1KMB	BREWER, K, 2 FLAGSTAFF TCE, DEVONPORT, AUCKLAND 1330
ZL1JBM	MULHOLLAND, J B, C/- 59 SUNRISE AVE, MURRAYS BAY, NORTH SHORE	ZL1KMN	FICZA, A, 111 View Road, Sunnyvale, AUCKLAND
ZL1JC	GRANGER, P L, 11 TAIT STREET, AVONDALE, AUCKLAND 1007	ZL1KN	HARRISON, N, 242C RAWHITI RD, RD2, TE AROHA
ZL1JD	DUNN, J R, 264 GLENVAR RD, TORBAY, AUCKLAND 1310	ZL1KO	GUBBINS, C P, 3 SACKVILLE ST, GREY LYNN, AUCKLAND 1002
ZL1JDL	HILDRETH, J D, 1550 STATE HIGHWAY 16, WOODHILL, R D 2, HELENSVILLE	ZL1KP	BURGESS, A B, 4 KILLARNEY ST, TE PUKE
ZL1JF	FINLAY, P T, 62 WOODSIDE RD, HENDERSON	ZL1KPH	HEMSWORTH, K, 20 ATHENRY PLACE, DANNEMORA, HOWICK AUCKLAND 1705
ZL1JG	DENT, R E, 7C BEACH ROAD, OREWHA, HIBISCUS COAST 1461	ZL1KQ	SMALL, J, 32 PADDINGTON ST, GLEN INNES 1006
ZL1JH	HALDANE, J E H,	ZL1KR	KLEYBURG, A, 12 CHERRYWOOD ST, HAMILTON
ZL1JI	LIU, ZHEN, 5/7 Edenvale Park Road, MT EDEN, AUCKLAND	ZL1KRH	HAMPSHIRE, K R, 5 SAPPHIRE DV, TAURANGA
ZL1JIM	DILLEY, J V, BAYSIDE MARINE, SIR PETER BLAKE PARADE, BAYSIDE, AUCKLAND	ZL1KRS	STEWART, K R, 5E SPRINGFIELD RD, ROTORUA
ZL1JJ	JACKSON, D W, 30 SUN GROVE RISE, SUNNYVALE, AUCKLAND 1008	ZL1KS	SMITH, K E, 27 BEDFORD STREET, TE ATATU SOUTH, AUCKLAND 1008
ZL1JJB	BRUMMER, J J, 154 NIXON STREET, HAMILTON EAST, HAMILTON	ZL1KSB	BENNETT, S J, 39 ADDINGTON RD, MANUREWA, AUCKLAND
ZL1JK	FREEMAN, J C, 3/7 Belle Verde Drive, MAIRANGI BAY, AUCKLAND 1310	ZL1KSS	SPENCE, K S, 1 KAHAOEA AVE, OMOKOROA 3050
		ZL1KT	TEVIOTDALE, D A, 7 BUDGEN ST, MT ROSKILL, AUCKLAND
		ZL1KU	BROOKING, K J,

ZL1DE	ADSHEAD, G O, 35 TREVOLA ST, AVONDALE	ZL1FY	ARMSTRONG, G W, MCIVOR RD, RD 4, WHAKATANE
ZL1DEE	ELLIS, D E,	ZL1FZ	COATES, K J, 2 BARDIA ST, TAKAPUNA
ZL1DEL	WROE, R D, 28 HANER DRIVE, URANGAN, HERVEY BAY, QUEENSLAND 4655	ZL1GAD	DAWICK, G A, 76 OKETE ROAD, TEUKU R D 1, RAGLAN
ZL1DES	RENNER, D M, 118 TE HAUMI DRIVE, PAIHA	ZL1GAR	RODGERS, A G, 16/41 BELL STREET, BELL GLEN, TAURANGA
ZL1DF	THAMES BRANCH NZ ART INC, 503 SEALEY ST, THAMES	ZL1GB	POWELL, D B, 6A UDY STREET, PETONE, LOWER HUTT
ZL1DFA	AYERS, D F, PO BOX 1756, SHORTLAND ST, AUCKLAND	ZL1GBB	BRAMWELL, G B, 27 LUCAS PLACE, FENTON PARK, ROTORUA
ZL1DG	GOODHEW, A D, 2369 CAMBRIDGE RD, TE AWAMUTU	ZL1GBJ	JACOBI, B R, 8 BENELLA ST, TOKOROA
ZL1DGK	KING, D G, PO BOX 126, HAMILTON	ZL1GC	CRAIG, G H, 12 EXPLORATION WAY, WHITBY
ZL1DH	EDWARDS, J R, 2 MOTUORA AVE, MANLY, WHANGAPARAOA 1463	ZL1GD	HIGHET, R J, 6-A BROOKFIELD RD, TE ATATU PENINSULA, AUCKLAND 1008
ZL1DI	LOGAN, J D, 17A QUONA AVE, HILLSBOROUGH, AUCKLAND 1004	ZL1GDH	HENLEY, G D, 4 CARSON ST, TOKOROA
ZL1DIY	ECKHOFF, C, PO BOX 5, RUSSELL	ZL1GE	MANNING, E, LAKE NGATU, R D 1, AWANUI 0552
ZL1DJB	BLOOMFIELD, D J, 191 KAURI RD, WHENUAPAI, AUCKLAND 1250	ZL1GEK	BADCOCK, R F W, P O BOX 302-620, NORTH HARBOUR, AUCKLAND 1330
ZL1DJH	HARWOOD, D, 5 ALOMA WAY, DEANWELL, HAMILTON	ZL1GEO	MILLER, G A, 49 TE AWA LANE, RD 3, HAMILTON
ZL1DJS	SILVESTER, D J, 237 WOODSIDE ROAD, COOPERS CREEK, OXFORD	ZL1GF	FISH, J F, 14 HOWARD RD, NORTHCOTE
ZL1DJT	TAYLOR, D J, 142 WELCOME BAY RD, TAURANGA	ZL1GG	VAN ZANDT, G, PO BOX 330, MANGONUI
ZL1DK	KARRASCH, D F, 24 BROOKE RD, PAPAKURA, AUCKLAND	ZL1GH	HAY, G R,
ZL1DKM	MACARTNEY, D K, 6 ART LANE, PUTARURU	ZL1GI	PRICE, P G, 67 ST ANDREWS DRIVE, BETHLEHEM, TAURANGA
ZL1DKW	DUREY, K, 13 WILDING AVE, NORTHCOTE, AUCKLAND	ZL1GIB	BAREA, H, 179 DOUGLAS AVE, TE AWAMUTU 2400
ZL1DLA	LUDWIG, D, MOUNT TIGER GARDENS, RD 1 ONERAHI, WHANGAREI	ZL1GIR	ROBSON, I G, 13 SUTTON ROAD, DRURY, AUCKLAND 1750
ZL1DLC	CULLOTY, D L, C/O 37 RAWHITI TCE, KELBURN, WELLINGTON	ZL1GK	SHERRARD, GRAEME, 21 CORCORAN ROAD, TE PAHU R.D.5, HAMILTON
ZL1DM	GRAYSON, R T, 25 REMBRANDT PLACE, PAPAKURA	ZL1GKO	OLIVER, G K, 28 HOUCHENS ROAD, GLENVIEW, HAMILTON
ZL1DMA	MCCULLAGGAGE, D, P O BOX 615, WHANGAREI	ZL1GL	KELLY, T D, 3/133 KOHIMARAMA ROAD, KOHIMARAMA, AUCKLAND 1005
ZL1DMB	BOSHIER, D M, 140 GLOUCESTER RD, MT MAUNGANUI	ZL1GM	GLADDING, M, 209 BALLIE STREET, THAMES 2801
ZL1DN	EVANS, D G, 31 MATIPO STREET, PUKETE, HAMILTON	ZL1GMW	WRIGHT, G M, 19 VINA PLACE, MASSEY, AUCKLAND
ZL1DOF	FLETCHER, D O, R D 2, KAIKOHE	ZL1GMZ	MATHEW, GEORGE,
ZL1DOT	PATTISON, B I, 1/16 Matipo Place, Hora Hora, WHANGAREI	ZL1GN	BECKHAM, D S R, 27 FIFTH AVE, MT ALBERT, AUCKLAND 3
ZL1DP	PAUL, R E, PO BOX 33-415, TAKAPUNA, AUCKLAND 1332	ZL1GO	SEKO, A, 204 BLEAKHOUSE RD, HOWICK, AUCKLAND 1705
ZL1DR	BROOKER, A S, 1023 MALINGAKAWA RD, RD 4, CAMBRIDGE	ZL1GOT	TUNNICLIFFE, G O L, REDWOOD MASONIC VILLAGE, TE NGAE ROAD, ROTORUA
ZL1DRS	SHORT, D R, PO BOX 10-227, TE RAPA, HAMILTON	ZL1GP	HENDERSON, R J, 87 GRANGE RD, MT EDEN
ZL1DRT	TYNDALL, D R, PO BOX 222, KAITAIA 0500	ZL1GPS	SHAW, P J, 49 MOUNT VIEW RD, HAMILTON
ZL1DS	STRONG, D J, PO BOX 184, WARKWORTH	ZL1GQ	HARDWICK, D B, 368/4 GLUE POT ROAD, OROPI, RD 3, TAURANGA
ZL1DSP	PICKLES, D S, PO BOX 124, CLEVEDON 1750	ZL1GRG	GREY, G R, 284 KENNEDY RD, ONEKAWA, NAPIER 4001
ZL1DST	TAPP, D, 19 KAURIMU RISE, TITIRANGI, AUCKLAND	ZL1GS	SHACKLETON, E G, PO BOX 22, KAITAIA
ZL1DT	TURNBULL, JOHN, 1206 RIVER ROAD, RD 1, REPOROA	ZL1GSG	STORZ, G, 12 HARBUTT AVE, MT ALBERT, AUCKLAND 1003
ZL1DTE	EWEN, D T, 29 BRAIGH RD, WAIPU 0254	ZL1GSM	MANNING, G S,
ZL1DTM	MCGEE, D, 97 BALMAIN RD, BIRKENHEAD, AUCKLAND	ZL1GSN	NISBET, G S, 21 WILLIAMS AVE, KAIKOHE
ZL1DV	VEALE, R S, 31 RANGITOTO AVE, REMUERA	ZL1GSP	PURVIS, G S, 2 NELSON ST, PAPAKURA, AUCKLAND 1703
ZL1DW	WALPOLE, D B, RD 5, TUAKAU, AUCKLAND 1892	ZL1GTB	BEAGLEY, G T, 24 BLOMFIELD ST, ROTORUA 3201
ZL1DWB	BLOOM, D W, MATAPOURI RD, TUTUKAKA, R D 3, WHANGAREI	ZL1GU	ROLFE, E M, 9 TAIT ST, KAMO, WHANGAREI
ZL1DX	DAVIES, R G, 31 MEARS ROAD, ST ANDREWS, HAMILTON	ZL1GVP	POINTON, G V, 3/8 WAHANUI ROAD, ONE TREE HILL, AUCKLAND
ZL1DYC	HEYER, H L, BREWSTER RD R D 1, TUAKAU, AUCKLAND 1892	ZL1GW	DUFFELL, A H, 16 HYDE AVE, DINSDALE, HAMILTON
ZL1DZ	CAMPBELL, Q D, 22 HALL CRESCENT, TAUMARUNUI	ZL1GWE	DUFFELL, 57 CRESCENT ROAD EAST, PALM BEACH, WAIHEKE ISLAND 1240
ZL1FA	GREENAWAY, A W, 14 LINDOCH AVE, TE PUNA RD 2, TAURANGA	ZL1GWP	PETRIE, G W, 64 SUNNYHILLS AVE, GLENVIEW, HAMILTON 2030
ZL1FB	BELL, J F G, 34 LAYTON RD, WHANGAPARAOA, AUCKLAND	ZL1GYM	MUZYKA, G Y, 33 VERNONT ST, PONSONBY, AUCKLAND
ZL1FC	BROTT, R O, RD 2, CHURCH RD, KAITAIA	ZL1GZ	GRAHAM, E W, 18 SEAWAY TCE, TAURANGA
ZL1FD	ARMSTRONG, D K, KAITUNA RD, RD 9, TE PUKE	ZL1HA	THOMPSON, F J, 29B HIGHGROVE LANE, GLENFIELD, AUCKLAND 1309
ZL1FF	Buckeridge, T, 409 Awatea St, Akina, Hastings	ZL1HAB	HUNGATE, H A, PO BOX 25026, TOWN BASIN, WHANGAREI
ZL1FG	GILBERT, W S, 25 BAY VIEW RD, RAGLAN	ZL1HAM	HAM, L J S, 58B FERGUSSON ST, TOKOROA
ZL1FH	Hudson, R F, 670 Grey St, Claudlands, Hamilton	ZL1HAU	HAU, A T, 10 ROBIN HOOD PLACE, ONERAHI, WHANGAREI
ZL1FI	POWER, W T, 24 KOKIRI STREET, ROTORUA	ZL1HB	HOLTZ, H R, 60 LANDING DRIVE, ALBANY, AUCKLAND 1331
ZL1FJ	SMITH, B, 81 HATEPE AVE, TAUHARA, TAUPO	ZL1HC	SCHOEMAN, S J O, 43 TURAKINA STREET, NEW PLYMOUTH
ZL1FK	CHALLINOR, M J, 15B HARRYBROOK RD, GREEN BAY, AUCKLAND 1007	ZL1HE	AHMU, H E, 388 ROSCOMMON RD, MANUREWA, SOUTH AUCKLAND 1702
ZL1FL	WATERHOUSE, D C, 2 MOANA TCE, MARAETAI, AUCKLAND 1705	ZL1HF	BAKER, G C, 101 HINEWA RD, TAURANGA
ZL1FM	LITTLEWOOD, B R, 34 MASON AVE, PUKEKOHE	ZL1HH	COTTLE, D J, RAINBOW FALLS ROAD, R D 2, KERIKERI
ZL1FMA	MAY, Frank, 44/B Mount View Drive, ROTORUA	ZL1HI	WILLIS, M W, HARPOON HILL, R D 1, GREAT BARRIER ISLAND
ZL1FN	KEESING, S,	ZL1HIT	RENTOUL, B J, 2/24 PRINCE REGENT DRIVE, BUCKLANDS BEACH, AUCKLAND
ZL1FND	FAR NORTH DISTRICT AMATEUR RADIO CLUB, PO BOX 4, AWANUI 0552	ZL1HJ	GANNON, M, 9 LIVERPOOL ST, TE KUITI
ZL1FO	BRENNAN, C F,	ZL1HK	SOUTH AUCKLAND REPEATER GROUP, C/O AV WALKER, 51 CARONIA CRES, MT ROSKILL, AUCKLAND
ZL1FOX	SINCLAIR, S C, PO BOX 45, ROLLESTON, CANTERBURY	ZL1HL	CARREL, J L, 167 ST ANDREWS RD, EPSOM
ZL1FP	RUMBLE, O W, 48 PAREWAITAI COURT, PAPAMOA 3003	ZL1HMS	FREELY, W B, C/O B ROWLINGS, 22 TAINUI ST, ONERAHI, WHANGAREI
ZL1FR	NIXON, J R, 363 QUEEN ST, AUCKLAND CENTRAL	ZL1HMT	TOLLENAAR, H, 1/33 ARGO DRIVE, HALFMOON BAY, AUCKLAND 1706
ZL1FRO	WISEMAN, A R, 57/A PARK ESTATE ROAD, PAPAKURA, AUCKLAND	ZL1HN	FARRELL, B, 18 OBAN AVENUE, GLENVIEW, HAMILTON
ZL1FS	MILLER, S P,		
ZL1FT	RIESTERER, L W, APOTU ROAD, KAURI, R D 1, KAMO		
ZL1FTL	LEWIS, F T, 16C STANNERS ROAD, RD 2, KERIKERI		
ZL1FU	HIBISCUS COAST AMATEUR RADIO CLUB INC, 479/1 WHANGAPARAOA RD, WHANGAPARAOA 1463		
ZL1FV	RUNCIMAN, G J, 18 LANSELL DRIVE, PARKLANDS, HOWICK AUCKLAND 1705		
ZL1FW	ROWE, M J,		
ZL1FX	HYDE, K G, 126B TE ATATU RD, TE ATATU SOUTH		

ZL1BYY

ZL1BYY	CARTWRIGHT, G T, 7 RAINES AVENUE, FORREST HILL, AUCKLAND 1309	ZL1CK	MARTIN, E T, 330 MAIN ROAD, R D 1, TOTARA, THAMES KELLERMANN, C, PO BOX 274, WAIKU, SOUTH AUCKLAND
ZL1BYZ	SHAW, J N, C/O POST OFFICE, PAERATA	ZL1CKM	BAUMGARTNER, A E, PO BOX 3501, RICHMOND 7031
ZL1BZ	HOWITT, I M, 3/49 HINEWAI STREET, OTOROHANGA	ZL1CLF	LANDMAN, A H, 22 NGAHERE STREET, INGLEWOOD
ZL1BZA	BARNETT, Z, 152 EDEN AVE, TE AWAMUTU	ZL1CLG	CALDWELL, J, 44 UXBRIDGE RD, HOWICK, AUCKLAND
ZL1BZC	MURCH, D E, 51 FOSTER AVE, HUIA, AUCKLAND	ZL1CM	PRINCE, R P, 425 LUND ROAD, R D 2, KATIKATI 3063
ZL1BZF	NESFIELD, J C, 12 JUBAEA PLACE, HENDERSON 1008	ZL1CMA	ELLWOOD, R, 152 MANGANESE PT ROAD, R D 4, WHANGAREI
ZL1BZL	ELLIS, D G R, 14-B GRANT ST, KAMO, WHANGAREI	ZL1CMB	BARNETT, C M, 11 Olive Street, Papatoetoe, AUCKLAND
ZL1BZT	CAWTE, P L,	ZL1CMC	CHRISTENSEN, C M, C/O 116 DONALD RD, KAITAIA
ZL1BZW	RODGER, T R R, 126 PYES PA ROAD, TAURANGA	ZL1CMG	Gray Catherine, 52 Waimapu Street, Greerton, Tauranga
ZL1BZZ	HOLMBERG, R E, RD 5, TAURANGA	ZL1CMK	MORRISON, C M K,
ZL1CA	TREBES, C E, VILLA 18, OCEAN SHORES VILLAGE, 80 MARANUI STREET, MT MAUNGANUI	ZL1CMR	ROWLANDS, C M, 6 MONTAGUE PLACE, ONERAHI, WHANGAREI
ZL1CAB	WHITTAKER, D J, 108A COMRIES ROAD, CHARTWELL, HAMILTON	ZL1CN	WOODFIELD, M K, 182 INGLETON ROAD, RD 2, WELLSFORD
ZL1CAC	HARSANT, N G, 105 CORONATION RD, HILLCREST, AUCKLAND 9	ZL1CNB	BRADFIELD, C N, 18B KITEWAO STREET, NORTHCOTE, AUCKLAND 1309
ZL1CAD	FRANCIS, S D, PO BOX 9313, NEWMARKET, AUCKLAND	ZL1COB	COBUSSEN, D G, PO BOX 29047 GREENWOODS CNR, EPSOM, AUCKLAND 1003
ZL1CAF	FRANCIS, M E, P O BOX 75530, MANUREWA, AUCKLAND	ZL1COD	SHEARER, J M, 57 STANLEY ST, TAupo 2730
ZL1CAH	MEYER, B F M, BARRETT RD, RD 10, HAMILTON	ZL1COM	JAMES, A B, PO BOX 100028, NORTH SHORE MAIL CENTRE, AUCKLAND
ZL1CAK	MILLER, R N, 106 CHADWICK RD, GREERTON, TAURANGA	ZL1COP	BRILL, A J, Private Bag 92002, AUCKLAND
ZL1CAL	BADMAN, N A, C/- SIMPLY SOUVENIERS, 11 MARAMA ARCADE, TAUPA	ZL1COR	TRENNER, T L, 72 LILLIS LANE, COROMANDEL
ZL1CAM	MCKAIN, C A, 8 EXETER ST, MT MAUNGANUI	ZL1COX	HOTSON, ANN, 40 PETRIE ST, WESTBROOK, ROTORUA
ZL1CAQ	GREGORY, J H, 29 RUAWAI RD, MT WELLINGTON	ZL1CP	CLARKE, R W, KAIMAUMAU RD, RD1, AWANUI 0552
ZL1CAS	GATES, N L, 542 WHANGAPARAOA RD, WHANGAPARAOA, AUCKLAND	ZL1CPL	WILTSHIRE, N L, 42 ATHENREE RD, RD 1, KATIKATI
ZL1CAT	NEWLAND, P J, MIDDLETON RD, RD 3, PAPAKURA	ZL1CPS	SHORT, N J, P O BOX 3000, TAUPA
ZL1CAU	EARNSHAW, M B, PO BOX 100862, NTH SHORE MAIL CENTRE, AUCKLAND 1330.	ZL1CPZ	ROBERTS, R W, 103 FAIRY SPRINGS ROAD, ROTORUA
ZL1CAV	VAN KUILENBURG, P A, 45 FARRELLY AVE, MT ROSKILL	ZL1CQ	DALRYMPLE, M B,
ZL1CAX	LAIRD, A G, EAST COAST RD, MAHIA, NUHAKA 4192	ZL1CR	NGAKURU, R A, PO BOX 278, KAIKOHE
ZL1CAY	LIDDLE, B D, 3 HINEMOTU AVE, KAWERAU	ZL1CRB	BAGRIE, R, 1 YORK ST, DRURY, AUCKLAND 1750
ZL1CB	NZART TE AWAMUTU BRANCH 40, C/- B WESTERBAAN ZLIWT, 38 WHITAKER STREET, KIHIKIHI 2430	ZL1CRM	MOUNTFORT, C R,
ZL1CBA	DE RIDDER, L J, PO BOX 246, KERIKERI	ZL1CS	SHAW, Craig, 1897-38-67 Takehara, Nakano-shi, Nagano-ken
ZL1CBD	WILSON, I A, 28 BUTLER RD, KERIKERI	ZL1CSC	CLAYTON, C S, 6 SPINNAKER DRIVE, TE ATATU PENINSULA, AUCKLAND 1008
ZL1CBE	WRIGHT, W A, R D 1, AWANUI	ZL1CSF	FOO, C S, 1-68 ALICIA ROAD, MEADOWLANDS, HOWICK, AUCKLAND 1705
ZL1CBI	GUILFORD, L I, FLAT 2/35 PROSPECT TCE, MILFORD, AUCKLAND	ZL1CT	TRAN, C, THE COTTAGE, ORINO CO VALLEY, RD1, MOTUEKA
ZL1CBQ	CONTESSA, L, PO BOX 7085, TIKIPUNGA	ZL1CTC	CURTIS, R A, 11 KEITHA PLACE, GLENVIEW, HAMILTON 2001
ZL1CCA	CUMBERLEGE, A C, 26 KNIGHTSBRIDGE DRIVE, FORREST HILL, AUCKLAND 1310	ZL1CTI	BOWMAN, M S, 10 PURIRI ST, TAKAPUNA, AUCKLAND 9
ZL1CCD	CUMIN, M H, PO BOX 334 082, SUNNYNOOK, AUCKLAND 1330	ZL1CTR	CARY, T R, P O BOX 92, GREENHITHE, AUCKLAND 1330
ZL1CCG	NEIL, H P, 203 PARAWAI ROAD, THAMES	ZL1CUC	HOBSON, J, 20 HOBSONVILLE RD, MASSEY, AUCKLAND 8
ZL1CCI	ANDERSON, J C, 6 WAITAKI BRIDGE PARK, 6 R.D.H., OAMARU	ZL1CUT	ALEXANDER, C J, 49 RICHARD FARRELL AVE, REMUERA
ZL1CCJ	GOODENOUGH, A R, 754 EAST COAST RD, BROWNS BAY	ZL1CV	FIRMAN, R J, 19 TAINUI ST, ONERAHI
ZL1CCN	PEARCE, P B, 3 SHANKILL PLACE, DANNEMORA, AUCKLAND	ZL1CVD	DAY, C V, 30 Killen Road., RD2 KATIKATI 3063, BAY OF PLENTY
ZL1CCP	DAVIS, T A, 224 KIRKWOOD ST, THAMES	ZL1CVK	WAHRLICH, R M, WHANGAMARINO RD, RD 2, TE KAUWHATA
ZL1CCT	NZART RAGLAN BRANCH 83 INC, C/O 25 BAYVIEW RD, RAGLAN	ZL1CW	HARGRAVES, J E, 7 OSTEND RD, OSTEND, WAIHEKE ISLAND 1240
ZL1CCV	PURVES, P S, 15 YOUNG ST, HAMILTON	ZL1CWD	CROMARTY, N C, 20 RAUTARA ST, ORAKEI, AUCKLAND 1005
ZL1CD	BRADNAM, R J, 58 FANCOURT ST, MEADOWBANK, AUCKLAND 1005	ZL1CWK	HAGAN, G, 919 WAINGARO RD, RD 2, NGARUAWAHIA
ZL1CDE	BRICKLAND, R L, 52 ASCOT PLACE, TE AWAMUTU	ZL1CX	SYKORA, P, P O BOX 302 346, North Harbour, AUCKLAND
ZL1CDF	UREN, P E, 4 FRASER ST, HUNTLY	ZL1CY	WEBSTER, D M, 46 SPEIGHT RD, KOHIMARAMA
ZL1CDJ	KITCHEN, D H, 146 MARAMARAH RD, RD 1, THAMES	ZL1CYK	STANSFIELD, D, P O BOX 15-038, TAURANGA
ZL1CDM	ROBERTS, D F, 2/162A KING ST, WHAKATANE	ZL1CYM	WILLIAMS, T O, 1/37 TITOKI STREET, TE ATAT PENINSULA, AUCKLAND
ZL1CDO	CRAIG, DAVID, 4 MARGARET PLACE, MELVILLE, HAMILTON	ZL1CZ	DUXBURY, T A, 3/57 MARGAN AVE, NEW LYNN, AUCKLAND 7
ZL1CDP	PARNELL, CHRIS, 10 COLENSO PLACE, MISSION BAY, AUCKLAND	ZL1DA	DAVIS, D S, 6 BROOKE TCE, CAMBRIDGE
ZL1CDQ	POWELL, G W, 394 BELK RD, RD 1, TAURANGA	ZL1DAA	BEAUMONT, G S, 70 WHAU VALLEY ROAD, WHANGAREI
ZL1CDT	WILSON, S M, KIRIKOPUNI RD, R D 2, WHANGAREI	ZL1DAB	WILLIAMS, G H, DRAFFIN RD, R D 9, WHANGAREI
ZL1CDW	KEEL, K P, 5 HICKFORD PLACE, OKATO, TARANAKI 4652	ZL1DAC	MOATES, C M G, PO BOX 102, MAUNGATAPERE
ZL1CDX	FIELDING, T, 26 ROOSEVELT RD, ROTORUA	ZL1DAD	SWIFT, G N, 8 AWHIRANGI PROMENADE, SWANSON, AUCKLAND
ZL1CDY	WALKER, R G, AO MARAMA PLACE, RD1, KERIKERI	ZL1DAI	EYRE, Edward, 5 Brunton Place, Glenfield, North Shore
ZL1CE	WILSON, G R S, 164 LADIES MILE, ELLERSLIE, AUCKLAND 1005	ZL1DAJ	COTTLE, J N, RAINBOW FALLS RD, R D 2, KERIKERI
ZL1CED	LEE, J, 54 LAGOON DRIVE, PANMURE, AUCKLAND 1006	ZL1DAS	WERLBERGER, B, MIRANDA ROAD, R D 1, POKENO 1872
ZL1CEG	GATES, A, 542 WHANGAPARAOA RD, WHANGAPARAOA, AUCKLAND 1463	ZL1DAW	WAKEFIELD, I C, 11 TUNUI PLACE, WHAKATANE
ZL1CEJ	FRANCIS, W D, P O BOX 75530, MANUREWA, AUCKLAND	ZL1DAY	DEWAR, D B, P O BOX 683, GISBORNE
ZL1CFV	VEITCH, CHARLES, P O BOX 57, WAIPAWA	ZL1DB	ST CLAIR, P R, P O BOX 14-195, PANMURE, AUCKLAND 1006
ZL1CG	Cheyne, Gavin Alexander,	ZL1DBI	SHELDON, R L, 16 CARTER ST, MT MAUNGANUI
ZL1CGB	SMITH, B J, 19 FIELDSTONE COURT, HOWICK, AUCKLAND	ZL1DBL	RALSTON, W B, 168 CAMBRIDGE RD, TAURANGA
ZL1CH	BOYD, H A, FAIRVIEW VILLAGE, 325/21 FAIRVIEW AVENUE, ALCBAY, AUCKLAND	ZL1DBM	RALSTON, 111 OLD PARUA BAY ROAD, RD 5, WHANGAREI
ZL1CHM	GILLEN, S M, 24A RIDGEWOOD CRESCENT, BIRKENHEAD, AUCKLAND 1310	ZL1DC	RIETZ, B A, P O BOX 82, TE AROHA 2971
ZL1CI	MEYER, T R, 9 HARDY PLACE, COOKS BEACH, RD 1, WHITIANGA	ZL1DCW	WEATHERLEY, D C, 70 GEORGE POINT ROAD, ONERAHI 101, WHANGAREI
ZL1CIM	GILLETT, S J,	ZL1DD	KIRKWOOD, B J, 66 CORY RD, WAIHEKE ISLAND 1240
ZL1CJ	SMITH, B W, KIMIHIA RD, RD 1, HUNTLY	ZL1DDL	GUENTHER, U, 27A TEMPLE ST, MEADOWBANK, AUCKLAND 1005

ZL1BN1	BRANT, P A, 41 REGENT ST, PAPATOETOE	ZL1BSC	FITZPATRICK, D J, 238 Valley Road, KAWERAU
ZL1BNJ	PEDERSEN, W J, PO BOX 404, OPOTIKI	ZL1BSG	PEARCE, T K L, 23 AUREA AVE, PAKURANGA
ZL1BNK	PAINTING, F J, 26 GREENACRES DRIVE, KAWAKAWA	ZL1BSN	WALLINGFORD, N, 55 WATLING ST, TAURANGA
ZL1BNL	SCHRICKEL, H J E, 8 MCPHERSON ST, REMUERA	ZL1BSS	HAWKER, A R, 94 HARRINGTON RD, HENDERSON
ZL1BNM	LARCOMBE, D C, 5 MCMILLAN PLACE, HOWICK,	ZL1BSW	WINGER, B S, PO BOX 1532, WHANGAREI
	AUCKLAND	ZL1BT	CHALLIS, D J, 4 OLIVER TWIST AVE, HOWICK, AUCKLAND
ZL1BNN	CAZALET, R, 19 HALBERG ST, PAPAKURA, AUCKLAND		1705
	1703	ZL1BTA	RODGERS, S J, 19 CRADOCK ST, AVONDALE
ZL1BNO	TWINAME, M H, FLAT 2, 4 BURT RD, MT WELLINGTON	ZL1BTB	PINFOLD, M A, 28 MCKENZIE RD, OWHATA, ROTORUA
ZL1BNP	WERE, B J, 366C ROTOKAURI RD, RD 9, HAMILTON	ZL1BTF	ROGERS, LESLEY, GILL ROAD, R D 3, KAITAIA
ZL1BNQ	GAMBLE, A A R, 19A CHIANIA PLACE, HOWICK,	ZL1BTI	MORONEY, R J, 495 SEAVIEW RD, ONETANGI, WAIHEKE
	AUCKLAND 1705		ISLAND 1081
ZL1BNV	KEATINGE, A, 8 BARNARD STREET, MATAMATA	ZL1BTK	PARKINSON, R J, 70 VANDELEUR AVE, BIRKDALE
ZL1BNW	COLLIN, J V, 65 PAINE ST, TAURANGA	ZL1BTL	ROWE, N G, PO BOX 161, CLEVEDON, MANUKAU
ZL1BNY	SHAKES, D B, 4 HERBERT STREET, TAKAPUNA,	ZL1BTP	TUBBY, E L, 470 PAPAMOA BEACH RD, PAPAMOA BEACH
	AUCKLAND		
ZL1BNZ	CLOUGH, D L W, 5 KELLY ST, ROTORUA	ZL1BTT	MACKAY, COLIN, 84 FRANCIS STREET, TAKAPUNA,
ZL1BOA	WIGG, J D, 42 DEEP CREEK, RD TORBAY, AUCKLAND	ZL1BTU	AUCKLAND 1309
ZL1BOE	MUIR, C B, PO BOX 54-228, BUCKLANDS BEACH,		ORANGE, L R, PO BOX 40-262, GLENFIELD, AUCKLAND
	AUCKLAND	ZL1BTX	1310
ZL1BOF	URQUHART, G A, 9 FOUR TREES, HOWICK	ZL1BTY	VAN DER MEULEN, F P, 20 WALTER ST, TAKAPUNA
ZL1BOG	DONNELLY, D R, 46 ELLISTON CRES, STANMORE BAY,	ZL1BTZ	MAINDONALD, D C, 123B DOMINION ROAD, MT EDEN,
	WHANGAPARAOA		AUCKLAND
ZL1BOI	BAY OF ISLANDS AMATEUR RADIO CLUB (INC), C/O MRS	ZL1BU	DAWE, L J, 6 LINWOOD AVE, FORREST HILL, AUCKLAND
	J COTTLE, RAINBOW FALLS RD RD 2, KERIKERI	ZL1BUI	10
ZL1BOK	ROWNTREE, R J, PO BOX 163 086, LYNFIELD, AUCKLAND	ZL1BUJ	FREDERICK, G I, 96 LAKEWOOD DRIVE, TAupo 2730
ZL1BOM	GLASGOW, M R, 11 BOWLER LANE, RD 6, TAURANGA	ZL1BUK	WILLIS, R P, PO BOX 3102, ONERAHI, WHANGAREI
ZL1BON	BONNINGTON, L M, 2 HIKUTAIA STREET, TE AROHA	ZL1BUL	MACKEY, C J, R D 1, KAMO, WHANGAREI
ZL1BOP	EMERY, N F, 10 CHARMAINE RD, TORBAY, AUCKLAND	ZL1BUP	DUSKE, J S, 11 PENDENE PLACE, FORREST HILL,
	1310	ZL1BUQ	HOLMES, N E, 4 BAMBURY CLOSE, PT CHEVALIER,
ZL1BOQ	DUFFY, D B H, 327 WAIKU RD PUNI, R D 3, PUKEKOHE	ZL1BUS	AUCKLAND 1002
	1800	ZL1BTB	JOHNSON, F T J, 49 YOUNGS RD, PAPAKURA
ZL1BOS	WILLIAMS, J B, KAINUI ROAD - 520, R D 1, TAUPIRI 2171	ZL1BUV	HAIGH, W H, 12 KAURI LOOP RD, ORATIA, AUCKLAND 7
ZL1BPA	CORIN, T G, PO BOX 11-018, ELLERSLIE, AUCKLAND 1131	ZL1BTU	O'BRIEN, T N, WISEMANS RD, RD, WAI TOA
ZL1BPPB	SMITH, R A, 37 KENSINGTON RD, WAIHI	ZL1BTV	EGGLETON, P W, PO BOX 109, RUSSELL 0255
ZL1BPC	MARTIN, F B, 223 BELLEVUE RD, TAURANGA	ZL1BUU	LEVIN, P C, RD 2, TAUPRI
ZL1BPE	PERSEN, B W, 26 JARMAN ROAD, MT WELLINGTON,	ZL1BUY	FINN, W J, 30 ATTWOOD STREET, R D 4, WHANGAREI
	AUCKLAND	ZL1BUZ	PONT, A, 8 LACHLAN AVE, ARATAKI, MT MAUNGANUI
ZL1BPF	WILCOX, H J, 64 TAYLOR RD, MANGERE BRIDGE	ZL1BVA	CULLEN, J K, 71 PATERSON STREET, MOUNT
ZL1BPI	RONKE, B R,		MAUNGANUI
ZL1BPJ	CHRISTENSEN, R A, JOHNSON STREET, ORMONDVILLE	ZL1BVB	YUEN, S T, 7 DALLAS PLACE, AVONDALE
	RD7, DANNEVIRKE	ZL1BVK	LEARMOND, A H, 14 TAKAPU ST, HENDERSON
ZL1BPK	JUNGE, A G, 128 STANLEY ST, TE AROHA	ZL1BVN	VAN DER HULST, P W, MATANGI RD, RD 4, HAMILTON
ZL1BPM	BROWNE, L, 27 VIVIAN DRIVE, OMOKOROA	ZL1BVO	MESSINGER, G E, 104 ELIZABETH ST, TAUP0
ZL1BPN	JOHNSON, E A, 11 KOWHAI PARK RD, WHANGAREI	ZL1BVT	SLEIGH, J P,
ZL1BPP	WILKINS, D J H, 12 VALDESE RISE, BROWNS BAY	ZL1BVW	BOYLAN, R P, 1 CERAMCO PLACE, TORBAY, AUCKLAND
ZL1BPPQ	NETTLEINGHAM, F J, MATAHUI RD, RD 2, KATIKATI		10
ZL1BPU	GREENMAN, M, 94 SIM RD KARAKA, R D 1, PAPAKURA	ZL1BW	WOLTERS DORF, W G E, SUITE 5, ACCADIA ON THE
	1730	ZL1BWC	AVENUES, 101 EDGECUMBE ROAD, TAURANGA
ZL1BPV	KELLY, D B, 17 ASHURST AVE, HAMILTON	ZL1BWD	COMBER, J P, 21 CASTOR PLACE, SUNNYBROOK,
ZL1BQ	AUCKLAND VHF GROUP INC, PO BOX 40-525, Upper Hutt,		ROTORUA
	Wellington	ZL1BWG	DOBBS, L, 32 AMBLESIDE DRIVE, CUMBRIES DOWNS,
ZL1BQA	DOELL, E D, 11 SANDSPIT RD, WAIKU	ZL1BWH	HOWICK AUCKLAND 1705
ZL1BQC	WOOLF, P H, 2 BOURBON TCE, KARORI, WELLINGTON	ZL1BWI	SCAHILL, B G, 5 TAHUNA PLACE, ONERAHI
ZL1BQD	RUNCIMAN, R J, 18 LANSELL DRIVE, HOWICK,	ZL1BWK	SHELDON, B R, 16 CARTER ST, MT MAUNGANUI
	AUCKLAND 1705	ZL1BWP	ROSE, A, 34 LYNDHURST RD, TE ATATU SOUTH
ZL1BQE	DIX, K, 91 EAST TAMAKI RD, PAPATOETOE, AUCKLAND	ZL1BWQ	MC CONNOCHIE, B D, 8 FARMER ST, TE AROHA
ZL1BQF	RYAN, L J,	ZL1BWS	HORN, B R, 5 MONIQUE PLACE, HAMILTON
ZL1BQI	MILNE, A W, 27A BRAMLEY DRIVE, OMOKOROA	ZL1BWW	LE CORNU, E M O, KIWITAI, RD 1, MORRINSVILLE 2251
ZL1BQJ	TETENBURG, C R, WARD RD, R D 2, ROTORUA	ZL1BXA	SCHUTZ, W F H, PO BOX 386, OPOTIKI
ZL1BQK	SHACKLETON, R V, 8 RONGOPAI PLACE, KAITAIA	ZL1BWD	THOMPSON, G M, PUNGAERE RD, PDC, WAIPAPA 0470
ZL1BQL	ROBINSON, L K, PO BOX 253, WARKWORTH		BUXTON, H C, 32 CASTLETON ST, BIRKDALE
ZL1BQO	HYNDS, A G, PO BOX 534, TAURANGA	ZL1BXX	VENCATACHELLUM, V, 47 AYTON DRIVE, GLENFIELD,
ZL1BQP	BUCKTON, M D, 84 JOHN GILL ROAD, HOWICK,		AUCKLAND 10
	AUCKLAND 1730	ZL1BXF	YOUNG, M B, 44 TOROA ST, TORBAY
ZL1BQW	ARMSTRONG, C M, MCIVOR RD, RD 4, WHAKATANE	ZL1BXX	HERROLD, N G, RD 1, HALL RD, WAIKU
ZL1BQX	CLARK, L C, 36A JUBILEE CRES, WHAKATANE	ZL1BXM	MIERS, E R, OMAHANUI, R D 1, DARGAVILLE
ZL1BQY	CLAYTON, C J,	ZL1BXP	WALSH, A R, KEREONE, RD 1, MORRINSVILLE
ZL1BRC	ROSS, S J, 5 ROXY TCE, GLENADOWIE	ZL1BXS	MILLER, P G, RD 1, RUSSELL
ZL1BRE	KRISTENSEN, P, KEENAN RD, RD 3, TAURANGA	ZL1BXT	JAMES, C H, 1037 HEAPHY TCE, HAMILTON
ZL1BRG	MACKEN, S A, PO BOX 65419, AUCKLAND	ZL1BXR	DAVIS, L H, 8 MURITAI ST, TAUP0
ZL1BRI	CRAWFORD, W, 42 FOREST LAKE RD, HAMILTON	ZL1BXX	YOUNG, B M J, 4 SOPHORA PLACE, TOTARA HEIGHTS,
ZL1BRJ	JONES, R, PO BOX 39403, HOWICK, AUCKLAND		AUCKLAND 1702
ZL1BRL	CORNWALL, P J, 10 PARK AVE, NORTHCOTE	ZL1BXY	LISTERMAN, B P, 25 VIRGO PLACE, GLEN EDEN,
ZL1BRN	NORGATE, M H, 692 Whareora Road, R D 5, Whangarei	ZL1BY	AUCKLAND
ZL1BRO	BRENNER, B N, PO BOX 33-112, TAKAPUNA	ZL1BYA	OPOTIKI AMATEUR RADIO CLUB, NZART BRANCH 72, C/O
ZL1BRS	SUTHERLAND, S D, 4 CARDIGAN STREET,	ZL1BYC	PO BOX 383, OPOTIKI 3092
	MIDDLEMARCH, OTAGO	ZL1BYD	MARTINSON, L, 31 RIVERSIDE DRIVE, WAIKU 1852
ZL1BRV	GARDINER, P R, 3 NYSSA PLACE, TOTARA HEIGHTS,		CORNISH, G M, 19 LEVLEY LANE, KATIKATI
	MANUREWA	ZL1BYE	EMMETT, G J, 9 JOHN LISTER CLOSE, HOWICK 1705,
ZL1BRW	BOGHURST, A D, 70 OSTEND RD, OSTEND		AUCKLAND
ZL1BRX	BAIN, E M, RD 2, 58 GEORGE CRES, BUCKLAND,	ZL1BYF	THOMAS, R S, 52 LYNMORE AVE, ROTORUA
	PUKEKOHE	ZL1BYG	WERDER, K J, SPRINGDALE, RURAL DELIVERY, WAI TOA
ZL1BRY	ANDERSON, H C, 37 ARKLES STRAND, WHANGAPARAOA,	ZL1BYI	MOREY, E J, 301 FAIRVIEW RD, TE AWAMUTU
	AUCKLAND 1463	ZL1BYL	RAMSAY, I S, 8 LOCKE AVE, HILLSBOROUGH
ZL1BRZ	HILL, B, 12A POWHIRE AVENUE, KENSINGTON,	ZL1BYO	ALLOWAY, F R, 311 BARACLOUGH RD, WHANGAMATA
	WHANGAREI	ZL1BYP	WILLIAMSON, B M, 158 ELIZABETH DRIVE, TOKOROA
ZL1BS	SCOTT, D T S, PO BOX 566, WHANGAPARAOA,		KENNEDY, A G, 116 WADE RIVER RD, ARKLES BAY,
	AUCKLAND	ZL1BYQ	WHANGAPARAOA
ZL1BSA	RODGERS, A H, 22 GOLDERS PLACE, TAUP0	ZL1BYW	ASHMORE, R W, 47 SHELLY BEACH RD, OSTEND,
			WAIHEKE ISLAND

ZL1BCH	DAVIS, B C, 5/34 RICHARD FARRELL AVENUE, REMUERA, AUCKLAND	ZL1BID	DAVIS, E T, 13 DUNDEE PLACE, BLOCKHOUSE BAY, AUCKLAND 7
ZL1BCI	SINCLAIR, N S, 29 MEADOWLAND ST, TAURANGA	ZL1BIG	BIGGINS, A J, HOUSE 24, THE FALLS ESTATE, 94 BOUNDARY ROAD, TIKIPUNGA WHANGAREI
ZL1BCN	MESSENT, A J, 53 RUSSELL ROAD, HUNTLY	ZL1BIK	MCKECHIE, K H, PO BOX 69051, GLENDENE, AUCKLAND 1230
ZL1BCO	NZART TAUPO BRANCH, C/- P J AURISCH, PO BOX 58, TAUPO	ZL1BIL	WEST, W J, APPLETON ROAD, RD 2, OPOTIKI 3092
ZL1BCV	WHITE, J W, 50 OTAIA RD, WOODHILL, WHANGAREI	ZL1BIP	BINGHAM, L H, PO BOX 72, KATIKATI
ZL1BCW	WEBBER, H C, 6 BRABANT ST, WHAKATANE	ZL1BIQ	PUFFETT, K H, 51 MCKEAN AVE, MANUREWA
ZL1BD	WILSON, A, WAINGARO RD, RD 1, NGARUAWAHIA	ZL1BIV	GARRETT, J W, 20 FIRST VIEW AVE, BEACHLANDS, AUCKLAND 1705
ZL1BDA	WRIGHT, C C, 3 LIVINGSTONE ST, MILFORD	ZL1BIX	SOPPET, D A, 4A RUARANGI RD, MT ALBERT, AUCKLAND
ZL1BDB	TREVENA, M R, 1 TALGA COURT, TAKANINI	ZL1BIZ	HENRY, E J, 27 MCRAE RD, MT WELLINGTON BREACH, J A, 74 OMOKOROA RD, TAURANGA
ZL1BDE	VISSER, P, 4 KAURI CRES, MATAMATA	ZL1BJA	HENDRIKSEN, R H E,
ZL1BDF	PETHERICK, G R, 84 AROHA AVE, MORNINGSIDE	ZL1BJC	ORCHARD, L J, PO BOX 190, WHAKATANE
ZL1BDG	MOGFORD, F L, 74 BUCHANAN ST, OPOTIKI	ZL1BJE	APPLEBY, W M, 8 BRIGHTSIDE RD, WHANGAPARAOA
ZL1BDH	LATHAM, G W, 5A HALBERG CRES, WHAKATANE	ZL1BJF	HENDERSON, A R, 322 ST HELIERS BAY RD, ST HELIERS
ZL1BDI	DRAPER, N, 61 CHURCHILL RD, MURRAYS BAY	ZL1BJI	GOODSIR, J W, 24 TE KAPA PLACE, SNELLS BEACH, WARKWORTH 1241
ZL1BDJ	MONK, E C, 23 MATIPO AVE, ROTORUA	ZL1BJL	WILLIAMS, C, RD 2, CAMBRIDGE
ZL1BDK	PHILLIPS, K A, 15 SHANLEY CRES, WAIKU, AUCKLAND	ZL1BJN	SCHLEF, W K, 13 ROSLYN RD, MT WELLINGTON
ZL1BDL	MEESE, R, 5 MEMORIAL DRIVE, RIVERSIDE, WHANGAREI	ZL1BJO	ORR, B, 1C ROSTREVOR AVENUE, EPSOM, AUCKLAND
ZL1BDM	HANSEN, A F, PO BOX 809, WHANGAREI	ZL1BJP	PARKINSON, D J, 2 UPLAND ST, BROOKFIELD, TAURANGA
ZL1BDO	MANCER, E S, 125 ASHLEY STREET, RANGIORA, CANTERBURY	ZL1BJT	TONG, B, 7 RIMU PLACE, OTANGAREI, WHANGAREI
ZL1BDP	JAMES, J R, PO BOX 471, TAUPO	ZL1BJU	THOMPSON, N K,
ZL1BDQ	WILKINS, S J, 41 BADDELEYS BEACH RD, RD6, WARKWORTH 1241	ZL1BJZ	FARMER, J B S, 88 NGAPUHI RD, REMUERA, AUCKLAND 1005
ZL1BDS	MCKAY, G N, 33 HALLADELLE RD, PAPAKOWHAI, WELLINGTON	ZL1BK	POMPE, H G A, 8 GLENMORE RD, PAKURANGA, AUCKLAND 1706
ZL1BDT	NGAKURU, N H, 31 WIHONGI ST, KAIKOHE	ZL1BKA	MCINTOSH, G S, 4 ALEXANDER AVE, MARAETAI BEACH
ZL1BDW	WEST, B D, 67 WOODLANDS RD, OPOTIKI	ZL1BKD	BUSCH, C T, PO BOX 372, WARKWORTH, AUCKLAND 1241
ZL1BDY	SEAKINS, J M, 64 PARR TERRACE, MILFORD, AUCKLAND 1309	ZL1BKG	WILSON, T G, 53 TIRIMOANA RD, TE ATATU
ZL1BDZ	HOBAN, C J, KAITEMAKO RD, WELCOME BAY RD 5, TAURANGA	ZL1BKI	SALMOND, A R, FLAT 2, 9 TOMINTOUL PLACE, HOWICK
ZL1BE	COLLINS, P, 14 PERCY ST, WARKWORTH, AUCKLAND 1241	ZL1BKJ	SANDLANT, P W, 17 MAYFAIR CRES, MAIRANGI BAY, AUCKLAND 1311
ZL1BEB	WILLIAMS, P, KAIHERE, RD, NGATEA	ZL1BKM	ENGEL, F W, PO BOX 6528, AUCKLAND
ZL1BEG	BEGG, J W K, 27-A SHANAWAY RISE, NORTHCOTE, AUCKLAND 1309	ZL1BKP	SEARLE, K A, 9 KAHAROA AVENUE, OMOKOROA BEACH, WESTERN BAY OF PLENTY
ZL1BEJ	MCCABE, B R, 130 TAKAHE RD, TITIRANGI	ZL1BKQ	ADAMS, C W, 90 BARBADOS DRIVE, UNSWORTH HEIGHTS, NORTH SHORE CITY 1309
ZL1BEK	MCTURK, P T R, 40 SILVERTON RD, WAIHI	ZL1BKTU	DAVIDSON, B J, 19 MAKAY ST, WAIHI
ZL1BEL	LEES, B, C/- 76 WINDMILL DRIVE, R D 2 SILVERDALE, HIBISCUS COAST AUCKLAND 1462	ZL1BKX	RODGERS, A E, PO BOX 19-006, AVONDALE, AUCKLAND 1230
ZL1BEM	LOCKWOOD, D C, 7 ADAMS ST, WAIHI	ZL1BKY	RANKIN, A N, 90 HASTINGS RD, MAIRANGI BAY, AUCKLAND 1310
ZL1BEU	JAMIESON, L I D, 1927 NGUNGURU RD, R D 3, WHANGAREI	ZL1BKZ	HENRY, R I, 27 MCRAE RD, MOUNT WELLINGTON
ZL1BEX	WILSON, A L G, 16 RAHIRI RD, MT EDEN	ZL1BL	HUNTLY BRANCH 17 AMATEUR RADIO CLUB, ROTONGARO RD, RD 2, HUNTLY
ZL1BEY	SMART, J B, PO BOX 54, WELLSFORD 1242	ZL1BLB	CHURCHER, B R, 80 HEPBURN RD, GLENDENE
ZL1BF	STURMEY, N B L, 42 ALTON AVE, NORTHCOTE, AUCKLAND 1309	ZL1BLC	MORRIS, T M J, 10 SYLVANIA CRESCENT, LYNFIELD, AUCKLAND 1007
ZL1BFB	WALKER, I D, P O BOX 163060, LYNFIELD, AUCKLAND	ZL1BLD	WARD, M T, BOX 66, PAIHIA
ZL1BFD	POTTS, G C, 169 ALFRISTON RD, MANUREWA	ZL1BLE	BEARD, G L, PO BOX 222, KAITAIA
ZL1BFE	POTTS,	ZL1BLI	OCKLESTON, E W, B208 INVERLOCHY APTS, 20 NAPOLEON AVENUE, MILFORD, AUCKLAND 1309
ZL1BFF	PERKINS, I M, 74 TAWARI ST, MATAMATA 2271	ZL1BLQ	SALMONS, R J, 2 TOWNHEAD CRES, TAURANGA
ZL1BFFK	FRAKES, M C,	ZL1BLR	FISH, L G, 476 PUNUI ROAD, TE AWAMUTU, WAIKATO
ZL1BFM	ANDREWS, T I, 48B MANAIA ROAD, TAIROA	ZL1BLS	SMITH, J B, 13 SELWYN AVE, TITIRANGI, AUCKLAND 7
ZL1BFSN	MATHEW, J C H, 21A FYFFE STREET, BLENHEIM	ZL1BLT	ALDERWICK, G B, 16 FOSTER CRES, BELMONT, LOWER HUTT
ZL1BFS	BIRT, K D, 64 MOANA RD, OKITU, GISBORNE	ZL1BLY	GOODBRAND, J A, 4A BRAINTREE ST, KAMO, WHANGAREI
ZL1BFZ	ROBERTSON, D J, 29C YOUNGS RD, PAPAKURA	ZL1BLZ	TUNNICLIFFE, G W, 17 Matau Rise, Te Atatu Peninsula, Auckland
ZL1BG	GRUMWALD, J B, TOKERAU BEACH, R D 3, KAITAIA	ZL1BM	MOLLOY, B L, 460 GREAT SOUTH RD, HUNTLY
ZL1BGA	MARTIN, G K, 26 DUNDEE PLACE, BLOCKHOUSE BAY	ZL1BMA	GREY, G R, 3 LOMOND PLACE, Nawton, HAMILTON 2001
ZL1BGB	GLOVER, D R, 5 WYMAN PLACE, PAKURANGA	ZL1BMB	MORONEY, P R, 26 OAKMOUNT PLACE, WATTLE DOWNS, MANUREWA AUCKLAND 1702
ZL1BGE	WHITWELL, G R, 3 GRACE ST, MATATA RD 4, WHAKATANE	ZL1BMG	SLONE, J, THORTON RD, RD 1, CAMBRIDGE
ZL1BGH	GEORGE, L H, 65 KING STREET, OPOTIKI	ZL1BMM	LETHBRIDGE, B R, PO BOX 418, PAIHIA
ZL1BGK	GORDON, K, 117 CASHMERE AVE, KHANDALLAH, WELLINGTON	ZL1BMP	MACMILLAN, L P A, UNIT 4-15 GODDEN CRE, MISSION BAY, AUCKLAND 1005
ZL1BGL	ZAMMIT, P, 6B PRIMROSE STREET, RAGLAN	ZL1BMQ	LONG, A H, 40 MORNINGSIDE RD, WHANGAREI
ZL1BGQ	MCWILLIAMS, D J, 6 KALGAN PLACE, PAKURANGA, AUCKLAND	ZL1BMS	SIMMONDS, B M, 7 LORIMER LANE, HILLCREST, HAMILTON
ZL1BGS	EAST, T A, ROTONGARO RD, RD 2, HUNTLY	ZL1BMW	LOWRY, M R, LOWRY RD, BOMBAY
ZL1BGU	FELT, B, Chongqing, Chongqing	ZL1BMX	GREENAWAY, W P, 8 STEWART PLACE, HAMILTON
ZL1BGV	ROBERTS, M J, 19 CANAANDALE DRIVE, FLAGSTAFF, HAMILTON	ZL1BMZ	PADGETT, A B, 5-A INAGH CLOSE, DANNAMORA, HOWICK AUCKLAND 1705
ZL1BH	HOLDEN, B J,	ZL1BN	NORTHERN DX ASSOCIATION, 182 INGLETON ROAD, RD 2, WELLSFORD
ZL1BHD	WRIGHT, S W, 26 TAWA STREET, EDGEcumbe	ZL1BNA	MARR, W R G, C/- NZMCA MAIL DROP SERVICE, PO BOX 72147, PAPAKURA AUCKLAND
ZL1BHE	MATTHEWS, J F, 26 OCEANVIEW RD, NORTHCOTE	ZL1BNB	NEWMAN, M D, 30 NIKAU ST, WANGANUI
ZL1BHJ	DEKKER, J, 11 WAIHEROWHERO DRIVE, ST ANDREWS, HAMILTON	ZL1BNC	DOWLING, B N, 47 GRAY AVE, MANGERE EAST
ZL1BHM	MCKENZIE, B, 36 PEACH RD, GLENFIELD, AUCKLAND	ZL1BND	ORTON, N J, 32 ORCHARD RD, ENDERLEY, HAMILTON
ZL1BHQ	POWELL, J F, 47 BECROFT DRIVE, FORREST HILL	ZL1BNG	BYRNAND, J L, 5 TE ANAU PLACE, TIKIPUNGA, WHANGAREI
ZL1BHU	WATSON, A G, 204A VALLEY RD, MT MAUNGANUI		
ZL1BHV	DAVIS, W H, 55 PIHANGA ST, TAUPO		
ZL1BHW	PARKINSON, M A, 23C EASON ST, ROTORUA		
ZL1BHX	PARKINSON, 21 ARTHUR STREET, GLEN DALE, OAMARU 8901		
ZL1BHY	YOUNG, C R,		
ZL1BIB	HOOKHAM, C R, 304/21 FAIRVIEW AVE, ALBANY, NORTH SHORE CITY		
ZL1BIC	BYRNAND, J L, 5 TE ANAU PLACE, TIKIPUNGA, WHANGAREI		

ZL1ASO	GRAYSON, R I, 484 PINNACLE HILL ROAD, R D BOMBAY, AUCKLAND	ZL1AX	STEVENS, K F, 49 VIVIAN ST, BURWOOD, CHRISTCHURCH
ZL1ASP	ABBOTT, R F, 62 BEACHWATER DRIVE, PAPAMOA	ZL1AXA	BURGESS, G W, 34 BOORALEE AVE, HOWICK
ZL1ASU	LITTLE, D C, 25 MARELLEN DRIVE, RED BEACH, OREWA	ZL1AXB	MURDOCH, P J, 183 GLENGARRY RD, GLEN EDEN
ZL1ASV	PHILLIPS, R L, 27-A SEAVIEW RD, MILFORD, AUCKLAND 1309	ZL1AXE	SPACKMAN, M L, THE VICARAGE, 20 CHURCH ST, DEVONPORT
ZL1ASW	WILLIAMS, A, 6 AWATEA GDNS, WIGRAM, CHRISTCHURCH	ZL1AXG	WOODS, M H, 399 KARORI ROAD, KARORI, WELLINGTON 6005
ZL1ASX	MACCLEMONT, W D, P O BOX 108, GREENHITHE, AUCKLAND	ZL1AXI	FOOTE, J R, PO BOX 4093, KAMO
ZL1ASY	MCGAUGHEY, J D, TE WAHAPU, RUSSELL	ZL1AXN	ANDERTON, T E, 87 WOOLFIELD RD, PAPATOETOE, AUCKLAND
ZL1ASZ	ANDERSON, A N, 3 MCKENZIE RD, MANGERE	ZL1AXS	GRiffin, P J, 44 WAIMARIE RD, WHENUAPAI VILLAGE
ZL1AT	REDMOND, N P, PO BOX 874, INVERCARGILL	ZL1AXT	DE LUCA, B C, 20 GWILLIAM PLACE, FREEMANS BAY, AUCKLAND 1
ZL1ATB	LEITCH, D, 51 GARTON DRIVE, MASSEY WEST, AUCKLAND	ZL1AXU	ORCHARD, M P, PO BOX 190, WHAKATANE
ZL1ATC	HAYMAN, S R, 68 KATH HOPPER DRIVE, OREWA, AUCKLAND 1461	ZL1AXV	RICHARDSON, K R, 4 REDCREST AVE, PAPAKURA
ZL1ATE	BABICH, A T, 20A MOTU PLACE, MT WELLINGTON, AUCKLAND 1006	ZL1AXX	SMITH, R I, 42 OXFORD PARK CRESCENT, GREENHITHE, AUCKLAND 1311
ZL1ATI	WARD, C J,	ZL1AXY	HJORRING, B G, 48 SMYTHE ROAD, HENDERSON, AUCKLAND
ZL1ATJ	COWELL, R E, 53 MAXWELTON DRIVE, MAIRANGI BAY, AUCKLAND 1310	ZL1AXZ	SAMPLE, K W, 71 BEATTIE ROAD, KAWERAU 3075
ZL1ATK	MILLAR, T P C, 2 GARDEN COURT, WHANGAREI PARK, R J, 205 HAPE RD, THAMES	ZL1AY	ALLEN, C W, 106B MAXWELL ROAD, MARAMARUA, RD 1, POKENO 1872
ZL1ATL	HAYHURST, K W, 10 RICHMOND VILLAS, 82 RICHMOND STREET, THAMES	ZL1AYA	D'ARCY, A E, FLAT 2 41 EAST COAST RD, MILFORD, AUCKLAND 1309
ZL1ATW	MEENAGH, M B, 55 CAXTON PLACE, TE AWAMUTU	ZL1AYB	BOWKETT, J A, PO BOX 17 281, KARORI, WELLINGTON 6033
ZL1ATX	VOGEL, H,	ZL1AYC	SHIPMAN, N J, 7 MENIN ROAD, RAUMATI BEACH 6010
ZL1AU	SCOUSE, P N, 17 CALLUNA CRES, TOTARA HEIGHTS, MANUKAU	ZL1AYE	MIDWINTER, G E D, RD 10, OTAIKA VALLEY RD, WHANGAREI
ZL1AUA	WILSON, B E, 10A JAEMONT AVE, TE ATATU SOUTH	ZL1AYH	WALLACE, A D, C/O 1124B WAINUI ROAD, RD 2, OPOTIKI 1702
ZL1AUB	NICHOLSON, J E, 14 IRENE CRES, HAMILTON	ZL1AYM	TENNANT, C H, 2/15 HUBER ST, WEYMOUTH, AUCKLAND 1309
ZL1AUE	WALKER, J H, 5 KATH HOPPER DRIVE, OREWA, AUCKLAND 1461	ZL1AYN	LOWE, R A, TUTAENUI RD, RD2, MARTON
ZL1AUG	STREET, G H, 4 EMORY DRIVE, TAKANINI	ZL1AYQ	MAINDONALD, J D, PO BOX 702, ROTORUA
ZL1AUH	MURRAY, N V, TE TORO R D 4, WAIKU, SOUTH AUCKLAND	ZL1AYT	VALOIS, D A, 46 McDOWELL CRES, BIRKENHEAD, AUCKLAND 1310
ZL1AUI	BANKS, R S, ARGYLE, 1214 ORURU ROAD, PERIA RD 2, KAITAIA	ZL1AYV	DINGLEY, M J, 2139 GREAT NORTH RD, AVONDALE
ZL1AUJ	WARMAN, R W, 6 HOSPITAL RD, TE KOPURU	ZL1AYW	SPEEDY, S L, SWAN LAKE SUITE, 4A WINDERMERE, 6 THE PROMENADE, TAKAPUNA, AUCKLAND 1309
ZL1AUK	HILL, M J, 30 B JEFFERSON PLACE, BROOKFIELD, TAURANGA	ZL1AYY	CANDY, F A, LOWER ACCESS RD, RD1, KAE0 0471
ZL1AUL	LOIACONO, V, 85 WARNOCK STREET, WESTMERE, AUCKLAND 1002	ZL1AZ	BROWN, M A, CMB 103, OWHANGO, VIA TAUMARUNUI
ZL1AUM	MADDOCK, C N, 75A METHUEN RD, AUCKLAND	ZL1AZB	YOUNG, R D, Po Box 1182, BLENHEIM
ZL1AUR	LINDOP, P R, CULLEN ROAD, WAIPU COVE, RD2 WAIPU	ZL1AZE	MILLER, B D, 67 HORNSEY ROAD, MELROSE, WELLINGTON 6003
ZL1AUS	INSLEY, J F, 1 D RIVERSIDE DRIVE, WHAKATANE	ZL1AZF	POWELL, W L,
ZL1AUU	WHITE, JOHN H S, RAINBOW POINT MOTEL, PO BOX 42, TAUPO 2730	ZL1AZP	BROOKE-ANDERSON, B, 2 GLENELG RD, RED BEACH, HIBISCUS COAST
ZL1AUV	SANDERS, J G, 28 DENNY HULME DRIVE, BAY PARK, MT MAUNGANUI 3002	ZL1AZT	CLARE, I K, 31A TE KOAH PLACE, TAURANGA
ZL1AUW	WOOLLER, A M, 40 POWRIE ST, GLENFIELD	ZL1AZU	NELSON, B C, 59 PERCY ST, WARKWORTH
ZL1AUX	GREAVES, G J, 40 WINDOMA CIRCLE, PAPATOETOE	ZL1AZX	ARMSTRONG, J B, RD1, OPOTIKI
ZL1AUY	BURKINSHAW, D E, 19 WILLIAMS AVE, MORRINSVILLE 2251	ZL1AZZ	DARRALL, P G, 8 PROSPECT PLACE, WESTERN HEIGHTS, HAMILTON
ZL1AUZ	HAWKINS, C R, 27 Lewis Street, Glenview, HAMILTON	ZL1BA	WITTING, E R, KEREHUNGA ROAD, RD 9, WHANGAREI
ZL1AV	TREMAYNE, D T, 147/149 SPENCER ROAD, LAKE TARAWERA, RD 5, ROTORUA	ZL1BAB	COOPER, W G, 7 HARTFIELD RISE, PAPAKURA
ZL1AVE	ATCHINSON, D R, 109/A HILLSIDE RD, PAPATOETOE, AUCKLAND 1701	ZL1BAC	HILLIAR, S W, PO BOX 33-874, TAKAPUNA, AUCKLAND 1332
ZL1AVG	JOHNSON, P R,	ZL1BAD	KNOWLES, R E, RD 2, MAIN RD, TUAKAU
ZL1AVH	ALDER, S H, 195 ST HELIERS BAY RD, ST HELIERS BAY	ZL1BAG	MCLENNAN, E D, 8A WINDSOR RD, OTUMOETAI, TAURANGA
ZL1AVI	KYLE, B V, 3/35 ALMORAH RD, EPSOM, AUCKLAND 1003	ZL1BAJ	CANDY, B R, LOWER ACCESS ROAD, R D 1, KAE0 0471
ZL1AVJ	HARPER, M J, 34 TUATARA BLOCK, KAMO	ZL1BAK	BURRAGE, G J,
ZL1AVL	MANNING, A J, 17 FAIRMONT ST, NGARUAWAHIA	ZL1BAM	MILLIGAN, J W, 16 GRACE AVENUE, TE AROHA, HAMILTON
ZL1AVO	ROBERTSON, K S, 2 JAEMONT AVE, TE ATATU	ZL1BAO	MARTIN, H R, 26 DUNDEE PLACE, BLOCKHOUSE BAY
ZL1AVQ	HAUTALA, H I, 3/240B ST HELIERS BAY RD, ST HELIERS, AUCKLAND 1005	ZL1BAR	MARTENSEN, J E, 34 LAWRENCE ST, HERNE BAY, AUCKLAND 1002
ZL1AVR	ROWE, J P, 100 TOTARA CLOSE, THAMES	ZL1BAU	BAKULICH, J V M, 7 MACKAYS CRESCENT, DARGAVILLE
ZL1AVU	GARLICK, C W, P O BOX 72115, PAPAKURA, AUCKLAND	ZL1BAV	VIAL, S B, 57B SIMON ELICE DRIVE, GLENFIELD, AUCKLAND 10
ZL1AVV	MCFADYEN, E J, 39 KAHU ST, ROTORUA	ZL1BAW	COLEMAN, R E, 94 DARRAGHS ST, TAURANGA
ZL1AVW	WING, B E, PUNGAERE RD, R D 2, KERIKERI	ZL1BAY	TARLTON, B M, PO BOX 81, KAITAIA
ZL1AVY	TENNENT, D R, 1/151 FARQUHAR RD, GLENDEENE, AUCKLAND 1008	ZL1BAZ	RICKARD, B A, 33 BAYLISS RD, RD 3, TE PUKE
ZL1AVZ	RYALL, B J, 195 TE ATATU RD, TE ATATU SOUTH	ZL1BBB	SHARMA, A, 11 SIOTA CRESCENT, KOHIMARAMA, AUCKLAND 1005
ZL1AW	WALKER, A N, CRANE RD, R D 1, KAMO	ZL1BBF	FAITHFULL, B B, PO BOX 305, WHANGAPARAOA
ZL1AWA	ANDERSON, A W, 32 GILMOUR ST, WAIHI	ZL1BBH	GREEN, A T, 98 ALBERT ST, HAMILTON 2001
ZL1AWD	PARSONS, N J, 14 CREWE ST, GORE	ZL1BBK	ALLAN, G D, PO BOX 35886, BROWNS BAY, AUCKLAND
ZL1AWE	MCFADYEN, D,	ZL1BBP	PEACE, K I, P O BOX 911-050, AUCKLAND MAIL CENTRE, AUCKLAND
ZL1AWF	SEXTON, E A, PAPARIMU, R D 3, PAPAKURA 1730	ZL1BBQ	MAXWELL, S G, 26 TUHAERE ST, ORAKEI
ZL1AWL	HOLLAND, A D, 66 OLD RAILWAY RD, R D 2, KUMEU 1250	ZL1BBR	CHAMBERLIN, P C, PO BOX 131, CLEVEDON
ZL1AWP	DENNISON, A S, 132 EVANS RD, PAPAMOA, MT MAUNGANUI	ZL1BBS	KILPATRICK, G A, 157A LONG DRIVE, ST HELIERS
ZL1AWR	GOODACRE, H W, 84 MORRINSVILLE ROAD, HILLCREST, HAMILTON	ZL1BBW	WILLIAMS, K, RD 4, WHANGAREI
ZL1AWW	WELFORD, G H, 8B WALPOLE AVE, HILLPARK, MANUREWA AUCKLAND 1702	ZL1BBZ	HOLT, R, 10 COLLINGWOOD RD, WAIKU
ZL1AWX	JILLINGS, M A, 71 HUTCHINSONS RD, HOWICK, AUCKLAND 1705	ZL1BCA	BATKIN, B W, 5B Tagalad Road, Mission Bay, Auckland
ZL1AWZ	LEITCH, T G, 38 DAVID ST, MORRINSVILLE	ZL1BCC	CRANDALL, S, 189 KAHOKEKAU ROAD, R D 7, TE AWAMUTU 2400
		ZL1BCE	ECKETT, J A B, 33-B THE CIRCLE, WHANGAPARAOA, AUCKLAND 1463

ZL1AJR

ZL1AJR CHAPMAN, R, 39A WEST TAMAKI RD, GLEN INNES, AUCKLAND 1006
ZL1AJS BARKER, J A, 6 RIVERVALE GROVE, STANMORE BAY, WHANGAPAROA 1463
ZL1AJT JESSOP, G D, FLAT 1, 4 INKERMAN STREET, ONEHUNGA
ZL1AJU BARNARD, B F, 1/47 DUDLEY ROAD, MISSION BAY, AUCKLAND 1130
ZL1AJV IRVING, P J, 4 SCOTT AVE, MANGERE BRIDGE
ZL1JW GILES, P M, 13 OZICH AVE, TE ATATU
ZL1AJX COX, J B, 4/95 WHETURANGI RD, GREENLANE, AUCKLAND 5
ZL1AJY BARRATT, M P, 6 BRUSSELLS PLACE, BIRKENHEAD
ZL1AK MITCHELL, B A, P O BOX 412, MATAMATA
ZL1AKB GILLARD, M L N, 22 STEWART ST, WHAKATANE
ZL1AKC CROOK, B W, P.O.BOX 1699, ROTORUA
ZL1AKI TAIT, C V, 46 MAYGROVE VILLAGE, 65 TAURANGA PLACE, OREWA
ZL1AKJ STUDHOLME, D L, 22 ANITA AVE, MT ROSKILL
ZL1AKL EAGLE, E H, 35 ARGYLL RD, TAURANGA
ZL1AKO OTTO, R H, RANGITANE, R D 1, KERIKERI
ZL1AKP POPE, K B,
ZL1AKS WIGLEY, J N, 43 OCEAN VIEW RD, NORTHCOTE
ZL1AKT FOLLETT, M S, 39 EDMOND RD, ROTORUA
ZL1AKV BELL, D C, 3 CUBA ST RD, WAIHI 3061
ZL1AKW HORNE, D W J, 3 VINE AVE, TAURANGA
ZL1AKX PASSAU, M B, 38 AWANUI RISE, RD2, PAPAKURA
ZL1AKY REED, G S, 510 GREAT SOUTH RD, PAPAKURA
ZL1AL BENTON, T J, C/O 5 WILTON STREET, WESTOWN, NEW PLYMOUTH
ZL1ALA HALDEN, J E, 154 OPUA RD, RD 2, NGATEA
ZL1ALC CHRISTENSEN, A L, 116 DONALD RD, KAITAIA
ZL1ALD SMITH, D W, 110 DOUGLAS ST, WHAKATANE
ZL1ALE JOHNSTON, A B, 2/29 MANSE RD, PAPAKURA, AUCKLAND
ZL1ALG OSBORNE, G J, 34 COBHAM DRIVE, KAWERAU
ZL1ALH LOCHMANN, I G, 19 HILLVIEW ST, NGARUAWAHIA
ZL1ALI LEE, A B, P O BOX 101 067, NORTH SHORE MAIL CENTRE, AUCKLAND 1330
ZL1ALK REED, C M, 510 GREAT SOUTH RD, PAPAKURA
ZL1ALN DUNCAN, K G, 2 MARSH AVE, MILFORD
ZL1ALQ DEVERICK, E I, P O BOX 33-1306, TAKAPUNA, AUCKLAND
ZL1ALR KAY, S R, P O BOX 28-176, REMUERA, AUCKLAND 1136
ZL1ALS SALANT, E L, 28A MC ARTHUR AVENUE, ST HELIERS, AUCKLAND
ZL1ALT ADAMS, N J, MATANGI RD, RD 4, HAMILTON
ZL1ALV USSHER, R R, 31A DEEPCREEK RD, BROWNS BAY, AUCKLAND 1310
ZL1ALX GUBB, G K, UNIT 4/278 SHIRLEY RD, PAPATOETOE, AUCKLAND 1701
ZL1ALZ BALSILLIE, A J, R D 1, POKENO
ZL1AM WHANGAREI AMATEUR RADIO CLUB, P O BOX 10-078, TE MAI, WHANGAREI
ZL1AMB BAIN, A M, RD 2, 58 GEORGE ST, PUKEKOHE
ZL1AMC ZWIES, O H, 19 HOFFMAN STREET, HOKITIKA
ZL1AME CROOK, F G, 17 HANLON CRES, DEVONPORT, AUCKLAND 1309
ZL1AMF GOSLING, K F, 131 ONERAHI ROAD, WHANGAREI, NORTHLAND
ZL1AMG MCGEE, A M, 97A BALMAN ROAD, BIRKENHEAD, AUCKLAND 10
ZL1AMH HOLROYD, A, 417A KAMO RD, KAMO, WHANGAREI
ZL1AMI JAMIESON, R A, 11 PHILLIPS DRIVE, OROPI DOWNS, RD 3, TAURANGA
ZL1AMJ SAUNDERS, J R, 187 GILL ST, NEW PLYMOUTH
ZL1AMM MURPHY, R E, 14P CRADOCK STREET, AVONDALE, AUCKLAND 1007
ZL1AMN JOHNSTON, D A, 2/29 MANSE RD, PAPAKURA, AUCKLAND 1703
ZL1AMO WRIGHT, R W, 28 CHORLEY AVE, MASSEY
ZL1AMQ MALE, F G, 67 WAIPUNA RD, MT WELLINGTON
ZL1AMR LINDSAY, I M, 31 COTTESMORE PLACE, HUNTINGTON PARK, EAST TAMAKI, AUCKLAND 1706
ZL1AMT MOORE, D A, 2 KANUKA WAY, ALBANY, AUCKLAND 1311
ZL1AMW WALLACE, A J, 14 ACACIA PLACE, GLENVIEW, HAMILTON
ZL1AMY FLETCHER, I G, 248 EAST COAST RD, TAKAPUNA
ZL1AMZ GLENDENNING, T, 16 MEADOW DRIVE, WHITIANGA 2856
ZL1AN BOLD, G E J, 15 KAURI RD, BIRKENHEAD, AUCKLAND 1310
ZL1ANA BOLD, G T, 14 CHELSEA VIEW DRIVE, BIRKENHEAD, AUCKLAND
ZL1AND TURNER, A B, 7 ACMENA LANE, PAKURANGA
ZL1ANE GINGLES, J C, RD 3, TE MAIKA RD, WHANGAREI
ZL1ANF BEALE, W M, 12 EMERSON ST, TE AROHA
ZL1ANH HUNT, G K, 30 GRAND VUE RD, KAWAHA PT, ROTORUA
ZL1ANI BELL, K A, 62B EDEN TCE, KAMO
ZL1ANJ ELLIS, J M, 3 HAWERA RD, KOHIMARAMA
ZL1ANL SMITH, I G,
ZL1ANM BARNETT, N M, UNIT 4/92 CADNESS STREET, NORTHCOTE, AUCKLAND 1309
ZL1ANP PARSONS, N L, 509/1 MUTU ST, TE AWAMUTU

ZL1ANT PATTISON, B,
ZL1ANY PEARCE, S G, C/- ANAESTHETICS DEPARTMENT, WHANGAREI AREA HOSPITAL, WHANGAREI
ZL1AO ALLISON, J N, P O BOX 79365, ROYAL HEIGHTS
ZL1AOA WHITNEY, J R, 35B WALLIS ST, RAGLAN
ZL1AOB HARROP, G N, 8 WAINGARO RD, NGARUAWAHIA
ZL1AOC HENDERSON, H R T, 11 CHESLEY PLACE, BUCKLANDS BEACH
ZL1AOD BYRNES, C D, 31 ROSEHILL DRIVE, PAPAKURA
ZL1AOE GILLGREN, S J, 58 GRAHAM RD, GISBORNE
ZL1AOH STEWART, M I, T.H. 130 HILDA ROSS VILLAGE, 30 RUAKURA ROAD, HAMILTON
ZL1AOI TRETHOWEN, V G, 13 WOODVALE ROAD, GLEN EDEN, AUCKLAND 1007
ZL1AOM BROWN, M W, 290 DOUGLAS AVE, TE AWAMUTU
ZL1AOD HOLLEY, W, 16 ASHLYNNE RD, PAPATOETOE
ZL1AOT MARGISON, I, FLAT 2, 44 PEMBROKE CRESCENT, GLENOWIE
ZL1AOV MATHESON, J L, MATA RD RD 1, KOHUKOHU
ZL1AOW FRANKHAM, D W, 3A KAURILANDS RD, TITIRANGI, AUCKLAND
ZL1AOX ASHLEY, I T, 894 PONGA ROAD, RD 4, PAPAKURA, AUCKLAND
ZL1AOZ MACKEY, W J, 87 ST STEPHENS AVENUE, PARNELL, AUCKLAND
ZL1AP DEN EXTER, J M G,
ZL1APD RICHARDSON, W J, 57 ESK ST, TAURANGA
ZL1APH DITTMER, C R, 1 HERBERT ST, TE AROHA
ZL1API HENDRIE, J G, MAKERUA RD, TOKOMARU 5450
ZL1APK TURVEY, G R, P O BOX 70, WHAKATANE
ZL1APM BOWERS, J, 20 STONELEIGH DRIVE, MAGNOLIA GROVE, HAMILTON
ZL1APP HAYSMITH, C A, 39 KATH HOPPER DRIVE, OREWA 1461
ZL1APQ CROOK, N W W G, 16-A SHERWOOD RD, ONERAHI, WHANGAREI
ZL1APS BROWNE, N H, 27 VIVIAN DRIVE, OMOKOROA 3051
ZL1APT JONES, E B, 13 CURSON STREET, ONEHUNGA, AUCKLAND
ZL1APU SOWERBY, B W, 42 CHERITON RD, HOWICK
ZL1APV FISHER, J R, 30 QUEEN MARY AVE, NEW LYNN, AUCKLAND 1007
ZL1AQ ROUSE, G C, 1 MEARS RD, HAMILTON
ZL1AQC SINCLAIR, V A, 37B BEATRICE AVE, HILLCREST, AUCKLAND
ZL1AQG BACICA, A, P O BOX 81, KAITAIA 0500
ZL1AQJ WRIGLEY, J S, 5 DERWENT ST, WESTERN SPRINGS, AUCKLAND
ZL1AQS SEXTON, J E, PAPARIMU, R D 3, PAPAKURA
ZL1AQU BOYER, C A, 311 PAKURANGA RD, PAKURANGA
ZL1AQV BARCLAY, S N, 28 LETTERKENNY PLACE, BLOCKHOUSE BAY, AUCKLAND 1007
ZL1AQX TOOMEY, A H, 39A MACLEANS RD, BUCKLANDS BEACH, AUCKLAND 1704
ZL1AQY KNAGGS, G R, 19 WARWICK PLACE, BROOKFIELD, TAURANGA
ZL1AR WALSH, J S, RD 1, MORRINSVILLE
ZL1ARB SMITH, P L, 56 HOBSONVILLE RD, WEST HARBOUR, AUCKLAND
ZL1ARD DUNCAN, L E, 14 COWLEY DRIVE, TEMPLE VIEW, HAMILTON
ZL1ARF WALLIS, BRIAN, FLAT 9, 3 BEDFORD STREET, PARNELL, AUCKLAND
ZL1ARG MILLER, R W K, MULLET POINT, R D 2, WARKWORTH
ZL1ARJ TWEED, R J,
ZL1ARK GENTRY, E A, P O BOX 1668, WHANGAREI 0115
ZL1ARL NENO, M R, 226 DICKSON RD, PAPAMOA
ZL1ARM MATTHEWS, J C H, 1 MAYFAIR CRES, MAIRANGI BAY
ZL1ARN BROWN, J T, 26B MAIN RD, RAGLAN
ZL1ARQ DUNHILL, I H, 19 GORING RD, SANDRINGHAM, AUCKLAND 1003
ZL1ARR ROBERTS, A R, 38 PEMBROKE DRIVE, BETHLEHEM, TAURANGA
ZL1ART ALLEN, A W, 106B MAXWELL ROAD, MARAMARUA, RD 1, POKENO 1872
ZL1ARV JONES, R, 59 RITCHIE RD, PARUA BAY, RD4, WHANGAREI
ZL1ARW FORSYTH, J T, 21 CHIPPING DALE, MANGERE BRIDGE, AUCKLAND 1701
ZL1ARX WRIGHT, P W J, 6 GRASSY DOWNS PLACE, HAMILTON
ZL1ARY CHANDLER, R W, 36 EASTERN BEACH RD, BUCKLANDS BEACH
ZL1ARZ GIBBS, F I, 22 FAIRVIEW PLACE, TE PUKE
ZL1AS LITTON, P J, 400 ONEMANA DRIVE, R.D. 1, WHANGAMATA 2982
ZL1ASD BAYLEY, E, 11 TRIMMER TCE, PAPATOETOE
ZL1ASH BAYLEY, 3 MONIQUE PLACE, DINSDALE, HAMILTON
ZL1ASI MCRAE, E D, 4 NOTTINGHAM RD, WHANGAREI
ZL1ASJ SCOTT, A J, 2 BRIDGMAN STREET, TE AWAMUTU
ZL1ASK KLINAC, T J, 45 CENTRAL AVE, PAPATOETOE, AUCKLAND 1701
ZL1ASL RIMMER, K S, 47 PORRITT DRIVE, KAWERAU
ZL1ASN ADAMS, R E V, P O BOX 72-458, PAPAKURA, AUCKLAND

NEW ZEALAND AMATEUR RADIO STATIONS

ZL1 CALL-SIGNS

ZL1AA	NZART AUCKLAND BRANCH INC, PO BOX 18-003, GLEN INNES, AUCKLAND	ZL1AEL	STANLEY, J W, PO BOX 525, WHANGAREI
ZL1AAA	GORDON, B D, 11 SIOTA CRES, KOHIMARAMA, AUCKLAND	ZL1AET	TSE, A E, PO BOX 11-263, ELLERSLIE, AUCKLAND 1005
ZL1AAB	CARDY, D J, 28 CITY VIEW TCE, BIRKENHEAD, AUCKLAND 10	ZL1AF	OGIER, I W, 32 RANGITANE ST, PALMERSTON NORTH
ZL1AAE	YEARSLEY, J K, BOAT HARBOUR RD, RD 1, WHITIANGA	ZL1AFB	OFFORD, J L, 43 QUEENS RD, NEW PLYMOUTH
ZL1AAF	WALKER, R L, 128 BUFFALO BEACH RD, WHITIANGA	ZL1AFD	OSBORNE, R, PO BOX 2098, TAURANGA
ZL1AAH	BACKHOUSE, R B, 17 DALE ROAD, KELLYS BAY, R.D. 1, TE KOPURU 0356	ZL1AFE	DE RENZY, P, PUKEKUTU RD, RD 2, MATAMATA
ZL1AAI	DE JONG, J W, 28A RICHMAL STREET, WAIHI 2981, WAIKATO	ZL1AFF	FLEMING, J, 43 BURNS ST, LEAMINGTON
ZL1AAJ	WILLIAMS, H J, 30 HALBERG ST, GLENFIELD, AUCKLAND 1310	ZL1AFM	BELLAMY, P R, 36 ETON RD, HILLSBOROUGH
ZL1AAK	STEPHENS, C H L, 56 KARAKA ST, TAKAPUNA	ZL1AFO	ROGERS, GERALD, PO BOX 79, KAITAIA
ZL1AAM	SCOTT, P L, 25 CHATSWORTH CRES, PAKURANGA	ZL1AFQ	ROSAN, D A R, PO BOX 65-147, MAIRANGI BAY, AUCKLAND 1330
ZL1AAN	FALKNER, H T, 8 KAPAI ST, DEVONPORT	ZL1AFS	COWLEY, T C M, 850 BEACH RD, WAIAKE, AUCKLAND 10
ZL1AAO	STEEL, L B, 503 SEALEY ST, THAMES	ZL1AFT	WALKER, K, 45 APOTU ROAD, R D 1, KAMO WHANGAREI
ZL1AAP	POPE, A A,	ZL1AFU	MURPHY, R J, 19 LITTEN RD, HOWICK, AUCKLAND 1704
ZL1AAQ	PALMER, W J, 27 THOMAS STREET, TIKIPUNGA, WHANGAREI 0101	ZL1AFV	BOYCE, A R, 26 SHAKESPEARE ST, CAMBRIDGE
ZL1AAR	ROWE, R G, 32 MANAWA RD, REMUERA	ZL1AFX	KILSBY, M R, 1/73 NEWHAVEN STREET, PIALBA, HERVEY BAY, QUEENSLAND 4655
ZL1AAS	SCOTT, A, 25A RODNEY ST, HOWICK, AUCKLAND	ZL1AFY	COLEMAN, P J, 2A KOHE ST, RIVERSIDE, WHANGAREI
ZL1AAU	ELLEY, C B, UNIT 11, WAIHI HOSP RETIREMENT VILLAGE, VILLAGE WAY, WAIHI	ZL1AFZ	MCLEAN, J P, GORGE RD, R D 3, PAHIATUA
ZL1AAX	ANDREWS, G S, 352 A MAUNGATAPU ROAD, TAURANGA	ZL1AG	GILES-PAIN, A K,
ZL1AB	NORTH SHORE BRANCH 29 NZART, C/- NORTH SHORE CIVIL DEFENCE HQ, 400 EAST COAST ROAD, NORTH SHORE CITY 1310	ZL1AGA	RASMUSSEN, J W, 65 SMITH ST, MATAMATA
ZL1ABC	BIDDLE, R R, C/O WESLEY COLLEGE, PO BOX 58, PUKEKOHE 1800	ZL1AGC	PASSAU, K M, PO BOX 444, DRURY, AUCKLAND
ZL1ABG	GARLICK, B, 14/1 CAMBRIA STREET, NELSON	ZL1AGG	BYCROFT, P E, 253 SHIRLEY RD, PAPATOETOE, AUCKLAND
ZL1ABL	DALE, A J, 61 RODNEY ST, WELLSFORD, AUCKLAND 1242	ZL1AGL	DE GRUYTER, Y H, 98 MARAETAI DVE, MARAETAI, AUCKLAND
ZL1ABM	HUMPHREY, M L G, 1009 TARARU RD, THAMES	ZL1AGN	CAMPBELL, M H, FENCOURT RD, RD 1, CAMBRIDGE
ZL1ABN	REAY, M J F, 16 PRISCILLA CRES, HAMILTON	ZL1AGP	HORWOOD, H, 233 KING ST, WHAKATANE
ZL1ABP	RUTTER, K L, 55 Eilis Avenue, Mt Roskill, AUCKLAND 1004	ZL1AGR	COTTON, J K, VILLA 177 / ACACIA COVE, 127 WATTLE FARM ROAD, WATTLE DOWNS, AUCKLAND 1702
ZL1ABR	WARD, B J, 44 CORDYLINE ROAD, RD 5 TUAKAU, PORT WAIKATO	ZL1AGS	COLLINS, P E, 185 VICTORIA ST, CAMBRIDGE
ZL1ABS	SHEFFIELD, M J, 176 ALBANY HIGHWAY, ALBANY, AUCKLAND	ZL1AGT	TAYLOR, E R, 18 THE CIRCLE, WHANGAPARAOA, AUCKLAND 1463
ZL1ABX	DUKES, J R, 102 AWARUKU RD, TORBAY	ZL1AGV	DIXON, L N, 18 KORU ST, MANGERE BRIDGE
ZL1ABZ	JOHNSON, I, 15 MUIREND AVE, TOKOROA	ZL1AGW	MCDONALD, D F, MARGARET PLACE, RD 1, WHITIANGA
ZL1AC	WESTERN SUBURBS RADIO CLUB INC, PO BOX 15-122, NEW LYNN	ZL1AGY	EASTON, J A, RD 9, WHEKI VALLEY HILL, WHANGAREI
ZL1ACD	COAKLEY, A H, 1 CLINTON AVE, TE ATATU PENINSULA, AUCKLAND 1008	ZL1AGZ	DELANEY, J D, 41 BIRDWOOD RD, SWANSON
ZL1ACE	WINDER, S P, 138 WELLINGTON ST, OPOTIKI	ZL1AH	WIGHTMAN, J D, 99C EIGHTH AVE, TAURANGA
ZL1ACG	CALDWELL, E G, 23 CLYMA PLACE, MASSEY, AUCKLAND 1008	ZL1AHD	FRANKLIN, M J, 138 BARRETT ROAD, RD3, ALBANY, AUCKLAND
ZL1ACH	TEN VELDE, R J M, 8 MATIPO PLACE, TOKOROA	ZL1AHK	TESTER, W, 48 PULHAM RD, WARKWORTH
ZL1ACJ	TURNER, R H, 7 KEISS STREET, BLENHEIM	ZL1AHL	MCLELLAN, G L, P O Box 33, WANAKA
ZL1ACK	MARSHALL, R F, P O BOX 41172, ST LUKES, AUCKLAND	ZL1AHM	BELL, A D, 182 OCEAN RD, OHOPE
ZL1ACM	MCKENZIE, C J, 20 Hinton Place, MANUREWA, AUCKLAND	ZL1AHO	SYKES, R J, 263 SHIRLEY RD, PAPATOETOE, AUCKLAND 1701
ZL1ACN	MESSENT, D L, 53 RUSSELL ROAD, HUNTRY	ZL1AHP	GREENDALE, L S, PO BOX 301, PAIHIA
ZL1ACO	GRUSNING, H N, 2 GORDON AVENUE, TE AROHA 2951	ZL1AHT	BUCKLAND, I D, 490 COATESVILLE HIGHWAY, R D 3, ALBANY 1331
ZL1ACT	MILLER, R N, 72 GRATTAN RD, TE AROHA	ZL1AHW	HOBAN, R P, 462 KAITEMAKO RD, WELCOME BAY RD 5, TAURANGA
ZL1ACV	TWISS, D G L, PO BOX 884, TAUPO	ZL1AHX	KING, A M, UNIT 2/106 VICTORIA ST, ONEHUNGA, AUCKLAND 6
ZL1ACX	ROUS, B W, 56 TAMAHERE DRIVE, GLENFIELD	ZL1AHZ	KIDD, B F, 18 ADDISON RD, ONERAHI, PARUA BAY 0250
ZL1ACY	BILLING, C J, 16 DOBELL RD, STANMORE BAY, WHANGAPARAOA 1463	ZL1AI	BADMAN, R G, 146 TOTARA DRIVE, PUKETE, HAMILTON 2001
ZL1ACZ	WILLIAMS, B C, M3 66 AVONLEIGH RD, GREEN BAY, AUCKLAND	ZL1AIA	BAYLIS, M B, 1 MUNRO ST, ONERAHI, WHANGAREI
ZL1AD	BLACKETT, D J, 56 CHURCH ST, NORTHCOTE, AUCKLAND 9	ZL1AIB	MORRIS, N C, PO BOX 12357, HAMILTON
ZL1ADA	WRIGHT, J R, 28 CHORLEY AVENUE, MASSEY, AUCKLAND 1008	ZL1AIF	REID, D M, 123 MCCOY RD, RD 2, OPOTIKI 3092
ZL1ADB	ATAYA, P G E, 4204 GREAT NORTH RD, HENDERSON	ZL1AIH	MCCORMACK, R K F, 181 ARARIMU VALLEY RD, WAIMAUKU, AUCKLAND 1250
ZL1ADC	MEHARRY, R G, 111 CLARKIN RD, FAIRFIELD, HAMILTON	ZL1AII	MCFARLANE, I R, 20 HAKARIMATA RD, NGARUAWAHIA
ZL1ADE	DUFFY, E J, 22 DUKE ST, MT ROSKILL, AUCKLAND	ZL1AIJ	BLAKE, C B, 4 BLACKWELL DRIVE, R D 1 TRYPHENA, GREAT BARRIER ISLAND
ZL1ADG	HUNT, C W, 990/1 BANK ST, TE AWAMUTU	ZL1AIK	LEWIS, P J, 6 TYBURNIA AVENUE, MT ALBERT, AUCKLAND
ZL1ADI	RADEMACHER, C A, 2247 SOUTH HEAD ROAD, RD 1, HELENSVILLE	ZL1AIP	PARKER, T H, 11 A ALBERT STREET, PAEROA
ZL1ADL	WILKINS, D N, 5 ETHEL ST, SANDRINGHAM	ZL1AIR	ARMSTRONG, B E, 24 BEACH RD, MANGONUI 0557
ZL1ADO	SULLIVAN, J K, 26 Karaka Park Place, ST HELIERS, AUCKLAND 1005	ZL1AIS	DYER, R J, c/o 3 TUDOR RISE, WHAKATANE, BAY OF PLENTY
ZL1ADP	MEDLAND, F J, 11 THE LANE, MEDLANDS BAY, GREAT BARRIER ISLAND 1240	ZL1AIX	ROBINSON, W J, 7 JOSEPH BANKS TCE, REMUERA, AUCKLAND 1005
ZL1ADS	TIBBLES, W J, 19 KOTANUI ST, ARMY BAY, WHANGAPARAOA	ZL1AJ	CULLOTY, H F J, 316/1 BUDDEN RD, POKURU RD 5, TE AWAMUTU
ZL1ADT	ORR, K R, PO BOX 95-151, SWANSON, AUCKLAND 1230	ZL1AJB	BRADDOK, A, PO BOX 57066, MANA, PORIRUA
ZL1ADW	CLARK, B E, 88 LINCOLN PARK AVE, MASSEY	ZL1AJD	KRIPPNER, F J, TE RORE, RD 6, TE AWAMUTU
ZL1AE	CROONEN, P W, 1071 HAZELMERE CRESCENT, TE AWAMUTU	ZL1AJH	Hobbs, A J, 3 York Place, Tokoroa
		ZL1AJI	JEFFRIES, A W, 70 WOODGLEN RD, GLEN EDEN
		ZL1AJK	WOOD, W B, 8 WILLIAM SOUTER ST, TAKAPUNA
		ZL1AJL	DEWAR, C A, 6 SYNTAX PLACE, CONIFER GROVE, TAKANINI
		ZL1AJM	MORGAN, J G, 26 HAROLD AVE, KAIKOHE
		ZL1AJN	HOLMES, W S, RD 1, WAIKU
		ZL1AJP	POPE, A J,
		ZL1AJQ	HOGAN, A H, PO BOX 1497, TAUPO

74 Wellington VHF Group (Inc)

Branch Callsign: ZL2WA.
Physical Address: Tawa Civic Building, Cambridge Street, Tawa.
Postal Address: PO Box 12-259, Thorndon, Wellington.
President: John Andrews ZL2HD.
Secretary: Dick Greenbank ZL2TGQ.
Net Information: 710 repeater on Wednesdays at 2000.
Contact Person: Secretary.
Contact Phone Number: (04) 970-3985. Email: zl2wa@clear.net.nz
Meeting Information: Last Thursday each month (except December) at 1945.

75 Queenstown

In recess.

76 Kaikoura Radio Club

Postal Address: 42 Churchill Street, Kaikoura 8280.
President: H. G. H. Bryant ZL3GB.
Secretary: R. J. Godfrey ZL3DR.
Net Information: Kaikoura 690 on Saturdays at 1930.
Contact Person: Bill Jackson ZL3PZ.
Contact Phone Number: (03) 319-5981, Fax: (03) 319-7081.
Meeting Information: As required.

77 Te Aroha and Districts Radio Club

In recess.

78 Far North Districts Amateur Radio Club (Inc)

Branch Callsign: ZL1FND.
Physical Address: FNDARC, Queen Street, Awanui.
Postal Address: PO Box 4, Awanui 0552.
President: Bob Banks ZL1AUI.
Secretary: Russell Shackleton ZL1BQK.
Contact Person: Eric Manning ZL1GE.
Contact Phone Number: (09) 406-7059. Email: ericos@kol.co.nz
Meeting Information: As required.

79 Howick and Districts Radio Club (Inc)

Branch Callsign: ZL1TB.
Physical Address: Keall House 31 Uxbridge Road, Howick.
Postal Address: C/- 1/1 Castlemaine Close Howick, Auckland 1705.
President: Alan Scott ZL1AAS.
Secretary: Vern Morris ZL1TDG.
Net Information: 146.575 on Sundays at 0900.
Contact Person: Vern Morris ZL1TDG.
Contact Phone Number: (09) 271-1301. Email: zl1tdg@nzart.org.nz
Meeting Information: First Wednesday each month (except January) at 1930.

80 Hibiscus Coast Amateur Radio Club (Inc)

Branch Callsign: ZL1FU.
Physical Address: 479/1 Whangaparaoa Road, Whangaparaoa.
Postal Address: 479/1 Whangaparaoa Road, Whangaparaoa 1463.
President: David Wadham ZL1WD.
Secretary: John Bell ZL1FB.
Net Information: 3620 kHz on Sundays at 0800. 147.300 MHz repeater with Branch 71 Thursdays at 1930.
Contact Person: John Bell 34 Layton Road, Whangaparaoa 1463.
Contact Phone Number: (09) 424 5725.
Meeting Information: Third Wednesday each month (AGM in December) at 1930.

81 Waikato VHF Group (Inc)

Branch Callsign: ZL1IS.
Physical Address: C/- 64 Sunny Hills Avenue, Hamilton.
Postal Address: PO Box 606, Hamilton 2015.
President: Noel Rowe ZL3GR.
Secretary: Gavin Petrie ZL1GWP.
Net Information: Waikato 695 on Sundays at 2030.
Contact Person: Gavin Petrie ZL1GWP.
Contact Phone Number: (07) 843-0326. Email: zl1gwp@nzart.org.nz
Meeting Information: Last Sunday (February, May, August and November) at 1330, listen to net for details.
Web Site: www.zl1is.info

82 Southern Wairarapa Amateur Radio Club

Branch Callsign: ZL2SWR.
Physical Address: 2 Revans Street, Featherston.
President: Neil Rait ZL2BLM.
Secretary: Peter Norden ZL2SJ.
Contact Person: Neil Rait.
Contact Phone Number: (06) 308-9341.

83 Raglan Amateur Radio Club

Branch Callsign: ZL1CCT.
Physical Address: 25 Bay View Road, Raglan.
Postal Address: 25 Bay View Road, Raglan 2051.
President: Jack Sanders ZL1AUV.
Secretary: Fred Gilbert ZL1FG.
Net Information: Saturdays 3608 at 0830 (NZT).
Contact Person: Fred Gilbert Email: fred.g@paradise.net.nz
Contact Phone Number: (07) 825-8018.
Meetings: As required otherwise on air on Saturday mornings.

84 Bay of Islands Amateur Radio Club

Branch Callsign: ZL1BOI.
Physical Address: Rainbow Falls Road, RD 2, Kerikeri.
Postal Address: 61 Pungaere Road, RD 2, Kerikeri 0470.
President: D. J. Cottle ZL1HH.
Secretary: B. E. Wing ZL1AVW.
Net Information: 146.750 MHz on Wednesday at 1930.
Contact Person: ZL1HH or ZL1AVW.
Contact Phone Number: (09) 407-9086.

85 Mercury Bay (Inc)

Branch Callsign: ZL1MBB.
Postal Address: 10 Harbour Lights Terrace, RD 2 Whitianga 2856.
President: ZL1AMZ.
Secretary: ZL1CWN.
Contact Person: Brian ZL1CWN or Tom ZL1AMZ.
Contact Phone Number: (07) 866-2346. Email: zl1cwn@paradise.net.nz
Meeting Information: Second Wednesday each month at 1900.

86 Suburban Amateur Radio Club (Inc)

Branch Callsign: ZL1ZLD, ZL1ZLF.
Physical address: Musick Memorial Radio Station, 20 Musick Point Road, Bucklands Beach, Auckland.
President: Ian Walker ZL1BFB.
Secretary: Ann Walker ZL1TRH.
Contact Person: Ian Walker ZL1BFB.
Contact Phone Number: (09) 626-7188 or Mobile 0274 411-820.
Email: zl1bfb@nzart.org.nz
Meetings: Second Sunday each month 1300.
Club members are in attendance most Wednesday mornings from 10 am or by appointment.

87 South Taranaki (Inc)

President: Rob Clarkson ZL2AFE.
Postal address: PO Box 156, Hawera.
Secretary: Graeme Bateman ZL2BHD.
Net Information: 705 on Sundays 2000.
Contact Person: G. W. Bateman.
Contact Phone Number: (06) 278-4793. Email: gfbateman@clear.net.nz.
Meetings: Third Monday (except January) at 1945, usually at STDC Recreation Rooms, High Street extension, Hawera—(sometimes in members lounges, check with secretary).

Affiliated Branches**Canterbury Amateur Radio Development Society (Inc)**

Branch Callsign: ZL3CAR.
Postal address: PO Box 21-188, Edgeware, Christchurch 8030.
President: Mike Barns ZL3TMB.
Secretary: Lorna Allan ZL3AAZ.
Contact Person: Lorna Allan ZL3AAZ.
Contact Phone Number: (03) 313-5352.
Email: lorna.allan@getheel.co.nz
Meetings: Third Wednesday of each month (except January) 1930 at the Branch 56 Clubrooms, Auburn Park, Christchurch.

57 Tokoroa (Inc)

Branch Callsign: ZL1AQR.
 Postal Address: PO Box 325, Tokoroa 2392.
 President: E. C. Penwarden ZL1TDV.
 Secretary: B. M. Williamson ZL1BYO.
 Contact Person: B. M. Williamson.
 Contact Phone Number: (07) 886-7675.
 Meeting Information: Third Monday (bi-monthly).

58 Helensville
 In recess.**59 Mangakino**
 In recess.**60 Taupo**

Branch Callsign: ZL1BCO.
 Physical Address: Hickling Park, A.C. Baths Avenue, Taupo.
 Postal Address: C/- PO Box 58, Taupo 3351.
 President: Richard Simmonds ZL1UTW.
 Secretary: John Turnbull ZL1DT.
 Net Information: Taupo 675 on Mondays at 2000.
 Contact Person: Graeme Frederick ZL1BU.
 Contact Phone Number: (07) 376-9544. Email: zl1bu@nzart.org.nz
 Meeting Information: First Thursday each month at 1930.
 Web site: www.reap.org.nz/~zl1bco

61 Central Otago

Branch Callsign: ZL4OO.
 Physical Address: Alexandra Fire Station
 Postal Address: C/- PO Box 7, Clyde, Central Otago.
 President: John Lochhead ZL4QS.
 Secretary: Ken Holdom ZL4HU.
 Net Information: 3660 kHz on Tuesday Nights at 2000 hours.
 Contact Person: Ken Holdom.
 Contact Phone Number: (03) 449-2579. Email: zl4hu@clear.net.nz
 Meeting Information: Fourth Thursday each month (except June, July and December) at 2000 at Alexandra Fire Station. If not available then Town and Country Club.

62 Reefton-Buller

Branch Callsign: ZL3RBC.
 Physical Address: 148 Torea Street, Granity, Buller.
 Postal Address: 148 Torea Street, Granity, Buller.
 President: Robert Duncan.
 Secretary: Graham Hunter ZL2USB.
 Contact Person: Graham Hunter. Email: purpleperson@xtra.co.nz.
 Contact Phone Number: (03) 782-8055.
 Meeting Information: Second Thursday each second month (beginning May).

63 Upper Hutt (Inc)

Branch Callsign: ZL2VH.
 Physical Address: Rural Fire Station, Park Street, Upper Hutt.
 Postal Address: C/- 204 Plateau Road, Te Marua, Upper Hutt.
 President: Mark Gooding ZL2UFI.
 Secretary: Mark Gooding ZL2UFI.
 Net Information: 3630 kHz Tuesdays 2100.
 Contact Person: Mark Gooding ZL2UFI.
 Contact Phone Number: (04) 526-8446. Email: mark@foxtrot.co.nz
 Meeting Information: Every Friday night at 1930.
 IRLP node number 6910 on Climie 730.

64 North Otago

Physical Address: Civil Defense Headquarters, Severn Street, Oamaru.
 Postal Address: Branch 64, 133 Reservoir Road, Oamaru 8901.
 President: Daniel Moffat ZL4DBM.
 Secretary: Denis Browne ZL4DB.
 Contact Person: Doug Walker ZL4TDF.
 Contact Phone Number: (03) 437-1262.
 Email: browne.d.p@xtra.co.nz.
 Meeting Information: Second Monday each month (except January) at 1930.

65 Papakura Radio Club (Inc)

Branch Callsign: ZL1VK
 Physical Address: Wellington Park, 1R Great South Road, Papakura.
 Postal Address: PO Box 72-397, Papakura 1730.
 President: David Karrasch ZL1DK.
 Secretary: Ian Ashley ZL1AOX.
 Net Information: 147.325 MHz on Sundays at 0830 and 3755 kHz on Sundays at 0900.
 Contact Person: David Karrasch.
 Contact Phone Number: (09) 286-0180 or (09) 298-5271.
 Email: prc@hug.co.nz.
 Meeting Information: General Meeting first Wednesday each month at 1930. Projects evening second Wednesday at 1930. Day meeting fourth Wednesday at 1330.
 Morse Examination administrator: Dave Johnston. ZL1AMN (09) 298-9297.
 Website: www.qsl.net/zl1vk

66 Auckland VHF Group (Inc)

Branch Callsign: ZL1BQ.
 Physical Address: Arthur Faulkner Reserve, Hazel Avenue, Mount Roskill, Auckland.
 Postal Address: PO Box 10-138, Dominion Road, Auckland 1030.
 President: Tim Moore ZL1TN.
 Secretary: Daniel Ayers ZL1DFA.
 Net Information: 6625 and 9875 repeaters every Sunday at 2015.
 Contact Person: Tim Moore ZL1TN.
 Contact Phone Number: 021 273 2429. Email: tmoore@clear.net.nz
 Meeting Information: Third Monday each month at 1930.
 Website: www.qsl.net/zl1bq

67 Kawerau

Branch Callsign: ZL1KW.
 Physical Address: Meetings held in members homes, confirm venue with Secretary.
 Postal Address: C/- 34 Cobham Drive, Kawerau 3075.
 President: Barry Liddle ZL1CAY.
 Secretary: Bev Osborne ZL1OS.
 Contact Person: Bob Krause ZL1TMK.
 Contact Phone Number: (07) 323-8560.
 Email: krause@quicksilver.net.nz
 Meeting Information: Third Tuesday each month at 1930 (except December) confirm venue with secretary.

68 North Canterbury Amateur Radio Club (Inc)

Branch Callsign: ZL3RR.
 Physical Address: Woodend Youth Centre, Woodend-Rangiora Road, Woodend.
 Postal Address: PO Box 14, Woodend 8255, North Canterbury.
 Branch Callsign: ZL3RR.
 President: Tony Buckland ZL3HAM.
 Secretary: Colin Rowe ZL3COL.
 Net Information: 6757 repeater, following the 725 net. Approximately 2015 on Sundays.
 Contact Person: Colin Rowe ZL3COL.
 Contact Phone Number: (03) 313-2303. Email: colingr@xtra.co.nz
 Meeting Information: Second Thursday of each month (except January) at 1930. AGM February.
 Monthly Newsletter: Ragchew.

69 Kapiti Amateur Radio Society (Inc)

Branch Callsign: ZL2KB.
 Physical Address: Corner Aorangi Road and Tutanekai Street, Paraparaumu.
 Postal Address: C/- Bill Cox, 5A Konini Grove, Raumati Beach 6010.
 President: Kevin Henderson ZL2DUS.
 Secretary: Bill Cox ZL2BIL.
 Net Information: Kapiti 146.85 MHz on Sundays at 1930.
 Contact Person: Bill Cox.
 Contact Phone Number: Home (04) 902-2630.
 Email: billcat@paradise.net.nz
 Meeting Information: First Wednesday each month 2000, Committee second Wednesday at 1930 and Clubrooms open every Saturday from 0930 until 1130. Make and mend evenings at clubrooms on the first and third Mondays of each month between 1930 and 2100.

70 Fielding Radio Club

Branch Callsign: ZL2AMR.
 Contact Person: Paul Harris ZL2WOG.
 Contact Phone Number: (06) 323-5524.

71 Rodney Amateur Radio Club (Inc)

Branch Callsign: ZL1ROD.
 Physical Address: Warkworth Scout Hall, Shoemsmith Street, Warkworth.
 Postal Address: PO Box 587 Warkworth 1241.
 President: Cec Tunnicliffe ZL2BCB.
 Secretary: Jim Goodsir ZL1BJI.
 Net Information: 147.730 MHz on Thursdays at 1930.
 Contact Person: Jim Goodsir Call Book QTH.
 Contact Phone Number: (09) 425-5944.
 Contact Email: zl1bj@nzart.org.nz
 Meeting Information: Second Tuesday each month (except January) at 1930 in Scout Hall.

72 Opotiki Amateur Radio Club (Inc)

Branch Callsign: ZL1BY.
 Postal Address: C/- 138 Wellington Street, Opotiki 3092.
 President: Jim Jones ZL1JRJ.
 Secretary: Jack Lake ZL1ONE. Email: jlake@wave.co.nz
 Contact Person: Steve Winder ZL1ACE.
 Contact Phone Number: (07) 315-7333. Email: zl1ace@wave.co.nz
 Meeting Information: Bi-monthly first Monday (March, May, July, September and November) at 1900 at the rear of St Stephens Church.

73 Northern Wairoa Electronics Club

42 Titahi Bay Amateur Radio Club (Inc)

Branch Callsign: ZL2AFV.

Physical Address: Tireti Hall, corner Tireti Road and TePene Avenue, Titahi Bay.

Postal Address: PO Box 50-402, Porirua.

President: Ken Pattle ZL2TKY.

Secretary: Mike Burch ZL2AUA.

Net Information: 3710 kHz on Sundays at 2000.

Contact Person: Mike Burch ZL2AUA.

Contact Phone Number: (04) 233-9038 Email: zl2afv@hotmail.com.

Meeting Information: First Tuesday most months at 1930 (telephone contact to check).

43 Waihi and Districts

Branch Callsign: ZL1QW.

Physical Address: Williams Street, Waihi.

Postal Address: 32 Gilmour Street, Waihi 2981.

President: Peter Anderson ZL1LR.

Vice President: Ian McCaw ZL2BIU.

Secretary: Anne Anderson, ZL1AWA.

Net Information: Thursday 1970 3620 kHz.

Contact Person: Anne Anderson.

Contact Phone Number: (07) 863-7546. Email: zl1awa@paradise.net.nz

Meeting Information: First Wednesday each month (except January) at 1930. Ring Secretary for location.

44 Matamata Radio Club

Branch Callsign: ZL1RF.

Physical Address: Matamata homes.

Postal Address: 74 Tawari Street, Matamata 2271.

President: John Rasmussen ZL1AGA.

Secretary: Ian Perkins ZL1BFH.

Net Information: 3560kHz on Sundays at 0900.

Contact Person: John Rasmussen ZL1AGA.

Contact Phone Number: (07) 888-8059 (day), (07) 888-6269 (night).

Meeting Information: As required at members homes on the second Wednesday month at 1930.

45 Waimarino

In recess.

46 Wairarapa Amateur Radio Club (Inc)

Branch Callsign: ZL2OA.

Physical Address: Hood Aerodrome, Manaia Road, Masterton.

Postal Address: PO Box 860, Masterton 5900.

President: Robert Lambert ZL2BFY.

Secretary: Ian Stewart ZL2TIS.

Net Information: Masterton 680 on Mondays at 2000 except meeting nights and January.

Contact Person: Ian Stewart ZL2TIS.

Contact Phone Number: (06) 377-0713. Email: zl2tis@orcon.net.nz

Meeting Information: Second Monday each month (except January) at 1930.

Check info

47 Waitara Amateur Radio Club

Branch Callsign: ZL2TO.

Physical Address: Manukorihi Park Sports Club, Manukorihi Road, Waitara.

Postal Address: C/- L Smart 48 Leslie Street, Waitara 4656.

President: Ian Cash ZL2BRA.

Secretary: Larry Smart ZL2SM.

Contact Person: Larry Smart ZL2SM.

Contact Phone Number: (06) 754-7583. Email: zl2sm.smart@xtra.co.nz

Meeting Information: First Sunday each month (except January).

Where Statutory Holiday falls on a Monday meeting is deferred one week.

48 Wanganui Amateur Radio Society (Inc)

Branch Callsign: ZL2JA.

Physical Address: Deer Stalkers Hall, 100 Peat Street, Wanganui.

Postal Address: C/- 1 Caversham Road, Wanganui 5001.

President: Jim Allen ZL2KR.

Secretary: Jeff Howe ZL2THO.

Net Information: Each Tuesday 2000 on 146.900 MHz (Wanganui 690).

Contact Person: Jeff Howe ZL2THO.

Contact Phone Number: (06) 344-4302. Email: howejef@clear.net.nz

Meeting Information: First non-public holiday Monday each month (except January and July) at 1930.

49 Westland

Branch Callsign: ZL3GY.

Postal Address: 37 Chapel Street, Greymouth.

President: Bob McQuarrie ZL3TY.

Secretary: Graham Hay ZL3WMM.

Net Information: Westland 695 as contact for club members.

Contact Person: Graham Hay ZL3WMM.

Contact Phone Number: (03) 768-9499 Email: zl3wmm@nzart.org.nz

Meeting Information: First Wednesday each month (except January) at 1930. Meeting held at Electronet Services, Tainui Street Building, Greymouth.

50 Wellington Amateur Radio Club (Inc)

Branch Callsign: ZL2WB.

Physical Address: WEMO Building, corner Murphy and Turnbull Streets, Thorndon, Wellington.

Postal Address: PO Box 6464, Marion Square, Wellington 6035.

President: Mike Kerr ZL2BCW.

Secretary: John Barnhill ZL2TCN.

Net Information: 7050 kHz on Sundays at 0930.

Contact Person: Tony Fletcher ZL2ALJ.

Contact Phone Number: (04) 383-8838 and (04) 389-8547. Email: zl2aj@paradise.net.nz or zl2tcn@nzart.org.nz.

Meeting Information: Third Tuesday each month (except December) at 1930 (NZT).

Information on Quartz Hill ZL6QH and ZM2E/ZL2MF for VLF. Contact through WARC or direct through Bob Stewart ZL2AMI, see Website: zl6qh.com

51 Eastern Bay of Plenty (Inc)

Branch Callsign: ZL1AIU.

Physical Address: Waieve Street, Hillcrest, Whakatane.

Postal Address: C/- D. M. Reid, 123 McCoy Road, RD 2 Oputiki 3092.

President: Murray Evans ZL1SZ.

Secretary: Donal Reid ZL1AIF.

Net Information: 147.300 MHz on Mondays at 1930.

Contact Person: Murray Evans.

Contact Phone Number: (07) 308-8409. Email: donal@wave.co.nz

Meeting Information: Second Wednesday each month (except January) at 1800—business at 1930.

52 Northern Hawkes Bay

In recess.

53 Te Puke Amateur Radio Club (Inc)

Branch Callsign: ZL1IB.

Physical Address: C/- Te Puke Holiday Park, 2122 State Highway 2, Te Puke.

Postal Address: C/- S. J. Rowe, 223 State Highway 33, RD 9, Te Puke 3071.

President: Andrew Race ZL1TAP.

Secretary/Treasurer: Syd Rowe ZL1LWR.

Net Information: Tauranga 680 on Wednesdays at 2030. 3600 kHz at 0900 on Sundays.

438.855 Repeater at 0900 and 1930 on Tuesdays.

Contact Person: Syd Rowe ZL1LWR.

Contact Phone Number: (07) 533-1029.

Email: sydrowe45@hyper.net.nz

Meeting Information: Second Saturday each month at 1330. Clubrooms open each Saturday at 1300 for activities.

54 Patea

Branch Callsign: ZL2QF.

Postal Address: PO Box 156, Hawera 4800.

President: Robin Clarkson ZL2AFE.

Secretary: Graeme Bateman ZL2BHD.

Net Information: 705 on Sundays at 2000.

Contact Person: G. W. Bateman ZL2BHD.

Contact Phone Number: (06) 278-4793.

Meeting Information: Third Monday each month (except January) at 1945 usually at STDC Recreation Rooms, High Street extension, Hawera (check with secretary).

55 Waitomo Radio Club

Branch Callsign: ZL1IZ.

Physical Address: Thomson Avenue, Otorohanga.

Postal Address: C/- 3/49 Hinewai Street, Otorohanga 2564.

President: Andrew Leadey ZL4SQ.

Secretary: Ihian Howitt ZL1BZ.

Net Information: 3850 kHz on Mondays at 2000. Waitomo 7375 and or 7225 on Sundays at 0900.

Contact Person: Ihian Howitt ZL1BZ.

Contact Phone Number: (07) 873-7349. Email: ihian@paradise.net.nz

Meeting Information: First Tuesday of month at 1930 when held, but irregular due to scattered area of members, contact Secretary for details.

56 Christchurch West Amateur Radio Club (Inc)

Branch Callsign: ZL3VV.

Physical Address: Auburn Park, Upper Riccarton.

Postal Address: C/- PO Box 31-095, Ilam, Christchurch 8030.

President: Doug Pratt ZL2BCF.

Secretary: John Walker ZL3IB. Email: zl3ib@nzart.org.nz

Net Information: Each Sunday at 2000 on 147.250.

Contact Person: Des Borgfeldt ZL3ACS

Contact Phone Number: (03) 980-9705, Email: borgfeldt@xtra.co.nz

Meeting Information: Fourth Tuesday each month (except December) at 1930. "Free n Easy" second Wednesday each month (except January) at 1330.

26 Nelson Amateur Radio Club

Branch Callsign: ZL2ARG.

Postal Address: PO Box 414, Nelson 7015.

President: Rob McMillan ZL2DO.

Secretary: Andrew Mackie ZL2HZ.

Net Information: Sundays 3890 kHz at 0900.

Contact Person: Dolph Lyford ZL2OL.

Contact Phone Number: (03) 548-8217.

Meeting Information: Third Wednesday (February to November) at 1930 in the Nelson Car Club rooms, Bolt Road, Tahunau, Nelson.

27 New Plymouth Amateur Radio Club (Inc)

Branch Callsign: ZL2AB.

Physical Address: Taranaki Emergency Management Office, 45 Robe Street, New Plymouth.

Postal Address: C/- Taranaki Emergency Management Office, 45 Robe Street, New Plymouth.

President: Roy Symon ZL2KH.

Secretary: Greg Banks ZL2BZH.

Net Information: Wednesday at 2000 on 147.200 MHz repeater.

Contact Person: Greg Banks.

Contact Phone Number: (06) 751-3271.

Meeting Information: Third Tuesday (February to November) second Tuesday in December.

28 Whangarei Amateur Radio Club (Inc)

Branch Callsign: ZL1AM.

Physical Address: Heritage Park, SH 14, Maunu, Whangarei.

Postal Address: PO Box 10-078, Te Mai, Whangarei.

President: Charlie Moates ZL1DAC.

Secretary: Trevor Gould ZL1KAG.

Net Information: VHF 146.650 MHz on Mondays at 2000. HF 3585 kHz on Sundays at 0800.

CW improvers 3580 kHz Tuesdays at 2000 (all times local).

Contact Person: Charlie Moates ZL1DAC.

Contact Phone Number: (09) 434-7292, Fax (09) 434-7206. Email: zl1dac@nzart.org.nz

Meeting Information: First Wednesday each month at 1930. Informal gatherings at the clubroom every Wednesday at 1700.

29 North Shore (Inc)

Branch Callsign: ZL1AB.

Physical Address: CD HQ, 400 East Coast Road, Mairangi Bay, North Shore.

Postal Address: CD HQ, 400 East Coast Road, Mairangi Bay, North Shore 1310.

President: Peter Smith ZL1ARB.

Secretary: Alan Wooller ZL1AUW.

Newsletter Editor: hfalkner@internet.co.nz

Net Information: 147.425 MHz on Wednesdays at 1930.

Contact Person: Alan Wooller.

Contact Phone Number: (09) 444-2423.

Meeting Information: First Monday in the month (except June).

Web page: www.geocities.com/mjsheffield/northshore.html**30 Otago (Inc)**

Branch Callsign: ZL4AA.

Physical Address: 109 Macandrew Road, Dunedin.

Postal Address: PO Box 5485, Moray Place Dunedin.

President: Lindsay Ross ZL4KS. Email: zl4ks@paradise.net.nz

Secretary: Ross Chapman ZL4RC. Email: zl4rc@slingshot.co.nz

Net Information: Dunedin 690 on Sundays at 1930 (except late December and early January).

Contact Person: Alan Gilchrist ZL4PZ.

Contact Phone Number: (03) 488-0808. Email: ham.radio@web4u.co.nz

Meeting Information: Each Wednesday (except late December and early January) at 1930.

Website www.qsl.net/zl4aa or link to www.nzart.org.nz**31 Pahiatua**

In recess—refer to Branch 06.

32 Rahotu Coastal Inc Opunake Radio Club

Branch Callsign: ZL2ANN.

Physical Address: 166 Tasman Street.

Postal Address: 166 Tasman Street, Opunake 4854.

President: Peter McNeil ZL2BQW.

Secretary: J. N. Jago ZL2DBX.

Contact Person: H. Gorton ZL2ADU.

Contact Phone Number: (06) 761-7027.

Meeting Information: As required.

33 Rotorua Amateur Radio Club (Inc)

Branch Callsign: ZL1ROT.

Physical Address: Rotorua Arts Village, Wohlmann House, 1240 Hinemaru Street, Rotorua.

Postal Address: 27 Lucas Place, Fenton Park, Rotorua 3201.

President: Graham Beagley ZL1GBT.

Secretary: Graeme Bramwell ZL1GBB.

Net Information: 144.350 repeater on Fridays at 2030.

Contact Person: Graeme Bramwell ZL1GBB (07) 349-6617.

Email: zl1rot@nzart.org.nz

Meeting Information: Rotorua Arts Village, Wohlmann House first and third Tuesdays at 1930.

34 South Canterbury

Branch Callsign: ZL3UR.

Physical Address: CD HQ, Bank Street, Timaru.

Postal Address: C/- PO Box 261 Timaru.

President: H. G. Bouwknecht ZL3HGB, 35 Elizabeth Street, Cave.

Net Information: Timaru 695 on Sundays at 1930.

Contact Person: H. G. Bouwknecht.

Contact Phone Number: (03) 614-3977. Email: henk@xtra.co.nz

Meeting Information: Last Monday of each month (except December) at 1930.

35 South Otago

Branch Callsign: ZL4JF.

Physical Address: Main South Road.

Postal Address: "Graylea", RD 2, Balclutha 9200.

President: Ron Blair ZL4TL.

Secretary: Cliff Gray ZL4AS.

Net Information: 3585 kHz on Mondays at 2000. Kuriwao 675 on Mondays at 1930.

Contact Person: Cliff Gray. Email: zl4as@nzart.org.nz

Contact Phone Number: (03) 418-1488.

Meeting Information: First Tuesday each month (except January, May, July, Aug) at 2000.

36 South Westland

In recess.

37 Invercargill (Inc)

Branch Callsign: ZL4GQ.

Physical Address: 249 Ettrick Street, Invercargill.

Postal Address: PO Box 1260, Invercargill 9515.

President: Gavin Thompson.

Secretary: Judi Thompson ZL4TGC.

Contact Person: Crosbie Stewart ZL4TIC.

Contact Phone Number: (03) 216-3060.

Meeting Information: AREC First Tuesday of each month, (except January) 1930.

Branch second Tuesday of each month (except January), at 1930.

Computer second Tuesday of each month (except January), at 1930.

38 Taumarunui

Postal Address: C/- T. R. Hardisty, 293 Taupo Road, Taumarunui 2600.

President: L. Palmer.

Secretary: T. Hardisty.

Contact Person: Trevor Hardisty.

Contact Phone Number: (07) 895-7994.

Meeting Information: As required.

39 Tauranga Amateur Radio Club (Inc)

Branch Callsign: ZL1TP.

Physical Address: WBOP District Council Chambers, Barkers Corner, Tauranga.

Postal Address: C/- Emergency Management Office, Private Bag 12803 Tauranga.

President: Brian Heywood ZL1IE.

Secretary: Brian Heywood ZL1IE.

Net Information: 3600 kHz on Sundays at 0900. 438.850 MHz on Monday at 0900 and 1930. On Wednesdays 146.800 MHz at 2030.

Contact Person: Brian Heywood ZL1IE.

Contact Phone Number: (07) 543-3677. Email: zl1ie@nzart.org.nz

Meeting Information: Second Tuesday each month (except January) at 1900.

40 Te Awamutu Amateur Radio Club

Branch Callsign: ZL1CB.

Physical Address: 509/1 Mutu Street, Te Awamutu.

Postal Address: C/- PO Box 157, Te Awamutu 2400.

President: Bernard Westerbaan ZL1WT, 38 Whittaker Street, Kihikihi.

Secretary: Bindy Owen ZL2AZY, 550 Kane Street, Pirongia.

Net Information: 3865 kHz on Thursdays at 2000.

Contact Person: Bernard Westerbaan (07) 871-7039.

Email: ewenrp@xtra.co.nz or zl1wtc@paradise.net.nz

Meeting Information: Third Wednesday (every second month).

41 Thames

Branch Callsign: ZL1DF.

Physical address : 146 Maramaraha Road, RD 1, Thames.

Postal Address: 146 Maramaraha Road, RD 1, Thames.

President: Ken Hayhurst ZL1ATU.

Secretary: David Kitchen ZL1CDJ.

Net Information: 3850 kHz and 145.700 MHz on Sundays at 0900.

Contact Person: Ken Hayhurst ZL1ATU.

Contact Phone Number: (07) 868-7330. Email: k.hayhurst@xtra.co.nz

Meeting Information: Quarterly 2nd Tuesday (February, May, August and November) at Thames Civil Defence Rooms, Macky Street, Thames.

11 Gisborne Amateur Radio Club (Inc)

Branch Callsign: ZL2AA.

Physical Address: Gisborne Cosmopolitan Clubrooms, Cnr Grey and Derby Streets, Gisborne.

Postal Address: PO Box 1017, Gisborne 3815.

President: Ric Coleman ZL2RIC.

Secretary: Pamela Campbell-Smith.

Net Information: 3685 kHz every evening from 2030. 146.800 every evening 1800.

Contact Person: Alan Makintosh ZL2AOP.

Contact Phone Number: (06) 868-6267.

Email: ricol@xtra.co.nz

Meeting Information: General meeting second Monday each month at 1930. Committee meets at private houses.

12 Hamilton Amateur Radio Club (Inc)

Branch Callsign: ZL1UX.

Physical Address: 88 Seddon Road, Hamilton.

Postal Address: PO Box 606, Hamilton 2015.

President: Robin Holdsworth ZL1IC.

Secretary: David Nation ZL1TCE.

Net Information: 3575 kHz on Mondays at 1930. 146.525 MHz on Mondays at 2000.

Contact Person: David King.

Contact Phone Number: (07) 847-1320.

Email: branch.12@nzart.org.nz

Meeting Information: Business Meeting first Wednesday at 1930 and General Meeting third Wednesday of each month (except January and December) at 1930.

13 Hastings/Havelock North

Branch Callsign: ZL2AS.

Physical Address: Surf Lifesaving Club Rooms, Winsor Park, Grove Road, Hastings.

Postal Address: PO Box 2403, Stortford Lodge, Hastings 4201

President: Warren Harris ZL2AJ.

Secretary: David Walker ZL2DW.

Net Information: 3615 kHz and 147.250 Repeater on Sundays at 0900.

Contact Person: Warren Harris ZL2AJ.

Contact Phone Number: (06) 844-6880, 021 649-284. Email: warren@technaserve.com

Meeting Information: Fourth Wednesday each month (except December) at 1930 at Surf Lifesaving Club Rooms, Grove Road, Hastings (Splash Planet car park).

14 Hawera Amateur Radio Club

Branch Callsign: ZL2AWW.

Postal Address: 126 Fairfield Road, Hawera 4800.

Contact Person: Peter Williams ZL2AID.

Contact Phone Number: (06) 278-4292.

Meeting Information: Irregular.

15 Central Hawkes Bay Radio Club

In recess.

16 Horowhenua

Branch Callsign: ZL2DS.

Postal Address: C- 24 Paeroa Road, RD 12 Levin

President: Kenneth Ireland ZL2KI.

Secretary: Les Jury ZL4SS.

Contact Person: Les Jury.

Contact Phone Number: (06) 367-3399. Email: zl4ss@nzart.org.nz

Meeting Information: Third Monday each month at 1930 at the Radio Reading Service Rooms

Levin Mall, Levin.

17 Huntly Radio Club

Branch Callsign: ZL1BL.

Physical Address: 520 Kainui Road, Taupiri.

Postal Address: 195 Rotongaro Road, RD 2 Huntley.

President: Terry East ZL1BGS.

Secretary Jim Williams ZL1BOS.

Contact Person: Terry East

Contact Phone Number: (07) 826-6730 or (07) 824-6805

Email: granteast1@thenet.net.nz

Meeting Information: Second Tuesday at 1930 at 520 Kaunui Road, Taupiri.

18 Hutt Valley (Inc)

Branch Callsign: ZL2HV.

Physical Address: Birch Street Reserve, Waterloo.

Postal Address: PO Box 30-519, Lower Hutt 6315.

President: Dave Williams ZL2DSW.

Secretary: Chris Purcell ZL2POS.

Net Information: 3675 kHz on Sundays at 0900.

Contact Person: Dave Williams.

Contact Phone Number: (04) 564-6713

Email: davewill@clear.net.nz

Meeting Information: First Monday each month at 1930. Also every Friday at 1930 (informal).

19 Inglewood

Branch Callsign: ZL2PT.

Physical Address: 34 James Street, Ingelwood 4651.

Postal Address: 1778 Mountain Road, RD 10, Ingelwood 4651.

President: Peter Cramer ZL2AIS.

Secretary: Tarry Martin ZL2KV.

Contact Person: Peter Cramer.

Contact Phone Number: (06) 756-7314.

20 Manawatu Amateur Radio Society (Inc)

Branch Callsign: ZL2KO.

Physical Address: 65 Totara Road, Palmerston North 5301.

Postal Address: PO Box 1718, Palmerston North.

President: P. W. Prist ZL2BOB.

Secretary: Ian Ogier ZL1AF.

Net Information: 3570kHz on Sundays at 0900. 147.125 MHz on Thursdays at 2000.

Contact Person: Stan Russell ZL2BRS.

Contact Phone Number: (06) 358-6683 Email ianwo@clear.net.nz

Meeting Information: First Wednesday each month at 1930, fourth Wednesday 1400 for "Old Timers", fifth Wednesday 1930 social "natta session", third Wednesday at 1930 committee meeting.

Additional information: First Friday each month 1700 hours on 999 kHz for those interested "Radio Waves" a program for the amateur. This is repeated the following Thursday Radio Reading Service at 2130 hours on 1602 kHz and 3935 kHz.

Web page: <http://www.zl2ko.orcon.net>

21 Manukau Radio Club (Inc)

Branch Callsign: ZL1QB.

Physical Address: 8 Guide Place, Papatoetoe.

Postal Address: 8 Guide Place, Papatoetoe 1701.

President: J. Paltridge ZL1JW.

Secretary: R. A. Blair ZL1WNZ

Net Information: 3655 kHz and 146.550 MHz on Sundays at 0900.

Contact Person: Jim Paltridge ZL1JW.

Contact Phone Number: (09) 278-3389 Email: paltridge@xtra.co.nz

Meeting Information: General meeting third Wednesday each month at 1930 hours. Morning meeting third Monday 1015 hours. Construction night fourth Wednesday at 1930 hours.

22 Marlborough Amateur Radio Club (Inc)

Branch Callsign: ZL2KS.

Physical Address: Marlborough EOC, Wither Road (West Extension) Blenheim.

Postal Address: PO Box 432, Blenheim 7315.

President: David Rothwell ZL2WDR.

Secretary: Tony Allan ZL2DOG.

Net Information: Blenheim 146.950, 145.600 and 147.225 on Mondays at 1930.

Contact Person: Tony Allan.

Contact Phone Number: (03) 579-3136 Email zl2ks@nzart.org.nz and a.allan@xtra.co.nz

Meeting Information: Committee fourth Thursday each month, General second Thursday each month and Social Group third Thursday.

23 Marton and Districts

Branch Callsign: ZL2AMS.

Physical Address: Marton CDHQ Rooms (back of Public Library Building), High Street, Marton.

Postal Address: PO Box 279, Marton 5460.

President: Brian Purdie ZL2ADL.

Secretary: Fred Rubery ZL2NR.

Net Information: Taihape 6775 repeater on Sundays at 2000.

Contact Person: Fred Rubery ZL2NR, 3 McDonald Place.

Contact Phone Number: (06) 327-7200 Email: fredrubery@xtra.co.nz

Meeting Information: Fourth Wednesday each month (check as winter meetings held bi-monthly) at 1930 at CDHQ High Street, Marton.

AREC: E Call ZL2EW, Section Leader Brian Purdie ZL2ADL (06) 329-3606 or 025 846-551,

Deputy Section Leader Jim Vernon ZL2BHX (06) 388-1855 or 025 462-628.

24 Motueka (Inc)

Branch Callsign: ZL2GK.

Physical Address: S.A.R. Rooms, High Street, Motueka Police Station.

Postal Address: PO Box 218, Motueka 7161.

President: J. Jackson ZL2BCG.

Secretary: N. B. Davenport ZL2LN.

Contact Person: Stephen Fogerty ZL2ASF.

Contact Phone Number: (03) 588-9366.

Meeting Information: First Monday each month.

25 Napier Amateur Radio Club (Inc)

Branch Callsign: ZL2GT.

Physical Address: 123 Latham Street, Marewa, Napier 4001.

Postal Address: 4 Tukes Place, Greenmeadows, Napier.

President: Laurie Winton ZL2TC.

Secretary: Randall Goldfinch ZL1NW.

Net Information: 3615 kHz and Napier 7250 on Sundays at 0900.

Contact Person: Laurie Winton ZL2TC.

Contact Phone Number: (06) 843-8519. Email: laurie@wilcom.co.nz

Meeting Information: First Wednesday each month at 1930 at Club Rooms (except January).

NZART BRANCH DIRECTORY

Alphabetical List of Branches

	Date of update				Date of update			Date of update
01M Ashburton	2006	16C Horowhenua	2006	52C Northern Hawkes Bay	2006	60N Taupo	2006	
02N Auckland	2006	79N Howick	2006	73N Northern Wairoa	2006	39N Tauranga	2006	
66N Auckland VHF	2005	17N Huntly	2005	64S North Otago	2006	77N Te Aroha	2006	
33S Balclutha	2006	18C Hutt Valley	2005	72N Opotiki	2004	40N Te Awamutu	2006	
84N Bay of Islands	2005	19C Inglewood	2006	30S Otago	2006	53N Te Puke	2006	
04N Cambridge	2005	76M Kaikoura		31C Pahiatua	2006	41N Thames	2006	
15C Central Hawkes Bay	2006	69C Kapiti	2006	65N Papakura	2006	42C Tatihi Bay	2006	
61S Central Otago	2006	67N Kawerau	2006	54C Patea	2006	57N Tokora	2002	
05M Christchurch	2006	20C Manawatu	2006	75S Queenstown	2006	63C Upper Hutt	2006	
56M Christchurch West	2006	59N Mangakino	2006	83N Raglan	2006	43N Waihi	2006	
51N Eastern Bay of Plenty	2005	21N Manukau	2004	32C Rahotu Coastal	2006	81N Waikato VHF	2006	
08S Eastern Southland	2006	22C Marlborough	2006	62M Reefton-Buller	2006	45C Waimarino	2006	
09C Egmont	2006	23C Marton	2003	71M Rodney	2005	46C Wairarapa	2006	
78N Far North	2006	44N Matamata	2004	33N Rotorua	2006	47C Waitara	2005	
70C Feilding	2003	85N Mercury Bay	2004	34M South Canterbury	2005	55N Waitomo	2006	
10C Franklin	2006	24C Moteuka	2004	36M South Westland	2006	48C Wanganui	2006	
11C Gisborne	2006	25C Napier	2005	24M Southern Wairarapa	2006	50C Wellington	2006	
12N Hamilton	2006	26C Nelson	2006	37S Southland	2006	74C Wellington VHF	2006	
13C Hastings	2006	27C New Plymouth	2006	86M Suburban	2006	03N Western Suburbs	2006	
14C Hawera	2006	68M Northern Canterbury	2006	06C Tararua	2006	49M Westland	2005	
58N Helensville	2006	29N North Shore	2006	38N Taumarunui		28N Whangarei	2006	
80N Hibiscus Coast	2006					CARDS	2006	

Letter after Branch number denotes electoral district – N=Northern, C=Central, M=Midland, S=Southern. *Italics* = Branches in recess.

Affiliated Branches: Canterbury Amateur Radio Development Society Inc (CARDS); Suburban Amateur Radio Club Inc.

01 Ashburton (Inc)

Branch Callsign: ZL3AF. Physical Address: Aviation Museum, Airport Road, Ashburton. Postal Address: 36B Burnett Street, Ashburton 8300. President: Jim Nelson ZL3ND. Secretary: Mike Trump ZL3TPQ. Net Information: 144.600 MHz on Mondays at 2030 except club nights. Contact Person: Mike Trump ZL3TPQ. Contact Phone Number: (03) 308-7119. Email: mtrump@orcon.net.nz Meeting Information: Second Monday each month (except December and January) at 1930.

02 Auckland (Inc)

Branch Callsign: ZL1AA. Physical Address: 400 St. Johns Road, Meadowbank, Auckland. Postal Address: PO Box 18-003, Glen Innes, Auckland 1130. President: Graham Hay ZL1GH. Secretary: Bob Murphy ZL1AFU. Net Information: 145.775 on Mondays at 2000 and 3645k Hz on Mondays at 2100. Contact Person: Selwyn Ross ZL1BRC. Contact Phone Number: (09) 575-8847. Email: zl1brc@nzart.org.nz Meeting Information: Third Tuesday each month February to November at 1930 and AGM second Tuesday of December. Committee first Thursday each month (except January). Clubrooms open on Saturday mornings from 0930. Web: www.qsl.net/zl1aa

03 Western Suburbs Radio Club (Inc)

Branch Callsign: ZL1AC. Physical Address: 3000 Great North Road, New Lynn, Auckland. Postal Address: PO Box 15-122, New Lynn, Auckland 1007. President: Andrew Barnett ZL2ALW. Secretary: ZL1AC C/- PO Box 15-122, New Lynn. Net Information: 146.525 on Wednesdays at 1930. 3.623 MHz on Fridays at 1930. Contact Person: Ross Reddell ZL1VRR ross.reddell@xtra.co.nz Contact Phone Number: (09) 629-0504 Email: ross.reddell@xtra.co.nz Meeting Information: Second Monday of each month 1930, Committee meetings fourth Monday 1930. Web: www.qsl.net/zl1ac

04 Cambridge Radio Club

Branch Callsign: ZL1HP. Physical Address: 22a Taylor Street, Cambridge. Postal Address: PO Box 650, Cambridge. President: Peter Sadgrove ZL2UJ. Secretary: Ian Honey ZL1AN. Contact Person: Peter Sadgrove. Contact Phone Number: (07) 827-6857. Email: zl2uj@nzart.org.nz Meeting Information: Every Tuesday of each month at 1930.

05 Christchurch Amateur Radio Club (Inc)

Branch Callsign: ZL3AC. Physical Address: 27 Galbraith Avenue, Avonside, Christchurch. Postal Address: PO Box 1733, Christchurch 8015. President: John Hirtzel ZL3ADF (03) 352-6323. Secretary: Rory Deans ZL3HB (03) 325-4181. Net Information: Canterbury 725 (if available, otherwise on 705 repeater) on Sundays at 2000 (except last Sunday of the month) then after Official Broadcast. Contact Person: John Hirtzel or Rory Deans. Contact Phone Number: As above. Email: jonej@xtra.co.nz Meeting Information: First Wednesday each month (February to December) at 1930. AREC meets on the second Wednesday at 1930. "Social get-together" every Tuesday night 1930 until late (February to December). Web page: <http://www.nzart.org.nz/branches/chch/branch05/>

06 Tararua District Radio Club

Branch Callsign: ZL2IB. Postal Address: C/- 24 York Street, Dannevirke 5491. President: Tom Fleming ZL2TF. Secretary: Stephen Cooper ZL2WAU. Net Information: Every Friday Night at 2000 to 2100 on 146.650 (linked to 438.700). Contact Person: Tom Fleming ZL2TF (06) 376-7638 Email: t.j.fleming@paradise.net.nz Contact Person: Stephen Cooper ZL2WAU (06) 374-8288 Email: rosewoodvilla@xnet.co.nz Meeting Information: Second Sunday each month (except December and January). Please contact club for venue. AREC Section Leader: Stephen Cooper.

08 Eastern Southland

Branch Callsign: ZL4AL. Postal Address: C/- PO Box 9, Wyndham. President: Dick Whyte ZL4AQ. Secretary: Lindsay Eunson ZL4LC Email: zl4lc@nzart.org.nz Contact Person: Alister Allan. Contact Phone Number: (03) 208-7288 027-432-1914. Email: anallan@woosh.co.nz Meeting Information: Fourth Wednesday each month at the Gore Town and Country Club at 2000.

09 Egmont

In recess.

10 Franklin Amateur Radio Club (Inc)

Branch Callsign: ZL1SA. Physical Address: Stadium Drive, Pukekohe. Postal Address: C/- 25 John Street, Pukekohe 1800. President: Tom McDonald ZL1TO. Secretary: Lynnette McDonald ZL1LL. Net Information: 3700 kHz on Sundays at 0900. Bombay 690 on Sundays at 0930. Contact Person: Bob Holt ZL1BBZ. Contact Phone Number: (09) 235-9549. Email: zl1ll@nzart.org.nz Meeting Information: Third Tuesday each month at 2000.

A Policy Statement by Council (Revised 1995)

Members will be aware of the requirement in paragraph 27 of the Association's Constitution that Branches must not admit to membership persons who hold an amateur station licence, but who are not members of the Association.

Over the years there have been attempts to repeal or modify these provisions, but successive National Conferences have made it quite clear that members will have none of it. The rationale for this Constitutional provision is that it provides at least one way in which non-members can be denied the privileges which membership of the Association brings. We cannot stop our non-member brethren enjoying some benefits—such as the negotiations the Association conducts with the licensing authorities, the use of repeaters, and the enjoyment of the benefits which band plans bring. Council is firmly of the view that it is unfair to those who do pay their subscriptions if the lot of non-members is made easier by the ready availability of members' privileges which the Association is, in fact, able to withhold. Further, the Association has to take into account the feelings of its many voluntary workers, who devote many hours to Association matters, and, in addition, pay their subscriptions as well. These persons have even greater cause to complain if the Association makes benefits available to non-members who do not contribute to these benefits by at least joining the Association and paying a subscription.

Branch Officers

It is disturbing to Council to find that some Branches not only fail to have regard to their Constitutional obligations by ensuring that licensed amateurs who are not Association members do not join the Branch, but even have as Branch Officers persons who are licensed amateurs but not members of the Association. This is clearly unconstitutional. If an Officer is not an Association

member, but is a licensed amateur, then there is a breach of the Association Constitution. This should also be a breach of the Branch Constitution—if it is not, the Branch Constitution is faulty and must be brought into line. (See the Association's Constitution, paragraph 27.)

Regrettably, there are still one or two clubs that indulge in a fiction—they attempt to evade their responsibilities to NZART, whether arising under paragraph 27 or otherwise, by purporting to distinguish between the local club and the NZART branch. This fiction ignores the realities, and is not acceptable. The reality is that the local club itself is the NZART Branch, and the Branch Constitution must be changed to reflect this commitment to NZART if that is necessary. Any attempt (for that is all it is) to circumvent the Association Constitution by resorting to this fiction is unfair to the local NZART members, other NZART members, and the Association itself.

Relationship between Branches and the Association

Sometimes, Branch members criticize these rules, often using catch phrases such as "breach of human rights", or "interference with independent clubs". These provisions of the Association Constitution are nothing of the sort. They are part of the contract that members make when they join the Association. By applying to become or by remaining an Association Branch, the Clubs or Branches surrender their independence to the extent required to conform with the Association's Constitution. Branches are expected to keep their houses in order; if they are not prepared to do this, then they should surrender their status as a Branch. There is nothing in the Human Rights Act to prevent the Association and its Branches from discriminating between members and non-members.

Whose job is it to be the policeman?

The answer is—nobody's and everybody's. The Association's Constitution does not specifically charge Council or any Officer with the task of enforcement. So long as we remain members, we are all parties to the contract represented by the Constitution and we each individually have that responsibility. If a Branch is Incorporated in its own right, then the Branch in its corporate capacity also has that duty.

Hardship

Hardship is not a ground for failing to become an Association member. Association subscriptions can be remitted under paragraph 7(e) of the Association's Constitution and Council will authorize this where there is genuine hardship. But Council's experience has been that the genuine hardship is rare indeed. Many claims of hardship over the years have been found, on enquiry, not to be genuine. Application for this concession should be made in person by the member. Council will then usually discreetly seek further information from the Branch. Council would expect there to be no more than half a dozen such cases throughout the country at any one time. The privacy of the applicant is respected by ensuring that as few persons as possible within the Association are aware of the Application.

Why are we telling you this now?

Council has never said anything else. But there are now some situations which create special problems for the Association.

The Association enters into contracts with public corporations and SOEs relating to right of entry for the siting of repeaters. These contracts recognize potential liability and require the Association as a condition of the contract to take public liability insurance which could be up to \$2 million or more. This insurance will be taken on terms which will extend to

protect both the Association and individual members. Naturally, the corporations we are dealing with take comfort in this insurance, as they know that while the insurance is in place the Association has the indemnities required to meet any claims. This means that to come within the Association's cover, individuals must be members, as the Association has no intention of paying additional premiums to insure against the actions of non-members. If an individual incurs liability as agent of the Association, then that individual must be a member to take the benefit of any cover the Association arranges. The Association will not appoint non-members as its agents, as this would nullify the insurance cover.

As Branches have responsibility with the Association for repeaters, Branch Officers are required to be Association members. This is not more than the Constitutional requirement. Because of these matters, Council will, in future, have to be more active in seeing that the Constitution is observed.

As the appointment of repeater trustees is an Association matter, even if exercised through Branches, repeater trustees must also be members. This, likewise, is a necessary consequence of the provisions of the Constitution. Council, in future, will have to ensure that repeater trustees are Association members, not only because this is a Constitutional requirement, but also to ensure that the persons responsible for the operation of repeaters have adequate insurance cover to meet the requirements of our contracts with the public corporations.

Action

Take action now to ensure that your Branch complies with the Association's Constitution. Your Councillors will help you with advice as required.

This policy statement was first published in the August 1990 Break-In. It is now reissued in a slightly revised form.

NZART Council

The Constitution of the New Zealand Association of Radio Transmitters Incorporated

is available from:

The Business Manager, NZART, Freepost 3565, PO Box 40-525, Upper Hutt 6415
or NZART URL: <http://www.nzart.org.nz/nzart> nzart@clear.net.nz

AUDIO-VISUAL LIBRARY

NZART Tape and Video Library

The following items may be borrowed from NZART HQ.

(1) All China RDF Competition

A serious 30 minute look at Amateur Radio Direction Finding; an official sport in China.

(2) The Happy Flyers Techniques of RDF

A 26 minute audio/visual presentation of the theory and techniques for VHF Radio Direction Finding.

(3) The Aerial Circus with Dud Charman G6CJ

45 minutes. Verification of the theory of the operation of a variety of VHF and HF antennas. See the theory confirmed by means of scale model antennas.

(4) Amateur Radio's Newest Frontier

30 minutes. A recent production from ARRL. Looks at the Radio Amateurs' involvement in space.

(5) NAREC 50

A 60 minute production by Branch 25. Looks at the Napier Conference and the 50th Anniversary of AREC.

(6) Communications—The Hidden Revolution

135 minutes. A address and demonstration by the Engineer-in-Chief, New Zealand Post Office, on modern communications techniques and methods

(7) The Integration and Launch of AMSAT OSCAR-10

35 minutes. A preview of the presentation and launch of OSCAR-10 by Werner Haus DJ5KQ.

(9) The Wonderful Wide World of Amateur Radio

27 minutes. Produced by JARL, a look at Amateur Radio in Japan.

(10) W. (Bill) Orr W6SAI Whakatane Conference Opening June 1988

20 minutes.

(11) 1987 Dayton Hamvention—a KG0P production

30 minutes.

(12) ARRL's New World of Amateur Radio 1988

Via WA6AI.

(13) W6AI Sunday 05/06/1988—Lecture on Linear Amplifiers

(14) Component Identification—ZL1TOF

18 minutes.

(15) Launch of Ariane IV 15/06/1988

(16) RSGB's Amateur Radio for Beginners.

43 minutes.

(17) Waiting for the Big One.

(18) Fuji-2 JAS-1 Japanese Amateur Satellite 1B

(19) Ham Radio In Space

30 minutes—ARRL

(20) SAREX—Shuttle Amateur Radio Experiment

19 minutes—ARRL

(21) "More Than Radios" from Zman Productions

This video is a very special message to Amateur Radio operators. It is a strong emotional video and unlike any other video you have seen about Amateur Radio.

(22) Getting Started in Packet Radio

From CQ Communications Inc. This video will help de-mystify the exciting but sometimes confusing world of Packet Radio.

(23) Getting Started in Amateur Satellites

From CQ Communications Inc. Find out how to locate and track ham satellites with ease. A video filled with easy to understand advice and tips that can't be found anywhere else.

(24) Dayton Hamvention 1996—Vaughan Henderson ZL1TGC

(25) Dxpedition May 1996 to Raoul Island—ZL8RI

(26) What's Happening in ARDF

7 minutes.

(27) ZL9CI—Campbell Island 1999—James Brookes 9V1YC

60 minutes. Further copies of this can be purchased @ \$35.00+p&p, through the following e-mail address <jamesb@pacific.net.sg>.

(28) An interview with Gerald Beattie—21/June 1989—28 minutes

(29) NZART Amateur Television Official Broadcast 30 March 1986

(30) NZART 75th Anniversary Conference Auckland 2001

(31) Commemoration at Musick Point 2003

(32) ZL2AMJ Investiture at Government House August 2002

(33) The Secret Wireless War (new)

120 Minutes ; Beyond Bletchley Park & Black Propaganda.

Cost of hire for each video is \$5.00 includes P & P.

CDROMS and DVDs for Hire

(1) Bell-Goyder QSO October 18, 1924

(2) 513A IOTA Yambe Island DX-pedition July 1-10, 2000

(3) NZART 75th Anniversary Conference 2001

(4) Otago Branch History (1928-2003) 75th Anniversary

(5) NZ WARO History (1962-2002)

(6) The Story of Enigma; not recommended for Branch use

(7) ARRL Ham Software Library

(8) Ham Radio CD Rom 1968-1976

(9) Ham Radio CD Rom 1977-1983

(10) Ham Radio CD Rom 1984-1990

(11) Tune in the Universe; Paul Shuch N6TX

(12) Ham Shack Brass Pounders & Rag Chewers on CD

(13) NZART Convention 2006; Radio Astronomy by Clive Rowe

(14) NZART Convention 2006; Time & Frequency by Dave Brown ZL3FJ

(15) NZART Convention 2006; How Sound Card Digital Modes Work by Murray Greenman ZL1BPU

Costs for hire of CD Rom \$10 includes P & P.

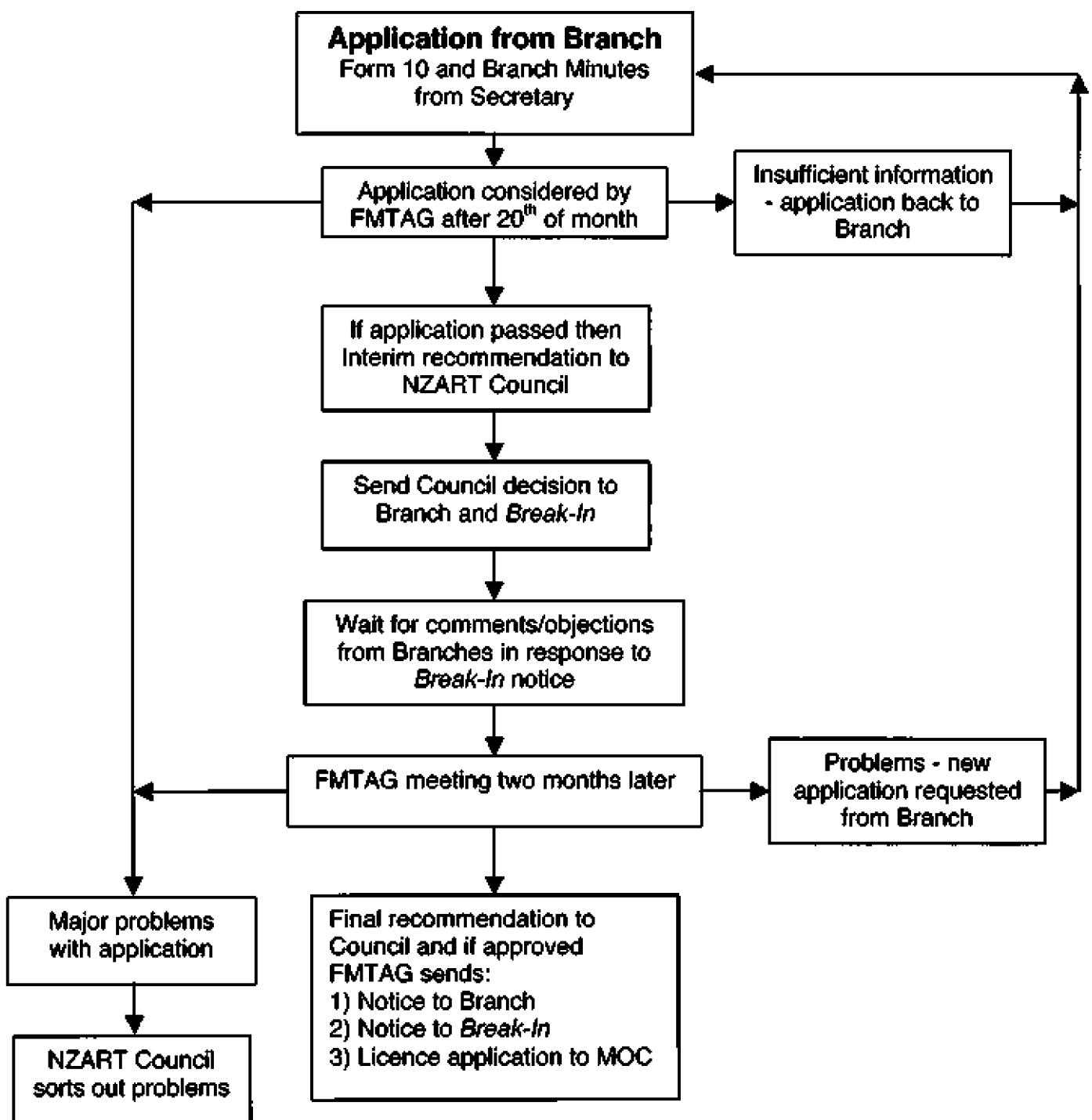
NZART Examination Training DVD

The series of 15 DVDs have been completed and are available via NZART HQ. This series is very much an individual's (me!) interpretation of how to present the material. I have kept the scripting fairly informal in order to maintain the material similar to how I would teach a class in person. I have checked the material and hopefully there are no obvious errors. The level of material is at, or a little above, the question bank for the exam. In order to teach material of any kind you do need to go a little above the level of the examination at times for clarity of explanation.

The introduction on DVD1 covers this. The technical quality is quite acceptable although some of the earlier material is a little low in video resolution but still adequate; this was due to the learning curve in the process of going from digital tape to DVD.

Any suggestions/constructive criticism are welcome, please e-mail me. I would like to acknowledge the invaluable assistance given by Grant Simpson ZL2BK in the technical production and Jim Meachen ZL2BHF in cleaning up a few rogue sound tracks.—Stuart Watchman ZL2TW <zl2tw@nzart.org.nz>

FMTAG Procedure - May 2000



FREQUENCY MANAGEMENT TECHNICAL ADVISORY GROUP (FMTAG)

FMTAG consists of:
Chairperson, Secretary and others
as appointed by NZART Council

The purpose and actions of the
FMTAG are:

- Study and report to Council on
matters affecting amateur radio
frequencies.

- Plan future use of amateur
bands
- Select frequencies for Amateur
Fixed Stations
- Maintain a register of Amateur
Fixed Stations
- Assists in preparing drafts for
Council including submissions
when needed, to the Ministry of
Economic Development (Radio
Spectrum Division) on behalf
of the Amateur Service prior to
each major ITU meeting or
conference
- Bandplans are developed by the
FMTAG based on IARU rec-

ommendations, local require-
ments, and submitted to NZART
Council for approval

Application Forms for repeaters
and beacons can be obtained from
a NZART Councillor, NZART HQ
or email your request to <fntag@
nzart.org.nz>.

Prepared by FMTAG MAY 2000

NZART Headquarters

Visitors welcome

Hours: 9 am-1 pm

Suite 9

19 Main Street

UPPER HUTT

Business Manager:

Debby Morgan ZL2TDM

Telephone: (+64-4) 528-2170

Fax: (+64-4) 528-2173

E-mail: <nzart.hq@clear.net.nz>

Postal: PO Box 40-525, Upper Hutt 5140

NZART Subscriptions

2006/2007

T Transmitting*	\$95.00
A Associate	\$95.00
B Branch	\$95.00
N Non-Transmitting	\$95.00
F Family (Transmitting additional)	\$30.00
G Family Non-Transmitting	\$30.00
S Student	\$40.00
Overseas Surface (No GST)	\$95.00
Overseas Airmail (No GST)	\$110.00

NZART Web Site

www.nzart.org.nz

Web Master

Mark Gooding ZL2UFI

E-mail: <webmaster@nzart.org.nz>

Phone: (04) 526-8446

Fax: (04) 526-8069

Break-In Editor:

J. R. L. Walker ZL3IB

The Official Journal of the New Zealand Association of Radio Transmitters (Inc.) published bi-monthly.

—All articles and letters to the Editor:

E-mail: <break-in@nzart.org.nz>

Editor

Break-In

PO Box 1733, CHRISTCHURCH 8140

CHANGE OF ADDRESS or DELIVERY PROBLEMS

Advise the Business Manager

PO Box 40-525, Upper Hutt 5140

Official Broadcasts:

J. A. Meachen ZL2BHF

E-mail: <zl6a@nzart.org.nz>

The monthly NZART Official Broadcast is made by ZL6A, AUCKLAND, 3900 kHz LSB, on the last Sunday of each month except December, when the broadcast is made on the Sunday before Christmas.

The broadcast is also made on the National System and some VHF repeaters. A list of these can be found in *Break-In*.

The time of the broadcast is 2000 hours. A repeat broadcast is made at 2100 hours.

Members and Branches are welcome to submit material to ZL2BHF, C/- NZART Headquarters, PO Box 40-525, Upper Hutt 5140, for inclusion in the broadcasts.

Conference Official Broadcast

The Official Conference Broadcast is held on the Sunday of Queen's Birthday Weekend at 2000 hours.

Presidents



1926-1927	E. A. Shrimpton	Z2XA
1928	R. J. Orbell	OZ1AX
1929	R. J. Orbell	ZL1AX
1930	T. R. Clarkson	ZL1FQ
1931	H. P. V. Brown	ZL3CG
1932	D. Wilkinson	ZL2AB
1933	N. W. Laugesen	ZL3AS
1934	W. G. Collett	ZL4BP
1935	C. N. Edwards	ZL1AA
1936	W. M. Hall	ZL2BF
1937	R. B. Dodds	ZL4FK
1938	L. G. Petrie	ZL2OV
1939	F. W. Sellens	ZL2MY
1940	B. E. Jackson	ZL2FJ
1941-1942	W. Fouhy	ZL2LB
1943-1944	C. G. Liddell	ZL2BI
1945-1946	E. B. Lough	ZL2OG
1947-1949	C. G. Liddell	ZL2BI
1949-1950	J. F. Freeman	ZL2AFB
1950-1951	C. T. Berry	ZL2BY
1951-1953	W. J. Wainwright	ZL3LI
1953-1955	R. H. Hanley	ZL2GU
1955-1958	H. F. Arnold	ZL3HA
1958-1960	J. F. Freeman	ZL1VA
1960-1962	G. M. Salt	ZL1CK
1962-1964	R. T. Woodfield	ZL2VN
1964-1966	C. G. Liddell	ZL3ND
1966-1969	H. Burton	ZL2APC
1969-1970	W. R. Hamer	ZL2CD
1970-1972	D. A. Lloyd	ZL4PG
1972-1973	D. E. Cleland	ZL1IY
1973-1974	J. F. C. Johnson	ZL2AMJ
1974-1977	W. D. Gorman	ZL2IY
1977-1983	A. G. Godfrey	ZL1HV
1983-1985	D. J. Mackay	ZL3RW
1985-1991	T. D. Carrell	ZL3QL
1991-1992	T. C. King	ZL2AKW
1992-1997	J. A. Meachen	ZL2BHF
1997-2001	A. J. Wallace	ZL1AMW
2001-2005	A. P. Norden	ZL2SJ
2005-	W. L. B. Douglas	ZL2WP

Honorary Life Members

1934*	N. W. Laugesen	ZL3AS	1980*	F. R. W. Andrews	ZL2IJ
1943*	F. W. Sellens	ZL2MY	1982	G. C. Blackwell	ZL3NT
1946*	W. Fouhy	ZL2LB	1983*	A. G. Godfrey	ZL1HV
1947*	W. D. Gorman	ZL2IY	1985	J. F. C. Johnson	ZL2AMJ
1948*	T. R. Clarkson	ZL2AZ	1986*	C. W. Parton	ZL3CP
1948*	J. F. Freeman	ZL2VU	1987*	D. Wilkinson	ZL2AB
1948*	G. M. Salt	ZL1CK	1989*	R. S. H. Morgan	ZL2GQ
1949*	A. F. Leader	ZL2BH	1990	G. A. Kilpatrick	ZL1BBS
1950*	W. M. Hall	ZL2IY	1992*	D. J. Mackay	ZL3RW
1950*	Mrs W. Hall	ZL2VU	1992	R. L. Baldwin	WIRU
1953*	R. Cassey	ZL2IQ	1996	R. W. G. Kingston	ZLAMK
1954*	J. G. Howard	ZL4FR	1998	R. N. Copeland	ZL2AKV
1961*	J. M. White	ZL2GX	2000	T. D. Carrell	ZL3QL
1964	H. F. Arnold	ZL3HA	2000	J. A. Meachen	ZL2BHF
1966*	C. G. Liddell	ZL3ND	2002	G. E. Bold	ZL1AN
1972*	M. R. O. Montgomery	ZL4CA	2004	R. E. Knowles	ZL1BAD
1975*	A. R. Harris	ZL4CA	2005	J. C. Pye	ZL2NN

*Denotes deceased



Council

President:

Bruce Douglas ZL2WP <zl2wp@nzart.org.nz>

Immediate Past President:

Peter Norden ZL2SJ <zl2sj@nzart.org.nz>

Vice-President:

John Lochhead ZL4QS <zl4qs@nzart.org.nz>

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 Gavin Smith ZL2ACT <zl2act@nzart.org.nz>
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 Stuart Watchman ZL2TW <zl2tw@nzart.org.nz>
 John Hirtzel ZL3ADF <zl3adf@nzart.org.nz>

Officers

Treasurer:

Evan Sayer

Administration Liaison Officer:

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 E-mail: <alo@nzart.org.nz>
 15 Field Street, Upper Hutt 5019
 Telephone: (04) 528-8313

National Director AREC:

Jeff Sayer ZL6EX/ZL4JS
 E-mail: <sayer@xtra.co.nz>

AREC Section Leaders' Net

Held on the third Monday of each month at 1930 hours
 on 3900 kHz USB.

Awards Manager:

Alan Chapman ZL3GX
 E-mail: <awards@nzart.org.nz>
 PO Box 1733, Christchurch 8140
 Telephone: (03) 338-9720

Contest Manager:

John Powell ZL1BHQ
 E-mail: <contests@nzart.org.nz>
 47 Balfour Avenue, Forrest Hill, North Shore 0620
 Telephone: (09) 410-5464

EMC Officer:

Brian Emmett ZL3BE
 E-mail: <brian.emmett@tait.co.nz>
 Flat 2, 144 Beach Road, North Beach, Christchurch 8083

Examination Co-ordinator:

Debby Morgan ZL2TDM
 E-mail: <exam@nzart.org.nz>
 NZART, C/- PO Box 40-525
 Upper Hutt 5140

FMTAG

Chairman: David Andrews ZL2SX
 Secretary: Doug Ingham ZL2TAR
 Frequency Co-ordinator: Doug Ingham ZL2TAR
 PO Box 40-525 Upper Hutt 5140
 Email: <fmtag@nzart.org.nz>

Local Government Liaison Officer:

Mike Newman MD ZL1BNB
 E-mail: <mnewman@clear.net.nz>
 30 Nikau Street, Tawhero, Wanganui 4501
 Telephone: (06) 344-6830

Monitoring Service Co-ordinator:

Len Martinson ZL1BYA
 E-mail: <lenmart@clear.net.nz>
 31 Riverside Drive, Waiuku 2123
 Telephone: (09) 235-7712

IARU/Overseas Liaison Officers:

John Lochhead ZL4RS <zl4rs@nzart.org.nz>
 Terry Carrell ZL3QL
 Steve Davis ZL2UCX <jamiep@clear.net.nz>
 Jamie Pye ZL2NN <jamiep@clear.net.nz>

Reciprocal Licence Bureau Manager:

Joe Reed W. St ZL2AH
 Email: <joreed@actrix.co.nz>
 7a Humphrey Street, Marton 4710
 Telephone: (06) 327-7003

Region 3 Officers in NZART:

Peter Lake ZL2AZ Region 3 Director <peter.lake@xtra.co.nz>
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 Peter Norden ZL2SJ Region 3 Beacon Co-ordinator
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NZART

MEMBERSHIP SERVICES

New Zealand Radio Frequency Service Liaison on licensing and spectrum matters

International Representation with membership in the International Amateur Radio Union

Amateur Repeater Service co-ordination by the Frequency Management and Technical Advisory Group

Satellite Co-ordination liaison with satellite organizations worldwide

Amateur Beacon Service co-ordination by the Frequency Management and Technical Advisory Group

Satellite Support donations and fund-raising

Spectrum Bandplanning for Council by the Frequency Management and Technical Advisory Group

Public Service Involvement by the Amateur Radio Emergency Corps for Civil Defence and Search and Rescue

Break-In Journal published bi-monthly six times a year

Amateur Radio *Call Book* published annually

Reciprocal Licensing advice for travellers to or from New Zealand

Publications with member discount

QSL Bureau for dispatch and collection of cards

Official Broadcast transmitted monthly

Teletext for current news and promotion

Video Tape Library for branch borrowing

Ionospheric Predictions printed bi-monthly in *Break-In*

Slow Morse Practise for Amateur Radio Operators' Certificate Monitoring Service to protect our bands

Contests and Awards administration; branch, national and international

Annual Conference, our national forum

VHF Convention for VHF constructors and experimenters

Technical Standards co-ordination

Third Party Insurance for NZART activities, Branches and AREC

Education and Development Group for co-ordination of Radio Training

Examination Division—organisation of Amateur Operator Certificate examinations

Bulletin Board Systems for up-to-date information and messages

Special Projects for funds for promoting radio in developing countries

Legal Advice on tower permits

Branch Services constitutional, legal, financial, etc.

NZART MEMBER'S ORDER FORM—July 2006

NZART Publications and Supplies	Price each	Non Member	Quantity required	Cost
Additional copies of <i>Break-In</i>	\$6.00	\$7.50		
Amateur Radio in New Zealand—The new rules explained	\$8.00	\$10.00		
Amateur Radio Logbook	\$10.00	\$12.50		
Amateur Radio Training Manual Fifth Edition (spiral bound)	\$24.00	\$30.00		
Call Book 2005/2006	\$17.00	\$21.00		
<i>Ham Shacks, Brass Pounders & Rag Chewers</i>	\$5.00	\$10.00		
Log Sheets (per 10)	\$2.00	\$3.00		
Secret Listening	\$5.00	\$7.50		
NZART Examination Questions—bound copy	\$12.00	\$15.00		
NZART CD ROM Study Guide	\$10.00	\$12.50		
NZART Badge—Call-sign	\$9.30	N/A		
—Life Member of Branch	\$13.60	N/A		
—OTC Blue	\$9.70	N/A		
—Plain	\$3.70	N/A		
Radio (AM/FM)	\$30.00	\$35.00		
Travel Care Kit/Clock	\$20.00	\$25.00		
Rotating Clock/Calendar/Stop Watch	\$20.00	\$25.00		
NZART Pen	\$2.00	\$4.00		
Satchel	\$20.00	\$25.00		
Plastic Coated Name Badge	\$10.50	N/A		
NZART Subscription: Transmitting = \$95.00; Family = \$125.00; Overseas (Air) = \$110.00 (surface) = \$95.00; Student = \$40.00				
			Total \$	

Prices include GST plus P & P and are subject to change without notice. Please include full remittance with order. Non-members: add 20 per cent to all prices. Overseas members will incur additional postage dependent on country.

Examination Application Fee = \$25.00



This year's *Call Book* is the full edition complete with a CD that contains additional material that cannot be included in the printed in the hard copy due to size limitations. Included on the CD are the

issues of *Break-In* for 2005 in PDF format and selected items from the Australian *Call Book*.

Thanks again to all those who have given their time to contribute to the content of this publication. I seem to be making this request every year but remember that the information in sections such as the Branch Directory can only be as accurate and current as that supplied. Some people send me their updated address details, please remember that the call-sign information published in *Call Book* is that directly downloaded off the Ministry of Economic Development (MED) database. At present we are unable to amend call-sign data due to legal constraints therefore if you require changes to your call-sign information you must advise MED; but also please advise NZART HQ so that our records can be kept current.

Doug Pratt
Call Book Editor

*To the Office Manager NZART
PO Box 40-525, Upper Hutt 6415*

CHANGE OF ADDRESS NOTIFICATION

Name: _____ Call-sign: _____ Membership No: _____

Old Address:

New Station Address:

Which address do you wish to appear in *Call Book*?

Station Postal Both
(Please tick selection)

Post code: _____

***Break-In* postal address (if different):**

Post code: _____

Membership benefits include the automatic inclusion of transmitting call-sign holders address details in *Call Book* (published annually).

If you DO NOT wish your details published please sign below.

I DO NOT want my address details published by NZART _____

REMEMBER: If you change address you must notify the nearest office of the Ministry of Economic Development (Radio Spectrum Management), AND the Office Manager NZART.

Please post this form to the Office Manager NZART at the above address.

AMATEUR RADIO

What is Amateur Radio?

Amateur Radio, also affectionately known as "ham radio", is a hobby of constructing, experimenting and communicating. In New Zealand hams are licensed by the Ministry of Economic Development (Radio Spectrum Management). Once licensed, an amateur can operate radio equipment from home, from their vehicle and from anywhere in New Zealand. A number of radio frequencies have been set aside for Amateur Radio use. On these frequencies a ham can talk across town or around the world. The scope and possibilities are endless—from sending TV pictures to operating through Amateur Radio satellites.

Who can be Hams?

Just about anyone can become a ham. Some famous people such as Kings and Prime Ministers are hams, but most are just people from all walks of life who like communicating. Young people find Amateur Radio a great training ground, older people find "hamming" an absorbing retirement hobby.

In fact Amateur Radio is more than a hobby, it is a service. Hams provide their equipment and operating skills whenever the need arises—such as for Civil Defence emergencies and Search and Rescue operations.

How do I become a Ham?

Passing a ham licence is quite easy. For a limited licence correctly answer 40 of 60 questions from a multi-choice question paper. The questions cover radio theory and regulations from a public-domain question-bank. As a newly licensed ham you will be able to operate on amateur bands below 5 MHz. After three months operation with 50 logged contacts you will be able to operate on all New Zealand amateurs bands..

Where do I get more information?

The New Zealand Association of Radio Transmitters (Inc.) is a non-profit association of Amateur Radio Operators. NZART has clubs and instructors in most larger cities and towns. For more information on Amateur Radio and details of club and licensing courses near you, contact:

The Business Manager, NZART, Freepost 3565, P.O. Box 40-525, Upper Hutt.

Email: nzart@nzart.org.nz World Wide Web: <http://www.nzart.org.nz>

New Zealand Association of Radio Transmitters INC

(Founder Member of the International Amateur Radio Union Region 3)

Mail to: FREEPOST 3565, OFFICE MANAGER, PO BOX 40-525, UPPER HUTT 6415, NEW ZEALAND

PLEASE ENROL ME AS A NEW MEMBER AS FOLLOWS:

<input type="checkbox"/> TRANSMITTING	<input type="checkbox"/> NON-TRANSMITTING	<input type="checkbox"/> STUDENT	<input type="checkbox"/> FAMILY	<input type="checkbox"/> OVERSEAS	<input type="checkbox"/> ASSOCIATE	<input type="checkbox"/> CONCESSIONARY
MR	INITIALS	SURNAME				
MS						
MRS						
MISS						
ADDRESS						
OCCUPATION		DATE OF BIRTH				

CALL-SIGN
PREFERRED BRANCH, NAME OR NO
PLEASE FIND ENCLOSED
\$
MY SUBSCRIPTION TO
Dec 31 2007
I agree to abide by the NZART Constitution
Signature:

The information requested (other than date of birth) is for membership records required to be maintained under the Incorporated Societies' Act 1908.
Date of Birth is requested for statistical purposes only.

Membership benefits include the automatic inclusion of transmitting call-sign holders' address details in *Call Book* (published annually).

If you DO NOT wish your details published please sign below:

I DO NOT want my address details published by NZART _____

IF YOU PREFER TO PAY BY CREDIT CARD PLEASE COMPLETE

<input type="checkbox"/> VISA	<input type="checkbox"/> MASTERCARD	<input type="checkbox"/> EXPIRY DATE

CARD No. _____

Signature: _____

The Amateur's Code

1

The Amateur is Considerate ...

never knowingly using the air in such a way as to lessen the pleasure of others.

2

The Amateur is Loyal ...

offering loyalty, encouragement and support to fellow radio amateurs, local clubs and to the New Zealand Association of Radio Transmitters, through which Amateur Radio is represented in New Zealand.

3

The Amateur is Progressive ...

keeping his or her station abreast of science. It is well-built and efficient. His or her operating practice is above reproach.

4

The Amateur is Friendly ...

slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration of the interests of others; these are the marks of the amateur spirit.

5

The Amateur is Balanced ...

radio is a hobby. It is never allowed to interfere with any of the duties owing to home, job, school, or community.

6

The Amateur is Patriotic ...

with knowledge and station always ready for the service of country and community.

—PAUL M. SEGAL
ex-W3EEA, W9EEA
(Amended by the Editor)

2006/2007



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CALL BOOK

NEW ZEALAND AMATEUR RADIO
AND RADIO REFERENCE

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ZL1SA	FRANKLIN AMATEUR RADIO CLUB INC, THE PRESIDENT, 10 COLLINGWOOD ROAD, WAIKU 1852	ZL1TBA	REID, G, 14 EPPING PLACE, TAUPU
ZL1SAD	ALDERSON, S E, 8 STONELEIGH DRIVE, CHARTWELL, HAMILTON	ZL1TBB	CARTER, R, 70 RANFURLY STREET, DARGAVILLE
ZL1SAM	CALDWELL, B, 289 HOBSONVILLE ROAD, HOBSONVILLE, AUCKLAND	ZL1TBE	ESSIPOV, B, MEADOW COURT MOTEL, PO BOX 23 001, PAPATOETOE AUCKLAND
ZL1SB	SAPICH, S, 148 FOREST HILL ROAD, RD 1, HENDERSON	ZL1TBG	SANSON, R G, 55 BERTRAM ST, WARKWORTH
ZL1SC	CORRIGAN, M L, PO BOX 40-135, GLENFIELD, AUCKLAND 1330	ZL1TBH	WOODING, G, 28 SADDLEBACK RISE, MURRAYS BAY, AUCKLAND
ZL1SD	COLQUHOUN, R D, RANGITANE LOOP ROAD, RD1, KERIKERI	ZL1TBK	KEENE, B S G, PO BOX 426, WHANGAREI
ZL1SDD	DARDEN, S C, PO BOX 161, RUSSELL	ZL1TBL	MCKENZIE, C T, 2 IRENE AVE, MT EDEN, AUCKLAND 1003
ZL1SEA	A.N.A.R.S., HOLDER: MR A E LOCK, 27 REGENT DRIVE, PARAPARAUMU	ZL1TBM	JULIAN, I R,
ZL1SEW	Wilton, Steven, 63 Ross Street, Woodville	ZL1TBN	SANDERS, P, NEWELLS RD, RD 3, HAMILTON
ZL1SFP	POPE, S F,	ZL1TBP	CROLL, D, 25 POUWHAPE ST, WHAKATANE
ZL1SH	ADAIR, M W, 2/33 SEA VISTA AVENUE, BIRKENHEAD, AUCKLAND	ZL1TBQ	ANGELL, A R, 2/29 TWEED ST, MT MAUNGANUI
ZL1SJ	HOLMES, G C, 4/43 HOWE STREET, HOWICK, AUCKLAND	ZL1TBX	BOTT, A D, PO BOX 11-056, ELLERSLIE, AUCKLAND
ZL1SJC	CRAWFORD, J S, 7A Gloucester Road, Manurewa, AUCKLAND	ZL1TBY	SECCOMBE, J G, RD 1, OAKLANDS RD, PAPAKURA
ZL1SJW	WILLIAMS, S J, 16-B MARINA RD, TORBAY, AUCKLAND 1310	ZL1TBZ	TATTON, W C,
ZL1SK	THOMAS, M R, 52 BOLLARD AVE, AVONDALE	ZL1TC	METCALFE, A D, 2 MACKAY CRES, RD 3, TE AROHA 2971
ZL1SKC	SAINT KENTIGERN COLLEGE, PO BOX 51-060, PAKURANGA	ZL1TCA	CLARKE, C A, PO BOX 258018, GREENMOUNT, AUCKLAND
ZL1SKF	FAUPEL, S K, 60 FORDYCE AVENUE, PAKURANGA, AUCKLAND 1706	ZL1TCC	TOPFER, K, 11 EDITH PLACE, HAMILTON
ZL1SLM	DUHS, P E, P O BOX 12-309, PENROSE, AUCKLAND	ZL1TCE	NATION, D L, 54 PRISK ST, HAMILTON
ZL1SLO	DUNATOV, F, 1-231 POINT CHEVALIER ROAD, POINT CHEVALIER, AUCKLAND	ZL1TCF	FORTUNE, T L, 129 BLEAKHOUSE RD, HOWICK
ZL1SM	DROEGE, H, PO BOX 38-336, HOWICK, AUCKLAND 1730	ZL1TCG	Nielsen, Darryl, 108 Te Haumi Drive, Te Haumi, Paihia 0252
ZL1SMG	DONALDSON, G D, 13 SAMPLE ROAD, ALBANY, AUCKLAND	ZL1TCI	GRANGE, D L, PO BOX 80-026, GREEN BAY, AUCKLAND
ZL1SMP	PAYNE, S, 75 HOSPITAL RD, MAUNU, WHANGAREI	ZL1TCJ	JACKSON, L H, 5 RIPON CRES, MEADOWBANK, AUCKLAND 1005
ZL1SN	NEL, S N, 244 CASTLEWOLD DRIVE, STERLING GATE, TAURANGA	ZL1TCK	WOOLLEY, M G, 5A SPRINGBANK LANE, TE ATATU NORTH
ZL1SO	MILLER, R L, 52 HINEKURA RD, TAUPO	ZL1TCN	HERBERT, E R, 86 C Kenny St, WAIHI
ZL1SP	BAIN, F J, 58 GEORGE CRES, BUCKLAND, R D 2 PUKEKOHE 1800	ZL1TCO	TAPP, A J, 94/21 FAIRVIEW AVENUE, ALBANY, AUCKLAND 1311
ZL1SPD	JAMES, R G A, PO BOX 10-0028, NORTH SHORE MAIL CENTRE	ZL1TCP	MATTLER, J L, 644 PARK ROAD, TE AWAMUTU
ZL1SQV	DAVIS, J S, 15/64 TAPU ROAD, HUAPAI, KUMEU 1250	ZL1TCR	BELL, K G,
ZL1SR	COPPELL, B L, 128A JAMES ST, WHAKATANE	ZL1TCS	BILLING, C I, 16 DOBELL RD, WHANGAPARAOA 1463
ZL1SS	SKELLON, D B, 36 MOUNTBATTEN AVE, GLENFIELD, AUCKLAND 1310	ZL1TCU	LEGG, M E, 1/15 HATTON ROAD, OREWA
ZL1ST	HUDSON, J, 67A ROTOKAURI RD, NAWTON, HAMILTON	ZL1TCX	TAYLOR, A J, 56 MAYFAIR CRESCENT, MAIRANGI BAY, AUCKLAND 1310
ZL1STR	STRACHAN, J A M, P O BOX 147-050, PONSONBY, AUCKLAND	ZL1TCZ	TURNWALD, F L, 29 CLIFF VIEW DRIVE, GREEN BAY
ZL1SV	PERKINS, J A, 2 PONUI PLACE, MAIRANGI BAY	ZL1TD	BOYCE, K R, 33 LAMBETH RD, MT ROSKILL, AUCKLAND
ZL1SVD	DUOBA, S V, 66 CHERRY LANE, TAMAHERE, RD 3, HAMILTON	ZL1TDA	SHACKLETON, R D, 35 HILL RD, WAIHEKE ISLAND, AUCKLAND
ZL1SW	WRIGHT, A T,	ZL1TDB	DINGLEY, J H, 2139 GT NORTH RD, AVONDALE, AUCKLAND 1007
ZL1SWR	DESMOND, G, 5 HUMARIRI STREET, PT CHEVALIER, AUCKLAND	ZL1TDE	DAVIS, W L, 48 CHATSWORTH CRES, PAKURANGA
ZL1SWS	Shin, Seung Won, 32 Bradbury Road, Highland Park, Manukau	ZL1TDF	FULLERTON, D, 9 LAURA STREET, KELSTON, AUCKLAND 1007
ZL1SWW	WATT-WYNESS, S C, 5 ABINGDON PLACE, GLENDOwie, AUCKLAND 1005	ZL1TDG	MORRIS, V, 1/1 CASTLEMAINE CLOSE, HOWICK, AUCKLAND 1705
ZL1SY	THOMPSON, M G, 13 McDOWELL ST, ROTORUA	ZL1TDH	DUNSBE, B L, 250 GUN CLUB RD, R D 1 PUKEKOHE, AUCKLAND 1800
ZL1SZ	EVANS, M J, 14 HENDERSON ST, WHAKATANE	ZL1TDI	LEE, C P, 117 CHELSEA VIEW DRIVE, BIRKENHEAD
ZL1TAA	SHARMA, A, 11 SIOTA CRESCENT, KOHIMARAMA, AUCKLAND 1005	ZL1TDJ	BURTON, R D,
ZL1TAB	HAYMAN, S R, 68 KATH HOPPER DRIVE, OREWA, AUCKLAND 1461	ZL1TDO	O'BRIEN, D, PO BOX 300293, ALBANY, AUCKLAND 1331
ZL1TAD	DOAR, T A, 49B PEACH RD, GLENFIELD, AUCKLAND 1310	ZL1TDQ	WOODFIELD, D M, 40B SEACLIFFE ROAD, HILLSBOROUGH, AUCKLAND
ZL1TAE	RISTIC, A T, BUCKLAND RD, R D 4, TUAKAU 1892	ZL1TDR	HARDING, B D, 25 MEADOWCROFT GROVE, JOHNSONVILLE, WELLINGTON
ZL1TAG	PLIMLEY, A E, 104 PARAWAI RD, THAMES	ZL1TDS	WRIGHT, M E, 26 TAWA STREET, EDGECUMBE
ZL1TAI	MCBURNEY, R T, 25 HAMILTON RD, PAPATOETOE	ZL1TDU	ALLAN, P K, 12 HIGH ST, WHANGAREI
ZL1TAJ	ELLIS, NEIL MARTIN,	ZL1TDV	PENWARDEN, E C, 61 CATHERINE CRESCENT, WHITIANGA
ZL1TAK	SERGENT, P A, 20 MARIE AVE, TE ATATU SOUTH, AUCKLAND	ZL1TDY	COGNET, P J, 33 PHILLIPS DRIVE, OROPI DOWNS, TAURANGA
ZL1TAL	BURRAGE, D A, 31/59 SACKVILLE STREET, GREY LYNN, AUCKLAND 1002	ZL1TDZ	MILLER, C J, PO BOX 128-152, REMUERA, AUCKLAND 1136
ZL1TAN	O'CALLAHAN, D R, 18/8 HAMILTON ROAD, HERNE BAY, AUCKLAND	ZL1TE	LYNNEBERG, R, 7 BEACH HAVEN PLACE, PARAPARAUMU BEACH 6450
ZL1TAO	KIMBER, W, 239 BRUCE RD, LEVIN	ZL1TEE	FARMER, P F G, PARADISE, WHANGAPOUA RD, RD 2, COROMANDEL 2851
ZL1TAP	RACE, A P, 8C NOVELLE GROVE, PAPAMOA	ZL1TEH	TEH, Y W, 18 AUGUSTA PLACE, KAMO, WHANGAREI
ZL1TAR	WILKINSON, R N, 19 ISLAND BAY RD, AUCKLAND	ZL1TEM	GULLIVER, E J, 10 VALLEY RD, MT EDEN, AUCKLAND
ZL1TAS	WILKINSON, 2/56 Challen Close, Takanini	ZL1TEO	GROSSMAN, R W, PO BOX 80-080, GREEN BAY, AUCKLAND 1230
ZL1TAT	BROWN, I W, 35 LANCASTER ST, HAMILTON	ZL1TER	MIDDLETON, T, 130 RAHU RD, MACKEYTHON, R D 4 PAEROA
ZL1TAU	COGHLAN, P R, 17 QUARTLY PLACE, HUNTINGDON PARK, EAST TAMAKI AUCKLAND 1701	ZL1TET	DU TOIT, E, 1/13 LANDSBERG WAY, MAIRANGI BAY, AUCKLAND
ZL1TAY	THORNTON, D, 12 RAHUI ROAD, GREENHITHIE, AUCKLAND	ZL1TEV	BARNETT, D S, 16 PEMBROKE ST, MOEREWA
ZL1TAZ	PURDY, G N, MAYGROVE OREWA VILLAGE, 21/65 TAURANGA PLACE, HIBISCUS COAST OREWA	ZL1TEX	SANDS, J E, 81 ROSS LANE, KUMEU, AUCKLAND
		ZL1TEY	MCDONALD, M S, 52 CARGILL ST, PAPAKURA 1703
		ZL1TEZ	GIBBONS, TERRY JAMES, C/- 101A KOHIMARAMA ROAD, MISSION BAY, AUCKLAND
		ZL1TF	MORRISON, I M, 1520B STATE HIGHWAY 10, KERIKERI, RD3, BAY OF ISLANDS
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		ZL1TFB	COOPER, S W, 202 OTAU MOUNTAIN RD, RD5, PAPAKURA AUCKLAND 1730
		ZL1TFC	GODFREY, J P, 15 CROMPTON RD, MASSEY

ZL1TFD

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ZL1TFG BALLANTYNE, D L, PO BOX 28, ALBANY VILLAGE,
AUCKLAND 1331
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AUCKLAND 1461
ZL1TFO BAIN, C J, PO BOX 1, BROADWOOD
ZL1TFP PURDY, R G, 8 DORCHESTER PLACE, THE GRANGE,
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ZL1TFW SAVAGE, J, 151 HENDERSON VALLEY RD, HENDERSON,
AUCKLAND 1008
ZL1TFX ROWE, R A, 422 THAMES ST, MORRINSVILLE
ZL1TFY MUNYARD, D A, 83 TIVERTON RD, AVONDALE, AUCKLAND
1007
ZL1TG RUMMING, E, 91 WESTERN ROAD, NGONGOTAH, ROTORUA
ZL1TGA STONE, G P, 377 WELCOME BAY RD, WELCOME BAY,
TAURANGA
ZL1TGC HENDERSON, V N, PO BOX 34507, BIRKENHEAD,
AUCKLAND
ZL1TGF MULLIONS, B A, 1 KENNEDY POINT ROAD, WAIHEKE
ISLAND
ZL1TGG SOPPIT, T R, 73 ASTLEY AVE, NEW LYNN, AUCKLAND 7
ZL1TGM MCGREGOR, G R, 38 KAWITI AVE, POINT ENGLAND,
AUCKLAND
ZL1TGP BIELBY, R K, 4 BENNETT RD, PAKURANGA
ZL1TGR HOOLE, G L, 111 BUCKLANDS ST, PUTARURU
ZL1TGS SMITH, J M, 24 DE QUINCEY TCE, HOWICK, AUCKLAND
1705
ZL1TGV HOLMES, B S, RD 3, COAST RD, WAIKU
ZL1TGW WATSON, E H C, RD 3, EASTBANK RD, WHAKATANE
ZL1TGZ PURVIS COMMUNICATIONS, PO BOX 142, WAIHI
ZL1TH HALL, T, 102 MAHANA ROAD, RD1, WAIMAUKU,
AUCKLAND
ZL1THB PHAYER, C.
ZL1THD TURNER, R W, PO BOX 381, TE KUITI
ZL1THF KIRKMAN, B A, CARTGATE, SH 22 GLENMURRAY, R D 5
TUAKAU 1892
ZL1THG BEVAN, T M, 435 WHITIKAHU RD, RD 1, TAUPIRI
ZL1THJ PAUL, R E, PO BOX 33-415, TAKAPUNA, AUCKLAND 1332
ZL1THK RUSSELL, J A, UNIT 1/29 CLONBURN RD, REMUERA,
AUCKLAND
ZL1THL PIPER, G L, 16 SAMUEL PLACE, HAMILTON
ZL1THN CROZIER, D K, 154 GREY ST, ONEHUNGA
ZL1THO MCNEIL, D R, 33 EIVERS RD, WHAKATANE
ZL1THU COOKE-WILLIS, S O, 15 MADRAS ST, WELLINGTON
ZL1THW THWAITES, I G, 14/48 ESPLANADE RD, MOUNT EDEN,
AUCKLAND 1003
ZL1TI GODKIN, I P, 45 DALWHINNIE PARADE, HOWICK,
AUCKLAND 1705
ZL1TIA DINGLEY, D G, P O BOX 19-189, AVONDALE, AUCKLAND
ZL1TIB DOBBIE, C H, 30 FAULDER AVE, WESTMERE, AUCKLAND
ZL1TIC COLES, R I, RD 2, PUTARURU
ZL1TIF CALLAGHAN, P J, PO BOX 10-0735, NORTH SHORE MAIL
CENTRE
ZL1TIG PALMER, L H, 10 PUKETAPU CRES, TAUMARUNUI
ZL1TII O'BRIEN, K M J,
ZL1TIK MOWRY, L E, 25 WARWICK PLACE, BROOKFIELD,
TAURANGA
ZL1TIL CLARKE, W D,
ZL1TIO BOWERS, S, 21 HINGAIA ST, TURANGA
ZL1TIQ WATSON, J R, 19 TANIA PLACE, BLOCKHOUSE BAY
ZL1TIR MACLARDY, W J, PO BOX 87, WHITIANGA
ZL1TJA POWELL, A T, 17 MURRAY ST, MAEROA, HAMILTON
ZL1TJB BALLANTYNE, J G, BOX 220, KAIKOHE
ZL1TJD LAMBOURN, D, PO BOX 60-258, TITIRANGI, AUCKLAND
1230
ZL1TJF FRAKNOVARY, G A, 10 CANBERRA AVE, LYNFIELD
ZL1TJG FRENCH, T G, 13 BANNERMAN RD, AUCKLAND
ZL1TJH GYDE, G N, 11 MCCRACKEN AVE, HAMILTON
ZL1TJK MUNDEN, A J, 24 PARAONUI RD, TOKOROA
ZL1TJL LAWRENCE, K, P O BOX 25-276, ST HELIERS, AUCKLAND
ZL1TJO BRADFIELD, S J, 18B KITEWAO ST, NORTHCOTE,
AUCKLAND 1309
ZL1TJR TRICKETT, N D, 42 RIDDELL RD, GLENDOWIE, AUCKLAND
1105
ZL1TJT MORGAN, A R, 553 MCGREGOR ROAD, R D 2, OHAUPO
ZL1TK HARRINGTON, R J, 45 PINE HILL ROAD, DONCASTER
EAST, MELBOURNE, VIC 3109
ZL1TKD GILL-FOX, D A, 23 HINDNESS STREET, HALSWELL,
CHRISTCHURCH 8003
ZL1TKE CLARK, D W, 29 PURIRI RD, WHENUAPAI
ZL1TKG TALBOT, V G, 93A PEMBROKE ST, HAMILTON
ZL1TKJ ROBINSON, C S, PO BOX 87-227, MEADOWBANK,
AUCKLAND 1130
ZL1TKN BAYLIS, M R, 1 MUNRO ST, WHANGAREI
ZL1TKO OWENS, K, C1/25 CHESHIRE STREET, PARNELL,
AUCKLAND

ZL1TKQ DUNCAN, R G, PO BOX 11-040, ELLERSLIE
ZL1TKR FOSTER, B E, 30 MORESBY AVE, WAIHI
ZL1TKS DUNCAN, A K, PO BOX 87337, MEADOWBANK,
AUCKLAND 1130
ZL1TKU HILLIAR, D J, 13 CHIPPING DALE, MANGERE BRIDGE
ZL1TKW BODMAN, K I, 9 FAIPING RD, RD 2, HAMILTON
ZL1TL PICKWORTH, R A, 35 GREEN ISLAND BUSH RD, RD1,
DUNEDIN 9015
ZL1TLA KOOLEN, J F L, 32 KINGS RD, PANMURE
ZL1TLC MAY, A P, 18 LONGWOOD PLACE, FORREST HILL,
AUCKLAND 1309
ZL1TLD WALKER, W D, PO BOX 241, OTOROHANGA
ZL1TLF CADNESS, R H, 109 GLAMORGAN DRIVE, TORBAY
ZL1TLH HARRIS, L I, 104 CAPTAIN SCOTT RD, TITIRANGI,
WAITAKERE
ZL1TLJ Warmington, D, 79 Fisher Terrace, Kamo, Whangarei
ZL1TLM TEARLE, M, 11 EPPING ROAD, HENDERSON, AUCKLAND
ZL1TLN ONRUST, F, 52 BAY VIEW ROAD, GLENFIELD, AUCKLAND
1310
ZL1TLO FAULKNER, R E, FLAT 21 - 95 VICTORIA ROAD, ST KILDA,
DUNEDIN
ZL1TLS ASHTON, L S, 9 Lauris Place, BIRKDALE, AUCKLAND 1310
ZL1TLU STEVENS, D P, 53 MARELLAN DRIVE, RED BEACH 1461
ZL1TM CHATALOV, A, 98 SARSFIELD STREET, HERNE BAY,
AUCKLAND
ZL1TMB McDONALD, B D, 7 ORIANA AVE, MT ROSKILL
ZL1TMF MCFADYEN, D G, 1 HIKURANGI TCE, TAUMARUNUI
ZL1TMG GREENFIELD, R S T, 33 TUI CRESCENT, MAUNU,
WHANGAREI 0101
ZL1TMI MOSELEY, S F, 34 DOMAIN ST, WAIKU
ZL1TMJ ESSCHER, P, PO BOX 60-428, TITIRANGI, AUCKLAND
ZL1TMK KRAUSE, R E, 7 GORDON ST, KAWERAU
ZL1TML MOUAT, E A, 3 CONNELL ST, WAIHI
ZL1TMO LAWRY, M G,
ZL1TML PIKE, T M, 468 OHAUTI ROAD, OHAUTI, TAURANGA
ZL1TMQ MCCARTHY, J W, 40 DAGENHAM STREET, MANUREWA
ZL1TMS WATSON, C D, 41 EAST BANK ROAD, RD3, WHAKATANE
ZL1TMV VELDHUISEN, M D, PO BOX 106-304, CENTRAL
AUCKLAND
ZL1TMZ LEE, JUNG-SIK, 36 PUKATEA AVE, ALBANY, AUCKLAND
ZL1TN MOORE, T D, 43A UXBRIDGE ROAD, HOWICK, AUCKLAND
1705
ZL1TND PROBINE, D C, 46A PAICE AVENUE, MT EDEN, AUCKLAND
1003
ZL1TNL RODGERS, P A, 22 GOLDERS PLACE, TAUPO
ZL1TNO O'LOAN, T J, 9 WHATAWHATA AVENUE, NGARUAWAHIA
ZL1TNQ TALBOT, A M, 9 WAIAU STREET, TORBAY 1310
ZL1TNY QUEDLEY, F J, 574 WHITFORD ROAD, WHITFORD,
AUCKLAND 1750
ZL1TO MCDONALD, T S, 25 JOHN STREET, PUKEKOHE
ZL1TOB CRAWFORD, J V, 2/10 PARK AVE, WHANGAREI
ZL1TOC COLBERT, O C, 390 PONGA RD, R D 4, PAPAKURA
AUCKLAND 1730
ZL1TOF BAKER, G S, 10 ANNAGHRY RISE, HOWICK, AUCKLAND
1705
ZL1TOG TAYLOR, L R, 805 RIDDELL RD, ST HELIERS
ZL1TON MELLARS, L R,
ZL1TOQ ASHTON, I M, PO BOX 40-172, GLENFIELD, AUCKLAND
1330
ZL1TOU LOWE, J, 51 EPSOM AVE, AUCKLAND
ZL1TOW ORR, W B, PO BOX 29-045, GREENWOODS CORNER,
AUCKLAND 1030
ZL1TOY MCGILP, F C, 6A LILIAN PLACE, PAKURANGA
ZL1TP TAURANGA AMATEUR RADIO CLUB INC, C/O Emergency
Management Office, Western Bay of Plenty District
Council, PO Box 12-803
ZL1TPB BROOKS, R K, 391 ELLERSLIE PANMURE HWY,
PANMURE
ZL1TPE MCEWEN, D J, 11 MATIPO RD, TE ATATU NORTH,
AUCKLAND 1008
ZL1TPG VAN LOON, Q J M, 30 STURGES RD, HENDERSON
ZL1TPH HAYMAN, S P, 68 KATH HOPPER DRIVE, OREWA,
AUCKLAND 1461
ZL1TPI SMIRK, A T, 3 MASONS AVE, HERNE BAY
ZL1TPJ WALKER, B J, CRANE RD, R D 1, KAMO
ZL1TPM MEAD, P G, 199A DON BUCK RD, MASSEY, AUCKLAND 8
ZL1TPN LUMMUS, J R, PO BOX 21-048, HAMILTON
ZL1TPO VOS, P M,
ZL1TPQ QUIRK, P D, C/- TOKOROA MOTOR PARK, 22 SLOSS
ROAD, TOKOROA
ZL1TPS SOAMES, M P, PO BOX 258018, GREENMOUNT,
AUCKLAND
ZL1TPW WILD, P T, 19A DUNN ROAD, PANMURE, AUCKLAND 1006
ZL1TPY BARR, H J, 15 WILLIAM BRYAN DRIVE, BUCKLANDS
BEACH, AUCKLAND 1704
ZL1TQF WEBSTER, E T, PO BOX 101, OKAIHOU 0455
ZL1TQM JOSEPH, D H, 38 SUNNYBRAE RD, GLENFIELD
WOODWARD, N F, 216 PONGAKAWA BUSH RD, RD 6, TE
PUKE

ZL1TQQ	HOBDAY, D S, 414-A SCENIC DRIVE, WAIATATUA, AUCKLAND 1007	ZL1TXN	VICKERY, W L, 3/19 HEAPHY ST, BLOCKHOUSE BAY, AUCKLAND 1007
ZL1TQT	REID, J D, 631 OMANAWA ROAD, TAURIKO, RD 1, TAURANGA	ZL1TXO	DAWSON, R N, 3 WILLOWBROOK, PUKEKOHE
ZL1TR	RIST, T A, 1/139 WYLLIE ROAD, PAPATOETOE, AUCKLAND	ZL1TXP	SCHULTZ, P O, RD 2, SCHULTZ RD, WAIPIU
ZL1TRA	COX, R O, 1/325 GREAT SOUTH ROAD, PAPAKURA, AUCKLAND.	ZL1TXQ	ROWE, A N, 100 TOTARA CLOSE, TOTARA, THAMES
ZL1TRC	HARDWICK, D E, 66 NORRIE ST, MELVILLE, HAMILTON	ZL1TXS	MOSELEY, I J, 9 HAIG ST, WAIWHE TU, LOWER HUTT 6009
ZL1TRE	SHEPHERD, M B, 70A LONG DRIVE, ST HELIERS, AUCKLAND	ZL1TXT	SHOTBOLT, P S,
ZL1TRG	WELCOME, P, 12 BATKIN RD, AVONDALE, AUCKLAND 7	ZL1TY	MONK, W K G, 23 MATIPO AVE, ROTORUA
ZL1TRH	WALKER, A V, 51 CORONIA CRES, MT ROSKILL	ZL1TYF	TOWLER, T J, 1 OLIVIA CRES, TAWA, WELLINGTON
ZL1TRJ	LAMONT, R J, STATE H/W 3, RD, MAHOENUI 2553	ZL1TYH	BURRELL, C J, 78 LEWIS ST, HAMILTON
ZL1TRK	KELLY, R J, 13B CRYSTAL AVENUE, GLENDALE, AUCKLAND	ZL1TYJ	BALL, R J, C/ WHIRITO A STORE, WHIRITO A, VIA WAIHII
ZL1TRL	HULJICH, A P, 137 TOTARA RD, WHENUAPAI	ZL1TYL	TAYLOR, P J, 14 GOLLAN RD, MT WELLINGTON
ZL1TRM	BULTE, L W, PARK RD, RD 3, WAIKU	ZL1TYQ	SADLER, J, 73 LAUREL DRIVE, RD 6, TAURANGA
ZL1TRN	NORMAN, R J D-B, 9 CASHMERE DRIVE, AOKAUTERE, PALMERSTON NORTH	ZL1TYR	CARTER, R D, 40 MONTGOMERY CRES, HAMILTON
ZL1TRV	HULJICH, P A, 137 TOTARA RD, WHENUAPAI	ZL1TYT	LOWE, E R, 20 WAIMARIE ST, HAMILTON
ZL1TRW	RICHARDS, D C, P O BOX 25-817, ST HELIERS, AUCKLAND	ZL1TYV	JENKINS, M W, 35 ROBERTSON ST, ROTORUA
ZL1TRX	WILSON, J P, 10 BRIAN AVE, MILFORD	ZL1TYW	MIDDLEMISS, G D, EUREKA STATION RD, RD 4, HAMILTON
ZL1TRY	CAZALET, R, 19 HALBERG ST, PAPAKURA, AUCKLAND 1703	ZL1TZ	STEWART, G W,
ZL1TS	PRENTICE, L G, 5 MOUNTAIN VIEW RD, MORNINGSIDE, AUCKLAND 1003	ZL1TZA	DOELL, S D, 199B Queen st, PUKEKOHE
ZL1TSB	BISHELL, S A, 28B ELIZABETH STREET, KENSINGTON, WHANGAREI 0101	ZL1TZA	REEVES, G F, 111 CORNWALL STREET, MASTERTON 5901
ZL1TSF	FISH, ALAN, P O BOX 112384, PENROSE, AUCKLAND	ZL1TZAU	MILLER, R T,
ZL1TSG	GURR, S W, 3 BRIGHTSIDE RD, STANMORE BAY, WHANGAPARAOA AUCKLAND 1463	ZL1TZW	SHAW, J E M, MAIN RD, PAERATA
ZL1TSN	HOLLIS, M A, 3/17 SELWYN RD, EPSOM, AUCKLAND 1003	ZL1TZX	FRYER, B S, 38 MONARCH AVE, GLENFIELD
ZL1TSQ	ATTRILL, J J, 7 TAWA ST, MT MAUNGANUI	ZL1TZY	NOBLE, P V, 1/25 SHOREHAM STREET, AVONDALE, AUCKLAND 1007
ZL1TSU	MACASKILL, S L, 167 WAIMUMU RD, MASSEY	ZL1TZZ	SKINNER, D E, 75 LYNNBROOKE AVE, BLOCKHOUSE BAY
ZL1TSX	WOODFIELD, S A, 19 B CRADOCK STREET, AVONDALE, AUCKLAND	ZL1UA	HARVEY, J K, 93 EIGHTH AVE, TAURANGA
ZL1TT	ROBERTS, R L, 39 KAY DRIVE, BLOCKHOUSE BAY	ZL1UAD	BLACKWELL, D M,
ZL1TTB	WEVERS, W F, 61 EDENVALE ROAD, HOWICK, AUCKLAND 1705	ZL1UAF	VERZYDE, P J, 8 MARY DREAVER ST, AVONDALE, AUCKLAND 1007
ZL1TTC	STEVENS, G C, 5 SENATOR DRIVE, ALFRISTON, MANUREWA	ZL1UAH	DODDS, M L E, 17 TE PAKA CRES, KAMO, WHANGAREI
ZL1TTE	COOKE, D C, P O BOX 44-132, PT CHEVALIER	ZL1UAJ	JILLINGS, A L, 82C KAWAHA POINT RD, ROTORUA
ZL1TTG	COOKE, 28 Coney Lane, Maraetai, Manukau 2018	ZL1UAM	CROOK, S A, P O BOX 1699, ROTORUA
ZL1TTK	NETTLEINGHAM, J, MATAHUI RD, KATIKATI	ZL1UAN	AH-CHAN, W R, 54 WYLIE ST, ROTORUA
ZL1TTO	CURRAN, W J, OLD ROTOKOHU RD, KARANGAHAKE RD 4, PAEROA	ZL1UAP	JOHNSON, G C, 7/20 BROUGHAM STREET, MT VICTORIA, WELLINGTON 6001
ZL1TTR	NICHOLSON, O C, 45 TUATARA DRIVE, KAMO, WHANGAREI	ZL1UAR	JOHNSON, 17 Wybourne Road, HAWERA
ZL1TTX	MOSS, G D, 71 LANDING DRIVE, ALBANY, AUCKLAND	ZL1UAY	OGDEN, I D, 12 LORANGI PL, HILLPARK, MANUREWA, MANUKAU CITY
ZL1TTY	VIJCICH, L M G, 35 BEACHLANDS ROAD, BEACHLANDS, AUCKLAND 1705	ZL1UB	WILSON, D A, UNIT 1, 35 RANGITOTO TCE, MILFORD, AUCKLAND
ZL1TU	BROUGHTON, T,	ZL1UBB	GARDINER, R S A, 5 LINGHAM CRES, TORBAY, AUCKLAND 1310
ZL1TUB	BORMAN, T G, 9B PURIRI ST, TAKAPUNA, AUCKLAND 1309	ZL1UOE	EDWARDS, J D, 290 HIGH STREET, DANNEVIRKE
ZL1TUE	ROBINSON, G M, 39 FITZHERBERT AVE, WESTHARBOUR, AUCKLAND	ZL1UBG	MILLAR, R C, 9 GILLAM CRES, ROTORUA
ZL1TUI	HANNAM, T M, C/- 2630 NZMCA, P O BOX 72 147, PAPAKURA	ZL1UBJ	FINDLAY, D K, 667 MT WELLINGTON HIGHWAY, MT WELLINGTON, AUCKLAND
ZL1TUJ	MARR, G E, 11 LILEY PLACE, REMUERA	ZL1UBK	BROWN, G A, 16A OCEAN RD, OHOPE
ZL1TUQ	CAMPKIN, A D,	ZL1UBL	FALLOON, G A, P O BOX 82-113, HIGHLANDPARK
ZL1TUR	TURNWALD, A M, 5 LEIGH TERRACE, BAYVIEW, AUCKLAND 1310	ZL1UBM	WILLIS, B E, 195 TAHAREPA RD, TAUPO
ZL1TUX	RAFFLES, G E H, 34 DUNDEE PLACE, BLOCKHOUSE BAY	ZL1UBP	MEIKLE, B P, 17 RIMUTAKA PLACE, TITIRANGA, AUCKLAND
ZL1TV	SEAR, M F, 216 Marina Lane, Friday Harbor, WA	ZL1UBR	RHODES, B A, 17 BELMONT AVE, HAMILTON
ZL1TVA	DHARMAPRIYA, C, 4 ARCHIBALD RD, KELSTON, AUCKLAND 7	ZL1UBU	MCCUTCHEON, G L, 29 SECOND AVENUE, JANNALI 2226, NSW
ZL1TVC	WERDER, G J, SPRINGDALE, RURAL DELIVERY, WAITOA	ZL1UBV	WITHERS, P G, 31B OTAIKA ROAD, WHANGAREI
ZL1TVI	HITCHINS, J T, 40 GLENLYNNE AVE, HAMILTON	ZL1UBY	MURPHY, S B, 4 SPINNAKER POINT, LITTLE MANLY, WHANGAPARAOA AUCKLAND
ZL1TVN	FRASER, L B, 34 MACLAURIN STREET, BLOCKHOUSE BAY, AUCKLAND 1007	ZL1UBZ	GAUDIN, S A, 12 ADA PLACE, FAIRVIEW DOWNS, HAMILTON
ZL1TVP	AIKIN, P M, 88 ROSS ST, ONERAHI, WHANGAREI	ZL1UC	DINES, S L, P O Box 1241, PORTLAND, VICTORIA
ZL1TVX	COBURN, C L, 11 FASCHING LANE, TAURIKO, TAURANGA	ZL1UCA	LANG, R G C, 29 ROBERT STREET, ELLERSLIE, AUCKLAND
ZL1TW	WILCOCKS, R J, 35 PURIRI ST, KAMO, WHANGAREI	ZL1UCC	BISESEBROEK, J, P O Box 121, OREWA
ZL1TWD	SPARKES, D G, P O Box 50-482, PORIRUA	ZL1UCF	PRICE, C, LAKE OHIA, RD 3, KAITAIA
ZL1TWE	NORRIS, D R H, 14 MANNING ST, HAMILTON	ZL1UCH	HOFFMAN, C, 2B PUNGA STREET, MOUNT EDEN, AUCKLAND 1003
ZL1TWG	MOSELEY, S R, 34 DOMAIN ST, WAIKU	ZL1UCI	PAHL, E W T, 17 LANDSCAPE RD, TAURANGA
ZL1TWI	JONKER, C B, 17 KINNARD LANE, RD 1, PAPATOETOE, AUCKLAND	ZL1UCJ	TEVIOTDALE, E A, P O Box 7051, ROTORUA
ZL1TWK	BANG, T J, 58 MONARCH AVE, HILLCREST, AUCKLAND 1310	ZL1UCQ	KIM, C H, P O Box 1008, ROTORUA
ZL1TWP	STONEY, D B, RD 4, WARKWORTH	ZL1UCR	JOPLING, W F, 24 MAYALL AVENUE, BEACHHAVEN, NORTH SHORE, AUCKLAND
ZL1TWR	PALMER, S D,	ZL1UCT	MEDLAND, J, 12 ARAWA STREET, DINSDALE, HAMILTON
ZL1TWX	MCFADZEAN, P A, 4 WINSPEAR PLACE, PAPATOETOE	ZL1UCX	SMITH, K L, 17 MAKIRI STREET, HELENSVILLE, NORTH AUCKLAND
ZL1TX	AIKIN, P M, 88 ROSS ST, ONERAHI, WHANGAREI	ZL1UD	CASE, A, 8C BRECKONS AVE, HAMILTON
ZL1TXH	SCHULTZ, W, RD 2, SCHULTZ RD, WAIPIU	ZL1UDB	BRYCE, D W, TE PURU, RD 5, THAMES
ZL1TXM	DEXTER, J D G, 5 HAINES GROVE, RAINBOW POINT, TAUPO	ZL1UDE	MOREY, E R, 35 ELMWOOD CRES, HAMILTON
		ZL1UDF	STREIFF, D R, 18 ANZAC AVE, MORRINSVILLE
		ZL1UDH	HODGKINSON, J R, 450 MANGAWHIO RD, RD 4, TE AWAMUTU
		ZL1UDM	STANNARD, E A,
		ZL1UDN	ROWE, S W, 57 VALENTINE ST, PAPAKURA
		ZL1UDR	MCDONNELL, T R, 44 STEPHENS PLACE, HAIRINI, TAURANGA
		ZL1UDV	FROGLEY, C D, 22 MELLONS BAY RD, HOWICK
		ZL1UDZ	GREENMAN, P M, 94 SIM RD, KARAKA, RD 1 PAPAKURA
		ZL1UE	WILLIAMS, M K, 7 Princess Street Ngaruawahia, Ngaruawahia

ZL1UEC

ZL1UEC HYNDS, K E, 29A ADAMS LANE, SPRINGLANDS, BLENHEIM 7301
ZL1UED BINGLEY, E R, 45 POWELL ST, AVONDALE, AUCKLAND 1007
ZL1UEF PORTER, J W, 776 MATAKANA VALLEY ROAD, R D 5, WARKWORTH 1240
ZL1UEJ MANDONALD, P G, PO BOX 702, ROTORUA
ZL1UEK MORECRAFT, I G, 27 GARDEN TCE, PUKEKOHE
ZL1UEL Abraham, Gary, 10 College Street, Edgecumbe
ZL1UEM KILFOYLE, H T, 2393B HUNUA ROAD, R D 3, PAPAKURA 1730
ZL1UEN PETERS, J W.
ZL1UEO ROBINSON, T V, 5 MCKINLEY ROAD, SUNNYVALE, WAITAKERE CITY, AUCKLAND
ZL1UES ROYDS, P I, 1204 CAMERON RD, TAURANGA
ZL1UET SEYMOUR, D J, 2/14 CROMDALE AVENUE, HIGHLAND PARK, HOWICK
ZL1UEU TAYLOR, M L, 805 RIDDELL RD, ST HELIERS, AUCKLAND 1005
ZL1UEV HARRIS, H J, WAIKARERA RD, R D 1, ONERAH
ZL1UEX COOKE, J B, PO BOX 44-132, PT CHEVALIER, AUCKLAND 2
ZL1UEY VOIGT, R E, 74 STILLWATER CRES, RD 3, SILVERDALE 1462
ZL1UF FORTUNE, D L, PO BOX 82-272, HIGHLAND PARK, AUCKLAND
ZL1UFC WARBURTON, J J, 2 PINE AVE, TAURANGA
ZL1UFE WHITE, D E G, 34 HASELER CRES, HOWICK
ZL1UFG GOODMANSON, P, PO BOX 4, MAUNGATAPERE 0250
ZL1UFN GALLAUGHER, I R, 6 ALF PLACE, HOWICK, AUCKLAND 1705
ZL1UFO ARNET, D A, 66 FITZWILLIAM DRIVE, TORBAY, AUCKLAND 1310
ZL1UFT SHEPHARD, B, PO BOX 23-684, PAPATOETOE, AUCKLAND 1730
ZL1UFW NICHOLLS, G R B, 350 GELLING ROAD, ARARIMU, R D 3 PAPAKURA
ZL1UFY JAMES, T C, PO BOX 100 028, NORTH SHORE MAIL CENTRE, AUCKLAND
ZL1UG REDGRAVE, C I, 48 COVIL AVE, TE ATATU SOUTH, AUCKLAND
ZL1UGF FOWLDS, G F, PO BOX 14-058, TAURANGA
ZL1UGG HEWER, P K,
ZL1UGM MOWRY, A K, 2 JOLLY ST, HAMILTON
ZL1UGO BISHELL, A J F, 28B ELIZABETH STREET, KENSINGTON, WHANGAREI
ZL1UGP HADFIELD, P G, ST KENTIGERN COLLEGE, PO BOX 51 060, PAKURANGA AUCKLAND 1730
ZL1UGS SIGNAL, G R, 4 B TIROHANGA ROAD, R D 1, OPOTIKI
ZL1UGT GULLIVER, K E, 10 VALLEY RD, MT EDEN, AUCKLAND
ZL1UGV SEBIRE, R W, 32 NERI CRES, ROTORUA
ZL1UGZ HANNAH, R T, 275 DON BUCK RD, MASSEY, AUCKLAND
ZL1UHQ SMITH, D J, 156 RANGITOTO RD, PAPATOETOE
ZL1UHR WENDELBORN, L N, 14 GARDEN PLACE, TIKIPUNIGA, WHANGAREI
ZL1UHS WINDRAM, M R, 2 AWANUI ST, BIRKENHEAD, AUCKLAND 1310
ZL1UHT GRIFFIN, M E, 12 VALLEY RD, PUKEKOHE, AUCKLAND 1800
ZL1UHX BRAMMER, P A, 7 CURACAO PLACE, GRENADA VILLAGE, WELLINGTON
ZL1UHZ SUTTON, L M, 207 FERGUSSON DRIVE, THAMES
ZL1UI CARDNO, I M, 5B KELDALE PLACE, FORREST HILL
ZL1UIN HITCHINS, A L, 40 GLEN LYNNE AVE, HAMILTON
ZL1UIO FREW, D J, F3/394 GLOUCESTER ST, TARADALE, NAPIER
ZL1UIS SMILEY, R E, RD 4, PAKIRI BLOCK RD, TOMORATA, WELLSFORD
ZL1UIT PARKINSON, R I, 488 MAHOE ST, TE AWAMUTU
ZL1UIU JENKINS, S E M, 35 ROBERTSON ST, ROTORUA
ZL1UIY STEVENSON, R A, 761 EAST COAST RD, BROWNS BAY
ZL1UIZ BARNETT, N R, 152 EDEN AVE, TE AWAMUTU
ZL1UJ JENNER, K W, 24 QUAIL DRIVE, ALBANY, AUCKLAND 1331
ZL1UJB BEALE, J P, 12 EMERSON ST, TE AROHA
ZL1UJC CORRIGAN, T L, PO BOX 40-135, GLENFIELD, AUCKLAND 1330
ZL1UJG MURPHY, K L G, 8 TAMAR PLACE, NAWTON, HAMILTON
ZL1UJK GRIFFIN, W P, 15 LINE RD, GLEN INNES, AUCKLAND 6
ZL1UJO CRANNA-POWELL, A W, C/O POSTAL DELIVERY CENTRE, PUHOI
ZL1UJP COBB, R P, 8 BEAUBANK RD, KELSTON
ZL1UJS FERGUSON, K D, P O B OX 3526, SHORTLAND STREET, AUCKLAND CITY
ZL1UJV HAYES, L T, 161 WHANGAPARAOA RD, OREWA
ZL1UJW HAIGH, C B, 12 KAURI RD, ORATIA, AUCKLAND 7
ZL1UK BEECH, S C, 113A PUPUKE RD, BIRKENHEAD, AUCKLAND
ZL1UKB HAYES, G M, 161 WHANGAPARAOA RD, OREWA, AUCKLAND 1463
ZL1UKC NICHOLSON, R, 27 DAWSON DRIVE, NGONGOTAH, ROTORUA

ZL1UKD WOODFIELD, S T, 9-A REWI RD, ROYAL OAK, AUCKLAND 1003
ZL1UKE HALLIWELL, P W, 77A TARGET RD, GLENFIELD, AUCKLAND 10
ZL1UKG LOVERIDGE, P R, 5 MOSTYN ST, KINGSLAND MCLEAN, A K,
ZL1UKO NGAKURU, D, PO BOX 278, KAIKOHE
ZL1UKP MCCAFFERTY, W M, 23 DUDDING AVE, NORTHCOTE, AUCKLAND 1309
ZL1UKR ARLIDGE, D V, PO BOX 29 228, GREENWOODS CORNER, AUCKLAND 1030
ZL1UKS COTTE, K J, 96 ALEXANDER ROAD, RAUMATI, KAPITI COAST
ZL1UKT DANCY, N K, 23 DELHI CRES, KHANDALLAH, WELLINGTON
ZL1UL GILMORE, G H, 82 GILMORE RD, TUHIKARAMEA RD 10, HAMILTON
ZL1ULA MALONEY, M J, PO BOX 627, AUCKLAND MAIL CENTRE
ZL1ULC ARMSTRONG, D J,
ZL1ULF MORRIS, D G, 3 ELSTREE AVE, GLENN INNES, AUCKLAND
ZL1ULH WADHAM, P L, 891 WHANGAPARAOA ROAD, LITTLE MANLY, WHANGAPARAOA
ZL1ULK GRIFFIN, D G, 12 VALLEY RD, PUKEKOHE
ZL1ULL JULIAN, R E,
ZL1ULN GOODE, D B, 40 RIVERPARK CRES, HENDERSON
ZL1ULR SHEFFORD, D W,
ZL1ULS DUNCAN, R, 173 TAHAPEA RD, TAupo
ZL1ULT OLLIFF, G M, 2/7 TAURI ROAD, EPSOM, AUCKLAND 1003
ZL1ULX RASMUSSEN, K S,
ZL1ULY GLOVER, S D, C/O STEVE'S MARINE, 18 CROSS RD, TAURANGA
ZL1UMC TWENTYMAN, I R, 1/68 HASELER CRES, HOWICK
ZL1UMG WALLACE, L G, 14 ACACIA CRES, GLENVIEW, HAMILTON
ZL1UMH MILNES, F S, PO BOX 205, TOKOROA 2392
ZL1UMJ ALLEN, E L, 452 PT CHEVALIER RD, PT CHEVALIER, AUCKLAND 2
ZL1UMK HOWIE, M H, 2/6 ALIFORD AVENUE, ORANGA, AUCKLAND
ZL1UML HARLAND, W R, 8 ROMILLY COURT, PAPAKURA
ZL1UMN BARNETT, E W, 152 EDEN AVE, TE AWAMUTU
ZL1UML EDGE, W B, PO BOX 125, KAIKOHE
ZL1UMV MACKAY, T D, 27 LEWIS STREET, INVERCARGILL
ZL1UMW GRAHAM, L R, UNIT 1, 4 NEWHAVEN ST, ELLERSLIE, AUCKLAND 5
ZL1UMX VAN VEEN, E F, 21 TAONUI ST, PAPAKURA, AUCKLAND
ZL1UMY SHON, Y J, 162 GLAMORGAN DRIVE, TORBAY, AUCKLAND 1310
ZL1UND JOWITT, R, PO BOX 497, PAPAKURA, AUCKLAND 1730
ZL1UNH Lawrence, Anton, 108 Glendale road, Glen Eden, Auckland
ZL1UNI SMITH, S R, COULSTONS RD, R D 2, PUKEKOHE
ZL1UNS BELL, K, PO BOX 250, ALBANY VILLAGE, AUCKLAND
ZL1UOJ KILGOUR, D A,
ZL1UOM JANE, M I, 27 KING ST, WAIKU
ZL1UON LUNENBURG, P C, 5-B BRIGHTS RD, CENTRAL PARK, WAIKU 1852
ZL1UOP SCHULTZ, T F, SCHULTZ RD, WAIPU
ZL1UOU TOTTENHAM, R D, 49 WESTERHAM DRIVE, HOWICK, AUCKLAND 1705
ZL1UOV BAINES, M J, PO BOX 1, BROADWOOD
ZL1UOW WELLS, E L, WHITE PINE BUSH, RD 2, WHAKATANE 3080
ZL1UPB WELLS, 17 ORCHARD EAST ROAD, NGATEA, NGATEA
ZL1UPJ JONASSEN, P W,
ZL1UPN NIELSEN, P C, 187 KIRIPAKA ROAD, TIKIPUNGA, WHANGAREI
ZL1UPO MOORE, H J, C/O 57 COLLEGE RD, ST JOHNS, AUCKLAND 1005
ZL1UPR RIDDICK, P J, 13 STIRLING ST, REMUERA, AUCKLAND 5
ZL1UPS SCOT, P A, 9 KOKICH CRES, ONERAH, WHANGAREI
ZL1UPT DONNELLY, S F, 9E CAMERON ROAD, HAMILTON
ZL1UPX MCCANN, K M, 52 CAMPBELL ST, TAUMARUNUI
ZL1UPY GUTMANN, P C, 24 DURNESS PLACE, OREWA, AUCKLAND
ZL1UQE COLLIS, M V, PARK ROAD, R D 3, WAIKU
ZL1UQI TAYLOR, R J, 70 OCEAN RD, PARAPARAUMU BEACH
ZL1UQJ REINHARD, P A, PO BOX 301, MANGONUI, MANGONUI 0557
ZL1UQN GORTER, T A, 47 BLACKWELL DVE, TRYPHENA, GREAT BARRIER ISLAND
ZL1UQO PRICE, E M, Tymana, R D 3, KAITAIA 0483
ZL1UQW WHARTON-ALLEN, R J, 13A SELWYN ROAD, LINMORE, ROTORUA
ZL1URM YOUNG, W R, 81A ARTHUR ST, ONEHUNGA, AUCKLAND
ZL1URU COPPELL, J M, 128A JAMES ST, WHAKATANE
ZL1URX HODGSON, A J, PO BOX 240, WHANGAMATA
ZL1US ARMSTRONG, M A S, 77 QUEEN ST, PUKEKOHE
ZL1USE SOPP, T G, 19 TAWHARA PLACE, EDGEUCUMBE
ZL1USG NETTLEINGHAM, P, MATAHUI RD, RD 2, KATIKATI
ZL1UT STILL, W J, 14 MEADOWBANK ROAD, MEADOWBANK, AUCKLAND 1005

ZL1UTC	CACCIAMANI, T, 2 HORSESHOE BUSH RD, DAIRY FLAT R D 4, ALBANY AUCKLAND 1331	ZL1VJP	PATEL, J N, 57 BURBANK AVE, MANUREWA, AUCKLAND
ZL1UTH	HARDISTY, T R, 293 TAupo RD, TAUMARUNUI	ZL1VJT	TUCKER, J R, PO BOX 4525, MT MAUNGANUI
ZL1UTS	GREY, D G, 4 ANICH STREET, MASSEY, WAITAKERE CITY, AUCKLAND	ZL1VK	PAPAKURA RADIO CLUB INC, PO BOX 72 397, PAPAKURA 1730
ZL1UTW	SIMMONDS, R N, 44 ROTOKAWA ST, TAupo	ZL1VKG	MOATES, C R, PO BOX 102, MAUNGATAPERE
ZL1UU	TWADELL, A S, 7 PRINCE REGENT DRIVE, PAKURANGA, AUCKLAND	ZL1VL	LEAR, V C, 19 FIELDSTONE COURT, HOWICK, AUCKLAND 1705
ZL1UUD	GRIMMER, S, F2/18 SCARLOCK AVE, BROWNS BAY, AUCKLAND	ZL1VLD	DOEL, L D, 21 LISSLETON DRIVE, DANNEMORA, MANUKAU CITY 1701
ZL1UUK	RAMSEY-TURNER, R, 3/55B RAUTAWHIRI ROAD, HELENSVILLE, AUCKLAND 1250	ZL1VM	ARNOLD, R R, 21 SEAVIEW RD, MILFORD
ZL1UUN	MCGOWAN, R A, APARTMENT 55, THE AVENUES RETIREMENT RESORT, 10TH AVENUE TAURANGA	ZL1VMA	ARMOUR, M H, 34 ENNIS AVE, PAKURANGA, AUCKLAND
ZL1UV	MORCH, J H, PO BOX 36418, BIRKENHEAD, AUCKLAND 1310	ZL1VMF	FOSTER, M S, P O BOX 1245156, WATERLOO, LOWER HUTT
ZL1UVG	BOND, A M J, PO BOX 195, WAIITU	ZL1VMG	GILBERT, M S, C/O 25 BAY VIEW RD, RAGLAN 2051
ZL1UVI	BARNETT, L E S, 48 WIHONGI ST, KAIKOHE	ZL1VMH	HALLAGER, J M, P O BOX 7000, WELLESLEY STREET, AUCKLAND
ZL1UVO	TILLEY, J W, PO BOX 585, OPOTIKI	ZL1VML	LEE, M J, 7/8 BOTANY ROAD, HOWICK, AUCKLAND
ZL1UW	TINSLEY, H G, 18 GRANDVIEW RD, HAMILTON	ZL1VMP	PHIPPS, M J, 11 IDESIA PLACE, TOTARA HEIGHTS, MANAKAU CITY
ZL1UWH	JACKSON, C W, 159 BRIDGE ST, OPOTIKI	ZL1VN	Willis, Alexander James, 68 The Drive, Brookfield
ZL1UWL	JOHNSON, I H,	ZL1VNR	ROBERTS, N W, 7 NAN PLACE, PAKURANGA, AUCKLAND 1706
ZL1UWZ	READ, J J, 127A, RAYNER RD, HUNTRY	ZL1VOJ	MCEWEN, J, 37 PUKITARATA ROAD, RD 4, OTOROHANGA
ZL1UX	HAMILTON AMATEUR RADIO CLUB (INC), PO BOX 606, HAMILTON	ZL1VOT	HART, S J, 1A LYNMORE DRIVE, MANUREWA, AUCKLAND
ZL1UXA	LAMBERTON, J J, 105 Arrowsmith Road, Waitakere, AUCKLAND	ZL1VP	PEMBERTON, V A, 161 CHURCH STREET, ONERAH, WHANGAREI
ZL1UXL	ROBERTS, W S, 16 BRIGHTON RD, WAIHI BEACH	ZL1VPB	BUSCH, P N, 1135A WHANGAPARAOA ROAD, HOBBS BAY, WHANGAPARAOA, AUCKLAND 1463
ZL1UXO	POSEL, W W, 24A PARAU STREET, THREE KINGS, AUCKLAND	ZL1VPG	GARLICK, P N, 1 HERNE BAY ROAD, HERNE BAY, AUCKLAND 1002
ZL1UXR	ELTRINGHAM, R J, 121 FARQUHAR RD, GLENDENE, WAITAKERE CITY 1208	ZL1VPJ	JARMAN, P J, 17 CORRIN ST, HAMILTON
ZL1UY	DOWNARD, T V E, 13 RIVERLEA DRIVE, KATIKATI	ZL1VPS	SOLE, P W, KAIPARA HILLS RD, R D 4, WARKWORTH 1241
ZL1UYB	ANDERSEN, H L C, PO BOX 17-211, GREENLANE, AUCKLAND	ZL1VQ	COPPARD, E T, 11 CHRISTENSEN ST, WAIHI
ZL1UYJ	DOUGLAS, G A M, 9 WILLIAMS CRES, PT WELLS, R D 6 WARKWORTH 1241	ZL1VR	GILLIGAN, C R, 4 LAMBERT ST, ABBOTSFORD, GREEN ISLAND 9006
ZL1UYW	PAYNE, C R, RD4, OHINEWAI, WAIKATO	ZL1VRA	ARMSTRONG, R C, 34 HOCHENS ROAD, GLENVIEW, HAMILTON
ZL1UYZ	PHILLIPS, D S M, PO BOX 36, WAIHI BEACH	ZL1VRR	REDDELL, R W, 394B MT ALBERT RD, MT ROSKILL, AUCKLAND 4
ZL1UZ	TRUMAN, A R, UNIT 1/24 TE MATA RD, HAVELOCK NORTH 4201	ZL1VS	DEVERALL, W H, 24A RIMU STREET, WAIKANAE 6010
ZL1UZG	SMITH, L A, 11 TOTANGI RD, NGATAPA, R D 2, GISBORNE	ZL1VSF	CROOKES, A J, 7 LORELEI PLACE, PAPAKURA, AUCKLAND 1703
ZL1UZJ	GRAHAM, J M, 18 SEAWAY TCE, TAURANGA	ZL1VSG	GURR, S R, C/O 3 BRIGHTSIDE RD, WHANGAPARAOA, AUCKLAND 1463
ZL1UZM	SCHINDLER, W H, UNIT 3/18 MONTMERE AVE, TE ATATU PENINSULA, AUCKLAND 1008	ZL1VST	WOODFIELD, K D, 9-A REWI RD, ROYAL OAK, AUCKLAND 1003
ZL1UZU	AKROYD, L T, 4 TOLDEO AVENUE, WESTERN HEIGHTS, WAITAKERE 1002, AUCKLAND	ZL1VTC	CRON, P B, 157C NIXON STREET, HAMILTON
ZL1UZY	HARTLEY, N A,	ZL1VTF	FRANGOS, T, 17 BELLMONT AVE, HAMILTON
ZL1VA	SEARS, V C A, 11 RODERICK ST, TAURANGA	ZL1VV	STOBBE, V, 23 Albert Street, Riverhead, Auckland
ZL1VAH	HOPKINS, A, 432 WHANGAPARAOA ROAD., WHANGAPARAOA	ZL1VWM	MUZYKA, V, 33A-33 VERMONT ST, PONSONBY, AUCKLAND 1002
ZL1VAK	KING, A B,	ZL1VX	BOYD, R, 14 DUNDAS ST, WHITIANGA
ZL1VAN	ADRIAN, I A, 37 PUKETARATA ROAD, RD 4, OTOROHANGA	ZL1VXH	HEDAYATI, S, 3/214 CARRINGTON ROAD, MT ALBERT, AUCKLAND
ZL1VAT	RICHARDS, P E, 16 TEROU ST, MANAIA	ZL1WA	WILLS, A E, 14A GRAHAM ST, PUKEKOHE, AUCKLAND 1800
ZL1VB	JONES, R C, PO BOX 111, OKAIHAU 0455	ZL1WAA	HARROP, P G, 6 WAINGARO RD, NGARUAWAHIA
ZL1VBI	PARRANT, D, 5 SMITH STREET, KAIAPOI, NORTH CANTERBURY	ZL1WAG	NIXON, L M, 10 PETER BUCK ROAD, AVONDALE, AUCKLAND 1007
ZL1VBN	ALLEN, D G, PO BOX 15, BUKA, NSP	ZL1WAJ	JONKER, W A, 17 KINNARD LANE, RD 1, PAPATOETOE, AUCKLAND
ZL1VBR	GATES, L J, 30 HOBSON ST, KAWERAU	ZL1WAM	TOWNSON, W R, 3 POINT ST, NAHURANGI EAST, WARKWORTH
ZL1VBT	MITCHELL, J D, 12 A MERSEY PLACE, NEW WINDSOR, AUCKLAND	ZL1WAR	GRAY, D A, 419 Kaitangata Highway, R D 1, Kaitangata
ZL1VBW	LIDDLE, Y D M, 3 HINEMOTU AVE, KAWERAU	ZL1WAT	PERCIVAL, M D, 32 TAMMADGE ST, TE KUITI 2500
ZL1VCB	BALE, C W, 66 VALLEY ROAD, HIKURANGI, WHANGAREI	ZL1WB	ROWLINGS, B H, 22 TAINUI ST, ONERAH, WHANGAREI
ZL1VCC	HILL, R A, 48 Icarus Place, ROTORUA	ZL1WBZ	WILSON, N R, 3 MAGDALEN PLACE, WESTHARBOUR, AUCKLAND
ZL1V CJ	JACQUES, C N,	ZL1WC	CRAMOND, W E H, 74 WAIKAKA RD, R D 1, MATIERE 2652
ZL1VCR	ASPINALL, N B, 42 OWAIKURA ROAD, RD 3, OTOROHANGA 2564	ZL1WCJ	JOHNSON, C A, PO BOX 60-202, TITIRANGI, AUCKLAND
ZL1VD	CUTLER, J L, 87 REALM DRIVE, PARAPARAUMU 6010	ZL1WD	WADHAM, D R A, 891 WHANGAPARAOA ROAD, LITTLE MANLY, WHANGAPARAOA
ZL1VDB	BOYES, D G, PO BOX 48, MANGONUI	ZL1WDZ	ZIEGLER, D A, 6 BROUDER PLACE, MANUREWA, AUCKLAND
ZL1VDF	FOSTER, D M, 12A FAIRVIEW RD, MANUREWA, PAPATOETOE	ZL1WE	EDLIN, W F, P O BOX 72-495, PAPAKURA, AUCKLAND
ZL1VDN	NEL, D, 16 MILSON DRIVE, OAKLANDS, PAPAKURA, AUCKLAND	ZL1WEN	CLARKE, A S, 158 ROYAL RD, MASSEY, AUCKLAND 1008
ZL1VEY	HARVEY, N M, R D 4, PUKEKOHE, AUCKLAND	ZL1WER	SHAW, D S, 19 GORDON RD, MT MAUNGANUI
ZL1VF	MOLLER, L J, 228 DOBSON ST, ASHBURTON	ZL1WET	JACKSON, A D, P O BOX 10-300, HAMILTON
ZL1VFO	POPLE, I O,	ZL1WFD	JONES, Y N, P O BOX 111, OKAIHAU
ZL1VFW	WHITE, F W, 150 PAHOIA RD, C/O BETHLEHEM PO, TAURANGA	ZL1WG	BORIC, H V, 27 CLEARY RD, PANMURE
ZL1VG	BICHENO, M C, 100 WOODBAY RD, NEW LYNN	ZL1WGA	ADDISON, G A, 99 RICHMOND AVE, TOKOROA
ZL1VGC	CONROY, G J, 36 COLLIE STREET, MANUREWA, AUCKLAND	ZL1WGB	BISHOP, W G, P O BOX 281, WHANGAREI
ZL1VGL	LEONG, G, NEWSTEAD, RD 4, HAMILTON	ZL1WGL	LANDON, J G, P O BOX 228, PUKEKOHE, AUCKLAND 1800
ZL1VH	SANNE, J H, 49 CAMERON RD, HAMILTON	ZL1WH	COE, P H, 21 MARSHALL AVE, TAupo
ZL1VHS	SOLE, H A, KAIPARA HILLS RD, RD4, WARKWORTH 1241	ZL1WHL	LEINWAND, H I, 73 TENDER RD, DAIRYFLAT, RD4 ALBANY 1331
ZL1VIM	MARTIN, D W, P O BOX 55-095, MISSION BAY, AUCKLAND 5	ZL1WI	MILAM, R E, 3 BUSH RD, ORATIA, AUCKLAND 1007
ZL1VJ	SOMERVILLE-RYAN, R, 13 CARR STREET, KAMO, WHANGAREI		
ZL1VJB	BUSCH, J M, P O BOX 372, WARKWORTH, AUCKLAND 1241		

ZL2 CALL-SIGNS

ZL2AA	GISBORNE AMATEUR RADIO CLUB INC, PO BOX 1017, GISBORNE	ZL2AGD	HAWKINS, W, 20 GILRAY AVENUE, MARAENUI, NAPIER
ZL2AAA	WHITE, M C, 502 HUIA ST, HASTINGS	ZL2AGH	MARSHALL, A W, 32 PLYMOUTH RD, HASTINGS
ZL2AAC	BRIDGMAN, A H S, 261 MITCHELL ST, WELLINGTON	ZL2AGI	GILES, F A, 1006 SUSSEX ST, HASTINGS
ZL2AAH	SAYERS, R K F, 33 BAMBER ST, CASTLECLIFF, WANGANUI	ZL2AGK	KING, A G, 42 NORBITON ROAD, FOXTON 5551
ZL2AAJ	DAVIS, S B, 8 KAWAU PLACE, WANGANUI	ZL2AGM	WEAVER, D B,
ZL2AAN	THOMPSON, R N, 1010 GORDON RD, HASTINGS	ZL2AGO	WOLF, J M, 12 CELESTE PLACE, GLENFIELD, AUCKLAND 10
ZL2AAO	SHACKEL, M W O, C/O POST OFFICE, OPUA	ZL2AGS	GOTLIEB, G D, 10 ASHTON FITCHETT DRIVE, PANORAMA HEIGHTS, BROOKLYN WELLINGTON
ZL2AAQ	JEFFERS, R J, 55A JELLI COE ST, WANGANUI	ZL2AGU	STEEL, G J, 674 KOWHAI DRIVE, TE KOUMA, COROMANDEL
ZL2AAAT	NICOLL, R J, 25 SELWYN STREET, WITHER RISE, BLENHEIM 7301	ZL2AGW	GILLON, K R, 11 FARNSWOOD PLACE, REDWOOD, CHRISTCHURCH
ZL2AB	NEW PLYMOUTH AMATEUR RADIO CLUB, C/O T.E.M.O., 45 ROBE ST, NEW PLYMOUTH	ZL2AGY	MARR, A H, PO BOX 3, GREYTOWN
ZL2ABB	CAMPBELL, S H, 20 ERIN ST, PALMERSTON NORTH	ZL2AH	REED, W S J, 7A HUMPHREY STREET, MARTON
ZL2ABC	PACKER, B A, 10 PATNA STREET, NGAIO, WELLINGTON	ZL2AHA	WARDS, I J, RD 2, MANUTAHI, PATEA
ZL2ABJ	BRIDGER, A, 11 MAWSON ST, GRACEFIELD, LOWER HUTT	ZL2AHB	DOUGLAS, L S, 9 SWITHLAND PLACE, CHRISTCHURCH 8004
ZL2ABL	BRAMLEY, K J, 14 REMBRANDT AVE, LINDEN	ZL2AHE	WILSON, A J, 7 PICKET BOAT LANE, WHITBY, PORIRUA 6006
ZL2ABM	ELVY, D L, 7 NORWICH ST, WELLINGTON 5	ZL2AHH	KEONG, P W, PO BOX 8108, HAVELOCK NORTH
ZL2ABN	RIDDING, G B,	ZL2AHI	MEADS, A M, 23 DARWIN CRESCENT, NEW PLYMOUTH
ZL2ABS	TONG, J, 5 NESTON GROVE, CHURTON PARK, WELLINGTON	ZL2AHM	SMITH, R A, 121 SLACKS RD, PALMERSTON NORTH
ZL2ABT	TURNER, O D, CADMAN RD, DANNEVIRKE	ZL2AHO	OWEN, D W, 12 Golders Road, Upper Hutt
ZL2ABU	VAN DER BURGH, J E C, 4a Trinity Place, Paraparaumu Beach	ZL2AHR	HAWTREE, G R, 50 FOX RD, WANGANUI
ZL2ABV	MARSHALL, L, 5 RAGLAN AVE, PALMERSTON NORTH	ZL2AHU	O'HARA, E R, 8 MILLER PLACE, MASTERTON
ZL2ABW	STEER, D W, 168 MOLESWORTH STREET, NEW PLYMOUTH 4601	ZL2AHY	HOWARD, C B, 24B CLEARMONT CRES, NEW PLYMOUTH
ZL2ABY	HUGGARD, J D, 22A RIMU ST, NEW PLYMOUTH	ZL2AI	PERT, P E, 29 RENOLDS DRIVE, GLENVIEW, HAMILTON
ZL2ABZ	MOORE, J A W, 112B BRITOMART ST, BERHAMPORE, WELLINGTON 6002	ZL2AIA	STEELE, R, 7 MARMON STREET, RAWENE PDS
ZL2AC	TURNBULL, P, 56 PLUMMERS POINT ROAD, RD 2, TAURANGA	ZL2AIB	CAMPBELL, W A, 225A TUKAPA ST, NEW PLYMOUTH
ZL2ACA	BARNETT, W J, RD 1, MAPUA, UPPER MOUTERE	ZL2AID	WILLIAMS, P R, 126 FAIRFIELD RD, HAWERA
ZL2ACC	COMRIE, A, 92-94 Revans Street, Featherston, South Wairarapa	ZL2AIE	PARKER, W J,
ZL2ACE	GREENE, R P, 5 ARANUI AVE, CASTLECLIFF, WANGANUI	ZL2AIIJ	NEWBERRY, M D, 35 CROFTON RD, WELLINGTON
ZL2ACF	VICTOR STAGPOOLE, 49 BOULD ST, WELLINGTON	ZL2AIIK	SMYTH, W M, 49C DORALTO RD, NEW PLYMOUTH
ZL2ACG	Goldie, Andrew, 50 Kenmore street, Newlands	ZL2AIIIL	MCMANAWAY, P H, MOFFAT RD, RD 1, MATARAWA, CARTERTON
ZL2ACJ	JONES, C M, 1 KENNY AVENUE, AHURIRI, NAPIER	ZL2AIN	JAMES, L A, 110 REDWOOD STREET, BLENHEIM
ZL2ACL	MYHILL, J, 63 DEEPDALE ST, BURNSIDE, CHRISTCHURCH	ZL2AIO	VOSS, R B, RD 6, MILL RD, PALMERSTON NORTH
ZL2ACN	LAKEMAN, D T, 5 COSTLEY STREET, MASTERTON 5901	ZL2AIR	MORRIS, S W, MAIN HWY, CLAREVILLE, CARTERTON
ZL2ACO	JEFFS, D E, 14 FREYBERG CRES, WAIKANAE	ZL2AIS	CRAMER, F H, 34 JAMES ST, INGLEWOOD
ZL2ACT	SMITH, G F, 26 SHERIDAN CRES, UPPER HUTT 6007	ZL2AIT	WHITING, P C, 5 WAKELY ROAD, NEWLANDS, WELLINGTON
ZL2ACW	GOTLIEB, R, 10 ASHTON FITCHETT DRIVE, BROOKLYN, WELLINGTON	ZL2AIU	JEPSEN, N, PO BOX 1904, PALMERSTON NORTH
ZL2AD	CONROY, T R, 21A WELD STREET, BLENHEIM	ZL2AIX	GEMMELL, A F, 482 CHILDERS RD, GISBORNE
ZL2ADB	BARROW, G W B, 60 BLEDISLOE CRES, WAINUIOMATA	ZL2AIY	HUNTER, D R, 16 TORLESSE STREET, WAKATU, NELSON
ZL2ADK	PURDIE, C M, 65 HEDGES ST, SANSON 5450	ZL2AJ	HARRIS, W, 114 AUPAKI ROAD, RD11, HASTINGS
ZL2ADL	PURDIE, B E, 65 HEDGES ST, SANSON 5450	ZL2AJA	PLUM, B F, 6 PORRIT PLACE, STOKE, NELSON
ZL2ADM	SMITH, I G, HILLVIEW, 94 GUPPY RD, GREENMEADOWS, NAPIER	ZL2AJB	HODGE, L D, 23 KENT CRES, PALMERSTON NORTH
ZL2ADN	STUART, J D, 11 KIPLING ST, PALMERSTON NORTH	ZL2AJC	HULSE, R L, 2 JUNCTION STREET, EPUNI, LOWER HUTT 6009
ZL2ADO	WILKINSON, J, 69A PARK RD, CARTERTON	ZL2AJF	VERNON, J H, 130 MAIRANGI RD, WELLINGTON
ZL2ADP	VILE, M E, 8A WILLOW GROVE, UPPER HUTT	ZL2AJG	GIBLIN, A G, 27 WEST AVENUE, RICHMOND
ZL2ADR	MCINTYRE, A, 1407 HIGH STREET, POMARE, LOWER HUTT	ZL2AJH	ANDREWES, L M, PO BOX 10-575, THE TERRACE, WELLINGTON 6036
ZL2ADU	GORTON, H J, 30 DIEFFENBACH ST, OPUNAKE	ZL2AJJ	MCHARDY, R A, 147A KINGS ROAD, MAKAURI, RD 1, GISBORNE
ZL2ADW	WEST, J D,	ZL2AJM	DONOVAN, MICHAEL, 370 ESTUARY ROAD, NEW BRIGHTON, CHRISTCHURCH
ZL2ADY	GALLAGHER, B G, 5 GEORGE ST, DANNEVIRKE	ZL2AJR	TEWARD, G J, 26 HOROPITO RD, WAIKANAE
ZL2AE	SOLE, A, 87 VEALE ROAD, RD1, NEW PLYMOUTH	ZL2AJV	SMALL, I R, 60 WHAKAPIO AVE, TAUPO
ZL2AEB	BOWRING, A E, 69 WAKEFIELD STREET, WANGANUI EAST, WANGANUI	ZL2AJZ	MASSEY UNIVERSITY (ELECTRONICS), PRIVATE BOX 756, WELLINGTON
ZL2AEL	LOCKE, A E, 27 REGENT DRIVE, PARAPARAUMU	ZL2AK	ROWSON, L T, 21 KELLYVILLE HEIGHTS, NEW PLYMOUTH
ZL2AEM	ROBINSON, P H, 10B BARIBALL ST, NEW PLYMOUTH	ZL2AKC	LARKIN, J F, 24 SURREY RD, WANGANUI
ZL2AF	JENKINS, I J, 35 OAK AVE, PAREMATA 6006	ZL2AKE	WATSON, M B, 25 ARMAGH TCE, MARTON
ZL2AFC	BURR, M K, 48 HOLBORN DRIVE, STOKES VALLEY	ZL2AKF	PEFFERS, W F, SPADE OAK VINEYARD, MAIN RD MAKAURI, RD1 GISBORNE
ZL2AFE	CLARKSON, R J, 247 HIGH STREET, ELTHAM	ZL2AKK	MOSS, J B, 9 SEYTON ST, STRATFORD
ZL2AFI	NICHOLLS, G A, 16A COLLINGWOOD ST, PALMERSTON NORTH	ZL2AKL	MULCAHY, A F,
ZL2AFJ	NICHOLLS, 6 MUDGWAY PLACE, PALMERSTON NORTH	ZL2AKM	GLASSEY, R B, 63 NORTHCOTE ROAD, CHRISTCHURCH 8005
ZL2AFK	FORD, P L, 34 AKATEA RD, KOROKORO, LOWER HUTT	ZL2AKN	SMITH, L K, PO BOX 1119, TAURANGA
ZL2AFL	JORDAN, N, CASA LOMA, WESTERN HUTT RD, MELLING, LOWER HUTT	ZL2AKS	TAYLOR, D, 31 AHURIRI ST, WELLINGTON
ZL2AFM	HAWKE, P D, PO BOX 2002, STOKE, NELSON	ZL2AKT	BUNDLE, R J, PO BOX 28, BULLS 5452
ZL2AFN	MACLEAN, A K, PO BOX 59, RAETIHI	ZL2AKU	CROSBY, B D, 28 SHERIDAN CRES, UPPER HUTT
ZL2AFT	WASSILIEFF, C, 69 TIBER ST, WELLINGTON	ZL2AKV	COPELAND, R N, 11 TE PUNI GROVE, UPPER HUTT
ZL2AFR	GORMAN, B D, 66 PACIFIC ST, TIMARU	ZL2AKW	KING, T C, 72 CHELMSFORD ST, WELLINGTON
ZL2AFT	ANDERSON, B P, 429 ALBERT ST, PALMERSTON NORTH	ZL2AKZ	BARDEN, T W A, 14 PURIRI PLACE, KAITAIA 0500
ZL2AFU	UDY, H A F, 1 TUDOR RD, PAHIATUA	ZL2AL	JENNINGS, L F, 203 BERESFORD ST, HASTINGS 4201
ZL2AFV	TITAH BAY AMATEUR RADIO CLUB INC, PO BOX 50-402, PORIRUA 6215	ZL2ALA	KENNY, A R, 60 POKOHWI RD, LOWER HUTT
ZL2AFW	JONES, B N, 23 MITCHELL STREET, ARAMOHO, WANGANUI	ZL2ALC	MAXWELL, H J, 52B AWATEA AVENUE, PARAPARAUMU 6010
ZL2AG	NEWLANDS, R G, 14 VASANTA AVENUE, NGAIO, WELLINGTON 6004	ZL2ALD	GILLESPIE, M E, PO BOX 667, PAPAKURA, AUCKLAND
ZL2AGC	WALDMANN, K J, PO BOX 47-047, UPPER HUTT	ZL2ALJ	FLETCHER, A B, 127 MELBOURNE RD, ISLAND BAY, WELLINGTON 6002
		ZL2ALL	TOMPKINS, A W, HALCOMBE RD, R D 5, FEILDING

ZL2ALM	LOVEGROVE, P J, 145 CARLISLE RD, BROWNS BAY	ZL2AQR	CRAWLEY, R J C, MAYFIELD- LISMORE RD, RD 5, ASHBURTON
ZL2ALO	SHEARMAN, A J, 12 SOMERSET RD, SPRINGVALE, WANGANUI	ZL2AQS	DUCKWORTH, P D, 7 EINSTEIN ST, GISBORNE
ZL2ALP	PATON, P J, 41 HYDE ST, WAINUIOMATA 6008	ZL2AQT	BENTON, S W, KAHUTARA RD, RD 1 WAINAWHENUA, FEATHERSTON
ZL2ALQ	PHILLIPS, D R,	ZL2AQX	MACARTNEY, R A, 129 SEAVIEW RD, NEW PLYMOUTH
ZL2ALR	JURY, J M, GLENDOWER, PONATAHI RD, RD 2, CARTERTON	ZL2AQY	OLSON, E L, 42 EASTON PARK PARADE, GLENFIELD, AUCKLAND 1310
ZL2ALT	TONG, A C, 12 PRINCES ST, HAWERA 4800	ZL2AR	TURFREY, G A, 15B RESERVOIR RD, WAIPUKURAU
ZL2ALW	BARNETT, A D, 70 WAIMA CRES, TITIRANGI, AUCKLAND 1007	ZL2ARC	CHRISTIE, ALISTAIR, 3 RHYL PLACE, BRYNDWR, CHRISTCHURCH
ZL2ALX	TARRANT, G W, RAWHITRUA, RD 8, MASTERTON	ZL2ARD	SCHOFIELD, D T, 34 KIWI RD, RAUMATI
ZL2ALY	WALKER, C M, 244A TE MOANA ROAD, WAIKANAE 6010	ZL2ARF	LANE, J R, 3 BASSETT PLACE, TARADALE, NAPIER
ZL2ALZ	HEALEY, G W, 78 SIDLAW ST, WELLINGTON	ZL2ARG	NZART NELSON BRANCH INC, PO BOX 414, NELSON
ZL2AM	GREAVES, I G, 20 PARKVIEW AVENUE, FEILDING	ZL2ARI	WILLS, A J, 45 RUAHINE STREET, PARAPARAHU MU
ZL2AMA	DWYER, M B, PO BOX 7313, WELLINGTON SOUTH	ZL2ARJ	WEBB, B D, 71 HILLSIDE DRIVE, UPPER HUTT
ZL2AMC	SARGENT, F W, 2125A GORDONTON ROAD, RD 1, TAUPIRI 2171	ZL2ARN	STEWART, D G, 75 NIMMO AVE EAST, WAIKANAE 6010
ZL2AMD	LAMONT, D H, 510 KENNEDY RD, NAPIER	ZL2ARQ	PAHL, D G, P.O.BOX 25104, CHRISTCHURCH
ZL2AME	HEATH, C A, 9 PATUTU GROVE, UPPER HUTT	ZL2ART	MCQUINLAN, T, 6 WHANAKE ST, TITAH BAY 6006
ZL2AMI	STEWART, R G, 105 ORANGI KAUPAPA RD, WELLINGTON 6005	ZL2ARV	JAMES, ALAN, 413 FREDRICK ST, HASTINGS
ZL2AMJ	JOHNSON, J F C, 15 FIELD ST, UPPER HUTT	ZL2ARW	WILLIAMS, P R, 15 PINNY AVENUE, LOWER HUTT 6009
ZL2AMK	VENDT, G R, 60 BIRD GROVE, STOKES VALLEY	ZL2ARY	JENKS, M D, PO BOX 193, KIRWEE 8170, CANTERBURY HASTINGS BRANCH NZART (INC), P O BOX 1119, HASTINGS
ZL2AMM	MORRIS, S J, 1 SIDLAW ST, WELLINGTON	ZL2AS	DINDALE, B, 14 BENMORE AVE, PALMERSTON NORTH
ZL2AMO	SPACKMAN, M L, UNIT 3/421 GLOUCESTER ST (ATAWHAI), TARADALE, NAPIER	ZL2ASC	DENTON, S B, 384A HARDY STREET, NELSON
ZL2AMP	SUTHERLAND, H, 111 QUEENS ROAD, WAIKANAE	ZL2ASD	DARBY, A R, 47 MCLAREN ST, MAYMORN, UPPER HUTT
ZL2AMR	FEILDING & DISTRICTS RADIO CLUB, C/O MS PRIOR, 7 KEITH ELLIOTT STREET, FEILDING	ZL2ASF	FOGERTY, S F, 5 MCCARTHY CRESCENT, MOTUEKA
ZL2AMS	MARTON BRANCH NZART, C/O TRUSTEE: MR T F RUBERY, PO BOX 279, MARTON 5460	ZL2ASH	CLARK, B S, 5 MAMAKU GROVE, KHANDALLAH, WELLINGTON 6004
ZL2AMT	GARMONSWAY, T L, RANGIWAEEA, RD 1, TAIHAPE	ZL2ASJ	JARDINE, S J A,
ZL2AMZ	HUMPHRIS, G J, 24 WOODHEIGH MEWS, PARAPARAHU MU BEACH	ZL2ASO	SEWELL, J R, 57 HINE RD, WAINUIOMATA
ZL2AN	SHEPHERD, ERIC, 293 FENTON STREET, ROTORUA	ZL2ASQ	DAWSON, E K, 680 EAST COAST RD, BROWNS BAY
ZL2ANB	FENTON, D J, 27 BLAKE ST, WAITARA	ZL2ASR	GILL, A H, 41 GAVIN BLACK ST, MEEANEE, NAPIER
ZL2ANG	TIPLER, B F, PO BOX 400, STRATFORD	ZL2AST	GROOMBRIDGE, J E, PO BOX 30-099, 15 OAKLEIGH ST, LOWER HUTT
ZL2ANI	MCLEOD, S A, 4 TREVELYAN ST, NAPIER	ZL2ASW	AVERY, G S, 24 TUDOR GROVE, FEILDING
ZL2ANN	OPUNAKE RADIO CLUB, INC RAHOTU BRANCH NZART, 30 DIEFFENBACH ST, OPUNAKE	ZL2ASY	CURRIE, R G, 75 HAIR ST, WAINUIOMATA
ZL2ANP	WILLIAMSON, J J, SINCLAIRS RD, RD 9, FEILDING	ZL2ASZ	WARDLAW, D A, NZART, PO BOX 40-525, ASTRAL TOWERS, UPPER HUTT
ZL2ANQ	KEANE, P M, PO BOX 1151, GISBORNE	ZL2AT	FABIAN, R R, 13 MCCOMBS STREET, SOMERFIELD, CHRISTCHURCH
ZL2ANS	MARTIN, D W, 111 AVENUE RD, GREENMEADOWS, NAPIER	ZL2ATB	BLACKWELL, F N, 103 KENMORE ST, WELLINGTON
ZL2AOA	WALL, T F, MAHAKI, RD 1, MARTINBOROUGH	ZL2ATC	HARRIS, E J, 43A CAMERON RD, NAPIER
ZL2AOC	VAN TOORENBURG, LAMMERS L M, 29 MAREWA RD, HAITAITAI, WELLINGTON 6004	ZL2ATE	MANLEY, R C, 22 AMBERLEY AVE, PALMERSTON NORTH
ZL2AOH	SUTTON, R L, 12C HERBERT GARDENS, 186 THE TERRACE, WELLINGTON 6001	ZL2ATI	CARTWRIGHT, K C, 8 MCNAUGHTON ST, WAITARA
ZL2AOI	MALKIN, E, 4/412 AVENUE RD WEST, HASTINGS	ZL2ATL	LATEGAN, P A, 88 AYTON DRIVE, WHITBY, WELLINGTON
ZL2AOK	WALLIS, G A, 6 BRUCE AVE, BROOKLYN, WELLINGTON	ZL2ATM	APLIN, E L, 16 KAKA ST, MASTERTON
ZL2AON	DAVIES, G, 25 MARINE STREET, HOKOWHITU, PALMERSTON NORTH	ZL2ATP	HURSTHOUSE, W M, 306 PRINCES DRIVE, NELSON
ZL2AOO	SINCLAIR, M L, 1 PORRITT PLACE, TAMATEA, NAPIER	ZL2ATU	HORN, I G, PO BOX 7250, WANGANUI
ZL2AOP	MACKINTOSH, A B, 34 MARIAN DRIVE, GISBORNE	ZL2ATV	CLENCH, H J, 40 BIRDWOOD ROAD, WATERLOO, LOWER HUTT
ZL2AOT	SANDERS, K D, FLAT 6, 40 HIGH STREET, RENWICK, MARLBOROUGH 7352	ZL2ATX	HASKELL, E H E, 1 GLENROWAN RISE, BETHLEHEM, TAURANGA
ZL2AOU	HOWAN, V E, 7 ALMORA VIEW, ASCOT PARK, PORIRUA	ZL2AU	WILSON, W C, 21 LONDON RD, PETONE
ZL2AOV	MCNEILL, D A, 58 FRASER AVE, JOHNSONVILLE, WELLINGTON 6004	ZL2AUA	BURCH, M A G, 49 KAHU ROAD, PAREMATA 6006
ZL2AOX	EDWARDS, M R,	ZL2AUB	MOORE, P J, 54 HERBERT AVE, PALMERSTON NORTH
ZL2AOZ	DAVIDSON, W E, RD 10, PALMERSTON NORTH	ZL2AUD	MARTIN, W, PO BOX 104, RAWENE, HOKIANGA 0452
ZL2AP	DE GREEUW, J F M, 12 GRANGE RD SOUTH, HAUMOANA 4250	ZL2AUE	KING, M, 312 GORDON STREET, MASTERTON
ZL2APA	CHIPPENDALE, J G, 66 REID AVE, HAWERA	ZL2AUF	BLAIR, S G, 15 POPLAR GROVE, THORNDON, WELLINGTON
ZL2APC	BURTON, H, 3 CHAMBERLAIN ROAD, KARORI, WELLINGTON	ZL2AUH	O'SHEA, Patrick, 4 Teppett Place, Foxton Beach, Foxton
ZL2APD	HOLMWOOD, E A, 11 NEWTON PLACE, PALMERSTON NORTH	ZL2AUJ	CATCHPOLE, D, 25 TAIPAKUPAKU RD, WELLINGTON
ZL2APE	PARNELL, J C, 87 DUNCAN TCE, WELLINGTON	ZL2AUK	LECKIE, D A, 188 HOKIO SAND ROAD, RD 1, LEVIN
ZL2APP	LUSTY, F W, 40 IHIAIA ST, WAITARA	ZL2AUR	TONG, T Y, 390A FERGUSSON DRIVE, TRENTHAM, UPPER HUTT
ZL2APH	HAISMAN, R A, 27 VALLEY RD, GISBORNE	ZL2AUT	MORTON, L W, 4 TORO ST, DURIE HILL, WANGANUI
ZL2APJ	JURY, A P, 83A FULFORD ST, NEW PLYMOUTH	ZL2AUW	NASH, A L J, 20 SEDDON ST, LEVIN 5500
ZL2APO	LEIGH, P, 4 PARCELL COURT, CROMWELL	ZL2AUX	LEWER, D H, 113 PUKEPAPA RD, MARTON
ZL2APT	ROPATA, P T, 46 BRIDGE ST, BULLS 5452	ZL2AUZ	BLAIR, R L, 12 CLELAND ST, PALMERSTON NORTH
ZL2APU	MARSHALL, D W, PO BOX 100, PATEA	ZL2AVB	HARGREAVES, A P, 22C HIGH ST, ELTHAM
ZL2APV	JURY, G V, 288 HENWOOD ROAD, NEW PLYMOUTH	ZL2AVF	GIBBS, L V, 19 CAMELLIA TCE, LOWER HUTT
ZL2APX	O'DWYER, M, 135 GUPPY RD, TARADALE, NAPIER	ZL2AVG	REYNOLDS, M G, 131 MT HERBERT RD, WAIPUKURAU
ZL2APY	HARTWIG, G, 23 GREY ST, WOODVILLE	ZL2AVJ	MCNABB, M D, 135B BEACH ROAD, KAIKOURA
ZL2APZ	BENSON, K J, 19 COOK STREET, MELFELL, NEW PLYMOUTH	ZL2AVL	LUSCOMBE, G W, MAIN RD, WAIORU
ZL2AQD	WATSON, J E, 28 HARRY SHAW WAY, RAUMATI BEACH 6450	ZL2AVM	MORRIS, R H C, 21 RANGOON ST, WELLINGTON
ZL2AQH	VOSS, S J, RD 6, KOPANE, PALMERSTON NORTH	ZL2AVR	DINNIE, J S, 27 RODNEY AVENUE, TE HORO BEACH, RD 1, OTAKI
ZL2AQI	CHEYNE, J A, 12 ABERDEEN AVE, PALMERSTON NORTH	ZL2AVS	HEATH, B O, 32 NIKAU ST, EASTBOURNE
ZL2AQK	MILLARD, A J, 34 VOLGA ST, WELLINGTON	ZL2AVX	RHODES, C J, 54 CLIFFORD ROAD, JOHNSONVILLE, WELLINGTON
ZL2AQL	SPEARMAN, M B, C/O 34 FIRST AVE, TAURANGA	ZL2AVY	OWEN, M L, KANE ST, PIRONGIA
ZL2AQN	HEALD, P J, 26 VOELAS ROAD, LYTTELTON	ZL2AW	BONNINGTON, R L, 182A CABLE BAY ROAD, RD 1, NELSON
ZL2AQO	WILSON, K A, 149-B BIRKDALE ROAD, BIRKDALE, AUCKLAND 1310	ZL2AWA	FARQUHAR, W E, 17 STANSELL AVENUE, NELSON
		ZL2AWE	COOKE, P, 31 KENT CRES, PALMERSTON NORTH
		ZL2AWF	ALEXANDER, D G, 34 TENNYSON ST, PETONE
		ZL2AWG	ROBERTS, J C, 40 GRAHAMS RD, CHRISTCHURCH
		ZL2AWH	BROSNAN, D C, 4/409 CHARLES ST, HASTINGS 4201
		ZL2AWI	SHERLEY, H F, 37 KIWI RD, RAUMATI BEACH 6450

ZL2AWJ

ZL2AWJ WOODHOUSE, C W, 12 WILLOUGHBY STREET, LOWER HUTT 6009
ZL2AWR ROBERTS, A W, 184 IKITARA RD, WANGANUI EAST
ZL2AWS SAYERS, P A, 97 HAPPY VALLEY RD, WELLINGTON
ZL2AWU TILLER, B A, 14 Martin Road, Paraparaumu Beach
ZL2AWW WESSELS, A W, PO BOX 5177, LAMBTON QUAY, WELLINGTON 6015
ZL2AWY WILLIAMS, D M, 5 BOONS VALLEY ROAD, WAIKAWA, PICTON
ZL2AX WARD, J G, 288 SMITH ROAD, RD 8, DANNEVIRKE
ZL2AXA DEWAR, A M, 248A OHIRO RD, WELLINGTON
ZL2AXB CRAWLEY, D R K, CAMPBELL RD RD 1, WANGANUI
ZL2AXC RAGAN, G S, 32 MITCHELL ST, WANGANUI
ZL2AXG YOUNG, W D D, 20 REXWOOD ST, CARTERTON
ZL2AXH AITCHISON, W B, 11 LIPMAN STREET, MT VICTORIA, WELLINGTON
ZL2AXL HARVEY, P R, 4A NORTON RD, OTUMOETAI, TAURANGA
ZL2AXN CRANE, R G, 11 DICKENS LANE, RD D 1, WANGANUI 502
ZL2AXO MATHERS, R W, POHARA VALLEY ROAD, TAKAKA
ZL2AXP LATTA, I K, 31 COLLINGWOOD ST, PALMERSTON NORTH
ZL2AXQ ROWLANDS, R E, 16 NORNA CRES, WELLINGTON
ZL2AXR RAMSAY, K A, 130A CHEVIOT RD, LOWRY BAY, WELLINGTON
ZL2AXT BREMFORD, J D, 9 WINSTON ST, WELLINGTON
ZL2AXW ANDREW, P J, DEVENPORT, J A, 17 SUNNY GROVE, WAINUIOMATA 6008
ZL2AYB FISHER, W G, 40 BEAUCHAMP ST, WELLINGTON
ZL2AYE WASTNEY, R J, 126 THE RIDGEWAY, NELSON
ZL2AYF AMIES, B W, 15 LYNDHURST RD, TAWA
ZL2AYK KELLY, P W, 173 VICTORIA ST, CAMBRIDGE
ZL2AYM SCHOLEFIELD, C O, 8 MARTIN AVENUE, WAKEFIELD, NELSON
ZL2AYQ HILL, K J, 27 WELLAND PLACE, OWHIRO BAY, WELLINGTON 6002
ZL2AYS BURTON, F S, 48 WIKITORIA RD, WANGANUI 4501
ZL2AYT BOLTON, P E, 176B KATHERINE MANSFIELD DRIVE, WHITEMANS VALLEY, UPPER HUTT 6007
ZL2AYU LEASK, D W, 11 CANNON ST, NEW PLYMOUTH
ZL2AYX POHL, K P, WAGHORN, T J, 12 HAWKINS DRIVE, MARTINBOROUGH 5954
ZL2AYZ COUSINS, W G, 20 BUICK STREET, BLENHEIM
ZL2AZ LAKE, P B, 12 BRASENOSE PLACE, TAWA 6006
ZL2AZA BORRELL, D, 109 POPE ST, CAMBORNE, WELLINGTON
ZL2AZE STRETCH, F, 3C HEATHER PLACE, PICTON 7372
ZL2AZH NOEL, L E H, PO BOX 133, RONGOTEA
ZL2AZJ COLE, A G, 66 PONSONBY RD, WELLINGTON
ZL2AZK LANKSHEAR, B R, 13 KIM CRESCENT, BLENHEIM
ZL2AZN WALKER, D G, 16 STEPHEN ST, JOHNSONVILLE, WELLINGTON 6004
ZL2AZP PINNY, H G, 6 DERWENT CLOSE, PARAPARAUMU
ZL2AZR HARRIS, M G, PO BOX 2043, RAUMATI BEACH
ZL2AZV STEPHEN, J M, 11 REEVE DRIVE, HAVELOCK NORTH
ZL2AZY OWEN, S C, 550 KANE ST, PIRONGIA 2450
ZL2AZZ RANDALL, J H, 7A SUNNY GLEN, WAIKANAE
ZL2BAB BERESFORD, B A, 41 WORKSHOP RD, MASTERTON
ZL2BAC OSBORNE, T G, 46 HICKS CRESCENT, WAIKANAE BEACH 6010
ZL2BAE SEARING, J J,
ZL2BAF DONOGHUE, C J, 35 MANCHESTER ST, PALMERSTON NORTH
ZL2BAG MARTIN, P J, 2/21 WANGANUI AVENUE, HERNE BAY, AUCKLAND
ZL2BAI GARTH, D J, 1001 WHAREKOPAE RD, RD 2, GISBORNE
ZL2BAK DOUGLAS, R J, 507 RIVERSIDE DRIVE, NAENAE, LOWER HUTT
ZL2BAP PACKER, B A, 10 PATNA STREET, NGAIO, WELLINGTON
ZL2BAQ CARR, P H, 17 TIMARU GROVE, LOWER HUTT 6009
ZL2BAT RAMAGE, B H, 28 WILMINGTON PLACE, FAIRWAY PARK, CHRISTCHURCH 8006
ZL2BAU MALLETT, P J, 22 MEEHAN STREET, BLENHEIM
ZL2BAW MCCARRON, J R, METLIFECARE COASTAL VILLAS, 134 POHUTUKAWA PLACE, PARAPARAUMU
ZL2BAY ELVY, J M, 62A SALISBURY ROAD, BIRKDALE, NORTH SHORE
ZL2BB BRADSHAW, F R, 40 SIMLA AVE, HAVELOCK NORTH
ZL2BBA RUNDLE, W J, C/O MRS LOIS FERGUSON, 151 MURPHY ROAD, PAUATAHANUI, PORIRUA
ZL2BBC COCKS, P, 24 PIRINOA ST, FEILDING
ZL2BBG GOSNELL, J B, 10 ETON PLACE, PALMERSTON NORTH
ZL2BBH JANSEN, J H, WAIROAITI, SEAFIELD RD, RD 2, NAPIER
ZL2BBL BARWICK, L G A, 25 WADES AVE, CHRISTCHURCH
ZL2BBN FINCH, B P, 142 BROOKLANDS RD, NEW PLYMOUTH
ZL2BBO LEALAND, T P, 16 HUNTER ST, HAWERA
ZL2BBS DOIG, A M, 72 GORDON RD, PLIMMERTON
ZL2BBT GROVE, K E, 3 LOMOND ST, NEWLANDS, WELLINGTON
ZL2BBU PEARMAIN, C E, 47 ALTON STREET, NELSON
ZL2BBZ DICKSON, L P, 57 VICTORIA ROAD, NEW PLYMOUTH
ZL2BC GENTRY, K R, 8 CHUDLEIGH GROVE, WELLINGTON

ZL2BCA SCOTT, D L, 74 DODSON VALLEY ROAD, ATAWHAI, NELSON
ZL2BCB TUNNICLIFFE, C G, 15 CARMEN TCE, SNELLS BEACH, AUCKLAND
ZL2BCE RACE, D J R, 20 EXETER CRES, PIRIMAI, NAPIER
ZL2BCF PRATT, D H, 30 DEEPDALE ST, BURNSIDE, CHRISTCHURCH
ZL2BCG JACKSON, J, 246 THORP STREET, MOTUEKA
ZL2BCL THORP, G R, 28 HETLEY CRES, TARADALE, NAPIER
ZL2BCO DAGG, A H, 77 BARKER RD, NAPIER
ZL2BCP OFFICER, B C, 30 PETERHOUSE ST, TAWA, WELLINGTON
ZL2BCV BROMLEY, J H, 9 ARCHER PLACE, CARTERS BEACH, WESTPORT
ZL2BCW WILLIAMS, C W, 36 TAWA ST, HAWERA
ZL2BCW KERR, M J B, 40 RODRIGO RD, KILBIRNIE, WELLINGTON 6003
ZL2BCY WALLEN, E J, 35 RANGINUI ST, NGONGOTAHĀ
ZL2BCZ BAILEY, I K, C/ PO BOX 75, NGONGOTAHĀ, ROTURUA
ZL2BD ROBBINS, B J, 10 ECLIPSE LANE, WHITBY, PORIRUA 6006
ZL2BDB HERBERT, J W, PO BOX 97, PICTON
ZL2BDD HARRIS, R S, MT ADDE, R D 4, BLENHEIM
ZL2BDG HEAD, B P, 4 CHANNING CLOSE, BETHLEHEM, TAURANGA 3001
ZL2BDH HULSE, J C,
ZL2BDK RODDA, D G, 4D TOTARA ST, MASTERTON
ZL2BDL MCLACHLAN, R M, PO BOX 8157, HAVELOCK NORTH
ZL2BDM MOTE, B J, 55 BURNESS RD, GREENMEADOWS, NAPIER
ZL2BDQ JOHNSON, W J, 363 WESTMINSTER AVE, NAPIER
ZL2BDR GREIG, N A, 145 NORMANDALE RD, LOWER HUTT
ZL2BDS CORBETT, A A, 7 MORRINGTON TERRACE, BLENHEIM
ZL2BDU PICKETT, B T, 869 MAIN ST, PALMERSTON NORTH
ZL2BDW SMITH, G B, 1299 FERGUSON DRIVE, UPPER HUTT
ZL2BE WOOLLARD, C J, PO BOX 2272, STORTFORD LODGE, HASTINGS
ZL2BED DUNKLEY, G J H, L ECOLE, FRENCH FARM, RD 2 AKAROA
ZL2BEF LONDON, P R, 92 MAJORIBANKS STREET, MOUNT VICTORIA, WELLINGTON
ZL2BEG CROPP, B A, 7 BLUE MOUNTAINS RD, SILVERSTREAM, UPPER HUTT
ZL2BEJ SQUIRE, D N, 266 OLD COACH RD, RD 9, TE PUKE
ZL2BEK CAMPBELL, L T, 14 LEIGHTON AVE, LOWER HUTT
ZL2BEL HOOGVEEN, W, 1 METRO AVE, HAMILTON
ZL2BEP WHITEFORD, P C, 46 CENTRAL TCE, KELBURN, WELLINGTON
ZL2BEQ PENBERTH, P M, RD 5, RANGITIKEI LINE, NEWBURY, PALMERSTON NORTH
ZL2BER CROMPTON, R P K, 97 INLET RD, KERIKERI
ZL2BEZ MILLER, P G, 2 DOWNING STREET, CHARTWELL, WELLINGTON 6004
ZL2BF FEICKERT, B, REDWOOD PASS, AWATERE VALLEY, RD 4, BLENHEIM
ZL2BFB WILDE, R H, 179 COOK ST, PALMERSTON NORTH
ZL2BFE FAKE, J L, 44 CUMBERLAND ST, NEW PLYMOUTH
ZL2BFF SUMMERFIELD, G C, 3 CROXLEY PLACE, PALMERSTON NORTH
ZL2BFG WEBLEY, H R, 21 FENDALTON DRIVE, CAVERSHAM, HAMILTON 2001
ZL2BFH HOLT, D, 5 HILLARY HEIGHTS, GISBORNE
ZL2BFJ IRELAND, P J, 45 GEORGE ST, LEVIN, 5510
ZL2BFR WIGGINS, H N, 23 SLACKS RD, PALMERSTON NORTH
ZL2BFS RUSHTON, G A W, 30B MOULTON STREET, NEW PLYMOUTH
ZL2BFU LACEY, G, 27 BLEDISLOE ST, MASTERTON
ZL2BFX KERR, A J, 1/28B Rangers Road, Cremorne, NSW
ZL2BFY LAMBERT, R, 7 KONINI ST, MASTERTON
ZL2BFZ THUM, F A, 43 RIMU STREET, WAIKANAE 6454
ZL2BG WILLIAMS, P G, MANGAKURI, R D 14, HAVELOCK NORTH 4230
ZL2BGC PASSUELLO, M G D, 36 ANDREW STREET, WAIKANAE 6010
ZL2BGD YORK, R W F, 41A NELSON STREET, BLENHEIM
ZL2BGE BOYLE, L, 37 LEWIS AVE, WANGANUI
ZL2BGI PYCROFT, W J, 156 MILTON STREET, NELSON
ZL2BGJ JONAS, G M, 21 MALONE ROAD, LOWER HUTT 6009
ZL2BGL CONWAY, I W, CASEY'S ROAD, RD, SEDDON 7353
ZL2BGR ROBERTS, B G, 4 GLENAMOY CRES, JOHNSONVILLE, WELLINGTON
ZL2BGX SMITH, W H, 22/305 EVANS BAY PARADE, WELLINGTON 6003
ZL2BGZ MCLEAN, G M, 107 RICHMOND ST, PETONE
ZL2BH ELVY, S J, LARKSFIELD, 34 ST LEONARDS ROAD, R D 1 BLENHEIM 7321
ZL2BHD BATEMAN, G W, 54 MURRAY AVE, HAWERA
ZL2BHE WALKER, D C, PO BOX 5304, LAMBTON QUAY, WELLINGTON 6040
ZL2BHF MEACHEN, J A, UNIT 1/ 25 CORONATION RD, GLENFIELD, AUCKLAND
ZL2BHG LAWSON, J R, 114 HOSPITAL ROAD, BLENHEIM

ZL2BHH	BURNHAM, E D, 15 TAWA ST, LEVIN	ZL2BMK	BOWMAN, R F, 146 CONCLUSION ST, PORIRUA
ZL2BHI	ORAMS, K J, 13 EAGLE ST, WELLINGTON	ZL2BMO	GARROD, J, 82 PATUWAI ROAD, RD 1, WHAKATANE
ZL2BHJ	ANDREWS, G J, 66 KHANDALLAH RD, KHANDALLAH, WELLINGTON 6004	ZL2BMS	MOORE, M B, 187 RIVERSIDE DRIVE, LOWER HUTT
ZL2BHK	JOHNSON, D H, 23 CULZEAN GROVE, BELL BLOCK, NEW PLYMOUTH	ZL2BMZ	MURRAY, P L, RD, PAPARATA RD, BOMBAY
ZL2BHL	FOWLER, R L, 513 MAIN ROAD, RIWAKA, R D 3 MOTUEKA	ZL2BN	RICE, L J, 67 WITHER ROAD, BLENHEIM
ZL2BHM	MATTHEWS, E F, RD, MOEAWATEA, WAVERLEY	ZL2BNA	HITCHMAN, G J, 33 NORFOLK CRES, FEILDING
ZL2BHN	ALLARDYCE, J P G, MARIST SEMINARY, 10 HOPETOUN STREET, NEWTON, AUCKLAND 1001	ZL2BNB	WALKER, R A, 28 FORFAR STREET, CAVERSHAM, DUNEDIN
ZL2BHO	HENDERSON, R L, 426 GLOUCESTER ST, TARADALE, NAPIER	ZL2BNC	COOK, R A, 9 FURLONG CRESCENT, CHURTON PARK, WELLINGTON
ZL2BHR	INWOOD, R G, 22 BENMORE AVE, PALMERSTON NORTH	ZL2BND	SMITH, T W, 4 ST JOHNS TCE, TAWA
ZL2BHT	MCLAREN, D M, BDM TRUST, C/- 1 DI LEVA WAY, NELSON 7001	ZL2BNE	MARR, N C, 322 OLD RENWICK ROAD, R D 2, BLENHEIM
ZL2BHV	KILGOUR, A D, 7 MEADOW ST, KAIAPOI	ZL2BNG	GIBELLINI, J A, 71 POINT ROAD, MONACO, NELSON
ZL2BHW	QUAYLE, R P, C/O 5 TE PARI PARI RD, PUKERUA BAY	ZL2BNH	BASTIN, F T, 103 GASCOIGNE ST, HASTINGS
ZL2BHX	VERNON, T J E, 1 WHIO ST, TAIHAPI	ZL2BNM	MCKAY, P G, 2/130 QUEENSCLIFF ROAD, QUEENSCLIFF, SYDNEY N.S.W. 2096
ZL2BI	HOGAN, T J, PO BOX 39-166, WELLINGTON MAIL CENTRE, WELLINGTON	ZL2BNN	ROBINSON, H T, 6 BECROFT DRIVE, FORREST HILL
ZL2BIB	MEIKLE, D A, 73A WAIKAWA ROAD, PICTON	ZL2BNP	JOHNSON, P G, P O BOX 162, CROMWELL
ZL2BIF	MCKAIN, S J, 31 HIKUTAIA RD, OPOTIKI	ZL2BNQ	CLAYDON, K W, 86 REWA ST, INGLEWOOD
ZL2BIG	BINGHAM, W J, 31 ELIZABETH ST, FEILDING	ZL2BNS	TOWNSHEND, A P, 12 ATHOL STREET, THE GLEN, RD 1, NELSON
ZL2BIL	COX, W R, 5A KONINI GROVE, RAUMATI BEACH 5032	ZL2BNV	LOWE, P A, 7 RICHOMD AVENUE, KARORI, WELLINGTON
ZL2BIN	FLETCHER, G L, PO BOX 66, TAKAKA	ZL2BNX	ISHERWOOD, K, 49 AVONDALE RD, TARADALE, NAPIER
ZL2BIO	BARNES, D J, PO BOX 3265, RICHMOND	ZL2BO	SIMPSON, W N, 20 WHAREPAPA GROVE, MOTUEKA
ZL2BIQ	THORNER, G, 10A BELLA ROSA DRIVE, HORNBY, CHRISTCHURCH	ZL2BOA	THORP, M D, 28 HETLEY CRES, TARADALE, NAPIER
ZL2BIR	KIDD, P R, 8 GOLDIE PLACE, WAIKANAE	ZL2BOB	PRIEST, B W, 21 WINCHESTER ST, PALMERSTON NORTH
ZL2BIS	PORTER, I G, 20 BELFIELD ST, CHRISTCHURCH	ZL2BOE	LARGE, R A, 44 DONNELLEY DRIVE, WAINUIOMATA
ZL2BIT	WILLAN, L R, 8 WARREN PLACE, NEW PLYMOUTH	ZL2BOF	NIXON, S M, 4 SPYGLASS LANE, WHITBY
ZL2BIU	MCCAW, J I, 233 CHARTWELL AVE, WHANGAMATA	ZL2BOI	MORETTI, G S, 9 DROYLSDEN PLACE, PALMERSTON NORTH
ZL2BJ	HAWKEN, B J, 655 MAIN ROAD, STOKE, NELSON	ZL2BOJ	HARRIS, R E, 7 HEMPTON ST, NEW PLYMOUTH
ZL2BJA	ANGLAND, B J, 43 KENTUCKY WAY, PALMERSTON NORTH	ZL2BOL	BIGGINS, B F, 70 LOHIA ST, WELLINGTON
ZL2BJB	HORNE, D A, 10 KENWYN DRIVE, CARTERTON, 5951	ZL2BOM	PHILLIPS, O K, 12 TOTARA ROAD, PALMERSTON NORTH
ZL2BJD	ROBSON, E H, 64 ALEXANDER AVE, NAPIER	ZL2BON	NICHOLLS, S P, P O BOX 5, PONGAROA
ZL2BJG	MCGREGOR, B A, 4 HINDMARSH DRIVE, TAUPO	ZL2B00	HOPE, M R, PO BOX 812, BLENHEIM
ZL2BJJ	JARDINE, B J,	ZL2BOP	BRADLEY, R L, 59 OTIA DRIVE, RICHMOND 7002, NELSON
ZL2BJO	CATHCART, S J, PO BOX 1537, PALMERSTON NORTH	ZL2BOU	CARTER, A F, 30A NEWMAN AVENUE, BRIGHTWATER
ZL2BJS	JAMIESON, D R, 2 WAIPUNA STREET, BLENHEIM	ZL2BOV	GRIFFITHS, B A, 2/6 PRINCESS STREET, WAITARA
ZL2BJU	THOMPSON, J J, 17 SOMERSET CRESCENT, PARAPARAUMU	ZL2BOW	HOWAN, A R, 7 ALMORA VIEW, ASCOT PARK, PORIRUA
ZL2BJV	MENZIES, K J, MAIN ROAD, GROVETOWN, BLENHEIM	ZL2BOY	CLARKE, R G, 3 WHITBY PLACE, NEW PLYMOUTH
ZL2BJY	BENSON, A P, 14 MARK PERREAU PLACE, FOXTON	ZL2BP	MCNABB, R A,
ZL2BK	SIMPSON, G R, 8A FAULKLAND DRIVE, BLENHEIM	ZL2BPP	SANDILANDS, L C, 518 LOCKINGTON ROAD, R D 2, KATIKATI
ZL2BKA	DALE, J S A, 689 EAST COAST RD, BROWNS BAY, AUCKLAND 1310	ZL2BPC	KUIPERS, E V, C/O 153 NAYLAND ROAD, STOKE, NELSON
ZL2BKI	HURST, J J, 11 FERGUSON VILLAGE, WARD STREET, UPPER HUTT	ZL2BPD	DONOVAN, P E, 389 MURITAI RD, EASTBOURNE
ZL2BKL	ALLEN, B W, INLAND NORTH RD, R D 43, WAITARA	ZL2BPE	VENNIX, J H, 15 HAWKINS DRIVE, MARTINBOROUGH
ZL2BKN	BURLING, B N G, 69 MEEANEE QUAY, NAPIER	ZL2BPG	HARDING, B P, 119A WERAROA ROAD, LEVIN
ZL2BKW	HARROWFIELD, T R, RD 8, ROBERTS LINE, PALMERSTON NORTH	ZL2BPI	WATT, I D, c/o 9 Field Street, Wanganui
ZL2BKY	COX, K L, 37 CUBA ST, PETONE	ZL2BPJ	MADDOK, R H, 2 WAIPUNA GROVE, STOKES VALLEY, LOWER HUTT
ZL2BKZ	RODRIGUES, J F C, FLAT 4, 25 CLAWTON ST, NEW PLYMOUTH	ZL2BPL	KERSLAKE, M G R,
ZL2BL	BESWICK, D J, 283 HAPPY VALLEY RD, WELLINGTON	ZL2BPS	STEWART, P J, 1024 WHITEMANS VALLEY RD, UPPER HUTT
ZL2BLB	AMES, M L, RD 1, QUEEN ST EAST, LEVIN	ZL2BPT	CRAW, G J, RD 3, COUPERS RD, PALMERSTON NORTH
ZL2BLC	OTTAWAY, J T J, 5 HAMERTON STREET, LOWER HUTT 6009	ZL2BPU	GOODALL, R N, 31 PLYMOUTH RD, FLAXMERE, HASTINGS
ZL2BLE	DEW, A W, 5 POKOHIWI ROAD, HOMEBUSH, MASTERTON 5901	ZL2BPX	THOMPSON, S A, 8 DAMPIER AVE, PALMERSTON NORTH
ZL2BLF	KOY, W, 167 LANGDALE AVENUE, PARAPARAUMU 6010	ZL2BPZ	MCIVOR, W G, 218 WEST STREET, GREYTOWN
ZL2BLH	ELLISON, D M, 281A FLAXMERE AVENUE, FLAXMERE, HASTINGS	ZL2BQA	NIELD, G S, TE WHARAU RD, R D 3, MASTERTON 5921
ZL2BLI	INKSTER, D J, PO BOX 21, OHAKUNE	ZL2BQL	VAN LOEMEN, E, RD 4, CHRISTCHURCH
ZL2BLJ	HODGKINSON, J, 16 HARPER ST, WANGANUI	ZL2BR	HUNT, A F, 8 MANU CRES, NEW PLYMOUTH
ZL2BLK	LEARMONTH, B H, 924 MAIN ROAD KOPANE, R D 6, PALMERSTON NORTH 5321	ZL2BRA	CASH, I M, 77 GREY ST, WAITARA
ZL2BLM	RAIT, N A H, 2 REVANS ST, FEATHERSTON	ZL2BRF	Fearnley, Brian, 7 Claverton Grove, Churton Park, Wellington
ZL2BLN	SCARROTT, P E, BUCHANAN RD, BAY VIEW, NAPIER	ZL2BRG	EATOUGH, S, 53 POTO RD, NORMANDALE, LOWER HUTT
ZL2BLO	MOORE, P C, 8 MAXWELL PLACE, NAPIER	ZL2BRI	WILKINS, A G J, 3 RAILWAY TERRACE, OHAU, RD 20, LEVIN
ZL2BLP	RODGERS, G K, 43 DUNAIR DRIVE, BURWOOD, CHRISTCHURCH 6	ZL2BRM	HENDRARD, E A M, 6 BAILLIE CRES, CARTERTON 5951
ZL2BLQ	MANGIN, S G, 33 WEST ST, GREYTOWN	ZL2BRQ	GRAHAME, K S, 19 CHADWICK PLACE, PALMERSTON NORTH
ZL2BLS	LAVERY, M W, 16 MORRISSEY ST, HAWERA	ZL2BRS	RUSSELL, S G, 85 RUGBY ST, PALMERSTON NORTH
ZL2BLX	MCLAUCHLAN, A C L, 81A OXFORD ST, TAWA	ZL2BRU	ALLISON, R, 8 EDINBURGH ST, DANNEVIRKE
ZL2BM	JOHNSON, A F W, F 1 / 92 ARTHUR STREET, BLENHEIM	ZL2BS	WARD, T W, PO BOX 4127, NEW PLYMOUTH
ZL2BMA	CALVERT, R H G, KURATAWHITI ST, GREYTOWN	ZL2BSJ	KNOL, W, 3/154 ONEPU RD, LYALL BAY, WELLINGTON
ZL2BMB	WALKER, M K R, 13A Hildreth Street, KARORI, WELLINGTON 6005	ZL2BSL	MATHESON, J D, 61 TITOKI STREET, MASTERTON
ZL2BMC	CHILD, J R, 1002 FREDERICK ST, MAHORA, HASTINGS	ZL2BSP	LLOYD, W M, PO BOX 20554, TE RAPA, HAMILTON
ZL2BME	CLARKE, G R, 57 KAURI STREET, MIRAMAR, WELLINGTON 6003	ZL2BSQ	LAWRENCE, R W C, 25 LINWOOD DRIVE, PARAPARAUMU 6010
ZL2BMH	IRVING, J E, 38 LAWRY ST, NEW PLYMOUTH	ZL2BSR	ROBERTS, B, P O BOX 3168, NAPIER
ZL2BMI	SEARS, E J, 9 SADIERS STREET, STOKE, NELSON	ZL2BSW	GEDYE, E D M, 15 SEINE ST, WELLINGTON
ZL2BMJ	RAILTON-JACKS, P N, 31 SEAFORTH AVE, PALMERSTON NORTH	ZL2BT	FENNESSY, B G K, 1/204 SOUTHAMPTON WEST, HASTINGS 4201
		ZL2BTF	BUDGE, D, HERONCROFT, MOTUEKA QUAY, MOTUEKA
		ZL2BTG	WOODHAM, R B, 9 KING STREET, ASHBURTON

ZL2BTH

ZL2BTH EMSLIE, H H, P O BOX 19, TUAMARINA
 ZL2BTJ YORK, K E, 208 SPRINGSWOOD GROVE, BLENHEIM
 ZL2BTK WILLINGS, H K, 27 OXFORD STREET, PICTON
 ZL2BTL STEENHART, L, 27 KINGSFORD DRIVE, STOKE, NELSON
 ZL2BTO DUNCAN, C W, P O BOX 5145, PORT NELSON, NELSON
 ZL2BTQ ELWOOD, R F, 44 HIGH STREET, RENWICK 7352
 ZL2BTU DAKEN, T R, 259D ANIKIWA ROAD, RD 1, PICTON
 ZL2BTV CHING, G R, 51 MCLAUCHLAN STREET, BLENHEIM
 ZL2BU JAMES, B T, FLAT 1, 413 MAIN ROAD, STOKE, NELSON
 ZL2BUI BROSnan, J, 2/19 Howard Road, Eastbourne,
 WAINUIOMATA
 ZL2BUK STRATTON, G J, 17 YORK STREET, MOTUEKA
 ZL2BV VERNALL, R B, 90 CAMPBELL ST, KARORI, WELLINGTON
 6005
 ZL2BW HARLING, D S, 142 QUEBEC ROAD, NELSON
 ZL2BWK KELL, B W, 86 NAVIGATION DRIVE, WHTIBY, PORIRUA
 ZL2BWL LUKE, B W, 1/104 LOVEDALE ROAD, HASTINGS
 ZL2BX CRESSWELL, A F, 36 TITIROMOANA RD, KOROKORO,
 PETONE
 ZL2BY FLUERTY, R M, 24 THE SOUNDING, WHITBY, PORIRUA
 ZL2BYD PERRETT, I G, 22 MEADE PLACE, BELL BLOCK, NEW
 PLYMOUTH 4061
 ZL2BZH BANKS, G J, 6B VIRGINIA PLACE, NEW PLYMOUTH
 ZL2BZN O'DONNELL, A A, 39 LISMORE ST, NEW PLYMOUTH
 ZL2CA VERNALL, R B, 90 CAMPBELL ST, KARORI, WELLINGTON
 6005
 ZL2CAM CAMPBELL, M H, 65 POINT ROAD, MONACO, NELSON
 ZL2CAN MORRIS, G N, 15 OAKLEY COURT, EATWELL AVE,
 PARAPARAUMU 6010
 ZL2CAT RIDGE, J D, 48 AWANUI DRIVE, WAIKANAE
 ZL2CB BROWN, C H, 558 WAINUI RD, GISBORNE
 ZL2CC MATHER, M S, 85 KANAKANIA ROAD, TE KARAKA
 ZL2CCT TRATTLES, C, PO BOX 57194, MANA, PORIRUA
 ZL2CD HAMER, W R, 187 SEATOUN HEIGHTS, MIRAMAR,
 WELLINGTON 6003
 ZL2CDH MARSHALL, N R D, 58 FITZHERBERT AVE, WANGANUI
 ZL2CDK MCCORMICK, C D K, 14 PUKEKO PLACE, WESTSHORE,
 NAPIER
 ZL2CDM MILLS, C D, 59 ROBINSON CRES, PALMERSTON NORTH
 ZL2CE BICKNELL, J A, PAPAWAI RD, GREYTOWN
 ZL2CF LEE, C, PO BOX 90, CLIVE
 ZL2CG CORNICK, M L, 23 OAKLEY AVE, MARTON
 ZL2CH WHITE, A J, PO BOX 6013, GLENVIEW, HAMILTON
 ZL2CHJ GOLDING, W J, PO BOX 8173, HAVELOCK NORTH
 ZL2CI SINTON, A J, 6 CHESTER ST, GREENMEADOWS, NAPIER
 ZL2CIA GRAHAM, W,
 ZL2CID MORRISON, N J, P O BOX 5012, PORT NELSON, NELSON
 ZL2CIT ROULSTON, P R, 7 ARUNDEL GROVE, SILVERSTREAM
 6007
 ZL2CJ AUSTIN, P H, F2/48 MASEFIELD STREET, STOKE, NELSON
 ZL2CJH KING, M R, 5 POPLAR ST, GISBORNE
 ZL2CJR ROBERTSON, C J, 23 RICHMOND AVE, KARORI,
 WELLINGTON
 ZL2CJZ Zawodny, Chris,
 ZL2CK CREEDY, J,
 ZL2CL GUEST, R, 24A MIZPAH RD, BROWNS BAY, AUCKLAND
 1310
 ZL2CLB WILLIAMS, BENJAMIN CALEB, 29A TAYLOR PASS ROAD,
 BLENHEIM
 ZL2CLI MCARTHUR, E J B, C/O DR I MCARTHUR, PO BOX 126,
 CARTERTON
 ZL2CLL O'SULLIVAN, T S, 27 STOKES VALLEY RD, STOKES
 VALLEY, LOWER HUTT
 ZL2CM MARAIS, C P, 2 DORCHESTER PLACE, THORNTON
 ESTATE, HAMILTON
 ZL2CMC MCEWEN, C R, 21 SUNNYSIDE RD, NAWTON, HAMILTON
 ZL2CMG MILNE, T G, C/- 12 RAHUI STREET, STRATHMORE,
 WELLINGTON
 ZL2CNE EMKE, C N, 12 LEMON ST, OTAKI
 ZL2CO O'SULLIVAN, J P, 1 COOPER PLACE, RICHMOND
 ZL2COS BROWN, D W, 34A IZARD ROAD, KHANDALLAH,
 WELLINGTON 6004
 ZL2CP POPPE, C J, PO BOX 7, TAUPO
 ZL2CPH HARVEY, P N, 11 MONTEGO PLACE, MANUREWA,
 AUCKLAND
 ZL2CPR ROOD, P A, 13 Parnir Place, Welcome Bay, TAURANGA
 ZL2CQ MANLEY, P F, 225 Bridgman Road, TE AWAMUTU,
 HAMILTON
 ZL2CR MILLER, N, 36 STANLEY ST, WELLINGTON
 ZL2CS ROBERTS, W S, 188 NIKAU ST, HASTINGS
 ZL2CT EVANS, B, SOUTH FEATHERSTON RD, RD 1,
 FEATHERSTON
 ZL2CU UNDERWOOD, C, 5 REWA ROAD, HAITAITAI,
 WELLINGTON
 ZL2CV CREEDY, J,
 ZL2CVA ADAMS, A E, 1 EAST BEACH, WAITARA
 ZL2CVJ JAYNES, Vicky Cirrus, 17 BLICK TERRACE, NELSON

ZL2CVW SAUNDERS, A M, 96 ORIEL AVENUE, TAWA, WELLINGTON
 6006
 ZL2CW GILBERT, G B, 10 CHESTERTON ST, JOHNSONVILLE,
 WELLINGTON 6004
 ZL2CWA ARMSTRONG, C W, 74 TUKAPA STREET, WESTOWN, NEW
 PLYMOUTH
 ZL2CX STENNING, P D, PO BOX 4, UPPER MOUTERE, NELSON
 ZL2CY PALMER, N D, 7 BARRETT COURT, STOKE, NELSON
 ZL2CZ CLIBBORN, G H, 30 KENT TCE, TARADALE, NAPIER
 ZL2CZM ROONEY, J M, 48 RIMU ST, WAKANAE
 ZL2DA APPLETON, D, 19 FRANKLIN TCE, HAVELOCK NORTH
 ZL2DAA ANNETT, DAVID A, 111B ESKDALE ROAD, BIRKDALE,
 AUCKLAND
 ZL2DAN LEYLAND, D J, 20 Henry Street, Ebdentown, UPPER HUTT
 ZL2DAP LUXFORD, K B G, 26 KENNEDY GR, STOKES VALLEY,
 LOWER HUTT
 ZL2DAY MOTT, P W, PO BOX 36-502, NORTHCOTE, AUCKLAND
 1330
 ZL2DB BROWN, A D, 110 LEINSTER AVENUE, RAUMATI 6010
 ZL2DBA JORGENSEN, L H, 291 SOUTH RD, RD4, NEW PLYMOUTH
 ZL2DBC CHILDE, J, PO BOX 82-109, HIGHLAND PARK, AUCKLAND
 1730
 ZL2DBE PEART, C J, 7 CROMWELL ST, MURCHISON
 ZL2DBO O'DONNELL, J N, 39 LISMORE ST, NEW PLYMOUTH
 ZL2DBT MARSH, H A, 2/187 CARRINGTON ST, NEW PLYMOUTH
 ZL2DBX JAGO, J N, 156 PEMBROKE ROAD, STRATFORD,
 TARANAKI
 ZL2DC CHISHOLM, W P, 1 CAMELLIA COURT, PALMERSTON
 NORTH
 ZL2DCB BYRON, D C, 14 WOBURN PLACE, PALMERSTON NORTH
 ZL2DCS SCHOLES, D, 167 MILTON STREET, NELSON
 ZL2DCW WOODING, D, 132 SCOTT STREET, BLENHEIM
 ZL2DD SCOTT, D F, 68 CHATSWORTH RD, SILVERSTREAM
 ZL2DE JOHNSON, D H, F 1 / 92 ARTHUR STREET, BLENHEIM
 ZL2DEX MUIR, D N, 5 Edinburgh Street, LEVIN
 ZL2DF HAYTON, N M, 31 CAMERON STREET, NEW PLYMOUTH
 ZL2DG MCBETH, D O, 21B PORT VIEW CRESCENT, NEW
 PLYMOUTH
 ZL2DH WELSH, J W, 35 BEACH ROAD, RICHMOND, NELSON
 ZL2DI SHORTT, J H, 80 SAVAGE CRES, PALMERSTON NORTH
 ZL2DIZ TRATTLES, D L, PO BOX 57 194, MANA, PARAMATA
 ZL2DJ DICKSON, W J, 21 GRENVILLE ST, NEW PLYMOUTH
 ZL2DJA ANDERSON, D A D, NOSREDNA DYOLL, FACTORY ROAD
 RD 3, RIWAKA MOTUEKA
 ZL2DJB BALDWIN, D J, 8 CAMBRIDGE STREET, PATEA
 ZL2DJF FOX, D J, 112 NGAMOTU RD, NEW PLYMOUTH
 ZL2DK KEENAN, D S J, 13 RURU CRES, UPPER HUTT
 ZL2DLS NGUYEN HUU, T, 201 TUKAPA STREET, NEW PLYMOUTH
 ZL2DM CHRISTIAN, T C, 4 SNOWDEN AVE, PALMERSTON NORTH
 ZL2DN LUCAS, D C, C/O SOLANDER FISHERIES LTD, P O BOX
 5041, PORT NELSON
 ZL2DNS THORP, D, 246 MOUNTAIN ROAD, SENTRY HILL RD 3,
 NEW PLYMOUTH
 ZL2DO MCMILLAN, R H, 8 BROOKLANDS WAY, MARYBANK,
 NELSON 7001
 ZL2DOG ALLAN, A R, 18 ELMWOOD AVENUE, BLENHEIM
 ZL2DON CUTHBERT, D, 20A GUTHRIE STREET, LOWERHUTT
 ZL2DOW DOW, A J,
 ZL2DP PURTON, S D, 376 BOTANICAL RD, PALMERSTON NORTH
 ZL2DR REID, D, PO BOX 85, LEVIN
 ZL2DRF FARLEY, D, 119 JICKELL STREET, PALMERSTON NORTH
 ZL2DS HOROWHENUA BRANCH 16 NZART, C/- 24 PAEROA
 ROAD, RD 12, LEVIN
 ZL2DSW WILLIAMS, D S, 156 MAIN RD, WAINUIOMATA 6008
 ZL2DT CORDY, J G G, 50 STRATHMORE AVE, WELLINGTON
 ZL2DTM Morris, D T, 316/1 Bidden Rd, RD 5, Pokuru
 ZL2DU MILLANE, M L, 132 CAMPBELL ST, WELLINGTON
 ZL2DUS HENDERSON, K H, 30 VAUCLUSE AVE, PARAPARAUMU
 6010
 ZL2DVY HUNT, D, 403 COLLEGE ST, PALMERSTON NORTH
 ZL2DW WALKER, D J, BOX 2403, STORTFORD LODGE, HASTINGS
 ZL2DX HANNAGAN, C C, FRATERS ROAD, R.D.1,
 MARTINBOROUGH 5954
 ZL2DY PARSONS, A D, HUTT GABLES VILLA 9, 109A
 FERGUSSON DRIVE, UPPER HUTT
 ZL2DZ JANASZKIEWICZ, R, 26 FOSTER STREET, AVALON,
 LOWER HUTT 6009
 ZL2FA HOGAN, A V,
 ZL2FAB BURGESS, F A, 24 ISLAND RD, GISBORNE
 ZL2FAE STANNARD, S, 25 TOTARA CRESCENT, WOBURN, LOWER
 HUTT
 ZL2FAR MULLINS, M J, 41 MENIN ROAD, NAPIER
 ZL2FB HUNT, R, 9 ARROWFIELD DRIVE, PYES PA, TAURANGA
 ZL2FC COUTTS, C G, 12 PAIERAU ROAD, R.D.1, MASTERTON
 5901

ZL2FD	BUTEL, D, 39 MULBERRY ST, LOWER HUTT	ZL2HC	DOBSON, H M C,
ZL2FDH	DE HAIR, F, 29 TRURO ROAD, CAMBORNE, PORIRUA	ZL2HD	ANDREWS, J R, 66 KHANDALLAH RD, KHANDALLAH, WELLINGTON 6004
ZL2FE	FALKNER, B A, 49 KARINA TCE, PALMERSTON NORTH	ZL2HE	LAW, A E, P O BOX 368, DANNEVIRKE 5491
ZL2FF	HAYWARD, R S, 17 YORK STREET, MOTUEKA	ZL2HEM	HUMPHREYS, E M, 16 FERGUSON STREET, STOKE, NELSON
ZL2FFR	BEVAN, B, 151 EASTERN HUTT ROAD, POMARE, LOWER HUTT WELLINGTON	ZL2HF	LEWTON, P E, 11 JOHNSTON GROVE, LOWER HUTT
ZL2FG	TORRIE, A W, 25 TARANAKI STREET, ST JOHNS HILL, WANGANUI	ZL2HG	HALLIGAN, G, 35 SAINT JOHNS AVENUE, PALMERSTON NORTH
ZL2FH	GARTH, P E, 1001 WHAREKOPAE RD, R D 2, GISBORNE	ZL2HGR	DIXON, M T R,
ZL2FJ	WITHEY, D G, 16 KENMORE ST, WELLINGTON	ZL2HH	HARRIS, H B, RD 4, MT ADDE, BLENHEIM
ZL2FM	BURR, E J, 87 STANLEY RD, GISBORNE	ZL2HI	DILLON, J P, 7 WILFORD ST, LOWER HUTT
ZL2FN	WILLIAMS, E F, 31D LIFFITON ST, WANGANUI	ZL2HIS	SUTHERLAND, N, 73 HALIFAX STREET, NELSON
ZL2FO	HAWTREE, V, 50 FOX RD, WANGANUI	ZL2HJ	GARRETT, W E A, VILLA 6, MOLLY RYAN RETIREMENT VILLAGE, 269 MARJORIE ROAD, NEW PLYMOUTH
ZL2FOR	O'RORKE, F A, 50 MATAI ROAD, RAUMATI SOUTH	ZL2HJS	Sims, Hayden, 16 KIMBEREFLY GROVE, PALMERSTON NORTH
ZL2FOX	CLAYDON, A C, 10A RANGITAHU STREET, OTOROHANGA	ZL2HK	WAKELY, J R, 109 MT VIEW RD, WANGANUI
ZL2FP	GEORGE, S B, 7 TE WHENA PLACE, WAITARA	ZL2HL	BARRY, N W, 20 GLADSTONE ST, HAWERA
ZL2FQ	BURGOYNE, T A, 3 SHAKESPEARE WALK, NELSON	ZL2HM	MOORE, PETER R, 190 PLATEAU ROAD, UPPER HUTT
ZL2FR	DYETT, N D, 71 COUTTS ST, WELLINGTON	ZL2HO	WARNER, B A, 23 CITY VIEW GROVE, HARBOUR VIEW, LOWER HUTT
ZL2FRG	CLARKE, J O, 17 LONGFELLOW STREET, TRENTHAM, UPPER HUTT 6007	ZL2HP	WATKINS, A L, 1/26 OUTRAM GROVE, KELSON, LOWER HUTT 6009
ZL2FS	PRIEST, J R, 26 WOOLCOMBE TCE, NEW PLYMOUTH	ZL2HPK	KEMP, H P, 36 ABERFELDY STREET, PORIRUA
ZL2FT	WALLACE, J A, 16 OXFORD ROAD, WANGANUI	ZL2HR	BEATTIE, P, 43 GORDON ST, LOWER HUTT
ZL2FV	RICHTER, B E, 706D PIONEER HIGHWAY, PALMERSTON NORTH	ZL2HRL	LIGHTWOOD, H R, 137A HOSPITAL ROAD, BLENHEIM 7301
ZL2FW	HARBIGE, L W, 1B ROMNEY SQUARE, TAWA, WELLINGTON	ZL2HS	ROTTMAYER, T, 34A ADAMS LANE, BLENHEIM
ZL2FWE	SWARBRICK, A, 2 HUNTER AVENUE, RICHMOND, NELSON	ZL2HT	HOOKER, D D, 1A REEVE DRIVE, HAVELOCK NORTH
ZL2FWF	FUCHS, F W, 9 CHESTNUT GROVE, MAUNGARAKI, LOWER HUTT	ZL2HU	HOLDOM, K A, PO BOX 7, CLYDE 9180
ZL2FX	BILLINGTON, S G, 28 HERBERT AVE, PALMERSTON NORTH	ZL2HV	NZART HUTT VALLEY BRANCH INC, PO BOX 30-519, LOWER HUTT
ZL2FY	HARKETT, R J, 125 HELSTON RD, JOHNSONVILLE, WELLINGTON 6004	ZL2HW	MARSH, N O,
ZL2FZ	REEVE, R P, 5 EGINTON STREET, MOTUEKA	ZL2HWA	HAWERA AMATEUR RADIO CLUB, 126 FAIRFIELD RD, HAWERA 4800
ZL2GA	JOHNSON, D F T, 7 PINEHAVEN ROAD, UPPER HUTT	ZL2HY	DEVENPORT, B, 1782 WHARERATA RD, R D 2, GISBORNE
ZL2GAF	FLETCHER, G, 190 BREAKER BAY ROAD, SEATOUN, WELLINGTON	ZL2HZ	MACKIE, A J, 8 TARATA STREET, STOKE, NELSON
ZL2GAZ	JAMES, G B, 7 JAMES FOLLEY AVE, PIRIMAI, NAPIER	ZL2IA	CAMERON, R W, 34 BUDGE STREET, BLENHEIM
ZL2GB	LITTLE, Allen J, 7 EARL ST, LEVIN	ZL2IAN	THOMPSON, I, 8 DAMPIER AVE, PALMERSTON NORTH
ZL2GC	RUANE, M, PO BOX 31-280, LOWER HUTT	ZL2IAS	SWAIN, I A, Po Box 198, CARTERTON, WAIRARAPA
ZL2GCH	HARDGOOD, G C,	ZL2IB	TARARUA DISTRICT RADIO CLUB, C/0 ROSEWOOD VILLA (ATTN. S COOPER), 24 YORK STREET, HILLCREST, DANNEVIRKE 5491
ZL2GD	DANIEL, A G,	ZL2IC	HOLLAND, D J, 16 MAIRE STREET, TAHUNANUI, NELSON
ZL2GE	EVANS, G R, 30 MARGARET ROAD, RAUMATI BEACH 6010	ZL2ICE	HANLON, I E, 17 MT VIEW PLACE, NEW PLYMOUTH
ZL2GEM	CLARKE, G E, 57 KAURI STREET, MIRAMAR, WELLINGTON 6003	ZL2ID	APPLETON, C, 16 MERIDIAN GROVE, KELVIN GROVE, PALMERSTON NORTH
ZL2GEO	GIRLING, G F, 4 OLDFIELD PLACE, BULLS	ZL2IDM	MCKERCHER, I D, 39A MILFORD STREET, WITHERLEA, BLENHEIM 7301
ZL2GER	WILLEMSSEN, G A, 113 JELICOE STREET, R D 1, MARTINBOROUGH 5954	ZL2IFA	ANDREWS, I F, 43A AUGUST STREET, STOKES VALLEY, UPPER HUTT
ZL2GF	WATERS, R J, 32 TAFT ST, WELLINGTON	ZL2IFB	HINSON, G, 27 KAIKOURA STREET, MAUPUIA, WELLINGTON
ZL2GG	WATERS, R J, 32 TAFT ST, WELLINGTON	ZL2IH	HAYTON, I D,
ZL2GH	HUBERTS, G H, 2 KAURI CLOSE, 10 WELCOME BAY ROAD, TARANGA	ZL2IHW	WHITE, I H, 5 HILLSIDE CRES, NEW PLYMOUTH
ZL2GI	GILBERT, W M, 146 LIVERTON ROAD, BELMONT, LOWER HUTT 6009	ZL2II	CALDWELL, D G, 88 JUBILEE RD, WELLINGTON
ZL2GK	MOTUEKA BRANCH NZART, PO BOX 218, MOTUEKA	ZL2IJ	EASTWOOD, R J, 63 SHEPHERD RD, TAupo
ZL2GKK	Kulma, George Kazimir, 167 Vivian Street, New Plymouth	ZL2IK	MULHARE, P J, PIPIWAI RD, R D 6, WHANGAREI 0121
ZL2GL	LAWN, G, 3 KIMIORA CLOSE, FAIRVIEW DOWNS, HAMILTON	ZL2IM	BROWN, P W, 20 NEVADA DRIVE, NEW PLYMOUTH
ZL2GM	MCLEAN, G M, 107 RICHMOND ST, PETONE	ZL2IMM	MCLACHLAN, I M, 15 TOLERTON AVE, GISBORNE 3801
ZL2GMP	POLLOCK, G M,	ZL2IN	CRUMPTON, R E, 27 KAPITI CRES, TITahi BAY 6006
ZL2GN	MALABAR, R S, 9 MESSENGER TCE, OAKURA	ZL2IO	COLLINS, E S, RD 1, MAIN ROAD, WAKAPUAKA, NELSON
ZL2GO	BLACKLEY, L C, 26 KAITAWA CRES, PARAPARAUMU 6450	ZL2IOX	HOLDER, S M, 3 TIRIMOANA PLACE, TE AWANGA 4250
ZL2GP	COLE, G P, 58 WOODHOUSE AVE, KARORI, WELLINGTON	ZL2IP	BARNES, E J, 790 DURHAM RD, R D 8, INGLEWOOD
ZL2GQ	TOPLISS, P G, 7 VICTORIA HEIGHTS, NELSON	ZL2IQ	WILLS, M J, PO BOX 31-227, LOWER HUTT
ZL2GRE	GREENWOOD, P, WILLOWPARK DRIVE, RD11, MASTERTON	ZL2IR	CUTTRISS, N A, 2 MELDRUM ST, NAENAE, LOWER HUTT
ZL2GRI	CRONE, W G, 298B KAHUTIA ST, GISBORNE	ZL2IS	WERE, G, 180 REGAN ST, STRATFORD
ZL2GRM	TRIM, G, 79 NAPIER TCE, NAPIER	ZL2IT	LILLEY, E C C, 1B HARVEY RD, NAPIER
ZL2GRZ	ZAMBON, G R, 1A JOSEPH GROVE, UPPER HUTT	ZL2IV	GORMAN, D D, C/- D BEBAN, 9 TRINITY AVENUE, LOWER HUTT 6009
ZL2GS	LEGG, J B, 30 LYTTON STREET, FEILDING 5000	ZL2IW	CARTER, R S, 24 CLYDE STREET, RENWICK
ZL2GSW	ADLAM, R A, 174 BRIDGE ST, BULLS 5452	ZL2IX	PARKER, C H, 24 TIRAUMEA RD, PAHIATUA
ZL2GSX	EYRE, W B M, 174 BRIDGE STREET, BULLS	ZL2IY	GORMAN, T D, 51 TAKAPUA ROAD, MANAKAU, LEVIN
ZL2GT	NAPIER AMATEUR RADIO CLUB INC, 54A AUCKLAND ROAD, GREENMEADOWS, NAPIER	ZL2IZ	BARTLETT, J R, PO BOX 2209, GISBORNE
ZL2GTB	BLEWETT, Gordon, 1315 HASTINGS RD, RD 21, STRATFORD 4700	ZL2JA	WANGANUI BRANCH NZART, C/O 1 CAVERSHAM RD, WANGANUI
ZL2GV	HUTTON, J D, 1275 PAPAMOA BEACH ROAD, PAPAMOA, TAURANGA 3003	ZL2JAD	DUNLOP, J A, 105 KELBURN PDE, KELBURN, WELLINGTON
ZL2GVA	VAN ANTWERPEN, G, 137 VICKERMAN STREET, GROVETOWN, BLENHEIM	ZL2JB	RAWIRI, B R M, 165 TAYLOR STREET, BLOCKHOUSE BAY, AUCKLAND
ZL2GWD	WILSON, GRAEME, 629 STATE HIGHWAY 60, RD 2 PURAMAHOI, TAKAKA	ZL2JBR	BRADER, J M, 22A MAWSON ST, LOWER HUTT
ZL2GWL	LANE, G W, 75 BEAUMARIS CRES, ASCOT PARK, PORIRUA	ZL2JBS	Stevenson, Jason, 13 Armour Place, Marewa, Napier
ZL2GY	TAILLIE, L I, 8 FINDLAY ST, MANGAWHAI 0583	ZL2JC	CLELAND, W J, 574C ARANUI ROAD, NO 5 RD, KAIRANGA, PALMERSTON NORTH
ZL2HA	GENTRY, L J, 8 CHUDLEIGH GROVE, WELLINGTON	ZL2JD	DUNCAN, J R, 7 CROWN HILL, TITAH BAY
ZL2HB	STEPHENS, D A, 2 RIVERBEND RD, NAPIER	ZL2JDB	BARNHILL, J D, PO BOX 27-239, WELLINGTON
ZL2HBC	CHANDLER, H B, 34 KEITH ST, PALMERSTON NORTH	ZL2JDM	MANUEL, J D, 49 BATTERY RD, NAPIER

ZL2JDW	Craig, Jason, 17 Mouatt St, Waitara, New Plymouth	ZL2KWI	MANZE, J A, F10/4 DERBY ST, MT VICTORIA, WELLINGTON
ZL2JE	MORISON, R D, 40 OREGON DRIVE, TAUPÓ 2730	ZL2KX	JOHNSON, J F C, 15 FIELD ST, UPPER HUTT
ZL2JEL	LOVE, J E, 20 BOMBAY ST, AARAMAHO, WANGANUI	ZL2KZ	KINGSTON, G, 53 TANNADYCE ST, WELLINGTON
ZL2JEN	MacDonald, J, 39 Aniseed Grove, Timbereka, Upper Hutt	ZL2LA	VIVIAN, B A, 399 MANGOREI RD, NEW PLYMOUTH
ZL2JF	GREATBANKS, J, 907 HARDING RD, HASTINGS	ZL2LAB	VIDULICH, M J, 219 AUCKLAND RD, MISSION VIEW, NAPIER
ZL2JG	ANDERSON, G A, 20 LEYBOURNE AVENUE, WAIKANAE 6010	ZL2LAW	WINTON, L J, 8 ESK STREET, ROSLYN, PALMERSTON NORTH
ZL2JH	NICOL, D S, 93 HEWITTS RD, RD 4, PALMERSTON NORTH	ZL2LB	MILNER, M O, 21 RANGATIRA RD, TAWA
ZL2JI	THOMPSON, J P, 1 HEALEY PLACE, GISBORNE	ZL2LC	CHAPMAN, M A, 124B Edgecumbe Road, TAURANGA
ZL2JJ	BYAM, S P, RD 2, WAVERLEY	ZL2LD	MUNN, P M, PO BOX 446, MASTERTON 5915
ZL2JK	BUTLER, D B, TAVINOR ROAD, OTAIKA VALLEY, RD10, WHANGAREI	ZL2LDX	LAUDER, C D, 115 MAUNGARAKI ROAD, KOROKORO, LOWER HUTT
ZL2JKP	LEACH, FOSS, 2324 QUEEN CHARLOTTE DRIVE, NGEKUTA BAY, RD 1 PICTON	ZL2LE	WHITE, L M, PO BOX 1119, HASTINGS
ZL2JKS	SORENSEN, J K, 57 HETA RD, NEW PLYMOUTH	ZL2LF	DINGLEY, P D, 8 VOGEL PLACE, MAREWA, NAPIER
ZL2JKY	GOULD, A J, 9 NORMAN BENSEMAN PLACE, TAKAKA	ZL2LG	DUNNING, S P, 17 KANPUR ROAD, BROADMEADOWS, WELLINGTON 6004
ZL2JL	SWAN, K C, 40 SMITH STREET, WAVERLEY 5182, WANGANUI	ZL2LGB	BENNETT, L G, 89 HUATOKI STREET, NEW PLYMOUTH
ZL2JLB	BRADOCK, J L, 31 PIER C, MANA MARINA, MANA	ZL2LH	WAKEFIELD, M J, 5 GILLESPIE STREET, TAITA, LOWER HUTT
ZL2JM	MORRISON, J F, 27 MULGRAVE ST, ASHHURST	ZL2LHW	UPPER HUTT BRANCH NZART INC, C/- 35 MATAI ROAD, RAUMATI SOUTH 6010
ZL2JMA	HULSE, D J, 86A BALRUDRY ST, AVONHEAD, CHRISTCHURCH	ZL2LI	INKPEN, L W,
ZL2JMG	GIBSON, J M, C/O JOHN MCCAFFERTY 19 WALTER ROAD, LOWRY BAY, EASTBOURNE	ZL2LIN	ROBERTS, L S, 188 NIKAU ST, HASTINGS
ZL2JMN	NEIL, JUDY, P O BOX 9, PICTON	ZL2LJ	O'GRADY, P L, 18 BROOKVALE VILLAGE, PARAPARAUMU
ZL2JN	HODDER, A A, 394 SOMME PARADE, WANGANUI	ZL2LJR	ROBERTSON, L J, 15 ST JOHNS AVE, PALMERSTON NORTH
ZL2JO	LAMBERT, N H, 7 SUNBRAE DRIVE, SILVERSTREAM	ZL2LK	TAYLOR, T J A, 37 RIVERSDALE DRIVE, NEW PLYMOUTH
ZL2JOE	ABRAHAMS, J D, 1 WILLIS ST, MARTON	ZL2LKS	SHOTTON, L K, 58A GERALDINE CRES, PALMERSTON NORTH
ZL2JON	ROBINSON, J, 9 WATSON ST, BULLS	ZL2LL	SUTHERLAND, C I, 28 VENICE STREET, MARTINBOROUGH 5954
ZL2JOS	DAMES, J H,	ZL2LM	MERRICK, L F, 22A BLEDISLOE AVENUE, STOKE, NELSON
ZL2JP	SARTEN, C J, 212 CORONATION AVE, NEW PLYMOUTH	ZL2LMJ	JOUBERT, L M, P O BOX 31431, MILFORD, AUCKLAND
ZL2JPL	WATKINS, A S R, PO BOX 274, WELLINGTON 6001	ZL2LN	DAVENPORT, N B, 4 WAKATU PLACE, MOTUEKA
ZL2JPW	WILLIAMS, J P, 25A IKITARA RD, WANGANUI	ZL2LNX	Lynch, D J W, 2 Vivian St, Masterton
ZL2JRW	ROBERTSON, J, 100 CLUNY RD, PLIMMERTON	ZL2LO	KERR, C M, 10 SMART TCE, WANGANUI
ZL2JS	SMART, J, 2 TOMBANE LANE, PAPAKOWHAI, PORIRUA	ZL2LQ	COOTE, D, 19 CORLETT RD, PLIMMERTON
ZL2JSB	BARNES, S, 31 BROOKLANDS ROAD, ATAWHAI, NELSON	ZL2LR	REID, L R, 19A ROSLYN RD, NAPIER
ZL2JSW	Wooding, Joshua, 132 Scott Street, Blenheim	ZL2LS	SCOTT, L A, 74 DODSON VALLEY ROAD, ATAWHAI, NELSON
ZL2JT	MACKIE, J B, 8 TARATA STREET, STOKE, NELSON	ZL2LSD	CURRAN, B, PO BOX 40, PUNGAREHU
ZL2JTH	THORNTON, J P, 30 STAFFORD STREET, WANGANUI	ZL2LT	STEWART, J E, 11A HARTFORD CRES, TOTARA PARK, UPPER HUTT 6007
ZL2JUE	Schulz, Jürgen, 32a Bedford Street, Wilton, Wellington	ZL2LTC	Carr, Lawrence, 39 Fraser Drive, Feilding
ZL2JW	TEBBUTT, J W,	ZL2LUK	WILTON, L J, 88 CORNWALL ST, MASTERTON
ZL2JX	HODGSON, E R, 20 COLOMBO ST, PALMERSTON NORTH	ZL2LV	RYAN, J F, 44 SYLVAN AVENUE, WAIKANAE 6010
ZL2JY	VINCENT, G C, 124 UNION STREET, FOXTON	ZL2LX	MOTION, R, 2A HAZEL TCE, TAURANGA
ZL2JZ	JURY, E G, PONATAHI RD, RD 2, CARTERTON	ZL2LY	LAWSON, C, 114 HOSPITAL ROAD, BLENHEIM
ZL2KA	COLEY, D, 8 APOLLO PARADE, MILSON, PALMERSTON NORTH	ZL2LYN	MCQUEEN, LYNDON, 23 TAWA STREET, MASTERTON
ZL2KAS	SPINKS, K,	ZL2LZ	RUMSEY, J R, 51 FREYBERG ST, WELLINGTON
ZL2KB	NZART KĀPITI BRANCH INC, C/O G R Evans Secretary Kāpiti Branch 69 NZART, 30, Margaret Road, Raumatī Beach	ZL2MA	HUGHES, D C, 1745 MAIN ROAD, MAXWELL, RD4, WANGANUI 5021
ZL2KBK	HEARNE, W R, 56 ABRAHAM HEIGHTS, NELSON	ZL2MAB	WILSON, TANYA, P O BOX 2409, STORTFORD LODGE, HASTINGS
ZL2KC	BISSET, K T, 24 GREY ST, MARTON	ZL2MAC	MCCULLOCH, G L, KOROMIKO, RD 3, BLENHEIM
ZL2KD	KEEGAN, R J, 11 MALAGHAN GROVE, WELLINGTON	ZL2MAD	DAWKINS, M, 3 RADFORD WAY, HILLSBOROUGH, AUCKLAND
ZL2KEL	BIRCH, F K, 206 PUHI PUHI ROAD, RD 2, HIKURANGI, NORTHLAND	ZL2MAT	MAWSTON, M, 11 CHURCHILL CRESCENT, GONVILLE, WANGANUI
ZL2KEN	DEWAR, K D, 7 RICHARDSON AVE, GISBORNE	ZL2MAW	Wiggins, M A, 23 Slacks Road, Riverdale, Palmerston North
ZL2KF	FELLOWS, S K, 2 DOWLING GROVE, UPPER HUTT	ZL2MAX	WHEATLEY, M J, 150 WYNDHAM STREET, ASHHURST 5451
ZL2KPL	LANTSURY, KEITH, 1 AWARUA CRESCENT, HAVELOCK NORTH, HASTINGS	ZL2MB	MONTGOMERIE, J C, 11 GARDINER PLACE, HAVELOCK NORTH
ZL2KG	JEPSON, S J,	ZL2MBF	FRANCIS, B, 31 CLEMOW RD, NEW PLYMOUTH
ZL2KH	SYMON, D R, 25 ANNANDALE ST, NEW PLYMOUTH	ZL2MBS	BURRELL-SMITH, M L C,
ZL2KI	IRELAND, K J, 2 OSLO PLACE, LEVIN	ZL2MC	COOK, M J, 58 HEWITTS RD, WOODEND 8255
ZL2KID	CHANDLER, A J M, 4 TYNE STREET, ROSLYN, PALMERSTON NORTH	ZL2MCG	GORE, M C, 1 HULME ST, PALMERSTON NORTH
ZL2KJ	MCQUEEN, K J, DUNCAN STREET, RD 9 TAUWERU, MASTERTON	ZL2MD	WHITTINGTON, A, 46 HAYDON STREET, ROSLYN, PALMERSTON NORTH
ZL2KJG	Gregory, K, 11 Sunset Terrace, Waikanae	ZL2MDX	BURGE, T, 695 SCARBOROUGH RD, PAHIATUA
ZL2KK	KERR, R F, 51 Rayner Road, Huntly	ZL2ME	SARTEN, D M, 212 CORONATION AVE, NEW PLYMOUTH
ZL2KKA	ANDERSON, K, 31 LEVANT ST, PŌRIRUA	ZL2MFP	PLEWINSKI, M E, 3 BYRON STREET, UPPER HUTT
ZL2KL	Brucesmith, Alexander, 123 Rakau Road, Hataitai, Wellington	ZL2MF	FRENCH, M J, KINGFISHER LODGE, 122A WORK ROAD, R.D. 2, KATIKATI 3063
ZL2KM	MOORE, K J, P O BOX 300 155, ALBANY, NORTH SHORE 1330	ZL2MG	WAIMARINO BRANCH NZART, 5 MAIN RD, WAIOURU
ZL2KN	TRAINOR, A P T, 118 DIMOCK ST, TITAIH BAY	ZL2MGA	HILL, M, 25A WOODMANCOTE RD, KHANDALLAH, WELLINGTON 6004
ZL2KO	NZART MANAWATU BRANCH INC, PO BOX 1718, PALMERSTON NORTH	ZL2MGD	DUNCAN, M, 67 GUILDFORD DRIVE, PARAPARAUMU 6010, KĀPITI COAST
ZL2KOT	KENDRICK, K R, 33 MANU CRES, NEW PLYMOUTH	ZL2MGW	Wooding, Maxwell, 132 Scott Street, Redwood Town, Blenheim
ZL2KP	PRIOR, R T, PO BOX 1169, BLENHEIM	ZL2MH	NEAL, E W, 2A TRINITY PLACE, PARAPARAUMU BEACH, PARAPARAUMU
ZL2KQ	LARSEN, K, RD 44, URENUI	ZL2MHC	CAIRNS, M H, 4 TERRACE ST, WANGANUI
ZL2KR	ALLEN, J G, 95 MANUKA ST, WANGANUI	ZL2MI	MCCULLOCH, J G, 81 KEMP ST, WELLINGTON
ZL2KS	NZART MARLBOROUGH BRANCH 22 INC, PO BOX 432, BLENHEIM	ZL2MIC	CAMPKIN, M I, 25 PARATUTU ST, NEW PLYMOUTH
ZL2KT	BROOKER, R G, VILLA 39, SOMMERSET VILLAGE, TE MATA ROAD, HAVELOCK NORTH, HASTINGS		
ZL2KUZ	SPINDOR, B, 105 ORANGI KOUAPAPA RD, NORTHLAND, WELLINGTON 6005		
ZL2KV	MARTIN, C J, MOUNTAIN RD, RD 10, INGLEWOOD		
ZL2KW	BETTERIDGE, O J, 2/64 GLOUCESTER STREET, NAPIER		

ZL2MJ	MCCOLLOCH, JOSHUA, 6 GIFFORDS CREEK LANE, RAPAURA, RD3	ZL2OHM	LITTLE, Allen J, 7 EARL ST, LEVIN
ZL2MJL	LAWN, M J, 2 KIWI PLACE, TAWA, WELLINGTON 6006	ZL2OL	SIGGLEKOW, R W, 9 RAUKAWA ST, STOKES VALLEY
ZL2MK	KIRKNESS, M A, 54 RIMU ST, WANGANUI	ZL2OM	MANNING, S C, 87A WAIMEA ST, NEW PLYMOUTH
ZL2MLS	SAVAGE, M L, 22 FIRTH TCE, KARORI, WELLINGTON	ZL2OPB	BARRIBALL, O P, 23A PORT VIEW CRESCENT, MOTUROA, NEW PLYMOUTH
ZL2MM	DWYER, M B, PO BOX 7313, WELLINGTON SOUTH	ZL2OR	OSBORNE, D O, 9 GREENOCK PLACE, PALMERSTON NORTH
ZL2MN	MEYER, L H, 23 CANTERBURY ST, NAPIER	ZL2OV	LEE, W C, 11 HENDERSON ST, WELLINGTON
ZL2MO	BROWN, N L, 72 KAPANUI RD, WAIKANAE	ZL2OX	VAN DER HEYDEN, N, 99 OXFORD RD, OKATO, TARANAKI
ZL2MOT	MOORCROFT, T K, 14 PINE ST, GISBORNE	ZL2OY	BLACKWOOD, R L, 245 MAIN ROAD, TAWA, WELLINGTON 6006
ZL2MP	COLLEY, M J, 23 CHURCHILL AVENUE, RICHMOND	ZL2OZ	JACOBSEN, W J, 10 EMPIRE ST, DANNEVIRKE
ZL2MPW	WALKER, M P, 174 WATERSHED ROAD, RD10, HIWINUI, PALMERSTON NORTH	ZL2PA	MEEK, P, F3/68A GUPPY RD, GREENMEADOWS, NAPIER
ZL2MQ	CROOK, D J, 14A HARVEY ROAD, NAPIER	ZL2PB	MCLAREN, B B, 14 QUEBEC ROAD, NELSON
ZL2MQH	PACKER, B A, 10 PATNA STREET, NGAIO, WELLINGTON	ZL2PC	COWLEY, P N, 27B MANA ESPLANADE, MANA, WELLINGTON
ZL2MR	RYAN, M D,	ZL2PCG	GOULTER, P C,
ZL2MRE	POTTS, M R E, 4 WAIWERA PLACE, NEW PLYMOUTH	ZL2PD	WOODFIELD, A O J, 24 BEVERLEY ST, ST ALBANS, CHRISTCHURCH 8001
ZL2MS	CHAMBERS, P, 6 ELIZABETH PLACE, CLIVE, HAWKE'S BAY	ZL2PDJ	DE JOUX, P E I, 33 DOMINICA CRES, GRENADA VILLAGE, WELLINGTON
ZL2MSW	WOGAN, M,	ZL2PE	GROVE, P E, 244 TAITA DRIVE, AVALON, LOWER HUTT
ZL2MT	RAILTON, G H, 15 CHUDLEIGH GROVE, CHURTON PARK, WELLINGTON	ZL2PET	PETRI, A, 45 BEAVEN STREET, MARTON
ZL2MTH	HODGKINSON, M T, 19 THIRLMERE STREET, WAINUIOMATA, WELLINGTON 6008	ZL2PF	FARRELL, P J,
ZL2MU	JUPP, A L, 1 PROTEA PLACE, BELL BLOCK, NEW PLYMOUTH	ZL2PFH	HARRIS, P F, 19 CAMPBELL ST, FEILDING 5600
ZL2MUD	BRETHERTON, P D, 5 TACOMA DRIVE, TOTARA PARK, UPPER HUTT	ZL2PG	LAIRD, A K, 24 PATRICK ST, PETONE
ZL2MUF	PAWSON, S R, PO BOX 186, MASTERTON	ZL2PGJ	TSURUTA, K, 24 KINGSLEY STREET, GISBORNE
ZL2MUI	BADRICK, R, 3 SORRENTO WAY, SILVERSTREAM, UPPER HUTT	ZL2PH	MARSH, P, 40 BRANCH RD, HIGHLANDS PARK, NEW PLYMOUTH
ZL2MV	BRENCHLEY, G C, 98 MOORAY AVENUE, BISHOPDALE, CHRISTCHURCH	ZL2PI	GAUDIN, S L, 18 TRAFALGAR ST, NEW PLYMOUTH
ZL2MWH	HEARNE, M V, 56 ABRAHAM HEIGHTS, NELSON	ZL2PIH	KIM, D, 37 DUBLIN STREET, WANGANUI
ZL2MW	RUDDY, M W, 23B WALBROOK ROAD, MANLY, WHANGAPARAOA	ZL2PIP	HARRIS, P A, MT ADDE, R D 4, BLENHEIM 7321
ZL2MX	LAWN, M E, 60B GOVETT AVE, NEW PLYMOUTH	ZL2PJ	SPELLMAN, P J, 36 RECORD ST, NEW PLYMOUTH
ZL2MYT	SUTTON, A C, 444 BACK ORMOND RD, R D 1, GISBORNE	ZL2PKC	CREODY, P,
ZL2MZ	POOL, B L, 9 REMBRANDT AVE, LINDEN	ZL2PKJ	BEAUMONT, M, 2 RAWHITI RD, PUKERUA BAY, PORIRUA
ZL2NA	FAUCHELLE, J B, KINA BEACH, RD 1, UPPER MOUTERE	ZL2PL	JOHNSTON, P K, 3/126 FOURTEENTH AVE, TAURANGA
ZL2NAA	HOOPER, D R, 74/5 WOOD STREET, PALMERSTON NORTH	ZL2PM	YOUNG, C T, 3A PRINCETON RD, RAUMATI BEACH 6450
ZL2NAK	KNAPTON, N A, 16 GRANT STREET, HAVELOCK NORTH, HAWKES BAY	ZL2PMQ	APPLEYARD, B H, 13 MOLE ST, GREYTOWN
ZL2NAP	PUKLOWSKI, N A, 127 NORTH ST, ASHHURST	ZL2PN	APPLEYARD, 28 CROMPTON ROAD, MASSEY, WAITAKERE 1008
ZL2NBR	JAMIESON, A D, 2 WAIPUNA STREET, BLENHEIM	ZL2POS	NIXON, P A, 194 FRANKLEY RD, FRANKLEIGH PARK, NEW PLYMOUTH
ZL2NC	DUGAN, R F, 20 KURATAWHITI STREET, GREYTOWN 5953	ZL2PP	PURCELL, C R,
ZL2ND	FOSTER, N, 803 FRANCIS HICKS AVE, ST LEONARDS, HASTINGS	ZL2PP	JACK, P F, 3/43 Templemore Drive, Richmond, Nelson
ZL2NE	DOUGLASS, W S, 58 HALDEN CRESCENT, SPRUCE GROVE, ALBERTA T7X 2V6	ZL2PQ	SAYER, L A, 49B PEACH RD, GLENFIELD
ZL2NER	ROBSON, N E, 115 NAYLAND ROAD, STOKE, NELSON	ZL2PRO	ORSBORN, P, 325 UPPER PITONE ROAD, R D 4, NEW PLYMOUTH
ZL2NF	FRAZER, G C, 14 HINTON RD, TARADALE, NAPIER	ZL2PRS	SIMMONS, P R, P O BOX 5034, SPRINGLANDS, BLENHEIM
ZL2NG	AKED, M S, 6 SOMERSBY COURT, MIDLANDS, PARAPARAUMU 6010	ZL2PS	Stade, John Frederick, 322 High St, Motueka
ZL2NH	BAYLY, R B, 91 LYTTON RD, GISBORNE	ZL2PT	INGLEWOOD BRANCH 19 NZART, C- EMO, 45 ROBE STREET, NEW PLYMOUTH
ZL2NI	DUMBLETON, G W, 4 STORMONT PLACE, KINGSTON, WELLINGTON 6002	ZL2PTR	RIPLEY, P, 79B NGAIO RD, WAIKANAE
ZL2NJ	TARRANT, P E, PO BOX 55, WANGANUI	ZL2PU	PYEE, J T, 63 THACKERAY STREET, UPPER HUTT
ZL2NK	KATO, N, 16 Kimberley Grove, Highbury, Palmerston North	ZL2PV	MOLONY, M, 66 LONGFELLOW ST, UPPER HUTT
ZL2NL	NAVA, L A, P O BOX 247, KAIKOHE	ZL2PX	TAYLOR, M F W, 25B TAYLOR AVENUE, PAEROA, WAIKATO
ZL2NM	STEWART, H A S, 41 TAUTAHANGA RD, TURANGI	ZL2QA	KERMEEN, L V, 8 PONY LANE, SPREYDON, CHRISTCHURCH
ZL2NN	PYE, J C, 63 THACKERAY STREET, UPPER HUTT	ZL2QB	WENZEL, K D, RD 1, UPPER MOUTERE
ZL2NO	GRACE, K E, 9 TE ARA RD, PUKERUA BAY	ZL2QF	NZART PATEA BRANCH INC, PO BOX 156, HAWERA
ZL2NP	SMITH, F J A, 21 OTATARA RD, TARADALE, NAPIER	ZL2QG	BRUNTON, W R, 98 HOSPITAL ROAD, BLENHEIM
ZL2NQ	EVAROA, D T, APPLEBY RD RD 1, DRURY	ZL2QH	WELLINGTON AMATEUR RADIO CLUB INC, NZ ASSOCIATION OF RADIO TRANSMITTERS, P O BOX 40525, UPPER HUTT
ZL2NR	RUBERY, T F, 3 MCDONALD PLACE, MARTON	ZL2QK	KENNY, E J, 14 WILDISH COURT, KAITI, GISBORNE
ZL2NS	DOUCHE, W P, 142A MAIN RD NORTH, WAIKANAE 6454	ZL2QM	BURRY, J P P, 908 CAROLINE RD, HASTINGS 4201
ZL2NT	DOUCHE, 35 JICKELL STREET, PALMERSTON NORTH	ZL2QN	BURRELL, G A,
ZL2NV	JOHNSTON, A F, UNIT 9, 357 QUEEN STREET, RICHMOND	ZL2QP	MCNEIL, W G, 86 DOMETT ST, OPUNAKE
ZL2NW	SWARBRICK, W, 2 HUNTER AVENUE, RICHMOND, NELSON	ZL2QQ	COOK, S A, AWAKINO RD, RD 1, TE KUITI
ZL2NX	KIWI CONTEST GROUP, C/O MR TJ HOGAN, PO BOX 39-166, WELLINGTON MAIL CENTRE, WELLINGTON	ZL2QR	ABEL, A J, 20 RANFURLY RD, FEILDING
ZL2NY	RAMSAY, JANETTE, 114 AUPAKI ROAD, RD11, HASTINGS	ZL2QT	HANNAGAN, C A, FRATERS ROAD, R D 1, MARTINBOROUGH 5954
ZL2NZ	MILNER, G L, 21 RANGATIRA RD, TAWA	ZL2QX	ROBINSON, D M, PO BOX 6147, ROTORUA
ZL2NZL	WOOD, L R L, 118 BROWNE ST, WAITARA	ZL2QY	MCLEAN, P A, C/O NZMCA MAIL DROP, P O BOX 72 147 PAPAKURA, AUCKLAND
ZL2OA	WAIRARAPA AMATEUR RADIO CLUB INC, PO BOX 860, MASTERTON	ZL2QZ	WRIGHT, B E,
ZL2OAK	KEMSLEY, T R, 6 DONNELLY STREET, OAKURA 4650	ZL2RA	MANTELL, R A, 33 KAHU ROAD, PAREMATA, PORIRUA
ZL2OALH	WAIRARAPA AMATEUR RADIO CLUB INC, PO BOX 860, MASTERTON	ZL2RAE	CHRISTIAN, R K, 4 SNOWDEN AVENUE, PALMERSTON NORTH
ZL2OB	O'BRIEN, D P, 133 MAKINO RD, FEILDING	ZL2RAS	SUDLOW, R A, 154 STATE HIGHWAY 10, COOPERS BEACH YOUTH CAMP, MANGANUI
ZL2OD	COOMBE, H W, 31 LINKLATER AVE, FOXTON BEACH	ZL2RC	SEWING, R, PO BOX 620, GISBORNE
ZL2OF	PENTELOW, L C, RD 31, KINA RD, OPUNAKE	ZL2RD	WILLS, R E, 30 CITY VIEW GROVE, LOWER HUTT
ZL2OG	CHISNALL, R R, NATIVITY COURTS, 4D HENRY STREET, BLENHEIM 7301	ZL2RDH	HARWOOD, R D, 187 MATAI RD, RAUMATI BEACH
ZL2OH	MCMILLAN, W I, 67 BLUEGUM RD, PARAPARAUMU BEACH 6010	ZL2RDM	MURRAY, R D, 101 FREDRICK ST, HASTINGS
		ZL2RE	RENNIE, P W G, 64 PARK TERRACE, BLENHEIM
		ZL2REJ	JOHNSTON, R E, 9 MEADOWS AVENUE, WIAWHETU, LOWER HUTT
		ZL2RF	FLETCHER, A E, 480 FERGUSON DRIVE, UPPER HUTT

ZL2RFL

ZL2RFL Leicester, Rob, 114 Brookfields Road, Pakowhai RD3, Napier

ZL2RG NIXON, P A, 194 FRANKLEY RD, FRANKLEIGH PARK, NEW PLYMOUTH

ZL2RGW WRIGHT, R G, 2/41 THE BOULEVARD, SUNNYHILLS, PAKURANGA

ZL2RH HIGHMAN, R E, 51 BLACKWOOD DRIVE, WATTLE COVE, MANUREWA, AUCKLAND

ZL2RHD DUFFIELD, RUTH, 16 GRANT STREET, HAVELOCK NORTH, HAWKES BAY

ZL2RI MAIN, S G, 24 KINGSLEY ST, GISBORNE

ZL2RIC COLEMAN, R A, 12 GRUNDY ST, GISBORNE

ZL2RIG GIBSON, R I, 31 HOBART ST, WELLINGTON

ZL2RJ HOPGOOD, D J, 33 TRUSCOTT AVE, JOHNSONVILLE, WELLINGTON

ZL2RJF FLEMING, R J R, RD 11, FOXTON

ZL2RJP Prentice, Randall, 178 George Street, Stokes Valley, Hutt City

ZL2RK DALLAS, P M, 22 GLAMIS AVE, STRATHMORE, WELLINGTON

ZL2RKA ANTILL, R K, 50 ROSENDALE AVE, NEW PLYMOUTH

ZL2RKL WHITAKER, A J T, 10 RUTHKEN CRESCENT, SPRINGLANDS, BLENHEIM

ZL2RL BERG, B L, 8 WAIKARE AVE, LOWER HUTT

ZL2RM COLLECUIT, G P, R D 2, KAE0 0471

ZL2RMS STUART, R M, 61 LAVAUD ST, BERHAMPORE, WELLINGTON

ZL2RN ROYAL NAVAL AMATEUR RADIO SOCIETY NZ BRANCH, 20 GREENWOOD BOULEVARD, OTAKI 5560

ZL2RNN NEILL, R N, 39 ELLESMORE CRES, PALMERSTON NORTH

ZL2RO THOMAS, L R, 102 EMANO STREET, NELSON

ZL2ROB WALKER, R W, 105A Bryndwr Road, Fendalton, CHRISTCHURCH

ZL2ROG BURDON, R W, C/ 28A GILBERT STREET, BLENHEIM

ZL2RON DANNATT, R, 69 BEAZLEY CRES, TIKIPUNGA, WHANGAREI

ZL2ROO OOSTERLING, R, 37 HUMPHRIES STREET, RD 1, GREYTOWN

ZL2ROS HOLDAWAY, R J, 21 RICHARDSON AVENUE, BLENHEIM

ZL2ROY SEFTON, R C,

ZL2RP PETERS, R E F, 35 GIBLIN STREET, RICHMOND

ZL2RPD DIGNUM, R P, PO BOX 58153, WHITBY, PORIRUA

ZL2RQ DEE, R A, 3 AYRSHIRE DRIVE, GRANDVIEW HEIGHTS, HAMILTON

ZL2RR STEWART, B E, 1 CAVERSHAM RD, MOSSTON, WANGANUI

ZL2RRC GREENWOOD, P, WILLOWPARK DRIVE, RD11, MASTERTON

ZL2RS ROYAL SIGNALS AMATEUR RADIO SOCIETY, C/O C M Kempson, 339b Te Moana Road, Waikanae

ZL2RST GOODE, T, 76 AIRLIE ROAD, PLIMMERTON, PORIRUA

ZL2RT SPACKMAN, J M, 18A MAHANA RD, TE RAPA, HAMILTON

ZL2RVS STOCKER, R V, 1378 BRIGHTON ROAD, DUNEDIN

ZL2RVW SOUTHWART, P D, 5 TOWNLEY STREET, ELGIN, GISBORNE

ZL2RW WHITE, R S, Flat 3, 31 Lancaster St, Napier

ZL2RWE EUSTACE, R W, P O BOX 34, RONGOTEA

ZL2RX WINCER, R A, 302 ATAWHAI DRIVE, NELSON

ZL2RXN NICKEL, ROGER, 60 HOLLOWAY ROAD, MITCHELLTOWN, WELLINGTON

ZL2RY SMITH, S J, 414 ORMOND RD, GISBORNE

ZL2RZ WALL, A M, 8 RANDALL PLACE, NAPIER 4001

ZL2SAM ASHTON, S J, 20 FITZHERBERT ROAD, WAINUIOMATA, LOWER HUTT

ZL2SAW SIMPSON, A W, 79 CRACROFT ST, WAITARA

ZL2SB PETHERICK, E R, 2 DERWENT CLOSE, MIDLANDS VILLAGE, PARAPARAUMU 6010

ZL2SC COMBER, S, PO BOX 5518, LAMBTON QUAY, WELLINGTON 6040

ZL2SD WHITE, R L, 74 NORBITON RD, FOXTON

ZL2SE WHITE, 24 PIRINOA STREET, FEILDING

ZL2SEA GOLDSSTONE, N P, PO BOX 351, DRURY, AUCKLAND 1750

ZL2SET WILBY, E A, 5 MATUKU STREET, HERETAUNGA, UPPER HUTT 6009

ZL2SF LEWIS, A W, PO BOX 10-114, THE TERRACE, WELLINGTON 6036

ZL2SG WALLACE, R J, 956 RIVERSLEA RD STH, HASTINGS

ZL2SGN NEILL, S G,

ZL2SGW Warder, Stephen, PO Box 119, Waimauku, Auckland 5901

ZL2SH HARVEY, S R, 11 FLEET STREET, SOLWAY, MASTERTON

ZL2SJ NORDEN, A P, 38 BELL STREET, FEATHERSTON

ZL2SK ADAMSON, D P, OLD KIPS RD, R D 10, PALMERSTON NORTH

ZL2SKB BONNINGTON, S K, 46 AORANGI RD, R D 5, FEILDING

ZL2SKY CHANDLER, A J, 4 TYNE ST, ROSLYN, PALMERSTON NORTH

ZL2SM SMART, L E, 48 LESLIE ST, WAITARA

ZL2SMC McManaway, Stephen, 52 Massey Crescent, Marewa, Napier

ZL2SN BLACK, R B, 4201 TAIHAPI ROAD, RD 9, HASTINGS

ZL2SP JOHNSON, T A D,

ZL2SQ MCQUILLAN, H, RD 1, TASMAN, UPPER MOUTERE

ZL2SR CARRAN, S R, 263 GRAHAMS RD, BRYNDWR, CHRISTCHURCH

ZL2SS WALLACE, G J, 10B PARKVALE ROAD, OTUMOETEI, TAURANGA

ZL2ST WHITE, S J, 54A AUCKLAND RD, GREENMEADOWS, NAPIER

ZL2STR ROBINSON, S T, 16 COSTER ST, WAKATU, NELSON

ZL2SU HARRIS, Julian, 24 Gandalf Crescent, PARAPARAUMU

ZL2SV ROBERTS, S A, 84 BELL ST, FEATHERSTON 5952

ZL2SW WEDDERSPOON, W,

ZL2SWR SOUTHERN WAIRARAPA BRANCH NZART, C/O ST JOHNS, PO BOX 56, FEATHERSTON 5952

ZL2SWT TENNENT, S W, 94 BLANKEY STREET, HORNBY, CHRISTCHURCH 8005

ZL2SWZ SWARTZ, S,

ZL2SX ANDREWS, D V, 66 KHANDALLAH RD, WELLINGTON 6004

ZL2SY HARRIS, S B, 88A VICTORIA STREET, CARTERTON 5951

ZL2TA MCNEARNE, K B, 8 DUNK PLACE, PALMERSTON NORTH

ZL2TAB HINTON-COOPER, K E,

ZL2TAE SAYWELL, I C, WESTERN LAKE, R D 3, FEATHERSTON

ZL2TAF COOKSON, F J, 2 MOONRIDGE ROAD, RD 1, PORIRUA

ZL2TAG BENNETT, A J, 9 JASPER AVE, MT ROSKILL, AUCKLAND 4

ZL2TAJ SQUIRES, D R, 22B HOSPITAL ROAD, KAWAKAWA, NORTHLAND 0291

ZL2TAK INGHAM, C G, 138 DOWSE DRIVE, LOWER HUTT

ZL2TAL GYDE, R V, 148A PIONEER RD, NEW PLYMOUTH

ZL2TAM LAM, J C S, 16 MILLS ST, ELTHAM

ZL2TAP BAKER, W R E, 6 NATHAN ST, LINDEN, TAWA

ZL2TAQ HADFIELD, C I, 18 PEPPERTREE GLADE, PALMERSTON NORTH

ZL2TAR INGHAM, J D, 138 DOWSE DRIVE, MAUNGARAKI, LOWER HUTT 6009

ZL2TAS MARSH, J K, MAIN RD, OAKURA

ZL2TAU WILSON, S J, 12 ATUA STREET, JOHNSONVILLE, WELLINGTON

ZL2TAW RUSS, D, 153 CRACROFT ST, WAITARA

ZL2TB LINNEY, E, 14 QUIGLEY ST, NEWLANDS

ZL2TBD DONCLIFF, B, 2 HASLAM CRESCENT, HILLMORTON, CHRISTCHURCH 8002

ZL2TBE SIMPSON, K W, 3 MILTON STREET, MURCHISON

ZL2TBG SNELSON, K H, 26 THE ANCHORAGE, WHITBY

ZL2TBH HENDERSON, G J, 60 CEDAR STREET, MAUNGARAKI, LOWER HUTT

ZL2TBI SIMPSON, N M, 3 MILTON STREET, MURCHISON

ZL2TBK LOVE, G A, PO BOX 6826, WELLINGTON

ZL2TBL DELUGAR, K M, 211 MATAI ROAD, RAUMATI BEACH 6010

ZL2TBM MILES, B, 25 FOX ST, FEATHERSTON

ZL2TBN NELSON, B E, 14 CRANBROOK ROAD, WAIKANAE 6010

ZL2TBP NORPGROVE, A E, 90 SOUTH KARORI RD, WELLINGTON

ZL2TBS WARD, L A, 11 PINNY AVE, LOWER HUTT

ZL2TBU STEVENS, J E R, 48 CHESTERTON ST, WELLINGTON

ZL2TBZ MILSOM, M A, 1D BRORA CRES, PAPAKOWHAI 6006

ZL2TC WINTON, L J, 47 RICHMOND ST, NAPIER

ZL2TCC BROWN, G R, 28 MANGAROA HILL ROAD, MAORIBANK, UPPER HUTT

ZL2TCD PHILLIPS, A R J, 7 MACEY CRESCENT, BLENHEIM

ZL2TCG STIPKOVITS, S P, 76 VIEW ROAD, HOUGHTON BAY, WELLINGTON 6002

ZL2TCH HERD, C G, 17 HAUNUI ROAD, PUKERUA BAY 6010

ZL2TCL LACEY, J D, PO BOX 30-828, LOWER HUTT

ZL2TCN BARNHILL, J D, PO BOX 27-239, WELLINGTON

ZL2TCO CLODE, D B, 96 BATTYS ROAD, BLENHEIM

ZL2TCR DRAFFIN, C R, MT FLORIDA STN, PRIVATE BAG 7517, GISBORNE

ZL2TCU MILNE, R J,

ZL2TCW BONNOR, C R, 13 TURERE PLACE, WANGANUI 5001

ZL2TD PRESTON, P J, 201 CECIL ROAD, WADESTOWN, WELLINGTON

ZL2TDA DAWSON, D J, 4 COHEN PLACE, PALMERSTON NORTH

ZL2TDC DE GREY, S J,

ZL2TDD CLARKE, T R, 192 HELSTON RD, PAPARANGI, WELLINGTON

ZL2TDF DICKER, J L, STAPLEGROVE, WAIMEA WEST RD 1, BRIGHTWATER

ZL2TDH HINDRY, D J, RD 199 VALLEY ROAD, PARAPARAUMU

ZL2TDI DONEY, P A, 51C PATERSON ST, WANGANUI 5002

ZL2TDJ BOYD, D J, FLAT 1/48 CAMPBELL ST, WANGANUI

ZL2TDK DONALD, A J, 16 GOLF ROAD, PARAPARAUMU BEACH, WELLINGTON

ZL2TDM MORGAN, D P, 1252 FERGUSSON DRIVE, MAORIBANK, UPPER HUTT 6007

ZL2TDN THERKLESON, G L, 106 Tirohanga Road, Tirohanga, Lower Hutt

ZL2TDO	HYDE, P R, 26 RANDWICK CRES, MOERA, LOWER HUTT	ZL2TKB	KNIGHT, K J, 12 LORD AUCKLAND ROAD, WAKEFIELD, NELSON
ZL2TDP	Charles, Colin, 87 Pasadena Crescent, Totara Park, Upper Hutt	ZL2TKC	GEORGE, I A, MAIN RD, R D 2, TE KARAKA, GISBORNE
ZL2TDR	GILGRIST, H T, 183 TE MOANA ROAD, WAIKANAE 6010	ZL2TKH	HODGES, K J, 110 TOTARA DRIVE, HAMILTON
ZL2TDS	BOYD, C B, 110 LINTON ST, PALMERSTON NORTH	ZL2TKI	SANSON, I M, PO BOX 109, WAITANGI, CHATHAM ISLANDS
ZL2TDV	GROVER, D, PO BOX 3262, WELLINGTON 6015	ZL2TKL	THORNTON, W H, P O BOX 8139, HAVELOCK NORTH 4230
ZL2TE	IRESON, S, 57B SUNNYVALE ST, NEW PLYMOUTH	ZL2TKM	MICROBERTS, K, 49 ARROW STREET, NELSON
ZL2TEC	ADAMS, B W, 1 D'ARCY ST, RICHMOND, NELSON	ZL2TKV	BURNS, F N R, 1010 WAIPIUNA ST, HASTINGS
ZL2TED	COLGAN, E L, 55 HYDE ST, WAINUIOMATA, WELLINGTON	ZL2TKY	PATTLE, K A, 10 WOODSTOCK TCE, TAWA 6006
ZL2TEE	ROBBINS, S, 10 ECLIPSE LANE, WHITBY, PORIRUA	ZL2TLD	MCALLISTER, G B, 83 UPPER PLAIN RD, MASTERTON
ZL2TEL	LOEFFELLECHNER, E, 6 CUNLIFFE ST, WELLINGTON 6004	ZL2TLE	RAMSAY, K J, 62 KAIKOURA ST, MAUPUIA, WELLINGTON 6003
ZL2TEM	MCQUEEN, S E, 34 KERKWALL DRIVE, NAE NAE, LOWER HUTT	ZL2TLP	SARGENT, D J, 9 NGAHERE ST, INGLEWOOD
ZL2TER	ROBERTS, M A, 40 PORUTU STREET, FAIRFIELD, LOWER HUTT	ZL2TLPJ	JONES, B L, 64 PUHINUI RD, PAPATOETOE, AUCKLAND 1701
ZL2TEW	WOOLMAN, E R, 34B ELBOURNE STREET, TARDALE, NAPIER	ZL2TLL	WALLACE, D P, 149 ORANGI KAUPAPA RD, WELLINGTON 6005
ZL2TF	FLEMING, T A, 1 MATAI PLACE, PAHIATUA	ZL2TLO	O'DONNELL, L M, 27 AWANUI ST, NEW PLYMOUTH
ZL2TFB	COX, R J C, 8 BEN NEVIS PLACE, GRANDVIEW ESTATE, HAMILTON	ZL2TLPV	VERNON, L A F 1 WHO STREET, TAIHAPE
ZL2TFC	CARRUTHERS, B M, AG TRONICS LTD, PRIVATE BAG, NEW PLYMOUTH	ZL2TMM	EDWARDS, R F, 4 LEWIS ST, GISBORNE
ZL2TFI	PICKETT, B M, 60 WINTERS ROAD, PAPANUI, CHRISTCHURCH 5	ZL2TMB	BEER, M C F, 45A MILL STREET, MARTON
ZL2TFO	BROWN, E J, 12A CHURCHILL ST, WHAKATANE	ZL2TME	JONES, S E, PO Box 562, NELSON
ZL2TFR	RAMSAY, C G F, 62 KAIKOURA ST, MAUPUIA, WELLINGTON	ZL2TMI	LILL, V E, PO BOX 56-090, TAWA
ZL2TFS	SEARS, M E, 9 SADLIERS STREET, STOKE, NELSON	ZL2TMR	NORLING, R W, 94 MIRO ST, OHAKUNE
ZL2TFT	STOHA, F A, 36A PRETORIA ST, LOWER HUTT	ZL2TMS	PALLESEN, P A, 808 NORTH RIVERSLEA RD, HASTINGS
ZL2TFX	FOX, G J, 18 ROBERT ST, NEWLANDS, WELLINGTON	ZL2TMU	MCGHIE, R C, 67 MURRAY AVE, HAWERA
ZL2TFY	CANDY, D O, RAUMA RD, R D 3, TAIHAPE	ZL2TMW	WRIGHT, T M, 124 REALM DRIVE, GLEN HAVEN, PARAPARAHU
ZL2TFZ	SAYER, J B, 235 UPPER PLAIN RD, MASTERTON	ZL2TMX	SMITH, C F 6 RIMU PLACE, TARADALE, NAPIER
ZL2TG	DE BURGH, R J, 39 SEDDON STREET, FEILDING	ZL2TMY	HANNAN, P E, TIRONUI, R D 1, MARTINBOROUGH
ZL2TGC	COOKE, G J, 14 SYLVAN AVENUE, WAIKANAE 6010	ZL2TMZ	WOODFIELD, N C, 1487 WHANGAMATA RD, RD 1, TAupo
ZL2TGD	DEMPSEY, G D, 423 COLLINGE RD, HASTINGS	ZL2TN	BRIGHTING, T L, 18 ASHFORD AVE, PALMERSTON NORTH
ZL2TGF	MOORE, T E, 50 FLEET ST, NAENAE, LOWER HUTT	ZL2TNE	HAIGH, TANIA, 197 PARK ROAD, PALMERSTON NORTH
ZL2TGI	STEENSON, A D, 126 NAPIER ROAD, HAVELOCK NORTH	ZL2TNG	GIBBONS, N M, 35 MATAI ROAD, RAUMATI SOUTH
ZL2TGU	JONES, G W, 10 JOHN GUTHRIE PLACE, NEW PLYMOUTH	ZL2TNI	SUTTON, T D, 17 TORY STREET, NELSON
ZL2TGM	MEADS, G T, 12 TOTARA TCE, INGLEWOOD	ZL2TNI	LAING, N G, 1 FEARON STREET, SEDDON
ZL2TGN	BERRY, R M, PO BOX 8581, HAVELOCK NORTH	ZL2TNM	STOKES, D C, FLAT 2/185 CECIL RD, WADESTOWN, WELLINGTON
ZL2TGO	GREENBANK, R J, 31 SOMES CRES, WELLINGTON	ZL2TNU	DEVON, D R, 81 GRETA ST, OAMARU
ZL2TGW	CLIFFORD, K S, 69 HAGGERTY STREET, RD54, KIMBOLTON	ZL2TNW	EARL, T H, 148 KELBURN PARADE, WELLINGTON
ZL2TGX	MORRISON, J F, 27 MULGRAVE ST, ASHHURST	ZL2TO	NZART WAITARA BRANCH INC, C/O L SMART, 48 LESLIE STREET, WAITARA
ZL2THM	DARBY, P R, 25 SOUTH RD, NEW PLYMOUTH	ZL2TOA	RYDER, M A, 219 THORP STREET, MOTUEKA
ZL2THO	RIGGS, P T, 3 LATHAM ROAD, YORK BAY, EASTBOURNE	ZL2TOD	ROBINSON, M G, 55 LUPIN ROAD, OTAKI 6471
ZL2THD	SMOLNICKI, M, 19 OAKLEIGH STREET, MAUNGARAKI, LOWER HUTT 6009	ZL2TOF	VINCENT, P C, 7 PHARAZYN ST, FEILDING
ZL2THE	HOPKINS, M D, 6 TEDDER WAY, KARORI, WELLINGTON	ZL2TOH	FULTON, J E R, 22A TRELISSICK CRES, NGAIO, WELLINGTON
ZL2THF	HOWE, J F, 51 OXFORD RD, WANGANUI	ZL2TOO	DALEY, B J,
ZL2THP	DEWSNAP, A V, 30 RURU CRES, UPPER HUTT	ZL2TOP	COLEY, N, 84 MAIN ROAD, WAINUIOMATA 6008
ZL2THU	CROPP, I, 7 BLUE MOUNTAINS RD, SILVERSTREAM, UPPER HUTT 6007	ZL2TOQ	DAVSON, B E, 113 Revan St, FEATHERSTON
ZL2THV	NEILL, W J, 9 MALDA GROVE, KHANDALLAH, WELLINGTON	ZL2TOR	WOODS, D J, RD 5, NGAIO RD, FEILDING
ZL2THW	MUIR, A W, 61 DOWNING STREET, CHARTWELL, WELLINGTON 4	ZL2TOS	ANDERSON, K J, 215 STOKES VALLEY RD, STOKES VALLEY
ZL2THX	BLANCHARD, D C, 469A EGMONT RD, RD2, NEW PLYMOUTH	ZL2TOU	BRUNTON, R G, 19 GLADSTONE ST, WOODVILLE
ZL2THZ	HUBER, R F, PO BOX 3361, WELLINGTON	ZL2TOZ	O'DONNELL, M J, PO BOX 272-1009, PAPAKURA
ZL2TIE	GUILFORD, A E, 41 TUAKAU ROAD, PUKEKOHE, AUCKLAND	ZL2TPB	BARNETT, P, OLD COACH ROAD, MAHANA, R D 1, UPPER MOUTERE
ZL2TIG	DOUGLAS, A W J, 20 STANHOPE GROVE, KOROKORO, LOWER HUTT	ZL2TPC	WEBB, P, 3 SOMERVILLE LANE, BRIGHTWATER, NELSON
ZL2TIL	MAXWELL, D M, 7 PLUNKET AVENUE, PETONE, WELLINGTON 6008	ZL2TPH	HELLBERG, P E, 96 KELVIN GROVE RD, KELVIN GROVE, PALMERSTON NORTH 5301
ZL2TIO	BARNES, P E, 790 UPPER DURHAM ROAD, RD 8, INGLEWOOD	ZL2TPL	LAING, P D, 6 MCDONALD ST, TAITA, LOWER HUTT
ZL2TIQ	BRIESEMAN, P J, 12 FRANKLYN RD, TAWA	ZL2TPO	JACKSON, C D, PO BOX 180, OTAKI
ZL2TIS	STEWART, I, 99 UPPER PLAIN ROAD, MASTERTON	ZL2TPP	CALDWELL, J D, 36 RANGIORA TERRACE, TAHUNANUI, NELSON
ZL2TIT	TAYLOR, A F, 16 WASHINGTON TERRACE, NELSON	ZL2TPQ	BROWNING, K F, 56 COLE ST, DANNEVIRKE
ZL2TJ	JOHNSON, T A D,	ZL2TPS	STRINGER, P, P O BOX 3085, RICHMOND, NELSON
ZL2TJB	TOWLER, J I, 1 OLIVIA CRESCENT, TAWA, WELLINGTON	ZL2TQ	MACDONALD, A, 39 ANISEED GROVE, TIMBERLEA, UPPER HUTT
ZL2TJC	WAKELY, B, FLAT 1/3 THE RIDGEWAY, NELSON	ZL2TQA	NIXON, P J, 574A FERGUSSON DRIVE, UPPER HUTT, WELLINGTON
ZL2TJG	GOULD, J A, 24 REDVERS DRIVE, BELMONT, LOWER HUTT	ZL2TQD	FULTON, H R, 13 STAYSAIL PLACE, WHITBY
ZL2TJJ	HANNON, G J, 109 MAIN RD, CLIVE 4152	ZL2TQK	MAXWELL, C H, 8 MARTIN GROVE, LOWER HUTT
ZL2TJM	BAKER, R E, 7 BATT STREET, PALMERSTON NORTH	ZL2TQP	QUIN, C J, 29 DOMINION PARK RD, WELLINGTON
ZL2TJO	BRICE, D, PO BOX 317, FEILDING	ZL2TQQ	HILL, H R, 3A BALLIOL DRIVE, TAWA
ZL2TJP	BRYANT, P, 62 CLARENCE ST, WELLINGTON	ZL2TQZ	ROWE, I, 427 TEKOUMA BAY ROAD, TE KOUMA RD1, COROMANDEL
ZL2TJR	REISIMA, A J, 3 CRAIG GROVE, UPPER HUTT 6007	ZL2TR	HEADIFEN, T G, 15 TASMAN STREET, LEVIN
ZL2TJT	SCHMIDT, J T, 9 PONDEROSA GROVE, UPPER HUTT	ZL2TRB	HODGKINSON, V M, 19 THIRLMERE STREET, WAINUIOMATA, WELLINGTON 6008
ZL2TJV	VENEBERG, J, PO BOX 40-075, UPPER HUTT 6415	ZL2TRD	Smith, Peter Ross, 40 Summer St, Ponsonby, Auckland
ZL2TJX	EVANS, E T, 16 DAVIDSON AVE, NAPIER	ZL2TRE	JENNINGS, S B, 66 PINE AVE, UPPER HUTT
ZL2TK	GARING, T R, 2 HOLLIES CRESCENT, JOHNSONVILLE, WELLINGTON	ZL2TRF	STRICKLAND, M J,
ZL2TKA	RICKARDS, C M, 21A LONGVIEW DRIVE, NEW PLYMOUTH	ZL2TRG	OMER, P, 90 CAMERON RD, RD 1, GISBORNE
		ZL2TRL	JARVIS, M D, 11 STONEHAVEN CRES, PALMERSTON NORTH
		ZL2TRM	MACKENZIE, H R, 23 BALGOWNIE AVE, WANGANUI
		ZL2TRN	WILSON, W L, PO BOX 2409, HASTINGS

ZL2TRQ

ZL2TRQ	MCKENZIE, N A, 1 COLENSO AVE, NAPIER	ZL2TY	CONROY, T J, FLAT 2, 138 WADDINGTON DRIVE, NAENAE
ZL2TRT	THORBURN, C R, 35 TIRANGI ROAD, KILBIRNIE, WELLINGTON	ZL2TYB	LOCKYER, R H, 11 TREVELYAN ST, NAPIER
ZL2TRV	YALDWYN, J S C	ZL2TYI	JOHNSON, J W, 106 NEWLANDS ROAD, NEWLANDS, WELLINGTON 6004
ZL2TRW	WATSON, R H, 44 ORR CRES, LOWER HUTT 6009	ZL2TYO	FITZSIMONS, B J, 121 ONSLOW ROAD, KHANDALLAH, WELLINGTON
ZL2TRX	COUTTS, C G, 12 PAIERAU ROAD, R.D.1, MASTERTON 5901	ZL2TYR	ROBERTSON, D R, 19 LANYON PLACE, WHITBY, WELLINGTON 6009
ZL2TRZ	TONKIN, J R, 15 AHURIRI ST, WELLINGTON	ZL2TYU	ABERNETHY, R J, 40A PETERHOUSE ST, TAWA, WELLINGTON
ZL2TS	OFOSOSKI, J F, 8 WAYSIDE, MIRAMAR, WELLINGTON 6003	ZL2TZ	BOULD, J R, 14D BURNESS RD, GREENMEADOWS, NAPIER
ZL2TSD	KEEN, N K M, PO BOX 484, WHAKATANE	ZL2TZE	CONZA, P J, 4 MCFARLANE PLACE, BLENHEIM
ZL2TSE	THOMPSON, A B J, 15 FULTON AVENUE, FENDALTON, CHRISTCHURCH	ZL2TZG	SARGENT, G R, 14 HUTCHINS ST, WAITARA
ZL2TSI	ALLISON, D N, PO BOX 1066, QUEENSTOWN	ZL2TZH	HELSON, N G, MCLAUGHLINS RD, DARFIELD, RD1, CHRISTCHURCH
ZL2TSK	MILLARD, G, 710 MAIN ROAD NORTH, TE MARUA, UPPER HUTT	ZL2TZV	SUTTON, P R,
ZL2TSL	LAYBOURN, B J, 69 BELL STREET, FEATHERSTON	ZL2TZW	MILES, I D, 25 FOX ST, FEATHERSTON
ZL2TSM	BROWN-DOUGLAS, F A, PO BOX 10-133, WELLINGTON	ZL2TZX	HOSKINS, R H, 26 SIGNAL ST, FOXTON BEACH 5551
ZL2TSO	OSBORNE, S J, P O BOX 141, WAIPAWA 4176	ZL2UA	READ, E P, 36 GEORGE STREET, ORMISTON, QUEENSLAND 4613
ZL2TSP	SALT, B R, 514A FENWICK ST, HASTINGS	ZL2UAA	BISETT, W L, 6/16 BLEDISLOE STREET, RUAWAI 586
ZL2TSQ	MATHESON, A R, 21 FALKLAND STREET, WANGANUI	ZL2UAG	GILBERT, A C, 126 MT HERBERT RD, WAIPUKURAU 4176
ZL2TSY	LANG, K J, 97 RATANUI ROAD, PARAPARAUMU, WELLINGTON 6010	ZL2UAJ	NEWELL, M C, 18 PRATT AVE, FOXTON BEACH
ZL2TT	GILBERT, WIN, 146 LIVERTON ROAD, BELMONT, LOWER HUTT	ZL2UAN	WILLS, A R, 30 CITY VIEW GROVE, LOWER HUTT
ZL2TTA	MCNEIL, I J, 111 NORANA RD, UPPER HUTT	ZL2UAO	MURPHY, G R, 274 SONGER STREET, STOKE, NELSON
ZL2TTB	LYSKINE, G, 19 KOROMIKO RD, WAIKANAE	ZL2UAS	SOUTHWART, A, 5 TOWNLEY STREET, ELGIN, GISBORNE
ZL2TTC	ADAMSON, F R, 22 NAUGHTON TCE, KILBIRNIE, WELLINGTON	ZL2UB	TERRIS, R D, 45 MARLOWE STREET, STOKE, NELSON
ZL2TTE	CRAMPTON, J F, 40 ROGER STREET, BLENHEIM	ZL2UBA	MAITLAND, I J, PO BOX 743, WANGANUI
ZL2TTF	CHRISTIANSON, N J, 51 IMLAY CRES, NGAIO, WELLINGTON 6004	ZL2UBG	LOWES, C W, 27 ST HILL LANE, HAVELOCK NORTH
ZL2TTK	GRIDLEY, D C, 2 THOMPSON PLACE, TIRIMOANA, R D, PICTON	ZL2UBH	COLE, L R, 8 LONDON RD, PETONE
ZL2TTL	WATKINS, K R, 19A CARTHEW ST, OKATO	ZL2UBK	WEBBER, D, 4 VICTORY CRES, TAWA
ZL2TTM	DEKKER, J C, 10 CLAREMONT RISE, LEVIN	ZL2UBM	TAYLOR, G J W, RD 3, HAMMERRICKS ROAD, BLENHEIM
ZL2TTT	JANSEN, C T F, 31 BEDFORD STREET, NORTHLAND, WELLINGTON	ZL2UBN	BRIGGS, A G, 580 LOWE ST, HASTINGS
ZL2TTX	WALKER, R S, 9 MILNE TCE, WELLINGTON	ZL2UBO	GRENFELL, S K, 14 MAMARI ST, KILBIRNIE, WELLINGTON 3
ZL2TTY	BOYCE, M L P, 26 SUTHERLAND CRESCENT, PALMERSTON NORTH	ZL2UBP	RIORDAN, I M, R D 1, TAKAKA
ZL2TU	ADIN, B E, 18 DUKE ST, LEVIN	ZL2UBU	HOWIE, I M C, 9 TRELISSICK CRES, WELLINGTON
ZL2TUA	WEBB, D A, PO BOX 86, MURCHISON	ZL2UBW	MILLER, J R C, 58A THACKERAY STREET, UPPER HUTT
ZL2TUD	FUTTER, R J, PO BOX 38-662, PETONE 6340	ZL2UBZ	GAUDIN, G W, 18 TRAFALGAR ST, NEW PLYMOUTH
ZL2TUF	HASTIE, L M, RD 11, KOPUTARA RD, FOXTON	ZL2UC	HOOPER, A E, PO BOX 31-091, MILFORD, AUCKLAND 1309
ZL2TUI	BERGEN, E A, 4 ARMAGH TCE, MARTON	ZL2UCA	GILCHRIST, R J, 61 HETA RD, NEW PLYMOUTH
ZL2TUR	BANKS, M, 66 CUMBERLAND ST, NEW PLYMOUTH	ZL2UCD	CALVERT, D A, FABIANS RD, RD 1, GREYTOWN
ZL2TUT	MCPHERSON, D B, 60 WAIKAWA ROAD, PICTON	ZL2UCE	HURSTHOUSE, D E, 24 DUART RD, HAVELOCK NORTH
ZL2TV	SANSON, R G, 55 BERTRAM ST, WARKWORTH	ZL2UCG	BIRCHALL, O J, PO BOX 4505, PALMERSTON NORTH
ZL2TVA	BURNET, G L, 125 KNIGHTS RD, LOWER HUTT	ZL2UCI	RAWDON, P D, 2/38 FORTH STREET, RICHMOND, CHRISTCHURCH 8001
ZL2TVB	SEED, B V, 27 CLAY RD, RD 12, LEVIN	ZL2UCJ	BIRT, K J, 16 CHATSWOOD GROVE, NEW PLYMOUTH
ZL2TVG	BUCK, G K, 96 CLEGHORN STREET, BLENHEIM	ZL2UCN	GOLDSWORTHY, D A, 165 PEMBROKE RD, NEW PLYMOUTH
ZL2TVL	BROOK, M A, 10 MOUNT HOLDSWORTH ROAD, RD1, CARTERTON 5951	ZL2UCS	MCPHERSON, M E, 60 WAIKAWA ROAD, PICTON
ZL2TVM	CROSS, G E, 52 CUDBY STRET, LOWER HUTT	ZL2UCT	OBORN, D E, 68 PEMBROKE RD, NORTHLAND, WELLINGTON
ZL2TVO	SCOTT, P A L, 28 JEFFERSON PLACE, TAURANGA	ZL2UCW	BRAY, D K, 35 WAVELL CRES, MASTERTON
ZL2TVP	EDEN, A D, 8 Fell Place, STOKE, NELSON	ZL2UCX	DAVIS, S I, PO BOX 120, CHRISTCHURCH
ZL2TVT	JENKINS, A R, 13 SELWYN STREET, VOGETOWN, NEW PLYMOUTH	ZL2UDA	BARNES, B R, 175B CAMBRIDGE RD, TAURANGA
ZL2TVU	MCGAHEY, R, 27 ROBERTS AVENUE, ARAMOHU, WANGANUI	ZL2UDC	LOCKIE, D C, 70 CASHMERE AVE, WELLINGTON 4
ZL2TVW	NEWLAND, P B, 25A TAWA TCE, TAWA	ZL2UDE	SENIOR, R J, 34 LAHORE ST, WAIROA
ZL2TVX	COOKE, R J, 78 WAIHEMO STREET, PORIRUA	ZL2UDF	WHEELER, M B, PO BOX 39 079, WELLINGTON MAIL CENTRE
ZL2TVY	SMITH, R L, 1 BURWAH ST, BERHAMPORE, WELLINGTON 6002	ZL2UDO	NIELD, P J, 115 HOLLY STREET, AVONDALE, AUCKLAND 1007
ZL2TW	WATCHMAN, S J, 33 Brooklyn Drive, BLENHEIM	ZL2UDS	STUART, D J, PO BOX 38-589, WELLINGTON MAIL CENTRE
ZL2TWB	FELL, L J, P O BOX 9427, CHRISTCHURCH	ZL2UDT	ROONEY, S A, 48 RIMU ST, WAIKANAE
ZL2TWD	FEIST, D M, 2 ARNOT AVENUE, UPPER HUTT	ZL2UDV	BAKER, J, PO BOX 882, MASTERTON 5915
ZL2TWF	SIDDALL, R M, 20 MATT LANE, RD 1, HOWICK, AUCKLAND	ZL2UEF	WHITTAKER, J W, 154B Rata St, Naenae, LOWER HUTT
ZL2TWL	LACKNER, W, C/- MR A JACK, FIRE NO 17, HOMEBUS ROAD, MASTERTON	ZL2UEI	MCCONNEL, W K, 15 HINTON AVE, HAMILTON
ZL2TWM	WILSON, C I, 11 ASHTON TCE, CASTLECLIFF, WANGANUI	ZL2UEL	EVANS, R, 30 MARGARET ROAD, RAUMATI BEACH 6010
ZL2TWN	FOUBISTER, M W, 2 SERGEANTS WAY, CLARKS BEACH, AUCKLAND 1850	ZL2UEW	AURISCH, P J, PO BOX 58, TAUPO
ZL2TWO	JENNINGS, J P H, 18 ST JOHNS TERRACE, REDWOOD, TAWA	ZL2UFE	VICKERS, M P, ELTHAM RD, R D 21, STRATFORD
ZL2TWP	FRYER, R J, TIRONUI, R D 1, MARTINBOROUGH	ZL2UHF	HUNTINGTON, R J, 17 PRIME RD, GREY LYNN, AUCKLAND 1002
ZL2TWS	WYSOCKI, J M, 115A EPUNI ST, LOWER HUTT	ZL2UFI	GOODING, M S, 204 PLATEAU RD, TE MARUA, UPPER HUTT
ZL2TWW	WILHELMUS, NIGEL, 136 MAUNGATAPU ROAD, RD 2 RAI VALLEY, BLENHEIM	ZL2UFN	BLYDE, GRAEME, 18 EGMONT STREET, KAPONGA
ZL2TWF	MURPHY, P C, 274 SONGER STREET, STOKE, NELSON	ZL2UFP	CORDY, M, 32 DAVID CRES, KARORI, WELLINGTON
ZL2TX	Hardy, Nigel, Po Box 15078, Otaki Railway	ZL2UFR	GIBSON, B S, 56 RAUKAWA DRIVE, MAYFIELD, TAURANGA
ZL2TXJ	HOARE, M F, P O BOX 20-321, CHRISTCHURCH	ZL2UFS	KENT, ALAN, 7 HOUSE AVE, MANGERE BRIDGE, AUCKLAND
ZL2TXK	DUNCAN, G R, 3 King Street, Taradale, NAPIER	ZL2UFW	BALDWIN, T N, 158 RALEIGH ST, WAITARA
ZL2TXL	EASTERGAARD, A G, P O BOX 176, CARTERTON	ZL2UGC	CLARK, B A, P O BOX 189, CARTERTON
ZL2TXP	PRENTICE, A J, 21 JAMES ST, WAIKAWA BEACH, R D 31, LEVIN	ZL2UGF	NICOLSON, A J, PO BOX 9280, WELLINGTON
ZL2TXV	BALDWIN, A N, 8 HOBSON PLACE, PALMERSTON NORTH	ZL2UGG	SYME, D R, 17 ROGERS RD, BAY VIEW, NAPIER
ZL2TXX	PENNEY, B J, 52 NORWICH STREET, STOKE, NELSON	ZL2UGH	NEWPORT, C W, 162 KAWAI STREET, NELSON
		ZL2UGL	SOUTHAM, J E, 17A PIMLICO PLACE, NEWLANDS, WELLINGTON 4

ZL2UGN	GREGORY, B, 6 COBHAM ST, LEVIN	ZL2UST	COTTLE, A, 166 OLD HAUTERE ROAD, RD, OTAKI
ZL2UGR	SMITH, P R, 66 KENTWOOD DRIVE, WOODRIDGE, WELLINGTON 6004	ZL2USV	WHITE, P S, PO BOX 6013, GLENVIEW, HAMILTON
ZL2UGS	JONES, B R, 4800 STATE HIGHWAY 3, RD 3, OHAUPO	ZL2UT	DAVOREN, B J, PO BOX 275, GISBORNE
ZL2UGV	SENIOR, J I M, 34 LAHORE ST, WAIROA	ZL2UTG	HILL, A N, 79 FRANKTON RD, QUEENSTOWN
ZL2UHH	MCGOWAN, D W, 18A BELL STREET, WANGANUI	ZL2UTX	FRANCIS, G A, 31 CLEMOW RD, NEW PLYMOUTH
ZL2UHP	Turner, Robert Hemi, 19 Bangor Avenue, Flaxmere, Hastings	ZL2UU	DINES, J. P.o. Box 1241, Portland, Victoria
ZL2UI	BAILEY, I L, 5 RYEGRASS DELL, WELCOME BAY, TAURANGA	ZL2UW	TOLLEY, H G R, 28A ESSEX STREET, MASTERTON 5901
ZL2UIA	LIPSKI, K,	ZL2UWY	NAULLS, R D, 119 ARTHUR CRES, TAUPO 2730
ZL2UIB	MORRISH, I D, 11 PIGEONWOOD LANE, WOODRIDGE ESTATES, NEWLANDS, WELLINGTON	ZL2UX	LAYBOURN, R A, 146 PEMBROKE RD, NORTHLAND, WELLINGTON 5
ZL2UIH	BRIGGS, G J, 580 LOWE ST, HASTINGS	ZL2UXP	MACDONALD, J R, 39 ANISEED GROVE, UPPER HUTT
ZL2UIJ	WATTS, MALCOLM,	ZL2UZP	BRICKELL, G R, 18 TE PARI PARI RD, PUKEKURA BAY 6450
ZL2UIN	GREGORY, A, 6 COBHAM ST, LEVIN	ZL2UZQ	MARTENS, P H, 26 MULBERRY STREET, LOWER HUTT
ZL2UIO	MANNERING, W L, 8 GLASTONBURY DRIVE, BURWOOD, CHRISTCHURCH	ZL2VAF	ALLEN, A J, 8 SHAFTESBURY GROVE, STOKES VALLEY
ZL2UIV	CANDY, S T R, PO BOX 56-072, WELLINGTON 6230	ZL2VAL	NEWSON, J R, 19 LORNE CRESCENT, FLAXMERE, HASTINGS
ZL2UJ	SADGROVE, P C, 37 KING ST, CAMBRIDGE	ZL2VAR	LEECH, A W, 1/50 QUEENS RD, NEW PLYMOUTH
ZL2UJI	SADGROVE, 111 AVIEMORE DRIVE, HIGHLAND PARK, AUCKLAND	ZL2VAU	ANDERSON, G A, 2 MILFORD DOWNS, MASTERTON
ZL2UJK	KYLE, J P, PO BOX 26-525, EPSOM, AUCKLAND	ZL2VAX	HELLBERG, D J, 96 KELVIN GROVE RD, KELVIN GROVE, PALMERSTON NORTH 5301
ZL2UJL	RIDEN, C P, 92 ATAWHAI RD, PALMERSTON NORTH	ZL2VBC	FLEMING, P A, 711 BALLANCE VALLEY ROAD, R.D. 3, PAHIATUA
ZL2UJN	SINCLAIR, N J, 8 KAPU GROVE, NEW PLYMOUTH	ZL2VB	VAN BEEK, G G A M, 16 NORWICH PLACE, PALMERSTON NORTH
ZL2UJS	SINCLAIR, J J, 8 KAPU GROVE, NEW PLYMOUTH	ZL2VBC	ROSEWARNE, C, 53 LEE STREET, CASTELCLIFF, WANGANUI 5001
ZL2UJT	JURY, N J, 288 HENWOOD ROAD, R D 2, NEW PLYMOUTH	ZL2VBI	ALLAN, G, 20A COURTNEY STREET, MOTUEKA
ZL2UJW	WARRINER, J R K, 3 CHRISTOPHER WAY, PAPARANGI	ZL2VBO	GOODGER, G W, 5 DODSON ROAD, TAKAKA
ZL2UK	WAKEFIELD, C M, 5 GILLESPIE STREET, TAITA, LOWER HUTT	ZL2VBR	BENTON, B, 13 SEAVIEW ROAD, MOTUROA, NEW PLYMOUTH
ZL2UKF	KING, M A, 577 FERGUSON STREET, PALMERSTON NORTH	ZL2VC	JOHNSON, C, 2/3 TARBOT PLACE, FLAXMERE, HASTINGS
ZL2UKO	WILSON, C J, REDWOOD VALLEY LANE, RD 1, RICHMOND	ZL2VCC	WHEATLEY, C A, 150 WYNDHAM STREET, ASHURST
ZL2UKS	PRENTICE, N C,	ZL2VCM	MORRIS, C E, 196A UPPER PLAIN ROAD, MASTERTON
ZL2UKT	HUGHES, C M, 11-A EVEREST AVENUE, LOWER HUTT	ZL2VCR	Day, Denis Lawrence, 16 Kimberley Grove, PALMERSTON NORTH
ZL2UKW	PRIOR, M S,	ZL2VFW	WOOD, A R, P O BOX 1236, WELLINGTON
ZL2UKX	HALE, R E, 122 Westchester Drive, Churton Park, Wellington	ZL2VFR	PERCIVAL, P C, PRIVATE BOX 2565, WELLINGTON
ZL2UKY	VO WELL, D J, 22B JASMINE PLACE, MT MAUNGANUI, TAURANGA 3002	ZL2VG	PRICE, D A, P O BOX 19237, WELLINGTON
ZL2UKZ	CLAPCOTT, P J, 8J/18-36 WAKEFIELD ST, AUCKLAND 1001	ZL2VGB	MCANULTY, G B, 35 DANIELL ST, MASTERTON
ZL2UL	LYFORD, A W, 10C RUI STREET, TAHUNANUI, NELSON	ZL2VH	UPPER HUTT BRANCH NZART INC, C/- 35 MATAI ROAD, RAUMATI SOUTH 6010
ZL2ULB	MARTIN, G, 5 ATHERSTONE LANE, BELMONT, LOWER HUTT	ZL2VHF	CLARK, D I, 8 SEVERN TCE, PALMERSTON NORTH
ZL2ULC	NEWSON, I S, 23 SIGNALLERS GROVE, SEATOUN, WELLINGTON	ZL2VI	MANNING, E E, 33 TIVERTON GROVE, NEW PLYMOUTH
ZL2ULD	LENNOX, B T, 52 SIENA PLACE, OHOKA, R D 2 KAIAPOI	ZL2VJ	JONES, V L, 10 JOHN GUTHRIE PLACE, NEW PLYMOUTH
ZL2ULI	O'NEILL, A H, VILLA 42, SUMMERSET VILLAGE, 249 TE MATA RD, HAVELOCK NORTH	ZL2VJR	RHODES, J M, 54 KEMPTON ST, GREYTOWN
ZL2ULK	ETCHELLS, D J, C/- UPPER HUTT C ITY COUNCIL, PRIVATE BAG 907, UPPER HUTT	ZL2VJS	SEFTON, J,
ZL2ULM	SIMPSON, L M, 3 MILTON STREET, MURCHISON	ZL2VJW	WALLACE, J J, 91 AUSTIN ST, ONEKAWA, NAPIER
ZL2ULN	BRUCKEL, P,	ZL2VK	FORD, P J, 19 REDWOOD AVE, TAWA, WELLINGTON
ZL2ULO	BRUCKEL, 372 Annesbrook Drive, Tahunanui, Nelson	ZL2VKE	POMANA, S M, THE FLAT @ 2 MURPHY ROAD, TARADALE, NAPIER
ZL2ULT	TAYLOR, G R, 105 WAIKAWA ROAD, PICTON	ZL2VL	GLOAG, G F, 16A KIMBOLTON RD, FEILDING
ZL2ULV	ALLAN, P D, 20A COURTNEY STREET, MOTUEKA	ZL2VM	BULL, M B, 51 LIVERPOOL CRES, NAPIER
ZL2ULY	MEFFAN, P M, 595 ROCKS ROAD, NELSON	ZL2VMB	MCNABB, B V, 2 KARO PLACE, MOTUEKA
ZL2UMB	SHAND, B R, C/O RYDER CHESHIRE TRUST, 112A TE AWE AWE ST, PALMERSTON NORTH	ZL2VMH	HOULT, M R, 4 BANCROFT TCE, NEWLANDS, WELLINGTON
ZL2UMS	STACEY, M D, 27 CHAPMAN CRES, NAENAE, LOWER HUTT	ZL2VMJ	JOHNS, M F, P O BOX 953, NEW PLYMOUTH
ZL2UNH	HOLLAND, N L, 5 PARKLANE MEWS, 326 THE TERRACE, WELLINGTON 6001	ZL2VN	GAUDIN, W G, 18 TRAFALGAR ST, NEW PLYMOUTH
ZL2UNK	PLUM, D B, 178 THE RIDGEWAY, STOKE, NELSON	ZL2VO	HAYMAN, G, 73 MAKORA RD, MASTERTON
ZL2UNR	RICHARDSON, N, 129, HIGH STREET, MASTERTON	ZL2VP	CHESHIRE, A H, 5 SEDDON ST, UPPER HUTT
ZL2UNS	PARKER, M A, 64 PAHIATUA ST, PALMERSTON NORTH	ZL2VQ	GAUDIN, G C, 18 TRAFALGAR ST, NEW PLYMOUTH
ZL2UNX	BONIFACE, N J, 163 COLOMBO RD, MASTERTON	ZL2VRC	CLOUGH, R M, 6 WHITECHAPEL GROVE, STOKES VALLEY
ZL2UO	TEREZOW, T, 25 MAGNOLIA GROVE, MAUNGARAKI, LOWER HUTT	ZL2VRK	KOMARKOWSKI, R A, P O BOX 30004, LOWER HUTT, WELLINGTON
ZL2UOL	LEVICK, A H, 17 MASCOT ST, TAWA	ZL2VRX	GRAY, R A J, 7 NATHAN PLACE, PALMERSTON NORTH
ZL2UPB	BROOKS, P M, 33 HOTHAM STREET, MURCHISON	ZL2VSM	MCANULTY, S M, 35 DANIELL ST, MASTERTON
ZL2UPF	FRANCIS, S P, 57 HETA RD, NEW PLYMOUTH	ZL2VSP	PRakash, S, 71 ROTHERHAM TCE, MIRAMAR, WELLINGTON
ZL2UPH	HERD, P T, 17 HAUNUI ROAD, PUKEKURA BAY 6010	ZL2VSS	MCFADYEN, S J, 39 KAHU STREET, ROTORUA
ZL2UQ	WILLIAMS, R C, VILLA 28, SUMMERSET VILLAGE, 102 LIVERPOOL ST, LEVIN	ZL2VTH	HAYWARD, P R, 35 TIRANGI ROAD, KILBIRNIE, WELLINGTON
ZL2UQU	HERNANDEZ, M, 10A DUNCAN ST, TAWA, WELLINGTON	ZL2VV	CARTER, L J,
ZL2UR	LOCKIE, H A, 70 CASHMERE AVE, WELLINGTON	ZL2VVM	MONK, V B, KAPUA FARM, RD 1, FEATHERSTON
ZL2URE	EVANS, R G, 211 MATAI ROAD, RAUMATI BEACH 6010	ZL2VX	MCLEOD, P J, 3 SWANSEA STREET, PALMERSTON NORTH
ZL2URJ	JOLLY, I C, WILLOW PARK RD, RD11, MASTERTON	ZL2WA	WELLINGTON VHF GROUP INC, PO BOX 12-259, WELLINGTON
ZL2URN	CHRISTENSEN, J H, 86 QUEENS ROAD, WAIKANAE BEACH	ZL2WAK	CLARK, B J, 9 SAVAGE CRESCENT, PALMERSTON NORTH
ZL2US	BENIS, H G, VILLA NO. 64, SUMMERSET VILLAGE, 65 GUILFORD DRIVE, PARAPARAUMU 6010	ZL2WAL	WALLACE, R G, 28 HEREFORD STREET, WILTON, WELLINGTON 6005
ZL2USA	JONES, J, 4 DORSET STREET, LEVIN	ZL2WAS	KIRK, G A, 33 BARNES ROAD, REDWOOD, CHRISTCHURCH
ZL2USB	HUNTER, G M, 148 TOREA STREET, GRANITY, BULLER	ZL2WAT	THRESHER, A E, POHANGINA VALLEY EAST RD, R D 14, ASHURST
ZL2USG	LARDELLI, S M, RURAL BAG 7525, GISBORNE	ZL2WAU	COOPER, S R, 24 YORK ST, HILLCREST, DANNEVIRKE
ZL2USM	FOX, A C K, 37 ST JOHN TCE, TAWA	ZL2WAV	JAMES, A N, 24 HAMPDEN STREET, MURCHISON 7191
ZL2USS	HOLDEN, G D, 34 MIDDLETON RD, JOHNSONVILLE, WELLINGTON	ZL2WAX	CAMPBELL, W M, C/O P PEMBERTHY, R D 5 RANGITIKEI LINE, PALMERSTON NORTH

ZL3 CALL-SIGNS

ZL3AA	HARPUR, K, 4 WESTBY STREET, OPAWA, CHRISTCHURCH	ZL3AFW	WILSON, W E, SANDY KNOLLS RD, R D 1, CHRISTCHURCH
ZL3AAB	GARLICK, Z H, 18 HARBOUR ROAD, MOTUEKA	ZL3AFZ	HALL, C L, 20 SUMNER ST, SPREYDON, CHRISTCHURCH
ZL3AAC	ATKINSON, H R, 98 CONDELL AVE, CHRISTCHURCH	ZL3AG	GIBSON, E N, 36 GRAHAMS RD, CHRISTCHURCH 8004
ZL3AAD	ALDERSON, G, RD 1, 7 PRIORS RD, RANGIORA	ZL3AGA	BOLLAND, N, 12 BRENT PLACE, CHRISTCHURCH
ZL3AAG	BATTERBURY, C, 46 GLENMORE AVE, CASEBROOK, CHRISTCHURCH 8005	ZL3AGB	BARRETT, T, 47 ARNOLD ST, SUMNER, CHRISTCHURCH
ZL3AAN	COLVILLE, L M, 115 CAMERON ST, ASHBURTON	ZL3AGF	BLANCHARD, J S, 37 REYNOLDS AVE, CHRISTCHURCH 8005
ZL3AAO	BALLANTYNE, S T, 48 REMPSSTONE DRIVE, HALSWELL, CHRISTCHURCH	ZL3AGL	SINCLAIR, S, 54 WITHELLS RD, CHRISTCHURCH
ZL3AAS	SILKE, A J, PO BOX 5462, LAMBTON QUAY, WELLINGTON	ZL3AGM	JACKSON, B A, INNISFREE, KNIGHTS ROAD 5 RD WEST MELTON, CHRISTCHURCH
ZL3AAT	VAN WAELSDEN, F H A, 138 ROLLESTON ST, RAKIA 8355	ZL3AGP	THOMSON, G G, 10 HANRAHAN ST, CHRISTCHURCH
ZL3AAU	MILLER, J G, WHITEWOOD CRES, R D 5, CHRISTCHURCH 8021	ZL3AGQ	HARRIS, D W, 67 AYERS ST, RANGIORA 8254
ZL3AAY	BOWIE, A F S, 4 WESTBURN TCE, ILAM, CHRISTCHURCH	ZL3AGS	LOVELL, J D, 41 YARDLEY ST, CHRISTCHURCH
ZL3AAZ	ALLAN, L L, 74 GOOD ST, RANGIORA 8254	ZL3AGT	FOSTER, I M, 205 OLD RENWICK RD, RD2, BLENHEIM
ZL3AB	SULLIVAN, M T D, 64 BROADHAVEN AVE, PARKLANDS, CHRISTCHURCH 8009	ZL3AH	HERNANDEZ, A A, PO BOX 7, CLYDE 9180
ZL3ABA	ALLAN, S L, 74 GOOD ST, RANGIORA 8254	ZL3AHL	LYON, K W, 2 LEANDER ST, PAPANUI, CHRISTCHURCH
ZL3ABB	MCKAY, D J, 55 WINGATE ST, CHRISTCHURCH	ZL3AHM	DINEEN, R T, 106 HALSWELL JUNCTION RD, CHRISTCHURCH 8003
ZL3ABC	HOOKER, R O, 272 WAINONI RD, CHRISTCHURCH	ZL3AHN	WHITLEY, W G, 13 HEYDERS RD, CHRISTCHURCH
ZL3ABH	MIDDLEMISS, I R, UNIT 30/472 LINWOOD AVENUE, CHRISTCHURCH 8006	ZL3AHO	REED, B S, 76 CHILTONS ROAD, R D 2, KAIAPOI
ZL3ABJ	JENSEN, B D, 21 COLWYN ST, CHRISTCHURCH	ZL3AHP	PAYNE, A T,
ZL3ABN	LAWRY, D W, P O BOX 37197, HALSWELL, CHRISTCHURCH	ZL3AHQ	MCDONALD, A W, 73A CRANFORD ST, CHRISTCHURCH
ZL3ABO	LAWRY, PO BOX 2054, QUEENSTOWN	ZL3AHT	HOLLAND, S M, 15 ZEPHYR TCE, GOVERNORS BAY, R D 1 LYTTELTON
ZL3ABP	SNUSHALL, J G, PO BOX 108, KAIKOURA	ZL3AHU	HOLLAND, M C, 15 ZEPHYR TCE, GOVERNORS BAY, R D 1 LYTTELTON
ZL3ABR	HARRIS, G T, 283 CANNON HILL CRES, ST ANDREWS HILL, CHRISTCHURCH	ZL3AHW	WILLIAMS, NOEL, 174 Tramway Rd East, RD 3, Wyndham
ZL3ABU	STRACHAN, I S, 41 NEW BRIGHTON ROAD, SHIRLEY, CHRISTCHURCH 8006	ZL3AHX	WELLS, P H, 27 SAMUEL ST, CHRISTCHURCH
ZL3ABW	MAUNDER, H B, 29 AWATEA ROAD, WIGRAM, CHRISTCHURCH	ZL3AHY	LOVELL, M E, 41 YARDLEY ST, CHRISTCHURCH
ZL3ABY	O'SULLIVAN, K D, 53 MARLBOROUGH ST, GREYMOUTH	ZL3AI	FRASER, D J, PO BOX 12, WAIPARA
ZL3AC	NZART CHRISTCHURCH BRANCH 05 INC, PO BOX 1733, CHRISTCHURCH	ZL3AIB	TIMMS, R C, 7 DERENZY PLACE, CHRISTCHURCH 8004
ZL3ACA	NUTH, G L, 47 MARLOW RD, CHRISTCHURCH	ZL3AIC	CHILTON, M T, 183 BELFAST RD, CHRISTCHURCH
ZL3ACC	CHAMBERS, C H, 21 DE VILLE PLACE, CHRISTCHURCH	ZL3AID	HAWKSLEY, K A, 4 WINCHFIELD ST, CHRISTCHURCH 8007
ZL3ACD	BATCHELOR, G W, 41 KIRKWOOD AVE, CHRISTCHURCH	ZL3AIK	TAYLOR, D A, 34 MACKENZIE DRIVE, TWIZEL
ZL3ACE	DODGSHUN, J C, 10 DEVONPORT LANE, CHRISTCHURCH	ZL3AIV	ROWLANDS, R J, 6 CENTENNIAL AVENUE, RICCARTON, CHRISTCHURCH
ZL3ACF	RICHARDSON, J T, 3 MONOWAI CRES, CHRISTCHURCH	ZL3AIX	TILLMAN, E S, 19B MULBERRY PLACE, CHRISTCHURCH 8005
ZL3ACH	WHITE, D J, 1 PITMAN PLACE, WAIMATE	ZL3AJ	MCDONALD, K R, 68 INWOODS RD, QUEENSPARK, CHRISTCHURCH 9
ZL3ACL	BIDLAKE, R P, 24 JAMES ST, TIMARU	ZL3AJA	KEELEY, L J, 35 WILLS ST, ASHBURTON
ZL3ACM	ZAMPESE, M J, 105 ELLICOTT RD, HAMILTON	ZL3AJB	BRACE, A J, 14 QUEEN ST, WESTPORT
ZL3ACN	HONEY, R M, 167 BRITTEN ST, HOKITIKA	ZL3AJE	ROBBINS, D J, 66 ACACIA AVE, CHRISTCHURCH 4
ZL3ACP	SENIOR, G J, HOLME STATION, R D 2, TIMARU	ZL3AJW	WILDS, J R, P O BOX 130115, ARMAGH STREET, CHRISTCHURCH
ZL3ACS	BORGFELDT, C D, 37 BLANKNEY ST, CHRISTCHURCH	ZL3AK	ROWE, D J, 10 MARAMA CRES, CHRISTCHURCH
ZL3ACU	MCKAY, B, 23 PALMSIDE ST, CHRISTCHURCH	ZL3AKM	GLASSEY, R B, 63 NORTHCOTE ROAD, CHRISTCHURCH 8005
ZL3AD	DAVIDSON, A H, 804 OXFORD RD, RD 1, RANGIORA	ZL3AL	SMYTHE, G C, 20 GLEN CULLEN DRIVE, BISHOPDALE, CHRISTCHURCH 8005
ZL3ADB	CRASE, G E, 59 WAKEFIELD ST, WESTPORT	ZL3AM	PARK, S, 8 BAINTON STREET, BISHOPDALE, CHRISTCHURCH
ZL3ADC	LINTOTT, N, 49 JOCELYN ST, CHRISTCHURCH	ZL3AMP	PALMER, A M, C/O MARK FEARY, 9 GRANGE PARK AVE, PARAPARAUMU
ZL3ADF	HIRTZEL, J E, 451 GREERS RD, CHRISTCHURCH	ZL3AN	MCLEAN, J L, P O BOX 886, TIMARU
ZL3ADG	BURNSIDE HIGH SCHOOL RADIO CLUB, GREERS RD, CHRISTCHURCH	ZL3AO	BELL, M W, 203 WESTON RD, CHRISTCHURCH
ZL3ADH	BOOTE, R J, 8 HINTON RD, GREYMOUTH	ZL3AP	WHITFIELD, S J N, 48 HAWTHORNDEN RD, CHRISTCHURCH
ZL3ADJ	JENNINGS, L W, 5 BIRCHS ROAD, PREBBLETON	ZL3APP	PARKYN, P R, 4 WITHAM ST, HORNBY, CHRISTCHURCH 8004
ZL3ADL	WISE, R A, F/29 HARMON COURTS, 85 POULSEN ST, CHRISTCHURCH 2	ZL3AQ	MATTINGLEY, G T, 89 CREEK RD, ASHBURTON
ZL3ADO	DOLAMORE, C J, 50 OHOKA MEADOWS DRIVE, MANDEVILLE, RD 2 KAIAPOI	ZL3AR	MAY, A P, PO BOX 261, TIMARU
ZL3ADP	MACDONALD, D C, 221 MIDDLE RD, ASHBURTON	ZL3ARC	CHRISTIE, ALISTAIR, 3 RHYL PLACE, BRYNDWR, CHRISTCHURCH
ZL3ADQ	HAMILTON, J C, 12 HIGHCREST HEIGHTS, WESTMORLAND, CHRISTCHURCH 8002	ZL3ARJ	ADAMS, R J, 30 WESLEY ST, KAIAPOI
ZL3ADS	SQUIRE, D D, 15 ALEXANDRA ST, TEMUKA	ZL3AS	MURRAY, A G,
ZL3ADT	JOHNSON, R D, 15 REGENT AVENUE, RANGIORA	ZL3AT	THOMAS, A L, 50 ROSE STREET, PARKSIDE, TIMARU
ZL3ADV	PHILLIPS, R W, 31 APPLEBY CRES, CHRISTCHURCH 8005	ZL3ATV	O'BRIEN, C M, 104 ESTUARY RD, CHRISTCHURCH 7
ZL3ADZ	WIGNALL, T J S, 8 MARQUESS AVENUE, HALSWELL, CHRISTCHURCH 8003	ZL3AV	BLYTH, D, 1 WAINSCOTT ST, GREENMEADOWS, NAPIER
ZL3AE	MAY, S J, 156 PAGES RD, TIMARU	ZL3AW	PHILLIPS, M A, NSW, SIDING SPRING OBSERVATORY, COONABARABRAN, NSW 2357
ZL3AF	ASHBURTON BRANCH NZART, AVIATION MUSEUM ASHBURTON AIRPORT SEAFIELD ROAD, ASHBURTON	ZL3AX	WISE, M, 440 TUAHIFI ROAD, RD1, KAIAPOI
ZL3AFB	STIRLING, K W, 37 KELVIN CRES, ASHBURTON	ZL3AZ	RAYNER, D A, 29 THOMSON STREET, TINWALD, ASHBURTON 8300
ZL3AFC	SIMPSON, P R, PO BOX 164, HOKITIKA, CHRISTCHURCH 8005	ZL3BA	CARSHALTON, M D, 7 CHECKETTS AVENUE, HALSWELL, CHRISTCHURCH
ZL3AFE	ZAMPESE, L, 105 ELLICOTT RD, HAMILTON	ZL3BAB	ACKROYD, B E I, ACKROYD RD, WAIHOI, RD 25, TEMUKA
ZL3AFH	LATHAM, W I, 168 MACKENZIE AVE, CHRISTCHURCH	ZL3BAW	WRIGHT, B A, 64 TENNYSON STREET, CHRISTCHURCH 2
ZL3AFI	DALTON, T P, 41 CHARLES UPHAM AVENUE, HILLMORTON, CHRISTCHURCH	ZL3BB	GRAY, G W, 31 DENNISTON CRES, REDWOOD, CHRISTCHURCH
ZL3AFN	GRIFFITHS, J P, 54 FERRY ROAD, SPRING CREEK, BLENHEIM	ZL3BC	CAMPBELL, B M, 37A COMPTON ST, WOOLSTON, CHRISTCHURCH
ZL3AFQ	DUXBURY, I N, STEPHENS BAY, RD 2, MOTUEKA 7161	ZL3BCO	HOUGHTON, B, 1/10 SHELBOURNE STREET, NELSON 7001
ZL3AFS	PEARCY, E A, 239 CONDELL AVE, CHRISTCHURCH	ZL3BCR	ROWE, B C T, P O BOX 12, KIRWEE
ZL3AFV	HENDEN, J R, 371 HAREWOOD ROAD, BISHOPDALE, CHRISTCHURCH		

ZL3BD	DORE, B L, 66A COTTONWOOD ST, PARKLANDS, CHRISTCHURCH	ZL3DJ	GILL, M E, RIVER RD, GREENPARK RD 2, CHRISTCHURCH
ZL3BE	EMMETT, B A, FLAT 2, 144 BEACH RD, NORTH NEW BRIGHTON, CHRISTCHURCH 8009	ZL3DB	BISSLAND, DAVID, 12 HIGHGATE AVENUE, FENDALTON, CHRISTCHURCH
ZL3BG	HIMING, L C, 23 COOPERS RD, CHRISTCHURCH	ZL3DJW	WRIGHT, D J, 3A LOCHMORE STREET, HAREWOOD, CHRISTCHURCH 8005
ZL3BGD	Drumm, Brian, 3 Swithland Place, Avonhead, Christchurch	ZL3DK	GODFREY, C Y, RD 2, KAIKOURA
ZL3BI	BRICE, K L, 18 COLLEGE AVE, CHRISTCHURCH	ZL3DL	BARKER, L G.
ZL3BJ	Dougan, William John, 110 Jeff Drain Road, R D 2, Kaiapoi	ZL3DM	MCGUIRE, D H, 14 SNELL CRES, WAIHI BEACH
ZL3BK	CHAPMAN, B K, 17 CUBA STREET, CARLTON HILL, DUNEDIN 9001	ZL3DH	Hart, Douglas, Flat 1, 47 London Street, Richmond, Christchurch
ZL3BM	MEANS, C B, 1318 BLYTHE RD, RD 3, CHEVIOT	ZL3DO	O'MALLEY, D B, 72 CROFTON RD, CHRISTCHURCH
ZL3BMW	WATERS, B M T, 81B EASTERN TCE, CHRISTCHURCH	ZL3DON	CAMPBELL, D R, 244 FERRY RD, LINWOOD, CHRISTCHURCH
ZL3BN	BELLINI, B C, 98A QUEENS RD, GLEN AVON, NEW PLYMOUTH	ZL3DP	MEIKLE, B,
ZL3BOB	GORDON, R A, PO BOX 14, LYTTELTON, CHRISTCHURCH 8033	ZL3DR	GODFREY, R J, RD 2, MAIN SOUTH RD, KAIKOURA
ZL3BP	MOUNTFORD, T G, F2/207A OTIPUA RD, TIMARU	ZL3DRM	MACER, D R J, 31 COLWYN ST, CHRISTCHURCH
ZL3BQ	URLWIN, A J, PO BOX 259, WANAKA, DUNEDIN 91192	ZL3DS	BREWSTER, D W,
ZL3BRB	BENNETT, B, 19 KINTARE ROAD, R D 1 CIRCLE HILL, MILTON	ZL3DT	SEARLE, G, 8 SCORESBY STREET, OPUA, BAY OF ISLANDS
ZL3BRC	REEFTON-BULLER BRANCH NZART, 42 DOMETT ST, WESTPORT	ZL3DU	BETTRIDGE, M J, 2 COOK ST, CARTERS BEACH, WESTPORT
ZL3BS	TWEEDIE, S B, 167 WALES ST, CHRISTCHURCH	ZL3DV	JEFFERIS, E W, 4 CUNNINGHAM ST, LEESTON 8151
ZL3BSH	RICHARDS, P D, 162 HIGH ST, WAIMATE 8791	ZL3DW	BARRON, A D, 124 ST JAMES AVE, CHRISTCHURCH
ZL3BT	WHITE, E I, 95 ABBEY CRES, ST ALBANS, CHRISTCHURCH 1	ZL3DWM	Morrison, Donald, 5 Whitch Place, Kaikoura 7300
ZL3BV	WILKINSON, B V, 102 GRAFTON STREET, PHILLIPSTOWN, CHRISTCHURCH	ZL3DWS	SEARLE, D, PO BOX 20-256, BISHOPDALE, CHRISTCHURCH
ZL3BW	BURT, G L, PO BOX 215, KATIKATI	ZL3DX	MCGEE, W H, 116 B HIGHSTED RD, CHRISTCHURCH
ZL3BX	PATTRICK, B L, 1 KANUKU PLACE, CASHMERE, CHRISTCHURCH 2	ZL3DY	FIRMAN, R K, 1/8 HOPKINS STREET, TIMARU
ZL3BY	HALFORD, B B, 37 MCHARDIE ST, WALLACEVILLE, UPPER HUTT 6007	ZL3DYL	CROKER, J H, C/O WAIMANGAROA POST, VIA WESTPORT
ZL3BZ	JOHNSON, C, 17 HILLVIEW PLACE, PLEASANT POINT	ZL3DZ	THOMSON, G, 103 PALMERS RD, NORTH BEACH, NEW BRIGHTON
ZL3CA	SANDFORD, T W, 219 JOHNS RD, HAREWOOD, CHRISTCHURCH 8005	ZL3FB	THOMSON, 1 NGAIO STREET, MACANDREW BAY, DUNEDIN
ZL3CAN	HOWELL, H G M, 12A SALFORD AVE, CHRISTCHURCH 8005	ZL3FG	O'NEILL, J J, 26 MCBRATNEYS RD, CHRISTCHURCH
ZL3CAR	CANTERBURY AMATEUR RADIO DEVELOPMENT SOCIETY INCORPORATED, PO BOX 218, CENTRAL CITY, CHRISTCHURCH	ZL3FI	OLSEN, F B,
ZL3CAT	KINGSBURY, BRUCE, 23 Oxford Street, Claudlands, Hamilton	ZL3FJ	BROWN, D A, 62 HUDSON ST, CHRISTCHURCH
ZL3CB	FLECKNOE, G A, 6 KYEBURN PLACE, CHRISTCHURCH	ZL3FK	HEPBURN, L D, 305/21 Fairview Ave, Albany, Auckland
ZL3CD	MOYLE, J R, 68C CYLDE RD, CHRISTCHURCH	ZL3FM	BATEMAN, N E, 44 JOLLIES PASS RD, HANMER SPRINGS
ZL3CDM	MACKIE, C D, 67 SULLIVAN AVENUE, OPAWA, CHRISTCHURCH	ZL3FN	WILSON, R J, 11 HIGH ST, GREYMOUTH
ZL3CE	HEWSON, J N, 69/150 Williams Street, Kaiapoi	ZL3FO	BLACKMORE, J H, 364 RIVERLAW TCE, CHRISTCHURCH
ZL3CED	DAWSON, C E S, 26 TARANAKI DV, WOODEND 8265	ZL3FP	KYLE, E A J, C/O PJ ROGERS, 413 CASHMERE RD, CHRISTCHURCH 3
ZL3CG	SILVERWOOD, K, WAIMANGAROA, VIA WESTPORT	ZL3FR	NIXON, M A, 3 HOLMWOOD ROAD, FENDALTON, CHRISTCHURCH
ZL3CH	COOK, H P, UNIT 5 / 16 WANAKA PLACE, MAIREHUA, CHRISTCHURCH	ZL3FRI	YAMADA, K, 5 LYNWOOD TERRACE, BISHOPDALE, NELSON
ZL3CJ	PARKER, T L, 36 SHEFFIELD CRES, CHRISTCHURCH	ZL3FS	SMALL, F A A, 49 HEATHCOTE ST, WOOLSTON, CHRISTCHURCH
ZL3CJH	HARRIS, C, FLAT 6,126 ORANGI KAUPAPA RD, NORTHLAND, WELLINGTON	ZL3FT	CLAPHAM, T S, 206 PLATEAU RD, UPPER HUTT
ZL3CJS	SHUKER, C J, 163A KITCHENER ROAD, PUKEKOHE	ZL3FU	MCPHAIL, T K, 7 OSTEND PLACE, CHRISTCHURCH
ZL3CK	SEAY, M R,	ZL3FV	HINES, M J, 154 BRITTAN STREET, HOKITIKA
ZL3CL	LOVELL-SMITH, C D, 423 CASHMERE ROAD, WESTMORLAND, CHRISTCHURCH	ZL3FW	O'BRIEN, J R, 68A WINDERMERE RD, PAPANUI, CHRISTCHURCH
ZL3CLG	GOOD, C L, 81 AVENUE ROAD, HIGHFIELD, TIMARU	ZL3GA	CLARK, G D, 38A SNEYD ST, KAIAPOI
ZL3CM	BURRELL, K M, 5 JACARANDA GROVE, LOWER HUTT	ZL3GB	BRYANT, H G H, 46 WARD ST, KAIKOURA
ZL3CN	MANTELL, G N, 39 COOK DRIVE, WHITIANGA	ZL3GBO	GAULAND, AIDAN, 278 BROWNS ROAD ROAD, R D, OXFORD
ZL3CO	WYLIE, P B, 101 ENGLEFIELD RD, CHRISTCHURCH	ZL3GC	BAKER, D M, 534 NEWNHAM ROAD, WISHART, QLD 4122, BRISBANE, AUSTRALIA
ZL3COL	ROWE, C G, 20 KINGSBURY AVE, RANGIORA	ZL3GD	DONOVAN, G J, C/- PO BOX 56404, DOMINION ROAD, AUCKLAND
ZL3CP	PATERSON, C, 31 WORSNAP WAY, RD4, ALBANY, AUCKLAND	ZL3GE	WELFORD, A R, 12 DEVON ST, TIMARU
ZL3CR	SMITH, W E, 9 WOLSEY PLACE, HILLMORTON, CHRISTCHURCH 8002	ZL3GG	BERRY, R D E, UNIVERSITY OF CANTERBURY EEE DEPT, PRIVATE BAG 4800, CHRISTCHURCH
ZL3CS	DOWNER, G H, 29A GRANGE ST, OPAWA, CHRISTCHURCH 8002	ZL3GH	Hammond, Gary, P O Box 36019, Merivale, Christchurch
ZL3CSB	WONG, K K, 42 WAIMAIRI RD, ILAM, CHRISTCHURCH	ZL3GJX	CROSS, G J, 167 WARDS ROAD, RD1, RANGIORA
ZL3CT	BENNETT, R S, 67 ARONUI RD, ALEXANDRA	ZL3GK	ADAMS-RICHARDSON, C W, 3164 STATE HIGHWAY 6, HAVELOCK
ZL3CTN	SCOTT, M J, 9 RENOIR AVE, BELMONT, LOWER HUTT	ZL3GL	MAY, G D, 156 PAGES RD, TIMARU
ZL3CU	MOFFATT, S Z, 17 WAYSIDE AVE, CHRISTCHURCH 8005	ZL3GM	PIMM, O W, 50 OHOKA MEADOWS DRIVE, MANDEVILLE, RD 2 KAIAPOI
ZL3CV	BATES, C, 44 MAXWELL STREET, RICARTON, CHRISTCHURCH	ZL3GN	BENNETT, R B, 19 KINTARE ROAD, CIRCLE HILL, R D 1 MILTON
ZL3CW	CALVO, J, 31 RAURENGA AVE, EPSOM, AUCKLAND	ZL3GO	SCOTT, T R, 65 WINTER STREET, ASHBURTON
ZL3DA	JOHNSON, D A, 56 THORPE STREET, MOTUEKA	ZL3GP	MIDDLEMISS, P G, 17 DE BLOGE PLACE, BURWOOD, CHRISTCHURCH
ZL3DAC	CROKER, K J, MAIN ROAD, BIRCHFIELD, WAIMANGAROA	ZL3GR	ROWE, N L,
ZL3DAT	CULLEN, L, 46 WILTON CRES, CHRISTCHURCH	ZL3GS	WRIGHT, G M, 25 DUNEDIN ST, CHRISTCHURCH
ZL3DB	BUSCHL, B D, C/O SORENSEN, 62 SHORTLAND ST, Wainoni, CHRISTCHURCH 8006	ZL3GT	SOMERVILLE, J H, 6 HORIZON HEIGHTS, REDCLIFFS, CHRISTCHURCH 8008
ZL3DC	GRINDROD, R J, 309 LETHBRIDGE ROAD, R D 9, FEILDING	ZL3GV	KERDEMELIDIS, T, 421 WORCESTER ST, CHRISTCHURCH
ZL3DD	MITCHELL, A R, 55 SHOREHAM ST, BLOCKHOUSE BAY	ZL3GW	SEARLE, V, 7 WHITCOMBE TCE, HOKITIKA
ZL3DES	THOMAS, D J, 90 ALLENS RD, ASHBURTON	ZL3GX	CHAPMAN, A S, 7 DELLOW PLACE, CHRISTCHURCH 8024
ZL3DF	ELLIS, M R, P O BOX 24259, EAST LINWOOD, CHRISTCHURCH	ZL3GY	WESTLAND BRANCH NZART, MR G B HAY, 37 CHAPEL STREET, GREYMOUTH
ZL3DGW	WARD, D G, P O BOX 201-180, AUCKLAND AIRPORT, SOUTH AUCKLAND 1730	ZL3GZ	SMITH, H E, 38 PERCY STREET, BLENHEIM
ZL3DH	HARDIE, W S, 245A HAREWOOD RD, CHRISTCHURCH	ZL3HAM	BUCKLAND, A, 3100 TRAM ROAD, BENNETTS, R D OXFORD 8253
ZL3DI	TYLEE-PORTER, G J, 62 BROAD ST, SOUTHBIDGE		

ZL3HB

ZL3HB	DEANS, R H, 1382 TRAMWAY ROAD, DUNSDANDEL, RD 2, LEESTON 8151, CANTERBURY	ZL3KM	DAUFELDT, J, C/- STUART THOMAS, BANK NEW ZEALAND, P O BOX 1461, CHRISTCHURCH
ZL3HC	BRITTENDEN, C E R, 329 WAINONI RD, CHRISTCHURCH	ZL3KO	GARLOUGH, R H, PO BOX 7, CLYDE 9180
ZL3HD	CHAMBERS, D H, 5 STILES PLACE, CHRISTCHURCH	ZL3KP	MOYLE, C M, 68C CLYDE RD, CHRISTCHURCH
ZL3HF	MCDONALD, B M, 43 RIMU ST, TIMARU	ZL3KQ	HELLYAR, G I, 93 MARSHLANDS RD, CHRISTCHURCH 8006
ZL3HG	DAVY, K T, 75 DURHAM ST, RANGIORA 8254	ZL3KR	HUGHES, A G,
ZL3HGB	BOUWKNEGT, H G, 35 ELIZABETH ST, C/- PDC, CAVE 8770	ZL3KS	DOWNER, M H, PO BOX 83, KIRWEE 8170
ZL3HH	KIMURA, K, 56 ROCKING HORSE ROAD, SOUTHSHERE, CHRISTCHURCH	ZL3KSM	MUNFORD, K S, 77 DOVER RD, FLAXMERE, HASTINGS 4201
ZL3HHS	KIMURA, C/O CHRISTIAN ECKHOFF, PO BOX 5, RUSSELL	ZL3KT	BROMLEY, K M, 9 ARCHER PLACE, CARTERS BEACH, WESTPORT
ZL3HI	HIDER, D D,	ZL3KU	WATERS, K A, 22 BURNETT ST, TIMARU
ZL3HN	HOLTUM, J W, 461 JOHNS RD, CHRISTCHURCH	ZL3KV	BROWN, H H, 7 WESTBURN TCE, ILAM, CHRISTCHURCH
ZL3HP	HOVING, P, 24 ROYAL PARK DRIVE, CHRISTCHURCH 8009	ZL3KW	WILLIS, K M, 5 WISTERIA PLACE, QUEENSPARK, CHRISTCHURCH
ZL3HQ	CRAIG, T M, 9/12 MARU RD, TAKANINI, AUCKLAND	ZL3KWH	HEYWARD, K W, 46 YELLOWSTONE CRES, CHRISTCHURCH
ZL3HU	SANDFORD, B D, 19-A MONS AVE, MT ROSKILL, AUCKLAND 1004	ZL3KX	Sinclair, M, 109 Gardiners Road, Harewood, Christchurch
ZL3HW	WALLACE, C W, 36 REMPTON DRIVE, HALSWELL, CHRISTCHURCH 8003	ZL3LA	LUDBROOK, S W, 175A PALMERS RD, CHRISTCHURCH 9
ZL3HY	FLEMING, J G, PO BOX 18-714, CHRISTCHURCH	ZL3LE	GUARD, B N, CRONADUN, R D 1, REEFTON
ZL3HZ	SOUTHGATE, W A, 7 PAEROA ST, CHRISTCHURCH	ZL3LI	NEAL, J V, 118 BUDGE STREET, BLENHEIM
ZL3IA	TYERMAN, P F, 37A PENRITH AVENUE, SOMERFILED, CHRISTCHURCH	ZL3LIZ	BUCKLAND, E M, 3100 TRAM ROAD, BENNETTS, R D OXFORD 8253
ZL3IB	WALKER, J R L, 19 ATHOL TCE, CHRISTCHURCH	ZL3LJ	JORDAN, L P W, C/O S & R SMITH, PIGEON FLAT, R D 2, WAITATI
ZL3IC	MCCULLOCH, E N, 5 POWELLS ROAD, OXFORD	ZL3LJC	OSBORNE, R, CAMP DAVID, RD 3, WAIPARA
ZL3IDA	ANDREWS, I D, PO BOX 31003, ILAM, CHRISTCHURCH	ZL3LL	OSBORNE, P O BOX 32 060, CHRISTCHURCH
ZL3IE	HOPKINSON, L G, WINDSOR HOUSE, PO BOX 27091, CHRISTCHURCH 6	ZL3LM	MORRISON, L I, 37 ARUN STREET, OAMARU
ZL3IEH	HYDE, I E, 26 AYLMERS VALLEY RD, AKAROA 8161	ZL3LOU	MARSH, L, 31 MILL ROAD, WAIMATE
ZL3IG	ROSS, P J, 4 OAKFIELD ST, CHRISTCHURCH	ZL3LP	BROWN, H P, 8 NEILL ST, CHRISTCHURCH
ZL3IH	DUFF, I H, 54 Early Valley Rd, Lansdowne, RD2, CHRISTCHURCH	ZL3LQ	PALTRIDGE, K K, 131 WARRINGTON ST, CHRISTCHURCH
ZL3II	POTTER, A R, 60 MATHESONS RD, CHRISTCHURCH	ZL3LR	LEE, P B, 62 WINGATE ST, REDWOOD, CHRISTCHURCH 8005
ZL3IJ	INGLIS, J M, 288 ESTUARY RD, CHRISTCHURCH	ZL3LS	MILLER, G C, 42 GIBBS DRIVE, WOODEND, CHRISTCHURCH 8255
ZL3IM	SULLIVAN, J T, 34 ROLLESBY ST, CHRISTCHURCH	ZL3LSP	HAMBURG, A C, 39B NORMAN SENN AVENUE, KAITAIA
ZL3IN	SAVILLE, P G, 3 RYDAL STREET, CHRISTCHURCH 8002	ZL3LX	KIRKPATRICK, I J, 26 Birkdale Drive, Fairway Drive, CHRISTCHURCH 8008
ZL3IS	OKA, N, C/O MR MW BELL, 203 WESTON RD, CHRISTCHURCH 8005	ZL3LZ	DALE, A J E, 7 BRADSHAW TCE, RICCARTON, CHRISTCHURCH
ZL3IU	GRAY, N C, 203 SEAFIELD ROAD, SMITHFIELD, ASHBURTON	ZL3MA	KINGSWELL, G N, 333 KING ST, TEMUKA
ZL3IX	SMITH, G, 995 LOWER STYX ROAD, BROOKLANDS, CHRISTCHURCH 8009	ZL3MAC	Crosby, Mark, Drynie, R D 3, Amberley
ZL3JA	ANDERSON, J C, 191 WEST BELT, RANGIORA 8254	ZL3MAG	GAULAND, MICHAEL, 278 BROWNS ROCK ROAD, OXFORD, CHRISTCHURCH
ZL3JB	BURKE, J P, 246 MAIN NORTH RD, CHRISTCHURCH	ZL3MAT	WILSON, M D, P O BOX 10315, CHRISTCHURCH
ZL3JD	VAN KUILENBURG, P H, 45 FARRELLY AVE, MT ROSKILL	ZL3MB	BENNETT, J O, RD 3, ASHBURTON
ZL3JE	STEWART, D A, 33 KING ST, PAREORA	ZL3MD	DACOMBE, M, 20 ALLIN DRIVE, WAIKUKU BEACH, NORTH CANTERBURY
ZL3JEH	HALLIDAY, J E, 2A WINCHFIELD STREET, ARANUI, CHRISTCHURCH	ZL3ME	BRAMLEY, C J, 7 EDWARD ST, PREBBLETON, CHRISTCHURCH
ZL3JG	RAWSTORN, G J, 71 HALSWATER DRIVE, CHURTON PARK, WELLINGTON 6004	ZL3MEM	MCNAB, M E, 11 BOURNE CRESCENT, BRYNDWR, CHRISTCHURCH
ZL3JH	O'HARE, J, 45 DENMARK STREET, TEMUKA 8752	ZL3MF	FOUBISTER, M A, P O BOX 33 095, BARRINGTON, CHRISTCHURCH 8005
ZL3JI	FOULDS, L F, 45 JEROVIS ST, CHRISTCHURCH 8007	ZL3MG	URLWIN, R A, PO BOX 259, WANAKA 9192
ZL3JJ	CRUMP, M W, 66 HEWITTS RD, WOODEND 8255	ZL3MH	HELY, M O, RD 2, CHRISTCHURCH
ZL3JK	KING, J H, 45 ROBERTA DRIVE, CHRISTCHURCH 2	ZL3MJ	LEWIS, C T, 30 TE RAMA PLACE, CHRISTCHURCH
ZL3JL	MCFARLANE, A R, 88 CHALMERS AVE, ASHBURTON	ZL3MJS	STUBBERFIELD, J M, 138 RUTLAND ST, CHRISTCHURCH
ZL3JM	BENNETT, P W, 85 LEINSTER AVENUE, RAUMATI SOUTH 6010	ZL3MK	MAY, F K, 30 NIKAU PLACE, TIMARU
ZL3JMC	MCCAUGHTRY, J M, 11 Bunting Place, Woodend	ZL3ML	MCNICOL, A D, 26 GAINFORD ST, CHRISTCHURCH
ZL3JN	MUMMERY, B H, 8 MCINTYRE ST, SHIRLEY, CHRISTCHURCH	ZL3MLS	LAWSON-SEARLE, M O, 114 HOSPITAL RD, BLENHEIM
ZL3JO	JOHNSTONE, G V O, 2/28 NEW BRIGHTON RD, CHRISTCHURCH 6	ZL3MM	HILLS, R I, 25 RAPAKI RD, CHRISTCHURCH
ZL3JOE	HAMPTON, J, 34 TAMAR ST, OAMARU	ZL3MO	COLE, W R, 9 FLAX COURT, PENARTH, VALE OF GLAMORGAN, WALES CF64 2RJ
ZL3JQ	POLL, A K, 1A LANDSDOWNE TERRACE, CASHMERE, CHRISTCHURCH	ZL3MQ	MCMASTER, R J, 8 A HARRIS STREET, WAIMATE
ZL3JR	KELLY, S J C, 47 STUART & CHAPMAN DRIVE, KARORO, GREYMOUTH	ZL3MS	BRASH, J P, 5B INDIRA LANE, CASHMERE, CHRISTCHURCH
ZL3JS	SMITH, K R, 231 CHURCH ST, TIMARU	ZL3MSF	ALLAN, J J, 156 NORTH PARADE, BURWOOD, CHRISTCHURCH
ZL3JT	MCMAHON, D D, 15 HARLING ST, CHRISTCHURCH	ZL3MT	THOMPSON, M C, 18 GREENHILL MAIN ROAD, SHEFFIELD S87RD, ENGLAND
ZL3JU	SORENSEN, A G, 62 SHORTLAND STREET, WAINONI, CHRISTCHURCH	ZL3MU	GIBBS, H, 33 BUCHANAN ST, TIMARU
ZL3JV	MACGEORGE, B A, 9 OPIE ST, WAIMATE	ZL3MW	WELFORD, M R, 40 TEMPLE CRES, GLEN-ITI, TIMARU
ZL3JVX	ATHERTON, M, 116B ST MARTINS ROAD, ST MARTINS, CHRISTCHURCH 8002	ZL3MX	BURNET, A M R, 10 LEDA PLACE, NEW BRIGHTON, CHRISTCHURCH
ZL3JW	JOHNSTON, L L, 2 WAITAKI ST, CHRISTCHURCH 8007	ZL3MY	SEARLE, R W, 7 WHITCOMBE TCE, HOKITIKA
ZL3JY	STALKER, J P, RD 4, GREENPARK, CHRISTCHURCH	ZL3NA	ROBINSON, D G, RD, KOWHITERANGI, HOKITIKA
ZL3JZ	DUMBLETON, R S, 5 VILLAGE LANE, HALSWELL, CHRISTCHURCH	ZL3NAI	BATEY, S J, 408 BARRINGTON ST, CHRISTCHURCH 2
ZL3KA	MACER, D R J, 31 COLWYN ST, CHRISTCHURCH	ZL3NB	CARNEY, W J, 174 BEACH RD, CHRISTCHURCH 8009
ZL3KB	BARNSDALE, K P, 50 CARDRONA ST, CHRISTCHURCH	ZL3NC	CAMPBELL, N D, 37A COMPTON ST, WOOLSTON, CHRISTCHURCH
ZL3KC	MELSE, J, P O BOX 304, GREYMOUTH	ZL3ND	NELSON, J A, GLENAAN STATION, METHVEN
ZL3KD	HARDING, A G F, 6 BOWLINE PLACE, WHITBY	ZL3NE	GYDE, R M, 74 HILWELL DRIVE, HENDERSON, AUCKLAND 1008
ZL3KF	FISHER, K G, 7 NEPAL PLACE, CHRISTCHURCH	ZL3NG	MCVICAR, J J, 6 PEACOCK ST, CHRISTCHURCH 8001
ZL3KG	GIBBINS, K C, 56 OREGON DRIVE, MAORIBANK, UPPER HUTT	ZL3NH	ROGERS, P J, CNR CASHMERE & HAPPY HOMES RD, CHRISTCHURCH
ZL3KH	HEYWORTH, K C, 327 RIVER RD, CHRISTCHURCH 8001	ZL3NJ	KERR, N J,
ZL3KI	JACKSON, D W,	ZL3NK	WALKER, P G, 1/27 CLIVEDON PLACE, REDWOOD, CHRISTCHURCH
ZL3KJ	BANFIELD, E J, 15 REMBRANDT DRIVE, ROLLESTON, CHRISTCHURCH 8004	ZL3NL	TAIT, A M, 8 ASHBOURNE ST, CHRISTCHURCH
ZL3KJB	BAGNALL, K, 9 CARLISLE PLACE, MARCHWIEL, TIMARU		
ZL3KL	HOWELL, B C, 6 DEEPDALE ST, CHRISTCHURCH		

ZL3NO	JOHANNIS, K L, UNIT 1 BAINSWOOD, 191 KING STREET, RANGIORA 8254	ZL3RJK	KITCHEN, R J, 41 SHALAMAR DRIVE, CASHMERE, CHRISTCHURCH
ZL3NQ	DREVER, G R, 36C BURNETT ST, ASHBURTON	ZL3RK	KIRK, R M, 35 TINTERN AVE, CHRISTCHURCH 4
ZL3NR	BURNET, N J, 97 COX STREET, GERALDINE	ZL3RL	TUNNICLIFFE, D N, PO BOX 56-402, AUCKLAND 1003
ZL3NRA	HUNT, R A, CANTARA, 185 LAMBIES RD, R D 3 AMBERLEY	ZL3RLE	Ewing, Ross, 8 Haddon Lane, Harewood, Christchurch
ZL3NS	OSITIS, T, 128 BROOKSIDE TCE, CHRISTCHURCH	ZL3RM	MCKAY, R W, C/- MR M TAYLOR, 805 RIDDELL RD, ST HELIERS AUCKLAND 1005
ZL3NT	BLACKWELL, G C, F 5/82 LINCOLN RD, SPREYDON, CHRISTCHURCH 8002	ZL3RN	YEATES, D R, 69 ST ANDREWS HILL RD, CHRISTCHURCH
ZL3NW	MACKINTOSH, R M, 144 MAIN NORTH RD, RD1, KAIAPOI	ZL3RNL	RANGIORA NEW LIFE SCHOOL AMATEUR RADIO CLUB, DENCHS RD, SOUTHBROOK, RANGIORA
ZL3NX	EDGAR, M M, 34 RYDAL ST, HOON HAY, CHRISTCHURCH	ZL3RO	CARPENTER, R W, 95 CHAPEL ROAD, NORTH LOBURN R D 2, RANGIORA
ZL3NZ	DACOMBE, G N, 20 ALLIN DRIVE, WAKUKU BEACH 8254	ZL3ROB	GILKS, R, 992 NEWMANS ROAD, WEST MELTON RD 5, CHRISTCHURCH
ZL3OA	MACDONALD, B A, 24 Makepiece Place, BIRKENHEAD, AUCKLAND	ZL3ROC	ROCKEFELLER, A, 33 MIDHURST STREET, BISHOPDALE, CHRISTCHURCH
ZL3OC	SMITH, K J, 334 WAITI RD, TIMARU	ZL3RON	MCCAW, R C, 6 FARNDALE PLACE, CHRISTCHURCH
ZL3OD	BARNES, G J,	ZL3RP	TURNER, M C, 12 CAMP BAY ROAD, PURAU 8030
ZL3OE	RICHARDS, D L, 38 FRANKLEIGH ST, CHRISTCHURCH	ZL3RPS	RADIO PRESERVATION SOCIETY OF NZ (FERRYMEAD) INC, 269 BRIDLE PATH RD, CHRISTCHURCH
ZL3OF	MILNE, I F, 266A HOON HAY ROAD, CHRISTCHURCH	ZL3RQ	RIORDAN, G B, 5A GARDINERS ROAD, CHRISTCHURCH
ZL3OJ	DIGBY, N, 4 NORFOLK ST, CHRISTCHURCH	ZL3RQV	LAWRENCE, G S, C/- 2 ELM LANE, GORE
ZL3OK	DORWARD, I, HOUSE 7 BARROW RD FARM, ASHLEY RD 2, RANGIORA	ZL3RR	NORTH CANTERBURY AMATEUR RADIO CLUB, C/O SECRETARY, P O BOX 14, WOODEND
ZL3OU	BELLAMORE, A H, 87 RADLEY ST, CHRISTCHURCH	ZL3RS	CAMPBELL, D, 165 A FOREMANS RD, HORNBY, CHRISTCHURCH
ZL3OV	GILLMAN, B J E, 6 BOYD STREET, RANGIORA	ZL3RT	TAYLOR, J, 59 MACKENZIE AVE, ROIMATA, CHRISTCHURCH
ZL3OX	MITCHELL, C J, 320 MT PLEASANT RD, CHRISTCHURCH	ZL3RU	BENNETT, R G T, 60 KIRKWOOD AVE, CHRISTCHURCH
ZL3OY	DUXBURY, J, GENESIS DRIVE, WEST MELTON, R D 1, CHRISTCHURCH	ZL3RW	STEFFENSEN, K A, 10A SEFTON ST, BELFAST
ZL3OZ	OSBORNE, K W, 51 BARNES ST, GLENWOOD, TIMARU	ZL3RX	THIRKETTLE, R J, PO BOX 6396, UPPER RICARTON, CHRISTCHURCH
ZL3PAH	HOLLIDAY, P A, 275 RIVER ROAD, RICHMOND, CHRISTCHURCH	ZL3RZ	KING, S P, 2/86 ESPLANADE, CHRISTCHURCH
ZL3PC	HAINES, P C, 10 ST JOHNS AVENUE, TIMARU	ZL3RZY	VEINT, R, 197 Park Road, PALMERSTON NORTH
ZL3PD	PLUCK, R L, UNIT 3, CAMROSE VILLAGE, METHVEN	ZL3SA	GIBBS, R A, 97 LEAVER TCE, NORTH BRIGHTON, CHRISTCHURCH 9
ZL3PE	BLYTH, B W, 2 DE COURCY PLACE, AVONDALE, CHRISTCHURCH	ZL3SB	BROMLEY, S J, 9 ARCHER PLACE, WESTPORT
ZL3PH	ROWE, B, 250 GRAHAMS RD, CHRISTCHURCH	ZL3SC	SHEARMAN, G D, 68 PROCTOR ST, CHRISTCHURCH
ZL3PI	BARTRUM, B R, 31B BOWENVALE AVE, CHRISTCHURCH 8022	ZL3SE	PRINTZ, W,
ZL3PK	ALLAN, J L, 74 GOOD ST, RANGIORA 8254	ZL3SG	HARBECK, A D, MCHUGHS RD, 2 RD, KAIAPOI
ZL3PM	MCGEE, P, 1 CRAIGIEBURN ST, DARFIELD	ZL3SH	HARDIE, S R, 245A HAREWOOD RD, CHRISTCHURCH
ZL3PN	BOORER, G F, 48A NEWTON ST, TIMARU	ZL3SJ	FRASER, G J, 206 MAJOR HORNBROOK RD, CHRISTCHURCH
ZL3PO	TURNER, D K, PO BOX 99, WARD	ZL3SK	PATTRICK, T L, 116 BIRDWOOD AVENUE, CHRISTCHURCH
ZL3PP	CRICHTON, R J C, 11C ROGERS STREET, BLENHEIM	ZL3SL	PORTA, S, 27 RALEIGH STREET, BISHOPDALE, CHRISTCHURCH
ZL3PR	PETERSEN, C M, 51 DERBY ST, WESTPORT	ZL3SM	GRAHAM, B N, 230 ESPLANADE, KAIKOURA
ZL3PRJ	JACKSON, PETER, 5 LYALL TCE, TEMUKA	ZL3SMO	MAY, B D, 156 PAGES RD, TIMARU
ZL3PS	STREETER, P J, 14 MALTBY AVE, TIMARU	ZL3SN	OLDHAM, J E, 40 RUSSELL ST, WESTPORT
ZL3PT	CURRY, D R, C/- STUART THOMAS, BANK NEW ZEALAND, P O BOX 1461, CHRISTCHURCH	ZL3SO	KILKOLY, J W, 37 HASELDON ST, WESTPORT
ZL3PTB	BOWER, P T, 15 HARPER ST, TIMARU	ZL3SP	BROOKMAN, P J, 361 GARDINERS RD, CHRISTCHURCH
ZL3PTP	COLLINS, P T P, 489 AVONHEAD RD, CHRISTCHURCH 8004	ZL3SR	AVERY, F E, 66 MILL ST, WESTPORT
ZL3PW	FOSTER, P J, FLAT 1 694 AVONSIDE DRIVE, AVONSIDE, CHRISTCHURCH 8006	ZL3SS	SMALES, K A, 155 MONKS SPUR ROAD, REDCLIFFS, CHRISTCHURCH
ZL3PX	CHAPMAN, G A, 8 BOYS PLACE, CHRISTCHURCH	ZL3ST	GEORGE, A, 224 STANMORE ROAD, RICHMOND, CHRISTCHURCH
ZL3PZ	JACKSON, W B, 42 CHURCHILL ST, KAIKOURA	ZL3SU	ORCHARD, P J, 4 WILSON DRIVE, OHOKA R D 2, KAIAPOI
ZL3QA	PRENTICE, A E, SUNNINGDALE, HAMILTON RSA VETERANS HOME, FLAT 8, 174 PEACHGROVE ROAD	ZL3SV	WATSON, G L, PO BOX 262, MOTUEKA
ZL3QC	MULLIS, N A, 104 MOORAY AVE, CHRISTCHURCH 5	ZL3SZ	DALRYMPLE, D L, 65 FRANKLEIGH ST, CHRISTCHURCH
ZL3QD	CLARK, E R, 19 FARNSWOOD PLACE, REDWOOD, CHRISTCHURCH	ZL3TA	RITCHIE, M V H, FLAT 1, 313 ESTUARY RD, CHRISTCHURCH
ZL3QH	STANTON, K A, P.O. Box 31-095, Ilam, CHRISTCHURCH	ZL3TAA	FLETCHER, J N, 1186 Huia Rd., Huia, Waitakere
ZL3QI	WORNALL, C J, 5 MENLO TCE, CHRISTCHURCH	ZL3TAC	COLLINS, B A, 21 Woodside Common, Westmorland, CHRISTCHURCH 8004
ZL3QJ	HAVORD, P R, MOERAKI RD2, PALMERSTON 9061	ZL3TAF	TAEGE, B S, 16 Worthy Street, Avonhead, Christchurch
ZL3QK	DAWSON, R, 41 GARLANDS RD, CHRISTCHURCH	ZL3TAG	COOK, A J, PO BOX 5, WOODEND
ZL3QL	CARRELL, T D, 33 RYELAND AVE, CHRISTCHURCH	ZL3TAH	STEVENSON, M A, 44 PATTERSON TCE, HALSWELL, CHRISTCHURCH
ZL3QO	ALLAN, J M, 45 EGANS ROAD, 1 RD, RANGIORA	ZL3TAI	GRANDIEK, J N, 21 TUIRAU PLACE, ILAM, CHRISTCHURCH
ZL3QQ	SEED, T J, 4 WESTMONT ST, ILAM, CHRISTCHURCH	ZL3TAO	MACPHERSON, I W, 10 RHYL PLACE, BRYNDWR, CHRISTCHURCH 8005
ZL3QR	GILLMAN, G H, 6 BOYD STREET, RANGIORA	ZL3TAP	Prior, Colin, 128 Sisters Road, Parnassus, North Canterbury
ZL3QT	DELIS, J B G, 455A JOHNS RD, CHRISTCHURCH	ZL3TAR	VISSER, H K, 105 AVONDALE ROAD, AVONDALE, CHRISTCHURCH
ZL3QX	MAYO, G J L, 1048 RAPAURA ROAD, RD 3, BLENHEIM	ZL3TAT	BAKER, E J A, 2 TOTARA ST, PLEASANT POINT 8772
ZL3QY	BELCHER, E W, 7 JAMIESON ROAD, STH BEACH, GREYMOUTH 7801	ZL3TAY	ROSS, M J, 32 ZEPHYR TERRACE, R D 1, GOVERNORS BAY LYTTELTON
ZL3QZ	DANIELS, F J H, NGAKAWAU, VIA WESTPORT	ZL3TB	SOMERVILLE, J D, PO BOX 2936, CHRISTCHURCH
ZL3RA	RIACH, C D, 51 OWLES TCE, CHRISTCHURCH	ZL3TBB	BENISON, B D, RAVEN DRIVE, RD 4, CHRISTCHURCH
ZL3RAY	YOUNG, R A, 2466 SOUTH 450 EAST, BOUNTIFUL, UTAH 84010	ZL3TBC	GRENFELL, A D, 77 THREKELDS ROAD, R D 2, KAIAPOI
ZL3RB	SERRA, K C, AYLESBURY ROAD, RD 1, CHRISTCHURCH	ZL3TBD	SYMONDS, A C, 19 STYLES PLACE, CHRISTCHURCH 8006
ZL3RC	SIGNAL, C B, 8 BRIDGE ST, TEMUKA	ZL3TBE	PRITCHARD, D V, 16A WHITE STREET, TIMARU
ZL3RCR	KAUTZ, R C, 5 HAMEL LANE, KAIAPOI	ZL3TBG	ONEILL, T J, 89 PAGES RD, CHRISTCHURCH
ZL3RD	DAVEY, D R, 7 WESTVIEW CRES, WEST MELTON RD 6, CHRISTCHURCH	ZL3TC	COBB, P B, 2 WEYMOUTH GROVE, ARAKURA, WAINUIOMATA 6008
ZL3RDH	HENEY, R D, 22A OTIPUA RD, KENSINGTON, TIMARU	ZL3TCB	BROADHURST, C C, 649 GLOUCESTER STREET, LINWOOD, CHRISTCHURCH
ZL3RE	BOTT, R A, 9 HOLMCROFT COURT, CHRISTCHURCH 8002		
ZL3REW	WILLIAMS, R E, 61 ELIZABETH STREET, ASHBURTON		
ZL3REX	HANCOCK, R A, 24 FAIRFAX STREET, MURCHISON		
ZL3RF	DICKEY, C N, 31 SAILS STREET, PAPANUI, CHRISTCHURCH		
ZL3RG	ROBERTS, G R, P O BOX 9127, ADDINGTON, CHRISTCHURCH		
ZL3RHP	Prosser, Richard, 121 Dunbars Rd, Halswell, Christchurch		
ZL3RI	BOYES, J B, 6 DENLEY GARDENS, AVONHEAD, CHRISTCHURCH		
ZL3RJ	HUTTON, B G, 23 MANHIRE ST, CHRISTCHURCH		

ZL3TCD

ZL3TCD DALTON, T P, 41 CHARLES UPHAM AVENUE,
HILLMORTON, CHRISTCHURCH
ZL3TCG DEANS-SYDDALL, J M, C/- 32 GRAFTON STREET,
PHILLIPSTOWN, CHRISTCHURCH 8001
ZL3TCK SANDS, A J, C/- P O BOX 21188, EDGEWARE,
CHRISTCHURCH
ZL3TCL LIGHTBOWN, C P, 34 BELLA ROSA DRIVE, HEI HEI,
CHRISTCHURCH
ZL3TCM RAMSEY, R B, 31 ROLLESBY ST, CHRISTCHURCH
ZL3TCV GARRAWAY, W A, 120 WARREN CRES, CHRISTCHURCH
ZL3TCW STANDEVEN, E R, 24 BRYNLEY ST, HORNBY,
CHRISTCHURCH
ZL3TD DEAN, T, 5 NATHAN AVENUE, PARAPARAUMU BEACH,
PARAPARAUMU
ZL3TDD MARKS, J W J, 20 DOBSON ST, CHRISTCHURCH
ZL3TDF SMITH, B A, CHARODALE, OLD WEST COAST ROAD RD1,
CHRISTCHURCH
ZL3TDR ROBERTSON, D L, 15B PATEKE PLACE, LINWOOD,
CHRISTCHURCH
ZL3TDS TAYLOR, E G, 24 STALKERS ROAD, WOODEND BEACH,
RD 1, KAIAPOI
ZL3TDY CAVILL, J P, 1 EVERGREEN CRESCENT, HERETAUNGA,
UPPER HUTT 6007
ZL3TEC Harrison, S J, 107 Kippenberger Ave, Rangiora
LEU, E T-C, 19 CAMROSE PLACE, ILAM, CHRISTCHURCH
ZL3TFD RHODES, D, PO BOX 125, AKAROA
ZL3TFI WRIGHT, B A, 64 TENNYSON STREET, CHRISTCHURCH 2
ZL3TFJ LUNDY, R J, 10 ALPERS PLACE, HILLMORTON,
CHRISTCHURCH 8002
ZL3TFK WEIR, R G, 64A SELWYN ST, CHRISTCHURCH
ZL3TFM SMITH, B D, 88C CLYDE ROAD, FENDALTON,
CHRISTCHURCH
ZL3TFN WOOD, K L B, 126 PIKARERE ST, TITAH BAY
ZL3TFQ LEWIS, R L
ZL3TFW VAN TIL, H J, 128A ST JAMES AVE, CHRISTCHURCH
8005
ZL3TFY TIZZARD, R W, 9 CHEVY PLACE, CHRISTCHURCH
ZL3TG COPLAND, G M, 38 HALTON ST, CHRISTCHURCH 5
ZL3TGB GRAHAM, J C, 4 NGAUTAMA RD, PT HOWARD, LOWER
HUTT 6008
ZL3TGF RAE, P D, 28 Beatrice Place, Avonhead, Christchurch
ZL3TGG GROOM, C B G, 18 QUEENS AVE, WAIKUKU BEACH 8254
ZL3TGN NALDER, G W,
ZL3TGR TIMEWELL, I D, PO BOX 706, TIMARU
ZL3TGS OLIVER, A J, FLAT 2 32B HUNTSBURY AVE,
CHRISTCHURCH 2
ZL3TGV WINSLADE, R H, 15 HUNT ST, TIMARU
ZL3TGX HENRY, D H, 34 ALEXANDRA ST, CHRISTCHURCH
ZL3THB CREE, R A, 14 PLAINS VIEW, MT PLEASANT,
CHRISTCHURCH
ZL3THI WEALLEANS, G A, 37 EGLINTON ST, CHRISTCHURCH
8007
ZL3THP PLATT, R G, 0816 JONES ROAD RD 5, ROLLESTON
ZL3THQ CORBETT, R K, 256 JOWERS ROAD, RD 6,
CHRISTCHURCH
ZL3THW CORBETT, PO BOX 38078, CHRISTCHURCH
ZL3TIK RODGERS, P N, 29 PORTER ST, ASHBURTON
ZL3TIL ERRINGTON, J G, 15 RODERICK ALLEYN LANE, PAPANUI,
CHRISTCHURCH
ZL3TIQ MCCORKINDALE, D R,
ZL3TIV VAN HOOF, IVAN,
ZL3TIW PLATT, B J, 0816 JONES ROAD RD 5, ROLLESTON
ZL3TIX STEVENS, J B, GENESIS DRIVE, R D 1, WEST MELTON
8021
ZL3TJ WILSON, P J, 107 SEATOUN HEIGHTS RD, MIRAMAR,
WELLINGTON 6003
ZL3TJA THOMSON, D A J, PO BOX 212, TIMARU
ZL3TJC BRIGGS, N E, 124 RIVERSIDE DRIVE, WHAKATANE
ZL3TJF KING, T J, 95 HOON HAY RD, CHRISTCHURCH
ZL3TJH ROBINSON, P J, 10 TAKAHE DRIVE, CHRISTCHURCH 2
ZL3TJJ WARD, A J, 178 BRIDLE PATH RD, CHRISTCHURCH
ZL3TJL LYE, R D, 7 CROMER PLACE, CHRISTCHURCH
ZL3TJM DILLON, G A, P O BOX 28-164, CHRISTCHURCH
ZL3TJN HILLS, M P, HALCOMBE ROAD, R D 5, FEILDING
ZL3TJS WHITFIELD, B W, 14 MARRINER STREET, SUMNER,
CHRISTCHURCH 8008
ZL3TJU MCCONNELL, M M, 111 GARDINERS RD,
CHRISTCHURCH
ZL3TJV OSBORNE, K W, 51 BARNES ST, GLENWOOD, TIMARU
ZL3TJW RICKARD, B S,
ZL3TJX LAUGHTON, T J, 32 WOOSIDE COMMON,
CHRISTCHURCH 8002
ZL3TJY ALLAN, S E, EGANS RD, RD 1, RANGIORA
ZL3TK MARTIN, D F, C/- DIXON HOUSE, BRUNNER STREET,
GREYMOUTH 7801
ZL3TKA GUMBRELL, C B, 17 ROPATA CRES, BOULCOTT, LOWER
HUTT
ZL3TKB Butcher, Kim, 10 Raven Drive, RD 4, Christchurch
ZL3TKI EMPSON, T M, PO BOX 13-076, CHRISTCHURCH
ZL3TKQ MCINNES, G W, SYSTEMS 90, 18 BIDWELL PLACE,
CHRISTCHURCH 3

ZL3TKR DWYER, D S, 5 ZENA PLACE, BURWOOD,
CHRISTCHURCH
ZL3TKV LANG, A N, 62 RAHERA ST, CHRISTCHURCH
ZL3TKX PATTERSON, H W, 33 LEINSTER TCE, LINCOLN
GRUMBALL, P J, 52 NEWNHAM ST, RANGIORA
PATERSON, M S, 120 HASTINGS ST EAST,
CHRISTCHURCH
ZL3TLA O'DONNELL, L A, 39 MELTON ST, TIMARU
ZL3TLB CRAWFORD, C R, 89 JOSEPH BANKS DRIVE, WHITBY,
WELLINGTON
WEIR, D R, 64A SELWYN ST, CHRISTCHURCH
MCCONNELL, D A, 111 GARDINERS RD, CHRISTCHURCH
DIGBY, C M, 4 NORFOLK ST, CHRISTCHURCH
HARRALL, E D, 90 GAYHURST RD, CHRISTCHURCH
HARRALL, 442 PINE HILL RD, DUNEDIN
PERRY, S J, 31 FUSILIER ST, CHRISTCHURCH
VICKERS, L W, 17 WALKERS RD, LYTTELTON
BUCHANAN, W A, 10 MCGOWAN STREET, RUNANGA, VIA
GREYMOUTH
ZL3TMB BARNES, M S, PO BOX 218, CHRISTCHURCH
WILSON, J O, 15 BARNHILL CRES, PAPAKURA,
AUCKLAND
WILSON, D A, 58 LANE ST, ALLENTON, ASHBURTON
ZL3TML ATTEWELL, D R, 40 BUCHANANS RD, CHRISTCHURCH
8004
ZL3TMQ POT, M J, 6 TE KTEROA GROVE, WELLINGTON 4
ZL3TMS SEAY, M G, PO BOX 7405, CHRISTCHURCH
ZL3TMT SULLIVAN, B, 155 SHORTLAND ST, CHRISTCHURCH
ZL3TN DOWLING, D W,
ZL3TNC ANDREW, E D B, 448B HAREWOOD RD, BISHOPDALE,
CHRISTCHURCH
ZL3TNH DROWLEY, C A, 47 CHESTER ROAD, TAWA, WELLINGTON
6006
ZL3TNJ DAVIS, B, 40 LAING CRES, CHRISTCHURCH 8002
VON BIEL, H A, 15 Caleb Place, Northwood, Belfast
MAUNSELL, P B, 42 HINEMOA ST, CHRISTCHURCH 8002
PEARCE, S J, 11 MELFORD CLOSE, RANGIORA
AMTMAN, B L, 28A WHITMORE ST, RICHMOND,
CHRISTCHURCH
ZL3TNS CLAY, P D, 5 APPLEBY HIGHWAY, RICHMOND 7002
ZL3TNT FRASER, A L, PO BOX 12, WAIPARA 8270
ZL3TNY BROWN, S D, 78A HACKTHORNE RD, CHRISTCHURCH
ZL3TO GODKIN, R W, 147 AVONDALE RD, CHRISTCHURCH 8007
ZL3TOC MARSHALL, R W, 19 FRASER CRES, TWIZEL
ZL3TOF WARREN, P A,
ZL3TOH FORDYCE, A A, 26 LODGE PLACE, ILAM,
CHRISTCHURCH
ZL3TOI KING, A F, FLAT 2, 363 WITHELLS RD, CHRISTCHURCH
ZL3TOJ MEYERS, D R, PO BOX 14, RANGIORA
ZL3TOZ HURST, D W, 31 WAKANUI RD, ASHBURTON
ZL3TP MACLEAN, A G, 9 HORTON ST, PLEASANT POINT
ZL3TPD PITCAITHLY, D J, 9 WITBROCK CRESCENT, BURNSIDE,
CHRISTCHURCH 8005
ZL3TPE OBERS, W L T, 154 ROSS ST, INVERCARGILL
ZL3TPJ JARVIS, P J, SANDY KNOLLS RD, RD 1, CHRISTCHURCH
ZL3TPN PERKINS, N D, PO BOX 86, MURCHISON
ZL3TPO TURNBULL, P D, 3B ARMITAGE ST, NGAIO, WELLINGTON
ZL3TPQ TRUMP, M, FLAT B, 36 BURNETT STREET, ALLENTON,
ASHBURTON
ZL3TPS STEWART, P D, 12 BENMORE ST, TIMARU
ZL3TPT THOMPSON, B N, 18 GUNNS CRES, CHRISTCHURCH
8002
ZL3TPY FOTHERINGHAM, J P, 35A PARNELL ST, LOWER HUTT
ZL3TQ AGNEW, G A, 10 ROBYN PLACE, LINCOLN,
CHRISTCHURCH
ZL3TQD ROXBURGH, J G, 13 POUND ST, LEESTON
ZL3TQE AITCHISON, M S, 61 LONGFELLOW ST, CHRISTCHURCH
ZL3TQH WILTSHIRE, R, C/O BURNSIDE HIGH SCHOOL, GREERS
ROAD, CHRISTCHURCH 5
ZL3TR HAYNES, J C, C/- PACIFIC HAVEN RESIDENTIAL
CARE, 365 MARINE PARADE, SOUTH BRIGHTON,
CHRISTCHURCH 8062
ZL3TRD DUNCAN, R J, 308 PALMERSTON STREET, WESTPORT
ZL3TRE CLEINE, N C, RD 2, UTOPIA RD, WESTPORT
ZL3TRI GRAHAM, J A, 18 RIVERTON TCE, HALSWELL,
CHRISTCHURCH
ZL3TRJ SPURDLE, D P, 41 TAIT DRIVE, GREENMEADOWS,
NAPIER
ZL3TRL PARKER, G T, 36 SHEFFIELD CRES, CHRISTCHURCH
8005
ZL3TRR REINKE, J M, 92 NEIL STREET, HORNBY,
CHRISTCHURCH
ZL3TRT SAWYERS, T, CAPE RD, RD 2, WESTPORT
ZL3TRX HADLER, D J, SANDY KNOLLS RD, RD1, CHRISTCHURCH
ZL3TS PHILLIPS, S J, 138 HAY ST, LINWOOD, CHRISTCHURCH
ZL3TSM MILLER, N E, WHITEWOOD CRES, RD 5, CHRISTCHURCH
8021
ZL3TSW WEBB, S D, 3 SOMERVILLE LANE, BRIGHTWATER,
NELSON
ZL3TT SMITH, K G, 20 GILRAY AVENUE, MARAENUI, NAPIER
HAYWARD, L B, 45 DENISE CRES, HORNBY,
CHRISTCHURCH

ZL3TUM	MILNE, B J,	ZL3VAM	BROOK, P C, 130 KIPPENBERGER AVENUE, RANGIORA
ZL3TUN	REID, N, 1 BRACKEN COMMON, ROLLESTON 8004	ZL3VAP	PETERSEN, V A, 51 DERBY ST, WESTPORT
ZL3TUV	ROOKE, S A, 7/12 CURSON PLACE, PARKLANDS, CHRISTCHURCH 8009	ZL3VAS	STEPHENS, L C, 78 BROUHAM ST, WESTPORT
ZL3TV	SHAW, G R,	ZL3VAT	AXFORD, B R, 94 OMOTO VALLEY RD, KAIATA, GREYMOUTH 7823
ZL3TVB	MARTIN, B, 85 CANTERBURY STREET, LYTTELTON	ZL3VBC	PRATT, A, 30 DEEPDALE STREET, BURNSIDE, CHRISTCHURCH
ZL3TVK	Donovan, Robin, 18 Glenview Terrace, Highfield, Timaru	ZL3VC	MCLAUGHLIN, P T, 42 DOMETT ST, WESTPORT
ZL3TVS	STUBBERFIELD, R, 138 RUTLAND ST, ST ALBANS, CHRISTCHURCH 8005	ZL3VF	KENDALL, J D, 50 PAGET DRIVE, WOODEND 8255
ZL3TW	RILEY, T R, 20 REARSBY DRIVE, CHRISTCHURCH 3	ZL3VI	MELHUISH, B J, 34 ST ANDREWS HILL RD, CHRISTCHURCH
ZL3TWH	BURROWS, R M, 25A ESPERANCE ST, CHRISTCHURCH 8005	ZL3VII	SINCLAIR, D A, 17 HALLS PLACE, ADELAIDE, SOUTH AUSTRALIA
ZL3TX	LAYT, P A, 15 KERRS RD, AVONSIDE, CHRISTCHURCH	ZL3VIII	MCISAAC, I B, THE SHIRE, POWELLS RD, OXFORD 8253
ZL3TY	MCQUARRIE, R J, 21 WEENINK RD, GREYMOUTH	ZL3VJP	PAYNTER, J J, 42 FORTUNE ST, CHRISTCHURCH
ZL3TZ	RIO, N N, 3 ROSENBAY RISE, HENDERSON, WAITAKERE	ZL3VJX	MILLIGAN, T J, PO BOX 21-053, EDGEWARE, CHRISTCHURCH
ZL3UA	MULHOLLAND, F S T, PO BOX 21, LEITHFIELD BEACH	ZL3VKK	LAWRENCE, J E, 25 ANDREW ST, TIMARU
ZL3UAC	CROSBY, A A, 13 PRINCES ST, WAIKARI 8276	ZL3VL	JACKSON, E M, 87 MAIN ROAD, WAIHI BEACH
ZL3UAD	WOODFIELD, A R, 40B SEACLIFFE ROAD, HILLSBOROUGH, AUCKLAND	ZL3VLF	BRIGGS, D J, 100A NORMANDALE RD, NORMANDALE, LOWER HUTT
ZL3UBU	WHITE, T C, PO BOX 24-285, EASTGATE, CHRISTCHURCH 8001	ZL3VLN	NEAME, L A D, 13 COWPER STREET, GREYMOUTH
ZL3UBW	CARRAN, P S, 50 BENGAL DRIVE, CHRISTCHURCH 8002	ZL3VM	WILSON, D W T, 77 ALLENS ROAD, ASHBURTON
ZL3UCD	ANDREWS, M P, 6 MANUEL PLACE, BISHOPDALE, CHRISTCHURCH	ZL3VML	VENTER, M L, 30 MANOR PLACE, BRYNDWR, CHRISTCHURCH
ZL3UCK	BLANCHETT, C E L, 59 SHAKESPEARE ST, GREYMOUTH	ZL3VN	BRADLEY, J N, 169 WESTON RD, CHRISTCHURCH
ZL3UCM	MANSON, CALEB, 138 HOON HAY ROAD, HOON HAY, CHRISTCHURCH	ZL3VO	ELDER, J, 30 MALING ST, CHRISTCHURCH
ZL3UD	MCCONNACHIE, M E, 210 UNION STREET, MILTON 9250	ZL3VP	BRADSHAW, G J, 163A ASHGROVE TCE, CHRISTCHURCH
ZL3UDH	HERINGTON, D J, 43 OTIPUA RD, TIMARU	ZL3VQR	RAMSAY, I, P O BOX 19, MIDDLEMARCH 9056
ZL3UDJ	CROKER, D J, WAIMANGAROA POST, VIA WESTPORT	ZL3VR	MCMASTER, A S, 8A HARRIS STREET, WAIMATE
ZL3UDR	ROBB, D W, 78 CONNAUGHT STREET, BLOCKHOUSE BAY, AUCKLAND	ZL3VS	UDEN, M, 77 TANKERVILLE RD, HILLORTON, CHRISTCHURCH
ZL3UDW	WYSE, D, 16 ARRAN CRES, LINWOOD, CHRISTCHURCH	ZL3VV	CHRISTCHURCH WEST AMATEUR RADIO CLUB, PO BOX 31-095, CHRISTCHURCH
ZL3UE	PRATTLEY, R H, RD 2, ELLESMORE RD, CHRISTCHURCH	ZL3VW	WINSKILL, I E, CAVERHILL, RD 1, CHEVIOT
ZL3UEO	JENKINS, R C, 33 TOREA ST, GRANITY, WESTPORT	ZL3VX	PARRY, R I, 18 SUNVALE TCE, CHRISTCHURCH
ZL3UF	PRUE, B O, 111 UNION ST, CHRISTCHURCH	ZL3VY	DIXON, A P, 16 KILDARE TCE, LINCOLN
ZL3UFM	CHILTON, N J, 52 WHITING CRESCENT, NAPIER	ZL3VYL	O'MALLEY, M J, 72 CROFTON RD, CHRISTCHURCH
ZL3UFO	FRASER, A J, PO BOX 12, WAIPARA	ZL3VZ	PATERSON, A J, 52 CAVENDISH RD, CHRISTCHURCH
ZL3UGB	BARBOUR, G, 168 PACIFIC RD, CHRISTCHURCH 8009	ZL3WA	ALLEN, R W, 11 CHEAM ST, DALLINGTON, CHRISTCHURCH 8006
ZL3UGC	COOK, G J, 33 NORMANDY ST, CHRISTCHURCH 8005	ZL3WAR	WELLS, P J, P O Box 13, Outram
ZL3UGH	HANCOCK, G P, 5/29 O'BRIENS RD, CHRISTCHURCH	ZL3WBA	ANDERSON, B M, MCLEODS ROAD, RD, ROSS 7954
ZL3UGT	TURNER, G C, 83 BRIDGE STREET, SOUTH NEW BRIGHTON, CHRISTCHURCH	ZL3WC	REEVES, N J, 45 OROWAITI RD, WESTPORT
ZL3UGY	BRIGGS, R D, 32 FIRTH STREET, COBDEN, GREYMOUTH	ZL3WD	BAGNALL, A L, 44 RICHARDSON STREET, ST KILDA, DUNEDIN
ZL3UHH	HARDY, L M, 67 MOORE STREET, ROLLESTON	ZL3WDB	MANSON, D B, 7 BROCKENHURST ST, CHRISTCHURCH 8007
ZL3UI	MEREDITH, F P R, 1215 KARAMU ROAD NORTH, HASTINGS	ZL3WE	LONGSON, H J O, 21 KINNARD PLACE, CHRISTCHURCH
ZL3UIM	WATSON, S, 27 READING STREET, ILAM, CHRISTCHURCH 4	ZL3WEJ	MCISAAC, J A, THE SHIRE, POWELLS RD, OXFORD
ZL3UJZ	BEST, G, 16 Champion St, St Albans, Christchurch	ZL3WEM	MANSON, E M, 7 BROCKENHURST STREET, WAINONI, CHRISTCHURCH
ZL3UK	JULIAN, T, 154 HAMILTON AVENUE, ILAM.	ZL3WG	BAIRD, J F, 13A CHARLESWORTH STREET, FERRYSMEAD, CHRISTCHURCH
ZL3UKM	MANSON, K J, 74 SAPPHIRE ST, CASEBROOK, CHRISTCHURCH	ZL3WGM	MCDONALD, G K, 55 O'NEILL AVENUE, NORTHWOOD, CHRISTCHURCH
ZL3ULP	Crosby, Linda, Drynie, R D 3, Amberley	ZL3WIM	MACKAY, I M, 5 SPITFIRE PLACE, WIGRAM, CHRISTCHURCH
ZL3ULW	WILLUM, L, 16 A STANTON PLACE, WOODEND 8255, CHRISTCHURCH	ZL3WK	WELLS, K, PO BOX 514, RANGIORA
ZL3UN	GILL, I D, RIVER RD, GREENPARK, RD 2, CHRISTCHURCH	ZL3WM	OLIVER, J A, PO BOX 22, TAI TAPU
ZL3UO	GENET, R C A, 67A WINTERS RD, CHRISTCHURCH	ZL3WMD	DOWLE, W M, CLANAGH, 103 BRUCES ROAD, SEFTON, RD 2, RANGIORA
ZL3UOK	MAY, S T, 156 PAGES RD, TIMARU	ZL3WMM	HAY, G B, 37 CHAPEL ST, GREYMOUTH
ZL3UP	MCNICHOLL, M W, 4 CORFE ST, CHRISTCHURCH	ZL3WNG	BYAS, B, 250 OPAWA ROAD, HILLSBOROUGH, CHRISTCHURCH
ZL3UPJ	BUTCHER, P J, 10 RAVEN DRIVE, RD 4, CHRISTCHURCH	ZL3WNP	PARKINSON, N I, RD 2, PUKETA, KAIKOURA
ZL3UR	NZART SOUTH CANTERBURY BRANCH INC, PO BOX, 261, TIMARU	ZL3WO	WELSH, L D, 18 WOODLAND PLACE, CHRISTCHURCH
ZL3URB	Butcher, Rebecca, 10 Raven Drive, RD 4, Christchurch	ZL3WP	BULLER HIGH SCHOOL RADIO CLUB, 35 DERBY ST, WESTPORT
ZL3URN	NAEYAERT, R, 65 GREENHAMVEN DRIVE, BURWOOD, CHRISTCHURCH	ZL3WPS	SEMMENS, W P,
ZL3URR	DE ROODE, H, PO BOX 35-151, THE PALMS, CHRISTCHURCH	ZL3WPT	MCLAUGHLIN, K M, 42 DOMETT ST, WESTPORT
ZL3USA	MAY, A P, 30 NIKAU PLACE, TIMARU	ZL3WQ	MACKAY, C J, 1 CAMP ST, AHAURA
ZL3USB	Butcher, Sarah, 10 Raven Drive, RD 4, Christchurch	ZL3WR	MARTIN, V E, 51 SKERTEN AVE, HORNBY, CHRISTCHURCH 8004
ZL3USM	MANSON, S B, 138 HOON HAY RD, CHRISTCHURCH	ZL3WS	STEIN, WILLEM, 48 CAMBRIA STREET, NELSON
ZL3USR	REYNEDERS, S, 393 BARBADOES STREET, CHRISTCHURCH	ZL3WT	STEIN, PO BOX 18-530, CHRISTCHURCH
ZL3UU	GORDON, M, 6 MACARTNEY AVENUE, HALSWELL, CHRISTCHURCH 8003	ZL3WU	WRIGHT, A F, 65 LUDSTONE RD, KAIKOURA
ZL3UX	VINCENT, L L, LISMORE, RD 5, ASHBURTON	ZL3WV	RIGBY, F, 81 JOHNS ROAD, RANGIORA
ZL3UXB	MORGAN, J H, PO BOX 15092, CHRISTCHURCH 8006	ZL3WW	DUMANOVIC, DUSKO, 28 GIBRALTAR CRESCENT, PARNELL, AUCKLAND
ZL3UXT	MACKLEY, G D J, PO BOX 12-926, PENROSE, AUCKLAND 1135	ZL3WX	SMILLIE, B, 19 GREENFIELD PLACE, CHRISTCHURCH
ZL3UYJ	PAGE, A, 1-14 CROZIERS ROAD, ST ALBANS, CHRISTCHURCH	ZL3WY	YEATES, J M, 69 ST ANDREWS HILL RD, CHRISTCHURCH
ZL3UZ	MCKENZIE, C D, 17 HULVERSTONE DRIVE, CHRISTCHURCH	ZL3WZ	MORGAN, W R, 5 HAWKSWOOD STREET, WAIKARI 8275, NORTH CANTERBURY
ZL3VA	JOHNSTONE, D E, 4A PARKWOOD PLACE, PARKLANDS, CHRISTCHURCH	ZL3ZMV	KENNEDY, M A, 56 DOMMETT ESPLANADE, COBDEN, GREYMOUTH
ZL3VAA	ORCHARD, A P, 4 WILSON DRIVE, OHOKA, R D 2 KAIAPOI	ZL3ZZZ	MCDONALD, D M, KNIGHTS ROAD, RD 5 ROLLESTON, CHRISTCHURCH
ZL3VAB	ORCHARD, J, 4 WILSON DRIVE, OHOKA, R D 2 KAIAPOI		
ZL3VAH	BLANCHARD, H E G, 37 REYNOLDS AVE, BISHOPDALE, CHRISTCHURCH		
ZL3VAL	BOOTE, V Z, 8 HINTON RD, KARORO, GREYMOUTH		

ZL4 CALL-SIGNS

ZL40AGY	MARR, A H, PO BOX 3, GREYTOWN	ZL4CL	LARSEN, C M, 26 COLUMBA AVE, LOOKOUT POINT, DUNEDIN
ZL4AA	NZART OTAGO BRANCH INC, PO BOX 5485, DUNEDIN	ZL4CO	SMITH, J D, 78 SUNDERLAND STREET, CLYDE
ZL4AAA	COOPER, P B, PO BOX 330, MANGONUI	ZL4CP	SHEA, D A, 15 GERALDINE ST, GREYMOUTH
ZL4AAK	DEVEREUX, R L, DANIELS RD, KINGSDOWN, RD 1 TIMARU	ZL4CR	Lupulescu, C R, 3/219 Geraldine Street, Edgeware, CHRISTCHURCH
ZL4AB	GRAY, H A, 102 BROWNSTON ST, WANAKA	ZL4CSS	SHIRREFFS, C S, 134 GLADSTONE TERRACE, INVERCARGILL
ZL4AC	LOWE, A F, 287 BARROW ST, BLUFF	ZL4CU	DUDLEY, G J, 47 VOGEL PLACE, INVERCARGILL
ZL4ACG	GLENNIE, A C, 31 JOHN STREET, OTATARA RD 9, INVERCARGILL	ZL4CV	MCKENZIE, J, 104 TRAFALGAR ST, WAIWHETU, LOWER HUTT
ZL4AD	COOK, B J, 38 MILL ROAD, WAIMATE, SOUTH CANTERBURY	ZL4CVE	HALFORD, J T, 25 RICHMOND AVENUE, NELSON
ZL4AE	OLSEN, W J, 21 MUSSELBURGH RISE, MUSSELBURGH, DUNEDIN	ZL4CW	BARKER, W G, 30 KOWHAI AVE, INVERCARGILL
ZL4AEA	ANDERSON, ATHOL, 64 TAWARD STREET, NORTH OAMARU, OAMARU 8901	ZL4CWN	DOAK, D, 289 CHEMSFOND STREET, ROSEDALE, INVERCARGILL
ZL4AF	FALCONER, A E, PO BOX 214, WHITERIG, GORE	ZL4DA	ANDERSON, D W, P O BOX 7, CLYDE, CENTRAL OTAGO
ZL4AFM	APPLEBY, R, 17-A LYNTON RD, BUCKLANDS BEACH, AUCKLAND 1704	ZL4DAM	MOREY, D A,
ZL4AG	BOSHIER, R F, 30 AYTON DRIVE, GLENFIELD, AUCKLAND 1310	ZL4DAV	Wright, David A J, P O Box 537, Nelson
ZL4AH	SCUDAMORE, E G, FAIRVIEW, TOTNESS ST, GREEN ISLAND	ZL4DBM	BROWNE, D J, 133 RESERVOIR RD, OAMARU 8901
ZL4AHW	WILLIAMS, NOEL, 174 Tramway Rd East, RD 3, Wyndham	ZL4DC	BROWNE, 14 REES STREET, DUNTRON
ZL4AI	KING, J A, 169 CARROLL STREET, CITY RISE, DUNEDIN 9001	ZL4DD	HALL, S J, 54A KENMURE RD, BELLEKNOWES, DUNEDIN
ZL4AJ	THOMPSON, J S,	ZL4DH	VAN VEEN, H M G, 161 EVANS ST OPOHO, DUNEDIN
ZL4AJS	SUNDE, A J, 70 HASTINGS STREET, OHAI, SOUTHLAND	ZL4DI	SINGLETON, F C, 25 MCKINNON LOOP, TE ANAU
ZL4AK	Pickering, Luke,	ZL4DIK	BAIN, C R, 27 DUCKWORTH ST, DUNEDIN
ZL4AL	EASTERN SOUTHLAND BRANCH NZART INC, C/O MR AN ALLAN RD 4, CHARLTON, GORE	ZL4DJ	DICKIE, R A, 14 KOA STREET, GORE
ZL4AM	BLAIR, J G H, 5 MERRIE CREEK RD, CLINTON	ZL4DJW	BAIRD, R A, 87 VENTRY ST, ALEXANDRA 9181
ZL4AN	SHAW, M Y, C/- NZMCA, P O BOX 72 147, PAPAKURA 1730	ZL4DK	BAIRD, 82 KITCHENER, GORE
ZL4ANW	NEWTON, A A, 75 BANKS ST, RICHMOND, INVERCARGILL	ZL4DLU	MULDER, D J, 266 CHAIN HILLS RD, RD1, DUNEDIN
ZL4AO	ALLAN, A N, RD 4, CHARLTON, GORE	ZL4DM	URE, D, 6 Arnott Street, Portobello, Dunedin
ZL4AP	SMITH, R C, 104 RETREAT ROAD, NO 2 RD, INVERCARGILL	ZL4DMM	BEATTIE, M J, 10B FIFE ST, WAKARI, DUNEDIN
ZL4APC	CHALMERS, A, PO BOX 285, GORE	ZL4DN	SHARP, J R, 72A BAYVIEW RD, DUNEDIN
ZL4AQ	WHYTE, R A, 8 MARGARET STREET, GORE 9700	ZL4DO	OLSEN, D W J, 65 ROSEBERRY STREET, BELLEKNOWES, DUNEDIN
ZL4AR	COLE, R S, 46 WALTON PARK AVE, FAIRFIELD, DUNEDIN	ZL4DQ	MASLEN, I A, 62 CHAMBERS ST, DUNEDIN
ZL4AS	GRAY, L C, GRAYLEA, STONEYCREEK 2 R D, BALCLUTHA 9200	ZL4DR	IRVING, J T, 28 KING ST, MOSGIEL
ZL4AT	TAYLOR, A J, 37 DIPTON ST, INVERCARGILL	ZL4DRB	BOWIE, D R, 7 MIDDLETON ROAD, UPPER RICCARTON, CHRISTCHURCH
ZL4AU	ERNST, R W, ROSLYN BUSH RD, RD 2, INVERCARGILL	ZL4DU	BOWEN, P D O, 207 TAIERI RD, DUNEDIN
ZL4AV	CHRISTIE, G A, 37 GARNET ST, GORE	ZL4DW	BABINGTON, A M, 45 THOMSON ST, INVERCARGILL
ZL4AW	PICKFORD, W J, 29 BLACK RD, OTATARA RD 9, INVERCARGILL	ZL4DWW	WRIGHT, D W, 309 TALBOT ST, INVERCARGILL
ZL4AY	MCLEOD, J H, 23 RICKTON PLACE, RANGIORA 8254	ZL4DX	BRASELL, C R, 10 WAIMATUA SCHOOL RD, WAIMATUA RD11, INVERCARGILL
ZL4AZI	BOIVIN, R A, 69 TAWARD STREET, OAMARU	ZL4DY	Shuker, W, 26 Hillary Cres, Napier
ZL4BA	JONES, G L, 10 BARCLAY ST, DALMORE, DUNEDIN	ZL4FA	SPITTLE, B J, 727 BRIGHTON ROAD, OCEAN VIEW, DUNEDIN 9051
ZL4BAM	MCMILLAN, B A, 24 MINERS TCE, BANNOCKBURN, RD 2 CROMWELL	ZL4FC	DOMINEY, R J, 67 KING ST, PARKSIDE, TIMARU
ZL4BDA	AMOAF, B, 59 MOMORANGI CRESCENT, REDWOOD, CHRISTCHURCH	ZL4FD	HEDGE, H G, 35 WEITI ROAD, OREWA, WHANGAPARAOA 1461
ZL4BE	ELLIOTT, BARRY, 51 BEECHWOOD DRIVE, BELFAST, CHRISTCHURCH	ZL4FG	RUSSELL, P F, 140 Aicken Rd, Otatara, No. 9 R.D
ZL4BEP	PATON, BRUCE, RIDGE ROAD, 2 CRD, OAMARU	ZL4FH	HALL, J N, 8 WATKIN ST, DUNEDIN
ZL4BH	HERLIHY, B K, 20 KEA PLACE, TOKOROA	ZL4FI	ASKIN, M G, 408 HAREWOOD ROAD, BISHOPDALE, CHRISTCHURCH
ZL4BI	CALDWELL, J, 54 BRYDONE ST, EDENDALE	ZL4FM	WILDEN, A J, 43 BALMAIN ST, HALFWAY BUSH, DUNEDIN
ZL4BJ	WICKENS, J R, 21 MARINE PARADE, MACANDREW BAY, DUNEDIN	ZL4FOX	KINDT, B, PO BOX 7227, WELLESLEY ST, AUCKLAND
ZL4BJC	CHAPMAN, B J, 38 MOULSON ST, INVERCARGILL	ZL4FP	MCLEOD, R J, 431 GORDON ROAD, RD 2, MOSGIEL, OTAGO
ZL4BK	MCDONALD, B N, 18 TRAVIS COUNTRY DRIVE, BURWOOD, CHRISTCHURCH	ZL4FS	FAULKNER, D N, 40 WYMER TCE, HAMILTON
ZL4BL	LAIRD, B, 30 B BROUGHTON STREET, GORE 9700	ZL4FUN	NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS INC, PO BOX 40-525, UPPER HUTT 6415
ZL4BM	MCALLUM, R H, RD, ASHLEY DOWNS, CLINTON	ZL4FV	WILLOUGHBY, J R, 18 REGENT ST, INVERCARGILL
ZL4BO	JACKSON, V R, 514 QUEENS DRIVE, INVERCARGILL	ZL4FZ	SMART, R G, 26 OLIVINE ST, CHRISTCHURCH
ZL4BR	HUNT, A F, 8 MANU CRES, NEW PLYMOUTH	ZL4GA	HOMER, G C, 5 CONWAY ST, MACANDREW BAY, DUNEDIN
ZL4BRI	HOWLETT, B, 156 LARNACH ROAD, WAVERLEY, DUNEDIN	ZL4GB	BENNETT, G J, 47 TASMAN RD, OTEMATA
ZL4BS	ALDRIDGE, J T, 28 CREEK RD, ASHBURTON	ZL4GD	WILKEY, T G, 68 MARINE PARADE, BLUFF
ZL4BT	TODD, R J, 30 NAUMAI ST, GORE	ZL4GE	HURRING, C J, 1A BELMONT LANE, DUNEDIN
ZL4BU	STEPHENS, R D, 72 WILFORD ST, INVERCARGILL	ZL4GF	BALAN, S C,
ZL4BV	Vidulich, B, 12 Ngarimu Crescent, Taradale, Napier	ZL4GFG	GEORGE, G F, 105B MELBOURNE STREET, SOUTH DUNEDIN
ZL4BW	WILLIAMSON, B C, 14 HORACE ST, CROMWELL	ZL4GG	BODDY, K H, EARNSCLEUGH RD, RD 1, ALEXANDRA
ZL4BWM	MIDDLEMISS, B W, 112 MARGARET ST, INVERCARGILL	ZL4GI	GOLLOP, P J, FLAT 6, 202 CRINAN STREET, INVERCARGILL
ZL4BX	SIMPSON, R K, 1018 BRIGHTON RD, BRIGHTON	ZL4GJ	SERVICE, T R, 5 BREMIDGE PLACE, HAMILTON
ZL4BZ	EVE, C R, 107 BREAM BAY DRIVE, RUAKAKA	ZL4GK	COLVIN, L J, 19 HIRINI STREET, GISBORNE
ZL4CA	WILLIAMSON, P, LEICESTER STREET, HAMPDEN	ZL4GL	GILDER, N J, 37 POMONA ST, GORE
ZL4CAT	CALLOW, PETER, 24 WAIKARAKA DRIVE EAST, R D 6 TE PUNA, TAURANGA	ZL4GM	ELLIS, D N, PO BOX 34-499, BIRKENHEAD, AUCKLAND 1330
ZL4CD	DUPONT, C C, 6 LOTHIAN CRES, INVERCARGILL	ZL4GO	THOMAS, M E, 27 STIRLING CRES, MOSGIEL
ZL4CFT	DUPONT, PO BOX 36, ROXBURGH, CENTRAL OTAGO	ZL4GP	MCCUTCHEON, M C, 145 TARBERT ST, ALEXANDRA
ZL4CG	RACKLEY, A M, 36 CRAIG HENDRY ST, GREEN ISLAND, DUNEDIN	ZL4GQ	NZART SOUTHLAND BRANCH INC, PO BOX 1260, INVERCARGILL
ZL4CHS	STEWART, C H, 29 PAISLEY PLACE, INVERCARGILL	ZL4GR	WATSON, D K, 114 CANNINGTON RD, DUNEDIN
ZL4CI	STRONACH, N, 26 LAKEFRONT DRIVE, TE ANAU	ZL4GT	SKINNER, L C, 36 DANIELS RD, REDWOOD, CHRISTCHURCH
ZL4CJ	O'CAIN, P J, 85 BAYNESS STREET, BURWOOD, CHRISTCHURCH 8006	ZL4GU	BRENTWOOD, P L, SLOPEHILL ROAD, R D 1, QUEENSTOWN 9692
ZL4CJS	STAYNES, C J,	ZL4GV	WILKEY, D G, 68 MARINE PARADE, BLUFF
ZL4CKR	READ, C K, 218 MАНHIRE RD, TE PUNINGA, RD 4, MORRINSVILLE	ZL4GVN	THOMPSON, G T, 71 PATERSON STREET, INVERCARGILL
		ZL4GW	WALSH, G J, 37 EDITH ST, FAIRFIELD, DUNEDIN
		ZL4GX	COLLIE, D B, 16 IONA COURT, INVERCARGILL

ZL4GY	WILLS, M E, 181 WILTON STREET, ROSEDALE, INVERCARGILL 9501	ZL4LA	Petricich, Christian, EUNSON, L C
ZL4HA	YOUNG, B S, 39 MELVILLE ST, CITY RISE, DUNEDIN	ZL4LC	STRONG, L D, 29 CHURCH ST, MOSGIEL
ZL4HAM	MCKENZIE, H A, WAIPARU, RD 7, GORE	ZL4LDS	ALLEN, D C, 115A MUSSLEBURGH RISE, DUNEDIN
ZL4HC	WATERS, M J, 6 BARLING ST, MACANDREW BAY, DUNEDIN	ZL4LDY	EVANS, L M, RD 6, TUSSOCK CREEK, INVERCARGILL
ZL4HD	HARDWICK, T R, 126 BARROW ST, BLUFF	ZL4LE	MILSOM, P S, 103 LAKEVIEW TCE, LAKE HAWEA
ZL4HES	STEPHENS, H E, 128 MULLER RD, BLENHEIM	ZL4LH	MACKENZIE, A I, 24 SCOTLAND ST, GREEN ISLAND
ZL4HF	KINDON, H A R, 10 TREFFERS AVE, RANGIORA	ZL4LJ	Leslie, Bagnall, 114 Woodlands Close, Goldfield Heights, Queenstown
ZL4HG	MCGINNELL, S J E, 44 STANBURY AVE, SOMMERFIELD, CHRISTCHURCH 8002	ZL4LJB	WHITTY, M J, 29/2 WILL ST, ABBOTSFORD, DUNEDIN
ZL4HI	BRUCE, F, 22 REYNOLDS DRIVE, GLENVIEW, HAMILTON 2001	ZL4LK	BENSON, J A, 15 HEATH ST, DUNEDIN
ZL4HL	SMIRK, A H C, 3 LITTLEBOURNE ROAD, ROSLYN, DUNEDIN	ZL4LL	TALL, E J, 1 MURRAY ST, MOSGIEL
ZL4HM	WHELAN, M L, 3 / 239 SPEY STREET, INVERCARGILL	ZL4LN	BRISTOW, H E, 17 GLEN CARRON ST, ALEXANDRA
ZL4HO	SUTTON, K E, 97 GREY ST, INVERCARGILL	ZL4LO	HOWIE, G A, 7 NORFOLK CLOSE, VICTORIA POINT, QUEENSLAND 4164
ZL4HP	HANNA, PADDY, PO BOX 10 301, THE TERRACE, WELLINGTON 6036	ZL4LS	RICHARDS, F B, P O BOX 84-016, WESTGATE, AUCKLAND
ZL4HQ	WILLIAMS, J C, 115 VEITCHES RD, CHRISTCHURCH	ZL4LT	COSTARD, T J, 17 STIRLING ST, DUNEDIN
ZL4HR	NISBET, G J, 33 SUTCLIFFE ST, DUNEDIN	ZL4LU	JOHNSON, P W, SADDLE HILL RD RD 1, DUNEDIN
ZL4HS	MARSH, W J, 47A HOPE DVE, BLENHEIM 7301	ZL4LV	EVANS, R W, 15 TAIPEA RD, NO 9 R D OTATARA, INVERCARGILL
ZL4HT	POWLEY, D M L,	ZL4LX	TODD, L M, 30 NAUMAI ST, WEST GORE, GORE
ZL4HU	HOLDOM, K A, PO BOX 7, CLYDE 9180	ZL4LZ	ANDERSON, M H, PO BOX 6273, DUNEDIN NORTH
ZL4IAN	FERGUSON, ROBERT DAVID, 4 EDEN PARK DRIVE, ROTOTUNA, HAMILTON	ZL4MA	ANDREWS, S E,
ZL4IC	COCKERAM, M R, 126 ARGYLE-OTAHUTI RD, RD 4, INVERCARGILL	ZL4MB	COLLIGAN, M J, 29 KENMARE ST, ALEXANDRA, CENTRAL OTAGO
ZL4IE	SAPWELL, H W D, WILSON COURT, 1/251 TANCREST ST, ASHBURTON	ZL4MC	HAYES, K J, RIPPONVALE, RD 2, CROMWELL
ZL4IEJ	JONES, I E, RAMSAY ST, ALLANTON, RD 2, MOSGIEL	ZL4MD	MORTON, K W,
ZL4IG	MCMILLAN, R G, 44 DUKE ST, INVERCARGILL	ZL4ME	GILES, M S, 62 KOA STREET, GORE
ZL4II	HOLLEBON, K W, RD 2, IRVINE RD, DUNEDIN	ZL4MG	GILES, 5 WAIMARINO ROAD, WEYMOUTH, AUCKLAND
ZL4IJ	DUERDEN, T W M,	ZL4MI	1702
ZL4IM	NORTON, J, PUKERAU, RD1, GORE, SOUTHLAND	ZL4MJ	MITCHELL, J S, 109 LAYARD ST, INVERCARGILL
ZL4IO	MALKIN, M J, 4/412 AVENUE RD WEST, HASTINGS	ZL4ML	LAMONT, M S, 3 GARDEN PLACE, DUNEDIN
ZL4IQ	KNOWLES, D C, 28 RATA RD, TWIZEL	ZL4MM	MURRAY, R W, 101 INNESCOURT ST, CROMWELL
ZL4IR	HARTZ, E, PO BOX 9, TE ANAU	ZL4MN	NORRIS, M,
ZL4IS	SMIRK, B A, 10 KARETAI RD, RD 2, DUNEDIN	ZL4MO	ASKEY, A J, 30 MURANO ST, DUNEDIN
ZL4IT	SAWERS, R N, 29 DONCASTER ST, UPPER RICCARION, CHRISTCHURCH	ZL4MP	CRICHTON, J, 29 ANNE STREET, INVERCARGILL
ZL4IX	HASLER, D G, 10 MEON ST, OAMARU	ZL4MS	SAVELL, MALCOLM, 126 REYNOLDS ROAD, R D 1, HAMILTON
ZL4IY	PIERCY, G H, 11 BAMBOOROUGH ST, INVERCARGILL	ZL4MT	MATTHEWS, R H, RD 1, MOKOTUA, INVERCARGILL
ZL4IZ	JEFFERY, I W, 7 POINT BUSH RD, WAIMATE	ZL4MU	COOK, R K,
ZL4JA	BIRSE, K C, 14 MARTBERN CRES, CHRISTCHURCH	ZL4MV	DAWSON, G L, 32 VERNON ST, INVERCARGILL
ZL4JAD	DELL, J A, 234 HIGHCLIFF ROAD, WAVERLEY, DUNEDIN	ZL4MW	WARD, W T R, WEST PLAINS, RD 4, INVERCARGILL
ZL4JB	BAZSIIKA, J J, 57 ASCOT STREET, ST KILDA, DUNEDIN 9001	ZL4MX	GOVAN, W A, 14B RAVELSTON ST, DUNEDIN
ZL4JC	MCLENNAN, E J, 161 HALL RD, SAWYERS BAY, DUNEDIN	ZL4MZ	SHERLAW, W G, 30 CHURCH STREET, MOSGIEL 9007
ZL4JD	DUDLEY, J T, 11 FRASER ST, WAIKIWI, INVERCARGILL	ZL4NAJ	JOHNSTON, N A, 33 HARBOROUGH STREET, WATLINGTON, TIMARU
ZL4JF	NZART SOUTH OTAGO BRANCH 35, C/O C GRAY, GRAYLEA STONY CREEK, RD 2 BALCLUTHA	ZL4NAK	OCONNOR, F E, PO BOX 702, QUEENSTOWN
ZL4JG	GILCHRIST, L J, 20 SADDLEVIEW PLACE, FAIRFIELD, DUNEDIN	ZL4NC	PATTERSON, B R, 66 KOREMATA ST, GREEN ISLAND, DUNEDIN
ZL4JH	BALCH, R M, 23 CONNELL ST, DUNEDIN	ZL4ND	FOX, J F, 17 ETON DRIVE, BROOKLANDS VILLAGE, MOSGIEL
ZL4JJ	FERRIS, R J, 269 STOKES VALLEY RD, STOKES VALLEY LODGE, G J, 43A HOLDAWAY STREET, BLENHEIM	ZL4NG	GRAY, N, PO BOX 1838, QUEENSTOWN
ZL4JC	THOMPSON, J J, 71 PATERSON STREET, INVERCARGILL	ZL4NI	BRADDOCK, A R, 39 NORTON ST, GORE
ZL4JT	STANTON, M, 18 Waimea Street, GORE	ZL4NK	KAN, N C Y, 90 NORTH RD, DUNEDIN
ZL4JK	STEWART, R D, 4 ARAWA ST, GORE	ZL4NO	DAVIDSON, M, 7 JACK ST, INVERCARGILL
ZL4JN	HAIG, A V, 43 MELBOURNE ST, DUNEDIN	ZL4NP	GOODIN, N H, 325 TOMAHAWK RD, DUNEDIN
ZL4JO	MALEY, G K, 31 ORBELL STREET, TIMARU	ZL4NQ	NZART QUEENSTOWN BRANCH 75 INC, C/O RUSS WATSON, PO BOX 2066, QUEENSTOWN
ZL4JP	MCKENZIE, G A, RD 7, WAIPARU, GORE	ZL4NR	MCVIE, K R, 18 GRIGOR ST, DUNEDIN
ZL4JQ	TORRANCE, A M, PO BOX 864, NEW PLYMOUTH	ZL4NS	HAGEN, R L, 1 - 23 TRAMWAY ROAD, STRATHERN, INVERCARGILL
ZL4JR	ARMSTRONG, J F, PO BOX 10-078, DUNEDIN	ZL4NU	MACKAY, A J, RD 9, OAMARU
ZL4JRR	RABBIDGE, J, 9 HOBSON ST, GORE	ZL4NZ	REID, K W, 1 BRACKEN COMMON, ROLLESTON 8004
ZL4JS	SAYER, J B, 235 UPPER PLAIN RD, MASTERTON	ZL4OB	BAIRD, O L, 131 NELSON ST, INVERCARGILL
ZL4JT	JENNINGS, J T, 15 COOLOCK ST, DUNEDIN	ZL4OC	SMITH, R F, 48 OATES ST, DUNEDIN
ZL4JU	MIDDLETON, C H, 10B LANES ROAD, ALEXANDRA	ZL4OCJ	OLDRYD, J C H, C/O 82 VERNON TERRACE, ST MARTINS, CHRISTCHURCH
ZL4JW	WATSON, R J, PO BOX 2066, QUEENSTOWN	ZL4OD	PARSONS, R D, 253 TALBOT STREET, INVERCARGILL
ZL4JWA	ANDREWS, J W A, 94 CARNAVON COURT, INVERCARGILL	ZL4OE	CUMMING, C T, 100 DOON ST, DUNEDIN
ZL4JWJ	JENNINGS, John, PO Box 1189, Cambridge	ZL4OI	SIM, R J, RD 2, GORDON RD, MOSGIEL
ZL4JY	YALDWYN, J S C,	ZL4OKY	DOAK, N, 289 CHELMSFORD ST, ROSEDALE, INVERCARGILL
ZL4KB	GEARING, W J, LESLIE GROVES HOME, 22 SHEEN STREET, ROSLYN, DUNEDIN	ZL4OL	MCALVEY, M J, RD2, WAITATI 9060
ZL4KC	CHRISTIE, K, 37 BOYNE STREET, CLIFTON, INVERCARGILL	ZL4ON	SUMMERELL, B W, 457 RACECOURSE RD, INVERCARGILL
ZL4KD	DUFFY, K J, PO BOX 6025, INVERCARGILL	ZL4OO	NZART CENTRAL OTAGO BRANCH INC, C/- K Holdom, Po Box 7, Clyde 9180
ZL4KF	FRANCE, K N, ARTHURTON, NO 1 R D, GORE	ZL4OW	VINCENT, S V, 30 CHARLES ST, WESTON
ZL4KH	SHINE, D H J, 4 TUDOR LANE, MOSGIEL 9007	ZL4OX	CHECKETTS, R N, 21 HIGHFIELD TCE, INVERCARGILL
ZL4KHS	KINGS HIGH SCHOOL RADIO CLUB, KINGS HIGH SCHOOL ATTN: KEVIN HAND, 270 BAYVIEW ROAD, DUNEDIN	ZL4OZ	ADAMS, D A, 26 WILLS STREET, MORNINGTON, DUNEDIN
ZL4KJ	ROBERTSON, D C, 33 COUTTS ROAD, GORE 9700	ZL4PA	ARONSEN, P G, 10 GIRVEN ST, WALLACETOWN, INVERCARGILL
ZL4KM	CRAIG, A J, 71 MACKWORTH ST, CHRISTCHURCH 6	ZL4PB	BROWN, P N, 25 BAXTER ST, BALCLUTHA
ZL4KN	FINDLATER, R B, 305 CONON STREET, INVERCARGILL	ZL4PC	CROY, P R, 65 SHAW ST, MOSGIEL
ZL4KO	WILLIAMS, T J, 8 ROB ROY LANE, WANAKA	ZL4PD	NEILL, K G, 38 TEIGNMOUTH ST, GREEN ISLAND, DUNEDIN
ZL4KS	ROSS, L A, 10 ROY CRES, CONCORD, DUNEDIN	ZL4PG	LLOYD, D A, 180 FORBURY RD, DUNEDIN
ZL4KT	WARING, D, PO BOX 118, WAITATI	ZL4PH	HAYTON, P N, 17 ARAWA STREET, ANDERSONS BAY, DUNEDIN
ZL4KU	TAYLOR, S J, 66 ROYAL TCE, ALEXANDRA	ZL4PJ	BLAIR, P J, 5 MERRIE CREEK RD, CLINTON 9252
ZL4KV	PATTON, J A, 18 KEATS TCE, CAMBRIDGE	ZL4PM	MARSH, P, 33 FALCON ST, DUNEDIN
ZL4KW	KIBBLEWHITE, K C, 30 TRIPP STREET, R D 21, GERALDINE	ZL4PN	SKEET, B R, NO 1 R D, ALEXANDRA
ZL4KX	MCCORMICK, B P, 39 MOANA CRESENT, MUSSLEBURGH, DUNEDIN		
ZL4KZ	ANDREWS, P J,		

ZL4PO	PRICE, L J, 90 MALLING ROAD, RD 1, RICHMOND, NELSON	ZL4TAC	PARISH, D A, 25 TRUSCOT AVE, WELLINGTON
ZL4PP	CAIRNS, J C, 35 ROYAL TCE, ALEXANDRA	ZL4TAD	MCKENZIE, A D, MARSHALL RD, KAPUKA SOUTH, RD 5, INVERCARGILL
ZL4PQ	PRYDE, G W, 20B JELICOE CRES, DUNEDIN	ZL4TAE	THOMAS, T M, 105 LARNACH RD, DUNEDIN
ZL4PR	REAY, P, 27A LONG MELFORD ROAD, RIVERDALE, PALMERSTON NORTH	ZL4TAF	BAYLISS, A, 13 LINDIS CRESCENT, OTEMATATA 8950
ZL4PT	THOMPSON, K P, 180 MORNINGTON RD, DUNEDIN	ZL4TAI	CALDER, A D, FERNHILL, ARDGOWAN, 1-D RD, OAMARU
ZL4PW	ORMANDY, PAUL, 33 GRETA STREET, OAMARU	ZL4TAJ	PATERSON, E G, 77 THOMPSON ST, QUEENSTOWN
ZL4PX	MCMILLAN, A D K, 33 BUSH ROAD, MOSGIEL, DUNEDIN	ZL4TAO	REYNOLDS, A W, 124 DASHER ROAD, 13 D R D, OAMARU
ZL4PY	BALL, G L, PO BOX 38, WAIMATE 8791, SOUTH CANTERBURY	ZL4TAQ	HOWELL, A D, 18 BEVERLEY ST, MERIVALE, CHRISTCHURCH 1
ZL4PZ	GILCHRIST, A J H, 20 SADDLEVIEW PLACE, FAIRFIELD, DUNEDIN	ZL4TAR	KIRKBY, K J, 5 LESNEY ST, MARYHILL, DUNEDIN
ZL4QA	GRIEVE, L M, RD 1, KENNINGTON, INVERCARGILL	ZL4TAY	McCarty, Christopher, 33 Kelvin Road, North East Valley, Dunedin
ZL4QC	WALTON, A D, 132 MARTIN RD, FAIRFIELD, DUNEDIN	ZL4TAZ	WADE, R B, 8 HARBOUR HEIGHTS, WAVERLEY, DUNEDIN
ZL4QD	HAND, K A, 45 AOTEA ST, DUNEDIN	ZL4TBR	CLEAVER, R A J, 26 WALBROOK CRESCENT, OAMARU
ZL4QE	PEARCE, B H, 22 JOE BROWN AVE, MOSGIEL	ZL4TCA	GRIFFITH, I W, 17 GILMORE ST, DUNEDIN
ZL4QG	NILSON, F E G, 19 DISTRICT RD, ROSENEATH, SAWYERS BAY	ZL4TCB	WALKER, B A, RD 1, GOODWOOD RD, PALMERSTON
ZL4QH	ADAMS, R J, 33 JAMESON AVE, ST ALBANS, CHRISTCHURCH	ZL4TCC	LE QUESNE, P W H, 23 ORIEL PLACE, PIRIMAI, NAPIER
ZL4QI	MCDARMID, K G, PO BOX 131, OAMARU	ZL4TCF	NORGROVE, T J, 9 DAKOTA PLACE, WALDRONVILLE
ZL4QJ	BURTENSHAW, J S, 33A GALLOWAY STREET, HAMILTON 2001	ZL4TCN	HOLLEY, J A C, 44 SCOTLAND ST, ROXBURGH 9156
ZL4QK	CROSS, A, 150 STATION RD, AYLESBURY RD 1, CHRISTCHURCH	ZL4TCO	MOONEY, W J, 43 Main Street, Weston, Oamaru
ZL4QM	MCLAREN, J B, 8 MARLBOROUGH CRESCENT, RICHMOND	ZL4TCS	FALCONER, E F, PO BOX 214, GORE
ZL4QN	BONNEY, J E, 195 QUEEN STREET, WAIMATE, SOUTH CANTERBURY	ZL4TDB	WILDEN, J H, 46 HOCKEN ST, DUNEDIN
ZL4QO	LAWSON, D, 30 MCFADDEN DRIVE, MOSGIEL	ZL4TDE	GALLAGHER, P R, 112 JOHN SIMS DRIVE, JOHNSONVILLE, WELLINGTON
ZL4QQ	MARSHALL, W H, 39 BELLONA STREET, ST KILDA, DUNEDIN	ZL4TDF	WALKER, J D, 7 MEON ST, OAMARU
ZL4QS	LOCHHEAD, J R, 14 DON PLACE, ALEXANDRA	ZL4TDG	GALLAGHER, S A, 26 JOSEPH ST, INVERCARGILL
ZL4QT	DONOGHUE, A M, PO BOX 4215, WANGANUI	ZL4TDJ	DINGWALL, A B, 47 GILKISON ST, DUNEDIN
ZL4QU	PIPER, R V, NO 2 R D, DRYSDALE RD, INVERCARGILL	ZL4TDK	DWYER, W A, 21 SUMMERTIME AVE, DUNEDIN
ZL4QW	DANIEL LEWIS, 314 THAMES HIGHWAY, OAMARU	ZL4TDM	MCKEOWN, D W, 61 EDEN ST, OAMARU
ZL4QY	MCLEAN, I A, C/O NZMCA MAIL DROP, P O BOX 72 147 PAPAKURA, AUCKLAND	ZL4TDQ	DAVIDSON, R W, 48 MONTROSE ST, INVERCARGILL
ZL4RAE	RAE, B G, 25 ETTRICK ST, BROCKVILLE, DUNEDIN	ZL4TDR	ZOEST, A R, 25 JAUNPUR CRES, BROADMEADOWS, WELLINGTON
ZL4RAY	PARIS, R C, 57 RATA DRIVE, OTEMATATA	ZL4TDS	KING, W A, P O BOX 410, ALEXANDRA
ZL4RB	NAISH, A W, 45 ARDGOWN RD, OAMARU	ZL4TDT	JOHNSON, W A, FLAT 10, 254 MAIN STREET, GORE
ZL4RC	CHAPMAN, R C, 17 CUBA STREET, CARLTON HILL, DUNEDIN 9001	ZL4TDU	LYNN, I G, 1/37 AVONHEAD RD, AVONHEAD, CHRISTCHURCH
ZL4RD	PERRIN, L D, 69A OTIPUA RD, TIMARU	ZL4TFD	BALL, D R, 2C TOWEY ST, OAMARU
ZL4RE	EAST, R S, 503 SILVERSTREAM VALLEY ROAD, RD2, MOSGIEL	ZL4TFF	BOKSER, D L, 216 NORTH RD, NORTH EAST VALLEY, DUNEDIN
ZL4RF	OSBORNE, H F, 8 CONWAY CRES, INVERCARGILL	ZL4TFG	NEILL, P G, 593 MACRAES ROAD, 3 RD, PALMERSTON, OTAGO
ZL4RG	CALVERT, K C, 183 DRYSDALE ROAD, MYROSS BUSH, NO 2 RD, INVERCARGILL	ZL4TFL	COLLIER, J B, 86 MAILER ST, DUNEDIN
ZL4RH	MCINTOSH, R W, 51 YOUNG STREET, DUNEDIN 9001	ZL4TFM	MCKENZIE, F M, 33 AILSA STREET, WALLACETOWN
ZL4RJ	BABER, L, PO BOX 12-665, THORNDON, WELLINGTON	ZL4TFP	BEDFORD, W M, C/O MILBURN GARDENS RD 2, MILTON
ZL4RM	WIJKSTRA, E, 28 WHITE ST, INVERCARGILL	ZL4TFV	CALDER, D G, PO BOX 113, WINTON 9662
ZL4RMF	FALCONER, R M, 421 DONALD ROAD, NO 5 R D, GORE	ZL4TFY	CRAIGHEAD, G, 162 BALMACEVEN RD, DUNEDIN
ZL4RML	MUELLER, R, PO BOX 6555, DUNEDIN	ZL4TGA	SCOTT, P R, 99 GILKISON ST, DUNEDIN
ZL4RO	GRAHAM, J D, 30 GRANTS ROAD, TIMARU	ZL4TGB	GRANT, W A, PO BOX 375, DUNEDIN
ZL4RP	GILLIONS, R M, 5 CHERRY DRIVE, MOSGIEL, DUNEDIN 9007	ZL4TGF	WILLIAMS, G B, 64 FORFAR CRES, INVERCARGILL
ZL4RQ	PYCROFT, B E, 8 ORCADES ST, SHIRLEY, CHRISTCHURCH	ZL4TGH	CONNOLLY, R C, PO BOX 1229, DUNEDIN
ZL4RR	Donnelly, David, 40 Brookwood Rd, Bethany, Connecticut	ZL4TGJ	PETTIGREW, A D, 89 WARD STREET, INVERCARGILL
ZL4RS	JONKER, J A, 148A ELGIN ROAD, MORNINGTON, DUNEDIN 8751	ZL4TGM	BLACK, W A, WEST COAST ROAD, R D 1, AWANUI 0552
ZL4RT	SMITH, D J, 181 MILTON STREET, NELSON	ZL4TGP	WATSON, R M, 21 ARCUS ST, WHANGAREI
ZL4RU	POWE, R L, PO BOX 26, PALMERSTON	ZL4TQQ	ANDREWS, BRIAN, 14 COMO STREET, MAORI HILL, DUNEDIN
ZL4RUS	EADE, R W, 27 GRAHAM STREET, MOSGIEL	ZL4TGT	GERRIE, A L, 22 MARHILL TERRACE, MORNINGTON, DUNEDIN
ZL4RV	TAMPLIN, A F K, 88 MAHOENUI VALLEY RD, R D 3 COATESVILLE, ALBANY AUCKLAND	ZL4TGW	WRIGHT, G W,
ZL4RW	BAILEY, W D, 35 TYNE STREET, ROSLYN, DUNEDIN	ZL4TH	LARSEN, S N, 26 COLUMBA AVE, LOOKOUT POINT, DUNEDIN
ZL4RXD	GRIFFITH, ROYCE, EN HAKKORE, RD4, RANFURLY, CENTRAL OTAGO	ZL4THE	BOOTH, A W, P O BOX 77, STEWART ISLAND
ZL4SA	HELM, P D, RD 4, RANFURLY	ZL4THF	BURGE, G G, 34 COLMAR RD, MELLONS BAY, HOWICK AUCKLAND 1705
ZL4SB	STEVENSON, D J, P O BOX 9008, DUNEDIN 9030	ZL4THG	MCAULIFFE, K J, P O BOX 56, KINGSTON 9660
ZL4SC	EMERSON, M P, 41 EMBO ST, KEW, DUNEDIN	ZL4THJ	RABBIDGE, M J, CRAYBURN FARM, GRAHAM RD, RD 1, TOKANUI
ZL4SD	EXCELL, R A, PO BOX 7, TE ANAU	ZL4THN	HANNAH, I R,
ZL4SE	BRANNIGAN, A M, 2 COLLINS STREET, ASHBURTON	ZL4THP	DA-RIN, K J V, 141 FORBURY ROAD, ST CLAIR, DUNEDIN
ZL4SEA	ROLTON, G L, 59 BALMAIN AVE, HALFWAY BUSH, DUNEDIN	ZL4THQ	CRIMP, G R, 31 DAVIES RD, NEW PLYMOUTH
ZL4SF	WATT, B F, 91 WESTON RD, OAMARU	ZL4THT	BLEE, A R, 7 CAMPBELL ST, ALEXANDRA
ZL4SJ	JEPSON, S J,	ZL4THZ	MCLEAN, C J, RD 1, LONGBUSH, INVERCARGILL
ZL4SL	POPE, K, 160 HOWICK ROAD, BLENHEIM	ZL4TID	MCRAE, G F, 1 HILLCREST AVE, MATAURA 9690
ZL4SM	FINER, W R, 7 SWANSON RD, HENDERSON, AUCKLAND 1008	ZL4TIE	BARBER, B J, RD 2, GLENCOE, INVERCARGILL
ZL4SN	MCLEOD, N C, 65 STUART ST, OAMARU	ZL4TIG	HILL, A R M, 16 WYRE ST, KAITANGATA
ZL4SO	ELLIS, K M, 3 HAWERA RD, KOHIMARAMA	ZL4TII	PEIRSON, W E, 16 GARDINERS ROAD, BISHOPDALE, CHRISTCHURCH
ZL4SQ	LEADLEY, A M, 33 TAWARAU RD, RD 1, PIOPIO 2555	ZL4TIK	CURLINE, A J, 16 DERBY ST, GREEN ISLAND
ZL4SR	FLETCHER, R E, 19 RIVERSIDE DRIVE SOUTH, LOWER HUTT	ZL4TIL	DRAGE, I J, C/O 12 GREY STREET, INVERCARGILL 9501
ZL4SS	JURY, L S, 24 PAEROA ROAD, R D 12, LEVIN	ZL4TIM	WATSON, N R, 27 READING STREET, CHRISTCHURCH 4
ZL4ST	BEVERIDGE, G W, 83 RUSSELL ST, ALEXANDRA	ZL4TIO	MOORE, J S, 10 DALRYMPLE ST, DUNEDIN
ZL4SU	MURRELL, I G, 8 AWAKINO ROAD, TE KUITI	ZL4TIR	WOODROW, P J, 32 BAKER ST, STIRLING 9200
ZL4SV	HAYTER, J W, 22 OMAPERE RD, KAIKOHE	ZL4TIY	LAROOG, G M, 85 RIVERLEA ESTATES DRIVE, RIVERLEA ESTATES, BELFAST, CHRISTCHURCH
ZL4TA	MILLAR, G E, 18A ARUN ST, OAMARU	ZL4TJP	ASKIN, F A, 408 HAREWOOD, BISHOPDALE, CHRISTCHURCH
		ZL4TJR	TAYLOR, J F,
		ZL4TKK	SPENCE, R W, 41 BLACK RD, OTATRA RD 9, INVERCARGILL
		ZL4TKM	MITCHELL, GLENN, 17 KAKA ROAD, ST. LEONARDS, DUNEDIN
		ZL4TKQ	TAMPLIN, N L A, 58 COOPER ST, KARORI, WELLINGTON

ZL4TKR	TAYLOR, G J,	ZL4US	LAMBERT, M G, 38 AYR ST, MOSGIEL
ZL4TKS	MASON, E C, 49 JOHN ST, RANFURLY 9171	ZL4VAB	WILDEN, R M, 46 HOCKEN ST, KENMURE, DUNEDIN
ZL4TL	BLAIR, R C, TAUMATA R D, CLINTON, DUNEDIN	ZL4VAC	BOOTSMA, D, 8 SELWYN ST, OAMARU
ZL4TLE	ELLIOTT, L G, 36A MURANO ST, DUNEDIN	ZL4VAD	MEIKLE, J W, 15 GIRVAN ST, OAMARU
ZL4TLG	MCCONECHY, G S, 71 HEYWOOD ST, INVERCARGILL	ZL4VAP	POPHAM, A D, 47 KELSO CRES, INVERCARGILL
ZL4TM	DUFFY, W J, PO BOX 6025, INVERCARGILL	ZL4VAQ	NEEDHAM, J W, 2/232 SPEY STREET, INVERCARGILL
ZL4TNT	GRABOWSKI, B M, 4 PATUTU GROVE, TRENTHAM, UPPER HUTT 6007	ZL4VCS	STEPHEN, C D, 53 ANTIMONY CRES, CROMWELL
ZL4TO	MANN, I A, 245 Macandrew Road, Saint Clair, DUNEDIN	ZL4VDF	FINDLATER, D N, 41 MONTAGUE ST, DUNEDIN
ZL4TP	GARRY, A M, 4 TILBURN ST, DUNEDIN	ZL4VDM	MILLER, D R, 34 HERRON ST, BROCKVILLE, DUNEDIN
ZL4TPD	DENNISON, W P, 301 YTHAN ST, INVERCARGILL	ZL4VEH	HUNT, E J, 691 PORTOBELLO RD, BROAD BAY, DUNEDIN
ZL4TPJ	DIXON, P J,	ZL4VGA	ANDERSON, R G, 121 ELGIN RD, MORNINGTON, DUNEDIN
ZL4TR	ARMSTRONG, E W, 15 LONDON STREET, WESTON, OAMARU 8901	ZL4VGV	SEIDELIN, G R, 45 ELGIN ROAD, MORNINGTON, DUNEDIN
ZL4TRM	MCLENNAN, R N, 161 HALL ROAD, SAWYERS BAY, DUNEDIN	ZL4VJS	SHAND, J C, 34 BAYVIEW ROAD, WOODEND RD1, INVERCARGILL
ZL4TRS	SHEAT, R A, MCLEW ST, KENNINGTON RD 1, INVERCARGILL	ZL4VK	RUSHBY, C H, P O BOX 531, DUNEDIN
ZL4TRW	CODLING, R D, 11A SEDDON ST, TIMARU	ZL4VM	MARRIS, V T, 7 MERIDIAN ST, PORT CHALMERS
ZL4TS	SMITH, J W, C/- DAVID PEARSON, P O BOX 1312 GREEN ISLAND, DUNEDIN	ZL4VOW	WATSON, O, 103 BRAEVIEW CRES, DUNEDIN
ZL4TSM	MANN, S P, 20 MARKHAM WAY, ROLLESTON	ZL4VPM	MORTIMER, V P, 18 ASH STREET, OAMARU
ZL4TSR	FORRESTER, S R, 43 THURSO ST, INVERCARGILL	ZL4VW	WILLIAMS, V R, 22 SWORD STREET, GORE
ZL4TT	CARTER, F L, 4 ROACH STREET, OAMARU	ZL4WA	SCOTT, J R, COCHRANES RD, RD 7, ASHBURTON 8300
ZL4TUD	MCCONNACHIE, N E, P O BOX 13146, GREEN ISLAND, DUNEDIN	ZL4WAH	WATSON, A H, 114 CANNINGTON RD, DUNEDIN
ZL4TUI	RICHARDSON, M, 196 HILL ROAD, BELMONT HILLS, WELLINGTON 6009	ZL4WAQ	JAQUIERY, S G, 56 ROYAL TCE, DUNEDIN
ZL4TUX	BARKMAN, G P, 31ASCOT STREET, ST KILDA, DUNEDIN	ZL4WAT	WRIGHT, A T, 5 PALMER ST, SEACLIFF, RD 1, WAIKOUAITI
ZL4TWO	CLARKSON, D J, 22 JACKSON ST, DUNEDIN	ZL4WC	WISHART, I D,
ZL4TX	STUART, B E, 353 HIGHCLIFF RD, DUNEDIN	ZL4WD	WALLACE, W D, C/O PO BOX 75, WAIPARA PC 8270
ZL4UDM	MCKENZIE, D S, 33 AILSA STREET, WALLACETOWN, INVERCARGILL	ZL4WDF	FRASER, D R A,
ZL4UHF	ALDRIDGE, S J, RD 4, UNDERWOOD, INVERCARGILL	ZL4WEK	KROL, E, 23 FRANKLIN ST, DUNEDIN
ZL4UJC	CUNNINGHAM, J C, 11 SANDOWN STREET, WAIHOLA, SOUTH OTAGO	ZL4WES	WESTON, A N, 3 KAURI ST, RICCARION, CHRISTCHURCH
ZL4UK	JONES, J B, 2 DUDLEY PLACE, MAORI HILL, DUNEDIN	ZL4WF	BEYER, W F T, 132 EDEN ST, OAMARU
ZL4UPB	JONES, UNIVERSITY OF AUCKLAND, PRIVATE BAG 72019, AUCKLAND	ZL4WG	SMITH, J, 1014 GREENVALE ROAD, NO 5 RD, GORE
		ZL4WJ	BUSBY, W J, 25 ETRICK ST, BROCKVILLE, DUNEDIN
		ZL4WRC	CLARK, R W, 5 LETHABY ST, ABBOTSFORD, DUNEDIN
		ZL4WW	CARTER-O'BRIEN, H, C/O KDXA, PO BOX 7, CLYDE, CENTRAL OTAGO
		ZL4WX	HOLLAND, B J, C/O POLICE STATION, 32 PRINCES ST, WAIKARI 8276
		ZL4WZ	HOLLAND, J P, 3 OKIWA PLACE, RD 1, PICTON

NEW ZEALAND DEPENDENCIES

ZL6A	NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS INC, PO BOX 40-525, UPPER HUTT 6415
ZL6FF	FISTS CLUB - NZ CHAPTER, C/- 12C / 186 THE TERRACE, WELLINGTON 6001
ZL6IW	NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS INC, PO BOX 40-525, UPPER HUTT 6415
ZL6KCM	KAPITI COAST MUSEUM WAIKANAE INC, 9 ELIZABETH STREET, WAIKANAE 6010
ZL6LH	KARRASCH, D F, 24 BROOKE RD, PAPAKURA, AUCKLAND
ZL6LHW	UPPER HUTT BRANCH NZART INC, C/- 35 MATAI ROAD, RAUMATI SOUTH 6010
ZL6OTC	NEW ZEALAND OLD TIMERS CLUB (ZL), 25 ANNANDALE STREET, NEW PLYMOUTH

ZL6QH	WELLINGTON AMATEUR RADIO CLUB INC, NZ ASSOCIATION OF RADIO TRANSMITTERS, P O BOX 40525, UPPER HUTT
ZL6SAT	AMSAZ-ZL, C/- NZART, PO BOX 40-525, UPPER HUTT
ZL6YL	NZ WOMEN AMATEUR RADIO OPERATORS, C/O MRS JN O'DONNELL, 39 LISMORE ST, NEW PLYMOUTH
ZL7TK	KAMANA, T, P O BOX 16, WAITANGI, CHATHAM ISLANDS
ZL8R	Microfile Penguins DXpedition Team, C/- Chris Hannagan, Fraters Rd, RD 1
ZM2E	WELLINGTON AMATEUR RADIO CLUB INC, NZ ASSOCIATION OF RADIO TRANSMITTERS, P O BOX 40525, UPPER HUTT

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3D2ES	Saphore, Edward, P.O. Box 12-758, Suva.
3D2JO	Turaganivalu, J., 14 Alexander Street, Suva.
3D2KM	MacKinnon, K., c/- F.S.C, P.O. Box 63, Lautoka.
3D2LD	Damuni, Savenca, P.O. Box 90, Suva.
3D2MP	Prakash, M., P.O. Box 5324, Raiwaqa.
3D2PS	Schulz, A. F. P., P.O. Box 5372, Raiwaqa.
3D2SS	First Suva Scout Group, P.O. Box 2344, Government Buildings, Suva.
3D2UR	USP Amateur Radio Club, P.O. Box 1168, Suva.
3D2YL	Blisard, Karen S., P.O. Box 2474, Suva.

Cook Islands

E51AQ	Malcolm, Roger, PO Box 7, Areora, Atiu Island.
E51BK	Allan, Norman, Titikaveka, Rarotonga.
E51BS	C Is. Boy Scouts, PO Box 491, Rarotonga.
E51CG	Rivera, Victor, PO Box 618, Black Rock, Rarotonga.
E51DD	Clarke, Des, Aitutaki Island, South Cook Islands.
E51DG	Goodger, James, PO Box 597, Rarotonga.
E51JD	Ditchburn, Jim, PO Box 491, Rarotonga.
E51KH	Holdom, Ken, c/- ZL4HU, P O Box 7, Clyde, Central Otago 9180, New Zealand, zl2hu@clear.net.nz.
E51TW	Wichman, Tomoavao, PO Box 129, Rarotonga.
E51USA	Rivera, Victor, PO Box 618, Rarotonga.
E51WL	Latham, Warwick, Omoka, Penrhyn Island.

New Caledonia

FK1RO	Szymanski, Pascal, Box 11-451, 98802, Noumea.
FK1TK	Rainer, Henri, 190 rue Boutmy, Box 4608, 98847, Noumea.
FK1TV	Flotat, Leon, Box 3690, 98846, Noumea.
FK1UB	Morignat, Claude, 64 Route Anse-Vata, 98800, Noumea.
FK1UL	Jauneau, Jean-Claude, Box 2100, Pont des Francais, 98810, Mont Dore.
FK1UM	Janisel, Robert, Box 917, 98830, Koutio.
FK1UW	Tardivel, Gouven, 1 rue Henry Boissery, Box 1529, 98845, Noumea.
FK8AH	Garbe, Robert, Box 4490, 98847, Noumea.
FK8AL	Garbe, Jean, Box 3994, 98846, Noumea.
FK8BG	Cullell, Gilbert, 6 bis rue Charbonneaux, 98800, Noumea.
FK8BN	Thiriet, Guy, Box 1491, 98845, Noumea.
FK8BR	Ynet-Mine, Maurice, 98825, Pouembout.
FK8CA	Gouillard, Alain, Box 238, 98840, Tontouta.
FK8CC	Deramane, Simon, Box 7514, 98801, Noumea.
FK8CP	Touzard, Remi, Box 945, 98845, Noumea.
FK8DD	Torope, Samuel, Box 3040, 98846, Noumea.
FK8DI	Rabu, Dominique, 5 rue C. Savoie, 98800, Noumea.
FK8DJ	Kryger, Jean-Claude, 21 rue Charbonneau, 98800, Noumea.
FK8DL	Roussel, Jean-Claude, Box 8585, 98807, Noumea.

FK8DM	Thouvay, Gilles, Box 2016, 98846, Noumea.
FK8EB	Pesnel, Henri, Box 9754, 98807, Noumea.
FK8EF	Martin, Arsene, Box 3519, 98846, Noumea.
FK8ET	Dufermon, Jean-Michel, Box 3859, 98846, Noumea.
FK8FA	Tuband, Aimee, via VK4CTA.
FK8FB	Debien, Lionel, Box 428, 98845, Noumea.
FK8FC	Tourette, Michel, Box 2309, 98846, Noumea.
FK8FG	Lepelletier, Bernard, Box 6258, 98806, Noumea.
FK8FI	Nagle, Alain, QSL to F6FNU.
FK8FK	Torregrosa, Jean-Philippe, Box 8485, 98807, Noumea.
FK8FL	Gazengel, Albert, Box 4561, 98847, Noumea.
FK8FO	Chanaron, Jean-Paul, Box 7133, 98801, Noumea.
FK8FR	Nixon, John, Box 2319, 98846, Noumea.
FK8FS	Todori, Georges, 47 rue du Dr. Drayton, 98800, Riviere Salee.
FK8FX	Mercier, Yvon, 16 rue Gal Sarail, 98800, Noumea.
FK8FZ	Blanchet, Yves, Box 11490, 98802, Noumea.
FK8GF	Millot, Alexandre, Box 3977, 98846, Noumea.
FK8GJ	Bourez, Marc, only QSL to F6CXJ.
FK8GM	Esposito, Eric, Box 4480, Noumea, 98847, or via WB2RAJ.
FK8GN	Allegret, Alain, Box 133, 98850, Koumac.
FK8GO	Kherzi, Michel, via VK4CKM.
FK8GT	Debien, Philippe, Box 8340, 98807, Noumea SUD.
FK8GU	Marrades, Jacques, Box 3528, 98846, Noumea.
FK8GW	Enrico, James, Box 6008, 98806, Riviere Salee.
FK8GX	Mahault, Michel, Box 955, 98870, Bourail.
FK8GY	Bouleau, Joel, Box 7219, 98801, Noumea.
FK8GZ	Gaveau, Emile, Box 2005, 98846, Noumea.
FK8HA	Lefebvre, Patrice, Box 74, 98830, Dumbea.
FK8HC	Petitjean, Franck, only via VK4FW.
FK8HF	Pebellier, Michel, 12 bis Rue Bureau V D C, 98800, Noumea.
FK8HG	Tual, Robert, Box 9053, 98807, Noumea.
FK8HH	Roussel, Odile, Box 8585, 98807, Noumea.
FK8HM	Pesque, Eric, 20 rue de la Riviere, Pointe aux Longs coups, 98800, Noumea.
FK8HN	Lavisse, Didier, Box KO 1412, 98830, Dumbea.
FK8HP	Hertzog, Pascal, Box 6005, Riviere Salee 1, 98806, Noumea.
FK8HQ	Said, Eric, 12 bis rue E Mercier Vdc, 98800, Noumea.
FK8HS	Rieux, Christine, Box 7325, 98801, Noumea.
FK8HW	Poitvin, Thibault, only via VK4FW.
FK8HZ	Bunel, Maurice, 6 Rue Barleux, 98800, Noumea.
FK8KAB	A.R.A.N.C., Box 3956, 98846, Noumea.
FK8KBS	A.R.A.N.C. BBS, Box 3956, 98846, Noumea.
FK8KRU	A.R.A.N.C., Box 3956, 98846, Noumea.
FK8PCT	ATRASEC, Box 2793, 98846, Noumea.
FK8ZHA	Repeater, Box 3956, 98846, Noumea.
FK8ZHB	Repeater, Box 3956, 98846, Noumea.

Solomon Islands

No update for 2006	
H44GP	Pearson, G., P.O. Box 292, Honiara.
H44GR	Richardson, G., P.O. Box 127, Honiara.
H44MS	Steffen, B., see DL2GAC.
H44NC	Caisson, N., P O Box 168, Munoa.
H44PT	Taylor, P, see G8BCG.
H44SI	Solomon Island Radio Society, P.O. Box 418, Honiara.
H44XJA	Ashley, J., P.O. Box 986, Honiara.

NON-TRANSMITTING MEMBERS

Bell, D, P O Box 43, Otaki 5560.
Bennett, R. B., R D 1, Circle Hill, Milton 9250.
Bryant, B W, ZL3144, 44 Ward Street, Kaikoura 8280.
Byers, R. W, 95 Denton Road, R D 1, Levin 5500.
Conway, C, Caseys Road, R D, Seddon 7353.
Cosson, B, R D 1, Onerahi, Whangarei 0121.
Coutts, W E, 50 Cooper Street, Karori, Wellington 6005.
Dickie, R A, 14 Koa Street, Gore 9700.
Downer, M L, 25 Boundary Road, Alexandra 9181.
Ellis, G P, ZL364, 74 Le Cren Street, Timaru 8601.
Ferguson, K. D., P O Box 3526, Shortland Street, Auckland City 1015.
Gaudin, D A J, 18 Trafalgar Street, New Plymouth 4601.
Gibb, A N, 175 Helensburgh Road, Wakari, Dunedin 9001.
Gough-Jones, A, 24 Bidwell Place, Hillmorton, Christchurch 8003.
Gray, R G, Paierau Road, R D 1, Masterton 5921.
Lambert, P E, 15 Wither Road, Blenheim 7301.
Lennox, A E, 33 Greendale Road, Darfield 8172.
Low, S K, P O Box 112-167, Penrose, Auckland 1135.

McConnel, S J (Mrs), 66 Khandallah Road, Khandallah, Wellington 6004.
McGehan, M C, 80 Nelson Street, Howick, Auckland 2014.
McKenzie, C G, 253 Ohiro Road, Brooklyn, Wellington 6002.
McNeil, D A, 33 Eivers Road, Whakatane 3080.
McNickle, R, 1 Moana Avenue, R D, Atiamuri 3291.
Midwinter, G G, 6 Crabapple Close, Milson, Palmerston North 5301.
Morris, Tom, 316/1 Budden Road, R D 5, Te Awamutu 2400.
Murdoch, T, 5 Karaka Street, Otaki Beach 5560.
Parsons, C, 54 Wiloughby Street, Paeroa 2651.
Pritchard, H R, 1-67 Gribblehirst Road, Sandringham, Auckland 1003.
Renner, D M, 118 Te Haumi Road, Paihia, Bay of Islands 0252.
Sebire, P W, 32 Neri Crescent, Rotorua 3201.
Strachan, J W, 47 Morgans Road, Glenwood, Timaru 8601.
Thomson, B D, ZL149, 14 Puriri Street, Kamo 0101.
Walker, J, 32 Argentine Avenue, Miramar, Wellington 6003.
Webb, W R C, 13 Rembrandt Avenue, Linden 6006.
Wiggins, F G, ZL1306, P O Box 522, Tokoroa 2392.

AREC Officers

E.Call		Call	Home	Work	Deputy	Call	Home	Work	
ZK6EX	National Director	Jeff Sayer	ZL4JS	(06) 370-1245	(027) 450-8022	Geoff Chapman	ZL3PX	(03) 942-8180	(03) 377-8324
ZK6EXS	National Secretary	Doug Cooke	ZL1TTE	(09) 846-6075	(025) 978-121				
ZK1EX	Area Manager ZL1	Richard Gamble	ZL1BNQ	(09) 537-1238	(09) 272-0114	Jim Rowe	ZL1AVR	(07) 868-9193	(027) 235-7266
ZK2EX	Area Manager ZL2	Terry Waghorn	ZL2AYY	(06) 306-8926	(027) 488-7271	John Yaldwyn	ZL1AJY	(04) 293-1400	(04) 408-7080
ZK3EX	Area Manager ZL3	Gareth Bradshaw	ZL3VP	(03) 332-2406	(027) 432-4738	Paul Rennie	ZL2RE	(03) 578-5911	(03) 577-7007
ZK4EX	Area Manager ZL4	Bill Olsen	ZL4AE	(03) 455-7884	(027) 436-9107				
ZK6EX	Land SAR Liason	Jeff Sayer	ZL4JS	(06) 370-1245	(027) 450-8022				
ZK6EXT	Nat.Training Officer	Daniel Ayers	ZL1DFA		(021) 387-334				

AREC Section Leaders and Deputies

E.Call	Section	Section Leader	Call	Home	Work	Deputy Leader	Call	Home	Work
ZK1EA*	Auckland	Graham Hay	ZL1GH	(09) 278-8392	(021) 384-150	Don Webster	ZL1CY	(09) 575-5554	
ZK1EB*	North Shore	TBA				Alan Wooller	ZL1AUW	(09) 444-2423	(09) 309-1390
ZK1EC	Hamilton	Jim Medland	ZL1UCT	(07) 846-7415	(027) 359-4798	Bevan Holden	ZL1BH	(07) 850-6335	
ZK1ED*	Te Awamutu	Chris Ellison	ZL1AKK	(07) 871-3733		Mervyn Owen	ZL2AVY	(07) 871-9992	
ZK1EE*	Taumarunui	Lew Palmer	ZL1TIG	(07) 895-8113	(07) 895-8260	Trevor Hardisty	ZL1UTH	(07) 895-5924	(07) 896-7777
ZK1EF*	Waihi	David Bell	ZL1AKV			Peter Anderson	ZL1LR	(07) 863-7546	
ZK1EG	Northland	Brian Winger	ZL1BSW	(09) 438-8232	(027) 491-3888	Don Ewen	ZL1DTE	(09) 432-0185	(025) 974-356
ZK1EI	Thames	Jim Rowe	ZL1AVR	(07) 868-9193	(027) 235-7266	Mary Sutton	ZL1UHZ	(07) 868-7290	(021) 185-7250
ZK1EJ	Tauranga	Bill Richardson	ZL1APD	(07) 578-9317	(025) 687-1411	Don Spackman	ZL1MK	(07) 543-2730	(021) 066-3380
ZK1EK	Western Suburbs	Ross Reddell	ZL1VRR	(09) 629-0504	(027) 622-1055	Merv Thomas	ZL1SK	(09) 828-7174	(027) 409-0262
ZK1EL*	Cambridge	Tony Boyce	ZL1AFV	(07) 827-6107	(07) 827-7358	Des Hamlyn	ZL1HP	(07) 827-6247	
ZK1EM	Eastern B.O.P.	Alan McDonald	ZL1PI	(07) 308-7740	(07) 308-8967	Les Clark	ZL1BQX	(07) 308-8615	
ZK1EN	Franklin	Bob Holt	ZL1BBZ	(09) 236-9549	(027) 200-0331	Tom McDonald	ZL1TO	(09) 238-8680	(09) 536-6239
ZK1EO	Kawerau	Barry Liddle	ZL1CAY	(07) 323-8970	(07) 323-3860	Ray Dyer	ZL1AIS	(07) 323-6199	
ZK1EP*	Waitomo	Mick Gannon	ZL1HJ	(07) 878-7140		Andrew Leadley	ZL4SQ	(07) 877-8675	
ZK1EQ	Rotorua	Peter Dare	ZL1PJ	(07) 345-6469	(07) 343-5883	Murray Thompson	ZL1SY	(07) 348-9741	
ZK1ER*	Tokoroa	Graham Henley	ZL1GDH	(07) 886-6498	(07) 886-1746	Brian Williamson	ZL1BYO	(07) 886-5658	(07) 886-6109
ZK1ES	Papakura	Richard Gamble	ZL1BNQ	(09) 537-1238	(09) 272-0114	David Karrasch	ZL1DK	(09) 298-5271	(09) 266-0180
ZK1ET*	Taupo	Graham Messenger	ZL1BVO	(07) 378-4162		Roger Simmonds	ZL1UT	(07) 378-9676	
ZK1EU	Manukau	Ivan Lindsay	ZL1AMR	(09) 272-8295		Granville Emmett	ZL1BYD	(09) 273-2673	
ZK1EV*	Te Puke	John Hutton	ZL2GV	(07) 542-1159	027 493-5170	Ray Brown	ZL1RAB	(07) 573-8511	
ZK1EW	Rodney	Mike Ryan	ZL2MR	(09) 425-4401	(027) 213-4929				
ZK1EY*	Opotiki	Jim Jones	ZL1JRJ	(07) 315-7067		Steve Winder	ZL1ACE	(07) 315-7333	
ZK6EA	Far North	Russell Shackleton	ZL1BQK	(09) 408-0057	(09) 408-0190	Eric Shackleton	ZL1TQG	(09) 408-4125	(09) 408-0404
ZK6EB*	Te Aroha	Kevin Morton	ZL1TEA	(027) 286-8175		Jim Milligan	ZL1BAM	(07) 884-8660	
ZK6EC*	Hibiscus Coast	Darryl Nielsen	ZL1TCH	(09) 402-5075		John Bell	ZL1FB	(09) 424-5725	(025) 675-5327
ZK6ED*	Mercury Bay	Geoff Penney	ZL1APO	(07) 866-4703	(07) 866-0035	Jack MacLardy	ZL1TIR	(07) 866-5876	
ZK6EE*	Auckland VHF Grp.	Daniel Ayers	ZL1DFA		(021) 387-334	Peter Loveridge	ZL1UKG	(09) 377-3398	
ZK2EA*	Gisborne	Alan Mackintosh	ZL2AO	(06) 868-6267	(025) 234-8887	Steve Main	ZL2RI	(06) 867-0001	(06) 867-6544
ZK2EB	New Plymouth	Jill O'Donnell	ZL2DBO	(06) 758-1429		Wayne Gaudin	ZL2VN	(06) 753-5800	
ZK2EC	Motueka	Robin Reeve	ZL2FZ	(03) 528-6868	(021) 634-993	Jim Jackson	ZL2BCG	(03) 528-8357	
ZK2ED	Wanganui	Jason Wallace	ZL2FT	(06) 344-5687	(06) 345-0997	TBA			
ZK2EE*	Hastings	Robert Wallace	ZL2SG	(06) 878-4993	(027) 434-4027	Warren Harris	ZL2AJ	(06) 844-6880	(021) 649-284
ZK2EF	Kapiti	Len Blackley	ZL2GO	(04) 904-7048	(04) 496-2589	Geoff Cooke	ZL2TGC	(04) 293-2627	(04) 293-4003
ZK2EG	Wellington VHF	John Yaldwyn	ZL4JV	(04) 293-1400	(04) 496-7080	Jeff Sayer	ZL1AJS	(06) 370-1245	(027) 450-8022
ZK2EH*	Tararua District	Steve Cooper	ZL2WAU	(06) 374-8288	(06) 376-4745	Jim Edwards	ZL1UBE	(06) 374-7261	(021) 156-2524
ZK2EI*	Manawatu	Hayden Sims	ZL2WD	(06) 357-8580		Len Inkpen	ZL2LI	(06) 357-1493	
ZK2EJ	Wairarapa	David Bray	ZL2UCW	(06) 378-8268	(027) 449-5146	Gavin McAnulty	ZL2VGB	(06) 377-3978	(027) 429-16105
ZK2EK*	Rahotu Coastal	Peter McNeil	ZL2QP	(06) 761-8028		Len Pentelow	ZL2OF	(06) 763-8489	
ZK2EL	Upper Hutt	Maurice Vile	ZL2ADP	(04) 976-9022		Neil Gibbons	ZL2TNG	(04) 527-9067	(04) 528-4558
ZK2EN*	Nelson	Dave Scott	ZL2BCA	(03) 545-0237	(027) 446-4714	Brian Hawken	ZL2BJ	(03) 547-0382	(021) 230-0592
ZK2EO	Marlborough	Paul Rennie	ZL2RE	(03) 578-5311	0800-250-450	Ron Harris	ZL2BDD	(03) 575-7181	(03) 575-7181
ZK2EP*	Inglewood	Terry Martin	ZL2KV	(06) 756-7627		Graham Meads	ZL2TGM	(06) 756-7998	(06) 756-7194
ZK2EQ*	Napier	Mark Vidulich	ZL2LAB	(06) 844-2694	(06) 878-8109	John Lane	ZL2ARF	(06) 844-3266	(027) 246-3977
ZK2ES	Horowhenua	Kenneth Ireland	ZL2KI	(025) 449-449	(025) 449-449	Arther Gregory	ZL2UIN	(06) 368-4336	
ZK2ET	Titahi Bay	Mike Burch	ZL2UAU	(04) 233-9038	(021) 188-0035	Chris Herd	ZL2TCH	(04) 239-9914	
ZK2EV*	Patea	Graeme Bateman	ZL2BHD	(06) 278-4793		Michael Mulholland	ZL2WJM	(06) 278-7583	
ZK2EW	Marton	Brian Purdie	ZL2ADL	(06) 329-3606	(027) 321-4470	Jim Vernon	ZL2BHX	(06) 388-1855	(025) 462-628
ZK2EY	Hutt Valley	Bob Sewell	ZL2ASO	(04) 564-6929		Dave Williams	ZL2DSW	(04) 564-6713	
ZK7EA*	Feilding	Gil Hitchman	ZL2BNA	(06) 323-5847		A. Abel	ZL2QR	(06) 323-6538	
ZK7EC*	Wairarapa	TBA				Ian Cash	ZL2BRA	(06) 754-6183	(06) 755-0900
ZK7ED*	Sth. Wairarapa	Neil Rait	ZL2BLM	(06) 308-9341	(025) 575-370	TBA			
ZK3EA	Christchurch	Dudley Berry	ZL3GG	(03) 389-4718	(03) 364-2102	Steve Davis	ZL2UCX	(03) 348-0360	(027) 436-1796
ZK3EB	Westland	Graham Hay	ZL3WMM	(03) 768-9499		Kevin O'Sullivan	ZL3ABY	(03) 768-7598	(03) 768-9300
ZK3EC	Sth. Canterbury	Glenn May	ZL3GL	(03) 686-0306	(03) 688-0073	David Hetherington	ZL2UDH	(03) 688-3619	
ZK3ED	Ashburton	Les Vincent	ZL3UX	(03) 308-6306	(025) 411-647	L Moller	ZL1VF	(03) 308-1007	
ZK3EF*	Sth. Westland	Ron Searle	ZL3MY	(03) 755-6741		TBA			
ZK3EF*	Reefton Buller	Kevin Croker	ZL3DAC	(03) 789-9875	(03) 789-7997	Jenny Croker	ZL3DYL	(03) 789-9875	
ZK3EG	Nth. Canterbury	Geoff Gillman	ZL3QR	(03) 313-7137	(027) 647-5490	Colin Rowe	ZL3COL	(03) 313-2303	(021) 257-9643
ZK3EH*	Kaikoura	Bill Jackson	ZL3PZ	(03) 319-5981		H. Bryant	ZL3GB	(03) 319-5897	
ZK4EA	Otago	Dave Stevenson	ZL4SB	(03) 454-2527	(03) 455-5440	Martin Balch	ZL1AJH	(03) 454-3262	(027) 437-5242
ZK4EB	E. Southland	Alastair Allan	ZL4AO	(03) 208-7288	(027) 432-1914	Lindsay Eunson	ZL1ALC	(03) 206-4587	(027) 432-6136
ZK4EC*	Southland	Neville Checketts	ZL4OX	(03) 216-6599	027 437-7431	Crosbie Stewart	ZL4CHS	(03) 216-3060	(027) 422-9788
ZK4ED*	Balclutha	John Blair	ZL4AM	(03) 415-7849	(025) 640-1227	Russell Bennett	ZL3GM	(03) 417-7411	
ZK4EF*	Centr.Otago	Russell Baird	ZL4DJ	(03) 448-9363		TBA			
ZK4EG*	North Otago	Neil McLeod	ZLASN	(03) 434-7253		Gary Millar	ZL4ATA	(03) 434-5993	(03) 434-5029
ZK4EG*	Queenstown	TBA				Dave Allison	ZL2TSI	(03) 442-5258	

AREC records have been updated from the National Database. Any additions or omissions to AREC Secretary, P.O. Box 44-132, Pt Chevalier, Auckland 1246.

*Inactive Section - Based on Activity Reports received by the AREC Secretary over a 18 month period. Correct as at May 19, 2006.

The IARU Monitoring System (MS) is world-wide. It came into being in August 1985 when a small group of IARU and monitoring people met in Geneva to devise a monitoring system to tie the three previously independent regional monitoring systems together. The IARU MS now comprises the three regional MS. In turn the regional MS are made up from the national societies' MS. The IARU MS defines a route by which the ordinary radio amateur in any country has a means of access to the international bodies in cases of harmful interference.

The present IARU MS is the culmination of many years work by a few dedicated amateurs. They have struggled on, often in the face of apathy and sometimes hostility. These few "Intruder Watchers" as they were called, had the support of a few far-seeing administrators in two or three societies and in the IARU who realised that the amateur bands were not a limitless resource and that we had to protect the frequencies allocated for our use.

With the increasing demands for spectrum space and the tendency of some administrations to ignore their responsibilities under the ITU convention, it is evident that the amateur service must have a strong and effective MS if it is to retain its frequency allocations and must present factual and authoritative information to these administrations when reporting cases of harmful interference.

Over the years a lot of very hard work, long hours and hard negotiations by a lot of very dedicated people world-wide, has gone into making the amateur service what it is today. It is our job, yours and

mine, with no exceptions, to help keep it that way. One of the most important ways we can do this is to report any and all intruders into our exclusive bands. The longer we ignore them the harder it will be to remove them.

Do nothing and we will lose the right to use these bands.

Intruders

An intruder is any non-amateur radio transmission in the exclusive amateur bands. Some intruders reserve the right to use any frequency they like including the amateur bands—they are probably not members of the ITU or they just ignore the ITU regulations. Some do not know that they are causing harmful interference by spurious or harmonic radiation, and that is where the MS can help by bringing the problem to their notice.

Harmful interference

Interference which seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations (from 2002 of the Nairobi Convention). In the work of the IARU MS this includes both out-of-band emissions and spurious emission, as defined below.

Out-of-band emissions

Emissions on a frequency or frequencies which are outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

Spurious emissions

Emissions on a frequency or frequencies which are outside the necessary bandwidth and the level

of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Reporting

You can use a copy of the report from shown below or you can make your own, but it must show the following details.

Frequency to the nearest kHz if possible. See the table below to help you find the frequency.

Time—all times in MS reports are in UTC.

Date—this must also be UTC date.

Emission—see the table elsewhere in Call Book for emissions.

Identification—the call-sign or station identification if possible.

Remarks—these should include any traffic passed or text or length of transmission or how often transmission heard, etc.

There is an identification tape and booklet available on request.

Frequency measurement

Emission	Measure frequency at
A1A	Zero beat of carrier
A2A	Zero beat of carrier
A3A	Zero beat of carrier
A3C	Zero beat of main carrier
B9W	Centre frequency of emission
C3F	Centre frequency of emission
F1A	Centre frequency or halfway between the two carriers

Emission	Measure frequency at
F1B	Centre frequency or halfway between the two carriers
F3E	Resolution frequency of the modulation
F3C	Centre frequency of emission
F7B	Centre frequency of the four carriers
FFX	Centre frequency of emission
JAM	Centre frequency of emissions
J3E	Resolution frequency of the sideband
J8E	Resolution frequency of the two sidebands
NON	Zero beat of carrier
P0N	Centre frequency of emission
R3E	Zero beat of carrier or centre of resolution
R7B	Centre frequency of emission

If you cannot determine the exact centre frequency put estimated or "Est." next to the reported frequency.

Reports should be sent to the co-ordinator monthly by e-mail, snail mail or telephone.

The NZART Monitoring Service relies heavily on your reports.

The NZART MS does not handle complaints by amateurs against other amateurs, that is for the National Society to deal with.

NZART Monitoring Service Co-ordinator

Len Martinson ZL1BYA
 31 Riverside Drive
 Waiuku 1852
 Telephone: (09) 235-7712
 E-mail: <MS@nzart.org.nz> or
<lenmart@clear.net.nz>

NZART MONITORING SERVICE

REPORTER: _____

SUMMARY OF REPORTS FOR: _____

FREQUENCY	UTC	DATE	MODE	COMMENTS

Where do I fit in?

As a radio amateur, your NZART Membership is vital to all of us.

Amateur Radio is an activity requiring international co-ordination in radio frequency spectrum matters. This is achieved through several international organizations and your support is needed.

Membership of NZART acknowledges importance for the continuance of amateur radio in New Zealand, of representation by radio amateurs to government and liaison between NZART and overseas amateur radio societies.

ITU—the International Telecommunication Union

The ITU is a United Nations Agency and can be viewed as an assembly of government representatives. See the ITU web page at www.itu.int. New Zealand is a Member and the New Zealand Administration is the Ministry of Economic Development. The MED spectrum management web page is at www.med.govt.nz/rsm.

Through its International Radio Regulations, the ITU allocates radio services to specific frequency bands. Member states are required to recognize these treaty provisions when licensing services to operate on specific frequencies within their own regulations and national boundaries. The ITU Radio Regulations also define the Amateur Service and the Amateur Satellite Service and set down other operating requirements.

Frequency band allocations and the International Radio Regulations themselves are reviewed at ITU World Radiocommunication Conferences (WRC).

The New Zealand Radio Regulations reflect the International Radio Regulations.

The International Amateur Radio Union (IARU)

The IARU is a Sector Member of the ITU where it represents the Amateur Services. It is recognized by administrations as the appropriate body to make recommendations on amateur radio issues. The IARU is permitted to present papers for the information of ITU conferences.

The IARU is a worldwide voluntary federation of more than 150 amateur radio societies, founded in 1925. New Zealand joined in 1929. The prime purpose of the IARU is the protection of the Amateur and Amateur Satellite Services. The IARU Constitution is at the IARU web page: www.iaru.org.

The IARU is co-ordinated by an Administrative Council (AC) comprising a President, Vice-President, and two representatives from each of the three Regions:

Region 1 covers Europe, Russia and Africa,

Region 2 the Americas, and

Region 3 the remainder including New Zealand and Asia Pacific area.

One society provides the IARU Secretary and the IARU International Secretariat (IS) administrative services. Currently this is the American Radio Relay League (ARRL).

The business of IARU is transacted at triennial regional conferences arranged in sequence so that one is held each year. The IARU member-societies of the Region meet at these regional conferences to discuss common problems, to find solutions, to determine policy, and promote international amateur radio.

Each Region has its own IARU regional organization. NZART is a founder and active member of IARU Region 3. Founded in 1968, the IARU Region 3 Secretariat is in Tokyo. The affairs of the Region are attended to between conferences by Directors who are elected at the triennial conference.

NZART

Founded in 1926, NZART is the New Zealand society. The IARU Constitution recognizes only one member-society in each country. NZART is duty-bound to represent the interests of the Amateur and Amateur Satellite Services.

NZART is recognized by and makes representations to the New Zealand Administration, the Ministry of Economic Development, on behalf of itself and the IARU.

NZART also makes presentations to IARU Regional Conferences and can influence IARU policies.

IARU representatives at ITU conferences

The IARU is represented at ITU conferences by a selected team of specialists in amateur radio affairs drawn from IARU societies worldwide.

For some important ITU conferences, a representative of the Amateur Service is included in national delegations from Member countries. Where appropriate, NZART finances an Amateur Service representative in New Zealand's delegation. There was an NZART representative on the

New Zealand Delegations to ITU conferences in 1979, 1982, 1997, 2003 and 2006.

The International Radio Regulations

A copy of the text of the regulations pertaining to Amateur Radio can be obtained on request from NZART Headquarters or from the "Study Guide" found at the NZART web page. A full copy of the Radio Regulations is available from the ITU Geneva but occupies several volumes. It is also available on CD-ROM, and is expensive.

The International Radio Regulations do not of themselves regulate radio amateurs. With the status of an international treaty, they set out what administrations are expected to impose by their own national regulations.

International challenges for amateur radio

All classes of radio service compete for their share of the radio frequency spectrum. Most services wield strong influence at ITU conferences. Decisions made there are affected by many factors, political, economic and social. At times the conference atmosphere is hostile to amateur radio.

Some decisions take many years to implement. The patient pursuit of long-term policies is needed to ensure the future welfare of the Amateur and Amateur Satellite Services.

The cost of this continuing vigilance is high. It comes from the radio amateurs in national societies and from the devoted voluntary efforts by many amateur radio specialists. A part of your NZART subscription is remitted to IARU Region 3 each year to help fund international activities.

Remember, there is no actual security for the Amateur or Amateur Satellite Service. Constant vigilance, with time and money to protect our regulatory provisions are needed.

Further information

Enquiries on international radio matters are welcome at NZART Headquarters.

See the IARU web site at www.iaru.org and the Region 3 web site at www.jarl.org.jp/iaru-r3/. Both can be accessed via www.nzart.org.nz.

IARU

Administrative Council

President: **Larry E. Price W4RA**

Vice-President: **Tim Ellam VE6SH**

Secretary: **David Sumner K1ZZ**

Region 1:

Chairman: **Ole Garpestad LA2RR**

Secretary: **Don Beattie G3BJ**

Region 2:

President: **Rod Stafford W6ROD**

Secretary: **Reinaldo Leandro IV5AMH**

Region 3:

Chairman: **Michael Owen VK3KI, Australia**

IARU International Secretariat

Address: PO Box 310905, Newington, CT 06131-0905, USA

Secretary: David Sumner K1ZZ

IARU Region 3

Secretary: Keigo Komuro JA1KAB, PO Box 73, Toshima, Tokyo 170-91, Japan

Chairman: Michael Owen VK3KI, Australia

Directors:

Professor Rhee-Joong Guen HL1AQQ, Korea

Shizuo Endo JE1MUI, Japan

Gopal Madhavan VU2GMN, India

Peter Lake ZL2AZ, New Zealand

Monitoring System Co-ordinators:

International: Position vacant

Region 1: Wolf Hadel DK2OM

Region 2: Bill Zellers WA4KFI

Region 3: Arasu Manohar VU2UR

Beacon Project Co-ordinators

IARU Beacon Project: Bob Fabry N6EK

Region 3: Peter Norden ZL2SJ

Brett Graham VR2BG, Hong Kong

IARU Satellite Adviser

Hans van de Groenendaal ZS6AKV

IARU EMC Adviser

Christian Verholt OZ8CY

Region 3

Joong-Guen Rhee HL1AQQ

Region 3 EMR Co-ordinator

Keith Malcolm VK1ZKM

General

The amateur Service is defined in the Radio Regulations as: a radio-communication service for the purpose of self training, inter communication and technical investigations carried out by amateurs, that is by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

In accordance with Article 25.6 of the International Telecommunications Union Radio Regulations regarding technical and operational qualifications of amateur stations, a person operating an amateur station (whether the licensee or other person authorised by the licensee) must be the holder of a General Amateur Operator's Certificate granted in accordance with the Radiocommunications Regulations 2001.

There is now only one New Zealand amateur radio licence: General Amateur Radio Operator Licence.

Examination structure

There is only one Amateur Radio Examination. It is a sixty-question multiple-choice written examination in: radio regulations, the principles of electricity, radiotelegraphy, and radiotelephony; operating procedures, service codes and abbreviations as are applicable to the amateur service; and in the adjustment and operation of radio apparatus used in a typical amateur radio station. The sixty questions are randomly-selected by computer from a 600-question public-domain

question-bank to form an examination paper. Every exam paper is different.

Study Courses Training materials and a book showing all the 600-questions are available from NZART at the address given below. See the NZART web page: <www.nzart.org.nz>.

Requirements for certificates

Forty correct answers are required for a pass.

Taking the examination

The Examination Division of NZART conducts examinations on behalf of the Ministry of Economic Development Radio Spectrum Management group (MED RSM).

The date, time and place for the examination are by mutual arrangement between the supervisors and the candidates. The allowed time for the examination is two hours, with an extra reading time of ten minutes.

Applications for examinations

Applications for all examinations should be made to your local examination supervisor. A list of supervisors can be found on the NZART web page or from NZART Headquarters. The supervisors expect you to contact them.

Examination fees

A fee of \$25 is required to accompany the examination application.

Should you fail the first time and wish to re-sit, there is no further fee.

Examination result notification

If you are successful you will receive an Examination Result Notification (ERN) form direct from the examiners. On completion of a Radio I Application Form, please forward the ERN and the application form to the Ministry of Economic Development on the address listed on the form. This is the proof of your successful result, no fee is payable for the new licence.

Examination recounts

Applications for recounts of the marks awarded must be made to the NZART Examination Division no later than one month after the examination in respect of which mark in question was awarded.

Call-signs

Your licence gives your call-sign. Application may also be made for a specific radio call-sign, if not already allocated.

Further enquiries

Please direct any enquiries about the Amateur Radio Examination to: NZART Examination Division, PO Box 40-525, Upper Hutt 6415.

Telephone (+64 4) 939-2189, Fax (+64 4) 939-2190. E-mail <exam@nzart.org.nz>.

Morse code

Competency in the Morse code is not needed for a licence. NZART provides a Morse test for travellers to countries requiring evidence of Morse competency for reciprocal licensing. Tests are also available by mutual arrangement for individual challenge purposes.

A certificate of achievement is available from Morse testing supervisors on attaining a speed of five words per minute or higher, sending and receiving. The test details are available on application.

Note to branches

The NZART Morse Testing Service is managed by the Examination Co-ordinator, an officer of the Association. The Morse tests are administered by participating NZART Branches. Branches are responsible for choosing a Morse Tester and a Scrutiniser from the members of their Branch. These persons should be members of NZART. NZART requires the names, call signs and contact details of the persons the Branch nominates to these roles, with this information annually updated. The Examination Co-ordinator will appoint the Morse Examiners. Each is given registration number.

A candidate is to contact a local Morse Tester. The Tester will arrange a date for the test. The test text pieces will be computer-generated in Farnsworth format. Each Branch is responsible for providing the necessary hardware, computer, oscillator, key and earphones as required. There is no fee for a Morse test.



STOLEN REGISTER

The Stolen Equipment Register is operated by me on behalf of NZART, for the benefit all radio amateurs and is only as effective as the rate of reporting thefts. Thefts are an invasion of privacy, traumatic, and antisocial. They can also be seen by some as being an opportunity for upgrading equipment at the expense of the insurance company. Whatever the attitude you take when you are robbed—please report the event to me so that it might be prevented from happening to someone else.

Details of stolen equipment to be notified to:

Roy Symon, ZL2KH,
25 Annandale St, New Plymouth.
Phone: (06) 758-2156.
Cellular: 027-245-1406
E-mail: zl2kh@nzart.org.nz

This is to be in writing and to include all relevant details such as: make, model, where and when stolen, and a copy of the notice from the Police verifying that the theft has been notified to them.

Any notification made to me by telephone or packet must be confirmed as soon as possible, in writing, as accurate records are a necessity and help to prevent malicious or false reports getting into the system.

There should be a declaration from the owner that the equipment belonged to them and that, to the best of their knowledge, all the details supplied are true and correct.

A lot of the details I find necessary will not be published. The lists will only show the make, model,

serial number, date stolen; whereas I would need to know the location, owner's name and address, Police station to which notification was made, etc.

Updates of stolen equipment will be published in Break-In, HQ Info-Line, and will be on the NZART Official Broadcast.

I have compiled a cross-indexed database so that any parameter can give a match or access—and it is possible to give an answer re listing or otherwise over the phone in a similar manner to that given to people purchasing a car—all care and no responsibility though as the list could never be guaranteed as being complete. I would merely be able to state that a particular serial number did or did not appear on the list.

by
ROY SYMON
ZL2KH

The aim of keeping this register is to make stealing amateur equipment unattractive (or even downright repulsive) to the stealer; to prevent amateurs purchasing stolen equipment and subsequently having it confiscated; and to recover stolen equipment for the rightful owner. The temptation to buy a very cheap rig that has fallen off the back of a truck should be resisted at all times—the next gear stolen could be yours!

Please notify me, as soon as possible, of any stolen equipment that is recovered—it can then be withdrawn from the register and will help me measure the success of the scheme.

Roy Symon ZL2KH
Manager, NZART Stolen Equipment Register

Radiocommunications Regulations (General User Radio Licence for Amateur Radio Operators) Notice 2006

Pursuant to Regulation 9 of the Radiocommunications Regulations 2001 ("the Regulations") made, under section 116 (1) (b) of the Radiocommunications Act 1989, and acting under delegated authority from the chief executive, I give the following notice.

Notice

1. Short title and commencement—(1) This notice is the Radiocommunications Regulations (General User Radio Licence for Amateur Radio Operators) Notice 2006.

(2) This notice comes into force on July 1, 2006.

2. General user radio licence—A general user radio licence is granted for the transmission of radio waves by amateur radio operators in New Zealand, for the purpose of communications in the amateur radio service in accordance with the terms, conditions and restrictions of this notice.

3. Terms, conditions and restrictions applying to New Zealand amateur operators—(1) Persons who hold a General Amateur Operators Certificate of Competency and a call-sign issued pursuant to the Regulations, may operate an amateur radio station in New Zealand.

(2) The call-sign prefix of "ZL" may be substituted with the prefix "ZM" by the call-sign holder for the period of, and participation in, a recognised contest, or as the control station for special event communications.

(3) Operation on amateur bands between 5 MHz and 25 MHz is not permitted unless a person has held a General Amateur Operators Certificate of Competency for three months and logged 50 contacts during this period. The person must keep the logbook record for at least one year and, during this period, produce it at the request of the chief executive.

4. Terms, conditions and restrictions applying to visiting amateur operators—(1) Persons visiting New Zealand who hold a current amateur certificate of competency, authorisation or licence issued by another administration, may operate an amateur station in New Zealand for a period not exceeding 90 days, provided the certificate, authorisation or licence meets the requirements of Recommendation ITU-R M.1544 or CEPT T/R 61-01 or CEPT T/R 61-02 and is produced at the request of the chief executive.

(2) The call-sign must be the national call-sign allocated by the other administration to that person, in conjunction with the prefix or suffix "ZL" which is to be separated from the national call-sign by the character "/" (telegraphy), or the word "stroke" (telephony).

5. Terms, conditions and restrictions applying to all amateur operators—(1) The use of call-signs, including temporary and club call-signs, must be in accordance with publication PIB 46 "Radio Operator Certificate and Callsign Rules" published at www.rsm.govt.nz.

(2) Call-signs must be transmitted at least once every 15 minutes during communications.

(3) National and international communication is permitted only between amateur stations, and is limited to matters of a personal nature, or for the purpose of self-training, intercommunication and radio technology investigation, solely with a personal aim and without pecuniary interest. The passing of brief messages of a personal nature on behalf of other persons is also permitted, provided no fees or other consideration is requested or accepted.

(4) Communications must not be encoded for the purpose of obscuring their meaning, except for control signals by the operators of remotely controlled amateur stations.

(5) Except as provided to the contrary in this notice, transmitter power output must not exceed 500 watts peak envelope power (pX), as defined in ITU Radio Regulation 1.157.

(6) In accordance with Article 3 of the International Radio Regulations, amateur stations must, as far as is compatible with practical considerations, comply with the latest ITU-Recommendations to the extent applicable to the amateur service.

(7) In accordance with Article 25 of the International Radio Regulations, amateur operators are encouraged to prepare for, and meet the communication needs of, national and international disaster relief.

(8) Amateur beacons, repeaters and fixed links may not be established pursuant to this licence.

(9) Unwanted emissions outside the frequency bands specified in this schedule must comply with the requirements of technical standard ETSI ETS 300 684 published by the European

Table 1.

Frequency Range	Notes	Frequency Range	Notes
130 to 190 kHz	2, 4, 6	921.00 to 929.00 MHz	3, 7
1.80 to 1.95 MHz	2	1.24 to 1.30 GHz	1, 2
3.50 to 3.90 MHz	2	2.396 to 2.45 GHz	1, 3
7.00 to 7.10 MHz	1	3.30 to 3.41 GHz	1, 2
7.10 to 7.30 MHz	2	5.65 to 5.85 GHz	1, 3
10.10 to 10.15 MHz	2	10.00 to 10.50 GHz	1, 2
14.00 to 14.35 MHz	1	24.00 to 24.05 GHz	1, 3
18.068 to 18.168 MHz	1	24.05 to 24.25 GHz	3
21.00 to 21.45 MHz	1	47.00 to 47.20 GHz	1
24.89 to 24.99 MHz	1	75.50 to 76.00 GHz	1, 2
26.95 to 27.30 MHz	2, 3, 5, 6	76.00 to 81.00 GHz	1, 2
28.00 to 29.70 MHz	1	122.25 to 123.00 GHz	2, 3
51.00 to 53.00 MHz	2	134.00 to 136.00 GHz	1
144.00 to 146.00 MHz	1	136.00 to 141.00 GHz	1, 2
146.00 to 148.00 MHz	2	241.00 to 248.00 GHz	1, 2, 3
430.00 to 440.00 MHz	1, 2, 3	248.00 to 250.00 GHz	1
614.00 to 622.00 MHz	2	275.00 to 1000 GHz	2, 4

Telecommunications Standards Institute (ETSI).

(10) The ranges of frequencies, and specific conditions of use, are those prescribed in the Schedule to this notice.

6. Consequential revocation of licences—(1) The Radiocommunication Regulations (General User Radio Licence for Visiting Amateur Radio Operators) Notice 2004 dated the 2nd day of July 2004 and published in the *New Zealand Gazette*, 8 July 2004, No. 85, page 2118, is revoked.

(2) All radio licences of the class Amateur General (H5) granted pursuant to the Regulations, are revoked.

Schedule

The Schedule is shown in Table 1 (above).

Notes to Schedule

1. Table 2 shows the ranges of frequencies which may also be used for amateur satellite communications.

2. These frequencies are, or

Table 2.

7.00 to 7.10 MHz	435.00 to 438.00 MHz	24.00 to 24.05 GHz
14.00 to 14.25 MHz	1.26 to 1.27 GHz*	47.00 to 47.20 GHz
18.068 to 18.168 MHz	2.40 to 2.45 GHz	75.50 to 81.00 GHz
21.00 to 21.45 MHz	3.40 to 3.41 GHz	134.00 to 141.00 GHz
24.89 to 24.99 MHz	5.65 to 5.67 GHz*	241.00 to 250.00 GHz
28.00 to 29.70 MHz	5.83 to 5.85 GHz†	
144.00 to 146.00 MHz	10.45 to 10.50 GHz	

*limited to the earth-to-space direction.

†limited to the space-to-earth direction.

may be, allocated for use by other services. Amateur operators must accept interference from, and must not cause interference to, such other services.

3. The frequencies:

27.12 MHz (26.957-27.283 MHz), 433.92 MHz (433.05-434.79 MHz), 921.5 MHz (915-928 MHz), 2.45 GHz (2.4-2.5 GHz), 5.8 GHz (5.725-5.875 GHz), 24.125 GHz (24.00-24.25 GHz), 122.5 GHz (122-123 GHz), and 245 GHz (244-246 GHz), are designated for industrial, scientific and medical (ISM) purposes. These frequencies may also be allocated to Short Range Device (SRD) services. Amateur operators must accept interference from ISM and SRD services within these frequency ranges.

4. Allocated to the amateur service on a temporary basis until further notice.

5. Telecommand and telemetry operation only.

6. Radiated power must not exceed 5 watts e.i.r.p.

CONTINUED ON PAGE 3-6

THE NZART QSL BUREAU

The NZART QSL Bureau is one of a network of approximately 185 bureaux established by the IARU to facilitate the exchange of QSL cards between NZART members and radio amateurs and listeners throughout the world.

Outward QSL cards

The service is free to both transmitting and non-transmitting members of NZART—non-members may make use of this service at a cost of 25c per card. All QSL cards for forwarding to radio amateurs and listeners in New Zealand and overseas countries should be posted to:

The QSL Manager
NZART QSL Bureau
PO Box 857
Wanganui Mail Centre
WANGANUI 4540

The call-sign of the station to whom the card is addressed should be printed clearly on both sides of each card. Are you sending your card to a DX-station's Manager? If so, please write the Manager's call on the back of the cards. (Cards are sorted using the call printed on the back of the card.) If you see fit not to write the recipients' call-signs on the back of your cards, it is pointless to carry out the last instruction—we are not clairvoyants! When writing call-signs onto your cards, please take care with the forming of the letters and numbers. Make sure that the letter V will read V, not U, an "S" looks like an ess and not the figure "5" and vice versa, etc. This will greatly help the Bureau staff in their sorting! Remember also that English is not the first language of everybody handing and receiving your cards!

Please sort your QSL cards into New Zealand call-district order (ie ZL1-ZL2-ZL3-ZL4, etc), USA and Australian call-district order and all others in alphabetical order: eg A3, EA, ES, EU, G, I, OK, S5, SM, UA, UN, UR, VK1-2-3, etc, W1-W2-W3, etc (USA prefixes are

kept together—A-K-N-W1 cards all go to their First District Bureau; likewise all A-K-N-W2 cards go to the Second District Bureau and so on), VU, ZL1-ZL2-ZL3-ZL4, 3D, 5W, 9A etc. Please do not separate countries with rubber bands, strips of paper etc.

Members must enclose a current year *Break-In* label with each posting. After complying with the above, sit back and be patient!

Inward QSL cards

The NZART QSL Bureau provides a free inward service for all New Zealand amateurs and listeners.

Collecting cards from the sub-bureaux by members and non-members

Please note that the four New Zealand sub-bureaux are arranged to cover the four mainland prefixes. A ZL1 living anywhere in New Zealand deals with the ZL1 sub-bureau, ZL2s likewise with the ZL2 sub-bureau, and so on through to the ZL4s. Supply your particular QSL sub-bureau (listed below) with a supply of suitable size self-addressed stamped envelopes (SASEs) to receive your incoming cards. Envelopes should be numbered and "Last Envelope" marked on one so that you are reminded when to renew the supply. Please make sure that you include your call-sign on the front of your envelopes as each sub-bureau only deals with call-signs and not with operators' names. Any specific requests for forwarding cards should be printed on the back of the envelopes; for example "send monthly" or "send when there are 10 cards" etc.

Some Branches have special arrangements for "Branch postings" in place with the appropriate sub-manager. Contact your local Branch secretary for information. (The possible provision of this serv-

ice is totally the prerogative of each individual sub-manager and there is no compulsion on any person to be a party to any such collective scheme.)

QSL sub-managers

ZL1

Mr J. Small ZL1KQ, 32 Paddington Street, Glen Innes, AUCKLAND 1072.

ZL2

Mr A. H. Marr ZL2AGY, 51 Taylors Road, OTAKI 5581.

ZL3

Mr E. W. Jefferis ZL3DV, 4 Cunningham Street, Leeston 7632, CANTERBURY.

ZL4

D. A. Adams ZL4OZ, 26 Wills Street, Balaclava, DUNEDIN 9011.

Your QSL Card

1. Should not exceed 140x90mm in size.

2. Have all the necessary information on one side of the card—if you intend having a two-sided card, make sure your call-sign is printed on both sides.

3. Use Universal Co-ordinated

time (UTC) (formerly referred to as GMT, also referred to as Zulu time)—New Zealand Standard time (NZST) or New Zealand Daylight Saving Time (NZDT) is meaningless to 99.9 per cent of amateurs—and you do want a card back from them!

4. It is advisable to write out the name of the month to avoid confusion.

5. Do not correct mistakes—make out a new card. Altered cards are valueless to the recipient

Any further information concerning the business of the QSL Bureau, or requests for info on DX station QSL Managers/direct mail addresses (we will do our best to assist!) can be obtained from the QSL Manager at P0 Box 857, Wanganui Mail Centre, WANGANUI 4540 or e-mail <zl2rr@xtra.co.nz>.

PS! Special calls and DXpeditions

If you, or your Branch, put on a special event/contest station using a special call-sign allocation for the duration thereof, or partake in a DXpedition, please notify the QSL Bureau Manager and supply him with the relevant QSL Manager info!

Remember

Leave a three second pause between overs when working repeaters

CONTINUED FROM PAGE 3-5

7. Radiated power must not exceed 25 watts e.i.r.p.

Dated at Wellington this 13th day of June 2006.

SANJAI RAJ, Group Manager, Radio Spectrum Management, Business Services, Ministry of Economic Development

Explanatory Note

This note is not part of the notice, but is intended to indicate its general effect.

This notice prescribes that, pursuant to Regulations made under the Radiocommunications Act 1989, a general user radio licence is granted for the transmission of radio waves by amateur radio operators in New Zealand, for the purpose of communications in the amateur radio service, in accordance with the terms, conditions, and restrictions of this notice. This notice comes into force on July 1, 2006.

A responsibility for each of us!

The amateur radio qualification is an achievable challenge to most people and is useful to career-seekers in our technological world. It shows aptitude and sincere interest in communications, and identifies an achiever. It can give a jump over others in this competitive world.

The late 1940s was a time with a wave of new entrants into amateur radio. Let us all try to promote a return to that level of interest! NZART Council encourages newcomers into Amateur Radio. This calls for the help of all radio amateurs. A challenge to all of us. Council has adopted the expression The New Wave to embrace initiatives and objectives to encourage new entrants.

(1) The NZART Constitution in its object says:

"The objects of the Association shall be the maintenance and expansion of the Amateur Service in New Zealand by:

- "(a) the encouragement of recruits into the Amateur Radio movement
- "(b) the provision of guidance and instruction in radio techniques and operating
- "(c) the promotion organization and conduct of activities on a national and local basis ...", etc.

(2) These objects are further reflected in wording in the NZART Strategic Plan, in particular Objective 2:

"To promote knowledge of amateur radio and encourage newcomers. To assist Branches in local activities, especially in schools. To provide education and training aids. To award suitable prizes and other recognition."

And, in the plans of action:

"To publish information in *Break-In*, training materials and aids, educational and publicity material."

(3) The NZART Strategic Plan Objective 3 states:

"To provide guidance and instruction in radio techniques and operating, and encourage practical experimentation."

With your guidance and your help, others too can experience the thrills of Amateur Radio. Active encouragement and support are sought from all NZART members and from all Branches to recruit newcomers and to run classes in preparation for the amateur radio examination.

Branches are encouraged to actively promote Amateur Radio.

Master copies of brochures, posters and other leaflets and publicity material are available to Branches for this purpose, free of charge from NZART Headquarters.

A sticker is available to NZART members from NZART Headquarters for 50c each. This is for displaying in the rear window of vehicles to show your support in a national campaign to increase the awareness of Amateur Radio in the general population.

Many computer users are unaware of amateur radio and what it has to offer. You are encouraged to widely advertise the NZART World Wide Web page, <www.nzart.org.nz>.

Simple-to-construct equipment is a way to show youth groups and other interested persons the fun of Amateur Radio. Show how inexpensive home-construction brings delight and excitement from the achievement of communicating without wires over long distances using self-built gear. Articles from *Break-In* may be freely photocopied and distributed for this purpose.

The Novice licence is an achievable challenge. Do you know anyone who has shown interest in Amateur Radio? A youth or grand-

child perhaps? Spread the word by demonstration!

After passing the amateur radio examination, a call-sign is issued by the Ministry of Economic Development, a call-sign that is unique world-wide. The challenge to attain such an identifying call-sign brings its own rewarding fun.

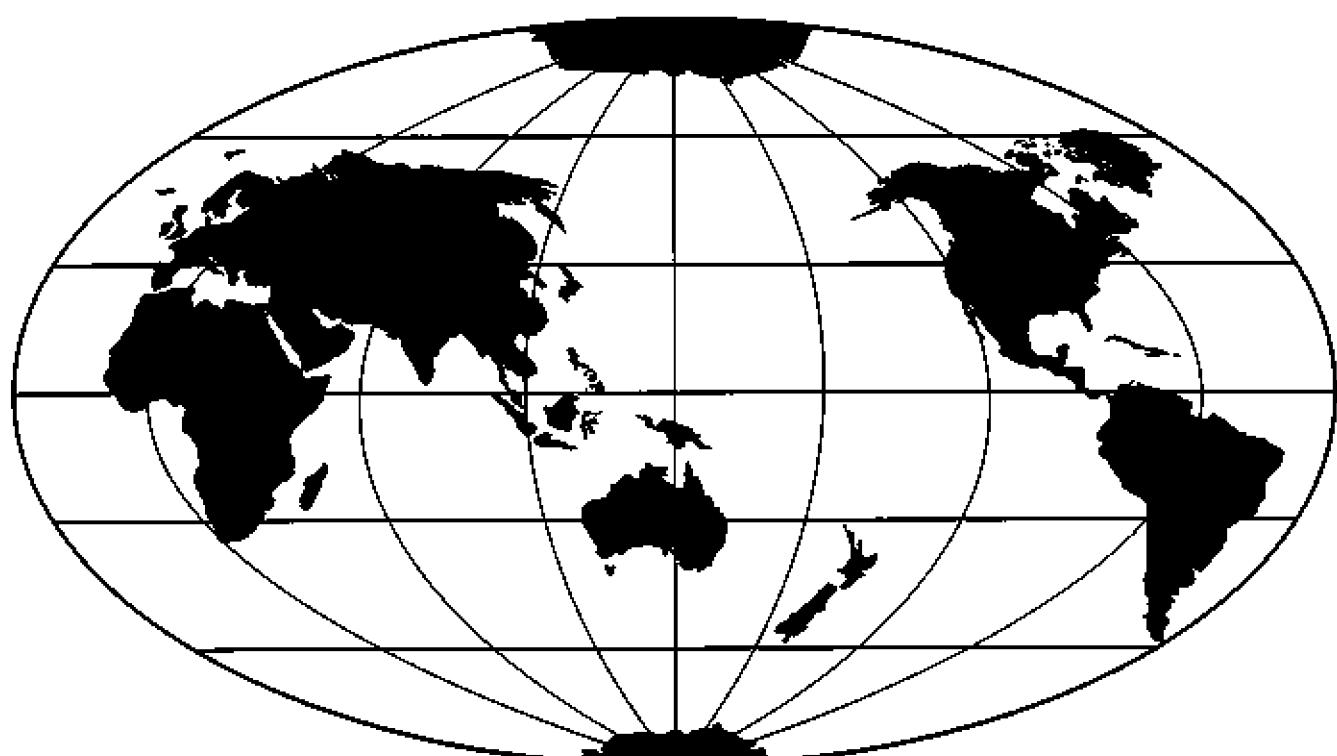
A local "group project", with the challenge to interest newcomers to develop their own local on-air amateur radio net, is worthy of consideration and encouragement.

The construction of receivers, transmitters and other projects under the guidance of experienced constructors at "club workshop nights" are worthy Branch activities.

Each Branch should appoint an "NZART Agent" as one of their executive, the task being to gain increases in NZART members, both Transmitting and Non-Transmitting, in their local areas.

A national and concerted effort by all New Zealand Radio Amateurs to promote Amateur Radio is necessary to ensure the continuation of a healthy and vigorous Amateur Service.

Help bring The New Wave of radio amateurs!



A GUIDE TO VHF AND UHF FOR NEW LICENSEES

Jane Atkinson ZL2QO, Jim Meachen ZL2BHF, Stephen McNeill ZL4HG

*This article has been prepared by those listed above on behalf of the Wellington VHF Group,
Branch 74 NZART (Inc.), PO Box 12-259 Wellington,
to offer guidance to the newcomer to the wonderful world of amateur radio.*

"Sam the Mobile Man" guest appearance courtesy of Sue Lill

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Why such an article?

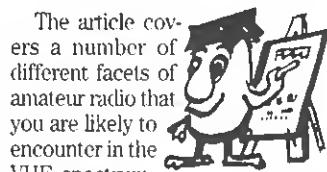
You've just got your licence. Your new rig has arrived today and is ready for use. You turn the power on. So, what do you do?

It can be pretty daunting when you first start out knowing what to say, or what not to say.

This article is designed to help you through your first few contacts. It's important to remember that there are no fixed rules. Many of the observations that are made in this article are the result of experiences we have had over a number of years, and you must remember that your operating may not necessarily cover what we've been interested in. So be it. This is a guide. Use it as a kind of à la carte offering of ideas.

The only way to become familiar with the operating procedures on VHF or UHF is to spend some time listening to the good operators, noting how and why their methods succeed where those of the poor operator do not. It is quite important as newcomers that you should be discriminating in this respect, and not simply mimic what you have heard when going on the air for the first time. To summarize, copy the good operators, and not the bad ones!

How this article is written



The article covers a number of different facets of amateur radio that you are likely to encounter in the VHF spectrum. You'll find these are often the same ideas you'll use on HF, but that kind of operating is beyond the scope of this article. You can find some excellent books on the general topic of operating, and you're encouraged to seek out the information contained therein. Some good examples of operating books, all of which can be obtained from NZART Headquarters, are as follows:

★ A Guide to Amateur Radio, Pat Hawker G3VA, RSGB, Nineteenth Edition.

★ Amateur Radio Operating Manual, R. J. Eckersley G4FTJ, RSGB, Third Edition.

★ The ARRL Operating Manual, edited by Robert J. Halprin K1XA, ARRL, Third Edition.

★ AREC Manual, NZART, 1978.



Some terminology

There are lots of words that are used everyday in the world of VHF in amateur radio. Among the most common are as follows:

AM Amplitude Modulation. A method of voice encoding a transmission which is seldom used these days. Specifically the strength of the signal transmitted varies with the strength of the voice signal.

AMSAT Amateur Satellite Corporation. An amateur radio organization promoting and developing the amateur satellite service. Over two dozen satellites have been built by amateurs worldwide and are universally available.

AREC Amateur Radio Emergency Corps. Groups of amateurs within NZART Branches who provide emergency communications in conjunction with other organizations as the situations demand.

ATV Amateur Television. The transmission of video signals by radio amateurs. This transmission can sometimes take place through a special kind of repeater.

Autopatch A device for interfacing a repeater to a telephone line. Such a device responds to audio tones generated by a telephone touch-tone pad connected to the user's rig or microphone.

Break The word used to interrupt a conversation on a repeater, often to indicate there is an emergency.

Call Book An annual publication by NZART that contains amateur call-signs, frequency allocations, repeater maps and other vital operating information.

Channel The pair of frequencies, input and output, used by a repeater.

Clear Indicates the end of a contact.

Coverage area the geographic

area within which a repeater provides communications (sometimes called the footprint).

CQ A general call made requesting someone to talk to.

CTCSS Continuous Tone Coded Squelch System. (Sometimes known as PL or Private Line.) A sub-audible tone system used when you want to activate just one or a small number of remote receivers.

CW Continuous Wave. Commonly known as Morse code. Used in weak signal or long distance applications and sometimes in conjunction with amateur satellites. This is an "on-off" or dot-dash type of transmission.

Data repeater A repeater specifically designed for use in passing data, rather than voice communications. Of course, it may be used for both.

Digipeater A Packet radio repeater. Packet radio is a form of data transmission. Voice cannot be transmitted through a digipeater.

Dropping out The situation that exists, while you are using a repeater, when your signal does not quite have enough strength to keep the repeater triggered (see "Trigger").

DTMF Dual Tone Multi Frequency. A system often used for repeater control, using two tone frequencies. This control is often achieved by a simple keypad on your microphone or rig.

Duplex A mode of communication in which you transmit and receive simultaneously.

FM Frequency Modulation. A method of voice encoding a transmission, which is frequently used in conjunction with repeaters. Specifically, the strength of the signal transmitted is constant but its frequency varies with the strength of the voice.

FTMAG Frequency Management and Technical Advisory Group. A group that advises NZART on technical matters, particularly those relating to VHF and repeaters.

Full quieting A received signal that contains no noise.

Handheld A portable receiver that is small enough to fit in the palm of your hand.

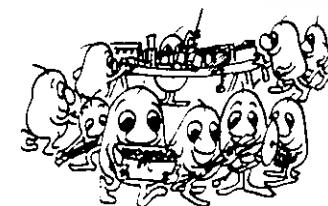
Handle This refers to your name. Note, the term "personal" is not generally used in amateur radio.

Horizontal polarization The nominal orientation that a radio-wave is taken to have as a result of an aerial's physical layout and orientation. Horizontal polarization is by convention very often used in weak signal applications at VHF/UHF.

Input frequency The frequency that the repeater receives on, and also the frequency on which you transmit to the repeater.

Magnetic mount (Also Mag Mount) A mobile antenna with a magnetic base that enables quick installation and removal from a car.

Ministry of Economic Development (Radio Spectrum Division) Ultimately responsible for the administration of all the radio frequency spectrum in New Zealand.



NiCd (also Nicad) A Nickel-Cadmium battery that may be recharged.

NZART New Zealand Association of Radio Transmitters (Inc). New Zealand's national amateur radio society, PO Box 40-525, Upper Hutt.

Offset The difference between a repeater's transmit and receive frequencies. In New Zealand this is plus or minus 600 kHz on the 2 m band and 5 MHz on the 70 cm band.

Output frequency The frequency that the repeater transmits on, and also the frequency on which your receiver receives the repeater.

Over The word used to indicate the end of a voice transmission.

Packet radio A way of transferring data or messages between amateurs across town, about the country or around the world.

Phone patch A device for interfacing the audio input and output of a radio transceiver to a telephone line.

RDF or DF Radio Direction Finding. The amateur technique of locating a transmitter.

Repeater trustee Person elected by an NZART Branch to take responsibility for proper operation of a repeater.

Roger The word that indicates all information was received correctly.

SAR Search And Rescue.

Simplex A mode of communications where you transmit and receive on the same frequency.

Sked A pre-arranged radio contact between two or more stations.

SSB Single Sideband. A method of narrow band voice encoding commonly used for long-distance or weak signal communications in both the high Frequency (HF), VHF and UHF parts of the spectrum. Very commonly used in conjunction with amateur satellites.

STSP Repeater Short Term Special Purpose Repeater. A repeater designed for emergency use or during special events.

Tone pad A device that is used to generate a standard set of tones that can be used to control certain functions on a repeater, or remote equipment (see DTMF).

Triggering To activate a repeater by transmitting on its input frequency.

Vertical polarization The nominal orientation that a radio wave is taken to have as a result of an aerial's physical layout and orientation. Vertical polarization is by convention very common in repeater operation at VHF/UHF. Antennas on handhelds when held upright and on cars are vertically polarized.

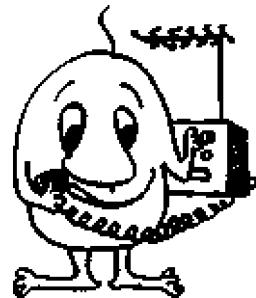
NZART

The New Zealand Association of Radio Transmitters (Inc) is New Zealand's representative society for radio amateurs. It provides a wealth of services to assist both the new and established amateurs. It publishes a monthly magazine (Break-In) and an annual Call Book. It represents the interests of amateur radio at both the national and international levels. It is controlled by an Executive Council elected by members. It has over 80 Branches throughout New Zealand, and has a membership of over 3000 amateurs.

One of the services that is provided by NZART is the planning of band usage and the national co-ordination of repeaters and beacons. It does this based on the recommendations of its Frequency Management and Technical Advisory Group (FMTAG).

Inquiries about NZART services and membership may be directed to:

NZART Headquarters
PO Box 40-525
Upper Hutt



Establishing a call

There are two accepted ways of establishing contact with another station. The first method is to put out a general call to all stations, known as a "CQ", and to hope that another station responds. The second is to call another specific station by prior arrangement, known as keeping a "sked", or after the other station has just finished a contact or called CQ.

CQ calls are not normally made through repeaters. Instead, stations announce that they are "listening" on the repeater. For example, you might say:

"This is ZL2BHF listening seven-ten."

To start a sked with another station, you will call the other station by its call-sign, followed by your own call-sign, such as:

"ZL2QO, this is ZL4HG."

The station that is being called might have his or her call-sign repeated a few times, just in case they don't hear the single call. You might also be wise to issue your own call-sign in phonetics so that there is no mistake who you are. For example:

"ZL2QO, ZL2 Quebec Oscar, ZL2QO, this is ZL4HG, ZL4 Hotel Golf, ZL4HG."

However, remember that phonetics really only need to be used to clarify who you are in conditions that might make certain letters ambiguous, or where the band is noisy, or where your signal is likely to be weak. Over-use of phonetics is rather annoying, and time consuming.

Answering a call

You answer a CQ or sked call from another station in the same way that you would make the sked call in the first place. For example, in the above instance, where ZL4HG is trying to call ZL2QO, the latter station might answer the call in the following way:

"ZL4HG, this is ZL2QO ..."

and the conversation would continue. It's that simple!

How to pass transmission to another station

When you have finished saying what you want to say on one trans-

mission, and you want the other station to reply, you do so by simply saying the word "over".

Before you say the word "over", you may want to indicate the other station's call-sign, and your call-sign too, in that order. Note that it is not absolutely necessary to give both call-signs at the beginning and end of each and every over, your own call-sign will suffice. But, if you do give the call-sign, you must give the full call-sign, not an abbreviated version. For example, use "ZL2BHF" and not "2BHF" or "BHF".



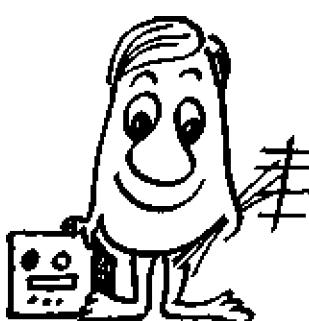
Letting other stations in

If you are in the middle of a conversation, and a station transmits his call-sign in the pause between transmissions, the next station in the queue to transmit should acknowledge that station and permit him or her to make a call and join the conversation. It is not polite to ignore him and, furthermore, it is rude to acknowledge him but not to let him speak. You never know, the calling station may need to use the repeater immediately. He may have an emergency on his hands, so let him make a transmission promptly.

Joining an existing conversation

If you wish to join a conversation that is already in progress, transmit your call-sign between transmissions. The station that transmits after you drop in your call-sign will acknowledge you, and usually invite you to transmit.

A brief pause, say three seconds, before you begin each transmission allows other stations to participate in the conversation. So don't transmit immediately that the other station stops. If you begin transmitting too quickly, you can prevent other stations from getting in. Also, there might be an emergency, so leave a pause!



Before you join an existing QSO, stop and think, "is it appropriate for me to join in?". If it's a technical matter and you know something about it, it's probably all right. If it's on a more personal level, it might be better to wait until they have finished before giving a call, unless you know them fairly well. Either way, just give your call-sign and wait to be invited in. Jumping straight in with your comments is no better manners on the air than it is in person.

How to tell when it's your turn to talk

The station with whom you are talking will pass transmission back to you by one of the methods outlined above. Remember the pause before you transmit!

When and how often to give call-signs

A major source of frustration and annoyance to many operators can be the excessive use of call-signs. Take this example:

"ZL4 HG from ZL2BHF, are you parked yet Stephen? Over."

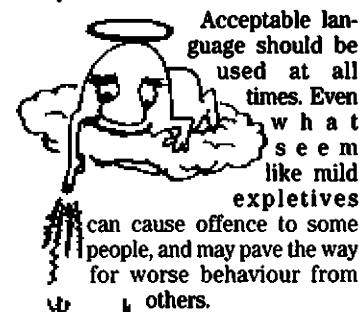
"ZL2BHF from ZL4HG. Yes. Over."

"ZL4HG from ZL2BHF, OK I'll see you later. Over."

"ZL2BHF from ZL4HG, over where, over."

We suggest you identify yourself at regular intervals, say once every ten minutes, as well as at the beginning and end of a conversation.

Standards of language, and topics best avoided



Whatever bands, mode or type of operating one is undertaking, there is a fundamental point to remember. That is that the "private" conversation with the other station is actually in public. Never discuss emotive subjects, such as politics, race or religion over the air to avoid the possibility of giving offence to others. Never give any information over the air which might be of assistance to the criminally inclined, such as the time that a house is unoccupied,

dates of holidays, and valuables in the house. Telephone numbers, especially those belong to others, should be handled with considerable discretion.

Unidentified transmissions

Occasionally you may hear a conversation that you think you can enhance with a suitably witty addition, suitably anonymous. Don't be tempted to do so! All transmission must be identified! If you hear someone who appears to be a pirate, or who might perhaps be trying to bait the users of the frequency, don't rise to the bait—just ignore them. They will soon become bored and go away.

List of commonly heard Q Codes

Q Codes were originally developed for use with Morse code, to speed up the sending of commonly used phrases. They are not strictly necessary when carrying on a voice contact, since it is usually just as quick to use the ordinary English equivalent: eg "Go to six-five-two-five" instead of "QSY six-five-two-five". However, some Q Codes are still used quite a bit on VHF and UHF. The more commonly used ones are:

QRM Interference
QRN Static
QRO High power
QRP Low power
QRT Cease transmitting
QRX Stand by
QRZ Who is calling? Who is there?
QSB Fading
QSO Contact, conversation
QSY Change frequency, go to
QTH Location

What a repeater is and how it works

A repeater is a special kind of transmitter and receiver combination that receives a signal and simultaneously retransmits it. A repeater situated on a vantage point such as a hilltop can dramatically increase the range of VHF and UHF communication in hilly areas and for users of low-power transceivers such as handhelds. To prevent the repeater from becoming unusable due to feedback, the receive and transmit frequencies are different. The difference between the two signals is known as the offset or split (see definitions).

To access a repeater, an amateur transmitter has to be set up so that it transmits on the repeater's input frequency and receives on the repeater's output frequency. Most (but not all) repeaters continue to transmit a carrier (known as the "tail") for a few seconds after the input signal ceases, so that the user can check that he or she is actu-

ally accessing the repeater. A list of repeater frequencies is given in Section 7 of this Call Book.

In New Zealand all repeaters are "open", that is, any licensed amateur is permitted to use the repeater without necessarily being a member of the local club. This is not necessarily the case in other countries.

Repeater timeouts

Some repeaters incorporate timing devices. These prevent an over from lasting longer than the time that the repeater is set to, usually two or three minutes. If a station transmits for longer than this, the repeater will cease retransmitting after the allotted time is up and a deathly hush will descend upon the frequency. The repeater timer resets when a new transmission begins. Two repeaters that currently incorporate this feature are Motueka 670 and Manawatu 910 (part of the National System).

Repeater alarms

Some of the more sophisticated repeater systems incorporate alarms to warn users of such things as power failure. Usually some kind of tone or signal will appear briefly at the end of each over.

The signal that appears after each transmission on Blenheim 695 is not an alarm but an identifier. It transmits the characters "BM" in Morse.

If you hear an alarm signal, first make a note of what type it is. If it is a digitized voice, what it is saying? Notify the repeater trustee as soon as possible (within reason—phone calls at 3 am are unlikely to be appreciated). If you don't know who the trustee is, get in touch with a committee member of the branch responsible for the repeater.

Most mains-powered repeaters have battery backup systems so that they can keep going if the power fails. As the repeater might have to remain on emergency power for some time, it is best not to use the repeater unless you really need to. Conserve emergency power for emergency use.

DTMF and CTCSS control codes

Some repeaters will respond to DTMF tones (see your transceiver manual to determine if your set can generate these tones). These fall into two main types: codes for use only by trustees for controlling repeater functions, and codes for use by amateurs in general. The most common in the latter group is the signal strength report generator. If a certain sequence of DTMF tones is transmitted, the repeater will respond with an indication of

the signal strength it has received. The sequence of tones and the type of response received will vary from repeater to repeater. One thing remains constant with all of them: the need to IDENTIFY YOURSELF. Something along the lines of "This is ZL2BHF testing" is usually sufficient.

The uses of continuous tone coded squelch system (CTCSS) are many and varied. It may be used, for instance, by one station to contact a second without the second station being disturbed by other stations on the frequency. This may be useful when a station is waiting for a specific station to talk, but it is not the way most of us operate. A second use of CTCSS is as a warning that your station is being called, without necessarily locking out other stations. Manufacturers offering CTCSS facilities on their rigs often do so in a way that makes these facilities specific to their products; this may limit the usefulness of this feature. So, you should consult other amateurs before you use these facilities.

The National System

The National System is a series of dedicated linked high-quality repeaters on the 70 cm band. When a station accesses one of these repeaters, the signal is relayed to all other repeaters in the System and can be heard simultaneously up and down the country. For example, a station with a handheld in Wellington can talk via the System to a station in Auckland as if he or she were in the local region.

Guidelines for repeater use

Your local repeater will be monitored by more people than any simplex frequency, both by amateurs and non-amateurs. For many people it will be the only one they use—if it is occupied they will not be able to go to another one in the same way that another simplex channel can be used if one is busy. Therefore, extra courtesy and consideration for others is warranted.

Pay attention to good operating procedures—other listeners need to know what is going on. They will particularly want to know if a contact has been finished, so that they can use the repeater without worrying about getting in the way of someone else's conversation.

Keep in mind at all times why the repeater is there. In most cases, this will be voice communications. Non-voice modes on a voice repeater are not usual practice unless there

are special circumstances—which usually means having discussed it previously with the repeater trustee. Digital modes (RTTY, AMTOR, Packet) are especially annoying to listen to and, of course, can't be deciphered without specialized equipment.

Voice on data repeaters (not digipeaters) is considered OK if that repeater is the only one you can use to make contact. It's probably best not to make the QSO any longer than absolutely necessary; you will no doubt reach this conclusion fairly rapidly yourself once the data starts coming in over the top of your transmissions!

One way use (ie, where one or more stations are not heard on the repeater output) is not advisable. A quick call to request another station to go to another frequency is OK, but it is inconsiderate and confusing to others to keep up a one-way contact for any length of time. Use simplex and a dummy load where possible for the alignment and preliminary testing of equipment. Avoid the use of repeater input frequencies for this purpose.

NZART co-ordinates the repeater system and will generally only accept proposals for repeaters that meet the guidelines commonly accepted in New Zealand. The FMTAG is responsible to NZART for the maintenance of repeater technical standards and recommended channel allocations. All repeater systems in New Zealand require a licence from the New Zealand Radio Frequency Service.

Bear in mind that all the comments above apply specifically to New Zealand repeaters and there may be marked differences in the operation of overseas repeaters and the procedures which you must use to work with them.

Amateur radio is "on display" on repeaters more than anywhere else. Try to create as good an impression as possible.

Phone patches

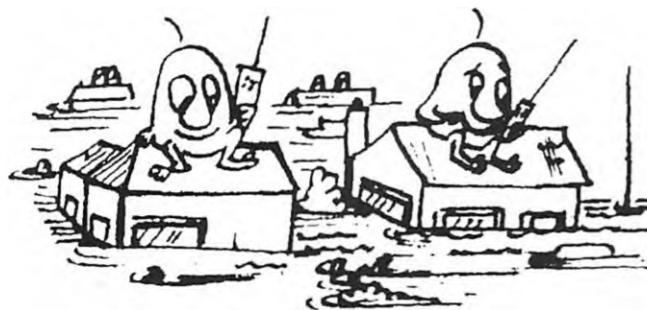
Radio regulations and licence requirements should be carefully observed when using a phone patch. Non-amateurs are not permitted to control an amateur station.

Normal traffic handled is "brief personal" messages, not business or commercial, and ONLY within New Zealand.

Phone patch equipment requires proper authorization to permit its connection to the public switched telephone network.

Packet radio

Messages sent via Packet radio should be in the spirit and tradition of amateur radio and meet



the requirements of the Radio Regulations.

Care should be taken when distributing hardware, software or publications via Packet radio as it may be interpreted by others as advertising or infringing the copyright of material originated by others.

Priorities on repeaters

Repeaters allow mobile and portable stations away from the luxuries of mains power supplies and sophisticated antenna systems to increase their range. Another important purpose is to facilitate emergency communications.

Amateur Radio Emergency Corps (AREC) operators are distinguished by the use of E (emergency) call signs, for instance ZL2EMA. If you hear these stations, give them priority.

Portable stations are those who are operating away from home, for example, a holidaymaker at a motor camp or a tramer in the ranges. They will identify themselves by using the word "portable" after the call-sign, eg. "This is ZL2QO portable listening seven-one-seven-five." If you hear these stations, give them priority—they may not have access to a telephone and could be needing to relay an urgent message. Mobile stations are actually on the move at the time of transmission. They may quite often be heard on their way to and from work at peak hours, and will identify themselves by saying: "This is ZL4HG mobile seven-ten." There are all sorts of variations on this basic theme, such as "pedestrian mobile" (on foot), "train mobile", "maritime mobile" (all at sea?) and even "stationary mobile"—surely a contradiction in terms if ever there was one! Mobile stations may need to report breakdowns, traffic delays, traffic accidents or other urgent/important pieces of information, so should be given priority if heard.

Usually a mobile or portable station will not hog the repeater but will be listening for other stations who may need to use the frequency. With a little give and take there is plenty of room for all.

STSP Repeater
(Short Term Special Purpose)

repeater). A repeater designed for emergency use or during special events. An example is perhaps the need to provide communication for some local public event. It's important to note that the frequencies that protected so that the repeaters can be moved about with little chance of interference with other repeaters.

The three second rule

Three seconds should be left between each over to allow other stations to access the repeater. If another station calls, let them in straight away—they may have an urgent message to transmit.

Long QSOs on repeaters

Lengthy conversations on repeaters need to be approached with care. It would not be very thoughtful to tie up a repeater for a long time during rush hour or early evening when other people are likely to be wanting to use it. Late at night is best. Where available, a 70 cm repeater that's not part of the National System might be a better choice if there is less traffic on that band and less likelihood of getting in someone else's way. Make sure that you leave three-second gaps for other traffic, and it may also be a good idea to leave longer gaps, such as 10 seconds, every so often. Bear in mind, too, that even though you may make every effort to allow other stations to use the repeater if they need to, many people would rather wait until you have finished altogether. If possible, break the conversation up into two or three shorter contacts and leave the repeater free in between them.

More of a nuisance than long QSOs are long overs, especially when there are inadequate gaps between them. At busy times, keep the overs short so as to allow others, possibly with urgent messages, to access the repeater.

Checking the repeater input signal

Most radios these days have a setting called "repeater reverse", "monitor" or something similar which allows the operator to check

the repeater input signal, ie, the frequency the other station is actually transmitting on. If you can hear this signal, it is a good indication that simplex contact with the station is possible.

Using simplex

Home station to home station contacts should be made on simplex where possible, thus leaving the repeaters free to facilitate mobile and portable communication.

Simplex is like carrying on a conversation at the back of a room: although fewer people will hear it, it is still not private. The same standards of language and content



apply regardless of frequency.

There are eight designated FM simplex channels on both the 2 m and 70 cm bands. A list of simplex channels is given in this Call Book.

Channel terminology

Channels or frequencies that are used on VHF/UHF are not normally named by all the numbers that make up the frequency. Instead, it is more common to use an abbreviated form of frequency for convenience. For example, the common simplex frequency of 146.525 MHz is referred to as six-five-two-five, where the rule is to omit the first two digits and the decimal point.

The exception to this rule is where the frequency ends in zero, in which case the zero is omitted. For example, the frequency 147.000 MHz is referred to as seven-hundred, not seven-thousand.

Simplex and repeater signal reports

Many transceivers incorporate a signal strength meter (often called an S-meter). When you are listening to a transmission on simplex, the S-meter reading will give you an indication of how strong the station's signal is. With a repeater, the situation is quite different. The repeater signal strength remains constant, regardless of the transmitting station's signal strength.

The degree of signal quieting varies instead—a strong input signal pro-

duces a clear, noise-free repeater output—described as "fully quieting" or "fully limiting"—while a weak signal will be noisy. If a signal falls below a certain level, it will not hold the repeater reliably but will pulse it intermittently or drop out altogether.

Please remember that other stations rely on signal reports to determine how well their setup is working—try to make your signal reports as accurate as you can.

Other modes

FM is not the only mode used on VHF and UHF, in fact almost any mode can, and often is, used on these bands. For example, singleband (SSB) is used for weak signal and long-distance work towards the bottom end of the 2 m band. By contrast, CW or Morse is used for very exotic work such as earth-moon-earth (E-M-E) communication. As on all bands, you choose the mode that best suits your application and your desire for experimentation.

You should be aware that many of the conventions we have outlined above for repeater operation may not necessarily apply to some of these exotic modes. As an extreme case, in E-M-E operation contacts are highly structured, based on very severe time constraints. The precise procedures for all the modes are beyond the scope of this article. They are covered in the recommended references.

The 6 m band

The 6 m band (50–54 MHz), lying between the highest high-frequency band and the 2 m VHF band, provides some exciting scope for experimentation into unusual modes of radio propagation. Communications over several thousands of kilometres is possible under favourable conditions, while at other times the band can seem dead.

This band lies close to the television Channel One, even overlaying part of this channel. For this reason a special MoC permit is required for operation in part of this band. You should consult a local Branch of NZART, FMTAG or known 6 m enthusiasts for details on the specific procedures before you begin operation.

Summary

Most of the special points relating to repeater use come under the category of commonsense considerations for others.

The Amateur's Code, first published in the ARRL Handbook, and reprinted in this Call Book, sums these up succinctly and we can do well to bear it in mind at all times.

OPERATING INFORMATION

ABT	About	OB	Old boy
AGN	Again	OC	Old chap
ANT	Antenna	OM	Old man
AR K	End of transmission	OP; OPR	Operator
AR VA	Final end of transmission	OT	Old timer; Old top
AS	Wait		
BCI	Broadcast interference	PSE;	Please
BCL	Broadcast listener	PWR	Power
BK	Break; I wish to break-in (interrupt) a transmission in progress	R	
BN	All between; been	RCVR; RX	Received as transmitted; are (sometimes also used as a decimal point, e.g. 1R5)
BUG	Semi-automatic key	REF	Receiver
B4	Before	RFI	Referring to; Referring to; Reference
C	Yes	RIG	Radio frequency interference
CL	I am closing my station; call	RPRT, REPT	Station equipment
CPI, CPY	Copy	RPT	Report
CQ	Calling any station	RTT; RTTY	Repeat; I repeat
CUAGN	See you again	RX; RCVR	Radioteletype
CUD	Could		Receiver
CUL	See you later	SA	Say
CW	Continuous wave, i.e. radio telegraphy	SASE	Self-addressed, stamped envelope
DE	From	SED	Said
DR	Dear	SIG	Signal
DX	Distance, foreign countries	SKED	Schedule
ER	Here	SIRI	Sorry
ES	And; &	SSB	Single sideband
FB	Fine business, excellent	SUM	Some
FER	For		
FM	Frequency modulation; From	T	Zero (0)
GA	Go ahead, continue sending; good afternoon	THIO	Though
GB	Goodbye	THRU; THRO	Through
GE	Good evening	TMW	Tomorrow
GG	Going; grounded grid	TNX; TKS	Thanks
GM	Good morning	TT	That
GN	Good night	TU; TKU	Thank you
GND	Ground	TVI	Television interference
GUD	Good	TX	Transmitter
HI	Laughter; High	TXT	Text
HPE	Hope		
HR	Here; Hear; Hour	WID	You
HV: HVE	Have	WKD; WKG	Your; You are (sometimes YR)
HW	How	WL	Yours (sometimes YRS)
K	Go ahead	WUD	
KN	specific station go ahead	WX	
MA; MILS	Milliamperes	VFO	Variable frequency oscillator
MNI	Many	VY	Very
MSG	Message		
N	No; North	XCVR	Transceiver
NCS	Net control station	XMTR; TX	Transmitter
ND	Nothing doing	XTAL	Crystal
NIL	Nothing; I have nothing for you	XYL; YF	Wife
NR	Number		
NW	Now	YL	Young lady
		73	Best Regards
		88	Love and kisses

THE Q-CODE

QRG	Will you tell me my exact frequency (or that of . . .)? Your exact frequency (or that of . . .) is . . . kHz.	QSB	Are my signals fading? Your signals are fading.
QRH	Does my frequency vary? Your frequency varies.	QSD	Are my signals mutilated? Your signals are mutilated.
QRI	How is the tone of my transmission? The tone of your transmission is . . . (1. Good; 2. Variable; 3. Bad)	QSK	Can you hear me between your signals and if so can I break in on your transmission? I can hear you between my signals; break in on my transmission.
QRK	What is the intelligibility of my signals (or those of . . .)? The intelligibility of your signals (or those of . . .) is . . . (1. Bad; 2. Poor; 3. Fair; 4. Good; 5. Excellent)	QSL	Can you acknowledge receipt? I am acknowledging receipt.
QRL	Are you busy? I am busy (or I am busy with . . .) Please do not interfere.	QSM	Shall I repeat the last message I sent you, or some previous message? Repeat the last message which you sent me [or message(s) number(s) . . .]
QRM	Is my transmission being interfered with? Your transmission is being interfered with . . . (1. Nil; 2. Slightly; 3. Moderately; 4. Severely; 5. Extremely)	QSN	Did you hear me (or . . .) on . . . kHz? I did hear you (or . . .) on . . . kHz.
QRN	Are you troubled by static? I am troubled by static . . . (1-5 as under QRM)	QSO	Can you communicate with . . . direct or by relay? I can communicate with . . . direct (or by relay through . . .)
QRO	Shall I increase power? Increase power.	QSP	Will you relay to . . .? I will relay to . . .
QRP	Shall I decrease power? Decrease power.	QST	General call preceding a message addressed to all amateurs and ARRL members.
QRQ	Shall I send faster? Send faster (. . . wpm).	QSU	Shall I send or reply on this frequency (or . . . kHz)? Send or reply on this frequency (or . . . kHz).
QRS	Shall I send more slowly? Send more slowly (. . . wpm)	QSV	Shall I send a series of Vs on this frequency (or on . . . kHz)? Send a series of Vs on this frequency (or on . . . kHz)
QRT	Shall I stop sending? Stop sending.	QSW	Will you send on this frequency (or on . . . kHz)? I am going to send on this frequency (or on . . . kHz).
QRU	Have you anything for me? I have nothing for you.	QSX	Will you listen to . . . on . . . kHz? I am listing to . . . on . . . kHz.
QRV	Are you ready? I am ready.	QSY	Shall I change to transmission on another frequency? Change to transmission on another frequency (or on . . . kHz).
QRW	Shall I inform . . . that you are calling him on . . . kHz? Please inform . . . that I am calling on . . . kHz.	QSZ	Shall I send each word or group more than once? Send each word or group twice (or . . . times).
QRX	When will you call me again? I will call you again at . . . hours (on . . . kHz).	QTC	How many messages have you to send? I have . . . messages for you (or for . . .)
QRZ	Who is calling me? You are being called by . . . (on . . . kHz)	QTH	What is your location? My location is . . . (QTHR—Location as per Call Book)
QSA	What is the strength of my signals (or those of . . .)? The strength of your signals (or those of . . .) is . . . (1. Scarcely perceptible; 2. Weak; 3. Fairly good; 4. Good; 5. Very good)	QTR	What is the correct time? The time is . . .

Morse Alphabet

A	• —	N	— •
B	— • • •	O	— — —
C	— • — •	P	• — — —
D	— • •	Q	— — • —
E	•	R	• — •
F	• • — •	S	• • •
G	— — •	T	—
H	• • • •	U	• • —
I	• •	V	• • • —
J	• — —	W	• — —
K	— • —	X	— — • —
L	• — • •	Y	— — • — —
M	— —	Z	— — • — —

Numerals

1	• — — — —	6	— • • • •
2	• • — — —	7	— — • • •
3	• • • — —	8	— — — — • •
4	• • • • —	9	— — — — — •
5	• • • • •	0	— — — — — —

Procedure Signals

Full stop	(.)	• — • — • —
Comma	(,)	— — — • — —
Colon	(:)	— — — — • • •
Question mark/Repeat	(?)	• • — — — • •
Apostrophe	(')	• — — — — •
Hyphen/dash	(-)	— • • • • —
Fraction bar	(/)	— • • — — •
Parenthesis (left hand)	(()	— • — — — •
Parenthesis (right hand)	(()	— — • — — •
Quotation marks	(“)	• — — • — — •
Error		• • • • • • • •

Spacing and length of signal

1. A dash is equal to three dots.
2. The space between the signals which form the same letter is equal to one dot.
3. The space between two letters is equal to three dots.
4. The space between two words is equal to seven dots.

		Azores, Cape Verde											
	Fernando de Noronha												
	Greenland, Rio de Janeiro, Brazil												
	Atlantic Standard Time, Chile, Nova Scotia												
	Eastern Standard Time, Montreal, New York, Peru												
	Central Standard Time, Chicago, Costa Rica												
	Mountain Standard Time, Calgary, Denver, Phoenix												
	Pacific Standard Time, Los Angeles, Seattle, Juneau												
	Eastern Alaska, Dawson												
	Hawaiian Islands												
	Nome, Alaska, Samoa, Midway Islands												
	International Date Line, Fiji Islands, New Zealand Standard Time												
	New Caledonia												
	Eastern Australia, Melbourne, Sydney												
	Central Australia, Tokyo Japan												
	Philippine Islands Perth Australia												
	Sumatra, Thailand Laos, Thailand												
	Calcutta, Novosibirsk Russia, Bangladesh												
	Central Russia, Pakistan												
	Mauritius, Oman, Reunion Island												
	Arabia, Iraq, Eastern Europe, Moscow, Ethiopia, Malagasy												
	Athens, Cape Town, Cairo												
	Central Europe, Berlin, Geneva, Stockholm, Vienna												
	Greenwich Meridian Time, London, England												
0000	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	1pm
0100	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm
0200	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm
0300	4am	5am	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm
0400	5am	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm
0500	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm
0600	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm
0700	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm
0800	9am	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm
0900	10am	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10am
1000	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
1100	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night
1200	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am
1300	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am
1400	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am
1500	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am
1600	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am	5am
1700	6pm	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am	5am	6am
1800	7pm	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am	5am	6am	7am
1900	8pm	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am
2000	9pm	10pm	11pm	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am
2100	10pm	11pm	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am
2200	11pm	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am
2300	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon

AMATEUR RADIO BAND USAGE

These charts show the New Zealand bandplans.

These bandplans are to ensure that your transmissions do not impose problems on other operators and that their transmissions do not impact on you.

It is to the advantage of all operators that the published bandplans be used.

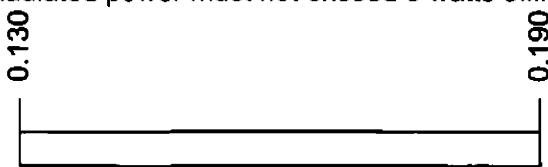
The Ministry of Economic Development (MED) defines the band limits, while the internal band segments are derived from the IARU Region 3 bandplans with New Zealand adaptations.

The band limits are found in "Schedule 3" (attached to each amateur radio licence) and on the NZART web site in the Study Guide (Regulations). (see note 1 below for URL)

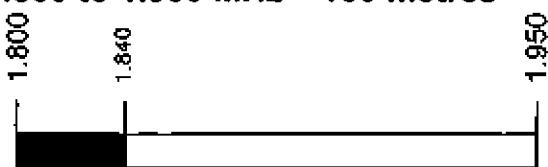
The Region 3 bandplans are at the IARU Region 3 web site. (see note 2 below for URL)

130 to 190 kHz – 1800 metres

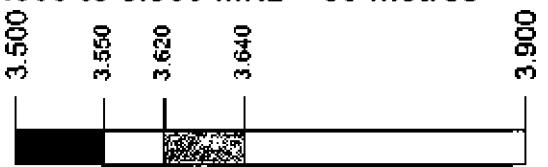
Radiated power must not exceed 5 watts e.i.r.p.



1.800 to 1.950 MHz – 160 metres

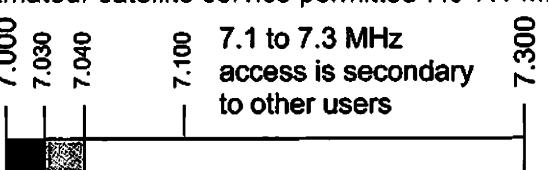


3.500 to 3.900 MHz – 80 metres

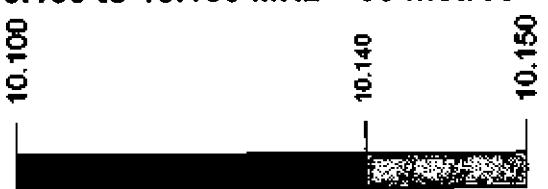


7.000 to 7.300 MHz – 40 metres

Amateur satellite service permitted 7.0-7.1 MHz



10.100 to 10.150 MHz – 30 metres



Note 1: NZART web site:

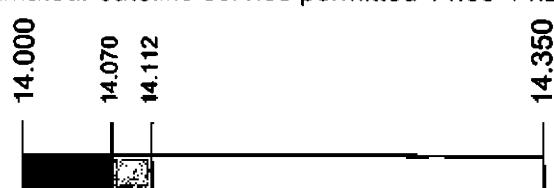
<http://www.nzart.org.nz/nzart/exam/>

Note 2: IARU Region 3 web site:

<http://www.jarl.or.jp/iaru-r3/r3bandplan.doc>

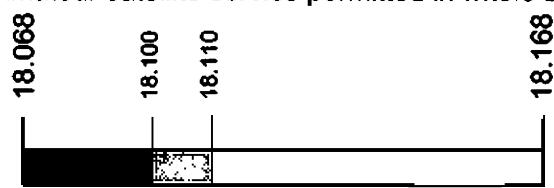
14.000 to 14.350 MHz – 20 metres

Amateur satellite service permitted 14.00-14.25 MHz



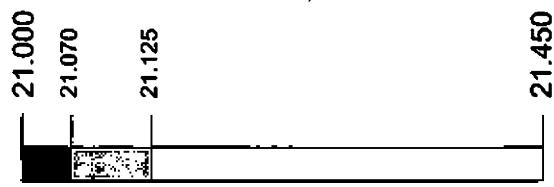
18.068 to 18.168 MHz – 17 metres

Amateur satellite service permitted in whole band



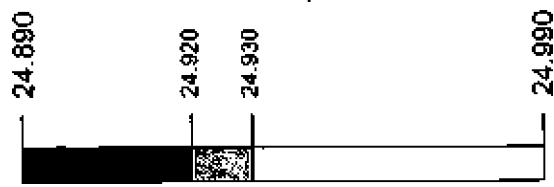
21.000 to 21.450 MHz – 15 metres

Amateur satellite service permitted in whole band



24.890 to 24.990 MHz – 12 metres

Amateur satellite service permitted in whole band



KEYS

- = CW or modes less than 1 kHz bandwidth
- = All modes with bandwidth less than 6 kHz
- ▨ = Data/packet, less than 6 kHz bandwidth

Prepared by Jamie Pye ZL2NN May 2006

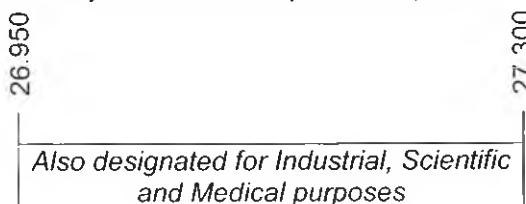
Updates or Comment to: zl2nn@nzart.org.nz

For the latest listings see: <http://www.nzart.org.nz/nzart/Repeater/> 8/18/2006 8:25 AM

NEW ZEALAND AMATEUR RADIO BANDPLANS

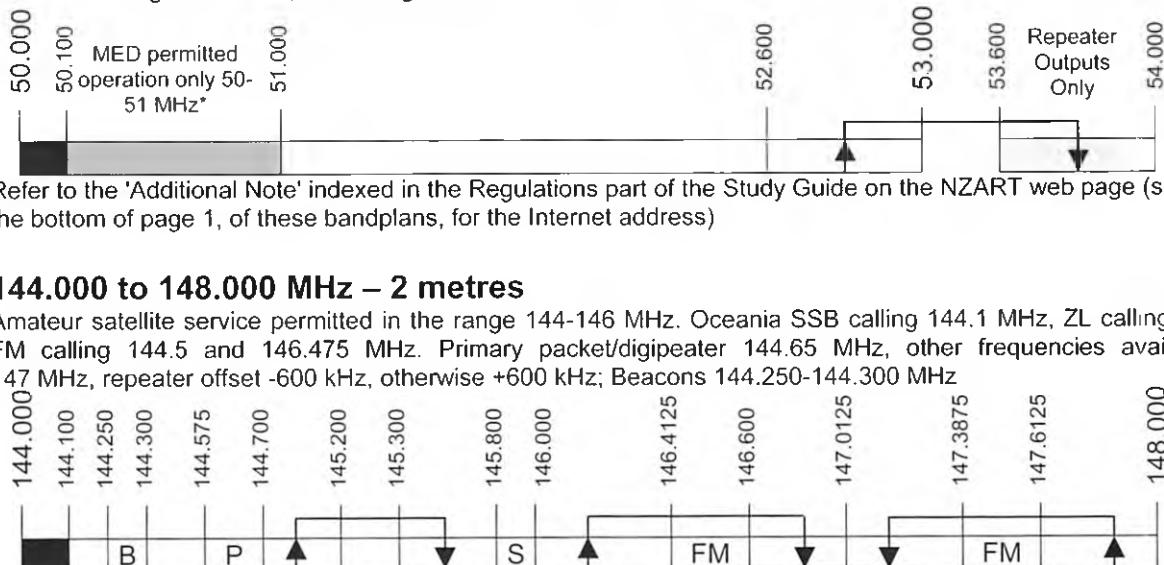
26.950 to 27.300 MHz – 11 metres

Telemetry or telecontrol only, 5 W e.i.r.p. maximum



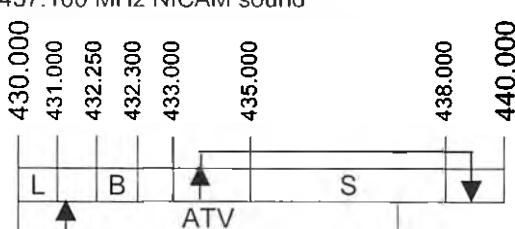
51.000 to 53.000 MHz – 6 metres

SSB/CW calling 52.05 MHz, FM calling 52.525 MHz. 53.6-54 MHz available for MED approved fixed transmitters



430.000 to 440.000 MHz – 70 cm

Amateur satellite permitted in the range 435-438 MHz. SSB calling 432.2 MHz, FM calling 432.5 MHz, Beacons 432.25-432.30 MHz. Primary packet/digipeater 432.65 MHz, other frequencies available. Repeater offsets -5 MHz in most cases, +5 MHz otherwise. In general, the ATV repeaters have an input frequency of 431.250 MHz vision, 436.750 MHz FM sound and 437.100 MHz NICAM sound



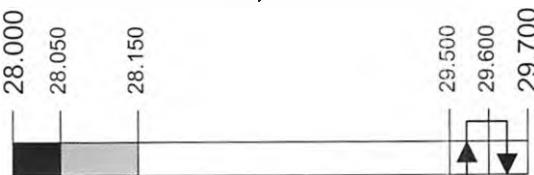
KEYS

- ↑ = Repeater input band segment
- ↓ = Repeater output band segment
- █ = CW or modes less than 1 kHz bandwidth
- = All modes
- = Data/packet, less than 6 kHz bandwidth
- = Repeater outputs only

ATV = Amateur Television, S = Satellites,
 B = Beacons, P = Packet, FM = FM simplex,
 L = Link

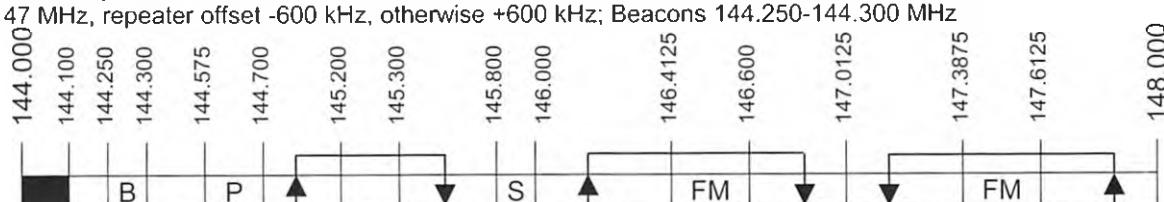
28.000 to 29.700 MHz – 10 metres

Amateur satellite service permitted in whole band



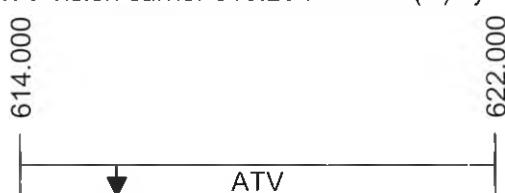
144.000 to 148.000 MHz – 2 metres

Amateur satellite service permitted in the range 144-146 MHz. Oceania SSB calling 144.1 MHz, ZL calling 144.2 MHz, FM calling 144.5 and 146.475 MHz. Primary packet/digipeater 144.65 MHz, other frequencies available. Below 147 MHz, repeater offset -600 kHz, otherwise +600 kHz; Beacons 144.250-144.300 MHz



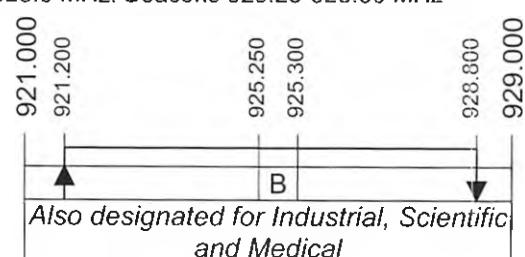
614.000 to 622.000 MHz – 50 cm

ATV vision carrier 615.25 MHz ITU(R) system G



921.000 to 929.000 MHz – 32 cm

Power 25 W e.i.r.p., SSB calling 925.2 MHz, FM calling 925.5 MHz. Beacons 925.25-925.30 MHz



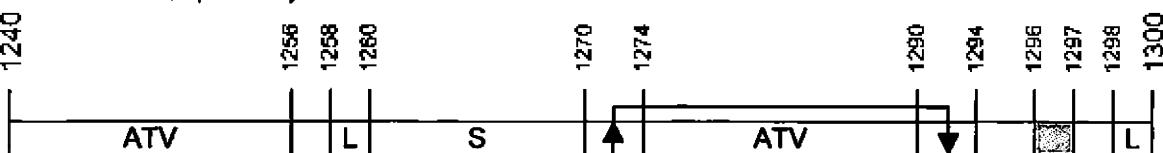
To find the narrow band segment bandplan for the microwave bands, please look for *Simplex and Calling Frequencies* that can be found elsewhere in this Call Book

Prepared by Jamie Pye ZL2NN May 2006
 Updates or Comment to: zl2nn@nzart.org.nz
 For the latest listings see: <http://www.nzart.org.nz/nzart/Repeaters/> 8/18/2006 8:24 AM

NEW ZEALAND AMATEUR RADIO BANDPLANS

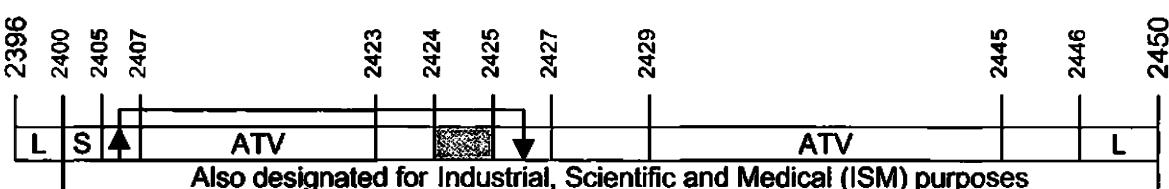
1240 to 1300 MHz – 23 cm

SSB calling 1296.2 MHz, FM calling 1296.5 MHz. Beacons 1296.25-1296.30 MHz. ATV video carriers 1241.25, 1249.25, 1275.25 and 1283.25 MHz ITU(R) system G. Repeaters -20 MHz offset. Amateur satellite service in band 1260-1270 MHz, uplink only

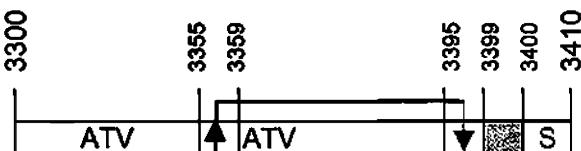


2396 to 2450 MHz – 12 cm

Standard 1 MHz narrow band segment 2424-2425 MHz. SSB calling 2424.2 MHz, FM calling 2424.5 MHz. Beacons 2424.25-2424.30 MHz. ATV in segments 2408-2422 and 2432-2446 MHz, ITU(R) system B. Repeaters -20 MHz offset. Amateur satellite service in 2400-2450 MHz. 2400-2450 MHz is also designated for Industrial, Scientific and Medical (ISM) purposes



3300 to 3410 MHz – 9 cm

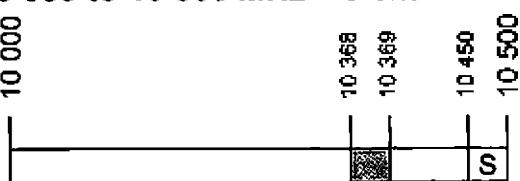


5650 to 5850 MHz – 5 cm

Satellites 5650-5670 MHz earth-to-space only; 5830-5850 MHz space-to-earth only



10 000 to 10 500 MHz – 3 cm

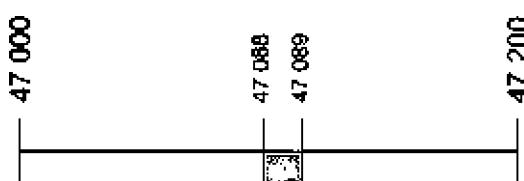


24 000 to 24 250 MHz – 1.2 cm



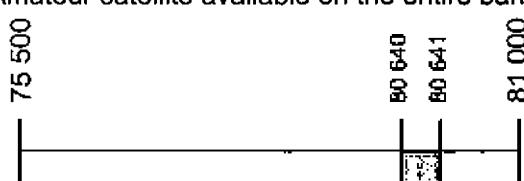
47 000 to 47 200 MHz – 6 mm

Amateur satellite available on the entire band



75 500 to 81 000 MHz – 4 mm

Amateur satellite available on the entire band



KEYS

- ↑ = Repeater input band segment
 - ↓ = Repeater output band segment
 - Box = All modes
 - Box with dots = Standard 1 MHz narrow band segment
- ATV = Amateur Television, S = Satellites,
L = Link

NOTE: Plans are in development for bands above 122.25 GHz

To find the narrow band segment bandplan for the microwave bands, please look for *Simplex and Calling Frequencies* that can be found elsewhere in this Call Book

Prepared by Jamie Pye ZL2NN May 2006
Updates or Comment to: zl2nn@nzart.org.nz

For the latest listings see: <http://www.nzart.org.nz/nzart/Repeaters/> 8/18/2006 8:23 AM

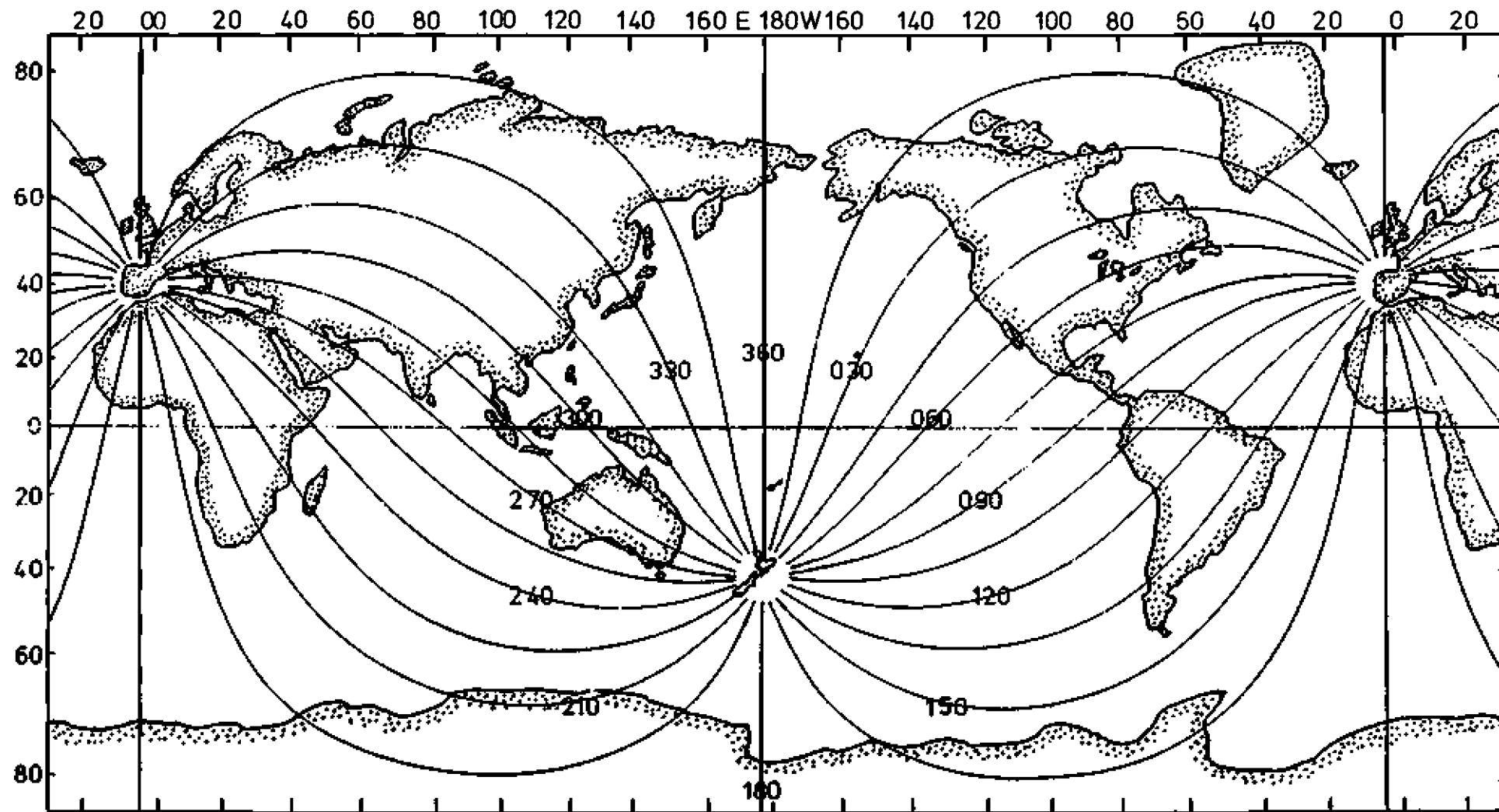
Great Circle DX Bearings Based on Wellington

prepared by RON MURPHY ZL1AMM

Listed below are the approximate short path bearings based on the great circle map centred on Wellington. These listings, based on true north, will point your directional antenna in the appropriate direction before final adjustment depending on the sharpness to which the antenna was installed. The long path bearings are about 180 degrees in the opposite direction.

A good inexpensive Azimuth (great circle on Wellington) map, number NZMS 47, is obtainable from metropolitan offices of the Department of Survey and Land Information. Available from overseas are several computer-derived DX beam headings.

A2	210	FJ, FS	100	KH2	320	S9	205	VU	270	3V	250
A3	20	FK	340	KH3	20	SM, SK, SL	330	VU7A	285	3W, XV	295
A4	270	FM	95	KH4	N	SP	310	VU7L	275	3X	155
A5	295	FO	60	KH5, KH5K	30	ST, ST0	250			3Y, Bouvet	185
A6	275	FP	65	KH6	25	SU	260	W, K, N, A	60	3Y, Peter I	155
A7	275	FR	235	KH7	N	SV, J4	270				
A9	275	FS	100	KH8	20			XE	70	4E7, DU	310
A, K, N, W	60	FT5W	220	KH9	350	T2	N	XF4	70	4J	330
AP	280	FT5X	225	KH0	320	T30	N	XT	180	4K2/FJL	N
		FT5Y	180	KL	15	T31	20	XU	295	4K5-9	290
BS7H, BS0H	290	FT5Z	230	KP1	90	T32	30	XV, 3W	295	4L	290
BV9P	310	FW	N	KP2	90	T33	N	XW	295	4K0	330
BV, BO	315	FY	115	KP3, KP4	90	T5	245	XX	305	4S	280
BY, BA, BD, BG	315			KP5	90	T7	280	XY, XZ	290	4U/ITU	300
		G, GX	345	KX	350	T8	320			4U/UN	65
C2	N	GD, GT	5			T9	285	YA	290	4W	255
C3	280	GI, GN	15	LA	335	TA	280	YB, YC, YD	300	4X, 4Z	265
C5	155	GJ, GH	345	LU	135	TF	15	YI	270		
C6	95	GM, GS	N	LX	325	TG	90	YJ	330	5A	260
C9	230	GU, GP	345	LY	320	TI	90	YK	270	5B	270
CE	130	GW, GC	350	LZ	285	TI9	90	YL	320	5II	230
CE0	110, 120					TJ	205	YN	90	5N	195
CO	80	H4	335	M, MX	345	TK	230	YO	285	5R	225
CN	220	HA	300	MD	5	TL	205	YS	90	5T	160
CP	125	HB	300	MI	15	TN	210	YU1, 6, 7, 8	285	5U	175
CT	130	HB0	300	MJ	345	TR	200	YV	100	5V	175
CT3	140	HC	100	MM	N	TT	220	YV0	100	5W	20
CU2, CT2	90	HC8	90	MU	345	TU	160			5X	235
CX	140	HH	90	MW	350	TY	190	ZA	275	5Z	235
CY9, 0	65	HI	90			TZ	160	ZB	180		
		HK	100	N, K, W, A	60			ZC	270	6W	150
D2, 3	210	HK0	90	OA	110	UA-U1, R	320	ZD7	180	6Y	90
D4	150	HL	325	OD	275	UJ-UM	290	ZD8	170		
D6	230	HP	90	OE	305	UN-UQ	290	ZD9	170	70	255/275
DA to DR	320	HR	90	OH, OJ	330	UR-UZ, EM-EO	300	Z2	220	7P	220
DU, 4E7	310	HS, E2	285	OK, OL, OM	310			Z3	285	7Q	230
		HV	280	ON	330	V2	95	ZF	90	7X	240
E2, HHS	285	HZ, 7Z	260	OX	20	V3	85	ZK1N	50	7Z, HZ	260
E3	245			OY	N	V4	95	ZK1S	60		
EA	260	I	280	OZ	330	V5	200	ZK2	N	8P	90
EA6	250	IS	270			V6	320	ZK3	30	8Q	275
EA8	140			P2	310	V7	350	ZL7	110	8R	110
EA9	180	J2	245	P4	95	V85	290	ZL8	30		
EI	10	J3	95	P5	325	VE	50	ZL9	190	9A	285
EK	290	J4, SV	270	PA	330	VK	280	ZP	125	9G	185
EL	180	J5	155	PJ	95	VK9C	270	ZS	210	9H	250
EM-EO, UR-UZ	300	J6	95	PJ7	90	VK9L	290	ZS8	210	9I, 9J	220
EP	280	J7	95	PY	140	VK9M	330			9K	270
ER	285	J8	95	PY0	125, 145	VK9N	340	1A0	280	9L	165
ES	320	JA	335	PZ	100	VK9W	320	1S	285	9M2, 4	285
ET, 9F	245	JD	335			VK9X	275			9M6, 8	285
EU, EV, EW	310	JT	325	RA	see UA	VK0H	220	3A	295	9N	295
EX	290	JW	5	R1A	180	VK0M	210	3B6	235	9Q	230
EY	290	JX	5	R1F	N	VP2	95	3B7	235	9U	230
EZ	290	JY	265	R1M	330	VP5	95	3B8	235	9V	285
						VP8	150, 180	3B9	230	9X	230
F	310	K, N, A, W	60	S0	140	VP9	80	3C	205	9Y	100
FC	230	KC6	320	S2	290	VQ9	265	3C0	205		
FG	100	KG4	90	S5	285	VR2, VS9	305	3D2	N		
FI	230	KH1	15	S7	240	VR6	90	3DA0	220	Antarctica	180



GREAT CIRCLE BEARINGS FROM WELLINGTON.

QRP operation has a long history in New Zealand, not only with home stations and DX successes, but also for portable use in the backcountry.

The origins

QRP is an abbreviation from the official list of Q-codes that were developed to speed up communication, especially between stations that spoke different languages. These codes go back to the days of Spark transmitters.

QRP? = Shall I decrease transmitter power?

QRP, with no question mark = Decrease transmitter power!

How much is QRP?

These days it is much easier to measure output power than perform meaningful and accurate input calculations.

In amateur radio circles QRP means operating a transmitter at a level of 5W Radio Frequency power output, or less, on any frequency, using any mode. QRPP stations operate with a power output that is less than 1W.

Sources

Traditionally QRP gear has been home made, and many hams still build their own QRP equipment and accessories. This can be achieved using tried and tested designs in kitset format, a few prefer to design a unit following first principles and fabricate it from available components.

Others enjoy restoring and reactivating low-power war surplus equipment from the 1940s such as

the ZC1 transmitter and receiver unit, designed and built here in New Zealand.

There exist knowledgeable Amateur Operators able to recreate 1920s and 1930s equipment from hoarded vintage parts. You can detect who these persons are by their ruthless bidding at Junk Sales.

For the "busy professional" person, commercially built QRP transmitting and receiving equipment is readily available. The introduction of new and sometimes innovative designs from major players makes this an attractive path for those of us who have the money to invest.

Forum

Break-In has a regular QRP column to cater for this interest. Back issues of this long running magazine contain many articles on all aspects of QRP equipment and operation.

Events

The premier event for ZL QRP operators is the Sangster Shield.

The photograph shows the person responsible for the Chelmsford QRP Transceiver, Mike Kerr ZL2BCW. Mike is depicted holding the rig that won the Sangster Shield Contest in 1984 for the late Rod Blagdon ZL2OM.

This Chelmsford Transceiver was featured in the November 1983 issue of *Break-In*. The Collins rig *circa* 1934, on the right hand side of the photograph, is an example of vintage QRO from the Golden Age of radio.



Most Contests, including our own Jock White Memorial Field Day, have a QRP category and provide an incentive for participation. In addition, Straight Key Night and Vintage Radio events like SPAM Military Radio Day attract QRP enthusiasts.

Informal nets that take place on 80 and 40m bands frequently include skilled operators running QRP outputs. Much of the handheld equipment utilised on VHF and UHF is QRP, more than sufficient to trigger the repeaters. At a more informal level, there are Teddy Bear's picnics, occasions when portable gear is given a day in the country and food and liquid items are liberated. These events are more popular in the warmer months.

The Challenge of QRP

A two-way QRP contact provides

the ultimate goal. Anyone can work DX with high power, even using a mediocre antenna system. The successful QRP operator adds operating skills and good practices to produce a successful outcome.

One advantage many of us have is that interference of all kinds is generally lower than overseas, although New Zealand is catching up, with the proliferation of poorly designed appliances using switching-mode power supplies. ZL operators provide a "real QRP DX contact" for overseas amateurs so a weak signal may still be considered worth the effort.

Fudging The Edges

There are many individual interpretations of what constitutes QRP, but one thing that every QRPer agrees with, QRP operation provides "joie de vivre" to the practitioner of amateur radio.

CHANGE OF ADDRESS NOTIFICATION

Please send to the Business Manager any details of your new address to retain your membership benefits, including the automatic inclusion of your details in Call Book (published annually).

If you DO NOT wish your details to be published please indicate this fact clearly.

REMEMBER: If you change your address you must notify the nearest office of the Ministry of Economic Development (Radio Spectrum Management), AND the Business Manager NZART.

Communication with neighbouring stations by ground waves is not affected by conditions in the upper atmosphere. In contrast all HF communications beyond, at the most, a few tens of kilometres depend on the presence of a layer of gases so strongly ionized as to act as a reflector for skywave signals. These signals projected at the correct angle, will be directed down to the desired destination, either in one hop or by successive hops around the curvature of the earth.

The ionization of the atmospheric gases is renewed each day by ultra-violet radiation from the sun. In the lowest layers (D and E) the density of ions decreases rapidly as the sun goes down, but in the higher F region the ionization lasts longer and diminishes slowly through the night. The strength of the ionizing radiation itself is liable to fluctuate from day to day and week to week. Observatories monitor the state of the ionosphere by sweeping through the HF spectrum with pulses directed vertically upward, timing the echoes to determine the virtual height of the reflecting layer, and noting the critical penetration frequency (f_0) above which reflections cease.

Radio waves impinging obliquely on the ionized layer can be reflected on higher frequencies that are related to f_0 by an obliquity factor. Thus, for example, with an F layer at 300 km, the required radiation angle above the horizon and the maximum usable frequency (MUF) for various distances would be:

0 km	90°	$1.0 \times f_0$
500 km	48°	$1.3 \times f_0$
1,000 km	28°	$1.9 \times f_0$
2,000 km	14°	$2.7 \times f_0$
3,000 km	4°	$3.4 \times f_0$

For instance, when the critical frequency (f_0) is 3 MHz the MUF for a 1000 km path is $1.9 \times 3 \text{ MHz} = 5.7 \text{ MHz}$. This path would be useable on 40 m (MUF = 7 MHz) if the critical frequency increased to $7 + 1.9 = 8.7 \text{ MHz}$.

Signals suffer power loss at every reflection and at every passage through the daytime D and E regions. The lower the frequency the more severe the loss—halving the frequency quadruples the loss. The lowest frequency to give a readable signal at the other end, in spite of losses, depends in part on the effective power radiated at the appropriate angle. Thus the lowest usable frequency (LUF) or absorption-limited frequency (ALF) is not a sharply defined limit applying to all stations like the MUF.

The IARU-NCDXF⁽¹⁾ worldwide network of beacons in continuous

operation on five amateur bands, and cycling through four power levels, provides a convenient means of sampling current propagation conditions to other parts of the world (see Figure 1 overleaf). The full 18-beacon sequence on any band can be scanned in only three minutes.

For planning ahead it is usual to make use of predictions of the MUF and LUF based on the historical data provided by ionospheric observatories and averaged for different levels of solar activity. For a long time the main indicator of solar activity was the sunspot number, but the measurements of microwave radiation from the sun, begun at Ottawa in 1946, have proved more relevant to ionospheric conditions. The solar flux index is the measurement made at local noon (now at Penticton, British Columbia) on 2.8 GHz.⁽²⁾ This is not the ionizing radiation, but is something measurable at the ground that seems to vary in parallel with the ionizing radiations that maintain the ionosphere.

If an estimate can be made of the level of solar activity likely to apply at the time of interest, computers can sort through the world maps of averaged past data and extract the most probable MUFs at the required reflection points, at the relevant time, month and activity level. With considerable simplification, some very convenient programs have been produced for PCs.⁽³⁾ Most try to predict median values of MUF for a path, but to allow for the normal day-to-day variations of ionospheric conditions over a month many also indicate the expected upper decile (UD) value of MUF (likely to be exceeded on about 10 per cent of days) and the lower decile (LD) values (below which the MUF is likely to fall on the worst 10 per cent of days).

Commercial stations normally set their frequencies some distance below the expected median MUFs to minimize the disruptions of schedules on "bad" days, and for this purpose often designate the LD as their optimum working frequency (OWF). This, however, is a compromise frequency—the best propagation is normally to be found just below the actual MUF at the time, which on a "good" day may be 15 per cent or more above the predicted median MUF. Although predictions of median MUFs such as those in Break-In may not always fit conditions on particular days very well, the predictions will still give useful indications of the best and worst times to try to communicate with distant places.

Most HF communications within

New Zealand are by single-hop sky wave, requiring a medium to high take-off angle. Most amateur contacts need radiation angles above 40–45°, few need radiation below 30° to reach the remainder of the country. At the steep angles needed for nearby communications, signals on the higher frequency bands will penetrate the ionized layers and be lost to space, though lower-angled rays may still be reaching more distant stations. This skip over surrounding areas is most frequent and extensive when the ionization is weak, notably at night, in the winter, and in the years of low solar activity. Amateurs (including AREC) can usually keep nearby contacts on the 3.5 MHz band, while SAR and CD can change to their lower "night" frequencies. In contrast to local communications, long distance contacts are favoured by the lowest practicable radiation angles in order to maximize the usable frequency, minimize the number of hops needed, and avoid unnecessary absorption losses.

Bursts of X-rays from solar flares can cause immediate intensification of ionization, notably in the D-region, over sunlit portions of the earth, causing sudden shortwave fadeouts. Clouds of charged particles ejected from the sun, and travelling more slowly, may be reported by satellite as a satellite proton event (SPE); they can interact with the earth's magnetic field, causing distortions of the field that are indicated by increases in the three-hourly geomagnetic K-index and the 24-hourly A-index, and themselves be deflected towards the magnetic poles to produce enhanced auroral displays, degraded radio propagation across the auroral zone, and perhaps severe polar cap absorption (PCA).⁽⁴⁾

Summary

For long distance contacts use the lowest practicable radiation angle and the highest frequency usable at the time; listen to the beacons for an overview of propagation in different directions (and take great care not to transmit on the beacon frequencies!); listen to the hourly broadcasts from WWV or WWVH for the solar flux and K and A indices (and do not expect great propagation across the auroral regions if the geomagnetic field is disturbed); consult monthly predictions of median MUFs in Break-In or on PCs but be prepared for MUFs to be 15 per cent or more above the predicted medians on good days and 15 per cent or more below on bad days.

For domestic communications

within New Zealand expect to do best with a medium to high radiation angle and a frequency low enough to avoid skip over the desired paths, but still use the highest band that is usable in order to minimize losses and multipath fading.

Useful websites (many cross-linked)

(1) The Northern California DX Foundation website (www.ncdfx.org) has pages on beacons, including sites, call-signs, schedules, propagation software and software to monitor the beacons using a sound card.

(2) The Penticton/Ottawa 2.8 GHz solar flux observations are displayed on www.ngdc.noaa.gov/stp/SOLAR/FLUX/flux.html (note the uppercase letters).

(3) Propagation prediction software is available through links on the NZART website (www.nzart.org.nz/nzart/ar_wv/other.htm) the NCDX site above and most other sites in this list.

(4) "Space weather" is the current jargon for solar activity and its influence on the earth. The website www.spaceweather.com (sponsored by NASA) has a lot of current and background information as well as links to other sites, the principal one being the Space Environment Center of the US National Oceanic and Atmospheric Administration (www.sec.noaa.gov) which is the major source of data used by other sites.

Learning about propagation

The RSGB Propagation Studies Committee has a very comprehensive website at www.keele.ac.uk/depts/por/psc.html with a listing "relating to radio propagation at all levels from introductory to professional". (There "what's new?" section includes two articles by Murray Greenman ZL1BPU.)

Two ionospheric organisations who are responsible for collecting ionospheric observations also have very good education sections on propagation. They are [www.sec.noaa.gov](http://sec.noaa.gov) (see above) and the Australian Ionospheric Prediction Service (www.ips.gov.au).

The NZART website has a link to the on-line data (the latest hourly ionogram) from the Eyrewell ionosonde near Christchurch (www.phys.canterbury.ac.nz/~physion/ionogram.html).

Additional material by Grahame Fraser ZL3SJ

ALLOCATION OF INTERNATIONAL CALL-SIGNS

AAA-ALZ	United States of America	HMA-HMZ	Korea (Democratic People's Republic of)	S7A-S7Z	Seychelles (Republic of)
AMA-AOZ	Spain	HNA-HNZ	Iraq (Republic of)	S8A-S8Z	South Africa (Republic of)
APA-ASZ	Pakistan (Islamic Republic of)	HOA-HPZ	Panama (Republic of)	S9A-S9Z	Sao Tome and Principe (Democratic Republic of)
ATA-AWZ	India (Republic of)	HQA-HIRZ	Honduras (Republic of)		
AXA-AXZ	Australia	HSA-HSZ	Thailand	TAA-TCZ	Turkey
AYA-AZZ	Argentine Republic	HTA-HTZ	Nicaragua	TDA-TDZ	Guatemala (Republic of)
A2A-A2Z	Botswana (Republic of)	HUA-HUZ	El Salvador (Republic of)	TEA-TEZ	Costa Rica
A3A-A3Z	Tonga (Kingdom of)	HVA-HVZ	Vatican City State	TFA-TFZ	Iceland
A4A-A4Z	Oman (Sultanate of)	HWA-HYZ	France	TGA-TGZ	Guatemala (Republic of)
A5A-A5Z	Bhutan (Kingdom of)	HZA-HZZ	Saudi Arabia (Kingdom of)	THA-THZ	France
A6A-A6Z	United Arab Emirates	H2A-H2Z	Cyprus (Republic of)	TIA-TIZ	Costa Rica
A7A-A7Z	Qatar (State of)	H3A-H3Z	Panama (Republic of)	TJA-TJZ	Cameroon (Republic of)
A8A-A8Z	Liberia (Republic of)	H4A-H4Z	Solomon Islands	TKA-TKZ	France
A9A-A9Z	Bahrain (State of)	H6A-H7Z	Nicaragua	TLA-TLZ	Central African Republic
BAA-BZZ	China (People's Republic of)	H8A-H9Z	Panama (Republic of)	TMA-TMZ	France
CAA-CEZ	Chile	IAA-IZZ	Italy	TNA-TNZ	Congo (Republic of the)
CFA-CKZ	Canada	JAA-JSZ	Japan	TOA-TQZ	France
CLA-CMZ	Cuba	JTA-JVZ	Mongolia	TRA-TRZ	Gabonese Republic
CNA-CNZ	Morocco (Kingdom of)	JWA-JXZ	Norway	TSA-TSZ	Tunisia
COA-COZ	Cuba	JYA-JYZ	Jordan (Hashemite Kingdom of)	TTA-TTZ	Chad (Republic of)
CPA-CPZ	Bolivia (Republic of)	JZA-JZZ	Indonesia (Republic of)	TUA-TUZ	Côte d'Ivoire (Republic of)
CQA-CUZ	Portugal	J2A-J2Z	Djibouti (Republic of)	TVA-TXZ	France
CVA-CXZ	Uruguay (Eastern Republic of)	J3A-J3Z	Grenada	TYA-TYZ	Benin (Republic of)
CYA-CZZ	Canada	J4A-J4Z	Guinea-Bissau (Republic of)	TZA-TZZ	Mali (Republic of)
C2A-C2Z	Nauru (Republic of)	J5A-J5Z	Saint Lucia	T2A-T2Z	Tuvalu
C3A-C3Z	Andorra (Principality of)	J6A-J6Z	J7A-J7Z	T3A-T3Z	Kiribati (Republic of)
C4A-C4Z	Cyprus (Republic of)	J8A-J8Z	Dominica (Commonwealth of)	T4A-T4Z	Cuba
C5A-C5Z	Gambia (Republic of the)	KAA-KZZ	Saint Vincent and the Grenadines	T5A-T5Z	Somali Democratic Republic
C6A-C6Z	Bahamas (Commonwealth of the)	LAA-LNZ	United States of America	T6A-T6Z	Afghanistan (Islamic State of)
C7A-C7Z	World Meteorological Organization	LOA-LWZ	Norway	T7A-T7Z	San Marino (Republic of)
C8A-C9Z	Mozambique (Republic of)	LXA-LXZ	Argentine Republic	T8A-T8Z	Palau (Republic of)
DAA-DRZ	Germany (Federal Republic of)	LYA-LYZ	Luxembourg	T9A-T9Z	Bosnia and Herzegovina (Republic of)
DSA-DTZ	Korea (Republic of)	LZA-LZZ	Lithuania (Republic of)	UAA-UIZ	Russian Federation
DUA-DZZ	Philippines (Republic of the)	L2A-L9Z	Bulgaria (Republic of)	UJA-UMZ	Uzbekistan (Republic of)
D2A-D3Z	Angola (Republic of)	MAA-MZZ	United Kingdom of Great Britain and Northern Ireland	UNA-UQZ	Kazakhstan (Republic of)
D4A-D4Z	Cape Verde (Republic of)	NAA-NZZ	United States of America	URA-UZZ	Ukraine
D5A-D5Z	Liberia (Republic of)	OAA-OCZ	Peru	VAA-VGZ	Canada
D6A-D6Z	Comoros (Islamic Federal Republic of the)	ODA-ODZ	Lebanon	VHA-VNZ	Australia
D7A-D9Z	Korea (Republic of)	OEA-OEZ	Austria	VOA-VOZ	Canada
EAA-EIIZ	Spain	OFA-OJZ	Finland	VPA-VQZ	United Kingdom of Great Britain and Northern Ireland
EIA-EJZ	Ireland	OKA-OLZ	Czech Republic	VRA-VRZ	China (People's Republic of) - Hong Kong
EKA-EKZ	Armenia (Republic of)	OMA-OMZ	Slovak Republic	VSA-VSZ	United Kingdom of Great Britain and Northern Ireland
ELA-ELZ	Liberia (Republic of)	ONA-OTZ	Belgium	VTA-VWZ	India (Republic of)
EMA-EOZ	Ukraine	OUA-OZZ	Denmark	VXA-VYZ	Canada
EPA-EQZ	Iran (Islamic Republic of)	PAA-PIZ	Netherlands (Kingdom of the)	VZA-VZZ	Australia
ERA-ERZ	Moldova (Republic of)	PJA-PJZ	Netherlands (Kingdom of the) -	V2A-V2Z	Antigua and Barbuda
ESA-ESZ	Estonia (Republic of)	PKA-POZ	Netherlands Antilles	V3A-V3Z	Belize
ETA-ETZ	Ethiopia (Federal Democratic Republic of)	PPA-PYZ	Indonesia (Republic of)	V4A-V4Z	Saint Kitts and Nevis
EUA-EWZ	Belarus (Republic of)	PZA-PZZ	Brazil (Federative Republic of)	V5A-V5Z	Namibia (Republic of)
EXA-EXZ	Kyrgyz Republic	P2A-P2Z	Suriname (Republic of)	V6A-V6Z	Micronesia (Federated States of)
EYA-EYZ	Tajikistan (Republic of)	P3A-P3Z	Papua New Guinea	V7A-V7Z	Marshall Islands (Republic of the)
EZA-EZZ	Turkmenistan	P4A-P4Z	Cyprus (Republic of)	V8A-V8Z	Brunei Darussalam
E2A-E2Z	Thailand	P5A-P9Z	Netherlands (Kingdom of the) - Aruba	WAA-WZZ	United States of America
E3A-E3Z	Eritrea	RAA-RZZ	Korea (Democratic People's Republic of)	XAA-XIZ	Mexico
E4A-E4Z	Palestinian Authority	SAA-SMZ	Russian Federation	XJA-XOZ	Canada
E5A-E5Z	New Zealand - Cook Islands	SNA-SRZ	Sweden	XPA-XPZ	Denmark
FAA-FZZ	France	SSA-SSM	Poland (Republic of)	XQA-XRZ	Chile
GAA-GZZ	United Kingdom of Great Britain and Northern Ireland	SSN-STZ	Egypt (Arab Republic of)	XSA-XS2	China (People's Republic of)
HAA-HAZ	Hungary (Republic of)	SUA-SUZ	Sudan (Republic of the)	XTA-XTZ	Burkina Faso
HBA-HBZ	Switzerland (Confederation of)	SVA-SZZ	Egypt (Arab Republic of)	XUA-XUZ	Cambodia (Kingdom of)
HCA-HDZ	Ecuador	S2A-S3Z	Greece	XVA-XVZ	Viet Nam (Socialist Republic of)
HEA-HEZ	Switzerland (Confederation of)	S5A-S5Z	Bangladesh (People's Republic of)	XWA-XWZ	Laos (People's Democratic Republic)
HFA-HFZ	Poland (Republic of)	S6A-S6Z	Slovenia (Republic of)	XXA-XXZ	China (People's Republic of) - Macao
HGA-HGZ	Hungary (Republic of)		Singapore (Republic of)	XYA-XZZ	Myanmar (Union of)
HHA-HHZ	Haiti (Republic of)			YAA-YAZ	Afghanistan (Islamic State of)
HIA-HIZ	Dominican Republic			YBA-YHZ	Indonesia (Republic of)
IIJA-HKZ	Colombia (Republic of)			YIA-YIZ	Iraq (Republic of)
HLA-HLZ	Korea (Republic of)				

YJA-YJZ	Vanuatu (Republic of)	4AA-4CZ	Mexico	6YA-6YZ	Jamaica
YKA-YKZ	Syrian Arab Republic	4DA-4IZ	Philippines (Republic of the)	6ZA-6ZZ	Liberia (Republic of)
YLA-YLZ	Latvia (Republic of)	4JA-4KZ	Azerbaijani Republic	7AA-7IZ	Indonesia (Republic of)
YMA-YMZ	Turkey	4LA-4LZ	Georgia (Republic of)	7JA-7NZ	Japan
YNA-YNZ	Nicaragua	4MA-4MZ	Venezuela (Republic of)	7OA-7OZ	Yemen (Republic of)
YOA-YRZ	Romania	4NA-4OZ	Serbia	7PA-7PZ	Lesotho (Kingdom of)
YSA-YSZ	El Salvador (Republic of)	4PA-4SZ	Sri Lanka (Democratic Socialist Republic of)	7QA-7QZ	Malawi
YTA-YUZ	Serbia	4TA-4TZ	Peru	7RA-7RZ	Algeria (People's Democratic Republic of)
YVA-YYZ	Venezuela	4UA-4UZ	United Nations	7SA-7SZ	Sweden
YZA-YZZ	Serbia	4VA-4VZ	Haiti (Republic of)	7TA-7YZ	Algeria (People's Democratic Republic of)
Y2A-Y9Z	Germany (Federal Republic of)	4WA-4WZ	Timor - Leste	7ZA-7ZZ	Saudi Arabia (Kingdom of)
ZAA-ZAZ	Albania (Republic of)	4XA-4XZ	Israel (State of)	8AA-8IZ	Indonesia (Republic of)
ZBA-ZJZ	United Kingdom of Great Britain and Northern Ireland	4YA-4YZ	International Civil Aviation Organization	8JA-8NZ	Japan
ZKA-ZMZ	New Zealand	4ZA-4ZZ	Israel (State of)	8OA-8OZ	Botswana (Republic of)
ZNA-ZOZ	United Kingdom of Great Britain and Northern Ireland	5AA-5AZ	Libya (Socialist People's Libyan Arab Jamahiriya)	8PA-8PZ	Barbados
ZPA-ZPZ	Paraguay (Republic of)	5BA-5BZ	Cyprus (Republic of)	8QA-8QZ	Maldives (Republic of)
ZQA-ZQZ	United Kingdom of Great Britain and Northern Ireland	5CA-5GZ	Morocco (Kingdom of)	8RA-8RZ	Guyana
ZRA-ZUZ	South Africa (Republic of)	5HA-5IZ	Tanzania (United Republic of)	8SA-8SZ	Sweden
ZVA-ZZZ	Brazil (Federative Republic of)	5JA-5KZ	Colombia (Republic of)	8TA-8YZ	India (Republic of)
Z2A-Z2Z	Zimbabwe (Republic of)	5LA-5MZ	Liberia (Republic of)	8ZA-8ZZ	Saudi Arabia (Kingdom of)
Z3A-Z3Z	Former Yugoslav Republic of Macedonia	5NA-5OZ	Nigeria (Federal Republic of)	9AA-9AZ	Croatia (Republic of)
2AA-2ZZ	United Kingdom of Great Britain and Northern Ireland	5PA-5QZ	Denmark	9BA-9DZ	Iran (Islamic Republic of)
3AA-3AZ	Monaco (Principality of)	5RA-5SZ	Madagascar (Republic of)	9EA-9FZ	Ethiopia (Federal Democratic Republic of)
3BA-3BZ	Mauritius (Republic of)	5TA-5TZ	Mauritania (Islamic Republic of)	9GA-9GZ	Ghana
3CA-3CZ	Equatorial Guinea (Republic of)	5UA-5UZ	Niger (Republic of the)	9HA-9HZ	Malta
3DA-3DM	Swaziland (Kingdom of)	5VA-5VZ	Togolese Republic	9IA-9JZ	Zambia (Republic of)
3DN-3DZ	Fiji (Republic of)	5WA-5WZ	Samoa (Independent State of)	9KA-9KZ	Kuwait (State of)
3EA-3FZ	Panama (Republic of)	5XA-5XZ	Uganda (Republic of)	9LA-9LZ	Sierra Leone
3GA-3GZ	Chile	5YA-5ZZ	Kenya (Republic of)	9MA-9MZ	Malaysia
3HA-3UZ	China (People's Republic of)	6AA-6BZ	Egypt (Arab Republic of)	9NA-9NZ	Nepal
3VA-3VZ	Tunisia	6CA-6CZ	Syrian Arab Republic	9OA-9TZ	Congo (Democratic Republic of)
3WA-3WZ	Viet Nam (Socialist Republic of)	6DA-6JZ	Mexico	9UA-9UZ	Burundi (Republic of)
3XA-3XZ	Guinea (Republic of)	6KA-6NZ	Korea (Republic of)	9VA-9VZ	Singapore (Republic of)
3YA-3YZ	Norway	6OA-6OZ	Somali Democratic Republic	9WA-9WZ	Malaysia
3ZA-3ZZ	Poland (Republic of)	6PA-6SZ	Pakistan (Islamic Republic of)	9XA-9XZ	Rwandese Republic
		6TA-6UZ	Sudan (Republic of the)	9YA-9ZZ	Trinidad and Tobago
		6VA-6WZ	Senegal (Republic of)		
		6XA-6XZ	Madagascar (Republic of)		

THE PHONETIC ALPHABET

The Phonetic Alphabet should be used with considerable discretion. Its primary purpose is to obviate confusion between letters and figures which have similar sounds, e.g.: BCDEGPTV, AKJ, MN, QU, FS, TWO, THREE, FIVE, NINE.

The possibility of confusion increases greatly under adverse operating conditions such as adjacent channel interference, high level of acoustic and electrical background noise, poor audio quality (including inferior articulation), fading, etc. Under these

conditions more frequent use of the phonetic code may be necessary. However, when there is a complete absence of interference of any kind and signals are perfectly readable, phonetics can be eliminated except for difficult place names, proper names, and

unusual words. Regardless of the quality of the circuit phonetics should always be used for callsigns during the establishment of initial contact. It is important to memorize the code thoroughly and to avoid using substitute words.

Phonetic Alphabet

Some words are likely to be misunderstood when passed over radio telephone circuits, due to phonetic similarity. A number of phonetic alphabets have been introduced to overcome this. The following being the most generally accepted at the present time.

A	ALFA	AL fah	P	PAPA	pah PAH
B	BRAVO	BRAH voh	Q	QUEBEC	Kwee BECK or Key BECK
C	CHARLIE	CHAR lee	R	ROMEO	ROW me oh
D	DELTA	DELL tah	S	SIERRA	See AIR rah
E	ECHO	ECK oh	T	TANGO	TANG go
F	FOXTROT	FOKS trot	U	UNIFORM	YOU nee form or OO nee form
G	GOLF	GOLF	V	VICTOR	VIK tor
H	HOTEL	hoh TELL	W	WHISKEY	WISS key
I	INDIA	IN dee ah	X	X-RAY	ECKS ray
J	JULIET	JEW lee ETT	Y	YANKEE	YANG kee
K	KILO	KEY loh	Z	ZULU	ZOO loo
L	LIMA	LEE mah			
M	MIKE	MIKE			
N	NOVEMBER	no VEM ber	1	WUN	2 TOO
O	OSCAR	OSS cah	6	SIX	7 seVEN
					8 AFT
					9 NI-ner
					0 ZERO

DX CENTURY CLUB COUNTRIES LIST

Current Countries Total 335—Revised January 2006—Reproduced courtesy ARRL

Prefix	Entity	Conti- nent	ZONE ITU CQ
1 ⁽¹⁾	Spratly Is.	AS	50 26
1A0 ⁽¹⁾	Sov. Mil. Order of Malta	EU	28 15
3A*	Monaco	EU	27 14
3B6, 7*	Agalega & St. Brandon Is.	AF	53 39
3B8	Mauritius	AF	53 39
3B9*	Rodrigues I.	AF	53 39
3C	Equatorial Guinea	AF	47 36
3C0	Annobon I.	AF	52 36
3D2*	Fiji	OC	56 32
3D2*	Conway Reef	OC	56 32
3D2*	Rotuma I.	OC	56 32
3DA#	Swaziland	AF	57 38
3V*	Tunisia	AF	37 33
3W, XV	Vietnam	AS	49 26
3X	Guinea	AF	46 35
3Y*	Bouvet	AF	67 38
3Y*	Peter I I.	AN	72 12
4J, 4K	Azerbaijan	AS	29 21
4L*	Georgia	AS	29 21
4P-4S*	Sri Lanka	AS	41 22
4U—ITU#*	ITU HQ	EU	28 14
4U—UN*	United Nations HQ	NA	8 5
4W ⁽⁴⁾	Timor - Leste	OC	54 28
4X, 4Z#*	Israel	AS	39 20
5A	Libya	AF	38 34
5B*	Cyprus	AS	39 20
5H-5I*	Tanzania	AF	53 37
5N-5O*	Nigeria	AF	46 35
5R-5S	Madagascar	AF	53 39
5T ⁽²⁾	Mauritania	AF	46 35
5U ⁽³⁾	Niger	AF	46 35
5V	Togo	AF	46 35
5W*	Samoa	OC	62 32
5X*	Uganda	AF	48 37
5Y-5Z*	Kenya	AF	48 37
6V-6W ⁽⁴⁾ *	Senegal	AF	46 35
6Y#*	Jamaica	NA	11 8
7O ⁽⁵⁾	Yemen	AS	39 21
7P	Lesotho	AF	57 38
7Q	Malawi	AF	53 37
7T-7Y*	Algeria	AF	37 33
8P*	Barbados	NA	11 8
8Q	Maldives	AS/AF	41 22
8R#*	Guyana	SA	12 9
9A ⁽⁶⁾ *	Croatia	EU	28 15
9G ⁽⁷⁾ #*	Ghana	AF	46 35
9H*	Malta	EU	28 15
9I-9J*	Zambia	AF	53 36
9K*	Kuwait	AS	39 21
9L#*	Sierra Leone	AF	46 35
9M2, 4 ⁽⁸⁾ #*	West Malaysia	AS	54 28
9M6, 8 ⁽⁹⁾ #*	East Malaysia	OC	54 28
9N	Nepal	AS	42 22
9Q-9T*	Dem. Rep. of Congo	AF	52 36
9U ⁽⁹⁾	Burundi	AF	52 36
9V ⁽¹⁰⁾ #*	Singapore	AS	54 28
9X ⁽⁹⁾	Rwanda	AF	52 36
9Y-9Z#*	Trinidad & Tobago	SA	11 9
A2*	Botswana	AF	57 38
A3	Tonga	OC	62 32
A4*	Oman	AS	39 21
A5	Bhutan	AS	41 22
A6	United Arab Emirates	AS	39 21
A7*	Qatar	AS	39 21
A9*	Bahrain	AS	39 21
AP-AS*	Pakistan	AS	41 21
BS7 ⁽¹¹⁾	Scarborough Reef	AS	50 27
BV*	Taiwan	AS	44 24
BV9P ⁽¹²⁾	Pratas I.	AS	44 24
BY*	China	AS	(A) 23,24
C2*	Nauru	OC	65 31
C3*	Andorra	EU	27 14

Prefix	Entity	Conti- nent	ZONE ITU CQ
C5#*	The Gambia	AF	46 35
C6*	Bahamas	NA	11 8
C8-9*	Mozambique	AF	53 37
CA-CE#*	Chile	SA	14, 12 16
CE0#*	Easter I.	SA	63 12
CE0#*	Juan Fernandez Is.	SA	14 12
CE0#*	San Felix & San Ambrosio	SA	14 12
CE9/KC4**	Antarctica	AN	(B) (C)
CM, CO#*	Cuba	NA	11 8
CN	Morocco	AF	37 33
CP#*	Bolivia	SA	12, 14 14
CT*	Portugal	EU	37 14
CT3*	Madeira Is.	AF	36 33
CU*	Azores	EU	36 14
CV-CX**	Uruguay	SA	14 13
CY0*	Sable I.	NA	9 5
CY9*	St. Paul I.	NA	9 5
D2-3	Angola	AF	52 36
D4*	Cape Verde	AF	46 35
D6# ^{(13)*}	Comoros	AF	53 39
DA-DR ^{(14)*}	Fed. Rep. of Germany	EU	28 14
DU-DZ**	Philippines	OC	50 27
E3 ⁽¹⁵⁾	Eritrea	AF	48 37
E4 ⁽⁴³⁾	Palestine	AS	39 20
E5	N. Cook Is.	OC	62 32
E5	S. Cook Is.	OC	62 32
EA-EH*	Spain	EU	37 14
EA6-EH6*	Balearic Is.	EU	37 14
EA8-EH8*	Canary Is.	AF	36 33
EA9-EH9*	Ceuta & Melilla	AF	37 33
E1-EJ*	Ireland	EU	27 14
EK*	Armenia	AS	29 21
EL#*	Liberia	AF	46 35
EP-EQ*	Iran	AS	40 21
ER*	Moldova	EU	29 16
ES*	Estonia	EU	29 15
ET*	Ethiopia	AF	48 37
EU, EV, EW*	Belarus	EU	29 16
EX*	Kyrgyzstan	AS	30, 17 31
EY*	Tajikistan	AS	30 17
EZ*	Turkmenistan	AS	30 17
F*	France	EU	27 14
FG*	Guadeloupe	NA	11 8
FI, FS ⁽⁴⁾ *	Saint Martin	NA	11 8
FH ^{(13)*}	Mayotte	AF	53 39
FK*	New Caledonia	OC	56 32
FK/C ⁽¹⁵⁾	Chesterfield Is.	OC	56 30
FM*	Martinique	NA	11 8
FO ^{(16)*}	Austral I.	OC	63 32
FO*	Clipperton I.	NA	10 7
FO*	French Polynesia	OC	63 32
FO ^{(16)*}	Marquesas Is.	OC	63 31
FP*	St. Pierre & Miquelon	NA	9 5
FR/G ^{(17)*}	Gloriosos Is.	AF	53 39
FR/J, E ^{(17)*}	Juan de Nova, Europa	AF	53 39
FR*	Reunion I.	AF	53 39
FR/T*	Tromelin I.	AF	53 39
FT5W*	Crozet I.	AF	68 39
FT5X*	Kerguelen Is.	AF	68 39
FT5Z*	Amsterdam & St. Paul Is.	AF	68 39
FW*	Wallis & Futuna Is.	OC	62 32
FY*	French Guiana	SA	12 9
G, GX*&	England	EU	27 14
GI, GT*	Isle of Man	EU	27 14
GI, GN*	Northern Ireland	EU	27 14
GJ, GII*	Jersey	EU	27 14
GM, GS*	Scotland	EU	27 14
GU, GP*	Guernsey	EU	27 14
GW, GC*	Wales	EU	27 14
H4*	Solomon Is.	OC	51 28
H40 ^{(18)*}	Temotu Province	OC	51 32
HA, HG*	Hungary	EU	28 15

Prefix	Entity	Conti- nent	ZONE ITU	CQ
HB*	Switzerland	EU	28	14
HB0*	Liechtenstein	EU	28	14
HC-HD#*	Ecuador	SA	12	10
HC8-HD8#*	Galapagos Is.	SA	12	10
HH#*	Haiti	NA	11	8
HI#*	Dominican Republic	NA	11	8
HJ-HK#*	Colombia	SA	12	9
HK0#*	Malpelo I.	SA	12	9
HK0#*	San Andres & Providencia	NA	11	7
HL*	Republic of Korea	AS	44	25
HO-HP#*	Panama	NA	11	7
HQ-HR#*	Honduras	NA	11	7
HS, E2*	Thailand	AS	49	26
HV	Vatican	EU	28	15
HZ*	Saudi Arabia	AS	39	21
I*	Italy	EU	28	15, 33
IS0, IMO*	Sardinia	EU	28	15
J2*	Djibouti	AF	48	37
J3#*	Grenada	NA	11	8
J5	Guinea-Bissau	AF	46	35
J6#*	St. Lucia	NA	11	8
J7#*	Dominica	NA	11	8
J8#	St. Vincent	NA	11	8
JA-JS*	Japan	AS	45	25
JD1 ⁽¹⁹⁾ *	Minami Torishima	OC	90	27
JD1 ⁽²⁰⁾ *	Ogasawara	AS	45	27
JT-JV*	Mongolia	AS	32, 23	33
JW*	Svalbard	EU	18	40
JX*	Jan Mayen	EU	18	40
JY#*	Jordan	AS	39	20
K,W,N,	United States of America	NA	6,	3,4,
AA-AK#			7,8	5
KG4#	Guantanamo Bay	NA	11	8
KH0#	Mariana Is.	OC	64	27
KH1#	Baker & Howland Is.	OC	61	31
KH2#*	Guam	OC	64	27
KH3#*	Johnston I.	OC	61	31
KH4#	Midway I.	OC	61	31
KH5#	Palmyra & Jarvis Is.	OC	61,	31
KH5K#	Kingman Reef	OC	61	31
KH6,7#*	Hawaii	OC	61	31
KH7K#	Kure I.	OC	61	31
KH8#*	American Samoa	OC	62	32
KH8 ⁽⁴⁸⁾ #*	Swains I.	OC	62	32
KH9#	Wake I.	OC	65	31
KL7#*	Alaska	NA	1,2	1
KP1#	Navassa I.	NA	11	8
KP2#*	Virgin Is.	NA	11	8
KP3,4#*	Puerto Rico	NA	11	8
KP5 ⁽²²⁾ #*	Desecho I.	NA	11	8
LA-LN*	Norway	EU	18	14
LO-LW#*	Argentina	SA	14,	13
LX*	Luxembourg	EU	27	14
LY*	Lithuania	EU	29	15
LZ*	Bulgaria	EU	28	20
OA-OC#*	Peru	SA	12	10
OD*	Lebanon	AS	39	20
OE#*	Austria	EU	28	15
OF-OF#*	Finland	EU	18	15
OH0*	Aland Is.	EU	18	15
OJ0*	Market Reef	EU	18	15
OK-OL ⁽²¹⁾ *	Czech Republic	EU	28	15
OM ⁽²²⁾ *	Slovak Republic	EU	28	15
ON-OT*	Belgium	EU	27	14
OX*	Greenland	NA	5,	40
OY*	Faroe Is.	EU	18	14
OZ*	Denmark	EU	18	14
P2 ⁽²⁴⁾	Papua New Guinea	OC	51	28
P4 ⁽²⁵⁾ #*	Aruba	SA	11	9
P5 ⁽²⁶⁾	DPR of Korea	AS	44	25
PA-PI*	Netherlands	EU	27	14
PJ2, 4, 9*	Bonaire, Curacao (Neth. Antilles)	SA	11	9
PJ5-8*	St. Maarten, Saba, St. Eustatius	NA	11	8
PP-PY#*	Brazil	SA	(D)	11
PP0-PY0F#*	Fernando de Noronha	SA	13	11
PP0-PY0S#*	St. Peter & St. Paul Rocks	SA	13	11

Prefix	Entity	Conti- nent	ZONE ITU	CQ
PPO-PY0T#*	Trindade & Martim Vaz Is.	SA	15	11
PZ	Suriname	SA	12	9
R1FI*	Franz Josef Land	EU	75	40
R1MV*	Malyi Vysotskij I.	EU	29	16
SO ^{(1),(27)}	Western Sahara	AF	46	33
S2*	Bangladesh	AS	41	22
S5 ⁽⁶⁾ *	Slovenia	EU	28	15
S7	Seychelles	AF	53	39
S8*	Sao Tome & Principe	AF	47	36
SA-SM*	Sweden	EU	18	14
SN-SR*	Poland	EU	28	15
ST*	Sudan	AF	48	34
SU	Egypt	AF	38	34
SV-SZ*	Greece	EU	28	20
SV/A*	Mount Athos	EU	28	20
SV5*	Dodecanese	EU	28	20
SV9*	Crete	EU	28	20
T2 ⁽²⁸⁾	Tuvalu	OC	65	31
T30	W. Kiribati (Gilbert Is.)	OC	65	31
T31	C. Kiribati (British Phoenix Is.)	OC	62	31
T32	E. Kiribati (Line Is.)	OC	61, 31	63
T33	Banaba I. (Ocean I.)	OC	65	31
T5	Somalia	AF	48	37
T7*	San Marino	EU	28	15
T8, KC6 ⁽²¹⁾	Palau	OC	64	27
T9(29)*	Bosnia-Herzegovina	EU	28	15
TA-TC*	Turkey	EU/AS	39	20
TF*	Iceland	EU	17	40
TG, TD#*	Guatemala	NA	12	7
TL, TE#*	Costa Rica	NA	11	7
TI9#*	Cocos I.	NA	12	7
TJ	Cameroon	AF	47	36
TK*	Corsica	EU	28	15
TL ⁽³⁰⁾	Central Africa	AF	47	36
TN ⁽³¹⁾	Congo (Republic of the)	AF	52	36
TR ⁽³²⁾ *	Gabon	AF	52	36
TT ⁽³³⁾	Chad	AF	47	36
TU ^{(34)*}	Cote d'Ivoire	AF	46	35
TY ⁽³⁵⁾	Benin	AF	46	35
TZ ^{(36)*}	Mali	AF	46	35
UA-UII,3,4,6 RA-RZ*	European Russia	EU	(E)	16
UA2#*	Kaliningrad	EU	29	15
UA-U18,9,0 RA-RZ*	Asiatic Russia	AS	(F)	(G)
UJ-UM	Uzbekistan	AS	30	17
UN-UQ*	Kazakhstan	AS	29-31	17
UR-UZ, EM-EO*	Ukraine	EU	29	16
V2#*	Antigua & Barbuda	NA	11	8
V3#	Belize	NA	11	7
V4 ^{(37)*}	St. Kitts & Nevis	NA	11	8
V5*	Namibia	AF	57	38
V6 ⁽³⁸⁾	Micronesia	OC	65	27
V7#*	Marshall Is.	OC	65	31
V8*	Brunei Darussalam	OC	54	28
VE, VO, VY#*	Canada	NA	(H)	5-Jan
VK#*	Australia	OC	(I)	29,30
VK0#*	Heard I.	AF	68	39
VK0#*	Macquarie I.	OC	60	30
VK9C#*	Cocos-Keeling Is.	OC	54	29
VK9L#*	Lord Howe I.	OC	60	30
VK9M#*	Mellish Reef	OC	56	30
VK9N	Norfolk I.	OC	60	32
VK9W#*	Willis I.	OC	55	30
VK9X#*	Christmas I.	OC	54	29
VP2E ⁽³⁷⁾	Anguilla	NA	11	8
VP2M ⁽³⁷⁾	Montserrat	NA	11	8
VP2V ^{(37)*}	British Virgin Is.	NA	11	8
VP5*	Turks & Caicos Is.	NA	11	8
VP6#*	Pitcairn I.	OC	63	32
VP6 ^{(46)*}	Ducie I.	OC	63	32
VP8*	Falkland Is.	SA	16	13
VP8, LU*	South Georgia I.	SA	73	13
VP8, LU*	South Orkney Is.	SA	73	13
VP8, LU*	South Sandwich Is.	SA	73	13
VP8, LU,	South Shetland Is.	SA	73	13
CE9, HF0, 4K1*				
VP9*	Bermuda	NA	11	5

Prefix	Entity	Conti- nent	ZONE ITU	ZONE CQ
VQ9*	Chagos Is.	AF	41	39
VR*	Hong Kong	AS	44	24
VU*	India	AS	41	22
VU*	Andaman & Nicobar Is.	AS	49	26
VU*	Lakshadweep Is.	AS	41	22
XA-XI#*	Mexico	NA	10	6
XA4-XI4#*	Revillagigedo	NA	10	6
XT ^{(39)*}	Burkina Faso	AF	46	35
XU	Cambodia	AS	49	26
XW	Laos	AS	49	26
XX9*	Macao	AS	44	24
XY-XZ	Myanmar	AS	49	26
YA	Afghanistan	AS	40	21
YB-YH ^{(40)*}	Indonesia	OC	51, 28	54
YI*	Iraq	AS	39	21
YI*	Vanuatu	OC	56	32
YK*	Syria	AS	39	20
YL*	Latvia	EU	29	15
YN#*	Nicaragua	NA	11	7
YO-YR*	Romania	EU	28	20
YS#*	El Salvador	NA	11	7
YT-YU, YZ*	Serbia	EU	28	15

Prefix	Entity	Conti- nent	ZONE ITU	ZONE CQ
(TBD) ⁽⁴¹⁾	Montenegro	EU	28	15
YY-YY#*	Venezuela	SA	12	9
YV#*	Aves I.	NA	11	8
Z2	Zimbabwe	AF	53	38
Z3 ^{(41)*}	Macedonia	EU	28	15
Z4*	Albania	EU	28	15
ZB2*	Gibraltar	EU	37	14
ZC4 ^{(42)*}	UK Sov. Base Areas on Cyprus	AS	39	20
ZD7*	St. Helena	AF	66	36
ZD8*	Ascension I.	AF	66	36
ZD9	Tristan da Cunha & Gough I.	AF	66	38
ZF*	Cayman Is.	NA	11	8
ZK2*	Niue	OC	62	32
ZK3*	Tokelau Is.	OC	62	31
ZL-ZM*	New Zealand	OC	60	32
ZL7*	Chatham Is.	OC	60	32
ZL8*	Kermadec Is.	OC	60	32
ZL9*	Auckland & Campbell Is.	OC	60	32
ZP#*	Paraguay	SA	14	11
ZR-ZU#*	South Africa	AF	57	38
ZS8*	Prince Edward & Marion Is.	AF	57	38

Notes

- (1) Unofficial prefix.
 - (2) (5T) Only contacts made June 20, 1960, and after, count for this entity.
 - (3) (5U) Only contacts made August 3, 1960, and after, count for this entity.
 - (4) (6W) Only contact made June 20, 1960, and after, count for this entity.
 - (5) (70) Only contacts made May 22, 1990, and after, count for this entity.
 - (6) (9A,S5) Only contacts made June 26, 1991, and after, count for this entity.
 - (7) (9G) Only contacts made March 5, 1957, and after, count for this entity.
 - (8) (9M2,4,6,8) Only contacts made September 16, 1963, and after, count for this entity.
 - (9) (9U, 9X) Only contacts made July 1, 1962, and after, count for this entity.
 - (10) (9V) Contacts made from September 16, 1963 to August 8, 1965, count for West Malaysia.
 - (11) (BS7) Only contacts made January 1, 1995, and after, count for this entity.
 - (12) (BV9P) Only contact made January 1, 1994, and after, count for this entity.
 - (13) (D6,FH) Only contacts made July 6, 1975, and after, count for this entity.
 - (14) (DA-DR) Only contacts made with DA-DL stations September 17, 1973, and after, and contacts made Y2-Y9 stations October 3, 1990 and after, count for this entity.
 - (15) (E3) Only contacts made November 14, 1962, and before, or May 24, 1991, and after, count for this entity.
 - (16) (FO) Only contacts made after 23:59 UTC, March 31, 1998 count for this entity.
 - (17) (FR) Only contacts made June 25, 1960, and after, count for this entity.
 - (18) (H40) Only contacts made after 23:59 UTC, March 31, 1998 count for this entity.
 - (19) (JD) Formerly Marcus Island.
 - (20) (JD) Formerly Bonin and Volcano Islands
 - (21) (KC6) Includes Yap Islands December 31, 1980, and before.
 - (22) (KP5) Only contacts made March 1, 1979, and after, count for this entity.
 - (23) (OK-OL, OM) Only contacts made January 1, 1993, and after, count for this entity.
 - (24) (P2) Only contacts made September 16, 1975, and after count for this entity.
 - (25) (P4) Only contacts made January 1, 1986, and after, count for this entity.
 - (26) (P5) Only contacts made May 14, 1995, and after, count for this entity.
- (27) (S0) Contacts with Rio de Oro (Spanish Sahara), EA9, also count for this entity.
- (28) (T2) Only contacts made January 1, 1976, and after, count for this entity.
- (29) (T9) Only contacts made October 15, 1991, and after, count for this entity.
- (30) (TL) Only contacts made August 13, 1960, and after, count for this entity.
- (31) (TN) Only contacts made August 15, 1960, and after, count for this entity.
- (32) (TR) Only contacts made August 17, 1960, and after, count for this entity.
- (33) (TT) Only contacts made August 11, 1960, and after, count for this entity.
- (34) (TU) Only contacts made August 7, 1960, and after, count for this entity.
- (35) (TY) Only contacts made August 1, 1960, and after, count for this entity.
- (36) (TZ) Only contacts made June 20, 1960, and after, count for this entity.
- (37) (V4,VP2) For DXCC credit for contacts made May 31, 1958, and before, see page 97, June 1958 QST.
- (38) (V6) Includes Yap Islands January 1, 1981, and after.
- (39) (XT) Only contacts made August 16, 1960, and after, count for this entity.
- (40) (YB) Only contacts made May 1, 1963, and after, count for this entity.
- (41) (Z3) Only contacts made September 8, 1991, and after, count for this entity.
- (42) (ZC4) Only contacts made August 16, 1960, and after, count for this entity.
- (43) (E4) Only contacts made February 1, 1999, and after, count for this entity.
- (44) (4W) Only contacts made March 1, 2000, and after, count for this entity.
- (45) (FK/C) Only contacts made March 23, 2000, and after, count for this entity.
- (46) (VP6) Only contacts made November 16, 2001, and after, count for this entity.
- (47) (To Be Determined) Only contacts made June 28, 2006, and after, count for this entity.
- (48) (KH8) Only contacts made July 22, 2006, and after, count for this entity.

*Also 3Y, 8J1, AT0, DP0, FT8Y, LU, OR4, VK0, R1AW, VP8, ZL5, ZS1, ZX0, etc. QSL via country under whose auspices the particular station is operating. The availability of a third-party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

Zone Notes can be found with Prefix Cross References.

DELETED ENTITIES

Credit for any of these entities can be given if the date of contact in question agrees with the date(s) shown in the corresponding footnote. Entities deleted after 23:59 UTC 31 March 1998 will not be included in the Deleted List.

Prefix	Entity	Conti- nent	ZONE
		ITU	CQ
(2)	Blenheim Reef	AF	41 39
(3)	Geyser Reef	AF	53 39
(4)	Abu Ail Is.	AS	39 21
1M ^{(1),(5)}	Minerva Reef	OC	62 32
4W ⁽⁶⁾	Yemen Arab Rep.	AS	39 21
7J1 ⁽⁷⁾	Okino Tori-shima	AS	45 27
8Z4 ⁽⁸⁾	Saudi Arabia/Iraq Neut. Zone	AS	39 21
8Z5, 9K3 ⁽⁹⁾	Kuwait/Saudi Arabia Neut. Zone	AS	39 21
9S4 ⁽¹⁰⁾	Saar	EU	28 14
9U5 ⁽¹¹⁾	Ruanda-Urundi	AF	52 36
AC3 ^{(1),(12)}	Sikkim	AS	41 22
AC4 ^{(1),(13)}	Tibet	AS	41 23
C9 ⁽¹⁴⁾	Manchuria	AS	33 24
CN2 ⁽¹⁵⁾	Tangier	AF	37 33
CR8 ⁽¹⁶⁾	Damao, Diu	AS	41 22
CR8 ⁽¹⁶⁾	Goa	AS	41 22
CR8, CR10 ⁽¹⁷⁾	Portuguese Timor	OC	54 28
DA-DM ⁽¹⁸⁾	Germany	EU	28 14
DM, Y2-9 ⁽¹⁹⁾	German Dem. Rep.	EU	28 14
EA9 ⁽²⁰⁾	Istni	AF	37 33
FF ⁽²¹⁾	French West Africa	AF	46 35
FH, FB8 ⁽²²⁾	Comoros	AF	53 39
FI8 ⁽²³⁾	French Indo-China	AS	49 26
FN8 ⁽²⁴⁾	French India	AS	41 22
FQ8 ⁽²⁵⁾	Fr. Equatorial Africa	AF	47, 52 36
HK0 ⁽²⁶⁾	Bajo Nuevo	NA	11 08
HK0, KP3, KS4 ⁽²⁶⁾	Serrana Bank & Roncador Cay	NA	11 07
I1 ⁽²⁷⁾	Trieste	EU	28 15
I5 ⁽²⁸⁾	Italian Somaliland	AF	48 37

Notes

- (1) Unofficial prefix.
- (2) (Blenheim Reef) Only contacts made from May 4, 1967, to June 30, 1975, count for this entity. Contacts made July 1, 1975, and after, count as Chagos (VQ9).
- (3) (Geyser Reef) Only contacts made from May 4, 1967, to February 28, 1978, count for this entity.
- (4) (Abu Ail Is.) Only contacts made March 30, 1991, and before, count for this entity.
- (5) (1M) Only contacts made from July 15, 1972, and before, count for this entity. Contacts made July 16, 1972, and after, count as Tonga (A3).
- (6) (4W) Only contacts made before May 21, 1990, and before, count for this entity.
- (7) (7J1) Only contacts made May 30, 1976, to November 30, 1980, count for this entity. Contacts made December 1, 1980, and after entity as Ogasawara (JD1).
- (8) (8Z4) Only contacts made December 25, 1981, and before, count for this entity.
- (9) (8Z5,9K3) Only contacts made December 14, 1969, and before, count for this entity.
- (10) (9S4) Only contacts made March 31, 1957, and before, count for this entity.
- (11) (9U5) Only contacts made from July 1, 1960, to June 30, 1962, count for this entity. Contact made July 1, 1962, and after, count as Burundi (9U) or Rwanda (9X).
- (12) (AC3) Only contacts made April 30, 1975, and before, count for this entity. Contacts made May 1, 1975, and after, count as India (VU).
- (13) (AC4) Only contacts made May 30, 1974, and before, count for this entity. Contact made May 31, 1974, and after, count as China (BY).
- (14) (C9) Only contacts made September 15, 1963, and before, count for this entity. Contact made September 16, 1963, and after, count as China (BY).
- (15) (CN2) Only contacts made June 30, 1960, and before, count for this entity. Contact made July 1, 1960, and after, count as Morocco (CN).
- (16) (CR8) Only contacts made December 31, 1961, and before, count for this entity.
- (17) (CR8,CR10) Only contacts made September 14, 1976, and before, count for this entity.

Prefix	Entity	Conti- nent	ZONE
		ITU	CQ
JZ0 ⁽²⁹⁾	Netherlands N. Guinea	OC	51 28
KR6,8,JR6, KA6 ⁽³⁰⁾	Okinawa (Ryukyu Is.)	AS	45 25
KS4 ⁽³¹⁾	Swan Is.	NA	11 07
KZ5 ⁽³²⁾	Canal Zone	NA	11 07
OK-OM ⁽³³⁾	Czechoslovakia	EU	28 15
P2, VK9 ⁽³⁴⁾	Papua Territory	OC	51 28
P2, VK9 ⁽³⁴⁾	Terr. New Guinea	OC	51 28
PK1-3 ⁽³⁵⁾	Java	OC	54 28
PK4 ⁽³⁵⁾	Sumatra	OC	54 28
PK5 ⁽³⁵⁾	Netherlands Borneo	OC	54 28
PK6 ⁽³⁵⁾	Celebe & Molucca Is.	OC	54 28
ST0 ⁽³⁶⁾	Southern Sudan	AF	47, 48 34
UN1 ⁽³⁷⁾	Karelo-Finnish Rep.	EU	19 16
VO ⁽³⁸⁾	Newfoundland, Labrador	NA	09 02,05
VQ1, 5H1 ⁽³⁹⁾	Zanzibar	AF	53 37
VQ6 ⁽⁴⁰⁾	British Somaliland	AF	48 37
VQ9 ⁽⁴⁰⁾	Aldabra	AF	53 39
VQ9 ⁽⁴⁰⁾	Desroches	AF	53 39
VQ9 ⁽⁴⁰⁾	Farquhar	AF	53 39
VS2, 9M2 ⁽⁴²⁾	Malaya	AS	54 28
VS4 ⁽⁴²⁾	Sarawak	OC	54 28
VS9A, P, S ⁽⁴³⁾	People's Dem. Rep. of Yemen	AS	39 21
VS9H ⁽⁴⁴⁾	Kuria Muria I.	AS	39 21
VS9K ⁽⁴⁵⁾	Kamaran Is.	AS	39 21
ZC5 ⁽⁴²⁾	British North Borneo	OC	54 28
ZC6, 4X1 ⁽⁴⁶⁾	Palestine	AS	39 20
ZD4 ⁽⁴⁷⁾	Gold Coast, Togoland	AF	46 35
ZS0, 1 ⁽⁴⁸⁾	Penguin Is.	AF	57 38
ZS9 ⁽⁴⁹⁾	Walvis Bay	AF	57 38

- (18) (DA-DM) Only contacts made September 16, 1973, and before, count for this entity. Contacts made September 17, 1973, and after, count as either FRG (DA-DL) or GDR (Y2-Y9).
- (19) (DM,Y2-9) Only contacts made from September 17, 1973, to October 2, 1990 count for this entity. On October 3, 1990 the GDR became part of the FRG.
- (20) (EA9) Only contacts made May 13, 1969, and before, count for this entity.
- (21) (FF) Only contacts made August 6, 1960, and before, count for this entity.
- (22) (FH, FB8) Only contacts made July 5, 1975, and before, count for this entity. Contacts made July 6, 1975, and after, count as Comoros (D6) or Mayotte (FH).
- (23) (FI8) Only contacts made December 20, 1950, and before, count for this entity.
- (24) (FN8) Only contacts made October 31, 1954, and before, count for this entity.
- (25) (FQ8) Only contacts made August 16, 1960, and before will count for this entity.
- (26) (HK0,KP3,KS4) Only contacts made September 16, 1981, and before, count for this entity. Contacts made September 17,1981, and after, count as San Andres (HK).
- (27) (11) Only contacts made March 31, 1957, and before, count for this entity.
- (28) (I5) Only contacts made June 30, 1960, and before, count for this entity.
- (29) (JZ) Only contacts made April 30, 1963, and before, count for this entity.
- (30) (KR6,8,JR6, KA6) Only contacts made May 14, 1972, and before, count for this entity. Contacts made May 15, 1972, and after, count as Japan (JA).
- (31) (KS4) Only contacts made August 31, 1972, and before, count for this entity. Contacts made September 1, 1972, and after, count as Honduras (HR).
- (32) (KZ5) Only contacts made September 30, 1979, and before, count for this entity.
- (33) (OK-OM) Only contacts made December 31, 1992, and before, count for this entity.
- (34) (P2, VK9) Only contacts made September 15, 1975, and before, count for this entity. Contacts made September 16, 1975, and after, count as Papua New Guinea (P2).

- (35) (PK1-6) Only contacts made April 30, 1963, and before, count for this entity. Contact made May 1, 1963, and after, count as Indonesia.
- (36) Only contacts made between May 7, 1972 and December 31, 1994, count for this entity.
- (37) (UN1) Only contacts made June 30, 1960, and before, count for this entity. Contacts made July 1, 1960, and after, count as European RSFSR (UA).
- (38) (VO) Only contacts made March 31, 1949, and before, count for this entity. Contacts made April 1, 1949, and after, count as Canada (VE).
- (39) (VQ1,5H1) Only contacts made May 31, 1974, and before, count for this entity. Contacts made June 1, 1974, and after, count as Tanzania (5H).
- (40) (VQ6) Only contacts made June 30, 1960, and before, count for this entity.
- (41) (VQ9) Only contacts made June 28, 1976, and before, count for this entity. Contacts made June 29, 1976, and after, count as Seychelles (S7).
- (42) (VS2,VS4,ZC5,9M2) Only contacts made September 15, 1963, and before, count for this entity. Contacts made September 16, 1963, and after, count as West Malaysia (9M2) or East Malaysia (9M6.8).
- (43) (VS9A,P,S) Only contacts made before May 22, 1990, and before, count for this entity.
- (44) (VS9H) Only contacts made November 29, 1967, and before, count for this entity.
- (45) (VS9K) Only contacts made on March 10, 1982, and before, count for this entity.
- (46) (ZC6,4X1) Only contacts made June 30, 1968, and before, count for this entity. Contacts made July 1, 1968, and after, count as Israel (4X).
- (47) (ZD4) Only contacts made March 5, 1957, and before, count for this entity.
- (48) (ZS0,1) Only contacts made February 29, 1994, and before, count for this entity.
- (49) (ZS9) Only contacts made from September 1, 1977 to February 28, 1994, count for this entity.

PREFIX CROSS REFERENCES

A8 = EL
 AC (before 1972) = A5
 AH = KH
 AL7 = KL7
 AM-AO = EA
 AX = VK
 AY-AZ = LU
 CF-CK = VE
 CL = CO
 CQ-CS = CT
 CR3 (before 1974) = J5
 CR4 (before 1976) = D4
 CR5 (before 1976) = S9
 CR6 (before 1976) = D2
 CR7 (before 1976) = C9
 CR9 (before 1985) = XX9
 CT2 (before 1986) = CU
 CX0 = CE9/VP8
 CY-CZ = VE
 CY0 (before 1985) = CY9
 D7 = HL
 DM-DT (before 1980) = Y2-9
 DS-DT = HL
 E2 = HS
 EA0 (before 1969) = 3C
 EK, EM-EO, ER-ES, EU-EZ = U
 ER (after 1992) = UO
 EU (after 1991) = UC
 FA-FF (after 1983) = F
 FA(before 1963) = 7X
 FB8 (before 1961) = 5R
 FBS (before 1985) = FT
 FC(before 1985) = TK
 FD8 (before 1961) = 5V
 FES (before 1961) = TJ
 FL(before 1978) = J2
 FU8 (before 1982) = YJ
 GB = G
 GC(before 1977) = GJ or GU
 H2 = 5B
 H3 = HP
 H5 (Bophutatswana) = ZS
 H7 = YN
 HE = HB
 HM (before 1982) = HL
 HT = YN
 IU = YS
 HW-HY = F
 J4 = SV
 KA1 = JD1
 KA2AA-KA9ZZ = JA
 KB6 (before 1979) = KH1
 KC4 (Navassa) = KP1
 KC6 (before 1990) = V6
 KC6 (before 1998) = T8
 KG6 (before 1979) = KII2
 KG6L (before 1970) = JD1
 KG6R, S, T (before 1979) = KH0
 KH7 (before 1996) = KH7K
 KJ6 (before 1979) = KH3
 KM6 (before 1979) = KH4
 KP4 (Desecheo) = KP5

KP6 (before 1979) = KH5
 KS6 (before 1979) = KH8
 KV4 (before 1979) = KP2
 KW6 (before 1979) = KH9
 KX6 (before 1990) = V7
 L2-9 = LU
 M = G
 M1 (before 1984) = T7
 MP4B (before 1972) = A9
 MP4M (before 1972) = A4
 MP4Q (before 1972) = A7
 MP4T, D (before 1972) = A6
 NH = KH
 NL7 = KL7
 NP = KP
 OQ (before 1961) = 9Q
 P3 = 5B
 P4 (before 1986) = PJ
 PX (before 1970) = C3
 RA, RN = UA
 RB-RR = UB-UR
 RS = U
 RT = UB
 RU-RX = U
 S4 (Ciskei) = ZS
 S8 (Transkei) = ZS
 T4 = CO
 T4 (Venda) = ZS
 TH, TM, TO-TQ, TV-TX = F
 UB (before 1994) = UZ
 UC (before 1991) = EU
 UD (before 1994) = 4J
 UF (before 1994) = 4L
 UG (before 1994) = EK
 UH (before 1993) = EZ
 UI (before 1994) = UJ
 UJ (before 1993) = EY
 UL (before 1994) = UN
 UM (before 1993) = EX
 UO (before 1994) = ER
 UP (before 1991) = LY
 UQ (before 1992) = YL
 UR (before 1991) = ES
 V9 (Venda) = ZS
 VA-VG = VE
 VH-VN = VK
 VK9 (Nauru) = C2
 VP1 (before 1982) = V3
 VP2A (before 1982) = V2
 VP2D (before 1979) = J7
 VP2G (before 1975) = J3
 VP2K (before 1984) = V4 or VP2E
 VP2L (before 1980) = J6
 VP2S (before 1980) = J8
 VP3 (before 1967) = SR
 VP4 (before 1963) = 9Y
 VP5 (Jamaica) = 6Y
 VP5E = VP2E
 VP6 (before 1967) = 8P
 VP7 (before 1974) = C6
 VQ2 (before 1965) = 9J
 VQ3 (before 1962) = 5H

VQ4 (before 1964) = 5Z
 VQ5 (before 1963) = 5X
 VQ8 (before 1969) = 3B
 VQ8 (Chagos) = VQ9
 VQ9 (Seychelles) = S7
 VR1 (before 1980) = T3
 VR2 (before 1971) = 3D2
 VR2 (after 1991) = VS6
 VR3 (before 1980) = T32
 VR4 (before 1979) = 1H4
 VR5 (before 1971) = A3
 VR6 (before 1998) = VP6
 VR8 (before 1979) = T2
 VS1 (before 1966) = 9V
 VS5 (before 1985) = V8
 VS6 (before 1997) = VR
 VS7 (before 1949) = 4S
 VS9M = 8Q
 VS9O (before 1961) = A1
 VX-VY = CY0/VE
 WH = KH
 WL7 = KL7
 WP = KP
 XJ-XO = VE
 XP = OX
 XQ-XR = CE
 XV = 3W
 XX7 (before 1976) = C9
 YU2 (before 1992) = 9A
 YU3 (before 1992) = S5
 YU4 (before 1992) = T9
 YU5 (before 1992) = Z3
 ZB1 (before 1965) = 9H1
 ZD1 (before 1962) = 9L
 ZD2 (before 1961) = 5N
 ZD3 (before 1966) = C5
 ZD5 (before 1969) = 3DA
 ZD6 (before 1965) = 7Q
 ZE (before 1981) = Z2-9
 ZK (before June 2006) = E5
 ZK9 (1983) = ZK2
 ZM6 (before 1963) = 5W
 ZM7 (before 1984) = ZK3
 ZS3 (before 1991) = V5
 ZS7 (before 1969) = 3D6
 ZS8 (before 1967) = 7P
 ZS9 (before 1967) = A2
 ZV-ZZ = PY
 2D = GD
 2E = G
 2I = GI
 2J = GJ
 2M = GM
 2U = GU
 2W = GW
 3B-3C (before 1968) = VE
 3D6 (before 1988) = 3DA
 3G = CE
 3Z = SP
 4A-4C = XE
 4D-II = DU
 4J-IL = U

Continents

AF = Africa
 AN = Antarctica
 AS = Asia
 EU = Europe
 NA = North America
 OC = Oceania
 SA = South America

Zone Notes

- (A) 33, 42, 43, 44
 (B) 67, 69-74
 (C) 12, 13, 29, 30, 32, 38, 39
 (D) 12, 13, 15
 (E) 19, 20, 29, 30
 (F) 20-26, 30-35, 75
 (G) 16, 17, 18, 19, 23
 (H) 2, 3, 4, 9, 75
 (I) 55, 58, 59

Introduction

Satellite operation is a fascinating and challenging aspect of amateur radio. There is a variety of modes both digital and analog that can be used and a choice of satellites to communicate through. Equipment required for satellite operation can range from a dual band hand held transceiver with a hand held Yagi antenna up to sophisticated ground stations with computer-controlled transceivers and antenna systems.

The amateur satellite service is recognised by the ITU. There are frequency allocations within the amateur bands for satellite operation, [see the New Zealand Amateur Radio Bandplans].

The first amateur radio satellite, was OSCAR 1 launched on December 12, 1961 by a Thor Agena B launcher from Vandenberg Air Force Base, California. Coincidentally the date was also significant because it was the 60th anniversary of the first radio transmission across the Atlantic Ocean by Guglielmo Marconi. It is impressive that amateur radio hams were able to build a successful satellite only four years after Sputnik 1, the first ever man made satellite, which was launched on October 4, 1957.

OSCAR 1 was the first non-governmental satellite ever launched. It transmitted "HI" in Morse code with 140 milliwatts of power on a frequency of 144.983 MHz. The speed of the cw message was used to indicate the temperature inside the satellite.

Since 1961 there have been approximately 90 amateur satellites launched and there are 11 more listed on the AMSAT web site, with future launch dates between September 2006 and March 2009. As at August 2006 there are 22 active satellites listed which have some form of amateur radio equipment on board. These range from satellites equipped with beacons sending telemetry data to satellites with several transponders on different bands and modes.

Most amateur radio satellites are awarded an OSCAR number as soon as the satellite is in orbit and operational. OSCAR stands for orbital satellite carrying amateur radio. So far there have been 58 OSCAR satellites. OSCAR numbers are issued sequentially and usually give a clue as to the origin of the satellite. For example AO-7 is from AMSAT North America, FO-29 is Fuji OSCAR from Japan, SO-50 is from Saudi Arabia, VO62 is from India, and UO-11 is from University of Surrey. As well as the OSCAR satellites, there was a

series of 18 Russian built amateur radio satellites, which were known as Radiosputnik or "RS" satellites. Many of the RS satellites were amateur radio transponders physically attached to commercial communications satellites and were not issued with OSCAR numbers.

Amateur radio has also been an important part of manned space exploration. The Russian MIR spacecraft (1986–2001) carried ham radio and SSTV equipment. Between 1983 and 1999 ham radio licensed astronauts participated in the SAREX programme during 28 space shuttle flights. They carried out 1000s of QSOs with hams on Earth and made the first space to space ham QSOs to chat to other hams aboard the MIR space station. The international space station (ISS) carries ARISS and PCSSat2. ARISS stands for "amateur radio aboard ISS", and is used for educational conversations to schools, ham QSOs by the space station crew, and Packet/APRS use. Recently there has been transmission of SSTV pictures from ARISS. It is proposed to that a slide show mode will be introduced where two or more photos could be downloaded on a typical ISS satellite pass. PCSSat2 was a separate VU mode digital (packet/PSK/APRS) transponder mounted on the outside of the space station. The "suitcase" carrying the radio equipment also contained an experiment studying how different materials react to being exposed to space for a long period of time. PCSSat2 is due to be returned to Earth by the space shuttle on August 29, 2006, so will no longer be operational by the time the call book is published.

Probably the most unique HAMSAT so far is SuitSat, a redundant Russian "Orlan" space-suit filled with a radio transmitter, some instrumentation, and padded out with unwanted laundry. The Expedition 12 crew launched SuitSat from the international space station on February 3rd 2006. AMSAT designated SuitSat as AMSAT OSCAR 54 (AO-54). SuitSat transmitted a digital recording of the voices of school children on 145.99 MHz. The signal was much weaker than expected, probably due to a broken antenna. SuitSat was last heard on February 18 and has now burned up in the Earth's atmosphere. There are plans for more SuitSats as there is no shortage of worn out space suits and the project attracted widespread publicity.

Amateur satellites can be grouped according to their orbit. High Earth Orbit (HEO) satellites usually have large elliptical

(Molniya) orbits. For example AO-40 has an apogee of 58,776 km and a perigee of 1044 km. The "footprint" or coverage area of HEO satellites is almost a complete hemisphere, one could expect to work stations in all of Europe, Asia, the Americas and part of Africa. Unfortunately neither of the two most successful HEO HAMSATS are still in operation. AO-10 is still listed by AMSAT as semi-operational but they also show both the beacon and transponder as non-operational. In January 2004, AO-40 suffered failure of all transponders due to failure of the main battery.

Low Earth Orbit (LEO) satellites have smaller elliptical or near circular orbits with perigee (nearest point to Earth) of around 680–800 km and apogee (farthest point from Earth) of around 800–1320 km. Since the LEO satellites are closer to Earth, the coverage area or "foot print" is much smaller than the footprint of a HEO satellite. A ham in New Zealand can expect to work all of New Zealand and Australia through the LEO OSCAR satellites. The ISS has a nearly circular orbit 333 km perigee to 348 km apogee.

There are many exciting AMSAT projects underway around the world. In Germany a team is working on P3E "Express" a high orbit satellite which will carry a whole range of transponders plus a camera and other experiments. The Americans are working on "Eagle", another high orbit satellite, designed to complement P3E and provide nearly continuous satellite coverage. The local New Zealand AMSAT group is working on Kiwi-Sat and was able to demonstrate a working "space ready" FM transponder at the last NZART Convention.

Modes and bands

The amateur satellites of most interest are those which carry transponders for relaying signals back to Earth. Some satellites carry linear transponders, which allow multiple users and transmission types, including SSB, CW, FM, SSTV, PSK and Domino. Some have FM voice transponders, which work like a cross band repeater channel and some satellites carry digital transponders, which receive and then transmit, regenerated digital data. Digital transponders are usually used for packet BBS, digipeaters and APRS.

Most satellite operation uses the satellite portions of the 2 m and 70 cm bands. Currently only AO-51 "Echo" has the capability to operate on L band (1268 MHz) and S band (2401 MHz). The P3E

"Express" satellite, due for launch in 2007 is proposed to have transponders on bands ranging from 29 MHz to 47 GHz.

Satellite transponders are often referred to by "mode". Rather than referring to the type of transmission SSB, FM etc. this relates to the frequency bands used by the satellite transponder. VU mode means that the satellite uplink is on VHF band (2 m) and downlink is on UHF (70 cm). Conversely UV mode means that the satellite uplink is on UHF band (70 cm) and downlink is on VHF (2 m). LS mode has a 1268 MHz uplink and a 2401 MHz downlink. The old AO-7 era "mode A" is now VA and "mode B" is now UV.

Some linear transponders are "reverse tracking" so that as the uplink frequency increases, the downlink frequency decreases. Generally this type of transponder is also "inverted", ie the sidebands reverse so that LSB input to the satellite becomes USB on the downlink.

Equipment requirements

The minimum requirement for transceivers is a dual band FM handheld, but for serious satellite work a multi-mode transceiver capable of full duplex crossband operation (2 m/70 cm), such as the Yaesu FT-847, Icom IC-910H or Kenwood TS2000 is desirable. Alternatively the station can consist of separate all mode transceivers for 2 m and 70 cm. Some satellites have a mode A downlink, which would require a 10 m HF receiver. L band operation can be achieved with a transmit converter, or some transceivers have optional built in L band transverters. S band operation is usually achieved using an S band to 2 m or S band to 70 cm down-converter mounted at the antenna.

For working LEO satellites Yagi antennas, five-elements on 2 m and 12-elements on 70 cm are quite acceptable. It is best if these can be pointed at the satellite using an Azimuth/Elevation rotator. The minimum antenna configuration is an omni antenna such as a collinear, discone or turnstile antenna. Almost any antenna capable of working on 70 cm and 2 m will get you started on the FM satellites when they are at high elevations. There is a significant advantage in using circular polarised antennas for satellite work. Circular polarised antennas minimise the effects of cross polarisation fading caused by the satellites' changing position, possible spin modulation (fading due to satellite rotation), and on

HEO satellites a small amount of Faraday rotation. The convention is to use antennas made with right hand circular polarisation (RHCP).

For HEO satellite operation high gain circular polarised (RHCP) antennas such as crossed Yagis, loop Yagis, or helix antennas are required. For S band (13 cm) operation dish antennas fed with small helix or circular polarised patch feeds are normal, although helix antennas are sometimes used. For L band (23 cm), helix or dish antennas are usually used.

Satellite tracking

To work stations through the HAMSATS, you need to know when the satellite will be above the horizon and where to point your antenna(s). Most satellite operators use one of the many satellite tracking programs available on the Internet. Programs include Instant Track, Wisp, Orbitron, Nova, Winorbit, Satscape and SatPC32. Current favourite is probably SatPC32 which offers rig control with automatic Doppler correction, rotator control, tracks multiple satellites, shows the ground track and satellite coverage footprint. If you have not installed tracking software, you can get a display of the next 10 passes for many amateur satellites by using the "Passes" tool on the AMSAT web site.

Three things are critical for accurate satellite tracking. Firstly the tracking program will need your QTH location, latitude and longitude. Some software can calculate your location from your Maidenhead grid square. Secondly the program will need up to date Kepler data, which can be downloaded from AMSAT, Celestrak or other web sites. The Kepler data describes the orbit of the satellites. Finally the clock on your PC needs to be accurate. A two-minute error on your PC clock could see your antenna pointing 36 degrees away from the true position of the satellite and of course the Doppler adjustment would also be way out. Utilities such as Dimension 4 can reset your PC clock very accurately. Kepler data should be updated at least monthly.

Glossary

—AOS—acquisition of signal. Time the satellite appears above the horizon.
—LOS—loss of signal. Time the satellite sets below the horizon.
—Uplink—the signal you send to the satellite.
—Downlink—the signal you receive from the satellite.
—Mode—frequency band of uplink and downlink (UV, VU, LS, VA).

- Pass—the time the satellite is above the horizon and can be used.
- Passband—frequency range of a transponder (FO-29 has a 100 kHz passband).
- Beacon—most satellites have a fixed CW or telemetry beacon transmitter, some have several.
- Transponder—A transponder is a wide band linear repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output.
- Repeater—a single frequency transponder, just like a standard FM repeater except it works cross band. All satellite repeaters and transponders are full duplex, meaning you can and should listen to your signal on the downlink while you are transmitting.
- Digipeater—a transponder which regenerates a digital signal and retransmits it on another frequency. As opposed to a repeater which does not regenerate the digital signal.
- Pilot tone—some FM sats need a tone, usually 67.0 Hz on your transmission to open the satellite receiver squelch. Most modern rigs can generate these DCS tones. AO-51 needs 67.0 Hz. SO-50 needs 74.4 Hz for a few seconds to turn on a 10 minute timer, then 67.0 Hz on each transmission.
- Inverted—The satellite receives on LSB and transmits on USB. Generally inverted transponders are also "reverse tracking".
- Reverse tracking—The downlink frequency increases as the uplink frequency decreases. Generally reverse tracking transponders are also "inverted".
- Kep data—Reference Kepler data downloaded as a text file
- Doppler—frequency shift caused by the speed of the satellite relative to your position.
- Analog satellite—satellite transponder for voice or cw, (or audio based digital transmissions like SSTV, Domino, PSK).
- Digital satellite—satellite transponder for digital modes often AX25 FSK, used for APRS, often carry bulletin boards, digipeaters or packet store and forward.
- ISS—International Space Station.
- ARISS—Amateur Radio aboard the International Space Station.
- perigee—satellite orbit closest point to Earth.
- apogee—satellite orbit farthest point from Earth.
- Footprint—area covered by a satellite's antennas. Higher satellites have bigger footprints.
- Spin modulation—fluttering or fading caused by the satellite spinning or tumbling.
- Attitude—angle of the satellite with respect to Earth.
- Squint—angle of satellite's antennas with respect to your location. (If the satellite's antennas point straight down they are not pointing directly at your QTH.)
- OSCAR—Orbital Satellite Carrying Amateur Radio.

Currently Operational Amateur Radio Satellites

The following satellites carry operational transponders as at August 20, 2006. For operating information see the frequency list and the AMSAT web site.

AO-7 AMSAT OSCAR 7

AO-7 was launched November 15, 1974, it is the oldest HAMSAT in orbit and is still operating after an amazing 32 years in space. AO-7's batteries are dead, but the satellite transponders will work, powered by the solar panels, while the satellite is in sunlight. Uplink power must be kept to an absolute minimum otherwise the current drain exceeds the power that can be supplied by the solar array and the satellite suffers from FM distortion on the downlink transmitter. As AO-7 resets each time it comes into sunlight, it can come up in either mode A, (VA) or mode B (UV) randomly each pass. There is also a timer which toggles the transponder mode. Recently AO-7 seems to be favouring mode B. Check out the AO-7 log and resource web site, and fill in the log even if you only heard the beacon or heard your own downlink.

AO-16 PacSat

AO-16 is a "semi-operational", VU and VS mode, 1200 bps AX25 digital satellite, with a packet digipeater for APRS. Callsign for broadcast is PACSAT-11. Packet BBS is non operational. AO-16 uplinks are made with a 2-Meter FM transmitter, while downlink reception requires a 70 cm SSB receiver. AO-16 accepts 1200 bps Manchester encoded FSK on any of its uplink frequencies. It transmits 1200 bps binary phase shift keying (BPSK). Current downlink is 437.051 MHz.

AO-27 EyeSat

AO-27 carries a VU mode FM voice repeater, but the transponder is only turned on while the satellite is over the northern hemisphere, so the satellite is of no interest to New Zealand hams.

FO-29 Fuji OSCAR or JAS-2

FO-29 is the most popular analog satellite used by ZL and VK hams. It has a 100kHz wide VU mode, linear transponder. Most QSOs are on SSB near the centre of the transponder, but SSTV and Domino modes have also been used successfully. The packet BBS and digitalker are no longer operational. FO-29 has a fairly weak beacon, on 435.795 MHz. The transponder is reverse tracking and inverting.

GU-32 Gurwin TechSat-1b

GU-32 carries a VU mode 9600 bps FSK digital Pacsat trans-

ponder for packet BBS and APRS use. The LU digital transponder is non operational. BBS call-sign is 4XTECH-12, Beacon call-sign is 4XTECH-11.

SO-50 SaudiSat-1c

SO-50 is an FM repeater in space. It has a mode V/U FM voice repeater with an uplink on 145.850 MHz and downlink on 436.795 MHz. SO-50 requires a user to send a short transmission with a CTCSS tone of 74.4 Hz to set a 10 minute timer. After that each transmission requires a pilot tone of 67.0 Hz to open the receiver squelch on the satellite. SO-50 can be tricky to wake up,

but when active is very sensitive. At high elevations it can be operated with a handheld dual band transceiver.

AO-51 Echo

AO-51 has the most transponders of any of the currently active satellites. It operates simultaneous digital and analog transponders usually in V/U mode. For a few days each month other modes such as AU, VS, LU or LS may be operating. The normal analog transponder is an FM mode V/U voice repeater, which requires a 67.0Hz pilot tone. The packet BBS and APRS broadcast transponder uses callsigns Broadcast: PECHO-

11 and BBS: PECHO-12. For an up to date schedule check the AMSAT web site.

VO-52 Hamsat

VO-52 has two mode UV linear transponders but only one is active at any given time. If the cw beacon on 145.860 MHz is active the Dutch made transponder is operational, if the unmodulated beacon on 145.936 MHz is active, the Indian transponder is operational. Both transponders have the same 60 kHz bandwidth and similar downlink power. VO-52 has a reverse tracking, inverting transponder.

ARISS Amateur Radio aboard International Space Station

ISS carries an FM 2 m mobile for use by the crew for educational and amateur radio use. Mode V/U uplink for Region 3 is 144.490 MHz and downlink for all modes is 145.800 MHz. Crew contacts are dependant on the spare time available to the space station crew. When the transceiver is not in use by the crew it is often setup as a 1200 bps AFSK digital transponder, with an uplink of 145.990 MHz and downlink of 145.800 MHz. ARISS is often used to relay APRS beacons and also carries a packet BBS. Recently the ARISS station has been transmitting SSTV pictures on a downlink frequency of 144.4900 MHz.

Amateur Satellite Frequency List

Frequency	Transponder Range	Satellite	Name	Mode	Service
144.490			ARISS	FM	Uplink
145.200			ARISS	FM	Uplink
145.800			ARISS	FM	Downlink
145.990			ARISS	FSK	Uplink
29.400	29.4000-29.5000	AO-7	AMSAT-OSCAR 7	SSB/CW	Downlink
29.502		AO-7	AMSAT-OSCAR 7	CW	Beacon
145.850	145.8500 - 145.9500	AO-7	AMSAT-OSCAR 7	SSB/CW	Uplink
145.975	145.9750 - 145.9250	AO-7	AMSAT-OSCAR 7	SSB/CW	Downlink
145.978		AO-7	AMSAT-OSCAR 7	CW	Beacon
432.125	432.1250 - 432.1750	AO-7	AMSAT-OSCAR 7	SSB/CW	Uplink
145.900		AO-16	AMSAT OSCAR 16	FSK	Uplink
145.920		AO-16	AMSAT OSCAR 16	FSK	Uplink
145.940		AO-16	AMSAT OSCAR 16	FSK	Uplink
145.960		AO-16	AMSAT OSCAR 16	FSK	Uplink
437.025		AO-16	AMSAT OSCAR 16	PSK	Downlink
437.125		LO-19	LUSAT-OSCAR 19	CW	Beacon
145.850		AO-27	AMRAD-OSCAR 27	FM	Uplink
436.795		AO-27	AMRAD-OSCAR 27	FM	Downlink
429.950		PO-28	POSAT-OSCAR 28	GMSK	Packet Downlink
146.000	146.0000 - 145.9000	FO-29	Fuji-OSCAR 29	SSB/CW	Voice Uplink
435.795		FO-29	Fuji-OSCAR 29	CW	Beacon
435.800	435.8000 - 435.9000	FO-29	Fuji-OSCAR 29	SSB/CW	Voice Downlink
145.850		GO-32	Gurwin-OSCAR 32	FSK	Uplink
145.890		GO-32	Gurwin-OSCAR 32	FSK	Uplink
435.225		GO-32	Gurwin-OSCAR 32	FSK	Downlink
145.850		SO-50	Saudi-OSCAR 50	FM	Uplink
436.795		SO-50	Saudi-OSCAR 50	FM	Downlink
28.140		AO-51	AMSAT-OSCAR 51	PSK	Uplink
145.860		AO-51	AMSAT-OSCAR 51	AX.25	Uplink
145.880		AO-51	AMSAT-OSCAR 51	FM	Uplink
145.920		AO-51	AMSAT-OSCAR 51	FM	Uplink
435.150		AO-51	AMSAT-OSCAR 51	AX.25	Downlink
435.300		AO-51	AMSAT-OSCAR 51	FM	Downlink
1,268.700		AO-51	AMSAT-OSCAR 51	AX.25	Uplink
1,268.700		AO-51	AMSAT-OSCAR 51	FM	Uplink
2,401.200		AO-51	AMSAT-OSCAR 51	AX.25	Downlink
2,401.200		AO-51	AMSAT-OSCAR 51	FM	Downlink
145.860		VO-52	VUSat-OSCAR 52	CW	Beacon
145.870	145.8700 - 145.9300	VO-52	VUSat-OSCAR 52	SSB/CW	Downlink
145.936		VO-52	VUSat-OSCAR 52	Carrier	Beacon
435.220	435.2200 - 435.2800	VO-52	VUSat-OSCAR 52	SSB/CW	Uplink
436.838		CO-55	CubeSat-OSCAR 55	CW	Beacon
437.470		CO-55	CubeSat-OSCAR 55	AFSK	Packet Downlink
437.385		CO-56	CubeSat-OSCAR 56	CW	Beacon
437.505		CO-56	CubeSat-OSCAR 56	GMSK	Packet Downlink
436.848		CO-57	CubeSat-OSCAR 57	CW	Beacon
437.490		CO-57	CubeSat-OSCAR 57	AFSK	Packet Downlink
437.345		CO-58	CubeSat-OSCAR 58	AFSK	Packet Downlink
437.465		CO-58	CubeSat-OSCAR 58	CW	Beacon

DXing is addictive

Probably the greatest lure in amateur radio is to contact someone else just a little further away. When you first start out into the world of DXing, DX may be 100 km but later you will work into every corner of the planet. With some it becomes an absolute obsession and they will go to any length to contact that country they haven't worked yet. For others, it is a pleasure to rag chew with an amateur in a foreign country, to learn more about that country and its culture. DXers often end up meeting other DXers when they travel and many lifelong friendships are made this way.

DXing is a competitive sport. You will find out the moment that you hear some rare DX that a thousand other hams heard that same station and are also calling at the same instant. The problem is that many of your competitors are outstanding operators with high power, excellent antenna systems and vast experience. Most of your competitors are average operators with average stations and antennas and they are easy to compete with. You just have to be a bit more cunning with your skills but eventually you can work up to competing with the top group. That rare DXpedition will usually work the big guns first and then you can easily make the contact at the end of their stay at the rare location.

Currently there are 335 DXCC "Entities" eligible for the ARRL DXCC award program. An entity can be as large as Australia or as small as St Peter and Paul Rocks out in the South Atlantic Ocean. There are rules that govern what constitutes an "Entity" and they may be found on the ARRL Website where you can find the rules for the various awards and download the application forms. *CQ Magazine* in the USA that runs the Worked All Zones awards program and sponsors major contests throughout the year has the rules on their website also. Usually you start off with trying to work the first one hundred countries or entities and that will be a milestone for you. It will teach you how to get involved with a pileup and how to be a bit cunning when you do. It will teach you that other DXers in other countries may not have the same sense of fair play as you do. The second 100 countries are a little more difficult to work. Achieving 300 countries is very difficult and will usually take many years. For a variety of reasons including sunspot cycles, rarity of the country

and how often its government will allow amateurs to operate there. The last 35 entities are extremely difficult and very few ZL amateurs have managed to do it. But the challenge is always there and it becomes a passion to achieve it.

Strategies for successful DXing

There are some proven strategies that work. Listen to the operator and find out where he is listening and if he is working split frequencies. Working "split" is not difficult, just different. It's a new skill for you to learn. Find out where the thousands of other operators are transmitting and avoid the pack. Position yourself just off the edge of the pack. Refine your timing so that you will be heard in a "gap" rather than in with the pack. Placement and timing is everything. Your signal should be slightly out of the pack so you will be noticed and your call should be slightly out of sync with the pack... just delayed a bit so that he will hear you start your call but not delayed long enough that you are calling on top of the guy the DX station has already decided to work and is answering. Successful experienced DXers are extremely skilful with their timing and consequently work the DX. You may not be heard on your first call; you're second or even after a few hours of calling. Be patient! Sometimes it's an exercise in pure frustration but persistence usually wins and it's an absolute joy when you snag that new country. Top level DXing is not easy but you will learn that amateur radio is more than inhabiting your local 2 metre repeater. You will also be rewarded with friendships around the world and an understanding of other cultures.

Is CW worth the effort?

It really is true that it's easier to work DX on CW than on Phone because there are fewer stations clamouring for the attention of a DX station on CW. CW will still be around for the foreseeable future in spite of recent changes in amateur licence regulations around the world.

Weak CW signals are more readable than weak Phone signals. Hone your CW skills. DX stations often run 20 wpm or more and while most of them are courteous and will come back to a station calling at 12 or 15 wpm, it's very satisfying to be able to work them at the speed they're calling CQ. Life is much easier with an

electronic keyer as it takes the work out of sending your call over and over. There is nothing worse than operating with a pair of uncomfortable, ill fitting, harsh sounding headphones. Invest in a good set of headphones to help you dig out the weak ones and avoid fatigue. A better idea is to buy a quality boom microphone headset with a good sounding microphone cartridge.

Work the contests

Contests can be intimidating, but your best chance for working new countries is often during the DX contests. Contest groups often will activate multi-multi stations in rare countries and they are easy to work. I recall working CN2R in Morocco on 80 m a few years ago. It was S9+ and begging for 80 m contacts and very easy to work. You don't have to work the entire contest, nor do you have to send in the logs for scoring. Figure out what information they're expecting you to exchange with them, either by listening to several contest QSOs or by reading the contest rules on www.contesting.com, then just jump in and start working stations.

What bands to operate

The seven popular amateur radio bands offer the DXer propagation to most parts of the world most of the time. When the sunspot count is low between the eleven year peaks, the higher bands like 10, 12, 15 and 17 m are poor and opportunities are limited. 20, 30 and 40 m present excellent DXing providing you have good antennas. DXing is more difficult on 80 and 160 m because the ambient noise levels are often intolerable in urban areas. When the propagation is right and the bands are open at sunrise and sunset, 80 and 160 m can be extremely rewarding with worldwide contacts. We are fortunate here in the Asia/Pacific region as many rare DXpeditions take place and are easy to work on the lower bands.

When the sunspots reach maximum every eleven years the higher bands are magic. 10, 12 and 15 m are often open 24 hours a day and it is relatively easy to work 100 countries during a weekend contest. Having a ZL call is a wonderful asset. ZLs are reasonably rare in other parts of the world and there are not that many ZL DXers to compete with. ZLs are often the first "real" DX station that Europeans work. ZL DXers are respected around the

world and we have some world class Kiwi DXers amongst us. It is not uncommon to call a CQ on 20 m and generate a pileup of Europeans or North Americans that may go on for hours.

Operating aids

The DXer has far more tools at his disposal than he had 30 or 40 years ago. Then, you heard a rumour, read monthly DX magazines or received a phone call from a trusted friend. You listened daily, you waited and finally you would hear that weak rare station and attempt to work him with primitive valve equipment. Today's modern DXers have computers with the Internet based newsgroups, real time packet clusters, propagation prediction programs and information not dreamt of by old timers in the game. Today one knows where and when the rare DX will operate. With a few mouse clicks the modern well equipped station will change the radio to that frequency and mode, track the amplifier to the right band, select the correct antenna system, turn the beam to the heading and set his call up in the logging program in a few seconds. Sounds easy! The reality is that you still have to use your skills to get your call in his electronic logbook. And it doesn't get any easier as thousands of other hams have the same technology. Below are some web links to programs and services that will help you work DX.

www.ac6v.com/—The definitive reference site for ham radio—Over 6000 links.

www.dxatlas.com/—DX Atlas—A great program for DXCC, WAZ, IOTA info plus brilliant Grayline and path headings.

www.dx4win.com/—Excellent logging program.

www.writelog.com/—Excellent contest logging program.

www.kc4elo.com/index.html—Free but very good logging program.

www.eqf-software.com/—Some great logging programs.

www.qsl.net/w6elprop/—Propagation prediction (and it's free!).

www.rchalmers.users.ch/—Packet Cluster program (and it's free!).

www.nzart.org.nz/nzart/Lists/dx.html—Subscribe to the NZ DX Newsgroup (it's free!) and you will be in touch with other keen DXers around New Zealand.

www.cq-amateur-radio.com/

awards.html—The *CQ Magazine* awards and contest website.

www.arrl.org/awards/dxcc/ The ARRL DXCC awards and contest website.

www.dxawards.com/book.html—The K1BV Awards directory listing for 3227 awards.

www.geocities.com/Athens/Parthenon/4205/xetbef.htm—Amazing website from Mexico with 20,000 links.

www.oh2aq.kolumbus.com/dxs/—Live DX cluster spots 24 hours a day.

www.ac6v.com/morseaids.htm—The definitive web page on Morse code—worth going to even if you don't understand it or use it!



A well-equipped DX/Contesting station.

(2) The stations with the 30m towers and stacked 5-el monobanders driven by very large amplifiers will often beat you in a pileup. These are the guys that work the rare DX first and they love doing it. After they have done it ... they go away and let the rest of us work the station. As long as you are aware of the big guns, it's not a problem because time will be kind to you.

(3) The stations that have the "best" sounding audio will always win in a pileup. It is human nature that the DX station will always take the path of least resistance and work the station he can understand and clearly hear the easiest. Best means clean, punchy and standing out from the rest. Commercial broadcast announcers are picked because of their mellow authoritative voices. Be aware of your own limitations and strive for the best audio you can generate. An authoritative voice helps!

(4) With CW—You will need an electronic keyer and clean keying set a bit below the pack's general speed. This is better than trying to impress the DX station that your electronic keyer can do 45 wpm with ease. He can't!—Well, actually some DX ops can but they are rare.

(5) At the end of the day everything helps, but don't get hung up on particular antennas or brands of radio equipment. They are only part of the picture. A good antenna is the second best investment you will ever make. The first is taking the time to learn the techniques and skills of how a rare DX station thinks and operates. A cunning operator will outwit a big antenna every time!

The process of QSLing

If a newcomer to DXing starts out by working DX stations during contests he will quickly learn that he will work key countries multiple times. I would make the bureau one of my first choices. The QSL Bureau Service here in New Zealand is excellent and it will save you postage costs. My best advice is to save your postage dollars and greenstamps for your rare station direct QSL requests. Confirming DXCC takes time anyway, and by the time one gets close to 100 different confirmed countries, several

months or years will pass. As one begins to find QSL cards in the mailbox, it is good to be prepared. There are several systems of filing, and the one that is probably the most common is to keep QSLs in order by DXCC entity. Shoeboxes help and they are inexpensive. There are some neat boxes sold by the big chain stores here in New Zealand to file photographs in and they are excellent for QSLs. Keeping QSLs in DXCC entity order is the first step in being able to find and sort cards for awards later down the line. Believe me, it is not an easy task to sort a couple of thousand QSLs from scratch. Be smart and start sorting at the very beginning.

Computer logging

Computer logging programs are almost essential for those who have a large number of QSOs. Over time they become one of the best tools around for keeping things in order. Don't start out with a cheap shareware logging program. A key factor in a logging program is to be able to display various award details in DXCC entity order as one has them worked or confirmed. The main prestige awards are DXCC, WAZ, DXCC Challenge, WAS, WAC, IOTA. There are thousands of others. When one wants to see how their goals are being met, they can look at their statistics right on the computer screen. Computer logging programs are a great time saver because most of them generate labels that will save hours and hours of handwriting. They can keep track of QSLs sent and received with just a click. A really good computer logging program will do all of the above and control your radio, send CW, display your local packet cluster DX spots and print the QSO information directly onto your QSL cards with no labels involved.

Awards and rewards

ARRL DXCC CQ 5 Band WAZ

ARRL 5 Band DXCC No 1 Honour Roll (All 335!) 5 Band Worked All States

There are over 3200 awards available to wallpaper your shack. Only a handful really measure how well you compete with other DXers around the rest of the world. They are the prestigious ARRL DXCC awards, the CQ DXCC and WAZ awards, the RSGB IOTA and Dxing awards and the European WAE (Worked all Europe) awards. In fact the list of awards that can be earned for working certain collections of DX stations is almost endless.

www.ac6v.com/ will give you a link to the universal awards page.

The picture shows Number 1

Honour Roll plaque for working all 335 DXCC entities. Only a few ZLs have managed to achieve this prestigious award. We have some world class

DXpeditions

If DXing is an obsession, then DXpeditioners comprise the lunatic fringe of the DX world. At any given time there are hundreds of amateurs operating from rare locations around the world. You can be assured that there are thousands of others actively planning a DXpedition somewhere and hundreds of thousands of "armchair DXpeditioners" who would love to go. Planning a major DXpedition is almost as complicated as a NASA mission. Large scale modern DXpeditions can chew through \$100,000 or more in no time so it isn't a project that any group of enthusiasts will take on lightly. New Zealand just happens to have ten or more of some of the rarest DXCC entities islands within its territory. ZL7—Chatham Island, ZL8—Raoul Island and ZL9—Campbell and Auckland Islands are usually in the top 25 most wanted entities. There have been major DXpeditions by New Zealanders to all these locations during the past ten years but the demand continues unabated. Opportunity abounds for ZLs to organize more trips to these desired locations. I can assure you there is nothing as sobering as a huge pileup of thousands of unruly Europeans on 20 metres calling you to make that elusive contact. It is frightening but is also the experience of a lifetime to participate as an operator on a DXpedition. The camaraderie and experience gained is incomparable. DXpeditions to ZL7 are easily organized and are tremendous fun and are to be recommended for gaining experience.

When you consider all these factors, it is no wonder that DXing is so popular. Even though we are only a couple of years past the fabulous conditions during the peak portion of sunspot cycle 23 there is always rare DX around to be worked. The next few years will not be as good for HF DX. On the other hand DXing on 80 and 40 metres will be easier. Have patience as sunspot cycle number 24 will peak in a few years from now and again provide fabulous world-wide propagation. I am trying to provide tips and information in this section to help you succeed in DXing, whether you are a newcomer to DX or a DXing veteran. If you would like to find out more about DXing, contact me at leejen@paradise.net.nz and I will be happy to put you in touch with DXers in your area. You can also subscribe to the NZDX News group by going to [www.nzart.org.nz/nzart/Lists/dx.html](http://nzart.org.nz/nzart/Lists/dx.html).

Electromagnetic compatibility (or EMC for short) may sound as if it is a new topic, but it has actually been around ever since electrical equipment was first developed. Electricity, electronics and radio each have numerous applications, but there needs to be recognition of compatibility between various systems. In the case of amateur radio, the possible impacts of operating a transmitter is the most obvious situation to consider for compatibility. EMC can be regarded as having two parts:

- EMI, electro-magnetic interference, where disturbance results from an emission
- EMS, electro-magnetic susceptibility, where exposure gives degraded performance

Should EMC problems arise then there is usually some sort of trade-off to consider by affected parties:

- Is the problem due to transmitter emission deficiency?
- Is the problem due to susceptibility (even with a "clean" emission)?
- What are the choices to solve the EMC problem?
- What are the costs of EMC treatment?

There should be very few, if any, circumstances where an amateur operator is forced to cease operation solely because of EMC difficulties. The end objective of clearing EMC problems should be to develop a practical result that is acceptable to all affected parties. There are advantages for amateur operators who are conversant with EMC causes and cures, as they can put their knowledge into practice should an EMC problem crop up with their station, or help others.

C-tick and compliance in New Zealand

Electrical products for sale in New Zealand are regulated by "C-tick" compliance. Appliances with a C-tick should meet standards for control of RF emissions (even for apparatus that has no intended emission). While the C-tick arrangement is generally good for minimising "RF fog", the compliance limits are mainly to protect broadcast service reception, which involves fairly solid wanted signal strengths, so compliance with C-tick may still be well above the noise floor of a sensitive amateur receiver with an antenna near the appliance in question. C-tick is silent on RF susceptibility.

EMC compliance in other countries

FCC Part 15 Class B covers emissions for apparatus intended to be used in residential situations, and is very similar in emission limits to C-tick. FCC Part 15 Class A caters for industrial apparatus and has higher emission limits than Class B. The European CE standard includes emission and susceptibility testing, so could be said to reflect a wider scope than C-tick.

Some basic physical factors for electric and magnetic fields

EMC is fundamentally to do with electric or magnetic energy interactions. It is generally desirable to keep one circuit sensibly isolated from another, but sometimes coupling may arise in unforeseen ways. Coupling could be by any or all of the basic mechanisms, namely:

- Conduction (by electron currents flowing in physical conductors)
- Induction (by way of electric or magnetic flux linkages)
- Radiation (by way of electromagnetic fields)

Radiation is of course an intended part of communication by radio, so the EMC challenge is to carry out amateur radio activities with minimal unwanted interaction with other equipment or services.

In the vicinity of a transmitting antenna there are magnetic and electric energy fields that are a complex combination of reactive (stored) and radiated (outgoing) components. The specific reactive and radiated components depend on the type of antenna. The strength of the near field falls away quite rapidly with increasing separation from an antenna (that is transmitting). Increasing the separation distance is always a winner for reducing EMC problems. Even with EMC problems inside the shack, like one piece of equipment affecting another, it is often surprising that even a modest separation can achieve a significant reduction in the original problem.

When it comes to suppressing unwanted signals, it is usually best to work on finding the root cause and trying to stop the unwanted signal from travelling away from the source. While prevention is better than cure, if the unwanted signal can not be prevented from developing then the next strategy is to minimise the ways in which it may spread.

EMC countermeasures include the following techniques:

- Shielding (solid metal, even

double screening)

- Bypassing (usually a suitable capacitor)
- Filtering (suitable series and shunt components)
- Suppression (usually within the equipment itself)

Note that many types of plastic equipment cases are transparent to RF and have useless shielding properties.

Low pass and band pass filters

Filters are one of the basic electronic building blocks that can make the difference between communications being satisfactory or unsatisfactory. There are many types of filter, designed for many applications and for many source or load impedances. Refer to a radio handbook for details on filters. Proper use of filters is central to solving many types of EMC problem.

A low pass filter in the antenna feeder can be a useful accessory for an amateur HF station. Using a low pass filter between a transceiver and the antenna can give a certain confidence to operating, as it generally results in "overkill" of possible harmonics or other unwanted emissions that happen to fall within television channels used in a given area. Without the low pass filter, some unwanted signals may make it to the antenna and thence have a good chance of spreading to local television receivers.

Be wary of the specifications of cutoff frequency for low pass filters made for HF operation. Some types of low pass filter are designed for protecting television broadcast bands used in other countries. In Europe and the USA the lowest band edge for television is 54 MHz. However, in New Zealand, television Channel 1 has a lower band edge of 44 MHz. For New Zealand television Channel 2 the lower band edge is 54 MHz. For amateur HF operation, the low pass filter should pass all of the 10m band, but then start cutting off at higher frequencies, and have high insertion loss at the lowest television channel in your area. It so happens that some USA manufactured low pass filters are designed to include control of unwanted signals that fall in the USA television receiver IF (in the mid 40 MHz range), and these types specify high attenuation above 41 MHz, so are obviously an appropriate type of low pass filter to use anywhere in New Zealand.

Band pass filters can be useful for some amateur situations, such as for reducing strong non-ama-

teur signals from getting into and overloading amateur receiver front ends. Field days or contests with multi-transmitter multi-band operation are examples where extra RF filtering is very useful.

Antenna considerations

Antennas are really the key to achieving overall effective performance of an amateur station. For nearly all types of antenna, the radiation efficiency and general effectiveness improve with antenna height above ground-level. The following factors can apply to high antennas:

- DX performance is usually better, on any band
- For receiving, gives some separation from local sources of QRM
- For transmitting, gives less exposure to ground level equipment or people
- Can run lower transmitter power and still sustain communications.

Ground-mounted vertical antennas have a reputation for having near fields that are "hotter" than those for other types of antennas. In a suburban situation, ground-mounted verticals tend to have strong radiation directly into nearby houses. By the reverse of what can happen on transmit, on receive these ground-mounted verticals can easily receive neighbourhood QRM. While verticals can be effective for communication on the lower bands, they are unfortunately also potential candidates for EMC problems in built-up areas.

Horizontal centre-fed dipole antennas are inherently much more balanced in operation than ground mounted verticals. Dipoles have surrounding flux patterns that are similar in shape each side of the centre feedpoint. The actual balance of the near field of a dipole depends on the angle from which the dipole is "viewed". A dipole viewed "side-on" presents good balance but viewed "end-on" the near side of the dipole predominates over the far side. On transmit there are unavoidable high voltages (and high field strengths) around the dipole ends. This is also the case for any antenna with an "open end".

Loop antennas are inherently one of the most balanced of all antennas. Much of the near field flux is contained within the loop. A loop antenna has a more confined near field pattern than is the case with dipoles. Loop antennas are widely reported as being quieter on receive than other types of antennas, yet are still effective

for transmitting. This is basically due to the reduction in near field size and consequently reduced impact of neighbourhood QRM. Loop antennas tend to be the better performers in the tougher EMC circumstances. A one wavelength loop can also work on near multiples of wavelengths, and with a tuning unit it can be useful on most bands. A smaller sized frame loop antenna can be useful for reception, when sited in a low noise location and with orientation to make use of the nulls broadside to the frame.

Antennas can develop corrosion in connections, or fatigue breaks in some strands of a multistrand wire. A bad connection or intermittent touching in a fatigued wire not only impairs performance on receive, but can cause arcing when transmitting. Arcing generally results in broad band interference and is obviously an undesirable situation. Even the best filtered transmitter in the country can cause EMC problems if there are bad connections in the antenna. Well-constructed and well-maintained antennas generally give least EMC problems. As always, antennas should be mounted "in the clear" for best communication results and least invitation for EMC problems where RF power couples into surrounding structures.

Transmitting antennas and feeders should be kept away from television antennas or downleads as otherwise it invites large levels of amateur band signals arriving at the television receiver front end.

Desirability of using a balun with a balanced type of antenna

Even if a balanced type of antenna is selected for use, the actual balance of the overall antenna system depends on how the feeder is connected. If the feeder is coaxial cable then using a balun (balanced to unbalanced transformer) at the antenna feed-point is one way of minimising RF current from flowing back down the outer of the coaxial cable rather than into the antenna proper. As well, a balun can minimise noise from travelling up the outer of the coaxial cable and making reception seem worse than it would be without the unwanted noise. Another technique for reducing the effect of the coaxial cable braid is to use an RF choke, typically by having a string of good-fitting ferrite toroids over the feeder. For making your own balun or choke, refer to an appropriate handbook.

Active antennas

An active antenna can be useful as a receiving antenna, especially where there is some localised interference. Active antennas are usually physically small and smaller size

is associated with a smaller near field. While a transmitting antenna usually has "full size" dimensions for radiation efficiency reasons, when used for receiving the larger size may be worse for pickup of local interference. The main criteria for an effective active receiving antenna is that the delivered result has atmospheric noise (QRN) dominating over electronic noise (noise from the active antenna devices). It is possible for a one metre whip and a JFET input pre-amplifier to be an effective active antenna over the MF and HF bands. Siting the active antenna away from houses and power lines can often deliver a better signal to noise ratio of a wanted radio signal than for reception using a "transmitting" antenna.

An active whip can be broadband. Frame loops can also be used as active antennas, but usually need to be tuned for best results. A fairly long feeder is possible as the head-end can incorporate enough active gain to compensate for some line loss. A multiwire cable is needed if power supply, tuning voltages and band switching control all need to be fed from the shack. If the power supply is mains powered, it needs to be carefully designed to resist breakthrough of mains-born noise. Obviously the active antenna electronics need to be designed for good linearity (low intermodulation) and survival from exposure to high signals (on-site transmission from another antenna). Great operational care should be taken to not inadvertently transmit into an active antenna, as such an experience usually renders it quite inactive until repaired. Transceivers with externally looped receiver input are ideal for selecting other receiving antennas, and not exposing any to risk of a possible direct connection to a transmitter.

Commercially manufactured transceivers

These days there are a great many commercially manufactured transceivers used by amateur radio operators. While it is a shame that home construction is less popular than in yesteryear, it should not be overlooked that the commercial "appliances" bring with them a reasonably high standard of performance in terms of suppression of harmonics and other types of unwanted emissions. Nearly all commercial transceivers include a good modulating stage, good signal filtering and a reasonably designed power output stage. In some countries there are regulatory requirements for limiting unwanted emissions, so commercial transceivers need to be designed for sufficient suppression of unwanted emissions if they are to qualify for marketing in those countries. The

general result is that "big name" manufacturers tend to have good pedigree for EMC, as they seek international sales potential for their products.

Power supply considerations

The humble power supply should not be overlooked as a possible EMC situation. For example, on-site hum modulation can occur when RF gets into mains rectifier diodes. The resulting hum modulated signal then escapes by the reverse path of how it entered the power supply. Regulated power supply action may malfunction should RF be conducted into the circuit via AC or DC power leads. General treatment for HF EMC problems is to use 0.01 μ F disc ceramic capacitors to "bypass" all leads and semiconductors, but of course they should be checked for not slowing down the response of electronic voltage regulators being able to follow variations in current drawn from the supply. VHF EMC problems should be treated with lower value "bypass" capacitors, or even metal shields. Do not skimp on safety ratings with capacitors used on mains leads (if a capacitor is not marked as being 230V AC mains rated, then do not use it on mains wiring). Winding AC or DC leads on ferrite toroids can also be effective at reducing RF getting into a power supply or into equipment connected to the power supply.

Hum loops can be a problem when several separate pieces of equipment are connected up, as the grounded conductors in connecting leads provide a web of paths in which earth return current is able to flow. Power supply currents sharing conductors with low level audio signals is a recipe for coupling unwanted hum and noise to the audio feed. A very effective way of controlling power supply hum loops is by using split bobbin power transformers and two wire mains leads. A split bobbin transformer with a double insulated rating is legally able to be used with no earth wire, thus a potential hum loop via the mains earth is entirely avoided (for safety reasons this is not a technique to try with other than the proper rated split bobbin type of transformer).

An isolation transformer in series with an existing power cord can be used with equipment that does not have a split bobbin transformer in its power supply. Isolation transformers have highest isolation at lower frequencies, and are limited by primary to secondary coupling capacitance in restraining higher frequencies from "jumping" the windings.

Switch mode power supplies

may give high efficiencies and small package size, but there are inevitably "hash problems" for lower bands and harmonics of the switching rate to spot frequencies in several bands. One innovation in a commercial switch mode power supply is to have a front panel "tuning knob" so the switching rate can be optimised for minimal interference falling on a given working frequency (and needs readjusting as appropriate). Having a tuning knob does nothing to reduce the generation of hash or harmonics but arranges for them to be steered to least harmful spots on the dial.

Limitations of inductors

High frequency inductors are sometimes rated by the manufacturer for operation over a specified frequency range. This is a realistic reflection that unavoidable inter-winding capacitance results in self-resonance at some relatively high frequency, and also for losses in core or coil former material. For frequencies above self-resonance the "inductor" appears to behave more like a capacitor, and explains why some filters may not deliver the expected results at higher frequencies. What is intended on a circuit diagram and what happens to an installed inductor may not achieve the intended result. Inductors need to be carefully selected if wideband performance is sought.

Limitations of capacitors

Capacitors also become self-resonant at some high frequency, when resonance occurs with unavoidable inductance of the leads and body. All lengths of conductor have some inductance, so it is impossible to build a perfect capacitor that would work at any frequency. However, capacitors are generally useful over a much wider frequency range than is the case for inductors. Disc ceramic capacitors are generally the best all round performers for HF and VHF work. The rated upper frequency range of mains bypass capacitors is sometimes no more than a few megahertz. Polystyrene or polypropylene capacitors are generally the lowest loss type of capacitor in the audio and lower frequency bands.

Ferrite and powdered iron components

There are many types of ferrite and powdered iron cores, and care is needed to end up with an appropriate type for a given application. There is quite a difference between selecting a core for a low loss RF transformer and using a core to attenuate unwanted RF signals. Transformer cores working at signal frequencies generally require selection of a given type of core material that has low loss in the fre-

quency bands of interest, especially where RF power is involved. With tuned transformers, high Q mode of operation is possible. However, for EMC applications ferrite material is generally selected as being well above the frequency range that it would be used as a transformer core, as low Q absorptive mode of operation usually gives best EMC performance. A low Q choke is like having an inductively coupled series resistor in the circuit.

Split-core ferrites can easily be fitted over existing wiring, and can effectively add a series impedance to higher frequency signals in the wiring. Split-core ferrites are widely used commercially, for the likes of reducing radiated noise from computer cables (especially in the VHF television bands). The split core (when fitted properly over a wire or cable) is equivalent to a one turn inductor with a toroid core, so not unexpectedly has fairly low impedance at lower frequencies, so does little to reduce conducted noise that happens to fall in the 160 or 80 metre amateur bands. Several turns on a high permeability core are needed for there to be useful attenuation in the MF and lower HF bands.

While ferrite material usually has a much higher permeability than powdered iron, it generally does not have the good power and linearity ratings that are available with powdered iron. Powdered iron is a core material widely used for inductors in transmitter output filters, and most of these are in toroid (ring) form. Toroid cores are ideal for keeping most of the magnetic flux within a closed path (around the toroid) which not only leads to fewer turns for a required value of inductance (thus higher Q) but also minimises the flux that possibly links with other circuits. Flux leakage can lead to EMC problems.

Powdered iron cores are colour-coded as to recommended frequency bands, and care should be taken to select the right material and core size (power rating) to do the intended job. Any core that runs into saturation can worsen rather than improve the signal quality being applied to what is hoped

to be a filter (saturating cores are similar in effect to peak clipping in amplifiers, so core saturation is obviously a situation to be entirely avoided in a filter circuit).

Telephones

Telephones are not intended to be used for RF modulation monitoring, but unfortunately too many of the newer types of electronic telephone have poor rejection of RF. Telecom rental telephones (identifiable by a Rintel type number) were developed with RF immunity as one of the performance considerations, however stocks are running out and not being replaced. It is difficult to offer useful EMC advice on selections of telephones for private ownership, as there are so many types of telephones in use, with new ones appearing, and marketing for low cost likely cuts corners in the specific area of RF immunity.

Controlling RF pickup in audio amplifiers

The input stages of audio amplifiers can act as crystal sets and detect RF that happens to arrive with good level at the input device. The detected parts of the RF envelope that are in the audio range can thus be amplified by subsequent audio stages. A useful way of reducing RF arriving at the first audio stage is to use a series resistor followed by a parallel capacitor to equipment chassis (local earth). A resistor of a few hundred ohms (but could be as much as 10 per cent of the amplifier input resistance) and a capacitor of a few hundred picofarads (but with a reactance that does not significantly reduce the level of the highest audio frequencies) can be very effective at controlling RF breakthrough. A suitable value series resistor is considered to be a more consistent performer than an RF choke (RFC). This is because the resistor retains its effectiveness over a very wide bandwidth, whereas the RFC may offer too little reactance to be effective at lower frequencies and become self-resonant below the

desired upper frequency limit of operation.

Speaker leads also act as unintended aerials. RF pickup in the amplifier can be reduced by winding the speaker leads on a ferrite rod or ferrite toroid (this of course uses up some of the length of the speaker lead).

Computers and amateur radio

Many amateur operators use a computer in the shack. The computer motherboard involves a myriad of high speed digital signals for clocking and data processing, so there is usually very high potential for interference to be experienced by a nearby radio receiver. The power cord, keyboard cable, printer cable, mouse cable, monitor cable and COM port cables are also possible ways that "computer hash" can escape. The computer monitor (CRT screen) necessarily has magnetic deflection fields that do not stop at the outside of the monitor enclosure, and high bandwidth video drive signals may also be noticed on nearby radio receivers. Nearly all computers and monitors use switchmode power supplies, which can also be "hash generators" from a radio perspective.

Before considering purchase, look for FCC or CE markings, or otherwise confirm compliance with known EMC standards. Taming interference within a computer would be beyond the scope of any warranty offered on a computer, and also be a difficult challenge. Having a portable radio with frequency coverage on bands of interest is one way of evaluating relative interference in a shop situation. Listening out on AM is much more informative than receiving on FM mode, and having an analogue S meter is useful for comparing levels. Some computers are quite acceptable for running in the shack alongside radio equipment. However, a "bad" computer can be an irritation to amateur radio operation.

Some switched mode power supplies have little or no inter-

nal RF filtering and these can be quite bad for causing local interference. Fitting an external mains filter is generally not as effective as having the filtering components inside the computer case. One way of improving such a situation, but without getting down to soldering iron level, is to change the power supply module for one that is known to include RF filtering. Many types of power supply can be directly interchanged, as there is a common standard for plugs and voltages. The main things to look out for is whether the power supply is AT or ATX, and whether the power rating is sufficient.

Split core ferrites are widely used for controlling unwanted signals on cables attached to a computer, however the suppression achieved is higher in the VHF broadcast bands rather than the MF or HF amateur bands. Several turns on a high permeability core is needed for best suppression at HF.

For radio data modes such as RTTY, packet, Amtor or Pactor, it is easy to for "buzzing noise" to get into microphone circuits unless audio isolation transformers are used (no conductive path between input and output, like a "braid-breaker"). Telephone style isolation transformers are ideal for using in a radio interface unit, as they have relatively high voltage isolation specifications. PTT control can be implemented with a suitable opto-isolator. Having a means of adjusting audio level is also handy, as computers can generate volts of audio drive and microphone inputs can easily be overloaded.

A lap top PC can have a very low level of overall radio noise. LCD displays are lower energy than cathode ray tubes, and lap top PCs generally have compact and well-shielded modular construction. In some cases an external switch mode power supply can be the worst interference generator in a laptop PC setup. An external power supply can be replaced by a low noise linear regulated power supply with the same DC output.

NZART



working for you—publications, videos, information



MISSION STATEMENT

To be the preferred provider of emergency communications to New Zealand Emergency Services.

The AREC was formed in 1932 following a devastating earthquake in Napier. Today, the AREC consists of 74 Sections throughout New Zealand, each with its own Section Leader who is responsible for the training and conduct of the Section. Each Section is attached to a Branch or Branches of NZART, from where members are drawn.

Management of the AREC is vested in a National Director who is appointed by NZART Council. The National Director likewise appoints a Deputy, Secretary, Training Officer and Managers for the four districts. These eight people form the AREC Management Group.

The current objectives are:

- ★ To train and provide communications personnel, skilled in assisting organizations during emergencies.

- ★ Maintain a close liaison with the New Zealand Police for Search and Rescue.
- ★ Maintain a close liaison with Civil Defence.
- ★ Maintain a liaison with community organizations.
- ★ Provide and maintain equipment appropriate for emergency operations.

National Director AREC controls the issue of AREC Station Identifiers, formally known as "E" call-signs. AREC Sections are listed in this publication, in identifier order, along with their Section Leaders and Deputies. The Section Identifier, in its basic two letter form, is issued to the Sections' Leaders for their use only. AREC Station Identifiers for Section use are then issued by the Section Leader for that operation/exercise,

with the following being normally reserved:

- "A" = Section Base Station
"X" = Established Relay Stations
"Z" = District Control Stations

AREC operators engaged in SAR activities and operating on SAR frequencies are to use the call-sign allocated for that operation/exercise. This call-sign is to reflect the geographical location (nearest town) of the search area. Civil Defence's radio call-signs are controlled by the CD organization.

7100 kHz
2 m and 70 cm repeaters

The general calling frequencies for AREC stations requiring assistance in emergencies are, 3900 kHz USB or local repeaters and these frequencies are normally monitored by AREC personnel during events such as storms, earthquakes and other significant events that could give rise to emergencies.

AREC Sections' Net

A monthly net is held on 3900 kHz USB at 1930 hours NZST or at 2030 hours NZDT on the third Monday of each month except December. This net uses the AREC Identifier of ZK6E, the AREC master station and is conducted as a contact net for those Sections wishing to seek information or report activities of an AREC nature.

Be prepared for an emergency—What to do—Some suggestions

As an Amateur Radio Operator, who may become involved with an emergency of some kind and having access to assistance via radio could provide timely intervention to those in distress. Preparations for such an eventuality would be good planning and the following suggestions are offered.

1. Be familiar with your local repeater services and frequencies, with a knowledge of the service area.

2. In the event of an SAR requirement, contact your nearest Police station, they will activate their system.

3. For Civil Defence requirements, contact either your Regional or District Councils.

4. Be familiar with your AREC representatives or Club officials, keep a list in the house and car.

5. Use the AREC call frequencies or break-in on any net and identify yourself and the emergency at hand.

When making a call for assistance, by radio, ensure that all the vital details concerning the emergency are passed to the station that is contact the emergency services, this will enable a more appropriate response.

Police, Fire, Ambulance check list**Type of incident**

Road accident—type and number of vehicles involved.

—Number and extent of injured or trapped persons.

Type of medical emergency—heart attack, electrocution, etc.

What is on fire—car, building, stove, etc.

Kind of accident—car/truck, car/person, motorcyclist etc.

Hazardous chemicals involved—gases, liquids, fuel, etc.

Location of accident

Street or road name and number, rural number, highway number.

Cross street or road reference.

Suburb and city or town.

Any other geographical detail to clarify location.

Other information

Vehicle registration number—burglar, hit and run, etc.

Description of people—clothing, height, race.

Direction of travel.

(If you are making a telephone call to the emergency services, make sure the above information is gained from the person on the radio before making the 111 call.)

Marine distress call

Intercepting a "MAYDAY" call, briefly listen to see if any other station is responding, then endeavour to contact the distressed vessel on the frequency and mode they are using. Do not get them to change frequency. Ask for details of the distress and write down the details given.

Essential information**Where**

Position, latitude and longitude, GPS information, any bearing and distance from geographical feature or place.

What

What is the nature of the distress?

What help is required?
What battery life or restrictions are on radio use?

What lifesaving equipment is on the vessel?

Has an EPIRB been activated?
What is the weather at the distress position?

Who

Description of distressed vessel, name, registration and size.

How many people in distress and their ages.

Colour of vessel and distinguishing marks.

Also record the time and frequency of the distress call. If practical get another person to telephone in the information and stay on the frequency to gather other essential information. Tell the operator what assistance you are giving to help them.

Desirable information**Voyage details**

Departed time, date, destination.
Last known exact fix, if position unsure.

Medical details

Any specific medical needs or conditions?

Extent of injuries.

Safety equipment

Food and water available.

Other types of radio equipment, VHF, HF.

Flares and types available.

The station called Mayday, in fact, might not hear you calling because of propagation or other factors, but continue to listen, they could transmit their position details blindly. Regardless, report the distress call to the coast guard or Taupo Marine Radio stating the time and frequency, when first heard and any other details of the signal, background noises or how genuine it sounds.

Earthquake

In the event of a moderate or greater earthquake felt in your location, your assistance, through AREC, could be valuable to Civil Defence. Switch to your local VHF repeater and monitor for activity about the event. An AREC station may be requesting reports from stations on what has occurred in their locality. AREC will be gathering this information to put together a "Felt Report" (refer to Earthquake Reporting). This information is then relayed to Civil Defence to help them assess the extent of damage that may have resulted.

Apart from estimating the intensity of the earthquake, any information about the state of the utility services and any other significant details known about your surroundings will be useful.

EARTHQUAKE REPORTING

THE MODIFIED MERCALLI SCALE OF INTENSITY OF EARTHQUAKES

Introduction

The severity of an earthquake can be expressed in two terms, namely intensity and magnitude. These two terms are different and are often confused.

Intensity is based on the effects of ground shaking on people, buildings, contents and natural surroundings and varies from place to place within the disturbed region. This observed effect depends on the location of the observer with respect to the earthquake epicentre (location within the earth's crust where the movement occurred).

Magnitude is related to the amount of seismic energy released at the hypocentre (point on the earth's surface directly above the earth movement). This measurement is made by and recorded on instruments (Seismograph) that have a common calibration, thus magnitude is determined instrumentally and uses the Richter Scale to indicate the magnitude. The Richter Scale bears little resemblance to how people perceive the intensity of an earthquake, thus the "Modified Mercalli Scale of Intensity" is measurable by people.

This scale is based on certain key responses being felt or observed by people who can then grade the intensity using this scale, and communicate this to others. When reporting an earthquake you should use this scale to convey the effects that had been felt in your location. When a number of reports are collected from an area and assembled in one place, a summary of this information then becomes known as a Felt Report (indicating the extent of the area it was felt over and what intensities were experienced).

Modified Mercalli Scale of Intensity

MM1

Not felt by humans, except in especially favourable circumstances, but birds and animals may be disturbed. Reported mainly from upper floors of buildings more than 10 storeys high. Tree branches, chandeliers, doors and other suspended systems of long natural period may be seen to move slowly. Water in ponds, lakes, reservoirs etc may be set into seiche oscillation.

MM2

Felt by people at rest indoors, especially by those on upper floors or otherwise favourably placed. The long period effects listed in MM1 may be more noticeable.

MM3

Felt indoors, but not immedi-

ately identified as an earthquake by most. Vibrations may be likened to the passing of a truck. It may be possible to estimate the duration, but not the direction. Hanging objects may swing slightly.

MM4

Generally noticed indoors, but rarely outdoors. Light sleepers may be awakened. Vibrations may be likened to passing heavy traffic, or to the jolt of a heavy object falling or striking the building. Walls and frame of building are heard to creak. Doors and windows rattle, liquids in open vessels may be slightly disturbed. Standing motor cars may rock, and the shock can be felt by their occupants.

MM5

Generally felt outside, and by most indoors. Most sleepers awakened. A few people frightened. Direction and motion can be estimated. Small unstable objects may be displaced or upset. Some glasses and crockery may be broken. Some large windows cracked/damaged. Hanging pictures move. Doors and shutters may swing. Pendulum clocks are affected.

MM6

Felt by all. People and animals alarmed. Many run outside. Difficulty experienced in walking steadily. Slight damage to masonry "D". Some plaster cracks or falls. Isolated cases of chimney damage. Windows, glassware and crockery broken. Object fall from shelves, pictures from walls. Heavy furniture moved. Unstable furniture overturned. Small church and school bells ring. Trees and bushes shake, or are heard to rustle. Loose material may be dislodged from existing slips, talus slopes or shingle slides.

MM7

General alarm of people and animals. Difficulty experienced in standing. Noticed by drivers of motorcars. Trees and bushes strongly shaken. Large bells ring. Masonry "D" cracked and damaged. A few instances of damage to masonry "C". Loose brick and tiles dislodged. Unbraced parapets and architectural ornaments may fall. Stone walls cracked, weak chimneys broken, usually at the roof line. Domestic water tanks burst. Waves seen on ponds and lakes. Water made turbid by stirred up mud. Small slips, caving in of sand and gravel banks.

MM8

Alarm may approach panic. Steering of motorcars affected. Masonry "C" damaged with partial collapse. Masonry "B" damaged in some cases. Chimneys, factory

stacks, monuments, towers and elevated tanks twisted or collapsed. Panel walls thrown out of frame structure. Some brick veneers damaged. Decayed wooden piles broken. Frame houses not secured to foundations may move. Cracks appear on steep slopes and in wet ground. Landslips in roadside cuttings and unsupported excavations. Some tree branches may be broken off. Changes in the flow or temperature of springs and wells may occur. Small earthquake fountains (fissures).

MM9

General panic. Masonry "D" destroyed, masonry "C" heavily damaged, sometimes collapsing completely, masonry "B" seriously damaged. Frame structures raked and distorted. Damage to foundations generally. Frame houses not secured to foundations shifted off. Brick veneers fall and expose frames. Cracking of ground conspicuous. Minor damage to paths and roadways. Sand and mud ejected in elevated areas, with the formation of fissures and sand craters. Underground pipes broken. Serious damage to reservoirs.

MM10

Widespread panic. Most masonry structures destroyed, together with their foundations. Some well-built buildings and bridges damaged. Dams, dykes and embankments seriously damaged. Railway lines slightly bent. Concrete and asphalt roads and pavements badly cracked or thrown into waves. Large landslides on river banks and steep coasts. Sand and mud on beaches and flat land moved horizontally. Large and spectacular sand and mud fissures. Water from rivers, lakes and canals thrown up on banks.

MM11

Wooden frame structures destroyed. Great damage to railway lines and underground pipes.

MM12

Damage virtually total. Practically all works of construction destroyed or greatly damaged. Large rock masses displaced. Line of sight and level distorted. Visual wave motion of the ground surface reported. Objects thrown upward into the air.

Masonry categories

"A"

Structures designed to resist lateral forces of about 0.1g that satisfy the New Zealand building code 1955. Typically, well reinforced ferro-concrete. All mortar is in good condition and the design and workmanship is good. Few

buildings erected prior to 1955 can be regarded as category A.

"B"

Reinforced buildings of good workmanship and with sound mortar, but not designed in detail to resist lateral forces.

"C"

Buildings of ordinary workmanship, with mortar of average quality. No extreme weakness, but neither designed nor reinforced to resist later forces.

"D"

Buildings of low standards of workmanship, poor mortar or constructed of weak materials like mud brick and rammed earth. Weak horizontally.

The R-S-T System

Readability

- 1—Unreadable.
- 2—Barely readable, some words distinguishable.
- 3—Readable with considerable difficulty.
- 4—Readable with practically no difficulty.
- 5—Perfectly readable.

Signal Strength

- 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.

Tone

- 1—Harsh, broad hiss, no perceptible tone.
- 2—Harsh, broad hiss, just perceptible tone.
- 3—Harsh, broad non-sinusoidal tone.
- 4—Harsh, broad tone, badly hum-modulated.
- 5—Poor sinewave, badly hum-modulated.
- 6—Good sinewave, pronounced hum modulation.
- 7—Good sinewave, definite hum modulation.
- 8—Excellent sinewave, just perceptible hum modulation.
- 9—Perfect sinewave.

The "tone" scale is used for reporting the amount of hum on a CW signal. If the signal has chirp, the letter "C" can be appended. If the signal has key-clicks, the letter "K" can be appended. Most of the signals you hear will be T9.



Digital Modes are a facet of the hobby of great interest to some Amateurs, but remain an unexplored and misunderstood world to others, who perhaps expect it to be difficult and expensive to get involved, requiring extensive computer skills, and lacking in interesting live contacts with other Amateurs. This is however not true at all. Use of Digital Modes, particularly HF Digital Modes, for real-time contacts, has grown tremendously. Some of the modes developed in the last 10 years or so are now extremely popular for working DX, while other modes have advantages when working locals when conditions are poor—no need to suffer those static crashes.

VHF and UHF operation is still mostly limited to packet operation, and although bulletin board and message forwarding by radio is now largely replaced with high-speed internet, microwave networking, APRS and similar “tools” have a following. There is also some interest in VHF SSTV, PSK-31, Hellschreiber, specialized Meteor Scatter, Aurora and moon-bounce modes, which offer considerable promise. Influenced by the internet, VHF packet activity has dropped markedly in recent years, but the HF digital “chat” modes are more popular than ever.

Digital modes make use of some type of keying or modulation to send data as “0”s and “1”s. For example, RTTY uses Frequency Shift Keying (FSK), sending “0”s on one frequency, and “1”s on another, with the elements arranged as five sequential data bits per character along with others for synchronizing the receiver. Morse and Hellschreiber send dots as carrier, and gaps between dots as no carrier. PSK31 sends “0”s and “1”s by switching the carrier phase, which you can imagine is the same as interchanging the leads to the antenna at the data rate. Many of the recent modes use multiple frequencies to send more data on each element, using techniques known as Multi-Frequency Shift Keying (MFSK) and Orthogonal Frequency Division Multiplex (OFDM).

Most digital modes use a coding system, which means that the letters and numbers (or even voice sounds or picture colours) are represented by numbers, which are transmitted as “0”s and “1”s. This improves the efficiency, but reduces the resistance to errors. RTTY (which uses the CCITT International Alphabet ITA2), PSK-31 (which uses the G3PLX Varicode), Pactor (which uses ASCII, also known as ITA5) and digital voice (for example DRM, which

uses a compression algorithm) are examples of coded modes. FAX, SSTV, and Hellschreiber are examples of uncoded modes.

Many of the newer modes use an error correction system to ensure that the data arrives intact despite problems in the propagation path. This error correction takes one of two forms: Automatic ReQuest repeat (ARQ) or Forward Error Correction (FEC). These techniques have different merits, so some modes use a combination of FEC and ARQ.

ARQ requires a two-directional link, where each “packet” or block of data received is checked for errors and a request for repeat transmitted back if necessary. These modes are characterised by alternate transmissions from each end of the link; they are not suited to broadcast or net operation, and can be difficult to monitor, because you have no opportunity to receive corrections, and may get multiple transmissions when one of the linked stations has data to repeat. Pactor, WINMAIL, Digital SSTV and VHF Packet use ARQ techniques. Provided conditions are good enough for the link to operate, the data transmitted via ARQ will always be perfectly received—eventually. When conditions are poor, throughput drops off dramatically.

There are several types of FEC, using a simple systematic repetition, complex mathematical algorithms or massive redundancy. FEC has the advantage that the information required to reconstruct the data accurately is transmitted along with the data, so is available to all receivers, while the data rate is constant, and no repeats are required. This is better for net operation. Some FEC types are extremely robust, but no FEC system can alone provide guaranteed perfect copy. Another disadvantage of FEC is that there is some coding delay at the transmitter, and decoding delay at the receiver; as a result, there can be unacceptable delays before print appears at the receiver.

Uncoded modes do not need or use error correction, as they are generally robust by nature; in other words an error is seen as a blemish, rather than a completely different image, character or sound. These modes rely on powerful human pattern recognition ability for reception. Uncoded modes have an elegant simplicity and are generally characterized by the ability to send “overs” as short as just one character. The classic examples are Morse and Hellschreiber.

Digital mode software

Most of the Digital Modes discussed below can be operated with nothing more than a PC with a sound card, with very high performance. The sound card is used to send and receive audio tones which are used with an SSB transceiver. Reference⁽¹⁾ is arguably the best available guide to PC Digital Modes. A Guide to Sound Card Digital Modes with links to the software is also available on the Call Book CD, along with a presentation on HF Digital Modes.⁽²⁾ The best way to locate the software mentioned in this review is via an Internet search engine, as web sites change frequently.

Other modes, such as Pactor and VHF packet, typically require an external module: either a modem or a modem and controller combination. There are now programs which emulate the modem and controller in software using the sound card.

Baud, bps and wpm

The symbol rate (baud) of a digital transmission is the rate in Hz at which the most basic data symbols are switched on the transmitted signal. For example, Amateur RTTY operates at 45.45 baud. The bit rate, in Bits Per Second (bps), is the actual data rate entering or leaving the modem (or sound card emulating a modem). For various reasons (compression, use of multiple carriers etc.) the bit rate may well exceed the baud rate. For example, MT63 has 64 carriers, and achieves 640 bps at only 10 baud.

The text transmission rate or typing speed in Words Per Minute (wpm) depends on how many bits there are per character (there are on average six characters in each English word, including a word space). As examples, 45.45 baud RTTY is 45.45 bps, and since there are 7.5 bits per character, RTTY operates at 6 characters/sec or 60 wpm. PSK-31 operates at 31.25 baud and achieves about 50 wpm. DominoEX11, an MFSK mode, operates at only 10.7636 baud using 18 tones, and yet achieves about 62 wpm. Fiel-Hell operates at 122.5 baud, uses up to 49 bits per character, and is capable of about 25 wpm.

The use of FEC also influences the relationship between raw bit rate and typing speed, always slowing the typing speed compared with operating without FEC. This difference is called the FEC rate. To use the previous example, MT63 operates at 640 bps, but achieves only 100 wpm due to heavy FEC with a rate of 0.1.

Techniques which vary the size of each character (for example variable sized codes, “varicodes”, or proportional fonts) can speed up the text speed for a given baud rate, and the actual speed then depends on context, just as it does in speech.

Bandwidth and speed efficiency

It is important to realize that some modes use much more bandwidth than others, often (but not always) in order to provide some other advantage. For example, compare PSK31 (bandwidth 50 Hz, speed 50 wpm) with MT63-500 (bandwidth 500 Hz, speed 50 wpm). MT63 uses much more bandwidth, and is less sensitive, but because it transmits much redundant information using FEC, is much more difficult to jam.

Some modes are poorly designed, having inappropriate modems, or use excessive bandwidth with no compensating advantages. Modes to avoid in this respect include HF packet, Olivia and MF Teletype. Other modes use too little bandwidth, or an unfortunate choice of keying rate, and so suffer from various ionospheric distortion problems. Some modes have very heavy FEC and other coding which considerably reduces the typing speed. For example Olivia operates at only 23 wpm, despite wide bandwidth, and has excessive delay. Most of the modes described below are well designed to have appropriate bandwidth and good efficiency. Advantages and any deficiencies are highlighted.

RTTY

The first digital mode to see widespread use in Amateur circles (after Morse, that is), RTTY (Radio Teletype) is a conversational or “chat” mode, and uses the ITA2 code to send a limited text alphabet, using frequency shift keying. Two tones are used, 170 Hz apart for Amateur applications. The transmission is about 450 Hz wide. Most Amateur operation is at 45.45 baud, while commercial services tend to be 50 or 75 baud. RTTY was designed for land-line use with mechanical machines, was never intended for DX radio operation, and suffers badly from multi-path effects. One lightning crash can cause a whole line of text to print in error.

RTTY still has a modest following, especially among mechanical machine enthusiasts, and it is still used for some contests. Perhaps the nicest sound card RTTY programs are TrueRTTY by

Sergei UA9OSV and MMTTY by Mako JE3HHT. Both have excellent tuning indicators and all the features one needs for simple yet slick conversations and even contests. MMTTY is more complex, but more versatile. MIXW by Nick UT2UZ and Denis UU9JDR is an excellent multi-mode alternative. For LINUX use RTTY by Jes's EB1DIX or LinPSK by Volker DL1KSV, and for Mac OS, Cocoamodem by Kok Chen W7AY.

AMTOR

AMTOR is rather like RTTY, but includes extra data to enable some errors to be detected. It operates at 100 baud, but the actual text throughput is the same as 50 baud RTTY. It was developed many years ago from the commercial SITOR system by Peter Martinez G3PLX. Most AMTOR operation was ARQ, characterised by very short transmissions (about one second), but is now little used (SITOR is still used by the marine service). AMTOR FEC is still useful for local bulletin broadcast (although MT63 is preferred) and was used to call CQ for AMTOR contacts. (NAVTEX is identical to AMTOR FEC and is used for marine weather and navigation warnings).

AMTOR is now very little used, and is not offered in PC sound card software, so you will need a TNC to operate AMTOR. AMTOR works well on 160m, but suffers badly on higher bands unless used for groundwave communications.

PSK-31

PSK-31 was developed by Peter Martinez G3PLX as an RTTY replacement, and was the first Amateur "designer" mode. It is a slick keyboard "chat" mode, but is much more sensitive and robust than RTTY, and uses less bandwidth than almost any other mode. PSK-31 uses differential phase shift keying (BPSK or QPSK). Just one tone is used. In BPSK mode the data is transmitted without error correction, while in QPSK mode each symbol represents two bits, allowing an FEC error correction technique to operate. The bandwidth is a mere 60 Hz. On HF, the error correction is disappointing, and PSK-31 is generally operated on HF without error correction.

PSK-31 is very popular, is still the most popular digital mode, and has proved to be excellent for HF and VHF DX, despite reception errors. It is not well suited to trans-polar or trans-equatorial paths (such as long path to Europe) or short F-layer paths, as it is susceptible to ionospheric flutter due to the narrow bandwidth. It copes well with adjacent signals, fading and multi-path reception, and it is not unusual to work stations you can barely

hear, even with several others in the receiver passband. Tuning is easy because even weak signals can be seen on the software tuning display.

Because of the sensitivity, low power is all that is needed. There is a wide range of PC software for PSK-31. A good program to get started with is DIGIPAN, conceived by Skip K6TY for use with QRP "PSK Warblers", dedicated crystal controlled PSK transceivers. MIXW and MultiPSK by Patrick F6CTE are also very popular, and there are several options such as gMFSK and LinPSK for LINUX, plus Cocoamodem for Mac OS.

MFSK16

Developed by Murray ZL1BPU specifically for Long Path DX, MFSK16 has a most unusual and recognisable musical sound. It uses 16 tones, transmitted one at a time at 15.625 baud. It is significantly better for polar and long path DX than PSK31, as it is immune to polar Doppler effects, and has high multi-path resistance. It is also a very sensitive mode, and has also been found very effective for 80 m DX. The only trouble is that the tuning requirements are quite tough—the receiver needs to be within 4 Hz of the right frequency to receive, and drift must be less than 4 Hz per over. Since most modern transceivers easily meet these requirements, MFSK16 is quite popular for DX and regular rag chewing.

MFSK utilizes special DSP techniques to enhance the performance and avoid ionospheric difficulties. With multiple tones, it is possible to achieve sensitivity not possible with RTTY, and also transmit more data per tone (four bits) than a two-tone or PSK system (one bit). This allows the baud rate to be reduced to counter multi-path effects, which are baud rate dependent. MFSK16 has strong Forward Error Correction, and achieves a typing speed of 40 wpm in a bandwidth of 315 Hz. Many programs are available for MFSK16. The original STREAM by Nino IZ8BLY is highly recommended, as is MIXW, by Nick UT2UZ and Denis UU9JDR, and MultiPSK by Patrick F6CTE. gMFSK by Tomi OH2BNS provides great performance in a LINUX environment. These last three programs also offer embedded picture and file transmission in MFSK16 mode.

DominoEX

This new mode was developed to provide high performance under Near Vertical Incidence Signals (NVIS) conditions, such as those on 80 m at night. This type of propagation is characterized by high angle F-layer reflection from the ionosphere, with deep fading and

severe propagation delays. Most digital modes do not work at all well under these conditions. The mode was also intended to be as good as MFSK16 under DX operating conditions, and should be used in preference when a suitable range of software is available.

New Zealand is an ideal country for digital mode development, and has seen many innovations in the past. DominoEX is (like MFSK16, Sequential MT-Hell and PSK-Hell) a New Zealand invention, and was designed and developed here by Murray ZL1BPU and Con ZL2AEP. DominoEX uses a series of important new developments to improve the performance of MFSK. A special tone management algorithm ensures that the signal spreading caused by multi-path cannot affect reception; differential frequency coding is used, which eliminates frequency drift and offset problems and "spreads" interference at the receiver to minimize its effect; and a special "nibble varicode" provides highly efficient character coding.

There are several other innovations in this new mode, which is very simple to use. It has a synchronous tuning display which allows the signal to be seen clearly and tuned in even when very weak; it has a full extended ASCII character set which allows transmission of files and accented characters; and an extra "secondary" character set which sends pre-defined data when the transmission is otherwise idle. This data is displayed in a separate receive window. This facility has many uses, the most obvious being to provide full-time automatic ID of each transmission.

DominoEX does not require high power, and works well on 80m even when there is a lot of static, or evening multi-path reception. It is an ideal mode for low power portable or emergency use. DominoEX is very robust without requiring FEC, although an FEC option is offered for when near-perfect reception is important. Six speeds are provided, so the speed can be changed to suit conditions. The default 11 baud mode suits evening and daytime conditions, and operates at 62 wpm, faster than most people can type. Early evening and low power suit using the 8 baud mode, at 50 wpm. Software for DominoEX is available in DominoEX by ZL2AEP⁽³⁾ and MultiPSK by Patrick F6CTE (which includes the FEC option). Versions for LINUX, Mac OS and MIXW are expected in the near future.

MT63

MT63 is an amazing mode that would not have been possible without Digital Signal Processing. Developed by Pawel SP9VRC purely as an academic challenge, in this mode 64 PSK carriers are trans-

mitted at once, each one carrying a different part of the transmitted signal. The data (which includes strong FEC) is spread across the width of the signal, and also spread in time, so MT63 is resistant to both time and frequency related interference. MT63 is very tolerant of poor operating conditions and interference. Unfortunately the signal is rather wide for a digital mode (typically 1 kHz), and very aggressive (causes interference but is not much affected by interference), so needs to be used with care. MT63 is an excellent mode for transmitting bulletins or leaving messages on unattended computers. Users often think that MT63 is very sensitive—this is not in fact the case—it just seems so, because the signal sounds like noise and looks like noise on the tuning display, and because it has such good error correction.

The MT63 software by Nino IZ8BLY is simple to use, easy to tune, locks on to the signal effortlessly, and is extremely robust. It is very sensitive, and excellent for DX under poor conditions. The MIXW version is even better, with higher sensitivity and better tuning tolerance. There is also a very good version of MT63 for LINUX in gMFSK, plus the original SP9VRC MT63 terminal.

Olivia

Developed recently by Pawel SP9VRC, this mode is a marriage of MFSK transmission with the highly redundant FEC used with MT63. Unfortunately the typing speed is very slow, there is a long delay between transmission and reception, and the bandwidth rather wide. The performance in terms of sensitivity and interference rejection is similar to MT63, and the mode enjoys good drift and tuning tolerance.

The most widely used version uses 32 tones in 1 kHz bandwidth, but there is a wide number of very confusing and non-compatible variations, difficult to tell apart, and differing in bandwidth, baud rate and number of tones. To add further to the confusion, there are similar modes with other names, such as "Contest" and "RTTYM". There are add-ons for these modes in MIXW, and Olivia is offered in MultiPSK. The original SP9VRC OLIVIA was written for LINUX.

Hellschreiber

This elegant mode almost became a lost art, but began an enthusiastic revival in the late 1990s thanks to the PC and sound card. Text and simple graphic symbols are transmitted uncoded, rather like sending the dots to a dot matrix printer. Because the signal has very high peak power compared with the

average power, and is interpreted by eye rather than by electronics, the mode is very immune to impulse noise and requires little power. It is also immune to most ionospheric effects if tuned with care. Since tuning is broad, it is simple to use, ideal for HF and for satellite working.

Hellschreiber has a special appeal that occurs with no other mode except Morse; there is an immense "feel" that the operator has for the propagation of the arriving signal, and the uniquely recognisable "fist" (in this case "font") of the transmission, as well as the signal sound which changes with propagation. The user can choose any one of many fonts to transmit (even "Windows" fonts), although the original 1930s font is still the best. The data rate, typically 122.5 baud, provides a good 25–30 wpm typing speed, depending on the font used. Big black fonts are best for DX, but tend to be slower.

The most commonly used mode is Feld-Hell, an on-off keyed CW radio mode which dates from the 1940s and predates RTTY. Invented by Rudolf Hell, Feld-Hell uses a single 980 Hz keyed tone. It is an ideal mode for 20 m, and performs well on other bands, even 80 m, satellites and moon-bounce.

The most sensitive Hell modes are PSK-Hell and FM-Hell, invented by Murray ZL1BPU and Nino IZ8BLY. These modes transmit the dots as phase reversals. These are excellent DX modes, very sensitive and (FM-Hell especially) not affected by ionospheric flutter in the way PSK-31 is. FM-Hell uses MSK modulation, and does not require a linear transmitter.

The best Hell software is IZ8BLY Hellschreiber by Nino IZ8BLY. It operates multiple modes, includes a very good tuning display, and is really simple to install and use. MIXW and MultiPSK are also widely used, and there are versions for LiNUX (gMFSK) and Mac OS (Cocoamodem).

Fax and SSTV

These modes can also be operated with nothing more than a PC with sound card. Fax is very rarely transmitted on Amateur bands, although there is some interest in receiving weather maps on HF (black and white) and weather satellite images (grey scale) on VHF. Both of these modes are straightforward with software like Christian Bock's WXSAT program. The resolution produced by this software is incredible. On satellite pictures it is often possible to identify the South Island lakes, the Waikato River, and puffs of steam from White Island.

SSTV is a great way to share photographs, graphics and simple

drawings with friends. The resolution is not very high, but the colour depth is good and the image content is restricted only by imagination and good taste. Much the best program to start with is MMSSTV by Mako JE3HFT. It helps if you have a scanner, digital camera or a good collection of digital images to send. SSTV is typically used to add interest to an SSB contact, and is also used on VHF FM, where picture quality is excellent. There are VHF SSTV nets in several parts of the country from time to time.

Digital SSTV and DRM

Digital SSTV is a recent development that can be experienced if your computer has enough power. The sound card modem used is based on that designed for DRM (see below), but restricted to 2.4 kHz bandwidth. Each block of data includes a checksum, and if the picture is received with some blocks incorrect, a semi-automatic process can request repeats of the missing blocks until perfect reception results. Picture quality is superb—identical to the original picture, and images of any size and resolution are accommodated. Transmissions are also identified by a header which includes the call-sign and image details.

The software tends to expect the user to be an expert, so find an experienced user to help you get started. Signals need to be strong and noise-free, with good propagation conditions for transmissions to be successful. HAMPAL by Erik VK4AES and DIGTRX by Roland PY4ZBZ are probably the easiest programs to use. The WINDRM modem used was designed by Cesco HB9TLK, and can also be used for fast file transfer.

Digital Radio Mondiale (DRM) is a new wideband digital mode intended for MF and HF commercial broadcasting. Reception quality can be very good, with low distortion, and often in stereo, although few stations are receivable in New Zealand at present. The modem uses sophisticated compression techniques, combining amplitude and phase modulation, allowing high sampling rates to be accommodated in 10 kHz bandwidth. There are several different formats allowing for transmissions up to CD quality. The mode is quite immune to fading, and does not suffer from selective fading that causes so much distortion on AM short wave broadcasting. A special receiver is required, but it is possible to receive DRM with a PC using the free DREAM DRM software by Volker Fischer, which works with a 12 kHz IF input to the sound card. A conventional receiver have an adaptor added to provide the 12 kHz output. The software also receives AM, SSB and FM, with very good quality.

DRM can be transmitted using the same software, and has been demonstrated on 80 m by ZL1WTT using an adaptation of a digital phasing exciter designed by W1TAG. High power is required for reasonable transmission range, and the transmitter linear amplifier must have very low distortion, and these conflicting factors makes this mode quite a challenge.

PACTOR

A cross between Packet and AMTOR, PACTOR is a commercial and proprietary FSK system which provides strong error detection and ASCII text with an ARQ format. Efficiency is improved by a clever system where repeated damaged blocks of data are averaged until the check-sum is met, so a complete error-free block is not actually required for correct reception. Many of the newer HF multi-mode controllers offer PACTOR, and there are some applications for PC or other processor and external modem. PC sound card receive-only programs are available, but like AMTOR, no PC sound card software offers full capability. Pactor operates at 100 or 200 baud, and switches between speeds as conditions permit. There are more recent versions (PACTOR2 and PACTOR3), which offer even better performance, but require expensive commercial hardware.

PACTOR is popular for bulletin board use, and it is rare now to have a conventional contact using PACTOR. There are many Bulletin Board Stations (BBS) available on HF, some with connections to the Amateur Packet network, some with internet connection for mail forwarding. PACTOR is also widely used commercially. The WINLINK stations, for example, are fixed mail store-and-forward stations based around the world, with connection to the internet. Each station has a frequency list that it scans every few seconds.

These frequencies are mostly on 40, 30, and 20 m. These stations provide a service to marine and other registered mobile or portable operators, who call on one of the published frequencies. Once connected, the BBS controls operation just like a Packet system.

LF and QRP Modes

Some modes are especially suited to weak signal operation, especially where the data rate can be very low, such as for beacons and for LF operation. Various types of Morse transmission are widely used, at a low speed (QRS) or very low keying speed (QRSS) that is read visually. One of the most popular ways to receive these modes is to use a Spectrogram such as ARGO by Alberto I2PHD,

which was designed specifically for Morse modes such as QRSS3 (3-second dots) down to QRSS120 (two minute dots).

Often the Morse is keyed using an FSK technique which allows the dots and dashes to be the same length and eliminates the need for spaces between elements, speeding up the transmission rate. These modes can also work well for HF beacons and QRP operation. Hellschreiber modes are also popular for QRP, in part because the average power is much less than the peak power, an important factor in portable operation.

Operating frequencies

Narrow band modes (RTTY, PSK-31) are to be found at the lower end of the digital allocation on each Amateur band, for example on 20 m from 14.070 to 14.099 MHz. Wider modes are found at the upper end of the allocation, for example on 20 m from 14.101 to 14.130 MHz. On 20 m the modes tend to be segregated to some extent, PSK31 at around 14.070 MHz, then Hellschreiber and other less used modes near 14.075 MHz, followed by MFSK16 and other narrow up to 14.080 MHz, where RTTY prevails. Wideband modes such as MT63 and Olivia are found around 14.109–114 MHz, with SSTV and digital SSTV around 14.230 MHz since they are used in conjunction with voice.

A ZL Digital Modes net operates on Friday evenings on 3560 kHz LSB, from around 8:30 pm. All modes are demonstrated and discussed, and newcomers are very welcome to join in and experience the different modes. The net is the perfect place for assistance in setting up, and for asking questions about Digital Mode operation. Some digital modes operators listen on this frequency every evening, and there are Morse and DominoEX nets on other evenings.

The operating frequency for most digital mode operation is usually quoted as the frequency the transmitter emits when idle, which in some modes can be measured with a frequency counter. For RTTY this is the mark frequency. For Morse, PSK-31 and Hellschreiber, it is the carrier frequency. MFSK16, MT-Hell and DominoEX signals are quoted from the lowest tone frequency. However, for complex modes like MT63, Olivia and SSTV, the frequency quoted is usually that indicated on the transceiver display in USB, since the tones transmitted and the sideband used are fixed by convention.

Most digital mode operation follows the USB-LSB convention used for SSB (LSB below 9MHz, USB above, with now a noticeable trend towards USB on all bands). The exception is RTTY, which for

no good reason is always operated in LSB. Some modes (Morse, PSK31, Hellschreiber, AMTOR) can be copied equally well on either sideband. Commercial operation is almost always USB, and the quoted frequency is the transmission centre frequency.

Packet Radio

Packet radio utilizes FSK and a protocol known as AX-25, which defines an automatic system to transmit blocks of information (called packets) which include the data, message type, information as to who the data is addressed to and sent from, and a robust error detection system called a Cyclic Redundancy Check (CRC).

Packet radio is organised so that many stations can operate on the same frequency with limited interference. This technique is called Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA), which means that stations listen for other signals before transmitting to avoid collision, but cannot guarantee not to cause interference to stations that cannot be heard. This situation frequently happens when stations on opposite sides of town share a BBS station.

Most, but not all, packets require acknowledgement (an ACK), and the sender will repeat the packet until a correct acknowledgement is received. This technique ensures that the data is received correctly and compensates for collisions and errors, but as the channel activity increases, the useful data rate slows down significantly, as more and more time is spent correcting and sending requests for repeats.

There is a special family of unacknowledged messages, called an unconnected Information (UI) packet, that is widely used for beacon messages and for the Automatic Position Reporting System (APRS) developed by Bob Bruniga WB4APR.⁽⁴⁾ APRS networks now operate in most centres, either using a local data repeater or the APRS calling frequency, 144.575 MHz. APRS is popular for tracking mobile stations equipped with GPS position location and equipment to automatically transmit the position, speed and heading of the vehicle. It is also remarkably effective for sending simple chat-type messages.

The most common Packet format is 1200 baud AFSK using an FM transmitter. A device called a

Terminal Node Controller (TNC) is generally used with a computer. The TNC contains both the packet controller and modem. Faster systems, to 9600 baud and beyond, are finding increasing use, especially for satellite forwarding and dedicated links. Most packet operation in New Zealand is on VHF or UHF, using narrow band FM. Appropriate frequencies are listed elsewhere in the Call Book.

Packet BBS operation

There are many packet BBS stations in New Zealand, most with 2m access, and many with 70 cm access. If you call them and connect, sending an "H" command will give you a list of commands to which the BBS responds. The list of commands and facilities on most BBS setups is extensive, but simpler functions like listing and reading messages, reading and sending mail, are simple and easily learned. Packet messages, either for general distribution (bulletins) or personal delivery (e-mails) are forwarded automatically between the BBS stations. Much of the forwarding within New Zealand takes place overnight using the National System on 70 cm.

Data Repeaters

To enhance the range and utility of packet radio, it is relatively easy to arrange for packet systems to repeat or forward data. In fact any packet station can act as a data repeater (called a "digipeater"). Unfortunately there is an extra delay in every digipeater that the data passes through, and unless the input and output is on a different frequency (called a "gateway"), the extra traffic on the radio channel further slows down the

throughput. A hill-top data repeater, similar to a VHF voice repeater, provides much better performance. Data repeaters are listed in the Call Book "Repeaters and Beacons" section.

References

- (1) Digital Modes for All Occasions, Murray Greenman ZL1BPU, published by the Radio Society of Great Britain, ISBN 1872309 82 8.
- (2) See Files folder on *Call Book* CD.
- (3) Install from Files folder on *Call Book* CD.
- (4) See <www.aprs.net/>.

DX PacketCluster

The DX PacketCluster is a Packet BBS provided especially for DX operators. While it has the normal bulletins and mail facilities normally associated with a packet BBS, it also has many other features of interest to DX operators. For example, if anyone logged on to the DX PacketCluster hears some interesting DX, this "DX spot" can be put up on the Cluster for the benefit of any others who may be logged on. The others will see the DX spot in real time, and anyone interested can tune up and work the DX station. This is the prime purpose of the DX PacketCluster. There are also other features such as WWV sunspot information which can be put up, a list of current

DXCC countries with prefixes, headings and distances from your QTH, and sunrise and sunset information for each country.

Various DX bulletins are put up on the Clusters from time to time.

Note that the ZL2AQY-10 PacketCluster is connected permanently to a network of Clusters operating in Australia, North America and Europe as is ZL2ARN-10. This means that information posted on the network is accessible to amateurs in New Zealand. ZL2AL-10 also receives this information all PacketClusters in New Zealand are linked.

The following is the information

for those interested in connecting to a DX PacketCluster:

ZL2AQY-10 Auckland Access through Klondyke node, ZL1AB-1 on 144.600 and ZL1PK-1 in Hamilton.

South Island access is also available through ZL3VML-6 in Christchurch, ZL1AMC-1 in Invercargill, ZL2AL-1 in Hawkes Bay or any node with ZL2AQY-10 in its nodes listing. Access also through the internet:

Telnet: zl2aqy.ath.cx:9000, ZL2ARN-10 Waikanae Access on Climie repeater on 438.600 and 145.425

Access also through the internet: Telnet zl2arn.ath.cx:7300 ZL2AL-10

by
**MURRAY WOODFIELD ZL1CN
CHRIS HANNAGAN ZL2DX**

Hastings Access on 144.65. Efforts will also be made to extend the network further, depending on the availability of resources.

If you are keen on DX on any band, including VHF and UHF, then the DX PacketCluster is for you.

Even if you have no experience at packet, you will benefit from connecting to a Cluster, and staying connected while you are tuning the band—you will even be able to put up spots and information yourself for the benefit of others.

Further information is available from the sysops, Eddie ZL2AQY and Gordon ZL2ARN. Eddie Olsen ZL2AQY and Murray Woodfield ZL1CN.

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2. The Guide and the Test Papers can also be viewed and

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3. Both the Guide and the Test Papers can be downloaded in separate self-extracting files for installation on your own computer. Installation details are on the web page.

Downloading is recommended, so these documents can be used at any time.

Please Note:

1. These documents can be used as a source of hand-out notes for Instructors at Radio Classes. Copy-and-paste can be used to copy material into a wordprocessor then photocopied for class use—or whole pages can be printed off.

2. The Guide is NOT a replacement for the NZART *Basic Radio Training Manual*. They support and complement each other.

New Zealand VHF/UHF/SHF records 2004

Band	Frequency	Type	Stations	Date	Mode	Distance (km)	Notes
6m	50MHz	Overseas	ZL3VTW/1-EH7KW	03/04/2001	SSB	19,921*	(1) New Zealand 70 cm band has now been reduced from 420-450 MHz to 430-440 MHz. The Video (TV) record of 31/01/1982 on 425 MHz stays as a 70 cm record.
6m	50MHz	Overseas	ZL3JT-N6XQ	04/03/2001	PSK31	14,268	
6m	50MHz	E-M-E	ZL2BGJ-WA4NJP	08/09/1988	CW	13,256	
6m	60MHz	E-M-E	ZL3TY-IW5DHN	15/11/2003	JT44	18,444	
2m	144MHz	Internal	ZL2ARW/p-ZL1BJB/p	03/02/1982	SSB	1,069	
2m	144MHz	Overseas	ZL1HH-VK5ZEE	15/01/1986	SSB	3,420	
2m	144MHz	Overseas	ZL3TY/VK2EI	14/05/2002	FSK441	2,028	
2m	144MHz	E-M-E	ZL2BGJ-G3POI	26/05/1985	CW	18,821	
70cm	432MHz	Internal	ZL2ARW/p-ZL1BJB/p	03/02/1982	SSB	1,069	
70cm	432MHz	Overseas	ZL1AOX-VK3EK	03/01/2004	SSB	2,413	
70cm	432MHz	E-M-E	ZL3AAD-G3SEK	112/03/1989	CW	18,970	
70cm	425MHz	Internal	ZL2TWS/p-ZL2ASF/p	31/01/1982	Video	373	
50cm	610MHz	Internal	ZL2UGR/p-ZL2AJI/p	23/04/1988	SSB/FM	302	
32cm	925MHz	Internal	ZL2TRV/p-ZL1TBG/p	30/11/2002	NB/FM	620	
23cm	1281MHz	Internal	ZL1TBG/p-ZL1WTT	05/07/1998	FM/ATV	76	
23cm	1296MHz	Internal	ZL2ARW/p-ZL1THG/p	30/01/1982	SSB	687	
23cm	1296MHz	Overseas	ZL1AVZ-VK2FZ/4	30/11/1995	SSB	2,317	
23cm	1296MHz	E-M-E	ZL3AAD-PA0SSB	13/06/1983	CW	18,657	
13cm	2304MHz	Internal	ZL2ARW/p-ZL1THG/p	31/01/1982	NBFM	687	
13cm	2304MHz	E-M-E	ZL2AQE-W3JWI/8	18/10/1987	CW	13,931	
9cm	3456MHz	Internal	ZL2AQE/p-ZL2ARW/p	06/03/1983	NBFM	547	
5cm	5760MHz	Internal	ZL1TBG/p-ZL1TPH/p	18/03/2001	CW	317	
3cm	10368MHz	Internal	ZL1THG/p-ZL2BFC/p	25/01/1981	WBFM	390	
3cm	10368MHz	E-M-E	ZL1GSG/p-DJ7FJ	12/03/1997	CW	18,340	
1.2cm	24000MHz	Internal	ZL2AQE/p-ZL2AZQ/p	20/03/1988	MCW	126	
2.5mm	122250MHz	Internal	ZL1TBG/p-ZL1TPH/p	25/08/2002	NBFM	0.032	

Moonbounce (E-M-E) records 2003

Frequency	Stations	Date	Mode	Distance (km)	Notes
50MHz	OH2BC-XROY	19/09/1995	CW	14,000	
50MHz	IW5DHN-ZL3TY	15/11/2003	JT44	18,444	
144MHz	K6MYC/KH6-ZS6ALE	18/07/1984		19,287	
222MHz	K1WHS-KH6BFZ	17/11/1983		8,154	
432MHz	ZL3AAD-G3SEK	12/03/1989		18,970	
902MHz	K5JL-AF1T	27/05/1990		2,384	
1296MHz	ZL3AAD-PA0SSB	13/06/1983	CW/SSB	18,773	
2304MHz	NU7Z-ZS6AXT	13/06/1999	CW	16,480	
3456MHz	WB5LUA-OK1CA	13/06/2002	CW	8,554	
5760MHz	ZS6AXT-W7CNK	22/11/1999	CW	14,758	
10368MHz	ZL1GSG/p-DJ7FJ	12/03/1997	CW	18,340	
24000MHz	AA6IW-RW3BP	21/04/2002	CW	9,512	

For a copy of the rules to follow and how to claim a record contact:
The VHF/UHF/SHF Records Co-ordinator
C/- NZART
PO Box 40-525
Upper Hutt
or vhfrecords@nzart.org.nz

For record updates and rules to follow when claiming a record see:
www.nzart.org.nz/nzart/vhf and <http://www.nzart.org.nz/nzart/vhf/rules.html>

INTERNET RADIO LINKING PROJECT

Radio Society
Kitchener-Waterloo ARC

Operating Modes

Direct Connect

Where a repeater at one location (Node A) connects via the Internet with another repeater (Node B). With this type of link the two nodes

or repeaters can be involved in the connection or resultant conversations. While repeaters "A" and "B" are connected, anyone attempting to connect with either node will be told by a recording that—"The node you are calling is currently con-

nected to call-sign". All local traffic on each repeater will be heard on the other repeater as well.

Reflector Connection

A reflector is a computer that is not connected to any radio, it is

connected to the internet allowing many repeaters to be inter-connected, redirecting received audio back to all other connected repeaters. At any given time there maybe 2 to 10 repeaters around the world interconnected via a Reflector.

With reflector use a gap of approximately 10 seconds must be left between transmissions, this allows:

- For the delays created by multiple Tone Squelch radios in the links between the repeater and IRLP link.
- users on other nodes a chance to check in.
- other nodes time to send touch-tone commands to drop their node.

Also allow a delay of approximately three second from the time pressing the PTT button at the start of a transmission.

With IRLP your transmission is now being heard on many repeaters around the world. To ensure intentions are understood give your call-sign (phonetically) along with your name and QTH of the repeater you are monitoring for a call. Mobile listeners may only pick out your prefix, your name or QTH.

When calling a station state your intentions by always identifying whom your call is meant for.

Example: Several stations including a DX station complete a QSO and you wish to contact the DX station. Action: VK3xxx this is Mike ZL3TMB in Christchurch New Zealand. By doing this rather than just using your call-sign you leave no question whom you wish to contact.

Making a direct connection

Listen on your local machine for 15-30 seconds before transmitting,

New Zealand IRLP Nodes

Node ID	Call-sign	Node City
6013	ZL4FOX	Auckland
6493	ZL3NTV	Auckland
6793	ZL2AS	Hastings
6900	ZL3TMB	Christchurch
6910	ZL2LD	Wellington Region
6920	ZL2WKJ	Palmerston North
6950	ZL1BQ	Auckland
6943	ZL2KO	Feilding
6184	ZL4DM	Dunedin
6931	ZL2W1	Upper Hutt

New Zealand Special Codes

73	Ends the current call and closes the node.
77	Checks the node to see if it is connected to another node or not.
66	Tell you the time in UTC.
67	Tell you the local time here in New Zealand.
##	##<node number> tells you the time at the remote node.

International Nodes

Node ID	Call-sign	Location
1000	VE7RHS	Vancouver
1015	VE7RNV	North Vancouver
1020	VE7RNA	Chemainus
1030	VE7VC	Victoria
1068	VE6JN	Edmonton
1130	WA7LPG	Nanooze Bay
1150	VE7REE	Summerland
1207	VE7BAS	Richmond
1210	VE7DOC	Prince Rupert
1230	VE6ZV	Calgary
1250	VE7FFF	Prince George
1330	VE5CMR	Saskatoon

ask if the repeater is currently in use. If all is clear, identify your self and give the node name or number you wish to call. Example: "ZL3TMB connecting to the Sydney node"—then enter the ON code for the node (node number then a 0) and release your PTT. Your local repeater will transmit carrier for a few seconds while waiting for the connection to be authenticated. Connections are confirmed with the transmission of the voice ID of the destination node and your node's voice ID on the destination repeater.

If your node is already connected to another node or reflector the greeting "your node is currently connected to ID of the connection" is played. In this case confirm if anyone desires the connection before closing it using the OFF code (node number then a 1 or just dial 73).

Once connected wait at least 15 seconds before transmitting because:

- The repeater may be in use, and your entry may have occurred between transmissions.
- The voice ID of your node is longer than the voice ID of their node, and the connection is not made until the ID is fully played.
- Their node computer may be slower, and hence take longer to process the connection than yours.

Press and hold the microphone PTT for a second and then announce your presence and your

intention such as you are calling someone specifically or just looking for a QSO with another ham in that city.

If no response is heard, announce your call and your intent to close the connection then key in the OFF code (node number then a 1 or just 73). This a normal courtesy and a regulatory issue in some countries who may be connected to the reflector.

Some nodes are configured so you cannot connect to them if that repeater is active and the message

"The node you are calling is being used locally" will be heard. If your repeater is inactive for 4 minutes the connection will automatically close transmitting a voice ID disconnect message on both nodes.

Connecting to a reflector

Listen to your local repeater for local use and then announce your intention to use the Reflector and send the ON command. When you hear the confirmation ID always WAIT at least 15 seconds before transmitting as you are most likely now connected with many repeaters and a QSO could be in progress. If after 15 seconds you hear nothing, identify yourself and indicate you are listening to the Reflector from "City and Country". As your local repeater possibly now has world-wide coverage include your QTH.

Connections to the reflectors time out with no activity however many node owners set this to a long period so it is not unusual

for repeaters with minimal traffic to stay connected to the Reflector for extended periods. When a node times out from a Reflector the message "Activity time out ... Reflector xxx, link off" will be played.

If you hear or wish to engage in a prolonged rag-chew on your local repeater out of courtesy to other node listeners drop the reflector.

Error messages

From time-to-time you may receive connection error messages, common ones are:

"The node you are calling is not responding, please try again later", caused by a loss of internet connectivity to one end of the call attempt.

"BEEP Error—The call attempt has timed out, the connection has been lost", occurs when a node is OFF-LINE or there may be temporary net or node problems.

"The Connection Has Been Lost", the internet connection has dropped.

If you are new to IRLP you should always consult with your local node sponsor to confirm the local guidelines on reflector connections in your area.

For a copy of the latest node numbers send a Self addressed envelope to:

Mike Barnes ZL3TMB
PO Box 218
Christchurch 8015
E-mail <zl3tmb@nzrt.org.nz>

Direct from the IRLP web site <<http://status.irlp.net/>>.

Node ID	Call-sign	Location
2620	VE3PLF	Fonthill / Niagara Region
2633	VE2CSI	Sept-Iles
2640	VA3ITG	Woodbridge
2650	VA3MME	Omemees
2680	VE3RSB	Burlington
2688	VE3LSR	Barrie
2700	VE3ORX	Orangeville
2710	VE3TRV	Kincardine
2736	VO1VCP	St. John's
2750	VE3KBR	Kingston
2820	VE5NP	Nipawin
2827	VE3WIK	Hamilton
2843	VE3FCG	Stratford
2860	VE3LTR	Little Current
2870	VE3LNZ	Lindsay
2874	VA3TJS	London
2897	KE4TTE	South Orlando
2900	VA3RVU	Brampton
2920	VE3YRC	Newmarket
2947	VE3KJG	Lavant
2950	VA3UUJ	Windsor
2952	VE1YAR	Yarmouth
2970	VE3ISX	Hamilton
2972	VE3NUU	Niagara-on-the-Lake
3000	AH6LE	Beaver Creek
3018	N5ZUA	Houston
3019	N7ORY	Twin Falls
3030	KB6THO	Pasadena
3033	KS5FOY	Mountain Home
3035	N5XQD	Odessa
3039	W7RAT	Portland
3040	WA6JFK	Los Angeles
3043	NO9PMZ	Colorado Springs
3045	WB4LDS	Tucson
3053	KB6WE	Palm Springs
3057	W6CX	MI. Diabolo
3060	AC7DE	Helena

Node ID	Call-sign	Location
3307	WR7CW	Gillette
3310	KA7STK	St. George
3315	K7AAE	Woodinville
3320	N7GZT	Columbia
3335	KG6STN	Pasadena
3337	N5ZUA	Columbus
3340	WR6JPL	Pasadena
3344	WA6EIK	Laguna Hills
3350	N0POV	Denver
3352	WTSP	Provo/Salt Lake City
3372	W6RAM	Idaho Falls
3373	KD6NAR	Murrieta
3377	KD7ITP	Oroville
3379	KC0CAS	Alexandria
3382	N5SKU	Richardson
3383	W9PCI	Central Point
3386	N4RAP	Paris
3388	KF7LA	Alo
3390	WB2BOW	New Windsor
3396	KD6DO	Osage Beach
3399	N5SIM	San Juan
3405	N3I0-7	Experimental
3407	K7OJU	North Salt Lake / SLC
3410	KD6GDB	Santa Monica
3412	K5SLD	Arlington
3415	W08M	Parker
3416	KB5ZJJ	Houma
3417	NB7C	Cascade
3420	N7PIR	Portland
3425	KB8ENV	Cleveland
3428	WB6MFV	Angels Camp
3437	N5KF	Georgetown
3440	AH6GR	Maui
3450	N0SZ	Boulder
3456	W5EXY	Port Aransas
3459	KL3K	Sterling
3460	WA6LA	Palos Verdes I [WALA]
3463	NA3J/0	Jefferson / Evergreen
3470	N6ICW	Sacramento
3480	WA6LA	Palos Verdes II [WALA]
3482	W7NTF	Spanaway
3483	KL3K	Whittier
3485	WB5QGJ	Mountain Home
3488	KE6ZOY	Santa Clara
3493	K9QAM	Bend
3498	K7FAY	Clairemont
3499	N5ADL	Corpus Christi
3500	K6JSI	San Diego - WIN System
3506	KL3K	Houston
3510	WB6EGR	Santa Clarita
3514	AC5KV	Little Rock
3518	KC0IKU	La Crescent
3520	WB6EGR	Burbank
3529	KC7LGT	Sequim
3530	K6JXY	San Marcos
3534	KE6SR	Olathe
3539	AK5Z	Harlingen
3540	W6DXX	Palm Springs
3543	KC7RJK	Eugene
3545	W2L6	Vallejo
3550	WE6RGP	San Diego - Echo/RLP
3560	WB6HD	Eureka
3568	KF7FY	Pocatello
3570	N7H0Z	Femdale
3574	WA7GTU	Cedar City
3576	WB7REL	Manti
3577	W7BYU	Roosevelt
3580	WU7Q	Sacramento
3582	K7RTM	Chandler
3583	KL0XE	Juneau
3588	KL3K	Anchorage
3590	N0BVE	Minnetonka
3592	KL3K	Name
3594	KJ7HE	Round Mountain
3595	KV0K	Glenwood Springs
3598	KD6HWC	Las Vegas
3599	KC7NOU	Yacolt
3602	K5FRC	Bonham
3608	W0WOB	Colby
3609	K6GETZ	Lakewood
3610	KGUB	Saratoga
3616	KQGFM	St. Louis
3620	KU6V	Fremont
3623	KE6PCV	Corona
3639	KC5LOS	Beeville
3640	WA6VPL	Lompoc [WALA]
3641	W7AOR	Las Vegas Gateway
3649	K7GNB	Lake Oswego
3650	KE6PCV	Los Angeles

Node ID	Call-sign	Location
3655	W6FYI	San Jose
3657	KC5NLO	Alamo
3659	KES5XF	Edinburg
3660	KD7EFG	Murray
3666	KL11O	Vaduz
3667	WB6BDD	Pleasanton
3668	KH6FV-5	North Shore, Oahu
3670	N6JHV-2	Chatsworth
3671	K6SA	Saratoga
3672	KH6FV-3	Guam
3673	K6T2	Santa Barbara
3675	K9VWC	Sioux Falls
3686	KA6AMR	Duarte
3690	N6SEX	Sacramento
3692	AA7KQ	Bozeman
3695	N5GI	McKinney
3707	K5DG	LaFeria
3710	WA4HND	Grand Junction
3714	AC3X	Westminster
3717	KB3A/J	Easton
3720	KH6FV	Honolulu
3733	KF6FKK	Napa
3735	WB6JAA	Grand Canyon
3736	N0OKL	Grand Junction
3740	WB3EHB	Camden
3747	K5M0T	Fort Worth
3750	WOKU	Golden
3753	WD5IEH	San Antonio
3756	AH6JA	Hilo
3762	WB5NFC	Mtn. Home, Arkansas
3773	W6TRW	Redondo Beach
3775	WB5TUF	Houston
3778	KL3K	Juneau
3780	WR6HMB	Half Moon Bay
3787	KL3K	Alaska Gateway
3790	WA6AXO	Juneau
3791	AD5KZ	Dallas
3792	K0VQ	Carbondale
3793	K7FAY	Parker
3797	N7EN	Gilbert
3799	KF7FLY	Rhome
3800	AH6JA	Hilo
3805	KE6PCV	Corona
3810	KG6EAQ	Kapaa
3820	KC7GHT	Phoenix
3822	KL1IN	Wasilla
3827	K6EKB	Rainier
3830	WB5EKU	Los Angeles
3832	W5KOL	Richland Hills/ Ft. Worth
3834	KL3K	Seward
3840	KG1XA	Atwater
3846	WB6T	San Juan Capistrano
3851	WA6E	Loomis
3852	N1BEN	Hurst
3853	KE6AMW	Saltines
3856	KD6RC	Santa Rosa
3860	W6YDD	Folsom
3863	KE6ALV	Moreno Valley
3867	WB5DEL-1	Oklahoma City
3873	W03B	Shingle Springs
3875	W7DI	Minden
3876	NJ7J	Clearfield
3877	WA6KYZ	Ridgecrest
3879	K7CSO	Bloomington
3880	K6RTL	Sacramento
3890	N4OKL	Huntsville
3892	W7DF	Tucson
3895	K6MVR	Sacramento
3898	KH6FV-7	Katua-Kona Airport
3900	K6MF	San Jose
3902	AB0SF	Fort Collins
3908	K9VKG	Sioux Falls
3915	K0RPT	Lincoln
3917	N7JYS	Russell
3920	K6MF	Santa Barbara
3922	KA7CJH	Reno
3924	KC7PO	Tucson
3925	N7XZ	Logan
3932	N7MHE	Moses Lake
3937	AB6PA	Moreno Valley
3940	WA6WDC	Sun Valley
3958	KC7VJY	Eugene
3960	N6SEX	Sacramento
3967	N6SGX	Ontario
3969	K7KAB	Loving/Graham
3971	W2IO	Erie
3976	W7B0	Woodland
3981	W7RY	Yacolt
3989	K5DX	Houston

Node ID	Call-sign	Location
3990	W0CRA	Denver
3999	N6ZSQ	Barstow
4000	WA3KOK	Washington
4008	KD1Z	Apollo Beach
4016	KE2EJ	Plainview
4020	KA2JZO	Pemberton Township
4022	KB4JDE	Miami
4028	KB1FX	Woburn
4030	N2ACF	Stony Point
4031	K9IU	Bloomington, IL ARC
4038	N3XXH	Laporte
4040	N2CKH	Lakewood
4050	N2BJ	New Lenox
4053	W2RAC	Daytona Beach
4056	W1IMD	Portland
4075	KP4E	Grosse Pointe Farms
4080	W2CNY	Syracuse
4090	KB2FAF	Corlend
4092	N1SZM	Meriden
4098	KA9OHV	Warsaw
4100	N3PE	Wellsboro
4102	W8HDU	Lima
4104	WW4M	Raleigh
4106	W8VFR	Eaton
4110	K0PCG	Des Moines
4112	KB8KPV	Charlevoix
4115	N3RBJ	Philadelphia
4116	WN8VIX	Green Bay
4120	KF6SWL	Omaha
4123	K06IN	Hampton
4125	W4DJY	Suwanee
4130	WA22PX	Middletown
4134	KP4EOP	Chicago
4140	WJ2W	Chartestown
4143	K1DWJ	Sedden
4145	WA4RYW	Atlanta
4149	N1LFE	West Haven
4150	N5IUF	Dallas/ Ft. Worth
4156	WC4PEM	Bartow
4158	W1HDN	Vernon
4162	N1RSP	Gloucester
4165	KG8DZ	Columbus
4170	WB7RES	Caldwell
4172	W4NCR	Wilmington
4180	N4MSE	Dallas
4183	K4VXR	Hampton
4186	K8EHB	Delaware-Columbus
4187	WB9TLH	Kirksville
4190	N4XOM	Atlanta
4196	N4TEC	Bradenton
4198	AC1V	Tolland
4200	AA4LB	Simpsonville
4204	N2VVS	New York City
4205	N2VSR	Rochester
4208	NS9RC	Winnipeg
4207	N2LEN	Catskill
4208	KS4BO	Roanoke
4210	W2ISB	Liverpool
4212	K69V	Muncie
4214	NM9J	Cortland Manor
4216	K43T	Hanover
4224	KA2NRT	Browns Mills
4230	WS2V	Budd Lake
4231	KC9EBB	Skokie
4234	N3KZS	Hanover
4235	WB8VSYU	Miamisburg-Dayton
4242	KB2NYH	Rosedale
4250	WR2AHL	Rochester
4254	W2FCC	West Arlington
4256	W1RJC	Dartmouth
4260	KD4RAA	Raleigh
4267	WF8M	Dayton
4269	WSYI	Thibodaux
4273	K5MES	Fort Smith
4277	K2MVR	New York
4280	W9ADS	Champaign-Urbana
4282	WB8BCR	Cleveland
4287	WB2SNN	South River
4290	N4HAJ	Kinston
4297	WB8AZP	Brighton
4300	N3APP	Erie
4302	W4NR	Miami
4304	N9RJZ	Menasha
4310	N3RJC	Lansdowne
4314	KB1GXW	Boston
4316	KB9KLD	Manyville
4317	K3ZMC	Pottstown
4320	W1QWT	Scituate
4330	K9WZ	Plymouth

Node ID	Call-sign	Location
4338	KE4TTE	Orlando
4339	N9TZN	Mishawaka
4348	KB4KDL	Portland
4350	W9DXN	Dixon
4360	W1CDO	Bellevue
4363	K9IA	Paxton
4370	W8HDU	Lima
4373	K8DAA	Holland
4376	KT4PA	Port St. Lucie
4377	W20EM	Springfield
4380	W9BCC	Wausau
4383	WB8COX	Satine
4385	K2SGS	Highland
4386	KG4VQB	Jacksonville
4397	K4RCC	Cullowhee
4400	KC8NCE	Grand Haven
4402	N2CJE	Bay Shore
4405	WB9QEN	Milwaukee
4410	N90IG	Union Grove
4412	K9HF	Mansfield
4415	WA4PLT	Freehold
4419	WA3ITR	Wellesley
4420	W9SH	Dubuth
4427	W2MKB	Coconut Creek
4428	K42TSV	Milan
4430	K9DRF	Peoria
4435	KB8DOA	Miami Beach
4439	WB3KAG	Bridgewater
4440	KB3HF	St. Peters
4450	N8DNX	Stutsmanville
4451	N9GMT	New Berlin
4456	KB2DZR	Brooklyn
4460	WB8NXP	Southfield
4461	K2EAG	Lockport
4469	WA2JSB	West Orange
4477	KF4DWV	Greensboro
4480	K1IMD	Eastern Long Island
4490	WB2C1K	West Hills
4494	KC6HUR	Sylmar
4499	AB9D	Plainfield
4502	W8HP	Beverly Hills
4510	KD4Z	Orlando
4512	N9VMR	Chicago
4513	KC2CWT	Carmel
4516	W4WWM	Madison
4521	KB2TZR	Vernon
4523	W8AK	Dayton
4528	K3PHL	Philadelphia
4529	K8RPT	Maybee
4530	K4KSA	Tampa Bay
4537	N3HVC	Lake Worth
4538	WB2JPQ	Portable
4540	K0JPR	Lees Summit
4542	WA3KOK	Clarksville
4544	N2OKO	Pine Brook
4548	KG4GQO	Boca Raton
4549	KB0XM	Fargo
4550	W4DOC	Atlanta
4554	KD4KTO	Morehead City
4556	K8BYI	Grosse Pointe
4572	K2CAD	Sedden
4574	KB200J	Elizabeth
4579	K1RFD	Ridgefield
4590	N1HUI	Branford
4595	KD4RAA	Raleigh
4596	W5NRU	Ellisville
4597	N8XHZ	Trifin
4598	W2SB	Fredonia
4606	N9GMT	Milwaukee
4610	WA1INV	Framingham
4613	N9GVU	Mishawaka
4617	KO1CY	Fairhaven
4620	N3JMD	Drexel Hill
4622	W2VER	Vernon
4629	WB4TCL	Pensacola
4630	N9EP	Barrington
4640	N5LEZ	Wichita Falls
4647	N4BSA	Clearwater
4650	KA1UAG	West Lebanon
4654	AF1JR	Clearfield
4655	WA9EOC	Anderson
4658	N3SHM	Philadelphia
4660	K4L	Murfreesboro
4663	N1LFE	*NEW-ENG*
4664	N3EHL	Cherry Hill
4665	KB2RPF	Freehold
4666	K2MTB	New Paltz
4668		

Node ID	Call-sign	Location
4912	N4MCD	Lumberton
4922	N2FCC	Union
4923	KB2ERJ	Camillus
4925	KC2EUS	Gloversville
4927	W9BIF	Goshen
4930	W1ET	Hanover
4935	W2NJR	Astbury Park
4940	N9TSW	Des Plaines
4943	KB4ZIN	Williamsburg
4945	KY4K	Henderson
4948	N3CB	Plymouth Meeting
4950	W4VM	Huntsville
5447	M1SJK	Kingston Upon Hull
5450	GB3PZ	Manchester (UK)
5452	G4JBX	Tamworth
5470	8P6AW	Bridgetown
5474	LA8DR	Sandnes
5480	KJ7YE	Eden
5483	2E18FH	Wellingborough
5510	MM0GEQ	Edinburgh
5514	G0VXN	Freckleton
5515	DB0VOX	Nuremberg
5520	KC4SFA	Key Largo
5530	KE6YRU	Oceanside
5540	KA2AEP	Mt Freedom
5550	KD7PSG	Bellingham
5560	N7TGB	Reno
5562	GB3IR	Richmond
5567	G1SSL	Didcot
5570	WB6GVO	San Luis Obispo
5580	KF5RH	Ardmore
5590	N9LKH	Milwaukee
5600	GB3LV	London
5610	K6VGG	Los Angeles
5620	WA7GIE	Salt Lake City
5630	WM5D	Rogers
5670	W7GMC	Great Falls
5678	G8UVE	Burnley (Test)
5690	WE8N	Warren County
5700	WA4RYW	Knoxville
5708	GB3XN	Langold
5710	WA4EVJ	Ft. Pierce
5720	NG5T	Lafayette
5740	WA6OUR	Sammamish
5770	KC4VQZ	Richmond
5780	WB7AWL	Oregon City
5799	SK4SO/R	Leksand / Mora
5800	K2GXT	Rochester
5820	KG6AHV	Fairfax
5822	D80RTD	Ingolstadt

Node ID	Call-sign	Location
5826	G4FLY	Reading
5850	KJ6W	Palmdale
5852	2E0TWS	Sheffield
5857	G0SXC	Whalley
5860	K7SPG	Seattle
5870	KC0EFC	Olathe
5883	E17MLR	Waterford City
5890	WB2RYB	Malone
5904	G0NWE	Runcorn
5910	N3CJG	Ocean City
5920	N1JBC	Johnston
5930	K2CIB	Nyack
5933	G7PFT	Stafford
5939	GM3ZXG	Greenock
5960	N1BOW	Niantic
5973	G4EID	Southport
5990	K7CWA	Mesa
5994	M1LOU	Barnsley
6000	VK2RBM	Sydney
6010	VK2RMP	Wollongong
6020	VK2RMB	Terry Hills
6040	VK2RTZ	Newcastle
6050	VK2RCZ	Sydney
6060	VK2RAG	Gosford
6079	VK3RFY	Hillside, Melbourne
6100	VK6RNC	Perth
6110	VK1RBM	Canberra
6184	ZL4DM	Dunedin
6200	VK6RFM	Perth
6209	VK7NAU	Launceston
6210	VK2TTA	Wahroonga
6211	VK2DCL	Bathurst NSW
6214	VK5ZSN	Adelaide
6220	VK2RIC	Lismore
6222	VK2BGL	Southern Sydney
6230	VK2RMR	Mt Riverview
6233	VK2DOR	Scone
6240	VK2RS	Berridale
6250	VK2ROT	Paddington
6260	VK2RWG	Wagga Wagga
6265	VK4RFT	Nerang
6285	ZL2KS	Blenheim
6288	VK2RCT	Campbelltown
6300	VK3RMC	Melbourne
6310	VK3RWA	Western Victoria
6320	VK3RRU	Merbein
6330	VK3RSP	Mt. Martha
6340	VK3DRB	Mt. Waverley, Melbourne
6350	VK3RMH	Melbourne
6360	VK3RQH	Glen Waverley

Node ID	Call-sign	Location
6363	VK2RGN	Goulburn
6370	VK3RSR	Swan Hill
6380	VK3RNE	Albury-Wodonga
6390	VK3RTL	Melbourne
6391	VK3RIR	Rosebud
6402	VK4RXG	Browns Plains
6405	VK4JAA	Gold Coast
6406	VK4ACN	Brisbane
6408	VK4RBS	Bayside
6430	VK4CCV	Brisbane
6444	VK4RAT	Townsville
6450	VK4RMN	Mackay
6493	ZL1TN	Howick, East Auckland
6499	VK3RSR	Melbourne
6500	VK5RAH	Adelaide Hills
6510	VK5RAC	Port Lincoln
6527	VK2IRL	Coffs Harbour
6600	VK6AMS	Karratha
6610	VK6RAL	Albany
6616	VK7TAX	Ulverstone, NorthWest
6620	VK6XAA	Collie
6625	VK2EVB	Coffs Harbour
6700	VK7TAX	Mt. Barrow, NorthEast
6702	VK4RGC	Gold Coast
6710	VK2ZY	Tea Tree
6722	VK3HEG	Ballarat
6741	VK4RBM	Mackay
6772	VK6RVP	Perth (Victoria Park)
6782	VK4RAI	Ipswich
6793	ZL2AS	Haslings
6794	VK3RLP	Frankston
6800	VK8ZMA	Darwin
6875	VK5WSR	Millificent
6887	HL9NP	Ichon II Dong, Yongsan
6889	VK4RTW	Toowomba
6900	ZL3TMB	Christchurch
6920	ZL2WKI	Palmerston North
6931	ZL2VH	Upper Hutt
6943	ZL2KO	Feilding
6950	ZL1BO	Auckland
6973	VK4RAR	Rockhampton
7000	J73D	Roseau
7008	WP4NAT	Mayaguez
7299	PJ2BR	Willemstad
7999	ZF1DG	Savannah Meadows
8000	SK6BA/R	Mark
8010	SM4VBO	Falun
8030	SK7HR	Nassjo
8045	XE2NLI	Linares
8050	SK6QW	Gotene

Node ID	Call-sign	Location
8066	7J1YAA	Meguro-ku
8069	JL3YKH	Hirakata
8080	NO1AK	Fort Collins
8090	LA9XR	Heggedal
8120	WA6BAI	Visalia
8130	KG4SVX	Palm Bay
8170	W6RHC	Chico
8179	JP1YIS/R	Shinagawa-ku
8190	N9TO	Westmont
8200	7J1YAB	Ota-ku
8220	WA7ABU	Salem
8240	KRGWP	San Carlos
8250	KD5QYV	Abbeville
8260	KB2ZAK	Crescent City
8270	K4DBX	Hatteras
8274	XE3NO	Oaxaca
8300	ZSSHAM	Durban
8307	JP1YJC/R	Aoba-ku
8310	KB6KJX	Bartlesville
8330	WA4JRJ	Seneca/Clemson
8332	JQ1YEG	Meguro-ku
8380	W9FEZ	Fort Wayne
8390	KB6KJX	Ebensburg
8410	WB6TC	Oakland
8420	K6BIV	Mt. Diablo
8427	ZS6QRK	Pretoria
8440	W5DEL-2	Oklahoma City
8520	N2TLD	Lake Grove
8549	JM1KGA	Shinagawa-ku
8550	AA8CC	Buckhannon
8555	ZS4B	Harrismith
8570	K1DWU	Selden
8600	P12EHV	Eindhoven
8620	P16EHN	Eindhoven
8632	JQ1YFK	Minamikoma
8654	W7RAT	Cannon Beach
8689	XE3BAJ	Tapachula
8700	ONOGRC	Gent
8710	KD5KTB	Enid
8720	WB5UGT	Houston - SGLS System
8730	KF6FKK	San Francisco
8749	JA1DPL	Aoba-ku
8760	AF4O	Bolivar
8770	KB7ZPL	Vancouver
8780	KD6HWU	Corvallis
8838	KC4AAC	Palmer Station
8930	KB8WYT	Scottsbluff
8950	MOHBK	Ascot
8952	XE1RCS	Ciudad de Mexico
8969	CA3JCQ	La Reina

EchoLink

Developed in early 2002 by Jonathan Taylor K1RFD, Edholink is a computer program using the Voice-over-Internet Protocol to establish long-distance communications (DX). The program has spread rapidly among the ham community and is today used by over 120,000 radio amateurs in 150 countries.

Instead of using ionospheric layers to establish long-distance communications, K1RFD suggested to amateurs to use the Voice-over-Internet Protocol, using the Internet in combination with RF linking and especially with VHF and UHF FM transceivers to work other amateur stations.

EchoLink has four main user groups

Repeaters

(Eg, ZL3CAR-R) where a computer is connected to a local repeater by radio and any number of people in range of the repeater can use the system.

(Eg, ZL2VBC-L) this normally means that there is a simplex radio link at the remote station, normally less range than a repeater station.

Home stations

(Eg, ZL3CAR) a ham's computer is connected to the Internet, normally this is a home station. Using headphone and a computer style microphone (no ham gear is required, just a call-sign).

Conference servers

(Eg, *ZL1VK*) these are just a computer with a very fast Internet connection, no radio gear is required by a server. These servers allow many stations to connect together.

The Papakura Radio Club operates an EchoLink conference server, *ZL1VK* (node 65001). Make sure you connect on Sunday nights from 7pm (New Zealand time) onwards. This server can be used to link computers, simplex radio links and repeater for running

local, nationwide or international nets. It is available for both open nets or private nets.

Operating Guidelines

Usual operating practice on EchoLink is to operate just as if you were on amateur radio. If any link station (call-sign-L) or repeater station (call-sign-R) are connected to the conference, you *are* on the radio. Be aware that other users may be anywhere in the world. Please use commonsense and courtesy.

Specifically, pretend you are on a busy repeater. That means:

- Identify with your call-sign now and then. You don't need to ID every transmission.
- Leave a pause of a few seconds between transmissions. This gives others a chance to break in. It also lets linked radios and repeaters drop out, so they don't get timed out.
- If several people are active in

conversations, consider turning it over to one specific station at the end of each transmission. Don't consider this mandatory, though. If there is a logical next person to speak, let that person speak. If not, then a simple rule is to rotate speakers in a fixed order. (The on-screen station list makes this easy. It is kept sorted with the most recent speakers on top. So just turn it over to the station on the bottom, or the lowest station who is actively participating.)

- If you want to have a long conversation with one other station, and the subject is not going to be interesting to others, consider dropping out of the conference and connecting directly. If you talk about something interesting, please stay on the conference.
- For more information and a copy of the software, check out any of the following links: <<http://www.echoLink.org/>>; <<http://www.hamradio.co.nz/>>; <<http://www.qsl.net/zl1vk/>>; <<http://www.qsl.net/zl2ufi/>>.



What is ARDF?

In simple terms ARDF is looking for a transmitter. In IARU Region III ARDF is played on 80 m and 2 m.

The competition would normally be in a rural area, preferably wooded valleys. Within this area are placed five transmitters that have to be found by the competitors. A sixth transmitter is usually provided at the finish line to help lost competitors find their way home.

Each transmitter will be keying a unique identification code in the form MOE, MOI, MOS, MOII, MO5. On VHF this will be MCW and CW on HF. These correspond to transmitters numbered one through five.

At the competition there may be several classes of competitor, not all classes are required to find all the transmitters.

Contestants are free to find the transmitters in any order they wish.

There is a time limit set for the course. Any competitor who has not finished within this time is disqualified. This time limit is set by the organizing group and takes into account the number of competitors, the terrain and the length of the course. IARU Region III rules recommends that it should be 100 to 140 minutes for a 4-7 km course.

The five transmitters on the course operate sequentially on a common frequency. Each transmitter will operate for one minute and then be silent for four minutes, during which the other four transmitters will operate.

In ARDF the transmitters are not usually "hidden", and in fact a competitor is only required to find the control point, which will be within 2 m of the transmitter. Figure 1 shows a typical control point.

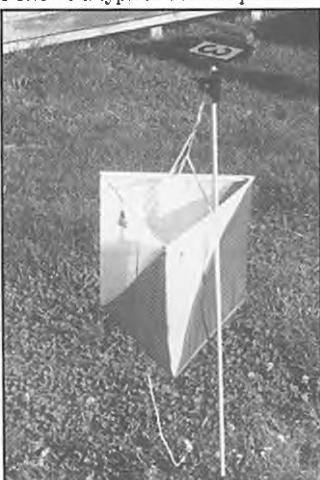


Figure 1.



Figure 3.



Figure 4.

Included at the control point is a "punch" that is used to mark your card to prove that you have visited the control point.

At each transmitter a referee will be sited to ensure there is no collusion between competitors as ARDF is an individual sport. Also the referee will ensure there is no "foul play", etc.

The "winner" of the event is the competitor who finds the most number of transmitters for their class in the shortest time.

What is needed to participate?

That depends a bit on you and on the course. It is possible to use a simple handheld. Any form of directional aerial can be used for ARDF, additionally an attenuator and a method of accurately determining signal strength would be useful.

As the level of competition becomes "keener" your equipment needs to become more refined. There are a number of commercial receivers available at a range of prices. Most of these receivers provide attenuators to cover a wide dynamic range and audible and visual strength indicators.



Figure 2.

Figure 2 shows a Japanese ARDF receiver. This is an excellent commercial design packed full of features. The unit is available from Apex Communications.⁽¹⁾

A full set of equipment is available from Australia from Ron Graham.⁽²⁾ Figures 3 and 4 are a couple of view of Ron Graham's VHF receiver. This is an AM dual conversion superhet based on the MC6632 chip. It is tuneable

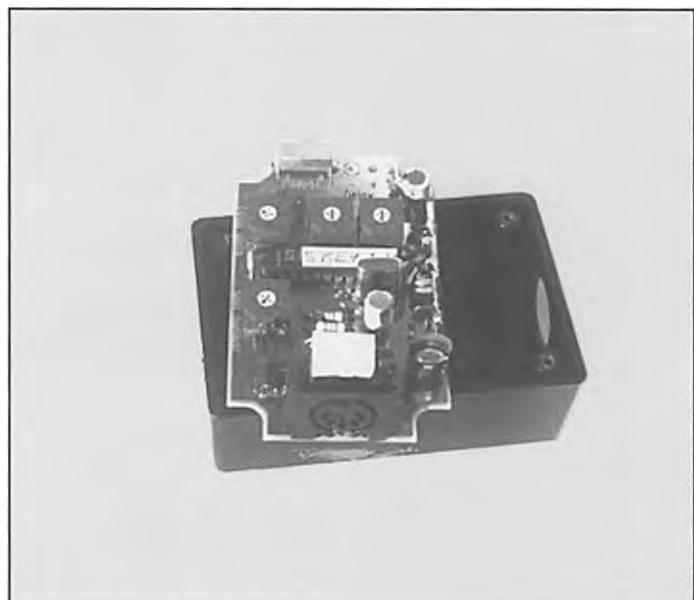


Figure 5.

over the bottom part of 2 m and includes an audio signal strength indicator. The antenna is a modified HB9V.

The Auckland VHF Group⁽³⁾ has available a microprocessor key that will meet most requirements (Figure 5). This was designed to interface with handhelds to provide Clubs with a quick and easy way to provide VHF ARDF transmitters. It

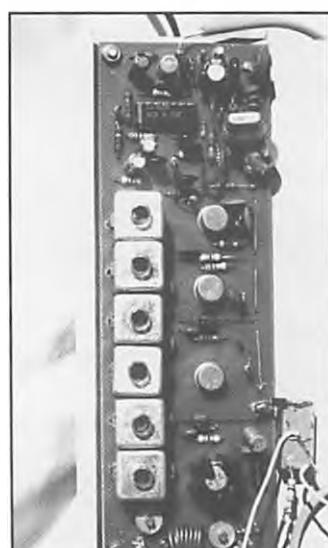


Figure 6.

also includes an output for keying a 80 m transmitter.

Figure 6 shows a typical 2 m transmitter that can be used as the hidden transmitter.

How fit do I need to be?

If you can walk 5 km then you will be able to compete in club events with a degree of success.

As the level of competition increases, so must your physical "prowess". To become a Regional or World Champion you should expect to become very much more athletic.

For most people there is a great amount of participation and fun that can be had between these two extremes.

Happy ARDF

References

1. Dave Walker, Apex Communications, Napier. Telephone (06) 876-5014.
2. Ron Graham Electronics, Box 323, Sarina, Queensland 4737, Australia.
3. Auckland VHF Group, Box 10-138, Dominion Road, Auckland 1030.



One of the many facets of Amateur Radio is operating in a contest. This is basically attempting to make as many contacts as possible in a given length of time. It's a great way to improve your operating skills and to prove the ability of your station for making contacts while having some fun. Depending on the rules of the specific contest, those contacts may be on one band, or all the bands (generally WARC bands excluded) and the mode can be Phone, CW or Digital.

In most overseas contests, only one contact with each station on each band is permitted during the contest period. However, in New Zealand, due to the relatively low number of amateur radio operators in the country, the total contest operating time is often broken into contest periods, typically of one hour. The same station can be worked in each new period. This helps keep the level of interest and activity up on the bands.

For the newcomer to contests, getting started requires nothing more than to read the rules for the particular event and after establishing contact with another participant in the appropriate or chosen mode, exchange the required information. This exchange of information usually includes an RS(T) report and a number starting with 001 and increasing by one for each contact. This incrementing number is by no means the only method used and other reports may require your CQ or ITU Zone Number, your age, your name or your NZART Branch number. The idea is to generate a report that can be verified by the receiving station and therefore complete the QSO.

There are basically two contest operating methods:

Running—select a clear frequency (if possible), call CQ Contest on Phone or CQ Test on CW and answer all callers.

Search and Pounce—tune the band(s) in use and answer each CQ you hear being called.

It goes without saying that a station with efficient antennas is going to be hard to beat, but even with a simple dipole, very good results can be obtained. After a few attempts, the incentive to improve antennas, equipment and operating skills will be great.

Another way to break into contest operating is to join a group that participates in contests such as Branch teams in the Jock White Memorial Field Day Contest or groups that take part in international contests, such as the group at Auckland Contest Group or the

Quartz Hill Group in Wellington. These groups tend to take part particularly in the premier international contest—the CQ World Wide SSB and CW contests on the last weekends of October and November. These contests are sponsored by CQ ham radio magazine, which also sponsors other contests.

To make closer contact with our neighbours across the Tasman, participation in a number of Australian contests is encouraged. Some of the Australian sponsored contests are; the John Moyle Memorial Field Day—third full weekend of March, trans/Tasman 80m and 160m Contest in May, June and July, Remembrance Day Contest—weekend nearest 15 August 0800 Saturday—0800 Sunday.

Contests organised by NZART.

Jock White Memorial Field Day

Last full weekend in February, 40/80m Phone/CW, Branch Field stations.

Thelma Souper Memorial

Refer to WARO column.

Sangster Shield Contest

Third full weekend in May 80m, CW only, QRP and new operators.

Memorial Contest

First full weekend in July, 80m Phone/CW/both, commemoration.

Waitakere Sprints (Sunday)

Last in July/first in August, 80m Phone, CW separate, one hour sprints.

Doug Gorman Memorial Frequency Measuring

First Monday September, 80m, Measure three frequencies.

Nostalgia Night

Second full weekend September 80m AM/CW old or WW II equipment.

Oceania Contest

First and second full weekend October, All band Phone (first weekend) and CW (second weekend).

Straight Key Night

First Sunday November, 80m CW, straight keys only.

The Thelma Souper Memorial is organised by WARO and the Waitakere Sprints are organised by the Western Suburbs Radio Club.

Full rules of the contests are given below and these are also available on the NZART Contest

website <<http://www.nzart.org.nz/nzart/update/contests>>. Any changes to the rules plus dates etc. are given in the Contests column in *Break-In*. The calendar associated with the column lists the international and local contests for the coming months and gives full details of the more popular events.

to contesting are

Contest Calendars

- <www.sk3bg.se/contest/index.htm>.
- <www.arrl.org/contests>.
- <www.hornucopia.com/contests/>.
- <www.hamradio.de/contest>.

CT Log Programme

- <www.k1ea.com>.

KA9FOX Contest Score

Rumours

- <www.qth.com/ka9fox/scores.shtml>.

CQ Worldwide Contests

- <www.cq-amateur-radio.com/awards.html>.

Contest Resources & Information

- <www.contesting.com>.
- <www.qsl.net/cwsp/k1ar92e.htm>.
- <<http://oh2aq.kolumbus.com/dxs>>.

Announced DXpeditions

- <www.usats.com/ce-dx.html>.

As Contest Manager, I am happy to provide full information on almost any contest held world-wide. Enclose a self-addressed, stamped envelope with your request.

Contests can be fun. Give it a go.

Jock White Memorial Field Day Contest

Last full weekend of February

This annual contest has been named to honour Jock White ZL2GX, NZART Contest and Awards Manager for over 40 years, for the service that he gave to NZART during that time. This contest, like many others, results from Jock's initiatives.

Home stations are now valid contacts in this contest and are encouraged to have a minimum of 50 Phone or 25 CW QSOs and to submit a log entry. The minimum numbers apply to the band being used or 50 and 25 on each band if on both bands.

This contest is primarily to test Branch organisation and weld a team of workers together. There is work for all members—XYLs, OMs, YLs and SWLs.

Of special significance

1. The term "Branch Points" replaces the more common term "multiplier" in these rules. Refer rule 14.2. There is no change in concept, just a name change.

2. The minimum number of contacts for a field station to qualify as

Some of the many websites related

"Branch" points for other stations is 50 on Phone or 25 on CW. Refer rule 14.2.4.

3. Restrictions applying to the use of linear amplifiers are given in rule 7.1. Complaints about the use of linears will be investigated.

4. Team leaders should ensure that all of the team understands the rules and that newcomers are assisted with their operating technique.

5. Stations should be operated within the amateur "codes" as regards procedures, equipment, operating speeds etc.

6. Have you considered entering the QRP section?

7. Rule 15.4 has been amended so that signing of logsheets by the operator is not compulsory. This has been changed because of difficulties in doing this with computer logging. However, it is essential that the operators check the log after their period of operation.

8. Rule 16.2.2 has been amended to include e-mail address alongside of certificate address. Results can be sent to the e-mail address given.

Rules

1. When: The last full weekend in February each year.

Saturday: 0200-1100, 1700-2400 UTC. (1500-2400 NZT)

Sunday: 0000-0200 UTC (0600-1500 NZT).

2. Bands: 40 and 80 metres.

2.1 Simultaneous operation on 80 and 40 metres is permitted provided that only one receiver/transmitter is operational on any one band at any one time.

3. Modes and contacts:

3.1. Modes to be used are Phone to CW. Phones to CW contacts are not permissible.

3.2. Home stations will identify themselves as such and field stations will identify themselves as such.

4. Sites/shelter: All equipment (except generators) to be under the same shelter. The shelter to be a tent (one or more tents within 10 metres of each other) erected on the weekend of the contest, mobile home or other vehicle (moved on to the site on the weekend of contest).

5. Antennas: for field stations, to be raised no earlier than 2300 UTC on the Friday (1200 NZT on the Saturday). This takes into account that some may choose to erect antenna supports while others may use natural or standing supports, eg. hills, trees, towers, buildings, etc.

6. Power: for field stations must be from a source independent of the AC or DC mains—ie all power

must be from batteries/engine alternator/vibrator/solar source/wind generator etc.

7. Contest sections: One section of the contest may be entered by any one station although that station may qualify for more than one section.

7.1. Open sections: The maximum output power from the transmitter final amplifier must not exceed the legal limit given in the Radio Regulations. Linear amplifiers may only be used to increase the power output of low power transmitters (eg 5-30W) to the equivalent of a typical transmitter (ie nominal 100/150W). These sections are for stations in the appropriate region or category. The trophies stated will be awarded to the highest scoring station in the section. Certificates will be issued to the winners of each section plus placegetters as warranted by entry numbers.

Field stations

7.1.1. Northern Region Section (Montgomery Cup)

7.1.2. Central Region Section (Patea Shield)

7.1.3. Midlands Region Section (ZL3/4 Trophy)

7.1.4. Southern Region Section ("4" Trophy)

7.1.5. Single Operator Section—operation unaided by any other person.

7.1.6. CW only Section—operation on either band or both bands CW only.

7.1.7. Phone only Section—operation on either band or both bands Phone only.

7.1.8. Other Power Section—power source solar, wind generator, water etc.

7.1.9. 80 Metres only Section—operation on 80 metres only.

Home stations

7.1.10. Northern Region Section.

7.1.11. Central Region Section.

7.1.12. Midlands Region Section.

7.1.13. Southern Region Section.

7.1.14. Overseas Section.

A certificate will also be awarded to the overall highest scoring home station.

7.2. QRP section (W. M. Hall Memorial Cup): The maximum output power from the final amplifier must not exceed 5 watts.

8. Operators: The station should be operated by members of NZART except that operators being introduced to NZART and helpers need not be members. Indicate accordingly on the summary sheet.

9. Mobile stations: are eligible for contest purposes as field stations for contacts made from within one branch area only. The branch number used will be that of the area where the station is operated.

10. Cypher exchanges:

10.1. The cyphers given will consist of report and serial number/branch number. eg. 59001/11 on Phone and 599001/11 on CW.

10.2. Serial numbers will commence at 001 and increment by one for each contact.

10.3. Where simultaneous operation is used a separate serial number series will be used for each band.

10.4. Phone and CW numbers on one band are from the same number series.

11. Branch number: is the NZART Branch number for the area in which the station is operated except that stations may move a few kilometres from their home area to a suitable location. eg. city to country. Home stations will use the branch number 00.

11.1. If the chosen location is within another Branch area care must be taken not to clash with the other Branch station. The onus is on the "moved" station to ensure that there is no clash.

11.2. The Branch number of branches in recess may be used.

12. Contest periods:

12.1. There will be 18 periods between the even hours. eg. 1500-1600, 1600-1700, etc.

12.2. Contacts may be made with any field, ZL home or "overseas" station (refer rule 13) once each period on each mode on each band. ie. on 80m: once on Phone and once on CW, and on 40m: once on Phone and once on CW, each period.

12.3. The contacts with any one station on Phone and CW on one band in a period, or on one mode at the end of one period and commencement of the next, may not be sequential except where 5 minutes have elapsed between those contacts.

13. "Overseas" Stations: are those located outside the New Zealand mainland, and in the South Pacific region. The prefixes that are eligible are: all VK, ZL5, ZL7, ZL8, ZL9, A3, FK, FO, FW, H4, P2, YJ, ZK1, ZK2, ZK3, 3D2, 5W.

14. Scoring: The final score will be the total of contact points (80m + 40m) x total Branch Points.

14.1. Contact points:

ZL Phone 3 per contact

ZL CW 5 per contact

Overseas Phone or CW 10 per contact

14.2. Branch Points (multiplier):

14.2.1. One Branch point is claimed for each Branch contacted on each band and mode. eg. One Branch point for contacting Branch 01 on 80m phone, two Branch points for contacting Branch 01 on 80m Phone and 40m Phone or 4 Branch Points for contacting Branch 01 on 80m Phone and CW plus 40m Phone and CW, etc.

14.2.2. Only one station from a branch may be claimed as a Branch point for a mode on one band. However, where a Branch has more than one station active different stations contacted may be claimed for the other band or mode.

14.2.3. Stations using the same Branch number may contact each other for contact points but not for Branch points.

14.2.4. To qualify as Branch points for other stations, a field station must have a minimum of 50 contacts on Phone or 25 contacts on CW on each band that the station is active on. eg. if active on 80m Phone, must have 50 contacts to count as one Branch point, if active on 80m Phone and CW, must have 50 contacts on phone and 25 contacts on CW to count as two Branch points, etc.

15. Logs:

15.1. One log per station in order of time, except that where simultaneous operation is used one log per band is required.

15.2. Head each page with the call, Branch or HS for home station and the page number.

15.3. Log sheet layout order: date/time/station contacted/CW or PH/band/cypher sent/cypher received. NZART log sheets are preferred. Entry in the points column is not required as totals are done from a summary, but the points column can be used for checking purposes. A total of PH/CW/DX contacts on each page is useful for counting purposes.

15.4. Use a separate logsheet per period except that where there are very few contacts per period, several periods (ruled off between periods) can be on one sheet. The operator (not logkeeper) must check the log.

15.5. Highlight or underline each contact claimed as a multiplier.

15.6. Check for accuracy and rule through any duplicate contacts in a period.

16. Summary:

16.1. The summary and final score details are to be on the "Jock White Memorial Field Day" summary forms provided to Branch secretaries each year and also available from NZART HQ.

16.2. Summary Sheet 1 contains:

16.2.1. call-sign used, Branch name and number or HS for home station.

16.2.2. postal address for certificates and e-mail address for results.

16.2.3. section entered (one only).

16.2.4. names and calls of operators/assistants.

16.2.5. Number of 80m Phone contacts.

Number of 80m CW contacts.

Number of 80m overseas contacts.

16.2.6. Number of 40m phone contacts.

Number of 40m CW contacts.

Number of 40m overseas contacts.

16.2.7. Calculation of contact points.

16.2.8. Branch points claimed for 80 Phone.

Branch points claimed for 80 CW.

Branch points claimed for 40 Phone.

Branch points claimed for 40 CW.

Total Branch points.

16.2.9. Total points claimed (contact points x total Branch points).

16.2.10. List transceivers/generator etc/power output.

16.2.11. Certification of power output and rule observance by two operators (except for single operator stations).

16.3 Summary Sheets 2 and 3 contain a table for listing the CALL-SIGN of the station claimed as a Branch point for each branch on each band and mode. Count the number in each column and transfer the figure to summary sheet 1.

17. Closing Date: Logs should be posted to reach Stan White ZL2ST 54A Auckland Road, Greenmeadows, Napier by the Saturday which is four weeks after field day Saturday. eg. If Field Day is held February 24/25, logs to be received by 24 March (in a non-leap year). Late logs will not be eligible.

NZART Sangster Shield Contest

Presented to the amateurs of New Zealand by Mr R. Sangster in 1927, the Sangster Shield is for annual competition to be won by the most efficient station. In this respect it should be pointed out, that in addition to the efficiency of the equipment used, the efficiency of the operator is of the utmost importance. To win this contest marks an operator as one who not only knows

how to obtain the most effectiveness from low power but also one who is most proficient in the art of telegraphic communication.

Rules

1. **When?** Third full weekend of May each year, between the hours of 2000 NZST and 2300 NZST on each evening. The maximum period of operation will be six hours.

2. **Power:** To compete for the Sangster Shield and Trophies the output of the transmitter *must not exceed 5 Watts*.

3. **CW to CW contacts only** are permitted.

4. All operations must be in the 80m band.

5. Contacts:

5.1. QSOs with any one station are permitted once only each half hour, based on an "even half hour" basis, eg 2000 to 2030, 2031 to 2100 etc.

5.2. It is not permissible to claim QSOs with the same station "twice running", i.e. at the end of one half hour period and at the beginning of the next, unless a different station is contacted by one of the two stations between QSOs, or a time delay of at least five minutes elapses between QSOs.

6. All ZL entrants must be financial members of NZART, except for first time entrants qualifying for the Transistor Trophy.

7. All Radio Regulations must be observed.

8. To give QRP contestants a fair chance (particularly with DX stations) higher power stations are requested to operate above 3530 kHz.

9. Logs:

9.1. Quarto or A4 size paper—preferably NZART log sheets.

9.2. Data in this order: Date, Time, Station Call-sign, Cypher Sent, Cypher Received, Points Claimed.

9.3. On a separate sheet a summary to show:

9.3.1. Entrant's callsign, name and address in BLOCK LETTERS.

9.3.2. Number of contacts with stations using 5W or less.

9.3.3. Number of contacts with stations using 6W or more.

9.3.4. Number of contacts with overseas stations.

9.3.5. List of different branches worked with the number and name of each branch as given in the Call Book (in branch number order) plus the callsign of the station claimed for that branch.

9.3.6. Total score—(total points multiplied by the number of branches worked).

9.3.7. Description of equipment, antenna and output power used.

9.3.8. Signed declaration that all contest rules have been observed.

10. Cypher system:

10.1. RST followed by branch number followed by power output—eg 569/11/04. indicating a 569 report; branch 11; and power of 4W. Power will always be given as two figures: over 100W will be given as 99, while below 10W will be preceded by 0.

10.2. Overseas stations are required to give RST plus a serial number beginning at 001.

11. Scoring:

For ZL entrants:

11.1. ZL to Overseas—10 points

11.2. ZL to ZL with Power given as 5W or less—5 points.

11.3. ZL using 5W or less to ZL with Power given as 6W or more—1 point.

11.4. ZL using 6W or more to ZL with Power given as 5W or less—1 point.

11.5. ZL using 6W or more to ZL with Power given as 6W or more—not permitted for contest purposes.

For Overseas entrants:

11.6. Overseas using 5W or less to ZL with Power given as 5W or less—10 points.

11.7. Overseas using 5W or less to ZL with Power given as 6W or more—5 points.

11.8. Overseas using 6W or more to ZL with Power given as 5W or less—5 points.

11.9. Overseas using 6W or more to ZL with Power given as 6W or more—not permitted for contest purposes.

11.10. Overseas to Overseas—not permitted for contest purposes.

Final score is total points multiplied by the Number of Branches worked. Note: Contacts with a Contestant's own Branch are OK for points but are not to be counted as a multiplier.

12. *Mobile or Mobile/Portable operation will be permitted for New Zealand stations*, however, the station must be operated from one location each evening. This means a station could operate from one location the first evening and another location on the second evening. The station must use the Branch number applicable to its location at the time. The entrant may combine both logs for contest purposes, but the logs must indicate their locations on both evenings. In this case then only one branch (either) is to be eliminated as an "own Branch" multiplier. Overseas Stations may be mobile or portable, but a maritime mobile station must be outside New Zealand's territorial waters to be counted as a DX contact.

13. **Discounted Contacts:** The Contest Manager expects that participating stations will provide a fair chance for all entrants to make contact with them. While it is not intended to discourage contestants from operating only part of the full contest it is considered that at least 20 contacts should be made and station operation should be over at least 3 half hour operating periods. Stations considered to have worked less than this requirement will have their contacts and branch multiplier contribution deducted from contest logs.

14. Awards:

14.1. *Sangster Shield*: to the highest scoring entrant using 5W or less and observing the rules as enumerated. (Note that all first time entrants qualifying for the Transistor Trophy will also be eligible for the Sangster Shield Award)

14.2. *Transistor Trophy*: to the highest scoring entrant using 5W or less and observing the rules as enumerated, but in addition who has been licensed for 12 months or less. Entrants must give Operator's Certificate number together with date of issue.

14.3. *The Arthur Stevens Trophy*: will be presented to the highest scoring South Island entrant using 5W or less. (This trophy is in honour of Arthur, formerly ZL1MT, a very long time stalwart of the Sangster Shield Contest).

14.4. Certificates to the first three entrants using 5W or less, also to the first three "newly licensed" entrants qualifying for the Transistor trophy.

14.5. Certificate to entrant using 6W or more with the highest score.

14.6. Certificates to Overseas entrants with the highest score in their respective call areas.

14.7. Certificate to the branch with the highest aggregate score from three entrants operating in the QRP section. A minimum of three entrants are required to be eligible for this section. The top three scoring entrants for any Branch will automatically be aggregated—it is not necessary for a Branch to send in an entry for this section.

14.8. Logs must be posted to reach the Contest Manager, Glenn Kingston ZL2KZ, 53 Tannadice Street, Wellington 6003, on or before the third Thursday of June.

NZART Memorial Contest

To commemorate those from our ranks who lost their lives in World War 2.

When: First Saturday and Sunday evenings in July. Six operating periods of one hour each from 2000 NZST to 2300 NZST each

evening.

1. Usual contest rules apply.
2. Single operator stations on the 80 metre band.
3. A station may be contacted twice during each operating period—once on Phone and once on CW provided that such contacts are not consecutive.
4. Mobile operation is permitted.

5. Cypher System:

Cyphers must be exchanged and acknowledged before points may be claimed for a contact. The cypher will consist of the RS(T) followed by a serial number starting at any number between 001 and 300 for the first contact and incrementing by one for each successive contact. eg if the first number is 599007, the next contact will be 599008 etc.

6. Scoring:

Phone

One point per Phone QSO.

CW

Two points per CW QSO.

Multiplier

The multiplier is one for each new prefix worked on Phone and one for each new prefix on CW.

Total score

Multiply the total of Phone and CW contact points by the multiplier. eg, for 100 Phone QSOs with ZL1, ZL2, ZL3, ZL4 and ZL6, the score is $100 \times 5 = 500$. For 100 Phone QSOs with ZL1-4 and 50 CW QSOs with ZL1-4, ZL6, VK1-3, W7, the score is $(100 + 100) \times 9 = 1800$.

7. Logs

The official log sheets available from the NZART Business Manager are the preferred log sheets.

Logs must show contacts in correct order of time. Do not group all ZL1, ZL2, ZL3 etc. contacts together.

8. Summary

A separate summary sheet must be completed and attached to the log sheets. This must show the following:

8.1. Call-sign of station and NZART Branch of which a mem-

ber.

- 8.2. Name and full address of operator.
- 8.3. Section in which competing:
 - 8.3.1. Open phone and CW (Memorial Trophy).
 - 8.3.2. Open CW only (Auckland CW Cup).
 - 8.3.3. "Beginners" CW only (Laing-Smith Cup).

Competitors in this section must state the number of their operator's certificate and the date of issue.

- 8.3.4. Low power phone and CW (Mannell Trophy).

- 8.3.5. Home made SSB equipment (Brother John Rodgers Plaque).

- 8.3.6. Phone only (Phil Armstrong Plaque).

8.3.7. Listeners section.

Rules as for the transmitting sections except that only the cypher sent by that station heard should be given. The callsign of the station heard and also of the station being "worked" must be stated.

- 8.3.8. Australian section. Rules as for the Open section.

- 8.4. Brief description of equipment used and power output.

- 8.5. Points summary (see Table 1).

- 8.6. Signed declaration that the contest rules and Radio Regulations have been observed.

9. Submission

All logs to be sent to "Memorial Contest Log", Win Gilbert ZL2GI, 146 Liverton Road, Lower Hutt, to arrive no later than four weeks after the contest date. Electronic logs are encouraged—on disk or by e-mail to <wgilbert@actrix.gen.nz>.

10. Trophies

Memorial Trophy. Donated by NZART in 1946. To be held for 12 months by the competitor with the highest score. Phone and CW may be used but contacts must be phone to phone or CW to CW. Phone to CW or vice versa is not permitted. A miniature is also awarded with the trophy, becoming the winner's personal property.

Auckland Shortwave Cup. Donated by the Auckland Shortwave Club in 1933 for Morse

competitions. To be held for 12 months by the competitor operating CW only, who returns the highest score. Contacts must be CW to CW. Power limit is 150 Watts.

Laing-Smith Cup. Donated by Mr. L. E. Laing-Smith ZL1BO in 1958. To be held by the competitor returning the highest CW score who, at the time of the contest, has held an amateur operator's certificate for no longer than 12 months. Contacts must be CW to CW. Power limit is 150 W.

This is to encourage CW operation amongst new hams. To quote ZL1BO "Any method of inducing or encouraging the new hams to use CW until they are at least proficient" has my support.

Mannell Trophy. Donated by Mrs Mannell in memory of her son, who was killed in an aircraft accident while serving with RNZAF. To be held for 12 months by the competitor using a power not exceeding 10 Watts who returns the highest score. Phone and CW may be used but contacts must be phone to phone or CW to CW.

Ron Gray Memorial Shield. Presented by Mr. And Mrs. D Gray and Jock White ZL2GX in memory of Ron ZL1304, who was a regular competitor in the Listeners' Section, for the highest SWL score.

Brother John Rodgers Memorial Plaque. Presented by a group who appreciated his contribution to the hobby. For the competitor with the highest score using home made SSB transmitting equipment.

Phil Armstrong ZL1BMC (VK7MC) Memorial Plaque. To be held on an annual basis by the competitor with the highest score on phone only. All contacts must be phone to phone.

Waitakere Sprints—2001

The Western Suburbs Radio Club is pleased to announce that the Waitakere Phone Sprint will be held on the last Saturday in July and the CW Sprint will be on the first Saturday in August. The contests are of one-hour duration on 80m, and are open to all licensed amateurs in ZL, VK and Oceania call areas.

Object of the Sprints

The operator's basic goal in the sprints is to make as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with ZL, VK or Oceania stations on 80 during the contest period can be counted, but a station may be claimed only once.

Eligibility

The Waitakere Sprints are open to all licensed amateurs anywhere in the ZL, VK and Oceania call areas. SWL logs will also be welcome.

Contest Periods

Phone 1000 to 1100 UTC, on last Saturday in July

CW 1000 to 1100 UTC, on 1st Saturday in August

Frequencies

Phone: 3.550 to 3.700 may be used.

CW: 3.500 to 3.550 may be used.

Power

In fairness and consideration to others we request that *no linear amplifiers* be used in the contest

Contest call

CQ Sprint, CQ Test or CQ Contest.

Exchanges

Minimum exchange for a valid contact will consist of a serial number, sent and received. The serial numbers must start at 001 and increment by one for each contact made.

Note: Time and signal reports are no longer required.

Awards

Certificates will be awarded to the overall winner and to the best score in each ZL call area and to the best three scores from VK/Oceania. Other certificates may be awarded at the discretion of WSRC.

Special Awards

To encourage contestants to enter both Sprints we have decided to issue a Special Certificate to the entrant with the Highest combined score. The method of calculation will be (Phone points + CW Points) $\times 2$.

All logs received will be considered for this award. To qualify for the multiplied points each log must contain a minimum number of valid contacts, ie. ten (10) for Phone, and five (5) for CW.

Logs

A separate log must be submitted for each Sprint and must be clearly marked Phone or CW.

Table 1. Points summary (insert 0 where mode not used)

	CONTACTS	POINTS	
PHONE		$\times 1 =$	
CW		$\times 2 =$	
CONTACT POINTS			PHONE + CW
NUMBER OF PREFIXES		Attach list of prefixes	
	CONTACT POINTS	PREFIXES	TOTAL
TOTAL SCORE		\times	

Contest logs must show for each contact: call-sign of station worked, serial number sent, serial number received.

SWL logs must show both call-signs in the QSO also both serial numbers.

Logs are to be in the hands of the contest manager, ZL2ALW, by mail to: Waitakere Sprint Contest, 70 Waima Crescent, Titirangi 1007, Waitakere City, or by e-mail (preferred) <zl2alw@post.com>, no later than September 1.

Operator Information

Each log must show the following details.

Mode

Callsign

Name

Address

Operating area (Eg. ZL1,ZL2)

Total Number of contacts claimed
A declaration that the operator has abided by the rules and spirit of the contest.

Any entry which is clearly in violation of the rules or spirit of this contest or which contains an excessive number of duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed) may be disqualified. The decision of WSRC Inc in respect of interpretation of these rules, the granting of awards and disqualifications will be final and no correspondence will be entered into.

Andrew Barnett ZL2ALW
Contest Manager WSRC

Doug Gorman Memorial Frequency Measuring Contest

When?

First Monday in September at 0915 UTC (2115 NZT).

1. Listen to ZL6A on approximately 3900 kHz for instructions on the frequencies that will be used and the procedure to be adopted. All instructions will be given by ZL6A.

2. Read each frequency as accurately as possible. To qualify for an award it is essential to read each of the three frequencies.

3. Post your entry to: Doug Gorman Frequency Measuring Contest, NZART, PO Box 40-525, Upper Hutt.

4. Entries should be sent within seven (7) days, together with details of equipment used and which section entered (eg. John McKim Cup or Norm Edwards Shield).

5. Judging

The degree of accuracy will be judged by subtracting your readings from the official reading. The resultants will be averaged to arrive at a final degree of accuracy.

6. Awards

6.1. John McKim Cup for those using simple direct reading type of equipment such as a receiver using a calibrated dial or LED readout to one decimal place, ie 3900.0 kHz. A simple heterodyne type frequency meter (BC221/LM10, etc), whether commercial or homemade.

6.2. Norm Edwards Shield for those using "sophisticated" equipment which might include receivers with LED readout to two or more decimal places (ie, 10Hz or better). Computer, oscilloscopes, audio generators, etc, used singly or in combination, whether commercial or home made.

6.3. Branch Award certificate to the branch with the lowest average of the three best competitors. If you wish to support your Branch, state your Branch number and name on your entry form.

6.4. Certificates to all those whose average deviation is 200Hz or better.

If you make readings during this activity, but do not wish to have your results published, please drop us a line so we know how many people were interested.

73 de Neil ZL2TNG and Gavin ZL2ACT

Nostalgia Night Contest

Nostalgia Night will be held each year on the second Saturday of September—put it in your diary now. This will give you plenty of time to fish out that old gear, check it out, make any necessary repairs, and then have a night of enjoyment just like the "good old days". Remember how much fun it was to go on the air? Nostalgia Night puts the fun back into Ham Radio. Put in plain language that means: drift, noise, smoke, heat, fading, and other fun things

Haul out that old equipment, dust off the cobwebs, check it over and join in a night of nostalgic fun. This year's contest will be in three sections, catering for the varied interests within the old equipment enthusiasts' ranks:

1. QRP;
2. Military;
3. Open.

The overall winner shall be the entrant having the highest points score which will be published in the following *Break-In*.

When?

Second Saturday in September, with four operating periods—each half an hour:

0700-0745 UTC (1900-1945 NZT);
0745-0830 UTC (1945-2030 NZT);
0830-0915 UTC (2030-2115 NZT);
0915-1000 UTC (2115-2200 NZT).

Equipment

Any rig of the past that uses thermionic valves, be it home made, of military origin, commercial or amateur, no solid-state of SSB type equipment is acceptable for this event.

Cypher

RS(T) plus branch number.

Points

Three points for Phone to Phone QSO. Six points for CW to CW QSO.

Multiplier

Each NZART branch worked (eg, 10 branches worked overall and 30 contacts):

$10 \times 30 = 300$, not 10 branches each period.

ZL1 to ZL3 or ZL4 or reverse multiply by 1.2.

ZL2 to ZL4 or reverse multiply by 1.2.

Total Points

QSO points multiplied by number of branches.

BUT

1. QRP section—if your rig is 5 W or less input, then multiply your score by 1.5.

2. If your rig is of military origin, ie, ZC1, ARC5, 19 SET, then multiply your score by 1.2.

3. Open section—if your rig is other than 1 or 2 but within the power limit no multiplier. The power limit is the legal power limit.

BUT

Only one multiplier may be chosen (eg, military OR QRP—not both).

Repeat QSOs:

These are permitted each operating period on Phone and CW, but no consecutive contacts with the same station.

Logs

Send to: Nostalgia Contest, Mike Digby-Smith ZL1MDS, 6 Baird Avenue, Te Kauwhata, within seven days with the following data.

1. Number of QSOs on CW.
2. Number of QSOs on Phone.
3. Number of different branches worked.

4. Score claimed (points \times branches).

Doug Gorman Memorial Frequency Measuring Contest 2000 Entry Form

Name _____ Call-sign _____

Branch _____

Details of all equipment used:

Make _____ Model _____

Comments _____

Section entered (please tick):

John McKim Cup Norm Edwards Shield Branch Award

Measured Frequencies:

1. _____ kHz 2. _____ kHz 3. _____ kHz

Post entry to: Frequency Measuring Contest, NZART, PO Box 40-525, Upper Hutt

5. Overall score claimed (points in 4 multiplied by section 1 or 2 as applicable).

6. Details of equipment used for the event.

7. Any comments about event or suggestions.

8. Do not send a copy of your log or contacts, just the above information.

9. Have a log of fun on the night.

Mike Digby-Smith ZL1MDS

<mike.ds@paradise.net.nz>

Barrie Vivian ZL2LA

Oceania DX Contest

1. Special notes (2004)

- Electronic logging is now compulsory for logs containing more than 50 contacts (2004 rule change), see rules 12 and 13 for details. While paper logging is still acceptable for a few contacts, it is much easier for the contest committee to get the results out quickly if electronic logs are provided.

- Electronic logs are to be in cabrillo format which is now generated by all of the popular contest logging software (2004 rule change).

- A reminder that Single-Op Single Band logs are to record *all* contacts made by the station—both on the band chosen for the entry and on any other bands (2002 rule change).

- Stations must log a minimum of 10 contacts to be eligible for an award (2004 rule change).

- A new trophy is available for the top Oceania station in the Single Operator All Band CW category (2003 rule change).

- Further information on the contest is available from the Oceania DX Contest website at <www.oceaniadxcontest.com>.

2. Aim of contest

The aim of the contest is to promote HF contacts with stations in the Oceania region (VK, ZL, Pacific Islands and other locations within the IARU "Worked All Continents" Oceania boundary).

3 Contest periods

Phone Contest: 0800 UTC Saturday to 0800 UTC Sunday on the first full weekend in October.

CW Contest: 0800 UTC Saturday to 0800 UTC Sunday on the second full weekend in October.

The object is for:

- Oceania transmitting stations to contact as many stations as possible both inside and outside the Oceania region.

- Non-Oceania transmitting stations to contact as many as pos-

sible inside the Oceania region. There is no penalty for working non-Oceania stations but contacts between non-Oceania stations will score no points or multiplier credits.

- Oceania receiving stations (SWL) to hear as many contest stations as possible both inside and outside the Oceania region.

- Non-Oceania receiving stations (SWL) to hear as many contest stations as possible inside the Oceania region.

5. Bands

160m-10m (no WARC bands).

6. Entry categories

- Single Op—Single operator, all bands or single band. Single operator stations are where one person performs all operating, logging and spotting functions. Only one transmitted signal is allowed at any time.

- Multi-One—Multiple operators, single transmitter, all bands. Only one transmitter and one band permitted during the same time period (defined as 10 minutes). Exception: one—and only one—other band may be used during any 10-minute period if—and only if—the station worked is a new multiplier. Logs found in violation of the 10-minute rule will be reclassified as Multi-Multi. All operation must take place from the same operating site.

- Multi-Multi—Multiple operators, multiple transmitters, all bands. No link to transmitters, but only one signal and running station allowed per band. Note: all transmitters and receivers must be located within a 500-metre diameter area or within property limits of the station licensee, whichever is the greater. All operations must take place from the same operating site.

- SWL—Short Wave Listener (receive only). All bands.

7. Exchange

RS(T) report plus a three or four digit number starting at 001 (or 0001) and incrementing by one for each contact. If necessary, Multi-Multi entries can use a separate serial number for each band.

8. Multiplier

The multiplier is the number of different prefixes worked. Note that the same prefix may be counted once on each band for multiplier credit.

A *prefix* in the letter/numeral combination that forms the first part of the amateur call—the same as the CQ WPX contest definition.

Examples of valid prefixes are N8, W8, HG1, HG19, KC2, OE2,

OE25, etc. Any difference in the numbering, lettering, or order of the same shall constitute a separate prefix. A station operating from a DXCC country different from that indicated by its call-sign is required to sign portable. The portable prefix must be an authorised prefix of the country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: N8BJQ operating from Wake Island would sign N8BJQ/KH9 or N8BHQ/KH9. KH6XXX operating from Ohio must use an authorised prefix for the US eighth district (W8, K8, etc). Portable designators without numbers will be assigned a zero (0) after the second letter of the portable designator to form the prefix. Example: N8BJQ/PA would become N8BJQ/PAA. All calls without numbers will be assigned a zero (0) after the first two letters to form the prefix. Example: XEFTJW would count as XE0. Maritime mobile, mobile, /A, /E, /J, /P, or interim licence class identifiers do not count as prefixes.

Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.

9. Contact points

All entries score 20 points per contact on 160m; 10 points on 80m; five points on 40m; one point on 20m; two points on 15m; and three points on 10m.

Note that the same station may only be counted once on each band for contact point credit.

10. Final score

The final score is the sum of the contact points multiplied by the multiplier (total number of prefixes worked), ie, sum of contact points from all bands multiplied by the total number of prefixes worked on all bands. Remember that the same prefix can be counted once on each band.

11. General Log requirements

Transmitting entries are to submit a log showing the following details for each contact—band or frequency, mode, date, time in UTC, call-sign of station worked, RS(T) and serial number sent, RS(T) and serial number received. Single-operator single band logs are to record *all* contacts made by the station—both on the band chosen for the entry and any other bands. Multi-One logs must be submitted in date/time order.

SWL entries are to submit a log showing the following details for each contact—band or frequency, mode, date, time in UTC, call-sign of "station heard", call-sign of

"station being worked", RS(T) and serial number sent by the heard station. The same call-sign may appear only once in any group of three consecutive entries in the "station being worked" column. Note that in the case of non-Oceania SWL entries, only Oceania call-signs should appear in the "station heard" column.

All duplicate contacts must be shown—*do not* delete duplicate contacts. No penalty will be applied to duplicate contacts.

Although no signed declaration is required, by submitting a log, you are deemed to have made a declaration that you observed the contest rules and operated within the limits of your licence.

12. Electronic Logs

Electronic logs are preferred and are *compulsory for logs containing more than 50 contacts*. Electronic logs are to be submitted in cabrillo format. The abrillo log file must include both an accurately completed header (containing the summary information) and the QSO log data. All of the fields in the cabrillo header must be completed except for the ARRL Section, Power Category Overlay and Soapbox lines. SWL entries are to use the same cabrillo QSO line format as transmitting stations, except there is no requirement to include the received RS(T) and serial number information. See www.oceaniadxcontest.com for the latest information on the cabrillo format requirements.

The log file name is to be in the form call-sign.log, for example, if ZL2WB submits a Cabrillo file then it should be named zl2wb.log. Send the file as an e-mail attachment to <ph@oceaniadxcontest.com> (for Phone entries) or <cw@oceaniadxcontest.com> (for CW entries). Note that the log file must be sent as an attachment, not as text or content within the e-mail message. The e-mail message subject line must include the entry's call-sign, Mode (CW or Phone), entry category and the word "OCEANIA". Do not zip files and only include one log entry in each submission.

The Committee is considering introducing an e-mail robot to automate the checking of the incoming cabrillo logs. Further information will be posted at <www.oceaniadxcontest.com>.

13. Paper Logs

Electronic Logs are preferred (as per the requirements in 12 above) but if this is not possible then paper logs in the Oceania DX Contest format are acceptable, provided they contain less than 50 contacts.

Each paper log is to be accompanied by a summary sheet that clearly states:

- The station's call-sign.
- Operator call-sign(s).
- Entrant's name and mailing address (for receipt of awards).
- Mode and Category entered.
- Contact points claimed on each band.
- Number of multiplier prefixes claimed on each band.
- Total claimed score.

Official log sheets and summary can be downloaded from the Oceania DX Contest website at <www.oceaniadxcontest.com> or obtained by sending a Self Addressed and Stamped Envelope to the address below with sufficient return postage. If official forms are not available then you may make your own in accordance with the general requirements outline above and in Section 11.

Paper Logs are to be posted to: Oceania DX Contest, C/- Wellington Amateur Radio Club Inc., PO Box 6464, Wellington 6030, New Zealand. Only one entry is to be included in each submission. Airmail is preferred if you are submitting a log from outside VK or ZL.

14. Deadline

All logs must be e-mailed or postmarked NO LATER than November 7. The reception of logs will be confirmed via e-mail (for electronic submissions) and a listing of all logs received will be posted on the Oceania DX Contest website at <www.oceaniadxcontest.com>.

15. Awards

To be eligible for an award, stations must log a minimum of 10 contacts.

Certificates will be awarded to the top-scoring station in each category listed under Section 6 for each IARU WAC continent and each country. The following trophies and plaques will also be awarded.

Oceania

- Top entrant from Oceania in Single Operator All Band Phone category—Ron Wills ZL2TT Memorial Trophy sponsored by ZL2GI, ZL2AL, Wellington Amateur Radio Club and NZART.
- Top entrant from Oceania in Single Operator All Band CW category—trophy sponsor to be confirmed.
- Top entrant from VK in Single Operator All Band CW category—Frank Hine CK2QL Memorial Trophy sponsored by WIA Federal.
- Top entrant from VK5 or VK8 call areas in Single Operator All Band Phone category—Plaque spon-

sored by WIA South Australia Division.

- Top entrant from VK5 or VK8 call area in Single Operator All Band CW category—Plaque sponsored by WIA South Australia Division.
- Top entrant from VK7 call area in Single Operator All Band phone category—Plaque sponsored by WIA Tasmania Division.
- Top entrant from VK7 call area in Single Operator All Band CW category—Plaque sponsored by WIA Tasmania Division.

Asia

- Top Entrant from Asia in Single Operator All Band Phone category—Plaque sponsored by Australia Eastern Mountain and Districts Radio Club.
- Top Entrant from Asia for Single Operator All Band CW category—Plaque sponsored by Australia Eastern Mountain and Districts Radio Club.

North America

- Top entrant from North America in Single Operator All Band Phone category—Plaque sponsored by N6RO.

Additional awards may also be allocated at the discretion of the Contest Committee.

16. Disqualification

Violation of the contest rules, unsporting conduct, taking credit for excessive unverifiable contacts or multipliers will be deemed sufficient cause for disqualification. The use of non-amateur radio means such as telephones or e-mail, or the use of Packet, to solicit contacts during the contest is unsporting and the entry may be subject to disqualification. In matters of dispute, the actions and decisions of the Contest Committee are final.

17. Further information

The latest information about the contest will be published on the Oceania DX Contest website at <www.oceaniadxcontest.com>. Any questions can be e-mailed to <info@oceaniadxcontest.com> or posted to Oceania DX Contest, C/- Wellington Amateur Radio Club Inc, PO Box 6464, Wellington 6030, New Zealand.

NZART Straight Key Night

Polish and lubricate that old morse key and enjoy an evening of old time radio fun. An activity night in which everyone can be a winner with a certificate to prove it.

When: First Sunday in November 2000-2300 NZST.

Band: 80m (3.5 MHz) only.

Mode: CW sent with *straight key* ie characters formed manu-

ally, no system of automatic dots, dashes or spacing permitted.

Divisions: Vintage QRP, Vintage QRO, Open QRP, Open QRO.

Explanation: Vintage: Receiver and transmitter or transceiver using valves, no solid state devices in the signal line permitted. QRP: 5 watts or less RF output.

Exchange: RST/QTH/operator's name (one word)/key used (e.g. ZC1, P&T)/TX type (eg ZC1, FT1000, homebrew)/TX power (watts). Except for DX stations (ie non ZL mainland) only RST, operators name, and QTH need be exchanged.

Scoring: 1 Point per QSO. Stations may be worked once, CW to CW only. All stations submitting logs *must* use a straight key throughout, but straight key stations may QSO stations using bugs, electronic keyers or keyboards.

Multippliers: Vintage QRP multiply total points $\times 2$, Open QRP multiply $\times 1.5$, Vintage QRO $\times 1.2$, Open QRO $\times 1$.

Logs: Each log QSO entry to show: Time (NZST or Z), callsign, RST, QTH, name, key type, Tx type, Tx power (of station worked).

Calculate total score, multiply to give total score claimed.

Logs to have associated data sheet giving entrant's name, callsign, QTH, age (optional), full description of equipment used ie key, Tx/Rx, Tx power, antenna.

Send logs by email, mail, fax, on or before November 20 to: Barry Kirkwood ZL1DD, 66 Cory Rd, Palm Beach, Waiheke Island 1240, Telephone/fax (09) 372-5161, e-mail: <bjk@ihug.co.nz>.

Certificates will be sent to the top three stations in each Division (including DX entrants who send in logs). All other entrants will receive a personalised certificate if an A4 self-addressed envelope is sent to the Straight Key Night manager. Any photos of operators and/or equipment gratefully received.

NEW ZEALAND VHF/UHF/SHF/EHF CONTESTS

There are five contests which are spaced over the period of a year. The contests are during Saturdays and Sundays, with 1 hour contest periods occurring from 1600 to 2200 on the Saturday and 0800 to 1400 on the Sunday.

The Contests are

Cliff Betson Memorial Contest

All bands 50MHz and up. Usually aligned the Australian Ross Hull Field Day (second weekend in January).

Hibernation Contest

All Bands 50MHz and up. First weekend in April (delayed a week if it coincides with the Technology Convention).

Brass Monkey Contest

All bands 50MHz and up. First weekend in July.

Microwave Contest

All Bands 614MHz and up. First weekend in October.

VHF Field Day

All Bands 50MHz and up. First weekend in December.

A large number of portable/field

stations take part, and the participation of home stations and stations from clubrooms is highly encouraged. In the last few years the number of stations participating has increased. VHF Field Day is well supported, but the popularity of the other contests would be helped by more participants.

The distances covered are often 400 to 600 km on 2m and 70cm, while the microwave bands can exceed several 100 km, depending on conditions.

There is a ZLVIIFCONTEST reflector on Yahoo Groups, which is supported by many of the contest operators. Other activities are sometimes posted there as well.

It is recommended that radio equipment, batteries and other hardware used for field days is well checked beforehand as parts may go faulty, missing or flat.

Last thing ... Have Fun.

For further VHF/UHF/SHF/EHF contest information go to <<http://www.nzart.org.nz/nzart/Update/Contests/vhfcontestrules.html>> or contact me either via email at <rflman@xtra.co.nz> or via the Call Book address of ZL1UJG.

Kevin Murphy ZL1UJG

WORLD HF CONTEST CALENDAR

Mode	Contest	Sponsor	Weekend	Times
January				
CW	HA-DX	MRASZ (Hungary)	Third full	Saturday 0000–Sunday 2400
CW	CQ WW 160	CQ Magazine	Last full	Saturday 0000–Sunday 2400
PH	Belgium DX	UBA	Last full	Saturday 1300–Sunday 1300
CW	French DX	REF	Last full	Saturday 0600–Sunday 1800
February				
R	CQ/RJ WW RTTY WPX	CQ Magazine/RTTY	Second full	Saturday 0000–Sunday 2400
M	PACC	VERON (Netherlands)	Second	Saturday 1200–Sunday 1200
CW	ARRL-DX	ARRL	Third full	Saturday 0000–Sunday 2400
PH	CQ WW 160	CQ Magazine	Last full	Saturday 0000–Sunday 2400
PH	French DX	REF	Last full	Saturday 0600–Sunday 1800
CW	Belgium DX	UBA	Last full	Saturday 1300–Sunday 1300
March				
PH	ARRL-DX	ARRL	First full	Saturday 0000–Sunday 2400
CW	Commonwealth	RSGB	Second full	Saturday 1000–Sunday 1000
R	BARTG	BARTG	Third full	Saturday 0200–Monday 0200
M	Russian DX	RDXC	Third full	Saturday 1200–Sunday 1200
PH	CQ WPX	CQ Magazine	Last full	Saturday 0000–Sunday 2400
April				
PH	SP-DX	PZK (Poland)	First full	Saturday 1500–Sunday 1500
M	YU-DX	Yugoslavia	Third full	Saturday 1200–Sunday 1200
M	Holyland DX Contest	IARC (Israel)	Third full	Saturday 0000–Saturday 2359
M	Helvetica	USKA (Switzerland)	Last full	Saturday 1300–Sunday 1300
May				
M	ARI International DX	ARI (Italy)	First full	Saturday 2000–Sunday 2000
R	VOLTA RTTY	COMO/ARI (Italy)	Second full	Saturday 1200–Sunday 1200
M	CQ-M International DX	Krenkel CRC (Russia)	Second full	Saturday 1200–Sunday 1200
CW	CQ WPX	CQ Magazine	Last full	Saturday 0000–Sunday 2400
June				
CW	WW-South America	LABRE (Brazil)	First full	Saturday 0000–Sunday 1600
PH	Portugal Day	REP (Portugal)	Second Saturday	Saturday 0000–Saturday 2400
R	ANARTS Digital Contest	ANARTS (Australia)	Second full	Saturday 0000–Sunday 2400
CW	All Asia	JARL (Japan)	Third full	Saturday 0000–Sunday 2400
CW	IV Marconi Memorial	ARI (Italy)	Fourth full	Saturday 1400–Sunday 1400
July				
M	Venezuelan Independence	RCV	First full	Saturday 0000–Sunday 2400
M	IARU Championships	IARU/ARRL	Second full	Saturday 1200–Sunday 1200
PH	IOTA Contest	RSGB	Last full	Saturday 1200–Sunday 1200
R	Russian RTTY	Russia	Last full	Saturday 0000–Sunday 2400
August				
CW	WAE-DX	DARC (Germany)	Second full	Saturday 0000–Sunday 2400
R	SARTG WW RTTY	SARTG (Scandinavia)	Second full	Saturday 0000–Sunday 1600*
M	SEANET-DX	SEANET (Thailand)	Third full	Saturday 1200–Sunday 1200
CW	TOEC WW Grid	TOEC (Sweden)	Fourth full	Saturday 1200–Sunday 1200
M	YO-DX	FRR (Romania)	Last weekend	Saturday 1200–Sunday 1200
September				
PH	All Asia	JARL (Japan)	First full	Saturday 0000–Sunday 2400
PH	WAE-DX	DARC (Germany)	Second full	Saturday 0000–Sunday 2400
CW	Scandinavian Activity	Scandinavia	Third full	Saturday 1200–Sunday 1200
PH	Scandinavian Activity	Scandinavia	Fourth full	Saturday 1200–Sunday 1200
R	CQ/RJ WW RTTY	CQ Magazine/RTTY	Last full	Saturday 0000–Sunday 2400
October				
R	Tara PSK31 Rumble	TROY (USA)	First Saturday	Saturday 0000–Saturday 2400
PH	RSGB 21/28 MHz	RSGB	First Sunday	Sunday 0700–Sunday 1900
PH	Oceania Contest	NZART/WIA	First full	Saturday 0800–Sunday 0800
CW	Oceania Contest	NZART/WIA	Second full	Saturday 0800–Sunday 0800
M	Worked ALL Germany	DARC	Third full	Saturday 1500–Sunday 1500
CW	RSGB 21/28 MHz	RSGB	Third Sunday	Sunday 0700–Sunday 1900
PH	CQ World-Wide	CQ Magazine	Last full	Saturday 0000–Sunday 2400
November				
M	Ukrainian DX	Ukraine	First full	Saturday 1200–Sunday 1200
CW	OK/OM-DX	Czech Republic	Second full	Sunday 0000–Sunday 2400
R	WAE RTTY	DARC (Germany)	Second full	Sunday 0000–Sunday 2400
M	LZ-DX	Bulgaria	Third full	Saturday 1200–Sunday 1200
CW	CQ World-Wide	CQ Magazine	Last full	Saturday 0000–Sunday 2400
December				
CW	ARRL 160m	ARRL	First full	Friday 2200–Sunday 1600
M	ARRL 10m	ARRL	Second full	Saturday 0000–Sunday 2400
CW	Croatian	HRS	Third full	Saturday 1400–Sunday 1400

Key: M = Multimode; PH = Phone; CW = CW; R = RTTY, * = not continuous. All times are UTC.

Most international contest dates are co-ordinated on a worldwide basis by the IARU, but local events can be influenced by moveable dates such as Easter. It pays to check the rules and dates with the organisers—just to be sure.

REGIONS - GUIDING LIGHT - CENTURY AWARDS



NZART Regions Award Basic Certificate for working 18 Districts in 4 Regions. Stickers for 36/8 and 54/12.



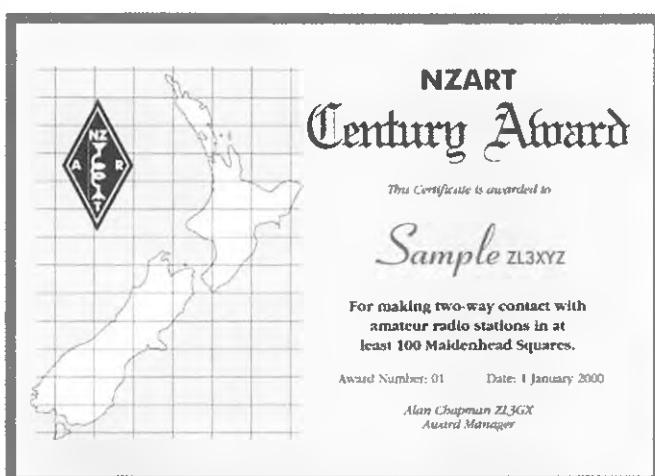
NZART Regions Award Certificate for working all 73 Districts.



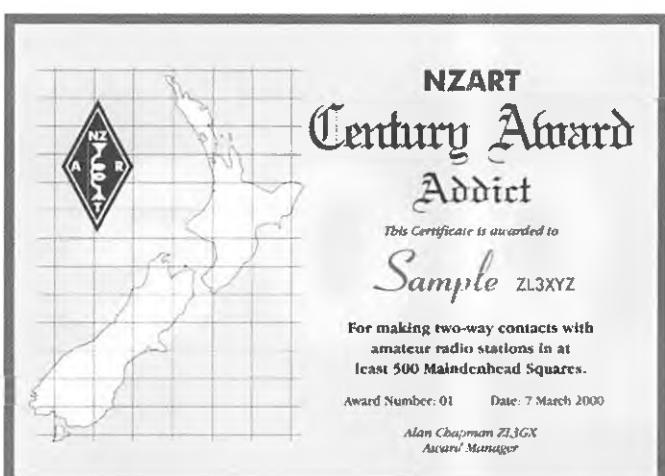
NZART Guiding Light Award - Mariners Certificate.
Requires a total of 20 points for this certificate.



NZART Guiding Light Award - Master Mariner Certificate.
Requires a total of 50 points for this award.



NZART Century Award for working 100 Maidenhead locator squares within New Zealand.



NZART Century Award, Addict Certificate, for working 500 Maidenhead locator squares within New Zealand.

Award Notes

When applying for an award, whether through NZART or through an overseas Society, courtesy demands that you observe the following: (1) PRINT your name, address and call-sign; (2) Clearly state what award (and endorsements) you are applying for; (3) Supply checking sheet with call-signs, dates of QSOs, mode, etc.; (4) Enclose required funds (currency/IRC/stamps) as requested.

For NZART Awards

1. The usually accepted rules apply to all NZART awards.
2. NZART stresses the HONOUR SYSTEM. Awards applicants need NOT hold QSL cards for claimed contacts. It is sufficient to merely certify that the QSO was legitimately made. This no QSL rule applies ONLY to NZART sponsored awards.
3. Endorsements for mode/time/location etc., made at applicant's request.
4. New Zealand, US or Australian currency accepted instead of IRC but cheques NOT desirable. New Zealand stamps OK \$1, \$2 or \$3 preferred.
5. Post applications to NZART Awards Manager, PO BOX 1733, Christchurch Mail Centre, Christchurch 8140, New Zealand.

APPLICATION FORMS suitable for most awards are available from NZART Awards Manager (SASE Please) or on the web at www.nzart.org.nz/nzart/awards/awards.html.

COST OF AWARDS. NB—Cost given for awards are those for ZL applicants. Overseas applicants pay US\$5.00 for each NZART award EXCEPT WAP (US\$6.00) or one IRC per \$1.00.

For Branch Awards

Logs need not be verified unless stated.

All awards are open to shortwave listeners unless stated.

The honour system also applies to Branch awards.

NZART AWARDS

CJC

Captain James Cook Award

To perpetuate the memory of this world famous navigator and seaman—in three classes: Basic "Sailor Class" requires contacts with—G in Yorkshire; FO; ZL2; VK2; KH6 ... For "Officers Class"—"Sailor Class" contacts as well as ZL1, ZL3, ZL4, VK3, VK4, New Guinea, and any Antarctic station ... For "Command Class", as for "Officer Class" as well as any five of the following—VE2, VO, A35, YJ8, FK8, CE8, KL7.

Certified list (confirmations not required) with \$3.00, overseas US\$5.00, to NZART Awards Manager.

ENZART

A prestige award to honour NZART

1. In three parts—(A) Basic award requires 200 points with endorsements for 250, 300, 350 points. (B) Honour award requires 400 points with endorsements for each additional 50 points. (C) HONOUR PLAQUE for 500 points.

2. Points earned as follows by contacting an NZART member who is on the voting roll of the Branch concerned—Phone QSO, 1; CW QSO, 2; Club Station QSO, 2; YL op. QSO, 1; UHF, VHF QSO, 1; Mobile QSO, 1; AMSAT QSO, 1; Branch President QSO, 1.

3. It is essential to clearly determine that the operator contacted is a financial member of NZART and on the voting roll of the Branch concerned.

4. Contacts claimed with a Branch Station must be from a Clubroom or other permanent headquarters, or alternatively when the station is being operated in a contest, from an exhibition, or other activity of a similar kind. Contacts as a result of call-sign "swapping" at a member's QTH are not eligible.

5. Contacts with mobiles are eligible only when the mobile station is within 50 km of his Branch's Clubrooms or his own QTH. (Note rule 3 above.)

6. One station may be claimed in several categories—e.g. the Branch President can be claimed for both Phone and for CW as well as for Branch President—but EACH claimed must be for a separate contact, and the contacts must be not less than 24 hours apart.

7. Contacts must be "Phone to Phone" or "CW to CW".

8. "Club Net" contacts are not eligible until the net concludes, while contacts made in an organized "awards net" with MC etc., are not eligible.

9. Permanent changes of QTH by claimant are permitted and likewise contacts made during genuine temporary operation.

10. ZL applicants must be members of NZART and all applicants must certify that each contact made fulfils award requirements. No QSL card need be held or submitted but applications must be made on special Check List—cost 10 cents plus SASE (large). Contacts must date November 1 1976 or later.

11. Each certificate costs \$3.00,

overseas US\$5.00. Endorsements free but SASE required. Overseas US\$2.00 Honour Plaque NZ\$10.00, overseas US\$12.00.

12. Applications to NZART Awards Manager.

IARU Region III Operating Awards

To publicise Region III

1. The award is available to licensed amateurs and SWLs.

2. Contacts made after April 5 1982 are eligible.

3. QSL cards NOT required. Send certified list of eligible contacts from Log Book. Include country in log.

4. Cost is \$3.00, overseas US\$4.00.

5. Eligible countries are those in Region III whose amateur societies are members of IARU Region III Association. These are: Australia, Bangladesh, Brunei, China (PRC), Chinese Taipei (Taiwan), Fiji, French Polynesia, Hong Kong, India, Indonesia, Japan, Korea, Macau, Malaysia, New Caledonia, New Zealand, Pakistan, Papua New Guinea, Philippines, Pitcairn Island (VR6), Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tonga, Vanuatu, Vietnam.

PLUS: ONE Country credit from US Territories in the Pacific from Guam, Northern Marianas, American Samoa, Wake Island, Baker Howland Group, as presented by ARRL. Chagos Archipelago (VQ9), represented by RSGB. Current total of available

"countries" is 35. Requirements for Award as from January 1 1986: Basic, seven areas; Silver Endorsement, 15 areas; Gold Endorsement, 20 areas. These to be reviewed as considered necessary by the custodian who would recommend appropriately to the Secretariat.

6. Awards may be endorsed for any mode or band.

7. Applications to NZART Awards Manager.

NZART Guiding Light Award

This award requires contacts with stations within 30 km of the more remote lighthouses and 10 km of the lighthouses near cities. Depending on the degree of difficulty each lighthouse has been allocated one to five points. A total of 20 points are required for the basic "Mariners" Award and 50 points for the "Master Mariners" Award.

The lighthouses

North Island	Points	km
Cape Reinga	2	30
Cape Brett	1	30
Mokohinai	5	30
Cuvier Island	3	30
Tiritiri Matangi	1	10
Bean Rock	1	10
East Cape	2	30
Portland Island	2	30
Castlepoint	2	30
Cape Palliser	2	30
Baring Head	1	10
Pencarrow	1	10
Somes Island	1	10
Cape Egmont	1	30

South Island

Cape Foulwind	1	30
Kahurangi Point	3	30
Farewell Spit	2	30
Boulder Bank	1	10
Stephens Island	5	30
The Brothers	2	30
Cape Campbell	1	30
Godley Head	1	10
Akaroa	1	30
Moeraki	1	30
Taiaroa Heads	1	10
Cape Saunders	1	10
Nugget Point	2	30
Waipapa Point	2	30
Dog Island	1	30
Centre Island	1	30
Puysegur Point	5	30

Full log sheets available from Awards Manager. Eligible contacts for this award must be dated November 1 1998 or later. Cost of both awards \$5.00, overseas US\$5.00 or five IRC. Applications to NZART Awards Manager.

DOClands Award**Purpose of Award**

To promote the use of Amateur Radio within DOC Controlled Areas. To advertise Amateur Radio from these locations to the public

Date of Award

For contacts on or after January 1 2003

Rules

A station can only be used for one point at each location per trip. If a station is operating from Lake Rotoroa in the Nelson Lakes National Park, from the Sabine Hut, that station must state whether it is a National Park, Forestry Hut or Lake Station. The Transmitting station must be located within the boundaries of:

(1) Forest Park for Forest Park Credit.

(2) National Park for National Park Credit.

(3) within 1km of a lake, within DOC boundaries for Lake credit.

(4) Within 10km of a lighthouse within DOC Boundaries for lighthouse credit, while the station itself must be within the boundaries of DOClands.

(5) Within viewing distance of a DOC Hut within DOC Boundaries for Forest Hut Credit.

(6) On an Island controlled by DOC for Island credit.

A station can claim itself for working stations from a location.

To work stations operating from:

DOC Campsite	2	4	6
National Park	1	2	3
Forest Park	1	3	5
Lighthouse in DOC Control	1	2	3
Lake in DOC Area	1	2	3
Forest Hut	2	4	5
DOC Controlled Land on Islands		1	2

QSL's not required

Lakes: Lakes as per our Lakeside award, but those on DOClands only

The log sheet includes the rules and a list of lighthouses on DOClands is available from the NZART Awards Manager and will be available in PDF format on the awards section of the NZART web site.

MIA**Minor Islands Award**

For contacts with minor islands of the New Zealand coast—e.g. Kapiti Island, Portland Island, Great Barrier Island, Little Barrier Island, Waiheke Island, D'Urville Island, Rangitoto Island, Kawau Island, Motutapu Island, etc., from which FIVE contacts are required. Certified list with \$3.00, overseas US\$5.00, to NZART Awards Manager.

1. So-called "islands" which are connected to the mainland by a causeway and rocks are not eligible.

2. The station must be located on the island or within the waters up to one nautical mile offshore, unless prevented by hazardous conditions.

3. Where public access is available, M/M stations must be on a mooring, ie, wharf, jetty, buoy, or anchor, or on arrival or departure from a mooring.

National Parks Award

1. For contacts made with stations operating WITHIN boundaries of a New Zealand National Park.

2. Basic award requires TWO contacts.

3. Usual NZART awards rules apply.

4. Endorsement: for each extra two contacts; for VHF Simplex; for VHF via repeater; for each amateur band; etc.

5. Duplicate Contacts (with SAME station) permitted ...

- ★ on different amateur bands
- ★ on different days
- ★ from different Parks.

6. Eligible contacts to date from January 1, 1988.

7. Applications with \$3.00, overseas US\$5.00, to NZART Awards Manager.

	Basic	Intermediate	Advanced
DOC Campsite	2	4	6
National Park	1	2	3
Forest Park	1	3	5
Lighthouse in DOC Control	1	2	3
Lake in DOC Area	1	2	3
Forest Hut	2	4	5
DOC Controlled Land on Islands		1	2

NZ Armed Services Award

This award is presented by the Counties Awards Net to remember all amateur radio operators who have served their country.

This award is open to all amateurs and SWLs.

All contacts made after August 1, 1992 will be eligible for this award.

All Amateur bands and modes may be used.

Repeater contacts accepted.

A station may only be contacted once.

Only one service number may be used.

ZL stations to work 100 contacts. VK stations to work 50 contacts. DX stations to work 30 contacts.

Information required: Log data, Service Number, Service in which served (ie, (A) Army, (AF) Air Force, (N) Navy.

Cost of Award: \$3.00, overseas US\$5.00.

Custodian: NZART Awards Manager.

Check sheet and rules also available from Awards Manager with SASE.

Provision for Award Update if required.

NZA—New Zealand Award

Available to all radio amateurs other than ZL.

Requirements:

35 contacts with ZL1.

plus 35 contacts with ZL2.

plus 20 contacts with ZL3.

plus 10 contacts with ZL4

plus one contact with ZL "territory"—either from NZ Antarctica, Chatham Islands, Kermadec Islands, or Campbell Island. This one contact may be substituted by 20 ordinary ZL contacts if desired.

This makes a minimum of 101 contacts which should be dated from December 8, 1945. Cost \$3.00, overseas US\$5.00.

NZC—New Zealand Counties

Basic award required contacts with 20 different New Zealand Counties. Endorsements for 40, 60, 80, 100 are made with a special certificate for 112. Map showing counties is depicted elsewhere in this section, while checking sheet is available from NZART Awards Manager.

1. Initial certificate with any or all endorsements to 100 costs \$3.00, overseas US\$5.00.

2. Separate endorsements to 100, after issue of basic award, costs 20 cents for any group—or one IRC. Plus SASE.

3. Special Certificate for "NZC 112" costs \$3.00, overseas US\$5.00.

4. Checking sheets which MUST be used and which are returned to applicant for record purposes cost SASE, overseas US\$2.00.

5. NZC "224"—the "224" Shield was instituted to recognize very outstanding achievement—that of "double 112" with different stations contacted in the relevant counties for each NZC 112. Current cost is \$15.00, overseas US\$25.00 (surface mail only). Applicants for NZC 224 must first hold TWO NZC 112 Awards. Send BOTH log sheets when applying for 224.

6. The operator on a "County DXpedition" whether Mobile or Fixed Portable may claim that County for his own NZC credit.

7. The original "Counties List" will be maintained irrespective of deletions or additions. The criteria will be the actual area of operation which must be determined by the honour of the operator.

NZLA—New Zealand Lakeside Award

1. For Basic Award, contacts are required with stations operating on the shores of TEN (10) freshwater lakes in New Zealand. Endorsements for each additional ten lakes up to 40; Honour Award for 50 lakes with further endorsement for each additional ten.

2. Stations must be located within ONE kilometre of the water or in a town on the lake shore.

3. Full rules are with the Check Sheets which MUST be used when applying for NZLA—these cost a 40 cent stamp plus SASE.

4. Basic Award costs \$3.00, overseas US\$5.00. Any endorsements SASE, overseas US\$2.00.

5. Check Sheets from NZART Awards Manager to whom all applications must be directed.

6. Eligible contacts must date May 1, 1976 or later.

NOTE: Check Sheets are returned to applicant and make up a complete record of lakes credited towards award. Basic work for this award was done for NZART by Mike Groth ZL1AHF.

NZART Century Award**Basic requirements**

This award is based on the Maidenhead Locator System. The award is open to all amateurs and SWLs. One hundred different sub-squares are required for the Century Award.

Addict certificate for 500 sub-squares.

Grand certificate for 1000 sub-squares.

Each contact must state the full six digits of the Locator position, eg, RF66HK.

Eligible contacts must date January 1, 2000 or later.

Any operator on a "Century Award DXpedition" whether mobile or portable may claim the sub-square for their own credit.

Note

All contacts must be from the New Zealand mainland or surrounding islands.

Log sheets and maps, which give a broad outline of the Squares are available. The map supplied does not give an accurate position of the squares. Info maps that have latitude and longitude must be used for the position of the Sub-squares. For example, InfoMap series 242-1, 242-2, 242-3, 242-4, or similar.

A program, written by W4SM, that will return the square for a given latitude and longitude is available via e-mail or send a 3.5" floppy with return postage to the NZART Awards Manager.

Cost

Century and Addict and Grand Certificates NZ, A, US\$5.00 each.

NZR Regions Award

This award is similar to the NZ Counties Award but relates to the current Regional Districts.

Basic requirements

Initial certificates with four Regions and 18 Districts.

Stickers for 8/36 and 12/54 Regions and Districts.

Special award for all Regions and Districts.

Contacts must date January 1, 2000 or later.

Cost

Basic award NZ\$5.00. Endorsements SASE plus a 40 cent stamp.

Overseas US or A\$5.00 or five IRCS. Endorsements \$2.00 or two IRCS.

All Regions and Districts Award NZ\$5.00, US\$5.00 or A\$5.00.

Double Region Award \$15.00, overseas \$25.00 (surface only).

Boundaries

The boundaries are as per InfoMaps 242B-1 to 242B-4 (four maps) and will remain to give a basis of stability.

Applications for the award must be on the log sheets which are available from the NZART Awards Manager. Send SASE or via e-mail (PDF file).

The following is a list of Districts (bold Italic type) and the regions.

North Island Regions

Northland

Far North
Whangarei
Kaipara

Auckland

Rodney
North Shore
Waitakere
Auckland
Manukau
Papakura
Franklin*

Waikato

Thames-Coromandel
Hauraki
Waikato
Matamata Piako
Hamilton
Waipa
Otorohanga
South Waikato
Waitomo*
Taupo*

Bay of Plenty

Western Bay of Plenty
Tauranga
Rotorua*
Kawerau
Whakatane
Opotiki

Gisborne

Gisborne

Hawkes Bay

Wairoa
Hastings
Napier
Central Hawkes Bay

Taranaki

New Plymouth
Stratford
South Taranaki

Wanganui-Manawatu

Ruapehu
Wanganui
Rangitikei*
Manawatu
Palmerston North
Horowhenua
Tararua

Wellington

Masterton
Carterton
South Wairarapa
Kapiti Coast
Porirua
Upper Hutt
Lower Hutt
Wellington

South Island Regions

Nelson

Nelson

Marlborough

Marlborough

Tasman

Tasman

West Coast

Buller
Grey
Westland

Canterbury

Kaikoura
Hurunui
Selwyn
Waimakariri
Christchurch
Banks Peninsula
Ashburton
Mackenzie
Timaru
Waimate

Otago

Waitaki*
Queenstown-Lakes
Central Otago
Dunedin
Clutha

Southland

Gore
Southland
Invercargill

*Districts cross Regions boundaries.

Tiki Award

Work five different ZLs each on FIVE different bands dated post-war. Cost \$3.00, overseas US\$5.00.

ZL1 Award

Basic Award requires contacts with 125 different ZL1 stations dating post-war. Endorsements 175 and 250.

ZL2 Award

Basic Award requires contacts with 100 different ZL2 stations dating post-war. Endorsements for 150 and 200.

ZL3 Award

Basic Award requires contacts with 50 different ZL3 stations dating post-war. Endorsements for 75 and 100.

ZL4 Award

Basic Award requires contact with 25 different ZL4 stations dating post-war. Endorsements for 35 and 50.

Note: cost of ZL1/2/3/4 Certificates is \$3.00, overseas US\$5.00, each with any endorsements. Further endorsements will cost 40 cent stamp plus SASE, overseas US\$2.00, UNLESS a new certificate is required instead of "sticker", in which case the cost is as above. On issue, certificates will be endorsed for band/mode as requested and for any yearly period of time (January through December). Such endorsements are

of course available to applicants at any time after the initial award has been made. ZL or ZM combination is OK. Applications with list to NZART Awards Manager.

VHFCC—VHF Century Club

One hundred points required from QSOs with ZL stations on the following basis:

50 MHz band contacts count one point.

144 MHz band contacts count three points.

432 MHz band contacts count six points.

(Further bands may be added in the future).

The same station may be claimed once on any one band but may be claimed repeatedly on different bands.

Endorsement stickers available for 200, 300, 400, 500 points. Cost \$3.00, overseas US\$5.00.

WAD—A VHF Award

Contacts required on any VHF band (or mixture of VHF bands) with ZL1, ZL2, ZL3, ZL4—One contact per Call Area. Cost—\$3.00, overseas US\$5.00. Endorsements for Satellite QSOs.

WAP—“Worked All Pacific”

Contacts required with 30 different "Oceania Countries".

Eligible countries ... Any Oceania country, i.e. eligible as Oceania for WAC (see DXCC list). Cost \$3.00, overseas \$6.00. Please include country on log sheet.

Five Band WAP

Contact any 30 eligible Pacific Countries (as counting for Oceania for WAC), each on FIVE different bands making a total of 150.

Send list of log extracts (QSLs not required to be held) to Awards Manager ... with \$15.00, overseas US\$25.00 surface mail only.

AWARD: Wooden Shield surrounded with NZART badge and suitably inscribed.

WAZL—“Worked All New Zealand”

Contacts required for 45 different Branches of NZART—EXCEPT FOR OVERSEAS APPLICANTS (for whom only 35 are required). Special endorsement when WAZL completed within 12 month period. NB: Mobiles operating outside their own Branch Area must use the Branch Number of the area in which they are operating (for WAZL credit). Cost \$3.00, overseas US\$5.00 to NZART Awards Manager.

NZART Branches for WAZL

- 01 Ashburton
- 02 Auckland
- 03 Western Suburbs
- 04 Cambridge
- 05 Christchurch
- 06 Tararua
- 07 Not issues
- 08 Eastern Southland
- 09 Egmont (in recess)
- 10 Franklin
- 11 Gisborne
- 12 Hamilton
- 13 Hastings/Havelock
- 14 Hawera
- 15 Central Hawkes Bay
- 16 Horowhenua
- 17 Huntly
- 18 Hutt Valley
- 19 Inglewood
- 20 Manawatu
- 21 Manukau
- 22 Marlborough
- 23 Marton and Districts
- 24 Motueka
- 25 Napier
- 26 Nelson
- 27 New Plymouth
- 28 Whangarei
- 29 North Shore
- 30 Otago
- 31 Pahiatua (in recess)
- 32 Rahotu Coastal
- 33 Rotorua
- 34 South Canterbury
- 35 Balclutha

- 36 South Westland
- 37 Southland
- 38 Taumarunui
- 39 Tauranga
- 40 Te Awamutu
- 41 Thames
- 42 Titahi Bay
- 43 Waihi and Districts
- 44 Matamata
- 45 Waimarino
- 46 Wairarapa
- 47 Waitara
- 48 Wanganui
- 49 Westland
- 50 Wellington
- 51 Eastern Bay of Plenty
- 52 Northern Hawkes Bay
- 53 Te Puke
- 54 Patea
- 55 Waitomo
- 56 Christchurch West
- 57 Tokoroa
- 58 Helensville (in recess)
- 59 Mangakino (in recess)
- 60 Taupo
- 61 Central Otago
- 62 Reefton-Buller
- 63 Upper Hutt
- 64 North Otago
- 65 Papakura
- 66 Auckland VHF
- 67 Kawerau
- 68 North Canterbury
- 69 Kapiti
- 70 Feilding
- 71 Rodney

- 72 Opotiki
- 73 Northern Wairoa
- 74 Wellington VHF
- 75 Queenstown
- 76 Kaikoura
- 77 Te Aroha
- 78 Far North Districts
- 79 Howick and Districts
- 80 Hibiscus Coast
- 81 Waikato
- 82 Southern Wairarapa
- 83 Raglan
- 84 Bay of Islands
- 85 Mercury Bay

6. Logs must include at least 20 ZL contacts.

7. Send \$3.00, overseas US\$5.00, to the NZART Awards Manager.

"5 x 5"—Five by Five

This premier award has been instituted to recognize the increasing interest in Five Band DX operation. The initial award requires that the same station be contacted on five bands repeated with five different DXCC countries. First endorsement after a further five has been contacted (total of 10) with the 20 endorsement requiring another ten and so on to 100. Certified list with full QSO data and fee of \$3.00, overseas US\$5.00, which includes all endorsements. Certificate is outstanding and is overprinted in embossed gold. Contacts must date from 1945.

Yearly Award

This award is an annual award starting on January 1 and ending on December 31 each year.

The rules are as follows:

1. A total of 80 contacts required.
2. The numbers of years licensed must be obtained from station worked.
3. The licensed years are totalled to 1000 or more years.
4. Log details must include the operator's call-sign, name, licensed years and date worked.
5. The award is open to all SWLs who must include in addition to the above, both operators names and call-signs.

ZLA Award

Contacts required with Auckland City, Wellington City, Christchurch City, Dunedin City, Antarctica ZL5, Campbell Island, Chatham Island, Kermadec Island. Applicants must send certified list to NZART Awards Manager with \$3.00, overseas US\$5.00. Specially produced certificate.

NZART Branch Awards

Aotearoa Postcode Award

This award has been presented to stimulate awareness and the use of postcodes in the New Zealand postal system—at least by the amateur fraternity. To some extent it is a sister award to the Australian Amateur Radio Postcode Club.

1. The award is open to all Amateurs and SWLs.

2. All contacts made on or after October 20, 1991, will be eligible for the award.

3. A certificate will be issued for basic qualification, and stickers for the various following upgrades.

4. Portable and mobile stations must give the postcode for the particular area they are in and can claim that postcode for the award.

5. Basic Award: Make contact with ZL stations and obtain their QTH and Postcode. Then use the suffix letters of the station claimed to complete the following phrase—**AOTEAROA LAND OF THE LONG WHITE CLOUD**.

Each letter of a call-sign may only be used once unless that station is contacted in a different postcode area. Claim each postcode once only.

6. Upgrades: Stickers will be issued as follows: Postie—100 different postcodes; Mail Officer—150

different postcodes; Supervisor—200 different postcodes; Branch Manager—250 different postcodes. (There is provision for an extension for the enthusiast.)

7. All amateur modes and bands may be used. Repeater contacts accepted.

8. Cost: Basic certificate—
ZL stations \$3.00
VK stations US\$2.00
DX stations US\$3.00

Upgrades—

ZL stations SASE plus \$1.00 for first—SASE for other three.

VK Stations SASE plus \$1.00 stamp for each upgrade.

DX stations SAE plus US\$1.00 for each upgrade.

9. On application send a log with the following: date of contact, station contacted, postcode number, and area to Awards Manager, 48 Leslie Street, Waitara 4320.

As NZ Post revamped the system in July 2006, all old numbers will be accepted for contacts made up to August 31, 2006. From July 1, 2006, the new numbers are acceptable

Bay of Plenty Award—Series 2

Sponsored by the Tauranga Branch 39 of NZART for work-

ing stations in the Bay of Plenty region—ie., Opotiki, Rotorua, Tauranga and Whakatane Counties and all cities and districts within this region.

ZLs need either 10 stations on any band or five stations on 50 MHz or higher.

The rest of the world need five stations on any band.

All stations to be in different Maidenhead Locator subsquares, since January 2006.

This award is available to listeners on a "heard" basis.

Applications with \$4.00 (overseas US\$5.00) with check-list showing station, date and time, worked mode and band (QSLs not required) to Secretary Tauranga NZART, C/Emergency Management Office, WBOP District Council, Private Bag 12 803, Tauranga Mail Centre, Tauranga 3143.

Christchurch Award

Requirements

Christchurch amateurs (those within the normal coverage of the 705 repeater) 25 different stations; rest of ZL—15 stations; VK—10 stations; rest of world—five stations. Definition of a Christchurch station that may be worked for this award is any station that is

operating from within the metropolitan area of Christchurch. Cost: ZL and VK NZ\$5.00; others US\$4.00 or equivalent. Applications to Christchurch Amateur Radio Club Awards Manager, PO Box 1733, Christchurch Mail Centre, Christchurch 8140.

Christchurch Amateur Radio Club Branch 05 Brasspounders' Club Award

The aim of this award is to promote Morse technique in a friendly competitive way and to encourage conversational CW between fellow amateur radio enthusiasts.

A Certificate of Accomplishment will be issued by the Christchurch Branch Awards Manager when suitable evidence shows that the applicant has gained the appropriate points total.

For the "INITIAL AWARD" (25 points minimum) the following QSO types are acceptable.

1. CW QSO with Christchurch Amateur Radio Club Branch 05 Club member—one point.

2. CW QSO with Christchurch Amateur Radio Club Branch 05 "Brasspounders" Club member—two points

3. CW QSO with Christchurch Amateur Radio Club Branch 05 "Brasspounders" Club member via ZL3AC Club Station—four points

Bonus points may be added to each of the above according to the following criteria:

4. If the QSO was conducted throughout using a STRAIGHT key, claim two bonus points.

5. If the QSO was conducted throughout using an ELECTRONIC keyer or SEMI-AUTOMATIC key (bug type) claim one bonus point.

A QSO conducted with COMPUTER Morse will not be eligible for a bonus.

Type "3" QSOs if multiple, must be spaced at least 24 hours.

Award Par Excellence

60 points minimum

For "AWARD PAR EXCELLENTE", New Zealand "Home Stations" must include at least two type "1" QSOs, and there is no points limit on type "5" contacts. Where the same station is being claimed more than once, there must be at least 24 hours separation between the QSOs.

Overseas stations need only one type "1" QSO for their "Award Par Excellence" included with their claim, and may claim two points for each "ZL" QSO together with one extra bonus point if the "ZL" is a "Branch 05 member". At least 24 hours must separate QSOs where the same station is being claimed more than once.

Rules

Frequencies: All Amateur Band CW frequencies may be used.

Who: All Radio Amateurs.

Claims: Log extracts showing date, time on/time off, signal reports, other operator's call and QTH.

Check: Log extracts shall be countersigned by one other similarly licenced amateur operator.

Duration: Contacts claimed shall have been of at least one-quarter hour (15 minute) duration.

Signals: No claims will be accepted with reports of T7 or lower.

When: Only QSOs commenced after the inauguration are acceptable. Inauguration date is February 1, 1993. There is no closing date for claims unless the award termination is promulgated.

Points: Points claimed for "INITIAL AWARD" may not be used for the "AWARD PAR EXCELLENTE".

Costs: NZ\$12.00 Initial Award.

The Club Station ZL3AC will be on the air from 0800 UTC on an occasional basis. The operating frequencies are from 3.5 MHz to

3.575 MHz and on other HF bands depending on conditions.

Address all claims to Christchurch Amateur Radio Club Awards Manager, PO Box 1733, Christchurch Mail Centre, Christchurch 8140, New Zealand.

City of Dunedin Award

Otago Branch 30 promotes this award which features colour photographs of Albatrosses in the colony on the Otago Peninsula, the lighthouse at Tairoa Heads, and a view of Dunedin City from Stuart Street.

Contacts since July 1, 1986 eligible and the required 10 points for ZL applications (five point DX) may be accumulated from the following allocations:

ZL4AA Branch station	3 points
Branch 30 President	2 points
Branch Life Member	2 points
Branch YL	2 points
Other Branch members	1 points

Award is open to SWLs.

NO repeater contacts and each station can be worked ONCE only. Any one band mode or a combination of any bands/modes may be used.

Cost—NZ\$2.50 with application to Awards Manager, PO Box 5485, Moray Place, Dunedin 9058.

Fiordland National Park Award

Requirements: Contact four separate stations/operators in or within one kilometre of the Fiordland National Park, plus two contacts with Branch 08 members. Total—six contacts. Send log (no certifying required) with \$1.50 (stamps OK) to George McKenzie ZL4JP, Waiparua, No. 7 RD, Gore 9777.

Gisborne Award

Requirements: Contacts after January 1 1969, as follows: Gisborne amateurs—ten different stations. ZL—four stations. Rest of world—two stations.

Cost: \$5.00. Apply to Awards Manager, PO Box 1017, Gisborne 4040.

Kapiti Branch Award

1. Ten points required on any band—including VHF-UHF and repeater contacts. Different stations are required.

2. One point for any NZART member residing permanently in the district.

3. Two points for any branch member.

4. Three points for any committee member.

5. Four points for ZL2KB.

6. Net contacts are permitted, except the Branch net.

7. A listeners' award is available. Recording of sufficient two-way contacts worth 10 points.

8. Packet contacts attract two points each for Kapiti Branch members worked direct.

9. Double points for CW contacts, excluding Field Days.

10. No two contacts with the same station are permitted.

11. Price \$5.00 per certificate.

12. Enquiries to Award Manager, Kapiti Amateur Radio Club, C/5a Konin Grove, Raumati Beach 5032.

Kawerau Woodskills Festival Award

This is to run the first two weeks in September each year.

Contacts with Kawerau Branch 67 stations on any band, ie, HF, VHF, UHF.

Rules

Ten points required for ZL applicants (five points for DX stations) may be accumulated as follows:

1. ZL1KW worth five points, Branch President worth three points, any other Branch member one point.

2. Award is available to all Amateur operators or SWLs who accumulate 10 points.

3. The Award application containing a copy of log details or SWLs, name and address plus \$5.00 fee to be received by The Awards Manager no later than November 1 each year.

Applications for this Award to the Awards Manager, Branch 67 NZART, C/- Bev Osborne ZL1OS, 34 Cobham Drive, Kawerau 3127, New Zealand.

Manawatu Award

For overseas stations working FIVE stations who are members of Manawatu Branch 20. Certified list and US\$3.00 or five IRCs to ZL2AFT, 429 Albert Street, Palmerston North 4410.

Manawatu Amateur Radio Society Windmill Award

The Manawatu Amateur Radio Society Windmill Award is open to all Amateurs and SWLs. To obtain the award stations require seven contacts with Branch 20 members of which one must be a compulsory contact with the Branch Station ZL2KO.

Stations may only be contacted once and must be financial members of Branch 20 at time of contact. All contacts to be made after September 1, 2000.

Overseas stations only need to contact five branch members and the club station is not a compulsory contact for them but optional.

The award is open to all amateurs and SWLs. The cost of the award is NZ\$6.00. Overseas US\$5.00 for overseas stations.

Please note that this is a separate award to the branch DX award although it is open to DXers.

Applications should be made to:

Award Custodian

Manawatu Amateur Radio Society, PO Box 1718, Palmerston North Central, Palmerston North 4440.

Papakura Radio Club "21" Award

For contacts with 20 members of Papakura Radio Club PLUS ZL1VK dating from January 1 1977. Band/Mode endorsements; certificates not numbered; certified list and \$2.00 to Secretary, Papakura Radio Club, PO Box 72-397, Papakura, Manukau 2244.

Railways Award

This Award is sponsored by Southern Wairarapa Branch 82.

To work amateurs within one kilometre of railways stations which are the stopping places for the "Northerner", the "Southerner", and Picton-Christchurch Express (Auckland to Invercargill). Full rules on the check sheet.

Check sheet which contains full rules is available. Send SASE to Railways Awards Custodian, PO Box 1733, Christchurch Mail Centre, Christchurch 8140. Cost of the Award is \$3.00.

Reefton-Buller Award

Basic Award requires contact with any five Branch 62 members.

Merit Award requires, in addition to Basic, that ZLs contact one Branch 62 XYL or YL and the Club station ZL3BRC. Overseas stations contact any one of those mentioned above. Two categories HF and VHF.

NO QSLs required. Send certified list with \$5.00 to NZART Awards' Manager. List of members etc available from Branch 62 Secretary.

The Rhododendron Festival Award

The award is to be held by the combined clubs of Taranaki branches on or about November each year to coincide with "The Rhododendron Festival". The award certificate will be one of a series of coloured, hand-painted prints of named Rhododendron varieties by the well-known Taranaki artist, Janet

Marshall. Other designs are provided if requested.

Rules

1. The Award will run for two weeks about the beginning of November each year. It is available to all Amateurs and Shortwave Listeners.

2. Contacts may be made on any band, any mode. Each station may be worked *once only* for each separate application for the Award.

3. *New Zealand stations* require 25 points from those listed below:

Compulsory contact with Special Event Station ZL6RFA—five points

Contact with Taranaki Branch stations—three points.

New Plymouth Branch 27—ZL2AB.

Hawera Branch 14—ZL2HAW.

Inglewood Branch—ZL2PT.

Rahotu Coastal Branch 32—ZL2ANN.

Waitara Branch 47—ZL2TO.

South Taranaki Branch 87—ZL2QF.

Each additional Taranaki station (ie, a station whose usual base station is in Taranaki)—one point

4. Overseas stations require only six points, calculated as above, and *do not have to make a compulsory contact*.

5. Copy of log, with a note of your Award choice and fee, to arrive before January 31, to:

The Award Custodian
NZART Branch 27
C/- 45 Robe Street
New Plymouth 4310
New Zealand

6. Fees, including return postage:

For ZL award applications \$6.00 each.

For all overseas award applications, US\$5.00 or fair equivalent.

Main operating frequencies Rhodo

Net—3.660 ± MHz, NZ Awards Net—3.677 MHz, and any amateur frequencies.

Rotorua Amateur Radio Club Inc.

Maidenhead Locator Award Rules

1. The name of this award is the Maidenhead RF81 Rotorua Award—in short, The RF81 Award.

2. The Award is the responsibility of Branch 33, Rotorua, NZART.

3. The Award is for contacts into 98 Sub-squares and two contacts with the Club Station ZL1ROT.

4. A certificate will be issued upon completion of contacts into five Sub-squares plus one contact with the Club Station ZL1ROT.

5. Four Endorsements will be issued as the number of Sub-

squares contacted reach 25, 50, 75, and 98. They will be known as the Geyser, Redwood, Lakeland, and Mountain Endorsements respectively. The final Endorsement requires a further contact with Club Station ZL1ROT, making a total of 100 contacts for the full award.

6. Contacts may be made on any Amateur band by any mode.

7. Operators working from a Sub-Square may claim that Sub-Square for their own Award.

8. Operators may be contacted before or after the Club Net (see Call Book) on 147.350 MHz. They will also operate on the Awards Net and other frequencies.

9. The masterplan of Sub-Squares will be held by the Award Manager. Copies, together with the Award Rules, will be circulated to the Award Net Controllers. A copy will also be supplied with the Certificate to assist operators to complete the Award.

10. The Sub-Squares identification are:

AL to GL, AM to GM, AN to GN, AO to GO, AP to GP, AQ to GQ, AR to GR, AS to GS, AT to GT, AU to GU, AV to GV, AW to GW, AX to GX, and AA to GA.

11. Claims for Awards are required to show: date, station contacted, band and Sub-Squares worked. SWLs are to quote both stations making contact and only one Sub-Square is to be claimed from each contact logged.

12. The Award commenced on March 25, 1988.

13. The cost of the Award is five only 40 cent stamps (note: only 40 cent stamps please).

14. Endorsements will be forwarded without further charge on receipt of SASE with claim.

15. Claims for this Award and subsequent Endorsements are to be addressed to: The Award Manager, Rotorua Amateur Radio Club Inc, 24 Iles Road, Lynmore, Rotorua 3010, New Zealand.

16. This issue of the Rules of the RF81 Award is effective from May 1 2000.

Southern Polar Plunge Award

This Award sponsored by the Otago Branch NZART Inc, coincides with the longest nights/shortest days of the year and is to highlight the mid-winter activities in the southern parts of New Zealand.

(1) The Award will run in the week of June 21 and contacts with Otago Branch operators on any band or mode are eligible but each station may be worked *once only*.

(2) Ten points required for ZL applications (five points for DX

stations) may be accumulated from the following allocations:

ZL4AA—Otago Branch Station, three points.

Branch President, two points.

Any other Otago Branch member, one point.

(3) Award is available to any amateur operators for SWLs who accumulate the necessary points.

(4) The Award application containing a copy of log details and operator's or SWL's name and address plus \$5.00 fee to be received by—

The Awards Manager
Otago Branch NZART Inc
PO Box 5485
Moray Place, Dunedin 9058
No later than July 31 each year.

Te Puke Amateur Radio Club NZART Branch 53 Visiting Amateur Award

Objects of the Award

To encourage more use of the radio spectrum.

To ensure foreign amateurs visiting ZL are likely to get a two-way contact.

All classes of ZL licence holders ie, novices, technician and general can compete for the award.

Award criteria

Open to all licensed ZL amateurs who are members of NZART.

Basic Award: Ten QSOs with foreign/visiting amateurs.

Advanced Award: Ten QSOs with foreign/visiting amateurs from 10 different countries.

Supreme Award: Fifty QSOs with foreign/visiting amateurs from 50 different countries.

Award rules/conditions

All contacts must be two-way Voice/Phone within the geographical boundaries of ZL on any of the authorized bands in the amateur radio spectrum.

A "country" as defined by the ARRL DXCC Committee and cannot be a deleted one.

When applying for the award a log extract must be submitted showing: call-sign of station worked, date, frequency and country of origin ie, ZL1/K3ZO (USA).

Cost of Award

\$5.00.

Cost of upgrades

\$2.00.

Award Manager

ZL1IB

Te Puke Amateur Radio Club Inc
C/- PO Box 10 Te Puke 3153.

The Rosetown of New Zealand "Grand Award"

This Award, available in two levels, BASIC ADDICT, is workable world-wide by any Amateur Radio Operator or SWL.

Any mode, any amateur frequency, mixed band usage permitted, and repeater contacts are not barred. Net operation is also permissible.

The object is to contact Grandparent operators, and claim points according to the list given below.

All applicants must be licensed amateur radio operators and their station must be operated in accordance with the Radio Regulations, plus the terms and rules of their own administration. Good operating manners and techniques will be encouraged and only one QSO per call-sign is permitted over the two levels.

Points may be claimed as follows:

A QSO with a Grandparent earns 10 points

who is also a Great-Grandparent earns another 10 points

who is also a Great-Great-Grandparent earns another 20 points

and should there be a Great-Great-Great-Grandparent another 100 points

and each Grandchild, Great-Grandchild, etc, earns 1 points

(Forexample, two Grandchildren, one Great-Grandchild and two Great-Great-Grandchildren = 5 points plus 40 = 45 sub-total for that QSO.)

The sub-total so claimed, is to be doubled if the operator contacted is a member of the National Radio Society of the country worked: ie, NZART, WIA, ARRL, etc.

The BASIC AWARD of 1000 points (QSL size) \$5.00, Overseas US\$6.00.

The ADDICT AWARD of 10,000 points (304mm x 203mm) \$7.00, Overseas US\$6.00.

Basic points can be credited towards the Addict.

Each Award is a beautiful photograph of a rose, and being laminated makes an ideal wall hanging or table placemat. The Award dates from January 1, 1992.

For Log Sheet and Rules, an SASE (or IRC) to: Awards Manager, Te Awamutu ARC, NZART Branch 40, C/- 509/1 Mutu Street, Te Awamutu 3800, New Zealand.

(There is no copyright on photocopying the log or rules.) Applications for the Award to be forwarded with the appropriate remuneration to the above address. Awards by ordinary post.

The Tane Mahuta Award

By Branch 28 with VHF and HF Rules:

1. The HF Tane Mahuta Award for 20 contacts including at least one in each of the Counties of Rodney, Otamatea, Hobson, Hokianga, Mangonui, Whangaroa, Bay of Islands, and Whangarei with the rules of NZC Award applying.

2. The VHF Tane Mahuta Award for 20 contacts including at least one in each of the Locator Squares RF63, RF 64, RF65, RF74 and that part of RF73 north of 36° 30'; that is, with Sub-Squares ending in M to X. Contacts must be made from one square to another.

3. Portable and Mobile operation is permitted.

4. Multiple contacts are permitted provided the station contacted is located in a different County or Locator Square for each contact.

5. Repeater contacts are permitted if they are made through Northland repeaters at 7100, 7150, 7175, 7200 from outside the Northland area.

6. Contacts on or after January 1, 1985 are eligible.

7. QSL cards are not required. Send certified list of relevant data. BUT for the VHF Award it is necessary to establish the full QTH Locator of the station worked.

8. Applications to Tane Mahuta Award, PO Box 10-078, Te Mai, Whangarei 0143, with cost as within New Zealand NZ\$5.00, Australia A\$5.00, others US\$5.00.

The Travellers Award

This award is sponsored by the Huntly Branch and is to contact stations that are away from their normal residence and camping in a tent, caravan or camper van/mobile home.

There are three camping modes for the award:

1. Tent. The portable station must be transmitting from a tent or in a vehicle nearby.

2. Caravan. The portable station must be transmitting from a caravan or in a vehicle nearby.

3. Camper Van/Mobile Home. The station must be transmitting from within the Camper Van/Mobile Home.

Note: The ham transmitting must be in the camping party.

There are three sections to the award:

Basic

Contact one tent, one caravan, one camper van/mobile home.

Intermediate

Contact Basic plus one tent, one caravan, one camper van/mobile home.

Advanced

Contact Intermediate plus one caravan, one camper van/mobile home.

All contacts after November 1, 2003. The award is open to all amateurs and listeners. Each station may be contacted once only. Contacts valid on HF, VHF, and UHF. No contacts to be made during other events (ie, Jock White Field Day, etc).

Fee for the award is \$5.00.

Send log details including date, time, station, frequency and location to: The Awards Manager, C/- J. Williams, Kainui Road, RD1, Taupiri 3791.

Upper Hutt Award

Available to Amateurs and SWLs with any required endorsement for contacts after July 2 1972 with stations operating in Upper Hutt Valley which count as ONE point except YL ops and Club station ZL2VH which count as TWO points. Upper Hutt applicants require a total of 15 points; rest of New Zealand require 10; overseas require five points. Certified list with FULL QSO data (no QSL cards) with \$2.00 or one IRC for New Zealand stations, two IRCs for overseas stations. Post to Upper Hutt Award, C/- 35 Matai Road, Raumati South, Kapiti 5032.

Note

Mobile stations operating in the Upper Hutt Valley count as a contact. Upper Hutt Club members outside the Upper Hutt Valley also count as a contact.

The ZL1FND Far North Avocado Festival Award

This is an award that will run in conjunction with the Far North Avocado Festival held late February/early March each year. The award will run during the final week of the festival only.

The award is open to all radio amateurs, including overseas amateurs and SWLs, and can be gained through contacts using 2m, 70cm (including repeaters and the National System) and the HF bands.

Contact confirmation by way of the operator's log will be required and should be received by the contest organizer by the end of April of the current year, together with the fee: New Zealand based operators—\$5.00; Overseas—NZ\$6.00 equivalent (no IRCs please). Once the log has been confirmed the certificate will be posted to the claimant.

To gain the award the following points are required:

New Zealand operators: 20.

Overseas operators: 10.

Points can be claimed as follows:

One contact with the Branch ZL1FND operator (compulsory)—five points.

Contact with Branch President or Vice-President (will identify)—four points.

Contact with any Branch 78 committee member (will identify themselves)—three points.

Contact with any other Branch 78 member—two points.

Dates and times (also frequencies for HF) will be notified in the January/February *Break-In* each year.

Claims for the award to: The Awards Manager, PO Box 4, Awanui 0451, Far North, New Zealand.

Wairarapa Regional Award

This Award is sponsored by Branches 06, 46 and 82.

Requirements for Award: work eight counties, 12 towns, 15 postcodes, three lakes, four hospitals, eight rivers, two aerodromes, two lighthouses and 23 museums/historic places. The Award can be worked in three stages: basic, upgrade and final.

A check sheet for working the Award is available on written request with SASE, from the

Awards Manager, PO Box 860, Masterton 5840.

This Award may be worked on all bands and all modes starting from January 1, 1997. The "Basic" award costs \$5.00. "Upgrade" and "Final" stickers are free on receipt of check sheet and SASE.

Waitomo Award

Make 10 points with Branch 55 contacts as follows: VHF Simplex or CW, two points; VHF or UHF Repeater, 1 point; HF Phone, one point; HF CW, two points; VHF Satellite, two points; Club Station ZL1IZ, two points. Award is open to SWLs.

Log details and \$5.00 to I. M. Howitt ZL1IZ, 15 Frederick Street, Otorohanga 3900.

Wanganui Award

For contacts since January 1 1982 with permanent residents in the Wanganui area—one point; with Wanganui-based Mobile stations regardless of location—one point; with ZL2JA—two points. Overseas stations require three points; ZLs require five points. (Repeater contacts acceptable.)

QSO details with \$3.00 or five IRCs to Award Manager, 1 Caversham Road, Wanganui 4105.

Old Timers' Club

Old Timers' Award

Rules for the Award

Ten contacts with OTC (ZL) members, each contact worth one point, Phone or CW with an upgrade of 50 points.

The information required on each contact is: call-sign, date, time,

name and OTC number. Contacts must be on or after launch date December 8, 1995.

Logs with remittance of \$5.00 or IRCs to OTC Award Manager, 25 Annandale Street, New Plymouth 4310. Note that points may not be gained on the OTC National Net on Sunday mornings.

WARO

New Zealand Women Amateur Radio Operators

NZWARO Award

General

Contacts may be any mode, any band with NZWARO members who are financial at the time of the contact. No QSLs required. Send full log details certifying that the contacts have been made to Award Manager, Lynnette McDonald ZL1LL, 25 John Street, Pukekohe 2120, New Zealand, with sufficient postage for return of award.

national 10 contacts, DX stations five. Contacts with DX members of WARO qualify for endorsements by endorsement application must contain at least three ZL contacts.

VHF/UHF Section

Stations work 10 WARO members on VHF or UHF (repeaters allowed). Endorsements for each additional five.

SWL Section

ZL and VK Listeners list 20 contacts heard with WARO members, DX list 10. Send full log details with call-signs of both stations. Endorsements for each additional 10.

NZWARO Century Award

1. Applications to contain full log details of contacts with 100 NZWARO members (DX members included) dating from June 1, 1987. DX stations may apply for a special DX Award listing 50 contacts only, with endorsements for further 10s until 100 contacts are achieved.

2. Contacts may be any mode, any band, and each member claimed must be a financial member of NZWARO at the time of the contact and may be counted once only.

3. Contacts made on repeaters and in nets will qualify, and WARO contest contacts made after June 1, 1990 will be accepted.

4. No QSLs required. Send list of full log details to Award Manager, Lynnette McDonald ZL1LL, 25 John Street, Pukekohe 2120, New Zealand, with sufficient postage for return of award.

NZWARO Mountain Buttercup Award

1. For contacts with licensed NZWARO members, resident, visiting, mobile, etc, in the 60 towns named in the official list. A WARO member working mobile, port-

able, etc, may claim the relevant town for her own credit. The same WARO member may be contacted in any number of towns.

2. Basic award is available for list of 15 contacts with endorsement seals for each further 10 contacts up to the full 60 required. Applicants submitting a list of the full 60 valid contacts will receive a special award distinctive from the one gained for the lesser number of contacts.

3. Contacts may be any mode or any band, but each YL worked must be a financial member of NZWARO at the time of the contact and must be within a 25km radius of the town claimed.

4. Endorsement seals can be claimed for each further 10 contacts (after the basic 60) using the same list of towns. The same WARO members can be worked but each must be in a different town to where previously claimed. Please SAW with applications.

Award dates from January 1, 1989. An official list of towns required to be worked is listed below or is available from the Manager on receipt of an SAE. No QSLs required. Send applications containing full log details

including the name of YL and town where worked, together with sufficient postage for return of award, to Award manager, Lynnette McDonald ZL1LL, 25 John Street, Pukekohe 2120, New Zealand.

North Island

1. Auckland
2. Dannevirke
3. Dargaville
4. Eketahuna
5. Featherston
6. Gisborne
7. Hamilton
8. Hawera
9. Helensville
10. Kaikohe
11. Kaitaia
12. Masterton
13. Matamata
14. Morrinsville
15. Napier
16. New Plymouth
17. Opotiki
18. Orewa
19. Otaki
20. Paihia
21. Palmerston North
22. Papakura
23. Putaruru
24. Rotorua
25. Taihape
26. Taumarunui

27. Taupo
28. Tauranga
29. Thames
30. Te Awamutu
31. Te Kuiti
32. Turangi
33. Upper Hutt
34. Waihi
35. Wairoa
36. Wangarui
37. Wellington
38. Wellsford
39. Whakatane
40. Whangarei

South Island

41. Alexandra
42. Ashburton
43. Balclutha
44. Blenheim
45. Christchurch
46. Cromwell
47. Dunedin
48. Gore
49. Greymouth
50. Hokitika
51. Invercargill
52. Kaikoura
53. Motueka
54. Nelson
55. Oamaru
56. Queenstown
57. Reefton
58. Timaru
59. Wanaka
60. Westport

Overseas Awards

Note

1. There are hundreds of awards which are publicised in amateur radio periodicals throughout the world each month! Many are listed in RSGB publication Amateur Radio Awards (priced in UK £1.20) and several publications of DX Awards Guide by Chuck Ellis, priced about \$7.00 to \$8.00 each! CTC Directory of Awards has been revised and published by NZART member Scott Douglas KB7SB. This is a very comprehensive publication selling for about US\$12.50 (check with NZART Awards Manager about these).

2. Most overseas awards can be certified by NZART Awards Manager so the QSLs don't have to be sent overseas BUT, always send a FULL checking list with all QSO data, etc., on which can be written the certification and which can be sent as the application. (ARRL Awards cannot be certified).

3. ALWAYS SEND SUFFICIENT RETURN POSTAGE for QSLs, etc. Print name and address on each sheet of paper used.

A-1 Operator Club

The basic aim of the A-1 Operator Club is to promote good operating in the amateur bands. To become a member one must be nominated by at least two operators who already belong. Every amateur should strive to merit nomination by following standard operating practice, by observing the rules of good Phone operation, and making his CW as clean and accurate as possible. An attractive certificate is awarded to each amateur who qualifies for membership. Note: This award is sponsored by the ARRL. Several ZL amateurs are members. Strive to merit nomination—you never know who may be listening. Similar awards are: TOPS; FOC; HSC.

WAC—Worked All Continents

Issued by IARU only through affiliated Societies. Applications from financial members of NZART only, must be made through the Awards Manager, accompanied by a

checking sheet, QSL cards from the six continents, and return stamped envelope.

The following eight certificates are available: Basic (mixed mode), CW, Phone, SSTV, RTTY, FAX, Satellite and 5-band. In addition, the following endorsement stickers are available: QRP, 1.8 MHz, 3.5 MHz, 50 MHz, 144 MHz, any higher frequency band and 6-band. Contacts made on 10/18/24 MHz or via satellite are void for the 5-band certificate and 6-band sticker.

QRP is defined as five watts OUTPUT (10 W input) and QRP contacts must date on or after January 1 1985.

ZL applicants must be NZART members and enclose Break-In label with application.

There is NO charge.

RSGB Awards

For WBC, BCRTA, CDX, etc—SASE to NZART Awards Manager.

French Awards

For information on DDFM, DUF, DTA, DTC, DPE and other French Awards send an SASE to the NZART Awards Manager and include a 40 cent stamp. (Applicants for These Awards can be certified by NZART Awards Manager.)

ARRL Awards

WAS—Worked All States

Obtain the rules and application forms for WAS and 5BWAS by sending a business-size SAE and a few IRC to the ARRL Headquarters, 225 Main Street, Newington, CT 06111, USA.

DXCC—DX Century Club

*See "Countries List" in this Call Book.

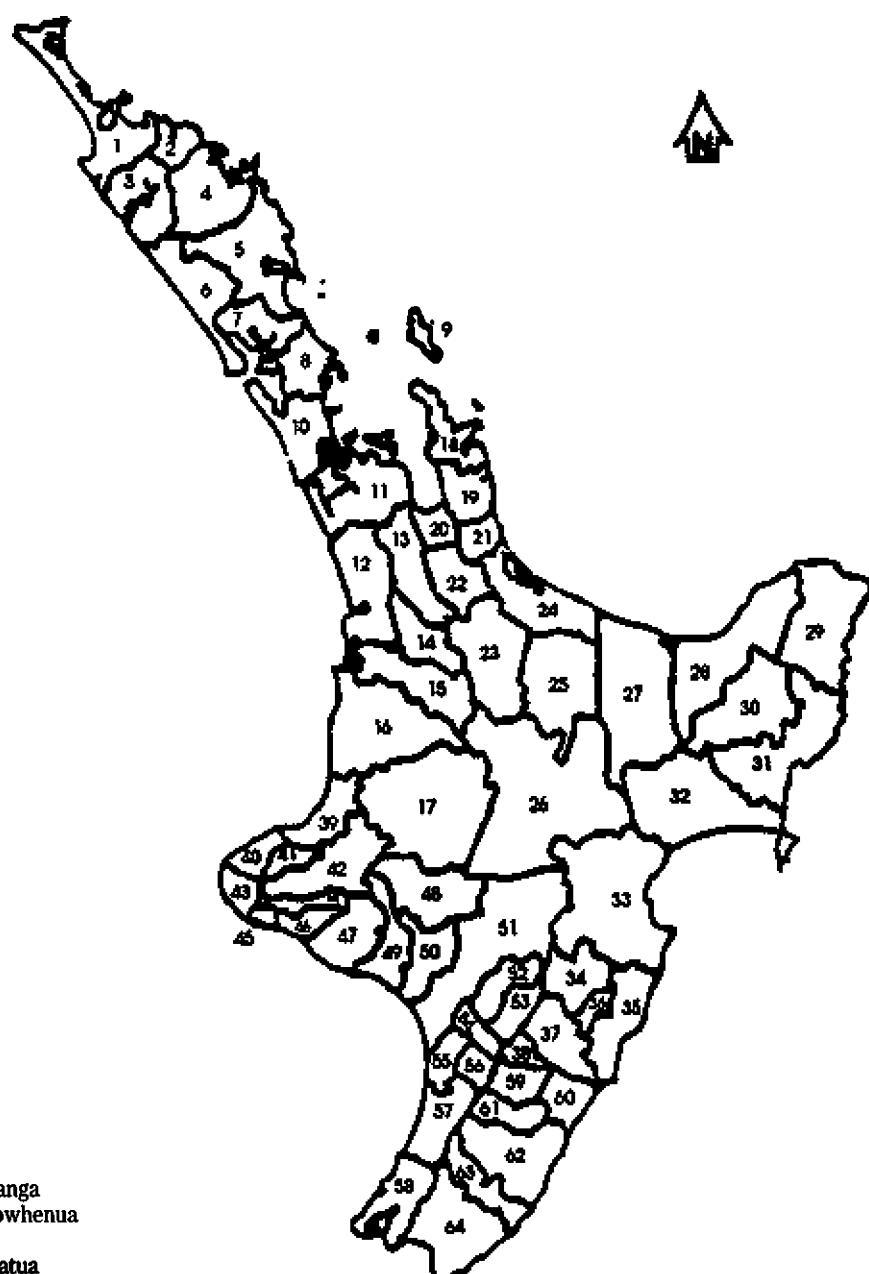
Many endorsements etc. available—full reprint of rules (4 A4 sheets) from Awards Manager for \$1.00.

NORTH ISLAND

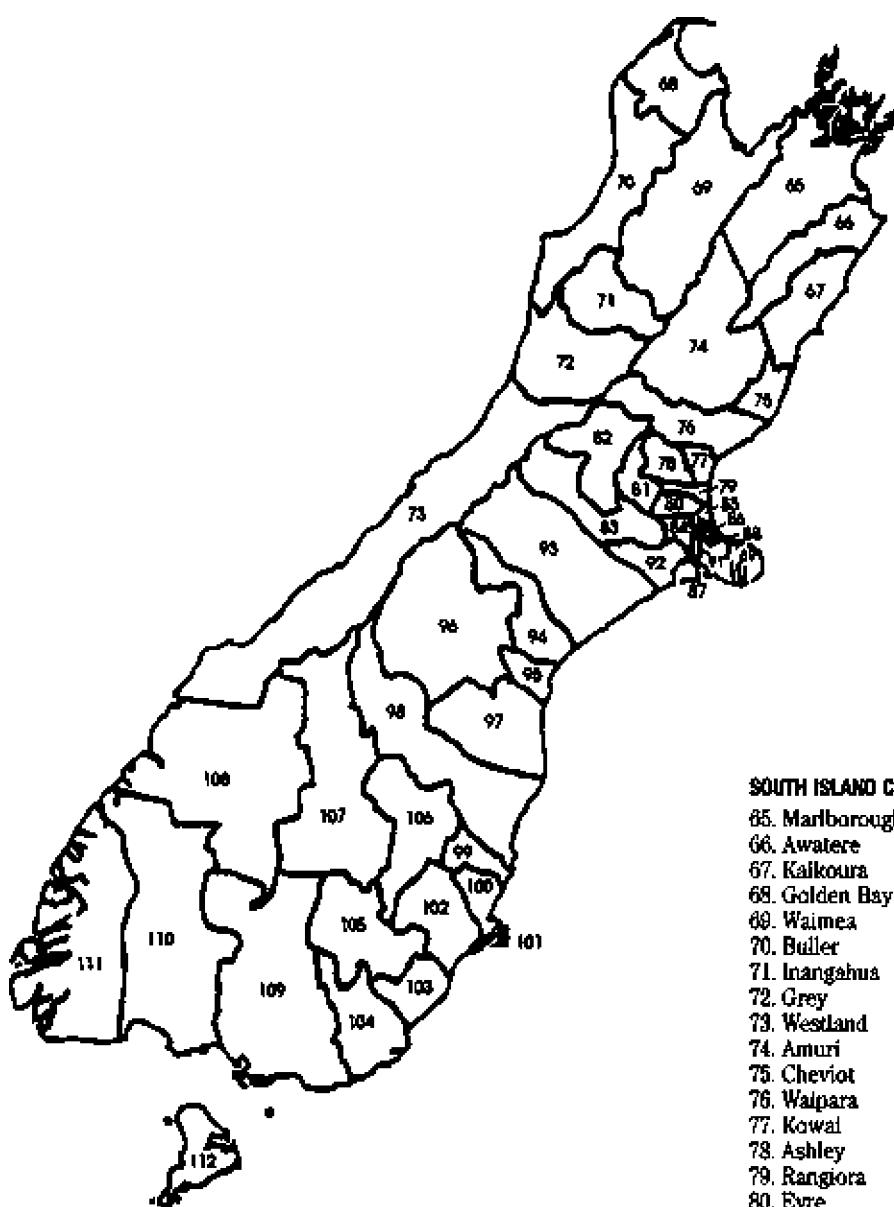
NORTH ISLAND COUNTIES

1. Mangonui
2. Whangaroa
3. Holianga
4. Bay of Islands
5. Whangarei
6. Hobson
7. Otamatea
8. Rodney
9. Great Barrier Island
10. Waitemata
11. Franklin
12. Raglan
13. Waikato
14. Waipa
15. Otorohanga
16. Waitomo
17. Taumarunui
18. Coromandel
19. Thames
20. Hauraki Plains
21. Ohinemuri
22. Piaiko
23. Matamata
24. Tauranga
25. Rotorua
26. Taupo
27. Whakatane
28. Opotiki
29. Waiau
30. Waikohu
31. Cook
32. Wairoa
33. Hawke's Bay
34. Waipawa
35. Patangata
36. Waipukurau
37. Dannevirke
38. Woodville
39. Clifton
40. Taranaki
41. Inglewood
42. Stratford
43. Egmont
44. Eltham
45. Waimate West
46. Hawera
47. Patea
48. Waimarino
49. Waitotara
50. Wanganui
51. Rangitikei
52. Kiwitea
53. Pohangina
54. Oroua
55. Manawatu

56. Kairanga
57. Horowhenua
58. Hutt
59. Pahiatua
60. Akitio
61. Eketahuna
62. Masterton
63. Wairarapa South
64. Featherston



SOUTH ISLAND



SOUTH ISLAND COUNTIES

- 85. Marlborough
- 66. Awatere
- 67. Kaikoura
- 68. Golden Bay
- 69. Waimea
- 70. Buller
- 71. Inangahua
- 72. Grey
- 73. Westland
- 74. Amuri
- 75. Cheviot
- 76. Waipara
- 77. Kowai
- 78. Ashley
- 79. Rangiora
- 80. Eyre
- 81. Oxford
- 82. Tawera
- 83. Malvern
- 84. Paparua
- 85. Waimairi
- 86. Heathcote
- 87. Halswell
- 88. Mount Herbert
- 89. Akaroa
- 90. Chatham Islands
- 91. Wairewa
- 92. Ellesmere
- 93. Ashburton
- 94. Geraldine
- 95. Levels
- 96. Mackenzie
- 97. Waimate
- 98. Waitaki
- 99. Waihemo
- 100. Waikouaiti
- 101. Peninsula
- 102. Taieri
- 103. Bruce
- 104. Clutha
- 105. Tuapeka
- 106. Maniototo
- 107. Vincent
- 108. Lake
- 109. Southland
- 110. Wallace
- 111. Fiord
- 112. Stewart Island

FIXED LOCATION STATIONS Updated as at 2006-05-18

These listings are based on the MED data base.

Please contact NZART FMTAG for blank copies of the correct forms for making additions, modifications or deletions.

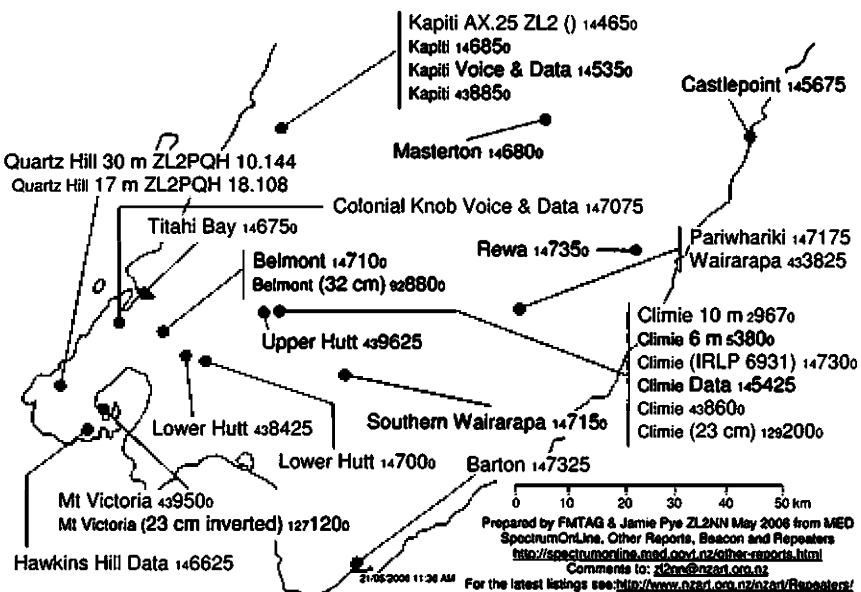
Note on operational status. The following stations are operational, or are expected to become operational during the currency of this Call Book.

Note on repeater input/output offsets. Most repeaters receive LOW and transmit HIGH, except 7025 to 7375 on 2 metres and 434.xxx National System repeaters.

Station Name	Output Frequency	MED Site Name	Map Ref	Branch	Trustee 1	Trustee 2	Note
10 m Repeaters							
User transmits 100 kHz lower. Vertical polarisation.							
Auckland 964	29.640	Laing Road Karaka	R12 743543	86	ZL1BFB	ZL1TRH	
Climie 967	29.670	Mt Climie	R27 898040	63	ZL2TNG	ZL2PDJ	
6 m Repeaters							
User transmits 1 MHz lower. Vertical polarisation.							
Alexandra 3625	53.625	Fruitlands	G42 142336	61	ZL4THT	ZL4GP	
Auckland 3725	53.725	Klondyke	R13 705258	74	ZL1QF	ZL1TN	
Climie 380	53.800	Mt Climie	R27 898040	63	ZL2TNG	ZL2PDJ	
Cass Peak 385	53.850	Cass Peak	M36 797300	CA	ZL3MJS	ZL3TMB	
2 m Repeaters							
Vertical polarisation. User transmits 600 kHz lower for output frequencies of 145.325 to 147.000 MHz. User transmits 600 kHz higher for output frequencies of 147.025 to 147.375 MHz.							
Rotorua Linear 435	144.350	Moerangi	U16 068393	33	ZL1PJ	ZL1BWC	
Kapiti Voice & Data 535	145.350	Mt Field	R26 875374	69	ZL2GO	ZL2HO	
Opunake 540	145.400	Kiri Road	P20 961014	87	ZL2ADU	ZL2BQW	
Brynderwyn 560	145.600	Pilbow Hill	Q08 383694	28	ZL1DTE	ZL1TVP	
Ward 560	145.600	Weld Cone	P29 072282	22	ZL2BK	ZL2BJV	
Tararua Voice & Data 5625	145.625	Mt Butters	T25 672674	06	ZL2KG	ZL1AFZ	
Raglan 5675	145.675	Plateau Road	R15 826651	81	ZL1TAT	ZL1THG	
Castlepoint 5675	145.675	Castlepoint	U26 820346	46	ZL2TFZ	ZL2UCW	
Manawatu 5725	145.725	Pahiatua Track	T24 416857	20	ZL2AUB	ZL2FX	
Auckland 5775	145.775	Musick Point	R11 799820	86	ZL1BFB	ZL1TRH	
Auckland 6625	146.625	Klondyke	R13 705258	66	ZL1TGC	ZL1TN	
Timaru 6625	146.625	Mt Horrible	J39 559434	34	ZL3TGR	ZL3AR	
Dunedin 665	146.650	Highcliff	I44 231779	30	ZL4GR	ZL4JH	
Whangarei 665	146.650	Parakiore	Q06 267150	28	ZL1DTE	ZL1TVP	
Wharite 665	146.650	Wharite	T23 529017	06	ZL2KG	ZL1AFZ	
Hawkes Bay 670	146.700	Kahuranki	V22 416494	13	ZL2DW	ZL2AJ	
Motueka 670	146.700	Mt Campbell	N27 976092	24	ZL2BCG	ZL2ASF	
Auckland 670	146.700	Ruaotuwhenua	Q11 487742	66	ZL1TGC	ZL1TN	
Oamaru 670	146.700	Station Peak	I40 172034	64	ZL4SN	ZL4DB	
Westport 675	146.750	Cape Foulwind	K29 823386	62	ZL3VC	ZL3SR	
Balclutha 675	146.750	Kuriwao	G46 301348	35	ZL4TL	ZL4AZI	
Bay of Islands 675	146.750	Manginangina	P05 843654	84	ZL2BER	ZL1AVW	
Taupo 675	146.750	Maroanui	U17 735940	60	ZL1BVO	ZL1DT	
Mount Grey 675	146.750	Mt Grey	M34 732872		ZL3UGB	ZL3AIC	
Titahi Bay 675	146.750	Onepoto Res	R27 653093	42	ZL2AUA	ZL2AZ	
Akatere 6775	146.775	Akatere	P04 715881	78	ZL1OT	ZL1AUI	Linked
Taihape 6775	146.775	Mataroa	T21 444641	23	ZL2TRY	ZL2JOE	
Invercargill 680	146.800	Bald Hill	D46 109364	37	ZL4OX	ZL4TFJ	
Tauranga 680	146.800	Cambridge Road	U14 854837	39	ZL1MK	ZL1KL	
Poverty Bay 680	146.800	Kaiti Hill	Y18 477683	11	ZL2UT	ZL2RC	
Tekapo 680	146.800	Mt Rollesby	I38 192691	34	ZL3TGR	ZL3AR	
Nelson 680	146.800	Princes Drive	O27 316919	26	ZL2BCA	ZL2UL	
Masterton 680	146.800	Rangitimuau	T26 407366	46	ZL2TFZ	ZL2UCW	
Arowhana 685	146.850	Arowhana	Y16 362316	11	ZL2UT	ZL2RC	
Kapiti 685	146.850	Mt Field	R26 875374	69	ZL2GO	ZL2OH	
Queenstown 685	146.850	Remarkables	F41 794632	75	ZL4JW	ZL4JW	Linked
Kaikoura 690	146.900	Kaikoura	O31 673650	76	ZL3PZ	ZL3DR	
Dunedin 690	146.900	Mt Cargill	I44 199855	30	ZL4GR	ZL4JH	
Auckland 690	146.900	Mt Puketutu	R12 899493	66	ZL1ABS	ZL1UET	
Wanganui 690	146.900	Wanganui	R22 855501	48	ZL2BGE	ZL2TDI	
Gisborne 690	146.900	Whakapunake	X18 091532	11	ZL2UT	ZL2RC	
Gore 695	146.950	Mcleods Hill	F45 898550	08	ZL4AO	ZL4GL	
Waitaki 695	146.950	Mt Studholme	J40 452147	34	ZL3TGR	ZL3AR	
Waikato 695	146.950	Mt Te Aroha	T13 525038	81	ZL1TAT	ZL1THG	
Greymouth 695	146.950	Sewell Peak	K31 736652	49	ZL3TY	ZL3ADH	
Blenheim 695	146.950	The Ned	P28 867510	22	ZL2BK	ZL2BJV	Linked
North Canterbury 6975	146.975	Mt Noble	M33 602152	68	ZL3AI	ZL4WX	Linked
Tairua 6975	146.975	Tairua	T11 608661	85	ZL1AAF	ZL1CWN	
Alexandra 700	147.000	Fruitlands	G42 142336	61	ZL4THT	ZL4GP	
Lower Hutt 700	147.000	Fitzherbert	R27 744968	18	ZL2TVM	ZL2TWS	
Edgecumbe 700	147.000	Putauaki	V16 376374	67	ZL1AIS	ZL1CAY	
Murchison 7025	147.025	Mt Murchison	M29 683418	26	ZL2BCA	ZL2UL	
Christchurch 705	147.050	Marleys Hill	M36 804330	05	ZL3VP	ZL3RX	

Station Name	Output Frequency	MED Site Name	Map Ref	Branch	Trustee 1	Trustee 2	Note
Egmont 705	147.050	Mt Egmont	P20 053104	87	ZL2AFE	ZL2WJM	
Colonial Knob Voice & Data	147.075	Colonial Knob	R27 613043	74	ZL3TC	ZL2TFZ	
Far North 710	147.100	Maungataureia	O04 542702	78	ZL1BG	ZL1FC	
Belmont 710	147.100	Belmont	R27 669016	74	ZL2ARW	ZL2TFZ	
Manawatu 7125	147.125	Pahiatua Track	T24 416857	20	ZL2AUB	ZL2FX	
Far North 715	147.150	Browns Hill	P05 882484	78	ZL1AUI	ZL1BQK	
Westport 715	147.150	Mt Frederick	L29 140440	62	ZL3VC	ZL3SR	
Taumarunui 715	147.150	Hikurangi	S18 099654	38	ZL1AO	ZL1UTH	
Southern Wairarapa 715	147.150	The Knoll	S27 126004	82	ZL2SJ	ZL2BML	
Pariwhariki 7175	147.175	Pariwhariki Trig	T27 389077	46	ZL2TFZ	ZL2UCW	
Te Puke 7175	147.175	Shaw Road	U15 972630	53	ZL1RAB	ZL1TAJ	
Eyrewell 720	147.200	Eyrewell	M35 552533	CA	ZL3MJS	ZL3TMB	
Whangarei 720	147.200	Parakiore	Q06 267150	28	ZL1DTE	ZL1TVP	
New Plymouth 720	147.200	Power Station	P19 990382	27	ZL2BR	ZL2BZH	
Nelson 720	147.200	Saddle Hill	O27 462923	26	ZL2BCA	ZL2UL	
Picton 7225	147.225	Mt Freeth	P27 924903	22	ZL2BK	ZL2BJV	
Doubtless Bay 7225	147.225	Rangiawhia	O03 466037	78	ZL1AUI	ZL1BQK	
Waipuna Road 7225	147.225	Waipuna Road	R16 846159	55	ZL1HJ	ZL4SQ	
Canterbury 725	147.250	Herbert Peak	M36 892243	05	ZL3VP	ZL3RX	
Whangarei 725	147.250	Horokaka	Q07 132917	28	ZL1DTE	ZL1TVP	
Napier 725	147.250	Taraponui	V19 333234	25	ZL2DW	ZL2TC	
Kakaramea 7275	147.275	Kakaramea	T19 437441	38	ZL1AO	ZL1UTH	
Climie 730	147.300	Climie	S27 901048	63	ZL2TNG	ZL2PDJ	
Rodney 730	147.300	Moir Hill	R09 539245	71	ZL2BCB	ZL1BKD	
Whakatane 730	147.300	Whakatane	W15 629502	51	ZL1BCW	ZL1NI	
Barton 7325	147.325	Barton	S28 052586	46	ZL2TFZ	ZL2UCW	
Ponga 7325	147.325	Ponga Hill	R12 886529	86	ZL1BFB	ZL1TRH	
Rotorua 735	147.350	Moerangi	U16 004306	33	ZL1PJ	ZL1BWC	
Rewa 735	147.350	Mt Rewa	T27 628081	46	ZL2TFZ	ZL2UCW	
Waitomo 7375	147.375	Rangitoto	S16 212126	55	ZL1BZ	ZL1HJ	
Golden Bay	147.375	Takaka Hill	N26 983203	24	ZL2BCG	ZL2ASF	

**Wellington & Wairarapa Amateur
Radio 10 m, 6 m, 2 m, 70 cm,
32 cm & 23 cm Repeaters**



Naming of Repeaters and Beacons

The repeaters name is split into two parts: The name (this is normally named after the repeater's location) and the frequency of transmission. The frequency is also split into two parts: an abbreviated version and the full transmit frequency in kHz.

Repeater name (bold)

Masterton 146800

Transmit frequency in kHz

NOTE: If the kHz digit is a zero it is not shown as part of the repeater name

Repeater Offsets (Splits)

Band	Repeater receives on a frequency of (kHz)
10 m	Lower by 100 kHz
6 m	Lower by 1 000 kHz
2 m	Lower by 600 kHz Higher by 600 kHz for repeater transmit 147 025 to 147 375
70 cm	Lower by 5 000 kHz Higher by 5 000 kHz for repeater transmit 433 250 to 434 975
32 cm	Lower by 7 600 kHz
23 cm	Lower by 20 000 kHz

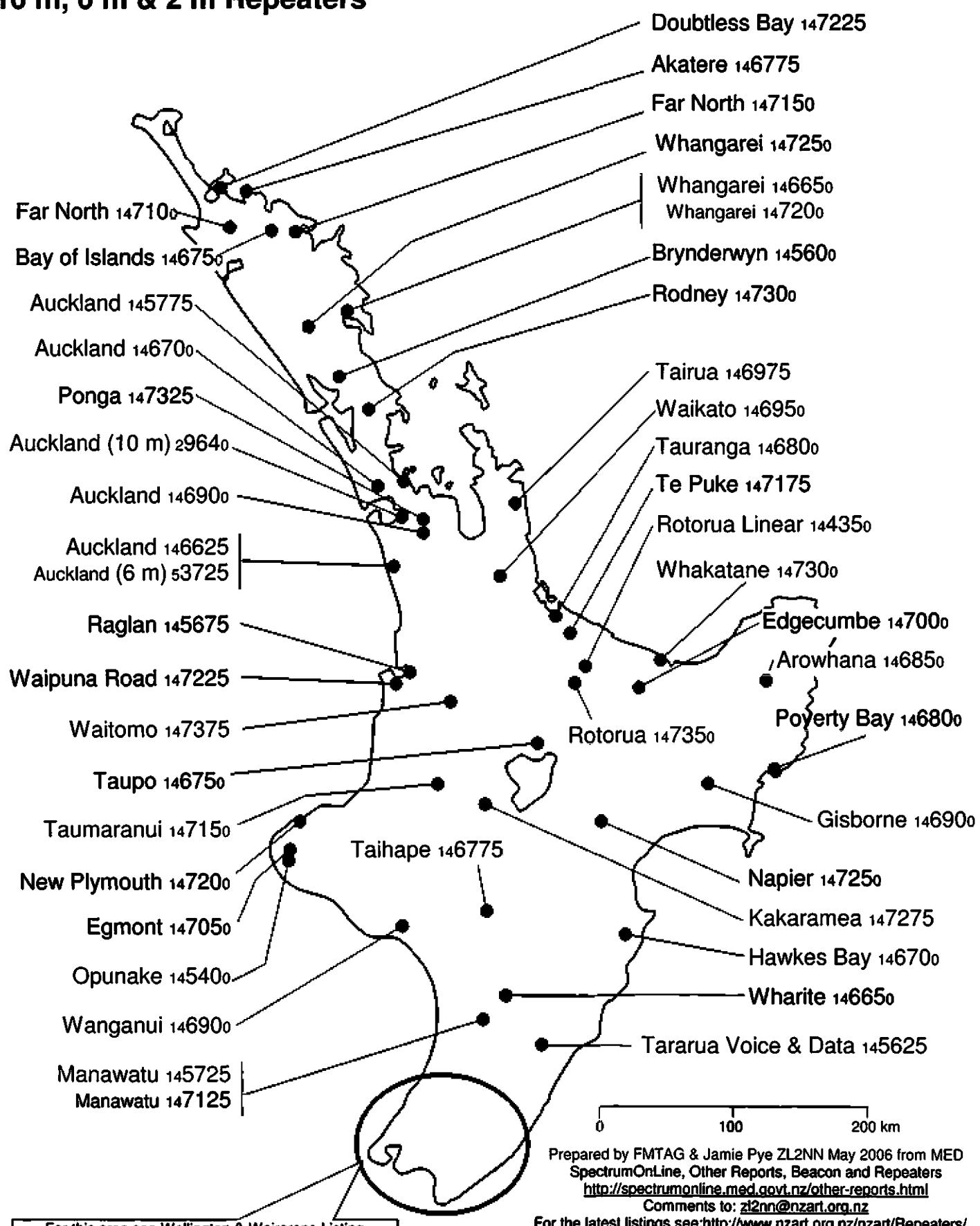
Internet Radio Linking Project (IRLP)

NOTE: Tables show stations that appear in these maps

IRLP Nodes @ 21 April 2006 from http://www.irlp.net/				
ID	Callsign	City	Frequency	Status
6285	ZL2KS	Blenheim	-146.9500	IDLE
6549	ZL1IS	Waikato	-146.9500	IDLE
6793	ZL2AS	Hastings	+147.2500	Down

ID	Callsign	City	Frequency	Status
6900	ZL3TMB	Christchurch	+147.2000	Down
6931	ZL2VH	Upper Hutt	-147.3000	IDLE
6943	ZL2KO	Manawatu	-145.7250	IDLE

North Island Amateur Radio 10 m, 6 m & 2 m Repeaters

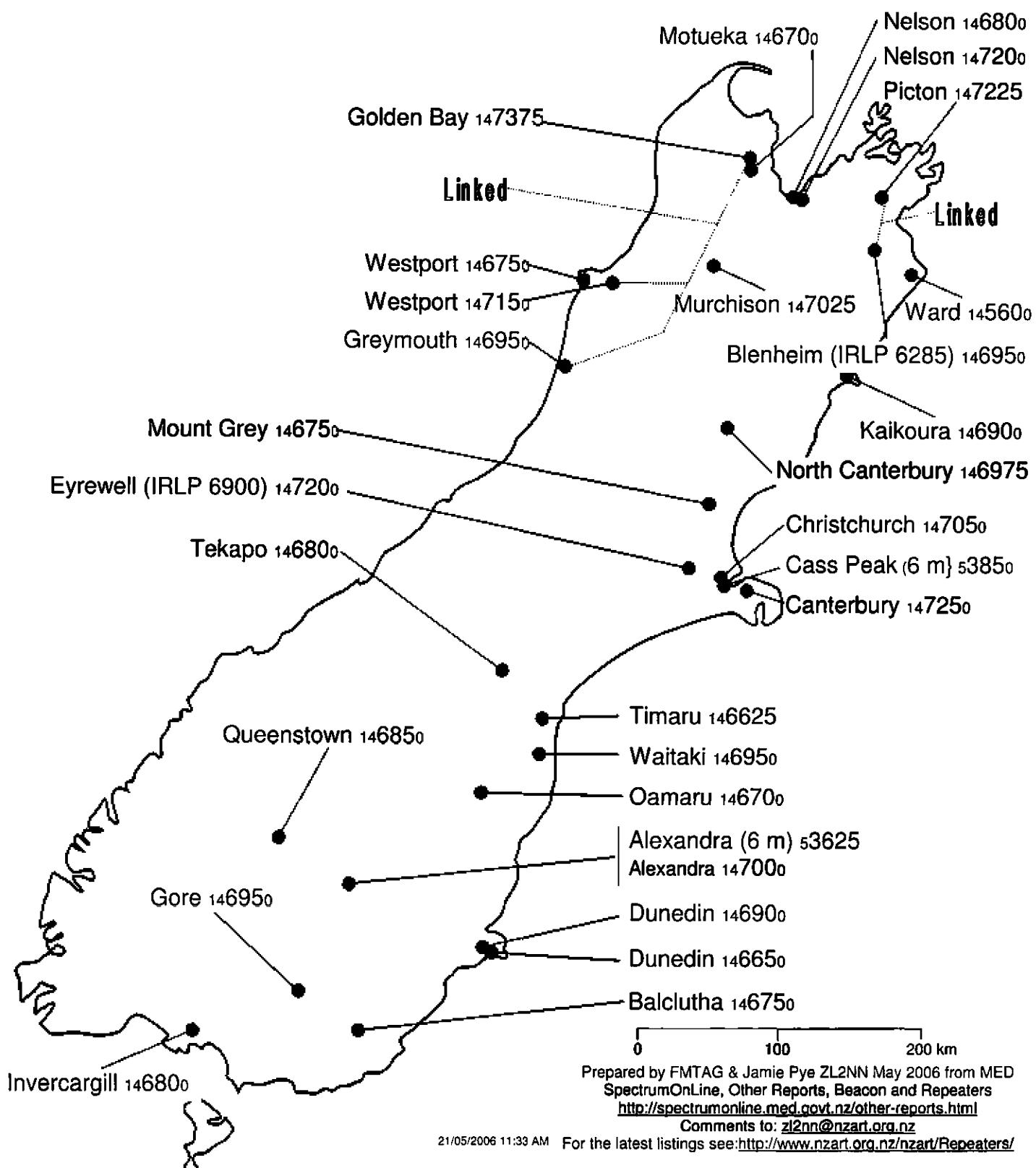


For this area see Wellington & Wairarapa Listing

18/06/2006 2:05 PM

For the latest listings see: <http://www.nzart.org.nz/nzart/Repeaters/>

South Island Amateur Radio 10 m, 6 m & 2 m Repeaters



70 cm REPEATERS

User transmits 5 MHz lower for 438.xxx and 439.xxx. User transmits 5 MHz higher for 433.xxx and 434.xxx. Vertical polarisation. National System repeaters are listed on another page.

Station Name	Output Frequency	MED Site Name	Map Ref	Branch	Trustee 1	Trustee 2	Note
Wairarapa 3825	438.825	Pariwhariki	T27 389077	46	ZL2TFZ	ZL2UCW	
Mosgiel 820	438.200	Saddle Hill	I44 055746	30	ZLAGR	ZL4JH	Simplex
Ponga 825	438.250	Ponga Hill	R12 896529	86	ZL1BFB	ZL1TRH	
Dunedin 830	438.300	Highcliff	I44 231779	30	ZL4GR	ZL4JH	Simplex
Eyrewell 835	438.350	Eyrewell	M35 552533	CA	ZL3MJS	ZL3TMB	
Christchurch 840	438.400	Marleys Hill	M36 805328	CA	ZL3MJS	ZL3TMB	
Waikato 840	438.400	Te Aroha	T13 526039	81	ZL1TAT	ZL1THG	
Lower Hutt 8425	438.425	Birch Street	R27 711976	18	ZL2TVM	ZL2TWS	
Taraponui 8425	438.425	Taraponui	V19 333234	25	ZL2DW	ZL2TC	
Auckland 845	438.450	Klondyke	R13 705258	66	ZL1TGC	ZL1TN	
Blenheim 845	438.450	Tuamarina	P28 884780	22	ZL2BK	ZL2BJV	
New Plymouth 8475	438.475	Carrington Road	P19 995240	27	ZL2BR	ZL2BZH	
Auckland 850	438.500	Auckland	R11 677815	66	ZL1ABS	ZL1UET	
Cass Peak 850	438.500	Cass Peak	M36 797300	56	ZL3ACS	ZL3VI	
Manawatu 8525	438.525	Pahiatua Track	T24 416857	20	ZL2AUB	ZL2FX	
Westport 855	438.550	Mt Frederick	L29 140440	62	ZL3VC	ZL3SR	
Te Puke 855	438.550	Te Puke	U15 972630	53	ZL1RAB	ZL1TAJ	
Manurewa 8575	438.575	Manurewa	R11 805664	86	ZL1BFB	ZL1TRH	
Greymouth 8575	438.575	Sewell Peak	K31 736652	49	ZL3TY	ZL3ADH	
Hunua 860	438.600	Gillespie Road	S12 909538	65	ZL1BNQ	ZL1AVR	
Climie 860	438.600	Mt Climie	S27 991048	63	ZL2TNG	ZL2PDJ	
Oamaru 865	438.650	Cape Wanbrow	J41 504639	64	ZLASN	ZL4DB	
Taihape 865	438.650	Cleavers Hill	T21 455828	23	ZL2TRY	ZL2JOE	
Invercargill 870	438.700	Invercargill	E46 532122	37	ZL4OX	ZL4TFJ	
Whangarei 870	438.700	Parahaki	Q07 318089	28	ZL1DTE	ZL1TVP	
Waitomo 870	438.700	Rangitoto	S16 212126	55	ZL1BZ	ZL1HJ	
Hawkes Bay 870	438.700	Te Mata	V21 448603	13	ZL2DW	ZL2AJ	
Egmont 880	438.800	Mt Egmont	P20 053104	87	ZL2AFE	ZL2WJM	
Kapiti 885	438.850	Mt Field	R26 875374	69	ZL2GO	ZL2OII	
Tauranga 885	438.850	Papamoa	U14 994798	39	ZL1VA	ZL1MK	
Nelson 890	438.900	Fringed Hill	O27 366885	26	ZL2BCA	ZL2UL	
Dunedin 915	439.150	Mt Cargill	I44 199855	30	ZL4GR	ZL4JH	
Hawkes Bay 9175	439.175	Te Mata	V21 447602	13	ZL2DW	ZL2AJ	
Mt Victoria 950	439.500	Mt Victoria	R27 604886	74	ZL3TC	ZL2TAR	
Gisborne 950	439.500	Te Kapua	Y17 341903	11	ZL2UT	ZL2RC	
Whangarei 9575	439.575	Horokaka	Q07 132917	28	ZL1DTE	ZL1TVP	
Wharite Voice & Data 960	439.600	Wharite	T23 531016	06	ZL2KG	ZL1AFZ	
Upper Hutt 9625	439.625	Akatarawa	R26 890135	63	ZL2TNG	ZL2PDJ	
Hawkes Bay Voice & Data 9675	439.675	Mt Threave	V22 341547	25	ZL2DW	ZL2TC	
Whakatane 9725	439.725	Whakatane	W15 629502	51	ZL1BCW	ZL1NI	

32 cm REPEATERS

Users transmit 7.6 MHz lower. Vertical polarisation.

Belmont 880	928.800	Mt Belmont	R27 669016	74	ZL3TC	ZL4JY
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23 cm REPEATERS

User transmits 20 MHz lower. Vertical polarisation

Mount Victoria 120	1271.200	Mt Victoria	R27 604886	74	ZL3TC	ZL2TAR
Auckland 190	1291.900	Glenfield	R11 642880	66	ZL1TGC	ZL1ABS
Climie 200	1292.000	Mt Climie	R27 898040	63	ZL2TNG	ZL2PDJ

VOIP (ECHOLINK & IRLP)

Simplex.

Station Name	Output Frequency	MED Site Name	Map Ref	Branch Number	Trustee 1	Trustee 2
Tauranga Echolink	432.700	Tauranga	U14 917815		ZL1CYK	

APRS, BULLETIN BOARDS & DIGIPEATERS

Simplex

Station Name	Frequency	MED Site Name	Map Ref	Branch	Trustee 1	Trustee 2	Note
ZL2PQH	10.144	Quartz Hill	R27 517938	50			
ZL2PQH	18.108	Quartz Hill	R27 517938	50			
Christchurch	144.575	Marleys Hill	M36 801332	05	ZL3VP	ZL3RX	
Timaru	144.575	Mt Horrible	J39 559434	34	ZL3TGR	ZL3AR	
Western Suburbs	144.575	Whau Bridge	R11 612753	03	ZL1MW	ZL1VRR	
Whitford Aprs	144.575	Whitford	R11 898705	66	ZL1TN	ZL1QF	
ZL1TEP	144.625	Te Puke	U14 975764	53	ZL1RAB	ZL1TAJ	
North Shore	144.650	Castor Bay	R10 684921	29	ZL1BNY	ZL1AUW	
ZL2SUM	144.650	Fringed Hill	O27 364885	26	ZL2BCA	ZL2UL	
ZL4AAI	144.650	Highcliff	I44 231779	30	ZL4GR	ZL4JH	
Dunedin BBS	144.650	Clubrooms	I44 158759	30	ZL4GR	ZL4JII	
New Plymouth	144.650	Hurford Road	P19 995264	27	ZL2BR	ZL2BZH	
Napier	144.650	Kahuranki	V22 416494	25	ZL2TC	ZL2AJ	
Kaikoura	144.650	Kaikoura	O31 676646	76	ZL3PZ	ZL3DR	
ZL3CHC	144.650	Marleys Hill	M36 804330	05	ZL3VP	ZL3RX	
ZLAALI	144.650	Millane Road	F45 014479	08	ZL4AO	ZL4GL	
Climie	144.650	Mt Climie	R27 898040	63	ZL2TNG	ZL2PDJ	
Kapiti	144.650	Mt Field	R26 875374	69	ZL2GO	ZL2OH	
Westport	144.650	Mt Frederick	I29 140440	62	ZL3VC	ZL3SR	
Murchison	144.650	Mt Murchison	M29 683418	49	ZL3TY	ZL3ADII	
Timaru	144.650	Mt Studholme	J40 452147	34	ZL3TGR	ZL3AR	
Greymouth	144.650	Paparoa	K31 736655	49	ZL3TY	ZL3ADH	
Waimoto	144.650	Rangitoto	S16 212126	81	ZL1BZ	ZL1HJ	
Queenstown	144.650	Remarkables	F41 794632	75	ZL4JW		
Nelson	144.650	Takaka Hill	N26 983206	26	ZL2BCA	ZL2UL	
Gisborne	144.650	Whakapunake	X18 091532	11	ZL2UT	ZL2RC	
ZL2SUM	147.500	Fringed Hill	O27 364885	26	ZL2BCA	ZL2UL	
Whitford APRS	432.575	Whitford	R11 898705	66	ZL1TN	ZL1QF	

DATA (AND VOICE) REPEATERS

Duplex with normal input/output frequency split. Vertical polarisation.

Station Name	Output Frequency	MED Site Name	Map Ref	Branch Number	Trustee 1	Trustee 2
Kapiti Voice & Data 535	145.350	Mt Field	R26 875374	69	ZL2GO	ZL2OH
Kaimai Data 540	145.400	Takaurunga	T15 684649	81	ZL1GWP	ZL3GR
Climie Data 5425	145.425	Mt Climie	R27 898040	69	ZL2TNG	ZL2PDJ
Auckland Node 5625	145.625	Klondyke	R13 705258	66	ZL1TGC	ZL1TN
Tararua Voice & Data 5625	145.625	Mt Butters	T25 672674	06	ZL2KG	ZL1AFZ
Hawkins Hill Data 6625	146.625	Hawkins Hill	R27 550854	74	ZL3TC	ZL2AOC
Colonial Knob Voice & Data 7075	147.075	Colonial Knob	R27 613043	74	ZL3TC	ZL2TFZ
Eyrewell Data 7125	147.125	Eyrewell	M35 552533	CA	ZL3MJS	ZL3TMB
Eyrewell Data 835	438.350	Eyrewell	M35 552533	CA	ZL3MJS	ZL3TMB
Wharite Voice & Data 960	439.600	Wharite	T23 531016	06	ZL2KG	ZL1AFZ
Hawkes Bay Voice & Data 9675	439.675	Mt Threave	V22 341547	25	ZL2DW	ZL2TC

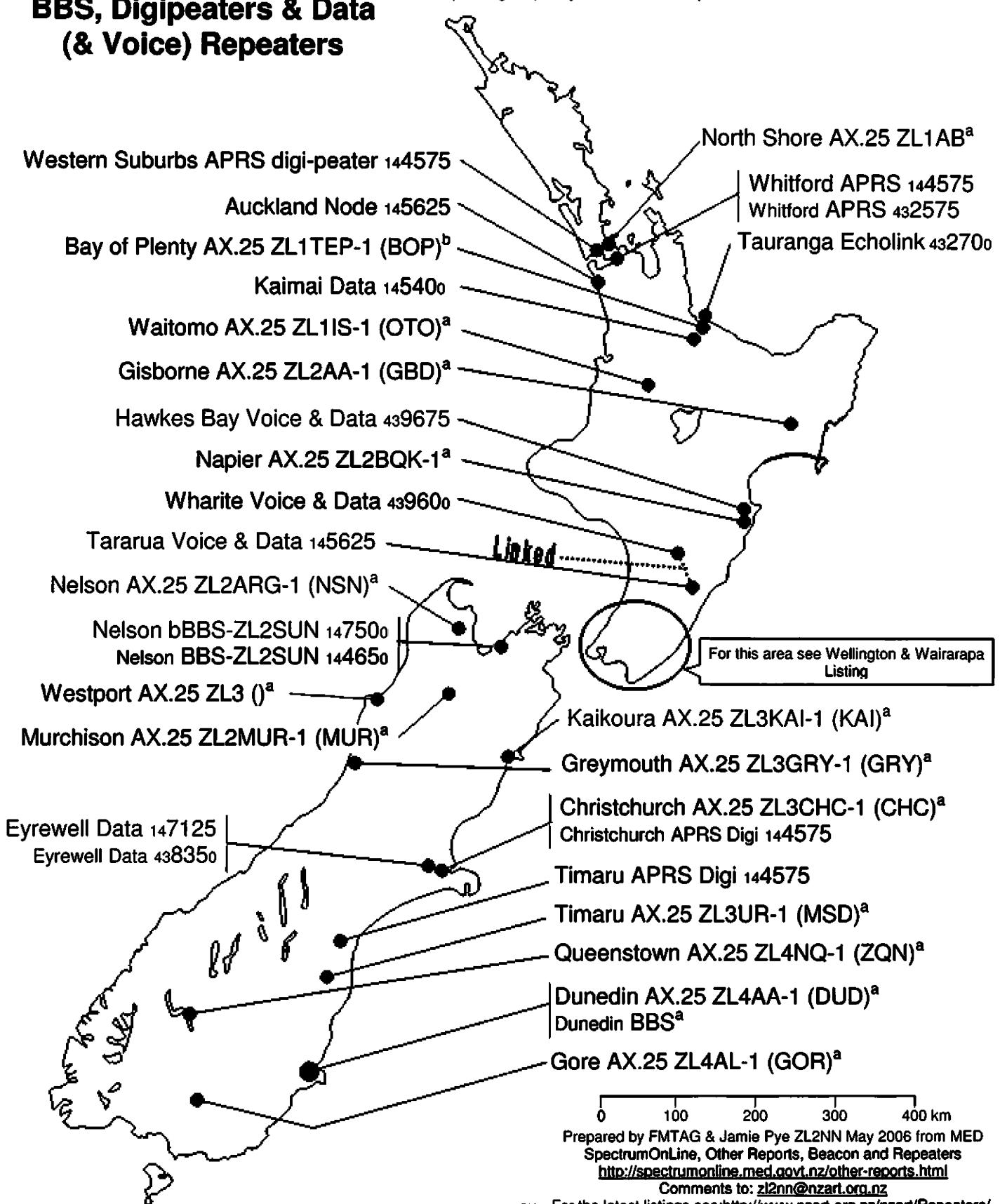
AMATEUR TELEVISION REPEATERS

In general, the 615.250 MHz repeaters have inputs of 431.250 MHz, and/or 1248 MHz and/or 1282 MHz. In general 431.25 MHz, 1248 MHz and 1282 MHz inputs have Horizontal polarisation. 615.25 MHz outputs have the same polarisation as local UHF broadcasts, either Horizontal (H) or Vertical (V).

Station Name	Vision Output Frequency	Polarisation	MED Site Name	Map Ref	Branch Number	Trustee 1	Trustee 2
Ngaio Atv	431.250	H	Ngaio Reservoir	R27 594933	74	ZL2HD	ZL2TAR
Ngaio Atv	922.250	H	Ngaio Reservoir	R27 594933	74	ZL2HD	ZL2TAR
Oamaru Atv	615.250	V	Cape Wanbrow	J11 504639	64	ZL1SN	ZL4DB
Christchurch Atv	615.250	H	Christchurch	M36 806363	05	ZL3WP	ZL3RX
Hamilton Atv	615.250	H	Hamilton	S14 082776	12	ZL1IC	ZL1PK
Hawkes Bay Atv	615.250	V	Latham St	V21 454813	25	ZL2TC	ZL2AJ
Belmont Atv	615.250	H	Mt Belmont	R27 669016	74	ZL2ARW	ZL2TAR
Dunedin Atv	615.250	H	Mt Cargill	I44 199855	30	ZL1GR	ZL4JH
Auckland Atv	615.250	H	Nihotupu	R11 506732	66	ZL1QF	ZL1ABS
Tasman Bay Atv	615.250	V	Takaka Hill	N26 983203	24	ZL2ASF	ZL2VBO
Gisborne Atv	615.250	H	Wheatstone Road	Y18 510683	11	ZL2UT	ZL2RC
Blenheim Atv	615.250	H	Wither Hills	P28 921619	22	ZL2BK	ZL2BJV
Whangarei Atv	615.250	V	Parahaki	Q07 318089	28	ZL1DTE	ZL1TVP
Whitford Atv	1248.000	II	Whitford	R11 898705	66	ZL1QF	ZL1ABS
Oamaru Atv	1282.000	V	Cape Wanbrow	J41 504639	64	ZL4SN	ZL4DB

New Zealand Amateur Radio BBS, Digipeaters & Data (& Voice) Repeaters

a = Operating frequency 144.650 MHz simplex
b = Operating frequency 144.625 MHz simplex

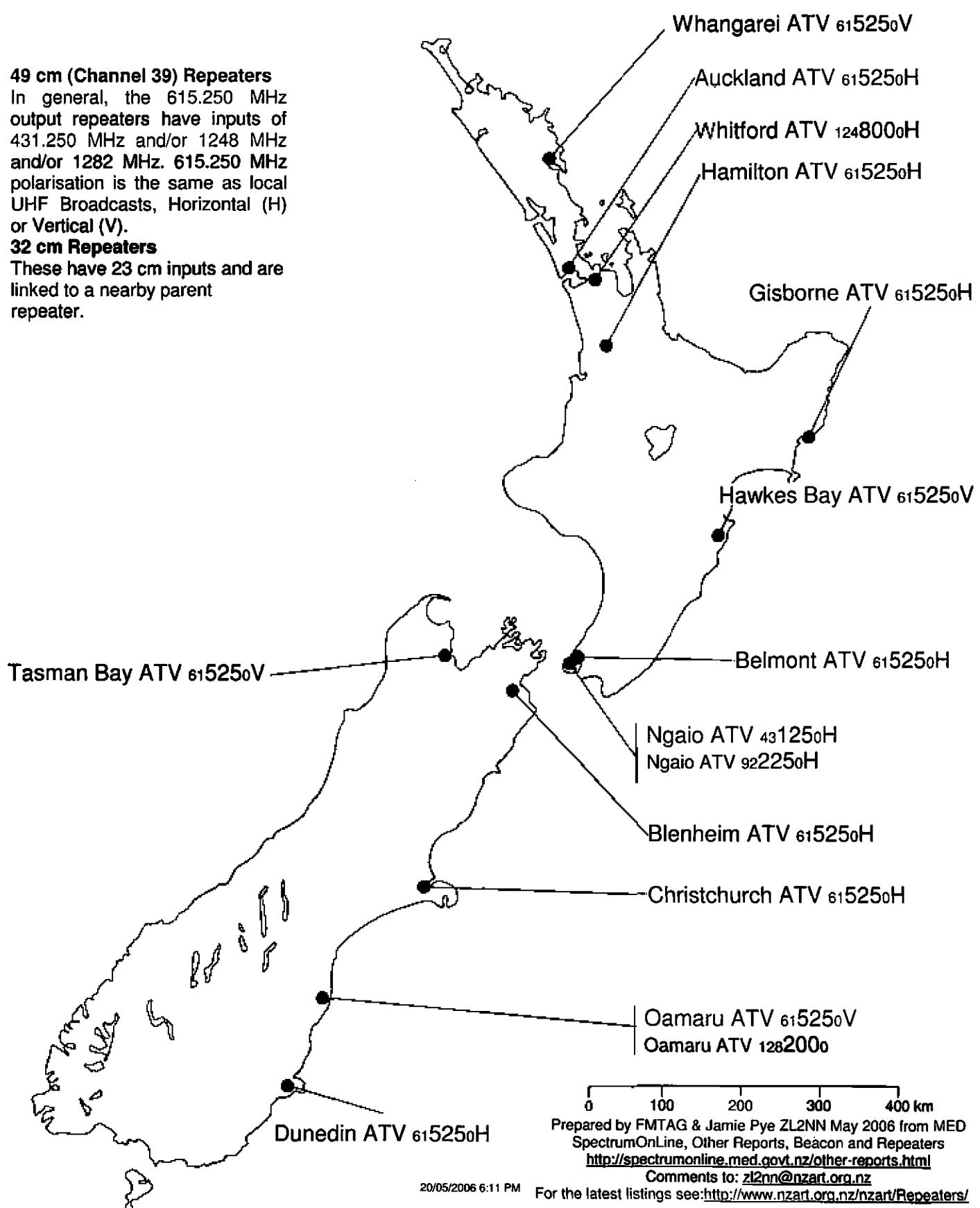


New Zealand Amateur Radio ATV Repeaters

49 cm (Channel 39) Repeaters
In general, the 615.250 MHz output repeaters have inputs of 431.250 MHz and/or 1248 MHz and/or 1282 MHz. 615.250 MHz polarisation is the same as local UHF Broadcasts, Horizontal (H) or Vertical (V).

32 cm Repeaters

These have 23 cm inputs and are linked to a nearby parent repeater.



NATIONAL SYSTEM REPEATERS

User transmits 5 MHz high for repeater with an output frequency of 434.xxx MHz User transmits 5 MHz low for repeater with an output frequency of 439.xxx MHz

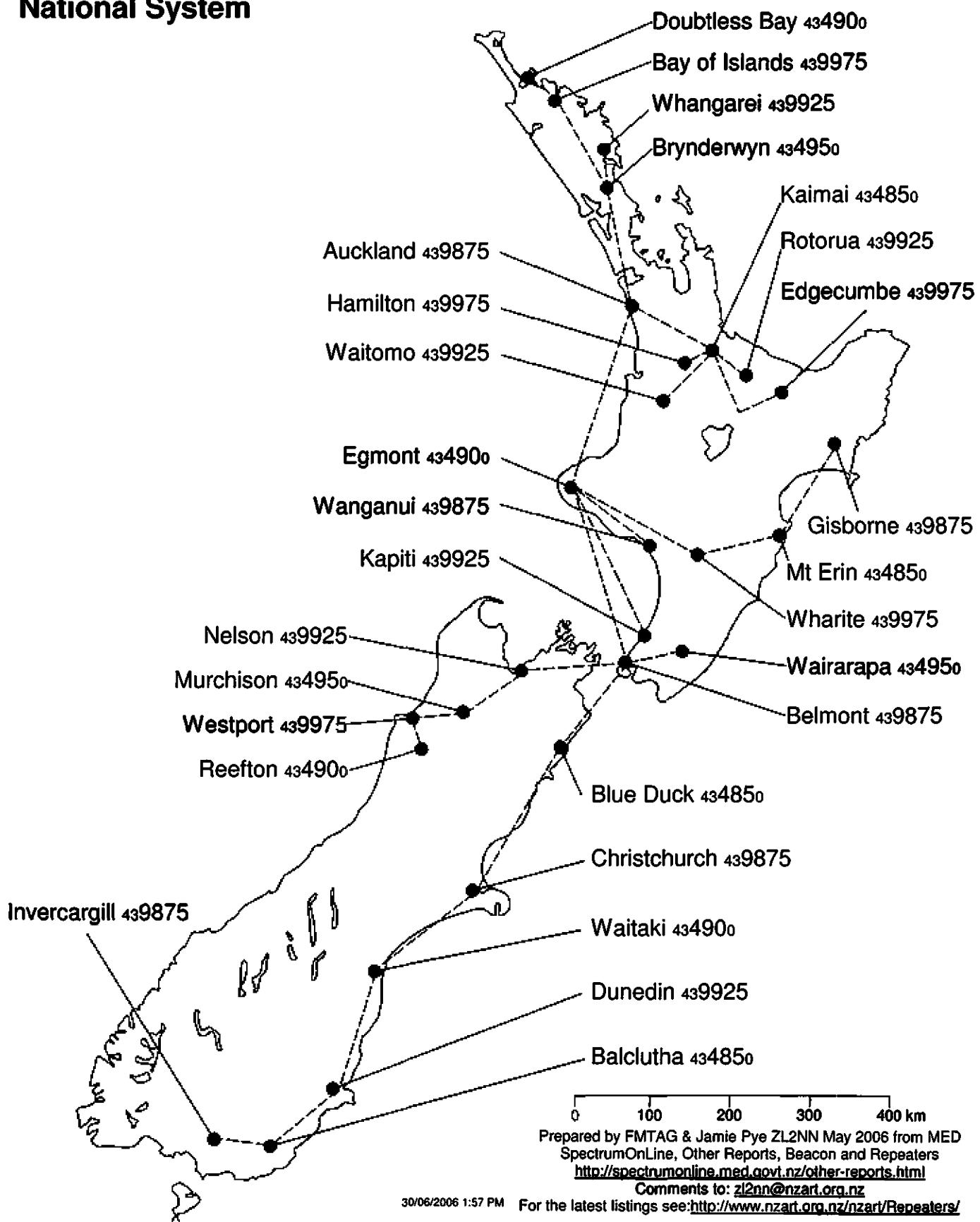
Station Name	Output Frequency	MED Site Name	Map Ref	Branch Number	Trustee 1	Trustee 2	Note
Blue Duck 485	434.850	Blue Duck	P31 753892	05	ZL3VP	ZL3RX	
Mt Erin 485	434.850	Mt Erin	V22 391556	25	ZL2DW	ZL2TC	
Balclutha 485	434.850	Mt Stuart	H45 601541	33	ZL4QS	ZL4TL	C
Kaimai 485	434.850	Takaurunga	T15 685649	81	ZL1GWP	ZL3GR	
Egmont 490	434.900	Mt Egmont	P20 036122	74	ZL2KG	ZL2ARW	
Waitaki 490	434.900	Mt Studholme	J40 452147	34	ZL3TGR	ZL3AR	
Doubtless Bay 490	434.900	Rangiawhia	O03 466037	78	ZL1AUI	ZL1BQK	
Reefton 490	434.900	Reefton	L30 180977	62	ZL3VC	ZL2BCP	C
Murchison 495	434.950	Mt Murchison	M29 683418	26	ZL2BCA	ZL2UL	
Wairarapa 495	434.950	Pariwhariki	T27 389077	46	ZL2TFZ	ZL2UCW	C
Brynderwyn 495	434.950	Pilbrow Hill	Q08 383694	28	ZL1DTE	ZL1TVP	
Southland 9875	439.875	Hedgehope	F45 783485	08	ZL4AO	ZLAGL	C
Auckland 9875	439.875	Klondyke	R13 705258	66	ZL1TGC	ZL1TN	
Wanganui 9875	439.875	Landguard	R22 830367	48	ZL1BNN	ZL2KR	C
Christchurch 9875	439.875	Marleys Hill	M36 804330	05	ZL3VP	ZL3RX	
Belmont 9875	439.875	Mt Belmont	R27 669016	74	ZL2ARW	ZL2TFZ	
Gisborne 9875	439.875	Whakapunake	X18 091532	11	ZL2UT	ZL2RC	C
Nelson 9925	439.925	Fringed Hill	O27 366886	28	ZL2BCA	ZL2UL	
Dunedin 9925	439.925	Mt Cargill	I44 199855	30	ZL4GR	ZL4JH	
Kapiti 9925	439.925	Mt Field	R26 875374	69	ZL2GO	ZL2OH	
Whangarei 9925	439.925	Parahaki	Q07 318089	28	ZL1DTE	ZL1TVP	
Waitomo 9925	439.925	Rangitoto	S16 212126	55	ZL1BZ	ZL1HJ	
Rotorua 9925	439.925	Whakapoungakau	U16 080399	33	ZL1PJ	ZL1BWC	
Hamilton 9975	439.975	Hamilton	S14 129719	81	ZL1TAT	ZL1THG	
Bay Of Islands 9975	439.975	Manginangina	P05 843654	84	ZL2BER	ZL1AVW	
Edgecumbe 9975	439.975	Mt Edgecumbe	V16 378374	67	ZL1CAY	ZL1AIS	
Westport 9975	439.975	Mt Rochfort	K29 063357	62	ZL3VC	ZL2BCP	
Wharite 9975	439.975	Wharite	T23 529016	06	ZL2KG	ZL1AFZ	

Notes: C = under construction.

AMATEUR RADIO BEACONS

Station Name	Output Frequency	MED Site Name	Map Ref	Branch Number	Trustee 1	Trustee 2	Callsign	Note
IBP; NCDX	14.100	Gladstone Road	S26 281149	46	ZL2FC		ZL6B	
IBP; NCDX	18.110	Gladstone Road	S26 281149	46	ZL2FC		ZL6B	
IBP; NCDX	21.150	Gladstone Road	S26 281149	46	ZL2FC		ZL6B	
IBP; NCDX	24.980	Gladstone Road	S26 281149	46	ZL2FC		ZL6B	
IBP; NCDX	28.200	Gladstone Road	S26 281149	46	ZL2FC		ZL6B	
Upper Hutt 10 m	28.229	Mt Clime	R27 898040	63	ZL2TNG	ZL2PDJ	ZL2MHF	
New Plymouth 6 m	50.045	Otaraoa Road	Q19 233368	27	ZL2BR	ZL2BZH	ZL2VHT	
Greymouth 6 m	50.053	Greymouth	J31 632602	49	ZL3TY	ZL3ADH	ZL3MHB	
Auckland 6 m	51.020	Nihotupu	R11 506732	66	ZL1QF	ZL1TN	ZL1UHF	
Hawkes Bay 6 m	51.030	Latham St	V21 454813	13	ZL2DW	ZL2TC	ZL2MHB	
Upper Hutt 6 m	52.275	Mt Clime	R27 898040	63	ZL2TNG	ZL2PDJ	ZL2MHF	
Blenheim 6 m	52.490	Wither Hills	P28 921616	22	ZL2BK	ZL2BJV	ZL2SIX	
Waikato 2 m	144.256	Hamilton City	S14 108781	81	ZL1THG	ZL1TAT	ZL1VHW	
Hawkins Hill 2 m	144.275	Hawkins Hill	R27 550854	74	ZL2AOC	ZL2ARW	ZL2UHF	
Christchurch 2 m	144.285	Clubrooms	M35 882434	50	ZL3VP	ZL3RX	ZL3VHF	
Hokitika 2 m	144.286	Hokitika	J33 427300	49	ZL3TY	ZL3ADH	ZL3MHB	
Invercargill 2 m	144.296	Hospital	E47 531088	37	ZL4OX	ZL4TFJ	ZLAVHI	
Auckland 2 m	145.100	Nihotupu	R11 506732	66	ZL1QF	ZL1TN	ZL1VHF	
New Plymouth 2 m	145.225	Otaraoa Road	Q19 233368	27	ZL2BR	ZL2BZH	ZL2VHT	
Hawkes Bay 2 m	145.240	Latham St	V21 454813	25	ZL2DW	ZL2TC	ZL2MHB	
Waikato 70 cm	432.256	Hamilton	S14 108781	81	ZL1THG	ZL1TAT	ZL1VHW	
Hawkins Hill 70 cm	432.275	Hawkins Hill	R27 550854	74	ZL2AOC	ZL2ARW	ZL2UHF	
Christchurch 70 cm	432.285	Clubrooms	M35 882434	05	ZL3VP	ZL3RX	ZL3UHF	
Auckland 70 cm	433.100	Nihotupu	R11 506732	74	ZL1QF	ZL1TN	ZL1UHF	
New Plymouth 70 cm	433.225	Otaraoa Road	Q19 233368	27	ZL2BR	ZL2BZH	ZL2VHT	C
Hawkes Bay 70 cm	433.240	Latham St	V21 454813	25	ZL2TC	ZL2AJ	ZL2MHB	
Lower Hutt 32 cm	925.275	Lower Hutt	R27 676979	74	ZL2AOC	ZL2TAR	ZL2UHF	C
Waikato 23 cm	1296.256	Hamilton	S14 108781	81	ZL1THG	ZL1TAT	ZL1VHW	
Hawkins Hill 23 cm	1296.275	Hawkins Hill	R27 550854	74	ZL2AOC	ZL2ARW	ZL2UHF	
Auckland 23 cm	1297.100	Nihotupu	R11 506732	66	ZL1QF	ZL1TN	ZL1UHF	
New Plymouth 23 cm	1297.225	Otaraoa Road	Q19 233368	27	ZL2BR	ZL2BZH	ZL2VHT	
Lower Hutt 12 cm	2402.275	Lower Hutt	R27 711976	18	ZL2TVM	ZL2TWS	ZL2UHV	
Whangarei 9 cm	3456.306	Sherwood Rise	Q07 347049	28	ZL1DTE	ZL1TVP		
Belmont 5 cm	5760.050	Mt Belmont	R27 669016	74	ZL2ARW	ZL2TFZ	ZL2UHF	
Muriwai 5 cm	5765.000	Muriwai	Q11 392826	74	ZL1TBG	ZL1AVZ	ZL1SHF	
Hawkins Hill 3 cm	10250.000	Hawkins Hill	R27 550854	74	ZL2AOC	ZL2ARW	ZL2UHF	
Hawkins Hill 12 mm	24150.000	Hawkins Hill	R27 550854	74	ZL2AOC	ZL2ARW	ZL2SHF	

New Zealand Amateur Radio National System



New Zealand Amateur Radio Beacons

Muriwai 5cm-5765 ZL1SHF

1. Frequencies are given in MHz
2. Small print in italics means beacon is not currently operating at 17 March 2006

Auckland 6m-51.020 ZL1UHF
 Auckland 2m-145.100 ZL1VHF
 Auckland 70cm-433.100 ZL1UHF
 Auckland 23cm-1297.100 ZL1UHF

Waikato 2m-144.256 ZL1VHW
 Waikato 70cm-432.256 ZL1VHW
 Waikato 23cm-1296.256 ZL1VHW
 Waikato 12cm-2424.256 ZL1VHW

New Plymouth 2m-145.225 ZL2VHT
 New Plymouth 70cm-433.225 ZL2VHT

International Beacon Project;
 Northern California DX Foundation
 IBP; NCDXF 20m-14.100 ZL6B
 IBP; NCDXF 17m-18.110 ZL6B
 IBP; NCDXF 15m-21.150 ZL6B
 IBP; NCDXF 12m-24.930 ZL6B
 IBP; NCDXF 10m-28.200 ZL6B

Lower Hutt 12cm-2402.275 ZL2UHV

Blenheim 6m-52.490 ZL2SIX

Greymouth 6m-50.0525 ZL3MHB

Hokitika 2m-144.286 ZL3MHB

Whangarei 9cm-3456.306 ZL1AM

Hawkes Bay 6m-51.030 ZL2MHB
 Hawkes Bay 2m-145.240 ZL2MHB
 Hawkes Bay 70cm-433.240 ZL2MHB

Upper Hutt 10m-28.229 ZL2MHF
 Upper Hutt 6m-52.275 ZL2MHF

Belmont 32cm-925.275 ZL2UHF
 Belmont 5cm-5760.050 ZL2UHF

Hawkins Hill 2m-144.275 ZL2UHF
 Hawkins Hill 70cm-432.275 ZL2UHF
 Hawkins Hill 23cm-1296.275 ZL2UHF
 Hawkins Hill 3cm-10250 ZL2UHF
 Hawkins Hill 1.2cm-24150 ZL2SHF
 Christchurch 2m-144.285 ZL3VHF
 Christchurch 70cm-432.285 ZL3UHF

0 100 200 300 400 km

Prepared by FMTAG & Jamie Pye ZL2NN May 2006 from MED SpectrumOnLine, Other Reports, Beacon and Repeaters
<http://spectrumonline.med.govt.nz/other-reports.html>

Comments to: z12nn@nzart.org.nz

7/07/2006 7:22 AM For the latest listings see: <http://www.nzart.org.nz/nzart/Repeaters/>

SHORT TERM SPECIAL PURPOSE (STSP) REPEATERS

MED Site Name	Output Frequency	Branch Number	Trustee 1	Trustee 2
Hamilton	145.325	12	ZL1IC	ZL1UCT
Alexandra	146.625	61	ZL4THT	ZL4GP
Upper Hutt	146.675	63	ZL2TNG	ZL2PDJ
Taumarunui	146.725	38	ZL1AO	ZL1UTH
Masterton	146.725	46	ZL2TFZ	ZL2UCW
Auckland	146.725	66	ZL1TGC	ZL1TN
Auckland	146.825	AREC	ZL1BNQ	ZL1AVR
Ballance Gorge	146.825	06	ZL2KG	ZL1AFZ
Whakatane	146.825	51	ZL1BCW	ZL1CDN
Papakura	146.875	65	ZL2SEA	ZL1MR
Hickling Park	146.875	60	ZL1BVO	ZL1DT
Wellington	146.875	74	ZL2TFZ	ZL2ARW
Napier	146.925	25	ZL2AJ	ZL2DW
Nelson	146.925	26	ZL2BCA	ZL2UL
Whau Bridge	146.925	03	ZL1MW	ZL1VRR
Christchurch	147.275	05	ZL3VP	ZL3RX
Wanganui	438.625	48	ZL2KR	ZL2THO
Auckland	438.625	AREC	ZL1BNQ	ZL1AVR
Nelson	438.625	26	ZL2BCA	ZL2UL
Auckland	438.675	AREC	ZL1BNQ	ZL1AVR
Wellington	438.675	74	ZL2TFZ	ZL2ARW
Auckland	438.725	AREC	ZL1BNQ	ZL1AVR
Timaru	438.725	34	ZL3TGR	ZL3AR
Hamilton	438.725	12	ZL1IC	ZL1UCT
Paraparaumu	438.725	69	ZL2GO	ZL2ARD
Auckland	438.750	AREC	ZL1BNQ	ZL1AVR
Papakura	438.750	65	ZL2SEA	ZL1MR
Auckland	438.775	AREC	ZL1BNQ	ZL1AVR
Levin	438.775	74	ZL2KG	ZL2TAR

SIMPLEX AND CALLING FREQUENCIES

144.100	Oceania SSB Calling
144.200	NZ SSB Calling
144.500	FM Calling
144.575	Data Simplex and APRS
144.600	Primary data/packet port-linked to Digital National System
144.625	Secondary data/packet port-linked to Digital National System
144.650	Primary Local Data/Packet Store/Forward
144.675	Secondary Local Data/Packet Store/Forward
145.250	Narrow band picture modes: FAX, Hellschriber, SSTV, etc.
146.425 to 146.600	FM Simplex
147.400 to 147.600	FM Simplex
147.500	Tertiary Local Data/Packet Store/Forward

432.200	SSB Calling
432.500	FM Calling
432.575	Data Simplex and APRS
432.600	Primary data/packet port-linked to Digital National System
432.625	Secondary data/packet port-linked to Digital National System
432.650	Primary Local Data/packet Store/Forward
432.675	Secondary Local Data/Packet Store/Forward
438.700	Voice-over-Internet Simplex
438.300	Tertiary Local Data/packet Store/Forward

Above 144 MHz, use the following as a guide to designated frequencies:
 F to F+1 MHz for standard narrow band or weak signal segment, where $F = 144, 432, 621, 925, 1296, 2424, 3399, 5760, 10368, 24192, 47088, 80640$ MHz.

F+0.200	SSB calling
F+0.250 to 0.300	Beacons (geographic plan - 1 kHz spacing)
F+0.500	FM calling
F+0.575	Data Simplex and APRS
F+0.600	Primary data/packet port-linked to Digital National System
F+0.625	Secondary data/packet port-linked to Digital National System
F+0.650	Primary local data/packet
F+0.675	Secondary local data/packet
F+0.700	Voice-over-Internet Simplex

There may be additional designated frequencies in this segment in some bands.
 Prepared by FMTAG

NCDXF/IARU INTERNATIONAL BEACON NETWORK



Table 1. NCDXF/IARU Beacon Transmission Schedule

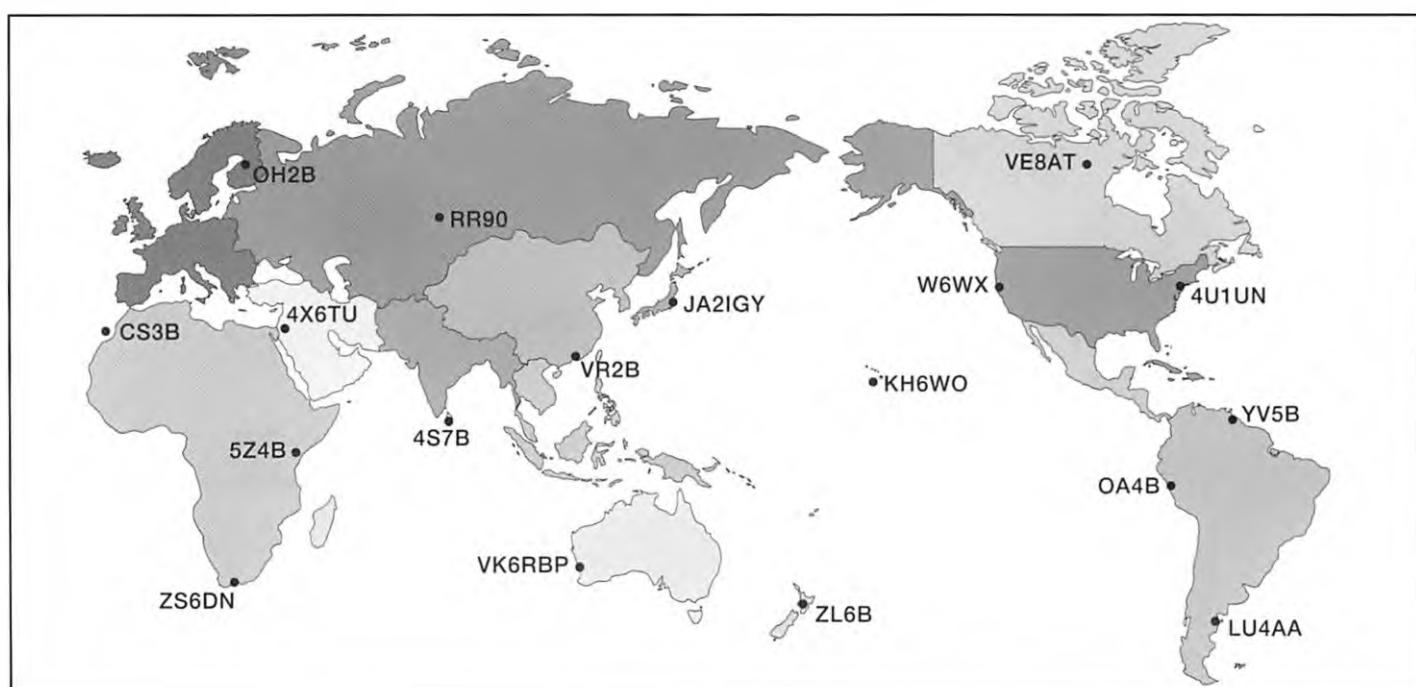
As at July 2006.

This table gives the minute and second within each hour of the start of the first transmission of each of the beacons on each frequency. Each transmission is repeated every three minutes. A transmission consists of the callsign of the beacon sent at 22 words per minute followed by four one-second dashes. The callsign and the first dash are sent at 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 0.1 watts.

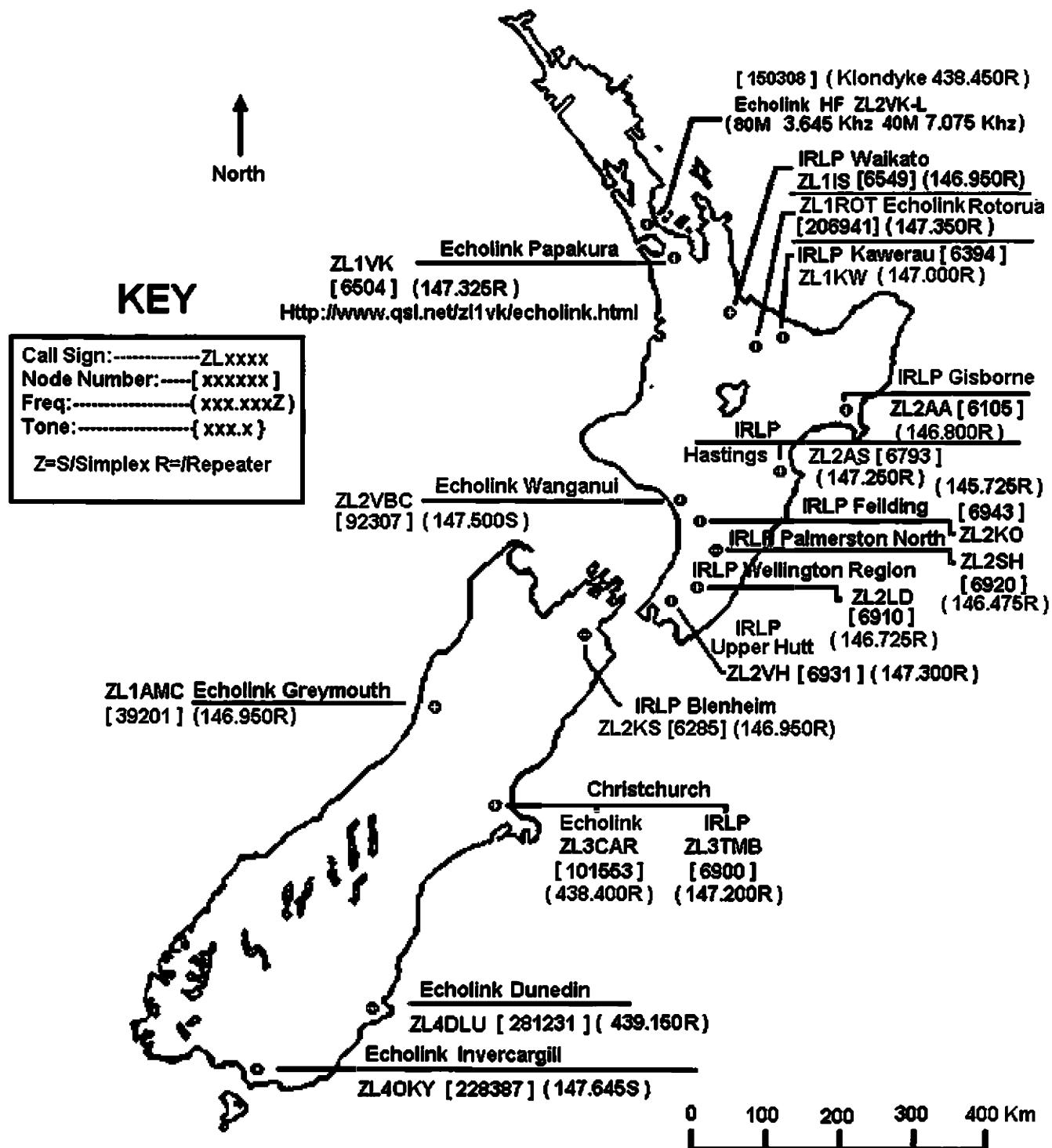
Slot	Country	Call	14.100	18.110	21.150	24.930	28.200	Operator	Status
1	United Nations	4U1UN	00:00	00:10	00:20	00:30	00:40	UNRC	OK
2	Canada	VE8AT	00:10	00:20	00:30	00:40	00:50	RAC/NARC	OK
3	United States	W6WX	00:20	00:30	00:40	00:50	01:00	NCDXF	OK
4	Hawaii	KH6WO	00:30	00:40	00:50	01:00	01:10	NOARG, HARC	OK
5	New Zealand	ZL6B	00:40	00:50	01:00	01:10	01:20	NZART	OK
6	Australia	VK6RBP	00:50	01:00	01:10	01:20	01:30	WIA	OK
7	Japan	JA2IGY	01:00	01:10	01:20	01:30	01:40	JARL	OK
8	Russia	RR90	01:10	01:20	01:30	01:40	01:50	SRR	OK
9	China	VR2B	01:20	01:30	01:40	01:50	02:00	CRSA, HARTS	OK
10	Sri Lanka	4S7B	01:30	01:40	01:50	02:00	02:10	RSSL	OK
11	South Africa	ZS6DN	01:40	01:50	02:00	02:10	02:20	ZS6DN	OK
12	Kenya	5Z4B	01:50	02:00	02:10	02:20	02:30	RSK	OK
13	Israel	4X6TU	02:00	02:10	02:20	02:30	02:40	UTel Aviv	OK
14	Finland	OH2B	02:10	02:20	02:30	02:40	02:50	U Helsinki	OK
15	Madeira	CS3B	02:20	02:30	02:40	02:50	00:00	ARRM	OK
16	Argentina	LU4AA	02:30	02:40	02:50	00:00	00:10	RCA	OFF
17	Peru	OA4B	02:40	02:50	00:00	00:10	00:20	RCP	OK
18	Venezuela	YV5B	02:50	00:00	00:10	00:20	00:30	RCV	OK

Table 2. NCDXF/IARU Beacon Locations

Slot	Country	Call	Location	Latitude	Longitude
1	United Nations	4U1UN	New York City	40° 45' N	73° 58' W
2	Canada	VE8AT	Eureka, Nunavut	79° 59' N	85° 57' W
3	United States	W6WX	Mt. Umunhum	37° 09' N	121° 54' W
4	Hawaii	KH6WO	Laise	21° 38' N	157° 55' W
5	New Zealand	ZL6B	Masterson	41° 03' S	175° 36' E
6	Australia	VK6RBP	Rolystone	32° 06' S	116° 03' E
7	Japan	JA2IGY	Mt. Asama	34° 29' N	136° 47' E
8	Russia	RR90	Novosibirsk	54° 59' N	82° 54' E
9	China	VR2B	Hong Kong	22° 16' N	114° 11' E
10	Sri Lanka	4S7B	Colombo	6° 54' N	79° 52' E
11	South Africa	ZS6DN	Pretoria	25° 54' S	28° 16' E
12	Kenya	5Z4B	Kilifi	3° 37' S	39° 50' E
13	Israel	4X6TU	Tel Aviv	32° 06' N	34° 48' E
14	Finland	OH2B	Espoo	60° 11' N	24° 50' E
15	Madeira	CS3B	Santo da Serra	32° 43' N	16° 48' W
16	Argentina	LU4AA	Buenos Aires	34° 37' S	58° 21' W
17	Peru	OA4B	Lima (temporary)	12° 04' S	76° 57' W
18	Venezuela	YV5B	Caracas	10° 25' N	66° 51' W



New Zealand Amateur Radio VoIP Systems



Prepared by Cyril Rosewarne ZL2VBC—August 2006

Review of Timekeeping in New Zealand

Timekeeping began in New Zealand in 1862, when Captain Stephen Carkeek, Controller of Customs, recommended to the Superintendent of Wellington Province that a transit instrument, an astronomical clock, and a time ball be placed in the new Custom House which was to be erected on what eventually became the site of the General Post Office.

A transit instrument allows mean local time to be calculated. This is the time appropriate to the longitude of the point of measurement, relative to the Greenwich Meridian, allowing four minutes per degree of longitude, or one hour per 15° . It was not until 1868 that the General Government proclaimed a uniform time for New Zealand based on the meridian $172^{\circ} 30'$ East. The advent of the telegraph had made rapid communications possible and therefore the concept of a uniform time feasible without the need for observations in every town and port. New Zealand was in fact the first country to establish a uniform time by legislation, and its scientists played an important role in establishing uniform time zones in certain other countries.

A new Colonial observatory was built in Wellington in 1869 in the Bolton Street Cemetery, on the site where the Richard John Seddon memorial now stands. Seddon's death in 1906, and the choice of the site for the memorial, precipitated the move of the Observatory to its present site in the Botanical Gardens in Kelburn. A small red brick building was erected on the site of the old Gardens Battery. It was completed in 1907 and became known as the Hector Observatory, after Sir James Hector, who had been Director of the Colonial Observatory.

Experiments with radio time signals began in 1916, with the reception of signals from Melbourne and transmission to ships in the vicinity of New Zealand and to Tahiti. Other regular services were established in 1919.

In 1926 the Department of Scientific and Industrial Research was formed, and became responsible for the Time Service. Although precision in time signals of a quarter of a second was claimed until the 1950s, the actual errors were often greater than this. The Geophysics Division of the DSIR was formed in 1951, and took over administrative responsibility for the Time Service. It was not until 1962, however, that any real advances were made. Clocks

which used the very stable electrical oscillations of quartz crystals were installed. Checks were made regularly against radio time signals from overseas which were obtained from astronomical observations, and appropriate corrections were made for the propagation time to Wellington.

In 1987 responsibility for the Time Service passed to the Physics and Engineering Laboratory, DSIR, and was relocated from Kelburn in Wellington to Gracefield, Lower Hutt. In 1992 when the DSIR was disestablished and its responsibilities taken over by Crown Research Institutes, the Time Service remained at Gracefield but became the responsibility of the Measurement Standards Laboratory of New Zealand (MSL), part of Industrial Research Limited.

UTC and UT1

Since 1967 the world's time has been related to an even more stable clock than our rotating earth—the vibrations of the caesium atom. Each element has its characteristic frequency of vibration, such as that of sodium which gives us the familiar orange colour of highway lighting. Although the characteristic frequency of caesium is particularly stable, a caesium clock on its own does not constitute a time standard. Rather, information from caesium clocks maintained by standards laboratories around the world is collated by the

Bureau International des Poids et Mesures (BIPM) in Paris to provide Co-ordinated Universal Time (UTC). As with the old Greenwich Mean Time UTC is the time at zero degrees longitude.

Because the rate of rotation of the earth is not constant, differences between mean solar time (UT1) and the atomic time (TAI) accrue which in time could become inconvenient. It is therefore necessary to make periodic adjustments to the atomic scale so that it roughly approximates UT1. At the beginning of 1972 the cumbersome "variable length second" used to adjust atomic time was replaced by the "leap second concept". UTC was set up to be slightly fast, so that a "leap second" could be added on the first day of January or July when necessary, but would not be expected to average more than one a year. The last adjustment was made on January 1, 1999 of one second so that the atomic time scale has now been incremented by 32 seconds since 1972. The atomic time scale is thus at all times within ± 0.7 seconds of mean solar time. The difference between UT1 and UTC, known as DUT1, is encoded and broadcast by time and frequency stations.

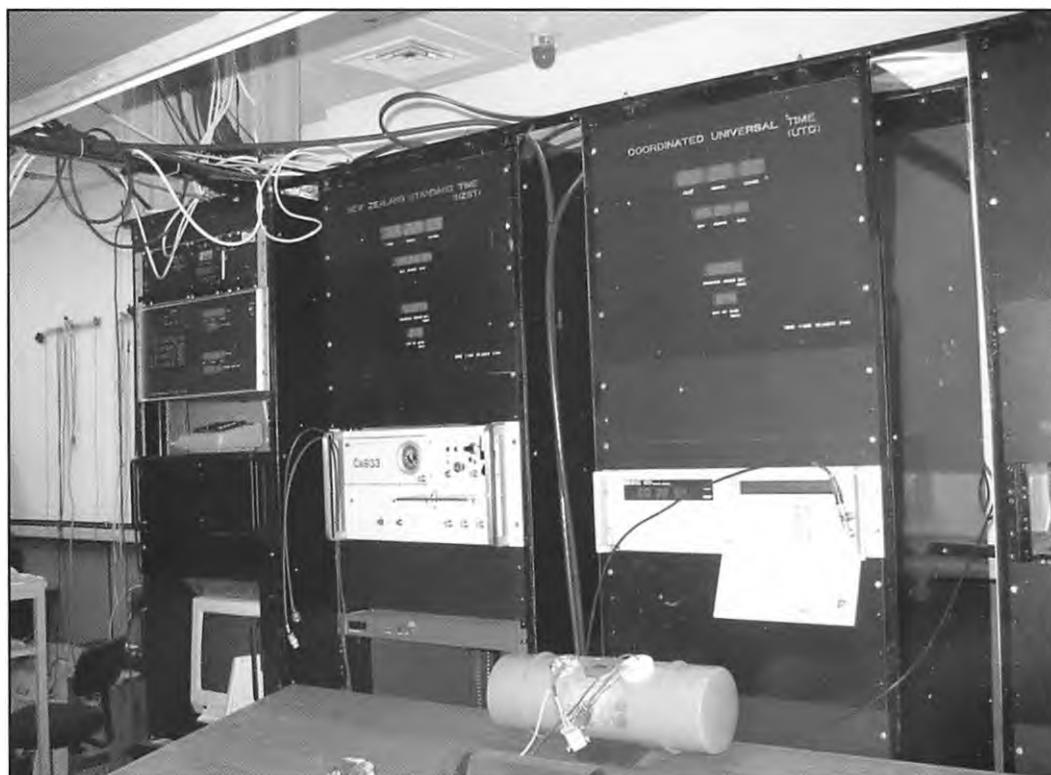
The New Zealand Time and Frequency Standard

The New Zealand time standard is maintained by means of three caesium clocks. Linkage to the

BIPM is via the Global Positioning Satellite system (GPS) which gives accuracies of better than 100 nanoseconds. The satellite system is also utilised to transfer the MSL atomic time to the BIPM to be included in the ensemble of clocks used to calculate the international atomic time scale.

The time standard is also New Zealand's frequency standard, accurate to parts in 10^{13} . Standard frequency dissemination to New Zealand users is via the TV1 and TV2 television transmissions. The colour burst frequencies of these transmissions are controlled by GPS-disciplined high accuracy oscillators which are monitored against the MSL caesium clocks, and are usually within 10^{-11} of the nominal colour burst frequency of 4.43361875 MHz. The highest accuracies, approaching one part in 10^{12} , are obtained by comparing the timing of selected synchronisation pulses with results obtained at MSL.

The most widely used time signals in New Zealand are those generated by MSL, for broadcast by National Radio. These signals are transmitted every hour and consist of six "pips" of 1000 Hz tone, at one second intervals, the beginning of each pip marking the exact second. When a pip marks the exact hour, its length is doubled. The precision with which the beginning of the long pip marks the exact hour is usually less than 10 S as it leaves



The New Zealand Caesium Clock installation.

MSL Delays along telephone lines to Radio New Zealand and in radio propagation to the remote parts of New Zealand can amount to a few milliseconds. When it is necessary to insert a leap second, seven pips are broadcast.

Dial up phone time for computers

MSL has developed a dial-up time service for computers. On dialling the service (0900 45-222) using a 1200 baud modem, a series of time strings is transmitted which contain the current time and date for both New Zealand time and UTC time, and an on-time marker. Warning is provided of forthcoming leap seconds and daylight saving changes. The accuracy of the system is limited by propagation delays in the telephone network and scrambler delays in the modems to around 100 ms. Software for IBM-compatible PCs to access the system automatically is available at no cost from MSL.

Internet Time

MSL operates a Network Time Protocol (NTP) server that can be used for setting the time of computers connected to the internet. Briefly, NTP works by the computer wanting the time (the client), sending a request to an NTP server. Included in the request is the client's time at which the request was sent. On receiving the request, the server adds its own timestamp to the request and sends it back to the client that notes the arrival time of the message. Armed with these three times, the client can determine the roundtrip delay and its time offset from the server time assuming the travel times are the same in each direction. Varying delays in the Internet can produce an error in a single time determination. The full NTP server programme maintains a software phase-lock loop so the time measurements are averaged over a long period of time to maintain the time in the client to better than 1 ms.

The MSL server is connected to a pulse-per-second output from one of the MSL caesium clocks and has a time stability of around 10 microseconds over the long term.

Further information on the MSL NTP server is on the MSL website at <www.iit.cri.nz/msl>. Information on NTP can be found at <www.ntp.org>.

WWV and WWVH

The National Institute of Standards and Technology (NIST) broadcasts standard time and frequency transmissions continuously through stations WWV and WWVH. Station WWV is located at Fort Collins, Colorado and broadcasts

continuously on the radio frequencies of 2.5, 5, 10, 15 and 20 MHz. Station WWVH is located at Kauai, Hawaii and broadcasts continuously on the radio frequencies of 2.5, 5, 10 and 15 MHz.

Both stations are controlled by caesium atomic oscillators. The frequencies are stable to better than one part in 10^{11} at all times, compared with the primary atomic standards maintained at the NIST Boulder laboratories. Changes in the propagation medium cause frequency changes which are several orders greater than the uncertainties described above.

Seconds pulses are transmitted continuously, even during tones and announcements, and are derived from the same oscillator which generates the carrier frequency. Seconds pulses comprise five cycles of 1000 Hz tone for WWV and six cycles of 1200 Hz tone for WWVH. Each minute, except the first of the hour, begins with an 800 ms tone of 1000 Hz at WWV and 1200 Hz at WWVH. Each pulse is preceded by 10 ms of silence and followed by 25 ms of silence. The first minute of the hour begins with an 800 ms tone of 1500 Hz from both stations.

At WWVH, time announcements are made by a female voice in the period 45 seconds to 52.5 seconds after each minute, while at WWV a male voice announces the time in the last 7.5 seconds of each minute. All time announcements are referred to in terms of UTC as maintained by the NIST. The 0 to 24 hours system is used. The first two figures give the hour and the last two figures give the minutes past the hour when the tone returns. The time announcement refers to the end of an announcement interval, ie, to the time when the 0.8 second long audio tone begins. At 1035 UTC for instance, the voice announcement, given in English, is: "At the tone, ten hours thirty-five minutes Co-ordinated Universal Time".

Standard audio frequencies of 440 Hz, 500 Hz and 600 Hz are broadcast by the two stations. The duration of each transmitted tone is approximately 45 seconds. A 600 Hz tone is broadcast by WWV during odd minutes and during even minutes by WWVH. A 500 Hz tone is broadcast during alternate periods unless voice announcements or silent periods are scheduled. The 440 Hz tone is broadcast beginning one minute after the hour at WWVH and two minutes after the hour at WWV. The 440 Hz tone is omitted during the first hour of the UTC day to act as a day marker. No audio tones or special announcements are broadcast during a semi-silent period from either station. The periods are from 45 to 50 minutes after the hour from WWV and from

15 minutes to 20 minutes after the hour at WWVH.

The method of coding the corrections (DUT1) to UTC to obtain UT1 uses a system of double second pulses. The first through eighth second pulse, when marked by a double pulse, will indicate a "plus" correction, and from the ninth through the fifteenth a "minus" correction. The amount of correction is determined by counting the number of second pulses which are doubled. For example, if the first, second and third second pulses are doubled, the correction is 0.3 seconds. Or if the ninth, tenth, eleventh, twelfth, thirteenth and fourteenth second pulses are doubled, the correction is "minus" 0.6 seconds.

A modified IRIG-H time code, giving the year, day of year, hour, minute, DUT1 value, and information on impending leap seconds and daylight saving (in the USA) is broadcast continuously on a 100 Hz sub-carrier.

A broadcast of radio propagation conditions and solar activity is broadcast in voice during part of every eighteenth minute of each hour from WWV. The announcements are short term forecasts, updated as required, every six hours if needed.

VNG

The Australian time and frequency station VNG is no longer operational.

Global Positioning System

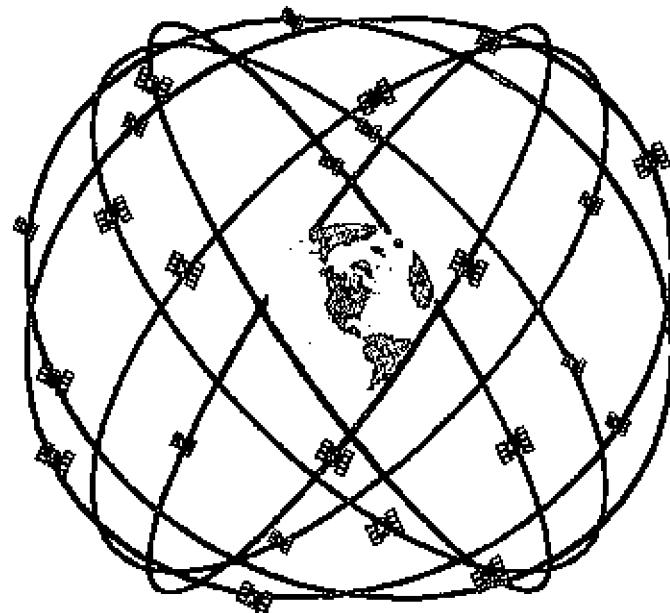
The Global Positioning System (GPS) is a world-wide satellite-

based radionavigation system developed and operated by the US Department of Defence. It comprises 21 satellites orbiting the earth in 12 hour orbits. Each satellite broadcasts information on two microwave frequencies (1575.42 and 1227.60 MHz) giving the time according to the on-board caesium clock, and the current satellite position. In a navigation receiver this information is used to determine the receiver's position anywhere on earth. The deliberate degradation of the accuracy of the time information available to civilian users ceased in May 2000. Time accuracy of the order of 10 nanoseconds and a frequency stability of better than one part in 10^{12} can be obtained.

Although some manufacturers of GPS equipment claim traceability of the time and frequency information to the US Naval Observatory, such traceability is not recognised by most measurement accreditation bodies. This is because GPS is primarily a navigation system and the provision of time and frequency information is an incidental feature. It can be wrong at times: we have noted leap seconds being introduced at the correct time for the US but taking a further six hours before receivers in New Zealand were aware of the change.

For additional information all the MSL services are covered at <<http://www.iit.cri.nz/services/time/index.html>>.

A. C. Corney
Measurement Standards
Laboratory, Industrial
Research Limited



SHORT WAVE LISTENING

Original text and photos by
BARRY WILLIAMS
ZL1ACZ

Edited by
KEVIN HAND
ZL4QD

Question a gathering of hams, and one will inevitably find that several were once DXers or short-wave listeners before they moved on to join the ranks of amateur radio. Many listeners progress no further than just being listeners, a few becoming serious DXers, but for some the novelty of talking to the world draws them into amateur radio. Those who have progressed through the hobby of DXing have acquired much of the basic radio theory, and are better prepared for the study required for sitting the amateur radio exam.

The similarities between the two hobbies are numerous. The bands that DXers monitor range from VLF to VHF. The modes range from AM to FM. With the increasing use of computers, digital reception is gaining interest. However, despite the widening range of options, listening to shortwave broadcasts still remains the most popular activity.

Like amateur radio, the equipment used over the years has changed. Gone are the days when the dual band household radio served as the DX receiver. After the war, DXers used war-surplus radio sets such as the Marconi R1155, ARC5 and Bendix MN26C compass receiver. Gradually, valve communication receivers, such as the Eddystone and Hallcrafters became available and affordable. Today, like the amateur, we are in the digital age, with sophisticated receivers ranging from the small portable SONY 7600G to the ICOM R7x series and the professional NRD545 communications receivers and latterly a variety of Software Defined Radios (SDR) or PC Controlled Radios (PCR). Over the years amateur equip-

ment has developed to an even greater extent, with many hams using multi-functional transceivers which incorporate all-band general coverage reception.

Unlike the amateurs, the antennas used by the DXer over the years have changed little. The fortunate few who have the space to run out a Beverage still chase the elusive medium wave DX. Most persevere with an end-fed wire or a dipole. Those DXers living in high noise suburbia try and develop low-noise antennas. Like amateur radio there is great scope for development, but we do tend to lack the technical expertise that the ham fraternity can draw upon. Because of the wide range of shortwave bands, the DXer does have great difficulty designing a multi-band antenna. However, with regard to propagation, I feel that any top DXer can "hold their own" with a ham DXer. Propagation is just as important to both hobbies. We complain about band conditions just as much as the ham down the road.

For many shortwave listeners, the QSLing of reception reports is the whole purpose of it all. But more and more, verification is becoming less important and just hearing the station and programme is the enjoyment. The variety of programmes heard over international broadcasters is far more varied and interesting than that heard on domestic radio. Nevertheless, serious DXing is still the backbone of the hobby, and the thrill of hearing and finally verifying a rare low powered station from some exotic country, is no different than that experienced by an amateur DXer.

DXing in New Zealand is almost



Group of international DXers chasing exotic broadcast signals at the 50th Anniversary Convention of New Zealand Radio DX League in 1998. Seated: Toshimichi Otake (Japan), Anker Petersen (Denmark). Standing: Ray Crawford and Chris Martin (Australia), Risto Vahakainu.

as old as amateur radio, with the first DX club being formed in 1931. Although the New Zealand DX Club folded in the late 1940s, two other DX clubs are still active; the New Zealand DX Radio Association, now over 70 years old, and the New Zealand Radio DX League, which will celebrate its 60th anniversary in 2008.

Amateur radio, like other hobbies, loses many participants to other pastimes and interests. This loss of interest in some cases may be due to boredom or burnout with the hobby. New horizons and challenges may be needed. We all get stale or frustrated at some time. May it be suggested to those amateurs who feel they need a variation or change, but still retain their interest in wireless, is that they consider shortwave listening? Some hams that entered amateur radio through the hobby of DXing might consider revisiting it. Most hams have an antenna and a rig capable of general coverage reception. It might be worthwhile

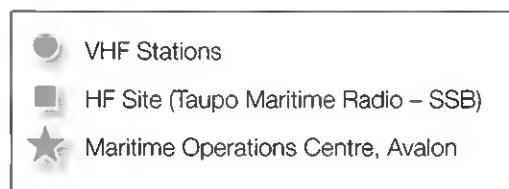
tuning a bit further than just the ham bands. Start listening to the world of International Shortwave Broadcasting. Both hobbies fit nicely together, as found in Auckland where the Western Suburbs Radio Club allows the Auckland Branch of the New Zealand Radio DX League to hold its monthly meetings in their clubrooms. In return, Branch 03 has gained several newly licensed hams from the ranks of the DXers. Check your *Break-In* and read Kevin Hand's "Shortwave Listening" section. Try listening to a few broadcasts or write for a sample of the New Zealand Radio DX League's monthly magazine, the *NZ DX TIMES*. The New Radio DX League has its own Internet site at www.radiodx.com, which is a great starting point for anyone interested in shortwave listening. I have found that shortwave listening and amateur radio complement each other and have helped maintain my interest in both hobbies for many years.



Keen members of the New Zealand Radio DX League at a DXpedition at Green Bay, Auckland, to hear special shortwave broadcasts from Radio St Helena. From left: Barry Williams ZL1ACZ, Paul Wells-Green ZL1WGP, the late Ivor Williams ZL1AGO and Arthur de Maine.

Chart

MARITIME RADIO VHF COVERAGE



Maritime Operations Centre Phone/Fax

Phone: (04) 914 8333
Fax: (04) 914 8334

**Fiordland
Maritime Radio**
VHF CH: 16, 71

Farewell Maritime Radio
VHF CH: 16, 68

Westport Maritime Radio
VHF CH: 16, 71

Greymouth Maritime Radio
VHF CH: 16, 68

Fox Maritime Radio
VHF CH: 16, 67

D'Urville Maritime Radio
VHF CH: 16, 67

Auckland Maritime Radio
VHF CH: 16, 71

Taranaki Maritime Radio
VHF CH: 16, 67

Cape Egmont Maritime Radio
VHF CH: 16, 71

Wanganui Maritime Radio
VHF CH: 16, 69

Farewell Maritime Radio
VHF CH: 16, 68

Westport Maritime Radio
VHF CH: 16, 71

Greymouth Maritime Radio
VHF CH: 16, 68

Fox Maritime Radio
VHF CH: 16, 67

D'Urville Maritime Radio
VHF CH: 16, 67

**Puysgar
Maritime Radio**
VHF CH: 16, 67

Stewart Island
VHF CH: 16, 71

Bluff Maritime Radio
VHF CH: 16, 68

Chalmers Maritime Radio
VHF CH: 16, 71

Waitaki Maritime Radio
VHF CH: 16, 67

Akaroa Maritime Radio
VHF CH: 16, 68

Kaikoura Maritime Radio
VHF CH: 16, 67

Wellington Maritime Radio
VHF CH: 16, 71

Picton Maritime Radio
VHF CH: 16, 68

**Napier Maritime
Radio**
VHF CH: 16, 68

**Wairarapa
Maritime Radio**
VHF CH: 16, 67

**Tolaga
Maritime Radio**
VHF CH: 16, 67

**Runaway
Maritime Radio**
VHF CH: 16, 71

Plenty Maritime Radio
VHF CH: 16, 68

Great Barrier
VHF CH: 16, 25, 67, 68, 71

Whangarei Maritime Radio
VHF CH: 16, 67

Kaitaia Maritime Radio
VHF CH: 16, 71

Cape Reinga
VHF CH: 16, 68

Cape Reinga
VHF CH: 16, 68

Kaitaia Maritime Radio
VHF CH: 16, 71

Whangarei Maritime Radio
VHF CH: 16, 67

Great Barrier
VHF CH: 16, 25, 67, 68, 71

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VHF CH: 16, 68

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**Napier Maritime
Radio**
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**Wairarapa
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VHF CH: 16, 67

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VHF CH: 16, 71

Picton Maritime Radio
VHF CH: 16, 68

**Tolaga
Maritime Radio**
VHF CH: 16, 67

Plenty Maritime Radio
VHF CH: 16, 68

Great Barrier
VHF CH: 16, 25, 67, 68, 71

Whangarei Maritime Radio
VHF CH: 16, 67

Kaitaia Maritime Radio
VHF CH: 16, 71

Cape Reinga
VHF CH: 16, 68

Note: This map represents approximate location and coverage of Maritime New Zealand's VHF radio stations. From time to time gaps may exist within the areas shown due to terrain shadows and system maintenance. Terrain shadows can occur close to the shore under cliffs or in bays and fiords.

- 24hr/day listening watch is kept by all VHF stations on channel 16.
- The coverage shown above is for vessels with a 25W radio working into a correctly installed antenna mounted 4m or more above the waterline.

NEW ZEALAND RADIO SPECTRUM USAGE

This table indicates significant, but not necessarily exclusive, existing and planned usage within New Zealand of ranges of frequencies (ie "bands") by various radio services. It is based on the International Radio Table of Allocations—particularly where international co-ordination is important such as in the aeronautical, maritime, satellite, navigation, space research, astronomy and amateur services. It should be noted, however, that some spectrum in New Zealand is the subject of privately owned management rights and this table is indicative usage based on such current information held by the Ministry as to the nature of licences issued by the managers of that spectrum.

Ministry of Economic Development (Radio Spectrum Division)

9-90	Fixed, Maritime-Mobile and Radionavigation
90-120	Radionavigation (LORAN C)
120-140	Restricted Radiation Devices (RRD)
140-165	Fixed, Maritime-Mobile and Radionavigation
165-190	Fixed, Radionavigation and Amateur
190-285	Aeronautical Beacons
285-325	Aeronautical and Maritime Beacons
325-415	Aeronautical Beacons
415-521	Maritime
521-612	MF-AM Sound Broadcasting
612-1690	Aeronautical Beacons, Broadcasting
1690-1800	Cordless Telephone (CT1 Base Tx), Radio Buoys
1800-1950	Amateur 160 m Band
1950-2000	Radio Buoys
2000-2300	Fixed and Mobile
2300-2495	Broadcast 120 m Band (Tropical)
2495-2505	Standard Frequency 2.5 MHz
2505-2850	Fixed and Mobile
2850-3155	Aeronautical
3155-3200	Fixed and Mobile
3200-3400	Broadcast 90 m Band (Tropical)
3400-3500	Aeronautical
3500-3900	Amateur 80 m Band
3900-4000	Broadcast 75 m Band
4000-4438	Maritime
4438-4650	Fixed and Mobile
4650-4750	Aeronautical
4750-4995	Broadcast 60 m Band (Tropical)
4995-5005	Standard Frequency 5 MHz
5005-5060	Broadcast 60 m Band (Tropical)
5060-5480	Fixed and Mobile
5480-5730	Aeronautical
5730-5900	Fixed and Mobile
5900-6200	Broadcast 49 m Band
6200-6525	Maritime
6525-6765	Aeronautical
6765-6795	ISM and RRD
6795-7000	Fixed and Mobile
7000-7100	Amateur 40 m Band
7100-7350	Broadcast 41 m Band. Amateur (7100-7300)
7350-8100	Fixed and Mobile
8100-8815	Maritime
8815-9010	Aeronautical
9010-9400	Fixed
9400-9900	Broadcast 31 m Band
9900-9995	Fixed
9995-10005	Standard Frequency 10 MHz
MHz	
10.005-10.100	Aeronautical
10.100-10.150	Amateur 30 m Band
10.150-11.175	Fixed
11.175-11.400	Aeronautical
11.400-11.600	Fixed
11.600-12.100	Broadcast 25 m Band
12.100-12.230	Fixed
12.230-13.200	Maritime
13.200-13.360	Aeronautical
13.360-13.550	Fixed and Mobile
13.550-13.570	ISM and RRD
13.570-13.570	Broadcast 22 m Band
13.870-14.000	Fixed
14.000-14.350	Amateur 20 m Band
14.350-14.990	Fixed
14.990-15.010	Standard Frequency 15 MHz
15.010-15.100	Aeronautical
15.100-15.800	Broadcast 19 m Band
15.800-16.360	Fixed
16.360-17.410	Maritime
17.410-17.480	Fixed
17.480-17.900	Broadcast 16 m Band
17.900-18.030	Aeronautical
18.030-18.068	Fixed
18.068-18.168	Amateur 17 m Band
18.168-18.780	Fixed
18.780-18.900	Maritime
18.900-19.020	Broadcast 15 m Band
19.020-19.680	Fixed
19.680-19.800	Maritime
19.800-19.990	Fixed

19.990-20.010	Standard Frequency 20 MHz
20.010-21.000	Fixed
21.000-21.450	Amateur 15 m Band
21.450-21.850	Broadcast 13 m Band
21.850-21.870	Fixed
21.870-22.000	Aeronautical
22.000-22.855	Maritime
22.855-23.200	Fixed
23.200-23.350	Aeronautical
23.350-24.890	Fixed and Mobile
24.890-24.990	Amateur 12 m Band
24.990-25.010	Standard Frequency 25 MHz
25.010-25.070	Fixed and Mobile
25.070-25.210	Maritime
25.210-25.550	Fixed and Mobile
25.550-25.670	Astronomy
25.670-26.100	Broadcast 11 m Band
26.100-26.175	Maritime
26.175-26.300	Fixed and Mobile
26.300-44.000	26.300
	Citizen Radio Service "CB" Band
	CB1 26.340
	CB40 26.770
26.800	Fixed and Mobile
26.960	Paging, ISM (27.120 MHz), RRD
27.300	
28.000	Fixed and Mobile
29.700	Amateur 10 m Band
30.000	RRD
	Cordless Telephone "CT1" Band
	CT1-1 30.075 Base Tx
	CT20 30.775 Base Tx
30.800	Paging 31.3-31.6 MHz, RRD
32.000	Fixed and Mobile (TV Sound IF 33.40 MHz)
35.000	ISM 35.4-36.0, RRD
37.200	Telecontrol and Telemetry 36.0-36.6 MHz
39.000	Fixed and Mobile (TV Vision IF 38.90 MHz)
39.700	RRD
	Cordless Telephone "CT1" Band
	CT1-1 39.776 Mobile Tx
	CT1-29 40.475 Mobile Tx
40.500	ISM 40.66-40.7 MHz, RRD
41.000	Fixed and Mobile
	VHF Television Broadcasting (Band I)
	CH1.1 44-51
51.000	Amateur 6 m Band
53.000	Fixed, Mobile and Amateur
54.000	VHF Television Broadcasting (Band I)
	CH1.2 54-61
	CH1.3 61-68
44.000-68.000	44.000
	Fixed "AB" Band
	ABX1 68.0125 Simplex
	ABX159 69.9875 Simplex
	AB1 70.0125 Alpha Tx
	AB143 71.7875 Alpha Tx
	ABX160 71.8125 Simplex
	ABX174 71.9875 Simplex
72.000	RRD and Cordless Telephone "CT1" Band
	CT1-22 72.800 Mobile Tx
	CT1-29 72.975 Mobile Tx
73.000	Fixed "AB" Band
	AB1 73.0125 Beta Tx
	AB143 74.7875 Beta Tx
74.800-75.200	74.800
	Aeronautical Marker Beacons
	Land Mobile "ESA" Band (Emergency Services)
	ESA1 75.2250 Base Tx
	ESA86 76.2875 Base Tx
76.300	Not allocated
78.100	Land Mobile "ESA" Band (Emergency Services)
	ESA1 78.10625 Mobile Tx
	ESA86 79.16875 Mobile Tx
79.200	80.000
	Not allocated
	Land Mobile "A" Band
	AX01 80.0125 Simplex
	AX11 80.5125 Simplex
	A501 80.5250 Base Tx
	A539 81.0000 Base Tx
	A1 81.0125 Base Tx
	A242 84.0250 Base Tx

88.000-108.000	88.000	AX101 AX136	84.0375 84.4750	Simplex Simplex	160.100	Telemetry (160.1-160.3) and Paging (160.3-160.6), RRD
	88.800	A501 A539	84.49375 84.96875	Mobile Tx Mobile Tx	160.600	Maritime Mobile "MM" Band MM60 160.625 MM7 160.950
	100.200	A1 A242	84.98125 87.99375	Mobile Tx Mobile Tx	160.970	Land Mobile "MS" Band MS1 160.9750 MS40 161.4750
	100.800	Guardband, Low Power Sound Broadcasting			161.490	Maritime Mobile "MM" Band MM18 161.500 MM91 162.175
	100.900	VHF-FM Sound Broadcasting (Band II) FM110 89.0 FM220 100.0			162.200	Land Mobile "EE" Band EE1 162.2125 EE279 165.6875
108.000-137.000	108.000	RRD, Wireless Public Address systems			166.400	Wide Area Paging "WP" Band WPN38 166.4125 WPN68 166.7875
	108.800	Guardband			166.800	Land Mobile "EE" Band EE1 166.8125 EE279 170.2875
	112.000	Land Mobile "B" Band B1 101.0000 B242 104.0125			173.000	EEX88 170.3125 EEX902 172.9875
	117.975	BX243 BX318	104.0250 104.9625	Simplex Simplex	174.000-230.000	RRD
	130.000	B1 B242	104.9750 107.9875	Base Tx Base Tx	174.000	VHF Television Broadcasting (Band III) CHL 4 174-181 CHL 5 181-188 CHL 6 188-195 CHL 7 195-202 CHL 8 202-209 CHL 9 209-216 CHL 10 216-223 CHL 11 223-230
137.000-138.000	137.000	Draft future plan: 88.000 RRD 88.500 Sound Broadcasting (FM and/or Digital)			230.000-404.000	230.00-300.00 International Military 300.00-305.00 International Military, RRD 305.00-328.60 International Military 328.60-335.40 Aeronautical ILS Glidepath 335.50-380.00 International Military
138.000-144.000	138.000	Aeronautical ILS Localizers			380.000	Land Mobile "ESC" Band (Emergency Services) (under negotiation)
	138.600	Aeronautical VOR Beacons			383.000	383.00-390.00 International Military
	139.400	Aeronautical Communications (R) ACX1 118.000 ACX480 129.975			390.000	Land Mobile "ESC" Band (Emergency Services) (under negotiation)
	140.000	Aeronautical Communications (OR) ARX1 130.025 ARX79 131.975			393.000	393.00-399.90 International Military 399.90-400.05 Radionavigation-Satellite (TRANSIT) 400.05-400.15 Standard Frequency Satellite 400.15-401.00 Meteorological & Met-Satellite (S-E) 401.00-404.00 Meteorological
	144.000	Aeronautical Repeater (OR) AR1 132.025 AR23 132.575			404.000-430.000	Fix "IA" Band 406.000 Beacon—Satellite Distress Band
	148.000	Aeronautical Communications (OR) ARX80 132.625 ARX190 135.375			406.100	Land Mobile "TD" Band TD9 406.1125 TD319 409.9875
	149.500	Aeronautical Repeater (OR) AR1 135.425 AR23 135.975			410.000	Mobile Tx Mobile Tx
149.900-150.050	149.500	Mobile-Satellite and Meteorological-Satellite, (S-E)			412.000	Fixed "IB" Band 414.000 Fixed "IA" Band
150.050-156.000	150.050	Land Mobile "ESB" Band (Emergency Services) ESB1 138.0125 ESB200 140.5000			414.000	Beta Tx
	156.000	ESBX1 140.5125 ESBX40 141.0000			414.100	Land Mobile "TD" Band TDX1 414.0125 TDX7 414.0875
	157.600	ESB1 141.0125 ESB200 143.5000			418.000	Land Mobile "TD" Band TD9 414.1125 TD319 417.9875
	158.070	ESBX41 143.5125 ESBX79 143.9875			420.000	Fixed "IB" Band 425.000 Fixed "IC" Band
	158.600	Amateur 2 m Band			430.000	Alpha Tx
	158.600	Mobile-Satellite Service (E-S)			430.000-440.000	420.000 Fixed "IC" Band 430.000 Radiolocation, Amateur 70 cm Band
	158.600	Radionavigation-Satellite (TRANSIT)			440.000-470.000	440.000 Fixed, Mobile, Radiolocation, Amateur
	158.600	Mobile-Satellite (E-S)			448.000	448.000 Radiolocation
	158.600	Land Mobile "E" Band ENX1 150.0625 ENX75 150.9875			449.000	449.000 Fixed "JC" Band
	158.600	EN22 151.0125 EN213 153.4000			449.750	Simplex
	158.600	ENX76 153.43125 ENX89 153.59375			450.000	Land Mobile "C" Band CNX1 449.75625 CNX20 449.99375
	158.600	EN87 153.60625 EN213 155.18125			450.275	Simplex
	158.600	EN22 155.19375 EN86 155.99375			453.625	Fixed "JC" Band 453.625 Fixed "JA" Band
	158.600	EN22 155.19375 EN86 155.99375			454.975	Mobile Tx Mobile Tx
158.600-162.200	156.000	Maritime Mobile "MM" Band MM60 156.025 MM7 156.350			454.975	Land Mobile "C" Band CNX47 454.98125 CNX73 455.30625
	158.600	MM67 156.375 MM77 156.875				
	158.600	MM18 156.900 MM91 157.575				
	158.600	Wide-Area Paging "WP" Band WPNI 157.6125 WPN37 158.0625				
	158.600	Land Mobile "MS" Band (Special Services) MS1 158.0750 MS41 158.5750				
	158.600	MSX1 158.6000 MSX120 160.0875				

458.335	CN1	455.31875	Base Tx		E39	614-622	Block 4	
	CN242	458.33125	Base Tx		E40	622-630	(Govt reserved)	
	Land Mobile "D" Band				E41	630-638		
	DNX1	458.34375	Simplex		E42	638-646		
458.540	DNX16	458.53125	Simplex		E43	646-654	Block 5	
458.610	Paging, RRD				E44	654-662		
	Land Mobile "D" Band				E45	662-670		
	DNX17	458.61875	Simplex		E46	670-678		
458.665	DNX20	458.66625	Simplex		E47	678-686	Block 6	
	Fixed "JA" Band		Beta Tx		E48	686-694		
	Fixed "JD" Band		Alpha Tx		E49	694-702		
461.475	Fixed "JE" Band		Simplex		E50	702-710		
	Land Mobile "D" Band				E51	710-718	Block 7	
	DNX21	461.48125	Simplex		E52	718-726		
	DNX47	461.80625	Simplex		E53	726-734		
	DN1	461.81875	Base Tx		E54	734-742		
465.180	DN240	464.80625	Base Tx		E55	742-750	Block 8	
	DNX48	464.81875	Simplex		E56	750-758		
	DNX77	465.18125	Simplex		E57	758-766		
466.675	Fixed "JF" Band		Simplex		E58	766-774		
	Fixed "JD" Band		Beta Tx		E59	774-782	Block 9	
	Fixed "JC" Band		Simplex		E60	782-790		
466.800	Land Mobile "D" Band				E61	790-798		
	DNX78	466.68125	Simplex		E62	798-806		
466.850	DNX87	466.79375	Simplex	806.000-890.000	806.000	Fixed "KK" Band	Alpha Tx	
	RRD, Telemetry				812.000	Land Mobile "ESD" Band (Emergency Services)		
	Land Mobile "D" Band					ESD241	812-0125	Mobile Tx
	DNX88	466.85625	Simplex			ESD280	812.9875	Mobile Tx
	DNX99	466.99375	Simplex		813.000	Expansion of ES or TS Bands		
	DNI	467.00625	Mobile Tx		814.000	Land Mobile "TS" Band (Trunked Despatch)		
	DN240	469.99375	Mobile Tx			TS321	814.0125	Mobile Tx
470.000-502.000	RRD (Medical Telemetry only)					TS520	818.9875	Mobile Tx
470.500	Land Mobile "F" Band				819.000	RRD		
	FNX101	470.50625	Simplex		824.000	Not allocated (AMPS extension Channels 991-1023)		
	FNX140	470.99375	Simplex		825.015	AMPS/DAMPS Cellular Band (Private Management Right)		
471.000	RRD					AMPS1	825.030	Mobile Tx
471.500	Land Mobile "F" Band					AMPS66	844.080	Mobile Tx
	FNX201	471.50625	Simplex		845.000	Alternative pairing with 890-894 MHz for US cellular		
	FNX240	471.99375	Simplex		849.000	Not allocated		
	FN1	472.00625	Mobile Tx		851.000	Fixed "KK" Band	Beta Tx	
	FN320	475.99375	Mobile Tx		857.000	Land Mobile "ESD" Band (Emergency Services)		
476.400	FNX301	476.00625	Simplex			ESD241	857.0125	Base Tx
	FNX332	476.39375	Simplex			ESD280	857.9875	Base Tx
477.425	Personal Radio Services "PRS" Band				858.000	Expansion for ES or TS Bands		
	PRS1	476.425			859.000	Land Mobile "TS" Band (Trunked Despatch)		
	PRS40	477.400				TS321	859.0125	Base Tx
	Land Mobile "F" Band					TS520	863.9875	Base Tx
	FNX401	477.43125	Simplex		864.000	Cordless Telephone "CT2" Band		
	FNX445	477.98125	Simplex			CT2-1	864.150	
	FN1	477.99375	Base Tx			BS2-40	868.050	
	FN320	481.98125	Base Tx		868.100	Land Mobile "TX" Band		
	FNX501	481.99375	Simplex			TX1	868.1125	Simplex
	FNX660	483.98125	Simplex			TX37	869.0125	Simplex
	FN321	483.99375	Base Tx		869.025	Not allocated (AMPS extension channels 991-1023)		
	FN640	487.98125	Base Tx		870.015	AMPS/DAMPS Cellular Band (Private Management Right)		
	FNX701	487.99375	Simplex			AMPS1	870.030	Base Tx
	FNX361	489.99375	Simplex			AMPS66	889.980	Base Tx
	FN321	490.00625	Mobile Tx		890.000	GSM Cellular Band (Private & Crown Management Rights)		
	FN640	493.99375	Mobile Tx			GSM1	890.200	Mobile Tx
	FP1	494.01875	Mobile Tx			GSM124	914.800	Mobile Tx
	FP279	497.49375	Mobile Tx		915.000	Fixed "K" Band (Studio-Transmitter Links)		
	FPX1	497.5125	Simplex		921.000	ISM, RRD, Amateur		
	FPX39	497.9875	Simplex		929.000	Fixed "K" Band (Studio-Transmitter Links)		
502.000-506.000	FP1	498.0125	Base Tx		931.700	Paging "KP" Band		
502.000	FP279	501.4875	Base Tx			KP1	931.7125	
	FPX101	501.5125	Simplex			KP12	931.9875	
	FPX139	501.9875	Simplex		932.000	Fixed "K" Band (Studio-Transmitter Links)		
	UHF Television Broadcasting (Bands IV and V)				935.000	GSM Cellular Band (Private & Crown Management Rights)		
	E25	502-510	Block 0			GSM1	935.200	Base Tx
	E26	510-518				GSM124	959.800	Base Tx
	E27	518-526	Block 1		960.000	960-1215	Aeronautical Radionavigation	
	E28	526-534				1215-1240	Radiolocation and Radionavigation	
	E29	534-542				12.40-1300	Radiolocation and Amateur	
	E30	542-550				1300-1400	Radiolocation and Radionavigation	
	E31	550-558	Block 2			1400-1427	Astronomy and Space Research	
	E32	568-566			960-1427	960-1215		
	E33	566-574				1215-1240		
	E34	574-582				12.40-1300		
	E35	582-590	Block 3			1300-1400		
	E36	590-598	(Govt reserved)			1400-1427		
	E37	598-606			1427-1525	1427-1465	Fixed "L" Band (Alpha Tx)	
	E38	606-614				1465-1485	Broadcasting and Broadcasting-Satellite	
						1485-1525	Fixed "L" Band (Beta Tx)	

NOTE: The Spectrum plan shown for 494-518 MHz is draft only and subject to further consideration and consultation.

1525-1710	1525	1525-1559	Mobile Satellite (S-E) (incl INMARSAT)			8.50-10.50 GHz	8.50	7730-8290	Fixed "W" Band
		1559-1610	Radionavigation-Satellite (S-E) (eg GPS)					8290-8500	Fixed "Y" Band
		1610-1626.5	Mobile-Satellite (E-S) (see 2483.5 MHz)					8.50-10.00	Radiolocation/Navigation
		1626.5-1660.5	Mobile Satellite (E-S) (incl. INMARSAT)					10.00-10.50	Radiolocation and Amateur
		1660.5-1670	Astronomy, Space Research, & Met Aids					10.50-10.68	Fixed "H" Band
		1670-1675	Aeronautical Public Correspondence (APC)					10.68-10.70	Astronomy and Space Research
		1675-1710	Meteorological-Satellites (S-E) (eg TIROS)					10.70-11.70	Fixed "Z" Band
1710-2300	1710	1710-1720	Not allocated					11.70-12.20	Broadcasting Satellite and MDS
		1720-1805	Fixed "M" Band (Alpha Tx)					12.20-12.50	Fixed "Q" Band and Fixed-Satellite (S-E)
		1805-1810	Not allocated					12.50-12.75	Fixed "S" Band and Fixed-Satellite (S-E)
		1810-1895	Fixed "M" Band (Beta Tx)					12.75-13.25	Fixed "X" Band
		1895-2300	Fixed "N" Band					13.25-13.40	Aeronautical Radionavigation
			(Note: Current use of this band is likely to change significantly with the introduction of PCS/MSS and PLMTS services.)					14.30-14.00	Radiolocation
2300-2396	2300	MDS Band (12 x 8 MHz Private Management Rights)						14.00-15.35	14.00-14.50 Fixed-Satellite (S-E)
2396-2500	2396	2396-2400	Amateur					14.50-15.35	14.50-15.35 Fixed "15G" Band
		2400-2450	ISM, RRD and Amateur					15.35-15.40	Astronomy and Space Research
		2450-2483.5	ISM and RRD					15.40-15.70	Aeronautical Radionavigation
		2483.5-2500	ISM and Mobile-Satellite (S-E) (see 1610 MHz)					15.70-17.30	Radiolocation
2600-2690	2500	2500-2690	Fixed "O" Band					17.30-17.70	17.30-17.70 Fixed-Satellite (S-E)
2690-3400	2690	2690-2700	Astronomy and Space Research					17.70-18.70	17.70-18.70 Fixed "18G" Band
		2700-3300	Radiolocation/Navigation (Weather radar)					19.70-21.20	19.70-21.20 Fixed-Satellite, Mobile-Satellite (S-E)
		3300-3400	Radiolocation and Amateur					21.20-23.60	21.20-23.60 Fixed "23G" Band, Broadcast-Satellite (21.4-22.0)
3400-4200	3400	3400-3600	Fixed "PB" Band and Amateur (3400-3500)					23.60-24.00	Astronomy and Space Research
		3600-4200	Fixed "P" Band & Fixed-Satellite (S-E) (INTELSAT)					24.00-24.05	Amateur
4200-5875	4200	4200-4400	Aeronautical Radionavigation					24.05-24.25	24.05-24.25 Radiolocation, Amateur, ISM (24.125) and RRD
		4400-5000	Fixed "PC" Band					24.25-25.25	24.25-25.25 Radionavigation
		5000-5650	Radiolocation/Navigation (MLS 5000-5250)					25.25-31.30	25.25-31.30 Not allocated (LMCS under consideration)
		5650-5875	Radiolocation, ISM & RRD (5725-5875) & Amateur (5650-5850)					31.30-37.00	31.30-37.00 Astronomy, Space Research and Radionavigation
5875-8600	5875	5875-5925	Fixed "RB" Band					37.00-60.00	37.00-40.00 Fixed "38G" Band
		5925-6420	Fixed "R" Band & Fixed-Satellite (S-E) (INTELSAT)					40.00	40.00-47.00 Not allocated
		6420-7100	Fixed "T" Band					47.00-47.20	47.00-47.20 Amateur
		7100-7425	Fixed "V" Band					47.20-50.40	47.20-50.40 Not allocated
		7425-7730	Fixed "U" Band					50.40	50.40-51.15 Fixed "50G" Band
								41.15	51.15-51.40 Not allocated
								54.25-57.20	54.25-57.20 Space Research
								57.20	54.25-57.20 Not allocated
								57.20-58.20	57.20-58.20 Fixed "60G" Band

NEW ZEALAND TELEVISION BROADCASTING CHANNELS

Channels 1 to 3 are VHF Low Band (Band I—44 to 68 MHz).

Channels 4 to 11 are VHF High Band (Band III—174 to 230 MHz).

Channels 27 to 62 are UHF Band (Band IV and V—518 to 806 MHz).

Transmissions conform to 625 line CCIR System B on VHF and System G on UHF with PAL colour.

The vision carrier frequency is nominally 1.25 MHz above the lower channel edge (an offset between -26 kHz and +26 kHz from the nominal may apply); the rest frequency of the analogue FM sound carrier is 5.4996 MHz above the vision carrier frequency; the centre frequency of the NICAM digital sound carrier (if transmitted) is 5.850 MHz above the vision carrier frequency. The B/G variant of 728 NICAM is used which has a total occupied bandwidth of 510 kHz.

Channel Sound Number	Frequency Limits (MHz)	Vision Carrier (MHz)	FM Sound Carrier (MHz)	N I C A M
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VHF

1	45 to 51	45.25	50.75	51.10
2	54 to 61	55.25	60.75	61.10
3	61 to 68	62.25	67.75	68.10
4	174 to 181	175.25	180.75	181.10
5	181 to 188	182.25	187.75	188.10
6	188 to 195	189.25	194.75	195.10
7	195 to 202	196.25	201.75	202.10
8	202 to 209	203.25	208.75	209.10
9	209 to 216	210.25	215.75	216.10
10	216 to 223	217.25	222.75	223.10
11	223 to 230	224.25	229.75	230.10

UHF

27	518 to 526	519.25	524.75	525.10
28	526 to 534	627.25	532.75	533.10
29	534 to 542	536.25	540.75	541.10
30	542 to 550	543.25	548.75	549.10
31	550 to 558	551.25	556.75	557.10
32	558 to 566	559.25	564.75	565.10

33	566 to 574	567.25	572.75	573.10
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34	574 to 582	575.25	580.75	581.10
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35	582 to 590	583.25	588.75	589.10
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36	590 to 598	591.25	596.75	597.10
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37	598 to 606	599.25	604.75	605.10
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38	606 to 614	607.25	612.75	613.10
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39	614 to 622	615.25	620.75	621.10
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40	622 to 630	623.25	628.75	629.10
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41	630 to 638	631.25	636.75	637.10
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42	638 to 646	639.25	644.75	645.10
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43	646 to 654	647.25	652.75	653.10
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44	654 to 662	655.25	660.75	661.10
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45	662 to 670	663.25	668.75	669.10
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46	670 to 678	671.25	676.75	677.10
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47	678 to 686	679.25	684.75	685.10
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48	686 to 694	687.25	692.75	693.10
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49	694 to 702	695.25	700.75	701.10
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50	702 to 710	703.25	708.75	709.10
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51	710 to 718	711.25	716.75	717.10
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52	718 to 726	719.25	725.75	726.10
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53	726 to 734	727.25	732.75	733.10
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54	734 to 742	735.25	740.75	741.10
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55	742 to 750	743.25	748.75	749.10
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56	750 to 758	751.25	756.75	757.10
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57	758 to 766	759.25	764.75	765.10
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58	766 to 774	767.25	772.75	773.10
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59	774 to 782	775.25	780.75	781.10
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60	782 to 790	783.25	788.75	789.10
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61	790 to 798	791.25	796.75	797.10
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62	798 to 806	799.25	804.75	805.10
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The 20-year management rights for Channels 27 to 34 and 43 to 62 have been sold to a number of television broadcast companies.

Channels 35 to 38 are currently used for Aeronautical Radionavigation (Radar).

Channel 39 is used for Amateur Television and Amateur Narrow Band Modes, see FMTAG Bandplan.

Channel 40 to 42 are used for low power television.

MOUNTAIN RADIO SERVICES IN NEW ZEALAND

In New Zealand the opportunity exists for many to take the hills. To help those who do so there are several Mountain Radio Services who hire lightweight mountain radios for people to communicate back to a town base or to other parties in the field. These mountain radio services are non-profit organizations who just charge sufficient for their services to cover their operating expenses.

The radios are single sideband and operate just below the 80m band on 3261 kHz in the South Island and 3345 kHz in the North Island. Many radios are also equipped to operate on the DoC National Park channels. The radios are used with a longwire half-wave dipole and with careful setting up are capable of communicating with the base stations from anywhere in the country.

The radios may be obtained from the following organizations:

North Island

Northland Mountain Radio Service

Noel Herman, PO Box 1410, Whangarei. Telephone (09) 437-5347 or 025 992-989.

Des Stephens, 2 Riverbend Road, Napier. Telephone (06) 843-8291.

David Walker, 36 Ardrossan Avenue, Hastings Telephone: (06) 879-8548.

Central Nth Is Mountain Radio Service

Peter Dare, 28A Wharenui Road, Rotorua Telephone: (07) 345-6469. Fax: 07-347-5507

John Hodgkinson, 60 Atkinson

Road, Te Awamutu. Telephone/Fax: (07) 872-7829.

Travers Moffit, Pohangina Valley West Road, Ashhurst. Telephone: (06) 350-8250.

Wellington Mountain Radio Service

Email: <wmrsinc@quanby.com>.

PO Box 30-519, Lower Hutt.

Hutt Valley: Bob Sewell. Telephone: (04) 564-6929. Collect sets at Dwights Canvas Great Outdoors Centre, 85 Queens Drive, Lower Hutt. Telephone (04) 570-0359.

Wellington: Bruce or Kerry Popplewell. Telephone: (04) 479-2144. Collect sets at Mainly Tramping, Ground Floor, Grand Arcade, 16 Willis Street. Telephone: (04) 473-5353.

Masterton: Colin Coutts, 12 Paiera Road. Telephone: (06) 344-0426 or Neil Richardson, 129 High Street. Telephone: (06) 377-0987. Fax: (03) 377-0347.

Otaki: Maurice Perry, 66 Otaki Gorge Road. Telephone: (06) 364-8441.

Palmerston North: Hugh Wilde. Telephone: (06) 356-9450. Collect sets at Mountain Equipment, 14 The Square, Palmerston North. Telephone: (06) 359-2162.

Wanganui: Darryl Greeks, 15 Liverpool Street. Telephone: (06) 345-6624.

South Island

Marlborough Mountain Radio Service

Paul Rennie, 64 Park Terrace, Blenheim. Telephone: (03)

578-5311.

Paul Rennie, 4 Sutton Street, Nelson. Telephone (03) 544-7085.

Canterbury Mountain Radio Service

Christchurch: Paul White. Telephone/Fax (03) 379-7905 or 021 365-618. Email: < paul@mountainradio.co.nz >. C/- Ballingers Hunting & Fishing, 173 Montreal Street, Christchurch.

DOC Te Anau & Wanaka (Fiordland & Mt Aspiring National Parks)

Methven: Alan Hepburn, 71 Main Road, Methven. Telephone: (03) 302-8410 (home).

Hokitika: Sam Meldrum, 135 Brittan Street, Hokitika. Telephone/Fax: (03) 755-6135. Email: < sam@mountainradio.co.nz >.

Dunedin: Martin Balch and Fiona. Telephone: (03) 454-3262. Mobile: 025 375-242. Fax: (03) 454-3223. Email: < martin@mountainradio.co.nz >. 23 Connel Street, Wavely, Dunedin.

Nelson: Greg Pickford, 4 Sutton Street, Richmond. Telephone: (03) 544-7085.

Takaka: Derry Kingston, RD1, Takaka. Telephone/Fax: (03) 525-9576.

Wanaka: Department of Conservation. Telephone (03) 443-7660. Visitor Centre, Wanaka.

Southland Field Radio

Southland Mountain Radio has a second channel fitted to all radios—DOC

Te Anau & Wanaka (Fiordland & Mt Aspiring National Parks)

Ray Phillips, Mill Road South



No. 1 RD, Invercargill. Telephone/Fax: (03) 216-3751. E-mail: < rkphillips@xtra.co.nz >. Stewart Burnby, Stewis Place, Caswell Road, Te Anau. Telephone: (03) 249-8363.

The Mountain Radio Service is the only public communication system for backcountry users. It is reliable, and effective. Follow instructions carefully and take care of the radio it could save your life!

Contact with the base stations is made at fixed schedule times in the evening, these times will be available from your radio supplier or with some suppliers a phone patch facility is available on an on demand basis.

At scheduled times weather forecasts and messages are relayed to the field radio. It is not unusual to have 30 or more stations on the nets.

The type of radio varies widely dependent on the supplier and type of service provided.

The Mountain Radio Services have been in operation now for over 25 years and it is recommended that those persons venturing into the mountains carry a mountain radio.

AT SEA SAFETY IS NO

ACCIDENT—CHECK

YOUR EQUIPMENT

COAXIAL PLUG ASSEMBLY

BNC Type (Female)



Step 1:
Cut end of cable evenly and remove 8 mm of outer sheath.

Step 2:
Slide clamp nut and pressure sleeve over cable, and comb out braid.



Step 3:
Fold braid back and insert ferrule between braid and dielectric. Trim off excess braid.



Step 4:
Remove 5 mm of dielectric without damaging centre conductor. Tin conductor.



Step 5:
Slide rear insulator over conductor hard against rear insulator. Solder contact to conductor.



Step 6:
Fit front insulator in body and push sub-assembly onto body. Slide pressure sleeve into body and screw in the clamp nut to clamp cable.

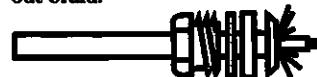


BNC Type (Male)



Step 1:
Cut end of cable evenly, and remove 7 mm of outer sheath.

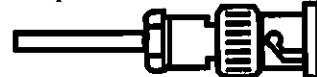
Step 2:
Slide clamp-nut, washer and rubber spacer over cable. Slide pressure sleeve over braid, and fan out braid.



Step 3:
Fold back braid against pressure sleeve and trim off excess. Strip 4 mm of inside insulation off centre wire. Solder pin onto centre wire.



Step 4:
Fit assembly, pin first, into main receptacle. Push washer, rubber spacer and clamp nut up and screw into place.



"N" Type



Step 1:
Cut end of cable evenly and remove 9 mm of outer sheath.

Step 2:
Slide clamp nut and pressure sleeve over cable, and comb out braid.



Step 3:
Fold braid back and insert ferrule between braid and dielectric. Trim off excess braid and remove 5.5 mm dielectric without damaging inner conductor. Tin end of conductor.



Step 4:
Slide rear insulator over conductor and position against end of dielectric. Slide contact over conductor until hard against rear insulator. Solder contact to conductor.



Step 5:
Fit front insulator in body and push sub-assembly into body. Slide pressure sleeve into body and screw in the clamp nut to clamp cable.



UHF Type

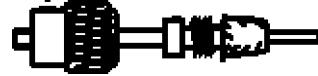


Step 1:
Cut end of cable evenly and remove 27 mm of outer sheath.

Step 2:
Slide coupling ring and adaptor onto sheath. Fan braid back over sheath.



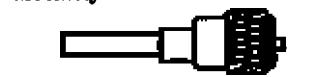
Step 3:
Compress braid around cable and position adaptor so braid fans over adaptor. Trim off excess braid.



Step 4:
Remove 12.5 mm dielectric and tin conductor. Screw the plug assembly onto cable and solder plug to braid through solder holes.



Step 5:
Solder conductor to centre pin and screw coupling ring onto assembly.



OTHER DATA

COAXIAL CABLE SPECIFICATIONS

Type	Nom. Imp	Outer Dia (mm)	Nominal Attenuation (dB/100 m)					Vel Factor %	Cap pF/m	Volts Vrms
			50 MHz	100 MHz	200 MHz	400 MHz	1 GHz			
RG-8/U	52	10.3	5.2	7.2	10.5	15.4	29.2	66.0	96.8	5000
RG-9/U	51	10.67	5.2	7.2	10.5	15.4	29.2	66.0	67.3	5000
RG-11/U	75	10.29	4.3	6.6	9.5	13.8	22.3	66.0	67.3	5000
RG-58/U	53.5	4.95	10.2	14.8	22.3	32.8	55.8	66.0	93.5	1900
RG-58A/U	50	4.95	10.8	16.1	23.9	37.7	70.5	66.0	101.0	1900
RG-58C/U	50	4.95	10.8	16.1	23.9	37.7	70.5	66.0	101.0	1900
RG-59/U	73	6.15	7.9	11.2	16.1	23.3	39.4	66.0	68.9	2300
RG-59B/U	75	6.15	7.9	11.2	16.1	23.0	39.4	66.0	67.3	2300
RG-62/U	93	6.04	6.2	8.9	12.5	17.7	28.5	84.0	44.3	700
RG-62B/U	93	6.15	6.6	9.5	13.8	20.0	36.1	84.0	44.3	700
RG-122/U	50	4.06	14.8	23.0	32.8	49.9	87.0	66.0	101.0	1900
RG-141A/U	50	4.06	6.9	10.5	15.4	22.6	41.7	69.5	95.1	1900
RG-142B/U	50	4.95	8.9	12.8	18.4	26.9	44.3	69.5	95.2	1900
RG-174/U	50	2.56	21.7	29.2	39.4	57.4	98.4	66.0	101.0	1500
RG-178B/U	50	1.83	34.4	46.9	62.3	91.9	150.9	69.5	95.1	1000
RG-178B/U	75	2.54	27.9	32.8	41.0	52.5	78.7	69.5	64.0	1200
RG-180B/U	95	3.56	15.1	18.7	24.9	35.1	55.8	60.51	49.2	1500
RG-187A/U	75	2.66	37.9	32.8	41.0	52.5	78.7	69.5	64.0	1200
RG-188A/U	50	2.59	31.5	37.4	46.6	54.8	101.7	69.5	95.2	1200
RG-196A/U	50	1.93	34.4	45.9	62.3	91.9	150.9	96.2	1200	—
RG-213/U	50	10.29	5.2	7.2	10.5	15.4	29.2	66.0	101.0	5000
RG-214/U	50	10.8	5.2	7.2	10.5	15.4	29.2	66.0	101.0	5000
RG-223/U	50	5.38	10.1	14.8	21.0	30.2	63.5	66.0	101.0	1900
RG-303/U	50	4.31	6.9	10.5	15.4	22.6	42.7	69.5	95.2	1900
RG-316/U	60	2.49	30.8	34.1	43.3	54.1	101.7	69.5	95.2	1200
BEL 9913	50	10.29	3.0	4.5	5.9	8.5	14.8	84.0	78.7	—

NB: Except for Belden 9913, all specifications are referenced to MIL-C-17D/F or JAN-C-17A as applicable.

COMMONLY USED SYMBOLS AND ABBREVIATIONS

A

A	ampere, amplification factor
AC	alternating current
A/D	analogue-to-digital
AF	audio frequency
afc	automatic frequency control
afsk	audio frequency shift keying
agc	automatic gain control
Ah	ampere hour
alc	automatic load (or level) control
AM	amplitude modulation
a.m.	morning
AMSAT	Radio Amateur Satellite Corporation
AMTOR	Amateur Teleprinting Over Radio
anl	automatic noise limiter
ant	antenna
AOS	acquisition of signal
ARA	Amateur Radio Association
ARC	Amateur Radio Club
AREC	Amateur Radio Emergency Corps
ARS	Amateur Radio Society; Amateur Radio Station
ASCII	American National Standard Code for Information Interchange
ATV	amateur television
avc	automatic volume control
AWG	American wire gauge
az-el	azimuth-elevation

B

B	flux density; susceptance
BASIC	Beginner's All-purpose Symbolic Instruction Code (computer language)
b	byte (a group of bits or binary digits, usually eight)
bc	broadcast
BCD	binary-coded-decimal
BCI	broadcast interference
bcl	broadcast listener
bd	baud (bits/sec)
ber	bit error rate
bit	binary digit
BFO	beat-frequency oscillator
bpf	band pass filter
bw	bandwidth
byte	computer word, 8 bits

C

C	Celsius, capacity, Coulomb
c	velocity of EM waves
CATV	cable television
CB	citizens band
CCIR	International Radio Consultative Committee
CCIT	Consultative Committee for International Telegraph and Telephone (ITU)
CCS	constant current source
cctv	closed circuit television
ccw	coherent CW;
CD	counter-clockwise
Ch	Civil Defence
cm	channel
CMOS	centimetre
coax	(or COSMOS)—complimentary symmetry metaloxide semiconductor
COR	coaxial cable or connector
CPU	carrier-operated relay
CQ	central processing unit
CRT	general call to all stations
	cathode-ray tube

ct

ct	centre tap
CTCSS	continuous tone coded squelch system
CW	continuous wave (code); clockwise

D

D	electrostatic displacement; flux density
D/A	digital-to-analogue
dB	decibel
dBd	antenna gain referenced to a dipole
DBDM	double-balance diode mixer
dBi	antenna gain referenced to an isotropic, a dipole has a gain of 2.14 dBi
dBm	decibel referred to 1 milliwatt
dBW	decibel referred to 1 watt
DC	direct current
det	detector
DF	direction finder; direction finding
DIP	dual-in-line package, 14 to 16 pins
dpdt	double-pole double-throw
dpst	double-pole single-throw
dsb	double sideband
DTL	diode-transistor logic
DTMF	dual tone multi-frequency
DVM	digital voltmeter
DX	long distance
DXCC	DX Century Club

E

E	voltage
e	base of Napierian logs
ECL	emitter-coupled logic
ECO	electron-coupled oscillator
EHF	extra high frequency (30–300 GHz)
EHT	extra high tension
eirp	effective isotropic radiated power
EMC	electro-magnetic capability
E-M-E	earth-moon-earth (moonbounce)
emf	electromotive force (voltage)
EMI	electro-magnetic interference
EMP	electromagnetic pulse
EPROM	erasable programmable read-only memory
EUV	extreme ultra-violet radiation
EQX	equator crossing
erp	effective radiated power

F

f	frequency
F	farad; Fahrenheit
FAX	facsimile
FCC	Federal Communications Commission
FD	Field Day
FET	field-effect transistor
FF	flip-flop
FM	frequency modulation
FMT	frequency measuring test
FMTAG	Frequency Management Technical and Advisory Group
fot	optimum working frequency
fsd	full scale deflection
FSK	frequency-shift keying

G

g	gram
G	giga (109); conductance; magneto motive force
	GaAs FET gallium arsenide field-effect transistor

GDO

GDO	grid-dip or gate-dip oscillator
GHz	gigahertz
gnd	ground
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Globa System for Mobile Systems

H

H	henry; magnetic field strength
HAAT	height above mean terrain
HF	high frequency (3–30 MHz)
HFO	heterodyne-frequency oscillator
hp	highest possible frequency; high pass filter
HT	high tension
Hz	hertz

I

I	current
IARU	International Amateur Radio Union
IC	integrated circuit
i-d	identification; identifier
ID	inside diameter
IF	intermediate frequency
IMD	inter-modulation distortion
I/O	input/output
IRC	international reply coupon
ISB	independent sideband
ITU	International Telecommunication Union
IW	Intruder Watch (Monitoring Service)

J

J	Joule
j	indicator for reactive component of an impedance; (+j inductive; -j capacitive); joule
JFET	junction field-effect transistor

K

k	kilo (1000)
K	kilobyte; specific inductive capacity; Kelvin; dielectric constant
kg	kilogram
kHz	kilohertz (10^3)
km	kilometre
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour

L

L	self inductance
LC	inductance-capacitance
LCD	liquid crystal display
LED	light-emitting diode
LF	low frequency (30–300 kHz)
lhep	left-hand circular polarisation
LO	local oscillator
loran	long-range navigation
LOS	loss of signal
lp	long periodic; long path
LSB	lower sideband; least significant bit
LSI	large-scale integration
LT	low tension
luf	lowest usable frequency
lw	longwave; long wire

m	metre (distance or band); milli (10^{-3}); mass	PM	phase modulation	T	time; temperature C
M	mega (10^6); mutual inductance	p.m.	afternoon/night	T	period; temperature K
mA	milliampere (one-thousandth of an Amp)	PMOS	p-channel MOS	TA	technical adviser
mAH	milliampere hour	pnp	positive-negative-positive	TCA	time of closest approach
MARS	Military Affiliate Radio System	ppi	plan position indicator (radar)	TE	trans-equatorial (propagation)
MATV	multi-access television	pot	potentiometer	tfc	traffic
MF	medium frequency (300–3000 kHz)	PROM	programmable read-only memory	THz	terahertz (1012)
mH	millihenry	PRV	peak reverse voltage	THD	total harmonic distortion
MHz	megahertz (106)	PSK	phase-shift keying	tpi	turns per inch
mike; mic	microphone	PTO	permeability-tuned oscillator	T-R	transmit-receive
mini-DIP	dual-in-line package of 8 pins	PTT	push-to-talk	TTL; T2L	transistor-transistor logic
mi/h	miles per hour	PSU	power supply unit	TTY	teletypewriter (from Teletype, the trade mark of Teletype Corporation)
mi/s	miles per second	Q	figure of merit (tuned circuits); charge; quantity	TV	television
mix	mixer	QRP	low power (less than 10 watts input)	TVI	television interference
mm	millimetre	QTHR	address correct in <i>Call Book</i>	Tx	transmitter
MO	master oscillator	R	resistance	UHF	ultra-high frequency (300–3000 MHz)
MOS	metal oxide semiconductor	RAM	random access memory	UJT	uni-junction transistor
mod	modulator	R/C	radio control	UoSAT	University of Surrey educational/research satellite (Great Britain)
modem	modulator/demodulator	R-C	resistor-capacitor	USB	upper sideband
MOX	manually operated switching	rcvr	receiver	UTC	Universal Co-ordinated Time
ms	millisecond	rev/min	revolutions per minute	uV	ultra-violet light
m.s.	meteor scatter	RF	radio frequency	V	
m/s	metres per second	RFC	radio-frequency choke	V	volt; voltage
MSB	most significant bit	RFI	radio-frequency interference	VA	Volt-Ampere
MSI	medium-scale integration	rhcp	right-hand circular polarisation	VCO	voltage-controlled oscillator
MSTV	medium-scan television	RI	Radio Inspector	VCR	video cassette recorder
MUF	maximum usable frequency	RIT	receiver incremental tuning	VCXO	voltage-controlled crystal oscillator
MUX	multiplex; multiplexer	RLC	resistor, inductance, capacitor network	VFBO	variable-frequency beat oscillator
mV	millivolt	rms	root-mean-square	VFO	variable frequency oscillator
mW	milliwatt	RO	Radio Officer	VHF	very-high frequency (30–300 MHz)
N	modulation factor	ROM	read-only memory	VLSI	very large scale integration
n	nano (10^{-9})	rptr	repeater	VOM	volt-ohm-milliammeter
nbfm	narrow-band frequency modulation	RS	Radiosport Satellite (USSR)	VOX	voice-operated switching
nbvm	narrow-band voice modulation	RSGB	Radio Society of Great Britain	VR	voltage regulator
n.c.	no connection	RST	readability-strength-tone	VSWR	voltage standing-wave ratio
NC	normally closed	RT	radiotelephone	VTVM	vacuum-tube voltmeter
NF	noise figure	RTL	resistor-transistor logic	VU	volume unit
NiCad	nickel cadmium	RTTY	radioteletype	V XO	variable crystal oscillator
NL	noise limiter	Rx	receiver	W	
NMOS	n-channel MOS	S	second; magnetic reluctance; Siemens	W	watt; work
NO	normally open	SAE	self-addressed envelope	WAC	Worked All Continents
npn	negative-positive-negative	SASE	stamped SAE	WARC	World Administrative Radio Conference
nS	nanosecond	SCR	silicon-controlled rectifier	WAS	Worked All States
NZART	New Zealand Association of Radio Transmitters	SHF	super-high frequency (3–30 GHz)	wbfm	wide-band FM
O		SINAD	Ratio of Signal to Noise and Distortion	Wh	watt-hours
OD	outside diameter	SM	silver mica (capacitor)	wpm	words per minute
OM	old man	SNR; S/N	signal-to-noise ratio	ww	wire wound; wire wrap
op amp	operational amplifier	spdt	single-pole double-throw	wx	weather
osc	oscillator	spst	single-pole single-throw	X	
OSCAR	Orbiting Satellite Carrying Amateur Radio	SS	sweepstakes; spread spectrum	X	reactance; electrostatic field strength
OTC	Old Timers' Club	SSB	single sideband	xivr	transceiver
oz	ounce	SSC	AMSAT Phase III special service channels	XO	crystal oscillator
P		SSI	small-scale integration	xfmr	transformer
p	pico (10^{-12})	SSTV	slow-scan television	xmtr	transmitter
PA	power	STSP	short-term special purpose (FM repeaters)	xtal	crystal
PAM	power amplifier; public address system	SWL	shortwave listener	XYL	wife
PCB	pulse amplitude modulation	SWR	standing-wave ratio	Y	admittance
PCM	printed (or etched) circuit board	sync	synchronous; synchronising	YF	wife
PEP	pulse code modulation	SYNCART	synchronous satellite carrying Amateur Radio Transponder	YL	young lady or lady operator
pF	peak envelope power			Z	impedance; UTC time
ph	picofarad				
PIN	phone				
PIV	positive intrinsic negative				
pk	peak inverse voltage				
pk-pk	peak				
PLL	peak to peak				
	phase-locked loop				

Conversion Factors (Metric-Imperial)

1 millimetre (mm)	= 0.03937 inch
1 centimetre (cm) = 10mm	= 0.3937 inch
1 metre (m) = 100cm	= 39.37 inches, 3.28 feet, 1.094 yards
1 kilometre (km) = 1000m	= 3280.8 feet, 1094 yards, 0.621 miles
1 gram (g) = 1000mg	= 0.03574 ounces
1 kilogram (kg) = 1000g	= 2.2046 pounds
1 tonne (t) = 1000kg	= 0.98 ton, 2204.6 pounds
1 cubic centimetre (cm³) = 1000mm³	= 0.6102 cubic inches
1 cubic metre (m³)	= 35.3 cubic feet, 1.3 cubic yards
1 litre (l)	= 0.220 imperial gallons, 0.264 US gallons
1 kilopascal (kP)	= 0.145 lbs/sq. inch, 0.009867 atmospheres
1 kilojoule (kJ)	= 0.948 BTU, 0.239 kilocalories, 737.56ft/lb
1 kilowatt (kW)	= 1.34 horsepower, 73.7ft.lb/sec
1 Newton (N)	= 0.2248lb force
1 Tesla (T)	= 10,000 gauss
1 Weber (W)	= 10^8 Maxwell

Prefixes for Multiples and Sub-multiples of Quantities

Multiple or Sub-multiple	Name	Prefix
10^{12}	Tera	T
10^9	Giga	G
10^6	Mega	M
10^3	Kilo	k
10^2	Hecto	h
10^1	Deca	da
10^{-1}	Deci	d
10^{-2}	Centi	c
10^{-3}	Milli	m
10^{-6}	Micro	μ
10^{-9}	Nano	n
10^{-12}	Pico	p
10^{-15}	Femto	f
10^{-18}	Atto	a

Preferred Number Series

(a) 10% Tolerance E12

10 12 15 18 22 27 33 39 47 56 68 82

(b) 5% Tolerance E24

10 11 12 13 15 16 18 20 22 24 27 30
33 36 39 43 47 51 56 62 68 75 82 91

DC resistance of conducting materials relative to copper

Material	Resistance	Material	Resistance
	Ratio		Ratio
Aluminium	1.6	Nichrome	63.0
Brass	3.8	Nickel	4.1
Cadmium	4.1	Phosphor Bronze	6.7
Chromium	12.0	Platinum	6.4
Copper	1.0	Silver	0.97
Gold	1.4	Stainless Steel	43.0
Iron	5.9	Tin	6.6
Lead	12.0	Zinc	3.6

Useful Formulae

- Wavelength (in metres)
Free space = $300/f$ (MHz)
Half-wave wire dipole = $143/f$ (MHz)
- Resonant frequency of an LC circuit
 $f = 1.59155\sqrt{LC}$
- The quality factor or Q of a circuit at resonance is
 $Q = 2\pi f L/r$
- The 3 dB bandwidth of such a single tuned circuit
 $B = f(\text{res})/Q$
- Estimate of transformer rating
Output = 31 A² Watts
where A = core cross-section in sq.in.
or Output = 4.8 A² Watts if A is in sq.cm.

Ohms Law

$$V = IR = W/I = \sqrt{WR}$$

$$I = V/R = W/V = \sqrt{W/R}$$

$$R = V/I = V^2/W = W/I^2$$

$$W = VI = I^2 R = V^2/R$$

Mains Plug Wiring

Phase	Brown	Red
Neutral	Blue	Black
Earth	Green/Yellow	Green

Average, Peak, RMS Values

	Average	Multiplication factor for sine wave		
		RMS	Peak	Peak-Peak
Average	—	1.1133	1.573	3.143
RMS	0.933	—	1.414	2.828
Peak	0.637	0.7073	—	2.033
Peak-Peak	0.323	0.3535	0.533	—

Colour Codes

Tantalum Capacitors

Top/Middle band: Value in pF (2 digits)

Middle Spot: Multiplier

Bottom band: Maximum voltage

Colour	Value	Multiplier	Voltage
Black	0	×1	10.0
Brown	1	×10	1.6
Red	2	×100	0.4
Orange	3	×1k	40.0
Yellow	4	×10k	6.3
Green	5	×100k	16.0
Blue	6		20.0
Violet	7	×0.0001	
Grey	8	×0.01	25.0
White	9	×0.1	2.5

Capacitors

Top band: First digit of value

Second band: Second digit of value (gives value in pF)

Third band: Multiplier

Fourth band: Tolerance—White 10%, Black 20%

Bottom Band: Voltage

Resistors

Bands from closest to lead:

First digit of value

Second digit of value

Multiplier

Tolerance

Colour	Value	Multiplier	Tolerance
Black	0	×1	
Brown	1	×10	1%
Red	2	×100	2%
Orange	3	×1 k	
Yellow	4	×10 k	
Green	5	×100 k	
Blue	6	×1 M	
Violet	7	×10 M	
Grey	8		
White	9		
Gold			5%
Silver			10%
No band			20%

Notes

1. 1% tolerance resistors have five bands. The first three give three digits of value, the rest as above.

2. Bands are closer to one end of the resistor. Read bands in sequence from this end.

Hexadecimal Constants

Hex Code	Most Significant Bytes		Least Significant Bytes	
0	0	0	0	0
1	4096	256	16	1
2	8192	512	32	2
3	12288	768	48	3
4	16384	1024	64	4
5	20480	1280	80	5
6	24567	1536	96	6
7	28672	1792	112	7
8	32768	2048	128	8
9	36864	2304	144	9
A	40960	2560	160	10
B	45066	2816	176	11
C	49152	3072	192	12
D	53348	3328	208	13
E	57344	3584	224	14
F	61440	3840	240	15

HEX TO DECIMAL CONVERSION

Decimal Value = IV + III + II + I

ASCII Character Codes as defined in ANSI X3.4

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	0	NUL	32	20	SPACE	64	40	@	96	60	_
1	1	SOH	33	24	!	65	41	A	97	61	a
2	2	STX	34	22	“	66	42	B	98	63	b
3	3	ETX	35	34	#	67	43	C	99	63	c
4	4	EOT	36	24	\$	68	44	D	100	64	d
5	5	ENQ	37	25	%	69	45	E	101	65	e
6	6	ACK	38	26	&	70	46	F	102	66	f
7	7	BEL	39	27	‘	71	47	G	103	67	g
8	8	BS	40	28	(	72	48	H	104	68	h
9	9	HT	41	29	)	73	49	I	105	69	i
10	A	LF	42	2A	*	74	4A	J	106	6A	j
11	B	VT	43	2B	+	75	4B	K	107	6B	k
12	C	FF	44	2C	,	76	4C	L	108	6C	l
13	D	CR	45	2D	-	77	4D	M	109	6D	m
14	E	SO	46	2E	/	78	4E	N	110	6E	n
15	F	SI	47	2F	\	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	,	91	5B	[	123	7B	[
28	1C	FS	60	3C	<	92	5C	\	124	7C	\
29	1D	GS	61	3D	=	93	5D	]	125	7D]
30	1E	RS	62	3E	>	94	5E	-	126	7E	-
31	1F	US	63	3F	?	95	5F	DEL	127	7F	DEL

ASCII Control Codes

NUL (Ctrl @) Null	DLE (Ctrl P) Data Link Escape
SOH (Ctrl A) Start of Heading	DC1 (Ctrl Q) Device Control 1
STX (Ctrl B) Start of Text	DC2 (Ctrl R) Device Control 2
ETX (Ctrl C) End of Text	DC3 (Ctrl S) Device Control 3
EOT (Ctrl D) End of Transmission	DC4 (Ctrl T) Device Control 4
ENQ (Ctrl E) Enquiry	NAK (Ctrl U) Negative Acknowledge
ACK (Ctrl F) Acknowledge	SYN (Ctrl V) Synchronous Idle
BEL (Ctrl G) Bell	ETB (Ctrl W) End of Transmission Block
BS (Ctrl H) Back Space	CAN (Ctrl X) Cancel
HT (Ctrl I) Horizontal Tab	EM (Ctrl Y) End of Medium
LF (Ctrl J) Line Feed	SUB (Ctrl Z) Substitute
VT (Ctrl K) Vertical Tab	ESC (Ctrl \) Escape
FF (Ctrl L) Form Feed	FS (Ctrl \) File Separator
CR (Ctrl M) Carriage Return	GS (Ctrl \) Group Separator
SO (Ctrl N) Shift Out	RS (Ctrl ^) Record Separator
SI (Ctrl O) Shift In	US (Ctrl _) Unit Separator

The RS-232C Interface

The basic RS-232C Electrical specifications

Communication rate:

0-20,000 bits per second

Driver output voltage levels, maximum no load:

-25 V logic 1, +25 V logic 0

Driver output voltage ranges for loads between 3 k and 7 k Ohms:

Logic 1: -15 V (7 k) and -5 V (3 k)

Logic 0: +15 V (7 k) and +5 V (3 k)

Driver output current, short circuit:

500 mA maximum

Driver output impedance with power off:

300 Ω minimum

Maximum driver output slew rate:

30 V per microsecond

Receiver input resistance:

7 kΩ maximum

3 kΩ minimum

Effective receiver input capacitance:

2500 pF maximum

Maximum receiver input voltage range:

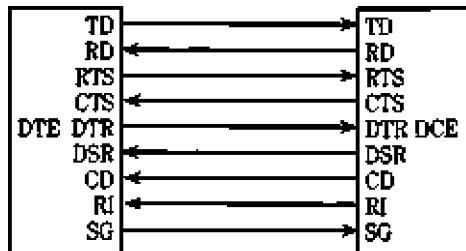
-25 V to +25 V

The following table shows the nine most common signals used for serial communications and their PIN allocations for nine and 25 PIN connectors:

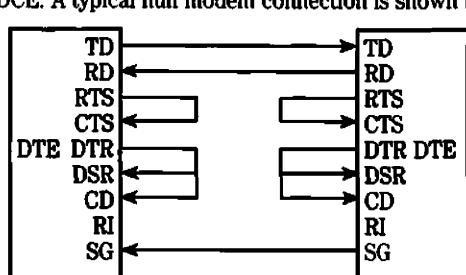
Signal	PIN No. (9 pin)	PIN No. (25 pin)
TD	Transmitted Data	3
RD	Received Data	2
RTS	Request To Send	7
CTS	Clear To Send	8
DSR	Data Set Ready	6
SG	Signal Ground	5
CD	Carrier Detect	1
DTR	Data Terminal Ready	4
RI	Ring Indicator	9

Common RS-232C Connections

Each signal (except ground) is either an input or an output depending whether it is on the Data Terminal Equipment (DTE) (eg, a computer terminal) or the Data Circuit Terminating Equipment (DCE) (eg, a modem). A typical connection is shown below.



When two computer terminals (DTEs) are connected together, a "null modem" hook-up is needed to fool each DTE into thinking that it is connected to DCE. A typical null modem connection is shown below.



BASIC AND DERIVED SI UNITS—CONVERSION FACTORS

Basic SI Units

Quantity	Name of unit	Unit sym-
Electric current	ampere	A
Length	metre	m
Luminous intensity	candela	cd
Mass	kilogramme	kg
Thermodynamic temperature	degree Kelvin	°K
Time	second	s

Derived SI Units

Physical quantity	SI unit	Unit symbol
Electric capacitance	farad	F = A s/V
Electrical charge	coulomb	C = A s
Electrical potential	volt	V = W/A
Electric resistance	Ohms	Ω = V/A
Force	Newton	N = kg m/s ²
Frequency	Hertz*	Hz = s ⁻¹
Illumination	lux	lx = lm/m ²
Inductance	Henry	H = V s/A
Luminous flux	lumen	lm = cd sr
Magnetic flux	Weber	Wb = V s
Magnetic flux density	Tesla†	T = Wb/m ²
Power	Watt	W = J/s
Work energy, quantity of heat	joule	J = N m

*Hertz is equivalent to cycle per second.

†Tesla is equivalent to Weber per square metre.

Conversion factors

To convert	into	Multiply by	Conversely
Amp hours	Coulombs	3600	2.778×10^{-1}
Atmospheres	Lb/sq.in	14.70	0.068
Centigrade	Kelvin	$^{\circ}\text{C} + 273 = ^{\circ}\text{K}$	$^{\circ}\text{K} - 273 = ^{\circ}\text{C}$
Cubic inches	Cubic feet	5.787×10^{-5}	1728
Cubic inches	Cubic metres	1.639×10^{-5}	6.102×10^4
Degrees	Radians	1.754×10^{-2}	57.3
Dynes	Pounds	2.248×10^{-6}	4.448×10^5
Ergs	Foot pounds	7.376×10^{-8}	1.356×10^7
Feet	Centimetres	30.48	3.281×10^{-2}
Foot pounds	Kilowatt hours	3.766×10^{-7}	2.655×10^6
Gausses	Lines per sq.in.	6.452	0.155
Grams	Dynes	980.7	1.02×10^{-3}
Grams per cm	Pounds per in	5.6×10^{-3}	178.6
Horsepower	Kilowatts	0.746	1.341
Inches	Centimetres	2.54	0.3937
Kilograms	Pounds (lb)	2.205	0.454
Kilometres	Feet	3281	3.048×10^{-4}
Kilometres	Kilometres	0.540	1.853
Kilometres	Nautical miles	0.621	1.609
Kilometres	Statute miles	0.621	1.609
Kilowatt hours	Joules	3.6×10^6	2.778×10^{-7}
Kilowatt hours	HP hours	1.341	0.7457
Knots	Miles per hour	1.1508	0.869
Lamberts	Candles per sq.cm	0.3183	3.142
Lamberts	Candles per sq.in	2.054	0.4869
Lumens per sq.ft	Foot candles	1	1
Lux	Foot candles	0.092892	10.764
Metres	Feet	3.28	10.764
Metres	Yards	1.094	0.9144
Miles per hour	Feet per second	1.467	0.68182
Nepers	Decibels	8.686	0.1151
Tons	Pounds	2240	4.464×10^{-1}
Watts	Ergs per second	10^7	10^{-7}

Ten Most Common Tower Building Mistakes

by
STEVE MORRIS
K7LXC

After working on over 100 amateur radio tower and antenna systems over the last 15 years, I have seen many problems and failures that could have, and should have, been avoided. By not making these mistakes, you can make your tower and antenna system safer and more reliable. It'll even let sleep at night better.

1. Not following the manufacturer's specifications

Commercially manufactured towers have to comply with current standards for wind loading and structural integrity. Licensed Professional Engineers (PEs) design the towers and make the calculations to make them safe. If you don't follow their specs at a minimum, the tower will not take the stresses and loads that it is subject to. In other words, it'll probably fail.

2. Overloading

This is the most common reason for amateur tower failure. The first thing you need to know to plan and build a tower and antenna system is what the wind speed rating for

your country is. Next, you need the manufacturer's specifications for that wind speed. Then you must not exceed the wind load rating based on these factors. This is even more important for crank-up towers. Refer also to number 1.

3. Underestimating wind forces

Wind pressure on a tower and antenna can be tremendous. Unless you've been up on a tower during a windstorm to feel the pressure and the forces, it's difficult to appreciate how significant they are. Increases in wind pressure are not linear, they are geometric.

4. Not building to the wind speed rating for the county

While many counties are only rated for 70 mph winds, many other counties have rating much higher, up to 115 mph. Find out what the wind speed rating is for your county, or your specific location, and use that as the minimum design parameter for your tower and antenna system. See also numbers 1 and 3 above.

5. Using the wrong mast for the job

Medium to large sized HF beams can put huge stresses on your mast. Know the difference between pipe and tubing as well as the pressure that your antenna system will put on the mast (tubing is generally acceptable, pipe is not). Then you can make sure that your mast will not bend or break in a big windstorm.

6. Not having the guy wire tensioned properly

Proper guy wire tension is a critical part of a tower's ability to handle wind stresses. Having the wrong tension can be like driving your car with over- or under-inflated tyres: it is potentially dangerous and is not the proper specification from the manufacturer. Find out the proper tension for your installation and tension them correctly.

7. Not having a proper ground system

A good ground system is necessary not only for lightning protection but also for minimizing RFI to adjacent electronic devices.

8. Not doing an annual inspection

Your tower and antennas system is in a constant state of deterioration. While it may be a slow process, it is going on continually. The best way to find and fix small problems before they grow into big problems and potential calamities is by doing an annual inspection.

9. Not fitting the tower sections on the ground

Tower sections, new or used, may not fit easily together. It's much easier to correct alignment problems on the ground rather than up on the tower.

10. Using the wrong hardware

Since tower and antenna materials are in a constant state of deterioration, you should only use hardware that minimizes corrosion. Galvanized or stainless steel materials are the only ones that will survive outdoor use reliably. Using the wrong hardware includes using non-closed-eye bolts. Use only forged or welded eye bolts since the wrong type can open up accidentally with disastrous results.

Derek Fortune ZL1UF (B.Sc.) presents some useful pointers on this popular and rewarding pastime.

Construction of one's own electronics project was once a mighty undertaking. Several tubes and a bulky power supply were required to achieve almost any logic or amplifier function. Enter silicon... no longer the case!

"Building block" integrated circuits make easy the realization of ideas like a precise, linear, voltage-to-frequency converter. These devices were limited to the realms of theoreticians less than 20 years ago. How about a preamp device having a flat 20 dB gain and low noise from DC to over 2 GHz. It operates from almost any power supply voltage (change one resistor) and costs less than \$10! The choice of project or device you might construct is almost limitless—test gear, home stereo and appliance control devices, projects for the car or boat, projects for the radio shack.

Choice of project

The classic beginners' text on electronics will describe several radio receivers, ranging upwards from the crystal set. Receiver projects are still very popular, and an amateur band transceiver project leads the licensed constructor into QRP (low power) operation. However, many people look towards something different. Magazines are forever spitting out new ideas for projects to build—whether you attempt a crystal set or a computer, there is a thrill in using the equipment you had a hand in making that is not available from the purchase of commercial, branded gear. You cannot help but teach yourself about electronics as you study someone else's circuit and explanations and then recreate it under your own conditions.

Not every project works from the first power-up; but the understanding of the project grows rap-

idly as the fault-finding technique progresses. If you cannot solve the problem yourself, you can usually find assistance from friends, clubs, or the project author as to finding the problem. Most authors are only too happy to discuss their project on the telephone, or in person. Letters like "it doesn't work, what can I do?" are much more difficult to answer. Interactive discussions allow the author to pose questions, and the two parties can converge on a likely solution.

Sources of designs

Magazines are definitely the best sources of varied, up-to-date projects. Nowadays *Silicon Chip* is probably one of the best publication available in this part of the world for a wide range of constructional articles for every purpose and skill level. Several European magazines have also run for years producing similar piles of potential projects. *QST* (published by the ARRL) and a host of other national amateur radio associations' magazines offer projects more selected toward the amateur fraternity. In New Zealand *Break-In* offers some excellent articles. If you have a pet project of your own design working well, get writing! Be sure to include a PCB layout with your article. Do contact a component supplier for details on currently available components before finalizing your design.

Many magazines of this nature are available through libraries. Some, like the Auckland University Engineering School Library, keep bound volume sets of each year's issues of many of these periodicals. Public libraries also keep desk copies available for reference use. Photocopiers are available in all these places for public use.

The annual index is usually included with the December issue of each magazine, so searching for articles on a given topic becomes quite easy. Radio Club libraries also can offer collections of books and magazines to the newcomer.

Choosing designs from Australasian magazines by preference is likely to give the least problems with obtaining components. Some European magazines especially are prone to use components which are very hard to get in New Zealand. More about this below.

Obtaining components in New Zealand

The Dick Smith chain still offers some discrete electronic components. However the range seems to be decreasing steadily.

Contact other local amateurs if you are looking for a component supplier in your region.

Printed Circuit Boards

PCBs for projects in many magazines are available. Marday Services in Auckland offers the PCBs for a number of *Electronics Today International* projects, as well as *Electronics Australia* and others. You can save a lot of time and trouble, especially if you are new to electronics, by obtaining the PCB to go with the published diagrams.

Construction techniques

Beginning constructors are well advised to obtain a copy of the *ARRL Handbook*. This monstrous text is probably the single best book anywhere to introduce the enthusiast to every part of amateur radio and contains a chapter on construction techniques. Tools and hardware, soldering and metalwork are described in detail in this chapter. Good soldering technique and care of the soldering iron is very important as you progress beyond your first projects. Most tables you will ever need in amateur radio, from drill sizes to low-pass filter component values are contained in this mighty tome.

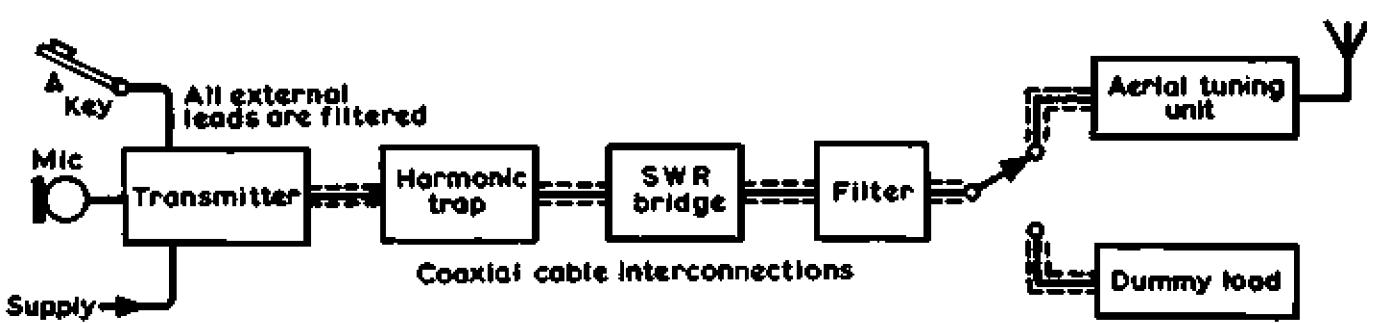
AC wiring technique needs to be given special attention in countries like ours which employ nearly the highest mains voltage in the world. One hundred and seventeen volts

AC usually gives you a shock you can feel—but 230 V on the other hand, and a good earth on the other, is quite likely to give you something to remember, if you live to remember it at all! Do not use the nearest convenient piece of wire when connecting the mains input wiring for your project. Hookup wire with the normal thin insulation is NOT SAFE for use at 230 V. Avoid odd colours too—the use of conventional colours for mains wiring is strongly recommended. Brown should be used for Phase and blue for Neutral; then you can keep red and black for low voltage rails.

Ordinary three-core power flex is easy to split with a sharp hobby knife drawn along the cable from one end. Pull out the three wires and tear the jacket away from them. In this way you can tear along a length of cable for as much wire as required. This technique yields three correctly coloured, well-insulated, AC-rated wires, perfectly suited to the internal AC wiring required for the project.

Plastic sleeving, or even better, heat-shrink tubing, is easy to fit to the few connections that really matter in most projects. Heat-shrink tubing is available in short lengths in several colours and can be shrunk by several methods apart from the usual gun. Take the time over little things like these, and then you need not fear investigating the equipment whilst it is operating.

Keeping clear when the power is first turned on is not the point. If you make a wiring mistake, you will find it hard to spot if you have used red wire for all connections. You may discover it later; if you put the oscilloscope ground on the red wire going to earth for some reason, you may find it is actually the red wire going to Phase when the clip explodes between your fingers! (The scenario here is imaginary, but someone did do something very similar with my work 'scope once!)



ITU CLASSES OF EMISSION CODE

The basic characteristics of radio emissions are usually given in a three symbol group, such as A1A for Morse code.

These symbols are arrived at as follows:

First symbol—type of modulation of the main carrier.

Second symbol—nature of signal(s) modulating the main carrier.

Third symbol—type of information to be transmitted.

Modulation used only for short periods and incidental purposes, such as identification, may be ignored.

1. First symbol—type of modulation of main carrier

- 1.1 Emission of an unmodulated carrier
- 1.2 Emission in which the main carrier is amplitude modulated, including angle-modulated sub-carriers—
 - 1.2.1 Double-sideband
 - 1.2.2 Single-sideband, full carrier
 - 1.2.3 Single-sideband, reduced or variable carrier
 - 1.2.4 Single-sideband, suppressed carrier
 - 1.2.5 Independent sidebands
 - 1.2.6 Vestigial sideband
- 1.3 Emission in which the main carrier is angle-modulated—
 - 1.3.1 Frequency modulation
 - 1.3.2 Phase modulation
- 1.4 Emission in which the main carrier is amplitude and angle-modulated either simultaneously or in a pre-established sequence
- 1.5 Emission of pulses—
 - 1.5.1 Sequence of unmodulated pulses
 - 1.5.2 A sequence of pulses—
 - 1.5.2.1 Modulated in amplitude
 - 1.5.2.2 Modulated in width/duration
 - 1.5.2.3 Modulated in position/phase
 - 1.5.2.4 In which the carrier is angle-modulated during the period of the pulse
 - 1.5.2.5 Combination of the above
- 1.6 Cases not covered above in which an emission consists of the main carrier modulated in a combination of angle, amplitude, or pulse
- 1.7 Cases not otherwise covered

2. Second symbol—nature of signals modulating the main carrier—

- 2.1 No modulating signal
- 2.2 A single channel containing quantized or digital information, without the use of modulating sub-carrier*
- 2.3 A single channel containing quantized or digital information, with the use of a modulating sub-carrier*
- 2.4 Single channel containing analogue information
- 2.5 Two or more channels containing quantized or digital information
- 2.6 Two or more channels containing analogue information
- 2.7 Composite system with quantized or digital information together with analogue information
- 2.8 Cases not otherwise covered

*This excludes time-division multiplex.

3. Third symbol—type of information to be transmitted

- 3.1 No information transmitted
- 3.2 Telegraphy—for aural reception
- 3.3 Telegraphy—for automatic reception
- 3.4 Facsimile
- 3.5 Data transmission, telemetry, telecommand
- 3.6 Telephony—including sound broadcasting
- 3.7 Television (video)
- 3.8 Combination of above
- 3.9 Cases not otherwise covered

For a more complete description, the three symbol group may be preceded by a four symbol group representing the necessary bandwidth. This group must comprise three numerals and one letter, which must be H, K, M, or G. The letter is placed at the position of the decimal point in the number denoting the bandwidth in hertz, kilohertz, megahertz or gigahertz respectively.

The calculation of necessary bandwidths is complicated and only a few examples can be covered here. For CW Morse, the baud rate is 0.8 times the words per minute. The bandwidth is three or five times the baud

rate, depending on the absence or presence of QSB. SSB Phone is just the highest modulating frequency. Double it for AM. FSK, RTTY (any code) is the baud rate plus 1.2 times the frequency shift.

Optionally, two more symbols may be added to the basic characteristics of emissions.

The optional additional characteristics are:

Fourth symbol—details of signal(s).

Fifth symbol—nature of multiplexing.

1. Fourth symbol—details of signal(s)

- 1.1 Two-condition code with elements of differing numbers and/or durations
- 1.2 Two-condition code with elements of the same number and duration without error-correction
- 1.3 Two-condition code with elements of the same number and duration with error-correction
- 1.4 Four-condition code in which each condition represents a signal element (of one or more bits)
- 1.5 Multi-condition code in which each condition represents a signal element (of one or more bits)
- 1.6 Multi-condition code in which each condition or combination of conditions represents a character
- 1.7 Sound of broadcasting quality (mono)
- 1.8 Sound of broadcasting quality (stereo)
- 1.9 Sound of commercial quality (excluding categories K and L)
- 1.10 Sound of commercial quality with the use of frequency inversion or band-splitting
- 1.11 Sound of commercial quality with separate FM signals for level control
- 1.12 Monochrome television or facsimile
- 1.13 Colour television or facsimile
- 1.14 Combination of the above
- 1.15 Cases not otherwise covered

2. Fifth symbol—nature of multiplexing

- 2.1 None
- 2.2 Code-division multiplex (including bandwidth expansion techniques)
- 2.3 Frequency-division multiplex
- 2.4 Time-division multiplex
- 2.5 Combination of F and T
- 2.6 Other types of multiplexing

Examples

- 25 wpm Morse on a local net: 060H1AAN
- 25 wpm Morse on a DXpedition: 100H1AAN
- Classic HF Baudot RTTY: 1K07F1BBN
- SSB Phone: 2K85J3EJN
- AM Phone: 5K70A3EJN
- So-called FM Phone on VHF: 16K0G3EJN
- 1200 baud Packet on VHF: 16K0G2DCN
- 9600 baud Packet on VHF: 13K2F1DCN
- GPS satellite navigation: 100KG7DCC
- On/off keyed Hellschreiber: 050HV1CAN



What is the NZART Radioscience Education Trust?

The Trust is a fund from which money will be made available for charitable purposes and the objectives of the Trust are set out in a Deed of Trust. It is structured to operate as a charitable trust to maximise the benefits to the recipients. It is governed by three Trustees who are responsible for all aspects of the Trust's operation.

What are the Trust's objectives?

The objectives for which the Trust has been established are to apply the Trust's assets within New Zealand to promote and encourage education in radioscience, whether by payment of course fees for worthy candidates, the provision of prizes for excellence in educational activities, grants-in-aid, or otherwise as the Trustees think fit. Beneficiaries do not have to be members of NZART, nor will members receive preference.

How does the Trust work?

Currently the Trust provides prizes and awards for students offering a project or exhibit having a radioscience theme at local school Science and Technology Fairs. Organising this activity involves NZART members at national and Branch level throughout the country.

Where does NZART fit into this Trust?

The Deed of Trust specifically sets the Association aside from any involvement. In effect, the Trust will be transparent to the Association since the awards, their control, and the financial aspects of the Trust are totally under the control of the Trustees.

How will the Trust's finances grow?

The Trust operates from the income generated by the capital invested and the accrued interest is used to finance the awards and prizes etc. Apart from the foundation donation, other significant capital has come from anonymous

donors and surpluses from NZART conferences.

The Trustees welcome inquiries from any person or organisation wishing to support the Trust by donation; replies will be treated in the strictest confidence. The Trustees intend that the fund should grow at least in line with inflation to ensure benefits are not eroded.

The Trust is recognised by the IRD as a "Charitable Trust". Briefly, this means that the Trust's income is not taxable and that in most cases donations to the Trust are tax-deductible.

Who are the Trustees and how are they appointed?

The three Trustees are all NZART members of long standing who hold the Association, its aims and objectives at the highest level. The inaugural Trustees are:

Terry Carrell ZL3QL, Christchurch. Life Member, Past-President, and ex-IARU Liaison Officer.

Peter Norden ZL2SJ, Featherston. President NZART.

John Walker ZL3IB, Christchurch. Editor *Break-In*.

The President of NZART, in consultation with the Vice-President, will appoint the Trustees as and when necessary.

The Science and Technology Fair organisation

Nationally, the Science and Technology Fair scheme is sponsored by a number of organisations and, at present, there are 22 regional Science and Technology Fairs whose winners go on to take part in the National Science and Technology Fair. More information on these may be found on the Royal Society's web page <www.rsnz.govt.nz/>.

What are the prizes for?

The aims of the Trust are broad. The Trustees wish to support and encourage all and any aspect of radioscience. Relevance to amateur radio is a plus but not a prerequisite.

For the time being the Trust sponsors a prize to the value of \$100 at each of the local area Science and Technology Fairs. Local NZART Branches are asked to provide judges and other forms of support for these events. The Trust also provides a Certificate of Merit (for the prize winner) and a Certificate of Commendation (one or more of which may be awarded at the judges' discretion). Prizes will only be awarded where the judges consider there is a worthy recipient.

Starting in 2007 the Trust plans to offer limited "Grants-in-aid" to support suitable radioscience projects in schools. Full details and application forms will be available in *Break-In* and on the Trust's web page

It is hoped that in the long term this two-way exchange will generate interest in radio and electronics leading to more young radio amateurs. At the same time it provides Branches with a means of local involvement and recruitment.

Looking ahead: let's talk about the Trusts, bequests and your will

By supporting the Trust you can partake in the development of new and exciting communications technology that is rapidly adding more options for a career, education, international understanding, and a wonderful pastime. You can help preserve this experience and pass it on to a new generation of New Zealanders by contributing to the Trust. You can be part of the future now!

It's quite natural to wonder about the future. Potential contributors

may ask in what way they can support the NZART Education Trust throughout a lifetime or beyond.

You may have had in your amateur radio activity an experience that has enriched your life, or seen or heard of something special that you wish to help perpetuate. Perhaps the Amateur Service with its many facets of activity, and public service, has made a lasting difference to your life, education and career.

A practical way to ensure future interest in Amateur Radio is by making a bequest to the Trust. The legally binding obligations on the Trust, as set out in its Deed of Trust, ensure that your donation will be preserved and used exclusively for the purpose intended, the promotion and encouragement of education in radioscience. We recommend strongly that a solicitor provide assistance when you are considering a bequest, or any modification to your will, as the law must be considered when executing a bequest. Your solicitor can assist you to tailor your will to your precise needs.

The NZART Radioscience Education Trust is a Charitable Trust founded the NZART Inc to promote and encourage education in radioscience. The Trust's income is tax-free and donations to the Trust are tax-deductible to the extent permitted by the Income Tax Act 1994.

Correspondence regarding the Trust and contributions should be addressed to: The Trustees, NZART Radioscience Education Trust, C/PO Box 1733, Christchurch.

Information about the Trust is also available on the NZART web site <www.nzart.org.nz/>.

SHIFTING HOUSE?

REMEMBER TO ADVISE THE FOLLOWING

1. AMATEUR LICENCE

Inform the Radio Inspector at your nearest Ministry of Economic Development (Radio Spectrum Management).

2. BREAK-IN DELIVERY

Advise the Office Manager, NZART HQ
PO Box 40-525, UPPER HUTT 6415

of your new address. Mention your call-sign and Membership Number (see page 4-16).

This advice will be forwarded to the *Call Book* Call-sign Compiler who will amend your *Call Book* listing.

NZART AFFILIATES

A document in the NZART Councillors' Handbook, the NZART Policy 1998, reads:

31 General

31.1 The following are NZART affiliates:

- 31.1.1 Old Timers' Club (OTC).
- 31.1.2 Women's Amateur Radio Organization (WARO).
- 31.1.3 Cook Islands Amateur Radio Club
- 31.1.4 Kapiti Coast Museum.
- 31.1.5 Canterbury Amateur Radio Development Society (CARDS).
- 31.1.6 Suburban Amateur Radio Club (SARC).

International Morse Preservation Society (FISTS)

New Zealand and Australia

The FISTS Club, (International Morse Preservation Society) is one where veteran operators help newcomers and less-experienced operators learn and improve CW proficiency. The membership has grown from 300 in its first year of operation to over 5,300 members worldwide and is one amateur radio's fastest growing organisations.

The New Zealand Chapter was formed in 1998 with Ralph Sutton ZL2AOH as the VK/ZL representative, membership now stands at over 120.

FISTS supports the use of Morse code

The club is devoted exclusively to CW operators and CW operating. We have three straightforward goals:

Further the use of CW

Engender friendships among members

Encourage newcomers to use CW

Brought together by a common love of Morse, FISTS members actively participate in a wide variety of amateur radio activities including nets, rag chewing, earning awards, QRP, contesting and of course "Elmering." All activities include both slow and higher speeds and emphasise courteous operating practices.

FISTS Club membership

FISTS members are young, old, both OMs and YLs—they live all over the world including every State in the USA and all enjoy CW communications at widely varying proficiency levels.

FISTS is not tied to any commercial interests and has no paid employees. VK and ZL members receive the UK produced newsletter Key Note and a local supplement FISTS Down Under. All activities are funded from annual fees of \$15.00 (spouses of existing members can join at no cost).

Requirements for membership of the FISTS Club are very simple. One simply has to like Morse code! You do not need to be a member of any other organisation and there is no minimum Morse proficiency requirement. You don't even have to be a licensed amateur.

FISTS QSL Bureaux

FISTS operate bureaux in the USA, UK, Japan, Korea and New Zealand/Australia for the quick exchange of QSL cards between members. This is a no-cost service to members.

FISTS contests

FISTS conducts contests for members and others

FISTS awards

FISTS members participate between themselves in a popular award scheme that includes the following:

Century award is for 100 FISTS

contact points

Platinum Award is for 100 Century Award contacts

250 Century award is for 250 Century Award holder contacts

500 Century Award is for 500 Century Award holder contacts

Silver Award is for 250 FISTS contact points

Gold Award is for 500 FISTS contact points

Diamond Award is for 1000 FISTS contact points

Worked FISTS all US States—for exchange between FISTS members in QRP as well as QRO categories.

Membership and other inquiries:

Ralph Sutton ZL2AOH
12c Herbert Gardens
186 The Terrace
Wellington 6001
Telephone: (04) 473-0847
Fax: (04) 473-0848
E-mail: <ZL2AOH@ihug.co.nz>
Web: <www.fistsdownunder.morsekeys.com>.

KAPITI COAST MUSEUM—WAIKANAE

The Waikanae District Museum was established in 1984 in the old Post Office Building, 9 Elizabeth Street, Waikanae—the Post Office building dating back to 1907. The driving force behind the radio collection consisted of George Anderson ZL2JG, Roy Curry ZL2AJP, Reg Danrell ZL2DR, Len Simpson ZL2HH, Les Wright and Dr Philip Bray.

The name was changed to Kapiti

Coast Museum in 1993 to reflect the change in local authority organization. The interior of the building was radically upgraded during 1993/94, more emphasis placed on local history and the museum, under its new name, and was re-opened in October 1994 by the Rt. Hon. Doug Graham.

The radio collection includes a good range of domestic receivers, ZL2AB's original station (1923),



A collection of early domestic receivers dating from 1925. ZL2AB's original station is displayed in the foreground.



Pictured is George Anderson ZL2JG, backed by a number of the classics of yester-year.

and ZL4GE, now ZL2JG, 1933 Hartley transmitter. The ZL2GX collection of Collins, National HRO and other receivers is on display. The Amateur station ZL6KCM is affiliated to NZART and RSARS and vintage equipment operated.

The museum also has a collection of telegraph keys and associated instruments plus a very good display of telephone equipment.

The museum is interested in obtaining items of historical interest and always keen to welcome new members to assist with the management of the museum and restoration of exhibits. The museum is open from 2pm to 4pm Saturday and Sunday and all Public Holidays. The museum can be opened outside these hours on request by contacting George Anderson (04) 905-6884.

Object

To promote and encourage interest in Amateur Radio amongst women.

WARO was formed in 1961-62 by a small but keen group of YL transmitters and has steadily grown both in numbers and enthusiasm.

For the annual subscription (currently \$15.00 for New Zealand members) members receive four quarterly Bulletins containing items of interest to operators and friends, with special attention to YL activities.

Associate members—YLs who do not have a transmitting licence are welcome, as are YLs from overseas, many of whom are sponsored by ZL members.

Friends of WARO—persons who support WARO may become Friends of WARO by making a donation of not less than the current subscription.

The Thelma Souper Memorial Contest is held annually in early April in honour of our founder. It is open to YLs and OMs and is held on the lower end of the 80 m band.

The WARO Achievement Award may be awarded annually to persons nominated by their peers for outstanding achievements in any aspect of Amateur Radio. Nominations close at the end of March each year and the Award is presented at the AGM in June. The form this takes is the Myrtle Earland Memorial Rosebowl in honour of New Zealand's first licensed YL.

WARO also operates several awards including the WARO Award

and the Mountain Buttercup Award. For further details on these see the Awards section elsewhere in this Call Book.

Elected Officers**President**

Rosemary Boshier ZL1RO.

Vice-President

Lynnette McDonald ZL1LL.

Secretary

Maxine Rowe ZL1FW.

Treasurer and Membership Applications

Margaret Bretherton ZL1MB.

Executive

Sue Holland ZL3AHT.
Bev Gillman ZL3TCR.

Award Manager

Lynnette McDonald ZL1LL.

Contest Manager

Bev Osborne ZL1OS.

Sponsorship Secretary

Celia Reed ZL1ALK.

Librarian

Joline Beale ZL1UJB.

Official Broadcast Co-ordinator

Rosemary Boshier ZL1RO.

Break-In Columnist

Biny Owen ZL2AZY.

Bulletin Editor

Bev Osborne ZL1OS.

YL Nets:**WARD VHF**

Auckland: Sunday 7pm NZ time
146.900 (Bombay 690).

Canterbury: Tuesday 9pm NZ time
147.250 (Canterbury 725).

WARD HF

WARD: Mondays 8pm NZ time
3.695MHz ±.

WARD Executive: Second Sunday
0800 UTC 3.695MHz ±.

International

ALAR: Mondays 1030 UTC
3.580 MHz.

YL "222": Mondays 0600 UTC
14.222 (Net Control June VK4SJ).

VE/VK/ZL: Fridays 0500 UTC
14.148 MHz.

BYLARA: Wednesdays/Saturdays
1115z BST 7050/7090 ± QRM.

CLARA: Tuesdays 1700 UTC
14.120 MHz (alternate frequency
14.180 MHz).

YLRL:

YL Open House—Wednesdays
1900 UTC 14.288MHz (one hour
earlier daylight savings time).

Tangle Net—Thursdays 1800
UTC 14.298MHz.

European DX/YL: Thursdays 1700
UTC 14.242 MHz ±. (Net Control
Christine GM4YMM.)

DX sponsorship

It is great to sponsor a YL from
another YL organization—increases
your awareness of other countries
and their people. We have DX-
sponsored members from all over

the world and it does help to forge
greater bonds between all of us. To
sponsor a YL contact the Sponsorship
Secretary for further information and
contacts. It costs the value of a DX
membership subscription and the
chance to exchange news and views
with each other.

YL Get-Togethers

These are held regularly throughout
the country as well as the
annual Get-Together at the time of
our AGM in June. Consider going
along to these affairs—they are a
lot of fun.

WARD Bulletin/Break-In page

Copy is always required for these
publications and any news/views
of/by or from members are very
welcome by the two persons concerned.
Photographs are especially
welcome—how about sending
some in NOW.

Enquiries are always welcome
from any YL for membership/fellowship
in all of our activities. Feel free to
contact any of the above-mentioned
YLs or any other member of
WARD. And always be on the look-
out for ZL6YL—our own call-sign.

WARD on the Internet

<www.qsl.net/zl6yl> or <www.nzart.org.nz>.

Visit the WARO website where
you will find past issues of the
WARD Bulletin and WARO news.
There is also a comprehensive history
of WARO, and links to DX YL
amateur radio organisations.

SPAM Society for the Preservation of Amplitude Modulation**Secretary/Treasurer**

Roy Symon, ZL2KH
25 Annandale Street
New Plymouth

Telephone

(06) 758-2156.

E-mail

<zl2kh@nzart.org.nz>.

Librarian and Archivist

John Nicholson, ZL1AUB
30 Alfred St
Fairfield
Hamilton 2001

Telephone

(07) 855-5435.

E-mail

<johnn@wave.co.nz>.

Meetings

The Annual General Meeting is
held annually at Queen's Birthday
Weekend in conjunction with the
NZART Conference.

Aims and Objects

To preserve Amplitude
Modulation as a means of Amateur
Radio communication.

General

In order to keep expenses to a
minimum, membership lists, financial
statements, information, etc.,

sought by members will be sent on
receipt of a stamped and addressed
envelope. The information sought
will be sent as soon as possible.

Nets

There are nets operating at
present on AM on 3.850 MHz at
the following times:

Friday evenings at 2000 hours
(Northern area based).

Those interested are urged to
call "CQ AM" on 3.850 MHz AM
any evening at 2000 hrs local time
if they want a QSO.

Subscription

\$5.00, payable once only

on joining. A collection will
be taken up each year at the
Annual General Meeting, and
donations will always be
acceptable.

Bulletins

Bulletins are sent out regularly
by e-mail to those who have
provided their e-mail addresses.
These are sent by the "blind copy"
method so individual's addresses
are not circulated to everyone.
The bulletins include news,
requests for information, parts
and equipment available, parts or
equipment wanted, plus anything
else that might be of interest to
members.

OLD TIMERS' CLUB (ZL)

The objects of the Old Timers' Club (ZL) are set out in our Constitution adopted in 1993. They are as follows:

(1) To recognise service to Amateur Radio;

(2) To revive and maintain interests and good fellowship among the older members in the common cause.

(3) To offer advice and encouragement to newer Amateurs.

The Club is affiliated to the New Zealand Association of Radio Transmitters (Inc.).

The Annual General Meeting is held on the Sunday morning of Queen's Birthday weekend (in conjunction with the NZART Conference) so it is possible that there will be changes in those holding office after that date.

Patron

Harry Martin ZL1PX.

Grand Old Man

Bram Bramley ZL3ME.

Secretary/ Treasurer

Roy Symon ZL2KH.

Postal Address

OTC, 25 Annandale Street, New Plymouth.

Telephone

(06) 758-2156.

E-mail

<zl2kh@nzart.org.nz>.

Roy can also be contacted at 1000 hours most Sunday mornings during the OTC Net on 7.058 MHz.

Any material for the *Break-In* page should be sent to: ZL2KH, 25 Annandale Street, New Plymouth.

Net Controllers

Roy Symon ZL2KH.

Don Dalrymple ZL3SZ.

Bob Banks ZL1AUI.

Reg Truman ZL1UZ.

80 m AM Phone—Doug Alexander ZL2AWF.

District Representatives

Peter Anderson ZL1LR, Don Dalrymple ZL3SZ, Don Bradfield ZL1DAQ, Alan Taylor ZL4AT.

OTC Scribe

Roy Symon ZL2KH.

A National Single Side-band Net is held every Sunday morning at 9.30 am. The call-sign is ZL6OTC. The frequency is 7.058 MHz but if propagation is poor on 40 m, the net may QSY to 3.865 MHz. An AM Net is also run on Sunday morning at 10.30 am on 3.850 MHz. The Secretary gives the Club News at 10.00 am on the SSB Net.

Full membership is available to any holder of a ZL call-sign who has held an amateur licence for the last 25 years or more and is still an active amateur.

In addition, Associate Membership is available to any ZL amateur who has attained the age of 60 years (and over) and has been an active amateur for 10 or more years. Voting privileges are not available to Associate Members.

Application forms for membership may be obtained from a District Representative or from the

National Secretary. A joining fee of \$10.00 is payable on application.

Evidence of eligibility which is to be submitted shall include, full name, present call-sign, original call, operator's certificate number and date of original licence. All applications for membership shall be proposed and seconded by present OTC members.

On acceptance a Certificate is issued to all Full and Associate Members, and they will be listed in the *Blue Book*. In addition further handsome certificates are available on request to those who attain 50, 60 and 70 years of Amateur Service.

All members of OTC are eligible to wear the Peacock Blue NZART Badge with call-sign so long as they are financial members of NZART. This badge is available from NZART HQ at the current price of the similar black membership badges.

Articles relating to all aspects of OTC or of vintage radio for publication in the OTC section of *Break-In* are welcomed by, and should be addressed to our Scribe, Roy Symon ZL2KII, 25 Annandale Street, New Plymouth.

JAMBOREE ON THE AIR

October 21 and 22 2006
October 20 and 21 2007

by
JIM PARNELL
ZL2APE



JOTA is an annual event in which about 500,000 Scouts and Guides all over the world make contact with each other by means of amateur radio. It is a real Jamboree during which Scouting and Guiding experiences are exchanged and ideas are shared, thus enhancing worldwide Scouting and Guiding. JOTA has been held annually since 1958 and Scouts and Guides are encouraged each year to invite radio amateurs to help them take part.

There are great potential benefits to amateur radio by encouraging young people to take part in JOTA as it introduces them to the hobby that you as an amateur enjoy. So it

is in the interests of New Zealand amateurs to anticipate invitations by Scouts and Guides and approach their leaders, offering their services and equipment.

The easiest way for Scouts and Guides to take part in JOTA is for them to visit an amateur station sometime during the JOTA period. At the station, the amateur establishes a contact with another amateur station and then hands over the microphone to the Scouts and/or Guides. Satellite, Packet, SSTV and other modes of communication (including e-mail) are now used for JOTA as well as the normal modes using HF and VHF/UHF.

Many stations are set up at Scout or Guide Headquarters, or at some local "interesting" or appropriate venue. Other JOTA stations are set up at camps, the radio activities being incorporated into the camping programme.

JOTA is now run concurrently with the Jamboree on the Internet (JOTI) and JOTA and JOTI stations are often combined on the same site. There is much information about JOTA and JOTI on the New Zealand Scouting web pages: <www.scouts.org.nz/>.

48th Jamboree

On The Air
Sur les Ondes

9th Jamboree
On The Internet
Sur l'Internet



On the world scout JOTA web pages: <www.scout.org/jota/>.

And on: <www.jimparnell.co.nz/jota/jota.html>.

JOTA and JOTI are both co-ordinated by the World Scout Bureau and are organised by National Organisers in each Scouting and Guiding country.

A regional JOTA is now held by the Asia-Pacific Region Scouting organisation early in August of each year, but the present New Zealand Scouting intention is to concentrate on participation

in the world-wide activity in October.

JOTA is always held during the 48 hours (local time) of the third full weekend in October. In the year 2006, JOTA will be held on October 21 and 22 (Labour Weekend), and in 2007, it will be on October 20 and 21 (this is also Labour Weekend).

Jim Parnell ZL2APE
<zl2ape@nzart.org.nz>
National Organiser for JOTA in New Zealand

The following programmes offer information on DX news, receiver reviews, media features, propagation, satellites broadcasting trends, amateur radio and the Internet. They are reproduced here courtesy of Ernest Riley of the Ontario DX Association who exchange magazines with the New Zealand Radio DX League.

UTC Day	Time	Programme	Station	Freq.
SATURDAY	0000	Allan Weiner Worldwide	WBCQ	7415
	0120	DX Corner	Radio Budapest	9590
	0240	DX Programme	Radio Bulgaria	9700, 11700
	0245	DXers Special Supplement	R.A.E.	11710
	0250	DX Corner	Radio Budapest	9795
	0510	DX Corner	Radio Japan	6110 bi-weekly
	0730	DX Partyline	HCJB	11750
	1000	Radio Weather	WHRI	7520
	1010	DX Corner	Radio Japan	6120 bi-weekly
	1030	DX Partyline	HCJB	15400
	1210	World Wide Friendship	KBS World Radio	9650
	1230	Radio Weather	WHRA	15665
	1230	World of Radio	WRMI	9955
	1245	DX Corner	Voice of Turkey	15450 bi-weekly
	1330	Wavescan	WRMI	9955
	1430	DX Partyline	HCJB	15390
	1430	World of Radio	WRMI	7385
	1530	World Wide Friendship	KBS World Radio WRN	
	1600	World of Radio	WWCR	12160
	1730	World of Radio	WRN	
	1930	DXing With Cumbré	WHRI	15285
	2000	This Week in Amateur Radio International	WBCQ	7415
	2105	DXers Unlimited	Radio Habana Cuba	9505, 11760
	2140	Radio Waves	Radio Ext. de España	9595, 9840
	2210	DX Corner	Voice of Turkey	9830 bi-weekly
	2330	DXers Unlimited	Radio Habana Cuba	9550
SUNDAY	0010	DX Corner	Radio Japan	6145 bi-weekly
	0018	The Whole World on the Radio Dial	Radio Ukraine	7440
	0030	Radio Weather	WHRI	7555
	0040	Radio Waves	Radio Ext. de España	15385
	0140	DXers Unlimited	Radio Habana Cuba	6000, 9820
	0145	Ask WWCR	WWCR	5070
	0200	Electronic DX Press	WWCR	5070 bi-weekly
	0210	World Wide Friendship	KBS World Radio	9560
	0215	DX Partyline	WWCR	5070
	0230	DXing With Cumbré	WHRA	5850
	0230	World of Radio	WWCR	5070
	0230	World Wide Friendship	KBS World Radio WRN	
	0315	DX Corner	Voice of Turkey	5975, 7270 bi-weekly
	0318	The Whole World on the Radio Dial	Radio Ukraine	7440
	0335	DXers Unlimited	Radio Habana Cuba	6000, 9820
	0530	DXers Unlimited	Radio Habana Cuba	6000, 6060, 9550, 9820, 11760
	0630	World of Radio	WWCR	3215
	0830	World of Radio	WRN	
	0930	Radio Weather	WHRI	7520
	0930	World Wide Friendship	KBS World Radio	WRN
	0945	Ask WWCR	WWCR	5070
	1110	DX Corner	Radio Japan	6120 bi-weekly
	1230	Radio Weather	WHRA	15665
	1430	International Radio Report	CKUT Montreal	www.ckut.ca
	1430	DX Partyline	WRMI	7385
	1530	DXing With Cumbré	WHRI	11785
	1730	World of Radio	WRN	
MONDAY	1800	Allan Weiner Worldwide	WBCQ	7415
	2000	Radio Weather	WHRI	16285
	2100	This Week in Amateur Radio International	WBCQ	7415
	2230	Radio Weather	WHRA	11765
	0230	DXing With Cumbré	WHRA	5850
	0300	Radio Weather	WHRI	7520
	0300	World of Radio	WBCQ	9330
	0330	DXing With Cumbré	WHRI	7315
	0415	World of Radio	WBCQ	7415
	0830	Mailbox	RNZI	7145 bi-weekly
TUESDAY	1130	Mailbox	RNZI	9870 bi-weekly
	1230	Ask WWCR	WWCR	16825
	1330	Mailbox	RNZI	7145 bi-weekly
	1530	Mailbox	RNZI	7145 bi-weekly
	0330	Mailbox	RNZI	13730 bi-weekly
WEDNESDAY	0930	DX Partyline	WWCR	9985
	0945	Electronic DX Press	WWCR	9985
	2105	DXers Unlimited	Radio Habana Cuba	9505, 11760
	2335	DXers Unlimited	Radio Habana Cuba	9550
	0135	DXers Unlimited	Radio Habana Cuba	6000, 9820
THURSDAY	0335	DXers Unlimited	Radio Habana Cuba	6000, 9820
	0530	DXers Unlimited	Radio Habana Cuba	6000, 6060, 9550, 9820, 11760
	0930	World of Radio	WWCR	9985
	2200	World of Radio	WBCQ	7415
	2300	World of Radio	WBCQ	18910
FRIDAY	0245	DXers Special Supplement	R.A.E.	11710
	0730	Radio Weather	WHRA	11565
	2130	Radio Weather	WHRI	15665
	0945	Ask WWCR	WWCR	9985
	2030	World of Radio	WWCR	15825
	2100	The Real Amateur Radio Show	WBCQ	7415
	2340	DX Programme	Radio Bulgaria	9700, 11700

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Thanks to Tait Electronics for supporting Amateur Radio in New Zealand for many years—see outside back cover.

Single Rescuer

C.P.R.



Initial Approach

- Ensure own safety
- Assess consciousness ("are you okay?")
- Call/yell for help
- Position victim

Airway

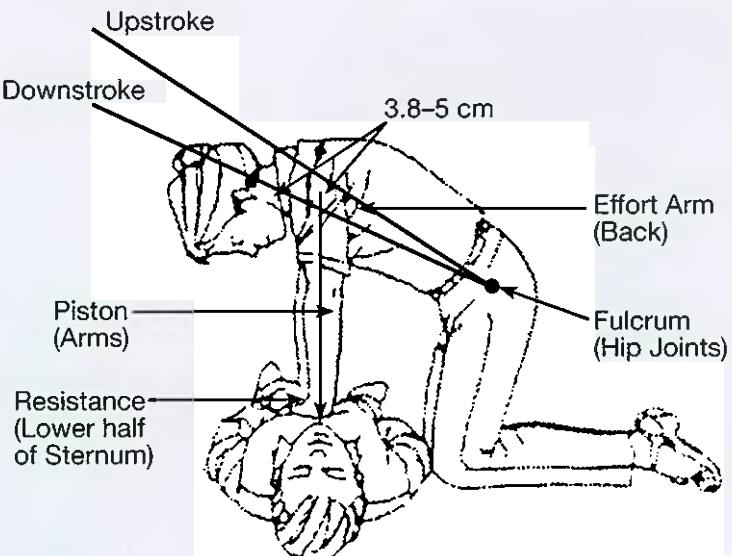
- Clear airway (remove objects/fluids from mouth)
- Open airway: head tilt–chin lift

Breathing

- Check breathing—10 seconds—LOOK, LISTEN, FEEL
- Rescue breathing: Give two effective breaths (up to five attempts)

Circulation

- Check for signs of circulation (10 seconds only)
- Rate 100
- Ratio 30/2
- After 30 compressions give two effective breaths



Checks

- Reassess for signs of circulation every three minutes

Continue C.P.R. Until:

- The victim's own pulse and breathing have been restored
- A doctor or other health professional takes over
- You are exhausted

DO NOT GIVE UP

Even when things look hopeless, until trained help arrives

**95% exported
100% kiwi**



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But despite our global success, we never lose sight of our roots. That's why we're proud to sponsor the New Zealand Association of Radio Transmitters' Conference.



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