RADIO SPECTRUM MANAGEMENT

Radio Licence Policy Rules (PIB 58)

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MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

New Zealand Government

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1. Introduction

1.1. Contents

This Public Information Brochure Radio Licence Certification Rules (PIB 58) specifies the Policy Rules that the Chief Executive of the Ministry of Business, Innovation and Employment (the Ministry) may consider when for granting (or declining) a Radio Licence when presented with an application under Regulation 8 of the Radiocommunications Regulations 2001 (the Regulations). The application must also meet the requirements of the Radiocommunications Act 1989 and its amendments (The Act).

The Licensee, being the entity to hold a radio licence and Approved Persons[1], being Approved Radio Engineers (ARE) and Approved Radio Certifiers (ARC), are required to comply with these rules when applying for the granting of radio licences.

These rules must be read in conjunction with Radio Licence Certification Rules (PIB 38) - Engineering Rules and Information for Approved Radio Certifiers and Approved Radio Engineers.

Radio Licence Certification Rules (PIB 38)

1.2. Disclaimer

The Ministry makes no warranty, express or implied, nor assumes any liability for any loss suffered, whether arising directly or indirectly, due to sole reliance on the accuracy or contents of this Public Information Brochure (PIB 58).

1.3. Changes

Radio Spectrum Management (RSM) may change, delete or add to, or otherwise amend information contained in this document from time to time to reflect evolving policies, technologies and services. Changes to this document will be notified through the 'Radio Spectrum Management Business Update' e-newsletter that is emailed to those that subscribe. These changes are also notified in the news section on the RSM website).

It is the responsibility of the Licensee and Approved Persons to ensure that they are familiar with the latest version of these rules.

1.4. Clarification and Corrections

RSM will provide clarification of the information contained in this document when requested and would appreciate receiving suggestions for its improvement, or advice relating to inaccuracies or ambiguity. Such matters can be emailed to radio.spectrum@mbie.govt.nz. Correspondence received will be acknowledged, investigated and appropriate action taken.

[1] In the context of this document Approved Persons are Authorised Persons

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1.5. Abbreviations and terminology

The Act	Radiocommunications Act (1989)
ALMR	Analogue Land Mobile Radio
Approved Person	ARC or ARE
ARC	Approved Radio Certifier
ARE	Approved Radio Engineer
BSS	Broadcast Satellite Service
CTCSS	Continuous Tone Coded Squelch System
DLMR	Digital Land Mobile Radio
ES	Emergency Services
FS	Fixed Service
FSS	Fixed Satellite Service
GURL	General User Radio Licence
GURL-AP	General User Radio Licence for Aeronautical Purposes
GURL-CB	General User Radio Licence for Citizen Band Radio
GURL-MP	General User Radio Licence for Maritime Purposes
GURL-SS	General User Radio Licence for Satellite Services
ICAO	International Civil Aviation Organisation
IRR	International Radio Regulations
ITU-R	International Telecommunications Union – Radio Sector
LMR	Land Mobile Radio
MSS	Mobile Satellite Service
MMS	Maritime Mobile Service
NZTM2000	New Zealand Transverse Mercator 2000 Map
PIB	Public Information Brochure
PSRFMG	Public Safety Radio Frequency Management Group
Register	The Register of Radio Frequencies
The Regulations	The Radiocommunications Regulations (2001)
RSM	Radio Spectrum Management
SCADA	Supervisory Control And Data Acquisition
SRD	Short Range Device
TOPO50	New Zealand Topo50 Map

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1.5.1. Frequency bands (in frequency order)

MF	Medium Frequency (0.3 – 3 MHz)
HF	High Frequency (3 – 30 MHz)
VHF	Very High Frequency (30 – 300 MHz)
UHF	Ultra High Frequency (300 – 3,000 MHz)
SHF	Super High Frequency (3,000 – 30,000 MHz)
EHF	Extremely High Frequency (30,000 – 300,000 MHz)

1.6. Amendment history

Date of effect	Issue	Description of amendment	Authorised by
July 2011	1	- First Public Release	
July 2014	2	- Update to the transition date for 25 kHz analogue land mobile above 470 MHz. - Minor editorial and formatting changes.	
November 2014	3	- Update to reflect changes to land mobile simplex licence categories. This allows channels of different bandwidths to be added to the same licence.	
November 2015	4	- Update to reflect changes to Fixed service bands, following the 2015 consultation. - Removal of Coastguard's maritime repeater channels following the moratorium on new services preceding the changes to VHF Maritime services in October 2016. - Updated details around 25 kHz transition for analogue land mobile services below 470 MHz.	J Hicks
October 2018	5	- Update of satellite frequencies in operation in Protection of the Geostationary Orbit (GSO). - Update of Studio to Transmitter Link (STL) rules. - Editorial and formatting changes. - Update of abbreviation and terminology section.	S Wieser
March 2021	6	- Update to the satellite section to reflect the addition of S band space operations. - Update to the fixed service bands, with the addition of 2GHz fixed service coordination with space operations.	

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2. General

2.1. Purpose and scope

Radio licences are granted under the Regulations in frequency bands that are not subject to Management Rights. Such licences must comply with a range of policy and technical requirements.

This document prescribes the policy rules that an application for a Radio Licence must comply with before it will be granted by the Chief Executive and entered into the Register of Radio Frequencies (the Register). These rules, which also apply to amendments to radio licences, complement the technical rules prescribed in the Radio Licensing Certification Rules (PIB 38) publication.

Radio Licensing Certification Rules (PIB 38)

These rules:

1. Include discussion of regulatory matters, but do not purport to provide legal advice on the Radiocommunications Act 1989 (the Act) or the Radiocommunications Regulations 2001 (the Regulations). Readers should take independent legal advice on interpretation of legislation.
2. Must be read in conjunction with PIB 38, and other Public Information Brochures (PIBs) and information[2] published on the RSM website www.rsm.govt.nz.
3. Don't include all the knowledge and expertise that applicants or approved persons (AREs and ARC's) need to have for the preparation of licence applications. They are intended to provide key principles and information to assist the correct completion of applications.

2.2. Procedure

Before a licence will be granted:

- The application must meet the requirements of these rules and be certified by an Approved Person in accordance with PIB 38.
- The annual fees must be paid for the balance of the current year.

2.3. Equipment Standards

Transmitters operating pursuant to radio licences must comply with technical standards where these are prescribed in notices made under regulation 32 of the Radiocommunications Regulations 2001. The current radio standards notice may be found on the RSM website or the New Zealand Gazette website.

2.4. Fees

Annual fees (GST inclusive) for radio licences are prescribed in Schedule 6 of the Regulations.

Each client (or licensee) has an anniversary date at the end of the month when their annual licence fees are invoiced.

[2] Should there appear to be a conflict between these rules and other PIBs or RSM publications, please email rsmlicensing@mbie.govt.nz.

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2.4.1. Fees for Fixed Term Licences

The fees for fixed term (or short term) radio licences are set in proportion to the number of months of the licence period, rounded up to whole months (e.g. for the period from February 25 to March 24 is one month, whereas to March 25 would be two months, i.e. two-twelfths of the annual fee).

All fees for fixed term licences must be paid prior to the commencement of transmission.

2.5. Licensing Multi-Carrier Systems

Licences are generally required on a per transmitter basis where:

- the spectrum is not channelled to a specific plan; or
- the usage is not aligned to the approved plan for the band

Systems using orthogonal frequency-division multiplex modulation (OFDM), such as digital terrestrial television (DVB-T), 4G LTE, WiMAX or 5G NR, are each considered to be a single system, and require only one licence per transmitter.

2.6. Dispensations

These rules must be followed by licensees and Approved Persons, however on occasion due to special circumstances dispensation for minor variation from the rules may be considered by RSM. Requests for dispensations must be justified in writing to the Manager RSM Licensing. In turn, the Approved Person must upload the dispensation document received from RSM to the licence 'Event Summary' in the Register.

2.7. Geographic Coordinates

The mapping system used by the RSM is New Zealand Topo50 (NZTopo50) and New Zealand Transverse Mercator 2000 (NZTM2000). NZTopo50 and NZTM2000 are the primary geographic coordinate system used to describe site locations within the Register. They use geodetic datum NZDG2000 that is based on the international standard reference WGS84 used by systems such as GPS.

When providing RSM with the details of new sites to be added to the Register, the geographic coordinate data must be given in either TOPO50 or NZTM2000 format as illustrated in Table 1 below.

Table 1 – Example of geographic coordinate data to be provided when requesting a new location in the Register

Site name: WINDY POINT				
Georeference	**Map**	**Easting**	**Northing**	**Height**
TOPO50	BZ12	952.88	827.18	543 m
NZTM2000		1295288 mE	5082718 mN	543 m
LAT/LONG (NZGD2000/WGS84)		169.1772278	-44.3448088	543 m

Latitude and longitude coordinates must not be provided in degrees, minutes and seconds.

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Although site geographic data is only accepted in TOPO50 or NZTM2000 coordinates, the Register will internally convert this location data to other formats for output. Table 2 illustrates the output formats available from the Register.

Table 2 – Example of geographic coordinate output data available in the Register

Georeference	Map	Easting	Northing	Height
TOPO50	BZ12	952.88	827.18	543 m
NZTM2000		1295288 mE	5082718 mN	543 m
LAT/LONG (NZGD2000/WGS84)		169.1772278	-44.3448088	543 m
NZMS260	F39	052.87	444.02	543 m
NZMG (LONG REF)		2205288 mE	5644402 mN	543 m
LAT/LONG (NZGD1949)		169.1771489	-44.3464625	543 m

Note in the above example, two LAT/LONG references show different values. This is because NZGD2000/WGS84 and NZGD1949 use different datum. LAT/LONG is not acceptable as an input format to avoid uncertainty as to the datum used.

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3. Common Rules for all Services

3.1. Fixed Term licences

3.1.1. Conventional Fixed Term Licences

Applications that conform to current band plans and the relevant rules in this document and PIB 38, may apply for a fixed-term radio licence where there is an expiry date. Some categories of licences may require an expiry date such as crane control and bush winch simplex (see section 4.13.6 Crane Control and Bush Winch Simplex).

Radio Licensing Certification Rules (PIB 38)

3.1.2. Non-Conventional Fixed Term Licences

Applications that do not conform to current band plans or the relevant rules are generally not permitted or granted. However on occasion, RSM may consider a dispensation for a fixed term licence for a non-renewable period of up to one year in accordance with section 2.6. Dispensations are considered for licences facilitating:

- special events; and,
- tests and demonstrations.

RSM will decide any appropriate conditions of the licence. Approved Person creating the licence must upload the consent received from RSM; to the event summary of the licence in the Register.

3.2. Use or Lose

'Use or lose' applies in accordance with Regulation 15C.

3.3. International Co-ordination

Some services in some frequency bands, notably those below 30 MHz and those used by satellite services must be coordinated by RSM in accordance with New Zealand's international treaty obligations.

This requirement may delay the processing of licence applications.

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3.4. Licence Agencies

Prior to granting licences in certain frequency bands, RSM may seek advice and make recommendations from a range of organisations with either specific statutory responsibilities, or particular knowledge and expertise. These are known as Licensing Agencies (LA). The most common LA's are:

CAA	Civil Aviation Authority
MNZ	Maritime New Zealand
NZART	New Zealand Association of Radio Transmitters
PSRFMG	Public Safety Radio Frequency Management Group
NZDF	New Zealand Defence Force
RSM	Radio Spectrum Management

3.4.1. Licence Agency Recommendation

When a licence application relates to a band subject to the LA procedure, the Register automatically sends the application to the relevant LA for approval, prior to the application being referred to an Approved Person for certification.

The LA recommendations are normally accepted, although RSM ultimately exercises the authority to grant or reject any radio licence application.

Table 3 summarises LA and certification roles.

Table 3 – Licensing agency approval and who can certify

Service	System		Licensing Agency approval required?	Who can certify
Aeronautical	Beacon	Marker	CAA	ALL
		VOR	CAA	ALL
	Land	< 30 MHz	CAA	ALL
		≥ 30MHz	CAA	ALL
	Mobile	< 30 MHz	CAA	ALL
		≥ 30 MHz	CAA	ALL
	Radionavigation	ILS	CAA	ALL
		Radar	CAA	ALL
Amateur	Beacon		NZART	ALL
	Fixed		NZART	ALL
	Repeater		NZART	ALL
Defence	225-328.6 MHz & 335.4-399.9 MHz		NZDF	NZDF
Fixed	Point to point	< 30 MHz	RSM	ALL
		≥ 30 MHz		ALL
	Point to multipoint			ALL

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Service	System		Licensing Agency approval required?	Who can certify
	TVOB			ALL
Land mobile	Repeater	< 30 MHz	RSM	ALL
		≥ 30 MHz		ALL
		ES bands	PSFRMG	ALL
	Simplex	< 30 MHz	RSM	ALL
		≥ 30 MHz		ALL
		ES bands	PSFRMG	ALL
	Paging			ALL
	Citizen band / PRS repeaters			ALL
Maritime	Beacon		MNZ	ALL
	Coast	< 30 MHz	MNZ	ALL
		≥ 30 MHz	MNZ	ALL
	Mobile		MNZ	ALL
	Radionavigation		MNZ	ALL
	Repeater		MNZ	ALL
Meteorological Aid	Radar			ALL
Radiodetermination	Radiolocation			ALL
	Radionavigation			ALL
Satellite	Fixed		RSM	ALL
	Receive Protection		RSM	ALL
	VSAT/SNG		RSM	ALL
	Mobile		RSM	ALL

Please note, in the column 'Who can certify'; 'All' refers to all Approved Persons.

3.5. Authorising Others to Use a Licence

Licensees may authorise other persons to operate pursuant to their licence in accordance with an agreement made under regulation 13. A copy of such agreements should be uploaded to the licence Events Summary in the Register.

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3.6. Cross-Band Linking

Cross-band linking generally refers to the practice of transmitting on a frequency in one service, while receiving on a different frequency in another service – rather than in accordance with the channel pairs as defined in Mobile Service Band in New Zealand (PIB 23)

- Cross band linking cannot be licensed and protected.
- Cross band linking is not permitted between the following services:
    - Land Mobile and Aeronautical; and
    - Land Mobile and Maritime.

Mobile Service Band in New Zealand (PIB 23)

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4. Land Mobile Service

4.1. Land Mobile Radio

The VHF and UHF bands available to Land Mobile Radio (LMR) services are defined in the publication Mobile Service Bands in New Zealand (PIB 23). Licence applications must comply with the channel use restrictions outlined in PIB 23.

Analogue Land Mobile Radio (ALMR) is permitted in all bands. Digital Land Mobile Radio (DLMR) is permitted in all commercial bands.

In the F and TS bands, no new ALMR 25 kHz licences will be issued.

The band plans and channelling for land mobile services can be found in Mobile Service Bands in New Zealand (PIB 23)

4.2. Restricted Channels

PIB 23 restricts certain simplex and duplex channels for use solely by individual organisations or solely for specific uses.

Where the assignment is to a government organisation, the assignment is exclusive to that department or service, and that channel must not be assigned to other organisations. For example, if a channel is listed in PIB 23 as a Government Exclusive, then it is exclusive and must not be assigned to another licensee.

4.3. All New Zealand Exclusive Simplex Licences

Other than simplex channels in Emergency Service (ES) bands 'All New Zealand' exclusive simplex licences will only be considered for government agencies on a case-by-case basis where there is a special need for an exclusive licence.

If allowed, an empty channel in a simplex band must be available. That channel will then become restricted and be listed in PIB 23.

4.4. Multiple Site Licences

Multiple site licences are a particular licence category labelled 'Land mobile radio licence fee (up to 5 repeaters or pagers) or 'Land mobile radio licence fee (unlimited repeaters or pagers)''. This licence category allows a licensee to have a single channel pair and have multiple repeater locations recorded on the licence.

Each multiple-site licence must have recorded on the licence all locations where the channel is to be used. A transmitter can only be used at locations recorded on the licence.

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4.5. Allocation Rules for Digital Land Mobile Radio (DLMR)

This section outlines the arrangements for the introduction of DLMR and the phase out of 25 kHz voice ALMR.

DLMR can be licensed as indicated in Table 4:

Table 4 – Frequency bands for Land Mobile services

Band	Frequency Range	Channel spacing	Typical Use	Modulation
ESA	75.2 - 80 MHz	12.5 kHz	Emergency Services	Analogue
A	80 - 87.5 MHz	12.5 kHz	Commercial	Analogue and Digital
ESB	138 - 144 MHz	12.5 kHz	Emergency Services	Analogue and Digital
E	150.05 - 156 MHz	12.5 kHz	Commercial	Analogue and Digital
EE	162.58125 - 173 MHz	12.5, 6.25 kHz	Commercial	Analogue and Digital
TD	406.1 - 420.00625 MHz	12.5, 6.25 kHz	Commercial Trunked Radio only	Analogue and Digital
C	449.75 - 458.3375 MHz	12.5, 6.25 kHz	Commercial	Analogue and Digital
D	458.3375 - 470 MHz	12.5, 6.25 kHz	Commercial	Analogue and Digital
F	471.5 - 494 MHz	12.5, 6.25 kHz	Commercial	Analogue and Digital
ESC	494 - 502 MHz	12.5, 6.25 kHz	Emergency Services	Analogue and Digital
TS	813 - 869.025 MHz	25[3], 12.5, 6.25 kHz	Commercial Trunked Radio only	Analogue and Digital

4.6. LMR Bands with Interlaced Band Plans

ALMR licences with channel bandwidths of 25 kHz are no longer granted.

All 25 kHz ALMR services below 470 MHz ceased operation by the end of 2015. No new 25 kHz ALMR licences will be issued in the bands above 470 MHz.

All LMR bands may be licensed for digital services designed to operate in 12.5 kHz and 6.25 kHz channels without the need for band migrations or special engineering considerations, provided the selected technology standards are compatible with existing analogue equipment.

When converting services from 12.5 kHz assignment to two 6.25 kHz channelling, a separate licence is required for each 6.25 kHz transmission. A Time Division Multiple Access (TDMA) transmitter carrying more than one circuit in a 12.5 kHz channel is deemed to be one transmission, and therefore requires only one licence.

Figure 1 illustrates the arrangements for the subdivision of channels in the LMR bands to provide for narrower channelling.

[3] Only digital modulation permitted for 25 kHz channels

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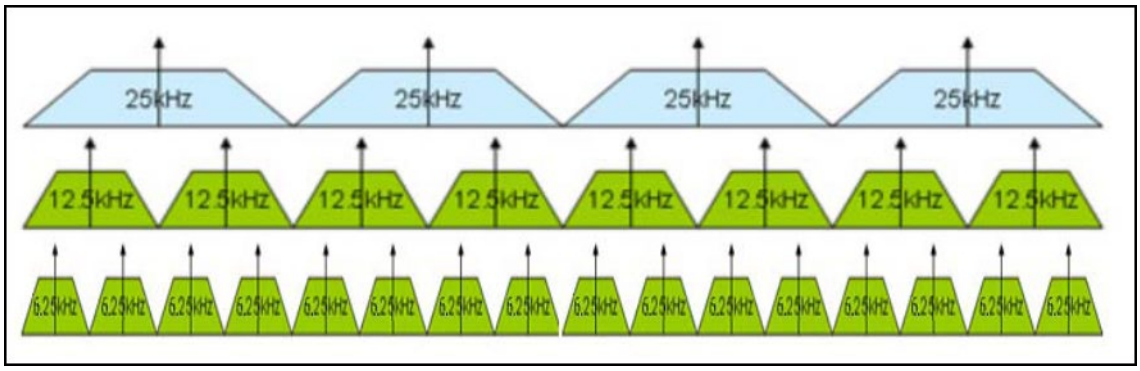

Figure 1 – Interlaced bands

4.7. Coded squelch systems, access codes and unique addressing

New licences for simplex LMR must use either a coded squelch such as Continuous Tone Coded Squelch System (CTCSS) in accordance with PIB 23, access code, or unique digital addressing. The Approved Person must include the licence conditions on the licence in accordance with PIB 38.

Mobile Service Bands in New Zealand (PIB 23)

Radio Licence Certification Rules (PIB 38)

4.8. SCADA and Data Links in LMR Bands

In the interests of spectrum efficiency, Supervisory Control And Data Acquisition (SCADA) and data links should use DLMR technology.

SCADA and data links may be licensed in 12.5 kHz LMR channels.

Applications for a dispensation to use 25 kHz channels for SCADA and data links must be made in accordance with section 2.6 Dispensations. Factors taken into consideration include extension of existing SCADA systems with significant investment; and necessary data rates.

4.9. Mesh Networks

Licences for Fixed Service Mesh Networks are generally not granted in LMR bands. This is because of the risk of the mesh receivers suffering interference (including receiver overload or blocking) in the wrong receive duplex portion of the band, or mesh transmitters creating spectrum denial to conventional LMR services. This is an inappropriate use of paired-frequency channelled LMR bands.

Mesh networks can be licensed in Fixed Service bands, or operate under General User Radio Licences.

4.10. Emergency Services Bands

4.10.1. Bands Exclusive to Emergency Services

Certain bands have been allocated to ES use in New Zealand. These are known as the ESA Band (75 – 80 MHz), ESB Band (138 – 144 MHz) and ESC Band (494 – 502 MHz).

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These bands are allocated for the sole use of the members of the Public Safety Radio Frequency Management Group (PSRFMG).

4.10.2. Composition of the PSRFMG Group

The group currently has representation from:

Ambulance New Zealand
Department of Conservation
Ministry of Civil Defence and Emergency Management
Ministry of Business, Innovation and Employment (Advisor Status)
New Zealand Customs Service
New Zealand Defence Force
Fire Emergency New Zealand
New Zealand Police

4.10.3. Licences in the Emergency Services Bands

For the purpose of licence applications in the ES bands, the PSRFMG is an LA in accordance with section 3.4. Generally it is not PSRFMG policy to agree to licences being granted to non-members.

However a person who is not a PSRFMG member may operate on ES channels subject to an agreement made under section 3.5 Authorising Others to Use a Licence with the relevant channel licensees.

It should be noted that PSRFMG policy presently requires all mobiles operating in the ESB Band to be fitted with PSRFMG liaison channels ES164 and ESX39.

4.10.4. Licence Conditions for Emergency Services

Approved persons are required to use the following conditions on all licences applications for frequencies in the ES Band:

"*The licence permits radiocommunication solely for non-commercial public safety and security operations relating to the protection of life and property*."

Licences where the licensee is the Ministry of Civil Defence and Emergency Management must also carry the following additional condition:

"*Primary use is for Civil Defence and Emergency Management purposes.*"

4.11. Back-to-Back Linking

Back-to-back linking, in regard to an LMR channel, describes the situation where a fixed location receiver tuned to the mobile receive frequency of one channel, is directly connected to a transmitter at the same location tuned to the mobile transmit frequency of another channel. Such configuration will not be licensed or protected because to do so would cause unreasonable spectrum denial on a radio site. Fixed links, or other wired services, must be used to connect repeaters to form wide-area networks.

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4.12. Land Mobile Repeaters

LMR repeaters are fixed location installations that consist of a transmitter on one frequency of a two-frequency channel pair (known as the base transmit), and a receiver on the other frequency (known as the mobile transmit). Most repeaters are located at elevated locations to relay communications over a wide area between mobile transceivers (vehicles or portables) operating on the reverse frequencies of the repeater channel configuration. Mobile transceivers can also be connected to a mains power supply at a fixed location.

Land mobile repeaters are used in applications such as analogue voice communications, digital voice communications (in certain bands), data communications such as SCADA systems and other control systems.

4.12.1. Repeater Channels

PIB 23 lists the bands and channels available for repeater licences. The base transmit frequency is the same as the mobile receive frequency, and the mobile transmit frequency is the same as the base receive frequency. The table below shows a typical example:

Base Transmit (TX)		Mobile Transmit (TX)	
Channel	Frequency	Channel	Frequency
A20	81.25 MHz	A20#	85.21875

The mobile transmit frequency is identified by the # symbol.

4.12.2. Duplex Direction

All LMR repeater installations must observe the correct transmit and receive configurations. Other configurations are neither permitted nor protected. In particular, no protection is given to receivers in the mobile transmit portion of the duplex band that are not at the repeater base station location stated on the licence.

4.12.3. Mobile Operating Area

Mobiles are not licensed to operate outside the -95 dBm coverage contour of the licensed base station, because of the potential for interference to other licensed services in the band.

4.12.4. Linear Repeaters

Under some circumstances linear repeaters may be licensed to provide coverage to relatively small areas within primary coverage service areas. Examples include where existing receive signal levels may be compromised by surrounding environmental factors, such as RF “shadowing” due to tall buildings physically blocking the base station’s direct line of sight radio signal path.

From a spectrum management perspective, linear repeaters exhibit several potentially undesirable characteristics. They are liable to transmit other signals in addition to the intended signals being repeated. Linear repeaters may also suffer system overload from exposure to other signals in the neighbouring spectrum, and may generate unwanted intermodulation products. Linear repeaters also have the potential to become unstable if operated with an excessively high system gain and if the output to input coupling factor changes with time.

Given the constraints on system gain, linear repeaters operate with characteristically low margins. This necessitates significantly more stringent interference protection levels than other systems. Linear

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repeaters must only be used to provide “in-fill” coverage and not to extend the primary coverage area of the land mobile service.

To avoid these problems linear repeaters to provide in-fill coverage must be located, engineered, and operated with caution.

4.13. Simplex

LMR Simplex refers to single frequency simplex (i.e. one way at a time) communication. It is usually bi-directional but may be unidirectional. At least one transceiver must be mobile, that is, not permanently operated at a fixed location (such as an office).

‘VHF and UHF Mobile service bands in New Zealand’ listed in (PIB 23) details the bands allocated for Land Mobile simplex use.

Simplex frequencies must not be used to provide ‘point-to-point’ / ‘point-to-multipoint’ Fixed Services or be located at fixed locations such as hilltops or where other radio services’ (such as land mobile repeaters) operate.

A number of simplex channels in PIB 23 are restricted, meaning that these channels have been reserved for particular purposes and are not available other than for the specified purposes.

Mobile Service Bands in New Zealand (PIB 23)

4.13.1. Multiple Simplex Channels with Different Emission Designations

Simplex services with different channel widths, and hence different emission designations, may be added to a single licence. For example, a 6.25 kHz channel can be on the same licence as a 12.5 kHz channel.

4.13.2. Multiple Simplex Channels with the Same Emission Designations

Where an application uses simplex channels in a number of separate simplex bands, these may be amalgamated on one licence. Such VHF and UHF simplex bands include AX, ENX, EEX, CNX, DNX and FNX.

The maximum number of simplex channels permitted on a land mobile simplex licence is 50 channels.

4.13.3. Categories of simplex channels

There are three categories of simplex channels:

1. Shared Simplex
2. Exclusive Simplex
3. Crane Control and Bush Winch Simplex

4.13.4. Shared Simplex

Simplex channels that are designated ‘General’ in PIB 23 are shared simplex channels. These are the most common type of simplex, where channels are shared among multiple users with no interference protection from those other users sharing the channel.

Users of shared simplex can expect to experience some level of degradation at times from other users in the same area.

All shared simplex channels are to be licensed and used for voice transmissions. A limited amount of data is permitted in bursts of no more than three seconds duration, and no more frequently than five times per hour. For continuous data there are shared channels designated solely for data in PIB 23.

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A shared simplex licence may cover multiple channels at multiple locations using an unlimited number of mobile terminals (sets or transceivers). A shared simplex licence should only cover what is required by the licensee where the number of channels and areas / locations of operation and should not exceed reasonable needs. For example if the licensee will only require three channels in Auckland then the licence should not have more channels covering All New Zealand. Where the number of channels appears excessive, justification may be sought.

4.13.5. Exclusive Simplex

Exclusive simplex channels are only available for Emergency Services administered by the PSRFMG and other government agencies. Examples are; Police, Fire, Ambulance, Defence, Customs, and the Ministry of Civil Defence and Emergency Management. The decision to allocate an exclusive simplex channel in a commercial (non ES) bands to Emergency Services will be on a case-by-case basis.

There are historic exclusive simplex assignments for organisations other than government agencies; however, these exclusive licences are no longer granted.

Exclusive simplex channels are only licensed on a single channel per licence basis.

4.13.6. Crane Control and Bush Winch Simplex

Channels and bands for Crane Control and Bush Winch services are designated in 'VHF and UHF Mobile service bands in New Zealand' listed in (PIB 23) and in the Register as restricted channels. Crane Control and Bush Winch licences have particular safety implications and need special care in selection and use.

Crane Control channels are reserved for cranes temporarily operating at discrete fixed locations - typically at construction sites.

Bush Winch channels are reserved for log hauling winches operating at discrete locations, or in defined forest areas.

All Crane Control and Bush Winch licences must be issued as Fixed Term licences with a specific location ('point' location for crane control. Bush Winch is either 'point' locations or a 'multiple points' location describing the forest area) and a specific expiry date. PIB 38 provides further details.

In the interests of safety, it is extremely important that Crane Control and Bush Winch licence records are accurate.

The Approved Person should communicate these obligations to the licensee, together with instructions that they must re-apply if the location of the crane or winching operation is to be changed.

Radio Licence Certification Rules (PIB 38)

4.14. Trunked Mobile Radio

4.14.1. Spectrum Efficiency

Trunked radio is a spectrally efficient land mobile system where a few channels can serve a large number of users. Trunked systems are controlled by central computing system that can dynamically allocate users a voice circuit when required.

The TD and TS bands are allocated solely to Trunked Mobile Radio.

To realise the spectrum efficiency in these bands, licences for a Trunked Mobile Radio system must, at each repeater location, have a minimum of:

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- three analogue voice channels; or
- digital voice circuits equivalent to three analogue voice channels.

Two simplex bands are restricted for use associated with Trunked Mobile Radio bands:

- Licensing in the TDX Band is restricted to licence holders of a Trunked Mobile Radio system licensed in the TD Band.
- Licences in the TX Band are only available for an operator of a Trunked Mobile Radio system licensed in the TS Band or to users of that system.

4.14.2. Use of Frequency Assignment Block Plan

Trunk mobile channels shall be assigned according to the block plan in PIB 23, unless there is a scarcity of channels. For the purposes of licensing, a scarcity of channels will be deemed to exist in an area when all blocks of channels have licences amounting to at least the minimum (three) number of circuits.

With the exception of areas where a scarcity of channels is deemed to exist under the above criteria, channels can generally be licensed in any area for any individual or organisation.

Every attempt should be made to assign new channels from blocks already used by a licensee in a given area.

Mobile Service Bands in New Zealand (PIB 23)

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5. Fixed Service

The Fixed Service (FS) is defined in the International Radio Regulations (IRR) as a "radiocommunication service between specified fixed points", and are commonly known as "fixed links". This covers a wide range of point-to-point and point-to-multipoint radiocommunication systems. The various bands and channels allocated to the Fixed Service are defined in Fixed Service Bands in New Zealand (PIB 22).

Fixed Service bands above 1 GHz in New Zealand conform closely to ITU-R Recommendations for channel plans and other technical parameters. These are identified in Radio Licence Certification Rules (PIB 38), Table 9, 'Fixed service frequency bands and antenna requirements' for Fixed Services. This table also specifies restrictions on usage of particular bands.

Links in the Fixed Service must be engineered to achieve efficient spectrum re-use. Consequently, licences for fixed links must contain detailed parameters of the system so that subsequent licences can be engineered to achieve this efficient re-use of spectrum.

Fixed service bands in New Zealand (PIB 22)

Radio Licence Certification Rules (PIB 38)

5.1. Common Rules

All ends of FS links must be at the fixed geographical locations stated on the licence.

One licence is required for each transmitter. For example, a bi-directional link requires two licences, one for each transmit end. Similarly, each frequency requires a separate licence. The use of both polarisations on a channel is covered by a single licence.

Bands cannot be split. Each bi-directional link must use the corresponding pair of channels (n and n#) from the channel plan for the band, as described in PIB 22.

The Fixed Service bands are mostly available only for point-to-point use. Point-to-multipoint use is only permitted as defined in PIB 38.

Certain Fixed Service bands are restricted solely to frequency diversity protected "n + 1 bearer" systems, as defined in PIB 38.

5.2. Studio to Transmitter Links

Some bands with wideband channels, typically >50 kHz, and bands in the 400 MHz and 800 – 900 MHz frequency bands are reserved for unidirectional Studio to Transmitter Links (STLs) carrying sound broadcast programming. PIB 22 details these bands and channels.

In all cases the following rules apply:

1. At least one terminal (end) of an STL licence must have either the transmitter located at the broadcasting studio or the receiver located at a sound broadcasting transmission site.
2. A sound broadcasting site is considered to be an STL 'receive site' for the purpose of section 2.3.3 Onsite Compatibility in PIB 38. STL transmitters shall not normally be located at sound broadcasting sites unless written agreements can be made with current site users or the site manager in accordance with PIB 38.

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3. An STL transmitter in the KL band (841 – 851 MHz) must not be located at an FM sound broadcasting transmitter site.
4. In a Defined Metropolitan Area (DMA)[4], STL links of more than one hop must be justified with the justification uploaded against the licence or application in the Register. A one hop STL is where the transmitter is located at the broadcasting studio and the receiver is located at the sound broadcasting transmission site, with no intermediate links.
5. No new dual Monophonic services shall be licenced. All dual Monophonic services which are in operation shall be allowed to continue. No dual Monophonic services shall be moved, repurposed or otherwise redeployed either at an existing location or a new location.

5.2.1. STL band: 400 MHz

The 400 MHz bands available for STL use have a limited number of channels and channel bandwidths. Hence, the bands 800 / 900 MHz are preferred for STLs.

The 400 MHz STL bands listed in PIB 22 are restricted for use for fixed links serving:

- AM broadcast sites; or
- Mono FM broadcast sites, and must only be used over difficult or obstructed paths.

Furthermore new services in the I STL band are restricted to a minimum path length of 5 km.

5.2.2. STL bands: 841 - 851 MHz, 915 – 921 MHz and 928 - 935 MHz

The channel plans can be found in PIB 22

The 841 – 845 MHz portion of the band has specific licence certification rules as outlined in PIB 38 because of its close proximity to adjacent cellular services.

The 915 – 921 MHz band previously used for STLs is now fully opened to Short Range Devices (SRDs). Consequently no new STL licences will be granted in this band and existing STL licensees no longer have protection from interference.

Licensees in the 915 – 921 MHz band will therefore need to assess if their STL is in a location that is likely to be at risk of interference from SRDs. If so, they may wish to either obtain a licence in a different STL band, or use a different technology to distribute their programme from the studio to the broadcast transmitter (e.g. leased lines, digital microwave radio, satellite linking).

Amendments to existing STL licences may be made but must be approved by RSM on a case-by-case basis. An example of an acceptable amendment is when a studio is being relocated to another building.

The 928 – 929 MHz band is now open for licencing in additional to the previously available 929 – 935 MHz band.

Fixed service bands in New Zealand (PIB 22)

Radio Licence Certification Rules (PIB 38)

[4] DMAs are defined in PIB 38, Appendix B, table 21

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5.3. Telemetry and Telecommand

Telemetry and Telecommand are a group of channels and frequency bands listed in PIB 23 and are denoted with the channel label TT. Telemetry and Telecommand channels are shared. Users of Telemetry and Telecommand may expect some level of degradation of service. The use of coded squelch or unique digital addressing is recommended.

Telemetry and Telecommand frequencies are only available for specific locations; however, usage within the premises and grounds of such locations for example a factory or industrial facility is permitted.

Telemetry and Telecommand frequencies are not available for “Area Locations”.

5.4. EE Band

Plans for 12.5 kHz and 25 kHz channels in the Fixed Service portion of EE band are specified in PIB 22. The EE band plan includes two blocks of paired channels within the range of 162.2 - 170.31 MHz. There are only a small number of channels available for Fixed Services in this frequency range, so this band is reserved for applications involving high data rate digital services over relatively obstructed paths. High gain antennas should be used to help maximize re-use of the channels.

Licences may only be assigned with 25 kHz channels for high efficiency digital services using at least a 16-state modulation scheme, such as 16 QAM or equivalent. Single-channel voice or single-low-rate digital transmissions must be assigned 12.5 kHz EE band channels.

5.5. LL Band

The LL band (1427.0 - 1429.5 and 1522.0 - 1525.0 MHz) is only available for high efficiency digital point-to-point links. Only point-to-point operations are permitted in this band.

As there are only a small number of channels available, especially when 250 kHz channels are used, all possible steps must be taken to ensure maximum reusability of the channels.

To achieve maximum efficiency of spectrum use, operation in the band is restricted to high efficiency digital links using at least 16-state modulation methods such as 16-QAM. Minimum antenna performance constraints apply in order to mitigate potential interference, as identified in Table 9 of PIB 38.

5.6. 5 GHz Band

The 5 GHz Band (4.4 - 5.0 GHz) is designed to be used for high capacity medium to long haul radio relay systems.

This band is only available for n+1 frequency diversity protected systems carrying high capacity data at, or equivalent to, Synchronous Transport Module Level 1 (STM1) rates per bearer.

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5.7. 18 GHz Band

5.7.1. Co-primary allocations

Because the 18 GHz Fixed Service band (17.7 - 19.7 GHz), is partly shared with satellite services the following rules must be observed.

(1) **Channels available to the Fixed Service in the 18 GHz band**

Channels defined in Table 5 as '(1) Channels available for the Fixed Service' have no restrictions as these channels avoid the satellite band: 18.8 - 19.3 GHz.

(2) **Restricted channels in the 18 GHz band**

Where an Approved Person's analysis has shown that a Fixed Service licence cannot be accommodated in channels in column (1) of the following table, the restricted channels in the 19.05 - 19.3 GHz spectrum may be used. These restricted channels are shown in Table 5 as '(2) Channels restricted for the Fixed Service.'

(3) **Channels unavailable to the Fixed Service in the 18 GHz band**

There will be no further licences to the Fixed Service in the 18.8 - 19.05 GHz spectrum. These channels are shown in Table 5 as '(3) Channels unavailable to the Fixed Service.'

Table 5 – Channel availability in the 18 GHz band

Channel size (MHz)	(1) Channels available for the Fixed Service	(2) Channels restricted for the Fixed Service	(3) Channels unavailable to the Fixed Service
110	18G6A - 18G8A & 18G6A# - 18G8A#	18G4A - 18G5A & 18G4A# - 18G5A#	18G1A - 18G3A & 18G1A# - 18G3A#
55	18G6B2 - 18G8B2 & 18G6B2# - 18G8B2#	18G4B1 - 18G6B1 & 18G4B1# - 18G6B1#	18G1B1 - 18G3B2 & 18G1B1# - 18G3B2#
27.5	18G6C2 - 18G8C4 & 18G6C2# - 18G8C4#	18G4C1 - 18G6C1 & 18G4C1# - 18G6C1#	18G1C1 - 18G3C4 & 18G1C1# - 18G3C4#
7	18G6D4 - 18G6D12 & 18G6D4# - 18G6D12#	nil	nil
3.5	18G6E1 – 18G6E7 & 18G6E1# – 18G6E7#	nil	nil

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5.8. Protection of the Geostationary Orbit (GSO)

The Table of Radio Spectrum Usage in New Zealand' (PIB 21) identifies bands allocated by the ITU-R to both the Fixed Service (FS) and other services on a co-primary basis. These other services include satellite services, such as the Fixed Satellite Service (FSS), the Broadcast Satellite Service (BSS) and the Mobile Satellite Service (MSS). PIB 21 also identifies the services with primary allocations specifically applying in New Zealand. Where the bands with FS allocations in New Zealand coincide with international FSS (Earth-to-space), BSS feeder link or MSS (Earth-to-space) uplink allocations, fixed links in New Zealand must not cause interference to the satellite uplinks.

PIB 38 sets out the restrictions and methodology for Approved Persons analysing the potential interference to the satellite services. Generally, the EIRP limits on fixed service applicable for various separation angles and frequency ranges are set out in Article 21 of the IRR. It is noted that the applicability of Table 21-2 of Article 21 is limited to those frequency ranges where the corresponding satellite services are consistent with the New Zealand allocation as contained in PIB 21.

Table of Radio Spectrum Usage in New Zealand (PIB 21)

Radio Licence Certification Rules (PIB 38)

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6. Satellite Services

In relation to space radiocommunication services, the following terms shall have the meanings as defined in the IRR and relevant ITU-R Recommendations:

- Amateur-satellite service (AmSS)
- Broadcasting-satellite service (BSS)
- Earth exploration-satellite service (EESS)
- Fixed-satellite service (FSS)
- Inter-satellite service (ISS)
- Meteorological-satellite service (MetSS)
- Mobile-satellite service (MSS), including aeronautical/maritime mobile-satellite services (AMSS / MMSS)
- Radio astronomy service (RAS)
- Radiodetermination-satellite service (RDSS)
- Radiolocation-satellite service (RLSS)
- Radionavigation-satellite service (RNSS), including aeronautical/maritime radionavigation-satellite services (ARNS / MRNS)
- Space operation service (SOS)
- Space research service (SRS)
- Standard frequency and time signal-satellite service (SFTSS)

This section addresses the licensing of satellite services within frequency ranges that are allocated in New Zealand to respective services as contained in PIB 21.The section should be read in conjunction with RSM PIB 60 Operational Satellite Policy.

6.1. Shared Bands

Where the Table of Radio Spectrum Usage in New Zealand (PIB 21) indicates that a satellite service has a co-primary allocation with other services in New Zealand; the satellite service must be co-ordinated with those terrestrial services.

Table of Radio Spectrum Usage in New Zealand (PIB 21)

6.2. How Satellite Services are Licensed

6.2.1. Satellite Downlink Notification with ITU-R

Because the satellites themselves are outside the New Zealand territory, satellite emissions are not licensed; however, the space sector portion of satellite services must still be registered with the ITU-R. RSM manages this process on behalf of the applicant.

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6.2.2. Licences for the Terrestrial Portion of the Satellite Service

Except as provided for under the following General User Radio Licences (GURL's), all earth stations transmitting uplink signals (Earth-to-space direction) to any associated satellites must be individually licensed:

- General User Radio Licence for Satellite Services – permits specific frequency ranges for satellite uplink transmission from portable/transportable earth stations, earth stations on-board land vehicles, Very Small Aperture Terminals (VSAT) and handheld mobile-satellite terminals;
- General User Radio Licence for Aeronautical Purposes – permits specific frequency ranges for satellite uplink transmission from earth stations on-board aircraft;
- General User Radio Licence for Maritime Purposes – permits specific frequency ranges for satellite uplink transmission from earth stations on-board vessels.

All satellite-related licences should contain the details of the corresponding satellite system, and its on-board space station, by including the name of the space station (and its orbital position if it is a geostationary satellite, for example 'NZLSAT-158E') that the earth station is communicating with. The licence should also record the associated ITU unique identifier[5] of the respective satellite filing notices (known as ITU Notice ID labelled as 'ITU Notice ID xxxxxxxxxxx') under the field 'Location Text'.

'Receive protection' licences may be appropriate in some circumstances to protect fixed ground station location of the satellite receivers.

6.2.3. Criteria for licensing terrestrial transmitters in Satellite Services bands

- Equipment which is approved by satellite service providers for use with their satellite systems is able to be licensed in New Zealand.
- The off-axis EIRP density shall comply with the most recent edition of ITU-R S.524, or the satellite operator's requirements, whichever is more stringent.
- The operation of the terrestrial component of a satellite service must comply with ITU-R recommendations.

Coordinating Satellite Services in the 18.8 – 19.3 GHz band

PIB 21 defines a primary allocation in New Zealand for the FSS space-to-Earth (FSS (s-E)) for the band 18.8 – 19.3 GHz.

The preferred portion of the Ka band for FSS downlink in New Zealand is 18.8 - 19.05 GHz, which supports bandwidths of 250 MHz.

If any satellite service provider requires access outside 18.8 - 19.05 GHz, then coordination will be required with Fixed Services operating in the band 19.05 - 19.3 GHz.

6.2.4. Fixed Service and Space Service Sharing

There are a number of frequency bands that are shared, by international allocation, on a co-primary basis between the Space Service and the Fixed Service (FS). Sharing analysis must be carefully undertaken to avoid interference.

Table 6 shows the principle shared bands.

[5] For satellite network already being brought into use, the corresponding ITU unique identifier of the respective satellite filing notices can be found in: http://www.itu.int/net/ITU-R/space/snl/listinuse/index.asp; whereas, for other satellite networks still within the regulatory timeframe subject to filing/coordination/notification process, they can be found in: http://www.itu.int/ITU-R/space/snl/

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Table 6 – Frequency bands used for Space Services

Satellite Band	Frequency range	Affected Fixed Service bands	Conditions
S	2 025-2 110 MHz	2 025-2 110 MHz	Coordination Requirement in PIB 38 Section 6.6.3
Standard C uplink	5 925 – 6 425 MHz	6 GHz band	C band available for FSS uplink but must be coordinated with FS
Ka downlink	17.7 - 19.7 GHz	18 GHz band	Ka band available for FSS downlink but must be coordinated with FS

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7. Aeronautical Service

The aeronautical service is a radio service relating to the operation of aeronautical communications. These Radio Licence Policy Rules, the IRR and The international Civil Aviation Organisation (ICAO) Annex 10 guide the operational policy rules for Aeronautical licences.

All applications for Aeronautical Service licences require LA approval recommendation from the Civil Aviation Authority (CAA).

Civil Aviation Authority requirements and current frequency use for Aeronautical Navigation and Route VHF/HF, and related CAA Aeronautical Information Publications can be found on their website www.aip.net.nz.

Aircraft and aeronautical mobile stations are covered by the General User Radio Licence for Aeronautical Purposes (GURL-AP). Aeronautical base and repeater station licences require appropriate licences.

Table 7 outlines aeronautical services that are available in New Zealand.

Table 7 – Aeronautical Services in New Zealand

Service		Purpose	Station	References
Aeronautical Mobile	Aeronautical Mobile (Route)	For communications relating to safety and regularity of flight, primarily along national or international civil air routes.	Aircraft	GURL-AP, Section 7.2
			Land portable handheld etc.	GURL-AP, Section 7.3
			Aeronautical Land (Route)	Section 7.3
			Aeronautical Repeaters	Section 7.5
	Aeronautical Mobile (Off Route)	For communications, including those relating to flight coordination, primarily outside national or international civil air routes.	Aircraft	GURL-AP, Section 7.2
			Land portable handheld etc.	GURL-AP, Section 7.4
			Aeronautical Mobile (Off Route)	Section 7.4
			Aeronautical Repeaters	Section 7.5
Radiodetermination	Aeronautical Radionavigation	A radionavigation service intended for the benefit and for the safe operation of aircraft.	Aircraft	GURL-AP
			Radio Beacons, NDB, ILS, VOR, DVOR, TACAN and VORTAC,	Section 7.6.2

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Service		Purpose	Station	References
			DME.	
	Radiolocation	A radio-determination service for the purpose of radiolocation.	Aircraft	GURL-AP
			RADAR, PSR SSR	Section 7.6.1

Channelling and designated use

The frequency bands and channels designated for aeronautical use are contained in, PIB 21, PIB 23, GURL-AP, IRR 2016 and ICAO Annex 10.

7.1. Operator Certificates and Callsigns

Refer to Radio Operator Certificate and Call Sign Rules (PIB 46), further information on the requirements is also available on the RSM website.

Radio Operator Certificate and Call Sign Rules (PIB 46)

7.2. Aircraft Licence

Aircraft do not normally require individual licensing as they are covered by the General User Radio Licence for Aeronautical Purposes (GURL-AP). However, should an Aircraft licence be required for presentation to overseas authorities, users may apply for an individual licence (fees apply).

Identification codes or a callsign in the ZK series, are obtainable from the CAA.

7.3. Aeronautical Route

Route frequencies are reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes. These frequencies are licensed to aeronautical base stations for control of airspace at international, domestic (served by scheduled airlines) and military airports.

7.4. Aeronautical Off Route

Off Route frequencies are for communication, including those relating to flight co-ordination, primarily outside national civil air routes. These frequencies are licensed to other aeronautical base stations, such as aero clubs, airline companies, and air strips.

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7.5. Aeronautical Repeater

Frequencies for aeronautical repeaters are listed in PIB 23.

7.6. Aeronautical Radiodetermination

Applications for an Aeronautical Radiodetermination system should be first discussed with RSM. Co-ordination with Civil Aviation Authority and Airways Corporation of New Zealand is likely to be necessary. All applications must be in accordance with ICAO annex 10.

7.6.1. Radiolocation

Aeronautical Radiolocation services that are operated in New Zealand are:

- Primary Surveillance Radar (PSR);
- Secondary Surveillance Radar (SSR);
- Automatic Dependent Surveillance-Broadcast (ADS-B); and
- Multilateration (MLAT).

7.6.2. Radionavigation

Aeronautical Radionavigation services that are operated in New Zealand are:

- Non Directional Beacon (NDB),
- Instrument Landing System (ILS),
- VHF Omnidirectional Range (VOR),
- Doppler VHF Omnidirectional Range (DVOR),
- Distance Measuring Equipment (DME)

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8. Maritime Mobile Service

The Maritime Mobile Service (MMS) is a radio service relating to ship-to-ship, ship-to-shore and shore-to-ship radiocommunications. Table 8 outlines specific details of Maritime services.

Specific frequencies for distress and safety communications are listed in IRR Appendix 15 'Frequencies for distress and Safety communications for the Global Maritime Distress and Safety System (GMDSS)'. Operation and use of these frequencies must be in strict accordance with the IRR.

Most MMS mobile stations (e.g. ships) are covered by a General User Radio Licence for Maritime Purposes (GURL-MP). Where a station (such as a fixed maritime repeater station) is not coved by the GURL, individual licensing is required. Table 9 outlines details of Maritime Coast station types.

Every MMS licence application requires a licensing agency recommendation from Maritime New Zealand.

Table 8 –Maritime services and description

Service	Description
maritime mobile service	A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations. Survival craft stations and emergency position-indicating radio beacon stations may also participate in this service
port operations service	A maritime mobile service in or near a port, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons
ship movement service	A safety service in the maritime mobile service other than a port operations service, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the movement of ships. Messages which are of a public correspondence nature shall be excluded from this service.
maritime mobile-satellite service	A mobile-satellite service in which mobile earth stations are located on board ships. Survival craft stations and emergency position indicating radio beacon stations may also participate in this service.
maritime radionavigation service	A radionavigation service intended for the benefit and for the safe operation of ships.

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Table 9 –Maritime stations and description

Stations	Description
Coast station	A land station in the maritime mobile service
Ship station	A mobile station in the maritime mobile service located on board a vessel which is not permanently moored, other than a survival craft station.
Ship earth station	A mobile earth station in the maritime mobile-satellite service located on board a ship
Coast earth station	An earth station in the fixed-satellite service or, in some cases, in the maritime mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the maritime mobile-satellite service.
Port station	A coast station in the port operations service
On-board communication station	A low-powered mobile station in the maritime mobile service intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions.

8.1. Operator Certificates and Callsigns

The Radio Operator Certificate and Call Sign Rules (PIB 46) provides further information.

Radio Operator Certificate and Call Sign Rules (PIB 46)

8.2. Coast Stations and Repeaters

Coast stations operating below 30 MHz, or that are remotely activated (for example, unmanned or hill top coast stations), and maritime VHF repeaters, require individual licensing. Other coast stations that are covered by the GURL-MP do not require individual licensing. The channels available for VHF Maritime coast stations and repeaters are found in PIB 23. The designated use of channels can be found in the GURL-MP.

8.3. High Frequency Maritime Stations

All licences for services below 30 MHz are processed by RSM as international co-ordination is required.

For general purpose simplex use, frequencies from Appendix 17 of the IRR are licensed. These are shared frequencies and exclusive use is not possible. A coast station will normally be licensed a calling channel and a working channel for each band required.

For the duplex radiotelephone service, the channel numbers and associated frequencies are contained in Appendices 17 and 25 of the IRR. Apart from the 4 MHz band, Appendix 25 shows New Zealand has only two channels in each band allotted. These channels are all allocated on a shared basis with a considerable number of overseas stations. Note that channel 425 in the 4 MHz band is currently reserved for possible future growth and therefore cannot be licensed at this time.

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Frequencies in the 8 MHz band are in demand as the propagation characteristics are favourable for long distance communications.

When a Private Coast Radio Station identifies requirements for two-frequency (duplex) operation, the following guidelines apply:

- The duplex radiotelephone channels in each band will be available for use by Private Coast Radio Stations on a non-interference, shared channel basis.
- Successful operation may require co-ordination, and possibly time-sharing. Under such conditions, the number of users may be limited, and therefore applications may be declined should the requirement for two frequency operation not be clear.
- Where interconnection with the PSTN is used, the ITU-T and ITU-R recommendations must be complied with.

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9. Radiodetermination Service

Radiodetermination means the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to those parameters, by means of radio waves.

When considering a licence application, RSM has regard to:

- Table of Radio Spectrum Usage in New Zealand (PIB 21);
- The International Radio Regulations;
- ITU-R recommendations; and
- Other international agreements, standards and recommendations.

The subset of Radiodetermination services are:

Radionavigation Service

A Radiodetermination service for the purpose of radio navigation (e.g. beacons used for navigation.

Radiolocation Service

A Radiodetermination service for the purpose of radiolocation (e.g. surveillance radar).

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10. Other Services

10.1. Radio paging

10.1.1. Local Area Paging

Local area paging is most suited to local areas such as buildings or building complexes. The frequencies are shared and require careful engineering to minimise co-channel interference. Channel and power restrictions for local area paging can be found in Mobile Service Bands of New Zealand (PIB 23).

Mobile service bands in New Zealand (PIB 23)

10.1.2. Wide Area Paging

Wide area paging is a paging system used to broadcast paging messages over a wide geographical area in the 157.6 MHz to 158.07 MHz band. There are restrictions on the use of the band as it is close in frequency to the international VHF Maritime Band.

In operating a licence the mean field strength of 77 dBµV/m at a reference height of 10 metres above sea level is not to be exceeded in the following areas:

1. Otago Harbour VHF Maritime Protection Area
2. Lyttelton Harbour VHF Maritime Protection Area
3. Greymouth VHF Maritime Protection Area
4. Picton VHF Maritime Protection Area
5. Nelson VHF Maritime Protection Area
6. Wellington Harbour VHF Maritime Protection Area
7. Auckland VHF Maritime Protection Area
8. Napier VHF Maritime Protection Area
9. Tauranga VHF Maritime Protection Area;

10.2. Radio Reporter

The Radio Reporter (RR) band and channelling are specified in' Mobile Service Bands of New Zealand' (PIB 23). RR is restricted to outside broadcasts or itinerant linking in conjunction with a sound broadcasting station or sound broadcasting network for the purpose of providing program content back to a studio. RR is used in applications such as sports commentary, mobile street reporters and reporters at events.

Radio reporter licences may only have:

- one frequency per licence; and
- one Regional Authority area per licence.

10.3. Television Outside Broadcast Service(TVOB)

The purpose of TVOB is to provide linking of programme material from source back to studio. It is intended for event specific, itinerant, operations that may occur for limited periods anywhere in New Zealand. It is not for permanent fixed linking purposes.

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TVOB is licensed in the 2G8 and 7GM bands as detailed in Fixed Service Bands of New Zealand (PIB 22). TVOB operates on a self-managed basis and users are required to co-ordinate with each other to minimise interference.

Licensing

Separate licences are required for 2G8 and 7GM Bands.

Applications for this service are made through the Register.

Tip: use 'search licences' search on channel using '2G8' or '7GM' (whichever is relevant), click on the licence, click on the licensee number, then click on addresses and contacts. The TVOB contact will be listed as technical and have the responsibility for TVOB coordination.

Terms for 2G8 and 7GM Bands

Applicants must supply a "technical" contact, and the number of radio sets to be licensed, at the time of application. Further sets may be licensed as required by notification to RSM.

Applications will be accepted for this service only where the use is clearly identified as links for temporary television outside broadcasting purposes.

The links must be of a transportable nature, and not conventional fixed links.

Licensees must:

- notify all other licensees in the band of dates, locations and channels to be used prior to use;
- ensure their contact details up to date in the Register; and
- only use the licence for the purpose of broadcasting specific short term events.

TVOB systems in the 7GM band must not cause interference to an existing fixed link between Glenorchy and Queenstown Hill via a passive reflector at Afton Burn. For details refer to the licences in the Register.

All Fixed Service operations in the 2G8 Band are subject to the provisions of §4.4 of the International Radio Regulations, and there is no protection from interference caused by legitimate transmissions originating from outside the jurisdiction of New Zealand. In this regard TVOB licensees need to be aware that the band is allocated to the Aeronautical Radionavigation service on a primary basis, and the Radiolocation service on a secondary basis. Interference to legitimate users of this band operating outside the jurisdiction of New Zealand will not be tolerated and any transmission causing interference will be required to cease operation.

10.4. Citizen Band Radio

Citizen Band Radio (CBR), also known as the Personal Radio Service (PRS), provides an economical alternative to LMR. Possible uses include sporting and community events, small businesses and hobby activities. No use, or user, has priority and this requires a responsible and cooperative approach by all persons sharing the service.

Most CBR use is covered by the General User Radio Licence for Citizen Band Radio (GURL-CB), but repeaters must be individually licensed.

General User Radio Licence for Citizen Band Radio (GURL-CB)

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10.4.1. PRS Repeaters

PRS repeater base stations are only permitted to operate on a channel specified for this purpose in Mobile Service Bands of New Zealand (PIB 23).

PRS repeaters are used to extend the communication range achievable by users of this service. Where a repeater station is established, communication through the repeater is available to all PRS users on an unrestricted basis, and without charge.

Repeater Rules

Repeaters will only be licensed under the following rules:

- a repeater station may only be accessed by radio apparatus covered by the General User Radio Licence and the Radiocommunications (Radio Standards) Notice;
- the purpose of the repeater is to re-transmit analogue voice telephony (speech);
- a licence for a 25 kHz channel must be geographically separated by a minimum distance of 20 kilometres from any other PRS repeater licence (whether the licence is using a 25 kHz or a 12.5 kHz channel);
- a licence for a 12.5 kHz channel must be geographically separated by a minimum of 5 kilometres from any other PRS repeater licence (whether the licence is using a 25 kHz or a 12.5 kHz channel);
- co-channelled licences must be geographically separated by a minimum of 100 kilometres (whether the licences are using 25 kHz or 12.5 kHz channels);
- frequencies are licensed on a shared basis and co-channel sharing must be tolerated;
- a remote control facility can be fitted to the repeater. However it must not be used to alter the technical operating parameters of the repeater other than to:
    1. Allow deactivation / reactivation of the repeater for maintenance purposes only; or
    2. Initiate the transmission of status information; or
    3. Indicate an alarm condition at the repeater site; and

PRS repeater stations cannot transmit information or voice from the Public Switched Telephone Network (PSTN), internet or any other telecommunications network.

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