



Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015

Radiocommunications Act 1992

made under section 262 of the
Radiocommunications Act 1992.

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About this compilation

This compilation

This is a compilation of *the Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015* that shows the text of the law as amended and in force on 29 October 2023 (the **compilation date**).

The notes at the end of this compilation (the **endnotes**) include information about amending laws and the amendment history of provisions of the compiled law.

Uncommenced amendments

The effect of uncommenced amendments is not shown in the text of the compiled law. Any uncommenced amendments affecting the law are accessible on the Register (www.legislation.gov.au). The details of amendments made up to, but not commenced at, the compilation date are underlined in the endnotes. For more information on any uncommenced amendments, see the Register for the compiled law.

Application, saving and transitional provisions for provisions and amendments

If the operation of a provision or amendment of the compiled law is affected by an application, saving or transitional provision that is not included in this compilation, details are included in the endnotes.

Modifications

If the compiled law is modified by another law, the compiled law operates as modified but the modification does not amend the text of the law. Accordingly, this compilation does not show the text of the compiled law as modified. For more information on any modifications, see the Register for the compiled law.

Self-repealing provisions

If a provision of the compiled law has been repealed in accordance with a provision of the law, details are included in the endnotes.

Part 1 Introduction

1.1 Name of Advisory Guidelines

These guidelines are the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015*.

1.4 Purpose of these guidelines

- (1) The purpose of these guidelines is to manage interference to apparatus licensed or class licensed radiocommunications receivers operating in and adjacent to the 3.4 GHz band.
- (2) These guidelines also provide guidance on managing interference across the geographical boundaries of spectrum licences issued in the 3.4 GHz band.
- (3) The ACMA takes these guidelines into account in determining whether a spectrum licensed radiocommunications transmitter is causing interference to an apparatus licensed or class licensed radiocommunications receiver operating in any of the circumstances set out in these guidelines.
- (4) These guidelines do not prevent a licensee negotiating other protection requirements with another licensee.

1.5 Interpretation

- (1) In these guidelines, unless the contrary intention appears:

3.4 GHz band means the part of the spectrum from 3400 MHz to 3800 MHz.

Act means the *Radiocommunications Act 1992*.

harmful interference has the same meaning as in the Spectrum Plan.

in-band means:

- (a) for a radiocommunications transmitter or radiocommunications receiver operated under a spectrum licence, the frequencies within the frequency band in which operation of those radiocommunications devices is authorised under the licence; and
- (b) for a radiocommunications transmitter or radiocommunications receiver operating under an apparatus licence, the frequencies within the lower frequency limit and the upper frequency limit specified in the licence.

ITU means the International Telecommunication Union.

ITU-R means the International Telecommunication Union Radiocommunication Sector.

ITU-R Recommendation means a Recommendation made by the ITU-R as in force from time to time.

Note ITU-R Recommendations are available on the ITU website at <http://www.itu.int>.

out-of-band means:

- (a) for a radiocommunications transmitter or radiocommunications receiver operated under a spectrum licence, the frequencies outside the frequency band in which operation of those radiocommunications devices is authorised under the licence; and

- (b) for a radiocommunications transmitter or radiocommunications receiver operating under an apparatus licence, the frequencies outside the lower frequency limit and upper frequency limit specified in the licence.

RALI FX 3 means the Radiocommunications Assignment and Licensing Instruction No. FX 3, *Microwave Fixed Services Frequency Coordination*, published by the ACMA, as existing from time to time.

Note RALI FX 3 is available on the ACMA website at <http://www.acma.gov.au>.

RALI MS 44 means the Radiocommunications Assignment and Licensing Instruction MS 44, *Frequency coordination procedures for the Earth station protection zones*, published by the ACMA, as in existence from time to time.

Note: RALI MS44 is available on the ACMA website at www.acma.gov.au.

RALI MS 47 means the Radiocommunications Assignment and Licensing Instruction MS 47 *Frequency coordination and licensing procedures for Area-Wide Licences (AWL) in the 3400–4000 MHz band*, published by the ACMA.

Note: RALI MS 47 is available, free of charge, from the ACMA’s website at www.acma.gov.au.

Spectrum Plan means the plan prepared under subsection 30(1) of the Act.

Note: The Spectrum Plan is a legislative instrument and is available, free of charge, from the Federal Register of Legislation at www.legislation.gov.au.

subsection 145(4) Determination means the *Radiocommunications (Unacceptable Levels of Interference – 3.4 GHz Band) Determination 2015*.

Note A number of terms used in these guidelines are defined in the Act and, unless the contrary intention appears, have the meaning given to them by the Act. These include:

- ACMA
- apparatus licence
- class licence
- core condition
- frequency band
- interference
- radiocommunications receiver
- radiocommunications transmitter
- Register
- spectrum licence.

- (2) Unless the contrary intention appears, terms used in these guidelines that are defined in the subsection 145(4) Determination have the same meaning as in that determination.

Note The following terms that are used in these guidelines are defined in the subsection 145(4) Determination:

- fixed transmitter
- Radio Regulations.

- (3) Unless the contrary intention appears, terms used in these guidelines that are defined in the *Radiocommunications (Interpretation) Determination 2015* have the same meaning as in that determination.

Note The following terms that are used in these guidelines are defined in the *Radiocommunications (Interpretation) Determination 2015*:

- area-wide receive licence
- earth receive licence
- earth receive station.

1.6 References to other instruments

In these guidelines, unless the contrary intention appears:

- (a) a reference to another legislative instrument is a reference to that other legislative instrument as in force from time to time; and
- (b) a reference to any other kind of instrument or writing is a reference to that other instrument or writing as in force or existing from time to time.

Note 1: For references to Commonwealth Acts, see section 10 of the *Acts Interpretation Act 1901*; and see also subsection 13(1) of the *Legislation Act 2003* for the application of the *Acts Interpretation Act 1901* to legislative instruments.

Note 2: All Commonwealth Acts and legislative instruments are registered on the Federal Register of Legislation and are accessible, free of charge, at www.legislation.gov.au.

Note 3: See section 314A of the Act.

Part 2 Background

- 2.1** The 3.4 GHz band has been designated for spectrum licensing in specified parts of Australia. Radiocommunications receivers of apparatus licensed and class licensed services may operate in and adjacent to this frequency band. These receivers may suffer interference from unwanted emissions and blocking caused by a radiocommunications transmitter operating under a spectrum licence in the 3.4 GHz band.
- 2.2** Unwanted emissions are by-products of a radiocommunications transmitter's emissions and include broadband noise, harmonics, intermodulation products, transient signals and other spurious signals. Blocking occurs when a high level off-tune signal overloads a radiocommunications receiver's front-end and causes a degradation in the quality of the wanted output signal. Intermodulation products can be generated in-band in the input stages of receivers in the presence of two or more high level signals at the receiver input.
- 2.3** These guidelines have been made for the management of these types of interference to licensed radiocommunications receivers operating in the following circumstances:
- Point-to-point fixed services operating in and adjacent to the 3.4 GHz band (Part 3 of these guidelines);
 - Fixed satellite service (FSS) Earth receive stations operating in the 3400-4200 MHz band (Part 4 of these guidelines);
 - Broadband wireless access (BWA) services operating in the 3400-3700 MHz band (Part 5 of these guidelines);
 - Radiolocation services operating in the 3300-3400 MHz and 3400-3600 MHz bands (Part 6 of these guidelines);
 - Class licensed services (Part 7 of these guidelines);
 - Adjacent area spectrum licensed receivers (Part 8 of these guidelines);
 - Earth station protection zones (Part 9 of these guidelines);
 - Earth station facility near Uralla, New South Wales (Part 10 of these guidelines);
 - Adjacent frequency wireless broadband services in the 3400–4000 MHz band (Part 11 of these guidelines);
 - Geographically adjacent area-wide licences (Part 12 of these guidelines);
 - Aeronautical mobile and aeronautical radionavigation services operating in the 4200–4400 MHz band (Part 13 of these guidelines).
- 2.5** As radio waves propagate in different ways because of factors such as frequency, terrain, atmospheric conditions and topography, there are a number of ways to predict path loss. ITU-R Recommendation P.1144 "*Guide to the application of the propagation methods of Radiocommunications Study Group 3*" provides a guide on the application of various propagation methods developed internationally by the ITU-R. It advises users on the most appropriate methods for particular applications as well as the limits, required input information, and output for each of these methods. It is recommended that the most recent version of propagation models defined by the ITU-R should be considered when modelling propagation in the 3.4 GHz band.

Note The use of other published propagation models applicable to the 3.4 GHz band may also be suitable.

Part 3 Point-to-point fixed service receivers

3.1 Background

- (1) Point-to-point fixed service receivers operating on frequencies in and adjacent to the 3.4 GHz band are licensed in accordance with the frequency assignment criteria detailed in RALI FX 3. RALI FX 3 provides details about channel plans for individual microwave bands and guidance on interference criteria and frequency coordination between microwave links to achieve certain performance objectives. It provides assignment criteria for each frequency band and specifies protection ratios.
- (2) RALI FX 3 is subject to continuing review in consultation with industry, to incorporate improved assignment techniques and changing technology requirements. Particular account is taken of changes in ITU-R Recommendations and standards made by other bodies. As revisions seek to improve spectrum access opportunities, without undue detriment to current licensees, users of RALI FX 3 are urged to consult the current version when planning systems, to increase spectrum productivity.

3.2 Protection requirements

- (1) The protection requirements for point-to-point fixed service receivers are specified in RALI FX 3 and apply to radiocommunications transmitters operated under a spectrum licence that were registered in the Register after the date of issue of the apparatus licence under which the receiver operates.
- (2) In planning for the operation of radiocommunications transmitters under a spectrum licence in the 3.4 GHz band, spectrum licensees are to provide a level of out-of-band and in-band protection from those transmitters as would be provided from apparatus licensed fixed service transmitters whose frequencies are assigned in accordance with RALI FX 3.

Part 4 Fixed satellite service Earth receive stations

4.1 Background

Fixed satellite service (FSS) Earth receive stations operate across the 3400-4200 MHz band. The Spectrum Plan allocates the 3400-3600 MHz and 3600-4200 MHz bands to the FSS on a secondary and primary basis respectively.

4.2 Protection requirements – FSS Earth receive stations operating in the 3400-3600 MHz band under earth receive licences

- (1) As indicated in section 12 of Part 1 to the Spectrum Plan, a secondary service:
 - must not cause interference to a primary service, irrespective of who was operating first-in-time;
 - cannot claim protection from harmful interference caused by a primary service.
- (2) Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band in accordance with the conditions of the licence, are not taken to cause unacceptable interference to FSS Earth receive stations operating in the 3400-3600 MHz band.
- (3) In planning for the operation of fixed transmitters under a spectrum licence in the 3.4 GHz band, before registering devices, spectrum licensees must notify the licensee of an FSS Earth receive station if frequency coordination indicates that interference may occur. This gives notice to the affected FSS licensee to implement mitigation measures, implement alternative arrangements for the delivery of their service or negotiate with the relevant spectrum licensee for the continued operation of their service.

Note Where practical, spectrum licensees are encouraged to work with incumbent FSS Earth receive licensees to resolve any interference issues.

4.3 Protection requirements – FSS Earth receive stations operating in the 3600-4200 MHz band under earth receive licences

- (1) Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band must protect earth receive stations for fixed-satellite services from co-channel emissions, unwanted emissions and receiver overload, if the radiocommunications receiver for the earth receive station:
 - (a) is operated under an earth receive licence;
 - (b) was registered in the Register prior to the date on which the radiocommunications transmitter operated under the spectrum licence is registered;
 - (c) is located within:
 - (i) 100 km of and not operating co-channel to a radiocommunications transmitter operated under a spectrum licence in the 3.4 GHz band; or
 - (ii) 200 km of and operating co-channel to a radiocommunications transmitter operated under a spectrum licence in the 3600-3800 MHz frequency band; and
 - (d) is operating in the 3600 to 4200 MHz band.
- (2) Earth receive stations for fixed-satellite services are to be protected from co-channel emissions to a maximum interference level of -128.6 dBm/MHz not to be exceeded for more than 20% of the time.

Note Refer to Recommendation ITU-R SF.1006 for further guidance on the procedure to use for the protection of earth receive stations for fixed-satellite services.

- (3) Earth receive stations are to be protected from unwanted emissions (out-of-band and spurious) to a level of -128.6 dBm/MHz, assuming a receiver noise temperature of 100K which is not to be exceeded for more than 20% of the time.

Note When assessing interference from unwanted emissions, the highest level of out-of-band or spurious emissions that fall within the licensed bandwidth of the FSS Earth station receiver should be considered in calculations.

- (4) A radiocommunications transmitter operated under a spectrum licence in the 3.4 GHz band is not considered to overload the receiver of an FSS Earth station if the total power received from the interfering service at the input of an FSS Earth station receiver (i.e. after considering Antenna gain, radiofrequency (RF) filtering and other losses) does not exceed -65 dBm. Before 16 July 2027, the minimum RF filtering level described in Table 1, at the front end of the Earth receive station for different frequency offsets, should be assumed.

On and after 16 July 2027, the minimum RF filtering level described in Table 2 should be assumed.

Frequency offset from appropriate frequency limit of licence for earth station receiver (MHz)	Rejection (dB)
< 50	$0.5 + 0.6 * f_{\text{offset}} \text{ (MHz)}$
<110	45.5
< 150	$30.5 + 0.25 * (f_{\text{offset}} \text{ (MHz)} - 50)$
< 200	55.5
≥ 200	70

Table 1: Minimum frequency response of earth receive station’s RF filter before 16 July 2027

Frequency offset from appropriate frequency limit of licence for earth station receiver (MHz)	Rejection (dB)
<15	$0.5 + 0.6 * f_{\text{offset}} \text{ (MHz)}$
<20	30
< 100	60
≥ 100	70

Table 2: Minimum frequency response of earth receive station’s RF filter on or after 16 July 2027

- (4A) For the purposes of Table 1 and Table 2 in subsection (4), for a licensed FSS earth receive station that is operated in the 3600–4200 MHz frequency band, the assumptions set out in subsections (4B) to (4D) apply.
- (4B) If the licence that authorises the station was issued before 16 July 2022, then, from the commencement of this subsection until 16 July 2027, the filter is assumed to apply only below the lower limit of the licence. In this subsection, **lower limit of the licence** means:
- (a) if the licensee holds only one licence authorising the operation of one relevant station on a particular centre frequency at a specific site and on a specific antenna,

subject to a particular bandwidth – the frequency obtained by subtracting, from the particular centre frequency, half the particular bandwidth; or

- (b) if the licensee holds only one licence authorising the operation of more than one relevant station at the same site and on the same antenna, each on a particular centre frequency and subject to a particular bandwidth – the frequency obtained by subtracting, from the lowest of the particular centre frequencies, half the bandwidth for the device authorised to operate on the lowest of the particular centre frequencies; or
- (c) if the licensee holds more than one licence authorising the operation of one or more relevant stations at the same site and on the same antenna, each on a particular centre frequency and subject to a particular bandwidth – the frequency obtained by subtracting, from the lowest of the particular centre frequencies, half the bandwidth for the device authorised to operate on the lowest of the particular centre frequencies.

(4C) If the licence that authorises the station was issued before 16 July 2022, then, on and after 16 July 2027, the filter is assumed to apply below the lower limit for the station and above the upper limit of the station. In this subsection:

lower limit for the station means the frequency obtained by subtracting, from the particular centre or emission frequency specified in the licence for the station, half the particular bandwidth specified in the licence for the station.

upper limit for the station means the frequency obtained by adding, to the particular centre or emission frequency specified in the licence for the station, half the particular bandwidth specified in the licence for the station.

(4D) If the licence that authorises the station was issued on or after 16 July 2022, the filter is assumed to apply below the lower limit for the station and above the upper limit of the station. In this subsection, **lower limit for the station** and **upper limit for the station** have the same meaning as in subsection (4C).

Note: To meet the assumptions in subsections (4C) and (4D), bandpass or notch filters may be required between different earth receive stations that are operating on different frequencies within the 3600-4200 MHz frequency range and on the same antenna. This is the case irrespective of whether operation of the stations is authorised by the same or different licences. If there are multiple earth receive licences authorising stations that operate on the same antenna in the 3600-4200 MHz frequency range, for interference management purposes, a bandpass filter can be assumed at the lower and upper edges of each group of licences where relevant stations operated under those licences are directly adjacent in frequency.

(5) When assessing interference caused by unwanted emissions or receiver overload:

- Propagation loss between a radiocommunications transmitter and an earth receive station for a fixed-satellite service should be calculated using Recommendation ITU-R P.452 with $p = 20\%$.

Note: The parameter p is defined in Recommendation ITU-R P.452 as the required time percentage for which the calculated basic transmission is not exceeded.

- In the event actual antenna radiation patterns are not available for an earth receive station in a fixed-satellite service, the antenna radiation pattern defined in ITU-R Recommendation S.465 can be assumed.
- The first time a spectrum licensee performs adjacent channel coordination with an apparatus licensed earth receive station operating in the 3600 to 4200 MHz band, and before the spectrum licensee registers their device, the spectrum licensee must notify the affected earth receive station licensee. This is to ensure the FSS licensee

has installed an RF filter with the relevant characteristics from Table 1 or Table 2 (as appropriate) to the front end of their earth station receiver.

4.4 Additional protection requirements – incumbent FSS Earth receive stations operating in the 3600-3800 MHz band under earth receive licences

- (1) An incumbent earth receive station is one that operates in the 3600–3800 MHz band under an earth receive licence and falls within one of the frequencies and areas contained in the following re-allocation declarations:
 - (a) *Radiocommunications (Spectrum Re-allocation—3.6 GHz Band for Adelaide and Eastern Metropolitan Australia) Declaration 2018;*
 - (b) *Radiocommunications (Spectrum Re-allocation—3.6 GHz Band for Perth) Declaration 2018;*
 - (c) *Radiocommunications (Spectrum Re-allocation – 3.6 GHz Band for Regional Australia) Declaration 2018;*
 - (d) *Radiocommunications (Spectrum Re-allocation – 3.4 GHz and 3.7 GHz Bands) Declaration 2022.*
- (2) Incumbent earth receive stations are to be provided with the protection defined in section 4.2 and section 4.3 of these guidelines.
- (3) Incumbent earth receive stations within 300 km of a transmitter operated under a 3.4 GHz spectrum licence are also to be protected from co-channel emissions to a maximum interference level of -119.9 dBm/MHz not to be exceeded for more than 0.005% of the time.

Note 1: Details of earth receive stations and site ID's are contained on the Register of Radiocommunications Licensees, accessible at www.acma.gov.au.

Note 2: Refer to Recommendation ITU-R SF.1006 for further guidance on the procedure to use for the protection of FSS Earth receive stations.

4.5 Protection requirements – FSS Earth receive stations operating in the 3750-4000 MHz band under area-wide receive licences

- (1) Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band must protect earth receive stations from receiver overload, if the radiocommunications receiver for the earth receive station:
 - (a) was included in the Register, in relation to an area-wide receive licence, before the date on which the radiocommunications transmitter operated under the spectrum licence is registered; and
 - (b) is operated in accordance with that area-wide receive licence; and
 - (c) is located within 100 km of the radiocommunications transmitter.
- (2) A radiocommunications transmitter operated under a spectrum licence in the 3.4 GHz band is not considered to overload the receiver of an earth receive station mentioned in subsection (1) if the total power received from the transmitter at the input of the earth receive station (after considering antenna gain, radiofrequency filtering and other losses) does not exceed a total of -65 dBm. The minimum radiofrequency filtering level described in Table 3, at the front end of the earth receive station for different frequency offsets, is assumed to apply at each lower limit for a licence and upper limit for a licence.

Frequency offset from lower or upper limit of licence for receiver of earth receive station (MHz)	Rejection (dB)
< 80	60
≥ 80	70

Table 3: Minimum frequency response of earth receive station’s radiofrequency filter under an area-wide receive licence

(3) In subsection (2):

lower limit for a licence means, in relation to the geographic area specified in an area-wide receive licence that authorises the operation of an earth receive station, the lowest frequency specified in the licence for the operation of radiocommunications receivers in that geographic area.

upper limit for a licence means, in relation to the geographic area specified in an area-wide receive licence that authorises the operation of an earth receive station, the highest frequency specified in the licence for the operation of radiocommunications receivers in that geographic area.

(4) When assessing interference caused by receiver overload:

- Propagation loss between a radiocommunications transmitter and an earth receive station for a fixed-satellite service should be calculated using Recommendation ITU-R P.452, with $p = 20\%$.

Note 1 The parameter p is defined in Recommendation ITU-R P.452 as the required time percentage for which the calculated basic transmission is not exceeded.

Note 2 Recommendation ITU-R P.452 is available, free of charge, from the website of the International Telecommunication Union at www.itu.int.

- In the event actual antenna radiation patterns are not available for an earth receive station in a fixed-satellite service, the antenna radiation pattern defined in ITU-R Recommendation S.465 can be assumed.

Note 1 Recommendation ITU-R S.465 is available, free of charge, from the website of the International Telecommunication Union at www.itu.int.

- For coordination occurring before 16 July 2027, the first time a spectrum licensee performs adjacent channel coordination with an earth receive station operating in the 3750 to 4000 MHz band, and before the spectrum licensee registers their relevant radiocommunications device, the spectrum licensee must notify the affected area-wide receive licensee. This is to ensure the area-wide receive licensee has the opportunity to install a radiofrequency filter with the relevant characteristics from Table 3 to the front end of their earth receive station.

Part 5 Broadband wireless access (BWA) service

5.1 Background

Broadband wireless access (BWA) services are authorised to operate in the 3400-3700 MHz band under apparatus licence arrangements. Frequency assignment arrangements for BWA are defined in RALI MS 47.

5.2 Protection requirements

- (1) Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band must comply with the requirements specified in RALI MS 47 relating to the levels of interference protection to be afforded to point-to-multipoint receivers, if the receiver:
 - (a) is licensed under the Act; and
 - (b) was registered in the Register prior to the date on which the device operated under the spectrum licence is registered.
- (2) The licensee who is second-in-time is responsible for bearing the costs of any changes required to facilitate coexistence.

Part 6 Radiolocation service

6.1 Background

The Spectrum Plan provides a primary allocation to the radiolocation service in the 3100-3400 MHz and 3400-3600 MHz bands.

6.2 Protection requirements

Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band in accordance with the conditions of the licence are not taken to cause unacceptable interference to radiolocation services operating in the 3100-3400 MHz or 3400-3600 MHz bands.

Part 7 Class licensed services

7.1 Background

- (1) The class licences listed in subsection (3) permit the operation of a number of different types of radiocommunications transmitters in the 3.4 GHz band.
- (2) The operation of radiocommunications transmitters under these class licences is on a no-interference and no-protection basis.
- (3) For subsection (1), the class licences are:
 - (a) the *Radiocommunications (Overseas Amateurs Visiting Australia) Class Licence 2015* or, if a later instrument replaces that class licence, the later instrument; and
 - (b) the *Radiocommunications (Low Interference Potential Devices) Class Licence 2015* or, if a later instrument replaces that class licence, the later instrument.

7.2 Protection requirements

Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band in accordance with the conditions of the licence are not taken to cause unacceptable interference to services operating under a class licence listed in subsection 7.1(3).

Part 8 Adjacent area spectrum licensed receivers

8.1 Background

The device boundary criterion, as defined in the subsection 145(4) Determination, is the primary mechanism for managing interference across geographical boundaries. However, at times it may be necessary for licensees operating radiocommunications transmitters in the 3.4 GHz band to negotiate with other spectrum licensees when deploying services in order to avoid harmful interference.

8.2 Recommended preliminary coordination procedures

- (1) Spectrum licensees planning to deploy radiocommunications transmitters in the 3.4 GHz band should have regard to radiocommunications receivers registered in the Register operating under other 3.4 GHz band spectrum licences.
- (2) In planning for the operation of fixed transmitters under a spectrum licence in the 3.4 GHz band, spectrum licensees should coordinate with any radiocommunications receivers registered in the Register. The coordination performed should:
 - (a) use the parameters of the radiocommunications receivers as recorded in the Register;
 - (b) use the level of protection set out in the subsection 145(4) Determination;
 - (c) make use of a suitable propagation model to model path loss between the fixed transmitters and radiocommunications receivers; and
 - (d) take into account terrain and any other relevant factors.

Note An example of a suitable propagation model is that set out in section 4.5.2 of ITU-R Recommendation P.526-13 *Propagation by diffraction*.

- (3) In the event that coordination performed under subsection (2) indicates harmful interference may occur, spectrum licensees should consider:
 - (a) replanning the deployment of the fixed transmitters to avoid causing harmful interference; or
 - (b) negotiating with the affected spectrum licensee to find a resolution.
- (4) In the event a solution under subsection (3) is not possible, interference is managed in accordance with any synchronisation requirement condition included in the spectrum licence, unless other arrangements are agreed to by the affected licensees.

Note: For a device with an active antenna system, the radiated power in the direction of a receiver operated under another licence, is defined as the sum of the gain of the antenna towards in the direction of the receiver (accounting for azimuth and elevation) and the Total Radiated Power (dBm). This allowance is based on the assumption that beam pointing angles and/or power can be controlled dynamically to ensure a defined level of radiated power in a specific direction is not exceeded.

Part 9 Earth station protection zones

9.1 Background

The ACMA has identified a number of locations that may be suitable as earth station protection zones (ESPZs) in eastern and western Australia. The purpose of these ESPZs is to define areas outside of reasonably sized population centres that provide long-term certainty and flexibility for investment in and operation of commercial space communications teleport facilities in Australia. The general protection requirements for these ESPZs are defined in RALI MS44.

9.2 Protection requirements

Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band must comply with the coordination and protection requirements specified in RALI MS44.

Note: The ACMA may vary RALI MS 44 to change the ESPZs.

Part 10 Earth station facility near Uralla

10.1 Background

There is an Earth station facility located near Uralla (the *Uralla facility*) within the HCIS NU7K4. Services at the Uralla facility operate at various frequencies in the 3400-4200 MHz band.

10.2 Protection requirements

- (1) Radiocommunications transmitters operated under a spectrum licence in the 3.4 GHz band must protect earth stations operating in the 3400-4200 MHz band at the Uralla facility to the levels specified in RALI MS44.

Note 1: Given some of the services operating at the Uralla facility are temporal in nature and/or may only track certain parts of the sky, there may be opportunity for detailed negotiations between licensees to manage interference while improving spectrum utilisation.

Note 2: The long-term viability of the Uralla facility may be reviewed in the future. This is in light of the increasing demand for fixed and mobile broadband capacity, growing international interest in the 3400–4200 MHz band for use by fixed and mobile wireless broadband services and the proximity of the site to major regional population centres. However, if it is shown that fixed and mobile broadband service deployments in nearby major towns are not unreasonably restricted (noting there is likely to be some restrictions), this would be taken into consideration when assessing the long term viability of the Uralla facility.

Part 11 **Adjacent frequency wireless broadband services in the 3400-4000 MHz band**

11.1 **Background**

- (1) The 3400–3475 MHz band has been identified by the ACMA for use by highly localised wireless broadband services in urban areas. This encompasses public, private and enterprise networks, including services at warehouses, factories, airports, ports, transport hubs, hospitals, schools and smart buildings.
- (2) There are arrangements for area-wide licences to operate in frequencies adjacent to the 3.4 GHz band. These licences are typically used to provide wireless broadband services.

Note: For the conditions that will apply to all such area-wide licences, see the *Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2020*.

11.2 **Protection requirements**

To manage interference between 3.4 GHz band spectrum licences and adjacent frequency wireless broadband services:

- (a) the ACMA intends generally not to issue apparatus licences in the 3470–3475 MHz frequency band for the operation of radiocommunications devices for highly localised wireless broadband services in urban areas; and
- (b) the ACMA intends generally not to issue area-wide licences authorising the operation of radiocommunications transmitters in the 15 MHz of spectrum directly adjacent to a 3.4 GHz band spectrum licence.

Part 12 Geographically adjacent area-wide licences

12.1 Background

There are arrangements for area-wide licences to operate in remote areas in the 3.4 GHz band. These licences are typically used to provide wireless broadband services and can be near or geographically adjacent to a 3.4 GHz spectrum licence.

Note: For the conditions that will apply to all such area-wide licences, see the *Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2020*.

12.2 Protection requirements

The device boundary criterion, as defined in the subsection 145(4) Determination, is the primary mechanism for managing interference across geographical boundaries from a spectrum licence to an area-wide licence. Geographically adjacent area-wide licensees and spectrum licensees are able to agree on the implementation of alternative measures to manage interference.

Part 13 Aeronautical services

13.1 Background

- (1) The Spectrum Plan allocates the 4200–4400 MHz frequency band to the aeronautical mobile service and aeronautical radionavigation service, as primary services.
- (2) The operation of aircraft stations as radio altimeters in the 4200–4400 MHz frequency band is authorised under the *Radiocommunications (Aircraft and Aeronautical Mobile Stations) Class Licence 2016*.
- (3) In this Part, ***aeronautical mobile service*** and ***aircraft station*** have the corresponding meanings given by:
 - (a) the *Radiocommunications (Interpretation) Determination 2015*; or
 - (b) if a later instrument replaces that determination and defines the terms – the later instrument.
- (4) In this Part, ***aeronautical radionavigation service*** has the meaning given by the Spectrum Plan.

13.2 Protection requirements

- (1) For spectrum licences, a licensee must not operate a radiocommunications transmitter in the 3700–3800 MHz frequency band if the operation of the transmitter would be inconsistent with any requirement for an area-wide licence in RALI MS 47 in relation to coexistence with radio altimeters.
- (2) For the purposes of this section, a reference in RALI MS 47 to:
 - (a) a ***non-exempt AWL tx transmitter*** is taken to be a reference to a radiocommunications transmitter operated, or proposed to be operated, under a spectrum licence in the 3700–3800 MHz frequency band;
 - (b) an ***AWL tx*** is taken to be a reference to a 3.4 GHz band spectrum licence;
 - (c) ***clause 4 of Schedule 4 to the AWL LCD*** is taken to be a reference to this section.

Endnotes

Endnote 1—About the endnotes

The endnotes provide information about this compilation and the compiled law.

The following endnotes are included in every compilation:

- Endnote 1—About the endnotes
- Endnote 2—Abbreviation key
- Endnote 3—Legislation history
- Endnote 4—Amendment history

Abbreviation key—Endnote 2

The abbreviation key sets out abbreviations that may be used in the endnotes.

Legislation history and amendment history—Endnotes 3 and 4

Amending laws are annotated in the legislation history and amendment history.

The legislation history in endnote 3 provides information about each law that has amended (or will amend) the compiled law. The information includes commencement details for amending laws and details of any application, saving or transitional provisions that are not included in this compilation.

The amendment history in endnote 4 provides information about amendments at the provision (generally section or equivalent) level. It also includes information about any provision of the compiled law that has been repealed in accordance with a provision of the law.

Misdescribed amendments

A misdescribed amendment is an amendment that does not accurately describe how an amendment is to be made. If, despite the misdescription, the amendment can be given effect as intended, then the misdescribed amendment can be incorporated through an editorial change made under section 15V of the *Legislation Act 2003*.

If a misdescribed amendment cannot be given effect as intended, the amendment is not incorporated and “(md not incorp)” is added to the amendment history.

Endnote 2—Abbreviation key

ad = added or inserted	orig = original
am = amended	par = paragraph(s)/subparagraph(s)
amdt = amendment	/sub-subparagraph(s)
c = clause(s)	pres = present
C[x] = Compilation No. x	prev = previous
Ch = Chapter(s)	(prev...) = previously
def = definition(s)	Pt = Part(s)
Dict = Dictionary	r = regulation(s)/rule(s)
disallowed = disallowed by Parliament	reloc = relocated
Div = Division(s)	renum = renumbered
exp = expires/expired or ceases/ceased to have effect	rep = repealed
F = Federal Register of Legislation	rs = repealed and substituted
gaz = gazette	s = section(s)/subsection(s)
LA = <i>Legislation Act 2003</i>	Sch = Schedule(s)
LIA = <i>Legislative Instruments Act 2003</i>	Sdiv = Subdivision(s)
(md not incorp) = misdescribed amendment cannot be given effect	SLI = Select Legislative Instrument
mod = modified/modification	SR = Statutory Rules
No. = Number(s)	Sub-Ch = Sub-Chapter(s)
o = order(s)	SubPt = Subpart(s)
Ord = Ordinance	<u>underlining</u> = whole or part not commenced or to be commenced

Endnote 3 – Legislation history

Title	Registration	Date of commencement	Application, saving or transitional provisions
<i>Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band) 2015</i>	25 May 2015 (see F2015L00728)	14 December 2015	
<i>Radiocommunications – 3.4 GHz Band Omnibus Variation 2018 (No. 1)</i>	27 July 2018 (see F2018L01063)	28 July 2018	-
<i>Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band) Variation 2023 (No. 1)</i>	26 June 2023 (see F2023L00855)	27 June 2023	
<i>Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band) Variation 2023 (No. 2)</i>	29 September 2023 (see F2023L01347)	29 October 2023	

Endnote 4 – Amendment history

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s 1.2	rep. LA s 48D;
s 1.3	rep. LA s 48C;
s 1.5(1).....	am. 2018 No. 1; am. F2023L00855;
s 1.5(3).....	am. F2023L01347;
s 1.6	ad. F2023L00855;
s 2.1	am. F2023L00855;
s 2.3	am. 2018 No. 1; am. F2023L00855;
s 2.4	rep. F2023L00855
s 3.1	am. 2018 No. 1;
s 4.2	am. 2018 No. 1; am. F2023L01347;
s 4.3	rs. 2018 No. 1; am. F2023L01347;
s 4.3(1).....	am. F2023L00855; am. F2023L01347;
s 4.3(4).....	am. F2023L00855; am. F2023L01347;
s 4.3(4A).....	ad. F2023L00855; am. F2023L01347;
s 4.3(4B).....	ad. F2023L00855;
s 4.3(4C).....	ad. F2023L00855;
s 4.3(4D).....	ad. F2023L00855;
s 4.3(5).....	am. F2023L01347;
s 4.4	ad. 2018 No. 1; am. F2023L00855; am. F2023L01347;
s 4.4(1).....	am. F2023L01347;
s 4.5	ad. F2023L01347;
s 5.1	am. 2018 No. 1; am. F2023L00855;
s 5.2	am. 2018 No. 1; am. F2023L00855;
s 6.1	am. 2018 No. 1;

Provision affected	How affected
s 6.2	am. 2018 No. 1;
s 7.1	am. 2018 No. 1; am. F2023L00855;
s 7.1(3).....	ad. F2023L00855;
s.7.2	am. F2023L00855;
s 8.2	am. 2018 No. 1;
s 9.2	am. F2023L00855;
s 10.2.....	am. F2023L00855;
Part 9.....	ad. 2018 No. 1;
Part 10.....	ad. 2018 No. 1;
Part 11.....	ad. F2023L00855;
Part 12.....	ad. F2023L00855;
Part 13.....	ad. F2023L00855;
