Licensing and coordination procedures for ‘area-wide’ apparatus licensed services in the 26/28 GHz bands

Radiocommunications Assignment and Licensing Instruction

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Amendment history

| Date | Comments |
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| Month 2020 | Initial draft covering arrangement for ‘area-wide’ apparatus licences in the 26 GHz and 28 GHz bands |
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Suggestions for improvements to Radiocommunications Assignment and Licensing Instruction MS xx may be addressed to:

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Please notify the ACMA of any inaccuracy or ambiguity found in this RALI, so that it can be investigated and appropriate action taken.

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# Introduction

## Purpose

The purpose of this Radiocommunications Assignment and Licensing Instruction (RALI) is to provide information about, and describe the necessary steps for:

* administratively issuing ‘area-wide’ licences in the 26 GHz (24.7-27.5 GHz) and 28 GHz (27.5-29.5 GHz) bands, and
* the coordination of devices operated under these licences.

The information in this document reflects the ACMA’s statement of current policy in relation to devices authorised under an ‘area-wide’ apparatus licence in the 26 GHz and 28 GHz bands.[[1]](#footnote-2) In making decisions, accredited frequency assigners and the ACMA’s officers should take all relevant factors into account and decide each case on its merits. Issues relating to this document that appear to fall outside the enunciated policy should be referred to:

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## Scope

The scope of the RALI covers the administrative allocation and coordination arrangements for ‘area-wide’ apparatus licences in the 26/28 GHz bands.

### Basic principles

The basic principles for issuing and operating devices under an ‘area-wide’ apparatus licence in the 26/28 GHz bands are:

* An ‘area-wide’ apparatus licence provides service and technology flexible access to a frequency range and geographic area specified on the licence. Conditions applicable to all ‘area-wide’ apparatus licences in the 26/28 GHz band is detailed in the [applicable Licence Condition Determination], as in force from time to time
* An ‘area-wide’ apparatus licence is issued prior to device coordination (if required). Any necessary device coordination is to be undertaken prior to including applicable devices in the Register of Radiocommunications Licences (RRL).
* An ‘area-wide’ apparatus licence can only be administratively issued if it complies with the licensing arrangements detailed in Chapter 4 of this RALI.
* Subject to the limitations detailed in Chapter 4, an ‘area-wide’ apparatus licence can be issued to authorise access:
* In any area within the ranges 24.7-25.1 GHz and 27.5-29.5 GHz
* In the range 25.1-27.5 GHz in areas not subject to the [*Radiocommunications (Spectrum Re-allocation—26 GHz band) Declaration 2019*](https://www.legislation.gov.au/Details/F2019L01374) (26 GHz band reallocation declaration)
* A device must not be operated under an ‘area-wide’ apparatus licence in the 26 GHz or 28 GHz band unless it complies with the [applicable Licence Condition Determination] and with any conditions detailed on individual licences.
* Before a device can be operated under an ‘area-wide’ apparatus licence, details of the device must be in RRL (except for exempted devices listed in the [applicable Licence Condition Determination])
* Before a device can be included in RRL, it must comply with the provisions in this RALI.

# Coexistence arrangements Frequency coordination procedures

## Identification of potentially affected services

Services operated under an ‘area-wide’ apparatus licence in the 26/28 GHz bands will need to coexist with the following services:

* Other ‘area-wide’ apparatus licensed services in the 26/28 GHz bands
* 26 GHz spectrum licensed devices operating in the range 25.1-27.5 GHz
* Space research service (SRS) earth stations operating in the range 25.5-27 GHz
* Fixed satellite service (FSS) gateway up-links operating in the range 27-29.5 GHz
* Ubiquitous FSS earth station up-links operating in the range 27.5-29.5 GHz
* Passive earth exploration satellite services (EESS) operating in the range 23.6-24 GHz
* Legacy fixed point-to-point services operating in the range 27.5-28.5 GHz

Class licensed devices operating in the frequency range 24.25-29.5 GHz.

Coexistence arrangements with the above services are detailed in the section 2.2.

## Coexistence arrangements

### Coexistence with adjacent ‘area-wide’ apparatus licensed services

All ‘area-wide’ apparatus licensed devices which are required to be included in the RRL must meet the aggregate power flux density (pfd) limit of -82.7 dBW/m2 measured at 5 metres above the ground at the geographic boundary of the licence[[2]](#footnote-3) – this requirement is included in the [applicable Licence Condition Determination]. This pfd limit is designed to provide adequate protection of user devices (which are not included in the RRL) without placing overly onerous restrictions on where base stations could be deployed.

Coexistence between base stations operated under adjacent ‘area-wide’ apparatus licence is managed on a case-by-case basis as detailed in section 3.1. These arrangements are intended to be applied as needed which improves the utility of ‘area-wide’ apparatus licences (i.e. protection requirements are only applied when needed). Negotiation between impacted parties is also encouraged which can result in more efficient solutions. A fall-back requirement is also in place to ensure coexistence in the event that negotiations fail.

### Coexistence with 26 GHz band spectrum licensed services

Similar to spectrum licences, ‘area-wide’ apparatus licences authorise the operation of devices in a defined frequency/area combination with licence conditions to manage out-of-area and out-of-band interference. Therefore, interference is primarily managed at the ‘area-wide’ apparatus licence boundary (frequency and area) and not the device.

The technical framework for ‘area-wide’ apparatus licences in the 26/28 GHz bands has been optimised for 5G wireless broadband services and is in effect very similar to the proposed technical framework for 26 GHz band spectrum licences. This will result in a reciprocal interference scenario at the licence boundaries between apparatus and spectrum licences.

It is proposed that coexistence between spectrum licensed and ‘area-wide’ apparatus licensed services will be managed by the following:

* At the frequency boundary:
* The unwanted emission limits specified in the [applicable Licence Condition Determination]
* The synchronisation requirement specified in the [applicable Licence Condition Determination] and on spectrum licences
* At the geographic area boundary between ‘area-wide’ apparatus licensed and spectrum licensed areas:
* The device boundary criteria (DBC) specified in the Radiocommunications (Unacceptable Levels of Interference — 26 GHz band) Determination 2020. This coordination requirement is detailed in section 3.2.
* The synchronisation requirement specified in the [applicable Licence Condition Determination] and on the spectrum licences

At both the frequency and area boundaries the synchronisation requirement provides the fallback (on a case-by-case basis) should interference occur which cannot be resolved through negotiation between relevant parties. This same requirement is placed on both ‘area-wide’ apparatus licences in the 26/28 GHz bands and 26 GHz band spectrum licences.

Coordination procedures are contained in section 3.1.

### Coexistence with SRS earth stations

Earth receive stations support space research activities in the range 25.5-27 GHz and are currently limited to space communications facilities at New Norcia, WA, and Tidbinbilla, ACT. Coexistence of ‘area-wide’ apparatus licensed devices with these SRS earth stations is managed via:

* Exclusion zones around SRS earth stations where ‘area-wide’ apparatus licensed transmitters cannot be operated. These exclusion zones are included as a condition in the [applicable Licence Condition Determination].
* A requirement for ‘area-wide’ apparatus licensed transmitters (limited to transmitters which are required to be included in the RRL) not to exceed a defined maximum aggregate interference level at the receiver input of these SRS earth stations. Protection requirements and coordination details are contained in section 3.3.
* A restriction on issuing ‘area-wide’ apparatus licences in the HCIS level 1 cells which contain these SRS earth stations – see section 4.1.1.

### Coexistence with passive EESS

Space-borne passive sensing EESS services operate in the 23.6-24 GHz band. Coexistence between ‘area-wide’ apparatus licensed devices and passive EESS is managed through imposing more restrictive unwanted emission limits in the frequency range 23.6-24 GHz – these additional limits are detailed in the [applicable Licence Condition Determination].

It is noted that additional filtering may be required on ‘area-wide’ apparatus licensed devices to meet these additional unwanted emission limits. Given the limitations of current filter technology it may not be possible to get enough attenuation at small frequency offsets. In order to allow the deployment of ‘area-wide’ apparatus licensed devices at small frequency offsets from the passive band where filtering is less effective, the [applicable Licence Condition Determination] allows relaxed (higher) unwanted emissions in the 23.6-24 GHz band for devices operating in the range 24.7-25.1 GHz.

Section 3.4 mandates density limits for ‘area-wide’ apparatus licensed base stations operating in the range 24.7-25.1 GHz to offset the increased unwanted emission limits in the 23.6-24 GHz band. The base station density limit will ensure that the aggregate interference to passive EESS satellites is not increased due to the relaxed unwanted emission limits.

### Coexistence with FSS gateway uplinks

FSS gateway uplinks operate in the range 27-29.5 GHz. The [applicable Licence Condition Determination] places additional licence conditions on some ‘area-wide’ apparatus licensed services to safeguard coexistence with FSS gateway uplinks.

The potential of interference from FSS gateway earth stations to receivers operated under an ‘area-wide’ apparatus licence will depend on a number of factors, in particular the geographical separation and antenna discrimination. The probability of interference to spectrum licensed receivers is low given:

* Studies undertaken by Task Group 5/1 indicate maximum separation distances of up to 7.5 km (for earth station elevation angles of at least 20˚) are required to protect IMT stations, however actual distances will depend on specific circumstances.[[3]](#footnote-4)
* the majority of existing FSS earth stations in the range 27-29.5 GHz have an elevation angle greater than 20˚

Given FSS gateways are operated at known locations and the interference potential will likely be limited to only short distances from the gateway, the onus is on the ‘area-wide’ apparatus licensee to ensure their devices do not receive harmful interference from existing gateways. No protection will be afforded to receivers operated under an ‘area-wide’ apparatus licence from interference caused by an existing FSS gateway earth station. Advisory note XX is to be attached to all ‘area-wide’ apparatus licensed issued in the 26/28 GHz band – see section 4.1.4

‘Area-wide’ apparatus licensed services in the range 27.5-28.1 GHz in areas not subject to the 26 GHz band reallocation declaration or in the range 28.1-29.5 GHz in all areas are secondary in relation to FSS services. Therefore, ‘area-wide’ apparatus licensed receivers in these frequency ranges and areas will not be provided protection from existing or future FSS gateway earth stations. Advisory note YY is to be attached to all ‘area-wide’ apparatus licences issued in the range 27.5-28.1 GHz in areas not subject to the 26 GHz band reallocation declaration or in the range 28.1-29.5 GHz – see section 4.1.4.

In planning deployments under an ‘area-wide’ apparatus licensed, the licensee should take account of the above arrangements and plan their services accordingly.

### Coexistence with ubiquitous FSS earth stations

Ubiquitous FSS earth stations operate in accordance with the Radiocommunications (Communication with Space Object) Class Licence 2015. In the 28 GHz band, ubiquitous FSS earth stations operate:

On a primary basis in the range 27.5-28.1 GHz in areas not subject to the 26 GHz band reallocation declaration, and in the range 28.1-29.5 GHz

On a secondary basis in the range 27.5-28.1 GHz in areas subject to the 26 GHz band reallocation declaration.

Primary ubiquitous FSS earth stations have priority over ‘area-wide’ apparatus licensed services operating in the range 27.5-28.1 GHz in areas not subject to the 26 GHz band reallocation declaration, and in the range 28.1-29.5 GHz. Therefore, ‘area-wide’ apparatus licensed receivers in these frequency ranges and areas will not be provided protection from existing or future ubiquitous FSS earth stations. Advisory note YY is to be attached to all ‘area-wide’ apparatus licences issued in the range 27.5-28.1 GHz and areas not subject to the 26 GHz band reallocation declaration or in the range 28.1-29.5 GHz – see section 4.1.4.

In planning deployments under an ‘area-wide’ apparatus licence, the licensee should take account of the above arrangements and plan their services accordingly.

### Coexistence with legacy point-to-point services

As detailed in the paper [Future use of the 28 GHz band – Planning decisions and preliminary](https://www.acma.gov.au/sites/default/files/2019-11/Future-use-of-the-28-GHz-band-Final.docx), no new point-to-point links are permitted in the 28 GHz band.[[4]](#footnote-5) Legacy point-to-point services will be able to continue to operate for a minimum of 7 years with a possibility of continued operation beyond this timeframe (subject to further review). During this time, ‘area-wide’ apparatus licensed services will need to coexist with existing point-to-point services.

Coordination requirements to protect legacy point-to-point links are detailed in section 3.5.

‘Area-wide’ apparatus licensed receivers will not be afforded protection from interference from existing point-to-point links. Advisory note XX, which is to be attached to all ‘area-wide apparatus licences in the 26/28 GHz band, is also applicable to this interference scenario – see section 4.1.4. In planning deployments under an ‘area-wide’ apparatus licence the licensee should take account of existing point-to-point transmitters and plan their services accordingly.

### Coexistence with class licensed services

Various class licensed devices currently operate in the 24.25-29.5 GHz range, including:

* Aviation security body scanning devices operating in the frequency range 24.25-30 GHz, authorised under the Radiocommunications (Body Scanning – Aviation Security) Class Licence 2018
* Devices authorised under the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 (the LIPD class licence) including:
* Wireless broadband services operating in the frequency range 24.25-25.1 GHz
* Radiofrequency identification transmitters operated in the frequency range 24.1-26.5 GHz
* Radiodetermination transmitters operating in the frequency range 24.05-26.5 GHz
* Ultra-wideband short-range vehicle radar systems operating in the range 22-26.5 GHz

The risk of interference between ‘area-wide’ apparatus licensed services and class licensed systems is low, however in the unlikely event there is interference services the following arrangements apply:

* LIPD class licensed devices operate on a no-interference, no-protection basis with other radiocommunications devices, including ‘area-wide’ apparatus licensed services in the 26/28 GHz bands.
* A device operated under an ‘area-wide’ apparatus licence must not cause interference to, nor is it provided protection from, a device operated under the Radiocommunications (Body Scanning – Aviation Security) Class Licence 2018, as in force from time to time (see the [applicable Licence Condition Determination])

# Coordination procedures

## Preliminary coordination procedures

Licensees planning to deploy radiocommunications transmitters in the 26/28 GHz bands under an ‘area-wide’ apparatus licence should have regard to radiocommunications receivers recorded in the RRL operating under another ‘area-wide’ apparatus licence or a 26 GHz spectrum licence.

In planning for the operation of fixed transmitters under an ‘area-wide’ apparatus licence, the licensee should coordinate with any radiocommunications receivers recorded in the RRL. The coordination performed should:

* use the parameters of the radiocommunications receivers as recorded in the Register;
* use the compatibility requirement set out in Schedule 2 of the *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 26 GHz Band) 2020* as in force from time to time;
* although there are no receiver performance requirements, the notional receiver performance level set out in Schedule 1 of *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 26 GHz Band) 2020,* as in force from time to time, is to be used for coordination purposes.
* make use of a suitable propagation model to model path loss between the fixed transmitters and radiocommunications receivers;[[5]](#footnote-6) and

take into account terrain and any other relevant factors.

In the event that the above coordination indicates harmful interference may occur, the ‘area-wide’ apparatus licensees should consider:

* replanning the deployment of the fixed transmitters to avoid causing harmful interference; or

negotiating with the licensee of the affected receiver to find a resolution.

In the event that replanning the deployment is not possible and a negotiated resolution could not be reached, interference is managed in accordance with the synchronisation requirementcondition included in the [applicable Licence Condition Determination], 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.

## Coordination at the geographic boundary with 26 GHz spectrum licences

The details of an ‘area-wide’ apparatus licensed transmitter must not be included in the RRL if it would operate in the range 25.1-27.5 GHz and any part of the device boundary of the transmitter lies inside a geographic area subject to the 26 GHz reallocation declaration. The device boundary is to be calculated in accordance with Part 1 of Schedule 2 of *Radiocommunications (Unacceptable Levels of Interference — 26 GHz band) Determination 2020*, as in force from time to time*.*

## Coordination requirements with SRS earth stations

The details of an ‘area-wide’ apparatus licensed transmitter must not be included in the RRL if it would operate in the 25.5-27 GHz range and the maximum co-channel aggregate interference level at the input of the earth station receiver (detailed in Table 1) would be exceeded.

In undertaking assessment against the maximum interference level, the SRS earth station operating parameters as recorded in the RRL, in addition those included in Table 1, are to be used.

|  |  |  |
| --- | --- | --- |
|  | Canberra Deep Space Communications Complex | New Norcia Deep Space Ground Station |
| Maximum co-channel aggregate interference level[[6]](#footnote-7) | -156 dBW/MHz at the input of the receiver | |
| Location | Latitude: -35.3951°N  Longitude: 148.9785°E | Latitude: -31.0484°N  Longitude: 116.1914°E |
| Antenna pattern | Defined in ITU-R Recommendation SA.509-3 | |
| Minimum antenna elevation angle above horizon | 11.3 degrees | 10 degrees |

1. Additional SRS earth station parameters to be used in coordination

## Coexistence with passive EESS

Table 2 provides the maximum number of transmitters in the range 24.7-25.1 GHz (which are required to be included in the RRL) which can be deployed within a 9km radius. The details of an ‘area-wide’ apparatus licensed transmitter must not be included in the RRL if it would operate in the range 24.7-25.1 GHz and the number of existing ‘area-wide’ apparatus licensed transmitters in the RRL is equal to or exceeds the limit in Table 2 for the operating range of the proposed transmitter.

In assessing compliance with Table 2, a transmitter (either existing or proposed) with emissions overlapping more than one frequency segment in Table 2 is to be counted as a service in each of the overlapping frequency ranges.

There is no deployment limit in the frequency range 25.1-29.5 GHz.

|  |  |  |
| --- | --- | --- |
| Wireless broadband operating frequency range | TRP limit into the range 23.6–24 GHz  (note 1) | Maximum number of ‘area-wide’ apparatus licensed transmitters (which are required to be recorded in the RRL) within a 9km radius |
| 24.7–24.8 GHz | -28 dBW/200 MHz for BS  -24 dBW/200 MHz for UE | 13 |
| 24.8–24.9 GHz | -29 dBW/200 MHz for BS  -25 dBW/200 MHz for UE | 16 |
| 24.9–25 GHz | -31 dBW/200 MHz for BS  -27 dBW/200 MHz for UE | 26 |
| 25­­–25.1 GHz | -33 dBW/200 MHz for BS  -29 dBW/200 MHz for UE | 41 |

Note 1: The TRP limits in this column are mandated in the [applicable Licence Condition Determination] and are included here for reference purposes only.

1. Deployment limits for ‘area-wide’ apparatus licensed transmitters (which are required to be recorded in the RRL) in the frequency range 24.7–25.1 GHz

## Coordination with legacy point-to-point fixed links

Interference from a proposed ‘area-wide’ apparatus licensed transmitter into a fixed link receiver is assessed using the steps described below. There is no requirement to assess interference from a point-to-point transmitter to an ‘area-wide’ apparatus licensed receiver – see section 2.1.7.

The coordination process calculates a wanted-to-unwanted signal level ratio at the fixed link receiver input and compares it against the relevant protection ratio value(s) given in the tables at Appendix A.

A prospective ‘area-wide’ apparatus licensed transmitter is not to be included in the RRL if it fails this coordination process.

**Step 1**: The first step is to identify all fixed link receivers that may be affected by the operation of the proposed ‘area-wide’ apparatus licensed transmitter. To identify potentially affected fixed link receivers, a recommended minimum distance cull around the site of the proposed transmitter of 100 km is required.

A frequency cull is then applied to further reduce the number of cases requiring more detailed coordination calculations and are based on protecting fixed link receivers from emissions at frequency offsets up to and including the second adjacent channel of the ‘area-wide’ apparatus licensed transmitter. Assuming a maximum transmit channel bandwidth of 400 MHz[[7]](#footnote-8), all fixed links with a centre frequency within 1056 MHz of the proposed transmitter centre frequency are to be included in the detailed coordination calculations.

**Step 2**: Calculate the level of wanted power at each receiver identified in step 1.

**Step 3**: Calculate the level of unwanted power at each receiver identified in step 1. Two separate cases exist (unwanted levels are to be calculated for both cases):

Case 1 – applies to ‘area-wide’ apparatus licensed transmitters which are required to be included in the RRL. Calculate the unwanted power level on the basis of the application details for the ‘area-wide’ apparatus licensed transmitter, using transmit power and antenna gain (with any discrimination taken into account), the licensed fixed point-to-point receiver gain (with any discrimination taken into account), and propagation loss from an appropriate propagation model.

Case 2 – applies to ‘area-wide’ apparatus licensed transmitters which are not required to be in the RRL. If the geographical location of the transmitter in case 1 is within 19 km[[8]](#footnote-9) of the fixed link receiver, coordination is deemed to fail. However, an ‘area-wide’ apparatus licensed transmitter may still be included in the RRL it can be shown that the coverage area of the case 2 transmitter does not overlap the interference zone of the fixed link receiver, assuming the notional transmitter characteristics in Table 3.

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Unit** |
| TRP | 23 | dBm/occupied bandwidth |
| Antenna gain | 17 (in the direction of the case 1 transmitter for calculation of coverage area and in the direction of the fixed link receiver for unwanted level calculations) | dBi |
| Antenna height | 5 | metres |

1. Notional parameters for transmitters not required to be included in the RRL

If the fixed link receiver is greater than 19 km from the case 1 transmitter, calculate the unwanted power level at the fixed link receiver assuming a transmitter located at the same coordinates as the case 1 transmitter and operating with the notional parameters in Table 3, the licensed fixed point-to-point receiver gain (with any discrimination taken into account), and propagation loss from an appropriate propagation model.

**Step 4**: Determine the applicable protection criteria for each victim receiver identified in step 1. To protect receivers from unacceptable interference, the unwanted power levels at a victim receiver must not exceed the required protection criteria for that receiver.

In this RALI protection ratios are used for the protection of fixed link receivers. Protection ratios should be adjusted to take account of actual path length and rainfall rate. Protection ratio correction factor graphs are also provided in Appendix A.

**Step 5**: A comparison of the calculated wanted-to-unwanted rations from steps 2 and 3 with the relevant protection ratio value(s) in the tables in Appendix A will determine if the protection criteria at the victim fixed link receiver is achieved. If the required protection ratio is not met, the coordination is deemed to fail and the prospective ‘area-wide’ apparatus licensed transmitter is not to be included in the RRL.

# Licensing

## Overview of Licensing

An ‘area-wide’ apparatus licence authorises the operation of radiocommunications devices within a frequency range and geographic area specified on the licence.

‘Area-wide’ apparatus licences authorising operation in the 24.7-29.5 GHz band will only be issued in geographic areas that are located outside the embargo areas defined in *RALI MS03: Spectrum Embargos* for the 24.7-29.5 GHz bands.

## Licence conditions

The operation of radiocommunications devices authorised by an ‘area-wide’ apparatus licence in the 26/28 GHz bands is subject to:

* Conditions specified in the *Radiocommunications Act 1992* (the Act), including an obligation to comply with the Act;
* Conditions specified in the Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 (as is force from time to time), the [applicable Licence Condition Determination] (as in force from time to time), and any other determinations made by the ACMA under section 107(1)(f) of the Act;
* Conditions specified in the licence; and
* Any further conditions imposed by the ACMA under section 111 of the Act.

## Assignment rules

This section outlines the rules for administratively issuing an ‘area-wide’ apparatus licence in the 26/28 GHz bands. An ‘area-wide’ apparatus licence in the 26/28 GHz bands can be issued, subject to the rules in this section, prior to device coordination requirements detailed in Chapter 3.

### Assignment instructions

‘Area-wide’ apparatus licences administratively issued in the 26/28 GHz bands must comply with the below instructions:

* The upper and lower frequency limits authorised by the licence must align with the channel raster in section 4.1.2.
* An ‘area-wide’ apparatus licence cannot be issued it its frequency range would overlap with the frequency range authorised by an existing ‘area-wide’ apparatus licence in the same HCIS cell. Only a single apparatus licence can be issued for a frequency range in a particular geographic area.
* The geographic area authorised by an ‘area-wide’ apparatus licence must consist of only whole HCIS cells.[[9]](#footnote-10)
* An ‘area-wide’ apparatus licence must not be issued if it includes frequencies in the range 25.5-27 GHz and it:
* Contains either of the following HCIS: MW4H6 of BV2A3, or
* Only contains one or more of the HCIS listed in Table 4.
* The allocation must comply with any Spectrum Embargo issued by the ACMA[[10]](#footnote-11)

| Area name | HCIS |
| --- | --- |
| New Norcia | BU7K, BU7L, BU7O, BU7P, BU8E, BU8F, BU8G, BU8I, BU8J, BU8K, BU8L, BU8M, BU8N, BU8O, BU8P, BV2B, BV2A1, BV2A2, BV2A4, BV2A5, BV2A6, BV2A7, BV2A8, BV2A9 |
| Tidbinbilla | MW4H1, MW4H2, MW4H4, MW4H5, MW4H7, MW4H8, MW4D7, MW4L2 |

1. SRS exclusion zones

### Channel raster

Channelling arrangements in 26/28 GHz band provide for a total of 96 x 50 MHz channels across the frequency range 24.7-29.5 GHz. The upper and lower frequency limits of the 50 MHz channels are calculated using the following formula:

Lower frequency limit = [24.65 + n(0.05)] MHz

Upper frequency limit = [24.7 + n(0.05)] MHz

Where:

n = channel number (integer range is between 1 to 96).

A licence can be issued which authorises operation over multiple aggregated 50 MHz channels.

### Assignment priority

The frequency range assigned to a licence must either:

* align with any existing 26/28 GHz band licences held by the licensee (either apparatus or spectrum), if that frequency range is available; or
* if the licensee does not already hold licences in the 26/28 GHz bands, the first frequency range available in the desired geographic area is to be assigned, noting the assignment priority in Table 5.

|  |  |
| --- | --- |
| Frequency range (GHz) | Channel assignment direction |
| 24.7-25.1 | Descending order |
| 25.1-27.5 | Ascending order |
| 27.5-29.5 | Ascending order |

1. Assignment priority

### Advisory notes

The following user selectable advisory note XX must be attached to all area-wide licences in the 26/28 GHz bands:

*A radiocommunications receiver operated under this licence is not afforded protection from interference by a radiocommunications transmitter operated under an apparatus licence, other than an ‘area-wide’ apparatus licence, which was issued before the commencement of this licence.*

*In planning deployments under this licence, the licensee should take account of existing apparatus licensed services and plan their services accordingly.*

The following user selectable advisory note YY must be attached to all ‘area-wide’ licences in the range 27.5-28.1 GHz in areas not subject to the 26 GHz band reallocation declaration or in the range 28.1-29.5 GHz:

*A radiocommunications receiver operated under this licence in the range 27.5-28.1 GHz and located outside the areas subject to the Radiocommunications (Spectrum Re-allocation—26 GHz band) Declaration 2019, or in the range 28.1-29.5 GHz is not afforded protection from interference caused by a radiocommunications transmitter operated under an earth apparatus licence or under the Radiocommunications (Communication with Space Object) Class Licence 2015, as in force from time to time.*

# Exceptions

Exceptions to the requirements of this RALI for prospective assignments require case-by-case consideration by the Manager, Spectrum Planning Section.

A request for exemption from the requirements of this RALI would need to be accompanied by evidence to support the request.

All requests for exemptions should be submitted to [freqplan@acma.gov.au](mailto:freqplan@acma.gov.au).

# RALI Authorisation

[not approved] xx/xx/2020

Manager  
Spectrum Planning Section  
Spectrum Planning and Engineering Branch

Communications Infrastructure Division  
Australian Communications and Media Authority

# Appendix A: Protection criteria for fixed link receivers

Protection ratios for 28 GHz band fixed services are provided in the following tables. Protection ratios apply at frequency offsets (between the channel edge of the receiver and the edge of the transmitter’s occupied bandwidth) of up to and including two-times the transmitters occupied channel bandwidth.

1. Protection ratios for victim 28 MHz channel fixed link receiver and interfering ‘area-wide’ apparatus licensed transmitter

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency offset (foffset)  (note 1) | BW < 100 MHz | 100 MHz ≤ BW < 200 MHz | 200 MHz ≤ BW < 400 MHz | BW ≥ 400 MHz |
| foffset < 0 MHz (note 2) | 62 | 59 | 56 | 53 |
| 0 MHz ≤ foffset < BW | 50 | 47 | 44 | 41 |
| BW ≤ foffset < 2xBW | 42 | 39 | 36 | 33 |

1. Protection ratios for victim 56 MHz channel fixed link receiver and interfering ‘area-wide’ apparatus licensed transmitter

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency offset (foffset)  (note 1) | BW < 100 MHz | 100 MHz ≤ BW < 200 MHz | 200 MHz ≤ BW < 400 MHz | BW ≥ 400 MHz |
| foffset < 0 MHz (note 2) | 64 | 62 | 59 | 56 |
| 0 MHz ≤ foffset < BW | 52 | 49 | 46 | 43 |
| BW ≤ foffset < 2xBW | 44 | 42 | 39 | 36 |

1. Protection ratios for victim 112 MHz channel fixed link receiver and interfering ‘area-wide’ apparatus licensed transmitter

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency offset (foffset)  (note 1) | BW < 100 MHz | 100 MHz ≤ BW < 200 MHz | 200 MHz ≤ BW < 400 MHz | BW ≥ 400 MHz |
| foffset < 0 MHz (note 2) | 64 | 64 | 62 | 59 |
| 0 MHz ≤ foffset < BW | 52 | 49 | 47 | 44 |
| BW ≤ foffset < 2xBW | 47 | 44 | 42 | 39 |

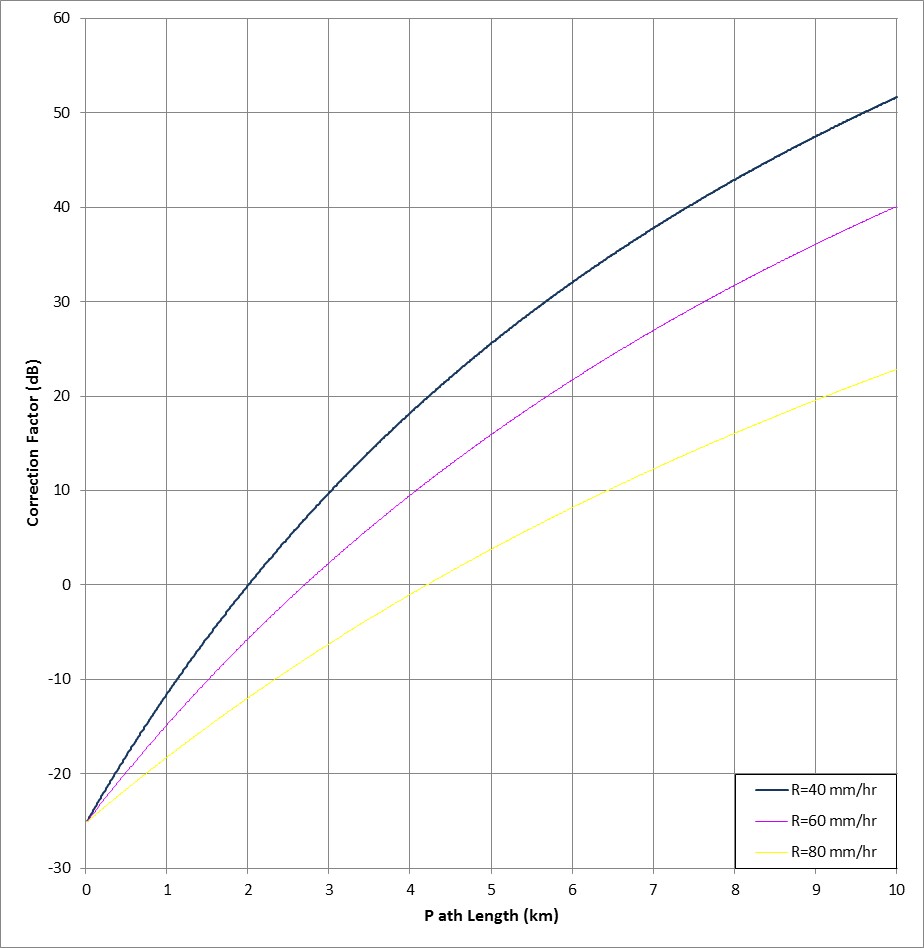
General notes:

1. foffset is the frequency offset between the channel edge of the receiver and the edge of the transmitter’s occupied bandwidth.
2. foffset is less than 0 MHz when there is an overlap of the receiver channel and the occupied bandwidth of the transmitter.
3. BW is the occupied bandwidth of the ‘area-wide’ apparatus licensed transmitter
4. Protection ratios are based on a 2 km path length and R (Rainfall rate in mm/hr for 0.01% of the worst month) of 40 mm/hr using Recommendation ITU-R P.530-15, section 2.4 as outlined in spectrum planning report SPP 2014/07. For other path lengths and rainfall rates refer to the appropriate path length correction factors graph on the following page.
5. Separate protection ratios for analog victims have not been defined. The above-mentioned protection ratios for digital systems shall be applied in such cases.

**THE 28 GHz BAND (27.5 – 29.5 GHz)**

**PROTECTION RATIO CORRECTION FACTORS**

**RAIN FADE**



R: Rainfall rate in mm/hr for 0.01% of the worst month.

For further details refer to Annex A to Appendix 1 of RALI FX-3.

1. In the RALI, the 26 GHz and 28 GHz bands are collectively referred to as the 26/28 GHz bands. [↑](#footnote-ref-2)
2. The pfd limit is not required to be met at some geographic boundaries – see the [applicable Licence Condition Determination] [↑](#footnote-ref-3)
3. See studies B and O in Attachment 3 to Annex 3 of Document [5-1/478](https://www.itu.int/md/R15-TG5.1-C-0478/en). [↑](#footnote-ref-4)
4. Also see Appendix 1 of RALI FX 3. [↑](#footnote-ref-5)
5. An example of a suitable propagation model is that set out in section 4.5.2 of ITU-R Recommendation P.526-14 *Propagation by diffraction.* [↑](#footnote-ref-6)
6. The interference level is based on Recommendation ITU-R SA.609-2 [↑](#footnote-ref-7)
7. Based on the maximum channel bandwidth of 400 MHz in the current 3GPP 38-series standard. [↑](#footnote-ref-8)
8. The notional coverage area has been estimated at 19 km (based on a fixed UE operating with parameters listed in Table 3 and a base station receive sensitivity of -83 dBm/50 MHz and an antenna gain of 23 dBi. [↑](#footnote-ref-9)
9. HCIS is a naming convention developed by the ACMA that applies unique ‘names’ to each of the cells that make up the Australian Spectrum Map Grid (ASMG) – more information is on the [ACMA website](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/pdf/The-Australian-spectrum-map-grid-2012.PDF?la=en). [↑](#footnote-ref-10)
10. Spectrum embargos are detailed on the [ACMA website](https://www.acma.gov.au/Industry/Spectrum/Radiocomms-licensing/Class-licences/spectrum-embargoes-spectrum-planning-acma). [↑](#footnote-ref-11)