Proposed updates to class licensing arrangements supporting 5G and other technology innovations

Consultation paper

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Executive summary 1

Issues for comment 2

Introduction 3

Class licensing and the LIPD Class Licence 3

LIPD Class Licence and standards 4

Overview of proposed updates 6

Invitation to comment 8

Making a submission 8

Appendix A: 5G and other Data Communications Systems in the 60 GHz band 10

Introduction 10

Current spectrum arrangements 11

Overseas arrangements 13

United States of America 13

Canada 13

United Kingdom 13

Europe 15

WRC-19 15

Proposed arrangements 16

Overview 16

Data Communications 17

Fixed Link Arrangements 17

Proposed variations to LIPD Class Licence 17

Data communications transmitters 17

Fixed point-to-point links (FCC arrangements) 17

Fixed point-to-point links (Ofcom arrangements) 18

Impact of proposals on existing services 18

Summary 19

Appendix B: General updates 20

Introduction 20

Ground and wall penetrating radars (30-12400 MHz) 20

Ultra-wide band systems 22

All transmitters (57-64 GHz) 24

Underground transmitters 24

Radiodetermination transmitters in the 76-77 GHz band 25

Executive summary

The ACMA is proposing updates to class licensing arrangements supporting 5G and other technology innovations to be implemented by varying the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 *(*the LIPD Class Licence). The purpose of the updates is to support new technology applications and bring Australia into line with international arrangements which support standardised and efficient equipment supply arrangements.

In brief, the proposed updates consider:

* Updating and expanding existing 60 GHz arrangements (57-66 GHz) for data communication systems, including 5G. Specifically:
* Adding 66–71 GHz
* Updating existing arrangements in 57–66 GHz regarding indoor and outdoor data communications systems.
* Adding new arrangements for ‘All transmitters’ in 57–64 GHz.
* Revising arrangements for underground transmitters in certain bands supporting fixed and mobile services between 70–520 MHz.
* Adding support for higher power radiodetermination transmitters i.e. radars (76–77 GHz).
* Adding support for ground and wall penetration radar as an adjunct to current apparatus licence arrangements (30–12400 MHz).

Aligning existing arrangements for ultra-wideband devices with US and European arrangements for generic (indoor and handheld) devices (3100–3400 MHz and 8500–9000 MHz) and aircraft applications (6000–8500 MHz).

The proposed updates are contained in the draft Radiocommunications (Low Interference Potential Devices) Class Licence Variation 2019 (No.1), available on the [ACMA website](http://www.acma.gov.au/).

The ACMA invites comment from interested parties on the proposed updates and draft variation by **COB, Friday 22 February 2019**. Information about making a submission is in the *Invitation to comment* section of this consultation paper.

In addition to the proposed variation, the ACMA invites suggestions from industry and individuals on devices and technologies for possible inclusion in the list of transmitters authorised under the LIPD Class Licence in future updates.

# Issues for comment

The ACMA invites comments on the proposed updates and draft variation to the LIPD Class Licence as set out in Appendix A ‘5G and other Data Communications Systems in the 60 GHz band’ and Appendix B ‘General updates’.

In the case of proposed arrangements for 60 GHz data communications systems at Appendix A, the ACMA is also seeking comment on:

1. Whether the arrangement for fixed point-to-point links from the United States Federal Communications Commission (FCC) or the United Kingdom Office of Communications (Ofcom) should be adopted.
2. The proposal that, in general, any change to arrangements should not adversely affect data communications systems operating under existing arrangements. Consequently, no changes are proposed to existing arrangements for:
3. apparatus licensed fixed point-to-point (self-coordinated) links that operate in the 58 GHz band (57.2–58.2 GHz)
4. outdoor data communication transmitters (59–63 GHz) that operate under item 64 of Schedule 1 to the LIPD Class Licence.

# Introduction

The ACMA is proposing updates to class licensing arrangements supporting 5G and other technology innovations to be implemented by varying the LIPD Class Licence.[[1]](#footnote-2)

Under subsection 136(1) of the *Radiocommunications Act 1992* (the Act), before varying a class licence the ACMA must invite interested persons to make representations about the proposed variations. Some of the changes fall across spectrum licensed bands and under subsection 136(1A) of the Act consultation is therefore also necessary with the spectrum licensees in those bands.

Under section 137 of the Act, the ACMA must not issue a class licence that is inconsistent with the spectrum plan (as made under section 30 of the Act). The proposed variations are consistent with the *Australian Radiofrequency Spectrum Plan* *2017*[[2]](#footnote-3) (the Spectrum Plan).

This consultation paper provides the context for the proposed variation to assist interested parties in preparing written comments.

The paper provides:

* an overview of class licensing and the LIPD Class Licence
* a description of the proposed variations
* an invitation to comment on the proposed variations

an invitation for suggestions from industry and individuals on possible devices and technologies for inclusion in future updates.

A copy of the proposed Radiocommunications (Low Interference Potential Devices) Class Licence Variation 2019 (No.1) is available on the [ACMA website](http://www.acma.gov.au/)..

A reference to an item of the LIPD Class Licence should be taken as a reference to an item of Schedule 1 to the LIPD Class Licence.

## Class licensing and the LIPD Class Licence

It is a general requirement of the Act that the operation of all radiocommunications devices within Australia be authorised by a radiocommunications licence.

A class licence is one type of licence available to authorise the operation of radiocommunications devices. It is an effective and efficient means of spectrum management for services where a limited set of common frequencies is employed, and equipment is operated under a common set of conditions.

A class licence sets out the conditions under which any person is permitted to operate any device to which the class licence is applicable—it is not issued to an individual user and does not involve the payment of licence fees. A class licence is issued by the ACMA under section 132 of the Act by making a legislative instrument that is registered on the Federal Register of Legislation (see [www.legislation.gov.au](https://www.legislation.gov.au/)).

The LIPD Class Licenceauthorises the operation of a wide range of radiocommunications devices in various segments of the radiofrequency spectrum. These devices are considered to have a low potential to cause interference to other devices due to their technical and operational characteristics. Example characteristics that contribute to a low potential for interference include:

* low power and operation over short distances (relative to other services operating in the same spectrum)
* low duty cycle of transmissions
* low spectral density compared to other services
* use that is limited to indoors mitigating the potential to cause interference to other devices

interference can be self-managed by users.

It is a condition of the LIPD Class Licence that the operation of a radiocommunications device does not cause interference to other radiocommunications services (see paragraph 4(1)(b) of the LIPD Class Licence). A device used under the LIPD Class Licence will also not be afforded protection from interference caused by other radiocommunications devices operated under the LIPD Class Licence. If interference does occur, it is the responsibility of the user of the radiocommunications device authorised by the LIPD Class Licence to take measures to resolve that interference.

The transmitters authorised by the LIPD Class Licence do not require individual frequency coordination for interference management purposes. Examples of equipment covered by the LIPD Class Licence include wireless microphones, electronic road tolling systems, industrial sensors, underground transmitters, Wi-Fi and Bluetooth devices.

In addition to the proposed updates detailed in this paper, the ACMA invites suggestions from industry and individuals on devices and technologies for possible inclusion in the list of transmitters authorised under the LIPD Class Licence in future updates.

## LIPD Class Licence and standards

In practice, the LIPD Class Licence operates in concert with the *Radiocommunications (Short Range Devices) Standard 2014* (the Short Range Devices Standard) made by the ACMA under section 162 of the Act.

The LIPD Class Licence authorises the operation of specified devices, while the Short Range Devices Standard regulates the technical performance of devices supplied to the Australian market.

The Short Range Devices Standard does not operate independently. It specifies that the applicable standard is either the standard listed in the LIPD Class Licence or, if no standard is listed, the industry standard being the Standards Australia standard AS/NZS 4268: *AS/NZS 4268:2017 Radio equipment and systems—Short range devices—Limits and methods of measurement* (the ‘industry standard’) for short range devices.

There is a 12-month transition period whenever arrangements change before compliance with the new requirements of the Short Range Devices Standard becomes mandatory.

Under these arrangements, the ACMA is able to regulate both the operation of the devices (via the LIPD Class Licence itself) and their supply to market (via the Short Range Devices Standard, augmented by labelling and record-keeping requirements).

If the variation to the LIPD Class Licence is made, the applicable standards for items subject to the variation will be those standards listed in the LIPD Class Licence.

# Overview of proposed updates

In the [*Five-year spectrum outlook 2018–22*](https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/5-Year-Spectrum-Outlook/five-year-spectrum-outlook) (FYSO), the ACMA advised of its intention to develop a proposed update to the LIPD Class Licence for consultation. We have considered the updates in two parts:

* Appendix A ‘5G and other Data Communications Systems in the 60 GHz band’

Appendix B ‘General updates” (considers all other updates)’.

The key changes identified for consultation include:

* **60 GHz data communications systems**: Proposing updates similar to those of the FCC for ‘unlicensed’[[3]](#footnote-4) data communications systems in the frequency range 64–71 GHz. These are intended to provide additional options for wireless data communications, including support for future 5G services. The scope of this work also considers whether changes are required to existing class and apparatus licensed arrangements supporting 60 GHz data communication systems which overlap the frequency ranges of the proposed updates to the LIPD Class Licence.
* **All transmitters (57–64 GHz)**: Introducing provision for all transmitters with maximum equivalent isotropically radiated power (EIRP) of 100 mW in the 57–64 GHz band, similar to arrangements contained in Annex 1 of ERC[[4]](#footnote-5) Recommendation 70–03, May 2018.
* **Underground transmitters (VHF Mid & High bands, 400 MHz band[[5]](#footnote-6))**: Revising existing arrangements for underground transmitters in the frequency ranges covering the VHF mid- and high-frequency bands and the 400 MHz band to include segments supporting fixed services, in addition to mobile services (as under current arrangements) and spectrum covered by Spectrum Plan footnote AUS 91 (420–430 MHz)

**Radiodetermination transmitters (76–77 GHz):** Changes to arrangements for LIPD Class Licence item 69, radiodetermination transmitters operating in the 76–77 GHz band, to increase the maximum EIRP from 25 W to 25 dBW (316 W) similar to arrangements contained in Annex 4 of ERC Recommendation 70–03 and the FCC under FCC Title 47 Part 95 Subpart M.

In the FYSO the ACMA also identified a further group of items that could be included dependent on other priorities. Of these the ACMA is proceeding with consideration of:

* **Ground penetrating radar (30–12400 MHz)**: Introducing provisions supporting ground penetrating radars similar to FCC Rules Part [15.509](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1509) ‘Technical requirements for ground penetrating radars and wall imaging systems’.

**Ultra-wideband systems**: Further alignment of Australian arrangements for ultra-wideband systems with US and European arrangements. Under consideration are expanding arrangements supporting generic (indoor and handheld devices) to include 3100–3400 MHz and 8500–9000 MHz and supporting aircraft applications in 6000–8500 MHz.

The ACMA is not including one item that was tentatively identified—considering provision for very low-powered devices similar to those of FCC Rules Part [15.209](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1209). The provisions of Part 15.209 specify general field strength levels (which equate to radiated power levels in the order of nanowatts) that cannot be exceeded in any band from 9 kHz and above except as provided elsewhere in Part 15. The available bands need to be considered in the context of FCC Rules Part [15.205](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1205) ‘Restricted bands of operation’ (bands where ‘sensitive’ services operate and only spurious emissions are permitted).

This item is not being included so the ACMA can further consider how the FCC arrangements might apply in the Australian spectrum environment.

# Invitation to comment

## Making a submission

The ACMA invites comments on the issues set out in this consultation paper or any other issues relevant to the proposed variations to the Radiocommunications (Low Interference Potential Devices) Class Licence 2015.

* [**Online submissions**](http://www.acma.gov.au/theACMA/Consultations/Consultations)—submissions can be made via the comment function or by uploading a document. The online consultation page provides details.
* Submissions by post—can be sent to:

The Manager

Spectrum Engineering Section and Space Section

Spectrum Planning and Engineering Branch

Australian Communications and Media Authority

PO Box 78

Belconnen ACT 2616

**The closing date for submissions is COB, Friday 22 February 2019.**

Electronic submissions in Microsoft Word or Rich Text Format are preferred.

Enquiries

* Consultation enquiries can be emailed to freqplan@acma.gov.au.
* Media enquiries can be directed to the media manager on 02 9334 7838 or by email to media@acma.gov.au.

Effective consultation

The ACMA is working to enhance the effectiveness of its stakeholder consultation processes, which are an important source of evidence for its regulatory development activities. To assist stakeholders in formulating submissions to its formal, written consultation processes, it has developed [*Effective consultation—a guide to making a submission*](http://www.acma.gov.au/theACMA/About/Corporate/Responsibilities/acma-evidenceinformed-regulation-and-effective-consultation). This guide provides information about the ACMA’s formal written public consultation processes and practical guidance on how to make a submission.

Publication of submissions

In general, the ACMA publishes all submissions it receives, including any personal information in the submissions (such as names and contact details of submitters). The ACMA prefers to receive submissions that are not claimed to be confidential. However, the ACMA accepts that a submitter may sometimes wish to provide information in confidence. In these circumstances, submitters are asked to identify the material (including any personal information) over which confidentiality is claimed and provide a written explanation for the claim.

The ACMA will consider each confidentiality claim on a case-by-case basis. If the ACMA accepts a claim, it will not publish the confidential information unless authorised or required by law to do so.

Release of submissions where authorised or required by law

Any submissions provided to the ACMA may be released under the [*Freedom of Information Act 1982*](https://www.comlaw.gov.au/Series/C2004A02562) (unless an exemption applies) or shared with various other government agencies and certain other parties under Part 7A of the [*Australian Communications and Media Authority Act 2005*](https://www.comlaw.gov.au/Series/C2005A00044). The ACMA may also be required to release submissions for other reasons including for the purpose of parliamentary processes or where otherwise required by law (for example, under a court subpoena). While the ACMA seeks to consult submitters of confidential information before that information is provided to another party, the ACMA cannot guarantee that confidential information will not be released through these or other legal means.

Privacy

The [*Privacy Act 1988*](http://www.comlaw.gov.au/Series/C2004A03712) imposes obligations on the ACMA in relation to the collection, security, quality, access, use and disclosure of personal information. These obligations are detailed in the [*Australian Privacy Principles*](http://www.oaic.gov.au/privacy/privacy-resources/privacy-fact-sheets/other/privacy-fact-sheet-17-australian-privacy-principles).

The ACMA may only collect personal information if it is reasonably necessary for, or directly related to, one or more of its functions or activities.

The purposes for which personal information is being collected (such as the names and contact details of submitters) are to:

* contribute to the transparency of the consultation process by clarifying, where appropriate, whose views are represented by a submission

enable the ACMA to contact submitters where follow-up is required or to notify them of related matters (except where submitters indicate they do not wish to be notified of such matters).

The ACMA will not use the personal information collected for any other purpose, unless the submitter has provided their consent or the ACMA is otherwise permitted to do so under the Privacy Act.

Submissions in response to this paper are voluntary. As mentioned above, the ACMA generally publishes all submissions it receives, including any personal information in the submissions. If a submitter has made a confidentiality claim over personal information that the ACMA has accepted, the submission will be published without that information. The ACMA will not release the personal information unless authorised or required by law to do so.

If a submitter wishes to make a submission anonymously or use a pseudonym, they are asked to contact the ACMA to see whether it is practicable to do so in light of the subject matter of the consultation. If it is practicable, the ACMA will notify the submitter of any procedures that need to be followed and whether there are any other consequences of making a submission in that way.

Further information on the Privacy Act and the ACMA’s privacy policy is available at [www.acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy). The privacy policy contains details about how an individual may access personal information about them that is held by the ACMA, and seek the correction of such information. It also explains how an individual may complain about a breach of the Privacy Act and how the ACMA will deal with such a complaint.

# Appendix A: 5G and other Data Communications Systems in the 60 GHz band

## Introduction

The ACMA is proposing updates to class licensing arrangements for 60 GHz (57-71 GHz) data communications systems. The proposed updates are intended to expand the available frequency range from 57–66 GHz to 57–71 GHz and provide additional options for wireless data communications, including support for future 5G services.

The ACMA outlined its intention to consider expansion of current arrangements for 60 GHz wireless data communication systems in its FYSO*[[6]](#footnote-7)* The ACMA indicated that it would develop a proposed update to the LIPD Class Licence to include arrangements similar to those of the FCC for ‘unlicensed’[[7]](#footnote-8) data communications systems in the frequency range 64–71 GHz.

The ACMA also plans to consider whether changes are required to existing arrangements supporting the 60 GHz band which overlap the frequency ranges of the proposed updates to the LIPD Class Licence, specifically arrangements for:

* Apparatus licensed point-to-point (self-coordinated) stations[[8]](#footnote-9) operating in the 57–59 GHz (58 GHz) band
* Existing items in the LIPD Class Licence for data communication transmitters that might be superseded by the new proposed arrangements, namely:
* Item 64: Outdoor data communication transmitters (59–63 GHz) with an EIRP of 150 watts
* Item 65: Data communication transmitters (57–66 GHz) (both indoor and outdoor) with an EIRP of 20 watts.

This Appendix outlines the proposed changes to the LIPD Class Licence to support operation of 60 GHz data communications systems under arrangements similar to those of the FCC. It also considers the impact on existing overlapping frequency arrangements and possible consequential changes. Presented are:

* current Australian spectrum arrangements in the frequency range 57–71 GHz
* overseas developments
* proposed changes to the LIPD Class Licence.

## Current spectrum arrangements

Under the Spectrum Plan there are allocations in the frequency range 57–71 GHz to the earth-exploration satellite, fixed, inter-satellite, mobile, space-research, radio astronomy, radiolocation, mobile-satellite, radionavigation and radionavigation satellite services.

Currently spectrum arrangements support the operation of:

* fixed apparatus licences, point-to-point (self-coordinated) links in the 58 GHz band (57–59 GHz)
* a variety of applications operating under the LIPD Class Licence in the frequency range 57–66 GHz.

58 GHz & 75 GHz band point-to-point (self-coordinated)

Self-coordinated arrangements were first introduced in 2007 with the technical criteria and coordination procedures contained in Radiocommunications Assignment and Licensing Instruction (RALI) [FX 20](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/pdf/RALI-FX20-Millimetre-Wave-Point-to-Point-Self-Coordinated-Stations.pdf?la=en) *Millimetre Wave Point-to-Point (Self-coordinated) Stations operating in the 58 GHz, 75 GHz and 85 GHz bands*.

In the 58 GHz band there is a 100 MHz guard band at each end of the band and self-coordinated links are authorised to operate in the frequency range 57.1–58.9 GHz with a maximum EIRP of 25 dBW and a maximum transmitter output power of 10 mW.

In the 75 GHz band (71–76 GHz) there is a 125 MHz guard band at each end and self-coordinated links are authorised to operate in the frequency range 71.125–75.875 MHz with maximum EIRP (up to 85 dBm) as defined by the ETSI EN 302 217-3[[9]](#footnote-10) standard and a maximum transmitter power of 30 dBm.

Self-coordinated links operate on a no protection, no interference basis, with the links registered to facilitate (industry) self-coordination as per RALI FX 20. Prospective licensees intending to operate in the 58 GHz band within 10 kilometres of radioastronomy sites at the Paul Wild Observatory, the Mopra Observatory and the Canberra Deep Space Communications Complex are required to notify the CSIRO.

As of 1 November 2018 there were nineteen 58 GHz links and 648 links in the adjacent 75 GHz band recorded in the ACMA’s Register of Radiocommunications Licences.

LIPD Class Licence

In the frequency range 57–71 GHz the LIPD Class Licence supports the operation of a variety of radiodetermination transmitters, data communications transmitters and non-specific ‘all transmitter’ applications[[10]](#footnote-11). Class licence arrangements for 60 GHz data communications transmitters were first introduced around 2005. Two items of Schedule 1 of the LIPD Class Licence authorise the operation of 60 GHz data communications systems:

* Item 64 authorises operation of outdoor data communications transmitters in the 59–63 GHz band with a maximum EIRP of 150 W and a maximum transmitter power of 20 mW.
* Item 65 authorises operation of data communications transmitters in the 57–66 GHz band with a maximum EIRP of 20 W and the transmitter must comply with FCC Rules Title 47 Part 15 Section 255.

Summary

Current arrangements for 60 GHz and 70 GHz bands are summarised in Table 1 and illustrated in

1. Current arrangements for the 60 GHz and 70 GHz bands

| **Type of transmitter** | **Frequency band** | **Technical parameters** | **Source** |
| --- | --- | --- | --- |
| Outdoor data communications transmitters | 59–63 GHz | Maximum EIRP limited to 150 W (51 dBm), maximum transmitter power of 20 mW (13 dBm) | LIPD Class Licence, item 64 |
| Millimetre point-to-point (self-coordinated) stations | 57–59 GHz | Maximum EIRP limited to 25 dBW (55 dBm), maximum transmitter power of 10 mW | RALI FX 20 |
| Data communications transmitters | 57–66 GHz | Maximum EIRP limited to 20 W (43 dBm) | LIPD Class Licence, item 65 |
| Millimetre Point-to-point (self-coordinated) stations | 71.125–75.875 GHz | Maximum EIRP limited to 85 dBm, maximum transmitter power of 30 dBm | RALI FX 20 |

1. Illustration of 60 GHz band arrangements



## Overseas arrangements

### United States of America

In 2016[[11]](#footnote-12) the FCC extended the frequency range of arrangements for ‘unlicensed’ data communications systems from 57–64 GHz to 57–71 GHz. The changes were intended to provide further options for data communications to support future 5G services (for example, backhaul in mobile broadband networks).

The requirements are contained in FCC Rules Title 47 Part [15.255](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1255) ‘Operation within the band 57–71 GHz’. Devices are authorised to operate provided transmitter emissions do not exceed the following EIRP levels:

* the average and peak power of any emission shall not exceed 40 dBm and 43 dBm respectively, or

for fixed point-to-point transmitters located outdoors, the average and peak power of any emissions shall not exceed 82 dBm and 85 dBm respectively, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi.

The FCC rules specify conditions for operation on aircraft, spurious emissions limits, conducted power limits and measurement requirements.

The FCC also supports arrangements similar to those in Australia for self-coordinated point to point fixed links under FCC Rules Title 47 Part 101 [Subpart Q](https://www.ecfr.gov/cgi-bin/text-idx?SID=5635e1354c0643c0aaf23a56e1c49472&mc=true&node=pt47.5.101&rgn=div5#sp47.5.101.q) ‘Service and Technical Rules for the 70/80/90 GHz Bands’. Under these arrangements the 71–76 GHz band is available for licensing on a basis of non-exclusive nationwide licenses with links required to be registered.

### Canada

Existing Canadian arrangements are equivalent to the US FCC arrangements outlined above but limited to the 57–64 GHz band[[12]](#footnote-13).

In its [Spectrum Outlook 2018 to 2022](https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11403.html)[[13]](#footnote-14) released 6 June 2018, Innovation, Science and Economic Development (IESD) Canada advised that it expects to extend current licence-exempt arrangements in the frequency range 57–64 GHz to 57‑71 GHz for terrestrial flexible use and other services in late 2021.

### United Kingdom

On 5 July 2018 Ofcom announced the outcomes and decisions of its “Review of spectrum used by fixed wireless services”[[14]](#footnote-15). Those decisions included the intention to introduce arrangements in the 60 GHz band similar to those of the FCC, though with differences in treatment of fixed outdoor transmitters. [Regulations](http://www.legislation.gov.uk/uksi/2018/1140/made) implementing those decisions came into force on 27 November 2018.[[15]](#footnote-16)

In summary, Ofcom revised its arrangements:

1. For short range wideband data transmission (as specified in [IR 2030](https://www.ofcom.org.uk/__data/assets/pdf_file/0028/84970/ir-2030.pdf)—UK Interface Requirements 2030 Licence Exempt Short Range Devices), to:
* extend the current licence exemption and technical conditions for 57–66 GHz up to 71 GHz; enabling the operation of non-fixed outdoor short-range devices with a maximum EIRP of 40 dBm and a maximum mean power density of 13 dBm/MHz.
* introduce new technical conditions to allow licence-exempt use of equipment operating in a fixed outdoor installation in the 57–71 GHz band with maximum EIRP of 40 dBm and maximum transmit output power of 27 dBm.
1. For fixed wireless systems (as specified in [IR 2078](https://www.ofcom.org.uk/__data/assets/pdf_file/0028/84646/ir_2078.pdf) ‘UK Interface Requirement 2078, Fixed Wireless Systems in the frequency band 57.1 to 70.875 GHz’), to:
* extend the current licence exemption (from 57.1 GHz – 63.9 GHz) to 70.875 GHz, and by doing so, change the current authorisation approach for fixed wireless systems operating in the 64 – 66 GHz band from light-licence to licence-exempt.
* extend the current technical conditions (from 57.1–63.9 GHz) up to 70.875 GHz.
* maintain the existing radiated power limits and antenna requirements (maximum EIRP of 55 dBm and maximum transmitter power of 10 dBm; minimum antenna gain of 30 dBi).

In effect the Ofcom arrangements parallel those of the FCC (and ISED Canada in 57–64 GHz) with exceptions for outdoor systems.

For fixed outdoor wireless systems (comparable to FCC fixed point-to-point arrangements) the first difference is specifying a lower maximum EIRP level of 55 dBm (compared to 85 dBm in the US) as Ofcom has expressed the view[[16]](#footnote-17) that there is limited evidence to suggest the need to increase EIRP levels above 55 dBm.

The second difference is the implementation of a 125 MHz frequency separation between the licence-exempt 57–71 GHz band and the coordinated fixed links in the 71–75 GHz band[[17]](#footnote-18) to minimise adjacent channel interference. Under Ofcom arrangements, coordinated fixed links are limited to operating above 71.125 GHz, effectively providing a 250 MHz guard band.

Ofcom considered this decision a precautionary measure and subject to further technical evidence on the risk of adjacent channel interference following concerns raised in stakeholder responses to its review. Ofcom considers that including a guard band would not impact on the equipment development opportunities within the new combined 57–71 GHz band given the recommended international channel arrangements for multigigabit wireless systems[[18]](#footnote-19) (see, for example, those of Recommendation ITU-R M.2003-2 Multiple Gigabit Wireless Systems in frequencies around 60 GHz which recommends channel centres of 58.32, 60.48, 62.64, 64.80 GHz, 66.96 GHz, and 69.12 GHz with a channel band of 2.16 GHz results in 800 MHz separation between the upper frequency edge of the highest channel and 71 GHz).

Australian arrangements under RALI FX20 for self-coordinated links in the 71–76 GHz band are similar to the Ofcom arrangements in that under both there is a guard band from 71–71.125 GHz.

1. Ofcom fixed link arrangements at 71 GHz[[19]](#footnote-20)

V band (licence exempt)

E band

(Ofcom coordinated)

E band

(self coordinated)

100 MHz

250 MHz

250 MHz

125 MHz

57.1

70.875

71.125

73.125

73.375

75.875

76 GHz

71 GHz

57 GHz

### Europe

In January 2018, the Radio Spectrum Policy Group[[20]](#footnote-21) of the European Commission published its paper ‘*Strategic Spectrum Roadmap Toward 5G for Europe, RSPG Second Opinion on 5G networks*’. In this paper the Radio Spectrum Policy Group stated that a general authorisation is foreseen in the 66–71 GHz band which could be an important band for 5G. This matter is being considered by the Electronic Communications Committee (ECC) Working Group Frequency Management Group on Short Range Devices[[21]](#footnote-22).

Current European arrangements support ‘unlicensed’ wideband data transmission systems in the 57–66 GHz band with a maximum EIRP of 40 dBm and maximum mean EIRP density of 13 dBm/MHz (refer to [ERC Recommendation (70–03)](https://www.ecodocdb.dk/document/845), Annex 3, item c). Arrangements are similar to those of Canada and current Australian arrangements for data communications systems. They are also similar to those of Ofcom and the FCC, though over a reduced frequency range.

For fixed point-to-point links, European arrangements support operation in the 54–64 GHz band (refer ECC Recommendation [(09)01](https://www.ecodocdb.dk/document/492)) and in the 64–66 GHz band (refer ECC Recommendation [(05)02](https://www.ecodocdb.dk/document/474)) under ‘light licensing’[[22]](#footnote-23) arrangements. Technical parameters are similar to those currently specified by the ACMA for 58 GHz self-coordinated fixed links.

### WRC-19

International Telecommunication Union (ITU) World Radiocommunication Conference 2019 (WRC-19) agenda item 1.13 will consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis. This agenda item is widely acknowledged to be focusing on spectrum harmonisation requirements for 5G mobile broadband technologies. Frequency bands under consideration include 66–76 GHz, which overlaps the frequency range of the proposed update to the LIPD Class Licence.

The ACMA is of the view that there is significant interest in Australia in progressing this work, in parallel with ITU consideration, as has been done in the United States and the United Kingdom.

Summary

Table 2 provides an overview summary of relevant overseas arrangements.

1. Overview of overseas arrangements in the 60 GHz band

|  |  |  |  |
| --- | --- | --- | --- |
| **Country/Region** | **Frequency band** | **Technical parameters** | **Authorisation**  |
| United States  | 57–71 GHz | Maximum mean EIRP limited to 40 dBm, maximum peak EIRP limited to 43 dBmFor fixed outdoor maximum average EIRP is limited to 82 dBm, maximum peak EIRP limited to 85 dBm and maximum antenna gain of 51 dBi | unlicensed |
| Canada | 57–64 GHz | Maximum mean EIRP limited to 40 dBm, maximum peak EIPR limited to 43 dBmFor fixed outdoor maximum average EIRP is limited to 82 dBm, maximum peak EIRP limited to 85 dBm and maximum antenna gain of 51 dBi  | unlicensed |
| United Kingdom | 57–71 GHz | Non-fixed outdoor maximum mean EIRP limited to 40 dBm, EIRP spectral density limited to 13 dBm/MHzFixed outdoor maximum mean EIRP limited to 40 dBm and maximum transmit output power of 27 dBm | licence-exempt |
| 57.1–70.875 GHz | Maximum EIRP of 55 dBm, maximum transmit output power of 10 dBm, and maximum antenna gain of 30 dBi |
| Europe | 57–66 GHz | Maximum mean EIRP limited to 40 dBm and EIRP spectral density limited to 13 dBm/MHz | general authorisation |

## Proposed arrangements

### Overview

The ACMA considers that alignment with international arrangements will have potential benefits for global harmonisation and economies of scale for 60 GHz data communications equipment, including support for future 5G services.

However, noting differences between Ofcom and FCC arrangements for fixed point-to-point links, the ACMA is seeking industry and public views as to which is the more appropriate option in the Australian spectrum context. The proposals outlined below have been developed to illustrate how such arrangements might be implemented to assist industry considerations in that regard.

### Data communications transmitters

The proposed variation to the LIPD Class Licence for 60 GHz data communications systems has been drafted to include arrangements consistent with those of the FCC and Ofcom. That is, to support data communications transmitters operating in the frequency range 57–71 GHz with a maximum EIRP of 20 W where the transmitter must comply with FCC Rules Title 47 Part 15 Section 255.

### Fixed point-to-point links

The ACMA has considered what are the appropriate arrangements (that is, FCC or Ofcom arrangements) for fixed point-to-point links operating under the LIPD Class Licence and is seeking industry and public views on this matter.

Options identified are:

1. Support fixed point-to-point data communications transmitters used outdoors operating in the frequency range 57–71 GHz with a maximum peak EIRP of 85 dBm where the transmitter must comply with FCC Rules Title 47 Part 15 Section 255: the FCC arrangements for fixed links.

**OR**

Support fixed point-to-point data communications transmitters used outdoors operating in the frequency range 57.1–70.85 GHz with a maximum EIRP of 55 dBm where the maximum transmitter power must not exceed 10 mW and the minimum antenna gain must be 30 dBi: the Ofcom arrangements for fixed links.

1. Illustration of proposals



## Proposed variations to LIPD Class Licence

Proposed LIPD Class Licence updates and consequential changes are outlined below.

### Data communications transmitters

Currently item 65 of Schedule 1 to the LIPD Class Licence authorises operation of data communications transmitters in the 57–66 GHz band with a maximum EIRP of 20 W and the transmitter must comply with FCC Rules Title 47 Part 15 Section 255.

To support data communications transmitters operating in the frequency range 57–71 GHz the variation to the LIPD Class Licence proposes to extend the upper frequency limit from 66 GHz to 71 GHz.

### Fixed point-to-point links (FCC arrangements)

Aligning with FCC arrangements for fixed point-to-point links requires inclusion of an item in the LIPD Class Licence similar to the proposal for data communications transmitters except that power limits are specified as maximum average EIRP of 82 dBm and a maximum peak EIRP of 85 dBm and transmitters must comply with FCC Rules Title 47 Part 15 Section 255.

Noting that under the Spectrum Plan there is a co-primary allocation to the radioastronomy service in the 58.2–59 GHz and 64–65 GHz bands, and similarly to arrangements for 58 GHz self-coordinated point-to-point links, it is proposed to include a limitation that the transmitter must not be operated in these bands within the nominated distance (currently defined as 10 kilometres in the LIPD Class Licence) from a specified Australian radioastronomy site without approval from the CSIRO.

### Fixed point-to-point links (Ofcom arrangements)

Aligning with Ofcom arrangements for fixed wireless systems would require inclusion of an item in Schedule 1 to the LIPD Class Licence that supports fixed point-to-point data communications transmitters used outdoors operating in the frequency range 57.1–70.85 GHz with a maximum EIRP of 316 W (55 dBm) where the maximum transmitter power must not exceed 10 mW and the minimum antenna gain must be 30 dBi.

As noted in the above subsection, due to the co-primary allocation to the radioastronomy service in the 58.2–59 GHz and 64–65 GHz bands in the Spectrum Plan, it is proposed to include a limitation that transmitters must not be operated in these bands within the nominated distance (currently defined as 10 kilometres in the LIPD Class Licence) from a specified Australian radioastronomy site without approval from the CSIRO.

## Impact of proposals on existing services

Item 64: Outdoor data communications transmitters (59–63 GHz, EIRP 51 dBm)

Outdoor data communications systems operating under item 64 would meet the proposed EIRP limit for point-to-point links for under both the FCC (85 dBm) and Ofcom (55 dBm) options. However, the proposed new arrangements for point-to-point links would introduce new requirements to comply with either the FCC, an ETSI standard or a UK Interface Requirement.

To avoid adversely affecting data communications systems operating under item 64 as it currently exists (by introducing new requirements) the ACMA does not propose to change item 64.

Apparatus licensed 58 GHz point-to-point (self-coordinated) links (EIRP 55 dBm)

Similar to the discussion on item 64, apparatus licensed self-coordinated links operating in the 58 GHz band would meet the proposed EIRP limit for point-to-point links under both the FCC (85 dBm) and Ofcom (55 dBm) options. However, operating under the LIPD Class Licence would mean that supply and operation of equipment will be subject to ACMA’s [radiocommunications standards](https://www.acma.gov.au/Industry/Suppliers/Regulatory-arrangements/Radiocommunications-devices/radiocommunications-standards-list) requirements via the [Short](https://www.legislation.gov.au/Series/F2014L01253) Range Devices Standard. Currently there are no mandated radiocommunications standard for apparatus licensed fixed point-to-point (self-coordinated) links in the 58 GHz band.

The ACMA does not intend to change (or remove) self-coordinated arrangements in the 58 GHz band, allowing licensees to decide which licensing regime to operate under (class or apparatus licence). The ACMA will advise relevant licensees so that they are aware of the changed arrangements (if implemented).

## Summary

Comments on issues raised in this Appendix are being sought as part of the consultation on the proposed variation to LIPD Class Licence. For 60 GHz data communications systems the ACMA invites comments on the following proposals:

Data communications systems

Variation to item 65 (Data communications transmitters in the frequency range 57–66 GHz) of Schedule 1 to the LIPD Class Licence to extend the frequency band from 57–66 GHz to 57–71 GHz.

Fixed point-to-point

The ACMA seeks industry and public views of which of the following two options should be implemented for fixed outdoor point-to-point data communications systems in the 57–71 GHz band:

1. Adopting FCC arrangements by inclusion of an item in Schedule 1 to the LIPD Class Licence that supports fixed outdoor point-to-point data communications systems operating in the frequency range 57–71 GHz where:
* The transmitter maximum average EIRP must not exceed 82 dBm
* The transmitter maximum peak EIRP must not exceed 85 dBm
* The transmitter must comply with FCC Rules Title 47 Part 15 Section 255
* The transmitter must not be operated in the frequency ranges 58.2–59 GHz and 64–65 GHz within the nominated distance from a specified Australian radioastronomy site without approval from the CSIRO.

**OR**

1. Adopting Ofcom arrangements by inclusion of an item in Schedule 1 to the LIPD Class Licence that supports fixed outdoor data communications transmitters operating in the frequency range 57–70.875 GHz where:
* The maximum transmitter EIRP must not exceed 55 dBm
* The maximum transmitter power must not exceed 10 mW
* The transmitter must comply with either ETSI Standard EN 302 217 or UK Interface Requirement IR 2078
* The transmitter must not be operated in the frequency ranges 58.2–59 GHz and 64–65 GHz within the nominated distance from a specified Australian radioastronomy site without approval from the CSIRO.

Grandfathering of existing arrangements

So as to not adversely affect outdoor data communications systems operating under item 64 of the LIPD Class Licence (for example, by introducing new requirements to comply with the FCC Rules, UK Interface Requirements or an ETSI standard), no other changes are envisaged. That is, there are no proposed changes to item 64, outdoor data communications transmitters (59–63 GHz).

The ACMA also does not intend to change (or remove) apparatus licensed self-coordinated arrangements in the 58 GHz band, allowing licensees to decide which licensing regime to operate under (class or apparatus licence). The ACMA will advise relevant licensees about changes to arrangements (if implemented).

# Appendix B: General updates

## Introduction

Detailed in this Appendix are the ACMA’s proposed updates to the LIPD Class Licence for ‘All transmitters (57–64 GHz)’, underground transmitters (VHF Mid & High bands and the 400 MHz band), radiodetermination transmitters (76–77 GHz), ground penetrating radar (30–12400 MHz) and ultra-wideband systems. The proposed updates are intended to support new technology applications and align Australia with international arrangements.

## Ground and wall penetrating radars (30–12400 MHz)

The ACMA is considering introducing class licence arrangements for ground penetrating radar and wall probing radar (GPR/WPR) systems that operate in the frequency range 30–12400 MHz. GPR/WPR systems are designed to radiate low level signals into materials, typically the ground, or in the case of WPR into the concrete, brick or stone of a civil engineering or building structure. They are intended for use by professionals. They are different from the more widely available pipe and cable detectors which operate like metal detectors and work on the principle of magnetic induction[[23]](#footnote-24).

The proposed frequency range (30–12400 MHz) for GPR/WPR systems covers spectrum used by almost all types of services supported by the ACMA (including broadcasting, land mobile, mobile broadband, radiolocation, satellite and spectrum licensing).

In addition to standard consultation requirements, when a proposed variation to the LIPD Class Licence affects spectrum licensed bands, the ACMA is required to consult with all licensees of spectrum licences who may be affected by the proposed variation. The ACMA is separately writing to spectrum licensees seeking their views. Before making a variation, the ACMA must also be satisfied that the variation would not result in unacceptable levels of interference to the operation of radiocommunications devices operated, or likely to be operated, under spectrum licences, and that the variation would be in the public interest. The ACMA is also seeking views on these matters to assist its consideration.

The LIPD Class Licence already supports some similar niche applications to GPR/WPR (some of which cover spectrum licensed bands). For example, applications such as radars used for building material analysis operating in the frequency range 2200–8500 MHz (item 80) (which cover the 2 GHz, 2.3 GHz, 2.5 GHz, 2.5 GHz Mid Band Gap, 3.4 GHz and the 3.6 GHz spectrum licensed bands) and level probing radar systems used in industrial processes operating in the frequency ranges 6000–8500 MHz, 24050–26500 MHz, 57000–64000 MHz and 75000–85000 MHz (item 71).

In Australia GPR/WPR systems operating in the frequency range 30–12400 MHz are currently supported if they meet the arrangements for scientific non assigned station ultrawide band stations as specified in the [Radiocommunications Licence Conditions (Scientific Licence) Determination 2015](https://www.legislation.gov.au/Series/F2015L01284).

The purpose of the proposal is to:

* align with overseas arrangements and
* decrease regulatory burden through class licensing rather than authorisation under the apparatus licensing system.

GPR/WPR systems operate under arrangements similar to class licensing in North America and Europe. The US requirements are contained in FCC Rules and Regulations [15.509](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1509) *Technical requirements for ground penetrating radars and wall imaging systems*. Canada’s ISED specifies arrangements similar to those of the FCC in its Radio Standards Specifications [RSS-220](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/RSS-220-I1-EN.pdf/%24FILE/RSS-220-I1-EN.pdf) — Devices Using Ultra-Wideband (UWB) Technology. In Europe arrangements follow the 2006 ECC decision [(ECC) Decision (06)08](https://www.ecodocdb.dk/document/402) on harmonised conditions for the use of the radio spectrum by GPR/WPR imaging systems in Europe, and ERC Recommendation 70-03 (Annex 6 “Radiodetermination applications”, item a).

The ACMA’s proposal is intended to align with these long standing arrangements.

In support of the use of GPR/WPR systems, ETSI Guide [EG 202 730](https://www.etsi.org/deliver/etsi_eg/202700_202799/202730/01.01.01_60/eg_202730v010101p.pdf)[[24]](#footnote-25) sets out a code of practice for the control, use and application of GPR/WPR. The ACMA proposes to include reference to that guide for information.

Applications of GPR systems in the agricultural industry include sensors that detect ground surface conditions obscured by crops during harvesting operations. Depending on crop height the UWB sensor could be up to 3.7 metres above ground height whereas typically GPR requirements require that the GPR transmitter only be operated within 1 metre above the ground. The FCC[[25]](#footnote-26) recognised this when considering a request to support UWB sensors to control header height on harvesting machinery and supports such sensors provided the sensor is no more than 1 metre above the crop height and 3.7 metres above the ground. To provide guidance in such application the ACMA is proposing to include a note advising that such systems will meet the requirements for this item.

Proposed new item 71A

The ACMA proposes to add new item 71A for GPR/WPR radiodetermination transmitters operating in the 30–12400 MHz band. Operation would be subject to the following limitations:

* The transmitter must be operated in a position such that emissions are directed towards:
* the ground or
* a wall of a building or similar structure.
* The transmitter must comply with either ETSI Standard [EN 302 066](https://www.etsi.org/deliver/etsi_en/302000_302099/302066/02.01.01_60/en_302066v020101p.pdf) or [FCC Title 47 Part 15.509](https://www.ecfr.gov/cgi-bin/text-idx?SID=12be504f36c353fd1e753f748eaa2464&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1521)
* The transmitter must not be operated within a nominated distance of a specified Australian radioastronomy site without approval from the CSIRO.

The transmitter must not be operated in the 8400–8500 MHz band within the nominated distance of a specified SRS earth station without the approval of the operator of the earth station.

Nominated distances are defined in the interpretation section of the LIPD Class Licence as 10 kilometres from a specified radioastronomy site and two to five kilometres from a specified SRS earth station.

Notes will also be included:

* referring to the ETSI Guide [EG 202 730](https://www.etsi.org/deliver/etsi_eg/202700_202799/202730/01.01.01_60/eg_202730v010101p.pdf) providing advice on the control, use and application of GPR/WPR systems.
* advising that UWB sensors used in crop harvesting where the sensor is no more than 1 metre above the crop height and 3.7 metres above the ground will meet the limitation to comply with FCC Title 47 Part 15.509.
* There are related changes to Schedule 2 to the LIPD Class Licence to reflect the inclusions of the EN 302 066 standard, EG 202 730 Guide and FCC Title 47 Part 15.509.

## Ultra-wide band systems

Ultra-wide band (UWB) technology makes use of very low power, extremely broad bandwidth noise-like emissions to provide very short range (less than 4 metre) wireless communications in the same bands as, and underneath (that is, beneath the noise floor of) existing traditional higher power radiocommunications services. Such use increases spectrum utilisation.

Applications of UWB technology include very short range high-speed data communications between computer peripherals such as wireless cameras and displays, precision location (RFID) tags, industrial sensors and imaging systems (including biomedical systems), and many others devices and systems requiring high-speed data rates or precision measurements.

There are differences between existing Australian UWB arrangements and those of Europe and North America (US and Canada). The ACMA’s proposals are intended to provide greater alignment with those arrangements. The LIPD Class Licence currently supports UWB systems in the frequency ranges[[26]](#footnote-27):

* 2.2–8.5 GHz for building analysis applications
* 3.4–4.8 GHz and 6–8.5 GHz for generic UWB and location tracking applications
* 4.2–4.8 GHz and 6–6.8 GHz for in ground UWB applications

22–26.5 GHz for short range vehicle systems

Comparison of UWB arrangements

The main difference between arrangements in Australia and those in the US and Europe is the frequency range available for generic applications. For generic UWB applications both Australia and the FCC do not support operation on aircraft; however, European arrangements support such use in the frequency range 6–8.5 GHz.

FCC arrangements support indoor and handheld devices in the frequency range 3.1–10.6 GHz (refer to FCC Rules and Regulations Part 15, [Subpart F—Ultra-Wideband Operation](https://www.ecfr.gov/cgi-bin/text-idx?SID=797f23eeb85bc1e056059140d9df8d75&mc=true&node=pt47.1.15&rgn=div5#sp47.1.15.f)[[27]](#footnote-28)).

In Europe, generic UWB applications are supported in the frequency ranges 3100–4800 MHz and 6000–9000 MHz. Arrangements are based on decisions made in March 2006 by the European Union in [(ECC) Decision (06)04](https://www.ecodocdb.dk/document/397) and contained in ERC Recommendation 70-03 (refer to Annex 1 “Non-specific short range devices”, items k1 and k2).

The ACMA is proposing to align with the European UWB arrangements because they have well-defined mitigation technology requirements that have been shown to protect other wireless communication services, such as detect and avoid (DAA) and low duty cycle (LDC) requirements.

The ACMA is not aware of any substantive evidence of overseas experience that the further expansion of arrangements supporting UWB technology would cause unacceptable interference to the operation of radiocommunications services, including those authorised under spectrum licensing.

Proposed change to item 78

To align with European arrangements for generic UWB devices the ACMA proposes to extend the current frequency bands of item 78 from 3400–4800 MHz and 6000–8500 MHz to 3100–4800 MHz and 6000–9000 MHz respectively.

The proposal also deletes the outdated limitation that a transmitter must not be operated in the 3425–3575 MHz band before 14 December 2015.

UWB on aircraft

The November 2012 ECC Decision [ECC/DEC/(12)03](https://www.ecodocdb.dk/document/437) defined harmonised conditions for the use of devices using UWB technology onboard aircraft operating in the frequency band from 6 GHz to 8.5 GHz. As recorded in ERC Recommendation 70-03, the arrangements have been widely implemented in Europe.

While operation on board aircraft is not supported under FCC arrangements, with widespread implementation in Europe, the ACMA proposes to implement the European arrangements as specified in ERC Recommendation 70-03, Annex 1 “Non-specific short range devices”, item l.

Proposed new item 78A

To align with European arrangements for UWB devices on board aircraft the ACMA is proposing to add new item 78A for operation of UWB transmitters on board aircraft in the frequency range 6000–8500 MHz. Operation would be subject to the following limitation:

* The transmitter must comply with ETSI standard [EN 302 065-5](https://www.etsi.org/deliver/etsi_en/302000_302099/30206505/01.01.01_60/en_30206505v010101p.pdf).
* There is a related change to Schedule 2 to the LIPD Class Licence to reflect the inclusion of the EN 302 065-5 standard.

## All transmitters (57–64 GHz)

‘All transmitters’ refers to authorisations under the LIPD Class Licence where there is no restriction on the types of applications to be provided. In these cases, the LIPD Class Licence simply authorises any transmitter operating within a certain technical ‘envelope’. Following a request from industry, the ACMA is proposing to add new arrangements authorising ‘all transmitters’ in the frequency range 57–64 GHz. The proposal supports new technology applications and aligns with international spectrum arrangements.

The proposal is based on arrangements in the European Conference of Postal and Telecommunications Administrations (CEPT) Recommendation [ERC Recommendation (70-03)](http://www.erodocdb.dk/Docs/doc98/official/pdf/REC7003e.pdf), Annex 1 ‘Non-specific short-range devices’, item n1.

While there are currently no equivalent FCC arrangements, the FCC[[28]](#footnote-29) is currently considering a request to support an interactive motion sensing technology that operates in the frequency range 57–64 GHz and can be used to enable touchless control of device functions or features. Transmitter power levels meet those specified in ETSI Standard EN 305 550.

Proposed new item 22A

The ACMA proposes to add the frequency band 57–64 GHz for use by transmitters for non-specific applications, after item 22 of Schedule 1. Operation would be subject to a maximum EIRP of 100 mW set out in Column 2 of Schedule 1 and would also be subject to the following limitations:

* the maximum transmit output power must not exceed 10 mW
* the maximum radiated power spectral density must not exceed 13 dBm per 1 MHz

the transmitter must comply with ETSI Standard EN 305 550.

There is a related change to Schedule 2 to the LIPD Class Licence to reflect the inclusion of the EN 305 550 standard.

## Underground transmitters

Item 47 of the LIPD Class Licence provides for the operation of underground transmitters in various frequency ranges between 31–520 MHz provided the maximum EIRP is 3.5 nW (determined at any above-ground opening associated with the underground communications). When first introduced in the 1990s, the frequency ranges for underground transmitters supported land mobiles services. The arrangements have not changed since their introduction.

The ACMA’s proposal is to expand the frequency ranges to include frequency segments supporting fixed services in the VHF Mid Band (70–87.5 MHz), VHF High Band (148–174 MHz) and the 400 MHz Plan (403–430 MHz and 450–520 MHz) [[29]](#footnote-30). The ACMA is also proposing to add 420–430 MHz which supports harmonised government services under the 400 MHz Plan and the Spectrum Plan.

The purpose of the proposal is to provide better support for underground activities such as mining by expanding the available frequency ranges supported under class licensing.

The ACMA considers that there will be negligible impact on other spectrum users from this change as the existing arrangements have been in place for over 20 years with no known interference issues. In addition, the 3.5 nW EIRP limitation is similar to the requirements for spurious emissions generated in receivers and below the limit specified by the FCC for tunnel radio systems (refer FCC Rules Part [15.211](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1211)).

Effectively the proposal means that for the:

* VHF Mid Band all segments are included, except for 74.8–75.2 MHz (aeronautical radionavigation services)
* VHF High Band all segments are included, except for 149.9–150.5 MHz (mobile satellite services), 156–157.45 MHz, 160.6–160.975 MHz, and 161.475–162.05 MHz (maritime mobile services)
* 400 MHz Plan, all segments are included, expect for 406–406.1 MHz (mobile satellite service – ‘[EPIRB](http://beacons.amsa.gov.au/)s’[[30]](#footnote-31)).

Proposed change to item 47

The ACMA proposes to revise existing arrangements for underground transmitters (item 47) in the frequency ranges covering the VHF Mid Band, VHF High Band and the 400 MHz Plan.

The bands listed in (g) to (t) of item 47 are proposed to be replaced by the bands 70–74.8 MHz, 75.2–87.5 MHz, 148–149.9 MHz, 150.05–156 MHz, 157.45–160.6 MHz, 160.975–161.475 MHz, 162.05–174 MHz, 403–406 MHz, 406.1–430 MHz and 450–520 MHz.

## Radiodetermination transmitters in the 76–77 GHz band

The ACMA has previously been considering changes to arrangements for LIPD Class Licence item 69, radiodetermination transmitters operating in the 76–77 GHz band, to increase the maximum EIRP from 25 W to 25 dBW (316 W). As part of the change the ACMA’s intention was to include compliance with ETSI Standard EN 301 091.

Rather than updating item 69 as previously advised, the ACMA intends to achieve this change via proposing a new item to ensure that existing transmitters authorised under item 69 can continue to operate without the additional requirement of compliance with the ETSI standard. The new item would support the operation of radiodetermination transmitters in the 76–77 GHz band complying with ETSI Standard EN 301 091, which is a multi-part European standard for short range devices, transport and traffic telematics (TTT) and radar equipment operating in the 76 GHz to 77 GHz range. It consists of three parts covering ground-based vehicular radar, fixed infrastructure radar equipment and railway/road crossing obstacle detection system applications.

The proposed change is based on the [ERC Recommendation (70-03)](http://www.erodocdb.dk/Docs/doc98/official/pdf/REC7003e.pdf), Annex 5 ‘Transport and Traffic telematics (TTT)’, item f1. The change will also align with FCC Title 47 Part 95 Subpart M ‘The 76–81 GHz Band Radar Service’.

Proposed new item 69A

The ACMA proposes to add new arrangement for radiodetermination transmitters operating in the 76–77 GHz band. Operation would be subject to the following limitation:

* The transmitter must comply with ETSI Standard EN 301 091.
* There is a related change to Schedule 2 to the LIPD Class Licence to reflect the inclusion of the EN 301 091 standard.
1. The current version of the LIPD Class Licence is available at [www.comlaw.gov.au](http://www.comlaw.gov.au). [↑](#footnote-ref-2)
2. <https://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/About-spectrum-planning/australian-radiofrequency-spectrum-plan-spectrum-planning-acma> [↑](#footnote-ref-3)
3. Overseas devices authorised under class licences in Australia are in some other jurisdictions often termed ‘unlicensed’ or ‘license-exempt’. [↑](#footnote-ref-4)
4. European Radiocommunications Committee, now replaced by the Electronic Communications Committee. See [www.cept.org/cept/background](http://www.cept.org/cept/background). [↑](#footnote-ref-5)
5. Refer [RALI MS 42](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/Word-Document/RALI-MS-42-VHF-Mid-and-High-Plans-docx.docx?la=en) Frequency plan for the VHF bands (70-87.5 MHz and 148-174 MHz) and [RALI MS 22](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/Word-Document/RALI-MS22-400-MHz-Plan-docx.docx?la=en) 400 MHz Plan (403 - 430 MHz & 450 - 520 MHz). [↑](#footnote-ref-6)
6. Refer ‘Low interference potential devices’ on pages 48-49 of the FYSO. [↑](#footnote-ref-7)
7. Overseas devices authorised under class licences in Australia are in some other jurisdictions often termed ‘unlicensed’ or ‘license-exempt’. [↑](#footnote-ref-8)
8. Refer RALI FX 20 [Millimetre Wave Point to point (Self-coordinated) Stations operating in the 58 GHz, 75 GHz and 85 GHz bands](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/pdf/RALI-FX20-Millimetre-Wave-Point-to-Point-Self-Coordinated-Stations.pdf?la=en). [↑](#footnote-ref-9)
9. ETSI EN 302 217-3: Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 3: Equipment operating in frequency bands where both frequency coordinated or uncoordinated deployment might be applied. [↑](#footnote-ref-10)
10. Refer items 23, 64, 65, 67 and 71 in Schedule 1 of the LIPD Class Licence. [↑](#footnote-ref-11)
11. <https://www.fcc.gov/document/spectrum-frontiers-ro-and-fnprm> [↑](#footnote-ref-12)
12. See Annex J of [RSS-210](https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01320.html) — Licence-Exempt Radio Apparatus: Category I Equipment [↑](#footnote-ref-13)
13. See <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11403.html> [↑](#footnote-ref-14)
14. Statement: Review of spectrum used by fixed wireless services at <https://www.ofcom.org.uk/consultations-and-statements/category-2/fixed-wireless-spectrum-strategy> [↑](#footnote-ref-15)
15. For details see <https://www.ofcom.org.uk/consultations-and-statements/category-3/implementing-decisions-57-71-ghz-band> [↑](#footnote-ref-16)
16. See p17-18, paragraphs 3.30 to 3.35 in the previously mentioned “Review of spectrum used by fixed wireless services”. [↑](#footnote-ref-17)
17. In Australian 71-76 GHz is support under RALI [FX 20](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/pdf/RALI-FX20-Millimetre-Wave-Point-to-Point-Self-Coordinated-Stations.pdf?la=en) – Millimetre Wave Point-to-Point (Self-coordinated) Stations operating in the 58 GHz, 75 GHz and 85 GHz bands. [↑](#footnote-ref-18)
18. See pages 19-20, paragraphs 3.43 to 3.49 in on the “Review of spectrum used by fixed wireless services”. [↑](#footnote-ref-19)
19. From page 20 of the “Review of spectrum used by fixed wireless services”. [↑](#footnote-ref-20)
20. See RSPG Second Opinion on 5G networks (Strategic Spectrum Road Map Towards 5G for Europe), January 2018 at [Document RSPG 18-005](https://circabc.europa.eu/sd/a/fe1a3338-b751-43e3-9ed8-a5632f051d1f/RSPG18-005final-2nd_opinion_on_5G.pdf). [↑](#footnote-ref-21)
21. Refer SRD/MG work program at <https://eccwp.cept.org/WI_Detail.aspx?wiid=563>. [↑](#footnote-ref-22)
22. European “light licensing”’ approach is akin to ACMA ”self-coordinated” apparatus licensing arrangements like those in the 58 GHz band. [↑](#footnote-ref-23)
23. As magnetic induction devices, the ACMA considers that pipe and cable detectors (like other magnetic induction devices) are not radiocommunications transmitters under the Act and hence not subject to licensing. However, they are required to meet the relevant requirements of the EMC framework for non-radiocommunications devices. For more information see [Determining the applicability of licensing and EMC regimes to transmitters](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/pdf/Radiocommunication-Assignment-and-Licensing-Instruction-Determining-the-Applicability-of-Licensing-and-EMC-Regimes-to-Transmitter.pdf?la=en). [↑](#footnote-ref-24)
24. Electromagnetic compatibility and Radio spectrum Matters (ERM);Code of Practice in respect of the control, use and application of Ground Probing Radar (GPR) and Wall Probing Radar (WPR) systems and equipment [↑](#footnote-ref-25)
25. Refer to FCC DA/FCC Number: [DA 17-207](https://www.fcc.gov/edocs/search-results?t=quick&fccdaNo=17-207) Headsight, Inc. Request for Waiver of Part 15 of the Commission's Rules Applicable to Ultra-Wide Band Devices. [↑](#footnote-ref-26)
26. Refer items 76, 78, 79 and 80 in Schedule 1 to the LIPD Class Licence. [↑](#footnote-ref-27)
27. Specifically [15.517](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1517) Technical requirements for indoor UWB systems and [15.519](https://www.ecfr.gov/cgi-bin/text-idx?SID=7aa6dadcf41d6291842c54b13f1bd17e&mc=true&node=pt47.1.15&rgn=div5#se47.1.15_1519) Technical requirements for hand held UWB systems. [↑](#footnote-ref-28)
28. See FCC [Docket 18-70](https://www.fcc.gov/ecfs/search/filings?proceedings_name=18-70&sort=date_disseminated,DESC) OET Seeks Comment on Google's Request for Waiver of Section 15.255(c)(3) of the Commission's Rules for Radars Used for Interactive Motion Sensing in the 57-64 GHz Band. [↑](#footnote-ref-29)
29. Refer [RALI MS 42](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/Word-Document/RALI-MS-42-VHF-Mid-and-High-Plans-docx.docx?la=en) Frequency plan for the VHF bands (70-87.5 MHz and 148-174 MHz) and [RALI MS 22](https://www.acma.gov.au/-/media/Spectrum-Engineering/Information/Word-Document/RALI-MS22-400-MHz-Plan-docx.docx?la=en) 400 MHz Plan (403 - 430 MHz & 450 - 520 MHz). [↑](#footnote-ref-30)
30. Emergency Position Indicating Radio Beacon [↑](#footnote-ref-31)