**Interim guideline: access to
5055–5065** **MHz for line of sight
remotely piloted aircraft systems**

Summary of and response to submissions

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# Executive summary

Remotely piloted aircraft systems (RPAS) usage and technologies have expanded significantly in recent years. Safe operation and seamless interoperability of RPAS within controlled airspace is emerging as an important next step.

We have been monitoring the progress of spectrum arrangements for RPAS control and non-payload communications (CNPC), both within the international regulatory environment and in other jurisdictions. We released a paper in April 2021 that was intended to begin a discussion with Australian RPAS regulators, the operator community and industry on the potential for using the 5030–5091 MHz band for line of sight (LoS) CNPC in controlled airspace

We received 3 submissions from industry in response to the discussion paper. All were supportive of the introduction of the 5030–5091 MHz band for the usage of RPAS CNPC.

ITU-R is currently in the process of finalising the new Recommendation ITU-R M.[CNPC\_CHAR\_5 GHz][[1]](#footnote-2) that concerns characteristics and protection criteria of terrestrial and satellite unmanned aircraft system CNPC links operating in the aeronautical mobile (route) service and aeronautical mobile satellite (R) service in the 5030–5091 MHz band.

While that work is not yet completed, we consider it sufficiently mature to inform interim licensing arrangements in the band, ahead of more permanent options being considered. With that view in mind, we released a draft interim RALI for consultation in May 2022. This RALI aims to facilitate interim access to 5055–5065 MHz for LoS RPAS CNPC links. We received 2 submissions in response to that consultation. This paper summarises those responses to the specific sections of the interim RALI.

We expect that the international spectrum arrangements will begin to firm up in 2023. We are developing and will release for consultation later an options paper identifying an approach for ongoing frequency arrangements that take into account the work being undertaken with ITU-R.

# Introduction

Remotely piloted aircraft systems (RPAS) – also known as drones or unmanned aerial vehicles (UAVs) – currently use radiocommunication technologies authorised under the Radiocommunications Low Interference Potential Devices Class Licence 2015 (the LIPD class licence)[[2]](#footnote-3) for both payload and control communications in non-controlled airspace. However, the operation of RPAS in controlled airspace is far more heavily regulated and the current radiocommunications licensing arrangements will require detailed consideration to address the need for the safe integration of the aircraft into current air traffic control (ATC) systems[[3]](#footnote-4).

In the Australian Radiofrequency Spectrum Plan 2021 (the Spectrum Plan), the
5030–5091 MHz band is allocated to the Aeronautical Mobile (Route) Service and Aeronautical Mobile-Satellite (Route) Service. Line of sight (LoS) RPAS CNPC in this band is intended to be facilitated under the Aeronautical Mobile (Route) Service (AM(R)S). The 5030–5091 MHz band was identified internationally for the implementation of the microwave landing system (MLS), a precision radio guidance system intended to be installed at large airports to assist aircraft in landing. These systems have largely been rendered obsolete by other technologies (most notably satellite and ground based RNSS augmentation systems) and are no longer in use.

The band is currently only accessed in Australia via a single scientific licence in the 5032.5–5037.5 MHz band, assigned to Insitu Pacific Ltd (an RPAS company, and a subsidiary of Boeing) for use in 5 locations in regional Queensland. In its response to the draft FYSO 2020–24, Boeing Australia submitted that dedicated spectrum arrangements are urgently required for RPAS operation in controlled airspace.

We have been monitoring considerations for 5030–5091 MHz RPAS globally to
inform timing considerations on developing domestic arrangements for RPAS in the 5030–5091 MHz band. While no countries have adopted regulatory arrangements for this band, international and domestic interest and negligible incumbency issues in the band meant that it was timely to start a discussion with industry on possible spectrum arrangements for LoS CNPC.

In April 2021, we released a [discussion paper](https://www.acma.gov.au/consultations/2021-04/new-arrangements-remotely-piloted-aircraft-systems-consultation-112021) examining future use of the
5030–5091 MHz band for RPAS CNPC. The discussion paper gave an overview of the current status of the spectrum arrangements for 5030–5091 MHz LoS RPAS CNPC in Australia and internationally. The paper sought input from industry on whether it would be appropriate to begin the development of facilitating LoS CNPC for RPAS in the band, focusing on 6 specific issues.

We received submissions from Boeing Australia, the Department of Defence and the Australian Association of Unmanned Systems (AAUS). The responses are all publicly available on the [consultation webpage](https://www.acma.gov.au/consultations/2021-04/new-arrangements-remotely-piloted-aircraft-systems-consultation-112021).

While respondents were enthusiastic in their responses about proceeding with domestic arrangements to support growth in domestic RPAS interests, international spectrum management arrangements are yet to be finalised for this allocation. This creates the risk that any domestic arrangements established now may ultimately be inconsistent with global arrangements creating equipment availability and interoperability issues.

To help balance these considerations, we will release an options paper with proposals for ongoing arrangements at a later date when global developments are clearer, including when the ITU-R has completed development of the relevant recommendation (most likely in 2023).

In the meantime, we are enabling interim aeronautical mobile licensing arrangements (as distinct from the current temporary access that made access possible under scientific licensing) that are based on current draft arrangements being considered within ITU-R (PDNR ITU-R.M.[CNPC\_CHAR\_5GHz]).[[4]](#footnote-5) In May 2022, we released a [draft interim RALI](https://www.acma.gov.au/consultations/2022-05/new-interim-arrangements-remotely-piloted-aircraft-systems-5055-5065-mhz-band-consultation-172022) for consultation. The RALI sets out those interim arrangements for access to a segment of the 5030-5091 MHz band for RPAS CNPC.

We received submissions from Airservices Australia (ASA) and Boeing Australia. The responses are all publicly available on the [consultation webpage](https://www.acma.gov.au/consultations/2022-05/new-interim-arrangements-remotely-piloted-aircraft-systems-5055-5065-mhz-band-consultation-172022).

# Summary of submissions

In their responses to the draft interim RALI, ASA and Boeing Australia were mostly supportive of proposed interim access arrangements detailed in the draft interim RALI. They both agreed with most of the measures described in the paper. They were mostly supportive of all proposals set out in the paper.

Table 1 below summarises responses of the stakeholders by specific sections of the interim RALI. It also lists our corresponding responses.

Summary of submissions – interim RALI

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Airservices Australia** | **Boeing Australia** | **ACMA response (if applicable)** |
| **Summary** | Airservices Australia (ASA) were mostly supportive of proposed interim access arrangements detailed in the draft RALI. They agreed with most of the measures described in the paper. | Boeing Australia welcomed arrangements for interim access to 5055–5065 MHz for LoS RPAS CNPC. They were mostly supportive of all proposals set out in the paper.  |  |
| **Licence type** | ASA agreed with the proposed licence type. | Boeing Australia agreed on the proposed licence type. |  |
| **Assignment procedure** | - | - |  |
| **Technical requirements** | ASA agreed with the proposed technical requirements. | Boeing Australia agreed with the proposed technical requirements. It also suggested that we should take the United States’ Radio Technical Commission for Aeronautics (RTCA) Command and Control (C2) Data Link Minimum Operational Performance Standards (MOPS) (Terrestrial) as a reference.  | The suggestion regarding RTCA MOPS for C2 data links is noted, and we will explore the relevance of those procedures when making long-term arrangements for access. |
| **Channelling arrangements** | ASA mentioned there is a broad expectation that the RPAS movements will overshadow Air Traffic Management movements by a factor of 10. From that perspective, ASA thinks that the proposed 40 channels will be insufficient. | Boeing Australia is of the view that the 10 MHz identified for LoS RPAS CNPC will not be viable for the use by larger and more sophisticated RPAS. It also suggested the allotment of 250 kHz for air and ground station is insufficient for more advanced medium/large RPAS. Boeing suggested that the draft RALI should be reviewed to extend the amount of frequency variable and number and width of channels to accommodate operation of larger RPAs. It requested we increase the ‘interim’ spectrum amount to at least 20 MHz. | The ACMA agrees that the provisions of the interim RALI may not be sufficient in the longer-term, but we note for the interim purposes of these arrangement the 40 channels identified will be more than sufficient, given:* There are currently no drones using 5 GHz CNPC in Australia.
* Regulatory arrangements in other key jurisdictions (e.g., air safety) still require finalisation before widespread deployment would be possible.
* Many countries have no arrangements in place.
* The life of the interim RALI is expected to only be one to 2 years, depending on finalisation timeframes for relevant ITU-R documents.

Regarding the suggestion for wider channel bandwidths, we note that the channel bandwidth proposed is consistent with the system 1 presented in the WD towards PDNR ITU-R M.[CNPC\_CHAR\_5 GHz].In addition, out-of-policy exemptions to conditions set out in RALIs, including potential aggregation of channels to enable wider bandwidths, can always be considered on a case-by-case basis. |
| **Licence condition – Notional service area** | - | Boeing Australia did not object to the geographical service areas set out in the interim RALI, but requested we remain open to exemptions on a case-by-case basis. | Out-of-policy exemptions to conditions set out in RALIs can always be considered on a case-by-case basis. |
| **Licence condition – SC 27** | ICAO handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718) established that safety-critical aeronautical communication, navigation and surveillance systems should be protected from harmful interference. The RPAS CNCP link is a safety-critical link and has been assigned as AM(R)S allocation. AM(R)S is reserved for communications relating to safety and regularity of flight. From that perspective, ASA considers it appropriate that spectrum used to deliver safety of life service is afforded protection under the licence.  | Boeing Australia stated that Special condition 27 ‘no interference / no protection’ is not appropriate for the frequency band 5030–5091 MHz allocated to the safety-of-life aeronautical mobile (R) service. This frequency band is allocated for safety-of-life operations globally through the International Telecommunication Union (ITU) Radio Regulations. Boeing Australia mentioned that Australia, as a member state of the ITU, has an obligation to uphold the provisions of the Radio Regulations, including this safety-of-life service allocation. | ‘No interference/no protection’ conditions are generally applied to itinerant and/or trial deployments, both being the case here. The interim provisions were being put in place to enable early deployments in advance of finalisation of relevant international studies and regulations, so it is appropriate that such deployments should not assert any interference/protection rights over existing services during the interim period. The alternative was to hold off on enabling interim access and await international outcomes instead.It is intended that long-term arrangements will afford licences the same status as other safety-critical aeronautical services.However, for these interim purposes, the ACMA is prepared to downgrade SC 27 to an advisory note, noting exclusivity of aeronautical use of this band. The advisory note establishes a first-in-time hierarchy of licences authorising RPAS CNPC for interference management purposes.  |
| **Advisory notes – Duration of licence** | - | Boeing Australia agreed that a licence duration of 12 months is appropriate. |  |
| **Advisory notes – Operating parameters** | - | Boeing Australia supported the application of this advisory note. |  |
| **Licence assignment** | In order to support the operation of RPAs, ASA is required to endorse assignments of aeronautical or aircraft frequencies. However, the ASA spectrum management database is only set up for frequency bands in (and around) the aviation VHF band. ASA will need to modify that system to allow for the endorsements of channels in the 5 GHz band. ASA requested we provide as much notice as possible before this draft RALI is finalised so they have sufficient time to update the system and avoid any delays in endorsing assignments. | Boeing Australia suggested the ACMA to work with ASA to explore a means for establishing a dynamic frequency assignment process to efficiently manage approved operator access to the frequency band on an automated basis.Boeing Australia again provided a reference to the proposal made by the Aerospace Industries Association (AIA) in a petition to the FCC to Adopt Service Rules for Unmanned Aircraft Systems (‘UAS’) Command and Control in the 5030–5091 MHz Band for a dynamic frequency assignment process.The AIA dynamic frequency assignment process proposes an authorised remote pilot in charge (PIC) can secure access to necessary frequency channels covering a specific geographic area, and then release those channels as soon as the UAS flight is completed. | We will provide advance notice of publication of the interim RALI to Airservices. Regarding dynamic frequency assignment, third-party band managers such as Airservices are welcome to implement access management systems as they see fit, so long as they hold the appropriate licences. |

1. Working document towards a preliminary draft new recommendation ITU-R.M.[CNPC\_CHAR\_5GHz] on the characteristics and protection criteria of terrestrial and satellite unmanned aircraft system control, and non-payload communications links operating in the aeronautical mobile (route) service and aeronautical mobile satellite (R) service in the band 5030–5091 MHz. [↑](#footnote-ref-2)
2. The current version of the LIPD class licence is available on the [Federal Register of Legislation website](https://www.legislation.gov.au/Details/F2022C00281). [↑](#footnote-ref-3)
3. In Australia, there are 2 major types of airspace: controlled, and uncontrolled. Controlled airspace in Australia is actively monitored and managed by air traffic controllers. To enter controlled airspace, an aircraft must first gain a clearance from an air traffic controller. Uncontrolled airspace has no supervision by air traffic control, so no clearance is required to operate within it.  [↑](#footnote-ref-4)
4. The latest working document towards a preliminary draft new Recommendation ITU-R M.[CNPC\_CHAR\_5GHz] can be found [here](https://www.itu.int/dms_ties/itu-r/md/19/wp5b/c/R19-WP5B-C-0649%21N18%21MSW-E.docx) (ITU TIES account is required to access the document). [↑](#footnote-ref-5)