
Boeing Australia Holdings' submission to the ACMA Proposed update to the Australian Radiofrequency Spectrum Plan Consultation paper

Boeing Australia Holdings (Boeing Australia) welcomes the invitation to comment on the revision of Australian Radiofrequency Spectrum Plan (ARSP).¹

The Plan is an important part of Australia's spectrum legislation and follows the revision of the International Telecommunication Union's Radio Regulations most recent 2020 edition.

This submission proposes an important consideration of a new AUS footnote to the Table of Frequency Allocations to accommodate increasing use of larger commercial Remotely Piloted Aircraft Systems in Australia.

We also include suggestions for the format of the ARSP and editorial/factual corrections under 'other issues.'

New AUS footnote 5 030-5 091 MHz RPAS

The revision of the ARSP provides a timely opportunity to move forward with identification of spectrum for use by larger commercial Remotely Piloted Aircraft Systems (RPAS).

The radiocommunication regulation of unmanned aircraft systems (UAS) is currently managed as class licence in the existing Low Interference Potential Devices (LIPD) and Industrial, Scientific and Medical (ISM) applications allocations. While this arrangement well serves smaller hobbyist and general users of UAS devices (aircraft typically less than 25 kg) it is problematic for larger and more complicated devices. Specifically larger scale remotely piloted UAS i.e. RPAS, can suffer critical interference issues using the current class licences.

The International Telecommunication Union's 2012 World Radiocommunication Conference determined global access for UAS in the aeronautical radiofrequency band 5 030-5 091 MHz (5 GHz band). This was achieved through a footnote to the ITU Radio Regulations (RR) Table of Frequency Allocations for a new aeronautical mobile route service (AM(R)S) allocation to support terrestrial RPAS command and non-payload communications (C2 link) RR footnote No. 5.443C (WRC-12). The RR Table of Frequency Allocations also includes a footnote for the aeronautical mobile satellite route service (AMS(R)S) for provision of satellite C2 links, RR footnote No. 5.443D (WRC-12). The footnotes are fundamentally designed to accommodate both the AM(R)S and AMS(R)S facilitating beyond-line-of-sight (BLOS) RPAS C2 communications using a possible mix of terrestrial and satellite applications.

¹ Boeing Australia Holdings' portfolio includes advanced manufacturing of commercial aircraft composite components, defence systems design and development, modeling and simulation, research and development, support and training, and unmanned systems.

There is also scope to specifically utilise footnote No. 5.443C to accommodate RPAS C2 links terrestrially and over a greater range than currently possible with the class licence provisions. However, there has been limited progress within country administrations to take advantage of either identification especially the satellite option due to no services being deployed.

Further complicating the take-up of these spectrum identifications is the need for administrations to have in place country specific regulations over and above spectrum planning and the agreement of dedicated safety and performance based standards applicable to 5 GHz RPAS operations.

Nonetheless, the proposed 5 GHz identification is well recognised as a most viable option to support current and future RPAS spectrum requirements. The allocation falls firmly in the RR global allocation to various aeronautical services. The frequency band is also allocated for the use of microwave landing systems (MLS) as a priority application via RR footnote No. 5.444 (WRC-15). However, these systems are no longer used, including in Australia and the frequency band is highly underutilised.

International developments

There is considerable momentum internationally to identify the frequency band 5 030-5 091 MHz for RPAS.

1. New Zealand Civil Aviation Authority and the Ministry of Business, Innovation and Employment (MBIE) have jointly released a paper ‘Dedicated Spectrum band plans and licensing for unmanned (remotely piloted) aircraft in New Zealand.’ This paper presents the preliminary views of the regulators and supports priority consideration of the 5 GHz frequency band for RPAS C2 Links use in New Zealand.²
2. The US Federal Communications Commission have recommended to Congress a rulemaking proceeding to develop service and licensing rules enabling UAS use of the 5 030-5 091 MHz band in collaboration with the FAA and NTIA.³

“Full-time access to the 5030-5091 MHz spectrum band will help enable expanded UAS operations, in turn, unlocking economic benefits,” said Max Fenkell, AIA director for unmanned and emerging technologies. The FAA and NTIA are expected to submit similar reports on the viability of the 5030-5091 MHz frequency band to Congress in the coming months.⁴

3. In Europe, the administrations of the Netherlands, Italy and Finland report they identify RPAS spectrum in the 5 GHz band in accordance with RR footnote No. 5.443C in their respective National Table of Frequency Allocations.⁵

Australian Government initiatives

In Australia the government has released the ‘Emerging Aviation Technologies National Aviation Policy Issues Paper,’ which references the timely need to facilitate ongoing spectrum access noting ‘Spectrum management in general, and targeted spectrum reforms for drones in particular, will play

² [Dedicated Spectrum band plans and licensing for unmanned \(remotely piloted\) aircraft in New Zealand](#)

³ <https://docs.fcc.gov/public/attachments/DOC-366460A1.pdf>

⁴ <https://www.aviationtoday.com/2020/09/01/fcc-study-supports-using-5-ghz-band-drone-operations/>

⁵ <http://www.easa.europa.eu/unmanned-aircraft-systems-uas-and-remotely-piloted-aircraft-systems-rpas>



a key role in enabling the social and economic benefits that drones are expected to facilitate.⁶ The spectrum consideration under the section on 'Infrastructure' includes a proposed policy approach,

The Australian Government will lead the development of a coordinated and informed approach to infrastructure planning, investment, requirements and approvals.

Conclusion

Given the unprecedented growth in RPAS/UAS operations and the commercial, safety and societal benefits of these new applications there is an urgent need to address the spectrum regulatory requirements of larger commercial RPAS in Australia. With the current revision of the ARSP, developments internationally and the Australian Government's approach to support the growth of the RPAS industry in Australia, Boeing Australia requests the ACMA to make tentative regulatory access to the widely considered best spectrum option available for RPAS, the 5 030-5 091 MHz frequency band.

It is timely to progress this regulation in the current review of the ARSP via an initial entry of a new AUS footnote to the Table. While recognising there is still more regulatory work to be done, both in spectrum access and broader aviation areas, the inclusion of an initial appropriately worded footnote provides a valuable clear indication to the Australian RPAS industry of an important way forward for more secure and safer terrestrial C2 links for RPAS.

As each revision of the ARSP follows the cycle of ITU World Radiocommunication Conferences with the next tentatively scheduled for 2023, it is imperative that the ACMA take this initiative in the current revision of the ARSP otherwise such a footnote will not be possible until at least 2024.

Proposal for ARSP AUS footnote

The following is a suggested new AUS footnote to the frequency band 5 030-5 091 MHz that may address this issue.

Consistent with RR footnote No. 5.443C the band is to be available in Australia for medium to large RPAS C2 links. Such use shall also be consistent with relevant performance based standards and current and future applicable ICAO C2 SARPs, CASA regulations and in accordance with the Radiocommunications (Aircraft and Aeronautical Mobile Stations) Class Licence 2016 as determined from time to time.

The wording is flexible to accommodate further progress with aviation regulators, yet provides scope for ACMA and possibly Airservices to look to licensing options in the near term. Such licenses may initially be individual but a form of non-assigned apparatus licence may be a longer term option.

Boeing Australia welcomes the opportunity to work with ACMA in further refining any necessary terminology and conditions to assist this matter going forward.

⁶ <https://www.infrastructure.gov.au/aviation/drones/files/drone-discussion-paper.pdf>

Other issues

1. ARSP format

The current format of the ARSP can be traced back to at least the 2005 ARSP produced by the then Australian Communications Authority the predecessor agency of the Australian Communications and Media Authority.

Since then there have been no noticeable changes to the layout, presentation or general content of the document. Conversely, use of the internet and sophisticated online tools have dramatically developed. While it is recognised that there may be a legislative requirement to keep the ARSP in a similar format there is also opportunity to make the document or at least the Table of Frequency Allocations more user friendly and functional online. This is consistent with the Australian Government's 'Digital government' whereby 'Australians can access Government services that are simple clear and fast.'⁷

Some suggestions are - at minimum in a word document or PDF file hyperlink the footnotes in the Table to their text at the end of the document. As an HTML online option footnote text may also be in the form of a popup from the footnote number where it appears in the Table. A good example of user friendly interactive Table of Frequency Allocations is the Swiss National Frequency Allocation Plan.⁸ Here footnotes are linked and there is also a useful frequency search bar that has obvious benefits when searching for specific frequency bands within extensive detail of the Table.

The ARSP will be used by many stakeholders over the usual four year period and it is of benefit to the ACMA and especially stakeholders to have it in a more accessible and contemporary format.

2. Use of international footnotes

The international footnotes that accompany the Table of Frequency Allocations are those taken from the most recent version (currently the 2020 edition) of the International Telecommunication Union's Radio Regulations (RR). The footnotes are in Volume 1 Article 5 of the RR.

For reasons not explained, the ARSP when replicating the footnotes drops the number '5' prefix from all footnotes. Effectively this means from a reader's perspective all international footnotes in Australia from the ARSP have different numbers to those recognised internationally. This can, and does, create a degree of confusion. It has been known that in documents submitted to international radiocommunication fora Australian documents have quoted the Australian version of the footnote number at the confusion of the reader not familiar with the ARSP. There are no other instances we are aware of whereby other administrations apply this approach with their National Frequency Table Plans.

There appears to be no benefit or value in changing the international footnote numbers in such a way, in fact it can only cause unnecessary confusion.

Our recommendation is the ACMA retain the entire RR footnote numbers as shown in the current edition of the RR in this and future ARSPs.

⁷ <https://www.industry.gov.au/data-and-publications/australias-tech-future/digital-government>

⁸ <https://www.ofcomnet.ch/#/fatTable>

3. Reference to the frequency scope of the ARSP

Under Part 3 'The Table of Frequency Band Allocations' section 7 'Interpretation' the first bullet point states,

the Table covers the radio frequency spectrum from 8.3 kHz to 420 THz

Article 1.5 of the RR defines radio waves as,

radio waves or hertzian waves: Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide

The range of Table of Frequency Allocations is 8.3 kHz to 3 000 GHz.

Our recommendation is this text should be reworded to reflect the actual Table of Frequency Allocations upper limit, should that be the intention.

4. Reference to radio astronomy

Chapter 1 Part 1 Section 14 of the ARSP states,

The radio astronomy service is the only entirely passive radiocommunication service defined by the ITU-R

The definitions of *Radio astronomy* and *radio astronomy service* are in RR Articles 1.13 and 1.58 respectively. Whereas slightly different definitions are used in the ARSP (Chapter 2 Part 1 section 3).

Nonetheless, in regard to the text in question, radiocommunications services are generally defined within the ITU Radio Regulations and not by the ITU Radiocommunication Sector (ITU-R).

Our recommendation is this text should be changed by referencing the 'Radio Regulations' instead of 'ITU-R.'

Respectfully submitted,



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