

**COMMUNICATIONS
ALLIANCE LTD**



**COMMUNICATIONS ALLIANCE
SATELLITE SERVICES WORKING GROUP**

SUBMISSION

to the

Australian Communications and Media Authority's
(ACMA)

Technical design features and allocation
considerations for the 2 GHz MSS band
(1980–2005 and 2170–2195 MHz)

20 FEBRUARY 2024

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INTRODUCTION

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the opportunity to provide this submission in response to the Australian Communications and Media Authority's *Technical design features and allocation considerations for the 2 GHz MSS band (1980 – 2005 and 2170 – 2195 MHz) Discussion paper*.

In summary, the SSWG draws to the ACMA's attention:

- that 3GPP standards include guidelines for NTN including for the operation of fixed beams and non-fixed beams Adaptive Antenna Arrays and that Resolution 212 (Rev. WRC-23) and AWG report 125 provide additional guidance for optimising national frequency arrangements most relevant for countries with land borders and nearby neighbours.
- to ensure protection of 2 GHz MSS/CGC systems from interference from other systems such as DA2GC systems.
- supports the proposal to reduce the current emission limits at the 2010 MHz boundary from –66 to –60 dBW/MHz EIR, noting that it may be conservative in regional and remote areas.
- proposes that statistical methods should be used to determine protection requirements where TOB does not operate or only operates sporadically.
- MSS/CGC services meeting the relevant 3GPP standards should not require coordination, whereas systems operating outside the 'Technical design features for 2 GHz MSS' should be required to coordinate.
- coordination of CGC transmitters with earth station receivers based on CGC out-of-band (OOB) emissions at the earth station receiver in accordance with Annex-1 of ECC Recommendation (10)01 is appropriate.
- that the current RQZ Band Plan provides adequate protection for the Radio Astronomy Service and this should not be increased and that no further requirements beyond those applicable to aeronautical VHF should be applied to aeronautical use of 1980 – 2005 MHz.
- P.1812 configured to 10% time/10% location would seem appropriate but that future reviews should look closely at OOB limits with a view to relaxing them such that a seamless transition from NTN to terrestrial network can occur.
- while 3GPP is based on 2 x 5 MHz channels, future MSS networks will require at least 2 x 10 MHz of spectrum and for robust services, 2 x 15 MHz of spectrum would be better.
- given the ACMA's decision on Narrowband MSS (NB MSS), the SSWG recommends *Configuration 1* for the most appropriate frequency lot configuration.

This submission does not necessarily reflect the views of Free TV who, we understand, are submitting their own response to the consultation.

About Communications Alliance

Communications Alliance is the primary communications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, platform providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to be the most influential association in Australian communications, co-operatively initiating programs that promote sustainable industry development, innovation and growth, while generating positive outcomes for customers and society.

The prime mission of Communications Alliance is to create a co-operative stakeholder environment that allows the industry to take the lead on initiatives which grow the Australian communications industry, enhance the connectivity of all Australians and foster the highest standards of business behaviour.

For more details about Communications Alliance, see <http://www.commsalliance.com.au>.

Responses to the Consultation

The SSWG would like to provide the following responses to the questions posed in the Discussion Paper.

2 GHz MSS parameters

- 1. What are your views on the proposal to develop technical requirements for mobile earth stations and CGC systems based on the 2 GHz spectrum licensing technical framework. Are there alternative approaches that could be used on different resulting values for key parameters such as power and unwanted emissions that we should consider?**

The SSWG would like to bring to the ACMA's attention the various 3GPP Standards.

The consideration of a broad range of discussions related to MSS in various contexts, including traditional and new technologies that can be considered within the MSS, will ensure compatibility between the services using the band and adjacent bands. Additional guidance on the minimisation of interference between terrestrial IMT and satellite services is provided in Resolution 212 (Rev. WRC-23) and AWG Report 125.

Planning the band using 3GPP Standards will also ensure economies of scale which will bring savings to consumers both in Australia and globally.

- 2. Having arrangement bases on the 2 GHz spectrum licensing technical framework means including support for active antenna systems. We seek views about the inclusion of active antenna systems in the technical framework for 2 GHz MSS.**

3GPP standards include guidelines for Non-Terrestrial Networks (NTN) including for the operation of fixed beams and non-fixed beams Adaptive Antenna Arrays.

3GPP Standards take into account available technology, developments costs and deployment schedules. This is important because satellites require a long design and construction lead time which generally cannot be changed to meet the requirements of domestic technical standards.

Drawing on information from Resolution 212 (Rev. WRC-23) and AWG report 125, being a Study on Technical and Operational Measures for Coexistence between Terrestrial and Satellite IMT Systems Deployed in the frequency bands of 1980 – 2010 MHz and 2170 – 2200 MHz in the Asia-Pacific Region, provides additional guidance for optimising national frequency arrangements most relevant for countries with land borders and nearby neighbours.

- 3. What are your views on developing technical parameters for aeronautical transmitters in CGC/DA2GC systems based on ECC report 2331? Are there alternative parameters that should be used?**

When planning the bands, the ACMA should ensure protection of 2 GHz MSS/CGC systems from interference from other systems such as Direct Air to Ground Communication (DA2GC) systems. ECC Report 233 was developed based on

¹ ECC Report 233: Adjacent band compatibility studies for aeronautical CGC systems operating in the bands 1980 – 2010 MHz and 2170 – 2200 MHz (May 2015).

extensive interference analysis from DA2GC systems into MSS and Complementary Ground Components (CGC). The report includes implementation methods and mitigation techniques to avoid interference into MSS and CGC. These important technical requirements should be maintained to ensure protection of the services operating in the adjacent bands (i.e., 1920 – 1980 MHz, 2010 – 2025 MHz, 2110 – 2170 MHz, above 2200 MHz) and of the CGCs of MSS systems in the 2 GHz MSS band.

4. What are your views on the proposal to reduce the current emission limits at the 2010 MHz boundary from –66 to –60 dBW/MHz EIRP intended to provide protection for TOB receivers operating above 2010 MHz?

The SSWG supports –60 dBW/MHz as this will permit better service delivery while maintaining protection of TOB receivers. This level may however be conservative in regional and remote areas where TOB use is either sporadic or rare. The –60 dBW/MHz limit aligns with that in ETSI EN 302 574-3, Table 3a for unwanted emissions outside the band 1980 MHz to 2010 MHz and Australia's closer adherence to this European norm will ensure a greater ecosystem of devices available for use in Australia.

5. For 2 GHz MSS emission limits above 2010 and 2200 MHz, which are intended to protect TOB receivers, do these limits achieve that objective? If not, please explain why and outline what the limits should be.

The proposed –60dBW/MHz levels will protect TOB to an acceptable level.

6. For 2 GHz MSS emission limits above 2010 MHz and 2200 MHz we seek views on the merits of applying more relaxed limits in areas of lower TOB usage and views on relevant emissions limits to apply in areas on low TOB usage.

TOB should only be protected where it operates regularly. Statistical methods should be used to determine protection requirements where TOB does not operate or only operates sporadically.

The SSWG highlights the importance of a continued consideration of deployment and use of technologies in adjacent bands in order to determine realistic protection limits for future and incumbent licensees in the 2 GHz band. Such an approach will ensure the efficient use of spectrum as technologies evolve over time.

Coordination requirements: 2 GHz MSS with other services

7. Views are sought on the coordination requirements outlined in Section 3.

MSS/CGC services meeting the relevant 3GPP standards should not require coordination.

Systems operating outside the 'Technical design features for 2 GHz MSS' should be required to coordinate. The SSWG notes that operation of secondary services should not cause interference into or claim protection from the primary MSS/CGC services.

The SSWG supports the ACMA proposal that no new fixed links be allowed in the 1980 – 2010/2170 – 2200 MHz bands.

8. Views are sought on the approach of coordinating CGC transmitters operating in the 2170-2195 MHz with earth station receivers using the level of CGC unwanted

emissions at the earth station receiver. What are appropriate earth station protection levels under such a methodology? Are there alternative approaches that we should consider?

Coordination of CGC transmitters with earth station receivers based on CGC out-of-band (OOB) emissions at the earth station receiver in accordance with Annex-1 of ECC Recommendation (10)01 is appropriate. 'A coordination area around the EESS/SOS/SRS earth stations within which coordination should be achieved with those CGC base stations having a power level above a given threshold which is a function of the distance from the receiving earth station'. CGC stations not meeting these requirements should be required to coordinate.

9. Views are sought on the suitability of the arrangement for coordination with the radio quiet zone, and what requirements should apply for aeronautical transmitters in 1980-2005 MHz with respect to the radio quiet zone.

The SSWG recognises the value of the radio quiet zone (RQZ) and associated facilities to the radioastronomy community, however protection of the RQZ does not come without cost. The current RQZ Band Plan provides adequate protection for the Radio Astronomy Service and this should not be increased.

While free space propagation from aircraft may be an issue at times when that band is in use within the RQZ, the interference would be both sporadic and transient. Noting also that the band is not allocated to radio astronomy we submit that no further requirements beyond those applicable to aeronautical VHF should be applied to aeronautical use of 1980 – 2005 MHz.

Coordination requirements: 2 GHz MSS with 2 GHz MSS

10. No coordination requirements are considered necessary between co-channel and adjacent channel MSS services. We are interested in views on this proposal, including views on any alternative coordination requirements considered necessary.

The SSWG suggests that compliance with relevant 3GPP or other relevant protection standards may be adopted as an alternative to coexistence showing or coordination. For example, if an operator does not use 3GPP standards, then a coexistence showing may be provided to the ACMA.

Reconsideration of 2 GHz narrowband requirements

11. We propose that the current emission limit at the 2010 MHz boundary could be reduced from -66 to -60 dBW/MHz EIRP. Are there other elements of arrangements for narrowband MSS that would be beneficial to review?

The power increase to -60 dBW/MHz is a positive move and should be implemented as soon as possible.

12. We are considering whether ITU-R Recommendation P.1812 configured to 10% time (percentage of average year for which the calculated signal level is exceeded) and 10% location (percentage of locations for which the calculated

signal level is exceeded) is an appropriate propagation model to use if arrangements are reviewed. What are your views on this proposal?

P.1812 configured for 10% time/10% location would on face value seem appropriate. However close to populated areas served by terrestrial IMT it is likely that potential interference from NTN would decrease while that from terrestrial networks would increase.

While the SSWG understands that Spectrum Licence technical frameworks are somewhat 'set in stone', future reviews should look closely at OOB limits with a view to relaxing them such that a seamless transition from NTN to terrestrial network can occur. Protection on PMTS outside spectrum licensed areas could occur immediately

Licence allocation design

13. We are interested in views about the intended uses of the 2 GHz MSS spectrum, as well as the availability of equipment.

Some SSWG members are already making use of the 2 GHz band in other parts of the world while other members are investigating its use.

There are a wide variety of current and future planned uses of the 2 GHz MSS band in Australia and globally. Common through all use cases is the ability to provide connectivity to small, or relatively small, battery powered devices that can be hand carried or installed in vehicles, fixed site locations, aircraft or boats and used while in motion. Additionally, what is called 'IoT' is already available via MSS and will develop over time supporting all levels of Australian society throughout the country. Typically, MSS services have been developed using proprietary technologies and there are many deployments of such technologies, however there is a move towards adopting 3GPP standards.

The next step in the development of MSS services is 5G New Radio-Non-Terrestrial network (NR-NTN) which will require the development of new 3GPP standards. This has been adopted in 3GPP Release 18 and is continuing in Release 19. NR-NTN will greatly improve on Release 17 capabilities and provide new capabilities with a focus on satellite capabilities for subscriber handsets (DTH). Such improvements will include faster data rates, more reliable connections, and the ability to make voice calls. In the future, improved data rates etc. will mean the transition from terrestrial to non-terrestrial network will be seamless for the user.

14. What is the minimum viable amount of spectrum for 2 GHz MSS services? Is a 2 x 5 MHz allocation useable or is a minimum of 2 x 10 MHz required?

While 3GPP is based on 2 x 5 MHz channels, this is not sufficient for realistic data links. Future MSS networks will require at least 2 x 10 MHz of spectrum but for robust services 2 x 15 MHz of spectrum would be better otherwise operators are unlikely to meet future user demands for access to capacity.

15. Which of the following options is the most appropriate frequency lot configuration for the 2 GHz MSS spectrum?

Configuration 1

- **2 x 15 MHz paired (1980-1995 MHz with 2170 – 2185 MHz)**
- **2 x10 MHz paired (1995–2005 MHz with 2185 – 2195 MHz).**

Configuration 2

- **5 generic 2 x 5 MHz paired lots which would provide participants in the allocation the opportunity to bid for as many blocks as suits their use case.**

Given the ACMA's decision on Narrowband MSS (NB MSS) the following assignment splits would permit optimal use of the band.

2 x 15 MHz paired (1980 – 1995 MHz with 2170 – 2185 MHz)

2 x 10 MHz paired (1995 – 2005 MHz with 2185 – 2195 MHz)

This allows 2 x 10 MHz (the lowest quantum viable for MSS service) and 2 x 15 MHz for a better level of service while still conforming to 3GPP bandwidth requirements.

The SSWG members with dissenting views will discuss this in their individual contribution to the ACMA.

Communications Alliance Satellite Services Working Group membership

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