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AMTA Submission

Australian Communications & Media Authority

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



About AMTA

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile network operators and service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.



Executive Summary

AMTA appreciates the opportunity to comment on the ACMA’s Discussion Paper—*Technical design features and allocation considerations for the 2 GHz MSS band (1980-2005 and 2170-2195 MHz)* (“the Discussion Paper”).

AMTA strongly agrees with the alignment of power limits for mobile earth station and complementary ground component (CGC) base stations, with the power limits for user equipment (UEs) and base stations (BS) (respectively) in the 2 GHz spectrum licence technical framework (SLTF). In turn, we strongly agree with those aligning with 3GPP technical specifications.

We also support the fact that the ACMA is not proposing any retrospective changes to the 2 GHz SLTF to accommodate 2 GHz MSS.

With respect to direct-air-to-ground-component (DA2GC) and CGC, we believe that a priority for the ACMA should be to ensure that these ancillary applications do not cause harmful interference to the MSS Satellite Direct-to-Mobile (DTM) use case operating in adjacent channels. DA2GC should not cause interference to adjacent-band terrestrial BS receivers operating under 2 GHz spectrum licences.

Lastly, we have some questions and comments on the ACMA’s proposed coordination requirements presented in section 3 of the Discussion Paper, in the responses to the ACMA’s specific questions.

Responses to the ACMA’s “Issues for Comment”

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 and different resulting values for key parameters such as power and unwanted emissions that we should consider?

Noting that the ACMA has already decided that this band would be allocated to 2 GHz MSS services, we strongly support the following aspects of the ACMA’s current proposal:

- That the intention is to support the satellite component of IMT-2020 and equipment operating in accordance with 3GPP Band n256 (for non-terrestrial networks (NTN) supporting MSS), and band 65/n65 (for terrestrial networks supporting CGC).
- The alignment of power and emission limits for mobile earth stations with those of 2 GHz SLTF for UEs, and for CGC BS with those of 2 GHz SLTF for BS. This will ensure that the likelihood of adjacent-band interference is minimised.

AMTA members strongly support the ACMA's proposal for 3GPP-compliant equipment to be used in the 2 GHz MSS band (3GPP NR band n256). As the ACMA observes, the 2 GHz MSS band is immediately adjacent to the 2 GHz IMT band (3GPP Band 1), and in order to minimise the risk of interference to the adjacent-band IMT services, it is important that all equipment (user terminals, base stations onboard satellites, and/or CGC base stations) is fully 3GPP-compliant.

We are open to the ACMA developing arrangements which would allow an MSS licensee to operate DA2GC, on the proviso that DA2GC does not cause harmful interference to adjacent-channel Satellite DTM uplinks, or to adjacent-band/adjacent-channel base station receivers (both 2 GHz SL BS and CGC BS).

Similarly, we are open to the ACMA developing arrangements which would allow an MSS licensee to operate CGC, on the proviso that CGC does not cause harmful interference to adjacent-channel Satellite DTM downlinks. See our response to Q10.

With respect to compatibility between 2 GHz SL and CGC, we believe that the alignment of power and unwanted emission limits for CGC BS with those of 2 GHz spectrum licences will facilitate coexistence (as per the second dot point above).

We would be strongly opposed to any retrospective measures being applied to 2 GHz spectrum licences by the ACMA with the intention of accommodating 2 GHz MSS, and we welcome the fact that such changes do not form part of the ACMA's proposed approach.

2. Having arrangements based 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.

We agree that the alignment of power and emission limits with the 2 GHz SLTF should include support for active antenna systems (AAS).

3. What are your views on developing technical parameters for aeronautical transmitters in CGC/DA2GC systems based on ECC report 233? Are there alternative parameters that should be used?

While we have not as yet formed specific views on the appropriate parameters that would ensure protection of adjacent-channel/adjacent-band networks, we believe that DA2GC should not be permitted to cause harmful interference to those.

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

We support the relaxation of this emission limit.

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

We have not as yet formed a specific view on this topic.

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.

We have not as yet formed a specific view on this topic.

Coordination requirements: 2 GHz MSS with other services

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

We largely agree with the coordination requirements proposed by the ACMA, although we note that none of the detailed coordination requirements (aside from unwanted emission limits) relate to traditional MSS / Satellite DTM operation; these are all proposed with a view to facilitating the introduction of DA2GC and CGC in the band.

We have a few specific comments on these:

- Section 3.2 on fixed point to point (PTP) links.
 - The protection ratios (PRs) in Appendix 1 of RALI FX 3, for the 2.1 and 2.2 GHz Bands, specify absolute frequency offsets in MHz which are not necessarily applicable if the tx and rx are not part of a common channel raster. As such, it would be better for a new RALI developed for 2 GHz MSS DA2GC/CGC to specify PRs for co-channel and (first- and second-) adjacent-channel scenarios.
 - While we agree that coordination of a proposed CGC BS tx with an existing PTP rx could make use of the PRs from RALI FX3 (or derivations thereof), these PRs are not applicable for the case of coordination between a PTP tx and a proposed CGC

BS rx. If the ACMA's view is that MSS licensees looking to deploy CGC BS should consider the interference risk to their CGC BS rx on their own, then this should be clearly stipulated in the relevant RALI, and therefore the coordination requirement is only applicable to the case of proposed CGC BS tx and existing PTP rx.

- Section 3.4 on Television Outside Broadcasting (TOB) services.
 - While we agree with the “no interference, no protection” (NINP) condition proposed for MSS services outside of metro areas (and “designated areas”) prior to the 28 February 2026 deadline, we believe there should be some more detailed protection requirements for CGC BS outside of metro and designated areas with *co-channel* TOB services *inside* the metro and designated areas. This could look something similar to a Device Boundary calculation.
 - While we agree with the requirement for CGC BS tx in 2170-2195 MHz to coordinate with *adjacent-band* TOB above 2200 MHz, we believe that the reference to Appendix B of RALI FX 21 may not suffice. It may be beneficial to provide further detail on the TOB collection stations, for example, the information in Appendix H.4 of the Space/Space Receive BOP¹, along with a cull distance, propagation model and so on.
 - We agree that aeronautical DA2GC transmitters should operate on a “no interference” basis with respect to TOB receivers, but there should be some guidance as to how determine where and under what conditions the ACMA would consider that an aeronautical transmitter might cause interference to TOB.
- Section 3.5 on Earth stations:
 - We agree with the protection and preservation of New Norcia WA, Tidbinbilla ACT and the Mingenew WA Earth Station Protection Zone (ESPZ). Should these protection requirements also include the other ESPZs (i.e. Quirindi, Moree and Roma)?
 - In the sentence “*no protection afforded from existing and future earth station transmitters to be provided to 2 GHz MSS receivers noting the 20 MHz frequency separation (between 2005 MHz and 2025 MHz)*”, we believe this would benefit from a clarification that here “2 GHz MSS receivers” refers to CGC BS receivers.

¹ ACMA, December 2023, Business operating procedure—*Submission and processing of applications for space and space receive apparatus licences*, available here: <https://www.acma.gov.au/publications/2020-08/guide/submission-and-processing-applications-space-and-space-receive-apparatus-licences>

8. Views are sought on the approach of coordinating CGC transmitters operating in the band 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?

We agree with the ACMA's proposed coordination approach. Recommendation ITU-R SA.609-2 recommends a protection criterion for stations in the Space Research Service (SRS) of -216 dBW/Hz for 0.1% of time for unmanned missions, which is also referred to in Recommendations ITU-R SA.1154, SA.2078-0 and SM.1448-1. Recommendation ITU-R SM.1448-1 also specifies a protection criterion of -154 dBW/MHz, for 1% time (0.5% for each of 2 interfering transmitters), for receiving earth stations in the Space Operations Service (SOS) and the Earth Exploration-Satellite Service (EESS).

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.

We note that the ACMA's coordination principles in Section 3.6.1 of the Discussion Paper deal with mobile earth station/UE transmitters in the uplink band (1980-2005 MHz) and detailed coordination of CGC BS in the downlink band (2170-2195 MHz). We agree with the ACMA's proposed approach to these scenarios.

We don't have a view on how protection of the ARQZWA from aeronautical transmitters would be ensured.

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.

We do not have any views on the in-band or adjacent-band coordination between MSS satellite networks operating in the 2 GHz MSS band.

That said, and noting the discussions on the 1.5 GHz Band, we consider there is an inconsistency in the MSS operators' need for guard band at the 1518 MHz boundary, but not between adjacent-channel 2 GHz MSS networks where one of the licensees is operating CGC. In this latter scenario, you could have a high-power terrestrial BS (i.e. the CGC use case) immediately adjacent to a mobile earth station trying to receiving the downlink from the Satellite (i.e. the Satellite DTM use case).

As mentioned in the response to Q1, we believe that it should be a priority for the ACMA to ensure that CGC base stations are not permitted to cause harmful interference.

Reconsideration of 2 GHz narrowband requirements

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

AMTA currently has no view on Narrowband MSS arrangements.

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?

AMTA currently has no view on Narrowband MSS arrangements.

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 suitable equipment.

Given that the ACMA has already decided that this band would be allocated to 2 GHz MSS services, we are supportive of the band being used for MSS Satellite DTM using devices supporting 3GPP Release 17 (R17) NTN for this band (3GPP Band n256).

14. What is the minimum viable amount of spectrum for 2 GHz MSS services? Is a 2x5 MHz allocation useable or is a minimum of 2x10 MHz required?

AMTA does not have a view on this issue.

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 x 10 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.***

AMTA does not have a view on this issue.

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