

19 September 2023

The Manager
Wireless Broadband
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

RE: Review of the 1.5 GHz band

Dear Sir/Madam,

Omnispace Australia Pty Ltd ("Omnispace") sincerely appreciates the opportunity to submit a response (see attachment 1) to the Australian Communications and Media Authority's Consultation Paper, "*Review of the 1.5 GHz band, Extended mobile satellite service (MSS) L-band options paper.*" As spectrum planning is integral to the availability and success of Omnispace's and all mobile-satellite service (MSS) businesses in Australia, we applaud ACMA for this timely review of the 1.5 GHz MSS band.

Omnispace has a specific interest in the 1.5 GHz L-band for providing a 3GPP NTN service to Australia, via an ITU-R L-band NGSO satellite filing that includes the (1668-1675 MHz Earth-to-space / 1518-1525 MHz space-to-Earth) "extended L-band" segments that the ACMA proposes to extend for MSS use.

Once coordinated, Omnispace's 1.5 GHz NGSO system will be brought into use in accordance with applicable International Telecommunication Union ("ITU") regulations, complementing its operational global 2 GHz S-band NGSO system, and operational Earth station gateways. Omnispace notes, that Resolution 225-2 (Rev. WRC-12) *Use of additional frequency bands for the satellite component of IMT* identifies the extended L-band for the satellite component of IMT. Furthermore, to maximise the utility of, leverage a global ecosystem, and thereby minimise the costs associated with using the L-band extension, it should be specified for 5G NTN by 3GPP.

Omnispace is leveraging over AUD\$1 billion of assets that the company acquired to deploy its NGSO L-band and S-band systems in order to provide MSS and hybrid connectivity via a complementary ground component (CGC).

Omnispace currently offers 2 GHz S-band MSS capacity in various markets through its existing operational on-orbit F2 satellite network. The F2 satellite network is the first element of the NGSO constellation that will be capable of providing continuous coverage and connectivity around the globe ("Omnispace System"). In 2022 Omnispace launched two S-band capable LEO satellites into space and is planning the launch of a 1.5 GHz MSS L-band capable LEO satellite constellation, as a significant expansion of the existing Omnispace NGSO system. In the USA and Canada, Omnispace

has entered into an MoU with Ligado networks which will see 40 MHz of L-band spectrum and 60 MHz of S-band spectrum utilised for a space based, direct-to-device 5G NTN compliant network.

Omnispace is investing in new technology and infrastructure as part of its next generation global constellation designed to provide hybrid 5G connectivity. The Omnispace satellite network will power critical global communications, including a 3GPP Release 17 compliant 5G NTN (5G Non-Terrestrial Network) and Internet of Things (IoT) connectivity, directly from its satellites in space to mobile devices around the world. Omnispace is building upon the investments it has already made to validate 3GPP standards-based 5G products and technologies and to demonstrate 5G connectivity from space.

In Australia, Omnispace has an operational gateway satellite Earth station at Ningi QLD with MSS feeder links in the 5 GHz and 7 GHz frequency bands for its S-band and planned L-band satellite network. Although, this does not preclude Omnispace from establishing additional gateway Earth stations, elsewhere in Australia, to meet growing demand for 5G NTN.

The Omnispace L-band and S-band satellite networks are included in the Radiocommunications (Foreign Space Objects) Determination 2014. Stemming from our plans for L-band service outlined above, Omnispace supports the ACMA's proposals to extend the L-band for MSS use. Omnispace supports option 2 or 3. Option 2 represents the fastest opportunity to open the extended L-band for MSS use, although it constrains the MSS to coordinate usage around incumbent radio licenses. That said, the implementation of Option 2 should explicitly include measures to prevent the licensing of new terrestrial services. Option 3 provides the greatest geographic scope for MSS operations and ensures certainty of the interference environment; however, the relocation of incumbents may be undertaken in parallel to implementation of Option 2 to enable earlier bringing into use of new MSS networks in the extended L-band.

We look forward to the next stages of planning especially in relation to determining coexistence options between MSS and other services. In relation to MSS receiver performance, Omnispace's intention to utilise the extended L-band for 5G NTN services again brings into focus the need to ensure the band is specified in 3GPP which in the process will provide clarity about receiver performance.

For gateway Earth stations, Omnispace requests that if/when ACMA implements new licensing requirements in the 6/7 GHz band, that protection is provided to existing gateway Earth stations operating in the band, and also allows for the introduction of new gateway Earth stations in other currently undetermined locations in Australia.

Thank you again for the opportunity to provide comments.

Please contact me at phone: 0418 312 134 or Email: LDavey@omnispace.com, should there be a need for clarification or additional information.

Sincerely,



Les Davey
Managing Director
Omnispace Australia Pty Ltd

ATTACHMENT 1

Introduction

Omnispace is pleased to have the opportunity to provide these comments on the Australian Communications and Media Authority's consultation on the "*Review of the 1.5 GHz band, Extended mobile satellite service (MSS) L-band options paper*".

Omnispace has a planned global non-geostationary orbit ("NGSO") satellite system filing in the 1.5 GHz L-band (1668-1675 MHz Earth-to-space / 1518-1525 MHz space-to-Earth), with licenced MSS feeder links in the 5175-5250 MHz (uplink) and 7010-7075 MHz (downlink) bands in Australia. Omnispace has an operational Earth station at Ningi in Queensland and is interested in acquiring a nationwide licence to provide L-band MSS / CGC service throughout Australia. In the USA and Canada, Omnispace has entered into an MoU with Ligado networks which will see 40 MHz of L-band spectrum and 60 MHz of S-band spectrum utilised for a space based, direct-to-device 5G NTN compliant network. Therefore, Omnispace's comments to this consultation focus on the L-band, and the importance of international engagement in ITU and APT regulatory developments, and 3GPP technical standard developments.

Responses to ACMA Issues for Comment

The Omnispace responses to the ACMA issues for comment are set out below.

1. *Comment is sought on the proposed desirable planning outcomes for the review of the extended MSS L-band.*

Omnispace is supportive of the introduction of MSS in the extended MSS L-band, reasonable time frame as per the ACMA indicative timeline for the 1.5 GHz band review process.

2. *Comment is sought on the options identified. Do you have any alternative options to propose?*

ACMA has identified 3 options for replanning the extended MSS L-band.

Omnispace prefers option 2 (to enable MSS use of the entire extended MSS L-band), which is also ACMA's preliminary preferred option.

Option 2 best aligns with the ACMA's desired planning outcomes, complements the existing L-band MSS arrangements, supports the timely introduction of extended MSS L-band services, is relatively simple to implement, and has no impact on incumbent services. Option 2 does constrain the MSS to coordinate usage around incumbent radio licenses, so to provide stability of the regulatory and interference environment the implementation of Option 2 should explicitly include measures to prevent the licensing of new terrestrial services.

Omnispace also supports option 3 (extension of extended MSS L-band), relocating some incumbent services), as this provides the greatest geographic scope for MSS operations and ensures certainty of the interference environment. However, the relocation of incumbents should

be phased in parallel with option 2 to allow earlier bringing into use of new MSS networks in the extended L-band.

Omnispace is opposed to option 1 (no change) as this does not support the timely introduction of an L-band MSS service.

Omnispace considers that the 3 ACMA options are sufficient to be considered in this review of the extended MSS L-band.

3. *Comment is sought on the ACMA's assessment of options.*

Omnispace agrees with the ACMA assessment of option 1 that it does not support the timely introduction of an L-band MSS service.

Omnispace agrees with the ACMA assessment of option 2 that it provides access to more L-band spectrum, and complements existing arrangements for L-band MSS.

Regarding the ACMA proposed operational restrictions, Omnispace supports the need for L-band MSS receivers to have good blocking performance. The ongoing consultation process notwithstanding, Omnispace's intention to utilise the extended L-band for 5G NTN services brings into focus the need ensure the band is specified in 3GPP which in the process will provide clarity about receiver performance.

Omnispace agrees with the ACMA assessment of option 3 that having to relocate some incumbent services may delay the timely introduction of MSS in the extended MSS L-band. And thus, suggests implementing Option 2 and Option 3 in parallel allowing the phased relocation of incumbent services.

4. *Comment is sought on the ACMA's preliminary preferred approach, including the proposed draft amendments to the [Radiocommunications \(Communication with Space Object\) Class Licence 2015](#) and associated licence application and allocation process.*

Omnispace supports the ACMA preliminary preference for option 2, as it best aligns with the ACMA's desired planning outcomes, supports the timely introduction of extended MSS L-band services, is relatively simple to implement, and has no impact on incumbent services.

Regarding the ACMA draft "Radiocommunications (Communication with Space Object) Class Licence Variation 2023 (No. 1), Omnispace supports the insertion of the following:

- the frequency band 1688-1675 MHz for earth stations
- the frequency band 1518-1525 MHz for earth receive stations

Regarding the provision to restrict the operation of a station in the 1673.38 to 1675 MHz band to protect incumbent licences, Omnispace is of the view that this requires further consideration.

Additional comments

Regarding the ACMA "Next Steps", Omnispace supports the ACMA decision to progress the 1.5 GHz band to the preliminary re-planning stage, and the ACMA indicative timeline for the 1.5 GHz review process.

The ACMA adoption of a “reply to comment” period of 30 days is noted and Omnispace will review the submissions of other stakeholders before making a further submission to the ACMA responding to the other stakeholder positions.

Omnispace considers that the extended MSS L-band, by virtue of being immediately adjacent to 3GPP 5G NTN band n255 (1525 – 1559 MHz space-to-Earth/ 1626.5 – 1660.5 MHz Earth-to-space), has the potential to be used as an extension of band n255. If 3GPP seeks to define the Extended MSS L-band for 5G NTN, it will consider adjacent band compatibility with n255 and the defined bands below 1518 MHz.

As noted above, the extended L band is identified for the satellite component of IMT. The ITU-R has initiated the process for technologies to be evaluated as the satellite component of IMT-2020 which is scheduled to conclude in 2024. As 3GPP has already defined bands n255 and n256 for 5G NTN, it will likely specify the extended L band for MSS and CGC services that will complement terrestrial mobile networks.

Omnispace is interested in acquiring a licence to provide L-band MSS / CGC service in this band throughout Australia and looks forward to contributing to relevant technical studies and consultations related to the band.

Regardless of allocation mechanism, there should be a condition(s) that guard against spectrum hoarding and market speculation, including that license seekers have an existing ITU-R satellite network filing for this band so that the network can be brought into service quickly thereby ensuring that Australians, particularly those in rural and remote areas, enjoy the economic and social benefits of early access to new services.

Noting that Australian Government priority is for digital inclusivity, especially for first nation Australians, priority for potential licensees should be afforded to those operators seeking to ensure cost-effective mass market-technologies such as 5G NTN that may be integrated with and complement terrestrial mobile network coverage.

It is a widely held opinion that the existing global MSS allocations are not sufficient to support the capacity required to support the demand for 5G NTN or future 6G NR and NTN integrated networks. As radio frequency signals at higher frequencies suffer from increasing atmospheric and hydrometeorological attenuation, and the antennas required for efficient reception of lower frequency radio signals are not easily accommodated in the form factor for modern mobile (and mobile satellite devices) it is necessary to find additional spectrum between 1 and 5 GHz to support growth of 5G NTN services.

In this regard Omnispace would like to collaborate with the ACMA on strategies and mechanisms to meet the increasing capacity demands for global MSS operations, such as but not limited to, the development of a future agenda item for additional MSS spectrum for WRC-27.