



28 February 2022

The Manager
Space Systems Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

RE: ACMA Proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services

Dear Sir/Madam,

Omnispace Australia Pty Ltd ("Omnispace") sincerely appreciates the opportunity to submit a response to the Australian Communications and Media Authority's Consultation Paper, "ACMA Proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services." Omnispace has far ranging and specific interests in the 2 GHz S-band given that it operates a MEO global non-geostationary orbit ("NGSO") satellite system in the 2 GHz S-band (1980-2025 MHz Earth-to-space / 2170-2200 MHz space-to-Earth) with feeder links in the 5-7 GHz band.

Background on Omnispace

Omnispace's NGSO system has been brought into use in accordance with applicable International Telecommunication Union ("ITU") regulations. Omnispace is leveraging over AUD\$1 billion of assets that the company acquired to deploy its NGSO system in order to provide Mobile Satellite Services (MSS) and hybrid connectivity via a complementary ground component (CGC).

Omnispace is managed by veteran satellite industry executives and has investments from leading private equity firms and strategic partners with a successful track record in the wireless and satellite domains. Omnispace's shareholders include Columbia Capital LLC, Telcom Ventures LLC, Greenspring Associates, Fortress Investment Group, and Intelsat S.A.

Omnispace currently offers 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 24 x 7 coverage and connectivity around the globe ("Omnispace System"). Omnispace plans to launch two additional satellites into space this year, leading to the significant expansion of the Omnispace System.

Omnispace is investing in new technology and infrastructure as part of its next generation global constellation designed to provide hybrid 5G connectivity. The Omnispace network will power critical global communications, including 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.

Omnispace's hybrid MSS system can provide a broad range of services of interest to Australia, including a wide array of possible commercial and government communications:

- **Industries:** Commercial MSS services to enterprises in agriculture, mining, fishing, etc.;
- **Hybrid:** In areas that are lacking in coverage or capacity due to blockage or density;
- **Connectivity:** Internet connectivity in rural and remote areas;
- **Emergencies/Public Safety:** Communications during natural and man-made emergencies, as well as disaster warnings to the public and government agencies;
- **Defence:** Increased capacity and resiliency for mobile defence applications;
- **Internet of Things (IoT):** Connected car applications, smart city (urban and rural), transportation and logistics (on-shore and off-shore);
- **Unmanned Aerial Vehicles:** situational awareness for disasters such as fires, damage caused by weather events, delivery, insurance inspections; and
- **Aviation Networks:** hybrid network that utilises both satellite and terrestrial networks to provide Internet access to airline flights.

In Australia, Omnispace has an operational satellite Earth station at Ningi QLD with MSS feeder links for its F2 satellite network in the 5 GHz and 7 GHz frequency bands. Ningi also provides Fixed Satellite System (FSS) feeder links for the ASIABSS satellite network in the 7 GHz segment.

Additionally, Omnispace has been working closely with ACMA throughout its 2 GHz replanning process with the goal of offering hybrid satellite terrestrial IoT service in Australia. In this regard, Omnispace currently has an experimental licence for a viticulture pilot in Victoria – a project that has performed very well.

Built around globally harmonised spectrum in the 2 GHz band and 5G NTN advanced technologies, the Omnispace System is ideally positioned to provide a wide array of commercial and government communications needs, subject to requisite licences and approvals.

Thank you again for the opportunity to provide comments on the “ACMA Proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services.”

Please contact me 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 "Proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services."

Omnispace has an operational MEO non-geostationary orbit ("NGSO") satellite system in the 2 GHz S-band (1980-2025 MHz Earth-to-space / 2170-2200 MHz space-to-Earth) and is interested in acquiring a nationwide licence to provide MSS / CGC service throughout Australia; thus, the company has a keen interest in the licensing arrangements for the 2 GHz band.

Issues for Comment

1. Omnispace supports ACMA's proposal to repeal the current Television Outside Broadcasting ("TOB") frequency band plan and to utilise the 1980-2010 MHz / 2170-2200 MHz band for MSS and CGC services. The globally harmonised 1980-2010 MHz / 2170-2200 MHz band is increasingly being utilised for MSS services including Internet of Things and 5G Non-Terrestrial Networks (NTN) which are being standardised in 3GPP Release 17.
2. Omnispace proposes that ACMA maintain the 2 x 30 MHz allocation for MSS/CGC and does not fragment the band by allocating 2 x 5 MHz for narrowband MSS. Our rationale is as follows:
 - Traditional MSS is also capable of transmitting narrowband signals, and Omnispace is of the view that the most efficient use of this spectrum would be as a part of the contiguous 2 x 30 MHz MSS allocation.
 - Allocating 2 x 5 MHz in the upper part of the 1980-2010 MHz / 2170-2200 MHz band unnecessarily fragments the normal 2 x 15 MHz bandwidth for MSS licences in this band.
 - Such a fragmentation is not only highly unusual and not in line with global best practice but could result in operational and administrative challenges in satellite operation.
 - Having the entire 2 x 30 MHz S-band MSS allocation would allow the ACMA to conduct an equitable allocation for two licences of 2 x 15 MHz, which would better accommodate future 5G non-terrestrial networks.
 - MSS has global (or semi-global depending on the orbits) coverage and to limit the band to an NB-IoT application of the MSS will only allow one subset of service when a panoply of MSS applications should be permitted to meet market demands.
 - Allowing the wider variety of services to be offered to the Australian continent as those that MSS systems are able to offer globally would result in more viable and credible business plans and a better use of the global spectrum and orbital resources.
 - Single country satellite applications have an inherent economy of scale disadvantage compared to global satellite systems.
 - In summary, Omnispace is of the view that the most efficient use of this spectrum would be as a part of the contiguous 2 x 30 MHz MSS allocation.
3. The consultation paper states that the technical requirements presented for the upper 2 x 5 MHz (2005-2010 MHz / 2195-2200 MHz) were developed considering the 3GPP work on 2 GHz Non-

Terrestrial Networks (TR 36.763).¹ Omnispace has been actively involved in the development of the 3GPP work on 2 GHz NTN and respectfully disagrees that the technical requirements are consistent with TR 36.763 for the following reasons:

- First, utilisation of a shared band on a non-interference basis is not consistent with the 3GPP Technical Specification Group Radio Access Network, Study on Narrow-Band Internet of Things (NB-IoT)/enhanced Machine Type Communication (eMTC) support for Non-Terrestrial Networks (NTN) ([Release 17](#)). In fact, the 3GPP technical parameters are for satellite operators that are exclusively utilising the frequency bands with only their devices in the frequency band. There is no “politeness” protocol built in and no sharing mechanism that has been articulated. While Omnispace supports no specific allocation for MSS NB-IoT, if the ACMA continues to endorse this specific allocation, Omnispace respectfully proposes that the ACMA consider an alternative manner of licensing the band for MSS IoT that would be consistent with 3GPP Release 17 and that would allow existing 2 GHz S-band MSS systems to be able to provide service in Australia. Please see section 5 below for the more detailed proposal.
 - Second, the duty cycle limits included in the ACMA consultation of 1% averaged over a 15-minute period with a maximum burst duration of 4 seconds are not included in 3GPP TR 36.763 and we respectfully propose they be deleted as 3GPP has implemented no duty cycle limitations in the IoT standard. Omnispace strongly encourages the ACMA to be consistent with 3GPP Release 17, which would mean that no duty cycle limits be included in the 2 GHz licensing framework.
 - Third, the power levels of EIRP being restricted to a maximum of 0.5 dBW/MHz proposed by the ACMA are significantly lower than what is supported by 3GPP (up to -10 dBW in 3.75 kHz) and what will be required to close the link budget.
4. Under the ACMA’s proposed technical conditions, a system such as Omnispace’s existing MEO satellite would be unable to provide meaningful MSS service because it could not close the link budget from the satellite to MSS devices. Therefore, should ACMA proceed with the 2 x 5 MHz class licensing of the 2005-2010 MHz / 2195-2200 MHz band, Omnispace proposes to eliminate the duty cycle limits and to allow higher power levels supported by 3GPP up to -10 dBW/ 3.75 kHz.
5. The ACMA has requested advice on how narrowband MSS could operate on a shared basis as the narrowband MSS segment is intended to be used on a shared basis where no satellite operator has exclusive use. Under the ACMA proposal, satellite operators are expected to coordinate use with each other, without involvement from the ACMA. Omnispace appreciates that the ACMA is open to considering additional guidance in the licensing procedures and to that end has some specific proposals regarding the various issues raised by the ACMA proposal.
- First, Omnispace believes that it would be very difficult to implement a workable system where “the narrowband MSS segment is intended to be used on a shared basis where no satellite operator has exclusive use” and the ACMA does not become involved. As mentioned above, the 3GPP technical parameters are for satellite operators that are exclusively utilising the frequency bands with only their devices in the frequency band and there is no “politeness” protocol built in. Other systems such as WiFi that have a “politeness”

¹ 3rd Generation Partnership Project, Technical Specification Group Radio Access Network, Study on Narrow-Band Internet of Things (NB-IoT)/enhanced Machine Type Communication (eMTC) support for Non-Terrestrial Networks (NTN) ([Release 17](#)).

protocol are very different from MSS IoT because they were designed to be used in “public commons” unlicensed bands by many simultaneous users without any single user or protocol gaining occupancy advantages. 3GPP has traditionally built protocols for carrier-based systems in licensed spectrum, so the base assumption is that the band is self-managed by the carrier without concern for other co-channel users. This is why existing cellular operators each have their own dedicated spectrum and do not share spectrum within common areas.

- Second, the ACMA has not proposed a sharing mechanism and the agency has indicated that satellite operators are expected to coordinate use with each other, without involvement from the ACMA. This reluctance of involvement from the ACMA on coordination may be due to the difficulties envisioned in trying to coordinate MSS IoT systems that operate throughout Australia on a dynamic and mobile basis. Given that MSS IoT systems are expecting thousands if not hundreds of thousands of devices being used on each system and that these devices may be constantly changing location, it could be extremely challenging for different systems to coexist without interference. The only possible approach to solving interference would be to segment the band between the users. And band segmentation seems to land back in the remit of the ACMA who could bring order to the possible chaos by specifically authorizing spectrum for each MSS IoT system.
 - Thus, authorizing one MSS IoT system per 2 x 1 MHz of spectrum would meet the ACMA’s stated goals of providing spectrum access to new entrants with minimal regulatory arrangements, thereby supporting growth in the Australian space industry, while maintaining coexistence with adjacent-band television outside broadcast (TOB) services. To this end, should the ACMA decide to proceed with its plan of allocating 2 x 5 MHz for narrowband MSS, Omnispace respectfully proposes that the ACMA consider authorizing one MSS IoT system per 2 x 1 MHz of spectrum in the 2005-2010 MHz/2195-2200 MHz band. This transparent and clear licensing system would mean that up to five narrowband satellite systems could be authorised under the class-based system. This proposal would further enable multiple operators to provide service in the 2 x 5 MHz sub-band in a manner that would be compliant with 5G NTN IoT standards and not on a shared basis where interference with one another would be a serious concern.
6. Given that the ACMA is ready to start authorising operations in the entire 1980-2010 MHz/2170-2200 MHz band by the end of 2024, Omnispace believes that the timelines of 2024 and 2026 for implementing MSS / NB-MSS and CGC and for transitioning TOB out of the bands should be expedited. Industry groups and operators interested in providing MSS/CGC services in the 2 GHz S-band should work with ACMA and TOB operations to develop mechanisms that would achieve shorter timeframes. In non-metropolitan areas, service could be allowed as soon as the class licences are issued and then once the MSS licensing is finalised, licenced operators could work with the ACMA and TOB operations to implement an earlier transition period.
 7. Omnispace supports the ACMA’s intention to make the proposed amendments to the CSO class licence by the end of Q1 2022.