

6 May 2022

The Manager
Spectrum Licensing Policy
Australian Communications and Media Authority
PO Box 13112
Law Courts
Melbourne VIC 8010

RE: Draft Five-year spectrum outlook (FYSO) 2022-27 and 2022-23 work program

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, "Draft Five-year spectrum outlook 2022-27 and 2022-23 work program" ("FYSO"). As government spectrum planning is integral to the availability and success of Omnispace's mobile-satellite service business in Australia, Omnispace applauds ACMA's efforts to develop a transparent spectrum management work program with public participation from companies like Omnispace.

Background on Omnispace

Omnispace has far ranging and specific interests in the 2 GHz S-band given that it operates a 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. 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 recently launched a LEO satellite into space in the 2 GHz S-band with ThalesAlenia on April 1, 2022 and plans to launch an additional satellite this quarter, leading to the significant expansion of the Omnispace NGSO 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 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.

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. Omnispace recently applied for inclusion in the Foreign Space Objects Determination and responded to the ACMA’s consultation to support its addition to Schedule 1 of the Radiocommunications (Foreign Space Objects) Determination 2014¹.

Additionally, Omnispace has been working closely with ACMA throughout its 2 GHz replanning process with the goal of offering 5G NTN and 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 for the last three years and will soon be receiving new equipment to continue testing.

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.

Omnispace is an active member of the Communications Alliance Satellite Services Working Group and has recently been accepted as an Affiliate member of the Asia-Pacific Telecommunity (APT) through the Australian international organisation process.

Thank you again for the opportunity to provide comments on the “Draft Five-year spectrum outlook 2022-27 and 2022-23 work program.”

¹ https://www.acma.gov.au/sites/default/files/2022-04/IFC03-2022_Submissions_zip%20%281%29.zip

Please contact me should there be a need for clarification or additional information.

Sincerely,

A handwritten signature in black ink that reads "Les Davey".

Les Davey
Ph: 0418 312 134
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 draft "Five-year spectrum outlook 2022-27 and 2022-23 work program."

Omnispace has a global operational 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 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 MSS / CGC service throughout Australia. Therefore, Omnispace's comments to the FYSO focus on the 2 GHz band, the 6 GHz band and the importance of international engagement at the ITU and the APT. We also comment briefly on pricing, satellite licencing, and terahertz spectrum.

Issues for Comment

2 GHz Band (1980-2010 / 2170-2200 MHz)

1. Omnispace supports ACMA's proposal to continue with the implementation phase of the 2 GHz band for MSS and CGC services. Omnispace recently participated in ACMA's two consultations² regarding this frequency band in the December 2021/January 2022 timeframe noting that 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) for which the 3GPP Release 17 specification will be completed in June 2022. Omnispace is interested in acquiring a licence to provide MSS / CGC service in this band throughout Australia and looks forward to contributing to relevant technical studies and consultations related to the band.
2. In its responses to the January 2022 consultations on the band, Omnispace proposed that ACMA maintain the 2 x 30 MHz allocation for MSS/CGC and not fragment the band by allocating 2 x 5 MHz for narrowband MSS with the rationale that:
 - Traditional MSS is also capable of transmitting narrowband signals.
 - 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 channel 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.

² ACMA, "Replanning the 2 GHz band: Review of the 2 GHz Television Outside Broadcast Frequency Band Plan Consultation paper," December 17, 2021 and ACMA, "Proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services consultation paper," December 20, 2021.

- 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 unnecessarily restrict service options when a panoply of MSS applications should be permitted to meet market demands.
 - Allowing the widest variety of services to be offered to the Australian continent as those that MSS systems can offer globally results in more viable and credible business plans and more efficient use of the global spectrum and orbital resources.
 - Single country satellite applications have an inherent economy of scale disadvantage compared to global satellite systems.
3. Our response to no. 2 above notwithstanding, should the ACMA decide to dedicate 2 x 5 MHz (2005-2100 MHz paired with 2195-2200 MHz) for satellite IoT and similar narrowband services to be used on a shared basis between operators, Omnispace has provided detailed feedback on why higher power cycles would be needed, why no duty cycle limits should be included and we have proposed an innovative “sharing” scheme based on spectrum segmentation that would enable five operators to utilise the 2 x 5 MHz with 2 x 1 MHz each. In this scenario, 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.
 4. Given that the ACMA is ready to start authorising operations in the entire 1980-2100 MHz/2170-2200 MHz band by the end of 2024, Omnispace also proposes expediting the timelines of 2024 in rural areas and 2026 in capital cities for transitioning TOB out of the band and implementing MSS / NB-MSS and CGC. 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.
 5. In terms of next steps outlined in the FYSO, we look forward to reviewing the outcomes of the January 2022 consultations by the end of Q2 2022, participating in the research and development of technical and regulatory arrangements to support MSS (including CGC) in the 2 GHz band, and to the consultation scheduled for Q1 2023. For the implementing planning decision scheduled in 2023-2024 following the 3400-3575 MHz and 3700-3800 MHz auction, Omnispace notes the preliminary view of ACMA is that the allocation will occur via auction given that demand would likely exceed supply but that is subject to further consideration. To date, there has not been an auction in the 2 GHz band for mobile satellite services on a stand-alone basis. However, when the complementary ground component was included as an additional option then, in the case of Mexico, a competitive market-based award process was used. Omnispace would be pleased to work with ACMA and provide additional information regarding allocation mechanisms for MSS spectrum in the 2 GHz band globally.
 6. If ACMA proceeds with an auction of this spectrum, there should be a condition(s) that guard against spectrum hoarding and market speculation, including that bidders 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.

6 GHz Band (5925-7125 MHz)

1. As noted in the FYSO, there is significant interest in ongoing international developments in the 6 GHz band. Parts of the 6 GHz band are being considered under WRC-23, Agenda Item 1.2 and during the WRC-19 study process, several segments of the neighbouring 5 GHz band (5150-5350 MHz and 5725-5925 MHz) were also considered, resulting in changes to the ITU Radio Regulations in some parts of those bands, most notably in 5150-5250 MHz. Omnispace supports ACMA's position of continuing to monitor developments in the ITU and other international trends to inform its consideration of this band.
2. Omnispace responded to ACMA's Q2 2021 discussion paper as part of the initial investigation stage, looking at the state of both the 5 GHz and 6 GHz bands and recent international developments in these bands. Omnispace operates licenced feeder links in the 5175-5250 MHz (uplink) and 7010-7075 MHz (downlink) bands in Australia with an operational satellite gateway Earth station at Ningi in Queensland. Omnispace believes that further studies on sharing and compatibility will need to be undertaken at the international level and experience gained on the feasibility and effectiveness of Automated Frequency Coordination (AFC) systems to protect incumbent services from high or Standard Power (SP) class licenced RLANs or future developments of wide-area IMT in the relevant parts of the band. Omnispace does not support any consideration of the use of the 6 GHz band for IMT, as it implies exclusive, primary use of the band for mobile services. Compatibility between outdoor IMT deployments and MSS downlinks in the same band will be challenging at best and tremendously problematical due to aggregate interference. In any event, as noted by the ACMA in the Q2 2021 discussion paper, IMT now has a large amount of spectrum available with more frequency bands available soon. WRC-19 also identified over 17 GHz of high-band spectrum for IMT, therefore it is difficult to fathom how spectrum that is currently being used by licenced and operating satellite services in Australia should be repurposed for IMT.

Pricing

1. Omnispace appreciates the recent implementation of the Spectrum Pricing Review reforms that have achieved significant reductions in the satellite apparatus annual licence fees. It is important that satellite licence fees continue to be benchmarked for comparison with those of other international spectrum regulators and we support that the ACMA continues to undertake annual licensing and band reviews for any spectrum pricing implications.

Satellite service licensing

1. Omnispace supports the ACMA's current approach to satellite regulation and is of the view that because the current approach achieves equitable, efficient and interference managed access to the spectrum and orbital resources the ACMA does not need to adopt a more interventionist approach.
2. Omnispace recently applied for inclusion in the Foreign Space Objects Determination and responded to the ACMA's consultation to support its addition to Schedule 1 of the Radiocommunications (Foreign Space Objects) Determination 2014.
3. Omnispace supports the class licensing of 2 GHz satellite user terminals.

Regulatory considerations for terahertz spectrum

1. Although Omnispace has no immediate intention to use sub-terahertz or terahertz spectrum, with the inevitable trend for satellite services to make use of these higher frequency bands,

Omnispace considers that it would be prudent for ACMA to begin its planning for satellite services to use these bands.

2. Considering the very narrow beams used by satellites at these frequencies, a greater degree of geographic and frequency sharing with terrestrial services will be possible, so Omnispace recommends proceeding with a light-handed regulatory approach to accommodate both services.

International Engagement

1. Omnispace recently joined the APT as an Affiliate Member via the Australian process and appreciates Australian leadership and engagement within international organisations such as the ITU and the APT. With the World Radiocommunication Conference occurring in 2023, it will be important that the Department and ACMA continue to place a high priority on telecommunication matters relevant to Region 3 and Australia's interest in the global community.
2. Omnispace is pleased that Australia plans to have delegations participate in the ITU-R WP 4A/B/C meetings in May and September as important work is being carried out these groups. For example, WP 4B will consider the standardisation of radio air interfaces for the satellite component of IMT-2020 and WP 4C will consider various frequency bands of interest to ACMA. Also, as mentioned in the FYSO, ITU-R WP 5D is working on WRC-23 Agenda Item 1.2 regarding the 6 GHz issue, which is important for continued operations of Omnispace's satellite feeder links in Australia. Omnispace is honoured to play a leadership role in the APT AWG where Mr. Alex Orange chairs the Spectrum Sub-Working Group on Sharing Studies which is currently considering issues related to frequency bands addressed in this draft of the FYSO.