

**COMMUNICATIONS
ALLIANCE LTD**



**COMMUNICATIONS ALLIANCE
SATELLITE SERVICES WORKING GROUP**

SUBMISSION

to the

Australian Communications and Media Authority's
(ACMA)

Satellite direct-to-mobile services:
regulatory issues

7 February 2024

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EXECUTIVE SUMMARY

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 *Satellite direct-to-mobile services: regulatory issues* consultation, arising from the issues raised in the Five-year spectrum outlook 2023–28 (the FYSO) and at the ACMA Spectrum tune-up which was held on 31 October 2023.

The SSWG generally supports a flexible approach to Direct-to-Mobile (DTM) services, noting that there are a number of variants as outlined in this submission. In particular, the SSWG supports DTM in existing MSS bands, new MSS secondary allocations in terrestrial mobile bands and additional primary allocations to MSS under WRC-27 Agenda Item 1.14.

The SSWG also supports the carefully considered use of the ITU Radio Regulations Article 4.4 for the provisions of new services.

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>.

1 Introduction

The satellite world is rapidly changing. Direct-to-Mobile (DTM) is already a reality with the announcement of commercial plans by operators and the deployment of a number of field tests and commercial services.

DTM services are developing rapidly, already offering messaging, with the future holding the promise of higher speed networks, with speeds in the tens of megabit per second to a 3rd Generation Partnership Project (3GPP) non-terrestrial networks (NTN) Release 17 handset for satellite operations in the S and L bands. Releases 18 and 19 promise even higher speeds with the possible introduction of additional frequency bands (e.g. C and Ku-bands).

The potential of DTM services is increasingly recognised globally. Australia is well placed to realise this potential and this has been recognised through the Government's LEOSat Working Group. The ACMA's *Five-Year Spectrum Outlook 2023–28* (the FYSO) indicated that Australia's existing licensing regime is sufficiently flexible to support the supply of satellite DTM services in Australia. The SSWG welcomes the ACMA's consultation as an important step to ensuring that the technical requirements and regulatory framework are fit to deliver the benefits of DTM services.

In the course of developing this submission, it has become apparent that there are some regulatory issues upon which member opinions diverge that may warrant further consideration by the ACMA. The SSWG would happily make itself available to the ACMA to discuss further.

2 Exciting time in innovation

The 3rd Generation Partnership Project (3GPP) specifications on satellite connectivity has opened up an exciting opportunity for terrestrial communication service providers to cooperate with satellite operators operating in designated 3GPP band classes, which comprise frequency bands allocated to the Mobile Satellite Service (MSS) (Release 17 and 18) and other bands beyond Release 18, to create a global NTN ecosystem. By enabling connectivity between terrestrial systems and satellite systems on the same mobile platform, the NTN ecosystem is beginning to deliver great value to individuals and organizations all around the world by offering truly global mobile coverage.

Some MSS systems have been based on proprietary solutions, but that is changing as satellite operators adopt standardised solutions. This includes solutions that are compatible with those of the 3GPP and other existing mobile Standards. NTN is now part of the 3GPP standard following the publication of Release 17 and Release 18. This standard has established a strong foundation for direct communication between satellites, smartphones, and other types of mass-market user equipment such as those supporting Internet of Things (IoT) applications. Globally, this has led to major advances in both terrestrial and non-terrestrial satellite technology which will bring significant benefits for Australia.

As the rate of adoption of mobile communication technology around the world rises, using the user equipment to support seamless coverage anywhere, at any time, has become increasingly important, particularly in countries like Australia where the populated areas make up only a small part of the total landmass.

Integrated satellite and terrestrial networks will, in the near future, provide coverage and service throughout Australia in areas where terrestrial networks are simply uneconomical. NTNs will also help to deliver resilient services to consumers and businesses currently unserved as well as providing service in emergencies when the terrestrial networks are unavailable or

congested. This partnership between space and terrestrial based networks will bring significant social and economic benefits to Australia, the region and globally.

Beyond the benefits NTN will deliver to consumer user devices, they will also have the capability to support both industrial and governmental IoT devices for industries such as transport, health care, agriculture, utilities, the autonomous aircraft/drone sector, national security, public safety and disaster relief.

3 Two Types of Direct-to-Mobile communications

There are two distinct models for DTM communications. Both have advantages and disadvantages but there are also distinct differences and requirements.

MSS DTM

The 'MSS DTM' approach uses MSS bands, and the communications within these bands will utilise satellites providing MSS services. The standards and technology surrounding MSS DTM are recent, with user equipment manufacturers have only recently been incorporating this technology into their device ecosystems. We expect as these services develop further and low earth orbit NTN are deployed, wideband data applications, including email, internet and streaming, will be available.

The MSS user equipment will be capable of communicating to satellites using conventional MSS bands and be able to 'roam' onto a terrestrial network when in range of a base station.

Access to additional MSS spectrum will enable delivery of higher data rates and support more diverse services to a greater number of users. The ACMA should consider support for additional MSS spectrum under WRC-27 Agenda Item 1.14.¹

IMT Sat DTM

The 'IMT Sat DTM' approach uses the terrestrial MS spectrum to transmit between existing user equipment (mobile handsets) and satellite, thereby complementing the terrestrial mobile network coverage, particularly in areas where it may be unavailable or does not exist. Given that IMT Sat DTM services are intended to operate on IMT spectrum bands, there are already mobile devices being currently used by consumers that may support the IMT Sat DTM service today², if the service were authorised.

IMT Sat DTM is envisaged in several terrestrial mobile bands given the right regulatory structure. In this case, agreements between the satellite operators and terrestrial operators are required since both the satellite and terrestrial networks can use the same spectrum in the same geographic areas with interference mitigation measures.

WRC-27 Agenda Item 1.13³ proposes to study some aspects of this issue however these studies may not be concluded before some operators wish to introduce the services.

¹ WRC-27 Agenda Item 1.14 to consider possible additional allocations to the mobile-satellite service in the frequency bands 2010 – 2025 MHz (Earth-to-space) and 2160 – 2170 MHz (space-to-Earth) in Regions 1 and 3 and 2120 – 2160 MHz (space-to-Earth) in all Regions, in accordance with Resolution 254 (WRC-23)

² Terrestrial mobile devices have not been tested by the Global Certification Forum for connection with satellites, noting that some mobile phone manufacturers, Apple being an example, already market the emergency SOS via satellite capabilities of their devices, including to the Australian market. See [Use Emergency SOS via satellite on your iPhone – Apple Support \(AU\)](#).

³ WRC-27 Agenda Item 1.13 to consider studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and International Mobile Telecommunications

Therefore, the use of IMT Sat DTM services prior to the completion of these studies should reflect balance between the needs of the terrestrial and satellite operators with respect to the potential impact on other terrestrial users, which include other terrestrial operators in the same or other countries, as well as other satellite operators as some bands are allocated for both MSS and terrestrial uses.

4 Regulatory Discussion

MSS DTM

In the case of MSS DTM, other than support for allocating new MSS bands under WRC-27 Agenda Item 1.14, the current Australian regulatory arrangements are fit-for-purpose and there are no additional regulatory concerns to be addressed. In addition, the existing MSS allocations in the S and L bands (3GPP band class n256 comprising 1980-2010 and 2170-2200 MHz and 3GPP band class n255 comprising 1626.5-1660.5 and 1525-1559 MHz) are already included in the 3GPP NTN framework and the eco-system is being created, so no additional regulatory action is needed to access these existing MSS allocations. Further, today MSS DTM services are available in markets across the globe. Using the new allocation of MSS band(s) projected under Agenda Item 1.14 in advance of WRC-27 would require authorisation under ITU Radio Regulations Article No. 4.4 and may leverage the ecosystem of existing user equipment.

Going forward, the ACMA should take care to not limit the use of MSS bands or filings, in any way (existing or future) or impose one sided protection requirements for MSS DTM.

As discussed above, MSS DTM offers significant benefits to Australia, and these will increase as the economies of scale take hold enabling the deployment of new systems to support these important services.

IMT Sat DTM

According to the ITU Radio Regulations, in order to facilitate IMT Sat DTM service operation, each candidate IMT band would either need an MSS allocation in the ITU Table of Frequency Allocations or the service would operate under Article 4.4⁴. Creation and use of a secondary MSS allocation must be supported by robust sharing studies and be, as far as possible, internationally harmonised. This approach is consistent with WRC 27 Agenda Item 1.13.

At WRC-23, Member States resolved under Agenda Item 1.13, to undertake 'studies on possible new allocation to the mobile-satellite service for direct connectivity between space stations and International Mobile telecommunications (IMT) user equipment to complement terrestrial IMT network coverage' in time for WRC-27.

As the ITU-R looks to study possible allocations across a wide array of bands to support connectivity between space stations and IMT user equipment, national administrations remain empowered to bring a service that is the subject of such study into use domestically, including via ITU-R Article 4.4. Using a new allocation in advance of WRC-27 may leverage the ecosystem of existing user equipment.

In this context, we welcome the clarifications provided by the ACMA in its recent FYSO on the extent to which the current radiocommunications regulatory regime for space objects

(IMT) user equipment to complement terrestrial IMT network coverage, in accordance with Resolution 253 (WRC-23)

⁴ As the ACMA has noted in its FYSO, services under Article 4.4 are operated on a no-interference no protection basis.

and the technology flexible nature of the spectrum-licensing regime enable the supply of IMT Sat DTM services within Australia.⁵ We also endorse the ACMA's statements that:

- the handsets used in such a system can be operated under the current spectrum licensing framework, subject to the handset complying with all applicable licence conditions, without the need for explicit approval from the ACMA; and
- a 'key feature of IMT satellite direct-to-mobile services is the need for an agreement or partnership' between the satellite operator and the spectrum licence holder as important to promoting effective interference management.

In regard to the latter, and to promote certainty, the ACMA may wish to formally confirm the need for such agreement as a pre-requisite to the supply of IMT Sat DTM services.

As with MSS DTM, there will likely be significant benefits if IMT Sat DTM services are supported with a sound regulatory approach that protects against harmful interference both in-band and adjacent band. For this reason, the SSWG supports, with the exception of some, the introduction of IMT Sat DTM services under Article 4.4 in Australia while ITU-R studies and possibly regional studies are progressed to assist with harmonisation of bands. In the meantime, the SSWG also supports the development of an appropriate regulatory framework, including additional secondary allocations to MSS, to support DTM.

5 Observations on Radio Regulations No. Article 4.4 (No. 4.4)

The ACMA's FYSO notes that a station may be authorised under No. 4.4 on the condition that it will not cause harmful interference to, nor claim protection from, other stations operating in accordance with the Radio Regulations.

During SSWG preparation of this submission, members expressed varying views regarding considerations relevant to the use of No. 4.4.

Some SSWG members agree that authorising IMT direct-to-mobile services under No. 4.4 would benefit Australian consumers by allowing mobile operators to efficiently extend their existing spectrum holdings to close coverage gaps and facilitate emergency response. These members stress that no regulatory barrier exists to using No. 4.4 in advance of the satisfaction at WRC-27 Agenda Items 1.13 and 1.14. Some SSWG members view that the use of Article 4.4 for satellite networks should be approached with caution as advised by the Radio Regulations Board at WRC-23⁶ especially the clarification that no first-in-time priority is afforded to transmissions operating under No. 4.4. This was agreed at WRC-23⁷.

Further detail of members positions is provided in individual submissions.

6 Timelines

The WRC-27 study cycle has started and the first meetings of the ITU-R Working Party 4C will occur in April 2024. The ACMA, in collaboration with the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, should undertake urgent

⁵ ACMA FYSO 2023-28, p.22

⁶ WRC-23/Document 50-E "Report by the Radio Regulations Board to WRC-23 on Resolution 80 (Rev.WRC-07)", Section 4.14.

⁷ WRC-23/Document 528-E "Minutes of the Thirteenth Plenary Meeting - Thursday, 14 December at 09:00 hours", Item 13.20.

consultation with industry to establish the Australian position on the above-mentioned WRC-27 Agenda items in facilitating DTM studies.

The ACMA is also undertaking valuable consultations on existing MSS bands and these should continue.

7 Conclusion

DTM promises many benefits for users in Australia and globally, which are already being recognised through deployment by early adopters. It is also evolving. While the current iterations of DTM are important, including emergency and messaging services, with improvements in satellite, antenna, chipset, modulation and spectrum availability, 3GPP Releases 17 and 18 promise speeds of tens of megabits per second in the near future. Alongside traditional 'smartphone' services, mobile satellite including DTM offer IoT connectivity and support to transport, mining and agriculture endeavours no matter where they are. DTM holds the future promise of seamless roaming between terrestrial and non-terrestrial networks that will be almost unnoticeable to the user.

Australia, due to its geographical environment and the absence of land borders, is in a better position than small land-locked countries to continue supporting the development of MSS DTM and IMT Sat DTM technology standards and regulation including operation of a system within the requirements of RR Article No. 4.4 as outlined in section 5 above. This would support a competitive market which benefits from the economies of scale being created through the inclusion of NTN in the 3GPP standards. It is important to remember that Direct to Mobile services are already in operation and soon will be available in many parts of the globe. Australia can benefit from them quickly if so allowed.

To conclude, the SSWG applauds the ACMA for acting early on these initiatives and offers our support as we move forward.

Communications Alliance Satellite Services Working Group membership

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