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## SATELLITE SERVICES WORKING GROUP

SUBMISSION

to the

Australian Communications and Media Authority's (ACMA)

Proposed updates to the LIPD Class Licence for 6 GHz RLANs

Consultation Paper

3 December 2021

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## EXECUTIVE SUMMARY

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the opportunity to provide comments to the ACMA *Proposed updates to the LIPD Class Licence for 6 GHz RLANs* Consultation Paper.

The SSWG accepts the ACMA's proposed changes to the LIPD Class Licence to introduce RLANs into the lower 6 GHz band (5925 – 6425 MHz) using the low power indoor (LPI) and very low power (VLP) outdoor parameters defined in the ACMA 37/2021 consultation paper.

The SSWG would not oppose consideration of the upper 6 GHz band for RLANs in the LIPD class licence, subject to the same technical constraints as the lower 6 GHz for the protection of FSS uplinks. The SSWG is open to consider high-gain directional antennas for RLAN devices in remote areas provided that such use does not increase the power radiated towards satellites. In addition to protecting satellite uplinks, a reliable means of protecting primary receiving earth stations from class licensed RLANs in the relevant parts of the band will be required.

The SSWG does not support 'standard power' (i.e. higher power devices) for outdoor use under a dynamic spectrum access system such as the automatic frequency coordination (AFC) system adopted in the U.S. Regional deployment of RLANs, especially outdoors and at high power, poses a long-term threat of aggregate interference to FSS uplinks in the 6 GHz band.

### About Communications Alliance

Communications Alliance is the primary telecommunications 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, equipment vendors, IT companies, consultants and business groups.

Its vision is to provide a unified voice for the telecommunications industry and to lead it into the next generation of converging networks, technologies and services. The prime mission of Communications Alliance is to promote the growth of the Australian communications industry and the protection of consumer interests by fostering the highest standards of business ethics and behaviour through industry self-governance. For more details about Communications Alliance, see http://www.commsalliance.com.au.

## 1. General comment

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the opportunity to comment on the ACMA's proposed updates to the LIPD Class Licence for 6 GHz RLANs (October 2021 – consultation 37/2021). The SSWG provided a submission to ACMA's 'Exploring RLAN use in the 5 GHz and 6 GHz bands' consultation paper in April 2021 (12/2021).

Under the Australian Radiofrequency Spectrum Plan, the 5925 – 7075 MHz band is allocated on a primary basis to the Fixed Satellite Service ('FSS'), 5925 – 7075 MHz in the satellite uplink and 6700 – 7075 MHz in the downlink, and many SSWG members have valuable operations and commercial satellite services in this band in Australia.

The SSWG can accept the ACMA's proposed changes to the LIPD Class Licence to introduce RLANs into the lower 6 GHz band (5925 – 6425 MHz) using the low power indoor (LPI) and very low power (VLP) outdoor parameters defined in the ACMA 37/2021 consultation paper, to minimise the risk of aggregate interference into the FSS uplinks (including FSS feeder uplinks for the Mobile Satellite System ('MSS')).

Regarding the possible upper 6 GHz for RLANs (6425 – 7125 MHz), higher power RLANs and future updates to the 5 GHz RLAN band in the LIPD Class licence, please find below our responses to the questions posed in the Consultation paper.

## 2. Upper 6 GHz band/higher power RLAN devices

**Q4. Should the ACMA make arrangements that permit high-gain directional antennas (for example, for wireless internet service providers in remote areas) under a class licensing regime?**

FSS systems operate across the full upper 6 GHz band and satellite operators have long term plans for the use of the band. For example, the band 6425 – 6575 MHz is used for feeder uplinks for MSS systems, which support safety of life services such as GMDSS and AMS(R)S. However, as mentioned in SSWG's April response, the SSWG would not oppose consideration of the upper 6 GHz band for RLANs in the LIPD class licence, subject to the same technical constraints as the lower 6 GHz for the protection of FSS uplinks.

The SSWG is open to consider high-gain directional antennas for RLAN devices in remote areas provided that such use does not increase the power radiated towards satellites. The use of high-gain antennas may be feasible if, for example, the direction of maximum radiation is below the horizon, and radiation above the horizon does not exceed the general outdoor limits. This may require the development of more complex limits, for example off-axis EIRP limits for radiation above the horizon.

In addition to protecting satellite uplinks, a reliable means of protecting primary receiving earth stations from class licensed RLANs in the relevant parts of the band will be required. If RLANs are allowed in 6425 – 7075 MHz, appropriate measures may also be required to protect non-GSO MSS feeder downlinks in the 6700 – 7075 MHz band, as several ground stations for the Globalstar and Omnispace NGSO MSS systems are situated in Australia and there are plans for a number of additional ones to support the EchoStar Global Australian MSS filing.

**Q5. If 'high power' class-licensed devices were to be introduced under an AFC system, what aspects of the system would need to be considered in setting it up? Is there interest from industry in administering such a system?**

As mentioned in the April 2021 submission, the SSWG does not support 'standard power' (i.e. higher power devices) for outdoor use under a dynamic spectrum access system such as the automatic frequency coordination (AFC) system adopted in the U.S.

Regional deployment of RLANs, especially outdoors and at high power, poses a long-term threat of aggregate interference to FSS uplinks in the 6 GHz band. While no single RLAN transmitter is expected to cause interference, an FSS uplink beam on a satellite will 'see' all RLAN transmitters within its coverage area. At large enough levels of RLAN deployment within such coverage area, especially outdoors, aggregate interference into FSS uplinks will be observed and lead to degradation of link performance.

The ECC studied aggregate interference from RLANs into FSS uplinks in the 6 GHz band. It found that by 2025, at high levels of outdoor RLAN deployment (5% outdoors), aggregate interference from RLANs would cause FSS uplinks to experience an I/N approaching or even exceeding the I/N allowed to be caused by a co-primary service in the same band under ITU-R Recommendation S.1432 (i.e. an I/N of -10 dB, apportioned between the FS and RLANs)[1]. In principle, however, class-licensed 'low interference potential' devices should not be allowed to cause as much interference into primary FSS as a co-primary service. Following this study, the ECC established LPI and VLP limits to 'help ensur[e] long term protection of FSS space stations from aggregate interference from WAS/RLAN devices.'[2]

In the SSWG's view, the U.S. approach of allowing much higher powered 'standard power' RLAN devices to be deployed outdoors (at up to 36 dBm EIRP and 23 dBm/MHz EIRP density for access points)[3] does not adequately address the risks of aggregate interference into FSS uplinks. In effect, this approach assumes that levels of outdoor deployments would be similar to historical levels of outdoor RLAN deployment (i.e. lower than 5%) and would never be so great as to ever pose an aggregate interference problem for FSS space stations. This is an odd assumption, as one would expect that the creation of a special class of unlicensed high-powered device for outdoor usage would result in much higher than historical levels of outdoor RLAN deployments. In turn, the deployment of more outdoor RLAN access points will likely lead to greater outdoor use of client RLAN devices (operating at up to 30 dBm EIRP and 17 dBm/MHz EIRP density).

The U.S. did impose an EIRP limit (21 dBm) in the skyward direction (at more than 30 degrees elevation) on unlicensed outdoor RLAN access points to provide some protection for the FSS against aggregate interference. However, this reduced EIRP limit is no substitute for the attenuation that would be expected from an indoor use requirement. This skyward EIRP limit also does not apply to outdoor client devices (which may continue to operate at up to 30 dBm), and remains much higher than the outdoor VLP EIRP limit (14 dBm) adopted by the ECC for the long-term protection of the FSS.

The AFC system adopted by the US to manage standard power outdoor RLAN access point devices is specifically not intended to provide protection against aggregate interference into the FSS. Instead, it is intended only to ensure that RLAN devices protect primary FS receivers operating in the same band using a database of licensed FS locations and frequencies. Even then, AFC-controlled standard power outdoor devices were not considered by the FCC to be adequate for the protection of Broadcast

[1] See ECC Report 302, Sections 3-4.
[2] See ECC Report 302, Section 4. Also see ECC Decision 20(01) Table 1 and Table 2.
[3] 'In the Matter of Unlicensed Use of the 6 GHz Band', FCC 20-51, Report and Order and Further Notice of Proposed Rulemaking, Table 3.

Auxiliary Service in the 6425 – 6525 MHz band (known as TV Outdoor Broadcast in Australia, which overlaps with the upper 6 GHz band at 7100 – 7125 MHz).

In the SSWG's view, there can be no assurance that RLANs operating under the LIPD class licence would remain 'low interference potential' with respect to the primary FSS without indoor restrictions and low- or very low- power limits, especially when there is no reliable means of capping the aggregate emissions from the RLANs.

**Q6. If 'high power' class-licensed devices were to be introduced under an AFC system:**

- **> Is there interest from industry in administering such a system?**
- **> Are there any impediments to developing and/or operating a system in Australia? What could be done to help enable, or otherwise encourage, the development and/or operation of a system in Australia?**
- **> To what extent would an Australian system need to be aligned with those to be implemented elsewhere? What scope could there be for customisation in an Australian system?**

**What aspects of an AFC system would need to be considered in the design, establishment, and ongoing operation, of such a system, including:**

- **> regulator and industry commitments**
- **> technical spectrum coordination and coexistence rules – for example, a tiered hierarchy framework for spectrum uses**
- **> IT infrastructure and system design, including security and system reliability issues**
- **> communication interfaces between an AFC system, the ACMA's Register of Radiocommunications Licences (RRL) and devices**
- **> ongoing interaction between the ACMA and system operators**

The SSWG does not support high power RLAN devices to be introduced through an automatic frequency coordination (AFC) system (see answer to Q5).

**Q7. If 'high power' devices were to be introduced under a manual registration process, what might those arrangements look like? Would the introduction of apparatus licensing for such devices be an appropriate option?**

The SSWG does not support high power RLAN devices (see answer to Q5).

**Q8. Would there be advantages in implementing different licensing and/or access management arrangements in different geographic areas for the use of high power RLAN devices?**

The SSWG does not support high power RLAN devices (see answer to Q.5.).

## 3. 5 GHz band

**Q12. If high power devices were to be authorised in both the 5 GHz and 6 GHz band, would it be appropriate to use the registration/authorisation method and system for both?**

The SSWG does not support high power RLAN devices in 6 GHz band (see answer to Q.5.)

## Communications Alliance Satellite Services Working Group membership

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COMMUNICATIONS
ALLIANCE LTD

Level 12
75 Miller Street
North Sydney
NSW 2060 Australia

PO Box 444
Milsons Point
NSW 1565

T 61 2 9959 9111
F 61 2 9954 6136
E info@commsalliance.com.au
www.commsalliance.com.au
ABN 56 078 026 507