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**COMMUNICATIONS ALLIANCE
SATELLITE SERVICES WORKING GROUP (SSWG)**

SUBMISSION

to the

Australian Communications and Media
Authority (ACMA) Consultation paper

Earth stations in motion in Ku band

*Regulatory status and proposed updates to
administrative licence procedures for space
and space receive apparatus licences*

26 April 2019

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INTRODUCTION

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the opportunity to provide this submission on the Australian Communications and Media Authority (ACMA) Consultation paper *Earth stations in motion in Ku band, Regulatory status and proposed updates to administrative licence procedures for space and space receive apparatus licences*.

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>.

GENERAL COMMENTS

The Communications Alliance Satellite Service Working Group (SSWG) commends the Australian Communications and Media Authority (ACMA) on the timely review of national regulatory arrangements in order to make way for the further introduction of earth stations in motion (ESIM) into Australia – on this occasion in Ku-band. This will enable the Australian market to keep pace with innovative international developments in satellite communications and assists with guarding against Australia falling behind in the implementation of new services and technologies. The general tenor of approach of the ACMA, in facilitating these services in a manner which is guided by existing regulatory solutions, is much appreciated and should expedite the processes of market access.

The ACMA has chosen a two-step approach to Ku-Band, dealing first with the 11.7-12.75 GHz and 14-14.5 GHz bands. The band 10.7-11.7 GHz is understood to be intended as a follow-up complementary consultation in Q4 (June quarter), and the SSWG strongly encourages this subsequent consultation, as a logical and needed extension in order to cover the whole of Ku-band as intended. Whilst the current consultation is in two parts, the SSWG would prefer that the resulting instrument(s) or amended instrument(s) be accomplished at the one time.

Within the area of fixed-satellite services (FSS) and the traditional regulatory treatment of fixed earth stations, a key feature of considering ESIM is the requirement of the services to remain within the envelope of operations of the FSS in which ESIM operate. Another very relevant feature of ESIM in other bands so far has been the acceptance that ESIM receive stations shall not claim protection from terrestrial services, where these services are allowed on a primary basis. There is reason to expect this condition would be suitable in 10.7-11.7 GHz band because of the ubiquitous nature of ESIM terminals. Furthermore, ESIM that will operate in this band would be receiving and not transmitting, thus will not cause interference to licensed fixed links. The ITU has addressed this situation, and in similar cases has agreed that the ESIM cannot claim protection from authorised fixed services. The ACMA may wish to take this into account as well as the CEPT decisions in their further work regarding ESIM operations in the 10.7-11.7 GHz band.

The current consultation is silent on the question of spectrum pricing. The cost of spectrum, however, remains a high barrier to entry for ESIM in general in Australia – more so than in many other jurisdictions. Because of the ubiquitous nature of ESIM terminals and a lack of dependency on protection, they do not create a circumstance of spectrum denial, which is typical of fixed earth stations in the FSS (for example for gateways). Therefore, the price of Space/Space Receive Apparatus licences in the ACMA Apparatus Licence Fee Schedule (Tables 25 and 26)¹ are largely based on spectrum denial and associated area segmentation of licence pricing in Australia. This becomes anomalous in the ESIM situation where two concepts collide. The SSWG is of the opinion that the ACMA should give due attention to the subject of pricing, either in parallel with the current consultations or shortly thereafter.

The construct of the pricing structure is thus now somewhat overtaken by new technology developments and, in Industry's view, is being applied beyond its relevance. Licensing charges comprise two elements: a charge for ACMA administrative overheads (Table 25 which is still relevant) and a taxation element (Table 26). This latter has its grounding in exclusive use of spectrum and it is this element which the SSWG believes should be exempted or the subject of a nominal low fee across the board, with no geographic dependency. Associated with Table 26 is a minimum taxation fee of \$40-32 and this may be a relevant starting point which can be justified.

¹ See <https://www.acma.gov.au/theACMA/About/Making-payments/Apparatus-licence-fees>

CURRENT NATIONAL ARRANGEMENTS

The construct of current national arrangements that support ESIM in Ku-band are outlined in the Consultation Paper. In the catalogue of relevant matters, the Radiocommunications Determinations for Australian and Foreign Space Objects could also be added as these contribute to the ability of the regulator to exert control over satellite operators and the conditions with which they are obliged to comply.

The Consultation Paper gives some emphasis (p.5, second paragraph) to ESIM being currently supported within existing MSS allocations. However, consistent with the main thrust of the document, ESIM may also be regarded under FSS. This is a key feature of the legitimacy of ESIM.

The traditional FSS architecture involves communications between satellites in orbit and earth stations in fixed locations. As the need for broadband communications to vessels, land vehicles and aircraft has rapidly evolved, it has become clear that use of FSS is required to meet the growing need for mobility.

Traditionally, separate regulation has applied for the various types of FSS earth stations to transmit while in motion: Earth Stations on Vessels (ESVs), Vehicle-Mounted Earth Stations (VMEs), and Earth Stations Aboard Aircraft (ESAAs) or Aeronautical Mobile Satellite Services (AMSS). We refer to these earth stations collectively as ESIMs. Below is an overview of some international specifications that outline technical conditions for the use of ESIMs in Ku-band frequencies.

Supported services

Division of Ku-band consultancy into two parts points to the different approaches historically taken in Australia to the parts of Ku-band. The 11.7–12.75 GHz and the 14–14.5 GHz bands have been treated with special dispensation towards satellite services, and fixed services – of which there are currently 15,300 – have been allocated also on a primary basis to the 10.7–11.7 GHz band.

Ubiquitous, uncoordinated ESIM terminals do not need to take advantage of this special dispensation for protection in the higher Ku downlink band, as they do not require protection from fixed services in the lower Ku band. Spectrum use on an exclusive basis is not an issue and, in addition, because the ESIM terminals are in receive mode they do not produce interference to fixed service or other terminals.

The ability of ESIM to share with other services in the FSS, BSS and FS bands points to the sharing environment within which ESIM can operate in Ku band – removing the need to consider exclusive use of spectrum. The conditions by which that sharing is enabled is the subject of further proposed considerations to apply as outlined in the additional procedures proposed by the ACMA in this consultation, and any later proposals for the 10.7–11.7 GHz band.

Licensing options

Of the two broad options for licensing cited by the ACMA, the first option of individual licensing for earth stations is, in the SSWG's view, neither practical nor economically efficient, in view of the numbers of terminals and their ubiquity.

The SSWG believes that licensing of the space segment is the preferred option with ubiquitous ESIM supported by a class licence. The current class licence applies to stations in the ranges 11.7–12.75 GHz and 14–14.5 GHz. In light of the foregoing, the SSWG recommends extension of this Class Licence to cover ESIM in 10.7–11.7 GHz, as an important consideration of the next consultation paper in Q4.

With respect to the licensing of ESIMs in the 14.0-14.5 GHz and 11.7-12.75 GHz bands, we believe that of the two broad options outlined by the ACMA in the Consultation Paper

individual licensing of earth stations is not a practical or economic approach that should be adopted by the ACMA. Rather, taking into account the number of ESIM terminals and their ubiquitous use, licensing of the space segment supported by a class license via the Space Object Class License is the preferred option as is the case today in CEPT for example² when it comes to land based ESIMs (i.e. connected cars).

For the bands 11.7–12.75 GHz and 14–14.5 GHz, the SSWG agrees with the ACMA that authorisation of ESIM for both transmission and reception is feasible, subject to appropriately further developed licensing assessment procedures which clarify the Ku-band operation, as proposed in this consultation.

Review of licensing procedures

The SSWG agrees that working forward from the established ACMA space/space receive BOP is the most attractive way forward. The current procedures are outlined in the consultation paper.

A simplified administrative processes, without the need to obtain individual terminal-by-terminal authorisation (e.g. based on a class-licensing regime) and a system of “free circulation” of ESIM terminals (i.e. providing permission for foreign ESIM terminals to operate on a temporary basis when in a visited country, as long as these terminals are duly authorised in the country of origin) are required to foster the implementation of ESIMs.

Regarding Ku band ESIM, aspects proposed by the ACMA for further review or addition are noted and agreed by the SSWG where these will provide clarity and the ACMA's expectations for the operation of FSS (both GSO and NGSO), and where these can be regarded as a reasonable expectation in light of the level of risk involved. For example, taking most use of existing accepted processes in other jurisdictions (including “blanket” licensing and costs), and ITU procedures which exist, rather than imposing unnecessary additional requirements. With this in mind, the proposed Appendix E to the BOP procedures appears to be quite comprehensive and a necessary and sufficient addition – with some qualifying comments (see below).

Assessment of ITU regulatory status

Where ITU Master International Frequency Register (MIFR) procedures are still in progress, the concept of a Letter of Assurance has proven to be successful in the past, and should be retained with ESIM considerations.

The ACMA sets out a cascade of conditions associated with ITU registration details and national application. Primary to this is that operation of ESIM works within the envelope of the FSS station(s) to which the ESIM applies. The ACMA recognises that there is as yet no class of station code, beyond code EC, to further indicate mobile operation in Ku-band. For national application, the ACMA should then, as a fallback, require notification and operating characteristics from the operator or licence applicant of this as indicated in the consultation paper.

Geographic area identification with the ITU is a useful comment.

Comments under Article 4.4 and a special licence condition are noted.

Interference management and due diligence

The ACMA proposes that the operator of the proposed services demonstrate due diligence in regard to risk and likely interference.

The SSWG agrees that an important consideration would be experience in other jurisdictions where ESIM has been accepted. This could ease the burden providing reasonable assistance as listed in the summary of how assessment might be achieved on p.12.

² <https://www.ecodocdb.dk/download/fbff3f53-335c/ECCDec1804.pdf>

However, the SSWG feels that additional detail would be required to provide the ACMA with more substantial feedback on the envisaged requirement to demonstrate due diligence and that an engineering assessment has been undertaken. For example, the Consultation Paper mentions that the information provided in a summary statement "could include" a "statement of various coordination agreements reached" or "compliance with relevant FCC and ECC requirements". More so, as elements of information which could be included in a summary assessment do not appear mutually exclusive. Neither is there an order of priority. The SSWG is, therefore, keen to understand in greater detail what information the ACMA is envisaging would satisfy the demonstration criteria.

In the context of EIRP limits, we already highlight our belief that, at the very least, coordinated off-axis EIRP density limits should take precedence over the EIRP density limits referenced in FCC rules and regulations or ECC rules decisions.

Protection for the Mid-West Radio Quiet Zone

The ACMA comments are noted. Whether these procedures should expand to all space and space receive licence applications in the future, and not just Ku band ESIM, is a matter for the ACMA to decide. However, singling out an individual service would appear to be a disproportional impost. Alternatively, a general application could be the subject of a separate broader ranging consultation.

FUTURE WORK

The SSWG strongly supports a second consultation on changes to regulatory arrangements to extend ESIM to the 10.7–11.7 GHz part of Ku-band, in order to create a fuller licensing environment for ubiquitous ESIM. This would then match up with other jurisdictions and technology which is coming into the market place. The SSWG envisages that this would involve expansion of the BPO and an appropriate amendment to the Space Objects Class Licence for ESIM purposes.

The existence of fixed links in the 10.7–11.7 GHz band should not impede the introduction of ubiquitous ESIM, given a non-protected condition of operation and the receive only nature of ESIM in this band. These conditions could readily be incorporated into technical restrictions on ESIM use and which do not constrain future fixed link deployment and growth.

Given the huge similarity between different regulatory requirements and characteristics of earth stations for different mobility applications (e.g. VMES, ESV, AES etc), having duplicative rules is unnecessary and inefficient. The trend is towards grouping these applications into one category which does not require individual licensing – independent of the type of platform upon which these ESIM terminals operate, and thus reducing regulatory burdens.

A further work area should involve a review of pricing for spectrum in which ESIM operates. The ACMA recently amended pricing for Apparatus Licences in Ka-band but did not treat with Ku-band, because of the special treatment which satellite communications has received in the past in Ku-band. However, all of these considerations are now overtaken by an age of ubiquity in satellite terminals where spectrum denial is no longer the key feature in justifying taxation arrangements in the case of ESIM.

The SSWG also continues to look forward to engage with the ACMA over the foreshadowed (FYSO) consultation on the use of the 27.5-29.5 GHz band for ESIMs after WRC-19.

Appendix D (proposed new Appendix E to space/space receive BOP)

With respect to the MIFR, the proposals appear sensible and practical. The format of the proposed Letter of Assurance is referenced to Appendix D – which presumably refers to the current BOP and not this consultation paper.

With regard to the checking of consistency with ITU registration details, the ACMA recognises that there is no class of station codes specific to ESIM operation in Ku band. In this case, the SSWG recommends that the ACMA could require operators to advise the ACMA of the intention to use mobile operation of the ESIM. Geographic area checks and the application of ITU RR **4.4** are agreeable comments.

“Uplink (Earth-to-space) 14-14.5 GHz” on p.29 refers to receiving ESIM operation. Should this be transmitting?

Under **“Interference management and due diligence”** this refers to “demonstrate compatibility of NGSO networks ...”. Should this be referring to NGSO systems as indicated on p.12, and does the demonstration mean over and above the coordination process?

Mid West Quiet Zone – see earlier comments.

Other comments:

Annex 1 provides some minor suggestions and corrected typographical errors.

Annex 1 : Minor Editorial Suggestions for Table in ACMA Appendix D

Global comment : “Telecommunication” is singular in ITU.

Space apparatus licence authorising ESIM in 11.7-12.75 GHz

The following additional special conditions and advisory notes are to be applied to space licences authorising the use of earth stations in motion communicating with geostationary space stations or non-geostationary space systems in the fixed-satellite service in the frequency band 11.7–12.75 GHz, in line with the procedures outlined above.

The SSWG has made some suggestions in the Table where greater clarity could be achieved (in red font).

Category	Type	Item	Text
Special Condition	Pre-defined (where network is in the MIFR)	SB	Operation of this space station and associated earth stations must be in accordance with frequency assignments recorded in the Master International Frequency Register of the International Telecommunication Union.
Advisory Note	Pre-defined	EI	The Master International Frequency Register (MIFR) is maintained by the International Telecommunication Union (ITU) in accordance with the Radio Regulations.
Special Condition	User-defined (where network is in the MIFR)		This licence authorises communications with <i>[name of satellite]</i> .
Special Condition	Pre-defined (where network is not in the MIFR)	SA	Prior to the frequency assignments being recorded in the Master International Frequency Register, this space station and associated earth stations may operate in accordance with the operating parameters published by the International Telecommunication Union (ITU) in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.

Category	Type	Item	Text
Advisory Note	Pre-defined	ED	Coordination agreements reached as a result of an ITU international frequency coordination process are intended to minimise the potential for harmful interference to radiocommunications stations. A radiocommunications station operated prior to a frequency assignment being recorded in the MIFR cannot necessarily claim protection from harmful interference from radiocommunications stations of other countries.
Special Condition	User-defined (where network is not in the MIFR)		This space station and associated earth stations are authorised to communicate with space stations of the [satellite network name] satellite network as published by the International Telecommunication Union (ITU) in Special Section [ITU reference – take the most recent document number] of International Frequency Information Circular [IFIC number]. Comment: Seems to be a circular reference to stations. Needs more clarity?
Special Condition	Pre-defined	ESIM8	Earth stations in motion may be operated in association with this licence provided that these earth stations would, if stationary, otherwise be in accordance with the operating parameters published by the ITU in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.
Special Condition	Pre-defined	EH	Transmissions must not occur in circumstances that result in harmful interference to stations outside of Australia where these stations are operating in accordance with the Radio Regulations of the ITU except where the transmissions are in accordance with any agreements reached as a result of an ITU international frequency coordination process.
Special Condition	Pre-defined	ESIM5	Radiocommunications between space stations and earth stations in motion authorised under this licence shall not be used or relied upon for safety-of-life applications.
Special Condition	NEW Pre-defined (when not recorded in MIFR or in MIFR with 11.41)		On receipt of a report of harmful interference from the space station under International Telecommunication Union Radio Regulation No. 11.42 all necessary steps shall be taken immediately eliminate the harmful interference or cease operation.
Advisory Note	NEW Pre-defined		This licence does not authorise operation of earth stations outside of Australia.

Space receive apparatus licence authorising ESIM in 14–14.5 GHz

The following additional special conditions and advisory notes are to be applied to space receive licences authorising the use of earth stations in motion communicating with geostationary space stations or non-geostationary space stations in the fixed-satellite service in the frequency band 14–14.5 GHz, in line with the procedures outlined above.

Category	Type	Item	Text
Special Condition	Pre-defined (where network is in the MIFR)	SB	Operation of this space station and associated earth stations must be in accordance with frequency assignments recorded in the Master International Frequency Register of the International Telecommunication Union.
Advisory Note	Pre-defined	EI	The Master International Frequency Register (MIFR) is maintained by the International Telecommunication Union (ITU) in accordance with the Radio Regulations.
Special Condition	User-defined (in the MIFR)		This licence authorises communications with <i>[name of satellite]</i> .
Special Condition	Pre-defined (where network is not in the MIFR)	SA	Prior to the frequency assignments being recorded in the Master International Frequency Register, this space station and associated earth stations may operate in accordance with the operating parameters published by the International Telecommunication Union (ITU) in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.
Advisory Note	Pre-defined	ED	Coordination agreements reached as a result of an ITU international frequency coordination process are intended to minimise the potential for harmful interference to radiocommunications stations. A radiocommunications station operated prior to a frequency assignment being recorded in the MIFR cannot necessarily claim protection from harmful interference from radiocommunications stations of other countries. <i>Comment: Intention of this paragraph is not very clear. Muddies the water.</i>
Special Condition	User-defined (Not in the MIFR)		This space station and associated earth stations are authorised to communicate with space stations of the <i>[satellite network name]</i> satellite network as published by the International Telecommunication Union (ITU) in Special Section <i>[ITU reference – take the most recent document number]</i> of International Frequency Information Circular <i>[IFIC number]</i> .

Category	Type	Item	Text
Special Condition	Pre-defined	ESIM8	Earth stations in motion may be operated provided that these earth stations would, if stationary, otherwise be in accordance with the operating parameters published by the ITU in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.
Special Condition	Pre-defined	EH	Transmissions must not occur in circumstances that result in harmful interference to stations outside of Australia, where these stations are operating in accordance with the Radio Regulations of the ITU, except where the transmissions are in accordance with any agreements reached as a result of an ITU international frequency coordination process.
Special Condition	Pre-defined	ESIM4	Radiocommunications between space stations and earth stations in motion authorised under this licence shall be subject to permanent monitoring and control by a Network Control Facility (NCF) or equivalent facility, and be capable of receiving and acting upon at least 'enable transmission' and 'disable transmission' commands from the NCF.
Special Condition	Pre-defined	ESIM5	Radiocommunications between space stations and earth stations in motion authorised under this licence shall not be used or relied upon for safety-of-life applications.
Special Condition	Pre-defined	ESIM7	The licensee shall advise the ACMA of changes to the point of contact provided for the purpose of tracing any suspected cases of interference from earth stations in motion.
Special Condition	NEW Pre-defined		Earth station transmitters on land associated with this space station must not be operated within 70 kilometres distance from the Murchison Radioastronomy Observatory without the approval of the entity responsible for operating the Murchison Radioastronomy Observatory. Comment: The "entity" needs to be defined.
Special Condition	NEW Pre-defined (when not recorded in MIFR or in MIFR with 11.41)		On receipt of a report of harmful interference under International Telecommunication Union Radio Regulation No. 11.42 all necessary steps shall be taken immediately eliminate the harmful interference or cease operation.

Category	Type	Item	Text
Advisory Note	NEW Pre-defined		This licence does not authorise operation of earth stations outside of Australia.

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Published by:
**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