

**COMMUNICATIONS
ALLIANCE LTD**



**COMMUNICATIONS ALLIANCE
SATELLITE SERVICES WORKING GROUP**

SUBMISSION

to the

Australian Communications and Media Authority's
(ACMA)

Apparatus licences in the 3.4–4.0 GHz band in
remote Australia - Licensing, allocation process,
technical framework and pricing arrangements

4 May 2022

CONTENTS

INTRODUCTION	2
<hr/>	
ISSUES FOR COMMENT	3
<hr/>	
Technical framework	3
Allocation process	5
Tenure and renewal	5
Pricing	6
<hr/>	
CONCLUDING COMMENTS	6
<hr/>	
COMMUNICATIONS ALLIANCE SATELLITE SERVICES WORKING GROUP	
MEMBERSHIP	7
<hr/>	

INTRODUCTION

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 *Apparatus licences in the 3.4 – 4.0 GHz band in remote Australia Licensing, allocation process, technical framework and pricing arrangements* Consultation Paper.

Several SSWG members operate C-band gateway Earth Stations in metropolitan and other areas of Australia, to support the maritime, mining, energy, defence, telecommunications and government sectors. These gateways provide vital communication links to remote and regional areas in Australia and the Asia Pacific, especially in tropical and oceanic areas; often where no other telecommunications options are available – and have done so for decades. Allocating Wireless Broadband (WBB) services to the 3400 – 4000 MHz band in remote Australia is likely to negatively impact the ability of connected C-band gateway Earth Stations to continue to provide these services via customer Earth stations (terminals) in remote areas.

The views of the SSWG as they affect the operation of FSS Earth stations in remote areas can be summarised as follows:

- (a) the draft RALI MS 47 Table 7, that proposes rejection levels of Earth station receivers due to filtering, is not practical for co-existing WBB and FSS receive Earth stations, because both are planned to operate in the 3400 – 4000 MHz band. No RF filter rejection (other than at 3400 MHz and 4200 MHz) can be assumed, and in-band protection requirements would apply.
- (b) since filters for FSS receive Earth stations would be difficult to apply from an operational point of view (due to the frequency segmentation between FSS and WBB being undefined in advance), only physical separation distances and coordination would therefore be implementable.
- (c) the SSWG would support ACMA's view to apply a spectrum embargo on assignment of new or modified transmitter licences in the remote area of South Australia in the 3400 – 4000 MHz band until the actual location(s) of new ESPZ(s) are identified.

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 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>.

Issues for Comment

The SSWG provides the following responses to the questions presented in the Consultation Paper.

Technical framework

1 Comments are sought on the proposed technical framework including the revised AWL, LCD, draft RALI MS 47, and updated RALI FX3 and FX19

The draft RALI MS 47 section 4.7.1. (3600 – 4200 MHz band) refers to section 4.3 of the current RAG TX (3.4 GHz band)¹ for protection and coordination with Earth receive stations. Regarding the draft RALI MS 47 and in particular section 4.7.1 (3600 – 4200 MHz band), the following issues are raised, and on which clarifications are sought:

- (a) There is no explicit mention in the text that the protection is required from Area Wide Licence (AWL) transmitters (as well as spectrum licenses). This could be corrected by adding the following texts '3600 – 4200 MHz band from an AWL is detailed in Part 4.3 of RAG TX'. The same treatment could be applied to section 4.7.1 (3400 – 3600 MHz) by adding the following texts '3400 – 3600 MHz band from an AWL is detailed in Part 4.2 of RAG TX'.
- (b) The terminology 'co-channel' and 'not co-channel' stated in section 4.3.1 of the RAG TX should be replaced in the draft RALI MS 47 with in-band and adjacent band. These terminologies are relative to which band the AWL TX plans to operate in relation to the FSS receive Earth station and whether RF filtering is assumed to be applied for Earth station receivers. Since FSS receive Earth stations can operate in the 3400 – 4200 MHz band, only RF filtering at 3400 MHz and 4200 MHz can be assumed.
- (c) Table 1 in Section 4.3 (4) of the RAG TX provides minimum rejection levels at frequency offsets of the spectrum licensed Tx from the lower edge of the receiver Earth station. This rejection is provided by RF filtering at the front end of the receive Earth station. In the draft RALI MS47 AWL 3400 – 4000 MHz, the same table has been used as indicated in Section 4.7.1. (i.e. Table 7), but the frequency offset is proposed to be from the nearest edge of the Earth station receiver. Since FSS receive Earth stations can operate in the 3400 – 4200 MHz band, this RF filtering cannot be assumed for coordination purposes. Given that emissions from the AWL Tx fall in the receive passband of the Earth station, there is no RF filter rejection and in-band protection requirements would apply.
- (d) Table 7 of the draft RALI MS47 does not provide flexibility to the deployment of FSS Rx ES should there be any changes to its frequency assignments, considering that satellite carriers, to support commercial services, often change frequencies within a one-year span to meet customer requirements. RF bandpass filters are not tuneable and would need to be replaced for each carrier frequency change to meet the filtering assumption in Table 7 of the draft RALI MS47. RF bandpass filters are expensive and such requirements are not commercially viable.
- (e) Often there are multiple carriers licensed on the same antenna. If the 'theoretical' filter assumptions in Table 7 of the draft RALI MS47 are used, and a

¹ Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015.

<https://www.legislation.gov.au/Details/F2018C00558>

second FSS Rx carrier was required on the same antenna, the band-pass filter would not allow the FSS Rx2 signal to be received by the earth station receiver. This limitation would apply for both a second FSS Rx operating above the WBB Tx (see Figure 1) or for a second FSS Rx operating below the WBB Tx (Figure 2).

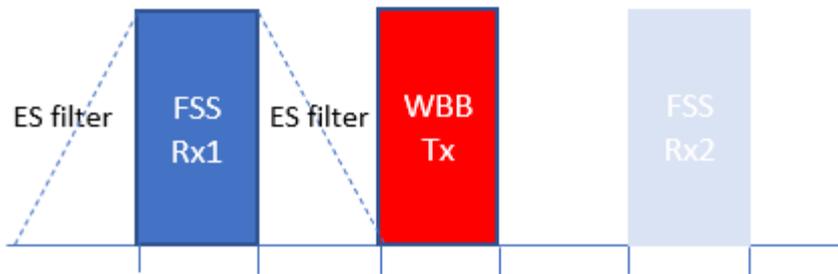


Figure 1: Second FSS Rx above WBB Tx

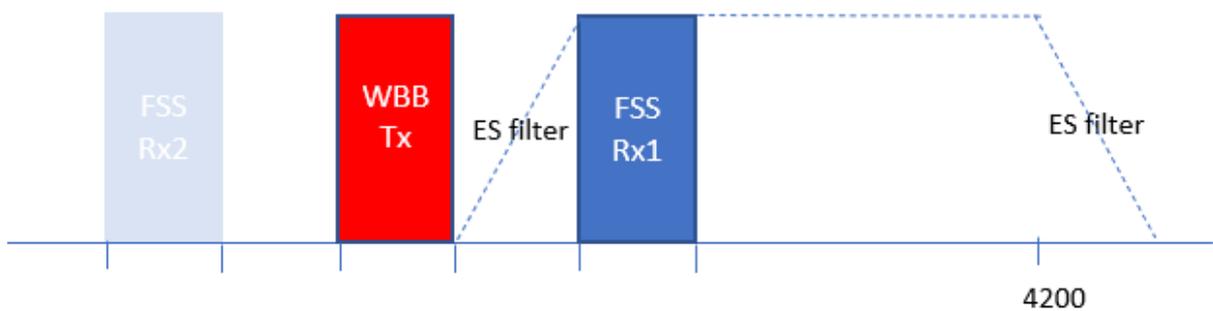


Figure 2: Second FSS Rx below WBB Tx

- (f) For the WBB service operating in remote areas in the 3400 – 4000 MHz band, the filtering assumptions of FSS Rxs in Table 7 of the draft RALI MS 47 are not practical and cannot be applied. The receiving earth stations in remote areas can be licensed for reception within the entire 3400 – 4200 MHz. Although the earth station may be using a specific portion of that spectrum in a given year to a specific client, it is our understanding that in remote areas this same earth station would still have the flexibility to receive in another part of the 3400 – 4200 MHz for servicing another client.

Taking this into account and as exposed above, filtering sub-parts of the 3400 – 4200 MHz for a specific operation is not practically implementable and therefore filtering requirements should not apply for remote FSS earth station.

The earth station LNB should therefore preserve its capacity to receive in the entire 3400 – 4200 MHz band and WBB Txs operating in the 3400 – 4000 MHz band would be considered as in-band in relation to FSS Rxs. Large separation distances would therefore be required to operate both the WBB and FSS services. Separation distances may be reduced through site coordination by taking into account the specific deployment environment and configuration of both the FSS ES and WBB station.

In addition to the above comments regarding the draft RALI MS47, the SSWG thanks the ACMA for noting the proposal raised in the Technical Liaison Group (TLG) for an additional ESPZ in remote South Australia. Noting the significant effort required to identify and agree on suitable location(s) for ESPZ(s), the SSWG would support ACMA's view to apply a spectrum embargo on assignment of new or modified transmitter licences in the remote area of South Australia in the 3400-4000 MHz band until the actual location(s) of new ESPZ(s) are identified.

2. Comments are sought on the other issues referred to in the technical framework that have not been resolved in the TLG, such as WBB coexistence with radio altimeters

As the ACMA is well aware, sharing between FSS and more powerful terrestrial 5G services will become difficult for both in-band and adjacent band cases, often leading to the need to impose geographical separation between spectrum users. In addition, it will require defining physical coordination areas around the FSS receive Earth stations in order to avoid harmful interference to these stations, because the FSS receive Earth stations are very sensitive to terrestrial interference from terrestrial 5G mobile signals.

Imposing spectrum sharing can pave the way to extinguishing existing FSS services, because the current out-of-band emission (OOBE) levels specified in 3GPP standards do not protect FSS signals in adjacent frequency bands. Therefore, both using a guard band and imposing strict OOBE conditions on terrestrial mobile 5G stations are required to ensure the coexistence of both services operating in adjacent band to each other.

In the case of the remote areas, the FSS receive Earth stations are able to use the entire 3.4 – 4.2 GHz for their operations meaning that there would be no way to know the frequency segmentation between the two services in advance. Only physical separation distances and coordination would therefore be implementable. The use of filters in the FSS receive Earth stations would not be implementable considering we will not know the frequency segmentation between FSS and WBB in remote areas in advance.

Allocation process

4. Comments are sought on the appropriateness of an allocation quantum policy. If an allocation quantum policy is adopted, do you have any views on whether that quantum should be 100 MHz or 150 MHz or some other quantum per single HCIS level 0 cell.

The SSWG supports a low bandwidth limit per single HCIS level 0 cell. The SSWG would like to remind the ACMA of OFCOM findings² demonstrating that only 40 MHz of C-band spectrum was needed to provide all the main services anticipated under 5G services (see OFCOM doc 1.20, 1.35 and Figures 1, 2 and 3).

Tenure and renewal

5. Comments are sought on the ACMA license tenure and renewal policy for AWLs in the 3.4 – 4.0 GHz band in remote areas.

The SSWG supports the ACMA's proposal to limit the duration of these AWLs to 31 December 2030 with the considerations that the ACMA would then be able to do a further review and audit of whether there is any need to provide the band 3400 – 4000 MHz for Local Area Wireless Broadband (LA WBB) in remote areas. After 31 December 2030, the ACMA could cancel the AWL licensing in remote areas should there be no AWL licenses application in remote areas.

² Ofcom - Award of the 700 MHz and 3.6 - 3.8 GHz spectrum bands - Further consultation on modelling and technical matters 15 May 2020.
https://www.ofcom.org.uk/_data/assets/pdf_file/0023/195521/consultation-sut-modelling-700mhz-3.6-3.8ghz-spectrum.pdf

In addition, the level of use of the AWL license should determine if a license is renewed. This should be an advisory note in the license.

Pricing

6. Comments are sought on the ACMA's proposal regarding \$/MHz/pop tax arrangements for AWLs in this band, similar to AWLs in the 26/28 GHz band, and similar to other area based licenses such as PMTS B apparatus licenses because the ACMA believe it to be a simple pricing arrangement well suited to area based licenses no matter the size of the license or where it is locate. Do you have any other pricing alternatives, or suggestions that may improve upon the ACMA's proposal?

It is understood that FSS receive Earth stations will continue to be licensed in remote areas through site-specific apparatus licenses. While the AWL pricing methodology may be appropriate for WBB in remote and metro/regional areas, applying this approach to licensing FSS receive Earth stations is not appropriate in metro/regional areas. The SSWG is very concerned about the likely cost impact to Earth station operators in metro/regional areas. With the pricing model for AWLs for Earth stations in metro and regional areas likely to be the same, or similar to, what is proposed for the remote areas, the use of population as a multiplier would make the FSS Rx AWL model not feasible from a business point of view.

C-Band earth stations are mostly used as hub teleport stations to connect remote sites in C or Ku-band (cross-strap). These sites usually located in remote areas, are to provide broadband connectivity in remote areas, therefore the metro and major regional 'population' are not the C-band customers of satellite operators, but the customers located in remote areas or external to Australia. Use of spectrum by satellite services in these areas are not proportional to the population density and therefore there will not be a spectrum congestion or higher use because of population growth.

As the ACMA has identified that LA WBB operators cannot compete (on cost) with WA WBB operators for spectrum licences, likewise FSS operators cannot compete with WBB operators under the conditions of AWL for FSS RXs.

Concluding Comments

The SSWG encourages the ACMA to fully consider the comments made in this response to the consultation paper, in order for C-band FSS operators to be able to continue to provide services to their customers in remote Australia. The SSWG requests that the ACMA continue dialogue on the points raised, so that mutually agreeable and optimum outcomes can be reached.

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