



IFC 05/2022 Open Spectrum Submission

Proposed updates to RALI FX 22
– Frequency assignment
requirements for the fixed
service in the 800 MHz band

11 MARCH 2022

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Mr. Chris Worley
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Dear Mr. Worley,

Introduction

Open Spectrum thanks the ACMA for consulting on the proposed updates to RALI FX 22, and appreciates the opportunity to provide comments. We agree with the general scope of the revisions, namely the clarification of the coordination requirements involving spectrum licensed devices and amendments to reflect that these will now also operate in the 850 MHz expansion band. As such, we only wish to provide comments on a few aspects of the draft RALI FX 22, including reiterating some comments from previous (2019) consultations.

Coexistence between 800 MHz spectrum licensed services and fixed links

Section 3 of RALI FX 22

In section 3, we note the correction of “spectrum licensed receivers” to “spectrum licensed transmitters” with respect to the protection requirements that are defined in the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 850/900 MHz Bands) 2021* (the “SL Tx RAG”). This alone has greatly improved the clarity of section 3, which now clearly states that SL transmitters need to protect existing registered fixed link receivers (in accordance with the protection criteria specified in sections 4 and 6 of RALI FX 22), and also that fixed link transmitters need to protect existing registered SL receivers (in accordance with the protection criteria in Appendix E).

That said, we would seek a further clarification that the protection requirements for fixed service receivers outlined in Section 3 are only applicable to fixed spectrum licensed transmitters registered in the RRL. In other words, there should be no coordination requirements between mobile spectrum licensed transmitters and fixed link receivers. This clarification was sought by Open Spectrum in response to IFC 29/2017, and by others in the industry during the 850/900 MHz TLG.

Appendix E of RALI FX 22—receiver overload calculation

The ACMA provides explicit guidance on the use of the maximum interfering power levels of Table E2, indicating that coordination focuses on a type of *receiver overload* calculation, i.e. ensuring that the total power in the interferer’s channel, measured at the input of the registered spectrum licensed receiver, should not exceed the maximum interfering power level specified. If this is the case, the Compatibility requirement (-108 dBm/5MHz) is not really applicable here and should be removed to avoid confusion.

It should also be clarified that—in calculating the interfering power level within the occupied channel of the transmitter, measured at the input of the registered spectrum licensed receiver, i.e. the overload calculation—the link budget should subtract the Receive RF filtering loss

detailed in Table E1. That way, there is clarity on the applicability of the parameters in Table E1, and Table E1 itself can be cut down to just listing the Receive RF filtering loss.

We don't see a need to specifying that the Receiver antenna gain should use the RRL data (as this is obvious) or at least not without also specifying that the RRL data should be used for the Transmitter antenna gain in the direction of the interference path. As such, we believe that the first page of Appendix E could be simplified as follows:

~~This appendix specifies the coordination requirements Arrangements to protect spectrum licensed receivers from out of band interference from apparatus licensed services fixed link transmitters in adjacent bands. The protection criteria in this appendix are derived from are set out in Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers – 850/900 MHz Bands) 2021. This appendix replicates parameters from these guidelines for ease of reference.~~

~~Coordination is to be made on a 'first-in-time' basis, where a new service is coordinated against existing registered services. Additional filtering on the fixed link transmitter may be required to meet these requirements.~~

~~The spectrum licensed receiver compatibility requirement, antenna gain and RF filtering characteristics are detailed in Table E1.~~

~~The coordination requirement is to ensure that the maximum interfering power level transmitted within the occupied channel of the transmitter (measured at the input of the registered spectrum licenced receiver) are does not exceed the maximum levels:~~

- > detailed in Table E2 for registered receivers operating in the range 814-845 MHz;
- > -15 dBm mean power for registered receivers operating in the frequency range 890-915 MHz.

~~In calculating the interfering power level at the receiver, an assumed Receive RF filtering loss (as per Table E1 below) may be subtracted from the interfering power level.~~

Table E1: Spectrum licence receiver parameters, where FreqOffset is the band edge frequency separation (in MHz) between the spectrum licensed receiver and the fixed link transmitter

Receive RF filtering loss	$2 + 60 \times \log_{10}[1+(2 \times \text{FreqOffset}/5)^{1.5}]$ dB	For FreqOffset \leq 2.5 MHz
	$2 + 60 \times \log_{10}[1+(2 \times \text{FreqOffset}/5)^2]$ dB	For 2.5 < FreqOffset \leq 9 MHz
	70 dB	For FreqOffset > 9 MHz

Appendix E of RALI FX 22—OOBE calculation

The ACMA listing the Compatibility requirement, and its mention that "Additional filtering on the fixed link transmitter may be required to meet these requirements", alludes to a possible requirement to consider the out-of-band emissions (OOBE) of the fixed link transmitters into the spectrum licensed receivers. If this is the case, the ACMA should explicitly state that this coordination requirement also needs to be satisfied, in addition to the receiver overload

calculation. If the ACMA does indeed consider that this calculation should also be carried out, then it can make a second section of Appendix E, in which it could state, for example:

In addition to the receiver overload calculation specified above, the out-of-band emissions (OOBE) of the fixed link transmitter also needs to be taken into account. Additional filtering on the fixed link transmitter may be required to meet these requirements.

The coordination requirement is to ensure that the OOBE of the transmitter (measured at the input of the registered spectrum licenced receiver) does not exceed the Compatibility requirement of the spectrum-licensed receiver.

The Compatibility requirement of the spectrum-licensed receiver is a maximum unwanted signal level within the occupied bandwidth of the receiver, of -108 dBm/5MHz, measured at the receiver input (not exceeded for more than 5% of any 1 hour period). Logarithmic scaling should be used to find the appropriate level for alternative bandwidths.

We wish to clarify that we are not advocating for fixed link OOBE to be considered, simply that, if it is indeed the ACMA's intention for this to be a requirement, it must be stated clearly and separately from the overload calculation.

Coordination with SOB services

RALI FX 22 in its current state is ambiguous about the coordination requirements for SOB services. On one hand, it indicates that SOB services are indeed subject to coordination:

Section 5.2.1: "The only frequency coordination to be conducted will be to determine if SOB spectrum is not available due to the use of the bands by SFFLs and in accordance with limitations detailed at section 5.2.2 of this RALI."

*Section 5.2.2: "SOB links may be authorised to operate... subject to availability of specified frequencies.
... the number of frequencies assigned to SOB links in high spectrum demand areas be... in line with spectrum availability (paying regard to assignment issues at section 5.2.7 of this RALI)."*

Section 5.2.3: "... the emission bandwidth needs to be referred to on the licence by a user-defined special condition for coordination purposes..."

Section 5.2.6: "... the service area is restricted to enable coordination with SFFLs."

On the other hand, it contradicts the above stating, in section 5.3.1: *"Fixed licences authorising SOB stations are a non-assigned licence, meaning that no technical coordination is undertaken"*.

This ambiguous guidance needs to be clarified.

Old coordination methodology in RALI FX 17

Prior to the introduction of RALI FX 22 in 2019, single-channel narrowband (both single- and two-frequency) fixed links were coordinated in accordance with RALI FX 17, and using a more simplistic coordination methodology based on a modified version of the "Longley-Rice" propagation model. RALI FX 17 has maintained this old methodology as an optional approach for generating a list of wanted-to-unwanted (W/U) ratios of co-channel links in the area. This is an interesting idea and it could be maintained in RALI FX 22, perhaps in an informative appendix, noting that 800/900 MHz links were coordinated for years using this model.

Antenna performance characteristics

In our response to IFC 31/2019, Open Spectrum suggested the decrease of required antenna gain in the 800 MHz Band from 16 dBi to 14 dBi, to support one of the most common yagis in the band (the RFI YB815-81). We reiterate this suggestion in this submission.

Editorial revisions and clarifications

Footnote 8 of RALI FX 22 clearly states that *"Point-to-multipoint service in the 800 MHz band are coordinated in accordance with RALI FX 16"*. FX 16 is listed in the "Historic RALI" column in Table 1, and the table contains a note that these P-MP services were historically operated under the two-frequency (single channel) sub-type. This note should be elaborated on to clarify that *"Two-frequency single channel fixed point-to-multipoint services continue to be dealt with under RALI FX 16, and were not migrated to RALI FX 22"*.

Summary

In summary, Open Spectrum supports the ACMA's proposed review of RALI FX 22, and recommends some further amendments for clarity, in particular in Section 3 and Appendix E (coexistence with spectrum licensed receivers), as well as Section 5 (SOB links). The reviewed RALI needs to be clearer about what exactly are the coordination calculations required by the ACMA.

Open Spectrum looks forward to continue working with the ACMA and the wider radiocommunications industry.

Yours sincerely



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