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1 710-2 300 MHz Discussion Document
Radio Spectrum Management Policy and Planning
Ministry of Business, Innovation and Employment
PO Box 2847
WELLINGTON

email: radio.spectrum@mbie.govt.nz

Dear Sir/Madam

DISCUSSION DOCUMENT – RE-PLANNING OPTIONS FOR FREQUENCY BANDS WITHIN 1 710-2 300 MHZ

This submission is the Dawn Aerospace response to the Ministry's *1 710- 2 300 MHz Discussion Document*. For simplicity each issue we wish to address has a direct reference to the discussion document.

Parts of this submission that are confidential under the Official Information Act 1982, or personal in terms of the Privacy Act 1993, have been indicated by red text. This information is not to be published or released publicly.

Dawn Aerospace's contact person for this submission is:

James Powell
Co-founder, GM



Introduction

The fundamentals of space launch haven't changed since the 1950s. Current methods are fundamentally unsustainable, very difficult to scale and complex to access. This holds true for governments and private companies alike. Dawn Aerospace is developing technologies to provide space transportation services that address all of these fundamental issues with current technology. We are developing a more efficient and sustainable way for assets to get into space, maintain their position and then bring them back down once they are done. Our vehicles will fly to space thousands of times, from existing airport infrastructure, without using toxic fuels. To do this, access to the radio spectrum is vital.

A more complete description of our philosophies and approach is outlined on our website at: <https://www.dawnaerospace.com/>.

Section 2 – Background

The Background section notes that in May 2018, a decision was taken not to renew the management rights in a number of the bands under consideration. It should be noted that Dawn Aerospace has an interest in one of these bands as it has contracted for operation in the band prior to the management right expiry on 31 March 2021. The block of interest to Dawn Aerospace is in the *“Paired 2200 MHz band”*.

Section 3 – Proposal for New Usages

Dawn Aerospace's interest relates primarily to the proposal under section 3.4 to: “Reserve the upper portion of the Paired 2200 MHz band exclusively for space operation use”.

Section 3.3 – Short Term Licences for Space Operation

Question 6: Dawn Aerospace agrees that the proposed channel plan for fixed links in the lower portion of the Paired 2200 MHz band could also accommodate short-term licences for space operation.

It is currently unclear exactly how much spectrum will be required by the space industry over the next few years. This approach would allow different users to access the spectrum on an “as required” basis and adjustments could be made in the future based on demonstrated need.

Question 7: In responding to Question 6 above, Dawn Aerospace noted the potential need for access to spectrum by the space industry in the future. It is also noted that fixed services have other bands available for their use, that this frequency band is allocated internationally for space operation, and there is a need for space operations to be coordinated with the ITU. Accordingly, it is proposed that this spectrum be specifically identified for future expansion of New Zealand based space operations, should it be required.



Section 3.4 – Space Operation

Question 8: As a new entrant into the rapidly developing space industry in New Zealand, Dawn Aerospace agrees with RSM's proposal to reserve 2 081.5-2 110 MHz and 2 256.5-2 290 MHz for space operation in New Zealand.

It is noted that Recommendation ITU-R SA.264-5 *recommends* that “frequencies for maintenance telemetering, precision tracking and telecommand should be between 1 and 8 GHz”. This domestic allocation provides spectrum as needed by the space industry for current and future use.

Recommendation ITU-R SA.264-5 also *considers* that “the e.i.r.p. of space station transmitters is limited, so that earth receiving stations must operate at maximum sensitivity”. Dawn Aerospace would therefore support the use of ITU-R Recommendations to ensure protection of the Space Operations service in the bands 2 081.5-2 110 MHz and 2 256.5-2 290 MHz.

Question 9: Dawn Aerospace is developing a craft intended to make many space flights over a short period of time.

Radio Spectrum Management will, of course, be aware that the Ministry and the New Zealand Space Agency are promoting the expansion of the space industry in New Zealand. All efforts in space inevitably require the use of radio spectrum, so while there is perhaps limited demand today for access to the radio spectrum, success by the NZ Space Agency will also mean a substantial increase in overall demand for access to spectrum for space operations.

Question 10: Dawn Aerospace considers the best use of the band 2 081.5-2 110 MHz and 2 256.5-2 290 MHz is for space operations.

Question 11: Yes, Dawn Aerospace agrees with the use of 10 MHz guard bands in the frequency range 2 290-2 300 MHz. This is supported for two reasons:

1. The international allocation for space operation does not extend beyond 2 290 MHz. This is important for ITU registration purposes.
2. The allocation is for space-to-Earth operation and the potential line-of-sight interference area is significant from the spacecraft as it gains altitude. As a result, the ability to limit potential emissions into the adjacent mobile band is welcomed.

A further guard band should also be considered at the 2 256.5 MHz boundary.



Conclusion

As noted above, Dawn Aerospace agrees with RSM's proposal to reserve 2 081.5-2 110 MHz and 2 256.5-2 290 MHz for space operation in New Zealand.

Please feel free to contact Mr James Powell should you wish to discuss this submission further.

Yours Faithfully

A handwritten signature in blue ink, appearing to read "James Powell".

James Powell

www.dawnaerospace.com

