

# Tait Submission to the Consultation Document: Options for 174 – 230 MHz.

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Tait Limited, trading as Tait Communications, offers this comment on questions raised in the Radio Spectrum Management consultation document “Options for 174-230 MHz - Review of option for allocating spectrum in VHF Band III”.

## About Tait Communications

Entering its fifth decade, Tait continues to deliver radio solutions for a variety of organisations and industries including public safety agencies, government services, utilities and urban transport providers. While several corporate functions are based in Christchurch, New Zealand, Tait has an international customer base and global support network serviced by wholly owned subsidiary companies based in Australia, the USA, Europe, Canada, England, Singapore, and China.

The private business of Tait continually re-invests heavily in research and development including strong links with New Zealand Universities and Crown Research Institutes. One example is Tait’s support for the national Wireless Research Centre (WRC) at the University of Canterbury in New Zealand. The goal of the WRC is to become a centre of excellence for mobile communications through collaboration between academia and industry.

Tait’s comments are based on its experience, its research, and its international communications business along with its appreciation of the distinctiveness of New Zealand’s radiocommunications environment.

## Response to Questions

### Q1. Should spectrum in Band III be allocated for radio microphones? If so, how much spectrum would satisfy demand in this area?

**Tait Response:** Spectrum in this range is valued for its propagation characteristics; characteristics of little relevance to radio microphones. Given that there is other spectrum available for that application this band should be reserved for those services that can fully utilise its unique propagation characteristics. Consequently no spectrum should be made available for radio microphones unless it is done in such a way as not to impose limits on other services.

### Q2. Should spectrum in Band III be allocated for DAB? If yes, why? If not, why not?

**Tait Response:** Tait has no interest in broadcasting and the decision on allocating spectrum for this purpose will be made elsewhere based solely upon the economics of its introduction or otherwise. However if the decision is made to introduce this service then it should be in the relevant part of Band III to allow for international harmonisation. It is important that any allocation for broadcasting should be the absolute minimum necessary due to value of the spectrum the many alternatives now available for distributing entertainment.

**Q3. Would an allocation of 14 MHz in the form of eight 1.536 MHz frequency blocks be an appropriate spectrum allocation for DAB in New Zealand? If not, how many multiplexes would be more appropriate for current demand?**

**Tait Response:** Refer to question 2.

**Q4. Should spectrum in Band III be allocated to LMR? If yes, how much spectrum would satisfy demand in this area?**

Tait Response: Yes, the current VHF LMR Bands are heavily utilised to the point that free channels can be difficult to find in many parts of the country. Because of this shortage commercial and critical infrastructure operators lack access to spectrum critical to the rapidly growing communication requirements that are essential to the conduct of their business.

The current VHF LMR Bands extend up to 173 MHz and as Band III is virtually contiguous with them the lower part of Band III is a logical choice for expansion of VHF LMR. 10 MHz of spectrum from 174 MHz to 184 MHz will provide approximately 360 12.5 kHz two frequency channels separated by 4.5 MHz; or an appropriate mix of two frequency and simplex channels.

Additionally 216 – 225 MHz is used elsewhere and this consequently would make a suitable extra LMR band for general operations in New Zealand to supplement the 174-184 recommendation.

**Q5. If spectrum is allocated to LMR, should there be technological requirements around the use of this spectrum? If yes, why? If not, why not?**

**Tait Response:** There should be technological requirements for the use of this spectrum including:

- the imposition of a 12.5 kHz raster
- a 4.5 MHz split for two frequency channels
- a minimum level of spectral efficiency
- the use of digital technologies such as DMR and P25 in order to meet efficiency requirements and to preserve interoperability with existing users in New Zealand

As Band III is virgin spectrum it would make sense to reserve it primarily for services that have needs difficult to accommodate within traditional LMR spectrum such as smart networks, distribution automation, common frequencies over wide areas, including the whole of New Zealand, or perhaps high duty cycle data transmissions. *Were this to occur then moving those services from existing LMR bands would free up commensurate spectrum in them for reassignment to general LMR use.*

**Q6. If spectrum is allocated to LMR, is it appropriate to charge a fee for this use or transfer the spectrum to the management rights regime? If yes, why? If not, why not?**

**Tait Response:** Yes, there ought to be a charge on spectrum use; principally to:

- impress upon users that the spectrum is a limited resource with a finite value
- encourage efficiency in its use
- recover management costs

This proposed spectrum allocation forms part of a larger block currently managed by the Crown under the Spectrum Management Rights legislation. There are three methods available to MBIE to open it up for extended LMR use;

1. Return it to the administrative licensing framework where it can then be licenced to potential users in the same way existing LMR frequencies are. However as MBIE licences frequencies on a first come first served basis this could make it difficult for any one group to gain nation-wide or specialised spectrum and it would be more appropriate in this case to allow restricted access based on the ES Bands model.
2. Retain the existing management right in the name of the Crown and then create spectrum licences for interested parties. While the Crown would normally licence channels by means of a public auction or tender under the rights framework it does have some discretion and could create spectrum licences for exclusive wide area or nation-wide critical infrastructure applications.
3. Transfer the spectrum to a management right which could then be sold or leased to a body similar to the Public Safety Radio Spectrum Management Group (PSRFMG) but focused on critical infrastructure which would then issue spectrum licences.

For options 1 and 2 it is appropriate to charge a fee since MBIE policy is to recover its spectrum management costs by means of licence fees. Option three will need to fund the purchase or lease of the spectrum and so a financial transaction will be required – its form is beyond the brief of this response.

Option 1 is preferred as it confers more flexibility and a lower administration effort than options 2 or 3.

### **Q7. Is there a demand for exclusive spectrum in Band III, either now or in the future, for IoT technologies? If yes, which IoT technologies are demanding this spectrum?**

**Tait Response:** There is currently no demand for VHF IoT and there is no dedicated equipment available; currently all IoT products operate in ISM bands, in GSM bands or in LTE bands.

However, the longer wavelengths at VHF have good penetration through forest and foliage which would open up a range of rural uses, such as farm management, the general area of trap and animal monitoring, and a range of other telemetry applications, which are not currently practical or are carried out by less efficient technologies. Some IoT technologies are designed for longer range operation than others and for those VHF spectrum would be useful.

Given that IoT is a rapidly growing industry utilizing a range of technologies it would be short sighted not to reserve VHF spectrum for its development and growth. This spectrum should be exclusive initially until maturing deployment rates can allow a final decision to be made between exclusive or shared use.

### **Q8. If spectrum is allocated to IoT, how much spectrum would satisfy demand in this area?**

**Tait Response:** Tait has no comment on this question.

### **Q9. Which type of licensing framework is most appropriate for spectrum allocated to IoT**

**Tait Response:** IoT is a growth industry and will attract a wide range of operators and technologies; certainly in its development phase. Conventional licensing will be expensive to manage and realistically optimum management of IoT technology in the 174-230 MHz part of the spectrum would be by way of an addition to the Short Range Device General User Radio Licence (SRD GURL).

### **Q10. Is there demand for exclusive Band III spectrum for utility companies? If yes, what types of uses are driving this demand and how much spectrum do these uses require?**

**Tait Response:** Yes there is a demand. This is discussed in detail within Tait's response to questions 4, 5 and 6. Q13 also applies. In summary the Crown should allocate a portion of this spectrum to the exclusive use of critical infrastructure operations, using the PPDR ES Bands as a model.

### **Q11. Is there demand for NZDF use of spectrum between 225–230 MHz?**

**Tait Response:** Yes, the NZDF has a stated need to recover the use of 225-230 MHz which was a part of its allocation until the 1980s.

### **Q12. Should spectrum in Band III be allocated to NZDF? If yes, why? If not, why not?**

**Tait Response:** Yes it should and Tait will support its allocation unreservedly.

### **Q13. Should New Zealand consider PPDR uses in Band III? If yes, why? If not, why not?**

**Tait Response:** ITU-R World Radio Conference resolutions have recommended a range of spectrum allocations for PPDR; in region 3 Band III spectrum is not supported and consequently Tait would prefer to see PPDR operate in areas where regional harmonisation would be possible.

However, Tait is aware that the PSRSMG wishes to relocate the users of the ESA Band higher up in the VHF spectrum and the re-farming of Band III presents an ideal opportunity to accommodate that need. Since this is an application that currently does not have international harmonisation and does not anticipate any need in future Tait would definitely support it.

### **Q14. If there is demand for PPDR in Band III, how much spectrum would satisfy this demand?**

**Tait Response:** 10 MHz with the same technical requirements and comments as we noted in Q5.

### **Q15. Are there any other uses of Band III that should be considered? If yes, please describe.**

**Tait Response:** New Zealand based MimoMax Wireless has developed a version of its high density data radio system operating in conventional VHF fixed services spectrum. This can readily be developed for Band III frequencies and give the rapid growth in data transmission requirements in this country a fixed service for point to point or point to multi-point should be considered.

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