

Fixed Services in New Zealand Discussion Document

Kordia Submission

10 March 2015



Table of Contents

Introduction	1
Summary of Questions	2
2.1. Digitisation.....	2
2.2. Spectral efficiency	2
2.3. Metropolitan site congestion	3
2.4. Interference evaluation method for Digital Microwave Radio (DMR).....	4
2.5. Adjacent channel interference criteria	4
2.6. Equipment standards	4
2.7. Necessary bandwidth and channel widths for digital services.....	4
2.8. Information on licence records.....	4
2.9. Transition of spectrum to the management rights regime	5
2.10. Channel widths	5
2.11. Band renaming.....	5
Band Specific Proposals.....	6
3.1. I (STL), JK (STL), KL and K STL Bands	6
3.2. EE Band	7
3.3. I Band.....	7
3.4. J Band	7
3.5. JL Band.....	7
3.6. KK Band	7
3.7. L Band.....	7
3.8. 5 GHz Band.....	8
3.9. P Band	8
3.10. R Band	8
3.11. T Band.....	8
3.12. V Band	9
3.13. U, W and Y Bands	9
3.14. H Band	10
3.15. Z Band.....	10
3.16. G Band.....	11
3.17. X Band	11
3.18. 18 and 23 GHz Bands.....	11
3.19. 38 GHz Band	11
3.20. 70 – 80 GHz Band	12



Introduction

Kordia thanks the Ministry of Business, Innovation and Employment (the “Ministry”) for the opportunity to submit on the *Fixed Services in New Zealand Discussion Document* published in January 2015.

Our submissions are made at each question. Please contact us if you have any questions on our submissions.

Contact Details:

Susie Stone

Chief Strategy Officer

Susie.stone@kordia.co.nz

Summary of Questions

2.0 GENERAL FIXED SERVICE PROPOSALS

2.1. Digitisation

1. *Should all or some sub 1 GHz fixed service bands be digital only? If so, are there particular bands that should be given priority to change to digital only services?*

Kordia submission: Yes, all sub 1GHz fixed service bands should be digital only. Priority should be given to the bands that are the most heavily used.

2. *Should any requirement for digital services apply to new licences only or should existing analogue services be required to transition to digital? If all licences are required to transition to digital services, over what time period should analogue licences be phased out?*

Kordia submission: All new licences in the sub 1GHz bands should be digital only. There should be a mandatory requirement to transition from analogue to digital over a ten year period.

2.2. Spectral efficiency

3. *Should the Ministry increase the minimum spectral efficiency of digital services from one bit to four bits per second per Hertz? If so, should this apply to some (please identify which ones) or all bands?*

Kordia submission: No, Kordia does not consider that the minimum spectral efficiency should be increased to four bits per second per Hertz. Kordia proposes an alternative minimum spectral efficiency of two bits per second per Hertz.

Assuming fixed error performance and availability objectives, an increased spectral efficiency requirement will result in larger equivalent isotropic radiating power licences to maintain these objectives. Assuming a fixed link capacity in megabits per second, it's unlikely that a smaller bandwidth channel with a higher spectral efficiency will meet the same error performance and availability objectives as a larger bandwidth channel with lower spectral efficiency.

4. *Should any requirement for increased spectral efficiency apply to new licences only or should existing licences be required to transition to this standard? If so, over what time period should the lower standard be phased out?*

Kordia submission: If this was introduced, the requirement should apply immediately to new licences and a transition of ten years for existing licences.

2.3. Metropolitan site congestion

5. *Should further areas be added to the designated DMAs and if so which areas?*

Kordia submission: We do not see a requirement for further areas to be added at this time.

6. *Should further DMA rules be introduced? If so, what should the rules specify? Should these be tailored to each particular DMA?*

Kordia submission: Yes, further rules for DMAs should be introduced for the fixed linking bands from 3-23GHz. The existing minimum cross polar discrimination requirement is suitable.

The existing Type 2 DMA front to back ratio requirements for the X and G bands should be increased. Under the existing Type 2 front to back ratio requirements a 0.3m diameter parabolic antenna can be licensed for X and G bands. Kordia considers that the minimum front to back ratio for X and G bands should be increased to facilitate a minimum parabolic antenna diameter of 0.6m.

A minimum antenna radiation pattern envelope should be specified in addition to the existing cross polar discrimination and front to back ratio requirements. Kordia does not consider that the current EN302 217-4-2 parabolic microwave antenna standard is stringent enough. Kordia considers that the minimum radiation pattern envelope should be equivalent to or better than an Andrew Valuline parabolic microwave antenna. Kordia has encountered unnecessary spectrum reuse issues at sites where parabolic microwave antennas with poor radiation pattern envelope characteristics are licensed. These spectrum reuse issues could be easily resolved with the use of antenna that are equivalent to or better than the Andrew Valuline parabolic microwave antennas.

The proposed DMA rule changes should apply to all DMAs. Individual rules for each DMA will result in unnecessary complexity for the Ministry, AREs and ARCs. If a universal minimum antenna radiation pattern envelope is adopted, the requirement for differing front to back ratios between Type 1 and Type 2 areas could be removed.

7. *Should any DMA specific rules be applied to new licences only or also apply to existing licences? If existing licences become subject to the new rules, how should the transition be managed?*

Kordia submission: Any DMA specific rules should apply immediately to new licences. Existing licences should be transitioned over a ten year period in accordance with the life cycle of the equipment.

2.4. Interference evaluation method for Digital Microwave Radio (DMR)

8. *Should the current '1 dB interference threshold degradation' method prescribed in Section 4.3 'Co-channel interference threshold' of PIB 38 be retained or replaced with a carrier to interference method? Please provide information on why the method should be changed and the increased spectral efficiency over the current 1 dB threshold degradation method expected to result from the change.*

Kordia submission: Kordia strongly recommends that the 1 dB interference threshold degradation method should be retained for the 3-80GHz fixed linking bands.

9. *If the method is changed to a carrier to interference method, how should this be implemented?*

Kordia submission: Kordia considers that this question should be the subject of a separate discussion document due to its complexity.

2.5. Adjacent channel interference criteria

10. *Are the Frequency Dependent Rejection values in PIB 38 appropriate? If not, what should these values be? Should there be different values for different bands?*

Kordia submission: The frequency rejection values in PIB 38 are appropriate.

2.6. Equipment standards

11. *Should the Ministry implement equipment standards for fixed services above 1 GHz? If so, what standard should be specified?*

Kordia submission: No, the international standards are appropriate.

2.7. Necessary bandwidth and channel widths for digital services

12. *Should the Ministry adjust the general licencing conditions for digital services to ensure licences better reflect occupied bandwidth in the microwave bands?*

Kordia submission: No, in the context of fixed service frequency licensing an ARE/ARC is unlikely to consider the occupied bandwidth of an individual licence.

2.8. Information on licence records

13. *Is inaccurate information on licences a significant issue for AREs and ARCs and licensees? If so, how should the Ministry respond to the issue?*

Kordia submission: No, Kordia does not consider it a significant issue. If the majority of AREs and ARCs do consider inaccurate information on licences to be an issue then Kordia would support the following actions:

- 1) Increasing in the number of licence audits being carried out on AREs and ARCs.

2) Increasing in the number of site audits by the compliance team, to ensure that installed equipment is accurately reflected in the details held in SMART.

3) Requiring additional professional development for AREs and ARCs on the licencing requirements.

2.9. Transition of spectrum to the management rights regime

14. Should the Crown consider creating management rights for bands where there is predominantly a single licensee? If so, are there other criteria that should be met before a management right is created for fixed service bands?

Kordia submission: We consider that this is worthy of further discussion with the Ministry.

15. If spectrum is transferred into the management rights regime, should it be managed by the Crown or allocated to a private manager? If allocated to a private manager, should the allocation be by contestable means or to the predominant user?

Kordia submission: If the Ministry were to transition the spectrum to a management right regime then the predominant user should be the manager.

2.10. Channel widths

16. Should the Ministry apply consistent channel sizes across specified frequency ranges in fixed service bands? If so, what should be the basis for these channel sizes? Should channel sizes be based on the preferred channel width shown in Table 3?

Kordia submission: Kordia considers that the existing channel sizes arrangements across the fixed linking bands are appropriate.

2.11. Band renaming

17. Should the Ministry rename bands that are currently prefixed with letters, by numbers representing their approximate frequency of operation?

Kordia submission: No.

Band Specific Proposals

3.1. I (STL), JK (STL), KL and K STL Bands

18. Should digital services be permitted in STL bands? If so, should digital and analogue services be permitted or should all existing analogue services be required to transition to digital?

Kordia submission: No comment.

19. Should a minimum link distance be specified for STLs in some bands for current and / or future links? If so, which bands should have the minimum link distance specified?

Kordia submission: No comment.

20. Should no new dual mono STL services be allowed? If not, should the Ministry transition users from dual mono services to digital links?

Kordia submission: No comment.

21. If the Ministry allows digital licences in the STL bands, should any broadcaster that transmits more than 3 programmes between a studio and broadcasting site be required to use a 500 kHz channel digital STL and those broadcasting a single programme be required to use a 250 kHz channel digital STL?

Kordia submission: No comment.

22. Should a limit of three STL licences (via a combination of analogue and digital transmissions) at any single location be introduced for any single licensee? If so, should this be limited to congested sites only? If so, which ones? Should these limits apply retrospectively to current licences or should they only apply for new licences. Should the limits apply once any licence holder applies to make a change to any one licence at a site?

Kordia submission: No comment.

23. How should the Ministry manage the timing and introduction of any changes to STL services? How should each of the five proposals above be managed?

Kordia submission: No comment.

3.2. EE Band

24. Are there any issues with the current band plan, use of, or future demands for the EE band?

Kordia submission: No comment.

3.3. I Band

25. Should the Ministry offer 100 kHz channels in the I band (Group G) which interleave with the current 50 kHz channel plan? If not, how should the channel plan be amended, if at all?

Kordia submission: No comment.

3.4. J Band

26. Should the Ministry offer 100 kHz channels in the J band (Group D) which interleave with the current 50 kHz channel plan? If not, how should the channel plan be amended, if at all?

Kordia submission: No comment.

3.5. JL Band

27. Are there any issues with the current band plan, use of, or future demands for the JL band?

Kordia submission: No comment.

3.6. KK Band

28. Are there any issues with the current band plan, use of, or future demands for the KK band?

Kordia submission: No comment.

3.7. L Band

29. What services should L band be used for in the future? Why?

Kordia submission: No comment.

3.8. 5 GHz Band

30. *Are there any issues with the current band plan, use of, or future demands for the 5 GHz band?*

Kordia submission: We consider that there are no issues with the current band plan. We are aware that there is potential for TDD PPDR services at the upper end of this band however we do not support the deployment of such services in this band in New Zealand.

3.9. P Band

31. *Do you have comments on the current coordination process or possible future demands for services in the P band?*

Kordia submission: No comment.

3.10. R Band

32. *Should the Ministry adopt 28 MHz channelling for the R band?*

Kordia submission: The Ministry should retain the current 29.65 MHz channels and remove the currently underused alternative offset group of 29.65 MHz channels. If the band is rechanneled to 28MHz the primary users will incur considerable costs in retuning or replacing filters for every R band radio bearer throughout New Zealand. We are also concerned that the radio manufacturers will not adopt the New Zealand channel plan without it being an international change.

We also need to consider the effect in co-ordination with C-Band uplink services.

33. *If the Ministry is to adopt 28 MHz channelling, should this be applied to new licences only or should all existing licences be required to transition to the new channelling? How long a timeframe should be allowed for the transition?*

Kordia submission: The proposed 28MHz channelling should apply immediately to new licences. Existing licences should be transitioned over a 10 year period. We are also concerned that the radio manufacturers will not adopt the New Zealand channel plan without it being an international change.

3.11. T Band

34. *Is the N+1 designation still required for efficient use of T band?*

Kordia submission: Yes the N+1 designation is still required for efficient use of T Band. The band's propagation characteristics and large 40MHz channels are well suited to backbone microwave networks. R band is available for those who wish to use the 6GHz frequencies without the N+1 requirement.

35. *Should the redundant TA channels be removed from the channel plan for the T band?*

Kordia submission: Yes the redundant channels should be removed.

36. *Should the Ministry consider rechanneling the T band to 14 MHz channel widths? If not, why not?*

Kordia submission: No, the Ministry should not consider rechanneling T band to 14MHz channel widths. If the band is rechanneled to 14MHz channel widths the primary users will incur considerable costs in retuning or replacing filters for every T band radio bearer throughout New Zealand.

3.12. V Band

37. *Should new 56 MHz channels V23A (7110.5 MHz) and V23A# (7341.5 MHz) be created? If so, could the new 56 MHz channels coexist with the TVOB channels currently in place? What would be an acceptable coordination policy if this were to occur? Should the new 56 MHz channels be available only on a non-interference basis?*

Kordia submission: No, the new 56MHz channels that overlap the TVOB V2/V2# and V2A/V2A# channels should not be created. The TVOB V band channels are used in all main centres of New Zealand on a weekly basis at multiple fixed locations, such a sport grounds and event centres, as well as dynamic locations for various live event broadcasts.

Introducing a co-channel and adjacent channel interference coordination requirement for each new itinerant linking location would result in significant costs for outside broadcasters, as they would need to consult an ARE/ARC on a weekly basis for every broadcast event.

Unfortunately due to the nature of the outside broadcast business, the linking technicians only have a few hours to setup linking for each event and do not have time for interference troubleshooting. The nature of 7GHz linking equipment can also restrict each link to a single 28MHz channel. Some 7GHz TVOB equipment can be relatively crude with no transmit power control, unknown antenna RPEs and unknown filter discrimination.

38. *Can existing demand for the TVOB channels in V band be accommodated on other TVOB channels?*

Kordia submission: No.

3.13. U, W and Y Bands

39. *Do you have comments on the current coordination process or possible future demands for services in the U band?*

Kordia Submission: The DMA recommendations proposed by Kordia in the answer to Q3 should also apply to U Band.

40. Should W band be rechanneled to enable either 28 MHz, 40 MHz, or 56 MHz channelling to enable new services? Which channel size is preferred? Why?

Kordia Submission: No, the Ministry should retain the current 29.65MHz channels.

41. Should the Yx channels be disestablished from the Y band channel plan, enabling the current dominant channel plan (YxA) to become the single channel plan for Y band?

Kordia Submission: Yes.

42. Should the Y band have an additional 56 MHz allocation added to the current YxA 28 MHz channel plan?

Kordia Submission: Yes.

43. Should the band boundaries be realigned to match ITU-R F.386, by adjusting the U / W boundary at 7.730 GHz down to 7.725 GHz, and by adjusting the W / Y boundary from 8.290 GHz to 8.275 GHz?

Kordia Submission: Yes, but without rechanneling the band it would serve little purpose.

3.14. H Band

44. Should the Ministry offer a 14 MHz channel plan for H band and migrate users away from 21 MHz channelling?

Kordia Submission: Yes.

45. Should the band be reallocated to a different service or use? If so, what other services or uses should be allocated to the H band?

Kordia Submission: No.

3.15. Z Band

46. Should the Z band channel plan be changed to 28 MHz channels? If not, why not?

Kordia Submission: No the Ministry should retain the current 40 MHz channels. If the band is rechanneled to 28MHz the primary users will incur considerable costs in retuning or replacing filters for every Z band radio bearer throughout New Zealand.

47. If a 28 MHz channel is adopted, should the Ministry also adopt a 56 MHz channel plan?

Kordia Submission: Yes.

48. If the band is rechanneled, should incumbent licensees be required to transition to the new band plan?

Kordia Submission: Yes, but with a ten year transition period.

3.16. G Band

49. Are there any issues with the current band plan, use of, or future demands for the G band?

Kordia Submission: No.

3.17. X Band

50. Should the Ministry introduce an additional 56 MHz channel to the X band, or should it remain unavailable for assignment?

Kordia Submission: Kordia recommends that the potential interference to Ku band satellite receivers should be studied prior to the introduction of the proposed lower 56MHz channel.

3.18. 18 and 23 GHz Bands

51. Should the Ministry facilitate in any specific way the development of satellite services in the Ka band? For example, should the Ministry consider early clearances of some fixed services in either the 18 or 23 GHz bands?

Kordia Submission: No, the Ministry should not facilitate the development of satellite services in the Ka band. Kordia considers that the existing 330MHz of paired spectrum at the bottom of the 18GHz band will be adequate for any future FSS, BSS, VSAT and SNG services. As microwave linking is increasingly being deployed as a backup for critical fibre based services, Kordia anticipates that demand in the 18 and 23GHz bands will continue to increase.

52. Should the Ministry remove the underutilised 3.5 and 7 MHz channels from the 23 GHz channel plan?

Kordia Submission: Yes

3.19. 38 GHz Band

53. Are there any issues with the current band plan, use of, or future demands for the 38 GHz band?

Kordia Submission: No.

3.20. 70 – 80 GHz Band

54. Should the Ministry move the licencing regime for the 70 – 80 GHz band from administrative licencing to a New Zealand general user radio licence?

Kordia Submission: No, the Ministry should maintain the existing administrative licencing scheme for the 70 – 80GHz band. The Ministry has noted that licensing is seen as a potential barrier to use this band. The cost of the licence certification and annual licence fees are not significant in comparison to the hardware and installation costs of an 80GHz link. Therefore Kordia does not view frequency licencing as a potential barrier to use this band.

Demand for SHF spectrum with a GURL can be accommodated in the 61.0 - 61.5 GHz band used for the 802.11ad standard.

ENDS.