

DIGITAL FUTURES

*Planning for Digital Television
And New Uses*



SUBMISSION

September 2009

*Prepared by Marcel Reinen
On behalf of WUNZ*



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**WIRELESS USERS
NEW ZEALAND**

INTRODUCTION

The **Wireless Users of New Zealand (WUNZ)** is a coalition of wireless microphone (radio microphone) distributors and professional users in the entertainment and screen production industries.

WUNZ was established in 2008 specifically to represent all radio microphone users and ensure that sufficient usable UHF spectrum remain available to the sector following the changeover from analogue to digital television. WUNZ has entered into constructive dialogue with the Radio Spectrum Management division of the Ministry of Economic Development on behalf of the sector.

In 2009 the Wireless Users of New Zealand Trust was formed.
The WUNZ trust's website is www.wunz.co.nz

The distributors represented in WUNZ have been providing radio microphone solutions for almost two decades and in particular, have been selling product in the UHF 700-800 MHz band for over 10 years. WUNZ estimates that there are as many as 100,000 radio microphone systems in operation throughout the country – most using the 700-800MHz band.

The WUNZ committee includes:

Stephen Buckland (Chairman) - Sound Techniques Ltd, Supplier

Marcel Reinen (Secretary) - Hills SVL, Supplier

Haresh Bhana (OB Representative) - Elephant Audio, Murray Tregonning & Associates

Dave Madigan (Policy Advisor) - Independent Sound Recordist, Film Freelancer

Tim Lambert - Audio Products Group, Supplier

Nick Treacy - Independent Sound Recordist, Video Freelancer

David Fuller - Jands NZ, Supplier

Neil Heathcote (Live Sound Representative) - Norwest Oceania Ltd



SUBMISSION

WUNZ members believe that the Planning for Digital Futures and New Uses document, as it stands, lacks due commitment to the provision of adequate continuous UHF spectrum to match the existing widespread use of wireless microphone technologies. Further the document ignores likely continued growth in the sector and puts in jeopardy the successful staging and broadcasting in New Zealand of a wide range of future events.

WUNZ concerns include:

- That the current plan provides only extremely limited and in some cases unusable guard band buffer zones and 'white spaces' for radio mics, IEM and other UHF communication equipment to operate in.
- That Government analysis severely underestimates the scale and value of UHF radio mic use in New Zealand and the impact that the current plan will have on the broad events sector and wider economy.
- That by effectively excluding provision for radio mic operations with the current DSO plan, in favour of extending allocations to television and telcos, the Government is not ensuring use of the UHF spectrum to the good of all New Zealanders.

The 'live audio' sector is a prolific user of radio microphones and in-ear monitor systems currently relying on the provisions of the GUSL. Oceania Audio is New Zealand's largest provider of audio, lighting and staging systems for the events and entertainment industry. In this role we are involved in several hundred events each year and only a handful of these events do not use radio mics.

As a recent example of the degree with which larger scale events rely on these devices, as suppliers to the recent Starlight Express run in NZ during the month of July we saw over 90 channels of radio mics in use over just four concurrent events:

Starlight Express	36 radio mics plus iems and RF comms
Cats @ Civic Theatre	26 radio mics
Batboy	19 radio mics
Kristen School	16 radio mics

The 96 channels above were required for just four shows ranging from the arena-scale west-end musical to the school production. The current plans for reallocation of spectrum will not only affect us as an equipment hire company but will seriously jeopardize the viability of large-scale events with multiple radio systems.

Our rental is only a small part of the revenue generated by these events and without them, many other businesses either within the entertainment industry or associated with it will suffer. As an example of the broad footprint large events have within an economy, the loss of the Michael Jackson concerts at London's O2 Arena recently cost the local economy 'hundreds of millions of pounds' in lost hotel bookings, restaurants, travel and other expected spend. This excluded any direct revenue from ticket sales.

– Neil Heathcote, Operations Manager, Audio, Norwest Oceania Ltd

Who uses Radio Mics and In Ear Monitors?



As illustrated by the list below, radio microphones – which also include instrument and in-ear monitoring systems (IEM) – have become integral not only to the professional broadcast and entertainment industries, but to a vast spectrum of other business enterprises including tourism-related activities, education, community arts and other activities. Taken as a whole the radio microphone industry covers many facets of our daily lives and is in no way a small player in our daily life-style enjoyment.

There are no official records of the extent of radio mic usage in NZ, however it is clearly evident that such equipment (and frequency access) plays a significant role in:

- The making of radio and TV productions
- Sports broadcasting and on-field management
- News gathering and reporting
- Film location and commercial shoots
- Tourism (including guides and tourist presentations)
- International and local entertainers / concerts
- Education at all levels
- Professional, school and amateur theatre
- International touring productions
- Business conferences and venues
- Gyms and other health programmes
- Houses of worship
- Museums
- Retail outlets
- Cultural performances and displays
- Hire companies
- Charitable foundations and events
- Language (including te reo and hearing impaired) development
- Many common public situations such as bingo halls and sports clubs.



While not all of these are threatened directly by shrinkage of secure operating bandwidth, the higher demand areas – those which most impact the country's global image aspirations, certainly are. Under the proposed scheme as presented by Kordia (an extrapolation is attached as an appendix) there will simply be insufficient spectrum for radio mics to operate, particularly in the main centres.



Any inability to accommodate the next Andrew Lloyd Webber spectacular in major cities, or to meet international media requirements for the next FIFA World Cup event offered to New Zealand for example, would represent a publicly unacceptable opportunity cost. WUNZ believes such risk is realistic without the provision of an adequate national bandwidth corridor and sufficient additional regional 'white spaces' within

the UHF spectrum 502- 698MHz.

Decisions about spectrum allocation and the provisions for radio mics must take into consideration that they are widely used tools and that many businesses and aspects of important industries rely on wireless microphone technologies to earn revenue, often to avoid wasteful infrastructure expenditure.

THE EDGE[®] operates three of the most prestigious venues in New Zealand being the Aotea Centre, The Auckland Town Hall and the Civic Theatre. These venues host approx 1500 events per year with attendee numbers of over a million patrons. In addition to the three main venues there are many small performance and meeting rooms.

The venues host many different types of events ranging from opera to rock and roll, from small meeting to major international conference with artists, performers and delegates coming from all over the world.

The extensive use of radio microphones, in ear monitors systems as well as technical communication systems are a major part of these productions and events. Large numbers of these devices are used throughout the different types of events happening at THE EDGE[®] venues as well as in nearly all other entertainment, sports and cultural facilities all over the country.

Currently THE EDGE[®] is hosting *Mamma Mia! The Musical* at the Civic Theatre playing eight performances a week to a potential audience of approx 2300 people per performance. Typical of a modern performance of this type, this musical is using around 26 radio microphones, 8 independent communication channels and a number of in ear monitoring channels. *Pricilla Queen of the Desert*, a hugely successful event in 2008 that broke many box office records had even higher numbers of these devices.

The location of the Civic and its proximity to other major entertainment venues (Sky City about 150 metres away for example) currently make management of frequency allocations difficult. There has been major investment in equipment that will more than likely become redundant if the proposed DTT band allocations are brought into reality. There will likely also be issues with large touring performances that bring their own equipment that don't have the ability to change systems to "fit in" to the proposed plan that will create severe limitations on available frequencies and may put this type of entertainment at risk.

– Kerry Griffiths, Production Manager, The Edge

The growing role of Radio Microphones and Wireless Comms

Radio microphone units are increasingly used in entertainment, teaching, news gathering, sports events as well as for cultural and community events. Numerous core industries including film, concerts, sports and theatre cannot operate efficiently or professionally without the use of radio mics. In each user situation there is need for sufficient bandwidth to use these systems as and where required.

I am the New Zealand appointed sole representative of The Frontier Touring Company, who are the biggest promoters of contemporary artists in Australasia. <www.frontiertouring.co.nz>

The Frontier Touring Company New Zealand, has booked more international shows into the Vector Arena in Auckland than any other promoter. These include Justin Timberlake, Rod Stewart, Billy Joel, Kylie Minogue, The Foo Fighters and Alicia Keys to name only some – with The Black Eyed Peas and Green Day soon to tour.

One major artist concert at Vector Arena can easily gross \$NZ 12M and can go as high as \$20M in my experience.

Concerts at the Vector Arena are regularly attended by people from all over New Zealand, as often the acts don't tour further south and only play Auckland. The impact to the economy is enormous with locally employed staff, travel bookings, accommodation, restaurants, taxis etc.

It is our understanding, and concern, that the proposed new wireless legislation will have a significant impact on the ability to stage these shows in New Zealand.

It is a very serious situation.

– Brent Eccles, Frontier Touring Company (NZ)

Entertainment: Radio mic technology is widely used for theatre and musical theatre shows such as *Cats*, where essentially every performer has a mic capsule and transmitter bodypack so that a clear and balanced sound mix can be achieved. Multiple channels of wireless is the only viable option for such shows whether performed by international troupes or local theatre groups.

Even small schools are now regularly doing productions using in excess of a dozen radio mic systems. Meeting audience expectation increasingly relies on this technology.



I am currently working on two youth productions – *Seussical the Musical* for Manukau Performing Arts and *High School Musical Jr.* for North Shore Music Theatre and am also planning productions next year including *Into the Woods*, *Big Top Cabaret* and *Miss Saigon* for NSMT. Each of these productions relies heavily on audio reinforcement and with live actors on stage radio microphones are the only option to achieve a good result. Our shows can include anywhere from 6 to 30 radio microphones.

– Andrew Comrie, Executive Committee Secretary, North Shore Music Theatre



Those currently ubiquitous TV reality shows commonly use one wireless system per contestant. When New Zealand's own Emmy Award-winning producer Phil Keoghan was last here filming *The Amazing Race* a total of 36 units were used and expected to perform in all the same diverse locations that the show's contestants were.

News: Television news crews travel around the country with their cameras and mostly rely on very expensive radio mic systems for their sound recording. The impact of DTT is already being felt in this industry with a number of additional systems being purchased to cover geographic areas that are no longer available to the current radio mic frequencies. The financial cost of this (about \$1,500 per system) further affects the ability to get adequate coverage of breaking stories.



Breaking news events such as the recent Napier gunman siege further illustrate the vital importance of a national frequency corridor. In such situations news crews need to be quickly despatched to any site around the country and should be able to use standardised wireless equipment on site without bandwidth restrictions.

Sport: A high number of radio mics and in ear monitoring (IEM) systems are often used in live TV and radio broadcasts. A typical televised sporting event will utilise 30 or more systems. At major rugby matches each referee has a mic and an IEM system, as do each of the TV and radio presenters. For a major international game as many as 50 UHF channels may be needed to cover requirements.

Any lack of available spectrum for radio mics and IEM's may well create an embarrassing negative factor in any potential bids for future 'World Cup' scale sporting events including the Commonwealth Games in 2018. With the international reporter presence at the Rugby World Cup 2011 it is anticipated that each match will involve as many as 40 wireless units. Hamilton is already notoriously difficult for wireless coverage of major events held there due to DTT transmissions occupying a contiguous block of 48MHz.



In early 2008, On Site Broadcasting (OSB), the outside broadcast provider to Sky Network Television, commissioned the very first High-Definition truck in New Zealand. For this truck 6 radio mic transmitters were also purchased, 4 of them operated in the 691.2 to 716.7MHz band and the other 2 operated in the 716.8 to 742.3MHz band. Each transmitter is able to switch frequencies in 100kHz steps, therefore can operate on any of 256 frequencies.

DTT transmissions fully commenced in late February 2008 and it immediately affected OSB's ability to operate these radio microphones in Hamilton. The main DTT transmission site for Waikato is Te Aroha, which is located about 50km from Hamilton city. An infill transmission site is also located within Hamilton and within 1.5km of the two major sporting venues which host top level cricket and rugby. The combination of the DTT transmissions from both local sites meant DTT frequencies occupied the entire spectrum from 670-718MHz. This effectively rendered 4 of OSB's newly acquired radio microphones unusable in Hamilton City. It soon transpired that the same situation exists in Tauranga.

These OB trucks represent the pinnacle of mobile broadcasting in New Zealand. The intention was that any truck could go anywhere with equipment already onboard to cover any situation. OSB had no choice other than to purchase additional radio microphones in lower frequency bands specifically for use in those cities. If a truck is heading to Hamilton or Tauranga the crew now has to ensure it has the specific radio microphones and accessories tuned for those locations.

This style of DTT planning is more than likely to be adopted nationally in the lead up to, and after Digital Switch Over, creating logistical nightmares for owners such as On Site Broadcasting.

– Haresh Bhana, Elephant Audio Ltd



Community: Radio mic use is wide spread throughout the community. Every School Fair, Surf Carnival, Church Service, Public Concert, and local RSA in this country uses radio mics for everyday activities. The loss of the 700MHz band and any subsequent need to purchase replacement equipment will have considerable economic impact on those organisations which rely on donations and public charity funding sources for their continued survival.



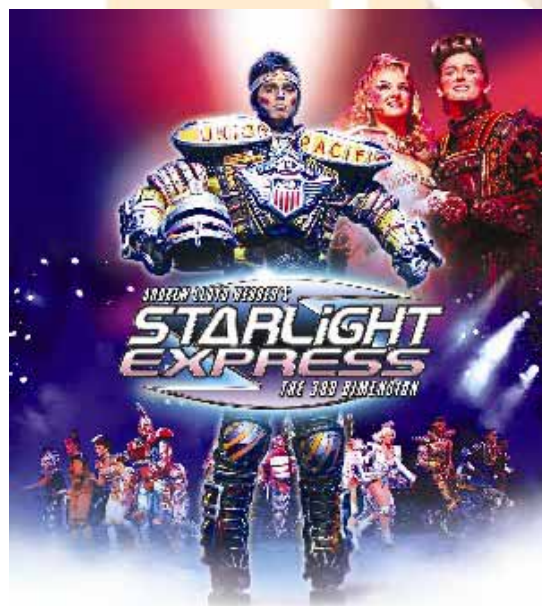
Some further relevant radio microphone channel usage guides:

At the Rugby World Cup in 2003 there were 105 UHF radio mic transmitters used at Telstra Stadium across 290MHz of spectrum.

The Sydney Olympics saw 797 UHF radio mic transmitters used on 502 different frequencies across 298MHz of spectrum

The 2007 Netball World Championships staged in Auckland involved 50 UHF radio mics across 184MHz.

The Starlight Express musical stage show which toured New Zealand main centres in 2009 required 36 channels of UHF radio mics plus in ear monitoring and comms spread over 290MHz of spectrum due to interference, intermodulations and availability of equipment.



The economic value of Radio Microphone usage

Direct economic contributions through wireless system use derive from many fronts, unfortunately direct economic figures are best estimates only. The following are among core usage sectors:

Equipment importers and wholesalers distribute thousands of systems a year – an estimated \$2.5 million + pa.

Dealers and retailers on-sell systems to the end users for an estimated \$3.7 million + pa.

Hire companies supply schools, venues, businesses, events and general users to an estimated \$10 million-plus pa value.

Local theatre and productions held in the many venues around New Zealand also account for a significant contribution to the local economy. **EVANZ - Entertainment Venues Association of New Zealand** has provided the following statistics based for the period between July 08/09.

EVANZ encompasses 78 venues around New Zealand which include 38 Theatres, 26 Event Centres, 7 Outdoor Stadia and 7 Convention Centres.

51 owned by local authorities

27 are privately owned (Company, Trust, incorporated Society)

29 managed directly by Councils, 11 by companies, 38 by independent trusts (some charitable Trusts)

Their combined Annual Gross Revenue is \$140 million pa.

The additional wider economy benefits via transport, accommodation, food and beverage consumption exceed that figure.

The film and television industries are among the heaviest users of radio mic technology. According to Statistics NZ figures the Screen Production Industry gross revenue in the 2007/08 year was *\$2,743 million of which *\$945 million was from physical screen production and \$1,155 million from television broadcasting.

It is also worth noting that the US film industry contribution to New Zealand film production companies was a total of \$481 million.

**(Screen Industry in New Zealand: 2008 – Statistics New Zealand, published 24/08/09)*

A simple summation of these industries exceeds \$2.900 million per annum.

WUNZ Requests

- **Allocation of exclusive (or near exclusive) UHF bandwidth in the 502-698MHz sector common throughout the country for use by radio microphone users.** WUNZ considers that at least 50MHz of continuous bandwidth is necessary in each location – although considerably more is required for larger scale events.
- **That allowances and provisions be made to accommodate radio microphone usage within a band that is commonly manufactured.** (New Zealand is a small market for manufacturers.) It is also essential that product importers be advised well in advance where any expected 'white spaces' will be, so that units using the appropriate frequency bands can be imported. A minimum of 3 years notice to migrate existing users outside 700 MHz band and 5 years notice to migrate users in 700 MHz band.
- **That radio microphone use be considered as a high priority** in the future re-allocation of UHF frequency blocks as current license periods expire.
- **That the one-for-one exchange of analogue channel licenses for digital frequencies be reconsidered** and/or that digital licensees be actively encouraged to code share (perhaps using the 'must carry' clause) via multiplexing in order to free blocks of UHF frequency in the 502-698MHz band.
- **N+2 scenario to be used while DTT frequency blocks are re-allocated.**
- **Continued self regulation with GUSL type arrangement.**
- **Greater liaison between MED / RSM and WUNZ.**
- **RSM to quantify amount of current radio mic usage.** Involvement of RSM when complex set ups are required.
- **Six months advance notification of any DTT switch-on or channel change.**
- **A clear picture of where to safely migrate to as soon as possible.**
- WUNZ strongly urges against the auctioning of any 700 MHz band spectrum which would further aggravate the situation for radio mic users. The optimal solution would include a minimum of 50MHz of available congruent bandwidth through the allocation of a dedicated band, and may comprise of a combination of a guard band plus some additional spectrum as well as the reshuffling of the proposed TV allocations to ensure more 'white' spaces throughout the country.
- Special planning attention is required for large venues such as stadiums (Telstra Clear, AMI, Albany, Westpac Trust, Eden Park, Mt Smart etc), concert and sporting venues which will regularly have the need for larger spectrum requirements. Some shows require 100+ channels of radio mics, IEM and other UHF comms.

Looking Forward

The radio microphone and related product market is estimated by WUNZ to exceed 100,000 users, the vast majority operating in the 700MHz bandwidth, and is growing consistently. Given international trends the NZ Government sale of UHF frequencies to yield a 'Digital Dividend' is logical, but must not happen at either the short or long term cost of this culturally important technology service and user sector.

There will need to be a minimum of a five year change over period to allow current users time to plan and purchase new hardware. This process will cause considerable financial burden to many current radio mic users, particularly those such as churches which rely heavily on donations.

The impact on everyday businesses such as gymnasiums, hire companies, conference venues, churches, schools and universities should not be underestimated. More visible sectors such as film, television, sports and major events will find tens of millions of dollars worth of business potentially jeopardised and as importantly the country will risk loss of international credibility in these valuable areas.

In comparison with other countries New Zealand already has, in parts, an excessive provision for television channels. Traditional media is increasingly challenged financially and by social changes, and it seems inevitable that future television providers will look toward broadband as a delivery platform rather than UHF broadcast.

In Auckland there are 23 stations for a space that can only cope with 24 in the proposed plan. There is effectively NO room for radio mics in that plan. One solution would be to require a number of analogue licenses to combine onto one or two multiplexed digital transmissions, a saving for them on hardware, power and ultimately freeing up spectrum for continued radio mic usage.

In the last month we have hosted three primary schools giving their bi-annual end of year performances, each requiring wireless radio microphones. Central School used six units for their performance of *Alice the Musical*, Eskdale School used 12 units in their performance of *We've Come So Far* and Porritt School a similar number for *Gnome Sweet Gnome*. The use of wireless microphones for these events is essential as even in a building with good acoustics the young shy voices need to be enhanced.

– Brendan Hey, Venue Technician, Napier Municipal Theatre



In Summary

WUNZ requests that the MED take into consideration the vast amount of current Radio Microphone users in New Zealand and makes provision for those plus future growth in structuring the Digital Dividend, after DSO.

It is our belief that as it is the duty of the MED to manage the spectrum for the good of all New Zealanders, that all radio mic users should be included and provided for, in planning the future use of the UHF spectrum. Though Radio Microphones are covered under General User Licences, it makes them no less important to the economy and the community.

Radio Microphone use has infiltrated nearly every aspect of New Zealand life and many people, businesses, organisations and sectors of the social economy would be adversely affected by enforced frequency changes and inadequate bandwidth allocation. Any decision must cater well for radio mic users now and in the future or will impact adversely on thousands of lives and livelihoods, indeed potentially on the nation's own reputation as a great first world host.

The appended table (p18) is a charted representation of the Kordia proposed plan as commissioned by the MED which shows how little "white space" will actually be available if this plan is adopted.

Thank you for your consideration. Please contact the writers regarding any of the issues discussed in the document.

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DIGITAL FUTURES

Planning for Digital Television And New Uses

QUESTIONNAIRE ANSWERS

1. Do you agree with licensing Amateur radio use in the 50 – 51 MHz band on a sole Primary basis?

Answer: WUNZ doesn't represent users of this band

2. Do you agree with licensing Amateur radio use in the 51 – 54 MHz band on a shared basis with Fixed and Mobile services?

Answer: N/A as above.

3. Do you consider any new spectrum allocation policies and planning should be developed to utilise the bands 54 – 68 and 174 – 230 MHz bands prior to the expiry of the current Management Rights in 2015? If so what services and at what time?

Answer: N/A as above.

4. Do you agree with approximately 100MHz of the band being considered for allocation to new uses on a nationwide basis? If not, what would you prefer and why?

Answer: The band 694 MHz to 806 MHz (referred to as the '700 MHz band') is part of the sole band where UHF radio microphones were permitted per the General User Licence until June 2009 year. Thus any allocation to new uses will require great dislocation and reinvestment for 90% of users who bought radio microphone systems legitimately until June 2009. WUNZ would prefer that any white space be able to be used by radio microphone users and that the transition period be five years or more.

5. Do you agree with a core reservation for digital television of approximately 1/3rd of the UHF band on a nationwide basis? If not, what would you prefer and why?

Answer: One third is considered reasonable only if sufficient space remains in any locale for the operation of radio microphones and a band of spectrum is available nationwide.

6. Do you agree with approximately 1/3rd of band being allocated on a geographic basis to meet television licence commitments in urban areas, and to allow new uses in other areas? If not, what would you prefer and why?

Answer: Television licence commitments and new uses should only be permitted once existing users have sufficient bandwidth for use for the foreseeable future.

7. What specific types of service do you think are desirable as new uses in areas outside of areas where there are digital television licence commitments? Do you have any views on how access to the licences necessary for such usage should be managed?

Answer: Radio Microphones are a desirable use for areas outside of DTT commitments. We strongly urge that the MED should make provision for them in planning.

8. Do you agree with the n + 2 basis for licensing of digital television? If not, what would you prefer and why?

Answer: Adequate white space must be provided for radio mic usage. The current Kordia plan does not appear to allow for space, particularly around main centres where the major venues are.

9. Do you agree with placement at the upper end of the frequency range, from approximately 700 MHz upwards? If not, what would you prefer and why?

Answer: In the U.S. model disruption to radio microphone users was lessened because they have had access to the entire frequency range from 500 MHz to 800 MHz thus when the 700 MHz band was sold off the proportion of affected users was smaller than in NZ where until June 2009 radio microphones were only permitted between 646 MHz and 800 MHz. Ironically the legitimate users in NZ will have to re-tool whereas those who ignored the licensing rules may be able to continue operating. Users will require a minimum of 5 years notice to move from the 700 MHz band and be entitled to ask for financial assistance with purchasing new equipment.

10. Do you agree with the placement of the spectrum released in geographic areas in two portions, i.e. from approximately 500 to 550 MHz and from approximately 650 to 700 MHz? If not, what would you prefer and why?

Answer: The placement should allow 50 MHz or more clear spectrum for Radio Mic use, and common spectrum nationwide.

11. What opportunities do you envisage for the promotion of te reo Māori me ngā tikanga Māori which need consideration in a revised frequency plan?

Answer: Promoting te reo in various circumstances involves the use of radio mics. The same available spectrum is used as by other users.

12. Do you agree with the proposal not to provide for Amateur television services in the UHF band? Please give reasons for your view.

Answer: WUNZ does not represent users of this band.

13. What additional services might require further digital licences to be allocated in the transition to full digital broadcasting?

Answer: Digital radio mics may require their own General User licence as they use a wide

bandwidth i.e 24 MHz and are expected to become more prevalent.

14. Is it desirable for the Crown to retain influence in the end use of any further digital licence set, and should this in turn influence the method of allocation. What method of allocation is preferred? Why?

Answer: WUNZ believes it is highly desirable for the Crown to retain influence as it is important that any decisions regarding spectrum usage are not solely driven by commercial interest and funding. Due consideration has to be given to economic and cultural concerns. In particular, users such as Radio Microphones, need to have their interests catered for in a non-commercial setting and only the Crown has that type of power and control. WUNZ believes it is part of the Crown's responsibility to cater for this type of use under Radio Spectrum Management.

15. Are the current new licences for radio microphone use in the band 518 – 582, with potential future extension up to 698 MHz, adequate for ongoing use after DSO? If not, what other provision should be considered?

Q15 Answer: The frequency plan outlined in the Kordia document **A Frequency Plan for UHF Digital Terrestrial Television** leaves WUNZ members with grave concerns about the lack of available spectrum even in this extended band. Some of the manufacturers who supply WUNZ' members do not manufacture radio microphones below 620 MHz, limiting the usable band even more. There is not adequate 'white space' in the proposed plan for radio microphones to operate as currently used or to allow for any expansion in use in the foreseeable future.

WUNZ members require reasonable bandwidth available common throughout New Zealand and 50MHz available including the spectrum above in all major centres preferably in contiguous blocks. Will the planned number of DTT channels be viable long term especially as the optical fibre broadband initiative proceeds?

16. Do you agree that new radio microphone use should be restricted in the nationwide released spectrum with effect from 2010, and existing use discontinued after 5 years, as transitional measures? If not, what other provision should be considered?

Q16 Answer: WUNZ would like to see usage of the any nationwide released spectrum available for a minimum of five years. To facilitate the changeover the beneficiaries of the released spectrum should contribute to the costs involved in making the transition. Before the transition can begin radio microphone users need to know what frequencies they can move to and there needs to be adequate bandwidth nationwide for them to move to. It is unclear whether this spectrum will be available.

17. Do you agree with the proposal to establish a preferred band limit at 694 MHz subject to finalisation as outlined below? If not, what alternative lower limit would you prefer, why?

Answer: WUNZ would prefer a 698 MHz limit and to maximise the guard band between the upper limit and users of the 700 MHz band. While radio microphones may work in the guard band it shouldn't be the sole source of spectrum as is very narrow (five channels max.) and there is considerable risk of interference.

18. Do you agree with the proposal to base New Zealand technical planning on the spectrum allocations used in the United States? If not, what alternative allocations would you prefer, and why?

Answer: Spectrum allocation in the US presents a model for discussion where radio microphone use in the 700MHz band is no longer permitted. However users there, and in Australia have had access to a wider block of frequencies. Because their TV channels are only 6 MHz wide there are more of them to use or leave vacant as white space. The nationwide use of cable in the US means less terrestrial digital broadcasts and potentially more white space.

Alliance with Australian practice makes some sense as shows and sporting events are common to both countries would be able to employ the same equipment. Many manufacturers make systems for use in Europe not America.

19. Do you agree with the concept of deferring detailed technical subdivision of the released nationwide spectrum, for completion in 2011 (when international trends are anticipated as being resolved), and allocation later in 2011 or 2012? If not what dates would you prefer for completion of planning and allocation?

Answer: WUNZ want to defer to give more time for consultation and investigation to maximise the benefit to all New Zealanders including radio microphone suppliers, users and the public who benefit whenever a radio microphone is deployed.

20. Do you agree with the use of area licences for licensing use of the mixed-use spectrum outside areas of television use? Do you have any views on the technical subdivision of spectrum or the preferred allocation method?

Answer: a. No, as this will provide even less uniform spectrum for Radio Mic usage. In practical terms this means that users would need even more systems to try and cover the available 'gaps' in the spectrum.

b. Yes. WUNZ would like to see an allocation based on the best use to allocate considerable spectrum for radio mic use.

21. Do you envisage any requirements by Māori interests for use of either the nationwide or geographic mixed-use tranches of spectrum? Please identify potential uses and any specific technical issues associated with planning for such uses.

Answer: WUNZ is not directly aware of any requests. Radio microphones are used by all sectors and anything which impinges on the available spectrum will adversely affect development in any field requiring radio microphones

22. Are there any other issues not fully covered in Section 5 that you consider should be taken into account? Please indicate these as specifically as possible with your response.

Answer: WUNZ would like 50MHz or more bandwidth with a band available nationwide, in order to cope with current radio mic usage.

Qs 23-39 refer to regional broadcasting which is outside WUNZ's remit.

DTT Post DSO - Proposed

Region	Channel MHz	BLOCK A										BLOCK B													
		TV25	TV26	TV27	TV28	TV29	TV30	TV31	TV32	TV33	TV34	TV35	TV36	TV37	TV38	TV39	TV40	TV41	TV42	TV43	TV44	TV45	TV46	TV47	TV48
Upper Northland	Puenteo																								
	Aniara																								
Lower Northland	Hokitika																								
	Mangawhai																								
Auckland	Waiarua																								
	Ping Hill																								
	Waikato Island																								
	Skytower																								
Waikato/BOP	Whangape																								
	Whangape																								
	Te Aroha																								
	Hamilton Tower																								
Rotorua	Korukauru																								
	Mt Edgecumbe																								
	Pukekohe																								
	Pukekohe Rangitikei																								
Taupo	Mangakino																								
	Tuhingamata																								
Hawkes Bay	Mt Erris																								
	Wheatstone Road																								
	Paikananga																								
	Whakatu																								
Taranaki	Nasser Airport																								
	Mt Tereva																								
	Mt Egmont																								
	Tauranga																								
Manawatu	Wharite																								
	Mt Jowet																								
	Ngarara																								
	Forest Heights																								
Wellington	Ohau																								
	Kaukai																								
	Batters Knob																								
	Fitzherbert																								
Nelson/Marlborough	Haywards																								
	Grampians																								
	Takaka Hill																								
	Mt Campbell																								
Christchurch	Kaka Hill																								
	Observatory Hill																								
	133 Waimoa Road																								
	Sugarloaf																								
Queenstown	Marlins Hill																								
	Diamond Harbour																								
	Carve Hill																								
	Peninsula Hill																								
Dunedin	Queenstown																								
	Coronet Peak																								
Southland	Mt Carrall																								
	Cowan Road																								
	Hedgehope																								
	Forest Hill																								

AB = Main Site (High Power) ab = Infill Site (Low Power)

TV25 TV26 TV27 TV28 TV29 TV30 TV31 TV32 TV33 TV34 TV35 TV36 TV37 TV38 TV39 TV40 TV41 TV42 TV43 TV44 TV45 TV46 TV47 TV48

Channel
MHz

Channel
MHz

Source: Kordia report to MED

All names are indicative only

Prepared by Hareesh Bhamal for WUNZ, 23/09/2009

