



29 April 2009

Telecommunications Branch
Commerce Commission
44-52 The Terrace
Wellington

Attn: Matthew Bailey

Dear Matthew

STD for Co-location of cellular mobile transmission sites

Kordia thanks the Commission for its enquiry as to the technical characteristics of our new tetra based trunk mobile radio service, KorKor.

In our view, due to the expansive nature of the definition of a cellular network, it seems that the KorKor network would be caught by the definition. However whilst digital Trunk Mobile and Cellular networks and services do have similarities, they are distinct and different in several important ways. In our view in attempting to address co-location issues for cellular networks, the Commission has unintentionally captured digital trunk radio networks. Analogue trunk radio networks are not caught by the definition, and yet they are similar to the digital trunk mobile networks in terms of the type of sites required. In our view by taking a more "sites based" approach (typically high altitude with large cell coverage) the Commission would be more correctly focussed on the types of sites that are at issue for cellular co-location.

What we have set out below is a table which details a comparison of the two networks. In addition we have also provided a description of some of the features of the digital trunk mobile network, which establish it as a private voice network as distinct from the public nature of a cellular network.

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Table: Typical distinguishing characteristics of Cellular Mobile, and Trunk Mobile services

Cellular Mobile	Trunk Mobile
Typically lower altitude cell sites	Typically higher altitude sites
Small cell areas, especially in urban areas	Large area cells, typically up to 58km radius
High re-use of frequencies	Low re-use of frequencies
High traffic density	Low traffic density
Approaching ubiquitous coverage	Coverage provided per customer area
One-to-one calls typical	Group calls a regular feature
Users can be individuals	Users typically part of a group or organisation

These differences are general and "typical" rather than absolute, as there will be exceptions in both Cellular and Trunk systems that cross over into the description of the other's typical characteristics. An amendment to the definition, based on the characteristics in the above table would when applied on a typical basis, exclude digital trunk radio networks from the definition of cellular networks.

TETRA network characteristics that may differ from cellular mobile networks

Group Call

This is probably the most basic voice service in TETRA (although the most complex to support effectively and efficiently). "Push to talk" is provided for group calls.

Group calls may be provided throughout the network, or within a defined operational area.

For group calls, the network automatically sets up the necessary communications links to all members of a group, to ensure they are connected as the caller begins communicating with the group.

Group participants, who may have been out of range of the network, such as before exiting from a tunnel, are automatically connected into their group if a call is already in progress.



Group Priority Protocols

Priority protocols for specified high priority groups (such as emergency services) provide connectivity to a high priority group across areas throughout the network, even when the network is busy by dropping low-priority user calls if necessary.

Call Retention

This feature protects selected radio terminal users from being forced off the network as a result of pre-emptive calls (emergency calls) during busy periods. When emergency calls are supported in a network, it is essential that only a small number of radio terminal users are provided with this facility as the objective of retaining important calls during busy periods could be lost.

Priority Call

During network busy periods, the Priority Call feature allows access to network resources in the order of user terminals' call priority status. There are 16 levels of priority in TETRA, to provide different Grade of Service (GoS) levels (and tariff structures) during busy periods. For example, front line officers would be provided with the highest priority levels in a Public Safety network to maintain the highest level of service access whilst routine users would be provided with lower priority levels.

Dynamic Group Number Assignment (DGNA)

This feature allows the creation of unique Groups of users to handle different communication needs and may also be used to group participants in an ongoing call. This feature is considered by many public safety organisations to be extremely useful in setting up a common talk group for incident communications. For example, selected users from the Police, Fire and Ambulance could be brought together to manage a major emergency where close co-ordination between the three emergency service are required. Similarly, DGNA is also considered useful for managing incidents by other user organisations such as Utilities and Transportation.



Local Site Trunking

Each TETRA base station can continue to operate and serve terminals in Trunked Mode Operation (TMO) within coverage area for communications between those terminals, even when its back haul link is disconnected from the main (TMO) network. Such disconnection could occur during fault conditions or during physical events associated with national emergencies. This fault tolerance is an important feature of TETRA. Single stand alone base stations can also be established on a temporary basis to provide local site (TMO) trunking during emergency situations, or for special events.

Direct Mode Operation (DMO)

DMO is the term used by the TETRA industry to describe the ability of TETRA radio terminals to communicate directly with each other (like a pair of 'Walkie-Talkies') independent of the (TMO) network. DMO RF channels are separate from the TMO channels used for normal TMO calls, and hence the use of DMO use does not impose any loading on the network capacity. (DMO is not new and has been a fundamental mode of operation by many traditional professional mobile radio¹ (PMR), user organisations for several decades.)

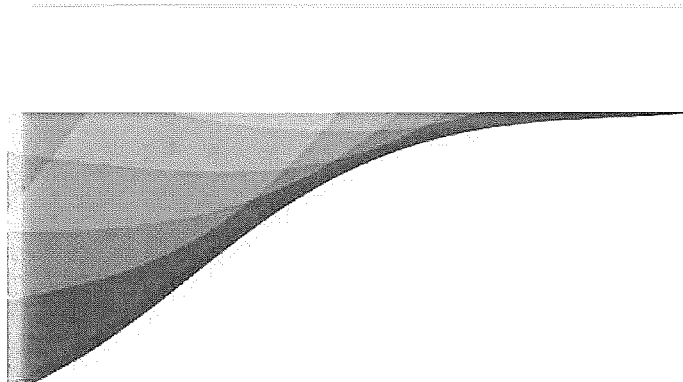
Local Area DMO Communications

Local area DMO communication is mainly used to provide additional capacity outside the TMO network for localised work activities, major incidents and/or periodic events. To a lesser extent, local area DMO communication is also used in poor TMO RF coverage areas and/or when service from a local base station site is lost. To provide this local area communication capability, practically all TETRA terminals, whether mobile or hand-portable terminals, are equipped with both TMO and DMO facilities. Local area DMO also uses RF channels separate from the TMO channels and does not impose any loading on the network capacity.

TMO Network Range Extension

One frequently used DMO application is to provide TMO network range extension allowing hand-portable communications in areas of a TETRA network where only mobile radio coverage is supported. (The better antennas and higher power of mobile radios may allow them to access the TMO network, while hand-portable radios in the area do not have the technical performance to access the TMO network.)

¹ PMR is also known as private mobile radio



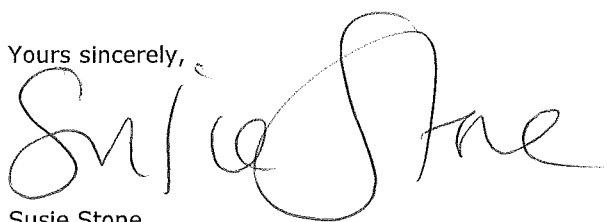
To provide this TMO network range extension facility, a vehicle mounted TETRA mobile radio terminal equipped with 'Gateway' operation is required to link a hand-portable or mobile radio terminals operating in DMO, with the TMO network. In effect the mobile radio with "gateway" operation acts as a temporary local base station for the other terminals in its vicinity operating in the DMO local area mode.

Enhanced Local Area DMO RF Coverage Performance

There are instances when RF coverage of terminals operating in a DMO local network needs to be enhanced, for example in localised areas where there is a significant amount of building clutter over a relatively large area causing unacceptable signal losses. In these instances, enhanced RF coverage can be provided by a 'Repeater' facility incorporated in a vehicle mounted TETRA mobile radio terminal, or a transportable radio unit, suitably located to provide the required area coverage. For practical reasons, this 'Repeater' facility is only made available on mobile radio terminals. Also, Repeaters can be provisioned with a Gateway facility to link DMO and TMO communications when necessary.

If you have any further questions on the technical characteristics it may be helpful for Ian Goodwin in our Wellington office to meet with Commission staff. If this would be useful please let me know.

Yours sincerely,



Susie Stone

General Manager Strategic Development

Kordia Group

