

## TAIWAN RAIL ADMINISTRATION

WORLD'S LARGEST  
TETRA RAILWAY  
CONTRACT IN  
TRACK LENGTH



**MOTOROLA**  
intelligence everywhere™

### BACKGROUND

Taiwan Rail Administration (TRA) serves an average of more than 500,000 passengers daily over a track length of 1,100km. With the high commuter traffic across this extensive track, it is critical to have a communications system that provides seamless coverage with real-time, high quality voice and data communications. This is essential for effective operational control and management of train fleet and scheduling as well as passenger safety.

Since the completion of digital electronic telephone switching devices in all 13 passenger terminals in 1994, TRA is continuously evaluating the latest digital technology to maximize operational efficiency and ensure passenger safety. The search for a replacement communications system that could provide extensive coverage across the entire track length resulted in a contract awarded to Motorola's Commercial, Government and Industrial Solutions Sector for a TETRA (TErrestrial Trunked RAdio) system. The digital trunked radio system provides improved spectrum efficiency and integration of voice and data services over the present analogue system that TRA is using.

The contract was awarded in April 2003, marking it as the world's largest TETRA railway contract in terms of track length. The contract was part of a larger project awarded to Mercuries Data System Ltd (MDSL).

This TETRA system represented yet another significant milestone for Motorola's leadership and innovation as a global TETRA solutions provider.

Other factors contributing to the selection of Motorola as the preferred partner-of-choice include the company's reputation as an experienced and dependable supplier in end-to-end radio communication solutions for the transportation industry, and its strong presence throughout the Asia Pacific region.

### CUSTOMER NEEDS

Taiwan Railway Administration was looking for a Train Dispatch Radio System (TDRS) to replace its existing, conventional system, which has been in use for over 20 years old. The TDRS is required to provide daily communications across the entire railway route with improved voice quality and integrated data capabilities.

With the existing conventional system, dispatching is done through rudimentary phone lines from the control centre to the railway stations. There is no centralised recording system and only 4 conventional channels are used to relay voice messages. This leads to the problem of channel congestion during peak periods.

An effective communications system is required for operational control and efficiency to meet the main priorities of timely train frequency and commuter safety. With over seventy years of experience in radio communications, Motorola is able to apply its in-depth industry and technical knowledge to meet TRA's requirements.



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### MOTOROLA SOLUTION

The fully TETRA-compliant Dimetra™ digital system operates in the 380-480 MHz band, and includes 2 zone controllers, 39 consoles, 5,400 MTP700 portables, 1,130 MTM700 train mobiles, 97 MTM700 vehicle mobiles, and 85 MTM700 fixed stations, covering 1,100km of track and 201 train stations.

Phase 1 of the project will be completed by mid-2005, and will provide radio coverage with 102 base stations, 85 fixed stations, 5,400 portables, and 97 vehicle mobiles, covering a route length of 563 kilometres. By end-2005, the second and last phase of the project would have been completed with 48 base stations and 1,150 train mobiles along the Eastern coastline, to cover a route length of 424 kilometres.

The new TETRA system will be used to monitor and supervise day-to-day operations of the train fleet and provide a range of dispatch services, enabling seamless coverage and roaming capabilities.

The seamless roaming across the entire system enables calls or messages to be communicated anywhere in the network, from the control centre to the moving trains and vice versa. Different types of calls can also be made based on group, section, station, depot or globally. This will ensure that the operational staff are contactable at all times, thus boosting the level of service and increasing public safety along the entire network.

The superior audio clarity of the TETRA system also benefits the operational staff with greater communication efficiency and reduced risk of miscommunication. This is achieved through the reduction of voice transmission delays and production of better voice quality and clarity across the network.

For a total radio communications solution, the TETRA system is integrated with a Computer Aided Dispatch (CAD) System to support the calling of trains by Train Run Number (TRN), as well as a Train-borne Radio System to support the interface to the Train Radio Control Panel, Train Protection Radio System (TRPS) and other on-board equipment.

High reliability is critical to railway operations, and Motorola's systems ensure that if one component fails, another immediately serves as a backup. High uptime of the system assures users that there is no disruption to operations.



### BENEFITS

- Seamless coverage and roaming capabilities over the entire route length
- Improved voice quality and clarity for daily communications between personnel
- Real-time and accurate train control and communications for enhanced operational performance and commuter safety
- Integrated capabilities for efficient tracking and calling of trains
- Backup of critical components for non-disrupted operations