INTEGRATED COMMUNICATIONS SYSTEM FOR NORTH-SOUTH, EAST-WEST MRT LINES, SINGAPORE

CUSTOMER

Land Transport Authority of Singapore (previously known as MRTC Singapore)

GENERAL

Singapore Technologies Electronics Limited (ST Electronics) together with its French consortium partners was awarded the contract to provide an Integrated Communications System for Singapore's North-South, East-West (N-S/E-W) Mass Rapid Transit (MRT) Lines in 1984.

The N-S/E-W lines form the backbone of Singapore's rail transportation system. Covering a total route length of 83km with 48 stations, this MRT system transports over one million passengers daily.

ST Electronics undertook this milestone project from conceptual design to commissioning at an unprecedented pace. It is a testimony to ST Electronics' capability in offering turnkey solutions on an integrated platform for rail systems.

Featuring some of the latest innovations in railway communications, the Integrated Communications System provides the means for carrying voice and data for smooth transit operations daily.

With the delivery of the Integrated Communication System, ST Elect has demonstrated its ability to take on and successfully complete large and complex electronic engineering projects.
SYSTEM CONFIGURATION

1. Transmission System
A redundant optical fibre transmission system serves as a backbone for all major communications within the MRT network is installed. A PCM system is connected to this backbone for transmission of audio channels as well as for data transmission for the following systems:
- Supervisory Control System
- Automatic Fare Collection
- CCTV & PA Control
- Synchronization of Clock System

2. EPAX System
A 1000 line EPAX network is provided with subscriber telephones at all key locations in the station for administrative and maintenance personnel.

3. Direct Line Telephone System
This system provides hot-line facility between the following telephones:
- Trackside Emergency Trip Station telephones to OCC controller
- Station Controller to OCC controllers and adjacent Station Controllers
- Maintenance Omnibus circuits linking up all the power substations and linking Relay Rooms to point machines

4. CCTV System
Fibre-optic cables and equipment are used to transmit video images from the stations to the OCC. Colour CCTV cameras are installed to monitor key areas at the concourse and platform remotely from the OCC and locally at the Station Control Room (SCR). Monitors are also installed in the train driver cab to view the train doors to ensure the safe entry/exit of passengers through train doors. The platform camera video is transmitted to the train-borne monitors through a microwave link.

5. Radio Communications Systems
The radio systems operate over the frequency range of 80MHz to 960MHz. Elevated tracks and above ground stations are covered by antennae on high masts. In the underground stations and tunnels, a total of 137km of "leaky" feeder cables provides the underground radio coverage towards the low-profile antennae on the trains.

Communications with pagers and mobile telephones remain distortion-free even as the passengers move between underground and aboveground areas.

6. Public Address (PA) System
All stations are provided with PA coverage. The PA system at each station is divided into several zones such as concourse, platform etc. and can be addressed individually or collectively from the SCR or OCC.

Automatic Noise Monitor microphones are also provided to compensate for noisy environment through gain control.

7. Other Systems
Ancillary facilities such as system-wide synchronized master clock system, voice recording of controllers' conversations are also provided.

SCOPE OF WORK

- Project Management
- System Design
- Installation Design
- Manufacturing Design
- Factory Test & System Integration
- Installation
- Testing & Commissioning
- Documentation
- Training
- Warranty