



# **Metrorail Auto Announcement System, Incorporating Communication & Safety Features.**

**Specifically Developed for Passenger Rail Agency of South Africa**

**by Advanced Digital Devices (Pty) Ltd**

## Special Features of the System

- The system is specially designed to be used onboard the new 10M5 motor coaches.
- It has an easy to use driver interface with LED function display.
- The Driver can use a dedicated intercom to talk to the Guard in the other motor coach.
- The Driver or Guard can make Public Announcements at any time.
- The Driver can communicate with the Centralised Traffic Control Office (CTC) through a built-in cellphone interface.
- The Announcement System will run automatically and needs no driver intervention.
- The driver can select on-board entertainment in the form of music.
- A tracking system will keep record of the trains position and speed at all times

# Passenger Information Function Features

## **System Unit**

- This system forms an extension to the existing PA and intercom equipment as already installed on several motor coach versions, including all current 10M5 motor coaches. The system is also compatible with some 10M2 motor coaches.

## **Messages**

- The purpose of the system is firstly to keep the passengers informed of events along the route travelled. This includes welcome messages, station arrival, destination, doors open and closed, end of trip, safety messages, etc. These messages can be selected in alternative languages depending on the route traveled.

## **Entertainment**

- During the trip the system can also play music. Music can be selected according to the trip travelled and customer requirements. Further enhancement of the system can incorporate streaming from a content provider which could include pertinent messages regarding events etc.

## **Advertisements**

- The system caters for pre-recorded advertisements to be played at specific locations or at specific times of the day.

# Safety and Communication Features

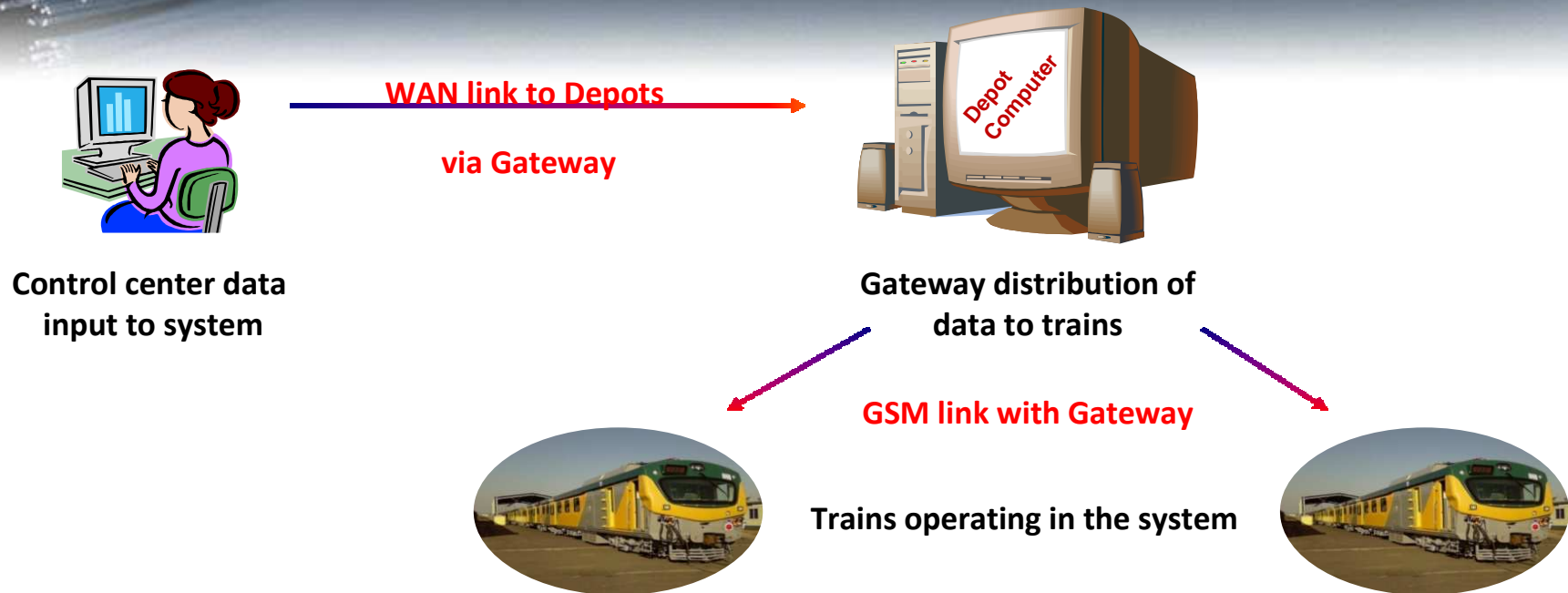
## **Communication**

- The system incorporates a cell phone interface that allows secure communication between the driver and the CTC offices. Importantly, the operator can identify with whom the conversation is taking place. At the same time the CTC office can select to make a direct announcement on the train. This announcement can also be pre-recorded.

## **Tracking**

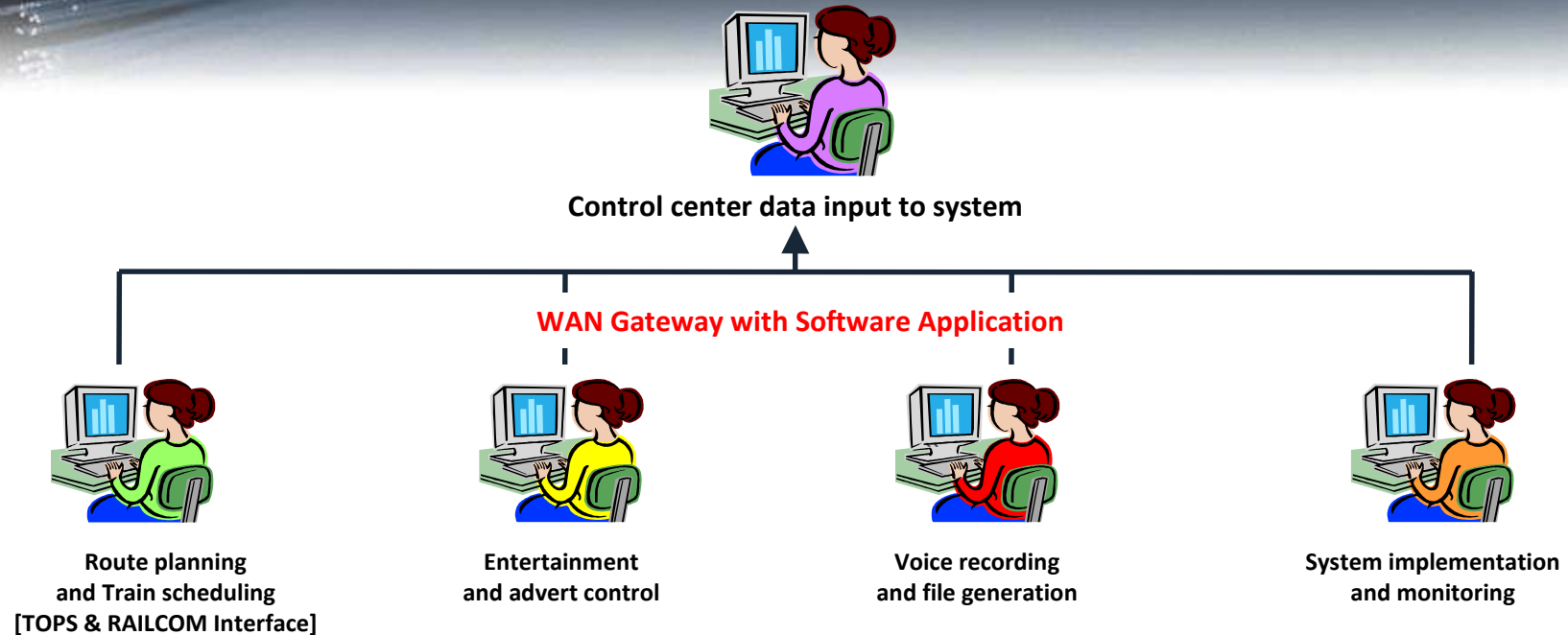
- At present the train position can be accurately recorded and monitored by authorized users at CTC or other institutions. This not only augments the present signaling system but allows the communication system to identify the exact train set or unit, position, speed and route selected. In addition events such as over-speeding can be logged. This event could trigger a SMS alert to be sent to the CTC offices. History of the routes traveled and other events can be recorded at the tracking system as well as on the train itself.

## Data Link To Trains



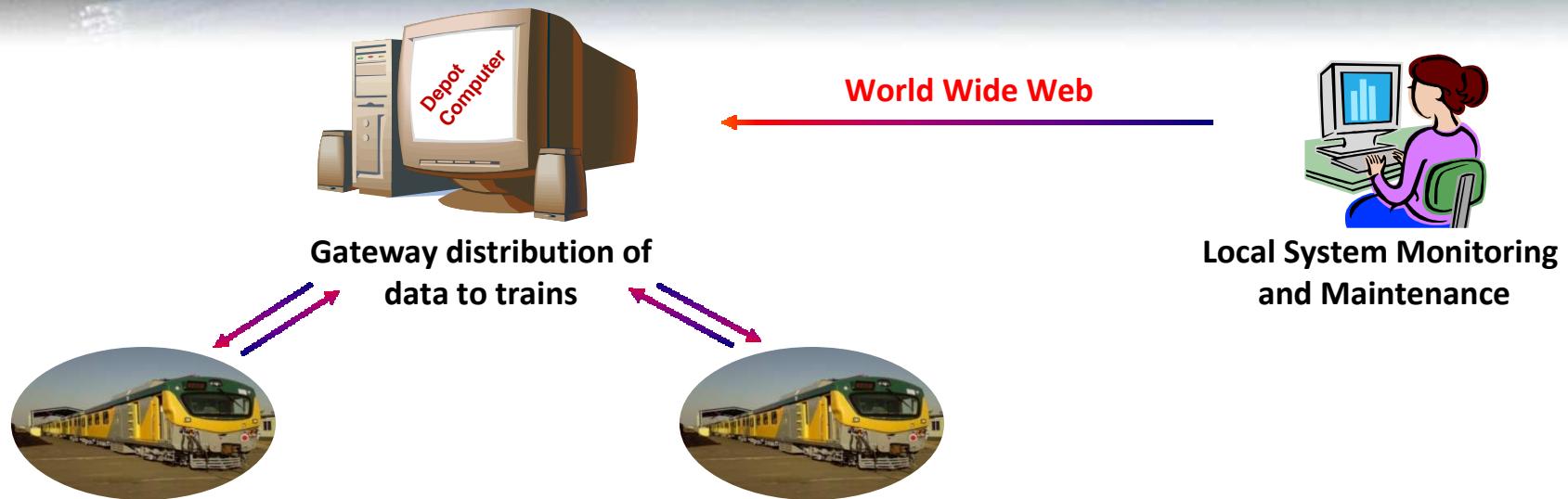
- The system operates through a gateway where all updates to software, route tables, messages, etc are stored.
- The onboard system is area based and will only load route information pertinent to the area it operates in.
- The trains will be equipped with a GSM link allowing direct connection to the Gateway. All data communications will take place over this link. A LAN port on the system will allow other users on the train to share the GSM link.
- When the train is switched on, the on-board system will contact the gateway and upload any new information pertinent to the area in which the train will operate. The system will also automatically start to give tracking information.

# System Information Recording



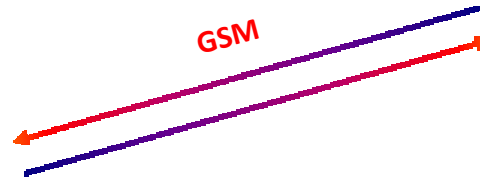
- The system will derive route information from the TOMS or RAILCOM system. Some conversion is necessary to convert to a SQL database suitable for the on-train unit. Conversion will be done in the gateway. Special trips for holidays and special occasions can easily be uploaded and added into the system.
- On-board entertainment in the form of music or podcasts can be uploaded to the gateway for distribution.
- Recording of messages or announcements should be done by a central office and then prepared for downloading to the required area.
- System implementation and monitoring will initially be done by the supplier to ensure that all problems are addressed.

# Maintenance & Additional Features



- A depot computer will be required to do maintenance, monitor malfunctions and trip violations.
- The system lends itself to ongoing usefulness by allowing for further extensions to provide more information to the public, safety features and making the rail system a more useful and safe environment.
- Running LED displays in the trailer coaches indicating the next stop and final destination. Running LED display in the window of the motor coach indicating the final destination of the train.
- Driver verbal warning messages, for example, when a dangerous area is approached, warning of speed violations or any other route related information.
- Broadcasting of Station approach information for Platform announcement and indicating systems in areas where the RAILCOM system is not available.

# Tracking & Cell phone Communication



CTC Office

- Once the train unit is switched on all tracking information is sent to the CTC Office.
- The CTC center will then be able to follow the train as it progresses along its route.
- Tracking history will be stored at the central office as well as onboard and can later be retrieved in case of an accident or any other event.
- The CTC Office can make a direct call to the selected train set.
- At the same time the train will be identified and the position displayed on the computer screen.
- Secure communication can thus take place.
- If required all calls can be recorded.

## Data Input and output of the System

- Data input to the system will be via the internet.
- Data is prepared by the various centers be it for route scheduling, voice recording or any other function which might be required.
- Data is then entered into the gateway computer where the data will be validated before distribution to the specific depots.
- Special software will allow the user to log into the gateway and to perform the above functions.
- The software will have a high level of security to interference or unauthorized access.
- A log will be generated each time the system is accessed.
- Some standard for the route schedules will be necessary. This can still be done on Excel but must be converted to the TOPS or RAILCOM System standards.
- Voice and media files will need to conform to a specific standard when being created.
- The depots will have reports generated by the system of usage and malfunctions of the system.
- Reports will be generated for the Media center to confirm music and adverts played. This is necessary to control public performance licenses and advertising revenue.

# Motor Coach Layout and Function

## DRIVERS CAB

- Driver Key
- Door Signal
- Speed Signal
- Train NBR Data
- Cell phone Communications

Drivers Console with Microphone,  
Input Keys and LCD display.

- PA Button
- CTC Call Button
- Intercom Button
- Select Announcement
- Stop
- Go
- Repeat

## MACHINE ROOM

GPS Antenna  
GSM Antenna

### PA and Automatic Announcement System

- Power supply
- Pre-amp & Output Control
- Intercom
- Automatic Announcement System
- GPS
- GSM
- CELL Interface

Power

Train Lines  
Audio Lines

Audio and Data Connection Cable

- The announcement system comprises of a rooftop antenna, train speed monitor, door interface and on-board computer with GPS/GSM and cell phone interface units.
- All the 'on-train' electrical wiring for the implementation of the system has already been documented by the drawing office in Koedoespoort.
- Should any further information be required please contact A.D.D.