

Quality control on the Factory Floor

TOA uses its very own factories both within Japan and overseas. Numerous engineers from Japan are sent to our overseas production plants to ensure that the state-of-the-art equipment adheres to the same stringent quality control system used in our Japanese production facilities. Furthermore, twice a year members from our Quality Control Division visit overseas production facilities to carry out inspections and make sure that quality standards are being maintained.



High value of Japanese technology in both Hardware and Software

State-of-the-Art Equipment

In order to satisfy the legal requirements and conditions of each country, products must pass a large number of stringent tests. By installing various kinds of testing facilities, such as anechoic/echoic chambers and EMC test chambers, and by carrying out in-house testing, TOA has been able to improve its development efficiency.



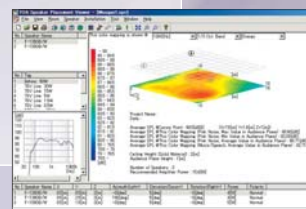
Compliance with Laws and Regulations

TOA is constantly carrying out tests to ensure that products comply with various regulations and standards around the world: safety regulations including UL, CE, CCC, RoHS, WEEE, EN 54, SASO, and REACH; the standards for each country; and ISO 9001. We do this so that consumers have complete peace of mind when using our quality products.



TOA Speaker Placement Viewer: Software for Acoustic Simulation

TOA is constantly trying to improve services and share information with the customers. TOA Speaker Placement Viewer provides an easy way to calculate how many speakers are needed in a room. The software allows virtual placement of TOA speakers.



Further information of the corresponding products is available on the following brochures. Please contact our sales departments or the nearest distributor to get.



TOA PA Speakers Wireless Microphones TYPE H Speakers NX-100/NX-100S VM-3000 Series VX-2000 Series N-8000 Series



Human Society with
Sound & Communication

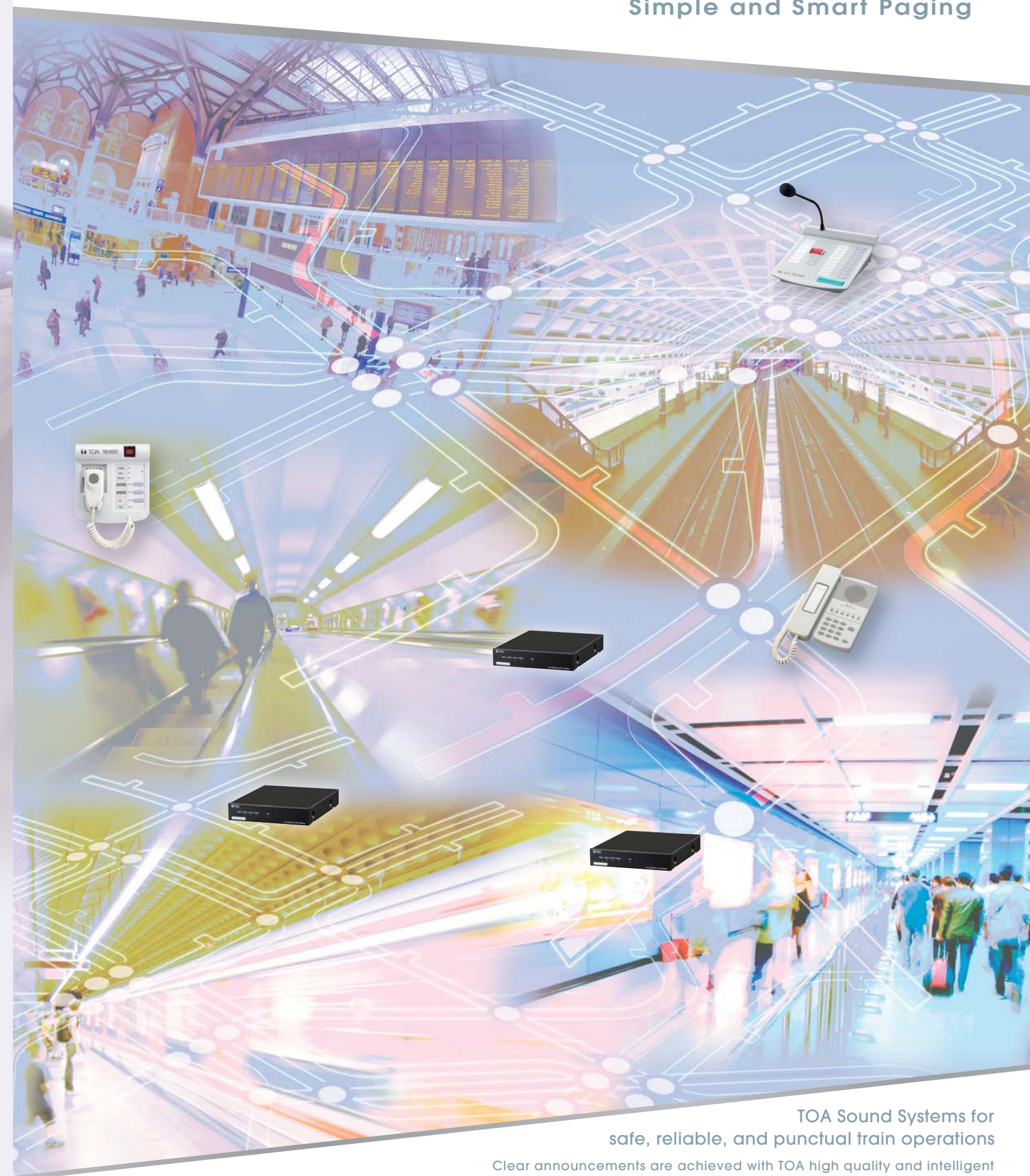
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SOLUTIONS FOR Metro Environments

Simple and Smart Paging



TOA Sound Systems for
safe, reliable, and punctual train operations

Clear announcements are achieved with TOA high quality and intelligent products that are compact and easy to setup.

Microphones



UHF Wireless Microphone System 5000 Series

Stable operation thanks to TOA's proprietary diversity system. Electret condenser microphones available in handheld and lavalier types. Long battery life: over 10 hours with single AA battery.

PM-660U Paging Microphone

Equipped with remote control switch (interlocked with talk switch) for amplifier power on/off operation or chime. Combination of PM-660D (with DIN plug) and RU-2002 (preamplifier) recommended when microphone and amplifier more than 100 m apart.

Speakers



PC-2869(6W) /2369(6W)/ 2852(15W)/Flush Mount Ceiling Speakers

Provides variety of size and power output, with simple and easy installation method.



PJ-100W(10W)/PJ-200W(20W) Wide Range Speakers

High intelligibility and durability design for both paging and background music.



F-1000(15W)/ 1300(30W)/2000(60W) Wide-Dispersion Box Speakers

2-way bass-reflex speakers. Black (B)/White(W) colors, and High/Low impedance types are available.

F-series Wide-Dispersion Ceiling Speakers

Minimal high frequency roll-off for intelligible and well-balanced sound reproduction over a wide listening area. Quick and easy mounting of speakers on ceiling.

Type-H Line Array Speakers

Reflection and feedback resistance design suitable for reverberant space to ensure the precise sound coverage and intelligible speech.



Products to recommend TOA BRINGS HIGH-QUALITY PRODUCTS WITH ABOVE FEATURES AND EXPERIENCED ENGINEERING TO THE METRO SOUND SYSTEMS IN THE WORLD.

Amplifiers



VX-2000 series Voice Alarm Emergency Evacuation System

Module-base sound system. Max. 18 audio inputs and 80 outputs with 4 bus lines. Max. 128 control inputs and outputs for system integration. Built-in yearly program timer for scheduled broadcasting. Options of graphic EQ, surveillance modules of speaker lines, and voice announcement board.



VM-3000 series Emergency Voice Alarm System

Compact-size multi-functioned amplifiers. Max. 15 audio inputs and 60 speaker zone outputs with 2 audio bus lines. Max. 80 control inputs and outputs for system integration. Built-in voice announcement, surveillance, tone signals and speaker zone attenuators.

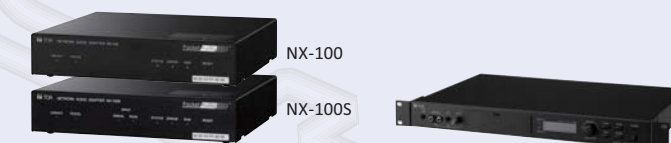
IP Network Intercoms



N-8000 series IP Intercom Systems

Ultra-reliable communication system based on TCP/IP network technologies. The system is designed for easy integration with paging systems, surveillance cameras, telephones and access controls. The frequency response extends to 7 kHz, allowing announcements to be extremely clear and easily intelligible. As a result, the system can be used for paging, conversations, streaming background music and various security functions. A single N-8000 system can be connected to a maximum of 3,072 stations and can be assigned up to 192 paging zones.

Associated Equipment



NX-100/ NX-100S Network Audio Adapter

Enables the two-way transmission of both high quality audio and control signals via TCP/IP networks in real time. The adapter allows the simultaneous transmission of audio signals to a maximum of 4 locations via Unicast and a maximum of 64 locations via Multicast.

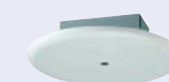
EV-350R Digital Announcer

Digital Announcing Machine features a maintenance-free design, and permits both recording and playback using the memory card. It can be mounted in an EIA Standard equipment rack.

DP-L2 Digital Ambient Noise Controller

Automatic adjustment of volume level of announcements in response to changing ambient noise levels. Option: AN-9001 Ambient Noise microphone.

AN-9001 Ambient Noise Mic



System Requirements

The paging service shall provide

Optimum information with broadcast area selection.
Clear and comfortable sound. Safety assurance in case of accidents and disasters.

The system shall be

Highly reliable to ensure minimum downtime.
Easily integrated with security systems and networks.
Capable of being remotely managed or monitored from the operation control center (OCC).
Instantly operative with emergency batteries in case of power failure.
Simple to install and maintain to reduce overall costs.

Speaker Selection and Layout

The types of speakers are selected depending on the installation place, purpose, architectural design, and required broadcast area. Proper speaker arrangement increases the intelligibility of speech. The sensitivity, input power, frequency response, impedance, and dispersion angle all affect the quality of announcements, as well as the cost and ease of installation. The layout and angle adjustment of speakers should be carefully chosen to provide uniform sound pressure levels and minimize reflection and cross talk in the broadcast area.

Announcement Level and Quality

To ensure the clarity of announcements, the sound pressure level should be about 10 dB higher than the ambient noise level. The frequency response of the system shall be at least 200 Hz to 7 kHz to cover the entire voice range.

Ambient noise at stations

Normal times: 50 – 55 dB
Crowded times: 55 – 70 dB
Trains passing: 80 – 90 dB

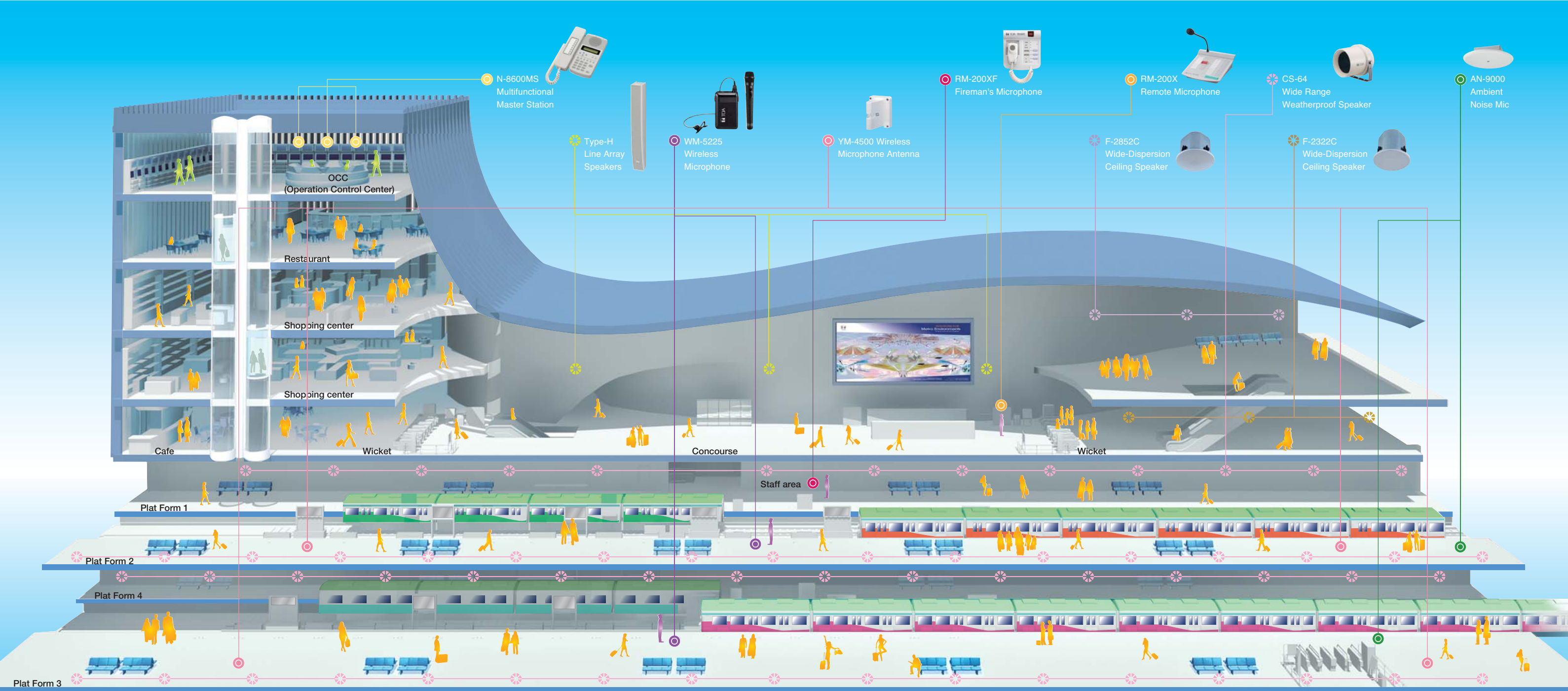
Type of Announcement

Type	Purpose	Content
Information	To give train information to passengers.	Train destinations, last trains, delays, changes.
Attention	To ensure passenger safety.	Warning signals / announcements of train arrivals and departures.
Emergency	To alert and evacuate passengers in case of accidents and disasters.	Urgent and emergency instructions.
Administration	To give administrative information to station staff.	General and emergency announcements.

Design Tips

The paging systems of subway (metro) stations are an indispensable facility to ensure safety, smooth flow and the comfort of passengers, as well as punctual train operations. However, the poor acoustic conditions of stations, such as long reservation, echoes, cross talk and

high ambient noise, debase the intelligibility of announcements and reduce their effectiveness. Therefore, paging system design requires an acoustic approach and functional configuration. In addition, systems should be reliable and easy to install, operate and maintain. TOA IP-network based systems enable more reliable, simple, rapid and economical installation.



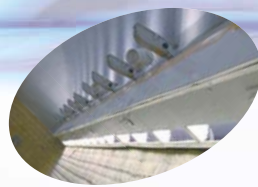
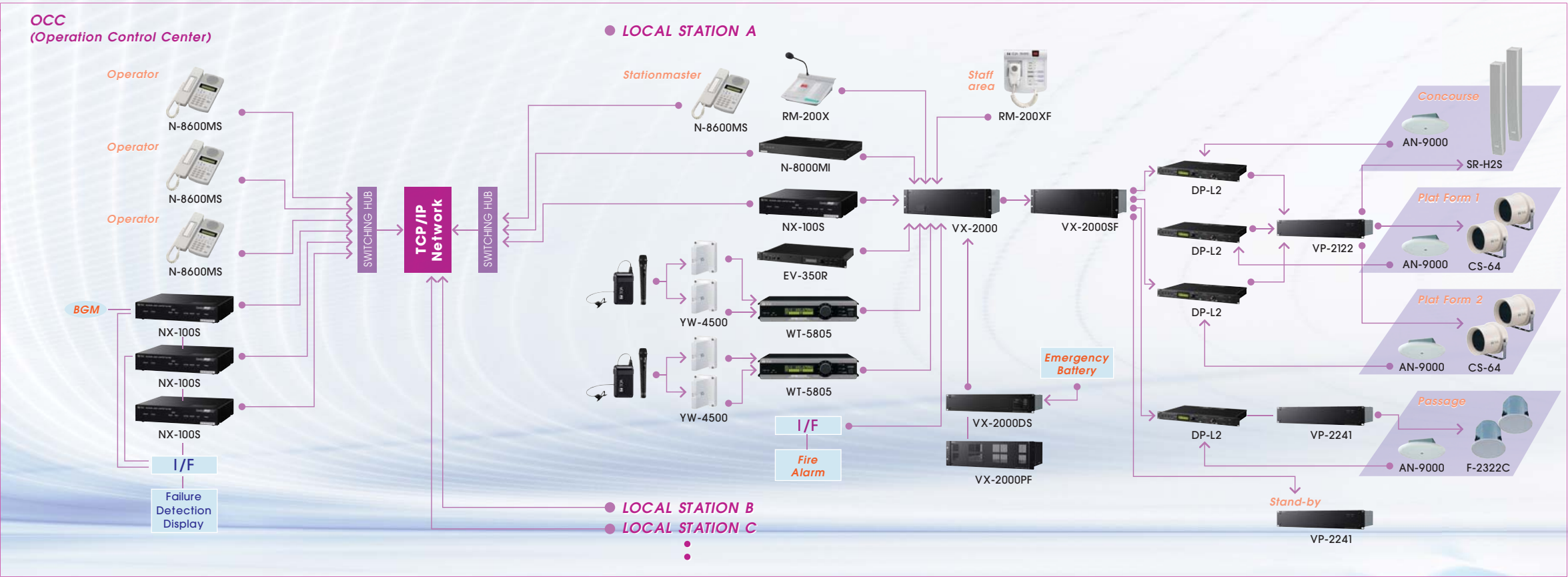
Intelligent System

OCC Function

The OCC Function effectively uses the intercom to communicate with station staff in an emergency and to send announcements or stream background music throughout the station. It monitors the broadcast facilities of a station to ensure they are working without problem.

LOCAL STATION Function

Normally, background music and/or commercial messages are streamed from the OCC throughout the network. As the need arises, announcements can be performed using a microphone in the stationmaster's room and by choosing the desired speaker(s) (e.g. the concourse, platform, etc.). The wireless microphone on the platform is useful to get the attention of passengers. The volume level of announcements is automatically optimized according to the noise level. An emergency evacuation message automatically plays in parallel with the fire alarm system in the event of a fire. The system includes an automatic failure detection function and an emergency power source in preparation for power outages. The system uses highly directional line array speakers that minimize echo and crosstalk and wide dispersion speakers capable of disseminating clear announcements throughout a broad area.



System at the OCC (Operation Control Center)

The operators at the OCC (Operation Control Center) monitor the situation of every train as well as the situation throughout the station, and provides instructions as needed. Each operator, using an intercom and microphone, provides train and station information such as train delays as well as instructions to station staffs and passengers. The system must also be able to monitor whether or not the broadcast facilities of local stations are functioning correctly. Communication between the OCC and stations uses the existing TCP/IP network. No additional communication cable etc. has to be installed.

System at Local Stations

Broadcasting at subway stations includes announcements in the concourse and platform areas, and announcements in the staff area when needed. Different announcements may be required in different places. The broadcast area, therefore, has to be divided into various control zones. Microphones, in general, are installed in the stationmaster's room, offices and on platforms. In the event of an emergency, the operator in the remote OCC must also be able to broadcast. In the event of a disaster, such as an

accident or fire, a pre-recorded emergency evacuation message has to play in line with the fire alarm system etc. It is desirable that the system includes an automatic failure detection function and backup capability in preparation for all eventualities, which sends a failure signal to the OCC to inform the operator of any system errors in the event of a failure. Furthermore, the system should have an emergency power source such as a battery which enables emergency broadcasts to be made in the event of a power outage.

Application Examples

Basic System

OCC Function

Through the network control center at the OCC, the system allows for announcements throughout the station using a microphone and audio adapter, and monitors the behavior of the station broadcasting system.

LOCAL STATION Function

In ordinary times, announcements are performed using a microphone in the stationmaster's room and choosing the desired speaker(s) (e.g. the concourse, platform, etc.). Announcements can be performed from the OCC in the event of an emergency. The system automatically broadcasts an emergency evacuation message in parallel with the fire alarm system in the event of a fire. The system includes an automatic failure detection function as well as an emergency power source in preparation for power outages. The system uses PJ-100W and PC-2668 type speakers, both of which are easy to install and produce sound of good quality.

