TOA

# Special Olympic Report

The Olympics Monograph

# “Bird’s Nest”

at a Glance

## Keep the basics in mind and the world in sight.

**TOA cooperates with the Olympic movement to create a bright future**

### *Remarks from the Chairman*

*Expand our contribution to the Chinese market through corporate growth, and realize self-worth for all members!*

### *Olympic Venues*

*Today, based on the concepts of “Reassurance” “Reliability” and “Closeness”, TOA strives to create a new audio-visual world!*

### *Voice of Partners*

*“Calm is the river as the tide ebbs away and the wind dies; on the same boat are we making a passage together!”*

### *Basic Business Policy*

*Be it in the past or the future, TOA shoulders its responsibility to society as an enterprise with the utmost sincerity.*


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# Table of Contents


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## Keep the basics in mind and the world in sight.

This TOA Beijing "Special Olympic Report" commemorates TOA's successful implementation of various projects for public address systems at Beijing Olympic venues.

As a professional manufacturer of public address systems and sound equipment founded in September, 1934, TOA will celebrate its 74th anniversary this year. Our corporate business is headquartered in Japan and we sell our products and services to over 100 countries. Our products play an important role in maintaining social stability.

TOA (CHINA) LIMITED. was founded in Shanghai, in November, 2008 and does business in Beijing, Shanghai and Shenzhen. In the Chinese market, our public address system is widely applied in various facilities, including airports, provincial and municipal government buildings, large markets, conference centers, and shopping malls.

Headed by the project for the National Stadium, known as the "Bird's Nest", the 2008 Beijing Olympic projects we were involved in encompassed seven new purpose-built stadiums and 14 other related facilities, making a total of 21 projects. TOA products were utilized in all of the projects.
We are extremely proud of having been able to make a contribution to these momentous national-level projects. As a dedicated and highly professional manufacturer, we continue to gather experience, develop new products, and endeavor with communities to create a harmonious society and better life for all.

TOA seeks to grow and develop with China, continuously making a contribution to Chinese society.

As editors of this special report we are deeply grateful to the TOA brand family for their enthusiastic assistance and support. Without this firm support our achievements would not have been possible. We extend our sincere thanks to all persons involved.

TOA CHINA LIMITED family branding enterprise concept:
Expand our contribution to the Chinese market through corporate growth, and realize self-worth for all members!

**TOA (CHINA) LIMITED.**
President
堀田昌人
August 1, 2008

Olympic Venues

# “Bird’s Nest” at a Glance



## “Bird’s Nest” at a Glance

Emerging from a global design competition, the design proposal for the National Stadium features a series of radial steel structures in a rotating pattern. Due to its striking resemblance to Chinese porcelain pits and a shape resembling a bird’s nest, this is how the National Stadium came to get its name the “Bird’s Nest”. The open-air nest-like stadium fuses architectural beauty with practical functions. It features natural sound ventilation, and also keeps out rain and inclement weather for spectators and athletes alike, fully embodying the people-oriented concept. Located in a placid location in the center of Olympic Park, National Stadium is designed like a container, whose rippling and rolling appearance avoids the architecture seeming too overbearing, while maintaining a sense of the dramatic. With this fine architectural appearance and harmonious unity of facade and structure, the National Stadium is imbued with a feeling of balance and purity. Its structure components are mutually supported, forming a netlike framework, just like a nest woven by branches and twigs. The spatial effect of the stadium is unprecedentedly original, simple and elegant.

“Bird’s Nest” lights the night sky with amazingly beautiful colors. After being put into use, the “Bird’s Nest” was lit up red at night, due to the fact that inside there is a red glass wall, which represents a flickering ball of fire at night, symbolizing the Chinese people’s enthusiasm for the Olympic Games.

The charm of “Bird’s Nest” lies not merely in its appearance, it also presents a variety of sensations inside the stadium itself. First, the stands are wide open, offering perfect viewing from whichever angle; second, the top space of the stadium is relatively large, increasing opportunities for conversion to a variety of functions.

The beauty of “Bird’s Nest” not merely lies in its unique design and beautiful color, but also in its masculine beauty. Using 100,000 tons of steel, occupying a building area of 258,000 sq. m. with 91,000 seats, “Bird’s Nest” may be the world’s largest environmental-friendly modern stadium, and is a unique historic landmark for the 2008 Olympic Games.

# National Stadium

## Application of Public Address System in the National Stadium ▶▶▶

### Outline of Beijing Olympic Games National Stadium (“Bird’s Nest”)

(1) Construction site: Beijing Olympic Park
(2) Building area: 258,000 sq. m. (333 m long from north to south, 294 m wide from east to west, 69 m high)
(3) Floors: 1 floor underground, 7 floors aboveground
(4) Seating capacity: 80,000 permanent seats, 11,000 removable seats
(5) Features: 42,000 tons of steel were used in the external steel structure. About 110,000 tons of steel were used for the entire construction. The internal top structure is composed mainly of damping material, which effectively absorbs echoes inside the stadium.
(6) Olympic events: Opening and closing ceremonies, field and track competitions, football final competition.

The public address system not merely offers timely news on events for 100,000 spectators in the “Bird’s Nest”, the main stadium of the Beijing Olympic Games, it also plays an important role in the event of emergency, and can be used to provide instructions and guidance on escape and evacuation.

With experience accumulated over ten years in the field of public address systems, TOA Corporation upholds the highest occupational standards, utilizing advanced professional technology, through which it has created the latest all-digital network large-scale public address system SX-2000 series products. As a result, TOA Corporation successfully met the various requirements for the public address system in the “Bird’s Nest” and other large-scale Olympic-related venues, thus making a contribution to the success of the Beijing Olympic Games.

The SX-2000 public address system integrates a variety of functions, including background music, public address, event information release and emergency broadcasts. This makes it ideal for the various types of broadcast required before, during and after Olympic events.

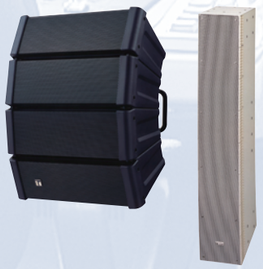
The SX-2000 public address system is interlinked with fire control, venue sound reinforcement and other related systems. The operation of the public address system can be monitored through the fire control port utilizing software, which creates a synergy effect between the two systems.

With a unique networking framework, the problem of transmission over extensive distances in a venue, which has plagued traditional public address systems for many years, has been easily solved. Broadcasting equipment no longer needs to be confined to a control room and spectators are able to enjoy beautiful background music and receive emergency notification wherever covered by the network. The operator is able to use the network to make modifications to the broadcasting system at any time.

Professional sound field analysis equipment determines the appropriate location for the loudspeaker, ensuring uniformity of the sound field inside the stadium.

### Main broadcast subzones of Beijing Olympic National Stadium

- Organizers’ administrative zone
- VIP zone
- Free media zone
- Athlete rest zone
- Media/athlete mixed zone
- Referee rest zone
- Spectator zone
- VIP box
- Equipment rooms
- Public zone walkway
- Outdoor landscape zone



## System design

### (1) General system design

All of the input/output signals of the National Stadium public address system are managed by a digital audio matrix management system. Through the paging microphone of the public address system, broadcasts can be delivered to different zones. Meanwhile, through the sound reinforcement system, broadcasts can be delivered to spectator zones, the rostrum, commentator zones, and other locations around the stadium. Signals can be interchanged between the public address system and sound reinforcement system. Through this program design, the public address system provides a sound reinforcement system with a one-channel audio signal; meanwhile, the sound reinforcement system also provides a public address system with a one-channel audio signal. To ensure reliable signal transmission, TOA applied two 4-core single-mode optical fibers to transmit signals.

In the event of an emergency, the public address system has a higher priority over the sound reinforcement system. In specific terms, in the event of an emergency, the public address system broadcasts evacuation information through the loudspeakers of the sound reinforcement system, thereby realizing overall control of public address system for the evacuation of the entire stadium.

Since news conference halls and video conference rooms are equipped with separate sound reinforcement systems, the fire control system would, in the case of fire, automatically switch off these independent broadcasting systems, and switch to fire emergency broadcast mode under the control of broadcast control room.

During the Olympic Games, the management of all kinds of audio signals is required to be unified and coordinated. The flow direction for signals therefore needs to be appropriately controlled in accordance with event requirements.

TOA SX-2000 digital networking public broadcast management system adopted in the system design can provide 64-channel audio input and maximum 128-channel audio output. Flow direction for signals can also be set depending on the various scenarios.

### (2) System composition

The entire system is composed of system manager, audio source, input unit, output unit, power amplifier, transmission lines and front-end equipment.
System manager—This is the core of system equipment, with a digital audio matrix controller managing audio switching for the entire system. It also conducts real-time detection for each equipment and transmission path in the system.
Audio source equipment—Digital recorder, dual cassette deck, DVD, AM/FM receiver, and paging microphone are program units of the system.
Input unit—features modular construction that allows it to handle from two to eight input per unit. Audio signals are transmitted digitally to the audio output unit.
Output unit—Equipped with 8-channel audio output, it receives audio signals from audio input unit via digital transmission.
Power amplifier—The drive unit of the loudspeaker. The power amplifier transmits audio signals to the loudspeaker.
Transmission lines—Switching hubs, optical fibers, data lines and management frames are a part of the system link, through which all of the signals are completed.
Front-end equipment—Loudspeaker, volume controller, noise detector

### (3) Design of the central control management room and sub-control room

Public address control equipment is placed mainly in the control room on the LO floor. Power amplifiers are installed in computer rooms in four elevator passageways, respectively located in four public address equipment rooms near 5#, 8#, 11# and 12# elevator passageways on LO floor.




### Central control management room

Central control management room contains: 1 system manager, 2 audio input units, 1 main control switch, 1 cassette deck, 2 five-disc DVD, 1 AM/FM receiver, 1 digital recorder, 1 zone paging microphone and 1 program timer.

The system manager SX-2000SM uses the matrix system controlled by microprocessor, world-class CPU microprocessor structure, advanced matrix input and output forms and menu display. Through software control, discretionary system compilation for programs is possible, making operations flexible and convenient, fully satisfying the needs for future modification and expansion. Through external personal computer and management software it is possible to realize system monitoring, system configuration and system parameter setting; the system console can be equipped with a timer, so as to realize regular weekly programming broadcasts.

The system manager provides four sets of background music, one broadcast set and two sets of match information release and broadcasting, capable of transmitting audio signals to each broadcast circuit, and broadcasting different background music and management information to different zone amplifiers. Through an interlocked interface the system manager is connected to the fire alarm system in the fire control center, so as to realize automatic or manual fire broadcasting. The National Stadium uses a loudspeaker system which integrates background music, event information release and fire emergency broadcasting. The system manager manages daily operations from an industrial control computer.

a. Digital audio input unit: 8-channel network audio input unit SX-2000AI is used to connect audio sources with remote paging microphone. Different input modules are chosen for different audio sources: Audio analog signal input uses audio input module; a paging microphone uses specialized remote microphone input module. In this program, the central control management room is equipped with 2 SX-2000AI, providing access to background music, broadcasting, telephone broadcasting audio source and paging microphone.
b. Switching Hub: 12 optical ports are utilized to distribute optical cables to 4 sub-control power amplifier rooms and make appropriate management.
c. Cassette, DVD, AM / FM: Used to provide different background music. In addition, the input audio sources of the National Stadium central control management room also include input audio source for the sound reinforcement system, so as to deliver the programs and music broadcasts through the sound reinforcement system at the venue. The public address system can transmit audio signals to the sound reinforcement control room on the fourth floor, and complete broadcasting through the sound reinforcement system.
d. Paging microphone
In the central control management room, the public address system is equipped with a set of remote microphones which can make venue and emergency broadcasts. The microphone has 14 functional keys, 1 call button, and 4 types of inner set indicator voices. Through increasing the expansion units, it is possible to classify business or emergency broadcasts in 80 zones around the venues. The keyboard of the microphone can be used as functional keys. By pressing a key, simultaneous broadcasting can be realized in the zones which require simultaneous broadcasting.

Through coordination between microphone and console, single selection, multi selection and full selection can be made for different zones. By selecting the zone to be called, the system will automatically interrupt the background music in the selected zone. Each functional key can be set through programming. 14 functional keys of the microphone in the zones can be set as general call, layered call, off-site call, on-site call, multi-zone call; the call keyboard unit has 10 buttons, of which each functional button can be set as an independent zone layered call.

By setting the control console to broadcast microphone, fire broadcasting norms N-1, N, N +1, N + Left, N + right (N refers to the serial number of elevator passageway) can be realized. Through zone buttons on the microphone, event broadcasts can be delivered to each zone or multiple zones.

As for switching and broadcasting to fire and emergency broadcasting in zones, both automatic and manual methods are available. Automatic selection is realized according to fire interlocked signals transmitted from the fire center, whereas manual selection is realized through remote microphone in the fire control center.

### Power amplifier room (strong current room)

The main equipment of amplifier room includes: 16 digital audio output units, 16 monitoring panels, 111 power amplifiers, 4 switching hubs, 1 digital audio input unit and 2 sets of zone paging microphones.

a. Digital audio output units:
Since power amplifiers are placed in sub-control rooms far away from the central control room, 16 SX-2000AO 8-channel network audio output units should be set according to the specification requirements.
According to the number of circuits with amplifier attached, the number of 8-channel audio output units inside each power amplifier room can be obtained.
No. 1 Power amplifier room: requires 4 audio output units;
No. 2 Power amplifier room: requires 5 audio output units;
No. 3 Power amplifier room: requires 3 audio output units;
No. 4 Power amplifier room: requires 4 audio output units;
b. Switching Hub:
Data exchange is made by switching hub in the central control management room. Each power amplifier room is equipped with one switching hub.
c. Digital audio input units:
The network computer room next to 12# elevator passageway is equipped with one digital audio input unit. Mainly applied to event information release, this zone is equipped with 2 check-in paging microphones, so as to release event information (results reporting, notification of check-in, people search, etc.). As for input audio source dedicated to broadcasting sports competitions in the referee/athlete activity zones, audio signals can be transmitted by a zone setting so that they only reach the relevant referee/athlete activity zones.
d. Monitoring disk: The monitoring disk is set up in the control room, and monitors the audio signals of the loudspeaker circuits.
e. Power amplifier:
Capacity of power amplifier should be calculated in accordance with the maximum power of the loudspeaker in the zone. In general cases, the output power must meet the maximum demands of the National Stadium and be of sufficient volume to cover the entire field. According to fire norms, the maximum output power for each loudspeaker is that to be used in emergency broadcast situations. The transmission pressure of loudspeaker circuits has generally three specifications: 50V, 70V and 100V. Low-voltage transmission is adopted in this program. Meanwhile, in order to reduce circuit dissipation, we adopt 100V constant pressure transmission and a two-wire system for loudspeaker circuits.

水滴 Tianjin Olympic Center Stadium

# Application of Public Address System in Tianjin Olympic Center Stadium ▶▶▶

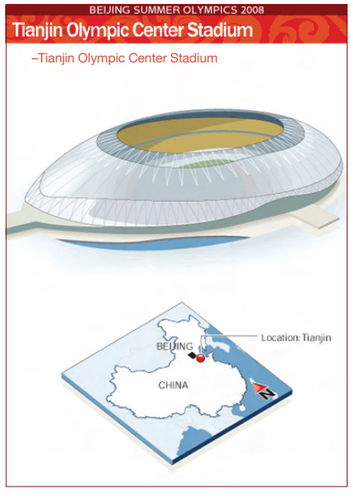

As one of the major venues for 2008 Olympic Games football competition and the venue for the first match of the 2007 Women's World Cup, Tianjin Olympic Center Stadium can hold 80,000 people. The internal structure of the stadium can be divided into six floors. The first floor includes three parts: the inner administrative area, the outer economic housing space, and the parking lane and parking lots between the inner and outer rings. The second floor includes two parts: the inner ring with exclusive stores and warehouses, and the outer ring with economic housing. The third floor is an area for distinguished guests, used for the reception of senior guests. The fourth floor is the VIP area, with each box accommodating up to 15 guests. On the fifth floor there are some exclusive stores, computer rooms and administrative offices. On the sixth floor there are water supply rooms. Outside the Stadium are four artificial lakes and four entrance zones.

### Outline of Tianjin Olympic Center Stadium

(1) Total area: 78,000 sq. m
(2) Seating capacity: 60,000
(3) Features: Featuring multiple ancillary facilities like stores, exhibition halls, conference rooms, and a fitness room, the stadium gets the name "Water Drop" because of its artificial lake.
(4) Olympic events: Football preliminary games

The audio system in the stadium has various functions, including background music broadcasting, public address and emergency broadcasting, all of which can be applied to the whole stadium. In normal conditions, music, event broadcasts and commercial information can be delivered; in the case of fire or other emergency, the system can be used for emergency broadcasting, directing spectators to the nearest exits in the event of stadium evacuation. Background music loudspeakers are evenly distributed, with no obvious sound source direction; the volume is appropriate and will not interrupt a normal conversation among people. The public address system plays an important role in commercial announcements, notification broadcasts and people search announcements.

Emergency broadcasting is a facility utilized to direct and evacuate people in the case of fire or other emergency. The sound reinforcement system must reach the required sound field strength. In the case of emergency, it is essential to ensure that all people in the venue can clearly hear the alarm and evacuation voice. This system utilizes TOA public address audio management matrix system VX-2000 series, a public address sound reinforcement management system that integrates background music, venue broadcasts and emergency broadcasting.




Inside the stadium, the broadcast zone is divided into 34 subzones, almost in conformity with fire subzones. Through the 34 subzones, broadcasts can be delivered both inside and outside the stadium. The entire system is equipped with three remote microphones, with which the personnel in the computer room on duty can deliver broadcasts to corresponding subzones as required. To strengthen fire protection function, TOA installs two control input modules, which create fire interaction subzone settings in all the zones. This system contains five monitoring machine frames and one backup slot in case of future extension. Each monitoring machine frame is equipped with one thermal backup amplifier. When there is a fault with the power amplifier, instead of manual adjustment, the backup power amplifier will automatically replace the malfunctioning power amplifier. In addition, this system has various other functions such as peripheral noise detection and automatic control of volume and frequency. By checking the level of the surrounding noise using a noise detector and making adjustments with the audio matrix controller, the sound volume and frequency can be automatically adjusted.

Through the utilization of a digital audio processing system, reverberation time for low range sound in the large event space, reflection influence in the high range, ambiguity of sound, language clarity and sound effects can be improved. Feedback signals through noise detector are transmitted to an automatic gain controller, which then transmits the controlling signals in accordance with four grades to the corresponding controlling ports of the matrix controller. Since the public address audio matrix has a preset broadcast model, automatic volume control output can be realized for normal or emergency cases, so as to ensure clarity of system broadcasts.



帆船 Qingdao Olympic Sailing Center

# Application of Public Address System in Qingdao Olympic Sailing Center ▶▶▶

### Outline of Qingdao Olympic Sailing Center

(1) Area: 450,000 sq. m.
(2) Feature: 800 berths
(3) Olympic events: Sailing competition

Located in the most prosperous area of Qingdao, the co-host city of the Beijing Olympic Games, Qingdao Olympic Sailing Centre will become a new tourist attraction after the Games. The sailing Centre is composed of an Olympic Village, athlete centre, media centre and logistics support center, outdoor buildings and other buildings.

The system is equipped with such functions as background music broadcasting, public broadcasting, network broadcasting and emergency broadcasting, which can be used in individual buildings on a pinpoint basis. In normal conditions, music, venue broadcasts and commercial information can be broadcast; in the case of fire or other emergency, the system can be used for emergency broadcasting, directing people in the building to safely evacuate. Emergency broadcasts require highest priority, as they are used to direct and evacuate people in the case of fire or emergency. The sound reinforcement system fully satisfies the required sound field strength, making sure that in the case of emergency, all the people in the venue are able to hear clearly the alarm and evacuation voice information.

Each single building is designed with a unique set of broadcasting system equipment. Given their different purposes, buildings have different requirements and utilize different broadcasting systems. Single buildings are interconnected by TOA Network Audio Adapters, which not merely realize networking and unified management of the broadcasting system inside and outside venues, but also ensure the stand-alone independence and work convenience for each building after the Games are over.

Olympic Village: Adopted the TOA EP integrated emergency public address system, which can expand to and connect 330 subzones at the maximum, and also manage public address broadcasts at eight buildings simultaneously. A single building can broadcast information through 60 aboveground floors and 5 underground floors at the maximum, completely satisfying the requirements of the Olympic Village. This system also has multiple other functions such as background music and subzone broadcasting.

Athlete center, media center and logistical support center: Adopted the VX-2000 public address system. With microcomputer control, four types of different background music and venue broadcasts can be broadcast simultaneously.

Outdoor background music and public broadcasts (outdoor broadcasts) are mainly used in the main match zone, audience zone and other public areas and are fully adjustable with a variety of functions. The outdoor broadcast system is equipped with one D-901 digital sound console and three commentator microphones, which are mainly designed for match commentaries. A set of microphones with the highest priority is also equipped so as to make rapid, subzone and prioritized broadcasts in special circumstances.

Unified networking broadcast for single buildings: For better compatibility and stability throughout the system, TOA adopted the TOA NX-100S Network Audio Adapter, which can transmit audio frequencies from the general control room to sub-control rooms, and additionally also transmit the contents of sub-control room to the general control room. Meanwhile, 8-channel control signals are transmitted between the general control room and sub-control rooms. It is possible make a signal preference from among the audio signals and controlling signals that are transmitted between the general control room and sub-control rooms, so as to meet the needs of different broadcast areas.

For single buildings, the emergency broadcasting system and background music broadcasting system share control consoles, loudspeakers and distribution network. As a result, in the case of fire or emergency, compulsory switching can be realized to respond to fire subzones, regardless of the position of the volume switch, and deliver emergency broadcasts at maximum volume to the accident zone and other affected zones. The configuration of the power amplification of this system means that it can provide 24-hour full power broadcasting in all of the zones. In the case of emergency broadcasts in single buildings, fire broadcasting information will be transmitted from sub-control rooms to general control room through the TOA Network Audio Adapter. The general control room will quickly get the message and coordinate a response (This function will be completed with a fire signal).

水晶皇冠

*Shenyang Olympic Sports Center*

# Application of Public Address System in Shenyang Olympic Sports Center

**Outline of Shenyang Olympic Stadium (Crystal Crown)**

(1) Construction Site: Shenyang
(2) Building area: 140,000 sq. m.
(3) Seating capacity: 60,000
(4) Olympic events: Football preliminary games

The project for Shenyang Olympic Stadium consists of one stadium and three gymnasiums. "One stadium" refers to the main stadium; "three gymnasiums" refer to comprehensive gymnasium, swimming pool and tennis stadium. The top construction priority was the Olympic Stadium and the main stadium has an area of 140,000 sq. m., accounting for more than half of the total area of the Olympic Sports Center and it can accommodate 60,000 spectators.

Appearance: "Crystal Crown" + "Wings"

"In terms of appearance, the main stadium is just like the crystal crown in the hands of the goddess of victory, whereas the three indoor stadiums in the east and west directions are the wings of the goddess of victory." This is how the principals of Shenyang Municipal Planning Bureau interpret the design concept of the Olympic Sports Center. The main stadium consists of two main structures: the reinforced concrete structure used for the stands and the steel structure used for the roof. The arched roof is composed of six steel tablets, three in the east and three in the west, which not merely lessened the difficulties of construction, but result in the stadium appearing more streamlined too.

Internal: two-floor stands + 100 boxes

As for the design of the main stadium of the Olympic Sports Center, a great deal of international concepts are utilized. Of the six arched tablets, there is certain gap between every two tablets, which not only guarantee air circulation inside the stadium, but also effectively avoid echoes that are typically heard in large venues and solve the potential problem of spectators not being able to hear broadcast information clearly.

Particularly worthy of attention is the fact that the roof of the main stadium adopts transparent materials such as sunlight panels and glass, which give the full benefit of natural light to the pitch below and also lengthen the conservation cycle. In addition, Olympic Sports Center Stadium breaks away from the standard three-floor stands model as adopted by most stadiums, instead using a two-floor structure for stands.

The view of a typical three-floor stand is very steep. Spectators seated on the third floor do not have a good view and comparatively, the first and second floors are more pleasing. In addition, 100 VIP boxes are specially set between the two floors for domestic and foreign distinguished guests. Strolling along Hunnan Avenue, you will find one building shaped like a crystal crown, which has many admirers. This "Crystal Crown" is Shenyang Olympic Stadium, the 2008 Olympic Games football venue that 7.2 million Shenzhen citizens have been long expecting.

Through a fierce bidding competition, TOA SX-1000 audio digital matrix was ultimately adopted by the operators of the stadium. This large scale matrix system with 16-channel audio buses can ensure 16 channels broadcast different contents simultaneously, fully realizing multiplexing as required by large stadiums. When fire or other emergency occurs, the control input port is connected to the fire alarm system, realizing an automatic fire voice broadcast.



奥运村

*Beijing Olympic Village*

# Application of the Public Address System in Beijing Olympic Village

Beijing Olympic Village is located in the northern end of north-south central axis line, where many historical sites and famous architectural wonders are located, for instance, the Forbidden City, Temple of Heaven and Olympic Park. Composed of a residential area and an international area within a total area of 66 hectares, Olympic Village is located in Olympic Park, adjacent to Forest Park to the north and the "Bird's Nest" to the south, boasting a beautiful environment and convenient transportation routes.

Besides apartments for athletes, there are clinics, restaurants, multi-functional libraries, a recreation center, recreation and sports zones, and other related service areas in the living zone of Olympic Village for the athletes. Among these, the recreation and sports zones contain gymnasiums, swimming pools, tennis courts, basketball courts, jogging trails, etc. The international zone is the venue where Olympic delegations are welcomed and other welcome and official events take place.

Occupying a total building area of 370,000 sq. m., Olympic Village apartments include 22 six-story buildings and 20 nine-story buildings with the same architectural style. The total living area reaches over 220,000 sq. m.

Broadcast zone division can meet the functional needs for outdoor areas, including building zones and landscaped areas. Independent programming or all-zone broadcasting can be realized in each zone by utilizing a microphone audio source.

1. An underground garage elevator hall and cultural gallery features background music and fire emergency broadcasting systems.

Background music broadcast in the underground garage elevator hall, entrance hall and cultural gallery is distributed according to floors, among which the cultural gallery had to be equipped with pipes and installed with ceiling-mounted loudspeakers of high quality sound. As for the elevator hall and entrance hall, the background music system and fire broadcasting system share the same loudspeakers. From the control center, routes lead into the different floors through integrated pipelines, and are connected to fire compulsory switching modules in the underground cultural gallery loudspeakers and weak current room. In normal cases, background music is broadcast; in the case of fire, fire compulsory switching modules would automatically switch to fire emergency broadcast mode.

2. Central public zone had to be set with background music and fire emergency broadcast functions.

Since the central public area, kindergartens and clubs are single stand-alone buildings, independent program broadcasts and independent control methods are utilized for daily broadcasts. All of the buildings above-mentioned were designed with independent background music systems. Buildings can broadcast music programs according to their own needs. For public buildings, the background music system loudspeaker and fire broadcasting system are used simultaneously; cables are led from control rooms in single buildings to fire compulsory switching modules in the weak current room. In normal cases, background music is broadcast; in the case of fire, fire compulsory switching modules would automatically switch to fire emergency broadcast mode. Meanwhile, the central public zone, kindergartens and clubs are equipped with a noise monitoring function. Every floor of the building is equipped with two background noise monitoring probes, with which the volume of background music can be automatically adjusted according to the loudness of the monitored background noise.

3. Olympic Village courtyard scenery background music broadcast

Olympic Village outdoor courtyard background music is designed according to zones A, B, C and D. Each zone is further divided into three functional zones according to landscape planning and design:

1) Main entrances, corridors and other passages with large pedestrian volume are set as a functional zone.
2) Underground squares, pavilions, main water systems and other main activity zones are set as a functional zone.
3) Other sub-channels in the park, such as the roads between the apartments, are set as a functional zone.

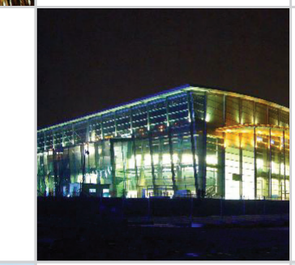
Different music programs can be broadcast according to the different characteristics of functional zones; service broadcasts for the whole zone can also be delivered; and emergency broadcasts must take priority in the case of emergency.

Loudspeakers in the park are mainly modeling speakers, corresponding to the overall landscape. The networking construction of the SX-2000 system provides a solution for the large area of the complex, with its many complicated functions and the requirements of Olympic Village. Owing to the networking construction, equipment of the SX-2000 system is located in different positions of Olympic Village, which not merely satisfies the needs of background music for temporary competition, but also solves the problem of placement of background music system equipment, which is also part of area planning after the Games. The system adopts an all-digital audio dual network system, distributed digital audio matrix system structure, and 100 V constant pressure analog audio output mode between power amplifier and the loudspeaker. The console with dual network and dual power guarantees the stable, secure and effective operation of the system.

TOA Olympic Venues

## Olympic Project Cases:
# Newly-Constructed Venues

### National Stadium "Bird's Nest"



### National Indoor Stadium

The steel roof frame has a north-south span of 144 m, east-west span of 114 m, and a weight of 2,800 tons. The stadium represents the best of the "two-way chord-tension space structure" projects in the world.
The stadium adopts the TOA VX-2000 integrated Voice Evacuation System.

### Peking University Gymnasium

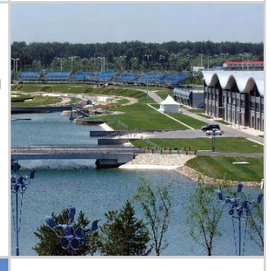
Peking University Gymnasium is the first official table tennis gymnasium ever constructed in Olympic history. Its roof resembles a rotating table tennis ball, garnering it the name "China Ridge".
The gymnasium adopts the TOA VX-2000 integrated Voice Evacuation System.

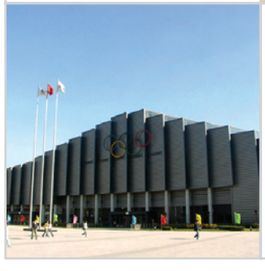
### Olympic Water Park

Covering an area of 260 hectares, this park holds Olympic rowing and canoeing competitions.
This park adopts the TOA VX-2000 integrated Voice Evacuation System, D-901 Digital Audio Mixer, HX-5 Compact Array Speaker System, etc.

### Beijing Shooting Range Hall

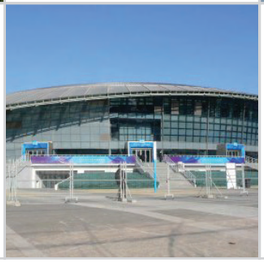
With a building area of 40,000 sq. m., Beijing Shooting Range Hall can accommodate a maximum of 9,000 spectators. Containing qualification competition halls and a final competition hall, Beijing Shooting Range Hall hosts Olympic Games rifle, pistol and motion target shooting competitions.
This hall adopts the TOA VX-2000 integrated Voice Evacuation System.





### China Agricultural University Gymnasium

China Agricultural University Gymnasium is the venue for Olympic wrestling competitions, with a total building area of 23,950 sq. m. and seating capacity of 8,000.
This gymnasium adopts the TOA VX-2000 integrated Voice Evacuation System and D-901 Digital Audio Mixer.



### Beijing University of Technology Gymnasium

Located in the southeast of Chaoyang District, Beijing, Beijing University of Technology Gymnasium occupies a total building area of 24,000 sq. m., and is said to be the first high-level gymnasium specially designed for badminton competitions.
This gymnasium adopts the TOA VX-2000 integrated Voice Evacuation System.



TOA Olympic Venues

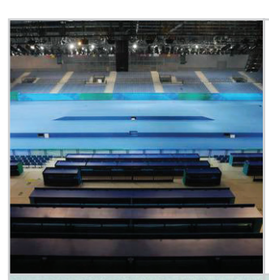
## Olympic Project Cases:
# Adapted Venues

### Beijing Shooting Range CTF

Located at the foot of Western Hills, this construction consists of two parts: main building and outdoor competitions. The trap competition venue is composed of A/B sections. The total building area of the two sections of the project is 6,169.41 sq. m.
This hall uses the TOA VX-2000 integrated Voice Evacuation System.

TOA Olympic Venues

## Olympic Project Cases:
# Temporary Venues



### National Convention Center (Fencing Hall)

According to the characteristics of National Convention Center, TOA offers two VX-2000 integrated Voice Evacuation Systems, which are installed respectively in the main conference center and office hotel complex annex. The public address system equipment complies with EN-60849, currently the strictest regulation relating to fire broadcasting in the world.

### Wukesong Baseball Field

Located in the southwest corner of Wukesong Cultural and Sports Center, Wukesong Baseball Field contains two competition venues and one training venue, with a designed seating capacity of 15,000 and a total building area of 12,000 sq. m.
This baseball field adopts the TOA VM-2000 integrated Voice Evacuation System.

TOA
Olympic Venues

## Olympic Project Cases:
# Venues in Co-host cities

### Qingdao Olympic Sailing Center

With a total building area of 138,000 sq. m, Qingdao Olympic Sailing Center adopts a broadcasting solution for separate utilization and general control, so as to solve its multiple functions and multiple subzones which feature at the venue. Three VX-2000 integrated Voice Evacuation Systems are utilized, all of which are connected by NX-100 Network Audio Adapters.

### Shenyang Olympic Stadium

The layout of the project is one stadium and three gymnasiums. “One stadium” refers to the main stadium; “three gymnasiums” refers to comprehensive gymnasium, swimming pool and tennis stadium. The whole project uses TOA SX-1000, a large scale matrix system with 16-channel audio buses, fully realizing multiplexing as required in large stadiums.

### Tianjin Olympic Center Stadium (Water Drop)

Tianjin Olympic Center Stadium has a building area of 158, 000 sq. m., length, width, and height of 380, 270, and 53 m respectively, six floors, and a seating capacity of 80,000, and is able to meet the standards required for staging international football games and athletics. This Center uses the TOA VX-2000 integrated Voice Evacuation System.

TOA
Olympic Venues

## Olympic Project Cases:
# Auxiliary Equipment

### Beijing Olympic Village

### Beijing Olympic Games Broadcasting and TV Center

### Olympic Media Hotel

With a total building area of 73,363 sq. m, Olympic Media Hotel has three floors underground and 22 floors aboveground. It integrates a Class A office building, residential and commercial apartments and five-star hotels, and provides prompt and convenient services for Olympic Games officials and referees. This hotel adopts the TOA VX-2000 integrated Voice Evacuation System.

### National Convention Center

National Convention Center is located in Beijing Olympic Park (B zone). During the Beijing Olympic Games, it plays host to fencing, fencing in modern pentathlon and air pistol competitions, and provides venues for the International Broadcasting Center (IBC) and Main Press Center (MPC). During the Paralympic Games, it holds wheelchair fencing and boccia competitions.
This Center uses the TOA VX-2000 integrated Voice Evacuation System. System detection/power amplifier backup is of standard configuration, providing ample support and guarantees for security during the Games.



Feature Interview

# *Olympic dialogue*

—TOA China Beijing Firm Sales Manager Han Bing

**Q:** What preparation work did you do before bidding for the Olympic projects?

**A:** We made various preparations by collecting information. Specifically speaking, the main task in the early stage of the project was to understand whether the relevant project public address system should be included in fire alarm system or weak current system; the main task before bidding was to know about the competitors, about how many fire alarm or weak current system integrators would bid for the project, before deciding how to bid according to the acquired information.

**Q:** What difficulties did you meet during the process of bidding, and how did you overcome them?

**A:** During the process of bidding, difficulties mainly come from the pressure applied by competitors. Since the public address system is the subsystem of fire alarm or weak current integrated systems, it becomes a crucial step in achieving a successful bid that we strive to make the bidding company adopt as many TOA products as possible.
Ultimately, due to high performance-price ratio and various solutions offered by TOA products, we won the trust of many partners, and achieved success in many bid projects.

**Q:** What equipment was adopted for Olympic projects? How did it meet the requirements of customers?

**A:** Mainly SX-2000 series and VX-2000 series products were utilized in projects. In addition to meeting the general requirements of the customers, the two systems meet IEC60849, the strictest safety standard in the world. Meanwhile, the Olympic organizers attached great importance to safety standards; this is one of the reasons that so many Olympic venues ultimately used TOA products.

**Q:** How did you feel after winning the bid? What problems still needed to be solved?

**A:** Our success in getting the bid for Olympic projects is, from my point of view, inseparable from the continuous promotion of TOA brand, the joint efforts made by the TOA team and the vigorous support from TOA Corporation; our success is the result of our combined knowledge and efforts.
In addition to bringing inspiration to the TOA team, the success and achievements of the Olympic Games inevitably attract attention from a vast number of competitors. Therefore, it becomes a problem for the future of how to maintain a competitive advantage, ensure sustainable development, and seek new growth points in an innovative manner; all of these are what TOA should take into consideration.

**Q:** What is the significance for future development of TOA’s success in winning bids for Beijing Olympic projects?

**A:** I think that through the numerous Olympic achievements, the cachet of the TOA brand has been strengthened, which will not merely help TOA establish itself as a good role model in the field of sports facilities, but also have far-reaching significance in expanding the influence of TOA in other fields.

## *"Calm is the river as the tide ebbs away and the wind dies; on the same boat are we making a passage together!"*


General Manager: Mr. Li Yifeng

—— Beijing Wayee Tech Co., Ltd
TTS (TOA Technical Service)
TTP (TOA Technical Partner)

**Q:** Beijing Wayee Tech Co., Ltd is the Beijing 2008 Olympic Games partner for TOA. Can you tell us something about the company's Olympic Games projects?

**A:** First of all, TOA Corporation is a company with a history of 74 years. TOA has been supporting the Olympic Games since the 1960s; TOA products have been applied in many Olympic Games and are widespread in many stadiums throughout the world, making TOA a renowned brand and the first choice for Olympic venues.

We began preparation for the Beijing 2008 Olympic Games as early as 2005 and we are a strategic partner of TOA. We carried out a series of Olympic-related marketing campaigns so as to enhance the TOA corporate brand, promote TOA products, improve customer relations and expand market share. We also explored the advantages of being a TOA Olympic partner, making full use of advantages and resources from all parties, earnestly carrying out sales activities in various forms, cooperating with all the parties concerned for mutual benefit and a win-win result, and expanding the Olympic Games market. With substantial support from TOA and efforts made by all the members of Wayee, we successfully bid for projects at 13 stadiums, including National Stadium ("Bird's Nest"), National Indoor Stadium, Table Tennis Gymnasium, Badminton Gymnasium, Olympic Water Park, etc., and seven auxiliary Olympic projects. All of the projects passed stringent assessments with flying colors and we also passed the "Good Luck Beijing" competition and gained high praise from users.

**Q:** As for this Olympiad, what measures have you taken to guarantee the implementation and after-sales service of Olympic projects?

**A:** As large and complicated system projects, Olympic Games projects feature long duration, complicated tasks, wide impact, and many responsible units. Therefore, it was imperative for us to adopt advanced and scientific project management methods, and manage projects with effective planning, implementation and control, so as to ensure the coordinated and orderly progression of complicated projects, and ultimately the success of the Olympic Games. Since the establishment of the Department of Olympic Projects in March, 2006, our company has held regular project review meetings, as well as controlling implementation conditions, confirming project risks and making timely adjustments, so as to ensure the successful progression of the projects. Further, we promoted and implemented an "Olympic personnel training plan" in early 2008. With a model of "From one point to the whole area, step forward stage by stage", we carried out systematic training for system integrators, Olympic technical support staff, and owners of property management departments, who were contracted to Olympic projects. For each project, we determined security needs and secured professional technical engineers in advance. Therefore, our company's Olympic security work procedure was implemented in strict accordance with the requirements of the Beijing Olympic Com mittee, and operation of the Olympic Games venue systems was implemented on schedule.

**Q:** What TOA systems have been adopted for Olympic Games?

**A:** National Stadium—Bird's Nest"—as the main venue for 2008 Olympic Games, is a cultural window oriented to society and the wider world. It is not merely used as a sports facility; it hosted the opening and closing ceremonies and other major celebration ceremonies during the Olympic Games as well. To ensure the smooth progression of various functions, the public address system is not merely required to be capable of broadcasting background music, notifications and commentaries; it must comprise, in the case of emergency, a complete intelligent emergency evacuation system with sound reinforcement system,. Therefore, the "Bird's Nest" adopts the most advanced TOA network CobraNet broadcast system and SX-2000 audio management system.

As a product integrating professional expertise and knowledge on safety fire prevention and voice communication accumulated over 74 years by Japanese TOA Corporation, the SX-2000 public address system boasts stable and excellent broadcasting functions, audio performance and outstanding sound recovery technology. Adopting a modular configuration, the system is well-suited for convenient expansion making it easy to upgrade the system. In particular applications, optimum system configuration can be realized through specific modules.

In other projects, such as National Indoor Stadium, National Convention Center & auxiliary Olympic facilities, Olympic Water Park, Beijing Shooting Range Hall, Beijing Shooting Range CTF, Beijing Olympic Games Wrestling Competition Gymnasium, Olympic Badminton Gymnasium, Rhythmic Gymnastics Competition Gymnasium, Olympic Table Tennis Competition Gymnasium, Olympic Media Hotel, Beijing Olympic International Broadcasting Center, etc., TOA VX-2000 digital integrated voice evacuation public address system is used. Equipment for this system meets IEC/EN60894, the strictest regulation for emergency broadcasting; system detection, power amplifier backup and emergency power management comply with strict standards too, offering adequate safeguards for Olympic Games.

As for the Olympic Water Park, we were responsible for rostrum sound reinforcement and Press Conference Hall conference system, where we utilized TOA D-901 Digital Mixer, HX-5 Line Array Speaker, TS-900 Series Wireless Conference System and other quality products. This system has been approved by the National Construction Engineering Quality Supervision and Inspection Center; its acoustic performance fully meets the acoustic parameters of Shunyi Olympic Water Park sound reinforcement system, as required by the Beijing Olympic Games Organizing Committee for the Games of the 29th Olympiad.

Besides the successful completion of Olympic venue projects, we have also completed the design development, equipment delivery and installation, and system debugging of public address systems at Inner Mongolia Baita International Airport and Shanxi Taiyuan International Airport, which serve as the auxiliary landing airports for the Olympics. We also completed a number of important auxiliary projects for the 2008 Beijing Olympic Games, such as National Grand Theater, CCTV new building, Beijing Yintai Center, China's National Digital Library and other key projects in Beijing, gaining a good market reputation for TOA brand.

**Q:** What are your thoughts on future development and corporate business philosophy?

**A:** In 2008 Beijing Olympic Games venue construction, TOA brand realized the top spot for itself in the industry. In the construction of landmark projects in Beijing, TOA brand also stands top in the industry. Currently the market is becoming increasingly mature and clients are choosing products, systems and services with rationality. Against this background, Beijing Wayee Tech Co., Ltd, as a vigorous young high-tech company, is positively studying the advanced management concept from TOA Corporation in Japan, so as to continuously improve corporate business philosophy, grasp the development trends in the industry, and enhance the core competitiveness of the company in the industry. Meanwhile, we are making efforts to boost staff training in quality and technical standards, whereby we study the practices of TOA Corporation, master the advanced industry technology and professional knowledge and skills, expand business scope, and cultivate professional ethics among company staff, constantly seeking to gain practical experience from many successful projects, realizing ambitious service targets, and achieving a business orientation that is based on "reassurance, reliability and emotion".

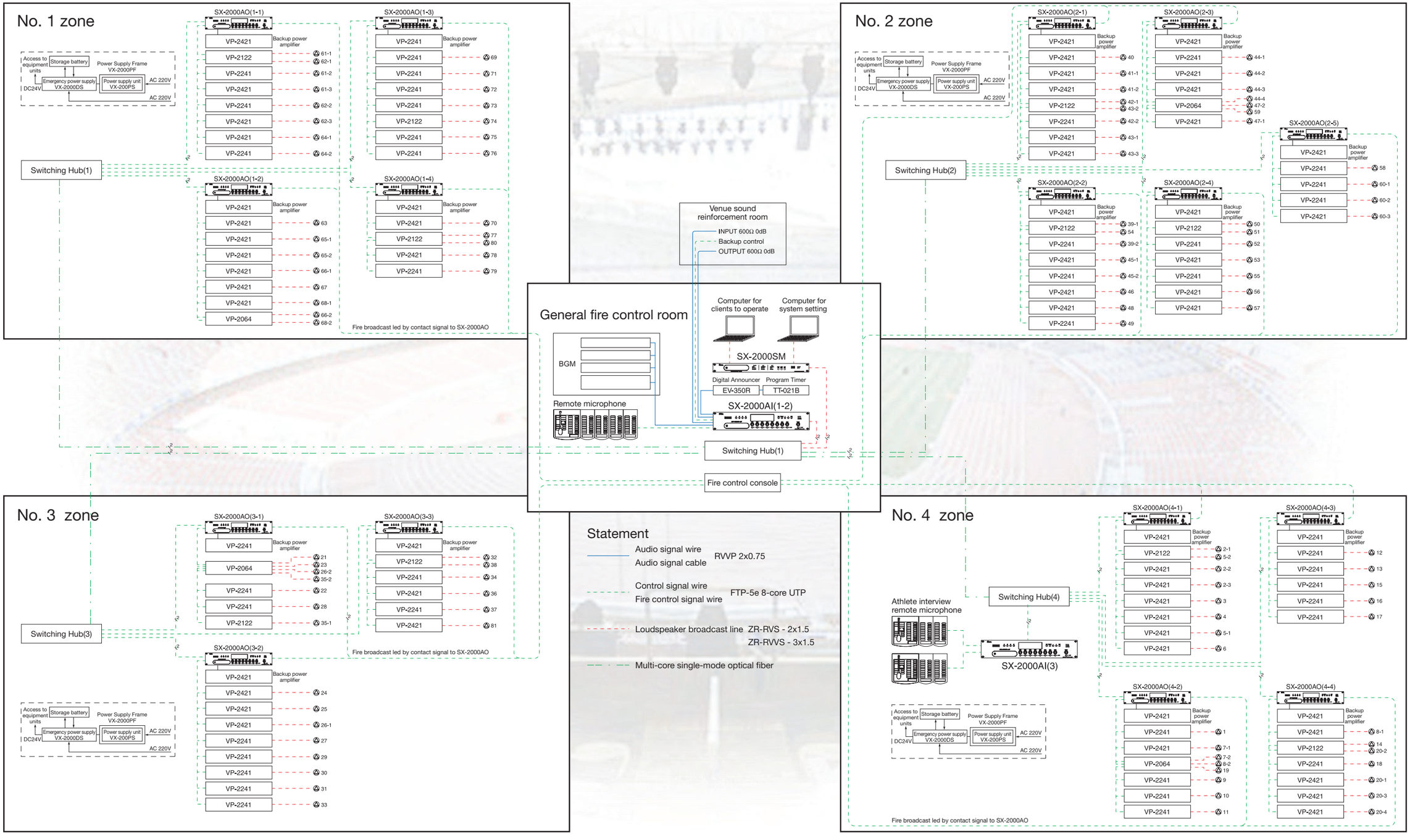
## *"People-oriented, technology-based"*

—— Shenyang Oriental Hengxun Science and Technology Ltd.
TOA authorized dealer

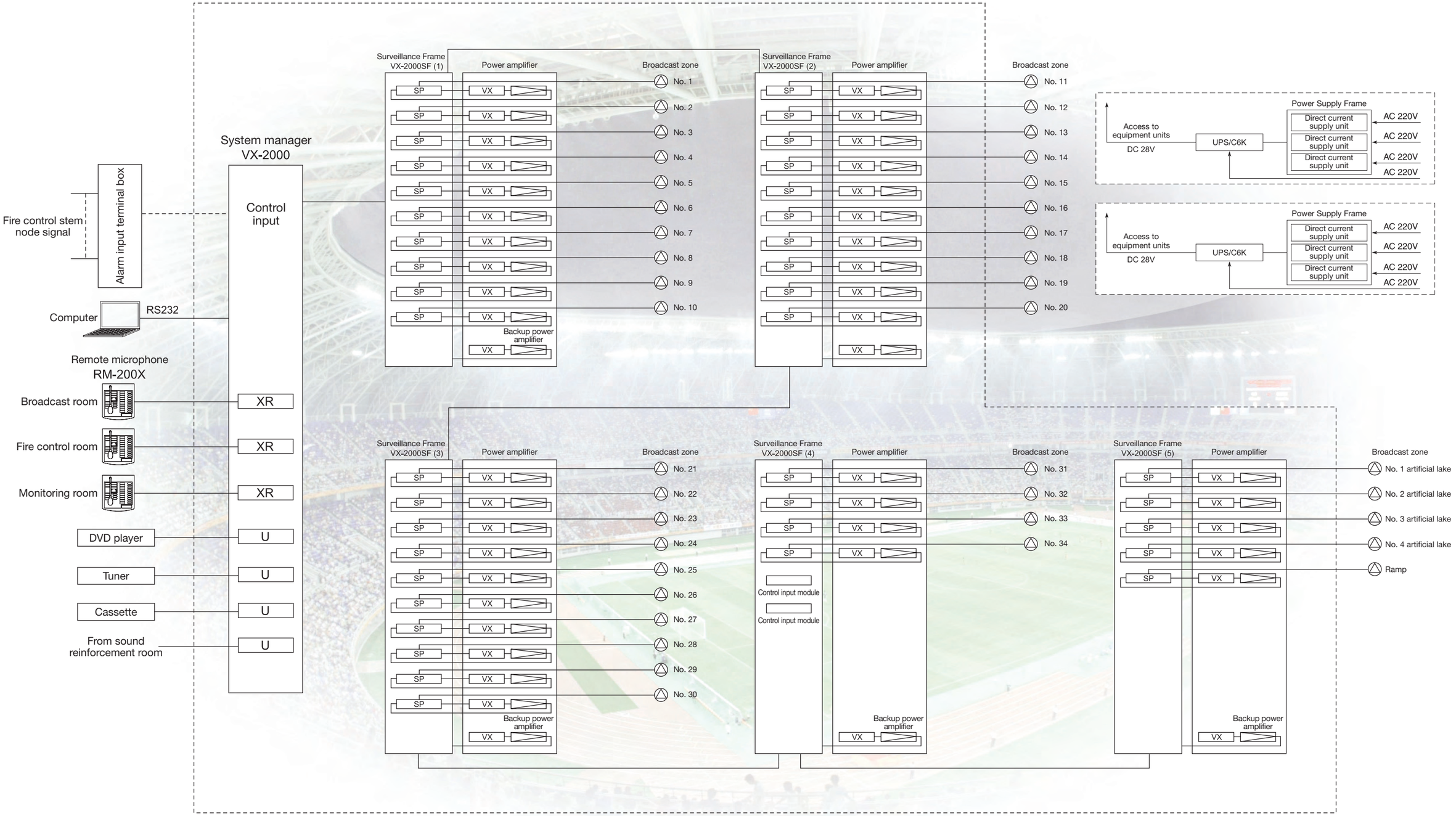

Embracing the business concept of "People-oriented, technology-based", with the vigorous help of TOA (Shanghai) Electric Appliances Co., Ltd. and the constant efforts of corporate personnel and groups, by virtue of the excellent quality and brand influence of TOA products, Shenyang Oriental Hengxun Science and Technology Ltd. has completed a vast number of classic weak current design and construction site guidance, gaining appreciation from project contractors and customers. The projects include Shenyang World Horticultural Exposition Shenyang Zhongshan Square, 2008 Olympic Games football preliminary competition venue (Shenyang Olympic Stadium), Jilin Customs, Northeast China Civil Aviation Administration, Anshan Iron and Steel Group Bayuquan iron and steel project, etc., which not merely improve the market share of TOA products in the northeastern region, but also strengthen the influence of the TOA brand in the northeastern market.

In the future, as a member of TOA family, Oriental Hengxun will, as it always does, be guided by customer requirements and prioritize technical service, actively exploring the northeastern market, so as to provide customers with better TOA product solutions and improved technical service.

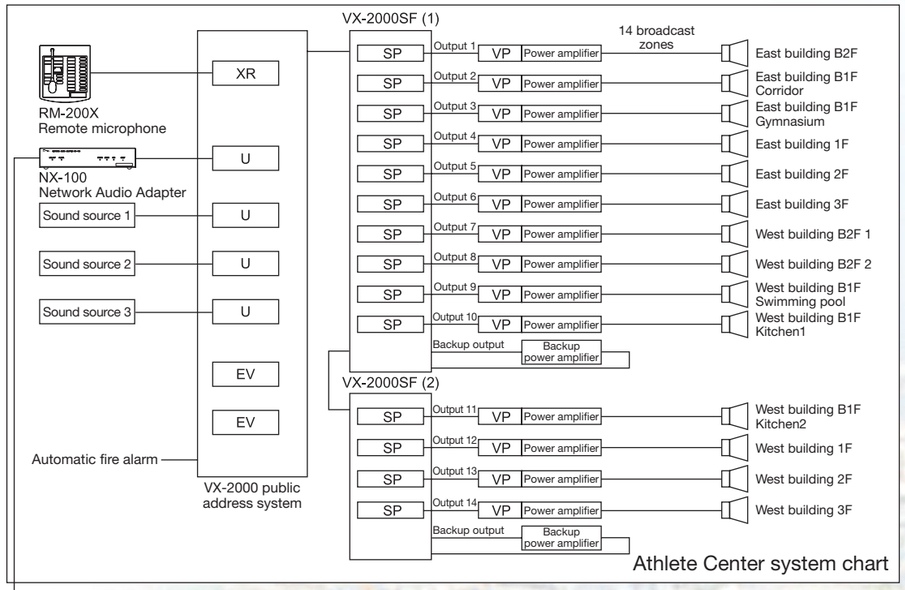
# Olympic venues public address system organizational chart 1

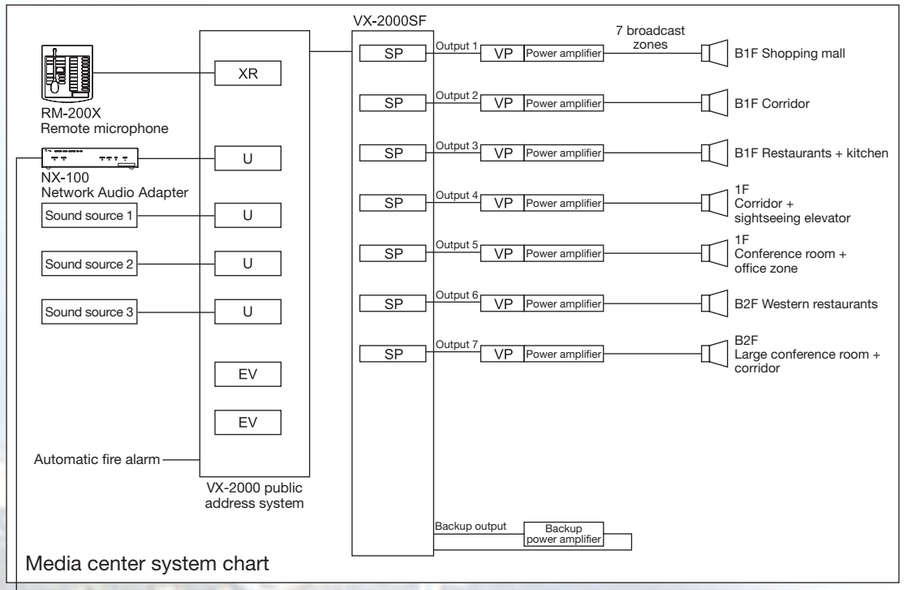


# Olympic venues public address system organizational chart 2



# Olympic venues public address system organizational chart 3

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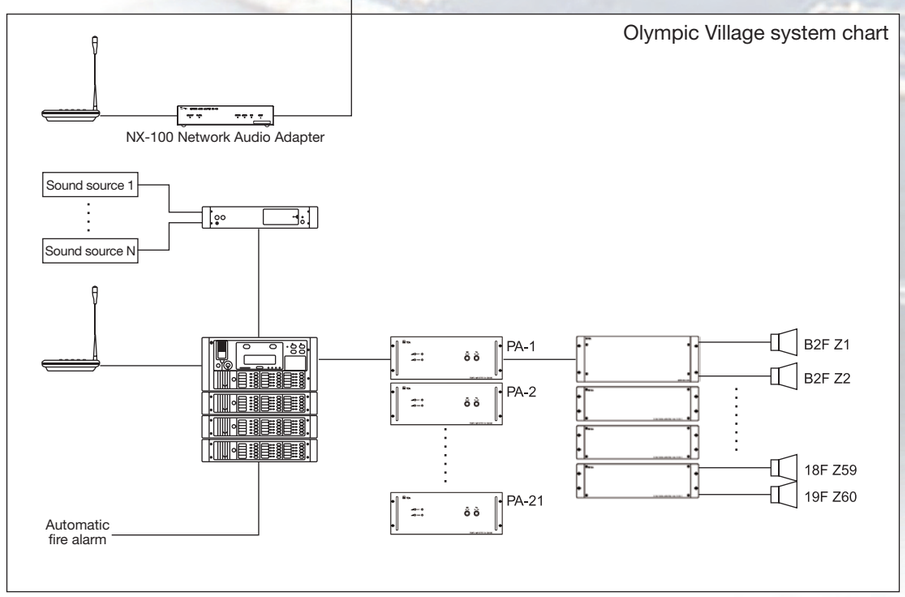


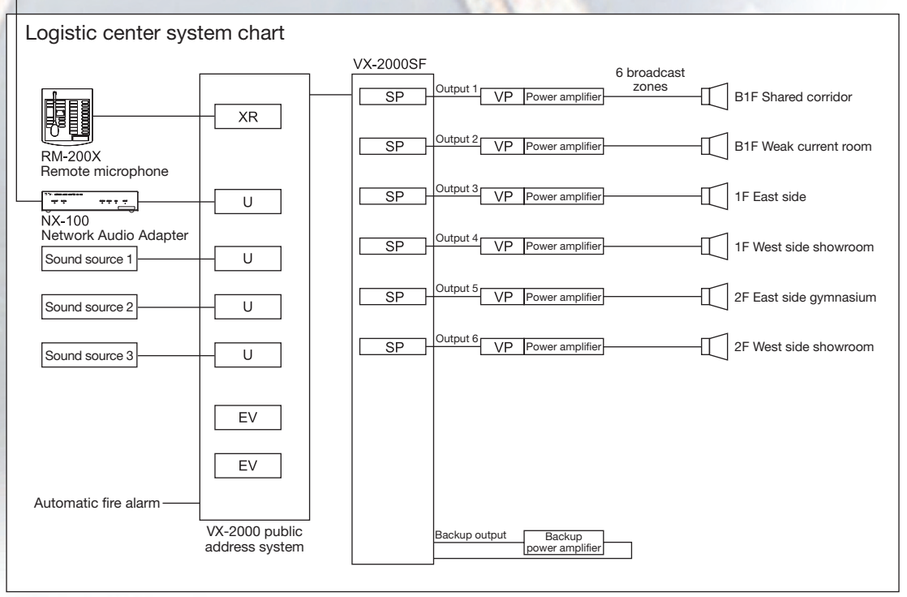

# Olympic venues public address system organizational chart 4