



# NEW NATIONAL THEATRE TOKYO



**TOKYO, JAPAN**  
ASIA/PACIFIC/OCEANIA

Japan's New National Theatre, Tokyo (NNTT) located in the Shinjuku area of Tokyo can arguably be described as the country's most famous performing arts space. It was constructed in 1997 for the production of opera, ballet, contemporary dance and drama. The theatre operates under the management of the New National Theatre Foundation (NNTF) from the independent administrative institution The Japan Arts Council.

Fukuchi Shigeo, President of NNTF said: "The New National Theatre has two major missions. The first is to continue to create world-class performances to present in Japan and abroad, while the second is to become a theatre that is widely enjoyed and loved by the people of Japan. We will strive to fulfil these missions and become a theatre

that the Japanese people will refer to with pride and affection, and that those abroad will look to with respect and admiration."

The performing arts venue has three halls of varying sizes to cater for every eventuality. The smallest of the three spaces is The Pit, a 'black-box' style theatre that can seat between 320 and 450, dependent on whether the room is set up for an end stage, a centre stage, a thrust stage or an arena stage. The Pit is ideal for intimate performances or theatre producers looking for a blank canvas in order to bring their vision alive. The Playhouse is the mid-sized stage and is capable of two distinct production styles - proscenium seating 1,038 or open apron seating 1,010 - equipping The Playhouse with two individual personalities. However, the largest theatre is the Opera House which has an 1,814-capacity, space for a 120-piece orchestra and four stages - rear, two sides and main - to offer ultimate flexibility. It was this space that was chosen for a recent audio upgrade, almost a decade after the theatre first opened its doors.



Kunio Watanabe, who supervises sound and acoustics at NNTT, was tasked with the new audio design and specification in the Opera House. The foundations (fundamentals?) were already in place, thanks to the thick oak panelling on the walls and ceiling, which provide an excellent acoustical environment, so he set out on his search for an electronic sound reinforcement solution that would support the theatre's top-level productions with the highest possible sound quality.

Problems with the previous system included insufficient power and imbalance at certain listening points, Kunio was keen to eradicate those issues, as he explained: "Opera depends primarily on acoustic sound, but when there is a very quiet instrument such as a harpsichord or guitar in the orchestra, or when a chorus is positioned outside the main stage area, for example, the acoustic sound is sometimes not sufficient to achieve the desired balance or impact. In such cases we might use the proscenium speakers to reinforce the sound while paying careful attention to positioning within the sound field. The electronic sound system can be used to deliver sound effects as well."

Kunio used an audition process in order to select the correct audio package. He began by testing a number of sound systems using a variety of sources - orchestra, chorus and

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sound effects, which ultimately left five audio manufacturers in the running. These five systems were then placed on the main stage in the auditorium, where they were tested again until a conclusion on the final three was reached, and at this point they were placed in the proscenium for the final testing process.

According to Kunio, the main criteria for speaker selection was natural sound. "Since the goal was to add electronic reinforcement to the main acoustic sound, it was essential that the electronic sound blend naturally with the theatre's acoustic sound," he said. Kunio was also looking for a sound system that was capable of producing high quality audio over a wide dynamic range. He commented: "A live orchestra has a very wide dynamic range. If, for example, a thunder sound effect is superimposed over an orchestra playing a fortissimo passage, the sound pressure level peaks can be as high as 120dB SPL. On

the other hand, there are scenes in which the only sound might be a chorus singing very softly in the distance."

The manufacturer which came out at the top spot, was Paris-based Nexo. The system comprises two sections, firstly the proscenium and side speakers for which Nexo's two-way GEO S1230 scalable loudspeaker modules and RS15 subwoofers - featuring Ray Sub Technology - were specified, while for the ceiling system, Kunio opted for a further GEO S1230 system, this time combined with Nexo's LS600 subwoofers. Kunio described the main reason why Nexo was crowned as the winner: "All of the speaker systems from other manufacturers had a distinctive sound. That in itself is not a bad thing, but the characteristics of those speakers did interfere with the natural reproduction of some of our sources. The Nexo speakers delivered the most natural sound with the greatest depth." ▶



A total of 10 clusters were installed for the main sound system. Each cluster comprises three Nexo GEO S1230 single 12-inch loudspeakers, which take care of the mid-high frequencies alongside a Nexo GEO S1230 high output bass enclosure. Two clusters have been installed in the proscenium, one cluster either side of the stage and six clusters in upper, middle, and lower groups positioned at the left and right sides of the auditorium. Each individual speaker cluster covers the entire audience area from the front of the stalls to the highest balcony so that it is possible to electronically position the sound to match the position or movement of the on stage performers. The clusters are split into nine zones to ensure full audience coverage. A further four Nexo GEO S1230 arrayable loudspeakers were ceiling mounted along with two Nexo LS600 sub bass units capable of achieving 138dB peak SPL. For amplification, digital audio networking and loudspeaker management control of the entire sound system, Kunio opted to stay with Nexo, selecting 23 of the company's NXAMP 4x4 powered digital TD controllers for the job. Featuring twin DSPs, switch mode power supply and Yamaha's EEEngine technology to achieve optimum efficiency in drive performance and power, the NXAMP 4x4s make the perfect partner for the Opera House's loudspeaker line-up.

Upon completion of the new sound system, no tuning was required mainly due to the fact that, for normal day-to-day operation, complex input and output parameters are handled by the mixing console - often brought in by the individual touring productions - while only level control is applied to the speaker system. This attests to the successful realisation of the two initial goals outlined at the beginning of the renovation process - natural sound that would blend with the hall's natural acoustics, and transparency. "Compared to the old system, the sound fills the hall naturally, and has a feeling of warmth," concluded Kunio. 📷

## TECHNICAL INFORMATION

### SOUND

**34 x Nexo GEO S1230 scalable loudspeaker module; 10 x Nexo RS15 subwoofer; 2 x Nexo LS600 sub bass unit; 23 x Nexo NXAMP 4x4 powered digital TD controller**

[www.nntt.jac.go.jp](http://www.nntt.jac.go.jp)

## FRANÇAIS

Le Nouveau Théâtre National Japonais de Tokyo (NNTT) situé dans la région de Shinjuku de Tokyo, est sans aucun doute la salle de spectacle la plus connue du pays. Plus de dix ans après son ouverture, Fukuchi Shigeo, président de la Nouvelle Fondation du Théâtre National, qui gère le théâtre a décidé de réaménager le système de sonorisation du NNTT. Cet espace dispose de trois salles de tailles différentes pour répondre à toutes les éventualités. Toutefois, le plus grand théâtre est l'Opéra et c'est cet espace qui sera réaménagé. Kunio Watanabe, qui supervise le son et l'acoustique pour le NNTT a cherché des solutions pour renforcer le son électronique qui permettrait aux productions du théâtre d'avoir accès au meilleur son possible. Après une procédure d'audition complète, le fabricant français, Nexo, est arrivé en tête de liste. Les modules haut-parleur évolutifs GEO S1230 bidirectionnels de la société composeront le cœur du système, et seront accompagnés des contrôleurs TD numériques 4X4 NXAMP de Nexo. Le système complet donne un son naturel qui se mélange à l'acoustique naturelle de la salle, et la transparence.

## DEUTSCH

Japans neues Nationaltheater in Tokio (NNTT), das sich im Shinjuku-Bezirk von Tokio befindet, kann als der berühmteste Raum für künstlerische Darbietungen des Landes beschrieben werden. Mehr als ein Jahrzehnt, nachdem seine Türen zum ersten Mal geöffnet wurden, hat Fukuchi Shigeo, Vorsitzender der Stiftung des neuen Nationaltheaters, die das Theater verwaltet, beschlossen, das Audiosystem im NNTT aufzurüsten. Der Treff für künstlerische Darbietungen verfügt über drei Hallen in unterschiedlichen Größen, um jeder Eventualität gerecht zu werden. Das größte Theater ist allerdings das Opernhaus und dieser Bereich wurde für die Aufrüstung ausgewählt. Kunio Watanabe, der den Sound und die Akustik im NNTT überwacht, suchte nach einer Verstärkungslösung des elektronischen Sounds, die die hochkarätigen Produktionen des Theaters mit der bestmöglichen Soundqualität unterstützt. Nach einem gründlichen Auditionsverfahren wurde der französische Hersteller Nexo ausgewählt. Die skalierbaren GEO S1230 Zwei-Wege-Lautsprechermodule des Unternehmens bildeten den Kern des Systems und wurden unterstützt durch NXAMP 4x4 gepowerte digitale TD-Controller von Nexo. Das komplette System verschafft einen natürlichen Klang, der gut mit der natürlichen Akustik der Halle harmoniert, und Transparenz.

## ITALIANO

Il nuovo Teatro Nazionale Giapponese di Tokyo, il NNTT, situato nella zona di Tokyo denominata Shinjuku, può essere indiscutibilmente definito il maggiore spazio per spettacoli artistici di tutta la nazione. Dopo oltre un anno dalla sua apertura, Fukuchi Shigeo, il Presidente della Fondazione del Teatro Nazionale, che ne cura la gestione, ha deciso di migliorare il sistema audio dell' NNTT. Il complesso che ospita le arti visuali e gli spettacoli è composto da tre grandi saloni di misure variabili in grado di far fronte a diverse esigenze. Ad ogni modo lo spazio teatrale più esteso è l'Opera House e proprio questa è stata prescelta per le migliori. Kunio Watanabe, il supervisore del suono e dell'acustica all' NNTT, ha cercato le soluzioni più interessanti per un incremento della qualità e della potenza del suono elettronico che fornissero la più elevata qualità acustica alle eccellenti produzioni ospitate nel teatro. Dopo una serie di approfondite audizioni, la migliore prestazione è stata aggiudicata alla ditta manifatturiera francese Nexo. Gli amplificatori modulari graduati a due vie GEO S1230 sono stati utilizzati come parte fondamentale del sistema audio, accompagnati dagli NXAMP 4x4 della Nexo alimentati da controlli digitali TD. Il sistema audio nella sua forma finale fornisce un suono naturale che si mescola alla naturale acustica e trasparenza della sala.

## ESPAÑOL

El Nuevo Teatro Nacional de Tokio, Japón (de sus siglas en Inglés, NNTT) ubicado en la zona de Shinjuku en Tokio, puede ser descrito como el espacio de arte más famoso del país. Más de una década después de que se hayan abierto sus puertas por primera vez, Fukuchi Shigeo, Presidente de la Fundación del Nuevo Teatro Nacional de Tokio, quien administra el teatro, decidió actualizar el sistema de audio en el NNTT. El sitio destinado a las artes interpretativas está compuesto de tres salones de diversos tamaños para abastecer toda eventualidad. Sin embargo, el teatro más grande es el Teatro de la Ópera y fue éste espacio el elegido para la renovación. Kunio Watanabe, quien supervisa el sonido y la acústica en el NNTT buscó soluciones para el refuerzo del sonido electrónico que pudieran soportar las producciones de más alto nivel del teatro con la calidad más alta de sonido posible. Luego de un meticuloso proceso de audición, el fabricante Francés, Nexo, quedó primero en la lista. Los módulos expandibles de altoparlantes de la empresa, GEO S1230 bidireccionales, conformaron el centro del sistema, el cual fue acompañado por los controladores digitales TD NXAMP 4x4 de Nexo. El sistema completo provee un sonido natural que se mezcla con la acústica natural del salón y su transparencia.