NEXUS
Digital Audio Routing and Interconnect System
NEXUS is an audio network and a router at the same time. It also provides for audio format conversion, A/D and D/A conversion, audio processing, data transmission, loudness metering, control interfaces, multichannel metering, amplifier control, intercom, logical functions, and much more ...

The basic NEXUS principle: Fibre-optic links transfer all audio and control information in a digital format. NEXUS Base Devices are installed in studios, in control rooms, and on stages. These Base Devices provide the inputs and outputs required in the appropriate format via standard connectors. Using a convenient GUI any number of inputs can be routed to the desired outputs – the physical location of the input and output resource and the format is irrelevant.

The NEXUS is the versatile audio network and routing system for controlling studio or mixing-console resources in switching rooms, for networking broadcast complexes, for sound-reinforcement, in O.B. trucks and for all other professional audio applications.

**NETWORKING**

NEXUS is the perfect method for creating distributed infrastructures with minimal cabling complexity and cost using fibre-optic connections. It supports long-distance cable runs of up to 100 kilometres without any deterioration in audio quality or sync inaccuracies.

The duplex fibre-optic links transfer a total of 256 audio channels plus control and sync information. Allocation of audio channels is flexible – for example, 128 channels in each direction and 192/64 or 64/192 setups are also supported.

**COMPONENTS**

NEXUS Base Devices are compact 19” mainframes for static or mobile use. 1 U, 3 U, 6 U, 9 U, 12 U, and 15 U versions are available. Input and output ports are on 3 U slide-in boards. NEXUS Base Devices are based on a 4 HP grid and accommodate modular boards such as I/O boards for analogue and digital audio, DSP boards for audio processing, special routing boards for data or switching signals and fibre-optic interface boards for interconnecting Base Devices.

**OPERATION**

NEXUS systems are controlled using PCs running the GUI software. The NEXUS software provides intuitive access to and control of all system components. All settings can be stored and presets can be recalled easily. The computer is only required for configuring the NEXUS, not for normal operation. PCs are connected to NEXUS Base Devices via Ethernet, USB, or serial links.
**System Size**

NEXUS routing systems are configured for each client individually and can be extended subsequently. The user can change the physical network setup autonomously using the software. The audio-network software supports up to 31 Base Devices with a maximum resource count of 4,096 inputs and 4,096 outputs.

**Loudness Metering**

Stage Tec is an active participant in the development of EBU R 128-compliant loudness metering. Latest-generation CPU boards for the NEXUS system (XCPU 09) implement three different metering methods on the NEXUS directly: **Momentary loudness** with an integration time of 400 ms, **Short-term loudness** with an integration time of 3 s and **Integrated loudness** with custom integration time, using a gating function.

**Audio Quality**

Stage Tec’s patented TrueMatch converters epitomise excellent conversion technology as well as the highest fidelity and guarantee unmatched audio quality. They achieve a dynamic range of up to 158 dB (A) and convert analogue to digital signals faithfully.

**Redundancy**

Secure operation is a core feature of the NEXUS. The systems can be equipped for maximum redundancy and each Base Device has an individual controller board. It is also possible to establish redundant fibre links between Base Devices. If a fibre link fails, the system switches automatically to a backup link within one sample! Another integral NEXUS security feature is the Auto Sync Search function which is launched in the event of a sync-source failure. If no external sync source is available, the system will synchronise to a Base Device internal clock generator. Base Devices can be equipped with redundant power supplies, for example, for operation on two separate circuits.

**Reliability**

The NEXUS »distributed intelligence« concept prevents complete failure in case of malfunctions. Failed components are recognised immediately thanks to a graphical alert system. Interface boards are hot-swap-enabled, i.e. they can be replaced during operation without affecting other system components. A newly installed board is available on the system within a few seconds.

**Award**

In 2010, the NEXUS was presented with the Primetime Emmy® Engineering Award for its exceptional audio quality and impressive feature set. At the presentation ceremony in Los Angeles, the NEXUS was referred to as the best routing system currently available.

*Primetime Emmy® Engineering Award*
APPLICATIONS

IN RADIO AND TV BROADCASTING:

- Switching rooms, full networking of broadcast centres
- Studio matrices
- Transmission systems

IN RECORDING AND POST-PRODUCTION STUDIOS:

- Mixing-console and studio matrices
- Complete wiring of studio complexes
- A/D, D/A, and format conversion

IN THEATRES, CONCERT HALLS, CONVENTION CENTRES, AND EXHIBITION GROUNDS:

- Interconnection of recording studios, stages, sound-reinforcement facilities and other areas
- Hall and building networking
VERSATILE FORMATS

NEXUS boards support a wide range of formats from analogue line level to Dolby E® to 3G-HD-SDI. The NEXUS provides a seamless, integrated workflow for Dolby E® signals.

ANALOGUE AUDIO

The XAD+, and XDA+ 8-channel analogue line-I/O boards offer an exceptional dynamic range of 133 dB (A) and 131 dB (A), respectively. Furthermore, the XMIC+ 32-bit microphone-input board achieves an impressive 158 dB (A). The XMIC+ inputs can also be used as line inputs without switching. This means that microphone clipping, or even microphone-gain adjustment, is now a thing of the past! The XMIC+ can be used either in the classical way with a single digital output, or as a splitter with up to four independent outputs per microphone input.

In just 4 HP, the HXAD and HXDA boards make available eight analogue stereo inputs and outputs, respectively, via D-sub or RJ45 ports! Both converters are designed for maximum analogue levels of up to 15 dBu and are suitable mainly for permanent installations.

DIGITAL AUDIO

A wide range of interface boards is available for various digital audio formats. The boards convert audio and ancillary data to the NEXUS 24-bit TDM format and are also be equipped with sample-rate converters for connecting asynchronous devices. The interface boards have been officially certified for Dolby E® signal transmission by Dolby Labs.

NON-AUDIO SIGNALS

The NEXUS routing and transmission features also include other signals. Different serial formats (RS 232, RS 422, RS 485, MIDI, DMX, LTC, etc.) and control signals for external devices (e.g. amplifier control, light control and machine control) are generated and distributed.

DOLBY E®

Dolby E® signals are routed transparently and can also be processed discreetly on the NEXUS audio network. I/O interfaces to the NEXUS include AES/EBU, MADI and SDI formats.

* Dolby and the double-D symbol are registered trademarks of Dolby Laboratories.
Stage Tec offers two Dolby E® boards that allow for discreet processing of Dolby E® audio. The XDED decoder board decodes a Dolby E® stream and extracts the separate channels and forwards them to the NEXUS system as discrete audio signals. Asynchronous input signals can also be decoded. The XDEE encoder board encodes up to eight discrete audio signals from the NEXUS system in compliance with the Dolby E® encoding specifications. Both boards use original Dolby Labs OEM modules.

**SDI Audio**

The XHDI02 slide-in board provides an SDI interface and supports SD, HD and HD-3G video formats. The board receives, generates and processes synchronous and asynchronous audio signals transported in a digital serial video stream. The following specifications have been implemented: SMPTE 259M (SD), SMPTE 292M (HD), and SMPTE 424M/425M (3G).

The XHDI02 embeds and de-embeds metadata streams used mainly during transport and processing of multichannel audio signals.

Use in combination with Stage Tec’s Dolby E® enabled components allows for de-embedding and decoding Dolby E® signals from an SDI stream, processing them in the NEXUS, and finally re-embedding them into the SDI stream. This is also supported for SDI signals clocked asynchronously. The XHDI02 is also capable of compensating for the latency intrinsic to Dolby E® decoding and encoding using a video delay of 0-15 frames (SD) or 0-8 frames (HD/3G).

**Relay-Control Signals**

Apart from routing audio, NEXUS systems also provide a number of control and switching functions. The XRI relay-interface board is available for interpreting, generating, and distributing relay-control signals.

Relay functions can be programmed for specific applications. Supported applications include routing signalling and remote-start on the NEXUS network, control of selected NEXUS functions using switches, and control of external loads or equipment.

**Logic Control**

NEXUS Logic Control is a programmable logic software unit for switching functions defined according to each user’s individual needs. Logic Control enables various NEXUS parameters to be queried including, for example, crosspoint statuses, fader-start relays, I/O levels, internal error statuses, etc. When used

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in conjunction with an AURUS console, Logic Control can also perform certain mixing functions such as fader remote start contacts and machine-control keys.

Logic Control is capable of controlling a variety of outputs and events including, for example, red-light control, crosspoint and line-level monitoring, mute keys, program switches, fader starts, auto backup-link switchover and intercom systems.

**Control Interface**

The universal intelligent NEXUS communication interface (XCI) extends the functionality of a NEXUS audio network with control features. The user can control external devices remotely and query control protocols using the XCI board. Applications include connectivity to hardware or software operating panels for controlling specific NEXUS functions, or the connection of remote-controlled peripherals such as power amplifiers, CD players or audio recorders. On request, other protocols and/or device-control functions can be implemented for other devices in addition to the pre-programmed standard protocols.

**Data Transmission**

The NEXUS, as a virtual, freely routable data cable, is perfectly suitable for routing external control data. Using the XTI data-transmission card, serial data signals are transmitted transparently over the network. The board supports a number of interface specifications including RS 232, RS 422 (RS 485), MIDI, DMX (RS 422/485), Timecode, LTC, and Dolby Metadata (RS 232 or RS 422).

The data streams are routed by the NEXUS control software in the same manner as audio signals and are transmitted transparently.

**Integration of the Mixing-Console Systems**

NEXUS can also be used as the input and output matrix for Stage Tec mixing-console systems (AURUS, CRESCENDO, AURATUS, ON AIR 24). In such setups, the consoles use the NEXUS I/O resources. However, the integration of mixing console and audio network goes much further than this and deep into the architecture of both systems. For example, the NEXUS can be operated from the console configuration computer. The console also provides dedicated keys for direct access to frequently used NEXUS parameters such as gain, phase inversion and filters for microphone inputs, activation of the sample-rate converter for digital inputs or injection of the internal test-tone generator.
**Audio Conversion**

All audio boards read and write the 24-bit audio format used on the internal TDM bus. Therefore input audio of any type can be routed to any of the NEXUS audio outputs. Thus, when using a NEXUS, complex and costly format conversion ceases to be an issue.

Signal routing does not require signal-processor boards. However, NEXUS DSP boards are available for whenever signal processing is needed. Signals can be routed to DSP boards at any point with all the important control elements for EQ, delay, dynamics, faders, etc.

**Data Retention**

The working memory on the XCPU controller board in each Base Device is battery-buffered. In the event of a power failure the last state is stored. When power is reapplied, it takes only seconds to restore all settings to the most recent state.

System and routing settings all fall within the scope of data-retention. Whenever the NEXUS system is powered up, it resumes its most recent status within a few seconds. This all happens autonomously in the NEXUS system — no external control computer is required.

Signal flow within a networked NEXUS system
**Specifications**

**Construction**
- 19" mainframe, 1-15 U in height (flightcase or mounting rack available on request)
- Each board is 3 U in height
- Up to 2 extra rows without backplanes for detached front panels
- 1 XCPU controller board
- 1 backplane power-supply unit (min.)
- Redundant power-supply units (optional)
- I/O boards as required

**Slots**
- 4 HP grid (20.32 mm)
- 20 free slots per front-panel row
- 60 slots (max.) plus two extra rows for detached front panels per Base Device

**Bus System**
- TDM (Time Division Multiplex) audio bus
- 256 time slots per Base Device assigned dynamically
- 24-bit audio plus ancillary data (AES-3 compliant)
- System configurations of up to 4,096 inputs and 4,096 outputs
- Sample rates: 44.1, 48, 88.2, or 96 kHz
- Pull down available on request

**Power-Supply Units**
- Power supply: 90 to 264 V AC
- Line frequency: 47 to 63 Hz

**Dimensions**
- Height: approx. 132.5 to 665.9 mm (3/6/9/12/15 U)
- Width: approx. 482.6 mm
  (front-panel area: 84 HP in total)
- Depth: approx. 440 mm
  (without handles or connectors)

Sometimes professional audio equipment can be found where one would least expect: in a publishing house, a casino, at the Disneyland Resort, or on the equestrian estate La Baumetta, home to Olympic show jumper Christina Liebherr. Despite the unusual surroundings, the reasons for using a NEXUS are still the same. Its easy-to-install fibre-optic cabling, high reliability, and simple control features were decisive factors in choosing to install the system at La Baumetta. Instead of heavy and inflexible multiway cables and a large number of remote controls, various multimedia services and control signals are routed via the NEXUS. The system can now support any situation, from in-ear monitoring during training sessions or for the celebrations after successful show jumping competitions.
NEXUS  DIGITAL AUDIO ROUTING AND INTERCONNECT SYSTEM

References

Several hundred NEXUS systems of various different sizes, with more than a thousand Base Devices, have already been installed worldwide – for example in broadcast and TV environments, in OB trucks, in theatres and convention centres, in film studios, government buildings and for live applications. There are also numerous AURUS, AURATUS, CINERENDO, ON AIR 24, CANTUS, and CINETRA installations where NEXUS systems are used as I/O interfaces, audio networks and or routers. Larger NEXUS installations are typically based on the NEXUS STAR audio router.*

Bolshoi Theatre, Moscow, Russia

If there is one theatre that can be called a national icon, it is definitely the Bolshoi Theatre in Moscow. It used to be the stage of Tsars and revolutionaries and acoustically was one of the greatest halls worldwide in its original design. After six years of overall restoration, the Bolshoi reopened with a magnificent ceremony in October 2011. As a partner of the Russian general contractor, the SALZBRENNER STAGETEC MEDIAGROUP was in charge of planning and installing the major audio systems.

The Bolshoi now houses three extensively configured AURUS consoles with full channel count. One is used for sound reinforcement in the large auditorium, one as a central mixing system serving the entire Bolshoi complex with its many halls and function rooms and one is for use as a mobile remote console, for example, for rehearsals. A NEXUS network comprising more than 30 Base Devices and several NEXUS STAR routers interconnects all audio-control rooms. The system was designed with a strong focus on expandability, allowing for other parts of the building to be integrated in the future, for example, the newly constructed concert hall.

BBC North, UK

MediaCityUK, BBC North’s new broadcasting complex in Salford near Manchester, is one of the most ambitious projects in Great Britain and will strengthen Central England’s media and creative industries after its completion in 2012. In the medium term, 2,300 people will work in the three TV and radio production buildings.

The studios and production facilities on the BBC campus house a large NEXUS audio network comprising 21 NEXUS Base Devices and two NEXUS STAR central routers. Connected over MADI links, the NEXUS handles a total of 7,600 analogue and digital inputs and outputs.

To the BBC, key factors were the legendary reliability the NEXUS offers plus positive experience with the NEXUS and DELEC systems, which have been in use at the BBC’s broadcasting centre in London since the overall refurbishment,† says Chris Collings, the MEDIAGROUP’s distribution partner in Britain. He and his company Aspen Media had secured the contract with the BBC.

A very important argument for the NEXUS was the redundant design of all

*The list includes a number of examples – large and small installations, more or less randomly selected. Therefore, the project selection and sequence does not imply a rating. A detailed up-to-date reference list with all our projects listed by their respective products is available on our website (http://www.stagetec.com).

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routing and control modules as well as the fact that every subnet can run independently. This means that local system components remain in operation even if a NEXUS STAR fails, Collings continued.

**ESC Eurovision Song Contest 2011, Dusseldorf, Germany**

“The winner is Azerbaijan! – and the NDR broadcasting service as the executive producer of this gigantic TV event. At the mobile broadcast centre on site, the NDR produced the sound feed for more than 40 national and international stations all over Europe using AURUS-based control rooms.

The SALZBRENNER STAGETEC MEDIAGROUP partnered with the NDR and acted as official supplier of mixing-console systems for the event. Four AURUS consoles, each with 48 faders and a full complement of DSP, were in use. Three in mobile control rooms on the premises plus another one in the NDR’s HD-enabled OB truck. This setup included two control rooms for music (one for stereo sound and another one for 5.1 audio) while two more control rooms were used to produce the international sound feed — separately for 5.1 and stereo, and each was used as a backup device for the other in case of failure. During the live production, which was completed without any failures, the stereo mixes were done manually rather than creating a downmix from the 5.1 signal automatically!

The TV compound was networked completely on the basis of a NEXUS system and many kilometres of fibre. Each control room had a dedicated NEXUS network. MADI links were used to exchange data between the control-room networks.

**German Music Archive, Leipzig, Germany**

The German Music Archive run by the German National Library is a central collection of German recorded music. All German publishers of recorded music are required to deliver two copies of every edition to the Archive. One copy is for common use (lending) while the second one is archived. In future, archiving will occur as pure data, i.e. regardless of the original recording medium.

This requires state-of-the-art audio systems. Planning and installation of the recording studio in the new annex to the Music Archive was an interesting challenge for the MEDIAGROUP. A 96kHz AURUS console supported by a NEXUS network was the system of choice. In such an environment, antiquated playing devices, some of them literally museum pieces, for example, wax cylinder phonographs, look very unusual. On the other hand, each recording medium requires an appropriate playing device to be present. The studio, however, meets current surround standards and provides excellent monitoring acoustics. Thus, the customers can focus on what really matters: the music!

**Esplanade Theatres on the Bay, Singapur**

Numerous concerts, dramas, vocal performances and dancing shows have been staged in the two large halls and on the two studio stages of this internationally renowned institution since its opening in October 2002. The extensive repertoire requires excellent audio quality. To ensure this, and to integrate
convenient signal routing throughout the building, a network comprising a total of 19 NEXUS Base Devices and one NEXUS STAR was implemented in 2008. The Esplanade planners placed particular emphasis on the outstanding signal quality provided by the NEXUS microphone inputs. But there were also other factors such as extensibility and the flexibility in daily work that spoke well for using the NEXUS in this application.

**RTS Radiotelevisione svizzera, Geneva, Switzerland**

In 2011, RTS began an extensive modernisation process to make all TV-broadcast and production systems HD-ready. In this setup, a NEXUS system ensures broadcast quality sound. RTS have switched their workflow to digital file-based production and broadcasting. The new approach includes consistent data handling from the recording stage to the archive, combined with database-driven standardisation of relevant signals.

Yannick Dumartineix, who designed this digital-audio concept for RTS, says: «We opted for Stage Tec systems and the NEXUS because this gear is so reliable. This is critical for on-air operation! Of course, the exceptional audio quality provided by the systems was another key factor.»

**Elbe Tunnel, Hamburg, Germany**

3.32 kilometres in length and with a daily capacity of 120,000 vehicles, Hamburg’s Elbe Tunnel is one of the longest and busiest underwater road tunnels in the world. Since it is equipped with a NEXUS-based announcement system, it is also one of the safest and most up-to-date ones. The acoustic environment inside such a tunnel presents a considerable challenge for systems used for announcements to drivers. Unwanted signal overlaps significantly decrease intelligibility.

The NEXUS announcement system utilises the tunnel acoustic rather than fighting it. Synchronised sound propagation inside the tunnel can be achieved using the Synchronised Longitudinal Announcement Speaker System (SLASS) concept implemented as a coherent wave. This spreads the wavefronts. The sound-wave fronts do not overlap each other chaotically but temporally-synchronised as a single coherent sound wave moving through the tunnel. With the new system just 46 speakers, i.e. one speaker every 64 metres, generate the coherent wave. The NEXUS system applies a delay to each speaker signal such that a speaker’s signal and the signal arriving from the previous speaker are in phase. Using this principle, the system produces an overall delay of about ten seconds over the length of the tunnel.

The system is based on NEXUS Base Devices with DSP boards used to delay the signals correctly. The NEXUS routes the delayed signals to separate power-amplifier channels. The results speak for themselves. A level of intelligibility unprecedented in tunnel environments has been achieved.
**21**️⃣ Winter Olympics 2010 in Canada

The IBC master control room houses a NEXUS network to manage all audio and transmit it to Switzerland. The special feature of the system is that 62 XSDI boards are in use in the master control room while 26 more have been installed in the Base Devices located in the control rooms. All in all, a total of 960 × 960 SDI I/Os are available. »The excellent NEXUS capability of being able to handle a very large number of embedded audio signals and route them anywhere on the system gives us the ability to produce almost any report, using the feeds provided by the host broadcaster, and forward it to Switzerland as an SDI stream,« says Thomas Neuenschwander, project engineer for tpc. Another benefit is that the producers in Canada can send feeds produced on-site to Zürich where the French and Italian commentary is added in Geneva and Comano, respectively. This approach requires still more SDI-embedding capabilities from the rental system.

**Mariinsky Theatre, St. Petersburg, Russia**

This is probably the only theatre worldwide that can afford its own OB truck—and one with the finest technology available. When it was designed the focus was on sound quality. It employs a rather extensive (376 × 280 crosspoints) NEXUS network with fully redundant fibre-optic links. In order to achieve this redundancy, each Base Device is equipped with two optical-interface boards. This provides a backup solution not only for link failure but also for the failure of an XFOC board.

**BBC, London, UK**

On the occasion of the wedding of Prince William, Duke of Cambridge, and Kate Middleton, the BBC produced the international sound feed for an estimated total of two billion TV viewers and radio listeners in 180 countries. To achieve this, the BBC used two OB trucks equipped with Stage Tec audio systems. A team on BBC Radio’s latest OB truck »Sound 5« was in charge of the radio feed. The vehicle not only houses a 40-fader AURUS desk for brilliant sound but also a number of NEXUS Base Devices as stage boxes which provided part of the audio network in and around Westminster Abbey. The TV sound feed was produced by the live-broadcast specialists from SIS LIVE on their OB truck »Mastersound«, which houses another Stage Tec classic: a CANTUS. The SIS LIVE people created the 5.1 and stereo mixes using the 128-fader console, which was installed about ten years ago. Up to 80 sources were connected to the console and distributed using the NEXUS system on the vehicle.

**International Forums Palace, Tashkent, Uzbekistan**

The NEXUS infrastructure at the International Forums Palace in Tashkent includes a STAR router and ten Base Devices of different sizes and configurations placed in strategic positions in the building. Next, there is extensive analogue cabling, for example, to the numerous junction boxes. Analogue lines are even run to the two amplifier rooms that feed the speakers in the hall;
NEXUS Digital Audio Routing and Interconnect System

However, these links are for backup purposes only and will only be used if the main digital connection fails. The large Base Device in the control room features numerous analogue audio ports for connecting any analogue channels to the digital router. This is useful, for example, for supporting in-house locations remote from a Base Device, or as a backup solution at hand that can be used by operators not specially trained.

Astro-TV, Kuala Lumpur, Malaysia

The Malayan pay TV station, Astro, equipped three of their studios with Stage Tec audio systems. Two studios in the All Asia Broadcast Centre (AABC) in Kuala Lumpur now house one AURUS console each. A CRESCENDO desk went to the special interest Astro Arena channel. With a NEXUS network including 14 XHDI boards, the studios are equipped to handle embedded audio in HD quality.

Radio Vatican

For more than twelve years a NEXUS audio network has been in use in the world’s smallest state. Radio Vatican, however, is anything but small. The station broadcasts in 21 languages on four separate terrestrial networks and DAB is broadcast worldwide via satellite and the Internet. The original purpose of the NEXUS was only to provide a connection between the Vatican and the external production premises. Today it also supports a comprehensive audio network in Vatican City. Therefore, the NEXUS system was enlarged considerably in 2010. A star-topology audio network including two NEXUS STARs and 15 Base Devices with a partially redundant layout now enables audio recording at the Vatican Conference Centre, in the Pope’s blessing room and even in St. Peter’s Basilica.

BBC, UK

In May 2010, top acts from Britain’s pop music scene, including Cheryl Cole, Faithless, Plan B, and Vampire Weekend met at the »Big Weekend«, Europe’s largest free open-air festival, which is organised by BBC Radio 1 every year.

For the audio infrastructure, the BBC relied on their NEXUS system. All four stages on the sprawling festival ground and the three BBC OB trucks were connected to a central control room via NEXUS. This was responsible for the broadcast feed final mix. Two AURUS equipped OB vans provided the live sound of the »Dance Stage« and the »Live Lounge Stage« to the control room. NEXUS was used as a stage box for all sources on the Main Stage and the New Music Stage. In the third OB van another, smaller AURUS-based control room was used for minor mixing tasks such as sound bites and atmos.

»Follies« in Washington D.C., USA

»Follies« premiered on Broadway back in 1971. Now the famous musical has been reprised at Washington’s Kennedy Center in May and June 2011. Sound design for the 1100-seat hall was undertaken by freelance sound designer Kai Harada who used an installation made up of an AURUS console and a NEXUS network to do rehearsals and the live mix. The task in hand was to create a...
brilliant and detailed mix from 28 live musicians in the orchestra pit and a cast of 38 singers including some big stars. AURUS and NEXUS perform extremely well, and — most importantly — provide excellent audio quality. With them I can get just the sound I want, Harada explains why he opted for Stage Tec.

Sound engineer Patrick Pummill adds: We installed the AURUS console and the NEXUS system in just half a day and a rehearsal of the entire show with the full company was able to start immediately. It usually takes two or three more days to get to that point. Pummill was particularly impressed by how simple it was to create an audio network using the NEXUS, We were able to start working without having to wait for other trades to finish rigging.

Olympic Games 2008, Beijing, China

I declare open the Games of Beijing celebrating the 29th Olympiad of the modern era. More than 90,000 visitors to the Grand National Stadium at Beijing heard those words on 8 August 2008. They were mixed on two AURUS desks installed at the central control room of the stadium and fed from a NEXUS audio network to the sound-reinforcement system comprising 220 line arrays. The NEXUS network includes eight Base Devices plus one NEXUS STAR. In addition to the variety of formats supported by the configuration, a key benefit of this integrated solution typical of Stage Tec systems is that the NEXUS internal audio-processing features can be used. For instance, all delay lines are set using NEXUS DSP presets. This ensures latency-free audio while preventing inadvertent changes to the settings, for example, the console configuration.

Incidentally, in contrast with many other sports events, the AURUS/NEXUS system was not just hired but was purchased and installed permanently in the stadium.

US NBA Finals Broadcast with NEXUS, Dallas, USA

Dirk Nowitzki is Germany’s new basketball superstar. Between 31st May and 12th June 2011, he and his Dallas Mavericks defeated the Miami Heat team 4 games to 2 to win the NBA Finals, thus securing their first NBA Championship. Three matches against their nemesis opponents took place in the Mavericks’ home arena, the American Airlines Arena in Dallas, Texas. German participation extended beyond the Mavericks. American sports broadcaster ESPN produced their live broadcasts from Dallas using an extensive NEXUS network with a NEXUS STAR as a central MADI Hub. The main job of the NEXUS was to connect the sources in the hall to the central OB vehicle in the broadcast centre and to network the entire broadcast and production fleet on the site. This included ESPN’s OB truck plus a number of vehicles for producing the audio sub mix, the international sound feed, and video footage (including 3-D video). Four NEXUS Base Devices populated with digital and analogue microphone-input boards were used to input the signals from the arena, the stadium announcements, the stadium atmosphere, and the outputs from three sports commentators.
Digital Innovation

From its formation in 1993, Stage Tec Entwicklungsgesellschaft für professionelle Audiotechnik mbH has specialised in the design of digital audio technology. Since then it has set new benchmarks, thanks to continuous research and development.

Milestones on the creative path have been

- the compact and intuitive ON AIR 24 broadcast mixer for self-op use in 2010,
- the AURUS (2002), AURATUS (2008), and CRESCENDO (2009) direct-access consoles offering different features sets for dissimilar applications,
- the CANTUS digital mixing console (1994),
- NEXUS (1993) – the first digital audio router with consistent optical networking and a distributed concept.

Stage Tec has become a world-leading vendor of professional audio systems. The bright new building on the bank of the River Spree in Berlin, houses the R&D department as well as production facilities with multiple commissioning rooms and a dedicated recording studio. Supported by a powerful partner, 13 graduate engineers founded the business as some kind of employee-owned company. All of them active partners in the company still today, constantly advancing innovation and efficiency.

Stage Tec imposes stringent standards on its hardware designs. All modules must be compact and lightweight with ultra-low power consumption and, at the same time, must have impeccable sound quality. Only then can you design lightweight, intelligent and flexible products like AURUS, CRESCENDO, AURATUS, or NEXUS.

At Stage Tec, the software and hardware domains are inextricably linked. Highly optimised hardware demands purpose-built software solutions. Stage Tec relies on its own skills and expertise. The entire software, the algorithms employed in the individual DSP building blocks and the control programs of the NEXUS and the consoles with their graphical user interfaces, all come from the in-house software-development department.

Whether NEXUS, NEXUS STAR, TrueMatch RMC, AURUS, CRESCENDO, or AURATUS, every Stage Tec product has been a trend-setter. With CANTUS (Stage Tec’s very first console) and NEXUS, the consistent separation between mixing and the I/O matrix is innovative and allows efficient decentralised systems to be constructed. The AURUS, CRESCENDO, and AURATUS consoles extend the family tree and excel with their unique operating concept: instant access to all key parameters. Something of a novelty in the digital world!

Superlative sound quality and ultimate reliability in professional use is the norm for all Stage Tec products. 40-bit floating-point arithmetic and 32-bit TrueMatch converters are standard features along with automatic self-test routines, hot-swap capable components, redundant power-supply units and fibre-optic lines. Distributed intelligence confers further security by ensuring there is no single point of failure that would disable the complete system.

Furthermore, all Stage Tec products are extremely compact, lightweight, and power-saving thanks to state-of-the-art design and the use of modern, innovative materials. These criteria are of considerable importance in many fields, for example in OB trucks.