

STAGES

Broadcast, Theatre, Film and more



Small is Beautiful: New Small-Format Console AURATUS

So Far And Yet So Near: HR Regionet with NEXUS

In the Service of Music: Berliner Philharmonie Hall with AURUS



What's in a Name?

Today, not many people are familiar with the word the ancient Romans used to describe the concepts of tone, sound, and even singing. Correct! It's CANTUS, which was borrowed for the name of STAGETEC's first mixing console. NEXUS is also Latin in origin, meaning approximately the same as *connection*. Could you think of a better name for a digital audio router?

AURUS, the name of the large scale digital console introduced in 2002, conflates the concepts of *aurum* - gold and *auris* - ear into the 'Golden Ear' and epitomizes the embodiment of this ideal into an engineering masterpiece suitable for the most discerning audio engineer.

STAGETEC's latest compact mixing console is called AURATUS – a name that immediately suggests many different connotations. AURATUS' orientation as an economical yet powerful design is a perfect match for the Latin *auratus* – gilded. The resemblance to the name AURUS emphasizes the flawless audio attributes and legendary direct-access handling of AURATUS. Finally, AURATUS has a particular charisma, an aura if you will, that makes everyday work with this console a real pleasure.

Even more interesting than the names are the products themselves! On the following pages, you can read about notable installations and learn more about our new baby that, with all its qualities and genealogy is a worthy addition to the STAGETEC dynasty.



Dr. Helmut Jahne



Dipl. Ing. Wolfgang Salzbrenner



Dr. Klaus-Peter Scholz

The Executive Directors of the STAGETEC Entwicklungsgesellschaft



The Cover Photo

The Alexandrinsky Theatre in St. Petersburg, Russia, radiates with a rare light. The sumptuous auditorium, which was extensively renovated according to the original design from the year 1832, is luxuriously appointed with red velvet and gold leaf.

Construction work and technical changes were so extensive that the Alexandrinsky, the oldest theatre in Russia, was closed for two years. However, thanks to this, the building could reopen early in 2007 in its full glory with pristine sound. In the main auditorium a very unusual location was chosen for the new AURUS. It is sited directly above the Tsar's box with a marvellous view over the meticulously refurbished stage. Without doubt, this is the most beautifully situated AURUS in the world.

AURUS Workplace at the renovated
Alexandrinsky Theatre



■	Short Stories	4
■	Small is Beautiful New Small-Format Flyweight Console with Heavyweight Performance	6
■	Bi-Media Control Rooms with AURATUS First AURATUS Installations at WDR Regional Studio in Siegen	8
■	So Far And Yet So Near HR Regionet Relies on Teaming NEXUS with IT	10
■	The Elegant Solution AURUS and NEXUS for Sound Reinforcement with Finesse	12
■	As Clear as Crystal Leading edge Convention Centre with NEXUS	14
■	In the Service of Music The Imposing AURUS Installation at the Berliner Philharmonie Hall	16
■	Worldwide with Heritage: The STAGETEC Success Story	19

Inside STAGES:

Publisher: STAGETEC Entwicklungsgesellschaft für professionelle Audiotechnik mbH,
Tabbertstrasse 10, D-12459 Berlin, Germany

Editorial: Medientechnik Presseservice, Köln;

English Editorial: Rob James, Bognor Regis, UK

Photography: Architektenbüro gmp, Hamburg; BFE, Mainz; Euroscena, Mailand; Dieter Kahlen,
Neukirchen-Vluyn; Medien Denkwerk Jahreiß, Hohenberg; Alexander Nemes, Köln; SALZBRENNER
STAGETEC MEDIAGROUP, Buttenheim; SALZBRENNER STAGETEC MEDIAGROUP, Kuala Lumpur;
Siemens Press Photo

Design, Litho: art & craft [design worx], Köln

Printing: Cede Druck, Köln

OB-Truck Village under AURUS Control

Some people refer to these vehicles as 'The world's biggest Outside Broadcast Unit'. One could also call them an OB-truck village. These new TV trucks, commissioned by the Commercial TV-production company Euroscena, based in Milan and Rome, can create a mobile production centre with unprecedented capabilities, especially when used in combination. Euroscena contracted Thomson/Grass Valley to construct a set of two large OB trucks plus another vehicle as tender and power-supply. The ensemble named 'Mobile Production Centre 34 High Definition' or MPC 34 HD for short, hit the road early in 2007. Space in OB trucks is usually at a premium. Not so with this fleet. When parked up, the main vehicle, 34A, can be enormously enlarged along its overall length using extensions on both sides. It then comprises two production control rooms, an AURUS audio control room, VTR and slomo workspaces, a camera control room and even a comfortable 25 m² VIP zone. The second vehicle, 34B, offers an extra facility. This is a Chromakey equipped 30 m² TV-production studio with a retractable side wall. It also offers a secondary production control



Short Stories

NEXUS and AURUS at Pacific Quay

Situated in the Govan district on the banks of the river Clyde and dominated by the 127 m Glasgow Tower, the former Princes dock is thriving once again. Now named Pacific Quay it looks set to become the future centre of media activity in Scotland. BBC Scotland is moving in to its first purpose-built Glasgow headquarters at Pacific Quay. The brand new 34,000 m² building features a structured wiring system, including optical fibres, an ideal environment for NEXUS and AURUS systems from STAGETEC.

Lead managed by Siemens a 56-fader AURUS has been installed in the HDTV studio control room for surround mixing. Together with the associated NEXUS STAR, this control room and studio complex has a total of five NEXUS base devices. A second 40-fader AURUS is installed in Studio C with its STAR and three NEXUS Base Devices. The building will contain many flexible spaces and exciting technology to support programme production.

The STAGETEC AURUS and NEXUS system allows mobile Base Devices to be deployed in a wide variety of locations within the building using the structured wiring. As many previous STAGETEC clients have appreciated, simultaneous direct access to many facilities, EQ, auxes and so on, is vital during live broadcasts.

The AURUS control surface behaves like a conventional analogue sound desk. There is direct access to a lot of facilities immediately on the channel strip, whilst under the hood, you have all the complexity and flexibility of a digital console and of course the impeccable sound.



KSC Manager for NEXUS

tv productioncenter Zurich, an important user of NEXUS audio routers, expressed the desire for a supervisor control system for their main switching room. The unique controller would be able to work with any type of router and should be event-based and object oriented. This was the principle idea behind the so-called KSC Manager, which is now offered as an independent product by the BFE company based in Mainz. Thanks to its multiple control interfaces, Nexus has always been able to be controlled by the KSC manager. Since 2007, BFE and STAGETEC are offering yet more: a real integration of NEXUS control into the KSC Manager. A specially developed NEXUS Server receives all the instructions about planned audio connections from KSC Manager and implements these at exactly the intended moment by setting NEXUS crosspoints. So, the KSC manager database only needs to communicate with the NEXUS Server.

All of the time-critical operations are executed directly by NEXUS Server. The advantage is that changes can be executed extremely rapidly regardless of the number of simultaneous switching operations. Further, the comprehensive NEXUS diagnostic tools can be used to create a detailed service log, providing significant assistance in controlling the entire system.

NEXUS Server will be delivered to two customers this year. Radio Bremen will soon open its brand-new digital broadcasting house with a NEXUS STAR main switching room and in the second half of the year, HR in Frankfurt plans to expand its NEXUS main switching room with NEXUS STARS and a NEXUS Server combined with KSC Manager.





room, a small AURUS audio-control room, and even toilets, which may well be another first in mobile production! When parked alongside each other a roofed passageway can connect the two trucks. Thanks to its diesel generators the tender can feed this mobile production island with sufficient power to operate completely independent of the mains. The choice of AURUS and NEXUS benefits the sound in many ways. Regardless of its power and the 1,272 sources and 1,024 destinations, this ultra-compact system requires just seven Base Devices occupying only 39 rack units in height. Another key factor was the AURUS' direct access user interface and handy multichannel mixing capabilities. Euroscena uses this set-up for producing material in formats up to 7.1, which then can be Dolby E encoded and routed via NEXUS.

Euroscena has owned a big digital OB vehicle for TV productions with onboard STAGETEC technology since May 2004. This has been used at countless major events during recent years. The NEXUS optical network as well as the totally reliable CANTUS main and slave consoles blazed a trail for AURUS and NEXUS in this unparalleled new OB set-up.



Used individually or in combination, Euroscena's MPC vehicles always rely on STAGETEC AURUS and NEXUS audio technology

XMIC+ No Need for a splitter

A compact form factor combining board size reduction with increased component density is characteristic of the new NEXUS boards that were introduced in 2006. Highlight of this new series is the XMIC+, a microphone input board for NEXUS audio networks and STAGETEC mixing-console systems. In comparison with its predecessor, the XMAD board, the XMIC+ offers twice the number of inputs.

The tiny board (3U x 2 cm width) enables up to eight unprocessed microphone signals to be converted to 28-bit digital signals. Thanks to this high resolution, analogue preamplification is no longer required – a feature that had already distinguished the XMIC+'s predecessors. The new board also handles higher levels up to 24 dBu and can consequently also be used to input line level signals. In addition, its linearity was still further improved.

The XMIC+ provides even more benefits. For live applications where the signals need to be available on multiple consoles, for example in sound reinforcement and recording, a digital splitter is implemented on the board itself. Each input signal can be distributed to a maximum of four separate paths with independent gain and subsonic filter settings! Hence, the boards can be operated without the external splitters and analogue microphone preamps required by conventional equipment.

State-of-the-Art Equipment

Korea's biggest and most modern centre of culture and arts, the newly renovated Sejong Centre in Seoul, has installed a NEXUS audio network and an AURUS mixing system. Established in 1978, Sejong Centre had been radically redesigned for the millennium and has since included a trade show and convention centre and a theatre with large and small halls. Various historic vernacular houses were integrated into the scheme to preserve the cultural heritage.

In July 2006, the large theatre hall's control room was fundamentally reconstructed and was equipped with a new STAGETEC audio system. Within just three days, a new 48-fader AURUS including a NEXUS was installed and the staff trained sufficiently to produce the first show with the new system.

AURUS is used in the large hall as a recording console for classical concerts as well as a sound reinforcement console, for example, for theatre performances. NEXUS is used at the Sejong Center not only as an I/O system for the AURUS but also for inter-area networking and format conversion.

The technical equipment outside the control room at the Sejong Center is also impressive. In the large hall LCD displays in many of the seat backs, used to display subtitles and other information, are just one obvious example of this.





Small Is Beautiful

New Small-Format Flyweight Console with Heavyweight Performance

For more than twelve years, STAGETEC digital consoles have been counted amongst the elite in the field. Flexible and versatile, the legendary sound quality of these consoles makes them superior in almost any application. However, sometimes CANTUS, AURUS and CINETRA systems have just been too big. In contrast, AURATUS, the latest arrival from Berlin, is both very small and very powerful. **AURATUS really is a mighty baby**

The idea of a small production console design has been maturing for quite some time at STAGETEC. Such a console should be compact and truly intuitive in use. These two requirements posed no real obstacle to the STAGETEC designers. The third imperative was much harder to meet. The new console was to be offered at an unprecedented price. The developers had found an elegant solution to this problem. They planned to distill all the electronics required for console audio processing onto a single narrow board within a standard NEXUS Base Device.

Only a few years ago, such extreme miniaturisation would have been impossible without compromising functionality. For this reason STAGETEC was hesitant initially about starting to implement the plan. Only the tiny packaging and incredible power of modern state-of-the-art processors allowed the engineers to realise their dream. The result is totally convincing. AURATUS is a fully-grown mixing console using miniaturised hardware with similarly miniaturised costs.

Quart in a Pint Pot

It is not mere coincidence that the name is reminiscent of AURUS. AURUS also co-operates with NEXUS but in contrast to AURATUS, a NEXUS STAR is required to accommodate the AURUS processor boards. Only a NEXUS STAR with its ultrafast backplane bus offers access to the multitude of audio signals a large mixing console system requires. This is quite different with AURATUS. A standard Base Device housing the console inputs and outputs and also providing the connection to an existing NEXUS audio network is far more suitable. This is once again a more cost-effective solution when compared with a NEXUS STAR installation.

With NEXUS as the I/O unit and routing system combined with the STAGETEC signal processing, there remains one outstanding issue, the superlative sound quality. In this regard, there are no compromises with AURATUS.

Clear and Simple

In any case, a comparatively low price was not the sole objective. Possible applications for a small console had been considered carefully before the development started. It was found that small desks are frequently used in fixed workflows, in fact more often than big consoles. Just consider a broadcast console in a radio station. The guest microphones, the CAR (Computer Aided Radio) system and a few other sources are permanently assigned to the console's channels.

These source assignments are normally fixed in order to ensure fast and accurate operation. One consequence of this is that a predefined internal bus layout is acceptable and even desirable in a digital console aimed at this target audience. The user can work with it immediately without the necessity of configuring it first.

Such a fixed structure also offers great benefits from the technical point of view since it allows for improved hardware optimisation. This enables a single board solution to be implemented, which provides 32 input channels, eight groups, one stereo sum and one 5.1 sum, eight aux paths, and eight mix-minus sums. Precisely the configuration STAGETEC had established as the perfect console for this market at a previous research stage in the project.

Despite the fixed architecture, AURATUS provides a degree of configurability. This feature is intended to allow for occasional adaptations to daily requirements rather than continually changing operational configurations. This is also why AURATUS no longer requires an internal configuration computer, unlike the CANTUS, CINETRA, or the AURUS. The maintenance staff pre-programme the initial configuration offline on any computer and subsequently upload the settings to the AURATUS via a flash card.

Configurable items include, for example, the four operating layers of the console, the I/O routing including the source names, and many of the logic and control functions integrated into the console. Naturally,



the NEXUS sources and destinations can be routed during operation via a NEXUS control computer or with dedicated control panels.

The Small Giant

The AURATUS control surface is not particularly small when compared to other compact mixing consoles available on the market. On the contrary, at first sight, it looks quite like an AURUS console because it largely echoes the AURUS design. However, the AURATUS channel strip offers just six of the familiar dual encoders instead of the eleven on the AURUS. This reduces the control surface depth to just 540 mm. The console height was also kept as low as possible by constructing the meter bridge from ultra wide 16:9 screens.

Just like any other STAGETEC console, the AURATUS has a modular layout composed of hardware panels. A panel unit comprises eight control strips, allowing for three different console versions with 8, 16, or 24 strips plus an additional master section. The console's power consumption is ultra-low at less than 100 watts for the largest version. This saves a considerable amount of energy and renders obsolete the fans required by so many other digital consoles. The AURATUS plug-in board for the NEXUS also excels with average power consumption of no more than 8 watts!

RJ 45 Revisited

When it comes to classifying digital mixing consoles, it's not only size but also the basic architecture that matters. Some consoles accommodate all the processing and audio connections inside the control surface enclosure. These are often heavy and unwieldy



examples at the lower end of the market. Another category employs a split concept where the console is simply a remote control for the actual audio processor. With its processor board located in a NEXUS Base Device, AURATUS belongs to this family. The console is connected to the processor board by conventional RJ45 plugs with one single network cable! This cable carries not only the console control data but also the audio from the talkback microphone, the headphone signals, the monitor mix and eight AES/EBU signals for the goniometer. IT network cabling was chosen both for its attractive price and more than adequate functionality. It also further simplifies on-site installation.

Foresight

All functions were optimised for clarity and rapid access. In the future the console will also be used in self-op situations by the presenters themselves rather than by sound engineers. Technically proficient users get their money's worth too, since the console offers a lot of features. The disposition of master/slave groups and mix-minus feeds are good examples. These functions are frequently somewhat complex on digital consoles. In AURATUS, such assignments are made quickly and easily on the channel strip itself. All channel settings including the routing are clearly displayed on the meter bridge.

Each input channel features a compressor and an expander/gate, four bell filters plus high-pass and low-pass. All these channel functions are operated by the dual encoders on the channel strip, or even more conveniently from the Master section. To improve clarity, small TFT screens were integrated into the Master section. Each TFT is dedicated to a specific function, for example, the EQ or dynamics parameters of the selected channel. A nice detail is the display of the resulting filter curve with the individual filter band curves overlaid in different colours.

An innovative OLED display has been integrated into each channel strip, directly above the fader. This is a very clear high contrast display made of organic light emitting diodes which offer excellent legibility even when viewed at an acute angle from the side. These displays show the name of the channel source as well as the name of the alternative background layer channel. The new OLED displays may well be a decisive factor for many users, because the screen raster is so fine that even non-Latin character sets will be displayable in the future.

Perfect Partner for Broadcast

Many will consider the AURATUS principally as a broadcast console and this is mostly because of its very clear displays and special

functions. For example, the fader-on functionality was a request of the first AURATUS user, the WDR broadcasting service in Köln. At the WDR it is common practice to open a fader to 0 dB on an on-air console by pressing a button instead of opening it manually.

Two timers, which can count up or count down, extensive 'ready' and 'go' cue light signalling and many audio-follows-video functions complement the broadcast orientation. The latter, for example, offers an elegant

way of switching camera and ambient microphones automatically when broadcasting a sports event with many cameras and fast cuts.



For this purpose, the tally light signal of the respective camera is used as a trigger for the expander/gate function on the AURATUS channel

Bi-Media Control Rooms with AURATUS

First AURATUS installations at WDR Regional Studio in Siegen

With major projects, such as the development of a new digital console, word gets around fast. This is also why STAGETEC products are always found in customer installations almost immediately after they are publicly announced. In fact, the design of one or other specific function is often based on early feedback from these customers, as was the case, for example, with the CINETRA installation at *Geyer Berlin*.

In a way, this is also true for the AURATUS. While the development was not yet fully completed, the WDR broadcasting service opted to use the new console, including a NEXUS audio network, at their regional studios.

AURUS or AURATUS?

The schedule for the studio build had already been fixed and with this the date of the first AURATUS installation as well. The first of three regional sites to receive completely new technical equipment installed by the BFE system vendor as general contractor in 2007 was the Siegen studio. In February the first consoles were installed in a new building.

On the other hand, it has always been one of STAGETEC's principles to supply customers only with mature and thoroughly tested products. In order to ensure this was the case in this instance, regardless of the tight deadline, a clever trick was employed. The first three AURATUS consoles delivered to the Siegen studio were manufactured as a special edition. The new AURATUS hardware equipped with proven AURUS processing technology. This was a real advantage to both parties since the reliability of the AURUS audio processors provided a high level of operational security at the WDR studio while STAGETEC gained extra time to fine tune the new AURATUS processor board. The other studios in Bonn and Duisburg will commission their new facilities later this year. At that time the AURUS hardware at the three Siegen studios will be replaced with AURATUS boards, followed by the AURATUS installations at the remaining eight regional WDR locations.

3-in-1

The implementation of new technology has not been WDR's only consideration when planning the move to a new building. Rather, there

is a new overall concept, the idea of the tri-media studio. TV, radio, and web content will be created by the same editors and be produced by the same crew of technicians. As far as the content is concerned, this is an efficient method of bundling the expertise of the present editorial and technical staff to produce programming for all three types of media, especially at smaller sites.

However, a tri-media studio requires different systems compared with the needs of traditional TV, radio, or web studios. The only logical step was to build a studio capable of serving all three types of media. For example, an interview might be broadcast on TV and also on radio. Moreover, a feature might initially be put online; later, due to the level of audience interest, it may end up as a TV report. All this can only be achieved if the technical equipment offers the essential prerequisites. Not forgetting that the studio also has to be straightforward to operate. After all, this new concept demands higher competencies from the technicians since they need to be familiar with all three media types.

Flexible Studio Concept

So, what is the solution to the problem? Constructing three TV studios including the control rooms and then using just the audio for radio broadcasts would be technically possible but is not really advisable. Expensive TV production systems, cameras, and the comparatively big space in a TV studio would rarely be required. Therefore, dedicating the rooms would be sensible and not only for financial reasons. In Siegen, WDR established a TV studio and a radio studio, both including a control room; however, the assignments of studios to control rooms is not fixed. The radio studio, which is actually a useful large talks studio, can also be used in combination with a third control room, the so-called bi-media BIM control room. For this purpose the studio table, including all the installed gear can be revolved, permitting eye contact through the BIM control-room window as well. A small additional voice cubicle, which is normally allocated to the BIM control room, is available for dubbing or news reading tasks and can be assigned to any of the three control rooms and also to four other video editing rooms.

strip. If the user has set up a suitable attack time and a relatively long release time, the automated switch will create a cross-fade to the microphone corresponding to the respective video signal. Adjusting threshold settings allows the microphone channels to be kept open at a low level, so the ambient sound remains more or less constant when automatically switching between several camera microphones. There is a further benefit to using this function. The faders can still be used to manually adjust the channel level despite the automated function.

AURATUS leaves users a great deal of freedom to apply their personal working methods. For example, each edition of a programme can be mixed using a specially configured AURATUS project. Such projects can be loaded easily at the press of a button and adjust the console set-up to suit the specific programme.

Within a project it is also possible to recall other predefined settings, namely by loading one of the possible 999 snapshots, a familiar concept from theatre applications. With snapshots, even the most complex broadcasting scenarios, for example, difficult multi location

conferences or chat shows with several contributors can be prepared and executed perfectly.

A Question of Time

STAGETEC's mighty new baby is already attracting a huge amount of interest from prospective purchasers. Even though the development programme is not yet complete, three consoles have already been installed as special editions. Delivery of the first real production units is scheduled to follow in late 2007.

Nonetheless, it is already quite clear that the AURATUS has all the necessary ingredients to become a real classic. That should come as no great surprise since the console is not only imbued with the essence of audio quality and steeped in STAGETEC expertise, but is also inspired by the latin word *aura*. Suggesting the value and permanence of gold, *aura* also echoes *aural*, of hearing, and the promise of intangible but desirable attributes such as charisma. In short, AURATUS.



The choice of rooms is important

Of course, the audio network also reflects this flexibility. Each of the three control rooms is equipped with a 24-fader AURATUS and accesses a common NEXUS network consisting of five Base Devices. Each control room is assigned one Base Device of its own, which will also accommodate the AURATUS processor board. The remaining Base Devices are used as network nodes and are therefore linked to all other Base Devices. In addition, they provide interfaces to all the important station signals such as external lines and codecs.

So, what happens when the radio studio is assigned to the BIM control room? During normal operation, the studio microphones are connected to the XMIC boards in the NEXUS in the radio control room and are routed to the corresponding AURATUS. As soon as the radio studio is assigned to the BIM control room, those sources as well as a number of return paths are automatically delegated to the AURATUS in the BIM control room. Red-light and yellow signalling control is also reassigned. Thanks to the NEXUS' extensive logic operations, this is possible without external equipment, only triggered in this case from a central studio controller from BFE.

The biggest problem when programming the logic operations was that this entirely new concept of variable control-room and studio utilisation required a precise definition of the workflows. But, since the approach at WDR is an example of true pioneering spirit, there is no previous experience to draw on. Nevertheless, the broadcaster's audacity is kept within reasonable bounds. Based on their technical concept and the combination of NEXUS and AURATUS, they have created a solution that, due to its flexibility, allows for virtually any type of utilization in the future.





So Far And Yet So Near

HR Regionet Relies on Teaming NEXUS with IT

German radio stations have entered a new stage in the digital revolution. After the introduction of small digital production islands and their subsequent interconnection, an all-embracing network of the separate sites is now overdue. The result is a **State-wide NEXUS network**

For many years, Germany's State broadcasting corporations have exchanged signals extensively between their main broadcasting centres and the associated regional studios. This has been driven even further forward by the increased use of digital technology. In the past, dedicated individual technical solutions had been utilized for single audio or video signals, for telephone, network and control data. Over the years this has grown into a confusing and inefficient hotchpotch of physical and logical interconnections. Changing this situation is now essential. To make full use of emerging technologies, all these services should be bundled together and implemented by just one service provider with a single consistent technology.

Rainbow NEXUS

The first German broadcaster to institute such a service bundle is Hessischer Rundfunk (HR). Their Regionet project connects five external sites to the main broadcasting complex located in Frankfurt. HR developed its own creative interpretation on the bundling theme and finally settled on using Dark Fibre¹ together with a CWDM² system. One of the spectral colours of this optical multiplex technique has been reserved for transmitting SDI, intercom signals, and Gigabit Ethernet for file transfer. Two other colours will be used for mass storage networking at a later stage of the project. Finally, the fourth colour serves exclusively for interconnecting all the sites' NEXUS audio routers.

Quantity and Quality

HR radio is already well acquainted with NEXUS since they had replaced their analogue audio system at the central control room with a NEXUS router in 1999. All production studios and several regional sites already use NEXUS. The new Regionet combines these separate NEXUS islands into a total network for HR, covering all main sites and satellite locations. This is unprecedented in the world of radio broadcasting! Consider this: Normally, audio connections between

different locations are made either using expensive 2-wire or 4-wire leased lines or nowadays more frequently via low-cost but data reduced audio codec lines. However, with this second approach, quality suffers which is in glaring contrast to the ever higher quality standards in radio production.

If all the local NEXUS audio routers at the various sites are networked, then these imperfections in programme exchange disappear. In fact, HR's Regionet now offers four linear AES/EBU lines at each site compared with the previous data reduced single codec line. Thus, the NEXUS network not only offers more choice and greater flexibility to the users of HR's Regionet but also enhanced audio quality.

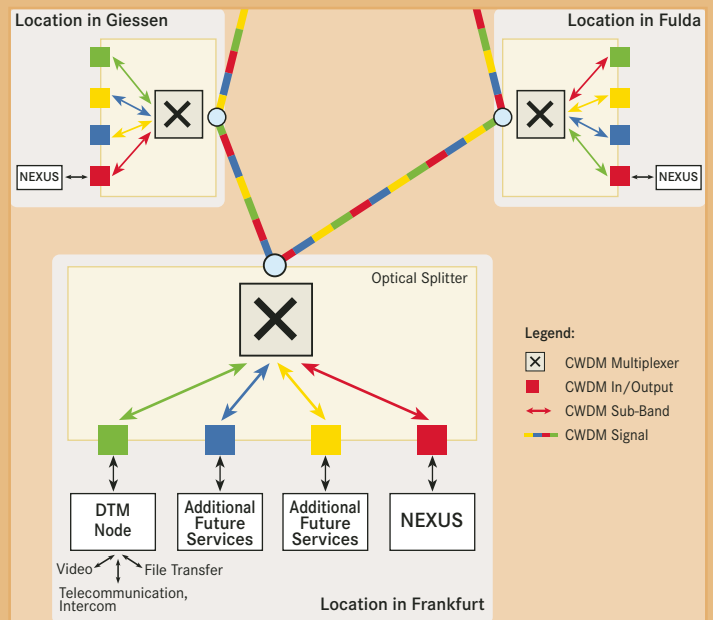
Shrinking the Distances

One of the keys to the Regionet project's success is the fast optical lines between Base Devices installed great distances apart. Using NEXUS and Dark Fibre, an audio signal can be transferred within just 3.5 ms from the Frankfurt broadcasting complex to the most distant site at Kassel and back. When compared with the 13 ms required for the same transmission using audio codecs, this represents a considerable improvement! The latency on this signal run, with an overall length of about 400 kilometres (250 miles), is so small that it is now possible to produce problem free live interviews or even live music performances involving multiple sites. So the low latency Regionet solution featuring NEXUS and Dark Fibre is also opening up entirely new applications. A welcome side effect at no extra cost! HR has introduced a further innovation by utilizing the option of distributing the digital clock through the NEXUS to all the locations. This results in all NEXUS Base Devices operating in sync to the same digital clock. In each regional studio installation, NEXUS now acts as word clock master. With this strategy, HR's entire digital audio system at all locations and regional studios run in sync. There is no requirement for sample rate converters at the source and destination points.

CWDM on the NEXUS

CWDM connectivity on a NEXUS network is no novelty. Experience had already been gained in cooperation with *tv productioncenter zürich* during the preparations for the Ski World-Cup 2002 in St. Moritz. Whilst at that time, external transponders were required, the current generation of NEXUS fibre-optic boards support CWDM technology directly. This means that the NEXUS fibre optic interfaces work with a selection of the frequency bands used for CWDM transmissions to enable a single fibre optic line to be shared with other services. This elegant solution would have saved the cost of an external converter for HR's Regionet. However, this was not part of the initial project because HR, as a long term NEXUS user, consequently already owned numerous legacy fibre optic modules which are now incorporated into the Regionet. These older NEXUS modules, in the common broadband version, are good for the budget since they were purchased several years ago.

CWDM transmission over Dark Fibre at HR (schematic)



Metering for All

Since the Regionet project encompasses a total of six sites each with four AES/EBU lines, many incoming and outgoing lines require monitoring. NEXUS has long supported this function with its multimeter display which might have been applicable to the Regionet. However, HR requires one significant restriction on their set-up: While multiple users must be able to view the multimeters, by no means all Regionet users are allowed access to change settings and crosspoints using the NEXUS Matrix software.

This access rights dilemma is remedied by a new multimeter application running separately from the NEXUS Matrix programme. Up to 48 channels can be monitored simultaneously with the new MultiMet.exe software which enables metered sources and destinations to be freely selected by each user. The display colours are configurable, and the window is scalable up to full-screen view. Thus the metering can be adapted to suit the individual requirements of the local studios. Unlike the classic Matrix 5 metering signal parameters such as the input gain cannot be altered.

The Word is Mightier Than The Code

In a large audio network, system monitoring has an even more important role than in a small installation. Therefore, the NEXUS internal monitoring of all modules is a real benefit. When a module such as a NEXUS Base Device power supply unit fails, a message containing precise error information will be sent. But there is more to it than that. The user often also wishes to monitor external equipment. For example, with HR Regionet, the AES/EBU emergency fall-back switches are constantly monitored. In case of failure, the watchdogs used for this purpose close a relay contact at the input of a NEXUS XRI board, triggering the NEXUS Logic Control sub programme to generate an error message.

Normally this message contains an automatically generated numerical error code. However, a different sub-routine can now be employed to convert this cryptic code into easily understandable text. In the HR Regionet system, for example, the error code, "Error No. 4711" is translated into the message "Fulda LTG1 path: No signal". This function

can also be used with ideograms and foreign characters from almost any language in the world.

Clockwise or Widdershins

NEXUS Logic Control is also used for other security functions on the Regionet. This particularly applies to monitoring optical lines. Due to the length of the leased Dark Fibre lines the possibility always exists that a fibre linking two cities could fail. In order to minimize the effects of a line failure, Regionet is based on a figure-of-eight shaped topology between the cities, with the Frankfurt broadcasting centre at the intersection of the eight. Thanks to this topology, there are always at least two network paths available from any one site to any other – clockwise or anticlockwise.

If a section of the Dark Fibre path were to fail, this would be recognized immediately by NEXUS Logic Control. The software at HR's Regionet is configured in such a way that a failure triggers a remote controlled and fully automated reconfiguration of all NEXUS crosspoints - in brief, a status reload will be performed. By doing this NEXUS automatically chooses the alternative route around the loop that is not affected by the failure.

Team Player

At the present stage in the project, the audio line assignments are static, i.e. like permanent lines leased from an external provider. Currently, the main benefit of using the new NEXUS rather than the old strategy is the increased number of high quality audio connections. In principle, a dynamic mode for Regionet is also possible where the connectivity is used differently as required. For example, there are plans for allocating a pool of sources to the editorial sites which users can freely select from. This can be the stock exchange news or the weather forecast for instance.

The conceptual details of this visionary deployment are still being worked out in cooperation with the editorial departments since they will be the actual users. This is a great environment for a technology offering total creative freedom for producing programmes in the future - thanks to Regionet and NEXUS.

Glossary:

¹ Dark Fibre:

An optical fibre, or a CWDM band on an external provider's fibre, where the customers themselves must take care of the light on the line.

² CWDM (Coarse Wavelength Division Multiplex)

An optical frequency-division multiplex technique used for transferring data via optical lines. It uses light signals composed of various spectral colours for transmission over a single optical-fibre cable.





The Elegant Solution

AURUS and NEXUS for Sound Reinforcement with Finesse

Many people in professional audio see sound reinforcement as an inconvenient activity. It is obviously far easier to turn up in a familiar OB truck with everything perfectly prepared for a TV sound mix than to have to set up speakers and install a pile of gear! However, sound reinforcement can be a technically challenging and creatively exciting domain – which is demonstrated by this feature about professional sound reinforcement supporting a TV show recording

How do you approach sound reinforcement for a TV show to achieve the best result? A simple question, yet with many possible answers. The experts at SALZBRENNER STAGETEC MEDIAGROUP designed their own solution back in 2003. It all started when they were asked to support a Carnival show for the Bayerischer Rundfunk, BR broadcasting service. Planning the system is just the beginning. When the BR televised the Carnival show in the town hall of Memmingen, a small city in the German region of Swabia, the distributed system comprised 14 speakers installed right under the roof of the hall. Arranged as seven individually addressable loops these speakers reproduced a mix of all the various artists and the Carnival Committee's radio microphones. This approach enabled the overall level to be kept low whilst optimising intelligibility thanks to the proximity of the loudspeakers to the audience. Another benefit of this distributed set-up became obvious whenever the actors left the stage and entered the hall. Whenever there was the risk of feedback, the level of the relevant loop could be reduced without adversely affecting intelligibility or the overall volume in the hall.

A second independent PA system was installed to amplify the band in the conventional manner. Thus, localization of the music was not disturbed, because at all times the instruments' direct sound and the amplified signals were clearly emanating from the stage. Apart from the fidelity advantages, this dual system concept also provides a high degree of reliability.

In Groups

Seven reinforcement loops plus an FOH mix – the audio console must handle all this in a convenient manner. No problem for the AURUS, where operational convenience is a given! For this production, MEDIAGROUP's two sound reinforcement audio engineers configured the portable AURUS console in such a way that it provided 16 group buses. The first use for these buses was to create submixes of

instrument groups in the traditional fashion. For example, the brass section was combined into a group that could then be controlled by a single fader. These subgroups, plus the remaining spot microphones, were subsequently routed to the groups feeding the various speaker loops. Incidentally, the option of re-routing a group output to another group cannot be taken for granted on mixing consoles! However, with the extensively configurable AURUS, sub-grouping presents no difficulties whatsoever.

Which Bus to Take?

Obviously, master buses could have been used as outputs to the speaker loops instead of groups. With AURUS, the difference between these two bus types lies in the extent of processing available. A group offers full processing including filtering, EQ, dynamics and delay, while a master bus has no signal processing capabilities. On the other hand, the master bus requires less DSP power. Since the speaker signals required individual filtering and delay for time-alignment, the AURUS project created for this job utilised group buses instead of mix buses for this purpose.

On analogue desks, aux outs are often used for routing signals to separate speaker loops. The AURUS also supports this approach. However, group control strips are freely assignable on the control surface. This makes for better clarity and is far more convenient to operate.

Well Prepared

With shows of this order of magnitude, you have to take into account a longer rehearsal time. In this case, two days were allotted to install the system plus two rehearsal days. This was plenty of time to label all the band microphones properly, each of the 24 wireless microphones, and all other sources on the NEXUS/AURUS network. The individual names then appeared on the channel-strip displays and when setting



up the routing on the NEXUS, thus significantly simplifying operation during the rehearsals.

The engineers also programmed an individual snapshot for each scene of the show, a procedure that is also frequently used in theatres.

Thanks to new editing possibilities for snapshots, this required minimal programming effort during the rehearsals while considerably simplifying the subsequent performance. At the end of the rehearsals, 20 such snapshots had been stored in the AURUS. This clearly illustrates why the AURUS, with a much more compact control surface compared with conventional desks, is more than adequate for such a task. Thus AURUS takes up less space during transport and in the hall while providing improved clarity. The sound-reinforcement team in Memmingen used a console with 32 faders that allowed them to mix the 60 or so signals quite comfortably using layers and snapshots. The topmost layer of the eight in each snapshot presented only the signals required at that moment. All other signals were hidden on lower layers. Each snapshot changed the assignments in the layers to show exactly what the scene required.

Live is Different

As is customary with German Carnival shows, the band plays short pieces and interludes time and again. Therefore the band microphones were statically assigned to surface faders, which never changed, thus allowing instant access. This simplified fast changes to the music mix. The stand up comedians and solo actors wireless microphones were however, handled in a completely different way. For each scene, only artistes performing currently were assigned to a fader on the top layer of the AURUS.

The prerequisite for this approach was the rather novel Isolate facility. As quite often happens during live performances, some of the musicians played much louder 'on the night' than during the rehearsals. These levels were manually lowered on the AURUS – but would have been subsequently overwritten by the now inappropriate rehearsal levels when loading the subsequent snapshot. Using the Isolate function, the signals in question were effectively removed from

the snapshot, so the updated settings remained intact after loading a snapshot.

No Multicore

Sound reinforcement was just one of many technologies needed to produce the show. The lighting control desk, used to create spectacular effects, was situated next to the PA console. Crucially, thyristor buzz and interference simply weren't an issue since the NEXUS audio network installed for sound reinforcement was based entirely on optical fibre, which is interference proof. A robust dual-core fibre cable connected the NEXUS stage box to another Base Device near the console. Conventional copper wiring was only used on stage and for the speaker lines.

It would even have been possible to do without traditional microphone splitters since the BR OB truck also uses NEXUS plus a CANTUS console. Thus, it would have been sufficient to run MADI lines from the NEXUS on the stage to the sound-reinforcement system or the OB truck. Another option would have been to use the split function of the new XMIC+ microphone input board. However, as these were not available at the time the engineers relied on the standard approach. The OB-truck crew set up their own dedicated on-stage NEXUS and used an external splitter to connect all the microphones to each of the systems.

In the Hall or on the Sofa

During the show, Memmingen Municipal Hall could only accommodate around 400 people. A much larger audience watched the show on TV. Taking this simple numerical difference into account, it becomes obvious that when recording a TV show, appropriate sound reinforcement must provide primarily for high-quality TV sound. Low levels, pure audio reproduction, and absolutely no PA feedback are the basic prerequisites of good TV sound. Which is precisely the reason for the extensive sound reinforcement at this event. This was a job for professionals – and a perfect application for AURUS and NEXUS.



The flexible AURUS bus routing enables even the most complex and unusual tasks to be handled with ease. AURUS fader strips are not limited to controlling inputs. In fact, when the console is configured, the group busses can also be assigned to fader strips and, just like a conventional input strip, can be allocated various processing options including filters, EQs, delay, and dynamics. Just as importantly the group outputs can be re-routed as inputs to other groups. For the production of the Memmingen Carnival tv show this feature was used extensively, abandoning use of the main mix buses other than for monitoring.



As Clear as Crystal

Leading edge Convention centre with NEXUS

Changing for the better: Vietnam's vibrant capital Hanoi is now a bustling metropolis with many attractions and a new highlight. In an extensive parkland setting the National Convention Centre, NCC, opened its doors in 2006. It is by far the largest and most modern convention centre of its kind in the country. For superb sound and clear speech the National Convention Centre relies on an optical network with many satellites

Long, polished limos glide past, helicopters circle overhead and vigilant security guards are everywhere. The atmosphere is electric. High ranking visitors, among them Vladimir Putin and George W. Bush, have assembled at the NCC for the APEC Summit, held in Vietnam for the first time in November 2006. This was an event of enormous importance for Vietnam, which had recently received the immensely significant confirmation of its admission to the World Trade Organisation. Therefore, hosting the Summit offered a unique opportunity to showcase the country's rapidly growing economy to the entire world.

Lofty Aspirations – Not Only for Audio

Vietnam has set itself ambitious goals. In 2010 the capital, Hanoi, is to achieve the status of a modern industrialised town. This vision is being pursued vigorously and using high-tech means. Therefore, it comes as no surprise that the newly built NCC was designed and constructed according to the most demanding international standards and with the participation of many foreign companies. The architects, the site managers, air-conditioning suppliers and the construction engineers came from Germany and with STAGETEC also the digital audio networking supplier.

The specification required the installation of an integrated and reliable system providing not only the necessary flexibility but also outstanding audio quality and a high degree of redundancy. The NEXUS with its flexible audio-network topology is perfectly suited to fulfilling these requirements.

A Demanding Network

The classical virtues of the NEXUS make it the ideal solution for a convention-centre environment. In the NEXUS system, communication between units is based entirely on optical fibres. Therefore a NEXUS network simply eliminates the problems inherent with copper wiring.

For example, interference or signal deterioration on long cable runs. The modular architecture of the optical network is particularly installation friendly; allowing for significant manpower savings when compared with copper-based speaker and microphone networks. At the NCC, just four thin fibres handle the duplex transmission of 128 audio channels including control data and even provide cabling redundancy!

Another decisive argument for the NEXUS was the converters on the TrueMatch boards, which offer 28-bit resolution and a dynamic range of 153 dB for unsurpassed audio quality. Altogether a total of 64 XMAX TrueMatch microphone-input boards are available at the NCC.

The Heart of the System

Each of the most important rooms such as the Plenary Hall, the Banqueting Hall, the International Conference Room and other meeting rooms is equipped with a dedicated NEXUS Base Device. This provides convenient connectivity to the audio network. The distributed Base Device locations enable, for example, audio signals produced on the Plenary Hall stage to be fed locally into the NEXUS and routed over a MAD1 interface to a third-party console for mix down.

NEXUS also feeds the sound-reinforcement systems, so it acts as the core of the entire audio system. Moreover, the NEXUS DSP modules also handle tasks such as summing, equalising, delay, and gain control in each sound reinforcement area of the NCC. In order to be able to react even more flexibly to the specific requirements of an event, the NCC network also includes two extra portable NEXUS racks.

In total, the NCC digital audio network comprises around 700 sources and 700 destinations that are made available by 13 Base Devices and two NEXUS STAR routers. The installation is based on a star topology, with the two interlinked NEXUS STARS at its heart and the Base Devices acting as satellites.



Network Security

For redundancy and reliability, each Base Device includes two optical-interface boards that run signals in parallel to the NEXUS STARS in the main control room. If an optical line fails, the signals can be routed via the second connection. The probability of both optical cables or both interface boards failing at the same time is negligible. Each Base Device and STAR is also equipped with a redundant power supply. All of this avoids any single point of failure and makes the overall audio network at the NCC very secure.

The NEXUS internal monitoring program provides still greater security. When a component on the network fails, a notification is submitted immediately. Incidentally, these notifications, as well as all other messages and prompts on the NCC NEXUS, are displayed in the local characters and language, Vietnamese. This is a small but very useful detail, making it easier for local operators to use the new technology.

A Flexible Solution

The NCC NEXUS system is administered and controlled by a computer located in the main machine room. However, in such a large and extensive installation, it may be more convenient to access the audio network locally, that is, inside a meeting hall. This applies particularly to the metering window. Whenever signals are being modified the metering window should be visible. On NEXUS networks, it is possible

to hook up a PC running the NEXUS control software to any node on the network, even if there are other computers already active in the system. At the NCC, this feature is exploited and now up to four extra NEXUS control computers can be put online in the various halls. To avoid unauthorised access, these NEXUS satellites are password protected with restricted user rights. This highly flexible solution is ideal, especially when considering the fact that the NCC is used for such a wide variety of applications.

All's Well That Ends Well

The final construction stages of big projects like the NCC are often the most critical, due to the immense time pressure. The companies involved have to compete to complete their respective installations. A dusty and dirty construction site is certainly not an ideal environment for the installation and testing of optical fibres! However, all the audio network lines were carefully cleaned and put through their paces before commissioning.

After all, the APEC Summit, which took place at the same time as the formal opening of the convention centre, had to go off without any hitches. In the end, the acid test was passed. Thanks to the ideal technology for the job and excellent STAGETEC audio fidelity, the Summit in the 'City Between the Rivers' was a complete success.



The NCC in Brief

In an overall area of 60,000 m², the NCC in Hanoi accommodates a conference room with 3,500 seats, a 1,000-seat banqueting hall, two conference rooms for high profile visitors, and several smaller conference rooms with 100 to 200 seats each. Apart from meeting rooms there are facilities for seminars, working and exhibition spaces, a press centre, and other service facilities.

Meinhard von Gerkan and Nikolaus Goetze from Hamburg based gmp architects created an overall complex embedded into rambling parkland with thematic and symbolic allusions to Vietnamese tradition and culture. Several hotels and a museum complete this architectural ensemble.

The evocative Convention Centre roof is modelled on a wave and accompanies the visitor on their way through the foyer. Access via the helipad on the rooftop is however, reserved for prominent guests.



In the Service of Music

The Imposing AURUS Installation at the Berliner Philharmonie Hall

Virtually every culturally minded Berliner will be familiar with No. 1 Herbert-von-Karajan-Straße in the Tiergarten district. This address is where you will find the Berliner Philharmonie, one of the top concert halls in the world. The hall is home to the Berlin Philharmonic Orchestra, conducted by such legends as Furtwängler, Karajan, Abbado, and Simon Rattle. Of course, the Berliner Philharmonie only uses top-class technology. For example, the **AURUS in the newly refurbished Studio 3**

The Berliner Philharmonie houses several sound control rooms within the prestigious building, Studio 3 being the most important. Thus it was chosen to be the home of the new AURUS. Studio 3 is also the most recent Philharmonie control room, commissioned as recently as 1992. Here, concerts by the world famous Berlin Philharmonic Orchestra are recorded as well as many other Great Hall events. In addition to mixing performances directly to stereo, the team also produces multitrack recordings for subsequent mixing in surround formats. Moreover, the studio is also available for CD productions and can be rented by broadcasters and record companies. This utilization by external recording teams also had an influence on the design of the new audio system.

Renovation at the Double

After almost 15 years of continuous operation, an extensive studio overhaul was scheduled for 2006. A modern digital solution was scheduled to replace the somewhat outdated analogue console. With due regard to the prestigious building and the orchestra it houses, only the highest quality solutions were considered. Starting with the newly designed acoustics and not forgetting the technical equipment, the aim was to create a representative and state-of-the-art studio providing optimal working conditions with due regards to the needs of the many guest producers.

For the project to succeed, the entire studio renovation including the installation of all the new digital audio and media equipment and all the user training had to be achieved within the two-month summer break in 2006. The first concert recordings had already been scheduled for late August!

Think Analogue

In order to select an appropriate mixing console, some internal specifications had been agreed. These described the user interface, integration into the studio environment of the Philharmonie and the

normal in-house work flow. In the end, the AURUS proved to be the best fit with the requirements, not least because its interface is closely related to analogue console concepts and does not demand radical rethinking on the part of the users. Head of the audio department at the Philharmonie, Klaus Peter Gross, comments: "We particularly like the large number of touch-sensitive controls on the channel strips that allow many channel settings to be made instantly. AURUS embraces operating concepts that have been developed and proven successful during many years of analogue working." Another key criterion was flexibly integrating NEXUS into the existing analogue cabling. Equally important was the option of making surround productions in a much more convenient way than ever before; a field the Berlin Philharmonic Orchestra focussed on early, for example with various SACD releases. Next, the handy snapshot functions of the AURUS proved to be very practical because there are frequently multiple productions happening simultaneously. While one team deals with the current series of concerts, another is already busy preparing the next.

Step by Step

For the implementation phase, a step by step transition from analogue to the digital domain was planned, using the existing analogue inhouse audio cabling for the time being. Proven workflow concepts were to be retained in the digital domain, and the existing technical infrastructure was to continue into the future. This, again, was an important decision regarding the frequent guest productions hosted at this studio. Therefore, an independent digital studio complex was created where a big pre-existing Lemo patchbay is now used as an interface to the complex in-house analogue cabling. This patchbay makes available more than 50 microphone inputs in the great hall as well as outputs and tie lines to the other studios, the entrance hall, and the neighbouring chamber-music hall.



Perfect Integration

The various components of the digital system are distributed over two floors to fit perfectly into the available space. The AURUS console in Studio 3, which is luxuriously equipped with 56 channel strips and communicates through fibre optics to the NEXUS STAR installed in Studio 1. This STAR router houses the AURUS boards and is also the heart of the star topology digital audio network. Next to the STAR is a NEXUS Base Device containing six XMIC+ boards with a total of 48 microphone inputs, fed from the LEMO patchbay. Studio 3 itself houses two more base devices. One is used for connecting external peripherals, and the other for the six multitrack recorders used for backup recordings. The main recording medium is a Sequoia system which is connected directly to the STAR via MADI lines. Another DAW of the same type in Studio 1 is used mainly for post-production of recordings.

The STAR router provides two extra MADI ports which are used, for example, by Radio broadcasters as the source for their recording systems.

Two big hi-res displays are provided on top of the console for a multitude of tasks, for instance to display all 48 recording buses at the same time using the new NEXUS multichannel metering feature.

With this, the user can see at a glance what is actually being recorded. Other applications include a magnified representation of the Sequoia user interface and various video inputs from the hall that can be routed using a media-control system. This is based on logic functions incorporated into the AURUS console.

Win Win

The Berliner Philharmonie requires a split of the microphone signals so that, for example, the sound engineers in one of the other control rooms can work with the same microphones but independently of Studio 3. At first it was planned to use an external microphone splitter but in the end it was clear that this could be achieved in a much more elegant and cost effective manner. The solution was to use the new XMIC+ microphone boards which can also act as a splitter. The XMIC+ includes four digital outputs per input, each with freely adjustable gain. One of the four outputs is reserved for use on the AURUS console. A second output can be used independently, for example, for sound reinforcement, in one of the other studios or for forwarding to an external OB truck.

Another issue arose in connection with this subject. A microphone splitter output can offer different levels on the various outputs. However,

New Hall Concept

Berliner Philharmonie was designed by German architect Hans Scharoun between 1960 and 1963. Scharoun is considered to be one of the leading exponents of Organic architecture. At first, the hall was controversial because, unlike many other contemporary halls, Berliner Philharmonie is minimalist with few architectural frills and trimmings. On the other hand, it is distinguished by harmonic lines and curves that almost literally radiate musicality. A novel and effective concept for a concert hall. Scharoun's idea was to eschew the conventional layout with the audience and the orchestra opposite each other. Instead the total of 2,440 seats are laid out in circles, terraced in an irregular pattern around the centrally positioned podium. This was inspired by the circle listeners intuitively form when listening to a musician performing outdoors. Every spectator sees not only what is going on the stage but also other spectators at the same time. Acoustically, Berliner Philharmonie also has a lot to offer. This has been appreciated not only by musicians, conductors, and concert goers but also by the local audio engineers to this day. Head of the audio department Klaus Peter Gross says: "If the object to be recorded

is a well-balanced orchestra, two correctly positioned omnidirectional mics with just a minimum of accents are sufficient for making perfect recordings in this hall."



independent external phantom power switching control is not available. Phantom power is either switched on or it is not.

Working on the AURUS in Studio 3, the user has the option of switching the phantom power individually for each microphone. But what happens if the engineer switches off the phantom power of one microphone and then shuts down the AURUS? An external user such as the engineer in an OB truck connected to the Berliner Philharmonie would have no way of switching the phantom power on again, simply because he has no AURUS or NEXUS user interface.

An elegant solution to this problem is a new feature of the NEXUS XCI board. The XCI neXus Communication Interface board is equipped with an SD memory card that can, for example, be used for storing multiple NEXUS statuses defined previously by the user. A status stored in this way cannot easily be overwritten, so it is truly protected against misoperation arising from stressful circumstances.

Phantom Power Auto-On

The system installed at the Berliner Philharmonie has two predefined phantom power statuses. One for when AURUS is being used as the mixing console in Studio 3 (in-house production), and another for using an external console in one of the other studios (guest production). If the AURUS is switched off, NEXUS will automatically load the status for guest production where phantom power for all inputs on the NEXUS microphone boards is switched on. When the AURUS is turned on once again, the XCI board triggers a changeover to the in-house production status with the phantom power status as stored in the loaded project.

Essentially, the previous XCI board was also capable of providing such a solution, but only by using an external computer. The new solution brings a number of benefits because, unlike an external computer, the memory board on the XCI is subject to the NEXUS internal error-checking function, improving reliability. Moreover, it cannot be switched off by mistake, a key issue when using an external PC.

Outstanding

Seamless integration of NEXUS and AURUS with the original analogue network is an unusual facet of this particular installation. In this case there are good reasons for an evolutionary approach. Flexible solutions were necessary for optimal integration and this was made easier because the MEDIAGROUP as the overall system vendor not only supplied the digital systems but also managed the technical and organisational aspects of the project.

There is yet one more extraordinary feature of this installation. It strikes the eye as soon as one enters the control room. It is the size of the AURUS, not only the expansive sound processing capabilities but its physical size. Seven fader panels with eight channel strips each on an overall width of 2.73 metres, or almost 9 ft. This is the biggest AURUS console available in the standard version on two legs. A console more than suitable for one of the most renowned concert halls in the world!

Germany's capital has many stages for cultural events – from theatres to operas and concert halls. The greatest importance is attached to the quality aspects of both technology and repertoire. This is one of many reasons why there are plenty of STAGETEC components spread all over Berlin – more than 20 CANTUS, CINETRA, and AURUS consoles, and countless NEXUS Base Devices and STAR routers. Among the numerous installations in theatres, there are two particularly significant ones:

Berliner Schaubühne

The *Schaubühne* in the Lehniner Platz is considered to be the avant-garde theatre in Berlin and is an excellent venue for high calibre dance productions. The theatre is home to three halls separated by sliding steel panels. These halls can be used separately or in varying combinations including one large hall. This high degree of flexibility is reflected by the STAGETEC installation, which comprises four AURUS consoles and a NEXUS audio network including two STAR routers and eight Base Devices just for the audio side of the set-up. Two fixed AURUS consoles are used in the control rooms while the remaining two are portable and can be hooked up to connecting points inside the halls whenever the production requires it. The sophisticated stage

management system is just as versatile. The three identically designed C.A.S. 300 desks are very lightweight and can be operated as required in all of the three halls. A global switchover feature provides for any of the possible hall arrangements: from one console dealing with all three halls to a configuration where each hall is monitored by its dedicated console and stage manager.

Berliner Ensemble

Back in the nineties, the *Berliner Ensemble* theatre at the Schiffbauerdamm was one of the first owners of a NEXUS audio network. This network was used in conjunction with an analogue console for some considerable time. When a modern digital console was finally acquired, the extensive distributed network that includes seven STAGETEC Base Devices was initially updated to the current Matrix 5 status and adapted to the structure of the state-of-the-art STAR router. A second step extended the overall system with a 48-fader AURUS console precision installed in the theatre's small audio control room.



1 July 1993, Berlin: A dedicated team of expert developers and sales specialists establish STAGETEC Entwicklungsgesellschaft, a manufacturer of innovative and professional digital audio components.

October 1993, New York: After just four months, the fledgling company presents its first product at the AES Convention in the USA, the NEXUS audio router. NEXUS introduces the novel concept of a distributed routing system which acts as a fibre optic based audio network at the same time. NEXUS was also the first step towards the next product ...

November 1994, Karlsruhe: ... the digital CANTUS console. Its launch at Tonmeisterstagung caused a real sensation. CANTUS rewrote audio history with its forward-looking design, by implementing the NEXUS digital router as a generic interface and supplementing it with audio processing and an exceptionally attractive console control surface.

November 1995, München (Munich): Bayerischer Rundfunk broadcasting service puts a CANTUS into operation, as the first customer in the world. The console is used for radio drama production, a genre where excellent sound quality combined with flexibility is a prerequisite. It was installed in BR's radio studio 10 and is still in use today.

Worldwide with Heritage

November 2006, Leipzig: Once again, STAGETEC surprises the pro-audio world by introducing a new digital mixing console, the compact AURATUS.

Yet another visionary product from Berlin's high technology forge, AURATUS quickly establishes a reputation on the market and is put into operation by the first customer only a few months after the initial presentation (refer to page 6ff).

November 1996, Karlsruhe: STAGETEC presents another innovative product at Tonmeisterstagung, an A to D converter with an incredible 28 bit resolution. Thanks to the patented TrueMatch technique, this unit achieves such a wide dynamic range that the use of conventional analogue microphone preamps is rendered obsolete.

Autumn 1999, Berlin: On the eve of the millennium, STAGETEC Entwicklungsgesellschaft move to their new Berlin company headquarters on the banks of the river Spree.

1999, Berlin: The CINETRA digital film console, a specialised enhancement of CANTUS, commences operation at Geyer Synchron Berlin, a renowned dubbing studio.

2001, Stuttgart: The German broadcaster SWR receives the first NEXUS STAR router for its radio broadcasting central control room, using it for a star-shaped audio network with MADI connections to all studios.

October 2001, Buttenheim/Berlin: The venerable company SALZBRENNER STAGETEC Audio Video Mediensysteme together with STAGETEC Entwicklungsgesellschaft in Berlin form the SALZBRENNER STAGETEC MEDIAGROUP.

2002, Göllheim: The renowned manufacturer of intercom systems, DELEC Audio und Videotechnik, becomes the latest member of SALZBRENNER STAGETEC MEDIAGROUP and complements the portfolio with intercom systems for broadcasting and theatre.

May 2002, München (Munich): Once again, STAGETEC takes the audience by surprise with a new product, an entirely new design: the AURUS. A digital console with extensive multi-channel support and the concept of direct access operation unique in digital production, is introduced at the AES Convention in München.

2003, New Delhi: For the first STAGETEC installation in India, a NEXUS is installed at the new digital broadcasting centre of the All India Radio government broadcasting service. It is used as their central audio network and routing system and networks the 27 radio studios to the main switching room. During subsequent years, the significance of the Indian market increased. In May 2006, a co-operation agreement is concluded with VTI, a major, nationwide sales company, for the exclusive distribution of SALZBRENNER STAGETEC MEDIAGROUP products.

2003, Buttenheim: The umbrella company, SALZBRENNER STAGETEC MEDIAGROUP celebrates their 40th anniversary! Back in 1963, Friedrich Salzbrenner opened his workshop for sound system maintenance and repair, the cornerstone of today's MEDIAGROUP.

January 2004, Kuala Lumpur: On the 1st of January 2004, SALZBRENNER STAGETEC MEDIAGROUP establishes a new office in Malaysia to serve the Southeast Asian and Pacific region.

April 2005, Tokyo: The first AURUS in Asia is put into operation at Fuji TV, Japan's biggest commercial TV station. The accompanying NEXUS network is also used for format conversion and transparent SDI forwarding.



December 2005, Beijing: With an atmospheric ceremony, the new MEDIAGROUP office at the Chinese capital opens on 17 December 2005.

May 2006, Berlin: A new, small version of the NEXUS audio router is introduced. This 1 U high rack version accommodates up to five modules. A favourite application for the compact newcomer is mobile use in outside broadcasting applications.

June 2006, Berlin: The AURUS digital console breaks all records. More than a hundred units have been sold since 2003.

Seoul, 2006: Pro-audio distributor Dreamsound takes on the distribution of STAGETEC and DELEC products in South Korea and installs an AURUS/NEXUS system at the renowned Sejong Centre in the very same year.

December 2006, Zagreb: SALZBRENNER STAGETEC MEDIAGROUP opens a new office in Croatia, which will mainly look after the broadcasting industry in the Balkans.

April 2007, Atlanta: By opening a new office at the east-coast State of Georgia, the MEDIAGROUP strengthen their presence in the U.S. In addition to the tv, film and theatre markets already covered by existing American distributors, the new office will focus particularly on broadcast installations.

You can find a complete list of all references, of the company's history and of all offices and distributors at www.stagetec.com

As of April 2007

Success is a matter of adjusting one's
efforts to obstacles, and one's abilities
to a service needed by others.

(Henry Ford)



Producing the perfect sound whatever the circumstances is an art. Whether the project is a live event or a production, TV or theatre, in a studio or OB truck – keeping everything under control requires versatility and creativity. And, of course, a console which emphasizes these talents.

AURUS is just such a console and all digital to boot. Its singular flexibility brings any challenge, however daunting, within your reach. In live performance AURUS' modest footprint allows an optimum view of the action, while all parameters can be controlled intuitively. In production its huge scope and sublime audio quality never fail to impress.

Industriegebiet See
96155 Buttenheim
Germany

Tel.: +49 (0) 95 45 440-300
Fax: +49 (0) 95 45 440-333

www.stagetec.com
sales@stagetec.com

