aurus

the Direct-Access Console



22 DIRECTLY ACCESSIBLE PARAMETERS — 11 DUAL CONCENTRIC ENCODERS PER CHANNEL STRIP • READY FOR 96 kHz • PARALLEL MIXDOWN TO MULTIPLE MULTICHANNEL FORMATS • FULLY INTEGRATED INTO THE NEXUS STAR ROUTING SYSTEM

STAGETEC



AURUS – Classic analogue feel with the power of a digital console!





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The novel digital mixing-console architecture introduced by the young and innovative Stage Tec team in 1994 has since significantly influenced the design of current digital desks and not only in appearance. And CANTUS – their first digital console – became a huge success.

In 2002, Stage Tec introduced a new first-class mixing console developed from scratch: **AURUS – the Direct-Access Console**. Many users have since evaluated the console, opted for it, and given feedback and made suggestions for optimisations. Thus, the AURUS is now available incorporating generic software functions for broadcasting, sound reinforcement, theatres, and recording.

AURUS continues the original concept of consistent separation of console and I/O matrix, which allows for setting up distributed and efficient audio networks; but at the same time, this separation is supplemented by a unique control concept, instant access to all key parameters. This is a novelty in the digital world! Instant access is made possible by the implementation of dual encoders. Each dual encoder enables two parameters to be adjusted in the space usually occupied by a single control and also provides an additional button.

As the digital console with the analogue user interface, AURUS is the perfect solution for live use, sound reinforcement, and especially for mobile use. The control sets composed of dual encoders and (also dual) LED arc indicators or digital displays ensure intuitive, quick, and clear control.

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The unusually large number of controls (at least for a digital console) provide instant access to the desired audio channels. Depending on the configuration, up to 96 channel strips and 300 audio channels are available. Optimum access to all controls and perfect legibility of all displays and indicators offers a high degree of user-friendliness whilst keeping the training period short.

AURUS as a desktop version or with easily removable legs is the perfect tour companion. Thanks to its compact size and low weight, AURUS guarantees ultra-short set-up times, saving time and money.

These characteristics as well as the hot-swap capabilities of all hardware elements, full redundancy up to double optical lines, low power consumption, and thus low heat dissipation make AURUS highly suitable for OB truck installation, as well.

Optimum functionality and flexibility with outstanding audio quality are ensured by features including the following:

- True multichannel processing (parallel mixdown to 5.1 and stereo formats, mixdown formats up to 7.1)
- Various types of static and dynamic automation
- Complete N-1 matrix
- VCA-group emulation
- Integrated intercom subscriber unit

Users, especially, from the broadcasting and theatre fields will appreciate the fact that two full-fledged AURUS consoles with distinct project management can share the same audio network. This enables the live sound for one event to be mixed while recording a different event at the same time. AURUS can also be operated in parallel mode.



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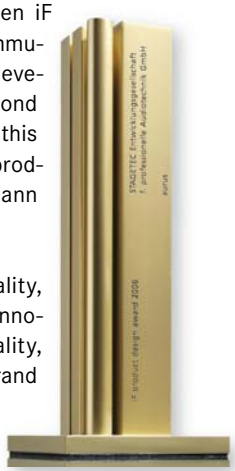
The meter bridges constructed with precision hires TFT colour displays that can be switched between a variety of metering modes. Further, the displays are used for a detailed audio-parameter view and for console configuration.

AURUS fully integrates with the NEXUS STAR router. Therefore ARUS has direct access to desirable NEXUS features such as outstanding converters, the diversity of digital formats, and the extensive application opportunities afforded by a digital audio network. If all this is insufficient, multiple AURUS consoles can coexist within a single NEXUS network.

iF product design award

In 2006, AURUS was awarded with the Golden iF Statuette in the consumer electronics/telecommunications category for outstanding design achievement. After the CANTUS in 1997, this is the second time that a console by Stage Tec has received this coveted award. As with the CANTUS, AURUS product design was developed by Arno Schünemann from Schünemann DesignSolutions, Berlin.

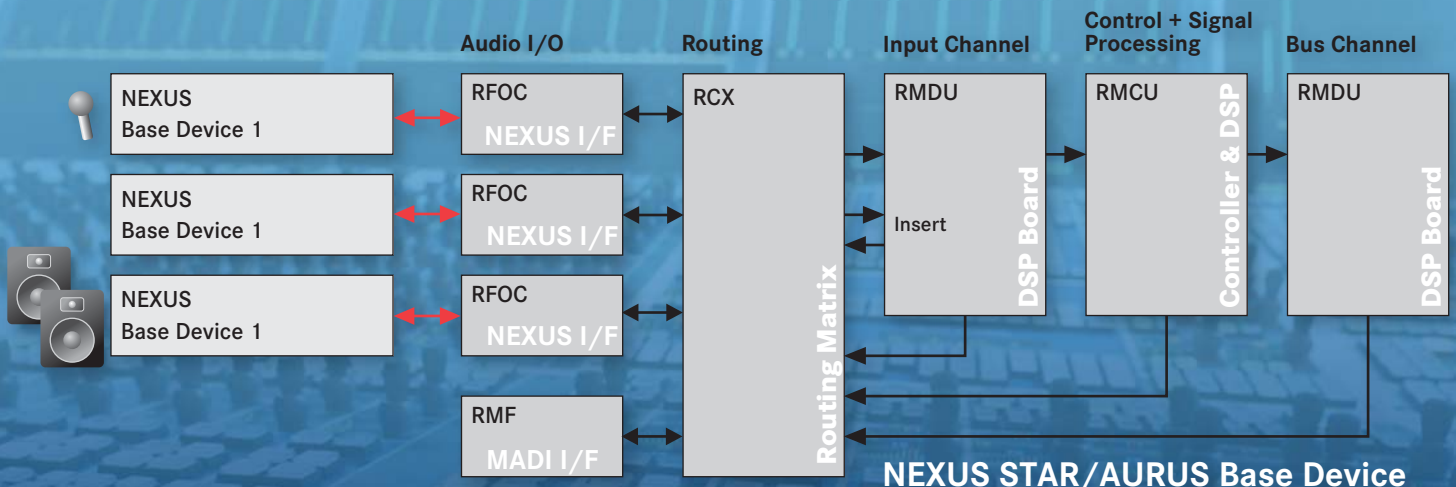


Decisive aspects included the design quality, workmanship, choice of materials, degree of innovation, environmental friendliness, functionality, ergonomics, visualisation of use, safety, and brand value/branding.

The 20 jurors – recognised design experts from all over the world – judged almost 2,000 products from 37 countries in a number of categories. The iF product design award is awarded every year by the iF Industrie Forum Design Hannover. Since its inauguration in 1954, the award has become a major international award for quality design.

AURUS Specifications Overview

- Classical direct access to channel parameters – up to 96 channel strips
- Clearly laid out control – just like an analogue desk
- High resolution metering, optional analogue response curve
- I/O routing access to fibre-optic audio network
- Precision digital design
- Analogue I/O has the headroom of an analogue desk; levels of up to +24 dBu
- Outstanding dynamic range
- Noise-free summing
- No overloads in channel signals; first-class audio quality thanks to 40-bit floating-point arithmetic
- Generous headroom on mix bus
- Sample rates: 44.1 kHz, 48 kHz and 96 kHz on overall system
- Up to 300 audio channels (depending on configuration)
- 128 buses
- Up to 32 full channels per DSP board (depending on configuration)
- Multichannel-capable architecture throughout
- Sub-systems interconnection with fibre optic cables, spanning distances of up to 100 km (60+ miles)
- Snapshot and dynamic automation for all console parameters
- Excellent microphone A/D converters
- Microphone inputs: 32-bit TrueMatch A/D conversion; dynamic range exceeding 158 dB (A)
- Line inputs: 24-bit TrueMatch A/D conversion; dynamic range: 133 dB (A) typical
- Line outputs: 24-bit D/A conversion; dynamic range: 131 dB (A) typical @ 24 dBu
- Digital audio formats: AES/EBU, AES 42 (digital microphones) and S/PDIF, Y2 (MEL2), SDIF-2, MADI, ADAT, TDIF, SD-SDI, HD-SDI, Dolby-E
- Sample-rate converters as optional or standard features (depending on the module type)
- Modular structure for simple system expansion
- Compact dimensions
- Low heat dissipation
- No cooling fans in any of the components
- Portable



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Concept

AURUS, the fully digital audio mixing-console system, consists of a main console and the separate audio processor NEXUS STAR. The NEXUS STAR rack accommodates all the processing components; the RMC main-controller board and up to seven RMD signal-processor boards. The RMC provides the optical ports for connecting one or two consoles. The optical lines transmit all data including Ethernet, audio signals for monitoring, metering, goniometer and talkback signals, etc. Thus, only a single optical cable and power cord need to be connected to the AURUS console.

The mixing-console system comprises the following components:

- Main console for operating and controlling the audio signal processing
- Secondary console (option)
- Remote control units for the console (option)
- Router-integrated audio DSP for digital audio processing
- NEXUS audio network handles different audio formats and provides extensive signal distribution

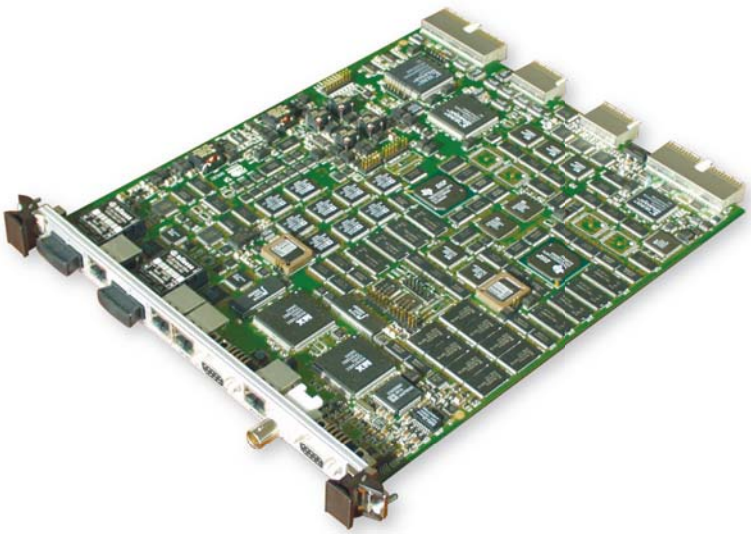
Thus, a small standalone mixing desk requires just the console, the NEXUS STAR audio processor, and one NEXUS Base Device.

Exceptional performance requires more than just the use of state-of-the-art components: Due to innovative circuit design, the implementation of audio and control DSPs and optimised bus systems, the highly integrated AURUS DSP modules achieve a level of performance that gives the user a real-time »analogue« experience.

The system components are interconnected using fibre-optic cables that transfer all control and audio data including talkback and monitoring signals for the consoles.

AURUS systems are available in a wide variety of flexible configurations. Thanks to modular design, the customer can decide the size of control surface, in units of 8 control strips, and the amount of signal processing to give the required number of channels and buses. A small console can control a big mixer or vice-versa to suit the application.

AURUS is completely integrated with the NEXUS STAR router, and multiple mixing-console systems can coexist within one NEXUS system.





AURUS at the WDR in Cologne

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Main Console

The fan-free AURUS console is just a control and operating surface providing 16 up to 96 assignable channel strips and a central control section. The portable console is designed as a lightweight desktop unit and is fully functional even without the legs installed.

The user interface is based on a modular structure and consists of several control panels, TFT screens, a graphics tablet, and a keyboard. There are various control panels for specific applications, which are interconnected using ribbon cables for convenient servicing.

The AURUS console unit integrates the interface electronics for connecting the audio processor to the control panels via fibre-optic lines. The console features its own independent redundant power supply.

Further, a configuration computer is integrated into the console for setting up mixing-console projects and controlling the connected NEXUS audio network. The computer is operated using the integrated keyboard and graphics tablet while feedback is provided by an assignable TFT display.

The Second Console

Simultaneous use of two AURUS consoles with a single NEXUS STAR processor rack is a fundamental AURUS concept. The second console can be employed in two different ways:

- The simplest is as an extension of the main AURUS with both consoles sharing a common pool of DSP and I/O resources. Alternatively, even with a single DSP card, the two consoles can be operated separately. In the third case two completely autonomous AURUS consoles, each with separate signal processing, can be used concurrently on a single NEXUS STAR. Although operating independently, the two consoles can share the same audio resources. This is especially useful, for example, when doing sound reinforcement for a show while recording or broadcasting it at the same time.
- AURUS can also be operated in parallel mode. In this mode, the secondary console – usually the smaller one – acts as a remote control of the main console via parallel access to selected main-console resources. The parallel console is often used during rehearsals within the auditorium.



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Concept

Audio Processor

The AURUS audio processor is integrated into the NEXUS STAR 19'' rack frame. This tiny 6 U high base unit accommodates not only the entire AURUS mixing-console system audio-processing components for several hundred audio channels (depending on configuration) but also the overall I/O-routing devices and the NEXUS fibre-optic or MADI audio interface modules that connect to the studio peripherals:

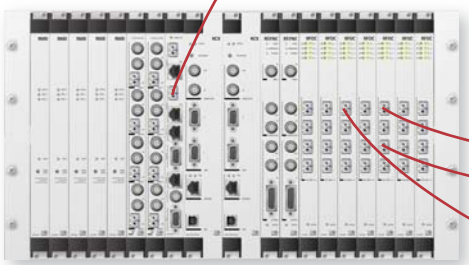
- RMC controller board for the mixing-console system
- RMD audio-processor boards equipped with powerful DSPs
- RCX controller board for the routing system
- RFOC NEXUS interface board or RMF MADI interface board
- RCX controller board and routing matrix
- Multiple digital bus systems
- Redundant XPSU power-supply units

AURUS Components

The RMD DSP boards are installed as additional boards in the STAR router. Here too, connectivity is provided via a star-topology NEXUS STAR bus. This makes the console inputs and outputs freely available on the overall system. DSP resources are distributed to the audio channels during the console-project configuration process. An additional RMD board can be specified to provide redundancy and therefore increased security.

AURUS offers two channel types for adapting the DSP resources to the project-specific requirements: full channels (fully-fledged audio channels) and short channels (reduced channels comprising key parameters, for example, for use as input channels, mix or group buses, or effects returns). The other channels (mixes, groups, aux, etc.) are also configured to suit their respective tasks.

More interface ports (MIDI, serial) are available for applications such as controlling external machines. The centralized timecode management is also performed by the RMC board.









All system components are exclusively interconnected using fibre-optic lines, ensuring quick installation followed by reliable and uninterrupted operation.

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NEXUS STAR

NEXUS STAR is an audio router designed for highly complex applications. It provides a routing unit plus slots for accommodating the AURUS mixing console DSP and controller boards. The device handles up to 16 modules with 256 inputs and outputs each, allowing for routing 4,096 inputs to the same number of outputs. The I/O boards connect to the RCX central router via a star-topology bus. The router is responsible for routing inputs to outputs.

In addition, the NEXUS STAR is used as an audio router handling both the internal console signals and external routing. The RCX board acts as the core of the audio network. An additional RCX can also be specified. When two RCX are installed one may then be used as a redundant component. It will then remain in hot standby mode during normal operation.

NEXUS Base Devices are connected to the NEXUS STAR in a star topology. All connections are made using the proprietary NEXUS optical format. The Base Devices themselves are populated with I/O boards for various formats as demanded by the customer. All audio and control data are transferred between Base Devices using fibre-optics.

The STAR router can also be equipped with MADI boards. This allows studio devices equipped with MADI ports to be directly connected to the router.

This flexibility enables the designer to create even the most complex and extensive audio systems, comprising multiple STAR routers, AURUS mixing desks, and a multitude of NEXUS Base Devices.

NEXUS Audio Network

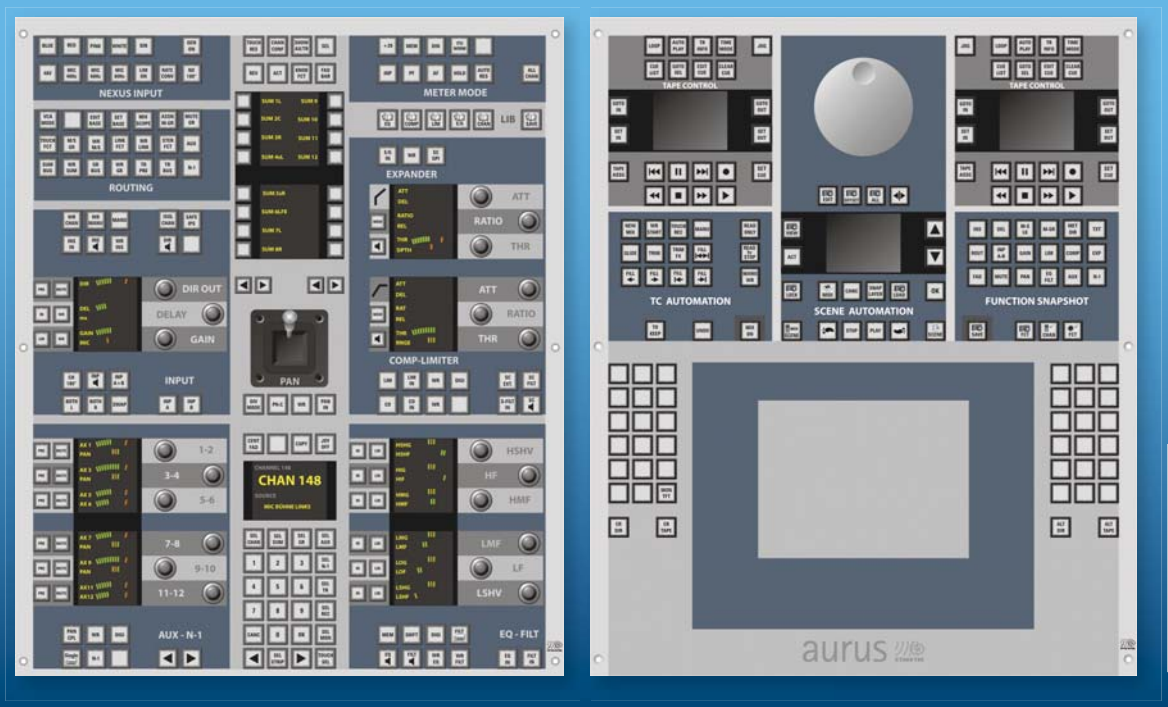
Utilizing NEXUS as the audio-network and routing system for AURUS provides for a flexible and distributed overall system topology. NEXUS handles a multitude of distributed Base Devices, thus covering many different applications, from modest theatre systems up to full-blown studio-complex and broadcasting-centre networking.

The exclusive use of fibre-optic cables simplifies the installation and allows distances of up to 100 km (60+ miles) to be spanned between Base Devices. For example, inputs and outputs can be made available from 3 U stage boxes placed exactly where they are needed (I.e. on the stage, in the studio, etc.). Inputs and outputs of multiple AURUS mixing-console systems, integrated into a NEXUS network, can be shared and distributed as required.

NEXUS Base Devices are available in various configurations, units between 1 and 15 U can be supplied. The interfaces are configured according to the customer's requirements. Interface boards for a wide variety of digital and analogue audio formats are available. In addition, control boards (relay or serial) can be implemented.







The centrally located Channel Panel provides quick access to all parameters of the selected channel. A joystick is included for straightforward panning in multichannel mixes.

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Design & Ergonomics

Ergonomics

Mixing console ergonomics are becoming ever more important. This is especially true for users working in a visual environment – film, TV, or live mix – these specialists frequently ask for more intuitive operation. In designing AURUS, our objective was to combine the direct access of a conventional analogue desk with the configurability, flexibility and the electro-acoustic parameters of an advanced digital console.

Users concentrating on the events on stage or on a video display rely on direct and spontaneous access to the mixing console. Complex graphical diagrams or multi-assigned controls are not appropriate for situations like these. You must be able to instinctively grab the right control since nothing is predictable in these environments.

All AURUS components – the DSP modules, the console, and the software – have been designed from scratch for just such applications. Unlike other digital console control paradigms, AURUS features a massive number of physical controls to provide direct access to all the relevant audio parameters, making it truly the **Direct-Access Console**.

11 dual concentric encoders per channel strip, combined with multicoloured, dual fan-shaped LED bargraphs, ensure instant access to the primary console functions. The largely fixed association of encoders to audio parameters considerably simplifies operation for new users; the console literally has an intuitive touch.

A central Channel panel supplements this channel strip oriented architecture. This gives access to all the available settings including those that do not need to be constantly accessible during normal operation. All parameters of the currently selected channel can be accessed from this centrally located panel at the same time.

The console dimensions were designed for optimum accessibility to all controls and perfect visibility of displays and indicators. Furthermore, the flat design of the console offers the optimum view to the studio, to video displays, or to the stage. The TFT colour displays provide an extended lateral viewing angle, giving clear legibility from virtually everywhere in the control room.

The AURUS system is the perfect compromise. On the one hand, all the critical parameters and their indicators are directly accessible; on the other, the user interface is not cluttered with seldom used functions that might distract from the real creative work.

Control Panels

Rapid operation as well as ease of maintenance were key objectives when designing the AURUS user interface. The controls for eight channel strips are distributed on panels (332 mm/13.07" in width), which are integrated into mixing-console frames of varying width.

The layout of channel strips is derived from conventional desks and formats and is based on an 8-channel grid. The panel width, the resulting channel-strip width, and the TFT-display dimensions were optimised to prevent any viewing offset between a channel strip and the corresponding display section.

The modular concept allows for a variety of control surface configurations. The user-interface restrictions imposed by analogue desks



In the Beijing Grand National Stadium at the Olympic Games 2008

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are lifted with AURUS since the console is purely a control unit. All the audio processing and I/Os are situated in remote NEXUS Base Devices. The control surface panels are interconnected with ribbon cables, so they can even be installed as detached control terminals outside the console.

Simple and reliable cabling between the panels allows them to be installed as satellites, for example, in the apparatus area or near a producer workstation. These panels can be fitted, for example, into small desktop consoles or directly into the studio furniture. Satellite panels are always functional components of the respective console.

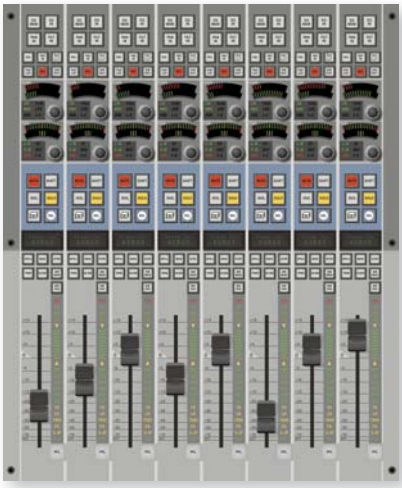
The control panels are optimised for their respective tasks: Channel strips consist of SFAD Fader panels, SMUL Multifunctional panels, and the SMET display. The Master section of the console has the SMON Monitoring panel, the SWAC Graphics-tablet panel, and the SZCH Channel panel for accessing all parameters of the selected channel.

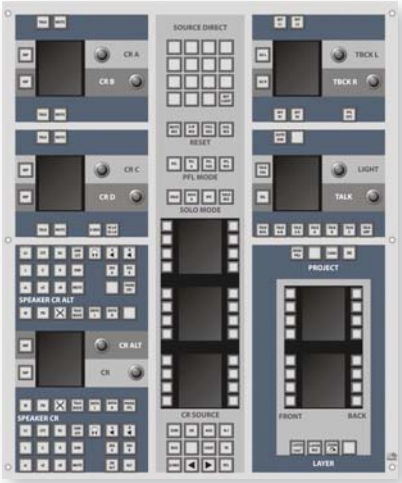
The individual panels are amazingly low in weight – just 2-3 kg each. The power consumption is also remarkably low.

The AURUS board range also includes the MADA A/D-D/A converter board featuring an integrated talkback-microphone amplifier, D/A converters for headphones and nearfield speakers, and AES/EBU outputs for a multichannel goniometer and special applications.

AURUS consoles can be supplied with gooseneck lamps; the meterbridge provides terminals for dimmable low-voltage lamps.













The large number of controls is an uncommon sight in a digital console.

Design & Ergonomics

Controls

AURUS is the first digital console to feature dual-concentric encoders combining control over two independent parameters with an additional button for the most efficient use of precious space.

The combination of dual-concentric encoders with dynamic, multicoloured, fan-shaped LED bargraphs and alpha-numeric TFT displays allows for both analogue-style indication and an exact numerical view of the respective parameter value. This allows for an »analogue« operational concept without inconsistent parameter representation or the use of adjacent operating strip displays. Both the controls and the associated displays are where they should be for intuitive operation.

AURUS' large number of controls is an uncommon sight in a digital console. A standard channel strip, for example, includes 11 dual-concentric encoders and 32 buttons for direct access. Consistent function assignment, familiar from analogue consoles, was chosen for the two dual-encoder layers (e.g. the EQ Gain and EQ Frequency parameters of an equaliser band). Less frequently used functions are accessible after pressing a button; for example, pressing the encoder changes from the frequency setting to the Q setting of a filter.

Due to the large number of controls, multiple function allocation could largely be avoided. The sound engineer can instinctively select the correct encoder – the ideal approach for hectic production environments or live situations. The TFT screens incorporated in the meterbridge provide more detailed information on the parameter settings.

The multicolour LED dual arcs on the channel strips have been enhanced with OLED (Organic LED) displays that are also capable of producing Arabic, Chinese, or Cyrillic characters.

Only high-quality components are used in AURUS consoles. These include; smoothly operating, yet precise, 100-mm faders, softly stepped dual-concentric encoders with integral button, and exclusively low-noise short-travel buttons with perceptible click, TFT and OLED displays, multicoloured fan-shaped LED bargraphs, and high-resolution TFT screens. The Master section includes a joystick for multichannel applications and a jogwheel for scrolling lists or external machine control. (Motorized joysticks are not available on U.S. units.)

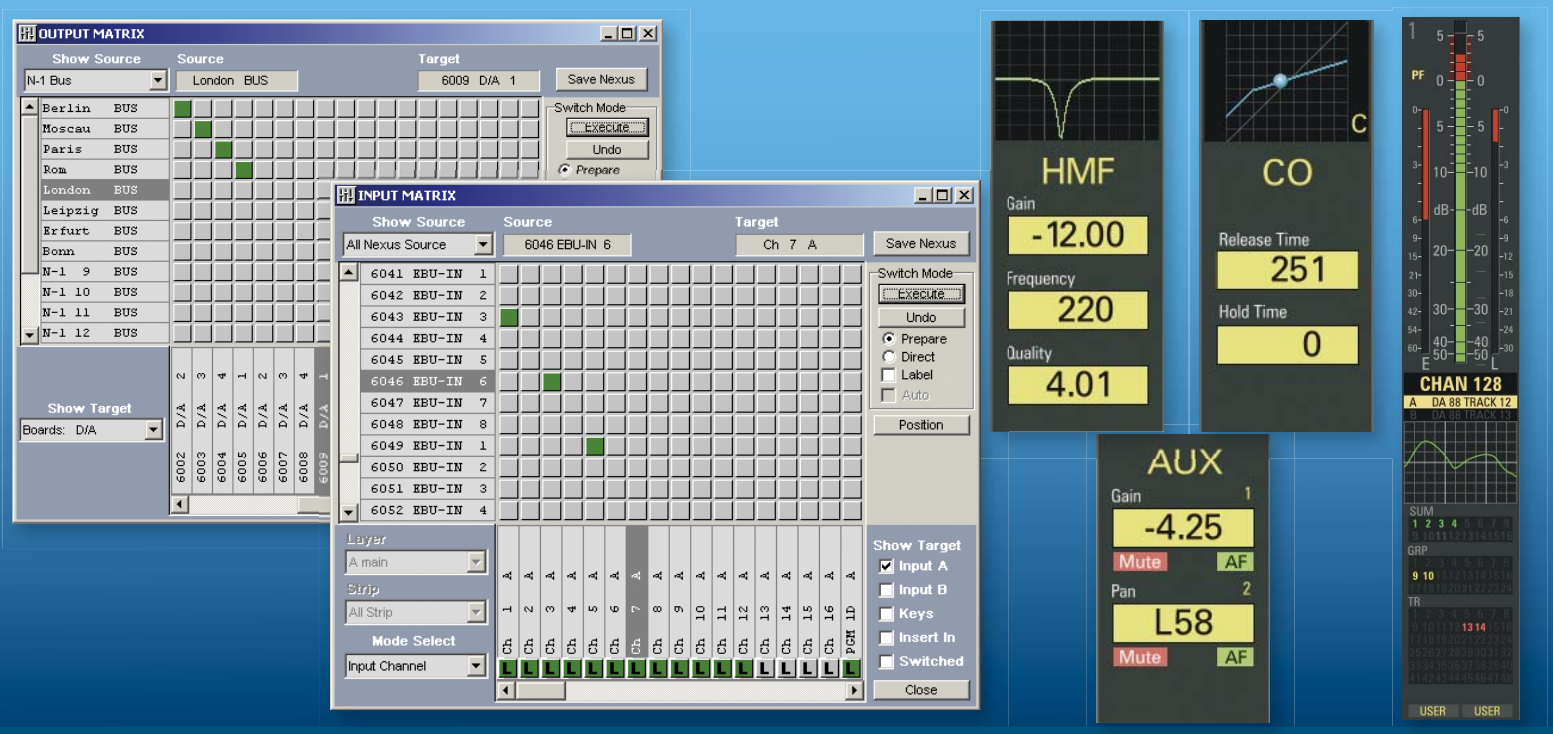
The notebook-style keyboard for the configuration computer can be slipped out from under the hand rest. It is slightly lowered to provide a good typing position. The hand rest has a sculpted hollow for the graphics tablet pen.

To sum it up, the user interface is perfectly suited to intuitive, quick, and reliable operation. The straightforward handling leads to a relaxed working atmosphere and high quality results, not only in live situations but also in recording and production environments.

Configuration

AURUS was designed as a **Direct-access console** for everyday jobs; however, it provides numerous configuration options. The user can redefine the basic mixing-console structure at any time, for example the distribution between channels and buses or the assignment of channel strips to audio channels. Thanks to this concept, AURUS may (and usually will) have less operating strips than actual audio channels.

Despite the analogue-style operating philosophy of AURUS, users can adapt the signal-processing functions and console layout



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to their specific production requirements. For example, this includes the following:

- Definition of channel and bus numbers and their respective configurations
- Creation of various multichannel groups and mix buses
- Monitoring-mode selection

Multiple configurations can be stored as pages and be quickly recalled using buttons. An additional background assignment can be defined for each channel. This alternative assignment can replace the foreground assignment at the press of a button.

A configuration computer is integrated into the console for system set-up. This computer has standard components such as a keyboard, a colour screen, and a graphics tablet.

Software

The AURUS uses hardware and software specifically developed for the purpose and is therefore less affected by ever-changing multipurpose computer operating systems and continuous hardware improvements. The familiar Windows graphical user interface ensures a shallow learning curve. The configuration computer is not required during the actual productions – the console operates autonomously.

The configuration software enables numerous functions to be altered at any time during operation. For example, this includes the following:

- I/O routing
- Order of signal-processing modules in the channels, groups, and mixes
- Association of channels to the various layers
- Master/slave-linking or stereo-linking of audio channels

Configurations set up by the user can be stored and recalled at any time using the project-management features. Loading such a project file resets the entire mixing-console system to the stored status. Further, these files are interchangeable between consoles - provided that they have identical hardware configurations.

The console contains a permanently stored user-defined default project. This project can be used as a basis for individual projects. More projects can be stored to dedicated buttons on the Master section for quick access. These predefined projects help simplify the use of AURUS for less experienced users.

Metering

AURUS provides metering and parameter-setting information on hires TFT colour displays. These displays are located directly in the sound engineer's view and provide optimum perception of the respective channel's status. Further, the TFT displays can be customized to suit the user's preferred methods of working. For example, they can show names, filter settings, dynamics, and or routing information.

The sets of encoder-bargraphs provide the user with a quick overview of parameter settings – literally on the spot. More detailed information is shown on the TFT displays – for example, graphical EQ frequency-response or dynamic curves.

The hires meters are designed in accordance with standardized curves and can even be switched to »analogue« metering (IRT 3.6). There is no need for additional external meters. The flexible displays show everything from a simple level meter up to complex multichannel metering and display of the gain reduction resulting from dynamic processing. The meters provide a display range from 0 to -60 dB. In addition, the sensitivity can be raised by +20 dB or +40 dB.



Swedish Radio OB at the Eurovision Song Contest 2005 in Kiev

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Audio

The Signal Flow

The combination of AURUS with the NEXUS audio network forms an overall system with distributed inputs and outputs for different formats. Within this system, the AURUS can access all available I/O resources independently of their physical location. In complex installations it might make sense to configure the system in such a way that the AURUS only has access to some of the available resources. This is possible within NEXUS – including the configuration of user rights for individual users. Furthermore the AURUS base unit can be specified with MADI inputs and outputs.

The signal flow from the recording microphone to the loudspeaker is set up either using the configuration software or directly on the console. The overall signal flow usually looks as follows:

- The signal sources are fed to the respective NEXUS modules installed in the Base Devices.
- These audio resources are routed to the desired mixing-console input channels using the integrated input matrix.
- The mixing-console channels perform the signal processing; similar to an analogue desk, the signals are routable to various buses or direct outs. Inserts and key inputs are also provided.
- The mixing bus signals can be adjusted using processing channels and are then fed to the NEXUS audio network via the output matrix.

I/O-Interfaces

The decentralized routing matrix of the AURUS mixing-console system consists of NEXUS Base Devices interconnected via fibre-optic lines. These Base Devices are placed wherever inputs and outputs are required. Thus, external audio devices can be connected to the inputs and outputs using very short cables and are then accessible anywhere within the overall system. The fibre-optic lines distribute audio and data signals plus control and sync data.

The central NEXUS STAR router with its integrated AURUS signal processing is usually the core of such a network. The NEXUS system allows for easy upward and downward scalability and therefore flexible adaptation to customer needs.

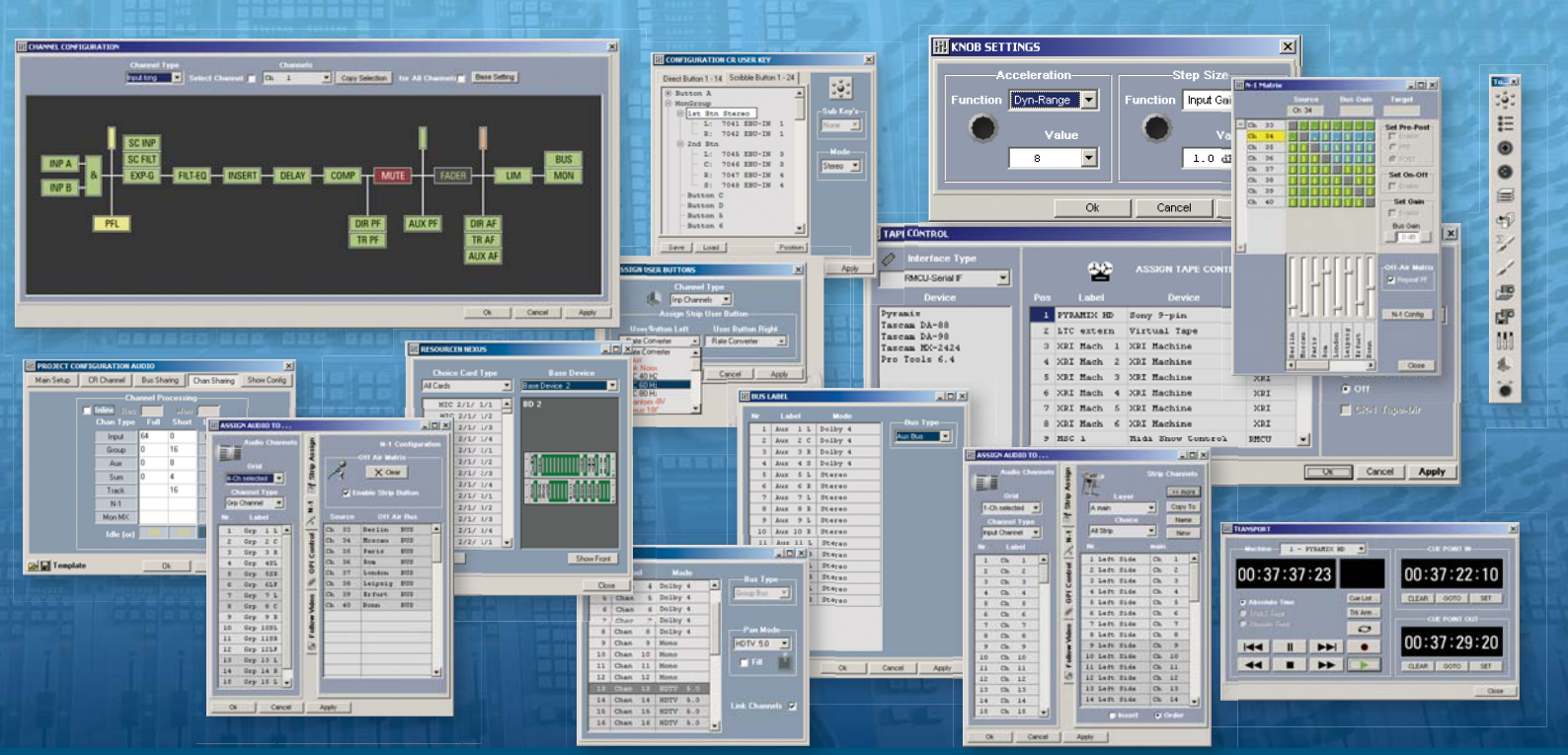
The entire NEXUS routing system is operated and configured from external PCs or from the configuration computer integrated in the AURUS console.

NEXUS Base Devices

NEXUS Base Devices are 19'' module frames (1 to15 U) accommodating NEXUS boards as required by the customer. The front panels of the modules feature standard interfaces, allowing for Base Devices to be used directly as patch panels.

NEXUS – an Extension Cable

Other modules (XTI) are available for NEXUS systems that allow for transparent serial data transmission from and to external devices via the NEXUS fibre optic network. The RS 232, RS 422/485, DMX, Timecode (LTC), and MIDI protocols are currently supported. The XRI and XCI boards are designed for controlling external machines featuring serial interfaces, or for switching consumer loads (e.g. red-light control).



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Analogue Interfaces

The use of NEXUS makes the excellent Stage Tec analogue-interface components available to the AURUS. These interfaces are based on Stage Tec's patented TrueMatch technology and include:

- XMIC+ – High-end Microphone Converter – 32-bit resolution, dynamic range = 158 dB (A)
- XAD+ – A/D-Converter Board – 24-bit resolution, dynamic range = 133 dB (A)
- XDA+ – D/A-Converter Board – 24-bit resolution, dynamic range = 131 dB (A)
- HXAD A/D converters featuring 16 analogue line terminals and 112 dB(A) dynamic range
- HXDA D/A converters featuring 16 analogue line terminals and 120 dB(A) dynamic range
- various terminal options (XLR, D-Sub, RJ45)

Digital Formats

NEXUS supports a multitude of digital audio formats such as AES/EBU, AES 42 (digital microphones) and S/PDIF, Sony SDIF-2, Yamaha MEL2 (Y2), Tascam TDIF, Alesis ADAT, MADI, SD-SDI, and HD-SDI.

Audio Processing

Audio Channels

Unlike analogue systems, AURUS provides for individual distribution of audio processing (DSP) resources as required. These distribution set-ups can even be stored by the user as mixing-console projects. Such a project is set up using the graphical control software by defining how many input, mix, aux-send channels etc. are required. The desired number of channels can be configured according to varying criteria. Depending on the hardware set-up and software configuration, mixing consoles with up to 300 channels, or 128 buses respectively can be achieved.

The system supports manifold monitoring and intercom functions. Monitoring speakers and external talkback units connect to the system via NEXUS, and the signals fed to nearfield speakers and to the integrated intercom system are carried and transmitted via fibre optic lines.

Signal processing is consistently performed using a 40-bit floating-point arithmetic, allowing not only for outstanding audio quality of EQ, filter, and dynamics modules but also for virtually overload-free internal console signal processing.

Audio-Channel Structure

The structure of the audio channels is derived from the principles and schemes of analogue systems. Wherever sensible, analogue limitations were abolished and extra functionalities implemented.

From the user's point of view, the audio processing comprises the input routing, input channels and buses of various types, optional output channels providing for mix-bus editing, and the output routing.

Direct routing of buses to outputs without signal processing is also possible, for example, to save resources. The functionalities of input, group, and mix channels are largely the same, with the exception of channel-specific features. For example, functions such as bus routing and panning are not available for mix channels.

AURUS provides two channel types: full and short channels. This feature allows resource utilization to be optimally adjusted to fit the actual requirements.

The channels are composed of processing modules such as fader, EQ/filter block, compressor, expander/gate, limiter, insert, mute, etc. The sequence of these modules within the channels and the access points of aux sends, track-sends, PFL and meters can be defined as required by the individual production. This configuration can



aurus the Direct-Access Console

Audio

be changed at any time – even during the production. The AURUS can also be configured as a traditional inline console with record and monitoring paths.

The mixing-console system offers up to 96 aux sends. A multichannel aux-send format is available for feeding multichannel effect units.

Hearing in detail

To help the users hear exactly what they are doing, AURUS allows for directly monitoring the output signal of specific processing modules within the channel.

I.e. the signal fed to the key input, the effect of the side-chain filter or the output signal of the respective Gate/Expander or Compressor module can be monitored. Another practical feature is the option of monitoring the filter output signal independently of the equalizer.

Buses

Buses are used as audio groups, mixing buses, auxiliaries, track sends, N-1 buses, and monitoring buses. Bus signals can be directly routed or, thanks to flexible configuration, individual downstream processing can be inserted. The buses can be linked to form various types of groups, ranging from mono to 7.1 formats.

Concurrent Multichannel

Thanks to its consistent multichannel design concept, AURUS is the first mixing-console system to allow for simultaneous mixdown in multiple multichannel formats. Thus, it is possible, for example, to create a stereo and a surround mix at the same time where the panpot settings will be applied according to the respective format. If necessary, the freely configurable integrated mixdown matrix can be utilised. No compromised down mix is required.

Adjustable base width, phantom centre, and divergence are extra features in multichannel mode.

Monitoring

The multichannel-console concept also includes the monitoring system. AURUS provides multiple independent or interdependent monitoring paths that fully support a variety of multichannel formats. This includes two inserts for external cinema processors. The processors as well as the solo and mute functions for individual monitoring paths are directly accessible via dedicated keys.

The two main-monitoring paths – Control Room Monitor and Alternative Monitor – are completely multichannel-enabled. Four additional stereo paths CRA...CRD can be used, for example, for playbacks. The sources of all monitoring paths are freely selectable.

In addition to the PFL and solo buses, virtually all signals within the system can be selected as monitoring sources: NEXUS inputs, channel outputs, mixing buses, or direct outs. Customized keypads on the monitoring panel and on the channel panel allow for input selection.

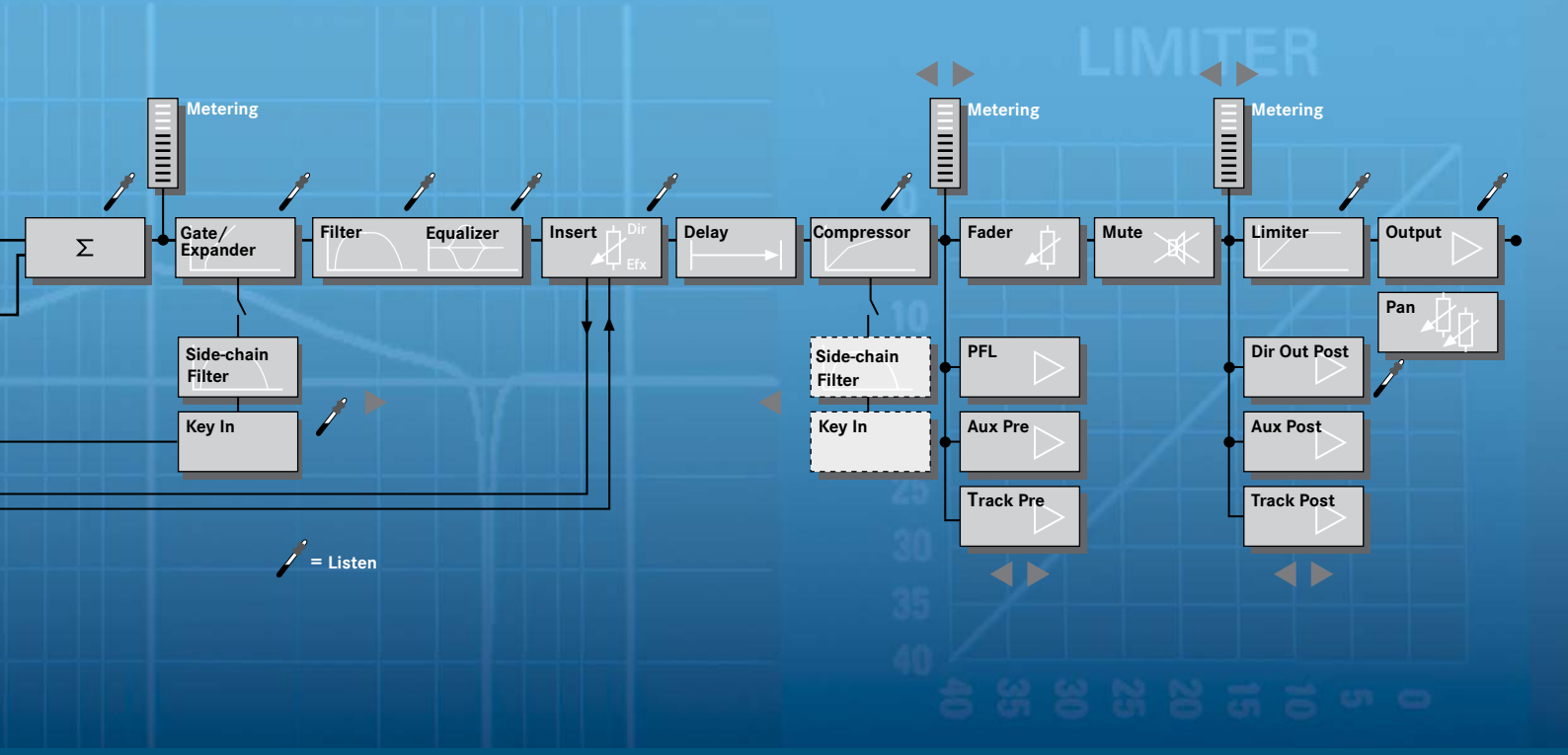
Analogue near-field speakers and headphones directly connect to the console. The console can be furnished with speaker stands on request.

Solo and PFL

AURUS provides multiple options for monitoring channels, various solo modes plus PFL. A separate stereo bus is available for PFL.

The solo function of AURUS is fully multichannel-enabled. Depending on the actual set-up, a solo bus with up to eight surround channels can be configured with summing or exclusive signals. Alternatively, the destructive »in-place solo« mode can be enabled.

In addition, supported PFL functions include back-stop PFL (»fader overpress«) and prioritised PFL.



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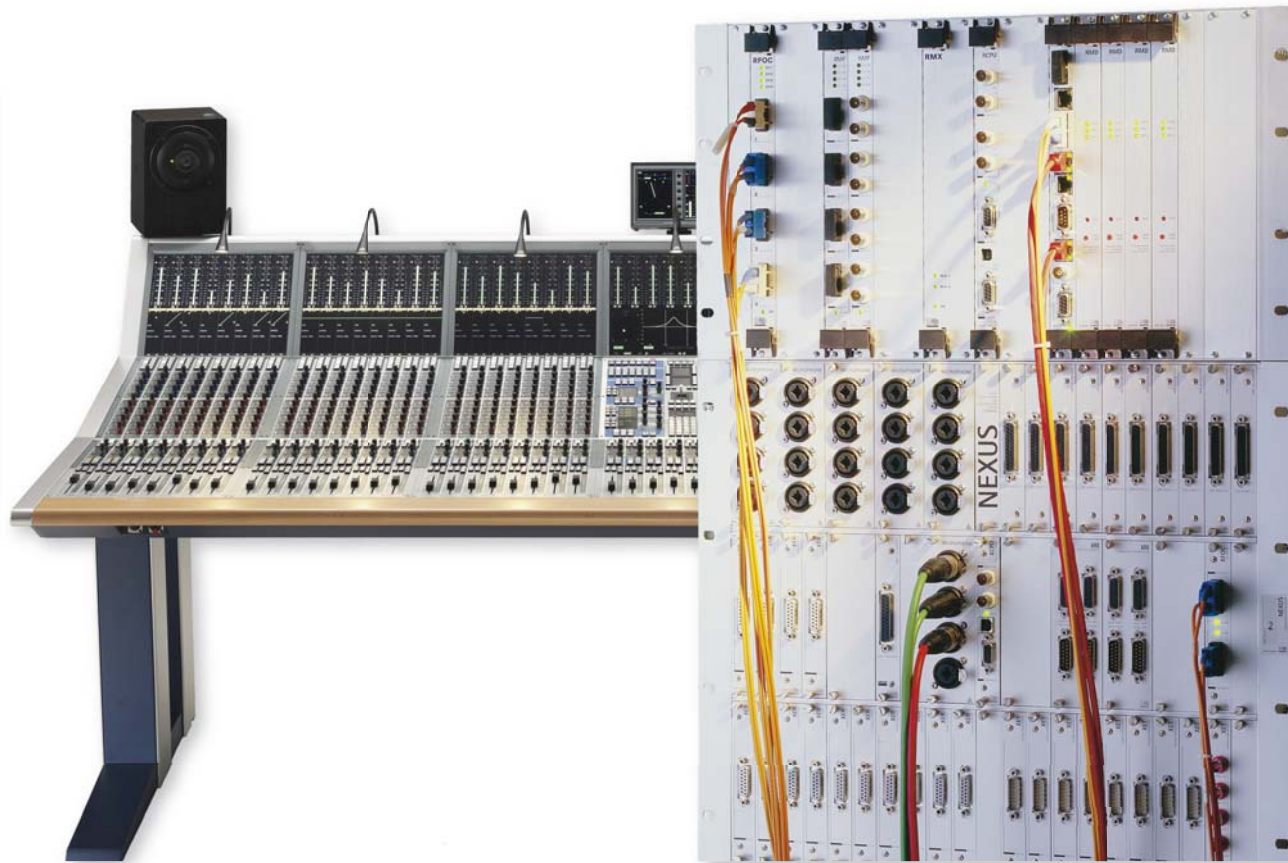
Communications

A standard integrated microphone is used for talking (slating) onto mix buses at the press of a button or for communication purposes. The Talk/Talkback system can address up to three target sections individually or collectively. The intercom signal is output from the NEXUS modules and can thus be fed to active speakers or headphone amplifiers.

2×2 talkback channels are available and can be associated with various monitoring speakers.

As an option, the SMON-R monitor-intercom combo panel is available for integrating a Riedel intercom system into the console.





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Features

N-1 System

The N-1 system allows for complex feeds to be simply achieved as required, for examples, at sports events or conferences. Whether the routing occurs pre-fader or post-fader it can be configured individually for each I/O pair. In addition, gain can be set separately for each crosspoint.

The additional configurable off-air matrix is a real helper: All participants who are off-air can communicate with each other. If one of them is put on air, the corresponding path will be removed from the conference. He can rejoin the conference after his fader has been closed again.

In brief, the N-1 system has the following features:

- Input, group, and mix channels can be used as sources.
- The maximum number of 48 N-1 buses should be sufficient for any application. The number of buses can be configured individually.
- The signal sources within the N-1 matrix can be freely routed and mixed to N-1 buses.
- The gain of each mix point can be set individually in the graphical control programme or from the console.

Automation

Automation functions for saving all audio parameters of the current project are standard feature of the AURUS mixing-console system. Three types of automation are provided to meet all requirements of various applications:

Snapshot Automation

With this type of automation, all parameter settings of all audio channels can be stored as snapshots. The automation data is stored as part of the project and is available as soon as the project is loaded.

The function stores all audio-parameter settings of the configured processing channels – for example, all channel parameters including the metering settings. An extra mode allows for storing selected function groups; for example, a snapshot can be limited to all equalizer settings, or even to individual functions.

Up to 999 snapshots can be handled within a project and be stored as part of the project to a hard disk or a removable drive.

Scene Automation

Using the scene automation, snapshots can be stored in any order and can later be recalled one by one using dedicated keys. Crossfade times are configurable, and various actions such as remote-machine start or signalling can be enabled using a sequence-control feature. Moreover, MIDI commands can be transferred to external devices, triggering sound units or controlling peripherals. The snap-mix function allows automated dynamic mixes to be integrated into the scene automation at the touch of a button.

Dynamic Automation

The dynamic automation is time-code controlled. It captures changes made to the audio parameters of a mix. Since data is stored in a 10-ms time grid, moves are precise with no skipping or jumping. The dynamic automation reads and writes all audio-related parameters, for example, encoder or fader settings or key actions. The mix-scope



The Master section provides a multitude of control elements, allowing for direct access to mixing-console functions.

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settings allow for limiting the extent of data capture down to a single function. Many trim and editing functions allow the user to work gradually towards the perfect mix.

Libraries

In addition to the automation facility, AURUS provides another function for storing project parameters. Equaliser and dynamics settings can be organised using libraries. The channel parameters are stored separately from the project but will be available as soon as the project has been loaded. The library can also be exported to a global file.

The library stores settings of this signal-processing units:

- Filter/equaliser
- Compressor
- Limiter
- Expander/noise gate
- Input gain

Machine Control

As a standard feature, the AURUS includes a remote controller which has the capability of controlling studio peripherals. Flexible software modules make it possible to address most machines relatively simply. The devices are controlled from two separate control panels on the console. The panels are not dedicated to specific machines and assignments can be changed at will.

The devices to be controlled are connected either to a serial interface on the AURUS controller board or to a serial or parallel NEXUS interface board (XCI, XRI).

A jog/shuttle wheel offers Varispeed control or frame-by-frame positioning of suitable devices. Timecode markers can be set and managed, and a loop function enables a previously defined section to be continuously repeated.

Apart from external devices the remote control can also be used to control the AURUS internal Timecode generator. This can, for example, be employed to enable dynamic automation if no external reference is available.

Freely Configurable Controls

NEXUS Logic Control is a programmable logic system for routing and control functions that can be configured by any user. Logic Control allows various NEXUS parameters to be queried such as patching statuses, fader-start relays, and input and output levels and also indicates internal system errors. In conjunction with an AURUS console, it can also be used to evaluate the statuses of specific mixing functions such as fader-start relays and machine control keys.

The system enables a huge number of various outputs and events to be controlled, for example, red-light control, mute keys, routing switches, level and crosspoint monitoring, fader starts, automatic breakdown-recovery measures, and intercom systems.



A brand new option for AURUS: a virtual control interface which can either append eight additional fader control channels to the console or be run in parallel with the mixing console's faders.

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Features

Offline Editor: Configuring an AURUS without an AURUS

Many users – in particular those frequently roaming about various production environments – will welcome the offline-configuration options of the AURUS since these offer serious time and cost benefits on tight production schedules, for example, in OB trucks or at live events.

The offline editor allows an AURUS to be set up even before it is physically installed or while it is still in use on another production. All set-up tasks including channel assignments, sum or group configuration, etc. are made using this straightforward standalone editor software running on a Windows PC. The results can be stored as a project on a USB memory stick and can subsequently be loaded into the AURUS just like any other project. The opposite approach is also supported: Projects can be imported from a console and then be edited using the offline editor. The current hardware set-up of the respective AURUS is predefined in the editor software and is also updated when updates or configuration changes are applied.

NEXUS Set-up Using the AURUS

Setting up the NEXUS audio network from the AURUS master section also saves a considerable amount of time. Crosspoints, filter parameters, and other audio-network parameters can be set even while the NEXUS hardware is not physically connected to the console.

Especially in outside broadcasting, network set-up used to cause waiting times for the OB truck crew – the audio network could only be set-up once all the NEXUS stage boxes had been installed. With the new offline mode, set-up can be started immediately because NEXUS Base Devices not present are emulated. When all stage boxes have been connected, the prepared settings can be loaded without delay.

Wireless Channel-Extension Unit

The AURUS Virtual Surface is a wireless channel-extension unit, i.e. a software application run on a tablet PC equipped with a touch-sensitive display.

Networked over Wireless LAN with the AURUS, this handy little remote control extends the console by 16 fader strips. Selected parts of the console interface are displayed on the tablet PC. Faders, encoders and buttons are operated using the mouse. The channel-strip indications reflect the physical statuses on the console. The settings made on the tablet PC can then be stored on the AURUS console. Of course, existing mixing-console systems can be updated to support the AURUS Virtual Software.

At first, the AURUS Virtual Surface was targeted towards theatre users, allowing the engineer to operate the console located in the control room in a very simple manner from the hall; however, many broadcasters have shown great interest in the system, which would help optimise large TV show rehearsals or even allow new production concepts to be implemented.



Philharmonic Gdansk, Poland

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Characteristics

Quality Control

Stage Tec products are manufactured for professional applications and therefore built to exacting standards. Their audio quality and hardware components meet even the most stringent requirements.

Digital audio processing at 40 bits with floating-point calculation as well as the excellent analogue components of the NEXUS router/switcher system ensure superb audio quality and maximum headroom for recording, mixing, and public-address applications. The AURUS complies with all requirements regarding analogue inputs and outputs as described in the IRT specification booklets 3/2 and 3/5. The quality of the digital and analogue audio interfaces has been tested and approved by the Rundfunk-Betriebstechnik institute (RBT, Nuremberg/Germany), RAI (Italy), ABC's Evaluation Labs (New York), and CCTV (China).

Quality First

All panels are subjected to thorough tests before they are shipped. The test routines and measurement sessions are aimed at ensuring that all functions work as expected and that the specifications detailed in the data sheets are indeed accurate. Each panel is first subjected to highly efficient, computer-controlled test routines, inspected by hand and subjected to durability tests within the entire system. More complex boards must also pass stringent endurance and individual tests.

Logistics

The following features make the AURUS mixing-console system perfectly suitable for OB trucks and live use: the low console weight, the extremely compact audio processor NEXUS STAR, the scalable routing matrix, and low power consumption, resulting in low heat dissipation.

Audio Quality

Digital audio processing with 40-bit floating-point arithmetic and the excellent analogue components of the NEXUS routing system provide the highest fidelity sound for recording, mix-down, and sound-reinforcement applications.

System Boot

NEXUS Base Devices - and therefore the entire routing system - are ready for operation within a few seconds after powering up or mains failure and recall all settings valid before the system was powered down (data-memorization facility). System set-up and signal-distribution settings are also included in the data memory.

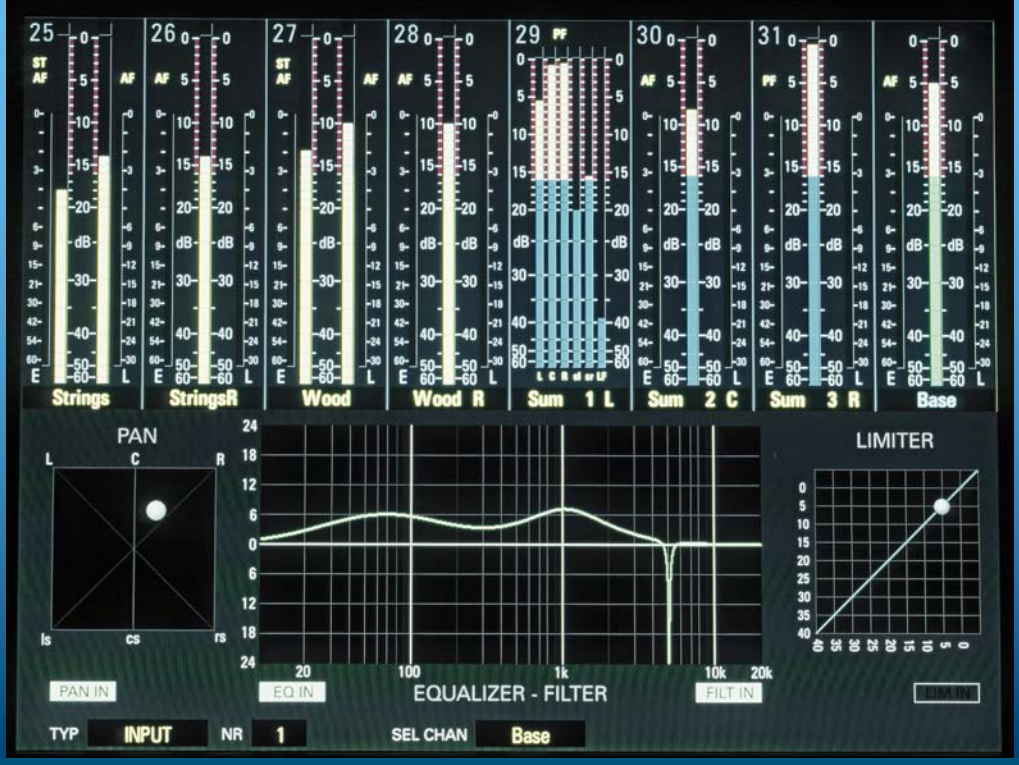
Data stored on the AURUS mixing-console system will survive even the longest power failure. When the outage is over, the console will restore its previous settings within a few seconds and will immediately be functional.

The configuration computer requires approximately one minute to boot.

Fibre-Optic Connections

The deployment of fibre-optic cables for system control and audio, data and word-clock information distribution simplifies the installation and makes the system insusceptible to electromagnetic interference and ground-loops.







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Characteristics

Flexibility

AURUS and NEXUS modular concept allows for a customised set-up of the overall system, which can be expanded by special functions as required.

Flexibility is provided even to existing users. The free configurability of channel and sum assignments as well as the channel layout that can be altered at any time allow for perfect project-specific adaptation to a multitude of different tasks. The various types of automation and the library functions simplify recurrent jobs.

Synchronisation

All NEXUS Base Devices and AURUS audio processors in the overall system synchronise to a common clock source. The clock signals are distributed in the system via fibre-optic connections, making a separate word-clock network superfluous.

AURUS and NEXUS support the standard sample rates of 44.1 kHz, 48 kHz and 96 kHz.

The NEXUS controller boards (XCPU, RCX) are fitted with precision WCL generators and can be used as studio master clock.

At sync-source failure, the overall system automatically switches to a different source; if no valid external source is available, internal synchronisation will be enabled. The sync preferences can be controlled via an editable list.

Distributed System

AURUS and NEXUS are mostly structured as systems with distributed control and processing, so failure is usually limited to partial functions.

For example, if the configuration computer breaks down, the console will remain operable – only the configuration can no longer be changed. At console failure or on disconnecting the fibre optic console connection, the audio processor will continue functioning, and the most recent audio-processing settings will be retained.

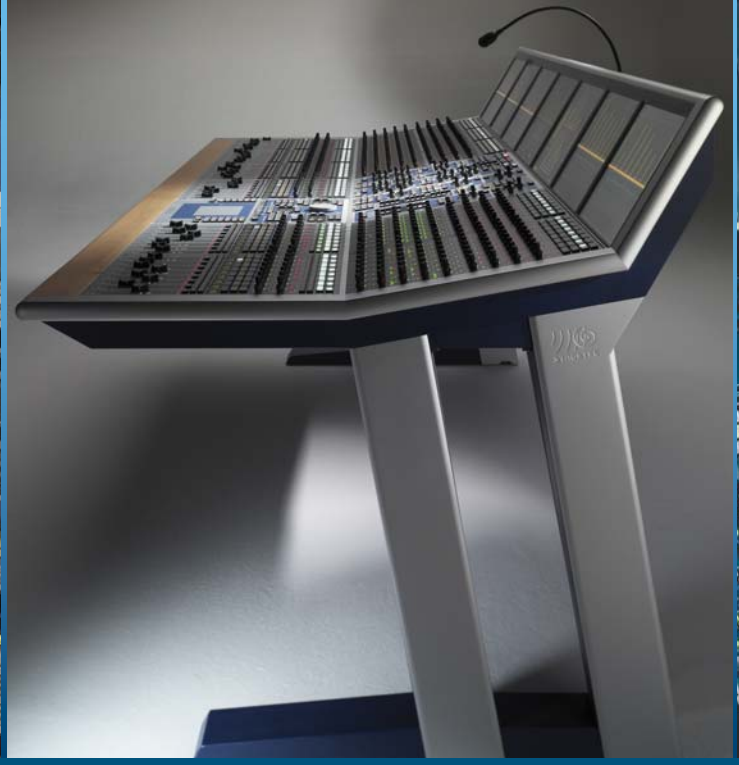
Audio processing is channel-specific, meaning that if malfunctions occur on an RMD board, only those channels processed on that board will be affected. This also simplifies identifying the defective board. A redundant RMD configuration can be implemented on request.

The concept of the virtual console, too, is protective: If malfunctions occur, the configuration can quickly be changed (for example, the channel assignment) in order to bypass any failed components.

Autonomous Processor System

The AURUS/NEXUS system is based on proprietary Stage Tec technology. This system comprises a multitude of special processors that perform decentralised calculations for the various tasks at hand. This approach not only improves system stability but also allows for a higher data throughput, so that all adjustments are carried out and applied in realtime. The operating software was conceived and written by Stage Tec for this particular purpose.







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A personal computer running a customised version of Microsoft Windows is embedded into the console. The familiar Windows GUI interface ensures a perfect start for every user. However, no computer is required for basic use of the console. Even if a computer fails or crashes, the console will remain fully functional – the only difference is that no new configurations can be created. In this case, it is still possible to load (user-defined) projects stored in the console memory.

Power Supply

One of the outstanding features of the AURUS is its low power dissipation (standard console: approx. 250 W, plus 20 W per audio-processor board). Therefore, it is highly suitable for mobile use.

The AURUS consoles as well as the NEXUS STAR which accommodates the audio processor feature power-supply units with automatic supply changeover. When feeding the power-supply units from separate power lines the console will continue working if one supply line breaks down. If required, Base Devices and audio processors can also be equipped with redundant power supplies.

Maintenance

Maintenance of the AURUS mixing-console system is supported in numerous ways. For example, the operating systems of NEXUS Base Devices, AURUS audio processors, and control-computer boards can be updated simply via the main-console configuration computer.

The audio processor and NEXUS Base Device boards can be replaced during operation (»hot swap«); the same applies to the control panels.

Maintenance of the NEXUS routing system is performed from the main-console configuration computer. Error messages and the locations of any failed boards are displayed on the TFT colour screen.

All relevant events will also be logged to the control computers.





Grand Théâtre de la Ville, Luxembourg



TopVision, Berlin, Germany



Guthrie Theater, Minnesota, USA

House of Music, Moscow, Russia



Eurovision Song Contest, Kiev, Ukraine



RTBF TV, Brussels, Belgium



References

The following list includes a number of examples of AURUS installations – large and small, 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).

Eurovision Song Contest, Kiew, Ukraine About 350 million viewers from 39 nations watched the popular song contest held in the Ukrainian capital of Kiev in May 2005. It was a double premiere. For the very first time, the event was broadcast live in stereo and 5.1 and for the very first time two AURUS consoles were in charge of the live mix.

The TV presentation of the semi-final on May 19 and the final on May 21 was a co-production between Sveriges Radio (SR) who provided an OB truck, outside-broadcasting experts of Prisma-TV from Sweden who supplied two more trucks, and SALZBRENNER STAGETEC MEDIAGROUP. Two NEXUS networks comprising three and two Base Devices, respectively, ensured reliable routing of the split audio coming from stage to an AURUS console installed in the SR truck and a fallback AURUS located near the hall.

For a high-profile event like this, absolute reliability is a must, so all mixes were made on two separate consoles at the same time. In case of a failure at the SR truck, the fallback AURUS would have performed an immediate takeover. Similar, if any on-stage NEXUS Base Device had gone down, all signals would still have been available via redundant MADI lines.

During this production, the SR engineers came to appreciate the AURUS panning concept. With traditional consoles, creating stereo and 5.1 mixes in a live application at the same time requires focusing on each of the formats. With AURUS this is different since it is capable of simultaneously computing different panning formats for the same channel strip to be routed to a stereo and a 5.1 bus at the same time, no additional effort arises from creating concurrent stereo and multichannel mixes. This is a significant benefit in stressful live productions such as the Eurovision Song Contest.

TopVision, Berlin, Germany When it comes to Bundesliga, the Champions League, the Nordic Skiing World Cup in Oberstdorf, or any other major sports happening, the TopVision OB trucks will almost certainly be on location. The outside-broadcasting experts provide all of Germany's public and commercial TV stations with image and sound from these events. TopVision opted for the »maximum equipment« in the audio control room of an HDTV truck. An AURUS comprising 7 DSP boards and more than 200 audio channels accommodated in a space-saving mainframe with 48 faders, supplemented by 16 NEXUS Base Devices, 1 NEXUS STAR, and 24 cameras.

Thanks to its DSP resources, AURUS has sufficient reserves to make multichannel mixes (up to 7.1) of lavish music and show productions. For this purpose, a total of three monitoring stations in the audio and video control rooms are 7.1-ready.

»The name TopVision stands for perfect image and perfect sound,« says managing director Achim Jendges, emphasising the great demands TopVision make on themselves. »Our set-up with AURUS and NEXUS is the perfect response to the requirements of our customers. This is particularly true in the field of high-quality productions such as music events.«

Grand Théâtre de la Ville, Luxembourg Today the Count of Luxembourg, next week songs by Tom Waits and Kurt Weill, then the rock opera Gormenghast – this is a routine programme at one of Europe's most renowned touring venues. The most distinguished touring companies from the French, English, and German speaking regions perform at the Grand Théâtre de la Ville, Luxembourg's famous venue for opera, drama and ballet.

Such versatility requires appropriate technical equipment. New set designs, ever-changing sound-reinforcement situations, and varying audio and video applications all necessitate adaptable technology. Also, if possible, the technology should be operable with little or no acclimatisation time for external sound engineers. This is why the AURUS digital console was chosen. Its benefits include a



Fuji TV, Tokyo, Japan



BR TV, Munich, Germany



tpc Zürich AG, Zurich, Switzerland

Friedrichstadtpalast, Berlin, Germany



Bundesmedienhaus, Bern, Switzerland



Aida, Stage Entertainment, Germany



WDR TV, Germany



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high degree of flexibility, short set-up times, and fast and intuitive operation.

Two halls with two control rooms were equipped with two stationary AURUS consoles (96 and 64 audio channels, respectively) integrated into a big NEXUS network featuring a NEXUS STAR router. The Theatre also acquired a small mobile AURUS, as the gear is needed on the spot more and more often – for example, for musicals or the FOH mix of bands.

In particular AURUS must prove its excellence on the studio theatre stage. Experimental projects are performed here, often demanding far more from the audio equipment than a classical drama. Amplified musical instruments, miking of voice and vocals, and surround-sound experiments combined with the variable geometry of stage and seating are a part of the studio programmes. Accordingly, the technology is adaptable. Lighting rigs allow for flying loudspeakers in many ceiling positions. There is no direct connection between speakers and power amplifiers; instead a patchbay adds flexibility. When combined with AURUS, which supports up to 128 buses – e.g. for feeding speakers and surround mixes –, this set-up allows for almost limitless staging options in the studio space.

iMedio Business Incubator, Osaka, Japan In an area of approximately 2,100 m², iMedio, (Incubator for Multimedia Industry Osaka) provides space, technology, and know-how to start-ups and young enterprises from the multimedia and IT domains to aid them in implementing their business ideas. At the heart of their new post-production studio is an AURUS, which is primarily used for mixing multimedia, video, and DVD productions.

A 9-U NEXUS Base Device supplements the standard configuration comprising an AURUS and a NEXUS STAR. The overall system is networked using fibre-optics. It may later be extended using more Base Devices as required. The NEXUS STAR accommodates a total of five DSP boards, each with a capacity of 32 audio channels.

In addition to simple operation and excellent audio quality, there was a third criterion that made iMedio opt for AURUS, its considerable flexibility. For example, thanks to the adaptable user interface, engineers can use AURUS as an inline desk if they prefer. No matter whether the project is a simple dubbing task or an extensive 5.1 production for DVD. All tasks that occur at iMedio are handled quickly and efficiently using the new AURUS.

Radio-Télévision Belge de la Communaute Française (RTBF), Brussels, Belgium RTBF is the national radio and TV service for the French-speaking population in Belgium. The TV department in Brussels broadcasts 24/7 channels to Belgium and, via satellite, to the whole of Europe. RTBF is also involved in Arte, the German/French culture channel, and in Canal+ in Belgium.

RTBF use AURUS consoles in two OB vehicles and a TV studio. One AURUS is in use at Studio 18 of the Brussels Broadcasting Complex. It is used for live TV news production and has a powerful set-up with 40 faders and up to 96 audio channels. An even larger console with 48 faders and up to 128 channels is installed on the »Magellan«, RTBF's biggest OB truck. The Magellan supports up to 20 cameras and is mainly used for live sports and music production. The third AURUS is located in an 8-camera OB truck with satellite uplink known as »One Shot«. This console also has 40 faders with up to 96 audio channels.

New Year Concert Mixed on the AURUS This year, the famous Vienna Philharmonic New Year concert was mixed on an AURUS console. Since the ORF attaches great importance to a 5.1 mix, the AURUS was the obvious choice – it enables stereo and surround mixes to be produced simultaneously in parallel. Thus, the numerous international stations broadcasting the event were able to select their appropriate format from three 5.1 sums and four stereo sums.

AURUS at BMW Welt The new BMW-Welt at Munich is a pinnacle in the world of event centres. The complex houses a distribution centre for new vehicles, a multipurpose hall (for concerts, shows, conferences, and events) and mounts exhibitions related to technology and design. There are also shops, restaurants and an education centre for children called the Junior Campus. The SALZBRENNER



Euroscena, Rome, Italy



BMW-Welt, Munich, Germany



National Convention Centre NCC, Hanoi, Vietnam

Philharmonic, Gdansk, Poland



France 2, Paris, France



Best of Musical, Stage Entertainment, Germany



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References

STAGETEC MEDIAGROUP completed two extensive tasks commissioned by BMW. Providing the audio, video, and sound-reinforcement systems in the event hall (called the Forum) and the audio and video installations in other parts of the complex – including the Double Cone. Live concerts, conventions, drama productions, films and banquets will all be presented in the Forum. A 48-fader AURUS with 136 audio channels handles all the audio signals here. Five fixed NEXUS Base Devices plus a mobile unit (used as a stage box) provide the required interfaces and route all audio to the speaker system.

In the Empire of the Tsar is probably the most beautifully sited AURUS workplace in the world – immediately above the Tsar's lavishly appointed box with its luxuriant red velvet and opulent gold leaf. It is located at the Alexandrinskij Theatre at St. Petersburg where the auditorium underwent extensive renovation to restore the original look from 1832.

AURUS: Best for Musicals Until recently it was not uncommon for promoters to build a completely new venue for a new musical show, or at the very least to refurbish. Today, German market leader Stage Entertainment takes the shows on tour. Examples are the Best of Musical 2006 and Best of Musical 2007 events that present excerpts from contemporary musicals. The shows are produced using two AURUS consoles. A 48-fader unit is used for the FOH mix and another 32-fader system for the on-stage monitoring mix. An orchestra of 30 musicians, a 20 background singers, and nine soloists rely on the monitoring system. This requires 126 input signals to be processed by the consoles. Each soloist's performance is picked up using a small hidden microphone and transmitter unit.

The audio network also includes four NEXUS Base Devices plus two NEXUS STAR routers, each containing seven DSP cards. All components are interconnected using special rugged optical cable. The mixes were carefully pre-produced by a sound designer and were then recorded to the AURUS as one snapshot per scene. This enables the beginning of each scene to be reproduced precisely during each performance at the touch of a button.

Sound-Designer Andreas Hammerich says »... there are indeed many digital consoles where the sound quality considerably degrades when mixing numerous input channels at high levels; however, we don't experience any such problems with the AURUS.«

AURUS at the BBC Glasgow In the summer of 2007, BBC Scotland moved to their new broadcasting centre at Pacific Quay. Lead-managed by Siemens, a NEXUS audio network and a 56-fader AURUS console specifically configured for multichannel mixing were installed in the control room of the HDTV studio. Another 40-fader AURUS was implemented in Studio C.

As is the case with many other AURUS installations, especially for live use in radio environments, the console's ease of use was a decisive factor. While behaving like a traditional analogue console, the AURUS also offers the extensive and flexible options typical of digital systems; in particular, instant direct access to numerous functions such as equalisers or auxes is a must for live applications.

EUROSCENA – AURUS-based OB Fleet Usually, space is decidedly tight inside OB trucks; however, this is not true of the new HD-enabled OB-van »village« of the Euroscena TV-production company from Italy. The main vehicle offers spacious extensions on both sides and contains two production-control facilities, an AURUS equipped audio-control room, a VTR/slomo workplace, a video-control area, and a VIP zone. The second truck features a chromakey-enabled 30-sqm TV-production studio, an extra production-control area, and another audio-control room.

Audio-processing benefits from the choice of AURUS and NEXUS in many ways. Regardless of its power and the 1272 inputs and 1024 outputs, the ultra-compact system requires just seven Base Devices occupying only 39 units in height. Another key factor was the AURUS' Direct Access and the convenient multichannel-mixing capabilities. Euroscena uses the set-up for productions in formats up to 7.1. The Dolby E-encoded mixes are then routed via the NEXUS.



Radio Bremen, Bremen, Germany



Berliner Ensemble, Berlin, Germany



Philharmonic, Berlin, Germany

National Stadium, Beijing, China



Sejong-Center, Korea



Alexandrinsky-Theater, St. Petersburg, Russia



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Impressive AURUS Installation at Berlin Philharmonic Berlin Philharmonic owns several audio-control facilities; one of the major ones is Studio 3. This is where the Berlin Philharmonic Orchestra concerts and many more events in the great hall are recorded. In addition to stereo recordings mixed directly to tape, multitrack systems play an important role because they allow surround mixes to be produced. The studio is also available for CD productions and for rental as a studio for radio and the recording industry.

These manifold production possibilities require a big AURUS: seven fader panels with eight channel strips each. With an overall width of 2.73 metres, this is the biggest AURUS console available in the standard version with two legs.

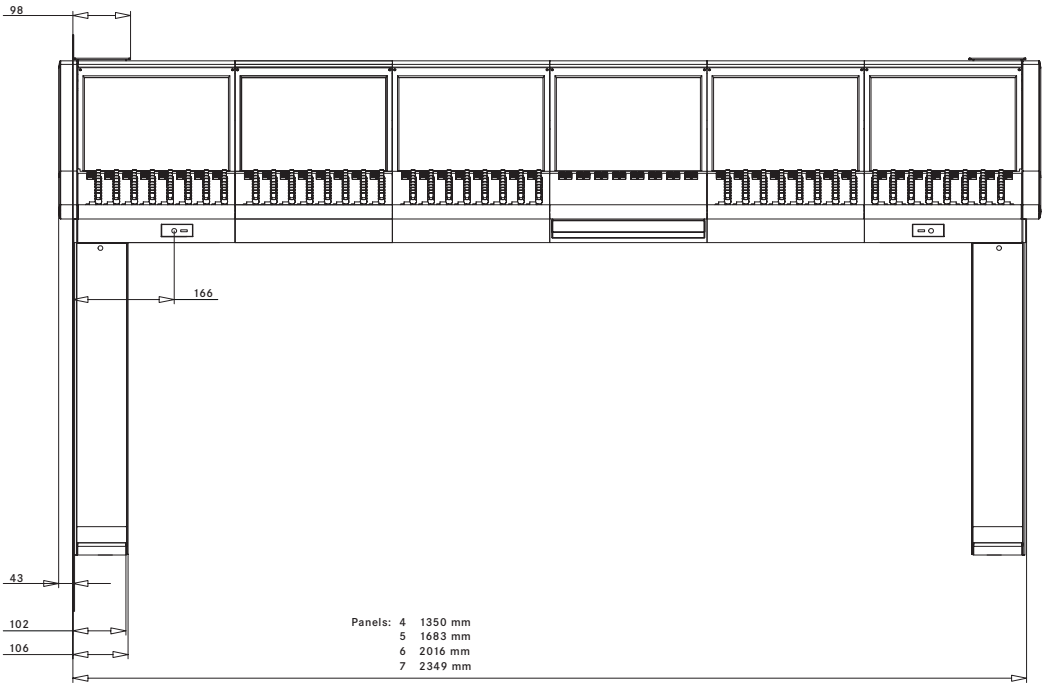
Olympic Games 2008 »I declare open the Games of Beijing celebrating the 29th Olympiad of the modern era«: More than 90,000 visitors to the Grand National Stadium at Beijing heard those words on 8 August 2008. They were mixed on two AURUS desks installed in the central control room of the stadium and fed from a NEXUS audio network to the sound-reinforcement system comprising 220 line arrays. The two AURUS consoles offer 40 and 8-channels, respectively. This ensured perfect sound not only for those on the spot but also to an estimated 40 billion TV spectators all over the world. Routing of the M&E sound to all connected OB trucks (around 60 vehicles) and the various technical centres was achieved using digital MADI lines.

Incidentally, in contrast with many international sports events, the overall system was not hired but permanently installed in the stadium.

Training on the AURUS For their AV courses, Robert Schumann University of Music (RSH) in Düsseldorf invested in an extensively configured 7.1-enabled audio-control room. »We opted for AURUS and NEXUS because of the AURUS' outstanding 7.1 performance, and since we needed an audio network with as flexible an architecture as possible. Another plus was that this system is in use at a large number of broadcasting institutions and events centres. It provides a practical and future-oriented working environment for the students,« says Werner Roth, professor of music production, about their decision to acquire an AURUS with 56 faders and NEXUS peripherals equipped with numerous MADI interfaces. The NEXUS system comprises the mandatory NEXUS Star, a stationary Base Device in the control room, and an additional mobile Base Device.

Radio Bremen digital Radio Bremen have moved to a new broadcasting centre, converted their systems to the digital domain, and consolidated TV and radio operation. Five main control rooms were implemented, four of which support bimedia use. (I.e. for TV and radio production). Each control room houses an AURUS desk. In particular, the AURUS console in the Event control room is crammed with DSP power and is therefore used for the larger scale radio and TV shows involving live music and the countless microphones that go with it. There are another two studios and four speaker cubicles supporting bimedia use. The OMUX multiplexer allows for highly flexible combinations of all the units. Each control room can be linked to any studio or cubicle.

State-of-the-Art Sound in Korea Koreas biggest and most modern centre of culture and arts, the newly renovated Sejong Centre at Seoul, uses a NEXUS audio network and two AURUS consoles. In July 2006, the control room of the big theatre hall was fundamentally reconstructed and was equipped with a new Stage Tec audio system. Within just three days, a 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. At Sejong Centre, the NEXUS is used as an I/O system for the AURUS and for local networking and format conversion. Another AURUS is in use at the small hall.



aurus the Direct-Access Console

Specifications

Console

Configuration: desktop or standalone console; min. width approx. 140 cm/4.6' (24-channel version)
Channel strips: max. 96 assignable channel strips plus Master section
Width: from 1,350 mm/53.15"
Depth (user interface): 800 mm/31.5" plus arm rest
Depth (total): 1,057 mm/41.61"
Height (total): 1,049 mm/41.30"

Operating Panels

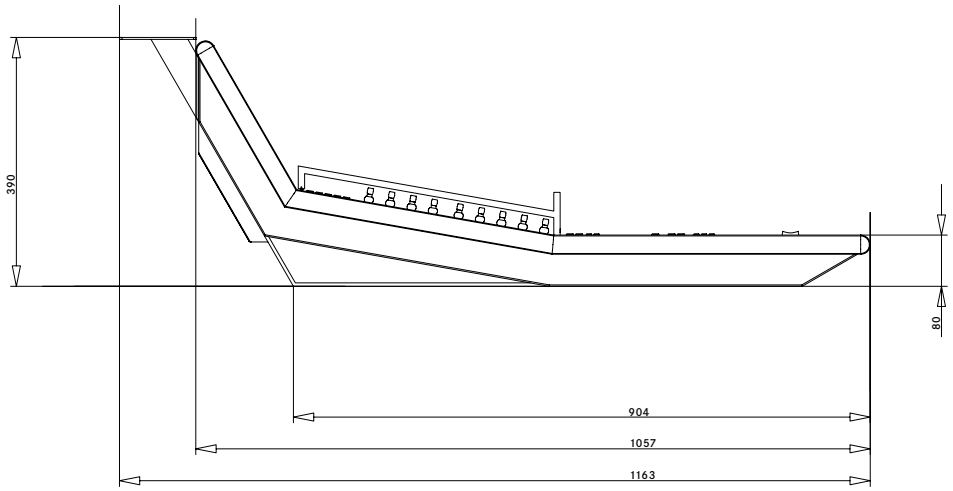
Dimensions: 332 x 400 mm/13.07 x 15.75"
Channel strips per panel: 8
Electrical connection: ribbon cable with square post header, incl. power supply
Hot-swap-enabled

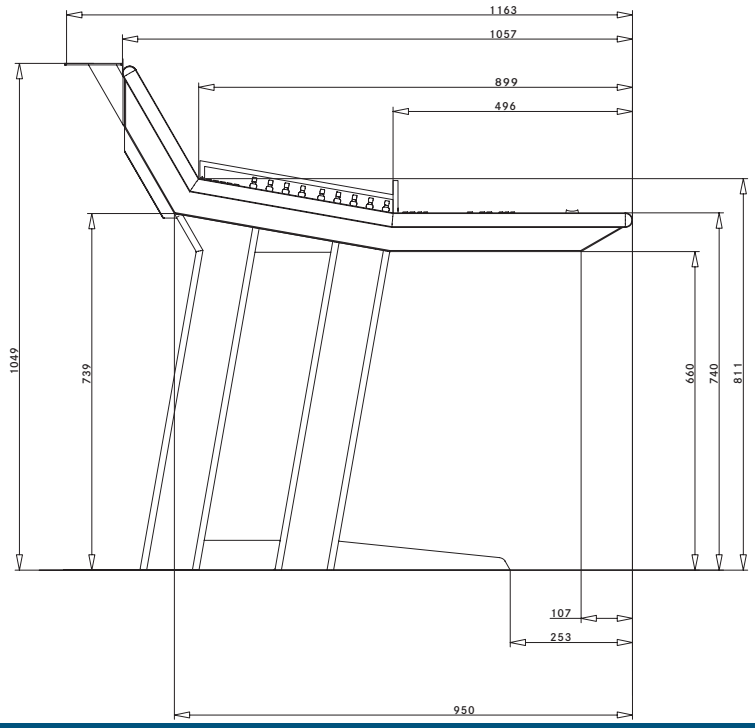
Features

Headphone terminals: 2
Talkback-microphone terminals: 2
Ready for lights
Speaker fittings: 2
Backup drive (USB memory stick)
Fitting for optional stereo-image display (option)
Sheet holder
USB interfaces at the desk

Interfaces (Console + Console Control)

External interfaces: SMPTE-LTC, MIDI, USB, Ethernet , FOC
Fibre-optic lines: 50/125-µm fibre;
rate: 1 Gbit/s; spanning distance: up to 1 km/0.62',
LC duplex terminals





aurus the Direct-Access Console

Audio Processor

Processors: ADSP 21160 »SHARC«
Accuracy: 40-bit (32 + 8) floating-point
Multichannel formats: 1 to 8 channels
Signal delay (incl. A/D and D/A conversion):
<1.5 ms@48 kHz/f_s; <1 ms@96 kHz

Signal-Processing Modules
Channel inputs
Side-chain input/side-chain filter
Gain
Compressor
Limiter
Expander/noise gate
High-pass filter
Low-pass filter
High shelving
Low shelving
Bell EQ (HF, HMF, LF, LMF)
Notch filter (2×)
Delay
Panpot
Direct out PF/AF
PF/AF-aux, PF/AF-TR, PF/AF-N-1
PFL/solo
Insert
Main fader
Channel out

I/O Formats
NEXUS fibre-optic interface board
MADI interface (optical or BNC)

For example, the following interface boards are available for NEXUS:

Analogue Audio
Microphone in, 32-bit ADC
Analogue line I/O, 24 dBu, 24-bit ADC

Digital Audio
AES/EBU I/O
S/PDIF I/O
MADI
SDIF-2
TDIF
Y2
ADAT
SD-SDI, HD-SDI
Dolby E

Controller
Relay controller (GPI/GPO)
Serial controller











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.

NEXUS, the first digital audio router based on a decentralised concept with consistent fibre-optic networking, the multi-award winning CANTUS mixing console system and the Direct-Access Console AURUS – shown for the first time in 1993, 1994 and 2002 respectively – are milestones on the road to a creative utilization of digital technology. The latest innovation is the AURATUS compact production console. 24 units of this product were sold to the WDR broadcasting service in the first year of its release (2007).

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. All 13 of the engineers who originally founded the enterprise as a kind of worker co-operative, are still active partners and carry responsibility for continuing 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. Modules must also be versatile building blocks for different applications. Only then can you design lightweight, intelligent and flexible products like AURATUS, AURUS, CANTUS or NEXUS.

At Stage Tec, the software and hardware domains are inextricably linked. Highly optimized 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 AURUS, CANTUS and NEXUS control programs with their graphical user interfaces, all come from the in-house software-development department.

Whether NEXUS, NEXUS STAR, CANTUS, the TrueMatch RMC, CINETRA, AURATUS or AURUS, every Stage Tec product has been a trend-setter. With CANTUS and NEXUS, the consistent separation between mixing and the I/O matrix is innovative and allows efficient decentralised systems to be constructed. The AURUS 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.

Stage Tec
Entwicklungsgesellschaft für
professionelle Audiotechnik mbH
Tabbertstraße 10
D-12459 Berlin / Germany
Phone: +49 30 639902-0
Fax: +49 30 639902-32
E-Mail: office@stagetec.com

SALZBRENNER STAGETEC
VERTRIEB PROFESSIONELLER AUDIOTECHNIK GmbH
Head Office
Industriegebiet See
D-96155 Buttenheim / Germany
Phone: +49 9545 440-300
Fax: +49 9545 440-333
E-Mail: sales@stagetec.com

SALZBRENNER STAGETEC
VERTRIEB PROFESSIONELLER AUDIOTECHNIK GmbH
Office Löffingen
Bahnhofstr. 13
D-79843 Löffingen / Germany
Phone: +49 7654 9104-0
Fax: +49 7654 9104-91
E-Mail: loeffingen@stagetec.com

STAGETEC

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