Swiss Sound

News and Views from Studer

April 2000 No 43
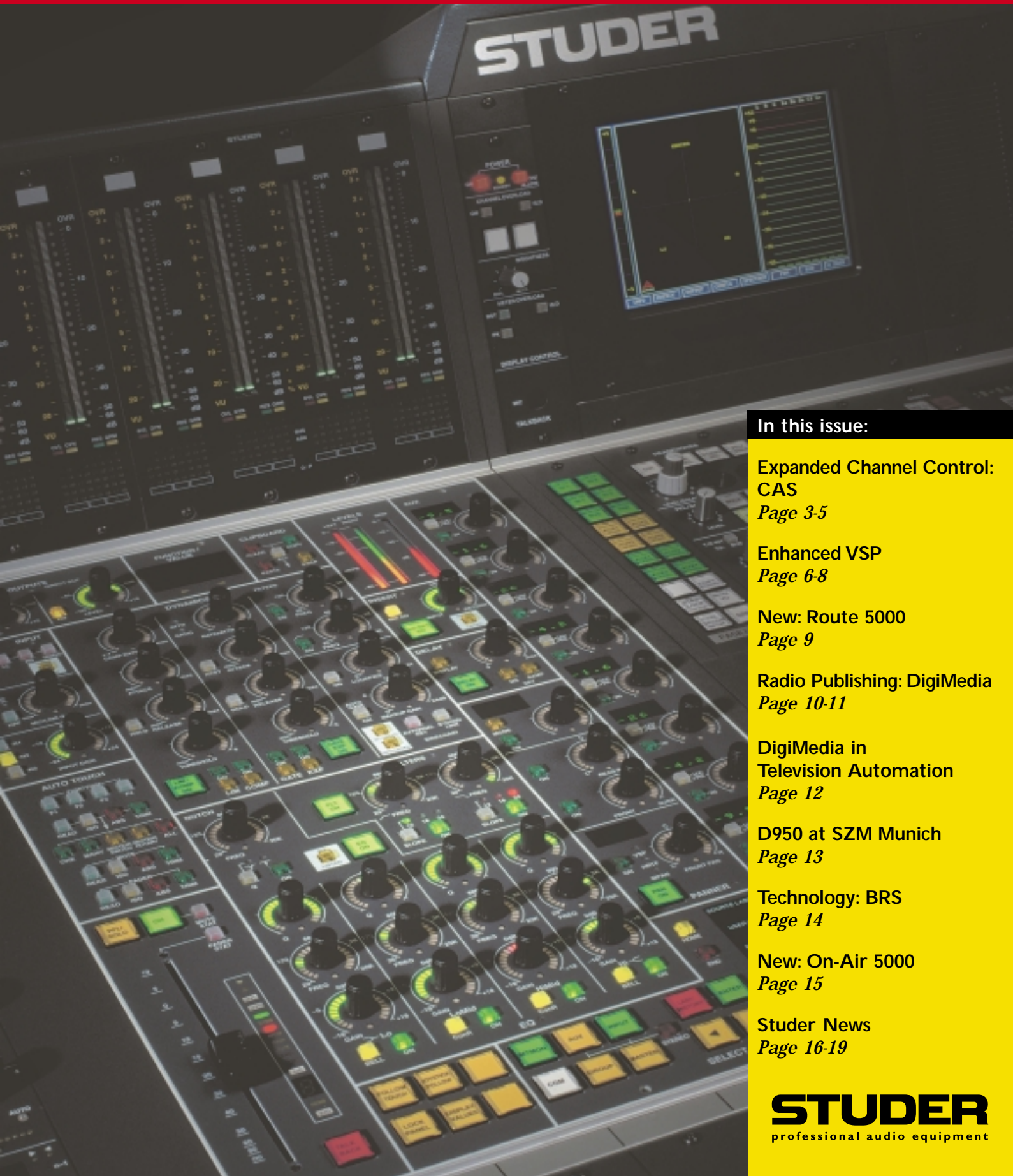
STUDER
professional audio equipment

Dear Swiss Sound Reader,

Derek Pilkington

It has been a year since Studer published the last edition of Swiss Sound. Since then many of our friends and partners, both customers and representatives, have frequently requested a new issue. Today it is my pleasure to introduce this new edition of Swiss Sound. It reflects on the substantial progress and successes Studer has enjoyed during the last year.

The D950 digital console is a worldwide success; firmly establishing Studer as one of the major players in this market. Studer's leading position in psychoacoustic research and its application in the D950 has contributed to this success. You can learn more about this innovative technology and its potential on pages 6 through 8, and 14. Studer is committed to constant improvements in both the hardware and software to assure customers receive long-term value. One example of this commitment is the new D950 Central Assign Section (CAS); a retrofitable add-on that improves the operational ergonomics as described on pages 3 through 5.

Studer remains very active with radio continuity products including desks, routers and automation. In this issue, you will find details of improvements made to the On-Air 5000 desk and a presentation of the new Route 5000 TDM routing system. Improvements in Studer's radio automation system, DigiMedia, include new modules to make radio even more attractive. An article on page 12 describes a new application of DigiMedia as a control system at a television station.

As always, we look forward to future opportunities to meet you, and to expand upon all that has happened at Studer in the last year. We hope you enjoy this edition on Swiss Sound.

Yours Derek Pilkington

Studer at Exhibitions

The twice annual AES Conventions, held in turn in Europe and the US, are the prime occassions for us to meet and communicate with our customers and representatives. The 107th Convention in New York (September 1999) attracted over 10,000 visitors (below) and the 108th in Paris (February 2000) almost as many, with over 8,000. Studer maintained a high profile with a large booth (left) and a demonstration room. Both areas were crowded most of the time - a positive indication of the interest being shown in all our new developments. ■

Expanded Channel Control:

Studer D950 Central Assign Section

Michael Tapes

The Studer D950 Central Assign Section (CAS) represents a new operational paradigm for current and future owners of the renowned Studer D950 Digital Mixing System. The CAS is a complete expanded channel strip that is laid out in a clear and logical manner, allowing its operation to be understood almost instantly. Designed to be mounted in the center section of the console, the CAS brings expanded channel control to the fingertips of the operators without forcing them to leave the "sweet spot", the optimum listening position. Much more than the "central section" sometimes found in other digital consoles, the Studer CAS has unique navigational controls that make the CAS faster, easier and more efficient.

The Studer D950 Central Assign Section is made up of easy to see visual blocks that each represent a separate processing section of a Studer D950 channel. Even a complete fader section, identical to those on the console channel strips, is presented within the CAS. Yes, this is truly a complete and expanded channel strip.

The Central Assign Section encompasses 46 rotary controls, each surrounded by a 21-LED concentric data ring that displays the current knob position. In addition, a central readout always displays the exact numerical value of the current or last touched control. In-Process-Listen (IPL) buttons in each main section allow the mix engineer to monitor the audio signal at each main stage within the channel. Large processing in/out buttons within each section give quick channel status information at a glance.

The sections are:

- **EQ** - Full 4-band equalizer with 3 knobs per band. Each band allows a full 20-20 kHz frequency selection, while the outer bands can switch from bell to shelf and the inner bands can switch from constant Q to constant range operation. This wide flexibility makes the Studer D950 EQ ideal for both musical and surgical use. For those channels configured with a notch filter a separate knob/button set is provided.

- **Filters** - Just adjacent to the EQ section are the 2 full range (20-20 kHz) hi and lo pass filters. Buttons are provided for in/out and slope (12/18/24 dB/oct) for each band as well as overall filter set in/out.

- **Insert** - In addition to the insert in/out switch, an insert mix control is provided that allows the insert return to be mixed with the direct signal coming through the channel, providing local "wet/dry" mixing on any channel.

- **Dynamics** - The dynamics section contains a full control set for the 4 band dynamics section which includes limiter, compressor, gate, and expander. Controls for the side chain include HLP filters, look forward, make-up gain. In addition, side chain keying and linking are available. Independent in/out buttons are provided for each dynamics band as well as the compressor/limiter section and the gate/expander section.

- **Input** - The comprehensive input section provides controls for polarity reverse, stereo mode switching, input selection, and input gain. On those channels patched to Studer's remote controlled microphone/line pre-amplifiers, there are dedicated controls for mic/line switching, HPF, mic and line gain, as well as phantom power on/off. All of this control takes place in the analog sections of the remote mic/line pre-amps, providing maximum headroom and digital resolution.

- **Outputs** - Dedicated level and on/off controls are provided for the direct output and the multitrack or n-1 bus output.

- **Panning** - In the dedicated panning section 3 knobs provide Front LCR, front/back, and rear LCR control. A fourth knob can be switched through several modes to provide center feed percentage, LFE feed, and divergence control. The panning functions can also be switched onto the Aux and Free Assign section where expanded functions include the proprietary Studer Virtual Surround Panning parameters like room size, absorption, ambience, and distance. Of course, joystick panning operation is also possible.

- **Delay** - Up to 100 or 240 milliseconds of delay may be configured within any console channels. The CAS provides delay control both in millisecond and sample resolution.

- **Fader** - The fader section is a complete duplicate of the fader section within the normal channel strip. In addition to the long throw Penny & Giles moving fader, Solo/PFL, Channel On, and automation switching are provided.

- **AutoTouch Automation** - Complete mode switching is provided within the CAS so that different controls within a channel can be in different automation mode simultaneously (version 3.0 software). All of the knobs in the CAS are touch sensitive for fast and efficient automation operation.

- **Auxiliary** - The primary function of this section is to allow 8 mono or 4 stereo aux sends to be controlled simultaneously. Switching is provided for access of up to 32 mono aux sends and 16 stereo aux send buses. However, this section can also be used to control the aux output levels or the 8 stereo or mono master levels of the console. Additionally, optional panning functions may be controlled here as well as future options such as internal console reverberation. Each of the 8 knob sections has a dot-matrix display that labels the function of each knob and also allows the numeric value to be displayed when each knob is touched.

- **Channel Selection** - This unique section has 2 functions. The first is to display the type of channel that is "assigned" to the CAS (Input, Aux, Group, Control Group Master, etc) as well as the channel number, the user label assigned to that channel and the label of the source signal that is patched into that channel. The second function is to allow the navigation through the console so that any channel

within the system maybe selected and assigned to the CAS without having to move (or reach) from the sweet spot monitoring position. A variety of controls are provided including arrow keys, scroll wheel, and home and end buttons. Another unique feature is the History Browser that allows any of the last 20 channels that have been assigned to the CAS to be instantly brought back to the CAS for further channel adjustment. ∎

Studer's Central Assign Section for the Studer D950 Digital Mixing System is a versatile addition that makes the console even faster and more convenient to operate. Not only can input channels be brought up onto the CAS, but any channel type within the system can also be controlled by the CAS; including masters, group outputs, aux outputs, multitrack monitor channels, and Control Group Masters. The CAS enhances creative control and speeds console operation. The CAS is available in all new Studer D950 console systems and may be retrofit into existing systems.

Aux and Free Assign section

Virtual Surround Panning:
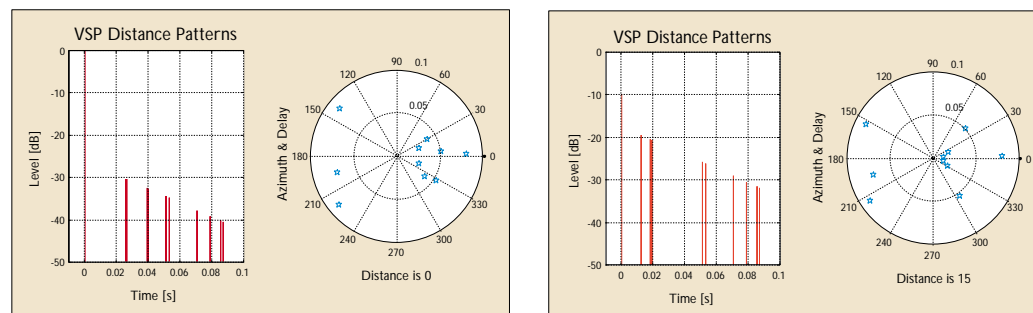
Enhanced Version

Dr. Ulrich Horbach

Studer's proprietary VSP panning algorithms have already captured the attention of surround sound mixers throughout the world. In the newly released version the capabilities and performance of VSP have been further enhanced. It is now possible to create an arbitrary number of distinct virtual auditory scenes within the mixing console. The underlying psychoacoustic comprises novel, so-called perceptual models that aim at closely simulating relevant features of natural acoustic environments.

Creating Auditory Scenes

Traditionally, positioning of a mono source in mixing consoles is accomplished by setting distinct levels according to a given loudspeaker set-up, based on so-called "amplitude panning laws". The sound itself can be "designed" with built-in modules that, for instance, introduce time delays, manipulate the tonal balance, or the temporal signal characteristics (EQ, dynamics processing). However, Studer's proprietary VSP technology goes far beyond this. Now source-related auditory attributes such as distance, direction-dependent timbre, spatial extension (focus), and room-related attributes like spaciousness, diffuseness and envelopment can be controlled by a set of easily accessible parameters. In this sense, by introducing the "spatial dimension", a more natural way of reproducing sound and music is within reach, while fully exploiting the capabilities of current multichannel formats. As will be shown, the source specific properties can be set in each channel where VSP has been configured, and the room specific properties in dedicated global processes that can be assigned to a desired number of channels. We call the resulting structure an "auditory scene". It is possible to superpose an arbitrary number of such auditory scenes in a final mix.

Improved Features of the new Version

According to the chosen values of the VSP parameters "room size", "distance", and the actual pan position, a psychoacoustically optimized reflection pattern is computed and rendered in real-time. *Figure 1* shows an example for two different values of "distance".

Discrete reflections are distributed both temporally and spatially in an optimized way, such that a clear impression of distance results while preserving the natural tonal balance. Apart from the improvement in quality, a new parameter called "Focus" has been introduced, which allows adjustment of the overall level balance of early vs. late discrete reflections (the transition point depends on the chosen room size). The result is a more focused or more diffuse spatial impression. The specular reflection patterns can be obtained from simulations of real halls. *Fig. 2* shows an example of the "Musikvereinssaal Vienna".
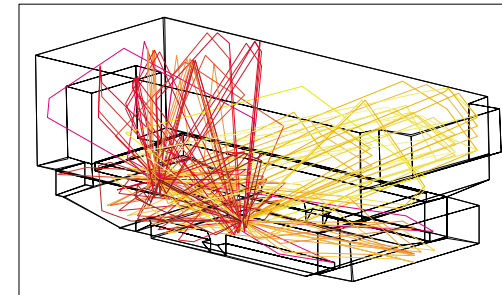

Fig. 2: Model of specular reflection patterns (Musikvereinssaal Vienna)

The resulting impulse responses are shown in *Fig. 3*, compared to those that were measured in the same hall. In spite of the very high order of simulated reflections, significant differences remain. In order to overcome this problem, and therewith to achieve a natural sounding environment, so-called diffusion filters were developed. Their function is to spread the particular reflection in time and space by an adjustable amount, while preserving the important localisation and distance cues.

Finally, a high-quality reverb processor has been developed, multiple versions of which can be configured and assigned to corresponding "auditory scenes". The reverb module adds necessary late reflection tails in order to complete the room simulation. It can also be used as a conventional, stand-alone, multi-channel reverb processor with the distinct advantage of having fully automated controls. Another pertinent feature is its novel "perceptual" control interface, with only six orthogonal parameters, which offer instantaneous control over the reverb characteristics, rather than forcing the user to select and download data from a complex set of presets.

Integration into Studer's D950 Digital Mixing System

Figure 4 illustrates the application in form of a configuration example. As explained, there are three distinct functional blocks:

• A number of VSP channel functions. A VSP surround pan replaces the usual L/R- or multi-pan functions after the channel output sections. The new VSP can be combined with the standard processing functions, like EQ, delay, or dynamics without restrictions in a mono channel. Generally, VSP can be applied to all surround formats that are currently supported by the Studer D950. As explained in the previous Swiss Sound issue, the channel functions of VSP contain a sophisticated, highly flexible, frequency dependent panner ("microphone emulator"), as well as a module where a number of discrete reflections are automatically generated, according to the position of the pan pot and a set of user parameters. These reflections are now grouped into a 4-channel format, feeding four dedicated "diffusion" buses.

Fig. 1: Example of VSP Distance Patterns.

Zero in the polar diagrams is the listener's position at arrival of the direct sound. The first reflections in this example come from the right hand side.
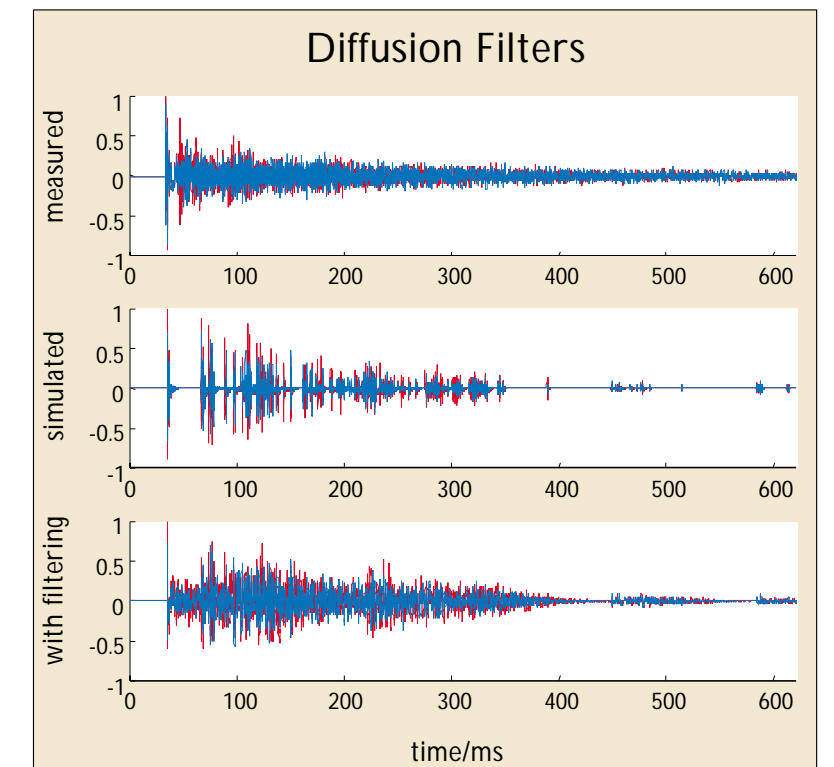

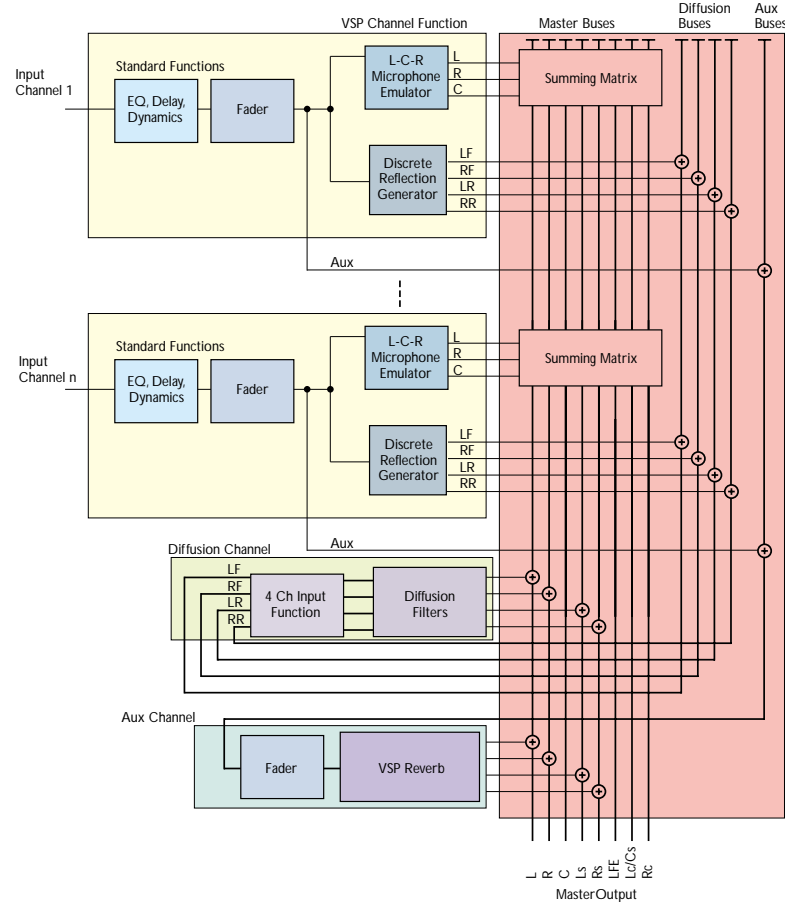*Fig. 3: Real-measured and simulated room responses, without and with diffusion*

Fig. 4: Configuration of VSP and Reverb.
L_c and R_c are the additional front channels in 7.1; C_s stands for Center Surround.

patched in conventional manner to the desired output master buses.
• The reverb module that generates the diffuse, late reverb tail, also generates L/R/LS/RS signals, to be added to the outputs. This function is configured in another dedicated reverb channel. It is fed from the output of a single aux bus, that contains the sum of the pre-panpot dry signals of the selected input channels.

An arbitrary number of different "rooms" (acoustical environments) can be configured, each fed by the outputs of respective groups of channels. Accordingly, the number of diffusion modules, reverb modules and corresponding buses must be increased. For example, some instruments and a group of soloists in an orchestra can be processed in a separate way. The listener perceives the superposition of different acoustics, e.g. the lead singer appears dry, in front, and the band playing in a large hall.

An overview over the channel- and room-related user parameters is finally given in *Fig. 5*

Summary
The main benefits of the new VSP version can be summarised as follows:

• Sources can be positioned at a distance, together with a defined spatial extent (focus) with less coloration and a more natural, pleasant sound.
• The effects of the "Room Size" and "Distance" controls have been sonically improved by using newly psychoacoustically optimized reflection patterns.
• A new multichannel reverb module with a user-friendly perceptual control interface has been developed.
• Diffusion filters allow the simulated auditory environment to closely resemble a measured one, thus improving naturalness further.
• Using the powerful configuration tool of the Studer D950 console, an arbitrary number of distinct acoustical environments can be created and superposed in a mix. ∎

• A special diffusion channel function where the outputs of these "diffusion buses" are further processed. This block contains the reflection distribution filters that have been introduced in the previous section. They are a unique feature of our system, compared with (even complex) room simulation tools that are offered by other manufacturers. The four outputs are

Fig. 5:
VSP User Parameter Set

CONTROLLABLE IN EACH CHANNEL		ONE CONTROL PER ROOM
PAN SOURCE PARAMETERS	**DISCRETE ROOM PARAMETRS**	**DIFFUSE ROOM PARAMETERS**
• Pan Format • Center Ctrl • Panaround	• Distance • Focus	• Diffusion
• Pan Mode • Front Pan • Back Pan	• Room Size • HF - Absorption • Ambience	• Cluster Level • Reverb Tail Level
• Divergence Mode • Divergence Ctrl		• Reverberation Time • Predelay
		• HF- Absorption • LF - Absorption

More flexibility, more processing power:

Studer *Route 5000*

Karl Otto Bäder

Swiss Sound has already reported on the possibilities of multiplex signal transmission and distribution via fibre-optic cables *(see issue 36)*. A lot has happened since then: new interface cards have been developed, and the DSP core of the Studer D950 digital mixing console is now used as the switching node. This brings some major advantages, including integrated signal processing, expected of modern routing matrixes, and the operational benefits of automatic system monitoring with seamless changeover to redundant cards in the event of failure. Add networked control with an open architecture, and all these improvements result in a new product: the Studer Route 5000.

Studer Route 5000 can handle virtually any signal format, using interface cards for AES/EBU (with optional asynchronous sample rate converter), 8-channel optical (ADAT), and analoge sources. Interface cards can be installed close to the source, reducing the amount of cabling. The interface module (19"/3U) outputs a MADI signal that can be easily transmitted up to 2 km via fibre-optic cable.

MADI data packets are disassembled in the switching nodes, and reassembled in arbitrary sequence for relaying to signal destinations. The node itself uses the same DSP cards found in the Studer D950 digital mixing console and the Studer On-Air 5000 broadcast variant, facilitating important signal processing functions like:

• Stereo channel swapping
• Channel phase inversion
• Mono summing
• Cross-fade
• Equalisation and filtering
• Limiting

The system controller merits special attention. Several control stations (PC workstations or special XY keypads) may be linked together via a Fast Ethernet network to facilitate segmented access (affecting just part of the routing system) as well as hierarchical access. Switching operations may either be performed ad hoc, or as timed events under software control by a schedule controller (similar to a broadcast automation scheduling system which is organised in discrete steps, repetitive blocks or sequences).

The concept is architecturally open in two directions: the control system can drive video switchers, color correctors, signalling or intercom equipment on the one hand, and integrate with existing control systems on the other. This makes the Route 5000 an extraordinarily flexible solution. ∎
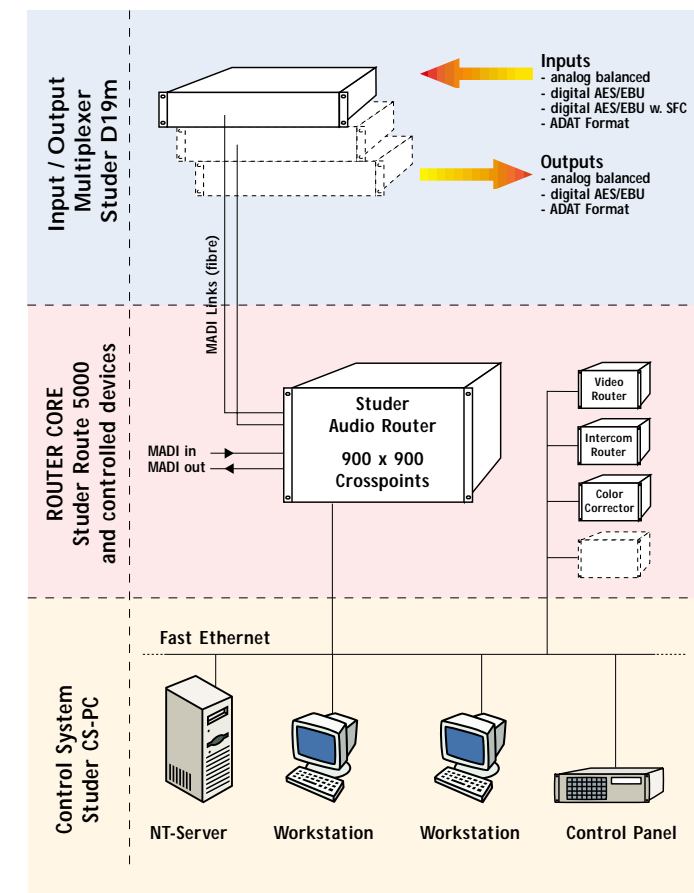
The success factor for Swiss radio stations:

Studer *DigiMedia* Radio Publishing

Robert Habersaat

Studer DigiMedia with Radio Publishing at Radio Pilatus (Swiss local station)

In addition to standard radio fare, electronic extra services are a growing factor in a radio station's success. Passive listening is no longer enough, audiences expect much more from their favourite station.

The development of radio from a strictly audio medium to a multi-medium is moving at an incredible pace. Swiss radio stations were early adopters of the additional services made possible by widespread digitisation. More than two years ago DigiMedia stations in Lucerne (Radio Pilatus) and Berne (Radio Förderband) were the pioneers, using the DigiMedia "Dynamic RDS" module to send title and artist details of the song currently on-air to listeners' RDS displays.

Extra services via internet
What many people initially dismissed as a gimmick turned into a runaway success, clearly appealing to listeners' desire for extra information. The next step, making this information available on the radio station's web site, was simply a logical progression. With DigiMedia "Internet Publisher" software, stations could not only publish text information from the DigiMedia database, but invite internet listeners to "tune in" using RealPlayer software.

Experience gathered over recent years means that Studer can offer numerous tools that take Radio Publishing from buzzword to reality.

Innovative DigiMedia module
DigiMedia InternetPublisherPro is a recently released software package that enables automatic generation of rich web site content from the DigiMedia database. All audio assets managed by DigiMedia can also be streamed from the web site to listeners' RealPlayer and Windows MediaPlayer clients.

The DigiMedia OnAir-Gateway can also transmit information from the DigiMedia database to SMS messaging centres, so listeners can use their mobile phones to check out the artist and title of the song currently playing, for example.

DigiMedia DynamicRDS allows the usual artist/title, plus all kinds of other information to be sent as RadioText to listeners' RDS displays.

Information via mobile phone
The idea is both simple and seductive: why give only listeners with RDS receivers or internet access the opportunity to download information about the song currently on-air, and even buy the music they have just heard, with a few key-presses? Why not provide this as a service to the growing community of mobile phone users too?

Implementation in record time
The momentum for rapidly realising this idea came from Minick AG in Erlenbach, a company specialising in e-commerce and m-commerce. Response from commercial radio stations was swift and unambiguous: they wanted it right away. Micromedia AG in Rotkreuz developed the DigiMedia OnAir-Gateway in record time. The DigiMedia OnAir-Gateway software extracts the required information from the DigiMedia database and forwards it in a defined format to SMS messaging centres. This was the foundation for all the subsequent projects.

A plethora of projects
Radio 24 with its partner, DiAx implemented a solution where listeners could call a freephone number to trigger an SMS with title/artist details. Radio Sunshine teamed up with agri.ch, an internet service provider, to implement a similar solution. Seven radio stations (Radio 105, Radio 32, Förderband, Radio Pilatus, Radio Top, Radio Z and Radio Zürisee) joined forces in the "mobileSound" project that came to fruition with help from Minick AG, CeDe Shop (an internet CD retailer) and Studer.

The mobileSound project
The main attraction of this system is not simply putting information on mobile phone displays, but the option to order the relevant CD with a few further key-presses. Listeners take delivery of their CD within 2 days, thanks to a CD sales operation run by CeDe Shop. The company was recently given the accolade of best Swiss internet CD retailer by Facts, a news magazine.

DigiMedia OnAir-Gateway
With DigiMedia OnAir-Gateway, any DigiMedia-based radio station can start implementing e-commerce and/or m-commerce solutions right away. The software package is available from Studer.

Studer DigiMedia with database replicator
Radio Rumantsch in Chur (CH) will be the first radio station to deploy the DigiMedia system with an SQL database for production and broadcast operations. An intelligent link between DigiMedia and the DigAS database makes it all possible.

SQL databases in conjunction with Studer DigiMedia at Radio Rumantsch (Swiss local station)

Major features of the installation are a state-of-the-art broadcast studio (24 channel Studer On-Air 2000 with DigiMedia playout) and an intelligent link to the established DigAS-SQL infrastructure, with more than 40 digital workstations. It is possible to work simultaneously with DigiMedia and the DigAS database, while a replicator keeps the systems synchronised and updated in both directions. ■

# Studer *DigiMedia* in Television Automation

Robert Habersaat

Television is just as amenable to broadcast automation as radio. The first system of this type went into operation at Swizz, a national music TV station, on 6 September 1999.

Hard disk video storage is a pre-condition. This is possible due to the MPEG-2 bit reduction algorithm, with 4:2:0 compression bringing the data rate down to 8 Mbit/s. 4:2:2 compression achieves better video quality; this is under development and will involve data rates between 12 and 16 Mbit/s.

Neither data rate poses a problem with modern hard disk interfaces. 100 Mbit/s fast Ethernet makes a suitable transmission channel, provided steps are taken to avoid access conflicts that are inherent to Ethernet technology and can hobble network speed.
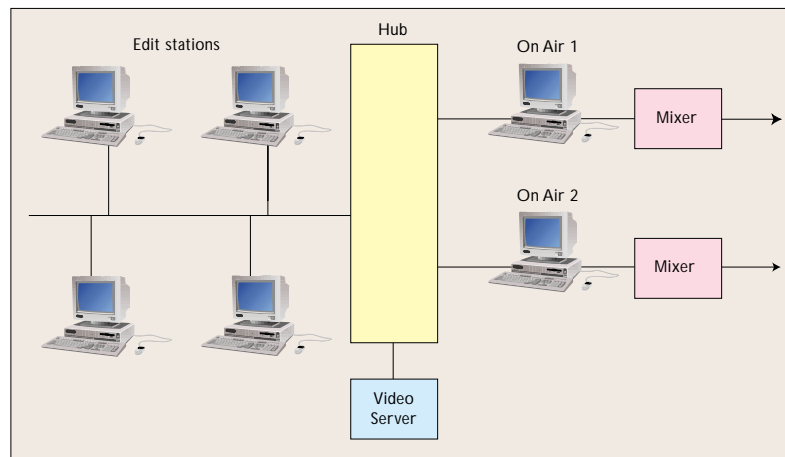
Proper segmentation is the key: one Ethernet segment connects to On Air station 1, which acts as the broadcast master. A second, independent segment connects to an identical station (On Air 2) that serves for production and can also be used as a standby during the broadcast.

The system output feeds into an (analog) video mixer that is used for "semi-automatic" operation. In this mode, the automation serves as a source like other peripheral equipment. In "fully automatic" mode, the video mixer is switched straight through and the automation system butt splices consecutive programme segments together.

15 editing workstations are also connected to the network, for off-line MPEG editing using a Vitec system. These workstations have low access priority, since small delays do not impair off-line editing activity.

The Teletrend company built the overall system, which currently includes a server with 1 terabyte of storage. Further expansion is planned.

The main reasons for choosing Studer Digi-Media to control the system were DigiMedia's proven and reliable track record at numerous radio stations, and the minimal training requirements for presenters, who are already highly familiar with this style of working from their previous jobs in radio. ∎

The perfect Match for SZM Studios in Munich

Klaus Peill

SZM Studios Film-, TV und Multimedia-Produktions GmbH in Munich (Germany) is a full-service provider of audiovisual media. With eleven studios ranging from 50 to 500 square metres in size, 32 linear and non-linear edit suites, over 30 graphics systems and a state-of-the-art animation and visual effects department, SZM is one of Germany's most innovative production companies.

Studer Germany, in a joint effort with system house BFE Studio und Mediensysteme in Mainz, delivered a Studer D950 digital mixing desk linked to an upstream Studer Route 5000 router within just 4 months of receiving the order. Both items are destined for a newly installed production suite for the N24 News station, which went on-air starting 24 January 2000. Driven by a BFE controller, the TDM router will operate as an audio-follow-video switching matrix, with a total of 448 x 448 audio ins and outs: 168 analog, 168 AES/EBU and 156 MADI channels. The router will handle sound from all the main transmission studios and as many as 10 remote studios at peak times.

The sound engineers and technicians at SZM studios always viewed the Studer D950 digital desk as the leading contender. Its analog-style control surface and intuitive operating philosophy promised a straightforward transition to digital technology. The desk is linked to two separate studios and announcer booths, and is equipped with 36 channel strips, 32 microphone/high-level inputs, 40 analog high-level inputs, 8 AES/EBU and 112 MADI inputs. There are 76 analog outputs, 8 AES/EBU outputs and 112 MADI outputs. Metering uses 36 dual bar-graph and 8 analog LED bar-graph displays. The central console area includes 50 source select buttons, 10 with LCD keycap legends, plus 5 x 10 source select buttons for play-in and machine control. A PFL loudspeaker and two talkback loudspeakers are built-in to the console.

The high proportion of live material broadcast by N24 - 18 hours a day - forms the basis for up-to-the-minute news reporting. 280 minutes of business news daily, with live reporting from key financial centres and an average of 50 telephone submissions is unique in German television. Between 6 a.m. and midnight, every programme goes out live. This inevitably leads to frequent changes in operating personnel. The desk is already in heavy use, and its flexibility will be pushed to the limit in the future. Application-specific configuration of DSP capacity allows definition of virtually unlimited auxiliary outputs and n-1 buses. ∎

## Binaural Room Scanning, a new technology:

BRS Processor

Monitoring surround signals in cramped mobile environments via loudspeakers is fraught with problems. Studer has a solution: the BRS processor, a system that emulates a surround studio monitoring system through headphones.

Attila Karamustafaoglu

Functions

By using a dummy head to measure the characteristics of a room equipped with surround monitoring, the way in which the sound is modified on its way from the loudspeakers to the ears may be determined and stored for various angles of head rotation. Technically, these modification coefficients are called "binaural room impulse responses", which is why the measurement technique has been called *Binaural Room Scanning (BRS)*. The resulting data can be used to recreate the acoustic wave front reaching the listener's ears, without further need for either the measured room or the monitor loudspeakers themselves. The BRS processor does this in real time, monitoring changes in head position by means of a tracker attached to the headphones.
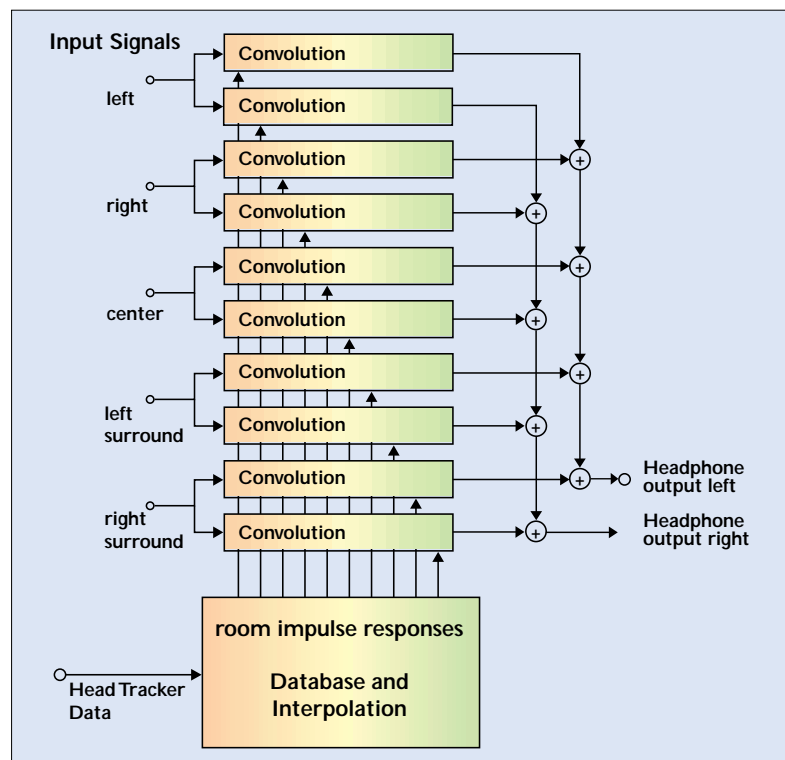
This makes it possible to virtually recreate a surround monitoring installation through headphones, based on previous room measurements.

Prototype

The prototype was realised as a 19" unit, with the complex algorithms implemented using multiprocessor hardware shown in the block diagram. The unit accepts a maximum of eight monitor speaker signals on digital inputs, and delivers the processed results to an analogue stereo headphone output. Eight sets of coefficients (for various rooms) can be stored in flash memory and recalled at the press of a button.

Applications

This new technological development has wide-ranging applications, from specialised situations in professional audio to home use as a "surround headphone". As mentioned earlier, mobile operation with loudspeakers can be a difficult issue, since it is hard to establish good acoustic conditions involving typically 5 loudspeakers. The BRS processor allows an existing environment, for example a familiar studio installation, to be effectively transported as a virtual headphone image. The BRS processor can benefit fixed installations, too: compact, low-cost surround workstations can operate simultaneously in a shared room, with none of the sound engineers having to forgo studio-quality acoustics. The facility to select among room emulations even permits comparisons between diverse listening environments, such as well-known studios, different monitor loudspeakers in the same studio, a cinema auditorium, domestic and in-car listening. ∎

Input Signals — left, right, center, left surround, right surround → Convolution → Headphone output left / Headphone output right

room impulse responses
Head Tracker Data
Database and Interpolation

State-of-the-art technology, ergonomically packaged:

Studer On-Air 5000

Roland Casagrande

Analog lines between studios and transmitters are being replaced by digital networks, DAB (Digital Audio Broadcasting) is just around the corner, and the number of digital sources, from sound media to automated playout systems, is on the increase. Given these developments, continuity and production suites both need an easy to use, ergonomic yet flexible mixing desk solution with all-digital audio and data processing.

The Studer On-Air 5000 Digital Mixing System, with its great flexibility and clearly laid out functionality, is ideally suited to these tasks. A personalised chip-card adapts the desk to the current operator's needs within a fraction of a second. Configuration and access rights can be defined for each user.

The mixing desk was designed with heavy emphasis on external communications: sports reports, phone-in and studio discussions, election results reporting, foreign correspondents, etc. The Studer On-Air 5000 can be equipped with up to 16 return channels for this purpose. Each broadcast participant receives an n-1 clean feed, while a second multiplex level facilitates conferencing between the presenter and guests waiting to go on-air.

The functional blocks can be individually placed to match the user's ergonomic requirements. The picture shows just one example of a possible layout of the Studer On-Air 5000.

The Studer On-Air 5000 consists of the following four compact functional blocks:

• Fader block with 8 faders (max. 32 faders)
• Central unit (channel-oriented functions)
• Monitor section (source monitoring and level displays)
• Instrument panel

These four functional blocks are integrated into a desk that can be organised to precisely match the customer's ergonomic and design wishes. Up to four fader blocks with a maximum of 32 channel faders may be grouped in any arrangement, or freely positioned – a concept very similar to that used by the desk's predecessor, the Studer D941.

The Studer On-Air 5000 deploys the same signal processing technology used in the Studer D950, with similarly high performance, flexibility and reliable operation. Floating-point digital processing, 40-bit internal word length and the already renowned Studer D950 algorithms guarantee excellent sound quality.

With 6 desks sold within just a few months of launch (for example to WDR in Cologne, Germany), the Studer On-Air 5000 is already proving to be a highly successful product. ∎

Studer News

News from the Pinboard

TF 1, the Paris-based French television company, has placed an order for 4 Studer D950 digital consoles for TV live production. Next to the advantages of Virtual Surround Panning (VSP) the ease of changing the configuration to adapt to different production requirements was the major decision point for Studer. A bonus is the multiple use of the stage boxes which can be routed to the various desks depending on the actual need for more or less inputs.

TVBS, the private TV station in Taipei (Taiwan) ordered a Studer D950 console. They were especially impressed by the redundancy of the DSP core which features automatic switch over to spare boards in case of failure in an operational part.

One of the top private radio stations in Germany, Antenne Bayern, has successfully started using a Studer DigiMedia radio automation system on air. Radio Athens (Greece) has just completed acceptance of another Studer DigiMedia, thus bringing the total number of installations to almost 150.

On November 3, 1999, 20:00 hrs. sharp, the No. 1 private radio station in Switzerland, Radio 24, went on air using the Studer DigiMedia On Air Automation. This was the 21st installation of this system in the German speaking part of Switzerland (out of a total of 26 private stations). No. 22 and 23 (Radio Eviva and Radio Ri) will follow in the next weeks.

ERTU in Cairo, Egypt, has ordered a total of 8 Studer D950 Digital Mixing Systems for its new on-air, word production and recording studios. Together with the existing console ERTU will have a total of 9 Studer D950 on duty. Furthermore ERTU has purchased an additional Studer 980 digitally controlled analog console for the renewal of one TV control room.

The Voice of Vietnam radio station in Hanoi has finished the planning for the first phase of their new broadcast center. Studer was appointed main supplier and will install eight On-Air 2000 consoles, a Studer Route 5000 router system, and a number of tape recorders.

The French TV channel France 3 has ordered two Studer D950 digital consoles. One will be installed in their Paris headquarters, the second in an OB Van based in Toulouse in the southern part of France. The stage box design and the ability to use redundant DSP boards in the core with automatic switch over were the most important reasons to drive the decision in favour of the Studer products.

BCC Taipei (Taiwan) plans to convert the full station to digital technology and has decided to purchase one Studer On-Air 5000, eight Studer On-Air 2000, and a Studer Route 5000 routing system. The use of glass fibre cable does not only reduce substantially the number of interconnections but makes the installation also much easier to understand and to service.

The city of Osaka is building a top recording studio for young artists and has decided to use a Studer D950 digital production console in this project.

In Dalian and Shinzuan, two cities in the Republic of China, the first phase of the broadcast center renovation has been planned. Studer got the order for eight and for two On-Air 2000 consoles and for a Studer Route 5000 routing system.

Education of the next generation is one of the most important tasks in our world. Both, the Academy of Music in Vienna (Austria) and the world renowned IRCAM Institute in Paris (France) will use Studer D950 digital consoles for this application.

The Romanian State Broadcasting Corporation in Bucharest decided to use Studer D950 digital consoles in their two new OB vans.

MBC Korea has standardized on the Studer 928 analog desk within their network and has ordered 10 units for the studios located in the major cities like Seoul and Pusan and at other venues all over the country.

Proof of a positive experience is when a customer who has already a product in use decides to acquire more of the same kind. So did SBS Korea with two more Studer 980 analog production consoles (bringing their total number to four) and France 3, the Paris-based French TV station, also with two more Studer 980.

YLE, the finnish TV station in Helsinki has decided to install a Studer Route 5000 routing system. Main reasons for the decision were the integrated processing, the glass fibre connections over long distances, and the open architecture which allows the connection to an external control system which YLE had already in use for quite some time. Additionally, a Studer CS-PC control system was ordered to do the scheduling for time dependent complicated switching processes.

The largest Studer D950 digital console so far was installed in the Sendezentrum (On Air Center) in Munich, Germany, serving the news complex of the Pro 7 private TV station. The installation also comprises a Studer Route 5000 routing system with signal distribution via glass fibre.

Studer News

Canada shows great interest in Studer digital consoles: The Canadian Broadcasting Corporation (CBC) ordered two units for the English network in Vancouver, DAVE (Digital Audio Video & Effects), and Master's Workplace in Toronto use the desk for video and film post production thanks to the architecture which allows each channel to be addressed by VSP processing.

Forty units of the final Studer A827 Gold Edition analog multitrack tape recorders have been already installed in studios in USA, Mexico, Japan, UK, and South America.

The most modern TV OB van of Europe will be put into operation by the Television Programm- und Nachrichtengesellschaft TVN, Hannover/Germany at the end of march. The large truck with extendable walls was built by Protec, Bingen/Germany, as a fully digital design and is equipped with one Studer D950 and 20 video cameras. The picture shows a computer simulation of the truck.

Program Training & Service Courses 2000, April to December

100041   V-Eight   English   3.4. – 5.4.00   3 days
Operation, applications, explanation, disassembling, assembling, alignment, servicing.
Teacher: *Bruno Bernet*

100051   D950   English   15.5. – 19.5.00   5 days
Technology, operation, applications, explanation of circuits, servicing.
Teacher: *several*

100052   D730, D731   English   22.5. – 23.5.00   2 days
CD technology, operation, applications, explanation, disassembling, assembling, alignment, servicing.
Teacher: *Simon Egli*

100053   D424   English   24.5. - 26.5.00   3 days
MO technology, operation, applications, explanation, servicing.
Teacher: *Kurt Schwendener*

100061   D827   English   5.6. – 9.6.00   5 days
Operation, applications, explanation, alignment, servicing, trouble shooting.
Teacher: *Simon Egli*

100091   A807   English   4.9. – 8.9.00   5 days
Operation, applications, explanation, alignment, servicing, trouble shooting.
Teacher: *Martin Berner*

100092   On-Air 2000   English   13.9. – 14.9.00   2 days
Technology, operation, applications, explanation of circuits, servicing.
Teacher: *Stephan Gripentrog*

100101   980   English   9.10. – 12.10.00   4 days
Technology, operation, applications, explanation of circuits, servicing.
Teacher: *Stephan Gripentrog*

100111   928   English   7.11. – 9.11.00   3 days
Technology, operation, applications, explanation of circuits, servicing.
Teacher: *Stephan Gripentrog*

New Brochures

General Catalogue	10.26.3920
Studer 928	10.26.3840
Studer Routing	10.26.3900
Studer On-Air 5000 Flyer	10.26.3850
Studer A827 «Gold Edition»	10.26.3880
Studer A1 Flyer	10.26.3760
Studer A3 Flyer	10.26.3770
Studer A5 Flyer	10.26.3780
Studer D950 PI	10.85.1030

Don't buy spares just anywhere!
Buy Studer genuine only.

Now you get true value and quality at the most competitive prices.

Call your Studer representative.

STUDER
professional audio equipment

H A Harman International Company