

Swiss Sound

News and Views from Studer

September 2000 No 44



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STUDER
professional audio equipment

Dear Swiss Sound Reader



Bruno Hochstrasser

A high standard of long-term customer satisfaction is one of our foremost goals – for every sale, and every system installation. Achieving this is hard work. It therefore gives me particular pleasure to present Bruno Keller's page 9 article about the Cesky Rozhlas Praha radiohouse in Prague, a complete broadcasting facility implemented by Studer as general contractor. The project came in exactly on budget, and on schedule – an astounding feat for a task of this magnitude. Excellent dialog between the technical managers in Prague and our project team was crucial to ultimate success. We are proud of having a highly satisfied client, and demonstrating our systems integration expertise.

The launch of the new Studer D950 M2 marks both a major evolutionary step for our successful flagship, and the introduction of a new design language. The result is a bright, visually appealing mixing console that nonetheless retains a clear identity with its stablemates in the Studer D950 series. Michael Tapes presents our new top-of-the-range model starting on page 4.

Swiss Sound readers have already heard much about the technology behind our unique Virtual Surround Panning (VSP) sound-source positioning tool. By popular request, we are now going into more detail concerning its practical application. Starting on page 6 of this issue, Stefan Ledergerber puts on his sound engineer's hat and explains the benefits of VSP for surround mixdowns.

Celebrity appearances are somewhat rare in Swiss Sound, but this time we have a good reason. Herman A. O. Wilms, Mr. AES Europe, looks back on 30 years of European AES conventions and explains on the following page why he has a particularly soft spot for Studer.

While on the subject of celebrities: this summer's internationally renowned Montreux Jazz Festival hit the airwaves thanks to Studer audio technology. You will find this, and other interesting topics, in the current issue of Swiss Sound. Happy reading!

Yours

Bruno Hochstrasser

Front cover: One of the control rooms, training of the technicians, details of the installation

Impressum

Editor

Nicolas Böhmer

Contributors to this issue:

Roland Casagrande
Robert Habersaat
Herman A.O. Wilms
Bruno Keller
Rainer Kunzi
Stefan Ledergerber
Klaus Peill
Michael Tapes

Layout + DTP

Max Pfister

Please mail your letters to:

Swiss Sound
Studer Professional Audio AG
Althardstrasse 30
CH-8105 Regensdorf
Switzerland

H A Harman International Company

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Studer at NAB Las Vegas

Our booth was well attended throughout the show. The new Central Assign Section (CAS) was introduced for the D950 Digital Mixing System with very positive response from both new prospective clients, and the D950 users in North America. The new Studer Route 5000 system and CS-PC software were introduced to the North American market with great success. During the Multi-Channel Technology Seminar (organized by the Surround Magazine) Studer demonstrated competence in Research and Development: Response to the presentation of Binaural

Room Scanning technology was very positive and encouraged Studer to continue to work on it for the future.



Herman A. O. Wilms, Mr. AES Europe:

30 Years with Studer



Herman A. O. Wilms

A long time ago, 1948 to be exact, the Audio Engineering Society (AES) was founded in the USA. This was the very same year that Willi Studer established his company. The innovative Swiss was aware of AES activities, and became one of the society's first European members as early as 1958.

Ten years later, as a young Brussels-based engineer with a strong interest in the technical aspects of audio, I also joined the AES. In mid-May 1970, I was asked if I wanted to assist with organising the first European AES convention. On receiving the invitation to meet with the interim committee in Frankfurt, my wife Madeleine could only comment, "Ben je gek? – Are you crazy?"

Although AES headquarters approved the decision to hold an inaugural European AES convention, its financing was fraught with uncertainty. In addition, the convention hotel in Cologne demanded guarantees for rentals, expenses and accommodation – our project seemed threatened with extinction. It was only many years later that I learned what happened subsequently. Karl O. Bäder,

Herman A. O. Wilms is pleased about the anniversary present: a Studer A37



the co-initiator (with EMT/Lahr at the time), held talks with Willi Studer, and received the sum of 6,000 Swiss Francs to cover the guarantee demands. The first European AES convention was held in March 1971, and far exceeded our expectations: 29 lectures in German, English and French, around 260 delegates, and a small but exquisite show featuring 12 exhibitors. We could repay Willi Studer's seed capital without further ado.

Today, as AES coordinator with 4.5 distorted languages, I can look back on 30 AES conventions that were only possible because of strong practical support by numerous volunteers. Of the 12 original exhibitors from 1971, it is surprising to note that half of them (= -6 dB ...) have been present at every convention to date. AKG, Beyerdynamic, Dolby Laboratories, Neumann, NTP and of course Studer were honoured at the AES 2000 in Paris with an award in the form of a decorative lead-crystal window: a typical Flemish "Glasraam" from my home region. By way of appreciation, I was invited to Regensdorf by Bruno Hochstrasser to be likewise presented with a "petit cadeau" – which in fact turned out to be a rather heavy one: a wonderfully preserved, historic Studer A37 dating from 1958!

30 years' experience with European AES conventions has clearly shown how vital this kind of activity is to the lifeblood of the professional audio industry. I feel heartfelt gratitude to Willi Studer, who I could affectionately call "my friend Willi" since 1975 and whose death in 1996 affected me deeply. It was his generous gesture that made the European AES conventions possible. ■

The Studer D950 continues its evolution:

New *Studer D950 M2* Digital Mixing System



Michael Tapes

The Studer D950 M2 represents a new and exciting version of the Studer D950 that combines vast enhancements to the software-based feature set, along with a newly designed control surface. The console desk has an all new look that exemplifies the advancements that have been incorporated into the Studer D950 over the past 2 years. It is also worth noting that the Studer D950 has achieved incredible worldwide success, with over 80 systems having been sold within that period.

The Studer D950 M2 comes standard with the new Central Assign Section, color 8-channel surround meter, as well as the new, larger 15" TFT color display monitor. The channel sections feature a top-surface plastic laminate resulting in clean, crisp labeling that will not wear over time. The knob sections contain new rotary encoders with an integral 21-LED ring for display of knob values. In addition, each knob is



flanked by an alpha-numeric readout that can display the function or precise value of each rotary controller in the system.



The channel strips of the M2 feature a new and consistent "graphic design language" that enables the operator to instantly recognize the sections of the strip for fast and efficient operation. Productivity is increased and fatigue is reduced. Even the placement of the Solo and Mute buttons have been optimized for fast multiple channel activation of either function.

Of course the Studer D950 M2 continues the Studer tradition of premium sound quality. Studer's finest 24-bit converters are used, all digital inputs/outputs are 24-bit, and internal processing takes place at 40-bit floating point precision on a 32-bit bus. The M2 digital core is fully configurable allowing the console to be set up with as many channels and buses as needed (depending on the number of DSP cards installed), and with dedicated allocation of processing effects so you won't run out of power in the midst of a session. Console capabilities can be expanded at any time by simply installing additional DSP cards.



The M2, like all Studer D950s, feature Studer's proprietary Virtual Surround Panning (VSP). And now, in the M2, the VSP architecture has been extended to provide both smoother and more natural early reflections, as well as the addition of late reflections (reverberation). Studer's Virtual Surround Panning makes the M2 (and all Studer D950s) the only console available today that can create a 5.1 sound field modeled around a few simple parameters that are set within each VSP equipped channel. A realistic room simulation is created with the operator being able to set the characteristics of the room, including size, ambience, and absorption. In addition, the pan location and distance of the sound source within, or beyond, the room can also be set. This simplifies and enhances surround sound mixing for both classical and popular music, as well as for mix-to-picture and complex audio post applications.

The Studer D950 series is acknowledged as one of the most reliable large format digital consoles available today. The M2 continues that tradition. Almost all the channel circuitry has been redesigned with simplicity and reliability as the premier design criteria. Along the way, enhancements have been made to critical circuits including the touch sensors, power distribution, and the moving fader servo amplifiers.

The heart of the central section of the M2 control surface is the newly introduced Central Assign Section (CAS) which represents a new operational paradigm for Studer. The CAS is a complete expanded channel strip that is laid out in a clear and logical manner that allows its operation to be understood almost instantly. Mounted in the center section of the console, the CAS brings expanded channel control and sweet spot mixing to the M2. Much more than the "central sections" found in some other digital consoles, the Studer CAS has unique navigational controls that make the CAS faster, easier and more efficient to operate.

The Studer D950 M2 will also feature Studer's revised AutoTouch dynamic automation system. The enhanced feature set offers a complete off-line editing facility as well as expanded on-line functionality. This new functionality includes Write-to-End, Static Objects, enhanced Trim mode, Audition Punch mode and much more.



In this brief summary, I have attempted to whet your appetite to look further into the Studer M2, the latest evolution of the Studer D950. The Studer D950 M2 represents a refinement and furthering of what many already regard as the finest Digital Mixing System available. ■

Application:

How to *surround*



Stefan Ledergerber

Surround sound vastly increases the spectrum of creative mix-down options. The extra channels can also be put to very different uses, some of which highlight limitations of the mixing technology that severely hinder efforts to create a high-quality listening experience. I will demonstrate a promising creative approach by examining the physical prerequisites and giving illustrative examples of practical surround mix-downs.

Surround today

There are two approaches to using the additional surround channels:

- a) Sound source imaging to the rear and sides. This may be considered an effect, to be creatively deployed by the recording engineer.
- b) Creation of the impression of a genuine acoustic event, with the so-called “envelopment” to give the listener a heightened sense of involvement. Besides others, the recording engineer faces the creative challenge of establishing a realistic-sounding envelopment.



This is achieved by feeding the surround loudspeakers with signals corresponding to what would be heard from a given direction: this includes crucial side reflections generated within the perceived space. The most natural way to create an envelopment is to use an array of 5 microphones positioned similarly to 5 loudspeakers, and route their playback signals directly to the corresponding speaker channels. The rear microphone pair picks up the surround portion, while the front pair picks up mainly frontal sound. This technique has proved successful for classical music recording in rooms with extremely clear and transparent acoustics. In most cases,

though, the recording engineer wants – or is compelled – to create an artificial mix incorporating sonic corrections or even to overemphasize certain aspects. The extreme would be to generate a surround image from a multitrack recording of pure mono sources, whereby the challenge is to create the envelopment as un-artificial sounding as possible, and establish a genuine surround impression.

What do we hear?

Let us take a closer look at the sounds reaching our ears. In order of arrival, these may be classified into:

- 1) Direct sound
- 2) Early reflections
- 3) Late reflections (reverberation)

(1) and (2) are most affected when a sound source changes its location relative to a fixed listening position. (3) remains virtually unchanged, since late reflections are already highly diffuse within the acoustic space. Generating all three components as faithfully as possible for each of the loudspeakers requires knowledge of the sound source position for (1) and (2). Looked at another way, realistically integrating a monophonic sound source (e.g. a single spot microphone or one track of a multitrack recording) in a

surround image with envelopment requires generating (1) and (2) dependent on the panner position. The simplest place to achieve this is in the panner itself. Reverberation (3) may be generated using an external surround reverb unit. Integrating the reverb unit with the mixing desk brings increased operational and automation convenience.

Contemporary surround mixing techniques

Surround mixes may be roughly classified as follows:

- The surround channels are used simply as effects. Although arbitrary and flexible, this technique is unlikely to deliver long-term listening satisfaction.
- Impressive surround effects may be generated using a battery of delay lines, reverbs and other effects units, with their outputs routed to the various playback channels. Mixing is very time-consuming.
- Surround music mixes are preferably made from material that already contains dedicated surround signals. In pop music, these are frequently derived from ambience microphones positioned close to the live audience. Classical or jazz recordings frequently use main microphones with rear-oriented capsules to acquire signals for the surround loudspeakers. At the start of the mix it is clear what signals are to be routed to the rear loudspeakers. The problem, having established a rough mix, is surround fall-off as more monophonic signals are added. This is caused by a lack of envelopment which matches these signals, particularly the type created by early reflections with correct directional and timing characteristics. Simply expressed, the fewer mono signals a surround mix contains, the better the surround image. This means compromising between acoustic balance and the overall surround impression.

Practical experiences

“The Proms”, Royal Albert Hall, November 1999 – mixing live classical recordings:

- 40 tracks
- Main microphones arranged as “Decca Tree“
- Additional ambience microphones
- Numerous spot microphones

The sound engineers began by establishing an enveloping surround image derived from the main and ambience microphones. Surround was perfect, but the balance and tone of individual instruments were unsatisfactory. Spot microphones were then added to the mix, mostly panned into the soundstage between the left and right loudspeakers. Balance and tone were now right, but the good initial surround was swamped by the 2-channel mix between the front loudspeakers. The logical corrective step was to increase the level of the surround channels, and add a touch of ambience from the side between the front and rear channels. The surround loudspeakers were audible again, but in place of seamless surround were two separate sound images emanating from the front and rear speakers. Even with additional reverb treatment, the new surround image was significantly inferior to the original.

Central Section of the Studer D950 M2, with joysticks and VSP



Starting from the previous mix, Virtual Surround Panning (VSP, see box) was activated in the spot microphone channels. First, the simulated room model was tuned to match the Royal Albert Hall as closely as possible (early reflections). Then, these reflections were subtly added to the respective pre-panned microphones. Despite the spot mics, the surround effect returned; the concert hall became apparent, suddenly we were back in the performance, totally involved and enveloped! Furthermore, it was no longer necessary to compromise between the front soundstage and the surround effect. Subtle early reflections brought another bonus: the spot microphones could be inserted at the correct distance impression in the sound image. It also eliminated the need to use a few external effects units, making the mix even more clear and transparent. The recording engineers compared this result with the previous, traditional mix. Opinion was unanimously in favour of the Studer VSP.

Virtual Surround Panning VSP explained

Virtual Surround Panning (VSP) is a parameterised audio positioning tool for realistically imaging a mono source using a 2 to 8 channel playback system. It offers the following independent advantages over conventional panners:

- 1) Generating early reflections within a simulated acoustic space, depending on the pan position. These reflections are reproduced from the correct direction, at the correct time.
- 2) Better directional imaging (left-right panning), by adding phase and frequency spectrum information to the customary amplitude difference between left and right loudspeakers.

The newest VSP version also provides for late reflections (reverb). These are delivered in de-correlated form, independent of the pan position, to two (2-channel stereo) or four (surround) loudspeakers. VSP in conjunction with reverb is a complete room simulation tool built into the Studer D950S.

“Grand Mothers Funk” – mix-down of a live concert recording:

- 40-track live recording
- No main microphones
- 4 ambience microphones
- 36 monophonic sources

A sound engineer performed the mix-down twice, with and without VSP. The startling difference between these mixes lay not so much in the individual instruments, but the envelopment generated from the separate mono sources. VSP engaged the listener, putting him in the thick of the musical action and emphasising the groove. Although only light VSP processing was applied to individual tracks, the result was a convincing surround experience.

Conclusion

Spatial perception hinges on positional reflections; nothing new there. Using surround to create a better image of the acoustic space clearly means paying more attention to these reflections. For the mixing desk panner to function as an effective positioning tool, it must also take account of position-dependent reflections. Virtual Surround Panning (VSP), as found exclusively in the Studer D950S, does precisely this and addresses many of the recent problems associated with surround mixing. Recording engineers can begin assembling a mix using a conventional stereo approach. Thereafter, the watchwords are development and experimentation! Practical experience clearly indicates that VSP boosts mix-down efficiency in various surround formats, and delivers convincing results. VSP offers new creative freedom. ■

Studer as General Contractor:

Architecture and Technology in Prague



Bruno Keller

It is a rare opportunity indeed for a radio station to design its future headquarters completely from scratch, and the public Radio Cesky Rozhlas Praha creatively exploited the chance. The result is an architecturally sophisticated building, equipped with the best in digital audio technology.

Prague architectural studio A.D.N.S. designed a cool and light structure, with an agreeably human atmosphere thanks to intelligent use of color and construction materials. Formal geometrical lines contrast well with the generous use of light-colored wood. This fascinating environment for radio production will commence high-tech digital operations in September. To prevent disturbance from the train tunnel underneath the building, the whole studio complex was put on springs for de-coupling.



Atrium inside the Broadcasting House of Cesky Rozhlas Praha



Large studio, right before the final installation

Studer Regensdorf was appointed general contractor, responsible for project management and all aspects of audio installation. Despite Studer's extensive project experience, the Prague broadcasting house presented a particularly major challenge. A single studio with all its equipment can be fully factory-tested before shipping; a broadcast headquarters with 20 control rooms and 16 studios is a considerably tougher proposition. Good organisation right from the project-planning phase was vital to ensuring that objectives were achieved on schedule.

Everything functioned perfectly in Prague, with smooth co-operation between the responsible individuals. A large part of the installation work was outsourced to local specialists, whose good training was apparent from the first-class quality of their work. The entire organisational effort was also not to be underestimated. Everything stayed under control, thanks to excellent support from Libor Havlicek (Auditech, our partner in Prague).

In parallel to the installation work, the first studio was put into operation in May for training purposes. The whole complex was ready for operation late July, leaving sufficient time for test and measurement in August. Apart from the usual technical tests and acceptance procedures, measuring toxin levels in construction materials, particularly the furnishings, was a first for Studer.

The project concept allowed finding the optimum balance between technology and people, reflecting the architectural surroundings. Performance and flexibility allied to high operational security and simple operation were all crucial. A total of 16 Studer On-Air 2000 digital mixing desks and 6 DigaStudios distributed among 20 control rooms and a journalists' production

suite will begin service in September. A large Studer Route 5000 (288 inputs, 472 outputs) in the master control room and four Studer Route 56 form the audio-technical backbone of the operation. Products from other manufacturers like AKG, Orban and Sony complete the installation. Technical details will be discussed at greater length in a future edition of Swiss Sound.

This extremely exciting project busied my colleagues and myself for over a year – a time in which we repeatedly had to marry architectural ideas and concepts with operational reality. The result is a highly attractive radio broadcast facility, with optimum ergonomics and efficient infrastructure. ■



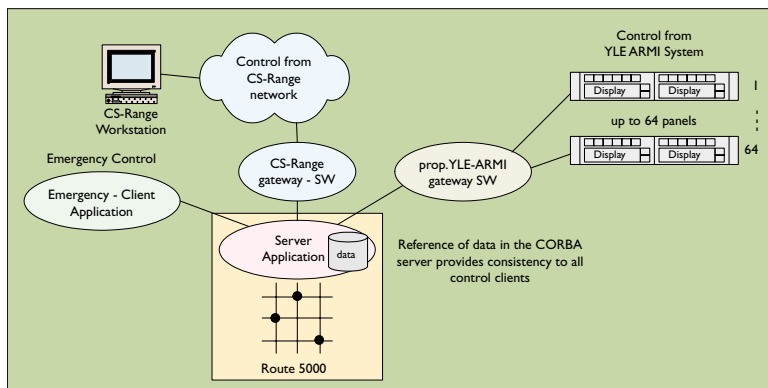
Rainer Kunzi

Studer Route 5000 at YLE in Finland:

Integrated Control

The router project at Yleisradio (YLE) in Finland presented some hard-to-meet conditions: the new router had to be controllable not just by its own software, but also using push-button panels linked to the station's proprietary YLE-ARMI control system.

Thanks to the Studer CS-PC control software's open architecture, the YLE-ARMI control system could be integrated with Studer Route 5000 operations. Up to 64 YLE push-button panels are used for switching, while the Studer CS-PC station replicates this functionality and adds features of its own: automated switchovers, signal processing (e.g. level matching) and snapshots (salvos). The Studer Route 5000 manages all YLE's studio feeds, programme outputs and broadcast landlines. The system also features an independent, redundant "emergency controller". With its modular architecture, the router may be expanded at any time in the future. ■



Studer 980 and Studer 928:

Surround Mixing for all Budgets



Roland Casagrande

Multi-channel surround sound is doubtless the format of the future. Studios and production facilities, radio, TV and film companies must therefore examine surround-capable mixing desks when planning their investments.

A top-flight digital desk like the Studer D950 M2 with Virtual Surround Panning (VSP) is beyond some budgets. Yet surround mixing is equally possible using considerably lower-priced desks like the Studer 980 and Studer 928. While not rivalling the convenience and technical finesse of Studer's digital flagship, these analogue desks are fully comparable in terms of reliability, excellent sound quality and adaptability to customer specifications.

Studer 980 Surround

A Studer 980, equipped with HDTV/film input modules, allows each channel to be panned between 2 to 6 outputs. Each channel includes two pan-pots (LCR and front/rear), while a separate divergence control adjusts width between the two front loudspeakers.

Channels carrying signals that need rapid, dynamic moving within the sound field can also be assigned to an (optional) joystick. The Studer 980 generally features two joysticks, but one or more can be specified.

Thus equipped, with snapshot automation (all buttons), a multi-channel/multi-format monitor section, and (optional) fader/joystick automation, the Studer 980 is well capable of handling quite sophisticated surround mixing tasks.

Studer 928 Surround

The Studer 928 is ideal for general-purpose applications and simpler surround mixing. Input channels are equipped with LR pan-pots, so surround output assignment may be achieved via groups. Of course, this can be achieved with greater elegance using one or more optional joysticks. As with the Studer 980, the desired channel can be routed via the jackfield to the joystick, whose outputs connect directly to the groups. The desk features the same multi-channel/multi-format monitor section as the Studer 980.

The Studer 928 and 980 analogue surround-capable desks combine great flexibility with excellent sound quality and compact dimensions, offering exceptional price/performance. ■



Zweites Deutsches Fernsehen ZDF in Mainz/Germany:

Studer D950 Remote Trucks MP-2 and MP-3



Klaus Peill

In early 1999, Zweites Deutsches Fernsehen (ZDF) in Mainz took delivery of a 10-camera MP-2 OB truck built by Protec, Bingen. After a year's planning and construction, the 12 m long, 26-tons Mercedes Actros went into operation with a Studer D950 digital mixing console taking care of broadcast sound.

ZDF is a long-time user of Studer mixer technology, and an enthusiastic and satisfied customer. This latest console delivery, with a total of 143 DSP channels, met expectations from day one. Outside broadcast makes special demands on compactness and low power requirements, as witnessed by this highly customised D950: the main desk, together with an auxiliary desk for playing-in "canned" material, share the same DSP core and can stand-in for each other if required. Two remote stage-boxes, each with 40 microphone inputs and additional sends, connect to the mixing desk via separate fibre-optic cable pairs.



ZDF's MP-2 is used for wide-ranging production tasks. The D950 has the flexibility to handle an orchestral concert, a sporting event, or a church service with equal ease. Because of the many ways the truck is employed, the sound engineers at Mainz make heavy use of the desk's assignable DSP capacity. A surround mix today, stereo broadcast tomorrow, each with differently equipped channel strips - such is life in outside broadcast. The Studer D950 can stand the pace.

ZDF's positive experiences with their digital mixing desk resulted in a decision to specify a second Studer D950 for the new MP-3 outside broadcast vehicle. As before, Protec is responsible for the vehicle's construction. The sister to the MP-2 vehicle will feature a virtually identical sound section, but with different bodywork (semi-trailer with an additional machine room having three operator positions), 16 cameras, and a somewhat larger video production area. MP-3 is scheduled for commissioning in March 2001. ■

View into the control room of the ZDF remote truck

34th Montreux Jazz Festival:

Festival Radio uses Studer Broadcast System



Robert Habersaat

The Montreux Jazz Festival is one of the world's best-known musical events. Each year, some 200,000 visitors from all over the world converge on Lake Geneva to enjoy concerts in the Stravinsky Auditorium, the Miles Davis Hall, the Off-Festival, and numerous fringe venues.

As in past years, Studer was awarded the contract to install a complete on air radio studio for the 34th Montreux Jazz Festival held from 7 to 22 July 2000. The supplied infrastructure also included two audio editing stations and all the installations for audio exchange via ISDN codecs and the internet.

A team of six professional broadcasters produced 3 to 4 daily reports and features for the three weeks of the festival. In addition to concert relays in "Montreux Live!", coverage included background information

Journalists' working environment with Studer DigiMedia and DigaStudio



and performer interviews. The event was carried by seven commercial radio stations covering a large part of German-speaking Switzerland and Liechtenstein: Radio 24 (Zürich), Radio Förderband (Berne), Radio Edelweiss (Basel), Radio Sunshine (Lucerne), Radio Grischa (Grisons), Radio Munot (Schaffhausen) and Radio L (Principality of Liechtenstein).

The festival radio studio was erected in the entrance hall of the Centre de Congrès, just a stone's throw away from the main concert venues: the Stravinsky Auditorium and Miles Davis Hall.

Studio equipment included a complete DigiMedia Broadcast System with a Studer On-Air 2000 mixing console and two DigaStudio production consoles for the journalists. The Montreux crew used Marantz PMD680 PC-card recorders for mobile work, with audio data transferred directly from PC or CompactFlash cards for editing on the Studer DigiMedia MultiTrackEditor.

Audio exchange used four Telos Zephyr ISDN codecs and an internet platform provided by mhs internet GmbH, giving affiliated stations direct access to all the audio material produced at Montreux.

The number of Swiss radio stations broadcasting with Studer DigiMedia was 23 in July; the world-wide total exceeds 120. Most of these stations also use the Studer On-Air 2000, which has a global installed base of around 350 units. ■

Studer D950 Digital Mixing System:

On Course for Success



Nicolas Böhmer

The **Zürich Opera House**, inaugurated in 1891, is one of Europe's leading opera and ballet venues. It enjoys international renown in both fields, and attracts world-class artistes. It was therefore especially satisfying for us to install the first Studer D950 Digital Mixing System in Switzerland, at such a prestigious site.

Just about every Studer D950 Digital Mixing System installation is unique, and the Zürich Opera House was no exception. The mixing desk basically consists of two control surfaces: a main desk with 24 faders (expandable to 32) plus Central Assign Section (CAS), and a second, highly compact transportable desk. Although no larger than the main desk's central section, it still boasts four complete channel strips, CAS and a monitor section. The small desk fits into a custom-built flight case for hassle-free transportation to the place of deployment, e.g. the auditorium. Both control surfaces are linked to a common DSP core, and can act either on the same channels in tandem, or independently on specifically assigned channels.

The first Studer D950 at ERTU was installed in Studio 45 for music recording



Egyptian Radio & Television Union ERTU generates not just domestic programming, but radio and television broadcasts targeted at the entire Arabic-speaking region, and globally via short-wave radio. ERTU has already taken delivery of 8 Studer D950 as part of a modernisation and digitalisation project for its radio and music studios. Following positive experiences with the first installation, ERTU ordered a further Studer D950 in May – the first for television production. A Studer 980 will soon go into operation at the television transmission facility.



Studer's flagship desk is also making waves in the Far East. **Seoul Broadcasting Systems SBS** in Korea has ordered three more Studer D950, in the wake of an initial order for two units. Two desks will be used for video dubbing, two in remote trucks, and one in the TV editing studio. To further reduce training times, all the desks will be almost identically equipped with 24 faders and a CAS.

The **Norwegian broadcaster NRK** has just ordered seven Studer D950S. The first desk will be installed in the organisation's upscale OB/L-12 outside broadcast truck, while the second is earmarked for the LK-12 production and broadcast studio in Bergen. The further five Studer D950 will follow step by step. ■

The first Studer D950s were installed in Europe and the USA in 1998. By the end of 1999, Studer could already report the 50th sale of its flagship mixing desk. Here are a few examples of more than 80 units currently in service:

Czech state television CTV is taking delivery of a Studer D950 in August, with operation expected to begin in September. The desk will be used in television production for the TV1 and TV2 channels, and later for film mixing.

RTL in Paris has already acquired a second Studer D950. The desk is impressive by virtue of its control surface alone, with two angled console "wings".

Beijing People's Hall in China is being equipped in November with a "dual" Studer D950 (multidesk), consisting of two large control surfaces and one DSP core.

Further Studer D950S have been sold to Universal Studios Japan Osaka, and MBS Osaka: the first Studer D950 M2 sold will be installed in a remote truck.

The Spanish commercial TV station TELE 5 has ordered a Studer 980. The desk is equipped with 36 mono and 6 stereo channels, for initial use in an outside broadcast vehicle. The desk is adaptable to changing needs, and can be reconfigured for stationary operation.

The main switching rooms at RTV Koper and RTV Maribor in Slovenia are each equipped with a large-scale Studer Route 5000. The Studer router was chosen primarily for its system flexibility.

The operational philosophy and overall concept of the Studer On-Air 2000 is proving popular with an ever-growing number of radio stations: more than 350 desks are already in use. A Studer On-Air 2000 went into operation at Downtown Radio in England during the summer. Chon-Ju in Korea has just taken delivery of three desks, while a further two went to Hong Kong. There have been further installations in Algeria, Canada, Japan, Spain, Taiwan, Tunisia, the United Arab Emirates (UAE) and the USA.

The compact and powerful Studer 928 analog mixing desk is popular all over the world.

Polish television has been regularly using Studer 928s in production, broadcast and OB vehicles since 1997. In spring 2000, four further desks were delivered to studios in Warsaw, Gdansk, Wroclaw and Katowice.

The Studer 928 enjoys a strong following in Israel. The overall concept, and the desk's reliability, led to purchases by GG Studios, Jerusalem Capital Studios and United Studios of Israel.

Studer acted as general contractor to Jordan's radio and television organisation, delivering and installing three turnkey studios. Each of JRTV's studios is equipped with a Studer 928, along with further products from Studer and other manufacturers.

There have been further Studer 928 installations in Bangladesh, Croatia, Estonia, France, Hong Kong, India, Italy, Japan, Norway, Portugal, South Korea, Spain and Taiwan.

New Brochures:

| | |
|------------------------------|--------------|
| General Catalogue | (10.26.4050) |
| Studer On-Air 2000 | (10.26.3940) |
| Studer On-Air 5000 Flyer | (10.26.3860) |
| Studer On-Air 5000 PI French | (10.85.1090) |
| Studer D950 M2 Flyer | (10.26.4070) |
| Studer Route 5000 | (10.26.4060) |

STUDER



Human Ear inspired by Leonardo da Vinci and Studer

Studer Creates Customer Solutions

Earing - understood and delivered

Studer offers complete turnkey system solutions for radio and television broadcasting that are precisely tailored to meet individual broadcasters needs. Flexibility and openness are designed into all installations to ensure the highest degree of investment protection, while proven products are selected from Studer's range of mixing consoles, recording systems, monitor speakers and peripheral equipment. Studer understands your broadcasting needs and has the ability to deliver - whatever your scale of operation.

For over 50 years, the name of Studer has been synonymous with excellence in professional audio. Thousands of installations in radio and television facilities worldwide demonstrate your faith in our technology. Regardless of the solution that you are seeking, Studer can provide it.

**Studer
Professional Audio AG**

CH-8105 Regensdorf-Zurich
Switzerland
Phone +41 1 870 75 11
Fax +41 1 870 71 34
eMail info@studer.ch

www.studer.ch



The powerful Studer Route 5000 lies at the heart of most systems, handling multiformat switching and distribution of signals