

SWISS

VIEWS AND NEWS FROM SWITZERLAND

SOUND

3/84

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## Editorial

**Worldwide Presence - special Responsibility**

**World-wide distribution and international presence result in complex interlacing of rights and duties of a marketing organisation and its agents at home and abroad.**

**T**ime and distance have nowadays taken on a completely new significance when comparing it with yesterdays situation. Within a couple of hours, we move from continent to continent, and within seconds communicate around the globe and exchange information almost instantly.

Our fast-paced presence does not remain without any influence on our products as well, because - purchased in one country - they are moved to another and returned to their home base again. STUDER REVOX equipment, based in Italy, may move across the border into a

neighbouring country to record a guest performance of the famous "Scala di Milano" for example or, the crew of a European broadcast network may take STUDER equipment across the Atlantic as has been the case at the recent Olympic Games in Los Angeles. A purchase of our equipment made in a country without any trade restrictions may lead to the use of such equipment in areas, where regular imports are restricted or even banned. In short: Sound recording equipment is occasionally changing address, too.

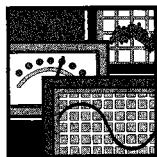
STUDER and REVOX are one of the few organisations that offer after-sales service on a world-wide basis. Replacement parts - even for older models - are kept in supply, and technical training of users' staff is ensured everywhere. With such service on hand, customers' satis-

faction is guaranteed in the professional and consumer markets alike.

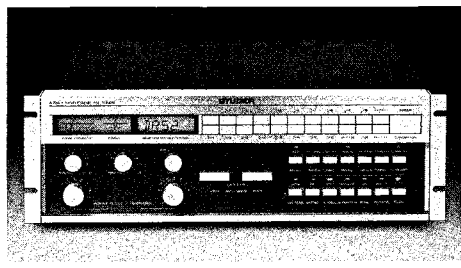
All this, however, is possible only because of the aftersales service rendered by STUDER REVOX subsidiaries and distributors in more than 50 countries in Europe and Overseas where the necessary support is given to the product regardless of the market it may have come from.

Not only our customers - may they be private individuals or government institutions - will profit from this uncompromising policy; it will eventually be the product and its name which thus become the synonym for reliability and technical perfection.

Eugen E. Spörri

STUDER A726 monitor tuner with MPX output

**It doesn't always have to be "ball" ...**

STUDER A726, the monitor tuner with an MPX output.

**Ball reception refers to the process of relaying a radio program via an FM receiver rather than through cable or a microwave radio link. In extreme situations such as in mountainous regions, it may be necessary to cascade multiple ball reception links. The requirements imposed on corresponding ball receivers are very stringent. In applications where the requirements are not as demanding, the A726 monitor tuner with MPX output is a cost-effective alternative.**

**Why an MPX output?**

**F**M stereo reception is and likely remains for some time the best method for quality transmission of audio programs. First introduced in Germany (of course in mono) after World War II, it is still gaining in popularity. Frequency modulation in the VHF band allowed not only wideband (15 kHz AF bandwidth) transmission but also achieved the desired AM noise immunity. With the expansion to 2-channels (stereo), a multiplex subcarrier system (MPX) was introduced. The latter operates with amplitude modulation, suppressed 38 kHz subcarrier, and two sidebands between 23 and 53 kHz. A 19 kHz pilot tone is also transmitted so that the stereo decoder can recover the stereo signal in proper phase relation.

When the receiver audio signal is used as input to a transmitter, it would make little sense to demodulate to the audio signal stage and to immediately regenerate an MPX signal from the audio signal. For this reason, the MPX signal is decoupled before the demodulator, and processed for further use.

**Design of the MPX stage**

As Figure 1 illustrates, the amplitude response of the MPX signal on the FM demodulator output (approx. -3.5 dB at 53 kHz) is corrected by a first stage. The resulting phase error is compensated in the next stage. A level controller, line amplifier, and muting circuit complete the MPX stage. The MPX signal is available on a BNC socket (1.55 V at 40 kHz deviation, according to standards).

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**Application potential of MPX**

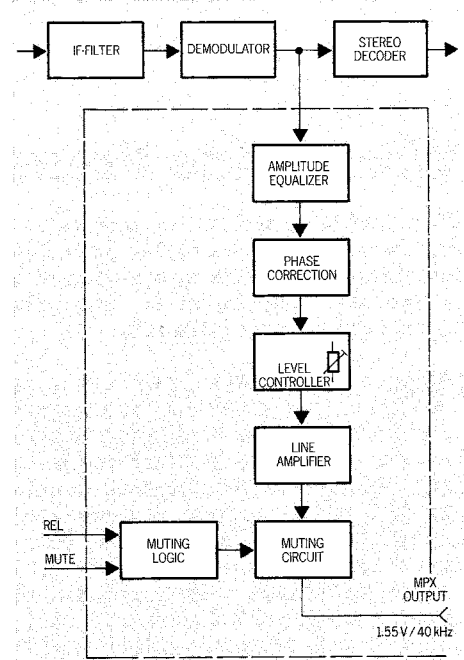
Even with an MPX output, a monitor tuner is still a monitor tuner. It is not a ball receiver because the latter must satisfy much more stringent requirements (e.g. with respect to large-signal immunity since a strong transmitter is usually located at the same location as the receiver; or high temperature resistance because the receiver is controlled remotely and installed in an unmanned site on a lonely mountain peak). No wonder true ball receivers cost up to 10 times more than an A726!

The A726 monitor tuner can nevertheless be used as a standby unit for a ball receiver. There are already several examples: the A726-MPX was tested by the French PTT (TDF) and in its performance accepted as a stand-by receiver. The evaluation was based on the concept that it is not absolutely necessary to install a second, highly expensive ball receiver which is only activated in the event of a malfunction in the primary receiver.

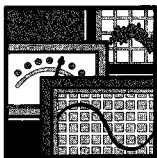
Because of its outstanding qualifications, the A726 monitor tuner is an ideal instrument not only for quality control of the broadcast modulation but also for use as a mini ball receiver, for example when the program of another station is to be taken over (in which case also the standard version without MPX output can be used because the signal is fed in from the control room). This method is practiced by local radio stations, for example, if broadcasting of the official radio program must be possible via ball reception in the event of a crisis.

**Conclusion:** An A726 in the budget is better than the fanciest ball receiver out of reach...

Marcel Siegenthaler



Block diagram of the MPX stage.



Bus Systems, Part 2

**Serial data links according to RS 232**

Anyone who wishes to interconnect two computer-controlled devices will sooner or later be confronted with the term "RS 232 interface", and he will soon find that it is not as easy as simply plugging in the corresponding cables in order to get the system working. The following article explains why this is so and what the problems are.

**1) The RS 232 standard**

This term was created in 1969 and defines a link between a terminal (DTE = data terminal equipment) and a modem (DCE = data circuit-terminating equipment).

- The standard also defines
- electrical characteristics (lines/levels)
  - mechanical characteristics (connectors)
  - signal descriptions
  - standard links

This type of interface is suited for transmission rates up to 20 kbits/sec and cable lengths up to 15 m (50 feet). The signal levels are defined as follows:

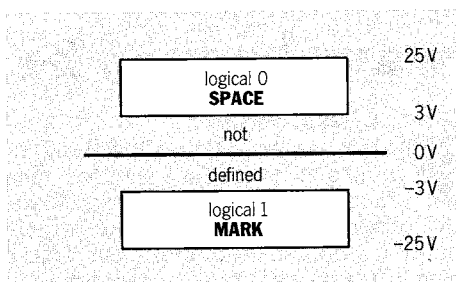


Fig. 1: RS 232 level definition.

The 25-pin connector can accommodate a variety of interface structures, in practice, however, there are virtually no applications in which all pins are assigned. Modern systems frequently use the minimum structure illustrated in Figure 2.

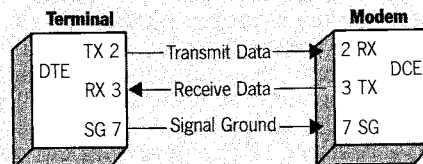


Fig. 2: Minimum structure for RS 232 links (terminal-modem).

From this diagram we can see that the terminal transmits on pin 2 and receives on pin 3 while the modem receives on pin 2 and transmits on pin 3. Let us briefly examine the link between two computers: which is the terminal and which is the modem?

The two previous definitions are no longer adequate, and there is no other choice than to cross the signal lines because it is not possible to transmit and to receive over the same pin.

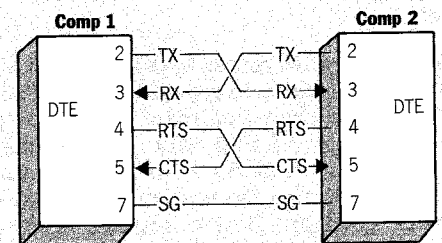
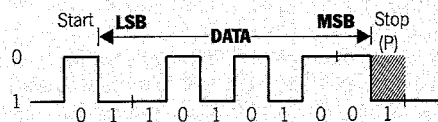


Fig. 3: Minimum structure for bidirectional link with handshake (terminal-terminal).

The RS 232 standard contains only these few (and imprecise) conventions. It is, therefore, strictly a "hardware" standard. The equipment manufacturer is free to define all other parameters.

**2) Individual enhancements**

Nothing so far has been said whether the link is to operate in SYNCHRONOUS or ASYNCHRONOUS transmission mode. For synchronous mode it would be ne-



**Fig. 4:** Asynchronous transmission of the decimal value 43 (hexadecimal 2B).

cessary to allocate an additional line to the clock. This is not the case for asynchronous mode because the transmitting and the receiving terminal are synchronized by inserting a start and a stop bit each.

To permit early detection of transmission errors it is possible to insert a test bit already at this level. This so called PARITY bit (P) is computed according to different methods:

**Even parity:** number of data bits in condition 1 + parity bit = **even number.**

or  
**Odd parity:** number of data bits in condition 1 + parity bit = **uneven number.**

The parity bit may be omitted or replaced by a second stop bit.

The transmission speed is specified as the number of transmitted bits per second (bauds). Common BAUD RATES are: 150, 300, 1200, 2400, 4800, 9600, and 19200. The driver and the receiver must, of course, be set to the same speed.

The term HANDSHAKE refers to a ready-for-communications message by the driver or the receiver. For example, if data are output by the computer to a slow peripheral device (e.g. printer), the latter must be able to interrupt the flow of data before it gets behind, otherwise data will be lost. Figure 3 illustrates a possible solution with two additional signals (RTS = request to send, CTS = clear to send). The driver signals with CTS that it wishes to transmit data. The receiver acknowledges with RTS that it is ready to receive the data and that transmission can be initiated.

A more elegant approach is the software handshake. One solution is to use two special characters from the ASCII set (X ON and X OFF). The receiver stops the transmission with X OFF and signals X ON as soon as the transmission can be resumed.

And finally it is also necessary to define the "language" in which the two devices are to communicate. In addition to strictly binary data transmission, the most commonly used codes are ASCII and EBCDIC (IBM) in which

- control characters
- digits 0 to 9
- upper, and lower case letters

are assigned to the numbers between 0 and 255.

**3) The serial interface of the A810**

The A810 does not use a 25-pin but rather a 9-pin connector according to SMPTE. With the use of an adapter cable (9 pins → 25 pins) the user is free to decide whether the device is to operate as a terminal or as a modem.

A810	Terminal	Modem
9-pole Socket	25-pole Connector	25-pole Socket
2 SNDATA	2 Trans. Data	3 Trans. Data
8 RCVDATA	3 Rec. Data	2 Rec. Data
9 GROUND	7 Sig. Ground	7 Sig. Ground

**Fig. 5:** Connecting cable for terminal or modem.

No additional handshake lines are used. Although implemented for all baud rates, the A810 requires a software handshake (X ON / X OFF) only for a transmission rate of 9600 baud.

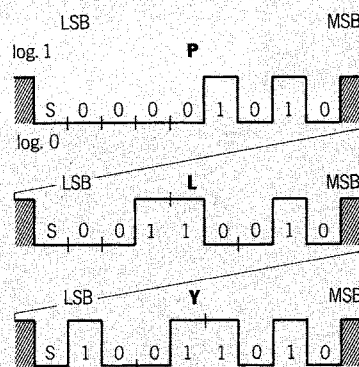
X ON (= ASCII DC1) 00010001: continue

X OFF (= ASCII DC3) 00010011: interrupt

After X OFF has been received by the A810 it still transmits up to two characters, and after transmission of X OFF it can still receive up to 5 characters without losing a command.

The following baud rates can be set with jumpers: 300, 1200, 9600.

Transmitted are 1 start bit, 8 data bits, 1 stop bit. NO parity test is performed, however, the data must contain ASCII characters.



**Fig. 6:** Play command "PLY" (P = hexadecimal 50, L = hex. 4C, Y = hex. 59).

Bruno Wacker

**4) Setting up the serial interface of the A810**

- Set up the computer or the terminal as follows: 1 start bit, 8 data bits, 1 stop bit (no parity bit). Baud rates: 300, 1200 or 9600. Echo mode yes or no. Connect any handshake lines CTS, RTS to ground.
- Serial remote controller PCB 1.810.751-00: this board contains the receiver and the driver of the RS 232 and the Studer interface for recording data on tape. Manual (position X) or automatic (position H) switchover between the two can be jumper selected. Automatic switchover is planned for future machines which means that the jumper should be plugged into position X. Insert the circuit board. Switch on monitor display LED with DIL switch 1. Both LEDs RX and TX are on. Set DIL switch 2 to OFF position, switchover to RS 232.
- Connect computer or terminal via adapter cable to the 9-pin socket of the A810 (for pin assignment refer to Figure 5). If the link is correct, the two LEDs RX and TX turn off.
- Set the desired baud rate with the aid of the address board. The machine must be switched off and on whenever the baud rate is changed because the switches are only read after a reset.

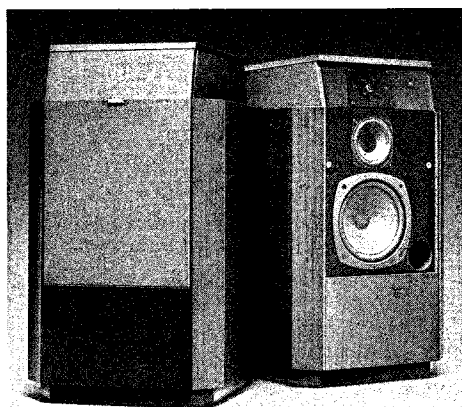
Addr. Board Switch	8	7	6	5	4	3	2	1
9600 bd with Echo	0	0	0	0	0	0	0	0
9600 bd without Echo	0	0	0	0	0	0	0	1
1200 bd with Echo	0	1	0	0	0	0	0	0
1200 bd without Echo	0	1	0	0	0	0	0	1
300 bd with Echo	1	0	0	0	0	0	1	1
300 bd without Echo	1	0	0	0	0	0	0	1

**Fig. 7:** Setting the baud rate.



## Active speaker box REVOX AGORA B (Part 1)

### The active way



The era of the passive speakers started when radio receivers became more sophisticated and the smart wooden housings were abandoned. In the course of this specialization the quality of free-standing speakers also improved, however some basic problems remained unsolved. Further technical evolution led in many instances to a separation of the tuner and the amplifier which made it possible to recombine the speaker and the amplifier in a single cabinet. The following article explains the consequences of this new partnership.

It is a well-known fact that a multi-way speaker system requires a crossover network in order to assign sound spectrum components to the individual speakers (this is, of course, only necessary because there is still no single speaker chassis that can reproduce the entire audible range with sufficiently high quality!). Since the crossover network must be matched to the characteristics of the individual speaker systems, it is installed directly behind the latter in the same cabinet. The full input power of the speakers flows through the feeder line and the crossover network. The principle is illustrated in Figure 1.

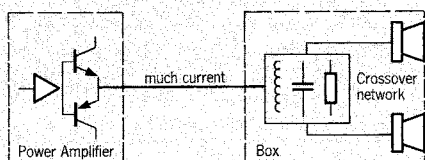


Fig. 1

If we examine the advantages and disadvantages of this configuration we discover the following facts:

Advantage:

– Only one line to the speaker cabinet.

Disadvantages:

– The feeder line and the crossover must be able to handle the full power which is why large copper cross-sections are used for the feeder line and the crossover. The directly coupled feeder line influences the crossover and consequently the speaker characteristic (e.g. deterioration of the damping ratio. This in turn has an adverse affect on the transient response of the speaker).

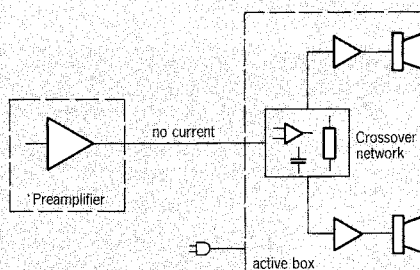


Fig. 2

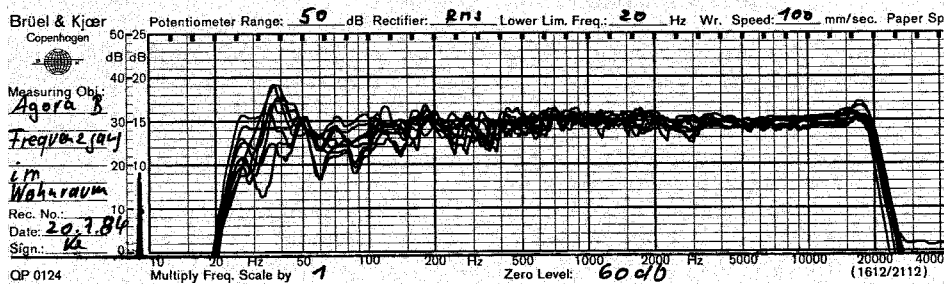


Fig. 3

– Electronic diaphragm control is impossible.  
– The feeder line is not screened; in RF interference fields this long "wire" can function as an antenna and insert parasitic signals into the amplifier.

These disadvantages are eliminated in the "active" box because the amplifier is inserted between the crossover and the speaker chassis (Figure 2).

Advantages of the active configuration:

– The feeder line carries no power and is screened.

– The active crossover can be accurately tailored.  
– The speaker lines are very short and always of the same length.  
– Individual, electronic diaphragm control is possible.  
– Reduced intermodulation distortion because of separate amplification of the frequency ranges.

### The design concept of the REVOX AGORA B

The Agora B is an active 3-way box with one high-frequency, one midrange, and two low-frequency speakers. The goal was to develop a speaker system suited for installation in living rooms, i.e. a system that can be placed anywhere and that provides excellent fidelity and the same low-bass response as a large, passive floor box. The high sitting freedom of the Agora B is illustrated by the frequency response curves in Figure 3.

These 10 frequency response curves were recorded and superposed from measurements in a so-called standard living room (according to IEC) of 10 statistically distributed measuring locations. Two important facts are noticeable:

(1) deviations between the curves are very small, the deviations in the bass range below 200 Hz was primarily caused by the different standing wave ratios in the room;

(2) the absolute frequency response of the speaker is virtually flat. A comparison with the frequency response of very expensive top-premium boxes will radically dispell any doubts...

Before we discuss the technical details of the unusual AGORA B it is worthwhile to look at the guaranteed specifications:

**Technical Spezifications**

- Bandwidth (DIN 45500):  
24 Hz ... 42 kHz
- Frequency response (-3 dB):  
30 Hz ... 21 kHz
- Harmonic distortion  $k_{tot}$  throughout entire bandwidth:  
max. 0.5% (sound pressure level 86 dB SPL)  
max. 1% (sound pressure level 96 dB SPL)
- Attainable sound pressure level:  
110 dB SPL (two AGORA speakers operating concurrently, in living room)
- Speaker configuration:  
Bass speaker  $\phi$ :  
(2 x) 200 mm  
Midrange  $\phi$ :  
122 mm  
Treble speaker  $\phi$ :  
19 mm
- Magnetic flux density:  
Bass speaker:  
(2 x) 1.25 T (12500 G)  
Midrange speaker:  
1.20 T (12000 G)  
Treble speaker:  
1.90 T (19000 G)!
- Inputs:  
PRE/AMP: 0.775 V (47 kohms)  
PWR AMP: 4 V (1.2 kohms)
- Power consumption:  
Standby max. 2 W  
Maximum 200 W
- Weight:  
31 kg
- Dimensions:  
W: 420 / H: 725 / D: 420 mm

**Wolfgang Kelpin (34):**

Graduate of the Engineering School Furtwangen (Germany), field of specialization: mechanical precision engineering for apparatus construction. Since 1974 development engineer at the Ewattingen branch factory of WILLI STUDER GMBH, Löffingen (Germany), where the acoustics laboratory was installed during this time. Currently project manager for speaker boxes.

Wolfgang Kelpin  
(in collaboration with  
P. Zwicky and M. Siegenthaler)



Radio by Cable

**Neue Welle Antenne Munich GmbH**

In Germany, as is the case in other European countries, the mass-media environment is rapidly changing. Various "Bundesländer" have passed new legislation that opens the way for cable pilot projects in which also private companies may participate.

This led to the founding of the "Neue Welle Antenne Munich GmbH". Very little time was required for planning this radio studio. Two meetings were held to discuss the concept and how it could be realized with the available technical equipment.

Twentyfour hours of music, evergreens, hits, and various local and international news are now broadcast daily, i.e. the studio is in operation around the clock.

Only one month elapsed from the initial contact to the firm order. We installed the equipment one month later, over the carnival weekend. When our truck arrived, no windows had yet been installed in the new building, but on Sunday the clean windows glistened in the sun and the installation was ready for preproduction operation. The following equipment has been installed in the **broadcasting studio**:

- 1 STUDER mixing console 269 with 6 switch-selectable MIC/LINE inputs, 9 high-level stereo inputs and signalization.
- 3 STUDER tape recorders B67-0.75
- 2 Professional turntables EMT 938
- 1 Patch field with FRB sockets on which all inputs and outputs are accessible; plus four additional lines which permit the preproduction studio to be used for broadcasting in the event of an emergency.
- 1 Cartridge unit
- 1 STUDER A710 professional cassette recorder
- 1 Balancing unit
- 1 Signalization module
- 4 Decoupling amplifiers

Broadcasting studio at "Neue Welle Antenne Munich GmbH".  
(Photo: Kuchler, Munich)

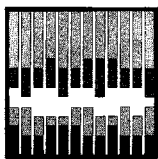


- 1 Amplifier for the speakers
  - 1 Telephone hybrid for 2 exchange lines
  - 2 REVOX tape recorders B77-SLS for monitor recording (logging of all broadcasts is required by law)
- We equipped the **preproduction studio** as follows:
- 3 STUDER tape recorders B67-0.75
  - 2 EMT 938 turntables
  - 1 STUDER A710 cassette recorder
  - 1 STUDER mixing console 169-10/2 PPM
  - 1 Tuchel patch board

Because the ambience in the studio is also important, a cabinetmaker enclosed the equipment with wood panels. A fairly large tape and disc library is under development in the adjacent facilities that also accommodates the small announcer studio.

The broadcasts are administratively prepared in the backrooms. Mr. Blohm, the vigorous manager of this young enterprise, is also responsible for the broadcasts. These are transmitted over leased telephone lines to the **Cable Communications Institute in Munich**. The audience can tune into the program via cable channel 55 and the transmitter frequency 103.65 MHz.

Walter Derrer



## Studer's digital audio technology **DAD-16 in service**

**Rico Sonderegger, whose recording studio "EXKLUSIV" we introduced in the edition 1/83 of SWISS SOUND successfully uses a digital audio delay unit DAD-16 in the production of top-quality records.**

**R**ico Sonderegger's cutting room is equipped with the latest hardware. It therefore comes as no surprise that Rico Sonderegger is one of the first users of a STUDER DAD-16.

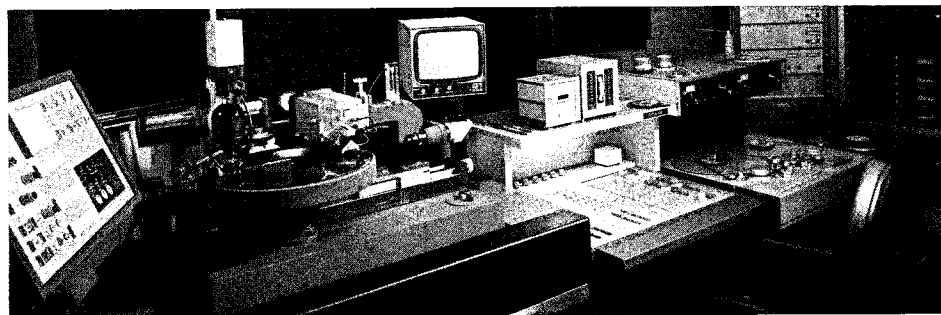
The cutting process is a critical operation in disc production. A cutting lathe

posed on a digital delay unit are correspondingly severe.

The digital prelistening unit DAD-16 (Digital Audio Delay, 16 bits) is designed for high-quality transfer of analog or digital master tapes to disc lathe foils. The DAD-16 can handle all required delay times for operating today's standard lathes. Its field of application ranges from analog masters with nominal or 50% speed to digital masters in 14 bit or 16 bit format, with sampling frequencies of 48, 44.1 kHz, or other commonly used

The DAD-16 is equipped with the new AES/EBU standard interface for digital audio links. The interface circuits for the brand-related formats of most commonly used digital tape recorders are built in as standard equipment. The DAD-16 is a stand-alone 19" unit.

Rico Sonderegger's cutting room is equipped with the latest Neumann lathe. An A80-1/4" preview and an A80 RC-1/4" or 1/2" are available as master recorders. There are also a digital unit Sony F1 and two Technics turntables for playing back freshly cut foils.



Cutting room at Rico Sonderegger's recording studio "EXKLUSIV".

requires a prelistening signal through which the cutting head can be controlled in such a way that the groove pitch is as narrow as possible. In an analog system, this prelistening signal is supplied from an additional reproduce head installed in a prelistening machine.

The desired modulation signal delay time can be selected with the aid of a series of tape guide rollers. Of course, the delayed signal must be of the highest audio quality. The requirements im-

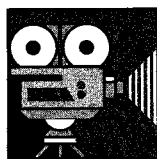
frequencies; if necessary with deemphasis. The level of the analog input signal can be adjusted prior to analog/digital conversion in order to optimize the operating level of the A/D converter. Since the level of the delay audio signal is also adjustable, all standard professional audio levels can be handled. The DAD-16 supplies a balanced phase-compensated output signal, and with its high-quality active filters achieves extremely small noise and non-linearity data.

Although Rico Sonderegger greatly admires digital recorders, he still prefers the A80-1/2" when sound quality is of the essence. In his opinion it will still take some time before digital recorders make a breakthrough. Rico Sonderegger likes the Studer prelistening unit DAD-16 because of its audio quality and ease of operation.

Many artists appreciate Rico Sonderegger's quality concept and come from abroad in order to take advantage of the services offered by this cutting expert domiciled in St. Gall. Evidence of this is the impressive list of customers who entrust their master tapes to Rico Sonderegger. Nena's "?" and "Ivory Man / Songs and Ballads" by Peter Hofmann sold over 250,000 times each and made the list of golden records.

The DAD-16 is destined to assist in the production of many other "golden discs".

David Walstra



## Olympic Games without Failures

# STUDER REVOX at Olympics International Broadcast Center

**Studer Revox products played an important role in broadcasting news of the 1984 Summer Games in Los Angeles to millions of radio listeners around the world.**

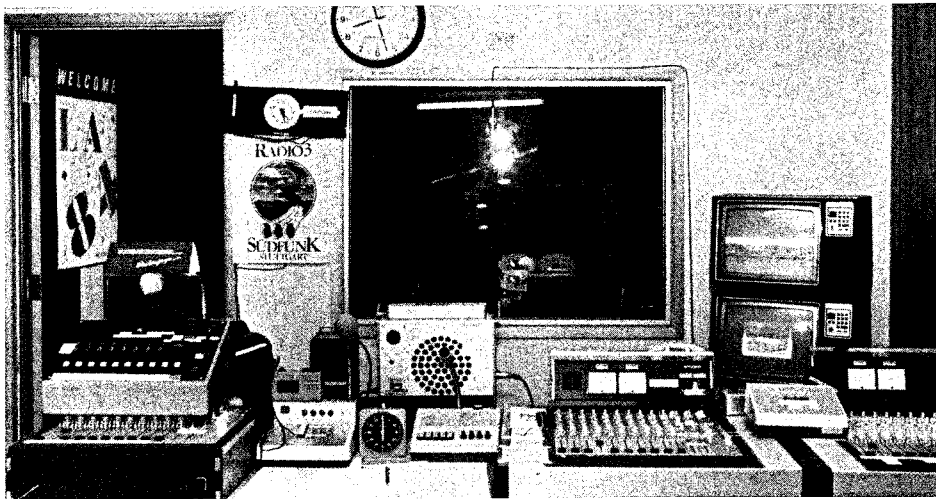
**T**he largest single user of Studer Revox equipment was Germany's ARD radio network. Through a

short-term lease arranged by South German Radio (Suddeutscher Rundfunk), the ARD broadcast trailer was equipped with **five STUDER 169** consoles, **five STUDER A810** recorders, and **four Revox PR99** recorders. According to a telex message from Peter Lentz of ARD, the Studer-equipped studio was "on-the-air" for 14 1/2 hours daily throughout

the games, and all Studer Revox equipment performed well with no significant problems.

In a separate arrangement, the American Broadcasting Company (ABC) leased **36 PR99** recorders from Audio Engineering Associates, a Southern California dealer for Studer Revox. ABC distributed the Revox recorders to vari-





ARD Broadcast Trailer at the Olympic Games.

ous studios throughout the sprawling International Broadcast Center. All the PR99s were high speed units, and some came equipped with options such as monitor panel, console, and cabinet.

The International Broadcast Center (IBC) was constructed by ABC inside the old Gower/Sunset film studio in Hollywood. A large sound stage was divided into dozens of small production studios to serve the more than 140 broadcast organizations that had come from around the world to cover the competition in Los

Angeles. Additional studio facilities were provided inside converted mobile homes parked outside the sound stage building.

Despite some dire predictions, the 1984 summer games in Los Angeles were successful and trouble-free. No terrorists. No thick, lung-clogging smog. No city-wide traffic jams. **And no Studer Revox failures.**

But, alas, no good photos of all the Studer and Revox machines in action!  
Sam Borgerson

## An Oldtimer goes in Pension

# STUDER C37 in Ampex Museum



Curator Peter Hammar with the STUDER C37.

**Last year, when the Ampex Museum of Magnetic Recording first opened, curator Peter Hammar had a problem. He needed a Studer.**

**G**ranted, he had some good photos of vintage Studer recorders. But, considering the importance of Studer in recording history, he knew he should have the real thing.

To dramatize his plight, Hammar asked his wife to pose while wearing a Studer Revox T-shirt. He took a photo of her standing in an empty space he had set aside for a Studer recorder. "This spot reserved for Studer", the photo proclaimed. "Please help."

The photo was quickly dispatched to Eugen Spörri at Studer International. A suitable machine was soon located and refurbished. It was then shipped to Studer America in Nashville for final inspection before delivery to the museum at

Ampex corporate headquarters in Redwood City, California.

Move over, Mrs. Hammer. The Studer C37 has taken your place!

**The C37** was chosen for display because it incorporated several important **technological innovations.** One important development was the unique system for providing constant tape tension over a wide range of tape pancake diameters. This system introduced the "two-rollers-on-a-rotating-disc", concept, an idea carried on in later Studer models.

Other C37 innovations included motor-driven tape scissors, use of an internal incandescent lamp to regulate voltage to the take-up motor, and the cascaded input of the reproduce amplifier.

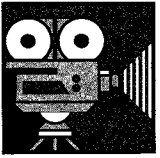
Production of the C37 commenced in 1960 and continued for a full decade, with about 1800 units made. Guido Besimo served as project manager under Dr. Studer's overall supervision.

The machine donated to Ampex, serial number 1735, was sold to the Swiss Radio Corporation in 1969. It was used at the Swiss Radio International Short Wave Center in Bern. The Short Wave Center replaced all existing units with new A80RC machines shortly after this machine was put in service; consequently, the unit now in the museum is in almost-new condition. (Other units at the Center had up to 70'000 hours on the clock!)

The Ampex Museum of Magnetic Recording houses a wide range of exhibits on the history of recording technology from the early 1900's through the present. Developed over a 2-year period by consulting curator Peter Hammar, the museum represents an investment of over \$1 million.

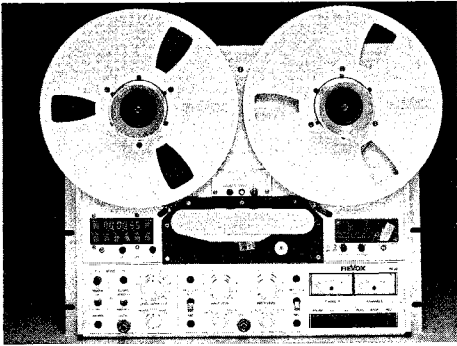
Equipment on display covers the spectrum from a rare 1911 telegraphone Model C wire recorder up through the latest video recording and digital image processing gear. In addition to Studer, other companies contributing to the museum include 3M, BASF, AEG-Telefunken, Agfa-Gevaert, Sony, and the American broadcasting networks ABC, CBS, and NBC.

Sam Borgerson



For the amateur? For the professional?

## Revox reel-to-reel recorders



**After the hi-fi fans and the tape amateurs, the third installment of this series covers the requirements of professional users.**

**P**rofessional applications can be categorized as follows:

- Recording and broadcast studios
- Active use in support of artists, musicians, and vocalists
- Passive sound coverage in restaurants, bars, hotels, department stores, auditoriums, discotheques, dance halls, etc.
- Recording of conferences

The following versions are suited for active use:

- High speed (HS) 7.5/15 ips
  - PR99 2-track or mono, NAB or IEC, with balanced inputs and outputs
  - B77 2-track, NAB or IEC, with unbalanced inputs and outputs
  - PR99 reproduce only, NAB or IEC
- Standard speed 3.75/7.5 ips
  - PR99 2-track
  - B77 2-track or 4-track

For passive use as well as logging, the following versions can be recommended:

- Low Speed 1 7/8 / 3 3/4 ips or Super Low Speed 15/16 / 1 7/8 ips
  - PR99 2-track
  - B77 2-track

### Balanced or unbalanced audio connections?

The audio connection of the B77 is limited to a hot conductor and a screen while for the PR99 a forward and a return conductor as well as a screen are required for each input or output. This professional connection method minimizes external influences such as switching

clicks from light switches or stray pick-up of RF signals on longer lines. Ripple loops are eliminated.

The following table lists the connection specifications of these two recorders:

#### INPUTS:

##### B77

Microphone	
Low	0.15 mV/2.2 kohm
Aux	40 mV/220 kohm
Radio	2.8 mV/20 kohm

##### PR99

Cannon	CCIR	+6 dBu
		(-4 ... +16 dBu*)
	NAB	+4 dBu
		(-10...+10 dBu*)
	UNCAL	(up to 10 dB higher)

#### OUTPUTS:

##### B77

RCA socket	1.55 V/390 ohm
DIN socket	1.55 V/4,7 kohm

##### PR99

Cannon socket	CCIR	+6 dBu/600 ohm
		+4 dBu/600 ohm
	UNCAL	(up to 10 dB higher)

\* internally adjustable with jumpers.

This list shows that professional users work with fixed operating levels in order to be able to establish connections with all types of equipment such as mixing console echo unit, dolby, etc. Of course, recording studios use only HS versions. The record or reproduce level can be increased by up to 10 dB with the two UNCAL buttons.

#### Specialities

Echo sound effects can be easily created with a REVOX reel-to-reel recorder. The possibilities are virtually unlimited with a corresponding level and the variable speed remote control.

Recording copies for customers: 2-track with PR99 or B77, 4-track with B77, or cassette with REVOX cassette recorder B710 which in the version A710 is also available with balanced audio connections.

#### Active sound coverage applications

Many famous artists use the B77 HS or standard for supplying an acoustic background to their performances. Specially prepared magnetic tapes with spliced-in transparent segments for automatic triggering of the stop function have been used already since the G36 series III. The play function can be reinitiated with the aid of a foot-operated or manually operated remote control.

Exercise recordings with the REVOX microphone 3500 and also recordings for subsequent disc or cassette production are readily possible.

#### Passive sound coverage applications

Uninterrupted music reproduction over more than six hours, and this in superb stereo quality without changing tapes, is possible with the magnetic tape REVOX 63L. We recommend the 2-track version for minimum quality losses and maximum service life of the tape. In conjunction with the cycle control, loop mode with one recorder and chained mode involving multiple recorders with or without loop are feasible. The PR99 repro only is, as its name implies, suited for reproduce-only applications.

In some countries such as Switzerland, recordings of all broadcasts are required by law. This requirement can be met with the combination B261 tuner (or A726 with balanced outputs) and a PR99 or B77 low-speed or super-low-speed reel-to-reel recorder. Copying, mixing, splice editing, etc., in other words the bread-and-butter activities of the studio personnel, are possible with these versions.

The B77 LS and the B77 SLS 2-track are eminently suited for recording conferences. Each discussion meeting or conference can be logged with one or several REVOX 3500 microphones.

Playback is possible on the same unit or on a second machine with the aid of a foot-operated remote control so that the secretary can prepare a written document.

The B77 SLS which operates at 15/16 ips features an uninterrupted recording capacity of over 12 hours. When two such recorders are chained with a cycle control, nonstop 24-hour recording is possible.

In the fourth and last installment of this series to be published in the next edition of Swiss Sound, the **applications of industrial users** will be discussed.

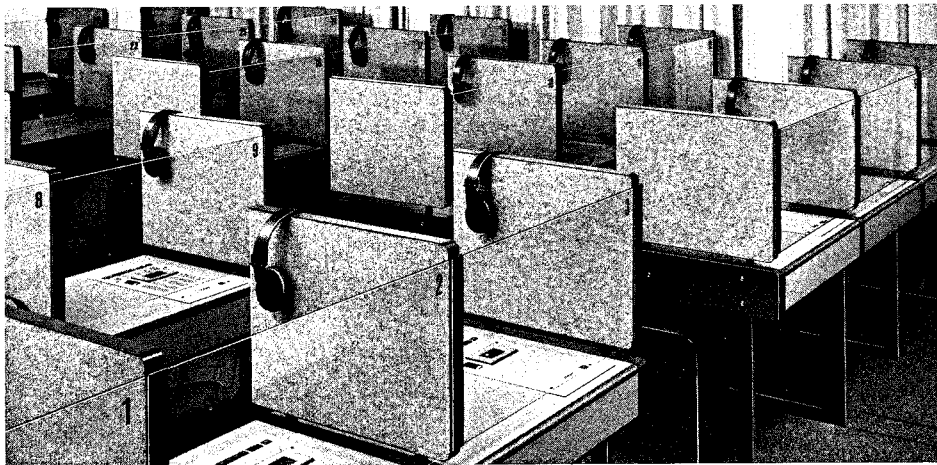
Bruno Baronio



## Language trainer Quo vadis ?

**In order to determine how this instruction medium fairs in practice, the CILA (Commission Interuniversitaire Suisse de Linguistique Appliquée) organized a workshop last Autumn at the University of Lausanne.**

The workshop was opened by **Professor Guex** in which he reminisced about his first contact with a language trainer. This was in 1955 at the NATO in Paris. He began practical and daily work with this medium in the sixties. Today he was still 100% convinced of its merit even though other users have raised doubts concerning the language trainer over the past decade. "Did these 'doubters' set their expectations too high? - or is the problem to be found somewhere else? To answer these questions or to reopen the case for the 'LANGUAGE TRAINER' is the goal of this workshop".



**René Richterich, University of Berne**, on the "prime" history of language learning. He reminded that already in 1904 a conversation course for the French language was offered in England on Edison rolls. By 1920 a vast number of language courses was available on records. The first language instruction machine became available in 1930 which allowed exercising according to the HSA method. This machine was based on a Dictaphone. During World War II, the Allies made extensive use of language trainers for instructing spies and high-ranking soldiers. After the war, interest in this medium waned until the Soviets put the first Sputnik into orbit. You may wonder what this has to do with languages. Basically nothing, at least not directly, but this event has caused the Americans to ask themselves: "Where do we stand, have we lost touch?", and

the US Congress decided to do everything possible to promote development of new technologies, language learning, and to reform universities, etc. The years that followed were often called the "golden age of the language trainer". It is evident that the language trainer was not a spontaneous idea but that it has undergone a long evolution. The same applies to the exercises and the methods. The structure exercises that today are frequently scoffed at as "a new fad" are actually not new: they were already described by Ferdinand de Saussure in his work "Cours de linguistique générale", published in 1916. But why have doubts concerning the language trainer been raised for some 10 years now? There are many influencing factors:

The value of a language trainer has still not been recognized by many users. Such installations are frequently used without a fixed connection to traditional instruction methods. All too often the students are required to participate in

lengthy exercises, even to the point of exhaustion. Sometimes exercises are used that are poorly fitted for the task. In order to remedy such crying abuse, the language laboratory users should sit in the school bench and learn that this medium is no panacea but rather a tool which - if properly used - should have a different name, e.g. "fitness room for words" or "language bath".

The exercises should be carefully analyzed before they are bought, preferably in cooperation with other language instructors and, if necessary, be tailored to the specific requirements of certain student groups (technical, commercial, medical, etc.) and not just to the instruction method but also the principles of modern instruction psychology (exercises not longer than 20 to 25 minutes, etc.).

Younger instructors show relatively little interest for this medium. Maybe because of their personal experiences as students in the language laboratory! But it doesn't have to be this way, as outlined by

**René Jeanneret, Directeur du Centre de Linguistique Appliquée of the University of Neuchâtel.** In this Canton of Switzerland, the instructors are trained during a 2-week course given by the CILA on the pedagogic and practical use of the language trainer. And lo and behold, this Canton is successful. Here some figures from last year's survey: 23 language trainer installations with a total of 574 student desks were installed between 1970 and 1973.

These installations have by no means been idle: those in higher grades ran for an average of 7500 hours and those at the university even 12,000 hours! "And it's going to continue in this direction. Neuchâtel believes in the language trainer and on Oct. 24, 1983, installs an additional system, a REVOX 884" (sic).

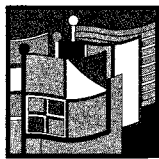
The older installations will eventually be replaced, also with the 884s. Responsible for the success in this Canton are not only the instructors, but also the infrastructure. The Canton employs two chief engineers and each school has a custodian with a deputy.

**Roger Scott, pedagogical adviser at the Eurocenter in Bournemouth** pointed out, by means of examples, how creative the activities in the language laboratory can be: role playing, spoken letters, fictitious interviews, describing what has been listened to, etc. Students of the language laboratory frequently work in pairs.

The foregoing demonstrates that a language trainer can only be successfully used if it is handled by well-prepared staff. Improvisation is out of place.

The CILA sees its function in continued research into methods and promotion of correct use of language trainers by the instructors. The language trainer is not dead. It is much discussed and again used more frequently. Some even talk about a "second spring" of this medium. It is our task to maintain contacts with the users and to recognize pedagogic trends so that we can respond with appropriate products.

Thomas Corboz



Exhibitions: FERA 1984 in Zurich

## Centre of Attraction: Broadcasting



The joint control room for local broadcasters has found great attention: CANAL 3, Biel, broadcasts a German/French mixed program.



Pro's at work: the program of radio "DRS 3" (SRG) is broadcasted with STUDER equipment - and this not only at the "FERA".

The Zurich "FERA" is one of Europe's most significant exhibitions in the field of radio and television home entertainment equipment. This year, it took place at the end of August, showing a distinctive tendency towards broadcasting - local broadcasting in particular.

In addition to the Swiss "DRS 3" radio station, new local broadcast stations introduced themselves with their own

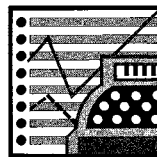
control rooms. A joint control room caught special attention where smaller "radiomakers" had the chance to broadcast in continuous sequences. Here, the audio equipment was all-STUDER, looked after by members of Studer International AG during the exhibition period. It was golden opportunity for many local broadcast pioneers to operate a fully equipped professional production and broadcast complex; it was done with a great deal of enthusiasm. The national broadcasters' section practically used STUDER equipment throughout and, as practiced in previous years, several exhibitors were supported with additional STUDER REVOX products.

Marcel Siegenthaler

Greece

## STUDER A810 broadcast recorder for Hellenic Radio

In a well-weighed decision, the national broadcasting organisation of Greece has decided to install STUDER professional broadcast recorders A810 with console and remote control facilities. A test machine passed muster in operation at various different studios.



Malaysia

## Successfully completed ...

with STUDER audio equipment was the on-air section of **TV CHANNEL 3 in Kuala Lumpur** who started broadcasting on June 1, 1984, in its partially accommodated building.



It took the STUDER installation crew a mere five weeks - until August 2, 1984 - to finish the installation of the production site, Studio A and B, and the post production suite.



In addition, the formal hand-over of the radio production house facilities (several studios, STUDER-equipped) at the **Centre of Education in Sabah, Kota Kinabalu**, was carried out by K.L. Government officials on July 27, 1984.

Studer's good wishes for success go to both centres.

Paul Meisel

Hellenic Broadcasting already operates STUDER Tape recorders A80 RC (stereo and mono) and the supply of STUDER A810 will replace a remaining number of older equipment of other make.

Rolf Breitschmid

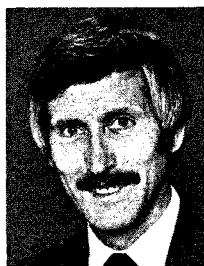


The Studer Group  
of Companies

## "Who is who"

This column has been reserved for introduction of personalities of our affiliated companies and representations in Europe and Overseas.

Introducing:



**Hans Kilchenmann**

Head of Finance and Personnel of WILLI STUDER AG • born 1940 and grown up in Rohrbachgraben, Canton of Berne • after compulsory school, training and practical work in farming, followed by training and employment at the Swiss PTT • five years later, he acquired a federal diploma in accounting and gains first experience in this field as an accountant of a large Swiss company in the ceramic-making industry • married, one son (15) • with WILLI STUDER since 1971.

Hans Kilchenmann took a remarkable step forward when after his initial training in farming he decided to become a graduated accountant, and work in a multinational company. With excellent experience in accounting, controlling and general organisation, he joined WILLI STUDER in 1971, to become responsible for finance and personnel, and assist with the preparation of short-, medium- and long-term objectives as regards the liquidity and profitability of the company. He also controls the STUDER REVOX daughter companies in this respect.

Four fully trained accountants assist him in his various tasks which requires a never-ending devotion and undivided engagement. Nothing changes faster than company figures and a month's account once delayed is hard to restore.

Since 1971, Hans Kilchenmann has taken part in the remarkable upswing of WILLI STUDER in close cooperation with the company owner. Responsible for improvement on the accounting sector, he takes active part in reorganising from punch-card system to EDP, and the automation of work processing. Whilst in the seventies all costing, calculating,

cost assessment of R & D orders, suppliers credits, control of type-connected tools, debtors' accounts etc. were manually assessed, it is today carried out with the aid of most modern on-line EDP equipment.

Automation currently requires latest information on certain resources. This in turn offers up-to-date and full evidence of all summaries – in Hans Kilchenmann words: "We have the better grasp on figures". Up-to-date information plays a most important part, as deviations from existing objectives are of no advantage to the company.

Accounting faces a new era as well; the mere acquisition of data has made room for a genuine control and management instrument; a company can hardly exist without it.

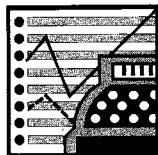
The international STUDER REVOX organisations benefit also from new applications. Hans Kilchenmann is convinced that controlling is of great importance as a supporting managerial instrument. Emphasis on automation will produce a steady flow of information required for the control of a company.

In his spare time, Hans Kilchenmann prefers to move in fresh air. He is an outdoor man and likes to take long walks, swim, cycle and work in the garden. He reads professional literature and for relaxation a detective story.

The thoughts and principles he maintains with regard to the profitability of the company and for successful guidance of his staff are manifold:

- A positive philosophy of life, full identification with the company and its products;
- discipline at work; the willingness to produce an above average output, and consider same self-critically;
- open-mindedness towards technical innovation;
- establish a close information system, based on an up-to-date and reliable status;
- improvement of professional level; overall interest more important than the interest of the individual;
- cost-minded conduct ("not to spend more than is earned");
- keep a watchful eye on liquidity;
- rightful treatment of all employees; not demand the impossible; encourage productiveness;
- last not least, clear objectives regarding quality of work and time involved.

Renate Ziemann



Studer Mixing Consoles – successful 900 Series

## 25 x STUDER 900 in Switzerland



Two years after the installment of the first 900 mixing console at the radio studio of the UNO in Geneva, Studer has delivered the twentyfifth 900 mixer in Switzerland. The requirements necessary to be successful with such a product can be summarized as follows: Expertise for customer consulting, particularly during the project conception, good technical specifications, reasonable price/quality ratio, and a reliable after-sales service.

In addition to these basic conditions, there was a strong demand for high-quality mixers in Switzerland. Supplies included a sound mixer for film service of the **Swiss Army**, mixing consoles for the **opera-house** and the **drama theatre** in Zurich, and various mixing desks for the **Radio and Television department of the Swiss PTT**. These special models cover a wide range of applications, from on-air operation, production of music and drama, to multi-purpose mixing consoles. These mixers have been designed in close cooperation with the PTT and the Swiss Radio Corporation. They are used in radio and television studios throughout the four-language regions in Switzerland, as well as at Radio International in Berne.

Walter Hodel

Regensdorf

## Change at REVOX ELA AG



Effective September 1, 1984, Mr. **Kurt A. Bürki** (39), was appointed **head of the Marketing and Sales department of REVOX ELA AG** in Regensdorf, following the resignation of Mr. Werner Schuler from this position.

His duties encompass marketing of the entire range of REVOX products, and the responsibility of directing the staff of area sales managers.

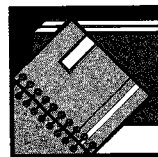
Kurt A. Bürki has had vocational training in the banking business; he also specialized as a stockbroker and for several years lived in France and England. He is married, and has joined REVOX in 1979.

The experience he has gained while working as an export manager in a well-known Swiss watch manufacturing company has provided him with most valuable know-how for the marketing of an exclusive national product.

Mr. Bürki was originally employed as Area Sales Manager and as such, was responsible for sales of REVOX hi-fi equipment in the Swiss market. He is equally well acquainted with all matters relating to consumer and specialized dealer business.

Many years of experience in marketing, and his entrepreneur approach are the distinguishing qualities of our new General Sales Manager.

We are wishing him every success in his new responsibilities.



## From the printers

- 10.26.0130 **TLS 4000**, Leaflet (g)
- 10.26.0140 **TLS 4000**, Leaflet (e)
- 10.27.0100 **TLS 4000**, OI (g/e)
- 10.23.5032 **A710**, SI (g/e/f)
- 10.27.0070 **A726**, OI/SI (g/e/f)
- 10.85.1270 **Telephone Hybrid**, TI (g/e)
- 10.85.1280 **Mixer** 069-3/2 & 069-6/2, TI (g/e)
- 10.29.0042 **CD-Player B225**, Leaflet (e)
- 10.29.0161 **CD-Player B225**, Leaflet (i)
- 10.30.0280 **CD-Player B225**, SI (g/e/f)
- 10.90.1451 **Revox product catalog**, (g)
- 10.90.1461 **Revox product catalog**, (e)
- 10.90.1471 **Revox product catalog**, (f)
- 10.90.1481 **Revox product catalog**, (span.)
- 10.90.1491 **Revox product catalog**, (danish)
- 10.90.1511 **Revox product catalog**, (dutch)
- 10.90.1521 **Revox product catalog**, (i)
- 10.18.4921 **PR99 MK II**, Leaflet (e)
- 10.18.4931 **PR99 MK II**, Leaflet (f)

PI = Product information  
 TI = Technical information  
 OI = Operating instructions  
 SD = Set of diagrams  
 SI = Service instructions

Sets of diagrams, operating and service instructions available at nominal charge.



Kuwait Airport

## Studer equipment for the VIP passenger sector

A stereo broadcasting system, designed by STUDER, is to be installed in the VIP passenger sector of Kuwait airport. It consists of a professional control room equipped with a STUDER mixing console 369, tape recorders PR99, patching facilities for a public address system and a patching panel for various rooms, covering the VIP lounge, visitors lounge and meeting room, main entrance and corridor.

Installation work will be carried out by a local company; STUDER provides all wiring and installation instructions and also carries out final check-up, commissioning and training of local technical staff.

The entire system will be operated and maintained by KBS, the national broadcasting organisation of Kuwait, technically responsible for the layout of this project.

Rolf Breitschmid

Internal note

## Staff changes in the editorial department of Swiss Sound



The editor responsible for the general section of SWISS SOUND, Massimo Schawalder, has left our company. His successor should not exactly be a stranger to many readers: it is **HEINZ SCHIESS** (34) who after graduating from engineering school (with specialization in telecommunications) in 1973 joined our development department for factory-owned measuring instruments. Through his time spent at STUDER FRANCE and STUDER REVOX CANADA, as well as his activities as regional sales manager for STUDER INTERNATIONAL AG, as manager of the office for project supervision, and as product manager for synchronizers at WILLI STUDER AG, Heinz is well qualified for a new assignment at STI. Besides his editorial activities he is since the beginning of September responsible as regional manager for

sales in Great Britain, France, and Scandinavia.

We should like to take this opportunity to thank Massimo Schawalder for his contributions during the first two years of the existence of SWISS SOUND. And to Heinz Schiess, the editorial team extends their heartiest welcome in the true "Spirit of SWISS SOUND" so that we can write, edit, design and print what is of the most interest to you, the readers.

And lest we forget: your comments, your opinions and suggestions, but also your reports on subjects related to our products are much appreciated and greatly enrich SWISS SOUND. They may also serve your very own interests.

Marcel Siegenthaler

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 Phone 01/840 29 60 · Telex 58 489 stui ch  
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