STUDER REVOX

SWISS SOUND

VIEWS AND NEWS FROM SWITZERLAND

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Editorial

Conquer the World...

In the last issue of SWISS SOUND, we have talked about "The Manufacturer with the Complete Range".

Today, there would be a lot to say about the product acceptance STUDER REVOX enjoys world-wide, however, such complex subject cannot be covered by a single issue of SWISS SOUND. We can only select one or the other project as an example and would appreciate to receive contributing information from our readers on particularly interesting installations and applications of STUDER REVOX equipment.

The story of the world-wide presence of STUDER REVOX products, the modest start we had in the sixties, our determination to supply STUDER REVOX equipment to people anywhere – be it on a Pacific island, high up in the North, in the depth of Africa or far out in Asia or Australia – such story would fill a book.

Now, in the midst of all turbulent occurrences of 1984, we are still determined to make our equipment available to every possible user throughout the world, and follow this up with great persistence and inspite of all difficulties an export-orientated company may experience.

We are grateful to those of our customers in Europa and Overseas who have given us their confidence over many years, and for their understanding when communication was somewhat neglected in times of great strain.

It has always been our principal objective to maintain an excellent relationship with you in all parts of the world – be this by contact with our representative or daughter company in your market or by visiting you from Switzerland.

Eugen Spörri

Braking method for A810 locator

Learning from experience...

Experience is a valuable asset for mastering the future, if we are willing to learn from experience. The following report by a software specialist describes how this learning process has been implemented in the A810 locator.

The quality of an autolocator algorithm depends largely on the information it receives concerning the mechanical status of the machine. If little information is supplied by the sensors, the missing data must be "learned" from experience.

Problem

How can a specific tape address on tape be found as quickly as possible? Very simple: approach the location (in the right direction!) at maximum speed and brake at the last possible moment. But how can this braking point be determined? And how can the required braking distance be developed?

There is obviously a certain analogy to car driving. The braking distance is proportional to the square of the speed. On a tape recorder it is also influenced by the mass intertia of the reels or the distribution of the masses between the supply and the take-up reels. As is the case for the automobile driver, the A810 has no advance knowledge of this inertia, but it "senses" it during the braking attempt. It must, therefore, determine the dynamic behavior of its operating mechanism.

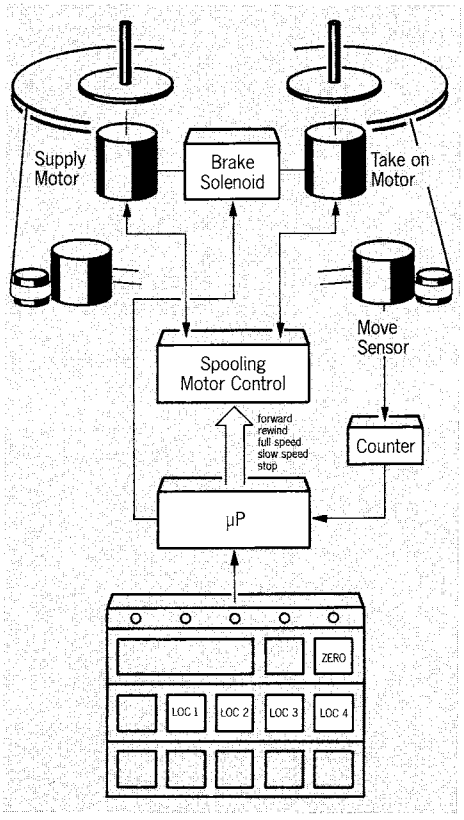

Fig. 1

A810 tape transport control

Which characteristics of the A810 can be used for writing the locator software? Fig. 1 illustrates the configuration and the links between the microprocessor control and the tape transport logic. Simple commands are available: forward, rewind (fast and slow) as well as stop. The

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only usable sensor signals are end-of-tape and tape motion. But the processor receives no information, for example, concerning the speed of the spooling motors. Through the tape move sensor it can, however, compute two variables: the momentary tape address and – with the aid of the timer – the tape speed. The world of the A810 is, so to speak, two-dimensional: V / X, where V is the tape speed and X the address. A dynamic process (acceleration, braking) describes a path on this plane. The A810 must live with this and derive all information required by the autolocator from the shape of this path.

The ideal braking curve

Two braking methods are feasible: the mechanical brakes can be applied or a counter-command (e.g. rewind during fast forward) can be triggered. Although mechanical braking is more efficient we have decided on the second approach in order to achieve smoother action (mechanical brakes generate noise).

The braking curve can be described by the following simple formula:

$V = P \cdot X^2$

where:

V = momentary tape speed
X = distance to the STOP address
P = parameter for the inertia of the tape reels and the tape distribution

It basically suffices to measure one braking curve in order to compute these parameters as follows:

$$P = \frac{V}{X^2}$$

But this method has two drawbacks:

- the parameter always relates to the last address at which the machine was braking. If the tape is wound forward and backward between two tape addresses, the machine always brakes with the "ideal" curve for the other, wrong tape address.
- Division by the time required in this equation is time-consuming for the microprocessor.

We have consequently implemented a "correction method" that develops a mean from the ideal parameters of the last few locator addresses:

$P' = P - C \cdot E$

where:

P = old parameter
P' = new parameter
E = error (distance between the location at which zero speed was reached and the target location)
C = constant, selected for reasonable learning speed

The advantages of this method are more stable behavior and simpler computation by the microprocessor.

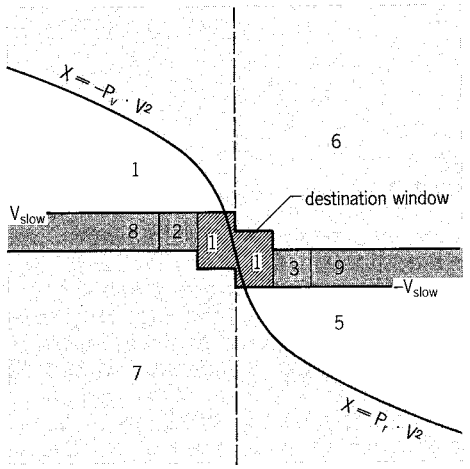
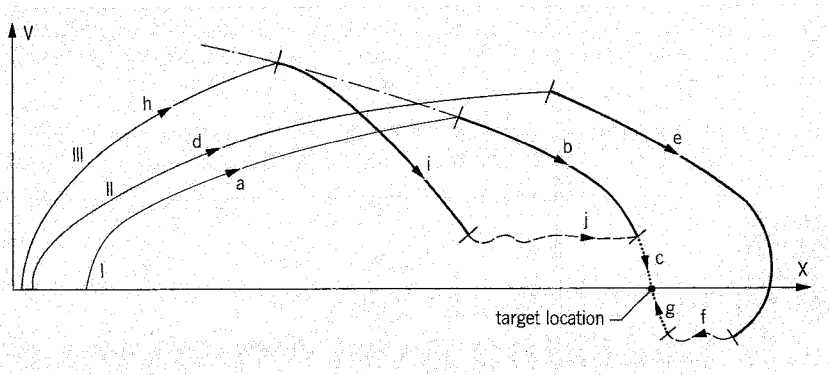


Fig. 3



I: **Locate with right parameter**
a) forward
b) rewind
c) mechanical brake

II: **Locate with to low parameter**
d) forward
e) rewind
f) rewind slow
g) mechanical brake

III: **Locate with identical parameter as I, but with lighter reels**
h) forward
i) rewind
j) forward slow
c) mechanical brake

Fig. 4: Different Locator brake curves.

Fig. 2 shows various locator braking curves that illustrate the gradual approximation to the ideal curve (learning process). Two independent parameters have been introduced in order to account for forward and backward tape movements: P_V for forward locator addresses and P_r for reverse addresses. The A810 can thus independently optimize the braking action in both directions. When the operator moves the tape forward and backward several times in search of a splicing point, the machine brakes ideally for both locations.

Software method

As mentioned, the A810 lives in a two-dimensional world, the V / X plane. The locator software has been exactly tailored to this plane. We have subdivided this plane into areas. The machine must have a different behavior for each of these. It is the task of the locator software to determine the area in which the machine is

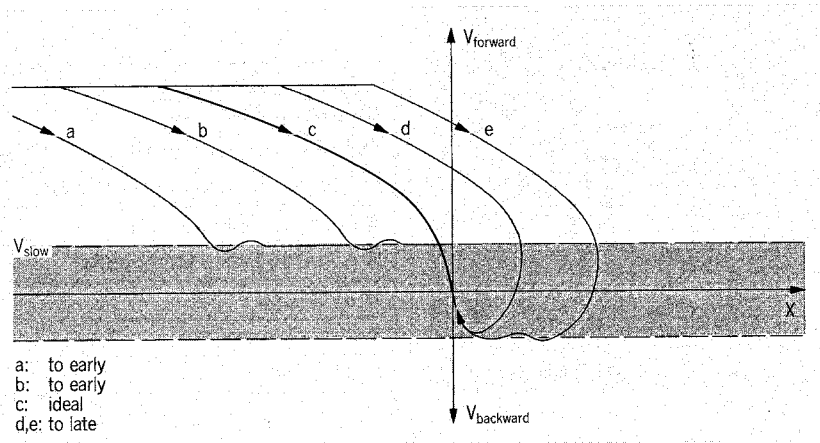


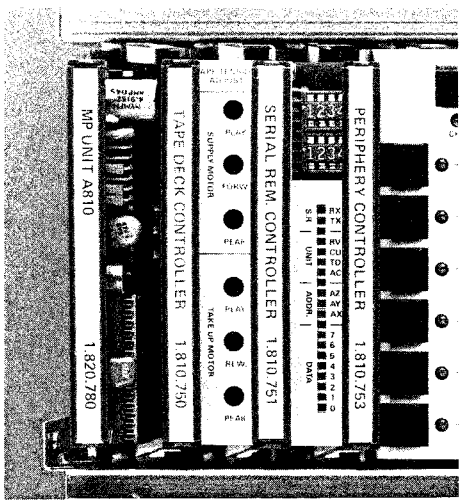
Fig. 2: Locator brake curve.

operating and particularly to determine the transitions from one area to others.

A third "internal" dimension is required for a complete description of the algorithm: the locator status (describes the history of a control sequence).

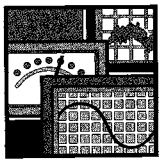
The relationship between positions on the plane (areas 1 to 9 in Fig. 3) and the possible control commands can de defined as a matrix and implemented in the software in finely graduated form. Some restrictions have been built in intentionally, primarily for aesthetic reasons, in order to prevent the impression that the machine is unsure:

- After a braking attempt (braking with spooling motors), the tape transport continues only at slow speed.
- The mechanical brakes are applied occasionally, when the A810 enters the destination window (1). The task is also terminated when the machine (in highly extreme situations) leaves the window during mechanical braking.
- The parameters are only recalculated if the braking curve crosses the line $V = V_{slow}$ and is sufficiently long to yield a good estimate.



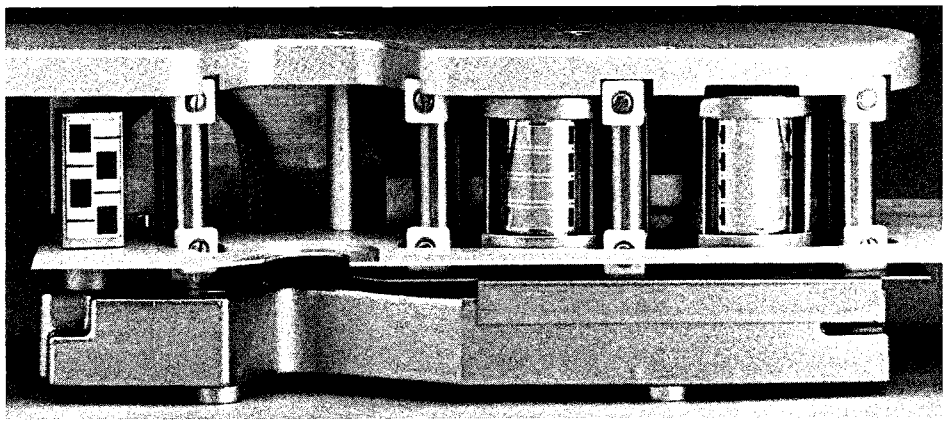
Dr. Alain Junod (36): Basic training in physics at the Swiss Federal Institute of Technology in Zurich. Assistant at the same institut, made his doctorate thesis at CERN Geneva. The subject was: Polarisation measurements in proton – proton elastic scattering. After travelling 3 years in South America from Mexico to Tierra del Fuego, he joined Studer in 1979. First he worked on the development of the language trainer 884 and then on the A810. Currently responsible for the audio electronic control (hardware and software) of the A820 multichannel machine.

Dr. Alain Junod



A80 MR MK II Master Recorders

P.R.E.C.I.S.I.O.N.



Of course, precision is relative, but in the quest for maximum phase stability in master recorders, the technology has been pushed to the feasibility limits – and the term PRECISION is quickly equated to absolute, hard realities.

What are the reasons why the requirements imposed on master recorders for producing cassette tapes are that severe? After all, the final product is "only" a cassette? To explain this, let us examine the steps required for producing a recorded cassette:

1. Original recording with a multitrack reel-to-reel machine on 1" or 2" tape at 15 or 30 ips.
2. Mix-down to master recorder at 15 or 30 ips tape speed (master tape for disc production).
3. Copying to master recorder at 3 3/4 ips; track configuration analogue to cassette tape.
4. Copying to cassette tape with "Bin Loop" master recorder and cassette tape slaves; tape speed ratio up to 64 : 1; lately even 128 : 1!

The master recorder is used for producing a master tape that is subsequently copied at high speed. A special reproduce ("Bin Loop") and a special record machine (slaves) copy the tape to cassettes at a speed of 64 x 1 7/8 = 120 ips (64 : 1), i.e. more than 3 m/s. In order to save copying time, the copying speed should be as high as possible. But the frequency range of the program material to be transferred also changes with higher copying speeds. The frequency band of 20 Hz to 20 kHz shifts to 1.28 kHz to 1.28 MHz when a copying speed ratio of 64 : 1 is used, i.e. the frequencies are now largely in the RF band (medium waves). This poses problems for the recording heads and the recording electronics, and difficulties for the reproduce machine.

The relation of the master recording speed to the copying speed is as follows:

[3.75"], 9.525 cm x 64 = 6.096 m/s
[7.5"], 19.05 cm x 64 = 12.19 m/s
[15"], 38.1 cm x 64 = 24.38 m/s

This table clearly demonstrates that normal speeds of professional recorders are hardly suited for master recordings because copying speeds of 10 m/s and higher are difficult to control. The master machine must run slower. But now the problem is shifted to the other side.

Master recorder requirements

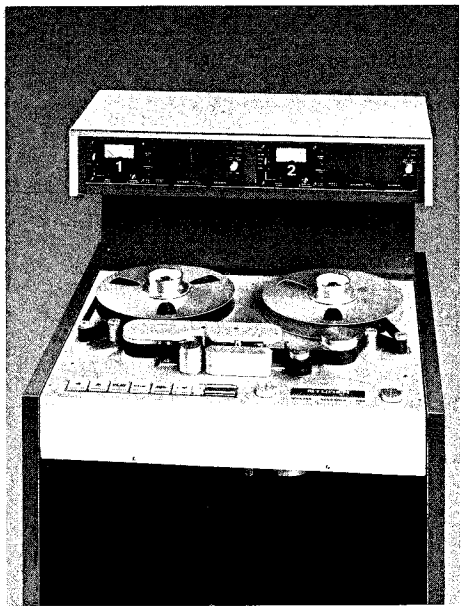
The master recorder must feature extremely low wow and flutter and outstanding stability in the headregion. The following considerations should make this clear: a phase difference between the individual channels can always be traced back to mechanical deformations in the head region, i.e. tiny differences between the recording on tape and the scanning elements (heads) occur. The problem can be caused by the headblock (vibrations, thermal expansion, etc.) or the tape transport (tape guides, flutter). Because these differences build up between the recording and the sound heads, the absolute error increases with slower tape speeds (be-

cause the recording density increases proportionally: physical wave length on tape only half as long at half the tape speed).

New cast steel headblock
On the A80 MR MK II, precision has been incorporated on both sides: a new, extremely stable cast steel headblock has been developed and much attention has been given to the tape guidance. A new headblock with four guide rollers has been created which, with respect to head/tape contact and phase stability, satisfies the most stringent requirements. As a consequence, high precision is required in the manufacture of the tape guidance elements. The precision and phase stability achieved are truly remarkable; the new headblock design is fully mature!

Additional new features
In order to improve the frequency response at 3 3/4 ips (20 kHz/3 dB), a new reproduce head with a gap width of only 2 µm is used.
New RF drivers in the electronics provide sufficient work room when operating with chromium tapes.

Because the new Dolby HX PRO* system gives excellent results in the production of master tapes at low speeds (higher treble response), options have been developed for the RF driver. The



newly developed master oscillator has also been designed for Dolby HX on/off switching. The A80 MR MK II is equipped with active, balanced, transformerless inputs and outputs.

Marcel Siegenthaler

* Headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Professional originated by Bang and Olufsen. «Dolby» and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

New features also for the A80 QC MK II
The new features of the quality control machine may also be of interest in conjunction with the A80 MR MK II:
- The headblock features new heads with greater efficiency and consequently improved signal-to-noise ratio in the reproduce-channel.
- The record/reproduce headblock is equipped with a double erase head system for reliable erasure of IEC IV tapes.
- The A80 QC MK II is now compatible with IEC I, II, and IV tapes.
- Cast steel headblock with excellent tape guidance characteristics through multiple flutter rollers; excellent data for sideband noise, also with critical tapes such as IEC II (chromium).

Tape Lock System STUDER TLS 4000

The "electronic shaft" of the future

There are mechanical as well as electric or electronic solutions to synchronization problems. Examples are the valve control for internal-combustion engines, railway station clocks, or the image on the TV screen. Synchronization among tape recorders or with video machines is much more difficult because synchronous running is to be achieved with autonomous machines that frequently have substantial moving masses. The following report outlines the principle and the facilities of the new synchronizing system TLS 4000.

The TLS 4000 synchronizer is a modular device for synchronous locking of any two tape transports. Because of its versatile control facilities, its ability to process multiple signal types, and its extensive instruction set, The TLS 4000 can operate either as a free-standing synchronizer or be used as a component in larger editing systems. A compact mechanical design has been achieved by employing 4 microprocessors in the electronics.

The basic function of a synchronizer is to lock the machine to be controlled (slave) with a reference (master). This is normally accomplished with an SMPTE time code recorded on tape. This code supports also other tape address related functions such as a locator.
Fields of applications of the TLS 4000 are:
- Video/audio and audio/audio synchronization
- Video/audio post production
- Film audio dubbing
- as well as other automation systems based on the SMPTE code.

The most simple operational arrangement is the combination of a slave tape transport with a basic synchronizer and a machine-related interface. In this case the synchronizer functions as a "black box" that supplies only one LOCK function, which can, e.g. be integrated in a slave remote control (Fig. 1).

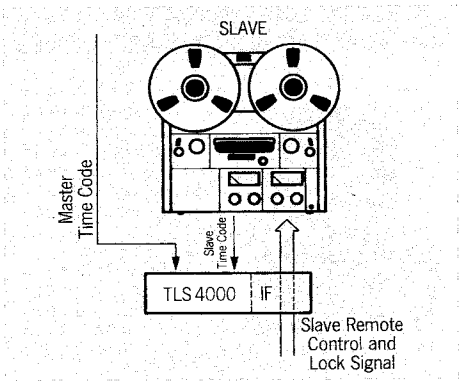


Fig. 1: "Black Box" Synchronizer.

Extensive exploitation of synchronizing commands and messages is possible by expanding this system with a local control unit (LCU). This "intelligent"

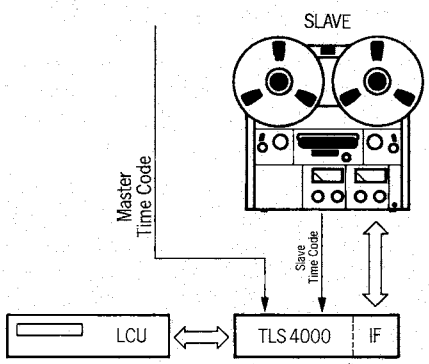


Fig. 2: Synchronizer with Local Control Unit (LCU).

serial remote control can also support some simple editing functions (Fig. 2).

Larger multislave systems can be implemented with the RS 232/422 interface (for radial configurations) or the SMPTE/EBU bus port (for bus-oriented configurations). Application-oriented configurations and subsequent expansions are possible because of decentralized, machine-related synchronization. The central controller has access to all synchronizing information, based on which it can make decisions and develop new, complex functions from basic functions (Fig. 3).

The SMPTE/EBU time code (TC) serves an "electric wave" for synchronization. Hours, minutes, seconds, and frames are BCD-encoded in serially transmitted 80-bit words. The TLS develops the clock frequency from this information and assigns the corresponding time to each edge (Fig. 4).

In the event of a time code failure or in pilot mode, synchronization is possible with an externally supplied clock pulse (frequency, biphase clock or composite video signal) in which case the time information is developed by integration. The synchronizer can compute deviations at any time with high accuracy by comparing the two clock signals, and generate a corresponding control signal for the slave tape transport. Synchronization between different signal types is possible (time code: 24, 25, 30 frame/sec and drop frame format, frequency: 20 Hz to 20 kHz) (Fig. 5).

The basic operating modes of the TLS 4000 are synchronous operation (LOC, WAITLOCK), SMPTE locator (GOTO), and PILOT modes (Autopilot and resolver pilot).

In **LOCK mode** the synchronizer functions as a phase lock loop in which the master code supplies the reference value and the slave code the actual value. The slave is parked, as a function of the reference speed, at the last read master time, and followed up with the spooling motors (chase mode) or set ahead of the master and subsequently fine-synchronized in play mode with the capstan control.

In **GOTO mode** the CUE register is selected as the reference which allows the slave to be parked at any tape ad-

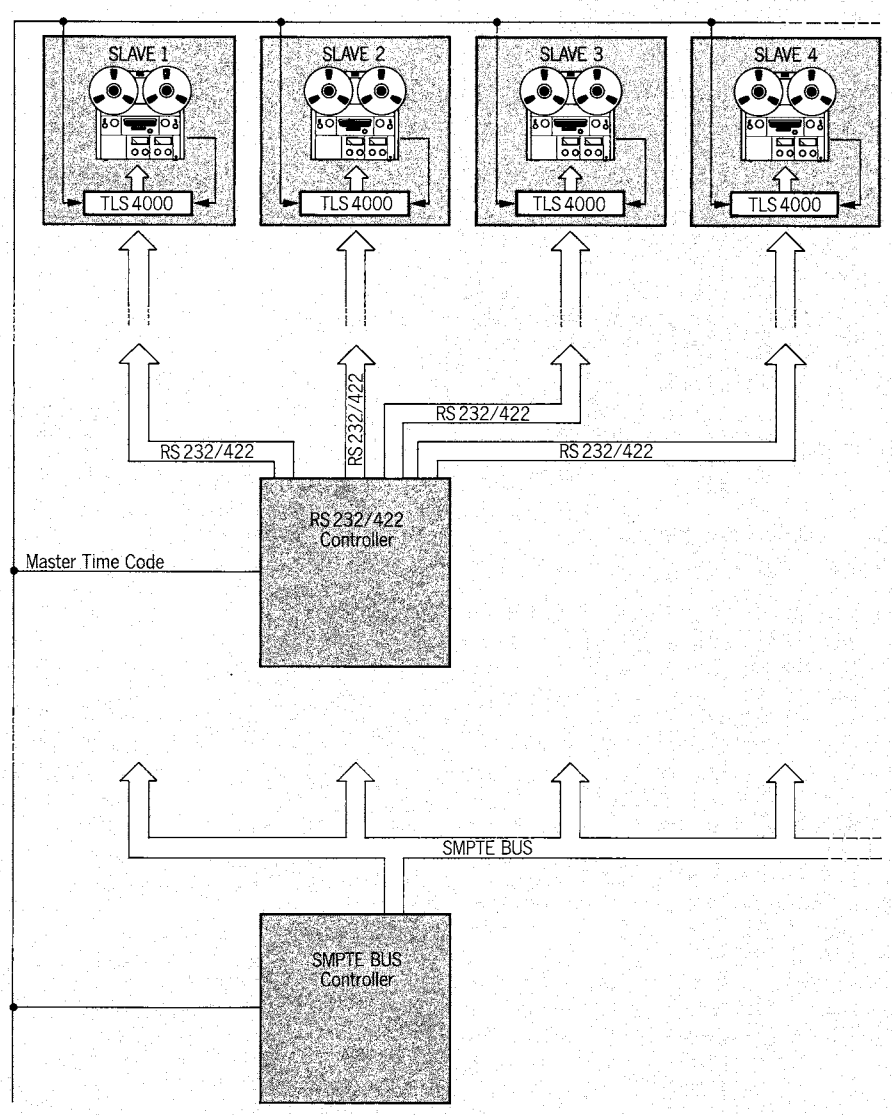


Fig. 3: TLS 4000 Systems.

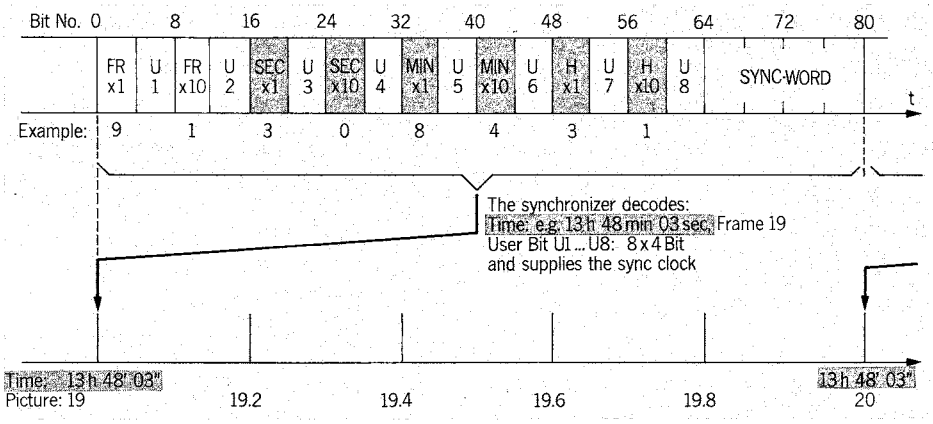


Fig. 4: Evaluation of Time Code.

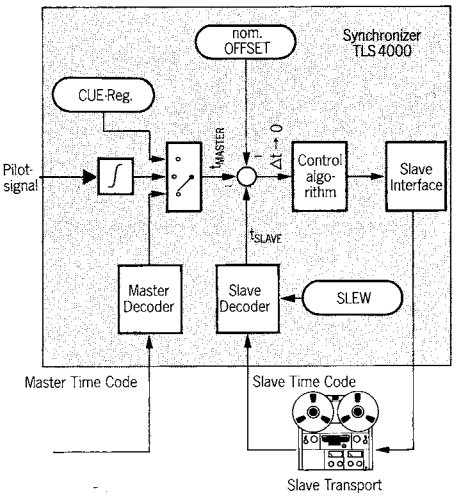


Fig. 5: Block diagram of Synchronizer Control System.

dress. If the play function is selected on the slave while the **resolver pilot mode** is active, the pilot frequency is automatically brought into the circuit as the reference signal. In **auto pilot mode** the synchronizer does not switch to the pilot frequency until synchronism has been achieved with the time code.

WAITLOCK mode is a combination of GOTO and LOCK. After the tape has been parked at the desired cue address, the synchronizer waits for time coincidence between the master and the slave. If at this moment the master speed is within the play range, the synchronizer switches automatically to LOCK mode. If synchronism is lost, the slave returns to the CUE point and waits for the next synchronization possibility.

Software-controlled time compression or magnification of the slave code (SLEW function) is possible in WAITLOCK mode as a special function of the TLS 4000.

An intelligent operating panel can assemble new, coordinating commands from these basic functions (e.g. rollback, loop, instant lock). A large number of parameters and auxiliary functions can be preselected and aligned (e.g. park and synchronization accuracy, slowlock, store offset, lead times).

In comparison with its predecessor, the TLS 2000, the hardware has been greatly simplified by employing microprocessor technology. The flat 19" rackmount unit contains a power supply, an interconnection PCB, and only 2 logic boards in wrap technique. All machine-independent function groups such as the demodulator, capstan control, and instruction decoding, are arranged on a double EURO-standard circuit board. A second module serves as a link between the synchronizer and any tape transport (interface).

Fig. 6: Block diagram of the TLS 4000 synchronizer with interface.

The master processor is the heart of the system. It is connected to the two peripheral processors via a dual port RAM each. Contact with the fourth microprocessor in the interface is established through a fast serial port.

The capstan processor (1) computes the deviation and controls the slave capstan motor with a universal control algorithm. The master and the slave clock are either supplied by the TC demodulator, implemented in combined analog/digital technique, or an external source (pilot/-reference signal). The corresponding time information is supplied by the demodulator processor (2).

The main function of the latter is to analyze the SMPTE time code. In the event of a code failure it can fall back to data from a move pulse counter if this information is supplied by the master or the slave machine.

The master processor (3) analyzes the commands from the serial port and the interface and supplies these with the required data. It is also responsible for the overall coordination within the synchronizer. All control signals to the slave machine (except the control frequency for the capstan) pass through the master – interface link.

The interface processor (4) converts these into machine-related commands which, depending on the type of slave, are transmitted to the tape transport via a serial and/or paralel interface. Additional synchronizer functions can be integrated (see block diagram), if a slave

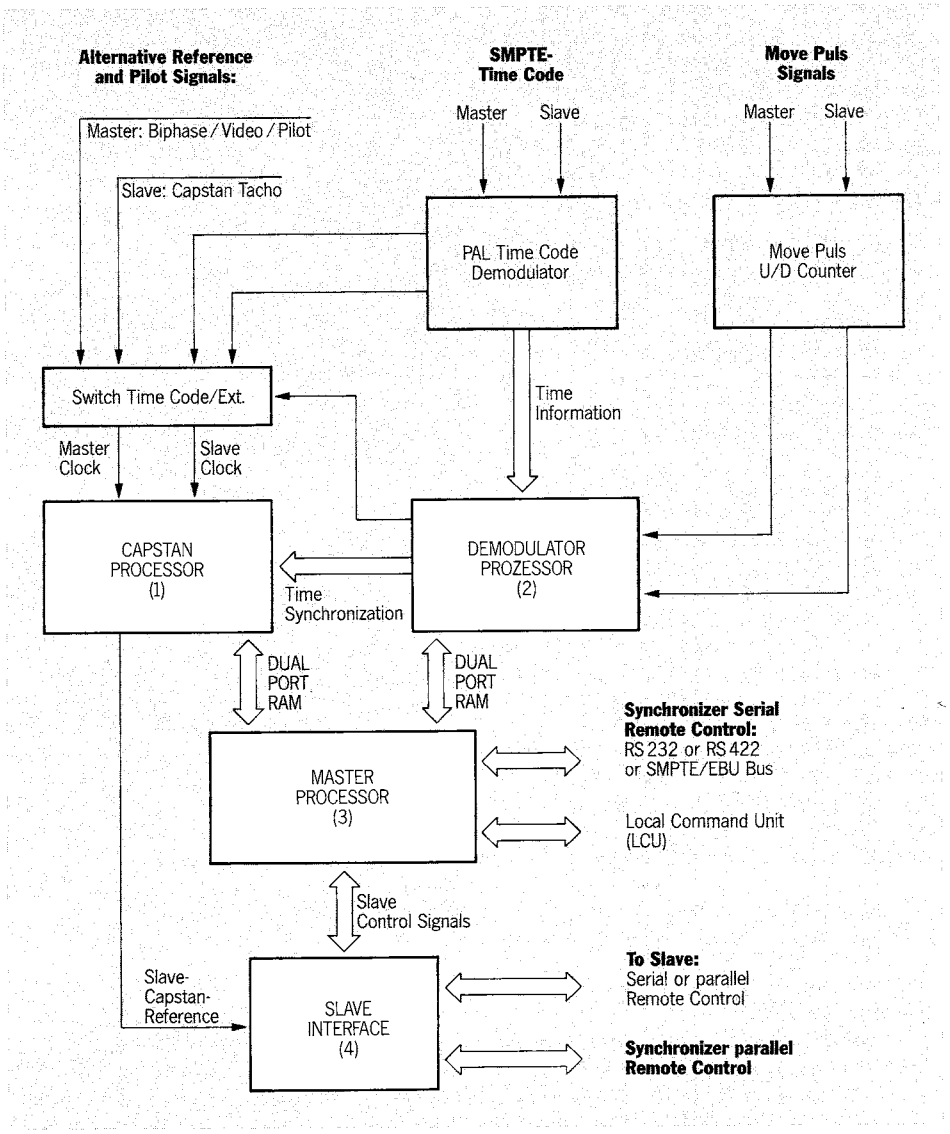


Fig. 6: TLS 4000 Block Diagram.

Portrait of a Company

STUDER REVOX Far East Ltd., Hong Kong

瑞士思德利（遠東）有限公司

The new business address – on the top floor.

As the centre of trade and industry, Hong Kong simply demands the establishment of a distribution company that looks after Far East markets, especially when headquarters and manufacture are in Switzerland.

Many factors have contributed to give Hong Kong its international reputation, the most important no doubt the fact that it is a major commercial centre and leading manufacturing complex within Asia. As yet, liberal economic policy dominates. There are no import tariffs or revenue duties payable, not even on vehicles when first imported.

This may, compared with other markets, sound like paradise, however, with distinct reservations. It presents the strongest competitive activities in business, with vastest offers of all kinds of goods that a free trade and a strategically well located area integrate.

...David and Denia Ling.

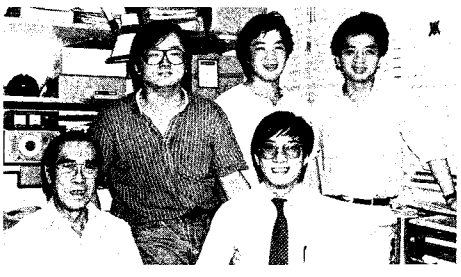
Our organisation – Studer Revox Far East Limited (SRFE) – looks back on years of experience in selling STUDER REVOX products not only in the Hong Kong area, but also in the PR of China, the Philippines, and the private market of Indonesia. In addition to the STUDER professional and REVOX hi-fi range of equipment, SRFE exclusively sells complementary equipment of wellknown make. The company enjoys an excellent reputation for technical expertise, guarantees spare parts supply and after-sales-service.

David Ling, in his mid-thirties, heads the company; he has long-standing experience in the distribution of STUDER REVOX products and is technically competent. His wife Denia Ling Chang looks after finance and administration. His brother Peter Ling directs sales and engineering. They are assisted by a dedicated and efficient team.

Since 1980, SRFE has experienced a considerable growth in all directions: business expanded and turnover increased drastically; the organisation had to be adapted to the requirements of the markets, and new premises be found.

Peter Ling ... and his right hand.

In addition to all increase of activity, the PR of China demanded special devotion, with positive business opportunities coming up. Today, PR China holds a major share of business volume in Studer Revox Far East Ltd.



Service Team Hong Kong.

The past was busy for our Hong Kong team; it looks as if in future, there will be no idle running either.

Renate Ziemann

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remote control is connected via the interface circuit board.

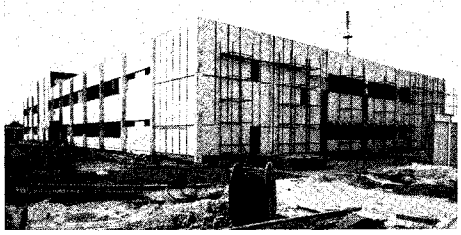
In order to implement these functions, 35 k bytes of programs had to be written for the four 6803 microprocessors. The local remote control requires additional 19 k bytes.

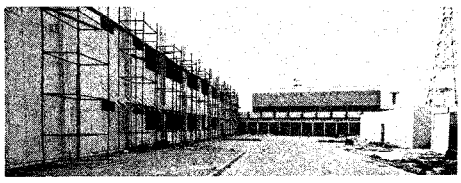
Kurt Schwendener (30):
Basic training as a physics laboratory technician, followed by engineering school studies with emphasis on control engineering and microprocessor applications. One year specialized study in system engineering. Development engineer since 1979 at STUDER. Assignments in various sectors (e.g. software B710, system software TLS 2000): Member of the synchronizer team from the beginning of the project. Since 1983 project manager for synchronizer TLS 4000.

Kurt Schwendener

United Arab Emirates

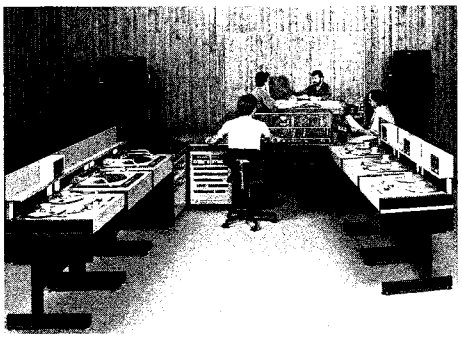
Studer Audio Equipment at Radio Production Centre in Abu Dhabi





The civil work construction and all acoustical treatment of studios and control rooms have reached a stage where installation of the audio part of the project may start.

In May 1984, an installation team of four specialized engineers/technicians was delegated to Abu Dhabi.



Cuntinuity Studio of Radio Production Centre Abu Dhabi, equipped with the new STUDER mixing console 900.

It had been estimated that the entire supply of electronic audio equipment and accessory units would be handed over within a period of eight months – installed, wired and tested.

The ground floor of the building accommodates the broadcasting and switching master control rooms, two recording studios, drama and editing studios, four editing rooms, library, maintenance room and technical workshop. The first floor premises will house four mono continuity studios, one stereo continuity studio, news agency and news studio, listening and editing studios for Arabic/English languages. The technology of all STUDER equipment installed represents latest broadcasting standards in all respects.

For technical acceptance tests, customer and consultants have sent their experts to Switzerland prior to the departure of the material. A last and final check-up will be made for two weeks in June this year, and we expect that the last lot of equipment will arrive in Abu Dhabi end of July 1984 at the latest.

The supply of an order representing a volume total of 300 m³ and a total weight of 60 tons requires excellent coordination of all departments concerned – the purchasing and exporting department, the expert advice of the regional manager, clerks handling shipping documents and, last not least, the team dealing with packing and forwarding.

Following the order of importance, our article should have started with the Forwarding Department of Studer International AG. A team of nine moves appr. 500 tons of equipment and accessories per year. The spare parts department, adjoined to stock keeping and forward-

"The Forwarders" of Studer International AG.

"A Prairie Home Companion"

A Studer Mix for America's Favorite Live Radio Show

"Who's that coming through my door?
I think we met sometime before.
Hello, love..."

With these words, sung by the breathy baritone voice of host Garrison Keillor, America's favorite live radio program takes to the airwaves each Saturday afternoon.

A production of Minnesota Public Radio, "A Prairie Home Companion" is transmitted by satellite uplink to over 200 public radio stations across the United States. The weekly audience is conservatively estimated at over two million listeners.

Now in its tenth year, "A Prairie Home Companion" offers two hours of music – a potpourri of traditional jazz, country, ethnic, and folk – intermixed with storytelling by writer/humorist Keillor. The show is sponsored by fictional businesses (Powdermilk Biscuits, Bertha's Kitty Boutique, The Fearmonger's Shoppe) in Keillor's make-believe hometown of Lake Wobegon, Minnesota.

The program is broadcast from a gracefully aging theater in downtown St. Paul. All equipment for the show is brought in, set up, and taken down each week.

Minnesota Public Radio takes great pride in its audio quality, so the Prairie Home Companion production team requires a portable mixing console of exceptionally high quality. Accordingly, a Studer 269 was chosen for the broadcasts back in 1980, when the show first began national distribution.

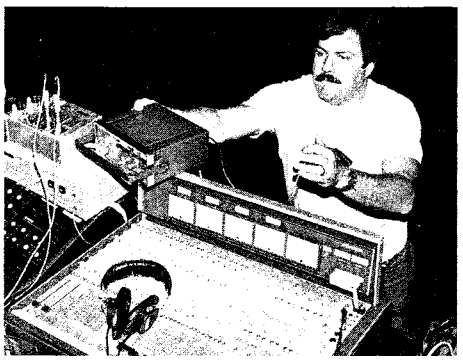
For several weeks of each year, the show travels to other cities, and the Studer console always comes along. "We

ing premises, consists of three staff members who handle 18% of the p.a. turnover of equipment with spare parts and accessories.

In the case of our Abu Dhabi project, the goods partly went by sea taken to a North European seaport in a 40 ft-container truck, and partly by air from Switzerland. The preparations for shipments of this size include the check-up ex stock, the application of special marks on all crates, and filling the truck for final shipment ex sea- or airport. In addition, the merchandise to be shipped requires a lot of moving after leaving the belt and before ending up on a boat or plane, special packing methods have to be applied. It is the skill and experience of our team that more often than not makes the impossible possible.

Rolf Breitschmid

chose the Studer because we needed a piece of equipment that would do a very good job at home," says Technical Direc-



tor Lynn Cruise. "And the Studer is also light and rugged enough to pack up and take with us."

All stage mikes are fed directly to the 269's 13 mike inputs. Some audience and ambience mikes go to auxiliary mixers. The 269 also has 3 stereo line level inputs.

Minnesota Public Radio is considered a model for other public radio systems in the United States. With such a strong emphasis on quality, it should come as no suprise that MPR studios are wellstocked with Studer equipment. The networks flagship station, KSJN, owns four A80 and nine B67 decks, plus a 169 console for remotes. The highly acclaimed broadcasts of the Minnesota Orchestra, also produced by MPR, are mixed and recorded using a STUDER 269 console and a STUDER B67 tape deck.

Sam Borgerson

75th AES Convention Paris

The EURO AES of superlatives

For the first time, three different versions of mixing consoles of the STUDER 900 series – in full action at the AES exhibition.

The AES convention in Paris is now history. But a brief review is still worthwhile because this event was a milestone in many respects. In the last issue of Swiss Sound (1/84) we introduced our stand and the exhibition program; we now present some closing facts and pictures.

The location alone promised an air of grandeur. The magnificent "Palais des Congrès" of the "Salon Concorde La Fayette" near the probably most famous triumphal arch, the "Arc de Triomphe" (on today's Place Charles-de-Gaulle) were ideally suited for holding a convention and exhibitions.

Rapid growth of the AES Europe

A reminiscence from the first day of the exhibition: the grandseigneur and coordinator of the AES convention, Professor Herman A.O. Wilms, inspects our demonstration facilities and stops somewhat bewildered in the middle of the room. Our senior representative, Walter Hodel, shocks him out of his perplexity with the comment: "In 1971 we started in Cologne with an area this size for the entire AES exhibition!" Here a few facts and figures to substantiate his assertion. Twelve exhibitors were crowded together in Cologne on a stand area of approximately 200 m² and some 250 persons (including exhibitors) attended the first European convention. At the first exhibition in Paris, in 1977, there were already 1800 visitors. And the figures for the largest AES exhibition in Europe so far, the 1984 convention in Paris, are: 4000 visitors, over 150 exhibitors, a total stand area of over 2000 m² plus 1000 m² of demo rooms! The fact that we also established a record with the largest stand and demo area (190 m²) ever set up is only mentioned for the sake of completeness.

Display of complete range of STUDER magnetic tape recording machines – far and wide an exceptional programme.

Digital celebrities meet: Mr. Rolf Beckman, Chairman of Technical Council of the Swedish Radio, Mr. K. Tanaka, Senio Digital Engineer of Mitsubishi (middle).

Concentrated activities
The singular opportunity to have the prominence of professional audio engineering assembled at an AES exhibition naturally leads to activities directly related to the actual exhibition hubbub. Lectures on 57 different topics were given within the framework of the convention, three by our company on the subject of DIGITAL RECORDING. A DASH forum was also held to which the visitors were invited by SONY, MATSUSHITA, and STUDER.

The day before the exhibition, we transported the newly developed products of our line to the "Salon Panoramique" (which really deserves its name since it is located on the top [34th] floor of the high-rise building) where we held a brief instruction meeting and discussions concerning analog and digital techniques with some 40 representatives from all parts of the world. And last but not least, Dr. Studer personally revealed the new PCM machine D820-2 for the first time.

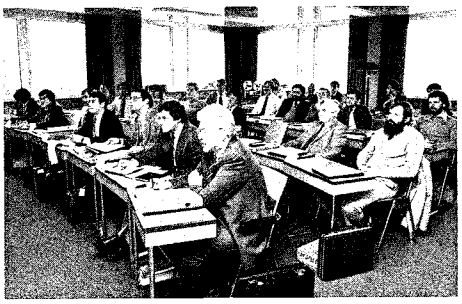
This first PCM stereo machine in DASH format was also the topic of a subsequent press conference, attended by some 20 reporters from France, England, Germany, and the United States.

Record number of visitors
Shortly after the exhibition it became clear that the enormous effort might pay off. The professionals quickly filled the ample space between the equipment in the demo room. There certainly was no lack of interest. Our decision to present the entire product line with emphasis on synchronizer demo, mixing consoles 900, A810 TC, and serial interface, as well as the elegant PCM machine, paid off. The STUDER stand was always filled with people! And, even more important, it was a highly interested public that was a real challenge to the team on the stand.

Unveiling of the Star – European and Overseas distributors cast a first glance at the concretized DASH future...

...and later, the presentation of the new STUDER D820-2 to the international professional press.

It is rather difficult to make concrete statements concerning the success because it cannot be measured directly in dollars and cents. No major hitches were encountered in the preparations, the transport, the installation, the demos, and the return shipment. The marketing experts assess the results positively and in comparison with the presentations of our direct competitors, we didn't do too bad. All in all this is a good reason and opportunity to thank those who have participated in the implementation of the AES convention: the Sales Department, the secretarial staff, Engineering, STI Shipping, the Product Managers, our representative in Paris, the employees of REVOX FRANCE, whose nerves we sometimes severely strained, and also the secretarial staff and the organizers in the Palais des Congrès. Exhibitions are team efforts, Paris has clearly demonstrated this.

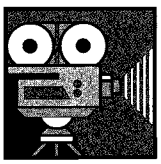


To meet the requirements of the future, a permanent learning process is a must: workshop for distributors at STI Regensdorf.

Workshop
Some of the representatives who made long journeys in order to attend the AES subsequently attended a workshop in Regensdorf were some of the subjects were covered in greater depth. This is essential because some of the new facilities such as the synchronizer, tape alignment by means of a computer, 900 audio engineering, and PCM technology impose greater demands on everyone.

The seed has been cast, let's work the field now!

Marcel Siegenthaler



Local Radio Stations in Switzerland

Radio Matterhorn

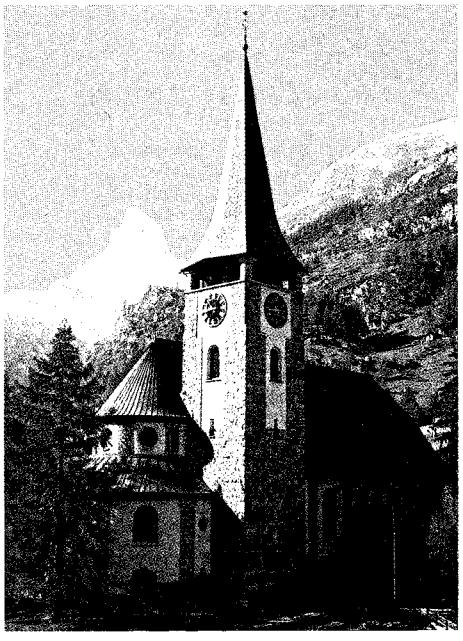
The Matterhorn is world-famous – but have you ever heard of RADIO MATTERHORN? Most probably not, and this is not surprising: RADIO MATTERHORN is a new local radio station with a service area that extends over a limited distance of

about 20 km between St. Niklaus and Zermatt, in the Canton of Valais.

Located in Zermatt, one of the main touristic centres of Switzerland, RADIO MATTERHORN not only provides the native population with information on current events but also numerous international guests – following the example of French stations, like Radio Val d'Isere.

FM 96,0 MHz
RADIO MATTERHORN

On December 1st, 1983, RADIO MATTERHORN started its transmissions in local dialect, offered tourist information in several languages on weather conditions, sports and cultural events of the region, and is since broadcasting news, folkmusic, hit parades and "specials". The major portion of the "on-air" time consists of four blocks of music, nonstop, and is broadcast from tape; the studio is consequently free for production of new programmes. Connected with the pulpit of the village church, RADIO MATTERHORN is undoubtedly the only local radio in Switzerland with a direct line to heaven.



...heavenly connection.

Four employees (!) share responsibility for moderation, editing, control room operation, including special events reporting and all administrative work. For special broadcasts, free lance assistance is engaged.

Studio and crew.

Studio premises are not accommodated on the "Matterhorn", as one would assume; they are conveniently situated in a combined apartment/office building in the centre of Zermatt. In a modified flat, on the second floor, the reception, all offices, sound library and announcer studio with visual connection to the control room were installed.

With the accommodation of the studios, Studer International AG has carried out a turnkey job which was handed over for immediate operation. STUDER tape recorders B67, cassette deck A710, a A726 tuner model, A68 amplifier, telephone hybrid, monitor speaker system 2706 and EMT turntable offer all-round broadcast service facilities. A couple of STUDER Compact Disc Players are foreseen for installation. Logging of transmitted programmes – compulsary for any local radio operation in Switzerland – is done with the aid of REVOX B77. Heart of the control room is a STUDER mixing console 269, with patchbay; for commercials and so-called "jingles", two ITC tripledeck cartridges are available.

Local radios are permitted to transmit commercials for 15 minutes a day; the whole operation is financed from such income. For a larger radio station, the somewhat limited financial source would present serious problems. Smaller stations have better chances to survive.

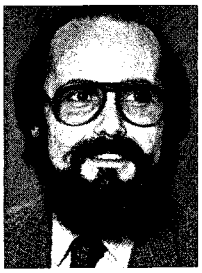
Not all local stations operate yet; whether or not they will survive for any length of time once they are on air, remains to be seen. RADIO MATTERHORN seems to be on the right track with its "local radio making".

Marcel Bossart

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:



Franz Trottmann

Director of production, member of the board of WILLI STUDER AG • born 1948 and grown up in Zurich • after compulsory schooling, four years apprenticeship at Metal Workers Technical School • part time studies of electro-engineering, graduated engineer HTL • SIB diploma Manufacturing Engineer • married, two children (4 and 9) • with the company since 1975.

In 1969, Franz Trottmann strives for experience: for one year, he works at the WILLI STUDER company in production assembly; this was the time when the STUDER A80 tape recording machine, operated world-wide today, superceded the famous C37. For another year, he takes active interest in sound engineering and for three consecutive years, gains experience at a research and development department in electronics,

electro-mechanics and electro-acoustics.

In 1975, Franz Trottmann joins WILLI STUDER to work in the quality control department. He also holds the job of a coordinator/adviser for Studer International AG, concerning STUDER professional tape recording machines. In 1977, he takes over managerial responsibilities for electronics production; in close succession, he was promoted production manager for the Swiss-based STUDER manufacturing plants. In 1982, the private WILLI STUDER company goes public.

The very first production run under Franz Trottmann's supervision is released at a time the recording machine B67 supercedes the A67 and the Tape Lock System 2000 is made. Production of the REVOX Tuner B760, Receiver B780, Tuner B251 and the STUDER Tape Recording Machines A80, A800, A810 and Mixing Console 900 follows in standard and various special versions.

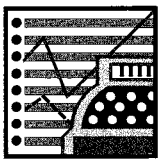
Today, his key responsibilities as director of production include management of production in the mechanics and electronics field, production planning and controlling. His experience gained in his work at the quality assurance department is an excellent basis for his present production work. His duties stretch to project planning for the manufacture of new products and its control, production and coordination with the sales departments of the international STUDER REVOX organisations, the preparation work for production processes (plans for investment, labour application, return of investment etc.). Franz Trottmann is assisted by managers of the buying and production planning departments (electronics and mechanics production). His work is almost his hobby.

Spare time is dedicated to family life; he plays the pan flute and the German flute, and likes to listen to music of all kind.

About his responsibilities at work, he resumes that "the guidance of men working in manufacture is to be compared with a rectifying process: all power is directed towards the company's objectives; seen 'electronically', this must not necessarily correspond to an ideal process; however, only small 'ripples' can be tolerated".

Renate Ziemann

For further information please contact



Greece

At Studio SIERRA in Athens a STUDER A800 is in practical service. The machine has been operating since last fall and gives the greatest satisfaction. Generally it is the first one for Greece. Other deliveries including various A800 and A80 VU multitrack recorders are scheduled for the next future. A new studio is at present under construction.

STUDER at international exhibitions 1984/1985

June 13 - 15
APRS London, Annual International Exhibition of professional recording equipment organized by the Association of Professional Recording Studios.

June 26 - 28
SIBC Seoul International Broadcasting & Communications Equipment Exhibition Korea

September 21 - 25
IBC – International Broadcasting Convention, Brighton UK

September 25 - 27
AES Regional Convention, Melbourne, Australia

October 6 - 9
AES New York, annual US Convention.

October 23 - 25
IBEE, International Broadcasting Equipment Exhibition, Tokyo

October 28 - November 2
SMPTE/N.Y.

November 21 - 24
Tonmeistertagung München, BRD

November 28 - 30
CTEAP Paris, Convention des Techniques Electro-Acoustiques Professionelles.

February 4 - 7, 1985
Mecom, Bahrain

Mars 6 - 8, 1985
AES Europe, Hamburg

June 6 - 12, 1985
14th Int. TV Symposium Montreux, Switzerland.

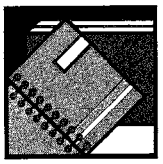
REVOX B225

First Laurels

Not only has the new Compact Disc Player REVOX B225 been highly appraised in several reviews of the German speaking audio press but at the consumer Electronics Show in Chicago it has been awarded for its design and engineering.

After the B710 and the B780 this is the third time Revox has gained this highly esteemed prize.

Michel Ray



From the printers

10.26.0070 **Tel. Hybrid,** Leaflet (g)
10.29.0011 **CD-Player B225,** Leaflet (g)
10.29.0041 **CD-Player B225,** Leaflet (e)
10.29.0150 **CD-Player B225,** Leaflet (f)
10.29.0160 **CD-Player B225,** Leaflet (it)
10.29.0450 **REVOX Collectibles,** Leaflet (g/e/f)
10.29.0470 **Special Print Test reviews B225 "Das Urteil" (The judgement),** (g)
10.30.0170 **B251,** OI (Spanish)
10.30.0180 **B261,** OI (Spanish)
10.30.0200 **B225,** OI (Italian)

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

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

Please mail your letters to:
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