

REVOX B77 SPECIAL VERSIONS

Why special versions?

Nowadays, the use of top quality tape recording equipment no longer restricts itself to the true fidelity recording and reproduction of speech and music.

Over the past 20 years, it has become increasingly evident that REVOX magnetic tape recorders have found their application in areas which are not at all the realm of high fidelity while other uses are falling into categories between pure amateur and strictly professional applications. Starting with the special versions of the legendary REVOX 36 series for mobile broadcast use, for logging purposes or for audiovisual applications, there has been a range of special model A77 recorders, which are in daily use to perform their special functions in research, schools, for aviation control, with the police and with the military, in telecommunications to record from wheater satellites and at radio stations and the semi-professional recording studio as well.

In each of these applications, the emphasis will be on a different requirement, thus a "universal unit" to satisfy all users seems hardly feasible. It would be complicated to operate and its price would become prohibitive.

The solution presents itself in the special version built for a particular application, which is derived from a basic concept designed for heavy duty use and which has stood the test as far as all of its performance parameters are concerned.



STUDER REVOX – what's behind these names?

STUDER and REVOX are registered trade marks of the Willi Studer company with headquarters in Regensdorf at the outskirts of Zurich/Switzerland. The number of people employed in the various factories in Switzerland and the nearby Black Forest in Germany totals 1500.



STUDER REVOX, headquarters at Regensdorf-Zurich

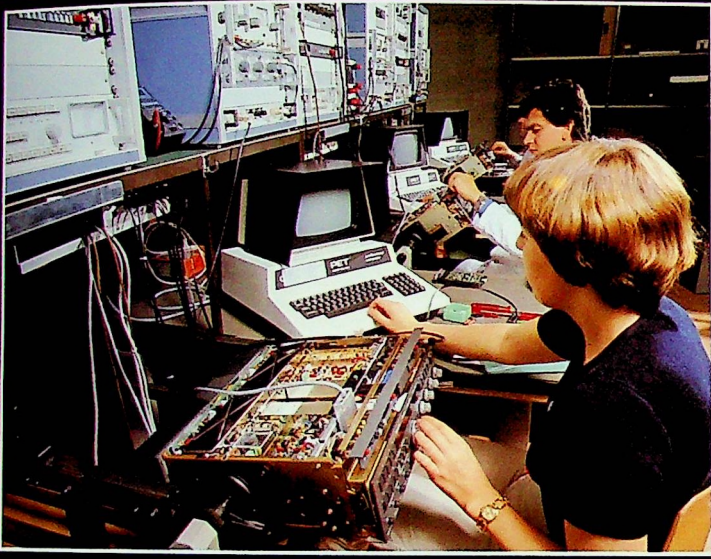
Situated at headquarters in Regensdorf are the research and development departments for all products manufactured by STUDER REVOX. For the audio markets around the globe, the company develops and manufactures high quality equipment which belongs to the following three major categories:

- Professional equipment and systems for broadcasting, television, motion picture- and disc recording studios.
- HiFi-system components for the discriminating audiophile.
- Language laboratory equipment and audiovisual teaching systems for educational purposes and other communication requirements.

The major products resulting from our research and production activities are:

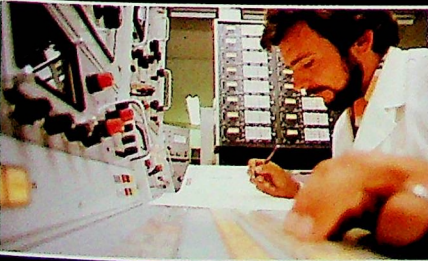
- Professional magnetic tape recorders with up to 24 tracks recording capacity.
- Complete remote control and synchronizing facilities for multitrack recorders.
- Audio mixing consoles for mobile and stationary use containing up to 32 channels.
- Professional FM-tuners and amplifiers for monitoring purposes.
- Complete studio installations and remote pick-up vans.
- HiFi-tape recorders, amplifiers, FM-tuners, FM-receiver, turntables and loudspeaker systems.
- Language laboratory equipment.
- Professional cassette decks.
- Audiovisual systems for synchronous sound and picture presentations.

STUDER REVOX



1. Up-to-date testing stations for state of the art products. Automated testing of the μ P controlled receiver B780 with the aid of a μ P computer.

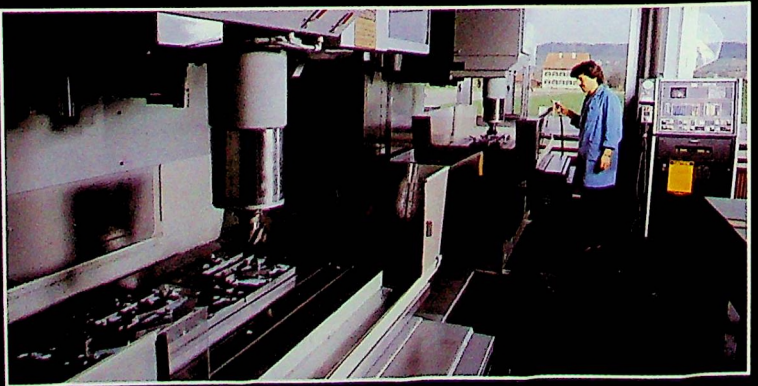
2. Technical know-how and highly developed skills form the basis for outstanding achievements in the field of audio electronics.



3. STUDER products are used by professionals in all parts of the world. The picture shows Control Room 3 of Radio Berne (Schweizerische Radio- und Fernsehgesellschaft, SRG).

4. Professional STUDER tape recorders are aligned to meet a clients' specifications.

5. High precision machine tools with advanced numerical control systems ensure most economical production methods while maintaining a high standard of quality.



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The REVOX B77 standard – the rugged base unit



The basic concept of the standard B77 recorder possesses all necessary prerequisites to build from it special versions of identical high quality.

Magnetic tape recorders are an outstanding example of the perfect combination of precision mechanics and top performing electronics. Even the best electronic circuitry would soon become worthless if the original precision in tape guiding is lost as a result of insufficient long term stability. One of the basic requirements, therefore, is to ensure stable performance for years with a rigid mechanical design which disregards the possible advantages that may lie in such tempting advertising claims as "feather weight" and "slim line"!

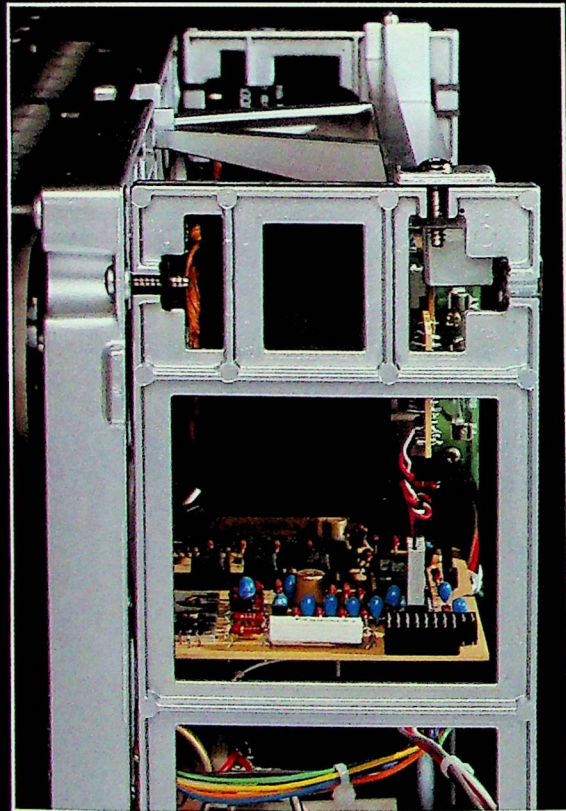
Our quality concept, which is best described by the expression "fit for use" has far reaching consequences.

We do not follow any short lived "fashion trends", we build for generations. A particular REVOX model may often be available on the market for 10 years and more and equally important: REVOX service centers perform repairs on equipment that has been in use for up to 30 years.

It is no coincidence when recognized technical reviewers compare REVOX tape recorders with professional recording equipment, because the well-known line of professional STUDER tape recorders which are in service world-wide at broadcasting, television, motion picture and disc recording studios are built by our parent company ever since its inception.

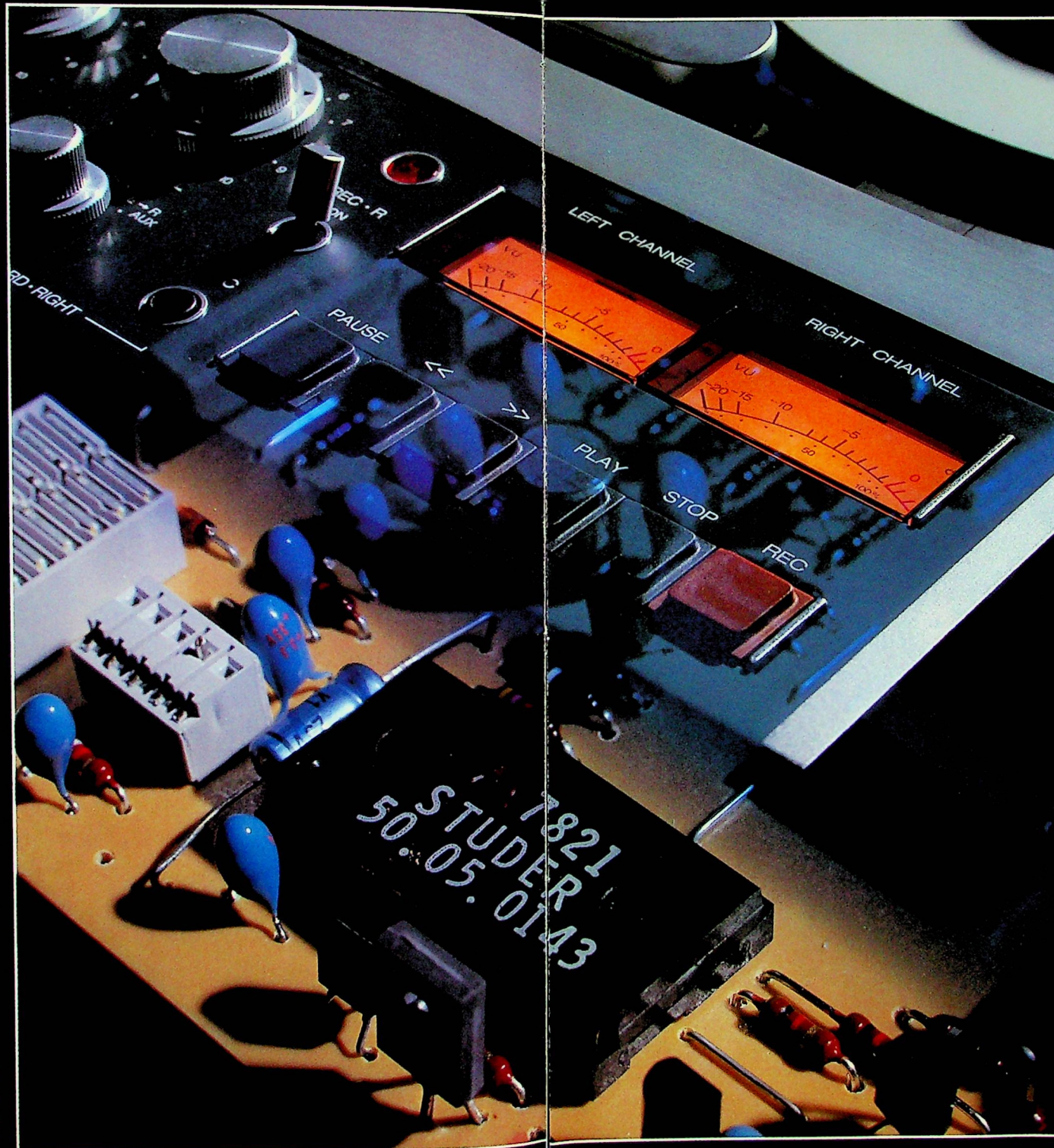
Well-proven mechanical concept

A well designed tape transport mechanism will not distort mechanically. It is insensitive to shocks and vibrations and will retain these qualities over a wide range of temperatures. Therefore, REVOX B77 tape recorders use diecast parts for the motor chassis, the side bearers, the crossmember and for the head block and the pinch roller arm. This ensures exceptional stability for the precision tape guiding system and the sound heads, as well as for the motors and the brake assembly. The motors are sturdy AC asynchronous types - unbeatable in simplicity and reliability - thus especially suited for heavy duty use.

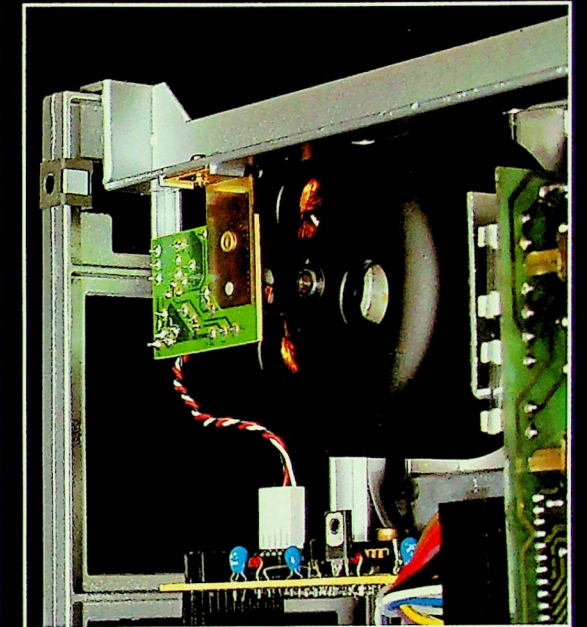


Precision cannot be realized without ruggedness. This is the reason why all important parts of the B77 transport mechanism are made from solid diecastings.

Comfortable and safe to operate. Computer grade touch-tip buttons for tape transport control. All control signals are processed in an electronically programmed logic circuit (PROM). Signals from the tape motion and end-of-tape sensors (both non contacting devices) are automatically analyzed, resulting in highly reliable performance, even under remote control operation.



Digital non-contacting tape drive logic



Non-contacting tape motion sensor at the right-hand spooling motor. It ensures the automatic and correctly timed transition between different operating modes.

Processing of all commands - whether they are entered via the touch-tip push-buttons on the recorder or via the remote control accessory - occurs in a non-contacting manner right up to the activation of motors and solenoids. Non-contacting sensors report to the control logic, the presence of tape on the recorder (infrared light gate), and whether the tape is moving or not. This enables the logic circuits to accept commands and to switch between modes - say from fast wind to play - rapid and automatically in the correct sequence. All functions of the B77 recorders can be operated via remote control as well.

The spooling motors are also switched in a non-contacting manner via solid state Triac switches.

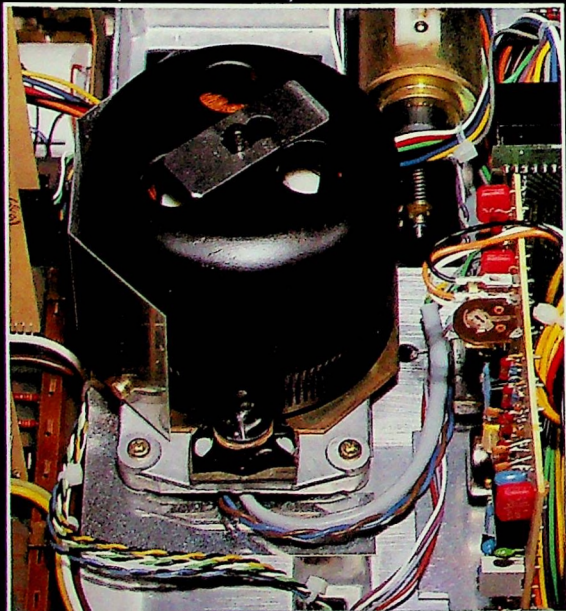
The solid state control logic marks another step in the direction of increased reliability and long troublefree operation.

Speed control via servo electronics

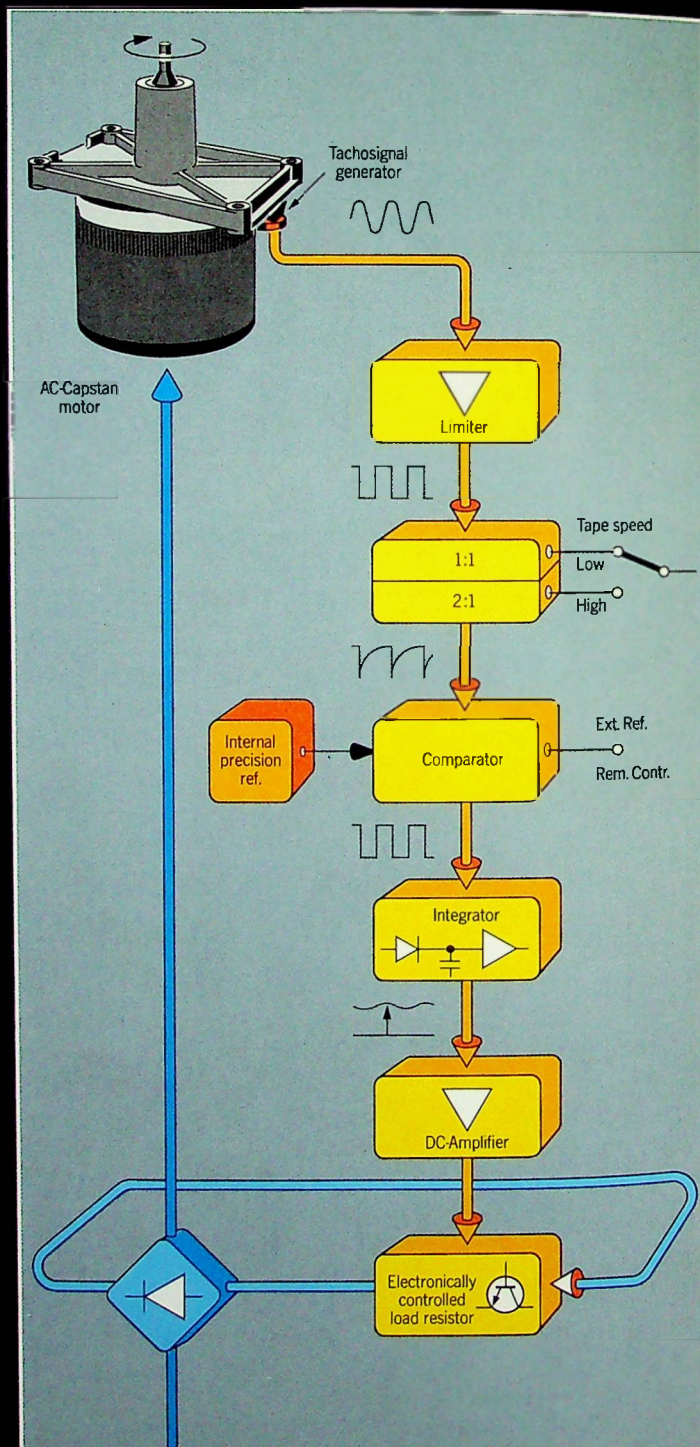
In 1967 STUDER REVOX had already ushered in the age of electronic capstan speed control for domestic tape recorders. Ever since then many have tried to copy it, yet they have never been able to match its simplicity and effectiveness.

The principle of electronically regulating a sturdy asynchronous motor by means of a separate precision reference has stood the test so well that it has been adopted for the STUDER professional tape recorders years ago. The capstan motor and its precision reference combined with the inductive speed sensor and its control circuits form a regulating loop which is highly insensitive to variations in power line voltage and frequency or changes in load. This system, which has proven its reliability in more than half a million tape drives, combined with ideal tape guiding results in outstanding motion stability (freedom from wow and flutter) which remains unchanged for years. The remarkable mechanical and electronic stability of the complete tape transport mechanism makes it well suited for mobile operation by powering it from car batteries in conjunction with an inverter.

For pitch matching or to achieve special effects, motor speed can also be varied continuously over a wide range with the help of an external speed control.

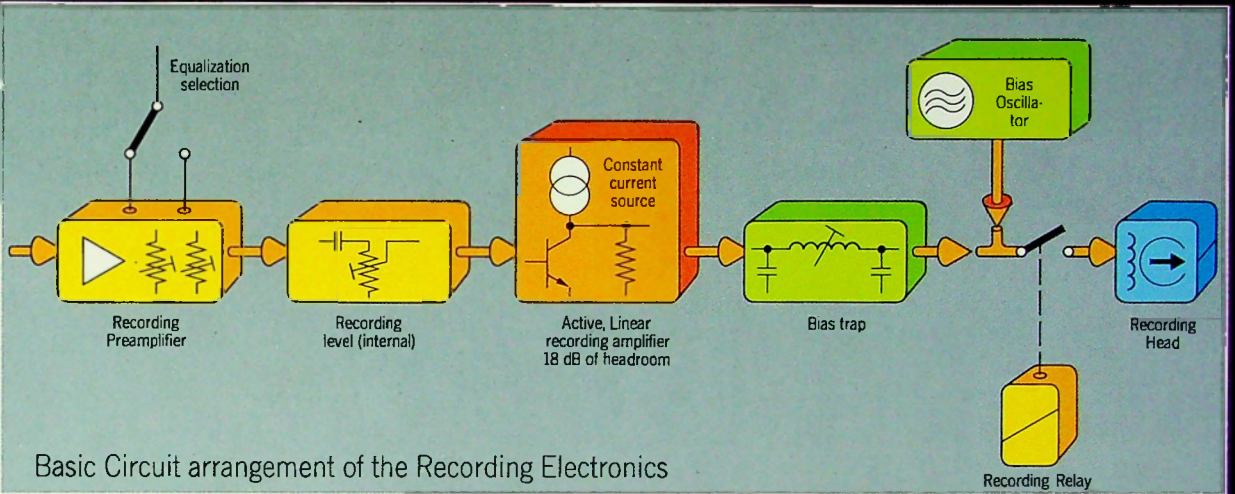


Direct drive capstan motor with tacho generator and servo electronics to ensure outstanding speed stability independent of variations in load or changes in the electrical supply voltage or frequency.



Basic Circuitry of the Capstan Servo Electronics

Trend setting audio electronics ensure low distortion and wide dynamic range



Basic Circuit arrangement of the Recording Electronics

The audio electronics have to perform the immensely important task of optimal signal processing for which the chosen concept is of decisive influence. The high degree of utility becomes evident by the uncluttered and functional lay-out of the B77 audio electronics which are designed to take special versions into consideration. All amplifier circuit boards are plugged into a mother board to facilitate maintenance and service work. The mother board itself carries the gold plated contact areas for all rotary switches with an additional layer of hard chromium plating to ensure a long life cycle.

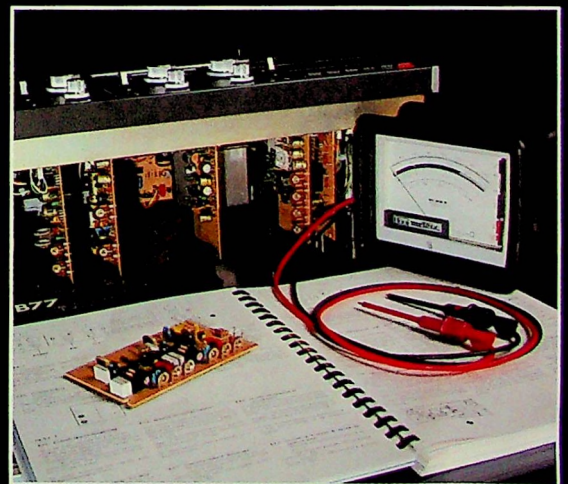
All inputs are designed to provide the excellent overload margin of 40 dB (1:100). Special mention of the recording amplifiers is warranted with their active and linear output stages that operate with 18 dB of headroom. Coupling to the record head occurs in a low impedance circuit via a bias trap, a technique which has proven its effectiveness in STUDER REVOX built equipment for decades - including professional designs.

To make the full utilization of the range of modern recording oxides possible, the B77 tape recorders are equipped with separate preset controls for each speed and channel, for bias adjustment, equalization, record level setting and tuning of the bias traps. This makes it possible to adjust the record electronics to match the characteristics of any tape, just as in professional recording equipment. Exact level matching for before/after tape monitoring and setting of the reproduce level is achievable with internal preset controls.

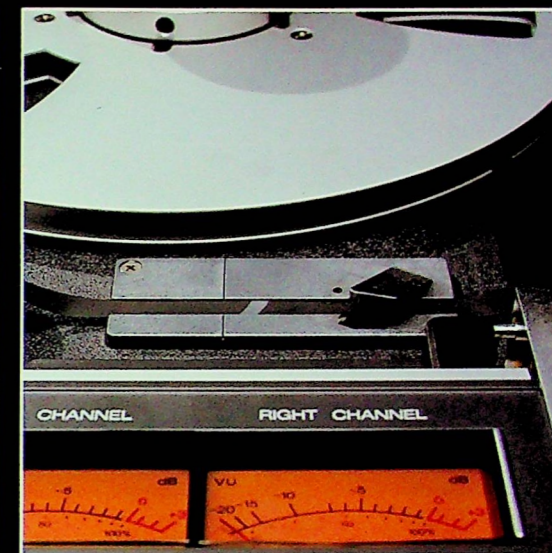
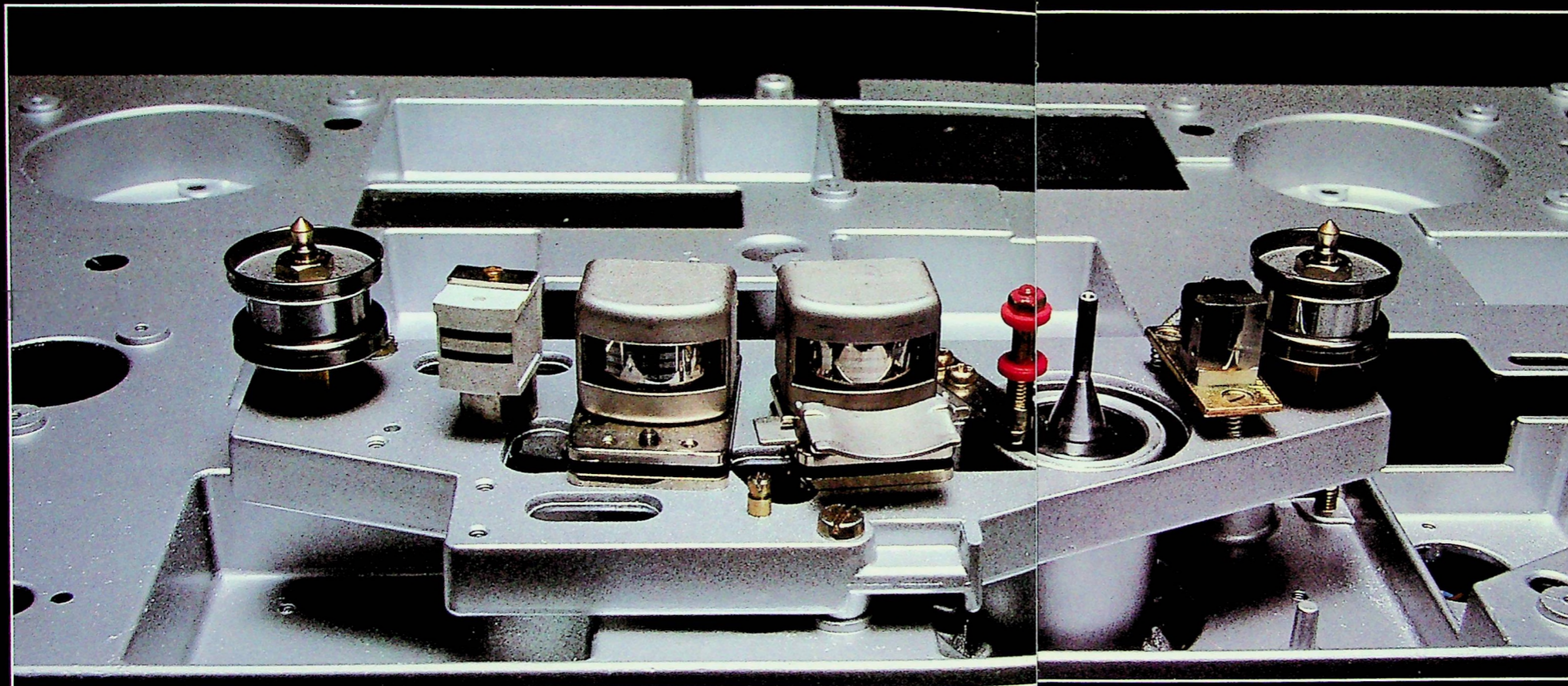
To ensure clickfree starts of a recording, the oscillator commences operation in a controlled manner. During the recorder's turn on cycle, all outputs are muted, thereby eliminating the possibility of interfering noises or thumps.

For precision level monitoring two large, accurately calibrated true VU-meters are provided. Their controlled ballistic behavior ensures optimum tape modulation by the average signal components which means full utilization of the available dynamic range. To compensate for their slow dynamic characteristics on transient peaks, they are equipped with LED indicators which fire instantaneously at a level of +6 VU.

Metering takes place at the line output which means that readings of the reproduce level are possible as well. For acoustical monitoring the B77 is equipped with separately adjustable headphone amplifiers.



Like any professional tape recorder the REVOX model B77 can be optimally aligned for any recording tape. Exemplary service documentations and a well organized service network enhance the value of each REVOX recorder.

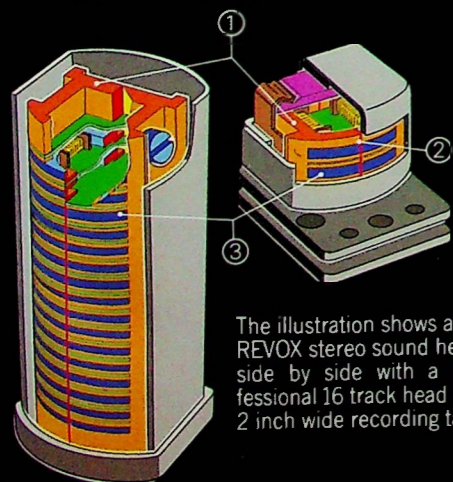


The tape cutter forms an integral part of the front cover and is standard equipment on every B77.

The integrated tape cutter makes editing a simple task. An ingeniously conceived edit mode facilitates motor assisted tape shuttling and final manual locating of the exact edit point.

No ferrite heads; Revodur sound heads instead – built to professional standards

REVOX sound heads are of the all-metal type. Their construction is identical with that of the well proven heads as used in STUDER professional tape recorders world-wide.



The illustration shows a REVOX stereo sound head side by side with a professional 16 track head for 2 inch wide recording tape.

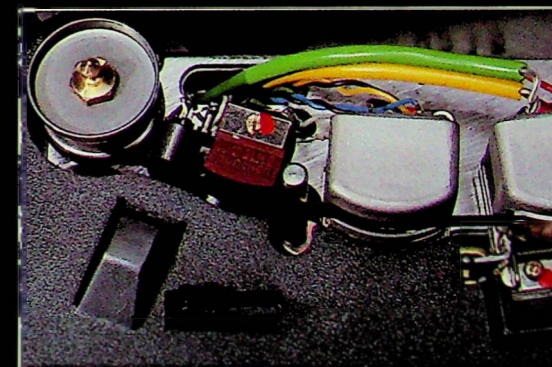
1. The milled core shell, machined to extreme dimensional accuracy, insures best possible uniformity for each track. Optimal workability of the gap areas guarantees a perfectly in-line gap.
2. The nonmagnetic gap of a playback head is only 0.08 mil (2 µm) wide. By comparison, the human hair is 1.5 ... 2.5 mil (40 ... 60 µm) "thick".
3. Magnetic core laminations made from high quality magnetic material of high permeability for low conversion losses (minimal noise voltage and low distortion).
 - Long pole pieces for ruler-flat frequency response down to the lowest frequencies.
 - Head shell and magnetic core have closely matched wear characteristics, thus insuring long head-life.
 - Magnetic sound heads are high precision components this being the reason why all STUDER REVOX heads are made by adhering to the company's own manufacturing process.

The Revodur all metal heads for recording and playback, the erase head, the infrared tape sensor and the tape guides; all these components are mounted on a rigid diecast frame. The fourth magnetic head is intended to record slide synchronizing pulses (DIA/DHA/FH).

As far as development of magnetic sound heads is concerned, STUDER REVOX is looking back on an experience which equals that of building tape recorders.

Our experts manufacture all metal heads for REVOX tape recorders and for professional sound recorders.

The special alloy Revodur ensures excellent magnetic properties and outstanding wear characteristics. The shape of the head's face is designed to ensure a "ruler flat" response down to the lowest audio frequencies.



The practical edit facility is standard equipment on each B77 recorder.

By operating the sliding button, the tape is brought into contact with the heads, the playback amplifiers become activated and the fast wind buttons respond only as long as they are held depressed. This facilitates motor assisted searching for the edit point while final tape positioning is then performed manually.

Ideal remote control accessories

All B77 machines permit the connection of a remote control device for all tape transport functions and a variable speed control for changing tape speed through the ranges of ± 7 semi tones or ± 1 semi tone respectively.



REVOX B77 remote control devices for tape transport functions and variable tape speed.



What to take into consideration when deciding between reel to reel or cassette recorder

When comparing a reel to reel machine with a cassette recorder – e.g. REVOX D88 – one must take several typical characteristics into consideration.

In general, a cassette recorder is small, it weighs less, it consumes less electrical current and cassette loading is quick and simple. This is contrasted by other factors and their consequences, namely: slower tape speed, narrow track width, thinner tape, thinner oxide layer and finally the system of tape guiding by the cassette.

The reel to reel machine has the following advantages to offer:

- Long uninterrupted periods for recording and playing.
- Superior wow and flutter performance without deterioration.
- No problems due to ageing or deformation of tape or individual cassettes.
- Better tape guiding as a result of thicker tape, higher tape tension and tape guide posts as part of the transport mechanism.
- Thicker oxide, wider tracks, therefore superior saturation characteristics and higher signal to noise ratios. Low distortion products at high recording levels.
- Higher tape speed (more magnetic particles per unit time) resulting in better resolution which means better high frequency performance.
- Less recording preemphasis required, therefore superior high frequency saturation characteristics.
- Editing without problems.
- Tape compatibility. On cassette recorders tape-head adjustments are rather delicate as a result of the narrow track width and the shorter magnetic wavelength on tape (due to the slower speed of $1\frac{1}{8}$ ips/4.75 cm/sec.).

STUDER REVOX



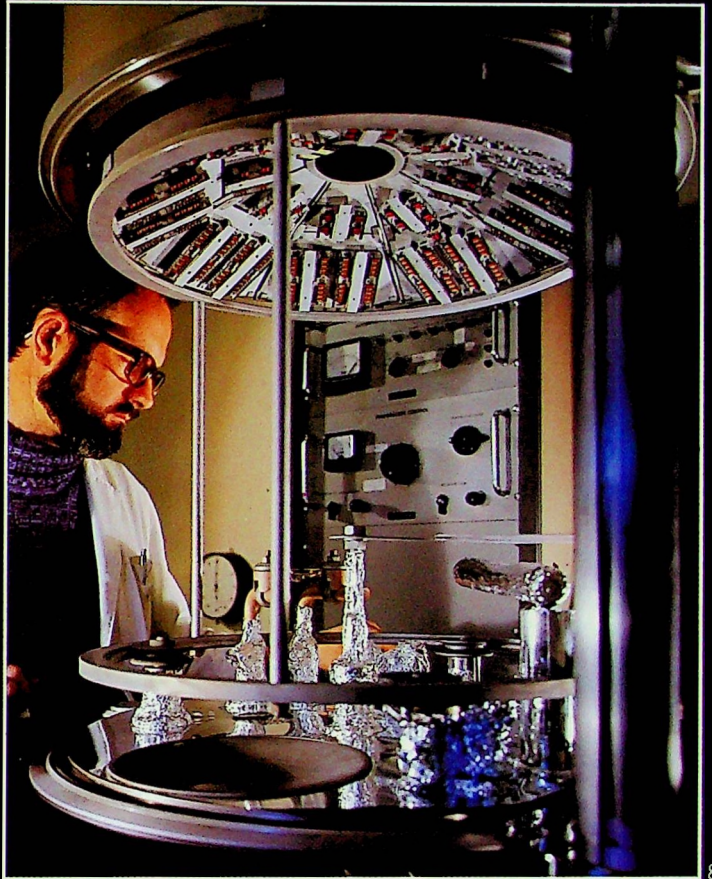
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6. STUDER mixing console Quadro 189 undergoing final testing.

7. REVOX Linear tracking turntable with direct drive. Its highly refined design makes operating errors impossible.



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8. Production of magnetic sound heads at STUDER REVOX.

9. REVOX-Audiocard AV-equipment for efficient training.

10. 24-track studio tape recorder STUDER A800 at the testing station.



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REVOX B77 SPECIAL VERSIONS

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