

# STUDER A710 PROFESSIONAL CASSETTE RECORDER



# STUDER A710, designed to meet the stringent requirements of recording studios

The compact cassette has gained a strong foothold not only in radio and television studios but also in recording studios and industrial audio-visual applications. Its ease of use, combined with the greatly improved tape characteristics and cassette technology, are convincing reasons why many professionals are working with this convenient recording medium – be it for on-the-spot coverage, for live recording in disc productions, or in the A-V studio for encoding audio signals and control commands. All professional recording applications demand superb quality of sound, reliability, consistent performance to stated specifications, and the ruggedness needed for continuous commercial service. Of course, these criteria must also apply to cassette recorders.

Today it is possible to meet not only one, but all requirements of the fully professional audio world using the cassette format. If this were not the case, there would be no cassette recorder in the Studer professional line.

The cassette technology has reached studio maturity; Studer Revox now builds a cassette recorder for professional applications: STUDER A710

With the development of the A710 tape transport it has now become possible to fully meet all key requirements of professional users. The extremely accurate tape transport, which is rugged enough for continuous commercial service, also features a trend-setting basic concept that opens new fields of applications such as automated broadcasting of radio programs, and audio-visual projection systems, at a totally new level of professional quality.



Functionally arranged operator controls and easy, direct access to cassette – for simple and safe operating.

Designed for treating your valuable tapes gently, the Studer tape transport is eminently suited for demanding professional use because its design is based on experience in precision engineering accumulated over more than 30 years of manufacturing tape recorders for the professional audio community.

## Main features of a professional tape transport

High-precision mechanical components:

- Solid metal, die-cast transport chassis for enduring precision. Light-alloy die castings for:
  - Dual capstan motor chassis
  - Spooling motor chassis
  - Headblock assembly
  - Pinch roller arms on headblock
- Professional 4-motor drive, for highly effective decoupling of dynamic components. Separate control circuits for each motor.  
Construction:
  - Dual capstan direct drive with 2 MDD motors (magnetic disc drive)
  - High-precision capstan shafts supported by dual bearings with widely spaced support points



STUDER A710 recorders are prepared for 19" rack installation

- Two DC precision spooling motors with ultra-low inertia for fast-response direct drive of cassette tape spools.
- Fully electronic braking for gentle, jerk-free stopping.
- Electromagnetic engagement of headblock assembly, pneumatically damped
- Electromagnetic locking of cassette shell

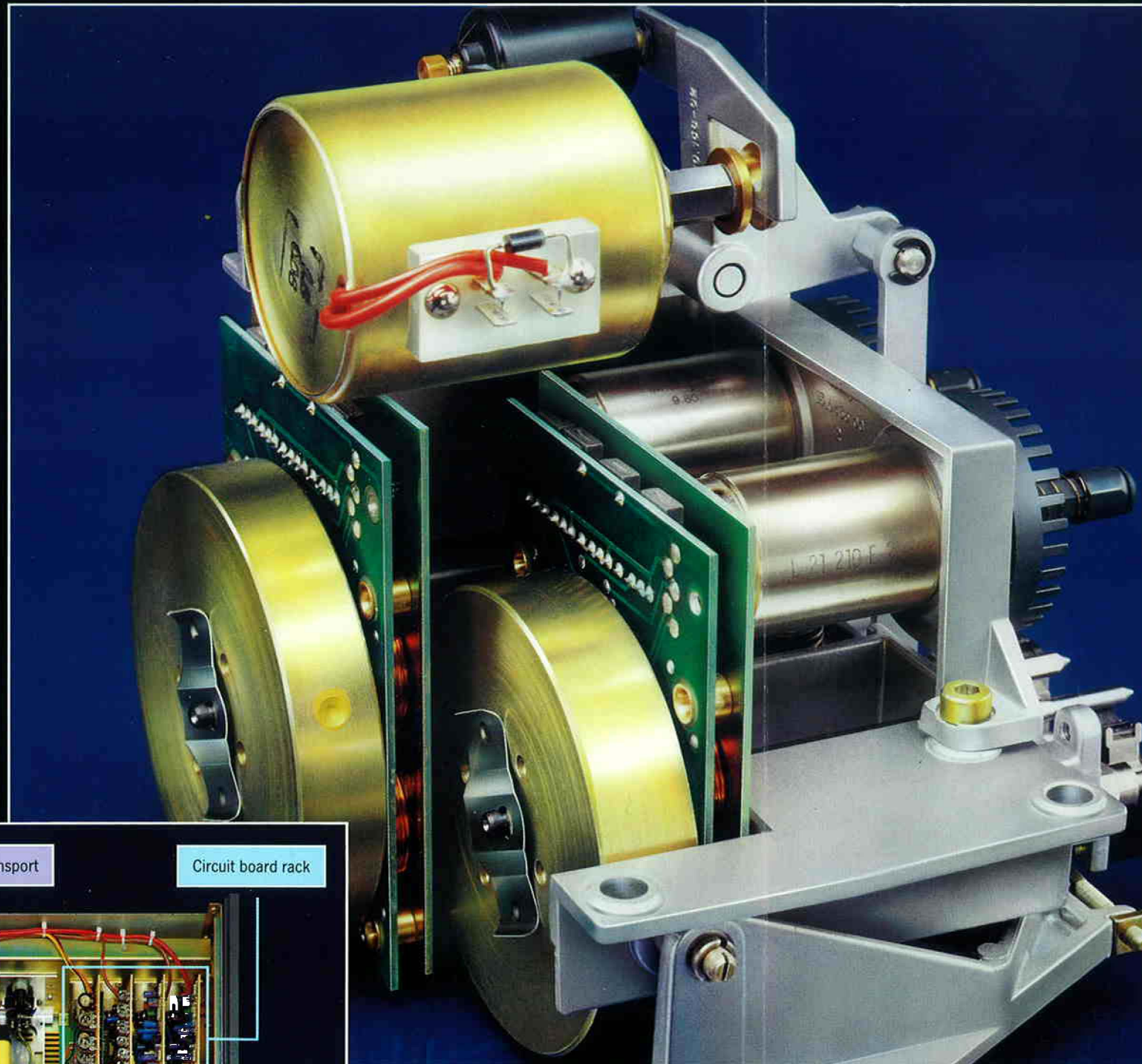
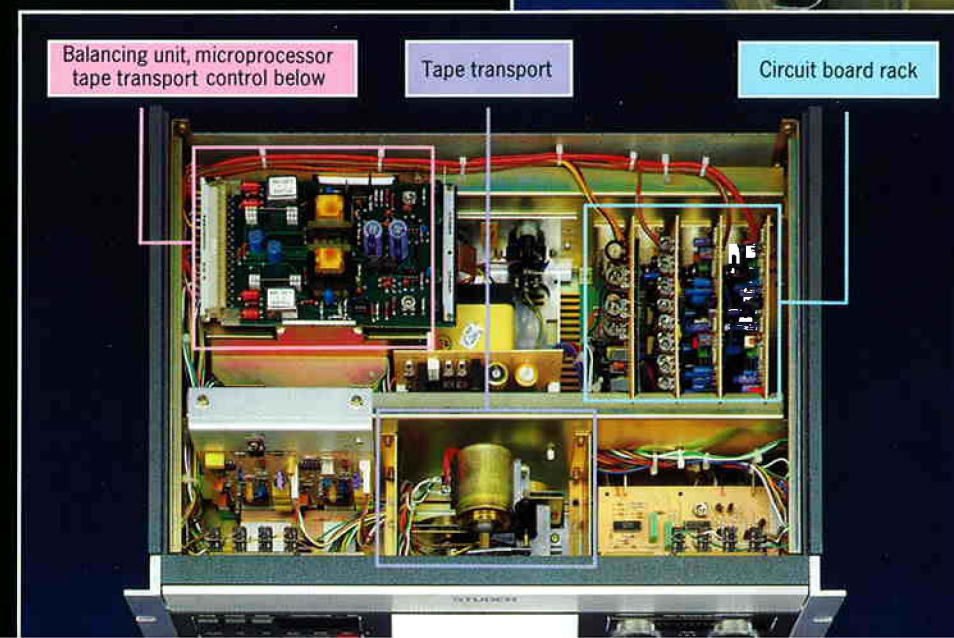


STUDER A710, the professional concept:  
Solid metal die-cast rigidity, Dual capstan direct drive,  
Direct drive tape spooling, Microcomputer control

State-of-the-art microcomputer electronics

- Microprocessor (type MK-3870 with 2 K byte ROM) for control and memory functions. Provides complete control of all motions and functional sequences combined with maximum ease of operation.
- Non-contacting control of capstan motors with inductive tacho generators and separate PLL servo control circuits supplied by a common quartz reference (3.072 MHz).
- Spooling motors controlled in all operating modes by the microprocessor in response to pulses from optical tacho generators. Variable torque control for very gentle tape handling (from start to finish, encompassing the tape tension in stop mode, acceleration, play/recording mode or continuously controlled spooling, and braking).
- End-of-tape sensor with IR light barrier enables microprocessor-controlled spooling without approaching the physical tape ends:
  - Fast forward: deceleration upon detection of transparent leader, braking before the end of the tape is reached, and disabling of the play and fast forward functions (the tape leader end cannot be reached even intentionally).
  - During rewind: deceleration upon detection of transparent leader, stop before the end of the tape, forward wind to start of oxide coating and zero re-setting of tape counter.

Functional, logical, and attractive design:



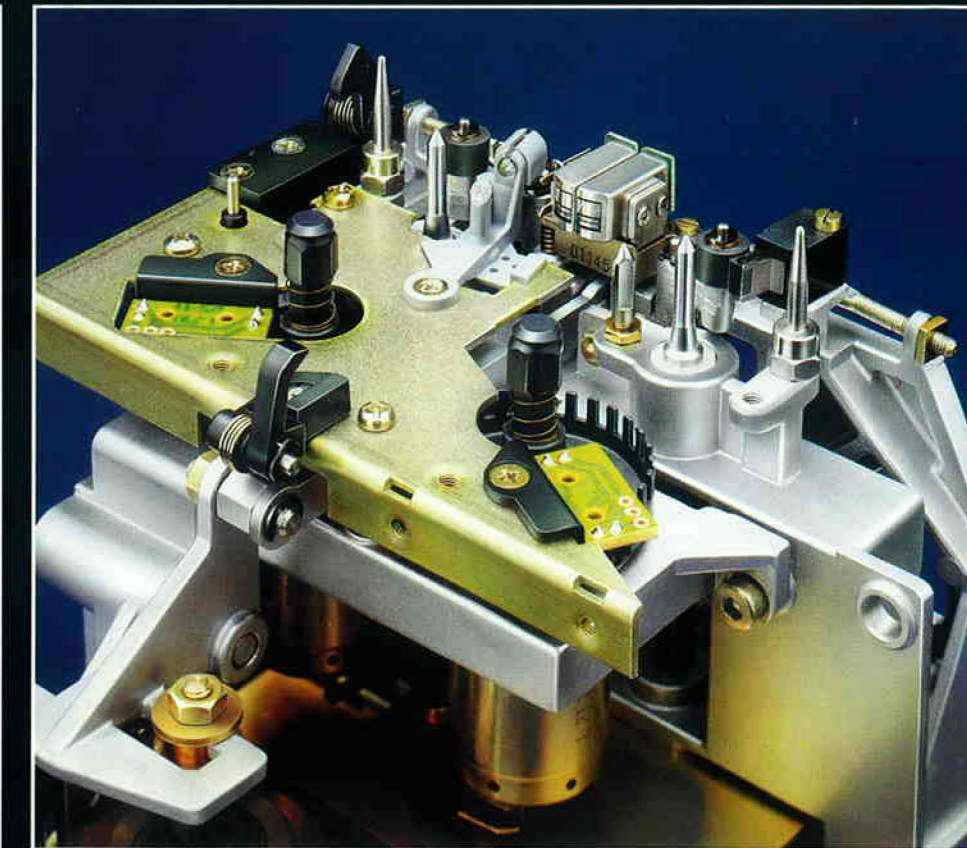
Stability is the best guarantee for consistent performance to specifications

Throughout all of these functions the microprocessor control is also programmed for very gentle tape treatment. Even in the event of a power failure the A710 electronics ensure that the tape is stopped smoothly.

- With the microprocessor control it was possible to implement the following fea-

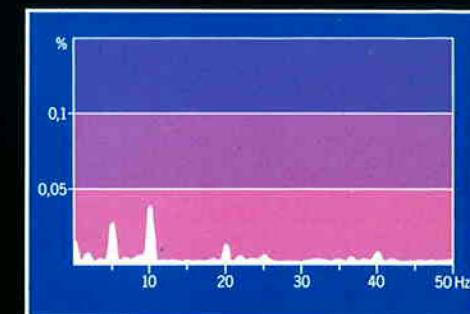
- Remote control of all tape transport functions including tape monitor and fader start
- Fader start through an additional terminal

STUDER tape transport technology:  
Mechanical accuracy and long-term stability  
combined with state-of-the-art microcomputer  
control



Optimized interaction of precision mechanical components and microcomputer electronics. The cover plate has been cut-away to provide a view of the opto-electronic tacho sensor of the left-hand spooling motor.

- Entering and storing the start and stop positions or the start and stop times
- Continuous repetition of a tape segment between any start and stop position
- Activation of an external relay between any start and stop time for controlling peripheral devices
- Switch-selectable functions of digital display: tape counter, (quasi-linear, controlled directly with spooling motor tacho signals and therefore exceptionally accurate and not subject to wear); or clock with quartz-controlled accuracy, reference 4 MHz, display resolution of 1 min, and 12 hour AM/PM format or 24 hour format (jumper selectable)
- Readout of stored positions or times
- Special pushbutton function raises the headblock to play position (no cassette inserted) to facilitate safe and simple periodic cleaning of the audio heads and the tape guidance elements.



The spectrum of the wobble frequencies is indicative of the well-balanced characteristics of the high-quality A710 tape transport (wow-and-flutter, typical values)

The sum of all features is decisive

To ensure that the tape transport will continue to perform to specifications and to treat your tapes gently over many years, the balance and the quality of all tape transport parameters are of decisive importance.

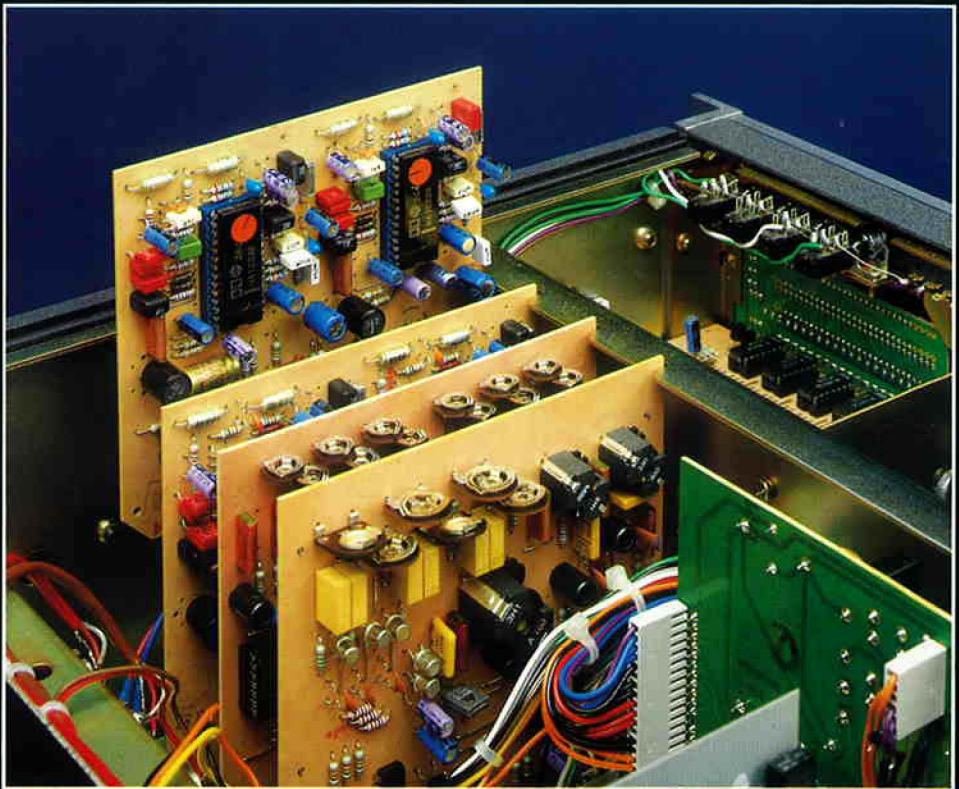
With STUDER you obtain this assurance from a manufacturer who for decades has been dedicated to producing exclusively top-quality audio products.

Studio-compatible audio connectors and calibration facilities

Professional type audio electronics with highly efficient noise reduction systems



Closely grouped audio controls: tape bias selection according to IEC standards, potentiometers and push buttons for input and output level as well as headphones level.



Professional type audio electronics: compactly arranged by functions on plug-in circuit boards with easily accessible trimmer potentiometers for adjusting audio parameters (RF bias, level, treble boost).



Standard equipment includes balanced inputs and outputs with professional type sockets and multipole connectors for tape transport remote control and faderstart.

**Main characteristics of the professional audio electronics:**

- Audio electronics arranged by function groups on plug-in printed circuit boards that are interconnected on a master board.
- Optimum accessibility to the audio electronics and to the trimmer potentiometers for the audio parameters.
- Audio parameters individually adjustable by channel and tape type for RF bias, sensitivity, and treble boost (18 potentiometers)
- Tape bias for standard, CrO<sub>2</sub>, and metal tape cassettes selectable with push buttons (IEC I, II, and IV) or set automatically by cassette code sensor

- cillator, noise reduction systems, source/tape monitoring, and muting
- PPM (peak program meter) display with 2 x 24 LED elements. Indicating range up to +8 dB, corresponding to the high recording levels achievable with advanced noise reduction systems.
- Separate plug-in circuit boards for record (encoder) and reproduce (decoder) noise reduction systems.
- Dolby B and Dolby C<sup>®</sup> noise reduction for record and play mode, switch selectable as standard feature; dolbyized source/tape monitoring with both systems possible

- tation of other noise reduction systems. We gladly inform you about current options.
- Separate record and reproduce heads in Sendust/ferrite technology, individually adjustable on common cast-metal block
- Balanced inputs and outputs via XLR sockets (LEMO available on request)
- Integrated, professional-type unit for balancing the inputs and outputs
- Calibrated inputs and outputs. Level gain approximately 10 dB with switch in uncalibrated position.

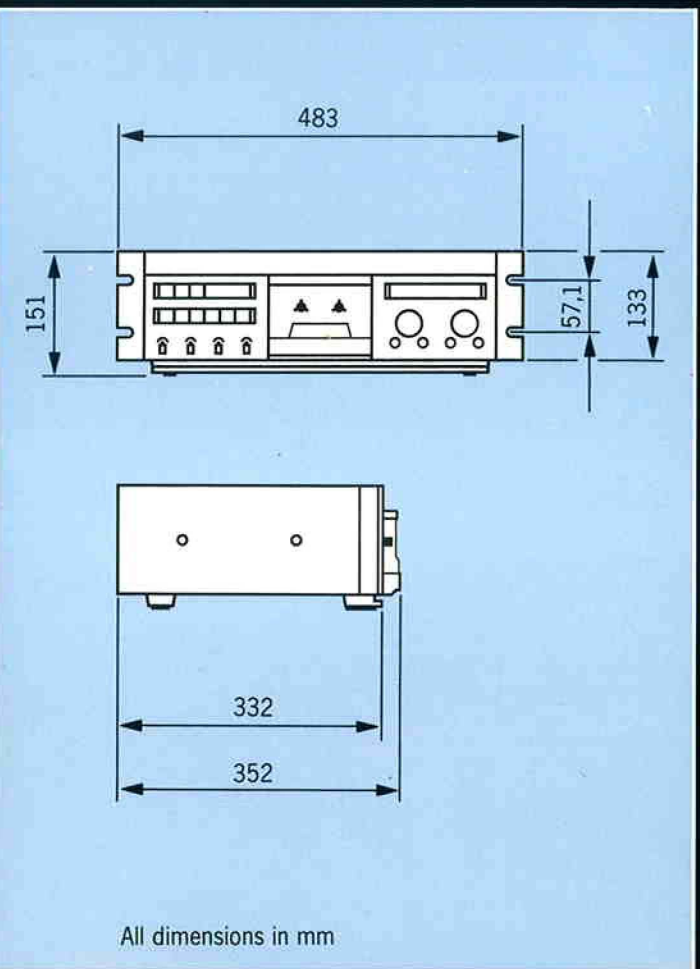
# STUDER A710

## Technical data/Dimensions

<b>Tape transport:</b>	4-motor dual capstan drive (for compact cassettes) 2 DC-spooling motors controlled by microcomputer 2 capstan shafts individually driven by quartz controlled MDD motors
<b>Tape speed:</b>	1 7/8 ips $\pm$ 0.3 %
<b>Cassettes:</b>	C46 to C120 (technical data guaranteed up to C90 only)
<b>Tape width:</b>	1/8"
<b>Wow and flutter:</b> (according to DIN 45507/IEC 386) peak value, weighted	0,1% with C60 and C90 cassettes
<b>Starting time:</b>	max. 1,0 sec (to reach double of specified wow-and-flutter value)
<b>Tape counter:</b>	4-digit, quasi-linear indication
<b>Winding times:</b>	approx. 45 sec for C60 approx. 65 sec for C90
<b>Inputs:</b>	balanced and floating input impedance min. 5 kOhm, 30 Hz ... 20 kHz
<b>Input level:</b> for OdB-level $\approx$ 200 nWb/m $\approx$ Dolby-level	calibrated: +4 dBu (OdBu $\approx$ 0,775 V), corresponds to +6 dBu at 250 nWb/m, adjustable from -8 ... +21 dBu uncalibrated: the input sensitivity can be increased by 10 dB
<b>Outputs:</b>	balanced and floating impedance $<$ 50 Ohm, 30 Hz ... 20 kHz
<b>Output level:</b> for OdB-level	calibrated: +4 dBu ( $R_L = 600$ Ohm), adjustable from -3 ... +14 dBu uncalibrated: the level can be increased by 10 dB (max. +21 dBu)
<b>Noise reduction systems:</b>	Dolby B/Dolby C processors in the recording and reproducing channels, switchselected
<b>Tape bias selection:</b>	IEC I: corresponds to Fe <sub>2</sub> O <sub>3</sub> IEC II: corresponds to CrO <sub>2</sub> IEC IV: corresponds to metal AUTO: automatic sensing of coded cassettes
<b>Playback equalization:</b>	3180 + 120 $\mu$ s for IEC I 3180 + 70 $\mu$ s for IEC II and IEC IV
<b>Frequency response:</b> Record - Reproduce, at -20 dB, NR switched off:	
IEC I:	60 Hz ... 10 kHz $\pm$ 2 dB 30 Hz ... 16 kHz $\pm$ 3 dB
IEC II and IEC IV:	60 Hz ... 14 kHz $\pm$ 2 dB 30 Hz ... 18 kHz $\pm$ 3 dB
Dolby B or Dolby C switched on: (measured with pink noise and a spectrum-analyzer)	
IEC I:	30 Hz ... 10 kHz $\pm$ 3 dB
IEC II and IEC IV:	30 Hz ... 14 kHz $\pm$ 3 dB
<b>Signal-to-noise ratio:</b> RMS value, relative to 3 % distortion, weighted according to IEC/A (Unweighted values in parentheses)	
	NR-OFF      Dolby B      Dolby C
IEC I:	55 dB (50)    64 dB (54)    69 dB (56)
IEC II:	57 dB (50)    65 dB (54)    71 dB (56)
IEC IV:	58 dB (50)    66 dB (54)    72 dB (56)
<b>Distortion:</b> at 315 Hz, 0 dB ( $k_3$ ), corresponds to 200 nWb/m	
IEC I:	better than 1,0 %
IEC II:	better than 1,5 %
IEC IV:	better than 1,5 %
<b>Erase depth:</b> measured with IEC IV tape	min. 70 dB at 1 kHz, NR switched on
<b>Erase and bias frequency:</b>	105 kHz
<b>Crosstalk rejection:</b> (between stereo tracks)	better than 40 dB at 1 kHz
<b>Level meter:</b>	peak value, according IEC-recommendations
<b>Power requirements:</b>	switchable 100/120/140/200/220/240 VAC $\pm$ 10 %, 50 ... 60 Hz
<b>Main fuse:</b>	100 ... 140 V = TT 500 mA 200 ... 240 V = TT 250 mA
<b>Power consumption:</b>	55 W max.
<b>Operating temperature range:</b>	+10 ... +40 °C (50 ... 104 °F)

<b>Humidity:</b>	according to DIN 40040, category F
<b>Working position:</b>	horizontal only (cassette vertical)
<b>Weight:</b>	net: 11,2 kg gross (airfreight): 13,7 kg
<b>Dimensions:</b>	(W x H x D) 483 x 151 x 352 mm

Notes concerning Dolby C:  
Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.  
"DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.



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Designed and manufactured in Switzerland.