

STUDER

A80 RC MKII PROFESSIONAL TAPE RECORDERS



A80 RC MKII

Professional Tape Recorders

Performance and reliability in productive use, enduring quality for a demanding future, and accuracy in daily work are characteristic requirements imposed on today's professional studio tape recorders. During the past 30 years STUDER has significantly influenced this development. STUDER has become a synonym for experience and proven technology in the manufacture of tape recorders of the most exacting quality standards.

NEW IN THE MKII-GENERATION

- Accurately timed, electronic editing (in recorders with full-track erase head). Drop-in delay can be switched off.
- Breakerless triggering command keys equipped with Hall elements
- Modified dump edit mode
- PLAY preselection during ZERO-LOCATE search
- Pilot and impulse pilot tone (marker) versions for all commonly used systems
- 1/2"-2-track master tape recorder for most exacting requirements



STUDER tape recorders are Swiss quality products. The secret: in-depth training and highly qualified personnel; sophisticated high-precision machinery, and exacting test and inspection system.



In the 1/2" version with tape speeds 30 and 15 ips, the A80 RC MKII achieves superb values with respect to stability, accuracy and electrical data.

Design features of the STUDER A80 RC MKII:

STABILITY,

for consistent performance to specifications and long service life

- Die-cast light-alloy tape transport and pinch unit chassis (with large stability reserve because chassis are identical to those used in multi-channel recorders)
- Die-cast light-alloy headblock chassis
- Sophisticated servo control circuits for all motors
- Tape tension controlled by electronic sensors, operating and limit values adjustable for various functions

A80 RC MKII – 1½"

The analog master tape recorder for the most exacting requirements



PRECISION,

for quality even in the most demanding use

- High-precision headblock, close head spacing, same precision for pilot head
- Electronic tape counter indicates real time for either tape speed, highly accurate photoelectric scanning
- Precision electronics for audio and transport control, all potentiometers and test points accessible from the front
- Accurate cutting with tape scissors and marking device built into headblock 1/4" models
- Accurate electronic editing with synchronous oscillator control for erase and bias frequencies

RELIABILITY,

for reliable operation, round the clock, with a minimum of maintenance

- Breakerless triggered transport logic
- Breakerless triggering, large, illuminated command keys (Hall elements)
- Rugged, maintenance-free, servo-controlled AC motors
- High-quality contact elements to ensure reliable connections for the plug-in modules of the audio and control electronics
- LED status indicator built into transport logic to ensure ease of maintenance
- Fully documented maintenance instructions

FLEXIBILITY,

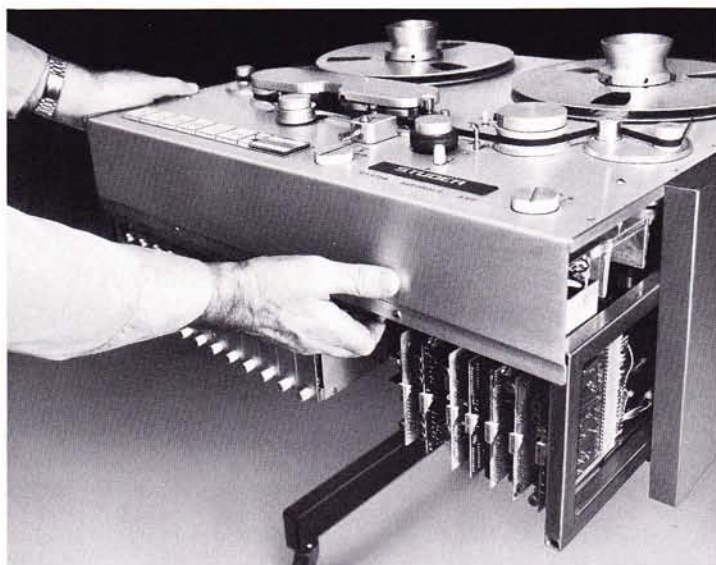
for specialization in wide range of applications

- Two speed versions, 15–7.5 cm/s and 30–15 ips
- Full-track, two-track, and stereo models (as well as models with mono/stereo switching)
- Pilot tone versions for NEO and FM systems with or without resolver
- Marker version for automatic broadcasting systems
- NAB or CCIR equalization, selectable
- Models with or without VU-meter panel and monitor speaker
- Full complement of accessories available for installation, operation and supplementation.



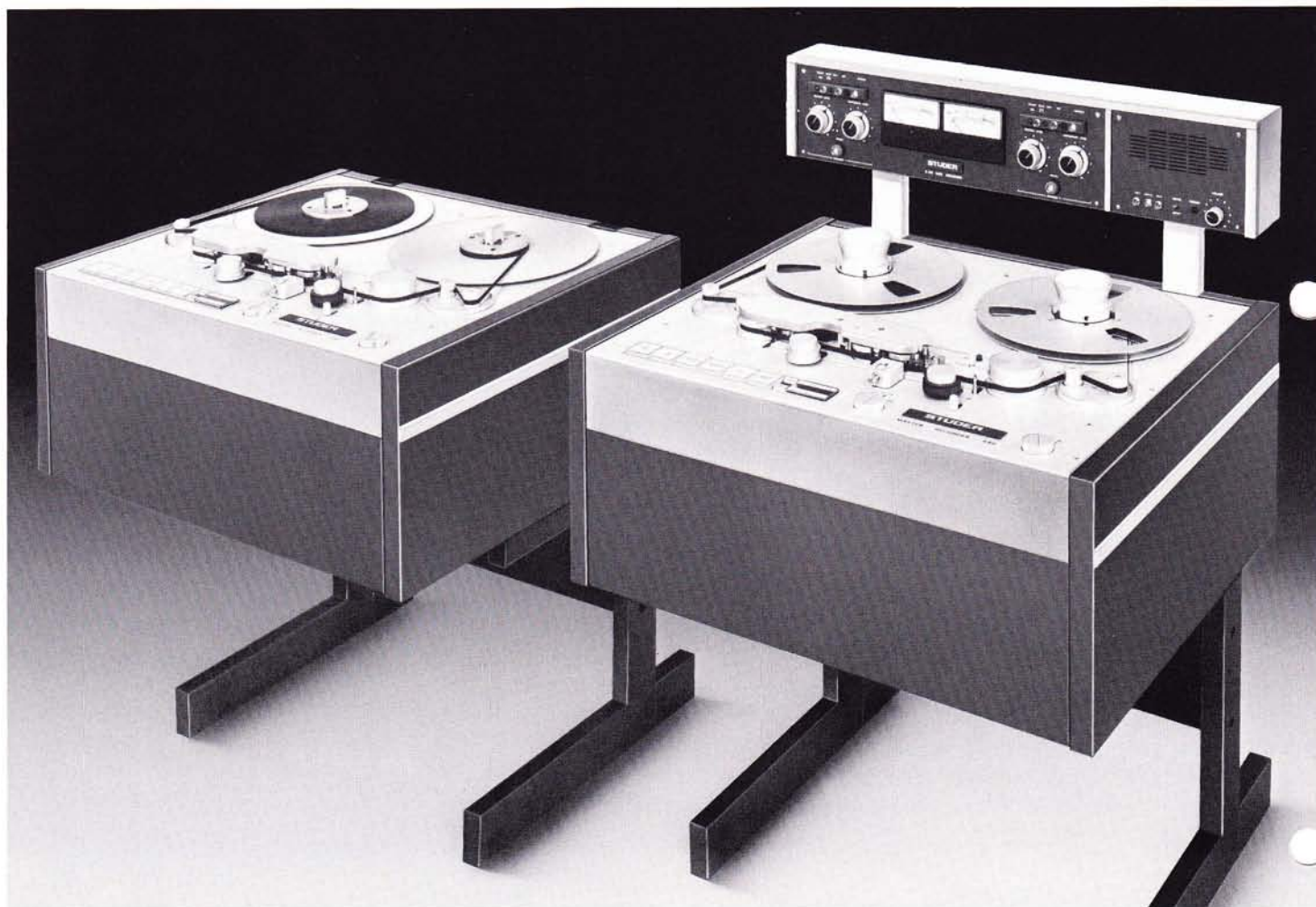
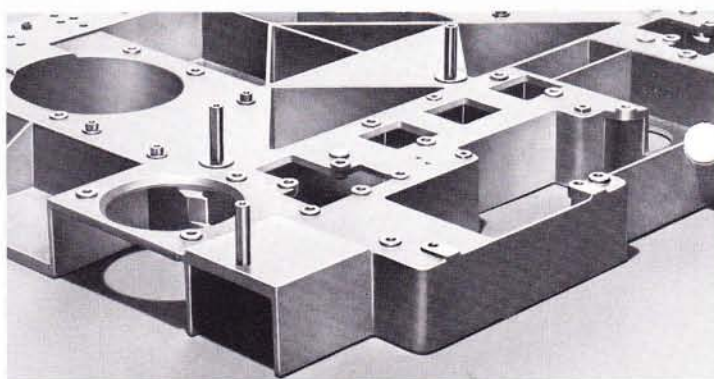
"Universal" console model with VU-meter panel. Shown is the FM pilot tone version with resolver unit A80 RC-2/2 PN-FM-VU. Instead of the VU-meter panel, a storage shelf with or without monitor speaker can be configured.

Proven design concepts



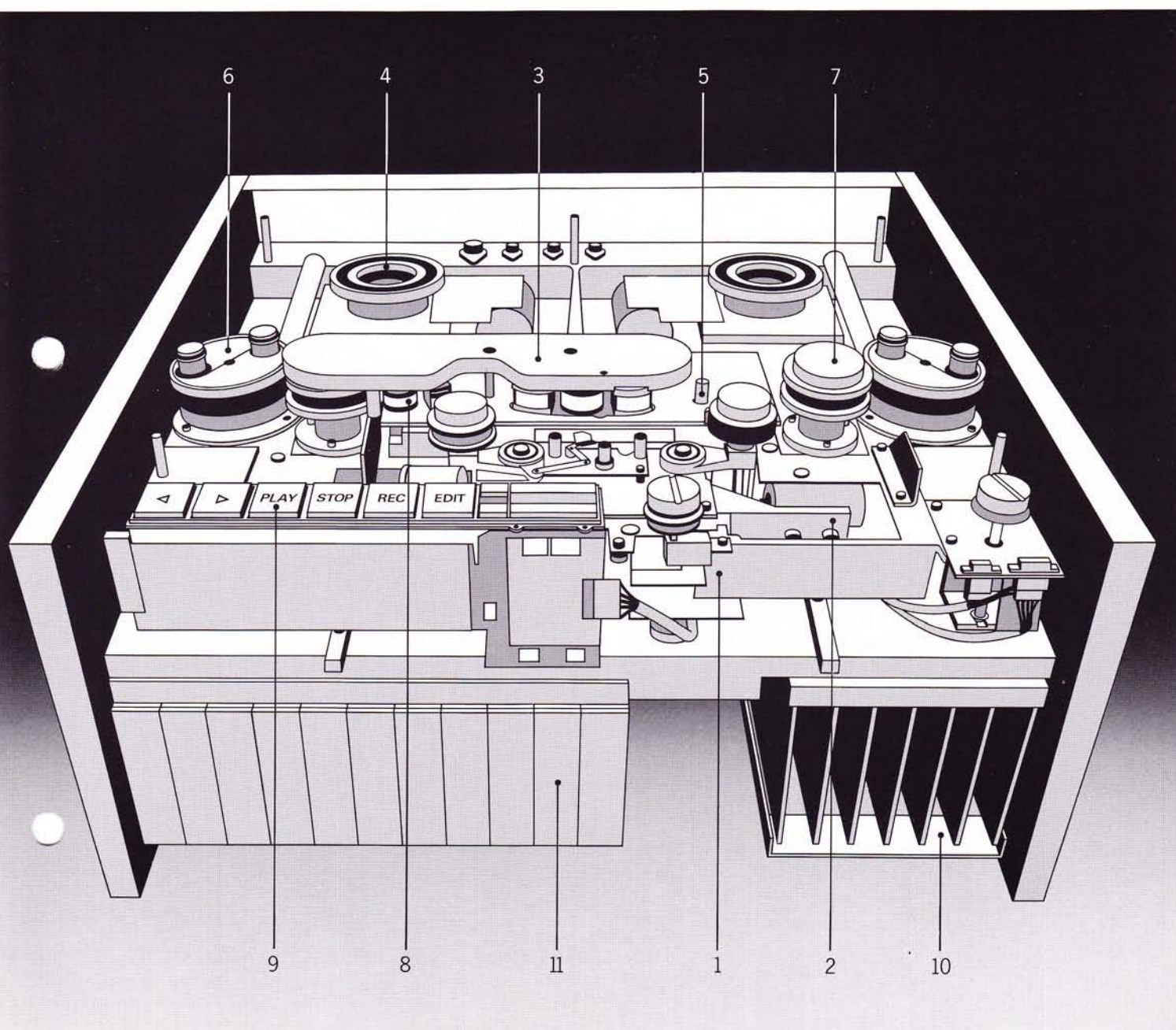
All circuits of the audio and control electronics are accessible from the front. For ease of maintenance, the complete tape transport can be pulled out of the console from the front.

All subassemblies of the tape transport system are mounted on a high-quality die-cast light-alloy chassis identical to the type used in multi-channel machines. The mechanical function modules of STUDER recorders are grouped into modules as is the case for the electronics so that they can be adjusted or replaced with a minimum of effort.



STUDER A80 RC MKII Tape recorders in full-metal "Universal" consoles, without and with VU-meter panel.

Worldwide proven tape transport with the stability and accuracy of a multi-channel machine



1. Highly stable die-cast light-alloy chassis, hinged within the frame
2. Pinch unit chassis, including movable roller bearings, also die-cast
3. Enduring precision of headblock thanks to extremely stable chassis, die-cast
4. Rugged, servo-controlled AC motors. Sine wave control for stable wow-and-flutter characteristics through the entire control range. Precision quick-release for NAB, DIN and three-prong adapters.
5. Maintenance-free AC capstan motor, servo controlled. Vari-speed as standard feature, two ranges, $\pm 4\%$ or ± 7 semitones. Only passive control elements are necessary (kit available as optional accessory).
6. Precision tape tension sensors with automatic blocking in EDIT mode.
7. Low-mass tachometer roller with optical scanning.
8. Light barrier can also be reprogrammed to function as end-of-tape sensor. Sensitivity adjustable.
9. Large, illuminated command keys. Maintenance-free switches with Hall elements.
10. Transport electronics implemented on plug-in modules, mounted in a hinged chassis. All parameters adjustable from the front, with LED status indicators.
11. Audio electronics implemented on plug-in modules, mounted in a hinged chassis. All parameters adjustable from the front.

State-of-the-art tape transport control
Programmed with PROMs,
with LED status indicator

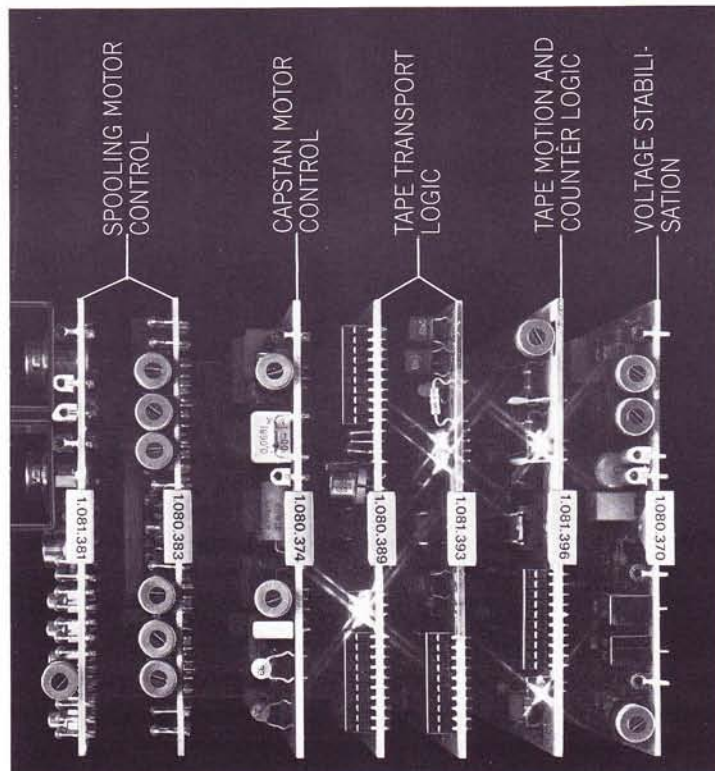
Precision tape counter
Real-time indication
Programmable display format

Since programmable circuit packages (PROMs) are used, the transport logic operates with stored commands. This means that the transport functions are recalled from memory via address lines. The logic functions are indicated externally by 11 LEDs to enable simple and reliable monitoring of the static and dynamic operating conditions.

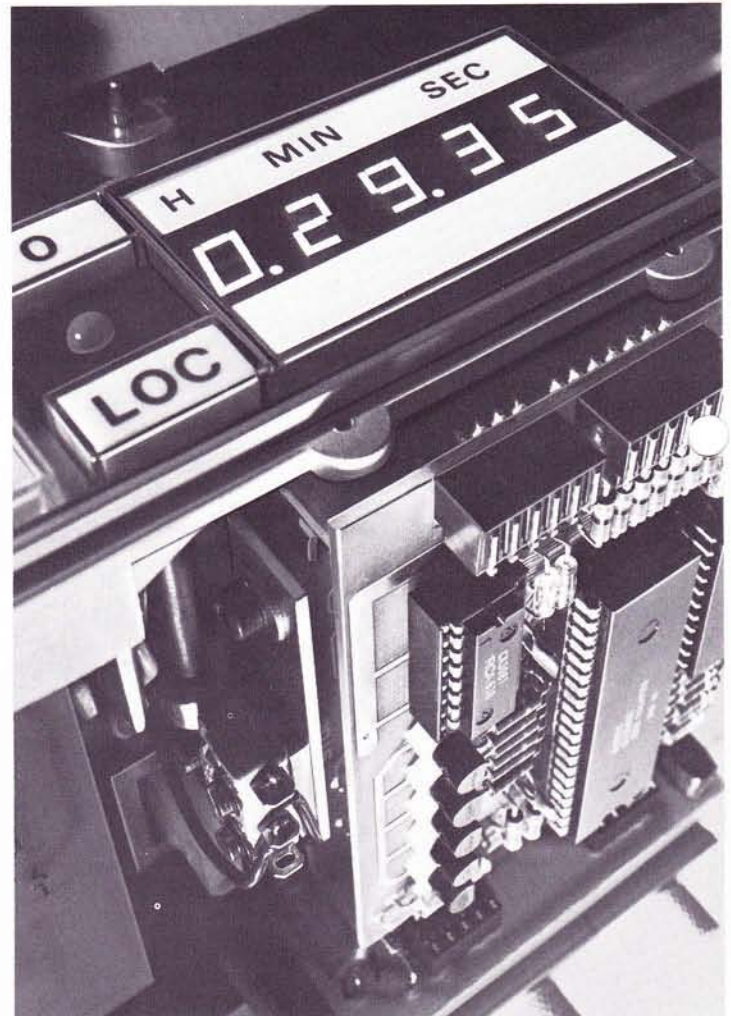
The modern, programmable logic provides many other advantages. For example it can be tailored to meet specific customer and application requirements. It can also be interfaced to a process computer for automatic control and monitoring of functions.

Manual features such as fader start and dump editing have been fully retained.

The various operating modes are actively signalled, i.e. the lamps in the push buttons are also controlled by the logic. The electronic transport control, consisting of 7 printed circuit boards, is accessible from the front so that adjustments and maintenance can be performed under optimum conditions.



Plug-in transport logic with LED status indicators and potentiometers on the front.



Electronic timer and Zero-locator function are standard features.

The electronic tape counter features the following functions:

- Time counter, 6 positions for indicating real time in hours, minutes and seconds, for either tape speed.
- Time displayed with five 7-segment LEDs.
- Display mode selectable with jumper:

MATHEMATICAL FORMAT:

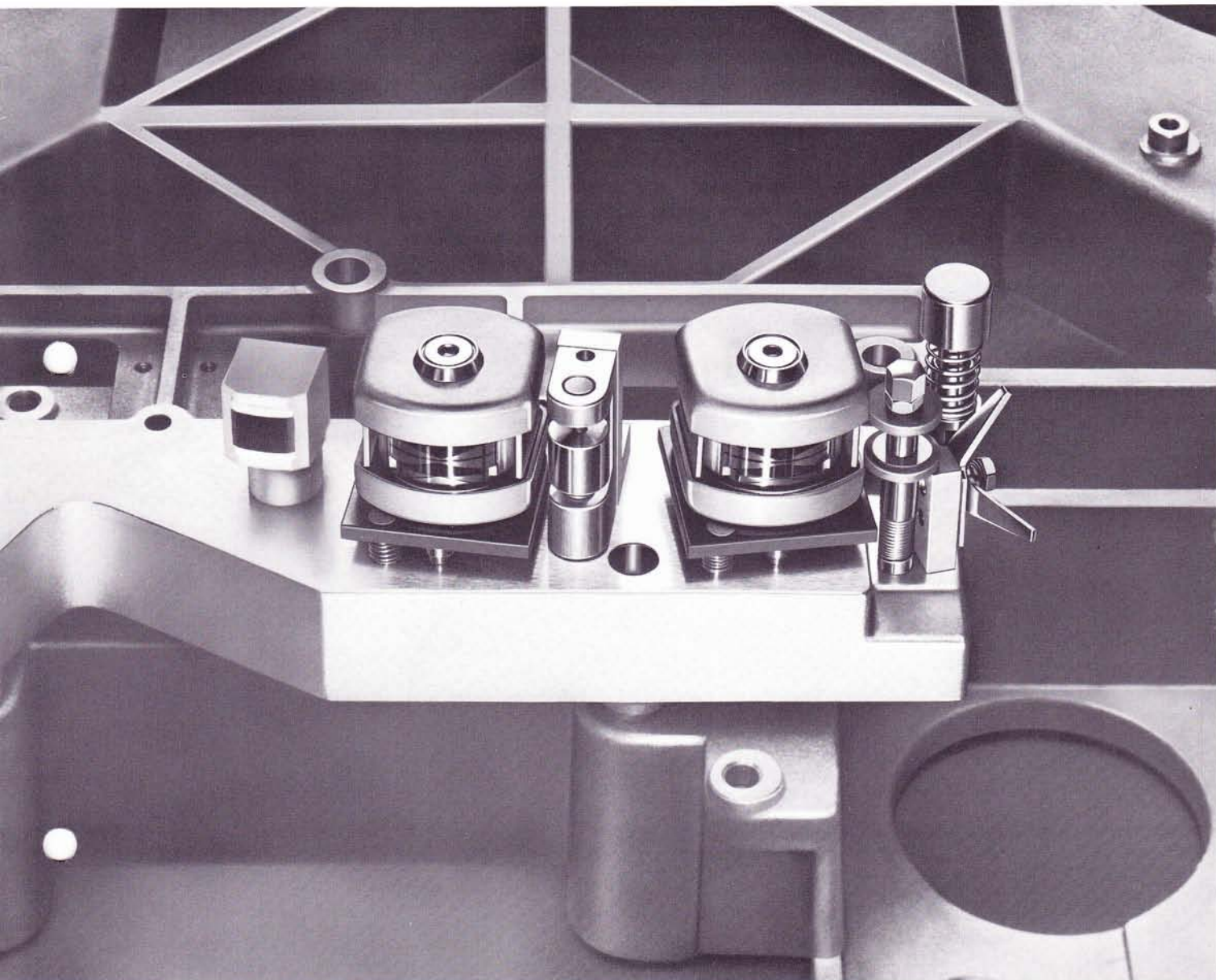
0.00.01/0.00.0/-..00.01. To indicate negative times, the hours digit is used for the minus sign.

COMPLEMENTARY FORMAT:

0.00.01/0.00.00/9.59.59. Negative times are indicated by the complement.

Up to three counters of this type can be connected to a recorder of which one is built in and two are mounted externally. The ZERO-LOCATOR, a standard feature, enables accurate and rapid search of the zero position. The PLAY function can be preselected during the search phase.

Precision headblock Maximum stability for consistent performance



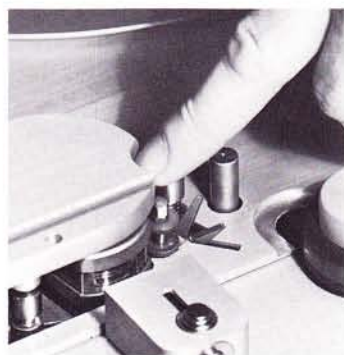
The excellent performance stability of the STUDER A80 RC tape recorders is achieved through highest precision in the heads and tape guidance elements combined with the high rigidity of the supporting die-cast light-alloy chassis.

The plug-in headblock assembly designed for close distances between the heads is a precision component of excellent mechanical stability. Together with the rigid tape transport chassis the headblock is responsible for ultralinear tape guidance, a characteristic feature of STUDER tape recorders. It is the guarantee for long-term performance to specifications and gentle treatment of the tapes.

In pilot tone versions, the same stability features also apply to the pilot head which takes the place of the scrape flutter roller. Close spacing of the heads is very advantageous for electronic editing.

The headblock and the transport control are also designed for manual editing. The CUE point can easily be found thanks to infinitely adjustable spooling speeds (EDIT function) and

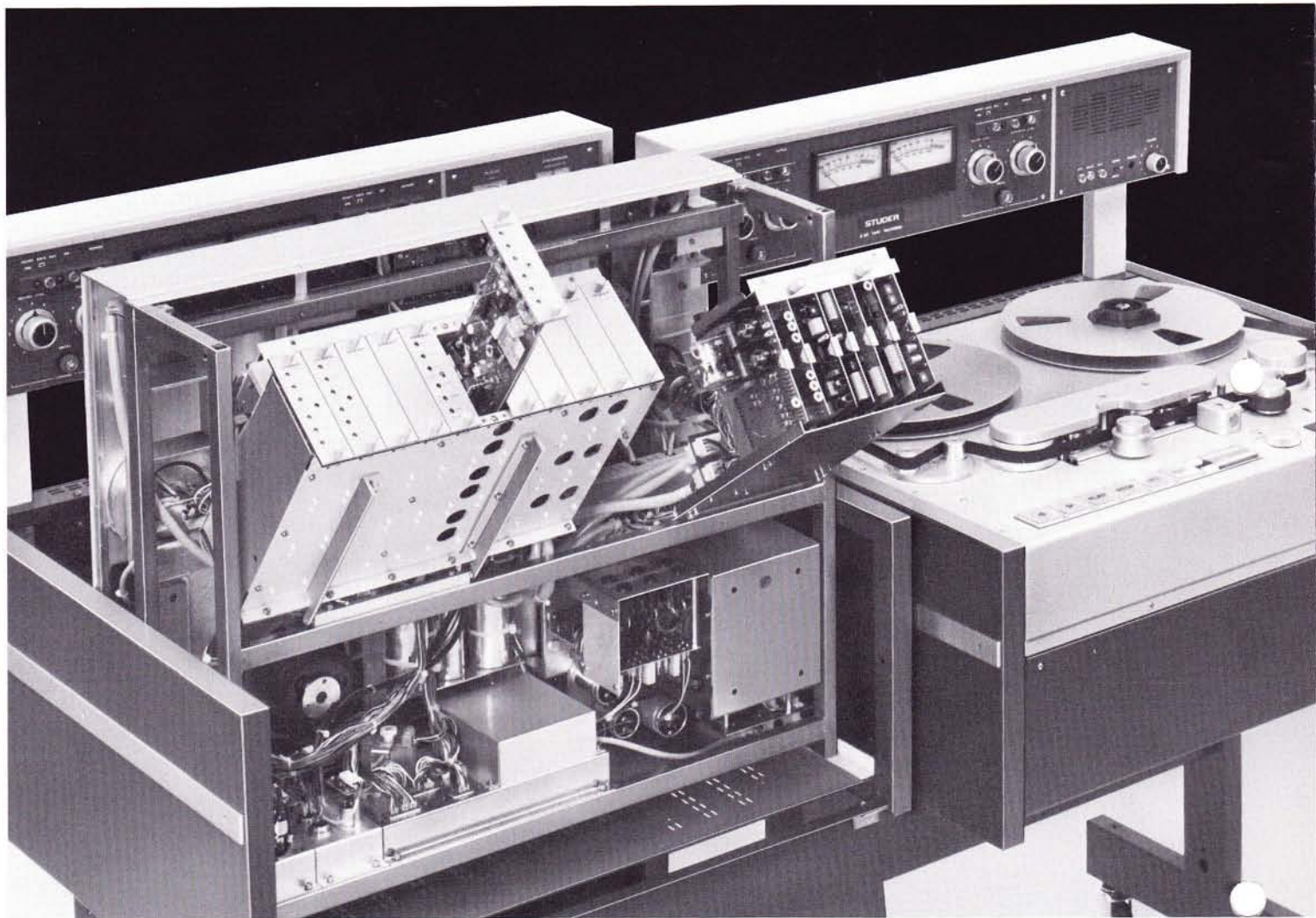
manually controllable tape monitoring. Because the tape tension sensors are automatically blocked when the tape is stopped in EDIT mode, the editing point can be accurately fixed.



Edit point, marking tape cutting and splicing consume a minimum of time because a (plug-in) marking device, built-in tape scissors and a splicing block on the head cover are standard equipment in the A80 RC MKII.

Audio electronics in professional modular technology

Program controlled oscillator for drop-in/drop-out functions



Professional audio electronics implemented on plug-in modules, potentiometers accessible from the front and the tiltable chassis reduce down times to an absolute minimum.

The circuit boards of the audio electronics are conveniently accessible after the hinged front cover is lifted up. In addition, the tape transport can be tilted into upright position in the console and the rack which houses the audio electronics swings out, thus providing unrestricted access to all adjustment controls and test points.

The modular audio electronics can be tailored to any type of application. Plug-in type equalization modules for CCIR and NAB can be installed as specified by the customer.

The following rack locations are prewired for further enhancement of the audio electronics:

- Pilot tone amplifier
- Pilot tone resolver
- Modulation monitor (extended mode control)

Terminals are provided for the following external controls:

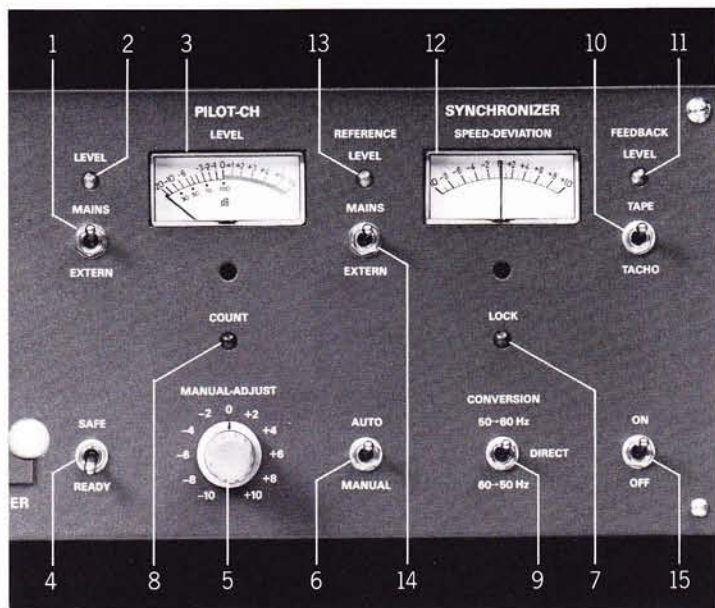
- Remote control
- Capstan speed control
- Extended mode control

The drop-in/drop-out functions are correctly timed by the program controlled oscillator, thus, perfect electronic editing is possible for machines equipped with a fulltrack erase head. The counting pulses are used by the delay circuit as reference signals. The delay is, therefore, not affected by the tape speed and functions correctly also with variable speed control.

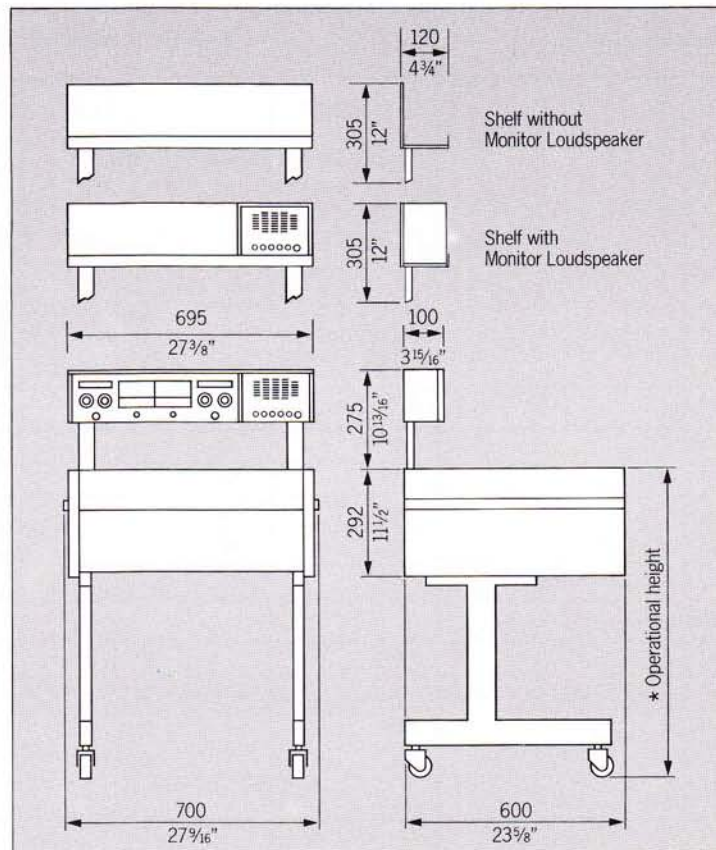
IMPORTANT: The drop-in delay can be defeated with a jumper (acknowledged by LED). When changing from RECORD to STOP (not PLAY), the drop-out delay is disabled, i.e. it operates as in a conventional recorder.

STUDER A80 RC-Pilot tone versions solve synchronization problems with professional accuracy

Dimensions Accessories



- | | |
|---|---|
| 1. Input source selector | 9. Frequency conversion selector |
| 2. Level indicator LED | 10. Feedback selector |
| 3. Level meter | 11. Feedback signal, level indicator LED |
| 4. Record preselector | 12. Speed deviation indicator instrument |
| 5. Correction control, manual | 13. Reference signal, level indicator LED |
| 6. Selector for automatic/manual correction | 14. Reference signal source selector |
| 7. Synchro indicator LED | 15. ON/OFF switch (OFF = Stand-by) |
| 8. Pulse difference indicator LED | |



The pilot tone versions of the A80 RC MKII can cope with any problem of synchronizing audio/visual sources and automatic broadcasting systems. The range of models includes mono recorders with Neopilot systems as well as stereo/two-track recorders with FM pilot systems (Nagrasync); all of these are available with or without pilot tone resolver. A special marker version is available for impulse pilot tone systems (automation).

Pilot tone resolvers are designed to correct scanning errors, caused e.g. by crosstalk or tape splices. The sophisticated resolver system not only performs the necessary corrections automatically, but is also capable of performing a number of additional functions and monitoring operations.

- Synchronization from pilot track or internal tacho signal
- Internally stabilized mains frequency signal can also be recorded as pilot tone
- Inertialess display of reference and feedback signal levels with LEDs.
- Preloading of correction memory during test start enables "hot start" with a minimum of resolver correction.
- Manual correction and input of a correction value are feasible. Indication of half-frames gained or lost.
- Frequency converter for 50 Hz and 60 Hz systems
- Digital-analog signal processor with correction memory; stable operation even with faulty pilot feedback signal.

A80 RC "Universal" consoles

- Height* 780 mm, with floor slides (20.020.201.00)
- Height* 840 mm, with floor slides (20.020.201.01)
- Height* 900 mm, with floor slides (20.020.201.02)
- Height* 840 mm, with casters (20.020.201.05)
- Height* 900 mm, with casters (20.020.201.06)
- Height* 960 mm, with casters (20.020.201.07)

Shelf with monitor speaker

complete with cable for "Universal" console (21.081.915.00)

Shelf without monitor speaker

for "Universal" console (1.038.484.00)

Transport and Zero-locator remote control

- in wooden housing (10.403.001.02)
- Matching connecting cable, length 15 m (10.403.003.02)

- Chassis version STUDER standard module dimensions (10.403.001.12)
- Matching connecting cable, length 15 m (10.403.003.06)

Vari-speed remote control

- in wooden housing (10.403.002.01)
- Corresponding connecting cable, length 15 m (10.403.003.04)
- Chassis version, STUDER standard module dimensions (10.403.002.11)
- Matching connection cable, length 15 m (10.403.003.08)

Vari-speed control kit (does not include installation)

External components, 10-turn potentiometer and accessories (1.080.080.00)

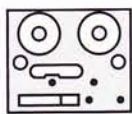
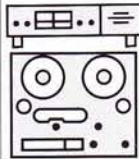








Monitor speaker kit

for installation in tape transport (1.081.920.00)

Tool kit A80, complete

- with 220 V soldering iron (20.020.001.01)
- with 110 V soldering iron (20.020.001.51)

Ordering information

Machine type	Headblock configuration							Additional elec- tronic circuits		Ordering code		
	Erase head		Recording head			Pilot head			Pilotone resolver unit PN	Stereo/Mono-Switching S		
	Mono	Stereo	Mono	Stereo		NEO	FM	Marker				
	Full track	Over-lapping	Full-track	Guard track: 0.75mm	2 mm							
												
Mono												
A80 RC-1	●		●								60.140.11301	
A80 RC-1 VU	●		●								60.140.11302	
A80 RC-1 P	●		●			●					60.140.11303	
A80 RC-1 PN-VU	●		●			●			●		60.140.11306	
A80 RC-1 P-Marker	●		●					●			60.140.11305	
Stereo												
A80 RC-0.75	●			●							60.140.11320	
A80 RC-0.75 VU	●			●							60.140.11321	
A80 RC-0.75 S	●			●						●	60.140.11325	
A80 RC-0.75 S-VU	●			●						●	60.140.11326	
Stereo/2-track												
A80 RC-2/2		●			●						60.140.11330	
A80 RC-2/2 VU		●			●						60.140.11331	
A80 RC-2/2 P-FM	●				●		●				60.140.11332	
A80 RC-2/2 P-FM-VU	●				●		●				60.140.11335	
A80 RC-2/2 PN-FM-VU	●				●		●		●		60.140.11333	
A80 RC-2/2 PN-FM-VU (M)	●				●		●		●		60.140.11334	
Stereo/2-track/1/2"												
A80 RC-2-1/2" VU	●				▲						60.140.11342	

Legend:

- P** = Pilot tone
- PN** = Pilot tone and resolver
- S** = Stereo/Mono switchable
- VU** = VU-meter, level control and SAFE/READY switching
- 1** = Mono (full track)
- 2/2** = Stereo/2-track (guard track 2 mm)
- 0.75** = Stereo, guard track 0.75 mm
- A** = Tracks 1 and 2 can be erased individually. Includes SAFE-READY switch for CH1 and CH2 (on headblock)
- B** = Tracks 1 and 2 can be erased individually
- C** = Monitor speaker built into tape transport cover
- D** = Tape speeds 30 - 15 ips
- ▲** = Track width 5.05 mm (0.199")

Supply following information with order:

Ordering code:

in addition to the machine type:

Tape speeds:

15 - 7.5 ips (19 - 38 cm/s) or
30 - 15 ips (38 - 76 cm/s)
(A80 RC-2-1/2" VU with 30 - 15 ips only)

Equalization:

CCIR or NAB
(Selectable, specs required for factory setting)

Type of tape:

Tape flux:
(with reference to recording level)

Line level:

Terminating impedance:

Mains voltage and frequency:
100 ... 120 V/200 ... 240 V; 50 or 60 Hz
(Switchable, specs required for factory setting)

General Notes:

The machine type specifies the chassis version (with or without VU panel). All models are suitable for mounting in a "Universal" console.
CINE, NAB, and DIN adapters as well as spindles are supplied with the recorder.
All applicable audio and tape deck connectors are supplied with the recorder.

Example of correct order specs:

60.140.11321 (A80 RC - 0.75 VU)

15 - 7.5 ips

CCIR

3M 250

510 nWb for +6 VU

+6 dB

200 Ohm

220 V/50 Hz

Technical Specifications

STUDER A80 RC-MKII (1/4")

Tape Speeds:	30 ips and 15 ips (76.2 and 38.1 cm/s) or 15 ips and 7.5 ips (38.1 and 19.05 cm/s)		
Tape Speed Deviation:	± 0.2 % max.		
Tape Slip:	0.1 % max.		
Tape Reels:	DIN, NAB, CINE up to 12" (300 mm) diameter		
Tape Width:	1/4" (6.3 mm)		
Wow and Flutter: IEC 368 (DIN 45507), peak weighted	30 ips 0.04 % max.	15 ips 0.04 % max.	7.5 ips 0.06 % max.
Starting Time:	0.5 s max. (to reach double of specified wow and flutter value)		
Tape Counter:	accuracy ± 0.2 % real time indicated in hours, minutes and seconds mathematical or complementary display sequence (complementary without zero-locator function)		
Tape Tension: *	70 ... 100 p in playback and fast wind mode		
Tension Peaks: *	500 p for start, stop and reserve		
Stopping Time: *	3 s or less from full wind speed		
Rewind Time: *	approx. 120 s for 3300 ft (1000 m) reel		
Audio Line Inputs:	balanced, floating impedance 8 kohms min., 30 Hz ... 20 kHz		
Input Levels:	0 dBm min. +22 dBm max.		
Audio Line Outputs:	balanced, floating impedance 30 ohms max., 30 Hz ... 20 kHz 200 ohms min. load impedance		
Output Level:	max. +24 dBm (RL 600 ohms)		
Equalization:	CCIR or NAB, jumper selectable		
Equalization Time Constants:	30 ips CCIR: 17.5/∞ µs NAB: 17.5/∞ µs	15 ips 35 µs 50/3180 µs	7.5 ips 70 µs 50/3180 µs
Track Width:	full track 0.236" (6 mm) stereo 0.106" (2.7 mm) two-track 0.079" (2 mm)		
Frequency Response: (Record-Reproduce)	30 ips 50 Hz ... 20 kHz ± 1 dB 60 Hz ... 18 kHz	15 ips 30 Hz ... 18 kHz 60 Hz ... 15 kHz	7.5 ips 30 Hz ... 15 kHz 60 Hz ... 12 kHz
Signal to Noise Ratio: RMS, Record-Reproduce, weighting filter DIN 45405/1967, equalization CCIR ■	30 ips full track (320 nWb/m), weighted: unweighted: stereo (510 nWb/m), weighted: unweighted: two track (320 nWb/m), weighted: unweighted:	15 ips 61 dB 61 dB 61 dB 61 dB 56 dB 56 dB	7.5 ips 58 dB 58 dB 58 dB 58 dB 54 dB 54 dB
Signal to Noise Ratio: RMS, Record-Reproduce, weighting filter CCIR 468, equalization CCIR ■	30 ips full track (320 nWb/m): stereo (510 nWb/m): two track (320 nWb/m):	15 ips 56 dB 56 dB 51 dB	7.5 ips 53 dB 53 dB 49 dB
Signal to Noise Ratio: RMS, Record-Reproduce, unweighted according to NAB-standard, equalization NAB ▲, referred 6 dB above 200 nWb/m	30 ips full track: stereo: two track:	15 ips 67 dB 64 dB 63 dB	7.5 ips 65 dB 62 dB 61 dB
Signal to Noise Ratio: RMS, Record-Reproduce, unweighted according to NAB-standard, equalization NAB ▲, referred to 1020 nWb/m, max. distortion 3 % in mid frequency range, measured with «high output» tape	30 ips full track: stereo: two track:	15 ips 75 dB 72 dB 71 dB	7.5 ips 73 dB 70 dB 69 dB

Distortion: Record-Reproduce, 1 kHz			
CCIR equalization ■	30 ips	15 ips	7.5 ips
tape flux 320 nWb/m:	0.8 % max.	0.8 % max.	1 % max.
tape flux 510 nWb/m:	2 % max.	2 % max.	2.5 % max.
NAB equalization ▲			
tape flux 200 nWb/m:	0.5 % max.	0.5 % max.	0.5 % max.
Crosstalk Rejection:	40 dB or more, 80 Hz ... 12 kHz		
stereo:	45 dB at 1 kHz		
Erase Efficiency:	75 dB or more at 1 kHz		
Erase and Bias Frequency:	150 kHz		
VU-Meters:	ASA-standard selectable for 0, +4, +6 and +8 dBm at operating level		
Power Requirements:	100 ... 120 V, 200 ... 240 V ± 10 % 50 or 60 Hz		
Power Consumption:	250 VA max. (tape transport and amplifier)		
Temperature Range:	+10°C ... +40°C (50°F ... 104°F)		
Humidity:	20 % ... 95 %, no condensed water		
Safety Standard:	according IEC-standard, publication 65, apparatus class 1		
Weight:	net	53 kg (117 lbs)	
	gross (air freight)	73 kg (161 lbs)	
	gross (sea freight)	118 kg (260 lbs)	

Additional Specifications A80 RC-MKII, 1/2" version

Tape Speeds:	30 ips and 15 ips (76.2 and 38.1 cm/s)
Tape Width:	1/2" (12.7 mm)
Tape Tension: *	150 ... 200 p
Track Width:	0.199" (5.05 mm)

NAB-versions

Signal to Noise Ratio: RMS, Record-Reproduce, unweighted according to NAB-standard, NAB-equalization ○, referred to 6 dB above 510 nWb/m

30 ips	15 ips
74 dB	72 dB

Signal to Noise Ratio: RMS, Record-Reproduce, weighted as per IEC 179, A-curve, NAB-equalization ○, referred to 6 dB above 510 nWb/m

30 ips	15 ips
78 dB	75 dB

Distortion: Record-Reproduce, 1 kHz

NAB-equalization ○	30 ips	15 ips
referred to 6 dB above 510 nWb/m:	3 % max.	3 % max.

CCIR-versions

Signal to Noise Ratio: RMS, Record-Reproduce, weighting filter DIN 45405/1967, CCIR-equalization ○, referred to 6 dB above 510 nWb/m

30 ips	15 ips
weighted:	70 dB
unweighted:	70 dB

Signal to Noise Ratio: RMS, Record-Reproduce, unweighted, weighting filter CCIR 468, CCIR-equalization ○, referred to 6 dB above 510 nWb/m

30 ips	15 ips
65 dB	65 dB

Distortion: Record-Reproduce, 1 kHz

CCIR-equalization ○	30 ips	15 ips
referred to 6 dB above 510 nWb/m:	3 % max.	3 % max.

* Adjustable with potentiometer

■ Measured with AGFA PER 525 or equivalent tape

▲ Measured with SCOTCH 3M 206 or equivalent tape

○ Measured with AMPEX 456 or equivalent tape

We reserve the right to make alterations as technical progress may warrant

Designed and Manufactured in Switzerland

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