AMPEX

VPR-1

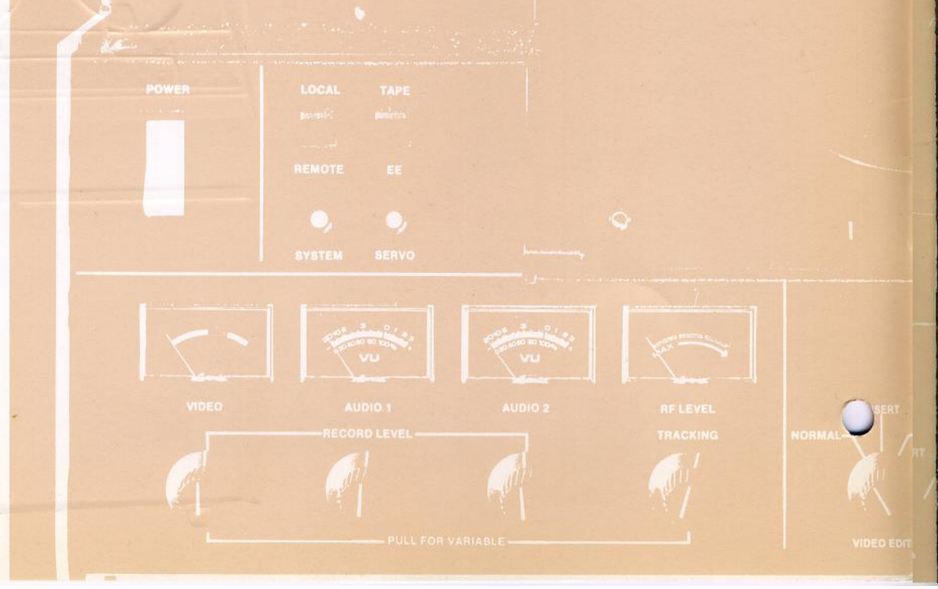
Video Production Recorder

A Dream....

Ask an experienced user of helical-scan videotape recorders to describe an ideal VTR, and he might define it something like this:

- It makes broadcast-quality color pictures.
- It won't introduce another format that is incompatible with everything else.
- It will solve the classic problems of helical machines—tracking and interchange.
- It will provide slow-motion and still-frame, without that annoying noise bar.
- It will be easier to maintain than any helical machine has ever been.
- As long as we're defining an **ideal** machine, it won't cost more than current models.

Sound implausible? It really isn't. In fact, it is only a partial description of a revolutionary new helical VTR...



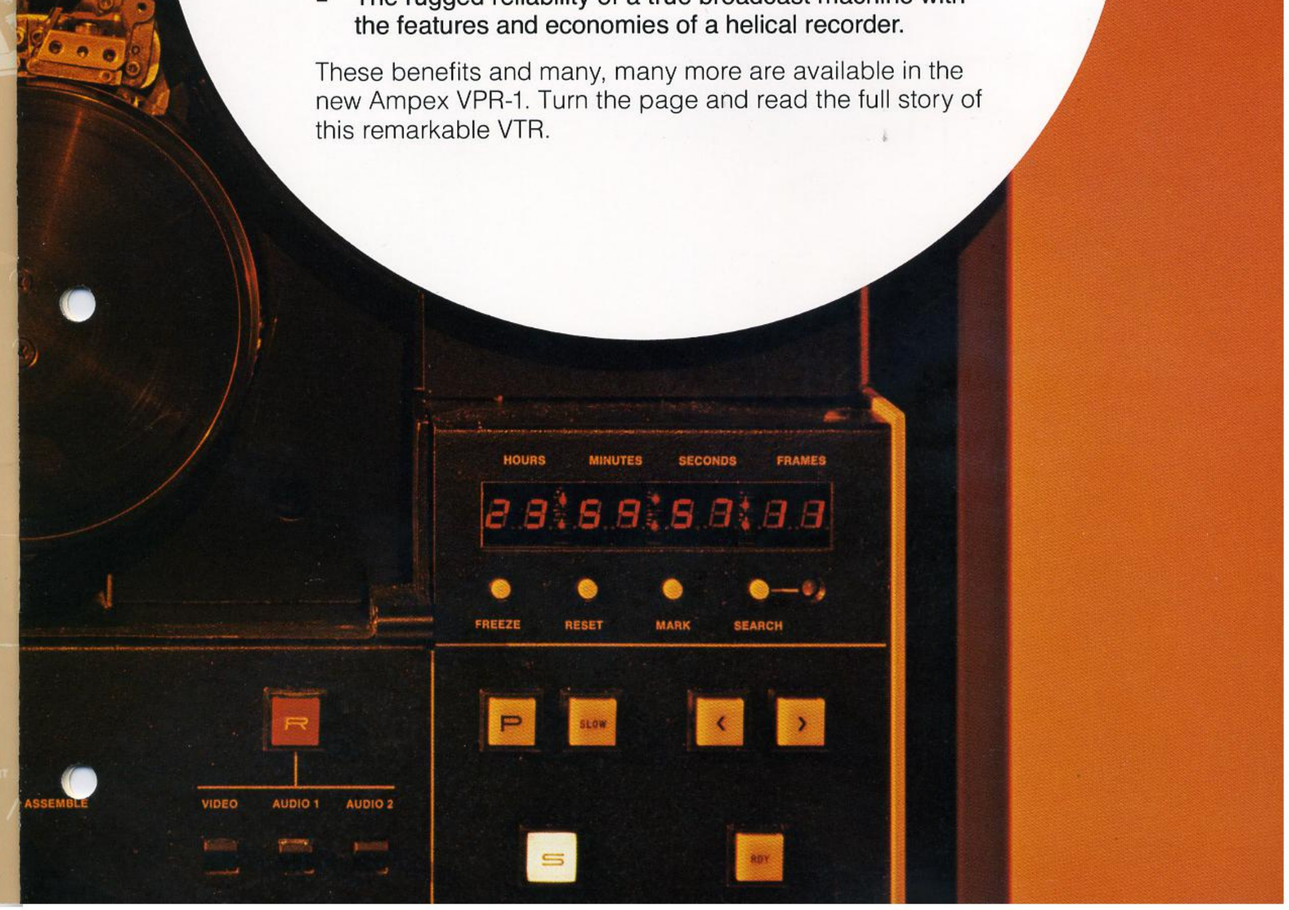
....Come True

The Ampex VPR-1

This teleproduction recorder offers performance features that are unprecedented in videotape recording. Benefits such as:

- **Outstanding recording and playback performance with perfect tracking (even improperly recorded tapes)**
- **1/5-speed slow motion and still frame pictures that are fully broadcastable**
- **The rugged reliability of a true broadcast machine with the features and economies of a helical recorder.**

These benefits and many, many more are available in the new Ampex VPR-1. Turn the page and read the full story of this remarkable VTR.



AMPEX VPR-1
Design Features

- Universal packaging design, can be upgraded to any configuration
- Exceptionally rigid and reliable tape transport
- Superb tape guiding
- Remarkable gentle tape handling in all modes, including start and rewind
- Electronic tape tension control
- High-band color: same as quad recorders

Operational Features

- 90-minute play time
- Full control panel with electronic tape timer and search-to-cue
- All new electronics with diagnostic circuitry
- Integral backspace editor
- New scanner assembly, easily replaceable without special tools or equipment
- Separate cue track
- Wide-band playback of the cue channel for use of SMPTE time code
- Fully compatible Ampex 1" format

Automatic scan tracking (AST) Option

- Autotracking
- Perfect 1/5 speed slow-mo
- Perfect still-frame
- Manual "jogging"
- Video confidence

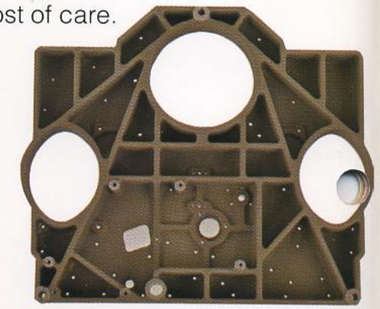
Other Accessories

- Digital time base correction system
- Dual/stereo audio with monitor electronics for "audio confidence".

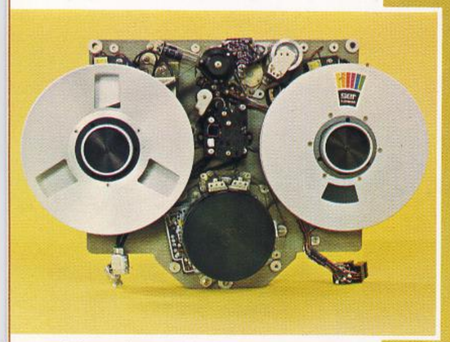
New From The Ground Up

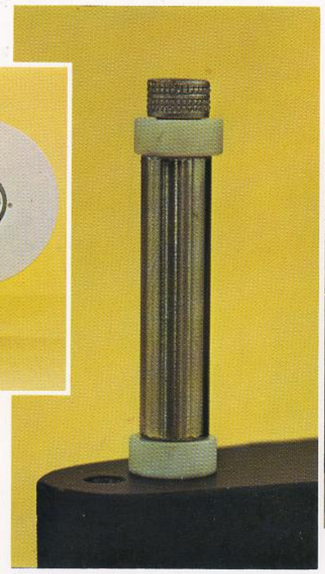
The VPR-1 is not an improved version of a previous model. Ampex set out to redesign everything necessary to make the ideal helical VTR.

To start with, you will find the deck is a solid, deeply ribbed aluminum casting, to provide the kind of rigidity you would expect to find only in the most expensive broadcast recorders. This deck is the foundation of the whole new precision tape transport mechanism.



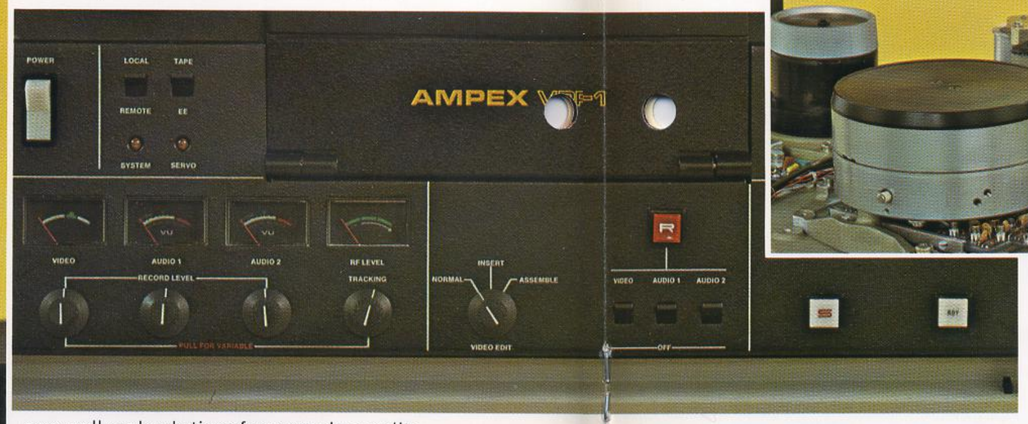
Fixed ceramic tape guides are another important feature. There is nothing to loosen or get out of alignment. Tape handling and tracking are consistent. Electronic tape tension on both the supply and takeup reels insures constant tension past the heads at all times.





Tape handling is gentle as well as precise. The servoed capstan is "ramped up" to speed, so that the tape is not subjected to undue stresses when motion is started. In Rewind, end-of-tape sensing circuits slow down the reels as the end of the tape approaches and stop the reels to prevent damage to the ends of the tape. You have the advantage of **high speed shuttle** up to 300 ips, yet the machine handles tape with the utmost of care.

Look at the control panel and you see a professional's choice of clearly marked and illuminated controls. LED indicators. A **digital tape timer, Search-to-Cue,** and convenient editing controls for efficient post-production work. An integral **back-space editor** insure accurate pre-roll calculation for precise edits.



Yet this is only the basic story of the VPR-1. The best is yet to come.

AST-The magic behind the miracles

Of the many new engineering features in the Ampex VPR-1, none is more exciting than the **automatic scan tracking (AST) accessory.** With this optional package installed, a VPR-1 immediately acquires an array of capabilities unheard of until now in a single video recorder.

The AST employs a special video head which can move in two planes. This technique allows the head to be electronically deflected over the actual video track during playback to automatically follow any deviation from the "ideal" track. There are many very important advantages to this capability.

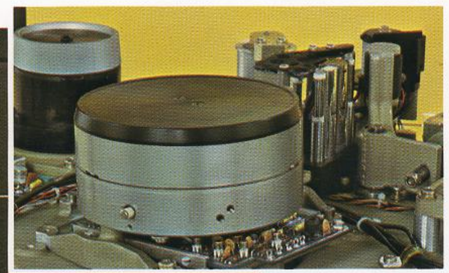
Autotracking

Interchange has been a classical problem associated with helical video recording. Quite often, some very exact tracking adjustments have to be made when playing back a tape that was recorded on another machine. A VPR-1 equipped with AST **tracks perfectly,** automatically, with no picture disturbance. Even tapes that were recorded so badly as to be considered unrecoverable can often be saved with the VPR-1 and AST.

Slow Motion

While some helical-scan recorders offer slow-motion capability, the quality leaves something to be desired. When tape speed slows, a fixed video head cannot track properly over the long helical track as it does at normal speed. The result is the familiar "noise bar" moving through the picture.

Again the automatic scan versatility of AST eliminates this old annoyance. Even though the tape is moving at 1/5 normal speed in slow-mo mode, auto-tracking remains precise and the picture remains perfect.



Still-Frame

In still-frame mode, the noise bar becomes more apparent on typical helical VTRs. On the VPR-1 there is **absolutely no noise bar,** because the AST maintains perfect tracking automatically even though tape motion is entirely stopped, providing a solid still-frame picture.

Both slow motion and still frame performance is of such high quality that you can actually broadcast in those modes with the aid of the optional Ampex time base corrector.

Manual "Jogging"

Since it can still-frame so accurately (and instantly), it becomes possible for the operator to manually control the movement of the tape from one frame to the next, **forward or backward,** on command. Thus, he can preview edits by looking at any number of adjacent frames, one at a time, before selecting the exact edit point.

Video Verification

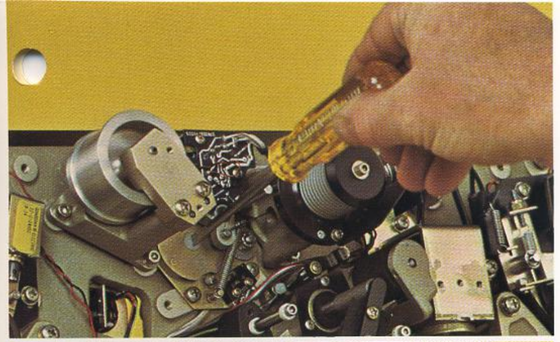
With the AST accessory, the three heads (record, flying reproduce, flying erase) are mounted 120° apart on the scanner. Consequently, you can record and **simultaneously playback** for an immediate view of your recording. The verification picture is full bandwidth direct color and full playback quality. Optimization (in record) is an easy task because of the simultaneous record and playback provided by the AST accessory.

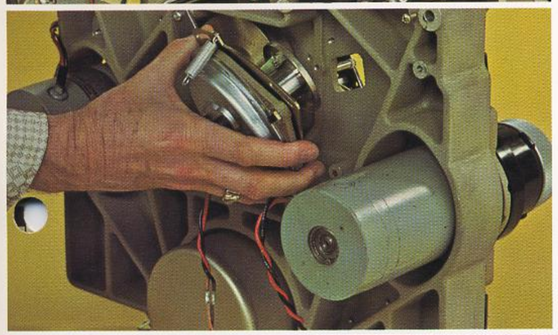
Time Base Correction

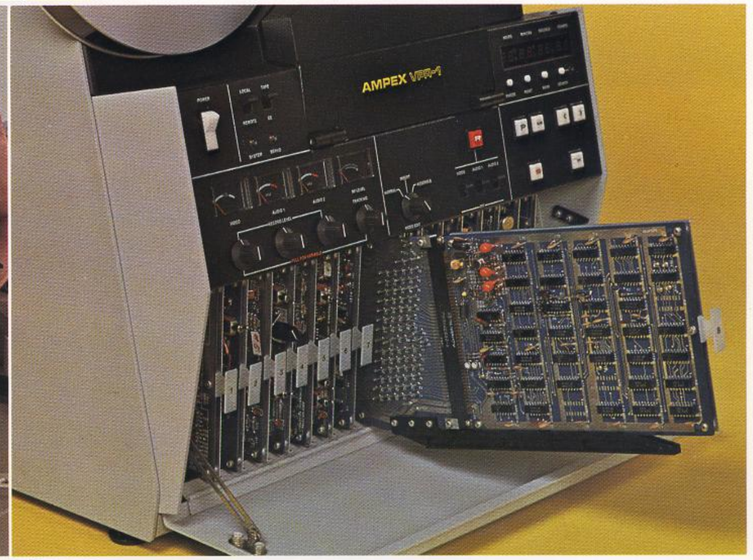
Ampex has traditionally offered superior time base correction systems, both as integral parts of its VTRs and as standalone units. Fourth-generation Ampex digital time base correctors are currently being used in numerous applications all over the world.

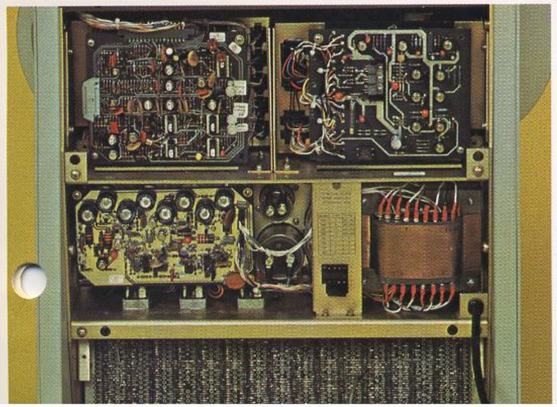
VPR-1 users who require broadcastable quality will find the optional digital time base corrector perfectly suited to their needs. Normal speed, slow-motion, and still-frame output may all be aired with complete confidence.

Options for the time base corrector include a dropout compensator (DOC) and a velocity compensator. The high-quality DOC replaces missing video information with material from the previous correctly phased line. The velocity compensator, among the finest of its kind, enhances the picture even further and insures multiple-generation dubs of consistently superior quality.









Maintenance

The same carefully considered attention to design that makes the VPR-1 a vastly superior performer also makes it easier to maintain than other helical VTR's. Tape guides, capstan, scanner, reel motors, and other major subassemblies are easily accessible and can be quickly removed from the transport. There is no need to separate the mechanics from the electronics.

Much of the point-to-point wiring typically found in helical VTRs has disappeared in favor of state-of-the-art, backplane printed wiring assemblies. Since the same basic VPR-1 is used in all configurations, it can be readily removed from a rack, the portable cabinet, or the console to facilitate maintenance. Every subassembly is easy to reach and easy to check out. PWAs are all easily accessible in the card cage, or on the back of the machine.

The scanner assembly can be readily removed from the transport, if necessary. The entire assembly is dynamically balanced in two planes. Heads can be removed in seconds. A vernier adjustment is provided for setting tip projection to within .0001 inch.

Configurations

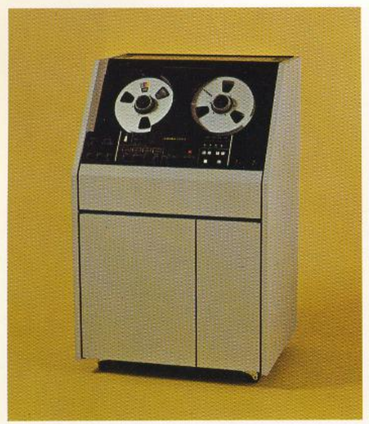
The basic VPR-1 recorder is a self-contained unit. You can mount it in a rack.

Or install it in its own unique cabinet for table-top use. Here, it is vertical.

By reversing the cabinet end-for-end, you can lay it down for horizontal operation.

Load it on our optional **mini-console** with the optional TBC below, and you can easily move it around the studio.

For a more permanent installation, mount it in the optional **studio console.** Now it's a sturdy but mobile system.



Add monitoring to the console and you have a highly sophisticated, full-capability video production recorder. Choose a monochrome or color picture monitor, video waveform monitor, and vector scope display.

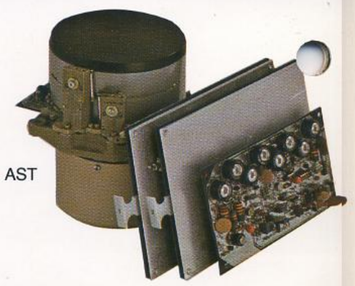
Remember, even if you have the full VPR-1 system in the console with all accessories, you can still remove the basic VPR-1 for location recording.

Accessories

A basic VPR-1 can be combined with any of a wide variety of accessories:

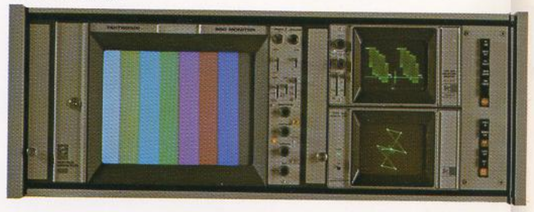
- Remote control
- Burst-lock color
- Dual/stereo audio
  - -cue channel
  - -monitor electronics
- Portable Case
- Mini-console
- Studio console
- Monitoring
  - -Color or monochrome video picture monitor
  - -Waveform monitor
  - -Vector display
- Automatic scan tracking (AST)
- Digital Time Base Corrector

No matter what your application is—from straightforward recording and playback to sophisticated teleproduction or broadcasting—there is a VPR-1 configuration to do the job. The basic VPR-1 can be upgraded as your requirements grow, or you can start now with a fully equipped version of the most dramatic helical VTR ever offered.

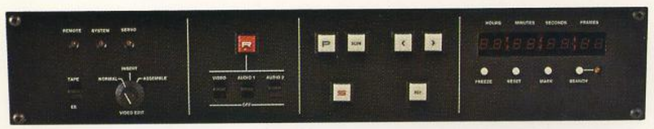


AST

Overhead Monitor Bridge



Remote Control



VPR-1

Mini Console

Studio Console

VPR-1 Preliminary Specifications

VIDEO PERFORMANCE	NTSC 525/60	PAL/SECAM 625/50
Bandwidth	Flat to 4.2 MHz Tolerance ±0.5 dB	Flat to 5.0 MHz, Tolerance ±0.5 dB −3 dB at 5.5 MHz
Signal-to-Noise Ratio (Rohde & Schwarz unweighted, with video bandpass filters in)	−46 dB peak-to-peak video to RMS noise on an interchange basis	−43 dB peak-to-peak video to RMS noise on an interchange basis
Low Frequency Linearity	4% blanking to white (maximum)	4% blanking to white (maximum)
Differential Gain	4% blanking to white (maximum)	4% blanking to white (maximum)
Differential Phase	4° at 3.58 MHz off-tape (maximum)	4° at 4.43 MHz off-tape (maximum)
Chrominance-to-Luminance Delay	50 nsec (maximum)	60 nsec (maximum)
Transient Response (2T sine² pulse and bar)	2% K-factor (maximum)	2% K-factor (maximum)
Moirè	−40 dB color bars 75% amplitude, 3.58 MHz subcarrier	−35 dB color bars 75% amplitude, 4.43 MHz subcarrier
Lockup time	3 seconds from READY mode	4 seconds from READY mode
AUDIO PERFORMANCE		
Frequency Response (400 Hz reference)	Audio: ±2 dB 50 Hz to 15 kHz Cue: +2, −3 dB 50 Hz to 12 kHz	Audio: ±2 dB 50 Hz to 15 kHz Cue: +2, −3 dB 50 Hz to 12 kHz
Signal-to-Noise Ratio	Audio: −55 dB from peak operating level Cue: −45 dB from peak operating level	Audio: −55 dB from peak operating level Cue: −45 dB from peak operating level
Distortion (Measured at 1000 Hz) @ 117 nWb/m oper. level @ 234 nWb/m oper. level	 1% 3%	 1% 3%
Depth of Erasure	−70 dB	−70 dB
Wow & Flutter (NAB unweighted)	.15% (audio channel)	.15% (audio channel)
SIGNAL INPUTS		
Video (75 ohms impedance)	0.5 to 2.0 volts peak-to-peak	0.5 to 2.0 volts peak-to-peak
Reference (75 ohms impedance) Composite Color Signal: Composite Sync Signal:	 0.5 to 2.0 volts peak-to-peak 0.7 to 4.0 volts peak-to-peak	 0.5 to 2.0 volts peak-to-peak 0.7 to 4.0 volts peak-to-peak
Audio Input Amplitude:	 −16 to +24 dBm (line) −34 dBm (.2mVrms) (mic)	 −16 to +24 dBm (line) −34 dBm (.2mVrms) (mic)
Input Impedance:	Standard 100k ohms balanced or unbalanced. 200 ohms mic input on cue channel	Standard 100k ohms balanced or unbalanced. 200 ohms mic input on cue channel
OUTPUT SIGNALS		
Video (75 ohms impedance) Composite Video Signal:	1.0 volt peak-to-peak	1.0 volt peak-to-peak
Audio and Cue	+8 dBm nominal, corresponding to 0 VU. +28 dBm maximum	+8 dBm nominal, corresponding to 0 VU. +28 dBm maximum
GENERAL		
Record Time	90 minutes	90 minutes
Shuttle Time	3 minutes maximum, 1 hour reel end-to-end	3 minutes maximum, 1 hour reel end-to-end
Tape Timer Accuracy (Control track updated)	+1 frame over full length of tape with continuous control track	+1 frame over full length of tape with continuous control track
Tape Speed	9.6 inches per second	9.45 inches per second (24.00 cm/sec)
Video Writing Speed	1000 inches per second	833 inches per second (2115.8 cm/sec)
Carrier Mode	7.06 - 10.0 MHz High-Band Color	7.16 - 9.3 MHz High-Band Color

PHYSICAL DIMENSIONS

	Rack Mount	Standalone Vertical	Standalone Horizontal	Mini-Console	Studio Console	Studio Console w/Monitor Bridge
Height	24.5 in 622 mm	25.5 in 648 mm	20.0 in 508 mm	51.5 in 1308 mm	52.5 in 1334 mm	70.5 in 1791 mm
Width	19.0 in 483 mm	19.25 in 489 mm	19.25 in 489 mm	21.5 in 546 mm	33.0 in 838 mm	33.0 in 838 mm
Depth	11.5 in 292 mm	16.0 in 406 mm	25.0 in 635 mm	23.0 in 584 mm	27.25 in 692 mm	27.25 in 692 mm
Weight	115 lb 52.16 kg	130 lb 58.97 kg	130 lb 58.97 kg	230 lb 104.33 kg	400 lb 181.44 kg	535 lb 242.67 kg

TEMPERATURE & HUMIDITY		
Temperature Humidity	0 - 45°C 10% - 90% RH (non-condensing)	0 - 45°C 10% - 90% RH (non-condensing)
POWER INPUT		
Prime Power Frequency Input Voltages Input Current (Without Monitor Bridge)	50 & 60 Hz, single phase 100/110/120/130 Volts AC, ±10% rms 200/220/240/260 ±10% Volts AC 115 vac Nominal 5A 230 vac Nominal 2.5A	50 & 60 Hz, single phase 100/110/120/130 Volts AC, ±10% rms 200/220/240/260 ±10% Volts AC 115 vac Nominal 5A 230 vac Nominal 2.5A

Specifications subject to change without notice.

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