

AMPEX

PROFESSIONAL
VIDEOTAPE
RECORDER

VPR-2B



VPR-2B: The World's Most Popular 1-Inch VTR

The success of the Ampex VPR-2B originates from the company's more than 25 years of dedicated service to the television broadcasting industry. The technology of the VPR-2B is state-of-the-art. It offers a full complement of unique performance and editing features, including slow motion in both forward and reverse.

The VPR-2B is lightweight, easy to use, and is adaptable to either studio or mobile environment.

Ampex No. 1 in VTRs

Ampex introduced the first practical videotape recorder in 1956, and the company has been a leader in recording technology ever since. The VPR series, unveiled in 1978, rapidly became the most widely acclaimed line of VTRs in the broadcast industry. Now with the VPR-2B, the excellence continues.

Popular acceptance of the Type "C" format in the world of entertainment, industry and education has increased worldwide use of the Ampex VPR series recorders.

Features:

- SMPTE/EBU 1-inch Type "C" Format
 - Small, compact
 - Rugged, reliable transport
 - A full line of VTR configurations—from tabletop and rackmount to full studio console with monitor bridge
 - Lightweight for easy mobile use on location
 - Frontal access for major mechanical assemblies and servicing of printed circuit boards behind a convenient hinged panel
 - Flexible and accurate editing
 - Built-in editor with automatic search-to-cue to add more creativity, and for simpler and faster production work
 - Individually replaceable video and sync head assemblies
 - Full remote control capability
 - Optional AST* automatic scan tracking system for fully
- variable speed (normal, slow motion, reverse slow motion and still field playback with no picture breakup)
 - "True Frame" for playback of both fields during stop mode
 - Time Code Reader/Generator accessory
 - Character Generator accessory
 - Optional Sync track
 - Optional 4th audio track (EBU Format "C")
 - Fully servo-controlled tape tension with direct drive DC servo motors
 - Tape speed override for editing or network delay sync
 - Standard color framing and autochroma

The VPR-2B is part of a family of Ampex products and accessories including the VPR-20 portable VTR, the TBC-2B digital time base corrector, the SMC-100 slow motion controller, the STC-100 multipoint search-to-cue and helical production editors.

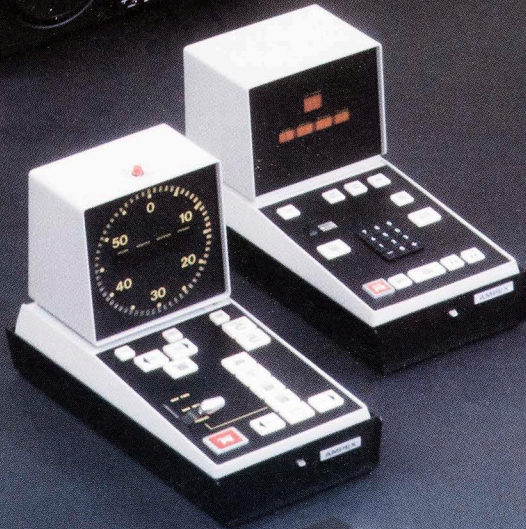
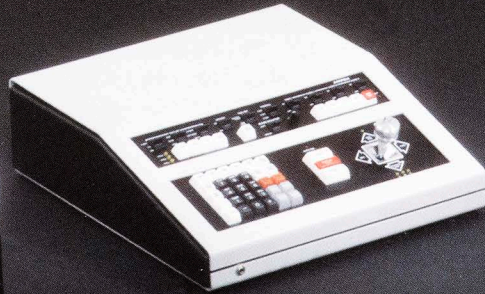
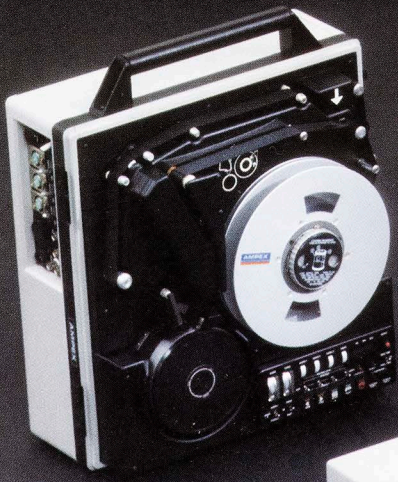
*™ Ampex Corporation



The image shows three trophies against a black background. On the left are two Emmy Awards, which are golden statues of a woman holding a globe. The base of the leftmost Emmy has an inscription: "To Ampex Corporation for the development of the Automatic Scan Tracking System for helical video tape recorder". The base of the middle Emmy has an inscription: "To Ampex Corporation for the development of the Automatic Scan Tracking System for helical video tape recorder". On the right is a silver trophy with a large stylized 'A' and 'V' on top, mounted on a rectangular base. The base has an inscription: "THE ROYAL TELEVISION SOCIETY GEOFFREY PARR AWARD".

Acknowledged Excellence

The Ampex VPR series has received overwhelming approval by worldwide professional video broadcasting executives and engineering personnel. In 1979, Ampex received two "Emmy" awards. One exclusive Emmy was bestowed for the Ampex AST automatic scan tracking system; the second was a joint honor for developing SMPTE Type "C" Format VTRs. The Royal Television Society of the U.K. also presented Ampex its 1979 Geoffrey Parr award for work accomplished by the AST development team.



VPR-2B: Frame-Accurate Editing Made Simple

The VPR-2B built-in editor offers a wide range of capabilities developed through years of field experience. As you would expect from Ampex, no technical detail or operator need has been overlooked. The VPR-2B's video timing is precise, and the audio erase and bias turn-on and turn-off are programmed as well to precisely time all editing functions.

Film Style Video

With the TBC-2B digital time base corrector, you get high-speed viewing — both forward and backward, plus frame-by-frame viewing right down to stop motion for film-style frame selection. For years, film editors have been able to continually view the picture at all speeds for quick, accurate decisions. Now, this "artistic license" is available with the same speed and accuracy using the VPR-2B.

Quick Access

The extremely rapid acceleration of the VPR-2B's transport permits fast

access to required points for editing decisions and recueing.

Highly Accurate Editing

The internal editor can be programmed for easy entrance and exit edits by use of the tape timer system. Since this system uses electronic memories, it does not tie up an audio channel for cue tones, and it leaves all audio channels available for normal use. Because of the built-in control track update system of the tape timer, editing is frame accurate with the VPR-2B, even without the complexities of time code and time-consuming "edit trims".

After initial entrance and exit points have been selected, they can be rehearsed without affecting the recording on the tape. If it is necessary to adjust these points, it's as simple as re-entering the editor cue point. The DC servo-controlled transport allows the operator to manually move the tape, if desired, by jogging the take-up reel and observing the picture film-style. Any new position is entered by pushing the entrance or exit pushbutton.

Unique Update System

If edit points are being determined

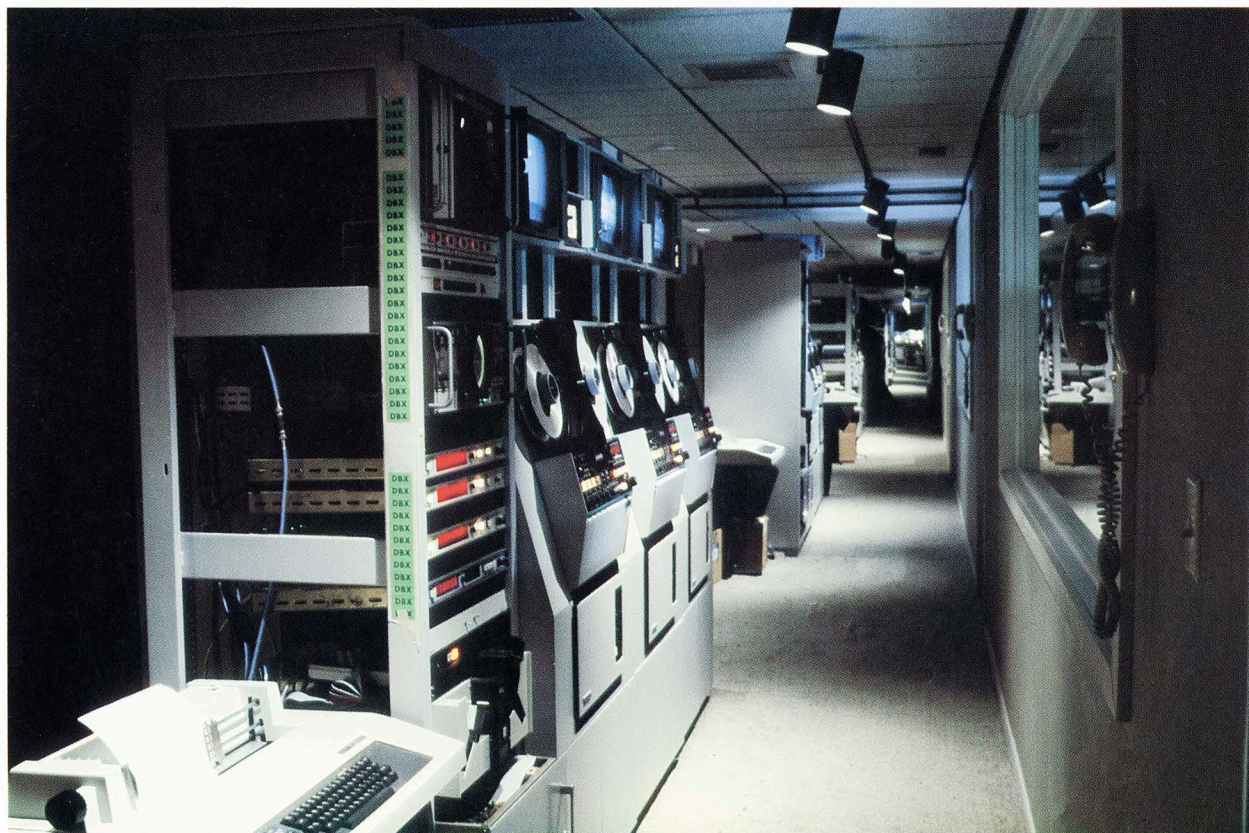
while reading time code off the Audio 3 and using the time code reader/generator accessory, then these points also are frame accurate. The time code reader uses a unique system of update that maintains frame accuracy from full shuttle speed down to still.

Standup Convenience, Too

For standup editing, each VPR-2B has a multi-VTR 4-wire interconnect system. When using this system, two or more VTRs can be connected in parallel. The record VTR is selected and sends control commands to the play VTRs. This provides a simple yet versatile means of controlling multi-machine edits from a single location.

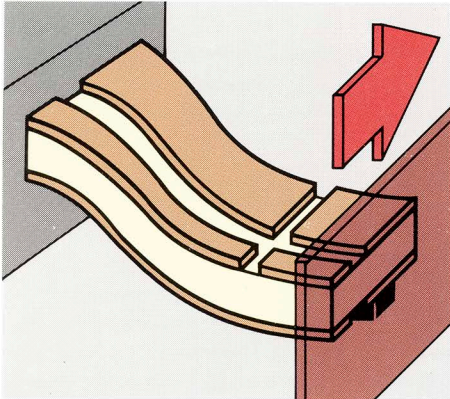
Interfaces With Ease

The remote interface connector of the VPR-2B offers the necessary access to input and output signals for external editing systems. The VPR series has proven that it interfaces with any editing system easily and effectively. Transport controls, timer display, editing mode selector, record enable functions, and tape speed override are just indications of the type of functions available.



AST — Variable Slow Motion And Still-Frame

Special video effects are demanded by today's successful production facility. The VPR-2B has become a necessity to such companies whose



clients insist upon and expect uncompromised quality.

What sets the VPR-2B apart from the competition is an exclusive Ampex-developed feature called automatic scan tracking, or AST®. First introduced in 1976, AST delivers broadcastable pictures in continuously variable forward and reverse slow motion and still-frame without bothersome noise bars or annoying transients. In short, AST makes the VPR-2B the most refined VTR in teleproduction use today.

How AST Works

Automatic scan tracking employs a flexible bi-morph strip made of piezoelectric material. As the playback head scans a field, the strip curves and recurves electrically over the entire deflection range. The result is optimum head-to-tape contact and a no-compromise picture quality throughout the VPR-2B's play range

which includes forward and reverse slow motion and still-frame or still-frame playback.

AST never needs to be manually activated. It is automatically engaged whenever the machine is in PLAY.

Picture-Perfect Slow Motion In Both Directions

The VPR-2B can play at speeds from $-1/4$ to $+1 1/4$ times normal. Within this range, AST delivers continuous, smooth, and disturbance-free slow motion. Direction and speed can be changed easily. The picture remains stable with no adverse effect at the transition point or during the new play mode.

VPR-2Bs used in conjunction with Ampex SMC-100 slow motion controllers and Ampex STC-100 search to cue units make for remarkably flexible systems that are ideal for sports coverage or other production applications.



Simplified, Rapid Editing

1. Identifying the entrance point is as simple as pushing a button.
2. Once selected, the VPR-2B will search to the pre-roll point by pushing the search button.
3. Performing the edit is achieved by pushing both play and record pushbuttons.



VPR-2B: Designed For Flexible, Easy, And Efficient Operation

Smaller Size

The VPR-2B is extremely compact. The tabletop model is just 25.5 inches high, 19.2 inches wide, and 16 inches deep. Standard equipment rack mounting is possible, easy, and practical. In fact, two machines and two TBC-2B digital time base correctors can easily fit into a 19-inch rack.

Flexible Configuration

The VPR-2B can be set up any number of different ways: in a standard equipment rack, on a table top, as a mini console, a studio console, or as a full studio console complete with monitor bridge.

Lightweight

Weight is a key factor in both studio and mobile situations. In rack mount configuration, the VPR-2B weighs only 120 pounds. In tabletop form, 135 pounds. And as a full studio console with monitor bridge, it is just 540 pounds.

Low Power Consumption

The tabletop VPR-2B uses only 640 watts of power with all accessories installed. Provisions are made for operation on a broad range of line voltages.

Designed For The Operator

Easy Threading

Quick and simple. Reliable reel lockdowns, a straight-forward tape path, and convenient tape guides all help to make tape threading easy.

Convenient Controls

You'll appreciate the VPR-2B's uncluttered control panel. Pushbuttons and switches are clustered logically according to function so there's less chance for a mistake. Access to secondary controls is easily gained through a convenient swing down front panel.

Non-Standard Modes Warning

The machine is equipped with a "System" light-emitting diode on the

control panel to alert the operator of non-standard operation. Amber LEDs are located with the secondary controls to guide the operator to corrective action.

Fault Warning

If a servo fault occurs, a red servo LED blinks a warning. Other red LEDs located with the secondary controls help to pinpoint the trouble spot.

Slow Motion

Continuously variable playback from 1/4 reverse to 1 1/4 forward play speeds is possible with Ampex's AST and the TBC-2B digital time base corrector. Breakup-free video is assured through any combination of play, slow, and stop mode transitions.

Search To Cue

Rapid and frame-accurate search to cue is made possible by advanced



tape timer circuitry and transport approach ballistics control. Conveniently selectable prerolls of zero, 33 frames, and 5 seconds (NTSC)/7 seconds (PAL/SECAM) are provided.

Tape Timer

An exclusive design providing control track updating of tape time information yields a tape timer accuracy of ± 1 frame with continuous control track on tape.

Editor

Simple, rapid and frame-accurate editing capability results from the combination of a frame-accurate tape timer, precise search system, AST, and 'human engineered' editor controls.

Color Framing

The VPR-2B provides swift and

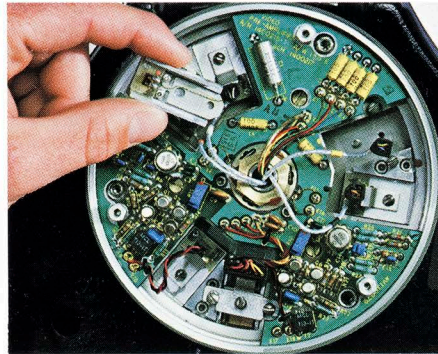
consistent color framing for both edit record and playback.

Autochroma

This standard feature automates the playback equalization adjustment to further enhance machine operation.

Audio 1/Audio 2 Flexibility

For post-production purposes, the



VPR-2B offers simultaneous recording of one track and monitoring of the other, all controlled from the main control panel.

Audio Spot Erase

The combination of an audio spot erase function and the machine's unique capability of manual tape motion control provides the ability to erase periods as short as one syllable. This feature is available on each audio channel.

EBU Audio

EBU (PAL/SECAM) VPR-2Bs can be optionally equipped with a high quality fourth audio channel.

Simplified Maintenance

Individual Replaceable Heads

When a video or sync head needs replacement, only the defective head is changed, and a screwdriver is the only tool needed. The procedure takes less than five minutes.

Electronics Design

Most of the VPR-2B's electronics are on printed circuit boards located below the main control panel. Power electronics are easily accessed at the rear of the VPR. Ampex makes extensive use of digital logic circuitry to improve recorder reliability and minimize adjustments. Convenient access and extensive application of jumpers and test points facilitate required maintenance and any necessary troubleshooting.

Mechanical Design

The VPR-2B's elegantly simple mechanical system is built upon a tough, precision-machined, single unit transport casting. Virtually all mechanical components are precisely indexed to the front of this casting, providing easy access for maintenance.

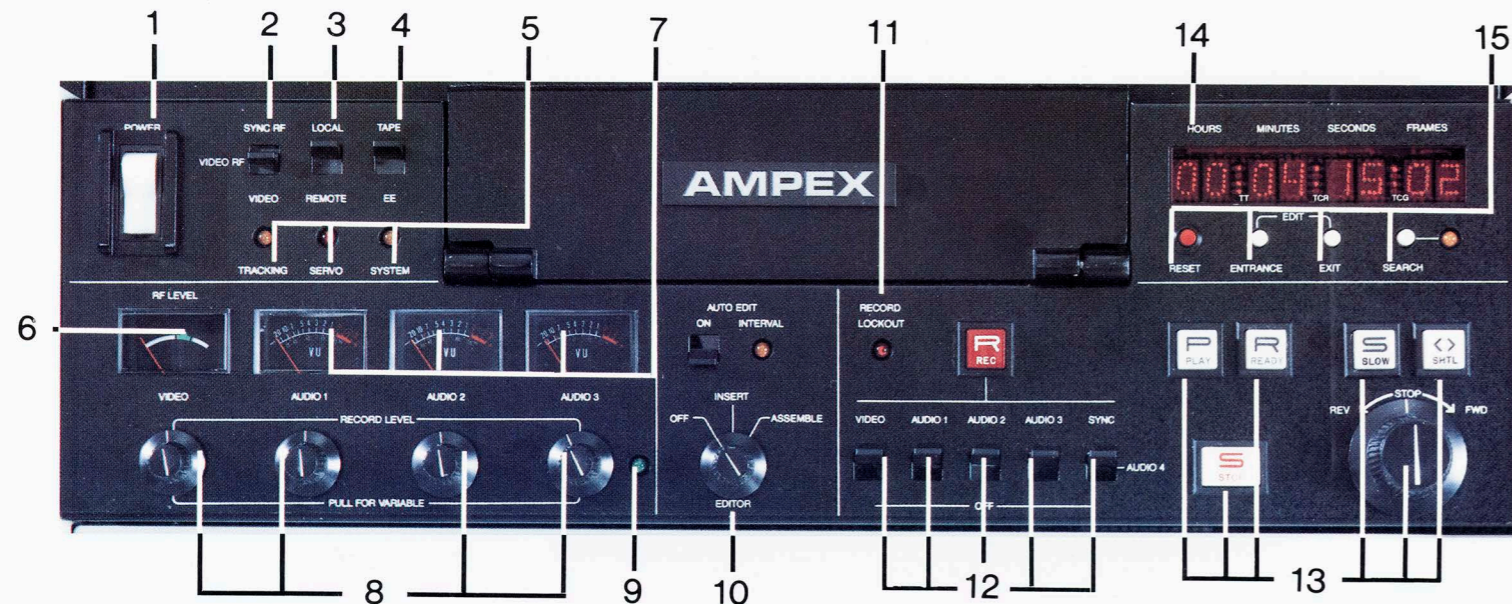
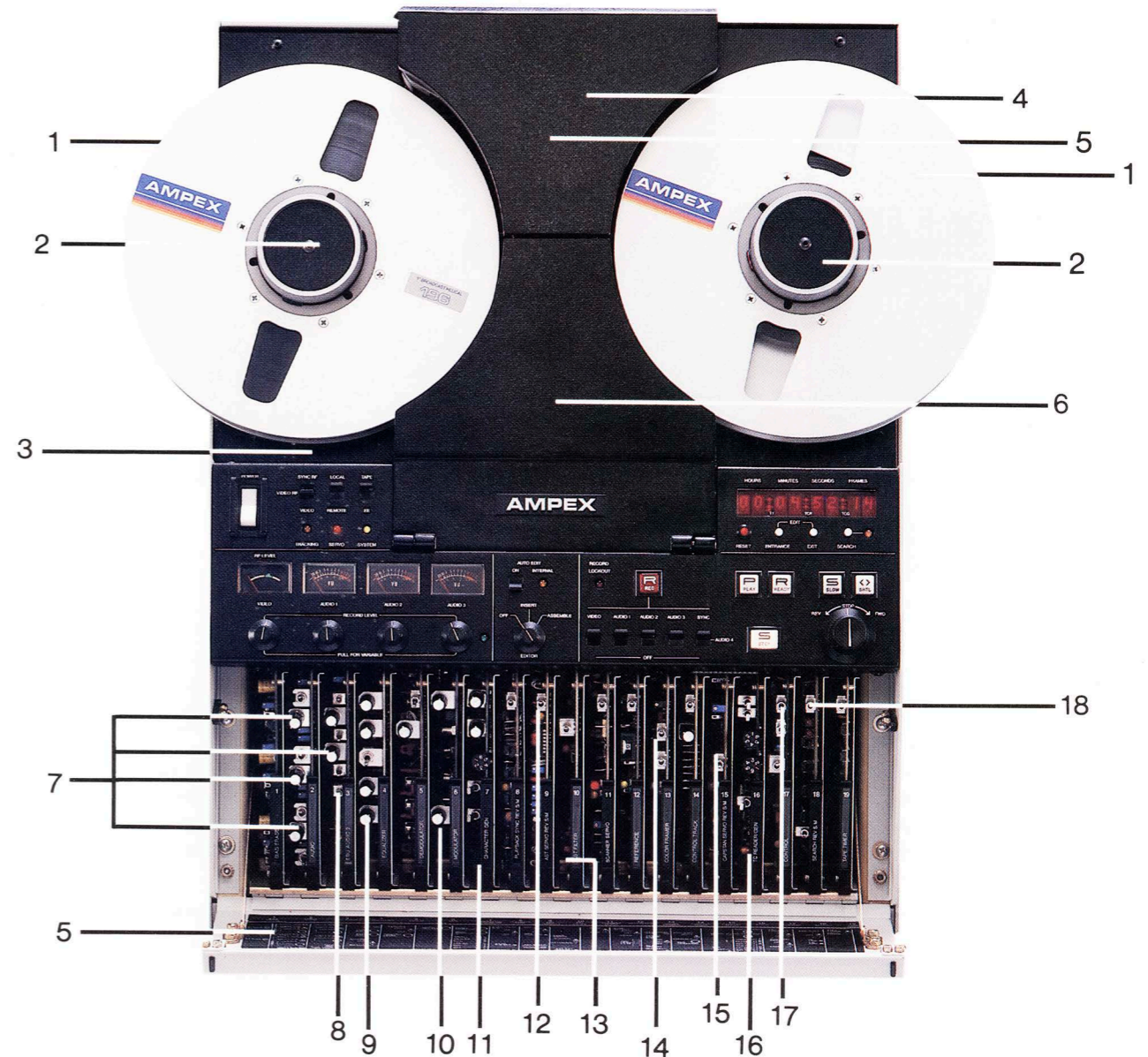
Remote Control

For added flexibility, the VPR-2B can be remoted in several ways. A remote control panel option puts all the machine's functions at your fingertips—even when it's sitting 300 feet away. Ampex also manufactures a changeover unit accessory (RCO-2) which allows the VTR to be switched to as many as three remote control devices.



VPR-2B: You Can Find Your Way Around With Ease

- 10½ Inch Reels — a full 90 minute program plus adequate overlap may be recorded on standard tape.
- Hold Down Knobs — Precision, twist-type, hold down knobs secure reels to the turntables for maximum stability and safety.
- Head Hour Meter — Digital display meter for logging head hours.
- EOT Sense — This end of tape sensor stops capstan, reel motor and scanner rotation when there is no tape threaded on the transport.
- Operating Controls — a threading diagram and complete diagram of operator controls are located inside the hinged scanner and electronics bay covers.
- Scanner — Scanner assembly runs quietly, protected from accidental external damage during operation.
- Audio Playback Level — These 3 controls and switches (or 4 on a 4 channel system) normally are used in the unity position. For variable control with the knob, the variable position is selected on the switch.
- Meter Switch — On a 4 channel system the right hand meter can be switched for selection of Ch 3 or Ch 4 audio level.
- DG and Equalization — On PWA No 4 video and sync, differential gain and equalization controls are provided. Autochroma can also be on or off.
- Video/Sync Optimize — On PWA No 6 video and sync RF drive controls are provided for record optimization.
- Character Generator Option — Refer to separate brochure for controls.
- AST On/Off — Switch on PWA 9 permits AST servo correction to be on or off.
- True Frame Switch — Allows selection of either a field or a frame playback in stop mode.
- Color Frame Switch — Three positions: Off at all times, On in edit mode, On at all times.
- Tape Speed Override (TSO) — This momentary 3 position switch permits 15% overspeed or underspeed for synchronization.
- Time Code Reader/Generator — Refer to separate brochure for controls.
- Master Record Lockout — When On, inhibits recording of video or any audio channel at all times.
- Preroll Selector — Three position switch: 5 or 7 second preroll for editing; Off; and 33 frame preroll (for slow motion and synchronous applications.)



Control Panel Functions

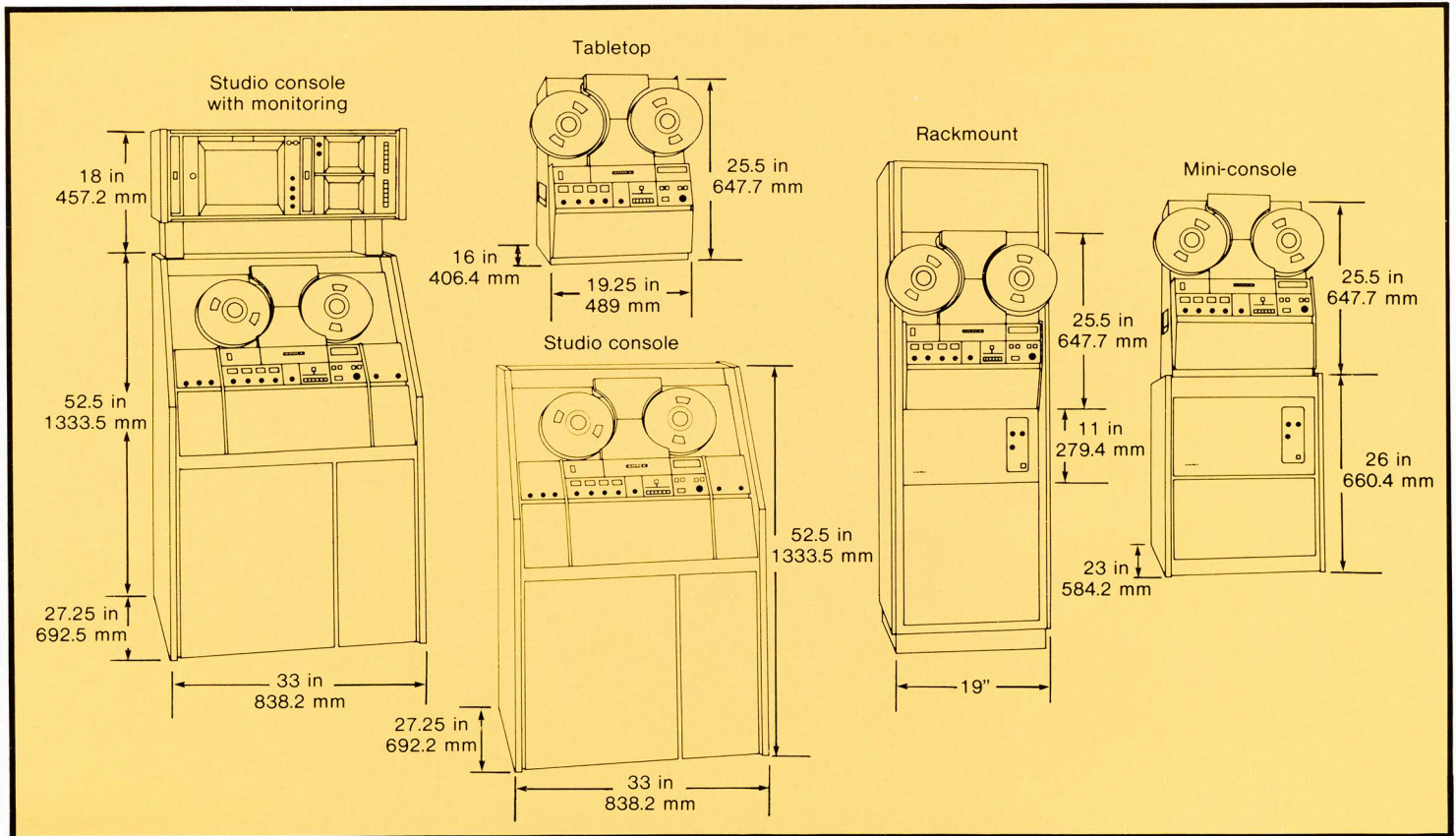
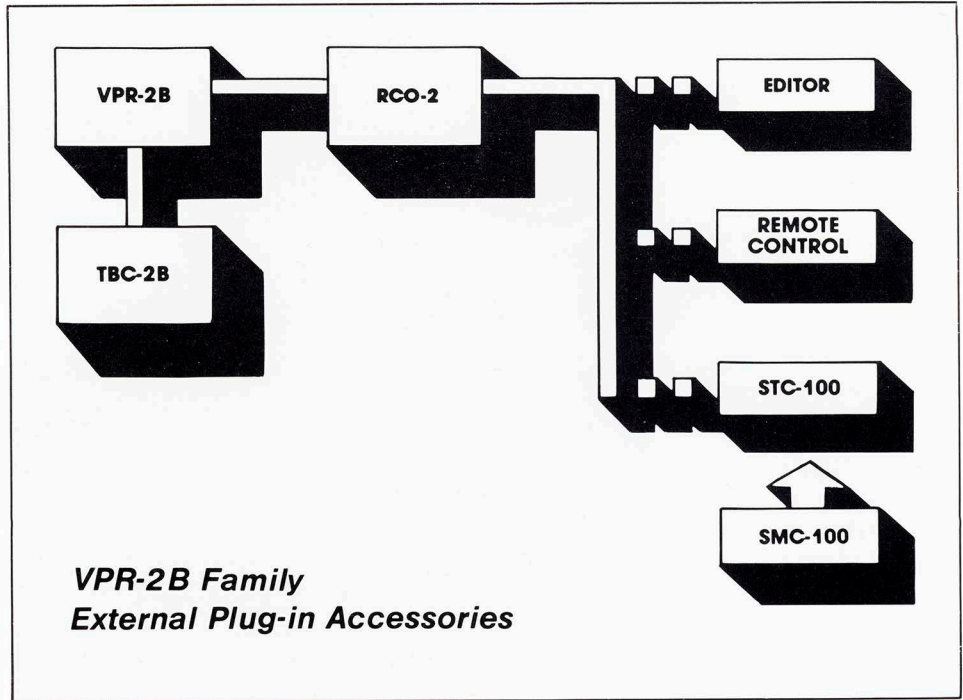
- Power On/Off Switch
- Video/RF Meter Switch
- Local/Remote Switch
- Tape/EE Switch
- Diagnostic Indicators
- RF/Video Meter
- Audio Level Meters
- Video In/Audio In Level Controls
- Audio Ch 3/Ch 4 Meter Indicator
- Edit Mode Selector
- Record Lockout Indicator
- Record Inhibit/Enable Switches
- Transport Controls (Record, Play, Ready, Slow, Shuttle, Stop, Slow/Shuttle Knob)
- Time Display
- Timer Related Controls: Reset to Zero, Entrance Edit Select, Exit Edit Select, Search-to-Cue

VPR-2B: It's The Most Versatile Production System Available Today.

A VTR Of Many Faces

The highly flexible VPR-2B can get the job done for you no matter where or how you need it. The basic VTR system is available in an array of different configurations. It may be rack-mounted in its smallest configuration, taking up a minimum of space. This is ideal for a mobile van or crowded studio. The VTR can be housed in a convenient "tabletop" configuration. Or it may find use as a "mini-console" on a roll-around cart that moves easily and quickly to any location in a busy studio or on remote assignments.

The VPR-2B is available also as a top-of-the-line studio console and the optional monitor bridge can be added, too. This system can include picture monitoring, waveform monitoring and vector display. Change from one configuration to another is quick, easy and economic.



Options And Accessories

AST

This option provides automatic tracking of previously recorded tracks. The standard video playback head is replaced with an AST playback head capable of electro-mechanical deflection. When used with a TBC-2B, AST permits continuous "slow motion", still field or frame playback, and video jogging, without picture disturbances, as well as high quality video playback during recording for video record confidence.

Sync Channel

An option to permit all vertical sync information to be recorded according to the SMPTE/EBU Type "C" formats. The sync channel is a full video bandwidth channel allowing recording and playback of the full video synchronizing information when required.

Four-channel Audio Kit

This EBU option provides a fourth high quality audio channel in the track space normally allotted to the sync channel.

Color Corrector

A rack-mounted add-on that provides viewable color video for record confidence and color slow motion for off-line editing. This corrector can be used for color playback where a time base corrector is not required.



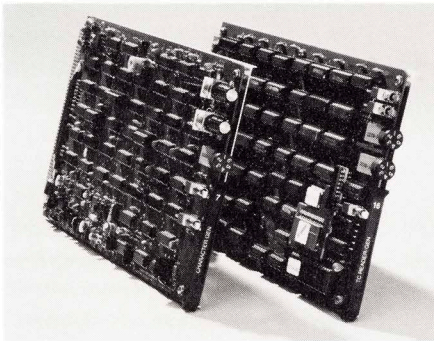
STC-100 Search to Cue

A compact, highly portable multi-point search-to-cue that plugs

directly into the VPR-2B with the ability to recall up to 99 auto cue points or 99 still recordings for quick, easy access. The STC-100 also has the ability to store its entire memory on tape for recall by another STC-100 at another location.

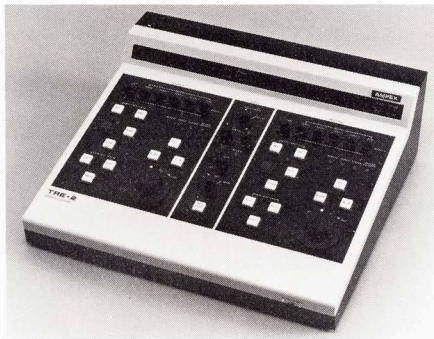
Time Code Reader/Generator

This accessory is a single, plug-in PWA that provides time code generation and reading on audio track 3. In addition, a second tape timer is added to the VPR-2B system.



Character Generator

Plug-in option to provide the VPR-2B with an internal capability for displaying characters selected on the time code reader/generator in three different sizes on the picture monitor.



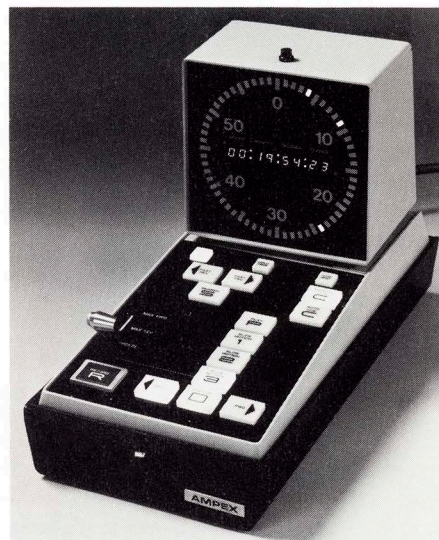
TRE-2 Editor

A low-cost editing system or dual remote control panel designed for the small or mid-size editing suite. Capable of interfacing two VPR-2Bs and providing conveniences such as search to cue and auto edit. Dual timers display frame-accurate tape location from either control track or SMPTE time code reference.

RCO-2 Remote Changeover Unit

Allows a VPR-2 or VPR-2B to be switched to any one of a maximum of three remote control devices. The

RCO-2 may be remoted up to approximately 150 feet from the VTR and may also be remote controlled.



SMC-100 Slow-Motion Controller

A remote controller that provides versatile speed control on all VPR series video recorders equipped with the optional AST system. The SMC-100 controls such operations as normal speed playback, variable slow motion in forward and reverse, freeze frame, variable speed shuttling, and an automatic cue point.

TBC-2B Digital Time Base Corrector

Provides a broadcast quality video signal from the VPR-2B during normal, slow motion and still-frame playback. TBC-2B offers optional features such as one-line dropout compensator to replace missing video information with video from a previous correctly phased line, and a velocity compensator to reduce time-base errors on a line-by-line basis. An exclusive "second order" velcomp reduces errors within a line for even better video performance, and a color processor for operation with AST as well as 1/2-inch and 3/4-inch VTRs.



Remote Control Panel

An accessory offering remote control of all VPR-2B transport, editor, set-up and control functions at distances up to 300 feet from the VTR (interconnect cable separately supplied).

VPR-2B SPECIFICATIONS

VIDEO AND SYNC	NTSC 525/60	PAL/SECAM 625/50
Bandwidth	Flat to 4.2 MHz \pm 0.5 dB -3 dB at 5.0 MHz	Flat to 5.0 MHz \pm 0.5 dB -3 dB at 6.0 MHz
S/N (Rhode & Schwarz unweighted with bandpass filter) using TBC-2B	-46 dB peak-to-peak video to RMS noise on interchange basis	-43 dB peak-to-peak video to RMS noise on interchange basis
LF Linearity	2% blanking to white (maximum)	2% blanking to white (maximum)
Differential Gain	4% blanking to white (maximum)	4% blanking to white (maximum)
Differential Phase (40 IEEE units of subcarrier through TBC-2B)	4° at 3.58 MHz off-tape (max)	4° at 4.43 MHz off-tape (max)
Chrominance/Luminance Delay	20 n sec (maximum)	25 n sec (maximum)
2T sin ² Pulse & Bar	1% K-factor maximum	1% K-factor maximum
Moire	-40 dB color bars 75% amplitude 3.58 MHz subcarrier	-36 dB color bars 75% amplitude 4.43 MHz subcarrier
AUDIO (Channels 1, 2, & 3)		(4 CHANNEL SYSTEM)
Frequency Response (400 Hz Ref) 100 nWb/m reference level	\pm 1 dB 500 Hz to 10 kHz \pm 2 dB 50 Hz to 15 kHz	\pm 1 dB 500 Hz to 10 KHz (Ch 4) \pm 2 dB 50 Hz to 15 KHz
S/N (with respect to 8 dB above reference level)	-56 dB Audio 1 and 2 -50 dB Audio 3 (Note 1)	-55 dB (Ch 4)
Distortion (measured at 1 KHz) @ 100 nWb/m reference level (+8 dBm) @ 251 nWb/m peak level (+16 dBm) With predistortion at 200 nWb/m (+14 dBm)	1% maximum 3% maximum 1% maximum	No predistortion A3
Depth of erasure on its own recording	-70 dB	
Wow & Flutter	0.08% NAB unweighted	0.1% DIN weighted
Playback Crosstalk (Audio 1 & 2) 1 KHz referenced to +8 dBm or 100 nWb/m	-50 dB maximum	
SIGNAL INPUTS		
Video Input (75 ohm) BNC	0.5 to 2 volts peak-to-peak	
Ref Video (75 ohm) BNC Comp sync Comp video	0.7 to 4 volts 0.5 to 2 volts	
Audio line inputs	-24 to +24 dBm	-24 to +24 dBm (Ch 4) -24 to +20 dBm (Ch 3)
Impedance	balanced; 50 K ohm 50 Hz to 15 kHz	
Microphone input (Audio 3 only)	-60 dBm at 200 ohms maximum -20 dBm	
SIGNAL OUTPUTS		
Video Output (75 ohm) BNC	1.0 Volt peak-to-peak	
Audio Line Outputs (Channels 1, 2, & 3)	+8 dBm nominal; balanced +25 dB maximum	+8 dBm nominal; balanced +25 dB maximum
Impedance	less than 30 ohms	
Headphone Audio Monitor (Audio 1 & 2 only)	0 dBm to drive 600 ohms	
Audio Meter Circuits jumper selectable VU or PPM		
Conditioned Time Code Output (Audio 3)	+10 dBm 600 ohms balanced	
GENERAL		
Record Time	92 minutes nominal; 4500 feet of tape on 10½" reel	
Shuttle Time	less than 2½ minutes for 60 minute tape	
Tape-Timer Accuracy (Control track updated)	\pm 1 frame with continuous control track	
Tape Speed	244 \pm 0.5 mm/sec 9.606 \pm 0.02 in/sec	239.8 \pm 0.5 mm/sec 9.44 \pm 0.02 in/sec
Video Writing Speed	1009 in/sec nominal	842 in/sec nominal
FM Carrier Frequencies	7.9 MHz blanking 10.0 MHz peak white	7.68 MHz blanking 8.9 MHz peak white
Audio Equalization	15 microseconds 3180 microseconds	15 microseconds
Lock-up time from Ready Mode	3 sec	4 sec

PHYSICAL DIMENSIONS

	Rack Mount	Table Top	Mini Console	Studio Console	Studio Console w/Monitor Bridge
Height	24.5 in 622.3 mm	25.5 in 647.7 mm	51.5 in 1308.1 mm	52.5 in 1333.5 mm	70.5 in 1790.7 mm
Width	19.0 in 482.6 mm	19.25 in 489.0 mm	21.5 in 546.1 mm	33.0 in 838.2 mm	33.0 in 838.2 mm
Depth	15.0 in 381 mm	16.0 in 406.4 mm	23.0 in 584.2 mm	27.25 in 692.2 mm	27.25 in 692.2 mm
Weight	120 lb 55 kg	135 lb 62 kg	235 lb 107 kg	405 lb 184 kg	540 lb 245 kg

TEMPERATURE & HUMIDITY

Temperature	0-45°C
Humidity	10%-90% RH (non-condensing)

POWER INPUT

Power Line Frequency	50 & 60 Hz, single phase
Input voltages	100/110/120/130 Volts AC \pm 10% 200/220/240/260 Volts AC \pm 10%
Input Current (Table Top)	115 vac Nominal 5.5A 230 vac Nominal 2.8A
(Lowboy console TBC and color monitor bridge)	115 vac Nominal 10.5A 230 vac Nominal 5.5A

Note 1: Audio 3 channel has wide-band capability for Time Code

Note 2: All specifications are based on Ampex 196 Tape or equivalent.

Ampex reserves the right to make product and specification changes at any time without notice.

U.S. Field Offices In: CALIFORNIA, Cupertino (408) 255-4800; Glendale (213) 240-5000 • GEORGIA, Atlanta (404) 451-7112 • ILLINOIS, Arlington Heights (312) 593-6000 • KENTUCKY, Louisville (502) 239-6111 • MARYLAND, Bethesda (301) 530-8800 • NEW JERSEY, Allendale (201) 825-9600 (in New York 736-6118) • OHIO, Dayton (513) 254-6101 • TEXAS, Carrollton (214) 960-1162 • UTAH, Salt Lake City (801) 487-8181 • WASHINGTON, Tukwila (206) 575-0156

International Offices and Representatives: ARGENTINA, Buenos Aires 46-2776, 46-7690, 45-6823 • AUSTRALIA, North Ryde (02) 887-3333 • BELGIUM, Nivelles 067/22.49.21 • BRAZIL, Rio de Janeiro (021) 274-8122 • CANADA, Bramalea (416) 791-3100 • COLOMBIA, Bogota 236-7855 • FRANCE, Paris 270.55.00 • GERMANY (FEDERAL REPUBLIC), Frankfurt (Main) 60580 • HONG KONG, Kowloon 3-678051-3, 3-7210323-4 • ITALY, Rome (06) 54-69-91 • JAPAN, Tokyo 03-264-7331 • MEXICO, Mexico City 539-68-70/71/72 • NETHERLANDS, Utrecht 030-61.29.21 • SINGAPORE, Singapore 2239241 • SPAIN, Madrid 20.29.141 • SWEDEN, Sundbyberg 08/28 29 10 • SWITZERLAND, Fribourg 037-81.31.11 • UNITED KINGDOM, Reading, England (0734) 875200 • VENEZUELA, Caracas 782-32-55

AMPEX

Ampex Corporation, Audio-Video Systems Division
401 Broadway
Redwood City, California 94063

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