

# VPR-2

VIDEO  
PRODUCTION  
RECORDER



AMPEX

# VERSATILITY: IN USE

# EXCEL

## Design Features

- State of the art design for maximum performance from the SMPTE Type "C" format.
- High configuration versatility allows a wide variety of uses.
- Exceptionally rugged and reliable transport.
- Maximum frontal access ease of mechanical and electronic areas.
- Tape speed override feature for edit or network delay sync.
- Servo controlled tape tension.
- Optional sync track.
- High-band color.
- Individually replaceable video/sync head assemblies.
- Built-in color framer and autochroma standard.

## Operational Features

- Offers all optional features provided for in the SMPTE type "C" format.
- Remote control panel.
- Built-in electronic diagnostic systems.
- Extremely flexible editing capability.
- Ease of interface to external editing system.
- Editing accuracy of  $\pm 1$  frame.
- Integral backspace editor.
- Usable "picture in shuttle" when combined with Ampex TBC-2 Digital Time Base Corrector.

## AST\* Automatic Tracking System

- Fully variable speed playback from normal speed to still-frame, with no picture break-up.
- Shuttle control provides full range of speeds from fast forward and rewind down to frame-by-frame "jogging."

The VPR-2 from Ampex takes the refinement of 1" helical VTRs another important step forward. This new system offers broader versatility and greater creative potential than has been available before in a machine of its type. Performance quality to satisfy any need is blended with an even wider array of operating features for more creative freedom. Wider application is now practical because the VPR-2 incorporates the SMPTE Type "C" 1-inch helical format.

Proven and perfected systems join with added new electronics in the VPR-2. To the proven transport design, shown to be ruggedly reliable in the VPR-1, an even greater number of high performance features have been added to benefit production versatility and editing ease. Even the magic of the AST\* Automatic Tracking System has been expanded.

The VPR-2 heads a family of superior video products from Ampex. Together with a fully compatible portable recorder, the VPR-20, and an unmatched digital time base corrector, the TBC-2, you have a complete solution to high performance, cost effective video production equation.



# LENCE: IN DESIGN

# FLEXIBILITY: IN PRODUCTION

## AST Automatic Tracking System A system within a system offers unequaled capabilities

When the Automatic Scan Tracking feature is combined with the basic designed-in excellence of the VPR-2, it becomes clear that this is the 1" helical broadcast VTR with the most to offer in creative video production potential. With the exclusive AST System option, the VPR-2 provides more important operational benefits for video acquisition, production and editing control than any other available 1-inch video recorder.

The AST servo system employs a special video head which moves in two planes simultaneously through a sophisticated micropositioning servo system. This technique allows the head to be electronically deflected over the actual video track during playback to automatically follow any deviation from the "ideal" recorded track.

In the basic VPR-2 without the AST system, 3 active video heads are used with a separate record and play head. This allows rapid and efficient video optimization. If the basic VPR-2 is fitted with an optional sync channel, similar ease of optimization is still achieved. Here are the exciting advantages of the AST system.

## Manual "Jogging"

Precise edits are routine in the "Jog" mode. Forward or reverse control at the Variable Slow-Motion and Shuttle knob allows the operator to look at any number of adjacent fields, one at a time, in either direction, before selecting the precisely desired edit point.



The Ampex VPR-2 recorder has evolved directly from the VPR-1, which has gained wide acceptance in both broadcast and non-broadcast applications. The VPR-1s shown above exemplify a variety of user applications including studio and remote broadcast, on-line and off-line editing, and post-production.

## Record Confidence

Simultaneous video channel record playback is also provided with the AST accessory. Separate record and AST reproduce heads provide full bandwidth, direct color verification playback. Optimization (in record) is an easy task because of the simultaneity of the process provided by the AST System.

## Variable Speed Playback

With the AST system the VPR-2 will play back the video channel at any speed from normal to still frame. Regardless of the speed, the picture has excellent definition free of disturbances even during rapid transitions from still frame to normal play. When played back through the TBC-2 Digital Time Base Corrector, the signal is broadcastable.

Nothing short of an actual demonstration can completely illustrate the startling picture clarity and stability offered by this combination of VPR-2, AST Tracking System, and TBC-2.

## Tape Speed Override

With this feature in use the operator can vary the play speed for network delay connections or editing sync of two or more VTRs. This feature is operational on a PWA mounted switch.

# "THOUGHT THROUGH"

It's the VPR-2 packaging refinement which speaks most eloquently of the simplified sophistication Ampex engineers have designed into this new video production recorder. In spite of its compact dimensions, room remains in the VPR-2 for innovative additions yet to be realized.

Configuration versatility and maximum ease of frontal access to both mechanical and electronics areas are prime features of the VPR-2. This VTR can be rack mounted and is easily transportable. It combines with a TBC in its own mini-console or becomes a full studio console VTR system with monitor bridge if desired.

In combination with the Ampex TBC-2 Digital Time Base Corrector, the VPR-2 with its shuttle control will provide a usable picture in shuttle modes. In terms of time saved in post-production editing, this feature is one of the most profitable benefits of the VPR-2.

When it comes to maintenance access, consideration to detail pervades this area as well. Frontal access to tape guides, scanner, reel motors and other major subassemblies allows

rapid removal if necessary. Separation of the transport from the electronics is normally not required but may be easily accomplished for major servicing. Backplane wiring with printed wiring assemblies (PWAs) in a card cage makes electronic maintenance ease a designed-in benefit. L.E.D. diagnostics are included to speed fault location. The proven, plus the improved combine to make the VPR-2 a one-inch video production recorder without equal.

Video head replacement, often a major concern, is accomplished with unmatched simplicity in the VPR-2. Its individually replaceable ferrite heads obviate the need for regular or routine replacement of the scanner or its drive assembly. This means time saved while the VPR-2 is off the job. It's yet another example of this VTR's well thought out design.

Fixed ceramic tape guides together with electronic tape tension provide consistent tape handling and tracking in the VPR-2. Tape handling can be described as "gentle precision." The capstan servo "ramps up" to the tape speed, eliminating excessive stresses on the tape. Damage in tape wind-off is



# DESIGN EXCELLENCE: THE VPR-2 FROM AMPEX

prevented in shuttle by integral end-of-tape sensing circuits. As the end of the tape approaches, the reels are gently slowed.

Operator convenience is apparent in the VPR-2's control panel, too. Clarity and logic prevail across the board. Level indicators, edit controls, channel select switches and transport controls are all clearly marked or illuminated. A switchable, drop-frame/non drop-frame digital timer is frame-accurate through an exclusive control track update system. Search-to-cue and an integral backspace editor promote more efficient post-production work and accurate pre-roll calculations for precise edits. Top all this off with high-band color performance, and you have a collection of beneficial features in a helical VTR second to none. But there's more.

The built-in editing capabilities of the VPR-2 provide a number of outstanding features as standard. Switchable automatic backspace insert and assemble editing blends with independent audio and video channel selection. Video playback through the record head may also be accomplished, and over-recording or gaps in the audio channels are prevented by a system designed to provide correctly timed audio edits.

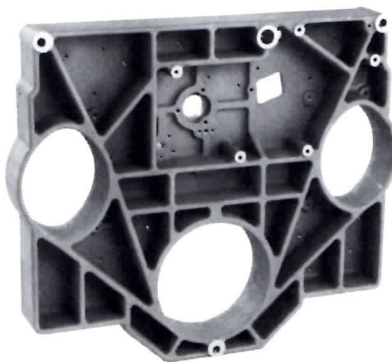
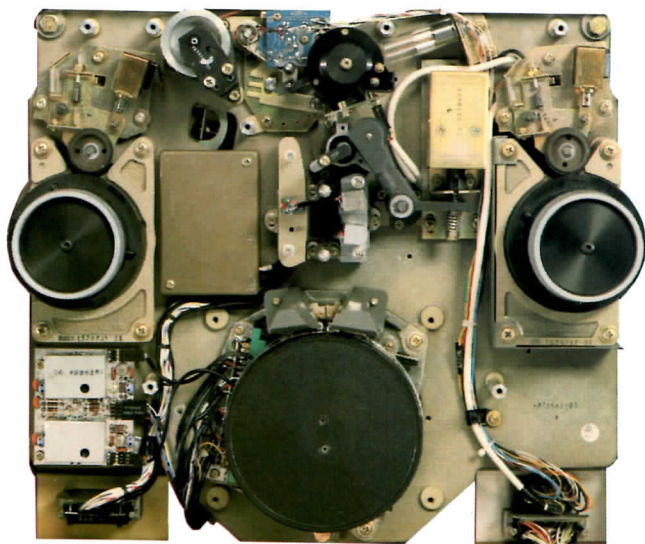
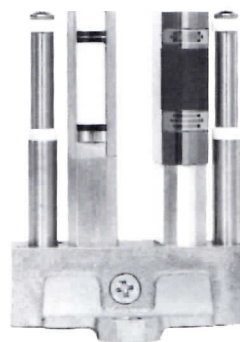
The VPR-2's three-channel audio system provides exceptional quality. Exceptional audio performance is achieved by the use of transport mounted preamplifiers in a mu-metal enclosure. In both signal-to-noise and frequency response the VPR-2's sound quality is in a league with its Ampex cousins in the professional audio recording field.

The basic system includes a field-by-field Auto Chroma, and Color Framer (switchable between record, play and off). Audio meters are jumper selectable between VU and Peak Reading (PPM).

Audio input and output circuits are designed for balanced lines.

Audio 3 is used for Time Code. Wideband circuits permit replay at shuttle speeds. A time code output at the remote connector provides a conditioned time code signal.

Impressive as these basic benefits of the VPR-2 are, they are almost overshadowed by the optional capabilities available.



# CONFIGURATIONS

Like the VPR-1, the VPR-2 is available in a variety of configurations to suit any need.

## BASIC MACHINE—

In its basic configuration, the VPR-2 can be rack-mounted, or installed in the convenient "tabletop" housing.

## MINI-CONSOLE—

When used with the Ampex TBC-2 Digital Time Base Corrector, the VPR-2 and the TBC can both be installed in the optional mini-console.

## STUDIO CONSOLE—

This optional console provides space for the VPR-2, a TBC-2, and other options and accessories.

## STUDIO CONSOLE WITH MONITORING—

When fully equipped with optional monitor bridge, the VPR-2 system includes a color picture monitor, a waveform monitor, and vector display.

When mounted in one of the console configurations the VPR-2 can always be removed and used in its basic record-playback configuration.

TABLETOP



STUDIO CONSOLE



MINI-CONSOLE



RACK-MOUNT



STUDIO CONSOLE WITH MONITORING



# ACCESSORIES

## Optional accessories

### SYNC CHANNEL—

The SMPTE Type "C" format allows users the option of recording the vertical sync information resulting in a recording of the entire video signal. A VPR-2 not fitted with the sync channel option will replay a recording on the Type "C" format, whether or not the recording includes the sync signal.

The sync channel is a full video bandwidth channel to allow recovery of the 10-line dropout (12 lines in 625) characteristic of the SMPTE type "C" format. Recovery of VITs and VIRs test signals does not require the optional sync channel, which is provided for future capabilities.

### SMC-60 SLOW MOTION CONTROLLER—

The SMC-60 is a versatile remote speed control accessory for all VPR-Series recorders equipped with the AST Automatic Tracking System. It controls the VTR functions of normal speed playback, variable slow motion, freeze frame, variable speed shuttle, and auto search-to-cue. A 60-second clock display and a remote tape timer are standard features of the SMC-60. (See separate literature for complete details.)

### REMOTE CONTROL PANEL—

A complete remote control panel is available offering full transport, editor, set-up and control functions. This option comes complete with remote connector. The remote control panel may be located up to 100 feet from the VPR-2.

### COLOR CORRECTOR—

This accessory is a rack-mountable component including an integral AC power supply. It offers an economical answer to the need for non-broadcast color operation. This operational feature provides a solid color picture from the VPR-2 in still frame through play speed.

### HPE-1 PRODUCTION EDITOR—

For VPR-Series recorders used in editing applications, the fully compatible HPE-1 production editor is an ideal choice. It controls up to four VTRs, utilizing joystick control of VTR functions. A variety of options and keyboard configurations is available. (See separate literature for complete details.)



HPE-1 PRODUCTION EDITOR



SMC-60 SLOW MOTION CONTROLLER

# VPR-2 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) Demodulator Output	-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)	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 <sup>2</sup> 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)

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
S/N (with respect to 8 dB above reference level)	-56 dB Audio 1 and 2 -50 dB Audio 3 (Note 1)
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
Depth of erasure on its own recording	-70 dB
Wow & Flutter (NAB unweighted)	0.15% rms
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	0.7 to 4 volts
Comp video	0.5 to 2 volts
Audio line inputs	-24 to +24 dBm
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
Impedance	less than 30 ohm
Headphone Audio Monitor (Audio 1 & 2 only)	0 dBm to drive 600 ohm
Audio Meter Circuits jumper selectable VU or PPM	
Conditioned Time Code Output (Audio 3)	+10 dBm 600 ohm balanced

## GENERAL

Record Time	92 minutes nominal; 4500 feet of tape on 10 1/2" reel	
Shuttle Time	less than 2 1/2 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 $\pm$ 0.2 in/s	239.8 $\pm$ 0.5 mm/sec 9.44 $\pm$ 0.2 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
All channels may be individually locked out in Record		
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

Prime Power 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)	1.15 vac Nominal 5.5A 2.30 vac Nominal 2.8A 1.15 vac Nominal 10.5A 2.30 vac Nominal 5.5A

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

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

**U.S. Sales Offices in:** CALIFORNIA, Los Angeles (213) 240-5000 • GEORGIA, Atlanta (404) 451-7112 • ILLINOIS, Chicago (312) 593-6000 • MARYLAND, Bethesda (301) 530-8800 • NEW JERSEY, Hackensack (201) 489-7400 (in New York City 736-6118) • OHIO, Dayton (513) 254-6101 • TEXAS, Dallas (214) 637-5100 • Sales and Service Companies throughout the world.

**International Sales or Service Companies:** ARGENTINA, Buenos Aires 49-4159, 46-9255, 49-4305 • AUSTRALIA, Sydney 439-4077 • BELGIUM, Nivelles 067/22.49.21 • BRAZIL, Rio de Janeiro 242-3795, 242-3794 • CANADA, Bramalea (416) 791-3100 • COLOMBIA, Bogota 85-05-17, 85-05-66 • FRANCE, Boulogne 609-91-55 • GERMANY (FEDERAL REPUBLIC), Frankfurt (Main) 60581 • GREECE, Athens 6822-681 • HONG KONG, Kowloon 3-678051-3 • ITALY, Rome (06) 54-69-91, Milan (02) 65.15.41-2-3-4 • JAPAN, Tokyo 03-264-7331 • MEXICO, Mexico City 539-68-70/71/72 • NETHERLANDS, Utrecht 030-61.29.21 • PUERTO RICO, Santurce (809) 727-3440 • SWEDEN, Sundbyberg 08/28 29 10 • SWITZERLAND, Fribourg 037-22.73.31 • UNITED KINGDOM, Reading, England (0734) 85200 • VENEZUELA, Caracas 782-71-22 Ext. 20



# AMPEX

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