

# Panasonic

**AJ-D960**  
DVCPRO50 Studio VTR  
(525/625 switchable)



**DVCPRO50**



# A Digital Studio Master VTR for High-End Bro

Standing at the top of the DVCPR050 series, the new AJ-D960 studio VTR has superior 4:2:2 component video picture quality and 4-channel digital audio needed for high-end broadcasting and production. Features such as variable slow-motion playback at -1 to +2 times normal speed make the AJ-D960 ideal for live and taped sporting events. Add an optional SDTI board and the AJ-D960 is ready for high-speed transferring both 50-Mbps and 25-Mbps images at twice the normal speed. The AJ-D960 is versatile, too — it's switchable between the DVCPR050/DVCPR0 and 525/625 formats, and it can play DV-based format tapes. This high performance digital VTR has everything you need in a master studio VTR.

## Master Quality

The AJ-D960 offers superior 4:2:2 digital component video picture quality and 4-channel digital audio geared to high-end broadcasting and production needs. Thanks to features such as variable slow-motion playback from -1x (reverse) to 2x normal speed in both DVCPR050 and DVCPR0 modes, the AJ-D960 is an outstanding choice for live sports relays and sports program production.





# Broadcasting and Production

## Master Multi-Format Versatility

The AJ-D960 has the extra versatility you need in a master studio VTR. It's fully switchable between the DVCPRO50/DVCPRO formats for recording, and in playback it switches automatically according to the format of the tape inserted. Also, both 525/625 modes are selectable at the front sub panel.

The AJ-D960 also plays back the DV-based formats tapes.



## Master Interface

The AJ-D960 comes standard with SDI, AES/EBU audio, and analog interfaces. Adding an optional board also allows the AJ-D960 to transfer compressed images and sound via SDTI. Using SDTI it can also transfer DVCPRO50 and DVCPRO data at twice the normal speed. This network-ready VTR can bring much higher efficiency to your broadcast operations.



# The Superior Digital Quality You Need for Studio Production

## 4:2:2 Component Video

DVCPRO50 lets you create high-end video productions with 4:2:2 component video recording and playback. Featuring a 3.3:1 compression ratio, picture degradation is minimal during both compression and decompression, so the 4:2:2 images retain their superior quality.

## 4-Channel Digital Audio

The AJ-D960 has four channels of high-quality 48-kHz/16-bit digital audio. A level meter for each channel provides a continuous display of the recording or playback level. A linear cue audio track adds convenience when searching for edit points.

\*There are two digital audio channels in DVCPRO mode.

## Digital Slow Motion

The AJ-D960 offers variable slow and fast motion playback for superior picture quality in either forward or reverse at -1x to +2x normal speed in both DVCPRO50 and DVCPRO. Speed can be set for optimum creative results.

DVCPRO50:	-1x	to	+2x
DVCPRO:	-1x	to	+2x
DV:	-1x	to	-1x

## DVCPRO50/DVCPRO Switchable Recording

The AJ-D960 can record and play back in both the DVCPRO50 and DVCPRO formats. In DVCPRO50, the AJ-D960 can record up to 92 minutes onto an AJ-5P92LP compact 1/4" cassette tape, while in DVCPRO mode recording time is doubled, to 184 minutes\*. In playback, the AJ-D960 automatically detects which format the tape was recorded in and switches accordingly.

\*When recording in the DVCPRO50 format onto a DVCPRO tape, the recording time will be half that indicated on the cassette.



DVCPRO/DVCPRO50 Cassette Tapes



## DV Playback Capability

For added versatility, the AJ-D960 can play back DV-based formats tapes. It plays standard DV tapes just as they are, and can play Mini-DV tapes using the AJ-CS455P adaptor.\*

\*The AJ-D960 cannot record on Mini-DV cassettes, even with the AJ-CS455P cassette adaptor.

\*The AJ-D960 cannot play back Mini-DV cassette tapes recorded in LP mode, or long-time Mini-DV cassette tapes (SP mode 80 minutes/LP mode 120 minutes), even with the AJ-CS455P cassette adaptor.

## Records and Plays Back in the PAL System (625)

The AJ-D960 can record or play back the 625 video signals used in the PAL broadcast system. It comes fully equipped with digital (SDI) input and output and analog component/composite output in 625.

## Reliability

The AJ-D960 continues the DVCPRO heritage of highly reliable top- performance VTRs.

The tape handling mechanism is designed for gentle yet positive tape movement, ensuring long term dependability for both the tape cassette and the tape transport.

## Linear Editing with To-the-Frame Precision

The use of intra-frame compression in both DVCPRO50 and DVCPRO modes enables tape-to-tape editing with to-the-frame precision. There's no picture degradation in the edit points.

## Complete Editing Functions in both DVCPRO50 and DVCPRO Modes

The AJ-D960 offers both assemble and insert editing functions, as well as preview, review and trim functions. Using the RS-422A control interface, single-event editing and audio split are possible with industry standard edit controllers.

## High-Speed Search

The AJ-D960 features shuttle search in forward and reverse at up to 32 times normal speed in both DVCPRO50 and DVCPRO modes. The shuttle function includes Jog mode.

## Channel Condition Indication

In digital recording, the channel condition indicates playback quality. Lamps on the front panel give the operator the convenience of seeing the actual condition.

## Easy Set-Up With On-Screen Display

A number of initial settings can be changed easily with on-screen convenience. The display combines a simple, straight-forward control panel with a host of functions.



Sub Panel



# The Expandability You Need for Future Broadcast Systems

## Data Transfer at 2x Normal Speed

Add an optional SDTI (Serial Data Transport Interface) board AJ-YAC960P, and the AJ-D960 can transfer compressed data at 2x normal speed. This gives you high-speed data transfer without the quality loss that occurs from decompression and recompression.

The AJ-D960 can playback at 2x normal speed in both DVCPRO50 and DVCPRO modes. This lets you transfer data to other peripheral at twice normal speed.

## Digital Interfaces

- The AJ-D960 comes standard with SDI (Serial Digital Interface), allowing input/output of 525/625 digital component signals.
- SDTI is available by adding the optional AJ-YAC960P board, which then allows input/output of SDTI.
- The AJ-D960 comes standard with AES/EBU digital audio in/out (4 channels).

## Analog Input/Output and Remote

- The unit comes standard with output video signals. Output of either 525-format or 625-format signals is also possible.
- Select from the following four optional boards for analog video input.
 

AJ-YA955:	525 High-Performance 10-bit
AJ-YA958P:	525 Standard 8-bit
AJ-YA956E:	625 High-Performance 10-bit
AJ-YA957E:	625 Standard 8-bit
- The AJ-D960 comes standard with analog audio input/output (4 channels).
- The AJ-D960 also comes standard with RS-422A (9-pin), RS-232C (25-pin) and parallel (25-pin) remote interfaces.

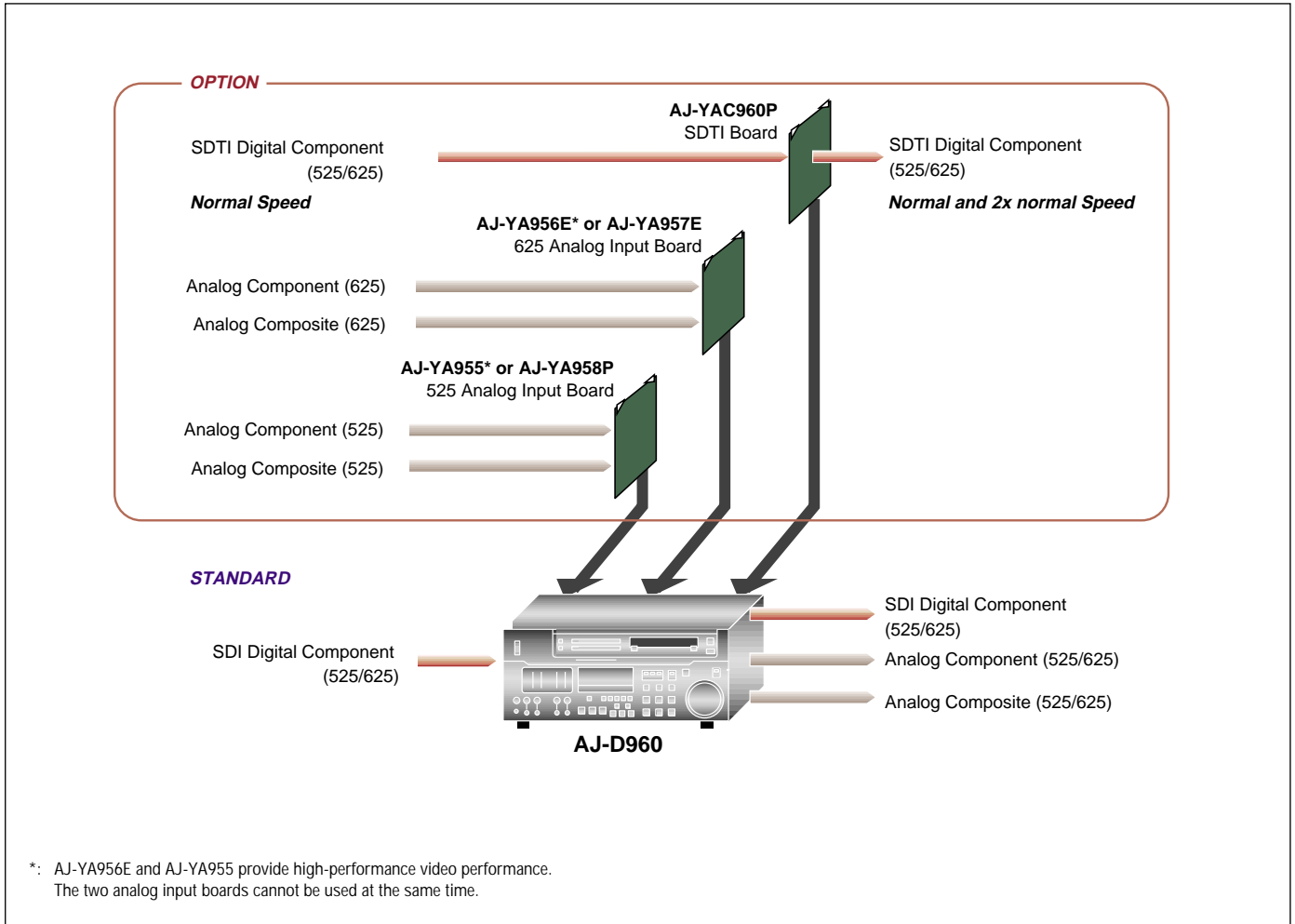
## Compact Size, Easy Installation and Easy to Carry

With its compact 4U size, the AJ-D960 fits into a 19-inch rack using the optional AJ-MA75\* rack mount adaptor for easy installation both in the studio and in OB vans.

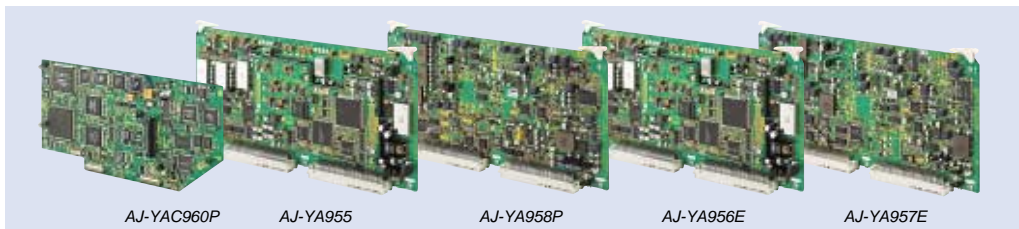
Easy-to-carry handles are also comes standard with AJ-D960.

\*Slide rail not included.





O P T I O N A L A C C E S S O R I E S



**AJ-YAC960P**  
SDTI Board (525/625)

**AJ-YA955**  
525 High-Performance Analog Input Board

**AJ-YA958P**  
525 Analog Input Board

**AJ-YA956E**  
625 High-Performance Analog Input Board

**AJ-YA957E**  
625 Analog Input Board



**AJ-CS455P**  
Mini-DV Cassette Adaptor



**AJ-MA75P**  
Rack Mount Adaptor (slide rail, not included)

# S P E C I F I C A T I O N S

## General

Power Supply:	AC120V ±10%, 50 to 60 Hz
Power Consumption:	280W (full operation)
Operating Temperature:	5°C to 40°C (41 °F to 104 °F)
Operating Humidity:	10% to 90% (non dew)
Weight:	44.09 lbs (20 kg)
Dimensions (WxHxD):	16-11/16" x 6-7/8" x 16-3/8" (424 x 175 x 415 mm)
Recording Format:	DVCPRO50/DVCPRO switchable
Recording Track:	Digital Video: 525/625 switchable Digital Audio: 4 channels (50 Mbps) 2 channels (25 Mbps)
	TC: Subcode area Cue: 1 longitudinal track CTL: 1 longitudinal track
Tape Speed:	525: 67.640mm/s (DVCPRO50) 625: 67.708mm/s (DVCPRO50)
Rec/Play Time:	Max. 92 minutes with AJ-5P92LP
Tape:	1/4" metal particle
FF/REW Time:	Less than 3 minutes with AJ-5P92LP
Search Speed:	±32x (in color)
Digital Slowmotion:	-1x to +2x (DVCPRO50/DVCPRO)
Editing Accuracy:	±0 frame (TC)
Tape Timer Accuracy:	±1 frame (continuous CTL)
Servo Lock Time:	Within 0.5 sec (color framing/standby ON)

## Video

Sampling Frequency:	Y: 13.5MHz, Pb/Pk: 6.75MHz
Quantization:	8 bits
Error Correction:	Reed-solomon product code
Compression Method:	DCT + Adaptive quantization + VLC
Compression Ratio:	3.3:1 (DVCPRO50), 5:1 (DVCPRO)
Bit Rate:	50 Mbps (DVCPRO50) 25 Mbps (DVCPRO)
<i>[Digital In/Composite Out] (standard)</i>	
525 Bandwidth:	Y: 30Hz to 4.5MHz ±0.5dB
625 Bandwidth:	Y: 25Hz to 4.5MHz ±0.5dB
S/N ratio:	60dB or more
K factor:	1% or less
Y/C Delay:	10 nsec or less
<i>[Digital In/Component Out] (standard)</i>	
525 Bandwidth:	Y: 30Hz to 5.75MHz ±0.5dB Pb/Pk: 30Hz to 2.75MHz ±0.5dB
625 Bandwidth:	Y: 25Hz to 5.75MHz ±1dB Pb/Pk: 25Hz to 2.75MHz ±1dB
S/N ratio:	60dB or more
K factor:	1% or less
Y/PB, PR Delay:	10 nsec or less
<i>[Component In] with optional AJ-YA955 or AJ-YA958P</i>	
525 Bandwidth:	Y: 30Hz to 5.75MHz ±1dB Pb/Pk: 30Hz to 2.75MHz ±1 dB
S/N Ratio:	55 dB or more
K factor:	1% or less
Y/C Delay:	10 nsec or less

## *[Component In] with optional AJ-YA956E or AJ-YA957E*

625 Bandwidth:	Y: 25Hz to 5.5MHz ±1dB, 5.75MHz -2dB Pb/Pk: 25Hz to 2.5MHz ±1dB, 2.75MHz -2dB
S/N ratio:	55 dB or more
K factor :	1% or less
Y/PB, PR Delay:	20 nsec or less
<i>[Composite In] with optional AJ-YA955 or AJ-YA958P</i>	
525 Bandwidth:	Y: 30Hz to 5.0MHz ±1dB, 5.75MHz -3dB
K factor :	1% or less
Y/C Delay:	10 nsec or less
<i>[Composite In] with optional AJ-YA956E or AJ-YA957E</i>	
625 Bandwidth:	Y: 25Hz to 4.5MHz ±1dB, 5.75MHz -3dB
K factor:	1% or less
Y/C Delay:	20 nsec or less

## Audio

Sampling Frequency:	48kHz (sync. with video)
Quantization:	16 bits
Error Correction:	Reed-solomon product code
Frequency Response:	20Hz to 20kHz, ±1.0dB (reference level)
Dynamic Range:	More than 90dB (1kHz, emphasis off, "A" weighted)
Distortion:	within 0.05% (1kHz, reference level)
Cross Talk:	Less than -80dB (1kHz, between any 2ch)
Wow & Flutter:	Below measurable limit
Headroom:	20 dB (525)/18 dB (625)
Emphasis:	T1=50µs, T2=15µsec (ON/OFF)
Cue Track:	300Hz to 6kHz (±3dB)

## Video Out Adjustment Range

Composite Video In:	±3 dB
Video Gain:	±3 dB
Chroma Gain:	±3 dB
Chroma Phase:	±30°
Setup:	±14 IRE
Sync Phase:	±8 µs
SC Phase:	±180°

## Video Input

SDI:	BNC x 2 (active through), SMPTE 259M-C
Reference:	BNC x 2 (loop-through) 75Ω On/Off
SDTI (option):	BNC x 2 (active through) with AJ-YAC960P, SMPTE 305M/321M (SDI in serves as a SDTI in, too)
Analog Component: (Input: option) (Output: standard)	BNC x 3 (Y/Pb/Pk), Y: 1.0Vp-p, 75Ω Pb/Pk: 0.525/0.757Vp-p, switchable, 75Ω (75% color bar, 0% set up)
Analog Composite : (option)	BNC x 2 (loop-through), 75Ω On/Off

## Video Output

SDI:	BNC x 3 (SDI3: Super on/off), SMPTE 259M-C
Analog Composite:	BNC x 3 (Video 3: Super on/off)
SDTI (option):	BNC x 1 with AJ-YAC960P, SMPTE 305M/321M (SDI out serves as a SDTI out, too)
Analog Component:	BNC x 3 (Y/Pb/Pk), Y: 1.0Vp-p, 75Ω Pb/Pk: 0.525/0.757Vp-p, switchable, 75Ω (75% color bar, 0% set up)

## Audio Input

Analog(CH1/2/3/4):	XLR x 4, +4/0/-20 dBu switchable, 600Ω/high-impedance switchable
Digital(CH1/2, CH3/4):	XLR x 2, AES/EBU
Serial Digital:	BNC x 2, (active through), SMPTE 259M-C/272M-A
Cue:	XLR x 1, +4/0/-20/-60 dBu switchable, 600Ω/high-impedance switchable

## Audio Output

Analog (CH1/2/3/4):	XLR x 4, Low-impedance, +4/0/-20 dBu switchable
Digital (CH1/2, CH3/4):	XLR x 2, AES/EBU
Serial Digital:	BNC x 1, SMPTE 259M-C/272M-A
Cue:	XLR x 1, Low-impedance, +4/0/-20 dBu switchable
Monitor:	XLR x 2, Low-impedance, +4/0/-20 dBu switchable
Phones:	M6, variable level control, 8Ω

## Others

TC IN:	XLR x 1, 0.5 to 8.0 Vp-p
TC OUT:	XLR x 1, 2.0 Vp-p
RS-422A IN:	D-sub 9 pin RS-422A I/F
RS-422A OUT:	D-sub 9 pin RS-422A I/F
RS-232C:	D-sub 25 pin RS-232C I/F
Parallel IN/OUT:	D-sub 25 pin
Encoder Remote:	D-sub 15 pin

Weight and dimensions shown are approximate.  
Specifications are subject to change without notice.  
These products may be subject to export regulations.

# Panasonic

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