Panasonic
ideas for life

AJ-HD1400
DVCPRO HD Compact Recorder

DVCPRO HD

DVCPRO HD **EX**

Outstanding Versatility and Cost-Performance in a VTR that Answers the Call for Universal HD Video Production

As HD broadcasting and cinema continue to expand around the globe, the AJ-HD1400 helps you keep pace with the growing demand for high-quality HD content.

This compact, economical desktop VTR records and plays in all of the world's HD broadcasting formats. It provides 720/1080 video format cross conversion and HD/SD down/up conversion. Also providing SD playback functions, the versatile AJ-HD1400 lets you produce video content for a variety of applications in all regions of the world.

The AJ-HD1400 makes a good fit in an AJ-HDC27H, VariCam HD production system where the need for DVCPRO HD quality is great. It can convert data from native 720p sources for output as 1080/24p or 25p data, and it adds a built-in function for gamma conversion of F.REC cine-gamma sources.

The AJ-HD1400 comes equipped with IEEE 1394 and HD-SDI digital input/output and a 9-pin remote interface for assemble/insert editing. From field recording to nonlinear and in-studio editing, the AJ-HD1400 is a practical, reliable solution to a host of HD production needs.

The AJ-HD1400 also offers outstanding cost-performance. Together with the Panasonic AJ-HDX900 Camera-Recorder being released at the same time, the AJ-HD1400 makes it possible to configure an HD production system that's cost equivalent to many SD systems.

Multi-Format HD Recording and Playback

With the addition of 720/50p, the AJ-HD1400 covers all of the world's HD broadcast formats in both 1080 and 720 video. It also offers playback of all DVCPRO HD sources, including the 1080/23.98p over 59.94i recorded by the AJ-HDX900 DVCPRO HD camera-recorder and the 720/24p (and 25p) over 60p recorded by Varicam. The built-in HD cross-converter makes it easy to convert between 720p and 1080i HD formats. These features combine to make the AJ-HD1400 a flexible solution for both broadcast and cinema applications.

Video Formats Supported by the AJ-HD1400

Recording:	1080/59.94i, 1080/50i, 720/60p, 720/59.94p, 720/50p
Playback:	1080/60i, 1080/59.94i, 1080/50i, 1080/23.98p (over 59.94i), 1080/29.97p (over 59.94i), 720/60p, 720/59.94p, 720/50p, 720/50p (over 60p), 720/23.98p (over 59.94p), 720/24p (over 60p), 720/29.97p (over 59.94p), 720/30p (over 60p), 720/25p (over 50p), 720/25p (over 60p), 480/59.94i, 480/23.98p (over 59.94i), 480/29.97p (over 59.94i), 576/50i, 576/25p (over 50i)
Cross-convert:	1080/60i <=> 720/60p, 1080/59.94i <=> 720/59.94p, 1080/50i <=> 720/50p 720/23.98p (over 59.94p) => 1080/23.98psf, 720/24p (over 60p) => 1080/24psf, 720/25p (over 60p) => 1080/25psf, 720/50p (over 60p) => 1080/50i, 720/50p (over 60p) => 720/50p,
Down-convert:	1080/59.94i, 720/59.94p, => 480/59.94i 1080/50i, 720/50p => 576/50i
Up-convert:	480/59.94i => 1080/59.94i, 720/59.94p 576/50i => 1080/50i, 720/50p

*Neither converted output or converted recording is possible for 59.94 Hz to 50 Hz.

SD Source Playback and Up/Down Conversion

The AJ-HD1400 can play DVCPRO 50, DVCPRO, DV* and DVCAM* SD sources. The built-in up-converter and down-converter make it possible to output HD data from SD sources, or SD data from HD sources using just the AJ-HD1400. HD and SD can be output simultaneously. There's also an aspect ratio conversion function for added flexibility.

*You need an optional AJ-CS455P Mini-DV Playback Adapter to play Mini-DV and DVCAM S cassettes on the AJ-HD1400. The AJ-HD1400 can play DV tapes in SP mode only.

1080/24p (25p) Output for AJ-HDC27H Varicam Source Production

The AJ-HD1400 can play 720/23.98p over 59.94p sources and convert them for output as 1080/23.98psf, and it can play 720/25p over 60p sources and convert them for output as 1080/25p. Used in this way, the AJ-HD1400 provides the AJ-HDC27H Varicam user with an easy integration path to native 1080/24p or 1080/25p based program production.

New Gamma Conversion Function for Use with AJ-HDC27H Varicam Cinema Production System

Some of the functions offered in the earlier AJ-GBX27G HD Gamma Corrector are now built right into the AJ-HD1400, making it a simple, low-cost solution for producing cinema or film-like video. There are two modes (TELECINE 5, TELECINE 6) for converting source materials recorded using the F.REC mode and gamma curve into video images with a film-like tone. There's also a CINEON mode for converting data into a gamma curve suitable for film recording.

Gamma Conversion Curve
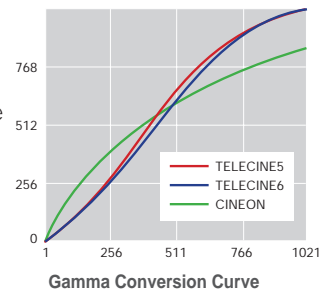
DVCPRO HD VTR: 64 Minutes of High-Quality Recording

Designed to broadcast specifications, the DVCPRO HD codec combines a video bit rate of 100 Mbps with 4:2:2 image sampling and intra-frame compression. This reliable recording system also minimizes quality degradation with fast-moving subjects and is highly resistant to drop-out. The DVCPRO HD-LP format allows up to 64 minutes of recording on large or medium-size cassette with reliable 1/4" metal particle tape.

Eight Channels of 16-bit Digital Audio

DVCPRO HD also offers superb 16-bit linear PCM sound quality, with eight embedded channels for recording in 5.1-channel surround sound. The AJ-HD1400 uses HD-SDI for independent input/output and editing of all eight channels.

AJ-HD1400 Playback Compatibility Chart

Playback Tape	Playback Tape Format	HD Output (YPbPr, HD SDI)	SD Output (Composite, SDI)	IEEE 1394 Output DVCPRO HD	DVCPRO50	DVCPRO	DV
DVCPRO HD	1080/59.94i	1080/59.94i	480/59.94i	1080/59.94i	480/59.94i	-	480/59.94i
		720/59.94p	480/59.94i	1080/59.94i	480/59.94i	-	480/59.94i
	1080/60i	1080/60i	480/60i *	-	-	-	-
		720/60p	480/60i *	-	-	-	-
	1080/50i	1080/50i	576/50i	1080/50i	576/50i	-	576/50i
		720/50p	576/50i	1080/50i	576/50i	-	576/50i
	1080/29.97p over 59.94i (AJ-HDX900)	1080/29.97p over 59.94i	480/29.97p over 59.94i	1080/29.97p over59.94i	480/29.97p over 59.94i	-	480/29.97p over 59.94i
		720/29.97p over 59.94p	480/29.97p over 59.94i	1080/29.97p over59.94i	480/29.97p over 59.94i	-	480/29.97p over 59.94i
		1080/23.98p over 59.94i	480/23.98p over 59.94i	1080/23.98p over 59.94i	480/23.98p over 59.94i	-	480/23.98p over 59.94i
	1080/23.98p over 59.94i (AJ-HDX900)	1080/23.98PsF	480/23.98p over 59.94i	-	-	-	-
		1080/24PsF	480/24p over 60i *	-	-	-	-
		720/23.98p over 59.94p	480/23.98p over 59.94i	1080/23.98p over 59.94i	480/23.98p over 59.94i	-	480/23.98p over 59.94i
	720/59.94p	720/59.94p	480/59.94i	720/59.94p	480/59.94i	-	480/59.94i
		1080/59.94i	480/59.94i	720/59.94p	480/59.94i	-	480/59.94i
	720/60p	720/60p	480/60i *	-	-	-	-
		1080/60i	480/60i *	-	-	-	-
	720/50p	720/50p	576/50i	720/50p	576/50i	-	576/50i
		1080/50i	576/50i	720/50p	576/50i	-	576/50i
	720/23.98p over 59.94p (AJ-HDC27H, Varicam)	720/23.98p over 59.94p	480/23.98p over 59.94i	720/23.98p over 59.94p	480/59.94i	-	480/59.94i
		1080/23.98PsF	480/23.98p over 59.94i	-	-	-	-
	720/24p over 60p (AJ-HDC27H, Varicam)	720/24p over 60p	480/24p over 60i *	-	-	-	-
		1080/24PsF	480/24p over 60i *	-	-	-	-
	720/25p over 60p (AJ-HDC27H, Varicam)	720/25p over 60p	480/60i *	-	-	-	-
		1080/25PsF	-	-	-	-	-
		-	576/25p over 50i	-	-	-	-
	720/50p over 60p (AJ-HDC27H, Varicam)	720/50p over 60p	480/50p over 60i *	-	-	-	-
		720/50p	-	-	-	-	-
		1080/50i	-	-	-	-	-
		-	576/50i	-	-	-	-
DVCPRO50	480/59.94i	1080/59.94i	480/59.94i	-	480/59.94i	-	480/59.94i
		720/59.94p	480/59.94i	-	480/59.94i	-	480/59.94i
	480/29.97p over 59.94i (AJ-SDX900)	1080/59.94i	480/29.97p over 59.94i	-	480/29.97p over 59.94i	-	480/29.97p over 59.94i
		720/59.94p	480/29.97p over 59.94i	-	480/29.97p over 59.94i	-	480/29.97p over 59.94i
	480/23.98p over 59.94i (AJ-SDX900)	1080/23.98PsF	480/23.98p over 59.94i	-	-	-	-
		1080/24PsF	480/60i *	-	-	-	-
		1080/23.98p over 59.94i	480/23.98p over 59.94i	-	480/23.98p over 59.94i	-	480/23.98p over 59.94i
		720/23.98p over 59.94p	480/23.98p over 59.94i	-	480/23.98p over 59.94i	-	480/23.98p over 59.94i
	576/50i	1080/50i	576/50i	-	576/50i	-	576/50i
		720/50p	576/50i	-	576/50i	-	576/50i
	576/25p over 50i (AJ-SDX900)	1080/50i	576/25p over 50i	-	576/25p over 50i	-	576/25p over 50i
		720/50p	576/25p over 50i	-	576/25p over 50i	-	576/25p over 50i
DVCPRO	480/59.94i	1080/59.94i	480/59.94i	-	-	480/59.94i	480/59.94i
		720/59.94p	480/59.94i	-	-	480/59.94i	480/59.94i
	480/29.97p over 59.94i (AJ-SDX900)	1080/29.97p over 59.94i	480/29.97p over 59.94i	-	-	480/29.97p over 59.94i	480/29.97p over 59.94i
		720/29.97p over 59.94p	480/29.97p over 59.94i	-	-	480/29.97p over 59.94i	480/29.97p over 59.94i
	480/23.98p over 59.94i (AJ-SDX900)	1080/23.98PsF	480/23.98p over 59.94i	-	-	-	-
		1080/24PsF	480/24p over 60i *	-	-	-	-
		1080/23.98p over 59.94i	480/23.98p over 59.94i	-	-	480/23.98p over 59.94i	480/23.98p over 59.94i
		720/23.98p over 59.94p	480/23.98p over 59.94i	-	-	480/23.98p over 59.94i	480/23.98p over 59.94i
	576/50i	1080/50i	576/50i	-	-	576/50i	576/50i
		720/50p	576/50i	-	-	576/50i	576/50i
	576/25p over 50i (AJ-SDX900)	1080/25p over 50i	576/25p over 50i	-	-	576/25p over 50i	576/25p over 50i
		720/25p over 50p	576/25p over 50i	-	-	576/25p over 50i	576/25p over 50i
DV/DVCAM	480/59.94i	1080/59.94i	480/59.94i	-	-	-	480/59.94i
		720/59.94p	480/59.94i	-	-	-	480/59.94i
	480/29.97p over 59.94i (DVX100 Series)	1080/29.97p over 59.94i	480/29.97p over 59.94i	-	-	-	480/29.97p over 59.94i
		720/29.97p over 59.94p	480/29.97p over 59.94i	-	-	-	480/29.97p over 59.94i
	480/23.98p over 59.94i (DVX100 Series)	1080/23.98PsF	480/23.98p over 59.94i	-	-	-	-
		1080/24PsF	480/24p over 60i *	-	-	-	-
		1080/59.94i	480/23.98p over 59.94i	-	-	-	480/23.98p over 59.94i
		720/59.94p	480/23.98p over 59.94i	-	-	-	480/23.98p over 59.94i
	576/50i	1080/50i	576/50i	-	-	-	576/50i
	576/25p over 50i (DVX100 Series)	1080/50i	576/25p over 50i	-	-	-	576/25p over 50i

* monochrome (Composite), no sync (SDI)

IEEE 1394 Digital Interface

Equipped with an IEEE 1394 interface, the AJ-HD1400 can transfer DVCPRO compression data without quality loss to a PC-based nonlinear editing system for low-cost desktop HD editing. SD output is also possible. Also, HD sources can be down-converted and output as either DVCPRO 50 or DV data. You can also use the AJ-HD1400 for convenient backup recording from the AJ-HDX900 or AG-HVX200 DVCPRO HD camera-recorder.

HD-SDI Input/Output

The AJ-HD1400's HD-SDI interface allows easy HD-SDI input/output and SD-SDI output, making the AJ-HD1400 ideal for

use in an HD broadcasting system. Use the AJ-HD1400 for line recording, in-studio production, data transmission and more. A switch is provided on the front panel for selecting the HD-SDI or IEEE 1394 interface for the input signal.

RS-422 9-pin Remote for Editing Use*

The AJ-HD1400's RS-422 9-pin remote interface allows assemble/insert editing similar to a studio recorder. Control from an external editing controller allows to-the-frame editing precision (with HD-SDI connection and using TC mode). This interface also makes the AJ-HD1400 a good choice for high-end production in non-compression, nonlinear editing systems.

*Only in 1080/59.94i, 720/59.94p, 1080/50i, or 720/50p video modes.

Encoder Remote Function

The AJ-HD1400 provides a new D-Sub 15-pin encoder remote control terminal. This gives the AJ-HD1400 data transmission capabilities that rival many studio recorders – something you wouldn't expect in such a compact, affordable unit.

New Joystick Design

The joystick has been redesigned to offer easy, comfortable Slow and Shuttle Search operation. For added convenience, the stick can also be used to select menu items and set the time code.

PF (Programmable Function) Buttons

You can assign functions from the setup menu to each of the three PF buttons provided. This customizing feature gives you quick, direct access to the operational functions you use most.

UMID* Data Recording and Playback

The AJ-HD1400 records and plays data that conforms to the UMID standard and contains a variety of supplementary information. This allows it to read GPS data (latitude, longitude and altitude) recorded by the AJ-HDX900/AJ-SDX900 Camera-Recorder. The AJ-HD1400 can handle VANC for a variety of user data including Closed Captioning, Dolby Dial Norm, and network signaling.

*UMID stands for Unique Material Identifiers, which are defined for AV material use in the SMPTE 330M international standard.

Small, Lightweight and Easy to Carry

Measuring only 8-1/2" wide, the AJ-HD1400 is virtually the same size as a 3U-tall waveform monitor, making it a space-saver in OB vans and other tight places. Its light 18.74-pound weight and convenient handle make it easy to carry.

AC/DC Operation

Operating on either AC or DC (12 V), the versatile AJ-HD1400 is a great desktop or rack-mounted VTR that you can also take away for OB van or field use.

Versatile Interfaces and Functions

- 2-channel analog audio in, and 4-channel analog audio out.
- Built-in SMPTE time code generator/reader and time code in/out.
- Auto rewind, auto repeat and memory stop functions.
- Optional AJ-A95 remote controller available, with shuttle search.
- Auto back function for seamless recording.
- Rec inhibit switch.
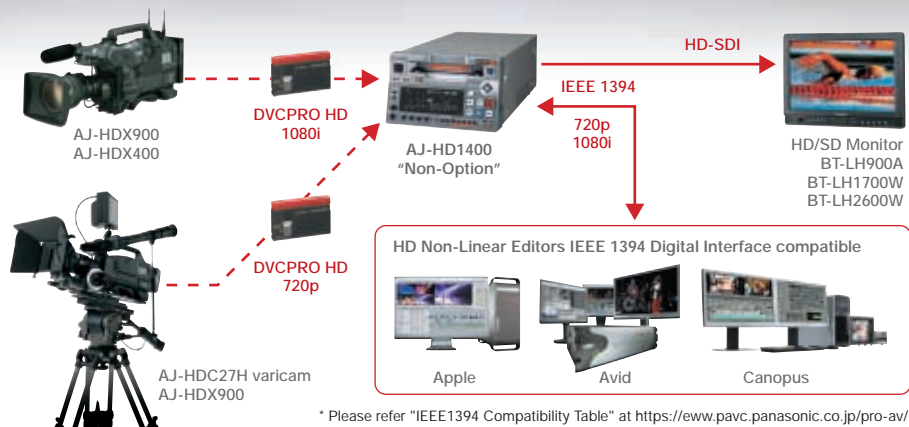- Headphone output with volume control.

SYSTEM APPLICATION

Application 1

IEEE 1394 for Nonlinear Editing

Equipped with an IEEE 1394 interface, the AJ-HD1400 connects easily to a nonlinear editing system for low-cost desktop production of native HD materials. The IEEE 1394 interface can also be used for uploading SD source data.
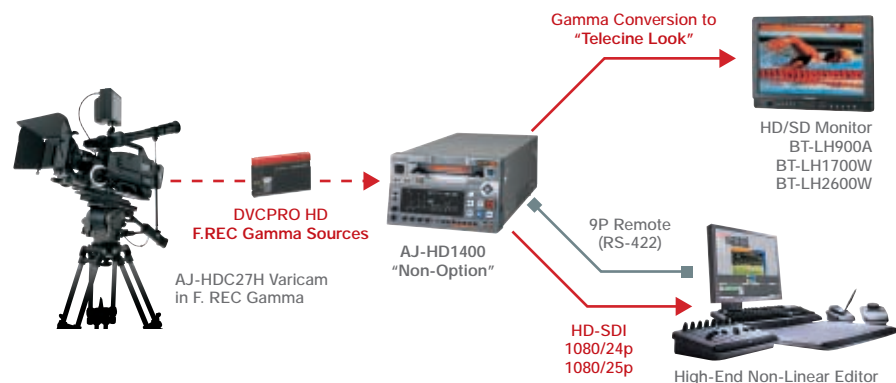
AJ-HDX900
AJ-HDX400

DVCPRO HD
1080i

DVCPRO HD
720p

AJ-HDC27H varicam
AJ-HDX900

AJ-HD1400
"Non-Option"

HD-SDI

IEEE 1394

720p
1080i

HD/SD Monitor
BT-LH900A
BT-LH1700W
BT-LH2600W

HD Non-Linear Editors IEEE 1394 Digital Interface compatible

Apple   Avid   Canopus

* Please refer "IEEE1394 Compatibility Table" at https://eww.pavc.panasonic.co.jp/pro-av/

Application 2

Full Compatibility with AJ-HDC27H Varicam

The AJ-HD1400 can convert data from AJ-HDC27H Varicam native 720p sources for output as 1080/24p or 25p data, and it provides a built-in function for gamma conversion of F.REC cine-gamma sources. Its HD-SDI and 9-pin remote interfaces also make the AJ-HD1400 ideal for high-end cinema production with non-compressed HD nonlinear editing.

DVCPRO HD
F.REC Gamma Sources

AJ-HDC27H Varicam
in F. REC Gamma

AJ-HD1400
"Non-Option"

Gamma Conversion to
"Telecine Look"

HD/SD Monitor
BT-LH900A
BT-LH1700W
BT-LH2600W

9P Remote
(RS-422)

HD-SDI
1080/24p
1080/25p

High-End Non-Linear Editor

Application 3

IEEE 1394 for Camera Backup Recording

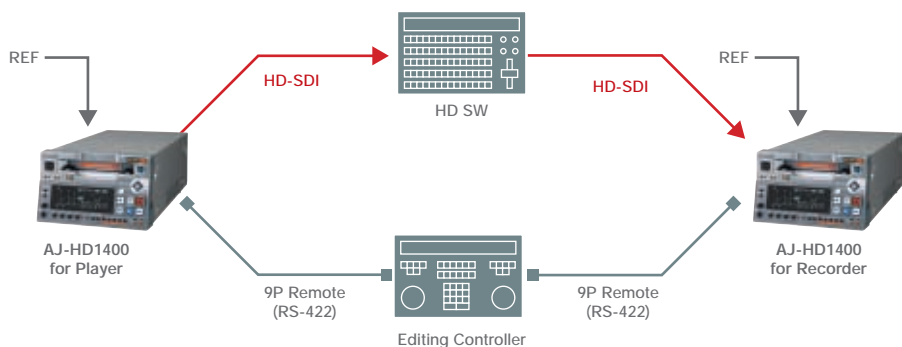Connect to the AJ-HDX900 or AG-HVX200 DVCPRO HD camera-recorder, and the AJ-HD1400 is ready to make up to 64 minutes of digital backup recording linked to the camera's start/stop operation.

AJ-HDX900

AG-HVX200

IEEE 1394
720p, 1080i

AJ-HD1400
"Non-Option"

SD (480i, 576i)
SDI/Composite

SD Monitor

HD/SD Monitor
BT-LH900A/LH1700W/LH2600W

HD (1080i, 720p)
HD-SDI/Component

HD/SD Monitor
BT-LH900A/LH1700W/LH2600W
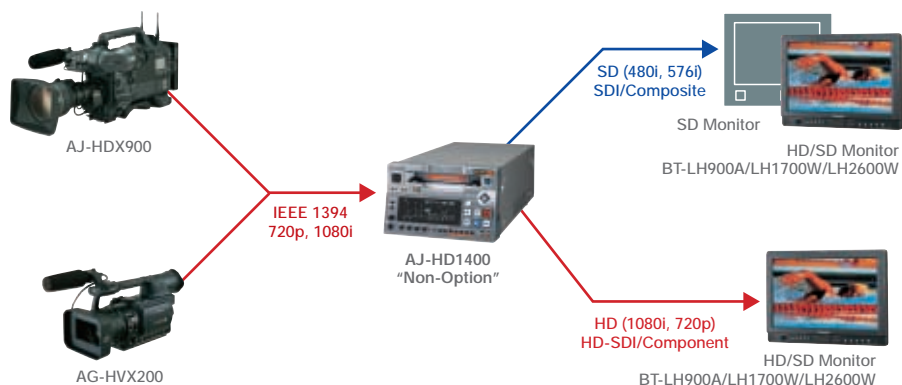
Application 4

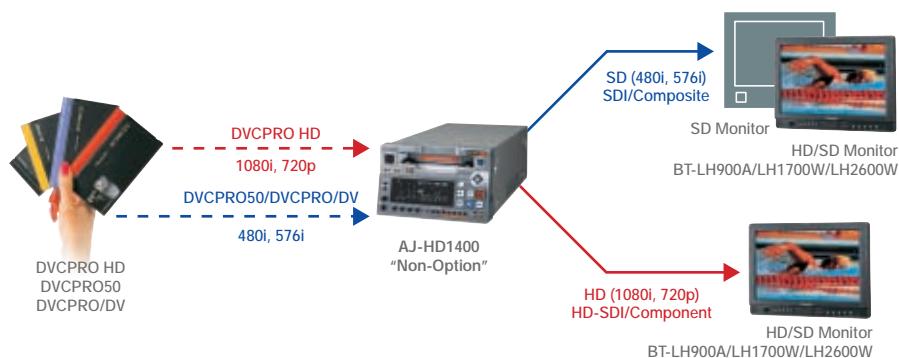### HD-SDI/9-pin Remote Editing

The AJ-HD1400's RS-422 9-pin remote and HD-SDI interfaces allow tape-to-tape editing with an external controller and convenient remote control of recording and data transmission.

REF

HD-SDI

HD SW

HD-SDI

REF

AJ-HD1400
for Player

9P Remote
(RS-422)

Editing Controller

9P Remote
(RS-422)

AJ-HD1400
for Recorder

Application 5

HD/SD Multi-Format Viewing and Conversion

Allowing playback monitoring of DVCPRO HD, DVCPRO 50, DVCPRO, AND DV (including DVCAM) sources and providing up/down/cross conversion of HD/SD formats, the versatile AJ-HD1400 lets you produce content for use in a host of applications anywhere in the world.

DVCPRO HD
DVCPRO50
DVCPRO/DV

DVCPRO HD
1080i, 720p

DVCPRO50/DVCPRO/DV
480i, 576i

AJ-HD1400
"Non-Option"

SD (480i, 576i)
SDI/Composite

SD Monitor

HD/SD Monitor
BT-LH900A/LH1700W/LH2600W

HD (1080i, 720p)
HD-SDI/Component

HD/SD Monitor
BT-LH900A/LH1700W/LH2600W

A C C E S O R I E S

AJ-A95
9-pin Remote Controller

AJ-CS455P
Mini-DV Cassette Adapter

BT-LH900A   (8.4")
BT-LH1700W (17" wide)
BT-LH2600W (26" wide)
LCD HD/SD Video Monitor

General

Power Supply:	AC (100-240) V ±10%, 50 to 60 Hz
Power Consumption:	AC*: 85 W, DC: 64 W
Operating Temperature:	41 °F to 104 °F (5 °C to 40 °C)
Operating Humidity:	10 % to 85 % (non dew)
Weight:	18.74 lbs (8.5 kg)
Dimensions (WxHxD):	8-1/2″ x 5-3/16″ x 17-7/16″ (214 x 132 x 442 mm)
Recording Format:	DVCPRO HD-LP
Recording Video Signal:	1080i/59.94Hz, 1080i/50Hz, 720p/59.94Hz, 720p/50Hz, and 720p/60Hz (Varicam) switchable
Recording Audio Signal:	48 kHz, 16 bit, 8 CH
Recording Track:	Video: 1080 i / 720 p
	Audio: 8 channels
	TC: Subcode area
	Cue: 1 longitudinal track
	CTL: 1 longitudinal track
Tape Speed:	67.64 mm/s
Rec/Play Time:	Max. 64 minutes
Tape:	1/4″ metal particle
FF/REW Time:	Approximately 90 seconds with AJ-HP64ELG

Video

Sampling Frequency:	Y: 74.25/1.001 MHz, Pb/Pr: 37.125/1.001 MHz
Quantization:	8 bits
Compression Method:	DCT + Adaptive quantization
Compression Ratio:	1/6.7
Error Correction:	Reed Solomonn Product Code
Bit Rate:	100 Mbps

Audio

Channel:	8 channels
Sampling Frequency:	48 kHz
Quantization:	16 bits
Frequency Response:	20 Hz to 20 kHz, ±1.0 dB (reference level)
Dynamic Range:	More than 85 dB (1kHz, emphassis off, "A" weighted)
Distortion:	within 0.1 % (1kHz, emphassis off, reference level)
Cross Talk:	Less than –80 dB (1 kHz, between any 2 ch)
Wow & Flutter:	Below measurable limit
Headroom:	20 dB (AJ-HD1400P) 18 dB (AJ-HD1400E)

Video Input/Output

HD SDI In:	BNC x 1 SMPTE 292M/296M/299M
HD Reference In:	BNC x 2 (loop-through), 75Ω auto (tri level sync) SD (B.B.) auto switching
HD SDI Out:	BNC x 2, superimpose on/off, SMPTE 292M/296M/299M
SD SDI Out:	BNC x 1, superimpose on/off, SMPTE 259M-C/272M-A ITU-R BT.656-4
HD Component Out:	BNC x 3 (Y/Pb/Pr), superimpose on/off
SD Composite Out:	BNC x 2 (Y connector), superimpose on/off (VIDEO 2)

Audio Input/Output

Analog In:	XLR x 2 (CH1/CH2), +4/0/–20/–60 dBu switchable, 600 Ω/high-impedance switchable
HD SDI In:	BNC x 1, (CH1 to CH8) SMPTE 299M embedded audio
Analog Out:	XLR x 2 (CH1/CH2), +4/0/–20 dBu switchable, low-impedance
HD SDI Out:	BNC x 2, (CH1 to CH8) SMPTE 299M embedded audio
SD SDI Out:	BNC x 1, SMPTE 272M-A//ITU-R BT.656-4
Monitor Out:	XLR x 2, +4/0/–20 dBu switchable, low-impedance Phono x 2, –8dBV
Phones Out:	M3, variable level control, 8Ω

Other Connector

DVCPRO/DV In/Out:	6-pin x 1, transfer rate selectable; 400/200/100 Mbps IEEE 1394-1995, IEC61883-Part 1, Part 2
Timecode In:	BNC x 1, 0.5 to 8.0 Vp-p, 10kΩ
Timecode Out:	BNC x 1, low-impedance, 2.0 ±0.5 Vp-p
Remote In:	D-sub 9 pin, RS-422A Interface
Encoder Remote:	D-sub 15 pin
DC In:	4 pin x 1, DC12V
DC Out:	DC12V, 250mA, for AJ-A95

Video Signal Adjustment Range

Component style

HD SDI Y Out Gain:	– ∞ to + 3 dB
HD SDI Pb Out Gain:	– ∞ to + 3 dB
HD SDI Pr Out Gain:	– ∞ to + 3 dB
HD SDI Y Out Black Level:	±10%
HD Component Y Out Gain:	– ∞ to + 3 dB
HD Component Pb Out Gain:	– ∞ to + 3 dB
HD Component Pr Out Gain:	– ∞ to + 3 dB
HD Component Y Out Black Level:	±10%
SD SDI Y Out Gain:	– ∞ to + 3 dB
SD SDI Pb Out Gain:	– ∞ to + 3 dB
SD SDI Pr Out Gain:	– ∞ to + 3 dB
SD SDI Y Out Black Level:*	±10%
Composite Out Gain:	– ∞ to + 3 dB
Composite Out Chroma Gain:	– ∞ to + 3 dB
Composite Hue/Chroma Phase:	±30°
Composite Y Out Black Level:*	±10%

Composite style

HD SDI Video Out Gain:	– ∞ to + 6 dB
HD SDI Chroma Out Gain:	– ∞ to + 3 dB
HD SDI Chroma Phase:	±30°
HD SDI Y Black Level:	±10%
SD SDI Video Out Gain:	– ∞ to + 6 dB
SD SDI Chroma Out Gain:	– ∞ to + 3 dB
SD SDI Chroma Phase:	±30°
SD SDI Y Out Black Level:*	±10%
Composite Video Out Gain:	– ∞ to + 6 dB
Composite Chroma Out Gain:	– ∞ to + 3 dB
Composite Chroma Phase:	±30°
Composite Y Out Set Up:*	±10%

System Phase

HD SDI Out/HD Component Out:

1080_59.94, 60i:	±0.5H (±1100 sample/13.5 ns step)
1080_50i:	±0.5H (±1320 sample/13.5 ns step)
1080_23.98,24psf:	±0.5H (±1375 sample/13.5 ns step)
720_59, 60p:	±0.5H (±825 sample/13.5 ns step)
720_50p:	±0.5H (±990 sample/13.5 ns step)

SD SDI Out:	NTSC: ±0.5H (±858 sample/37 ns step) PAL: ±0.5H (±864 sample/37 ns step)
Compsite Out:	NTSC: ±0.5H (±858 sample/37 ns step) PAL: ±0.5H (±864 sample/37 ns step)
Compsite Out SC:	more than ±180°

* Black clip on/off switchable, when black clip on, its clipping at pedestal.

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