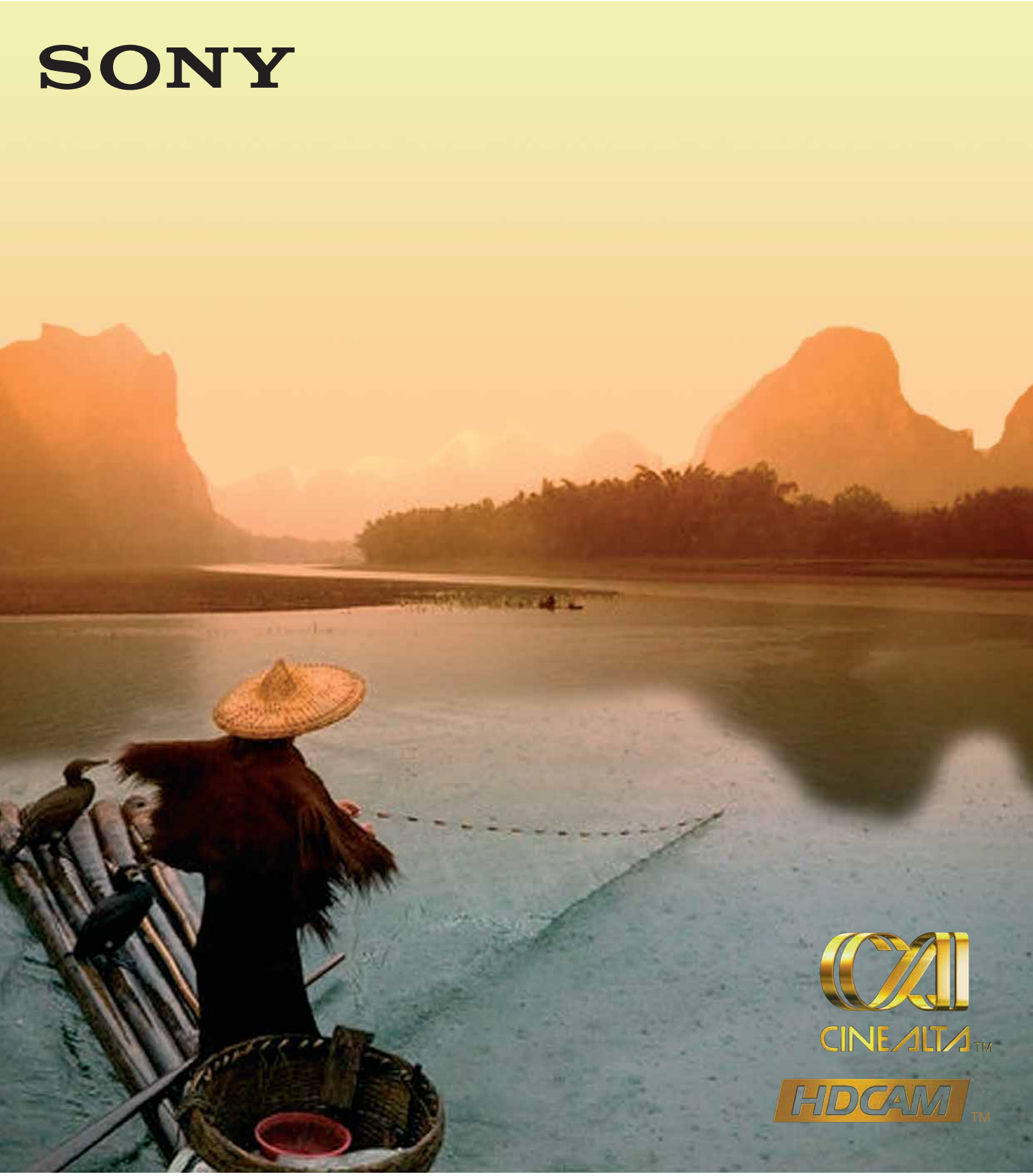
SONY



HDW-2000 Series
HDW-S280
J-H1 & J-H3

Digital Recorders and Players

www.sonybiz.net/hdcam

HDCAM

A WORLDWIDE STANDARD FOR DIGITAL PRODUCTION

High Definition equals better-looking television pictures – for the benefit of programme makers, broadcasters, advertisers and viewers.

Whether you're shooting quality drama, mainstream entertainment or commercials, High Definition is guaranteed to grab any audience's attention. Aside from its vastly improved on-screen look, HD increases the shelf-life and international marketability of all your productions.

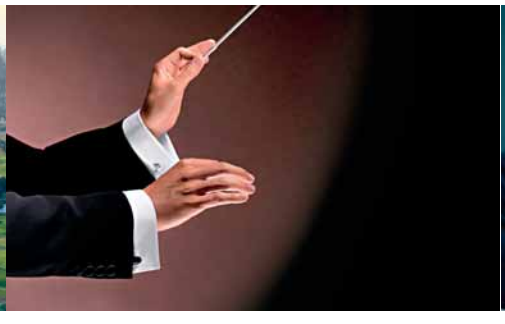
Guarantee a Premium for your Pictures
As consumers demand a higher quality viewing experience, Sony HDCAM ensures that your High Definition programmes always stand out from the crowd. Containing five times more information than Standard Definition PAL, pictures shot and produced in HDCAM offer breathtaking clarity and detail. Offering true 1080-line resolution and crystal clear digital sound, HDCAM is the perfect complement for any project where a prestige look is required. A natural partner for documentaries, natural history and live events as well as mainstream entertainment, it's firmly established as the preferred format for quality-conscious media professionals everywhere.

HDCAM builds on more than 25 years of Sony heritage in 1/2-inch tape technology – the overwhelming choice of hundreds of broadcasters who have standardised on Sony 1/2-inch formats for their on-air operations. HDCAM VTRs and players offer the same intuitive control layout, ergonomics and workflow that are familiar to Digital Betacam and MPEG IMX users. Just as importantly, HDCAM shares all the hallmarks of performance and reliability that you'd expect from proven Sony 1/2-inch technology. Selected models in the HDCAM line-up are playback-compatible with your Betacam SP, Betacam SX, MPEG IMX and Digital Betacam tape libraries, so there's no need to forfeit the value of your Standard Definition assets as you migrate smoothly to High Definition. With latest additions like the HDW-S280 Portable Recorder, the HDW-F900R CineAlta Camcorder and 24P recording now a feature of all HDCAM VTRs, the Sony line-up is stronger and more versatile than ever.

Operational Flexibility and Superb Value
HDCAM broadens your creative and commercial options with a choice of shooting modes to suit the demands of any project. Switch between interlace and progressive at a choice of frame rates to suit your creative preferences and distribution requirements. Equally, the benefits of HDCAM are not limited to productions destined for transmission and distribution in HD today. It's easy to down-convert HDCAM pictures to Standard Definition for post production and distribution – as proven by European prime-time television schedules that are already packed with HDCAM-originated programming.

Keeping costs down while providing an exceptional quality original recording for future distribution opportunities, HDCAM ensures your content commands a premium today and tomorrow. With HDCAM there's no need to compromise your personal vision – and with HDCAM VTRs starting at Digital Betacam prices, it's accessible to anyone who's passionate about making great-looking programmes.

Contents


HDW-2000 Series Digital Video Recorders and Player

CLASS-LEADING PERFORMANCE BUILT ON PROVEN TECHNOLOGY

Stunning High Definition Pictures

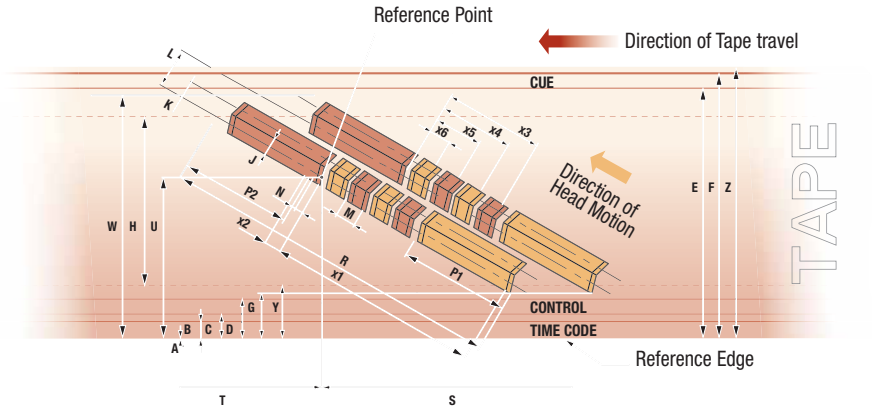
The HDW-2000 Series records High Definition component digital pictures using state-of-the-art HDCAM video compression. A video data rate of 140 Mb/s ensures superb picture quality. A 1/2-inch tape transport derived from Betacam and Digital Betacam technology provides a robust and reliable design.

A Smooth Path to High Definition

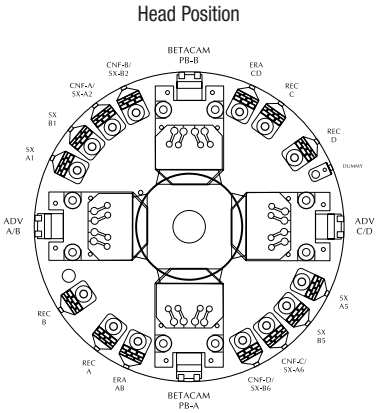
The HDW-2000 Series guarantees the smoothest path to the world of HD. With a choice of four models within the line-up, it's easy to choose the best combination of cost and performance for your facility. The low-cost HDW-2000 records and replays HDCAM. The top of the range HDW-M2000P adds compatible replay of Betacam, Betacam SP, Betacam SX, MPEG IMX and Digital Betacam tapes and, with over 280 million Sony 1/2-inch cassettes sold to date, offers unprecedented replay capability.

BETACAM
BETACAM SP
BETACAM SX
MPEG IMX
Digital BETACAM
HDCAM

HDCAM Track Layout



Drum Head Allocation



HDW-2000 Series Line-up

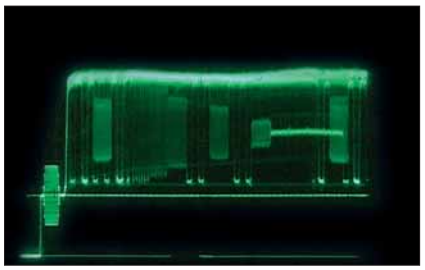
		Recording Format	Playback Format
HDW-2000	HD Digital Video Cassette Recorder	HDCAM	HDCAM
HDW-M2000P	HD Digital Video Cassette Recorder	HDCAM	HDCAM, Digital Betacam, MPEG IMX, Betacam SX, Betacam SP, Betacam
HDW-D2000	HD Digital Video Cassette Recorder	HDCAM	HDCAM, Digital Betacam, MPEG IMX
HDW-M2100P	HD Digital Video Cassette Player	—	HDCAM, Digital Betacam, MPEG IMX, Betacam SX, Betacam SP, Betacam

Built-in Up* and Down-converters

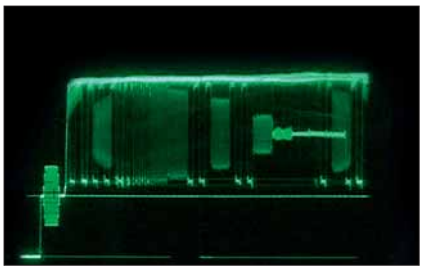
In addition to compatible replay of Standard Definition cassettes, the HDW-2000 Series features built-in up and down-converters as standard. Existing Standard Definition recordings can be up-converted to HD, while HDCAM material can be down-converted to SD for post production, transmission, or delivery via DVD. The “Super-sampled” images down-converted from HDCAM are visibly superior to those shot in Standard Definition, with higher horizontal and vertical MTF and reduced scanning aliasing.

* The HDW-2000 replays HDCAM tapes only. HD to SD down-conversion is provided, but SD to HD up-conversion is not.

Multi-burst Chart



Conventional 480/576-line Digital VTR



”Super-sampled“ HDCAM Down-converted signals

HDW-2000 Series Digital Video Recorders

HDW-M2000P Rear Panel

Switchable Between Interlace and Progressive Operation including 24PsF

HDCAM VTRs and players are ideal for facilities producing and distributing programmes internationally. Each model can be switched between 1080/50i, 1080/59.94i, 1080/25PsF and 1080/29.97PsF frame rates*1. Compatible replay of 576/50i and 480/59.94i is also provided by each deck*1.

To meet the increasing need for 24P programme creation, 1080/23.98PsF and 1080/24PsF recording and playback is now available on all HDW-2000 Series recorders. Conversion of 23.98PsF/24PsF recordings to a 25PsF output is also provided with time code conversion also performed by the VTR*2.

Finally, a 720/59.94P signal down-converted from 1080/59.94i or 1080/29.97PsF can be output from the VTR or player*2.

*1 The frame rate of the source tape cannot be converted at the output between 1080/59.94i and 1080/50i or between 480/59.94i and 576/50i. Playback of a 576-line analogue Betacam tape on the HDW-M2000/M2100 (NTSC model), and playback of a 480-line analogue Betacam tape on the HDW-M2000P/M2100P (PAL model) is for monitoring purposes only.

*2 Requires audio pitch correction. Down-conversion and/or "pull-down" of tapes played back at 23.98PsF or 24PsF frame rates is not provided.

Long Recording Time on a Single Cassette

The combination of HDCAM compression and high-density recording onto 1/2-inch tape yields a maximum recording time onto a small cassette of 40 minutes at 1080/59.94i, 48 minutes at 1080/50i and 50 minutes at 1080/24PsF.

Up to 124 minutes at 1080/59.94i, 149 minutes at 1080/50i, and 155 minutes at 1080/24PsF can be recorded onto a large cassette – ideal for feature films, dramas and football games running to extra time and penalties.

Digital Audio and Dolby®* Recording

The HDCAM format records four channels (two AES/EBU stereo pairs) of non-compressed digital audio (20 bit at 48 kHz). The HDW-2000 Series recorders can also record non-audio data streams within the audio recording area by packaging the data within an AES/EBU wrapper. Dolby-E and Dolby AC-3 (non audio) data streams can be input to the VTR and recorded onto the audio tracks.

* Dolby and the double-D symbol are trademarks of Dolby Laboratories Inc.

Compact Design and Low Power Consumption

The HDW-2000 Series is based upon a compact 4RU-size* design and weighs only 23 kg (50 lb 11 oz). It also has low power consumption of 220 W. This makes the VTRs and player ideal for studio use, and also in OB vehicles, where space is often limited.

*4 RU size = 427 x 174 x 540 mm (16 7/8 x 6 7/8 x 21 1/2 inches)

Easy Integration into your Facility

The HDW-2000 Series features a wide range of interfaces including:

- HD SDI I/O*
- SDI output (D1 component)
- SDTI I/O* (optional - requires HKDW-102 SDTI Interface Board)
- Analogue Component output
- Analogue Composite output (NTSC/PAL)
- Digital Audio I/O*(AES/EBU)
- Analogue Audio I/O*
- Audio Monitor output (2-ch analogue)

*The HDW-M2100P player provides outputs only.

HKDW-101 Control Panel with BKMW-102 Case

User-friendly Control Panel

Operators with experience of Betacam, Betacam SX, MPEG IMX or Digital Betacam will be instantly familiar with the operational controls of HDCAM VTRs and players. The layout of the tape transport and editing controls has been refined over generations of Sony 1/2-inch VTRs. The control panel has a multi-function display for quick access and easy control of the major operational functions. Dedicated rotary controls and meter displays are included for each of the four audio channels. An optional HKDW-101 control panel can be used in addition to the supplied control panel to operate the VTR remotely.

Easy Maintenance

Most of the circuitry of the HDW-2000 Series is arranged on plug-in boards to allow quick and easy maintenance. The drum assembly has been designed to achieve simple, low-cost maintenance by adopting an upper drum mechanism and an auto adjustment function as used in MPEG IMX VTRs and Betacam SX recorders. This helps to significantly reduce the time required for periodic drum replacement.

FAMILIAR OPERATION

HDW-750P Menu

HDW-2000 Series Time Code List

HDW-750P

Frame Accurate Editing

Insert and assemble editing with frame accuracy is provided with each channel of video and audio being independently editable.

High Speed Colour Picture Search

Recognisable colour pictures in shuttle mode, at speeds up to ±50 times normal playback, guarantee quick access to the required material on tape.

Dynamic Tracking™ Playback

Dynamic Tracking heads provide high quality slow motion pictures from -1 to +2 times normal playback speed from HDCAM and Betacam SX tapes. The slow motion range from Betacam, Betacam SP, MPEG IMX and Digital Betacam cassettes is -1 to +3.

Digital Jog Sound

The HDW-2000 Series replays four channels of digital audio in Jog mode (eight when replaying MPEG IMX tapes). Jog response is both fast and accurate for exact location of edit points. The monitored audio also remains precisely in sync with video.

Audio Crossfade

Digital Audio Crossfade provides smooth audio transitions at audio insert edit points. Previously recorded audio signals are read in advance using pre-read heads and then re-recorded onto the same track after being mixed with the input audio signal. The crossfade duration can be selected from a range of values.

Dynamic Motion Control (DMC) Playback

The HDW-2000 Series features DMC playback, memorising the tape speed trajectory over the DT speed range (-1 to +2 times normal speed).

Pre-read Editing

Pre-read editing became an instant hit when it first appeared on Digital VTRs over 15 years ago. HDW-2000 Series recorders are equipped with advanced playback heads to enable pre-read editing. Captions can be added using a single VTR A/B-roll editing can be performed with two VTRs, and audio crossfades can be added for smooth audio transitions.

1080/1035 Line Conversion

Bi-directional vertical filtering between the two active line standards (1080 and 1035) and enhanced quality of variable speed Dynamic Tracking playback is included as standard.

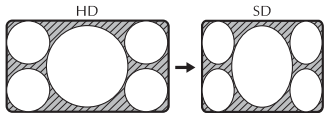
Shot Marks

HDW-2000 Series VTRs can scan tapes with Shot Marks and automatically detect their positions. After scanning, a list of Shot Marks is displayed on the video monitor, allowing rapid cueing to the required material.

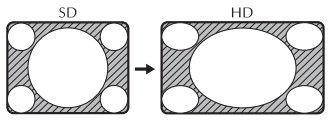
Selectable Aspect Ratio

Squeeze, Letterbox and Edge Crop adjustments are provided for control of picture aspect ratio when converting from SD to HD and vice versa.

SQUEEZE mode

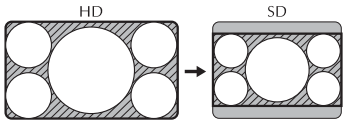


HD to SD, 16:9 HD picture is down-converted and output as a 4:3 SD picture.

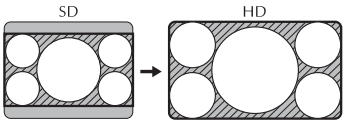


SD to HD, 4:3 SD picture is up-converted, then output as a 16:9 HD picture.

LETTERBOX mode

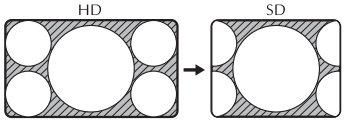


HD to SD, 16:9 HD picture down-converted to SD and output is presented in Letterbox on a 4:3 monitor.

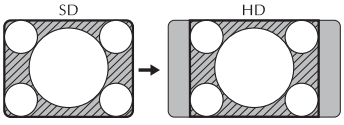


SD to HD, 4:3 SD picture is cropped and presented as a 16:9 picture.

EDGE CROP mode



HD to SD, edges of a 16:9 HD picture are cropped in the down-converted 4:3 SD picture.



SD to HD, 4:3 SD picture up-converted as a 16:9 HD picture, however the sides are cropped.

Metadata Handling

Metadata is user-defined data indicating when, where, or by whom material was created. The Unique Material IDentifier (UMID) has been standardised by the Society of Motion Picture and Television Engineers (SMPTE)* and is a globally unique identifier used for the identification of picture/audio material and data.

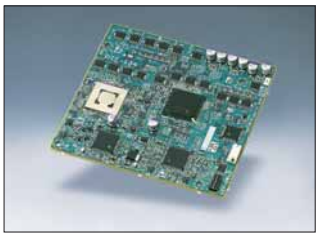
HDW-2000 Series VTRs provide the facility to generate and record UMID data on tape during dubbing, editing and up and down-conversion. Recorded UMIDs can subsequently be used in editing, archiving and distribution, to increase production efficiency throughout the programme production chain.

The HDW-2000 Series VTRs can record up to 255 bytes x 3 packets of metadata per field, which can be transferred to other devices via HD-SDI or SDTI.

* The UMID standard is SMPTE-330M

OPTIONAL ACCESSORIES

HKDW-101
Control Panel



HKDW-102
SDTI Interface Board

BKMW-102
Remote Control Unit

BKMW-103
Control Panel Extension Kit
(Cable length = 10m)

RMM-131
Rack Mount Kit

RCC-5G
9-pin Remote Cable

RM-280
Editing Controller

BCT-6HD/12HD/22HD/32HD/40HD/34HDL/64HDL/94HDL/124HDL
HDCAM Tape Cassette

BCT-HD12CL
Cleaning Cassette

BZNW-7000 Series MMStation™
Remote Monitoring and Maintenance Software

MLB-1M-100 Memory Label
(for Tele-File system)

HDW-S280 Digital Video Recorder

HDCAM OPERATION IN THE REMOTEST OF LOCATIONS

HDCAM is firmly established as the format of choice for high quality programming - from drama, commercials and natural history to documentaries, sport and mainstream entertainment. Since the launch of HDCAM, Sony has developed a line-up of camcorders and VTRs which are now in use by the most discerning professionals around the world.

To strengthen this line-up further, Sony has now added a compact recorder to the HDCAM range. The HDW-S280 is the first HDCAM VTR to offer CineAlta recording in a compact half-rack 3U chassis. Packed with features, the HDW-S280 is switchable between interlace and progressive mode with selectable frame rates, including 50i, 25PsF and 24PsF. Compatible replay of Betacam SX, Betacam SP and Betacam tapes and built-in up- and down-conversion is also included as standard.

Despite its small size, the front panel of the HDW-S280 houses a 3.5-inch* 16:9 colour LCD display for on-the-spot picture monitoring and configuration of VTR operational menus. AC, DC or battery operation completes an impressive list of features.

The HDW-S280 recorder is ideal in operations where space is at a premium and it has already been put to great use by production companies, outside broadcasters and aerial shooting specialists around the world.

* Viewable area, measured diagonally

MAIN FEATURES

Superb High Definition Pictures

The HDW-S280 records High Definition component digital pictures onto small HDCAM cassettes using state-of-the-art HDCAM video compression. A video data rate of 140 Mb/s ensures superb picture quality. A 1/2-inch tape transport derived from Betacam and Digital Betacam technology provides a robust and reliable design.

Powerful Legacy Playback

Betacam SP and Betacam SX camcorders are in widespread use around the world for programmes such as ENG, documentaries and mainstream entertainment. The HDW-S280 can replay Betacam, Betacam SP and Betacam SX cassettes, providing a smooth migration to the world of High Definition.

Switchable Between Interlace and Progressive Operation including 24PsF

The HDW-S280 is ideal for facilities producing and distributing programmes internationally. This compact model can operate in 1080/50i, 1080/59.94i, 1080/25PsF, 1080/29.97PsF and CineAlta 1080/23.98PsF* and 1080/24PsF* modes*. This versatile choice of rates makes the HDW-S280 ideal for the full range of mainstream and prestige productions

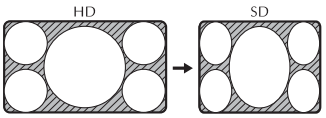
* The HDW-S280 does not offer a 3-2 pull-down capability. 1080/24PsF and 1080/23.98PsF recordings cannot, therefore, be converted to 1080/59.94i and 1080/50i output by the HDW-S280.

Built-in Up and Down-converters with Selectable Picture Modes

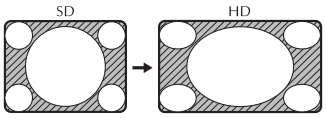
The HDW-S280 can output 480/59.94i and 576/50i signals via SD-SDI or analogue composite when replaying HDCAM material*. This is ideal where Standard Definition post production or distribution is required. The HDW-S280 can also output 1080i signals via HD-SDI when replaying SD legacy tapes. Squeeze, Letterbox and Edge Crop adjustments are provided for control of picture aspect ratio when converting from SD to HD and vice versa.

* 1080/24PsF and 1080/23.98PsF playback cannot be converted to 480/59.94i and 576/50i output.

SQUEEZE mode

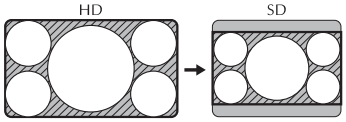


HD to SD, 16:9 HD picture is down-converted and output as a 4:3 SD picture.

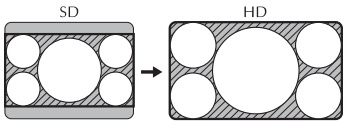


SD to HD, 4:3 SD picture is up-converted, then output as a 16:9 HD picture.

LETTERBOX mode

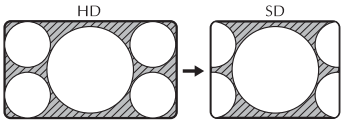


HD to SD, 16:9 HD picture down-converted to SD and output is presented in Letterbox on a 4:3 monitor.

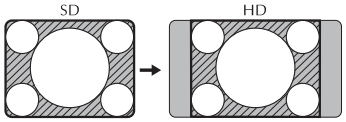


SD to HD, 4:3 SD picture is cropped and presented as a 16:9 picture.

EDGE CROP mode



HD to SD, edges of a 16:9 HD picture are cropped in the down-converted 4:3 SD picture.



SD to HD, 4:3 SD picture up-converted as a 16:9 HD picture, however the sides are cropped.

OPERATIONAL FEATURES

Compact and Portable Design

The HDW-S280 recorder has been designed for use wherever space is limited. Outside broadcast trucks, cars and helicopters are just some of the locations where you will find HDW-S280 recorders in use. Measuring only 3U high and half-rack width, with a weight of just 6.0 kg (13 lb 4 oz), the HDW-S280 is the smallest VTR in the HDCAM line-up. A carrying handle and a tilt stand further enhance its suitability for use on location.

User-friendly Control Panel Design

Technical performance counts for little if a VTR is not easy to operate. Although the control panel of the HDW-S280 is extremely compact, it is very easy to use, providing logical access to each operational control. A Jog/Shuttle dial is provided for quick and precise picture searching. A 3.5-inch* 16:9 colour LCD display, allows viewing of material and VTR setup without the use of an external video monitor – a feature especially useful for field operations. At the push of a button, the LCD display can be switched between video monitoring with superimposed time code and audio level meters, or system status/menu control mode. Dedicated audio control knobs are also located on the front panel.

* Viewable area measured diagonally.

Front Panel (Video Monitor View)

System Status View

HDW-S280 Digital Video Recorder

Rear Panel

AC/DC or Battery-powered Operation

The HDW-S280 recorder can operate on AC, DC and battery* power, greatly increasing its flexibility for field productions. The recorder also achieves low power consumption, enabling up to 80 minutes of operating time using the optional BP-GL95 battery.

* To use with a battery, the optional BKP-L551 battery adaptor is required.

Backspace and Assemble Editing

The HDW-S280 provides two types of editing capability. Automatic backspace editing with instant-start allows sequential recording, without picture interference at transition points. Assemble editing – including two-machine editing – is also supported*.

* Frame accuracy is ±1 frame.

Sequential Recording Function

The record duration onto a small cassette is up to 50 minutes at 24PsF, 48 minutes at 50i and 40 minutes at 59.94i. Should a longer record time be required, two decks can be connected to record sequentially without a break in the recording. Two minutes from the end of the first tape, the second deck starts recording, and the tape in the first deck can then be changed. An unlimited record time can be achieved.

HDW-S280 with BP-GL95 battery

Jog and Shuttle

Easy Setup Using Memory Stick™ Media

Search Functions – Jog and Shuttle Modes

The HDW-S280 recorder delivers recognisable colour pictures in shuttle mode at speeds of up to ±10 times normal playback. Jog operation is also supported, at up to ±1 time normal playback speed.

Easy Integration into your Facility

Although compact in design, the HDW-S280 supports the following interfaces:

- HD-SDI input and output
- SD SDI output
- Analogue composite output
- Analogue audio input and output
- Analogue audio monitor output
- Reference input
- Time code input and output
- RS-422 9-pin remote interface

Easy Setup Using Memory Stick™ Media

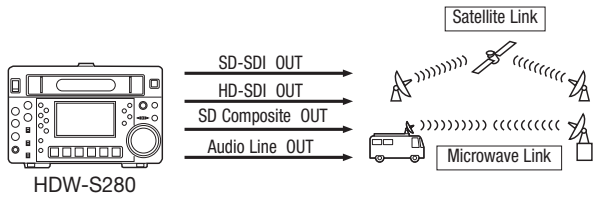
Operators can store and recall VTR setup parameters onto optional Memory Stick media, enabling quick and consistent setup of multiple VTRs.

Metadata Recording

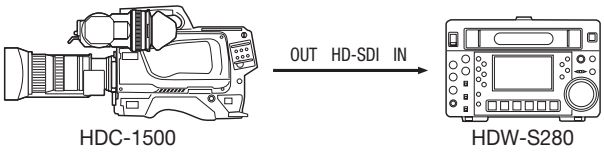
The HDW-S280 can record metadata including UMID (Unique Material IDentifier) and shot marks, which are used for quick cue-up to scenes of interest. This metadata capability improves overall efficiency across the production process.

SYSTEM CONFIGURATIONS

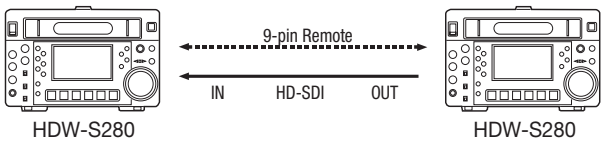
TRANSMISSION



ACQUISITION

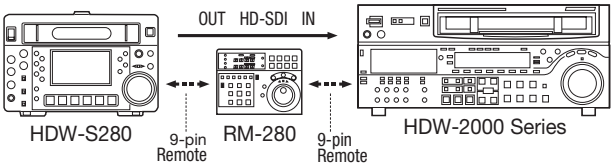


TWO-MACHINE EDITING

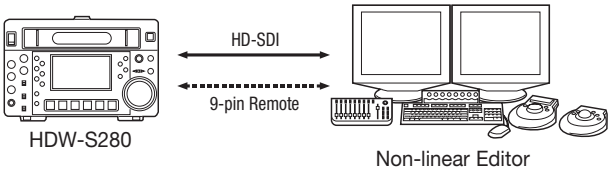


* Assemble editing only. Frame accuracy is ±1 frame.

EDITING WITH RM-280 EDITING CONTROLLER



NON-LINEAR EDITING



OPTIONAL ACCESSORIES

BCT-6HD/12HD/ 22HD/32HD/40HD
HDCAM Tape Cassette

BCT-HD12CL
Cleaning Cassette

RCC-5G
9-pin Remote Cable

RM-280
Editing Controller

BKP-L551
Battery Adaptor

BP-GL95/GL65
Lithium-ion Battery Pack

BP-L60S
Lithium-ion Battery Pack

BC-M150
Battery Charger

BC-L70
Battery Charger

J-H1/J-H3 Compact Digital Video Player

HDCAM PLAYBACK ON YOUR DESK

With HDCAM camcorders and studio VTRs now in widespread use around the world, it was inevitable that producers, editors and others involved in programme production would demand cost-effective HDCAM players for viewing, logging and feeding of HDCAM material into non-linear edit systems. The J-H Series compact players have been designed to meet this requirement. Sharing the same design philosophy and physical dimensions of the J Series Standard Definition compact players, both the J-H1 and J-H3 are affordable, compact and lightweight. While the J-H1 provides HDCAM playback at 59.94i, 50i, 25P, and 29.97P, the J-H3 is equipped with a number of additional features to support 24P production, and is the ideal partner to the CineAlta line-up and the HDW-750P camcorder.

FEATURES

Compact Design

Sharing the same chassis design as the J Series compact players for Standard Definition, the J-H1 and J-H3 retain a compact and lightweight design. Equivalent in size to a typical desktop PC, they can be located on the desks of producers, journalists and editors. The J-H1 and J-H3 players measure 307 x 100 x 397 mm (12 ⅛ x 4 x 15 ¾ inches) and weigh just 7.5 kg (16 lb 9 oz). They can be used horizontally or placed upright with the supplied vertical stand, for operation where space is limited.

Replay of Both Small and Large Cassettes

Despite their very compact design, the J-H1 and J-H3 can play back both large and small size cassettes.

HDCAM Replay at Multiple Frame Rates

The J-H1 and J-H3 can replay HDCAM cassettes recorded in 1080/50i, 1080/59.94i, 1080/25P and 1080/29.97P. The J-H3 adds 1080/23.98P and 1080/24P replay, making it ideal for the full range of mainstream and prestige TV programming, commercials and feature film applications.

Flexible Audio Outputs

Both the J-H1 and J-H3 provide two channels of analogue audio output, available from either the XLR or phono connectors located on the rear panel. A headphone socket is also provided on the front panel. The audio channels to be output from the analogue outputs and headphone socket can be selected from Ch 1/2, Ch 3/4 and the Cue track. Audio is automatically muted for off-speed playback and non-data playback.

Additional J-H3 Features – Extending Applications in Post Production

The J-H3 offers additional features specifically designed to improve its suitability for post production. These include:

- Reference input (HD/SD switchable)
- RS-422A
- Time code output
- Pull down function to convert 1080/23.98P to 1080/59.94i and 525/59.94i

Comprehensive Interfacing for Signal Output and Monitoring

HD and SDI Outputs

For Connection to High Grade Monitors

The J-H1 and J-H3 are equipped with an analogue Y/Pb/Pr component output (BNC x 3) for connection to an HD picture monitor. The J-H3 also offers HD-SDI and SD-SDI outputs for high quality monitoring and feeding to SD and HD non-linear editors. AES/EBU audio and non-audio data are embedded in the digital outputs.

Built-in Down-converter

For Connection to Standard Definition Monitors

Both the J-H1 and J-H3 have a built-in down-converter, offering NTSC or PAL composite video output from the BNC and RCA output connectors. HDCAM-originated content can be down-converted for viewing on a Standard Definition monitor or for subsequent post production in the SD domain.

RGB Computer Display Interface

For Connection to Computer Displays

The J-H1 and J-H3 are equipped with an RGB computer display interface to output HDCAM-originated content at XGA resolution. The pixel count of an XGA display is 1024 x 768, so the HDCAM image is “letterboxed” to 1024 x 577 pixels. Alternatively, the players can be connected to an XGA-capable data projector for review of material or for formal presentations.

i.LINK* Interface

“Single-Cable” Transmission of Video, Audio, and Time Code

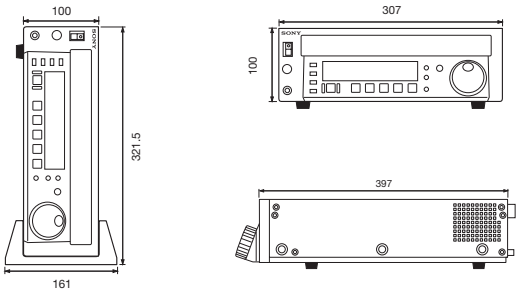
An optional HKJ-101 i.LINK interface board can be installed into the J-H1 and J-H3. This can feed down-converted HDCAM material as 25 Mb/s DV data, with audio and time code, via a single i.LINK interface cable.

This DV-output can be connected to a DVCAM deck for dubbing of HDCAM material to DVCAM tape**. It also allows a direct connection to DV-based non-linear editors for low-cost off-line editing.

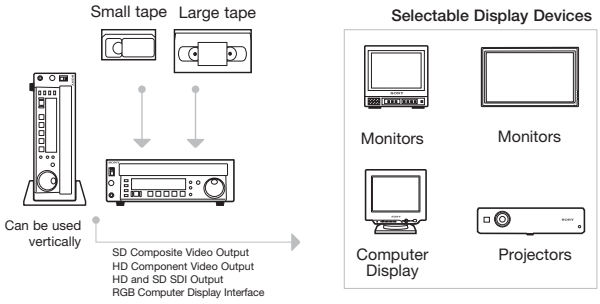
* i.LINK is a trademark of Sony used only to designate that a product contains an IEEE1394 connection. The i.LINK connection may vary depending on the software applications, operating system and specific device. It is possible that some products with an i.LINK connection may not communicate with others. Please refer to the documentation that comes with an i.LINK-equipped device for information on compatibility, operating conditions and proper connection.

** Assemble or Insert editing functions cannot be used.

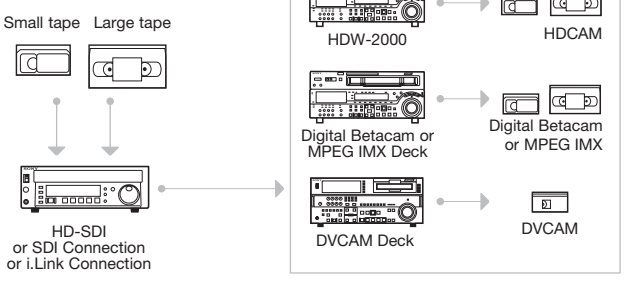
Dimensions



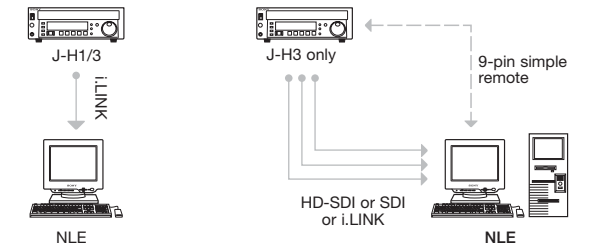
Viewing



Simple Dubbing



Source Feeding to NLE



Specifications

HDW-2000 **Series**

			HDW-2000	HDW-M2000P	HDW-M2100P
GENERAL					
Power requirements			100 to 240 V, 50/60 Hz		
Power consumption			220 W		
Operating temperature			+5 to +40 °C (41to 104 °F)		
Storage temperature			-20 to +60 °C (-4 to +140 °F)		
Humidity			25 to 90%		
Mass			23 kg (50 lb 11 oz)		
Dimensions (W x H x D)			427 x 174 x 544 mm (16 7/8 x 6 7/8 x 21 1/2 inches)		
Tape speed		HDCAM	96.7 mm/s (59.94i, 29.97PsF), 80.6 mm/s (50i, 25PsF), 77.4 mm/s (24PsF, 23.98PsF)		
		Digital Betacam	—	96.7 mm/s	
		MPEG IMX	—	64.5 mm/s (525/59.94), 53.8 mm (625/50)	
		Betacam SX	—	59.6 mm/s	
		Betacam/Betacam SP	—	118.6 mm/s (525/59.94), 101.5 mm/s (625/50)	
HDCAM record/playback time (HDW-M2100P is replay only)			124 minutes (59.94i, 29.97PsF, with BCT-124HDL cassette) 149 minutes (50i, 25PsF, with BCT-124HDL cassette) 155 minutes (24PsF, 23.98PsF, with BCT-124HDL cassette) 40 minutes (59.94i, 29.97PsF, with BCT-40HD cassette) 48 minutes (50i, 25PsF, with BCT-40HD cassette) 50 minutes (24PsF, 23.98PsF, with BCT-40HD cassette)		
Fast forward/rewind time			Approx. 3 minutes (with BCT-124HDL cassette)		
Search speed range	SHUTTLE MODE	HDCAM	Still to ±50 times normal speed playback (59.94i, 29.97PsF), Still to ±58 times normal speed playback (50i, 25PsF), Still to ±60 times normal speed playback (24PsF, 23.98PsF)		
		Digital Betacam	—	Still to ±50 times normal speed playback	
		MPEG IMX	—	Still to ±78 times normal speed playback	
		Betacam SX	—	Still to ±78 times normal speed playback	
		Betacam/Betacam SP	—	Still to ±35 times normal speed playback (525/59.94) Still to ±42 times normal speed playback (625/50)	
	VARIABLE MODE	HDCAM	—	-1 to +2 times normal speed playback	
		Digital Betacam	—	-1 to +3 times normal speed playback	
		MPEG IMX	—	-1 to +3 times normal speed playback	
		Betacam SX	—	-1 to +2 times normal speed playback	
		Betacam/Betacam SP	—	-1 to +3 times normal speed playback	
	JOG MODE		Still to ±1 times normal speed playback		
Servo lock time			0.6 s or less (59.94i, 29.97PsF, from standby on), 0.7 s or less (50i, 25PsF, 24PsF, 23.98PsF, from standby on)		
Load/unload time			6 s or less (both L and S cassettes)		
INPUT/OUTPUT					
HD-SDI input			BNC x 1 (SMPTE 292M), Serial Digital (1.485 Gb/s)		—
SDTI input (with optional HKDW-102 installed)			BNC x 1 (SMPTE305M), 270 Mb/s		—
Reference video input			BNC x 2 (with a loop-through), Tri-level sync, 0.6 Vp-p, 75 Ω, sync negative or Black Burst or Composite, 0.3 Vp-p, 75 Ω, sync negative		
Digital audio input (CH 1/2, CH 3/4)			BNC x 2, AES/EBU		—
Analogue audio input (CH 1/2/3/4/Cue)			XLR-3-pin type, female, x 5 Low off: -60 dBu, high impedance, balanced High off: +4 dBu, high impedance, balanced High on: -4 dBm, 600 Ω termination, balanced		—
Time code input			XLR-3-pin type, female, x 1 (0.5 to 18 Vp-p,10 kΩ, balanced)		
HD-SDI output			BNC x 3 (SMPTE 292M including one character out), Serial Digital (1.485 Gb/s)		
SDTI output (with optional HKDW-102 installed)			BNC x 2 (SMPTE 305M), 270 Mb/s		
SDI output			BNC x 3 (SMPTE 259M including one character out), Serial Digital (270 Mb/s)		
Analogue composite output			BNC x 3 (RS-170A, including one character out, one WFM out) Y: 1.0 Vp-p, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω		
Analogue component output			BNC x 3, for one set, 1.0 V p-p, 75 Ω,sync negative		
Digital audio output			BNC x 4, AES/EBU (CH 1/2, CH 3/4, CH 5/6, CH 7/8)		
Analogue audio output (CH 1/2/3/4)			XLR-3-pin type, x 5, male, +4 dBm (600 Ω load), low impedance, balanced		
Time code output			XLR-3-pin type, male, x 1 (2.2 Vp-p, low impedance, balanced)		
Monitor output L/R			XLR-3-pin type, male, x 2 (+4 dBm at 600 Ω load, low impedance, balanced)		
Headphones			JM-60 Stereo phone jack (-∞ to -12 dBu at 8 Ω load, unbalanced)		
Remote1 In			D-sub 9-pin, Sony 9-pin remote interface		
Remote1 Out			D-sub 9-pin, Sony 9-pin remote interface		
RS-232C			D-sub 9-pin		
Remote2 Parallel I/O			D-sub 50-pin		
Video control			D-sub 9-pin, D-sub 15-pin		
Control panel			D-sub 15-pin		
Others			"Memory Stick"™ slot, PCMCIA slot		
PROCESSOR ADJUSTMENT RANGE					
Video level			±3 dB/∞ to +3 dB, selectable		
Chroma level			±3 dB/∞ to +3 dB, selectable		
Set up/black level			±3 IRE		
Chroma phase/hue			±30°		
System sync phase			±15 µs		
System SC phase			±200 ns		
Y/C delay			—	±100 ns	
DIGITAL VIDEO PERFORMANCE					
Sampling frequency			Y: 74.25 MHz, R-Y/B-Y: 37.125 MHz		
Quantisation			10 bit/sample (compression: 8 bit/sample)		
Compression			Coefficient recording system		
Channel coding			S-I-NRZI PR-IV		
Error correction			Reed-Solomon code		
ANALOGUE COMPONENT OUTPUT PERFORMANCE					
Bandwidth			Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB		
S/N ratio			56 dB or more		
K Factor (2T Pulse)			1% or less		
ANALOGUE COMPOSITE OUTPUT PERFORMANCE					
Bandwidth			Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB		
S/N ratio			53 dB or more		
Differential gain			2% or less		
Differential phase			2% or less		
Y/C delay			20 ns or less		
K Factor (2T Pulse)			1% or less		
Output SCH phase			Based upon RS-170A/CCIR R.624-3		
DIGITAL AUDIO PERFORMANCE					
Sampling frequency			48 kHz (Synchronised with video)		
Quantisation			20 bit/sample		
Wow & flutter			Below measurable level		
Headrooms			20 dB (or 18 dB selectable)		
Emphasis (ON/OFF selectable in REC mode)			T1=50 µs, T2=15 µs (on/off selectable in recording mode)		
ANALOGUE AUDIO OUTPUT PERFORMANCE					
A/D quantisation			20 bit/sample		
D/A quantisation			20 bit/sample		
Frequency response			20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)		
Dynamic range			More than 95 dB (at 1 kHz, emphasis ON)		
Distortion			Less than 0.05% (at 1 kHz, emphasis ON, reference level)		
Crosstalk			Less than -80 dB (at 1 kHz, between any two channels)		
CUE TRACK					
Sampling frequency			100 Hz to 12 kHz ±3 dB		
S/N ratio			More than 45 dB (at 3% distortion level)		
Distortion			Less than 2% (T.H.D. at 1 kHz, reference level)		
Wow & flutter			Less than 0.2%		
Erase ratio			More than 60 dB		—
SUPPLIED ACCESSORIES					
			Operation manual (1), Installation manual (1)		

HDW-D2000
100 to 240 V, 50/60 Hz
220 W
+5 to +40 °C (41to 104 °F)
-20 to +60 °C (-4 to +140 °F)
25 to 90%
23 kg (50 lb 11 oz)
427 x 174 x 544 mm (16 7/8 x 6 7/8 x 21 1/2 inches)
96.7 mm/s (59.94i, 29.97PsF), 80.6 mm/s (50i, 25PsF), 77.4 mm/s (24PsF, 23.98PsF)
96.7 mm/s
64.5 mm/s (525/59.94), 53.8 mm (625/50)
—
—
124 minutes (59.94i, 29.97PsF, with BCT-124HDL cassette) 149 minutes (50i, 25PsF, with BCT-124HDL cassette) 155 minutes (24PsF, 23.98PsF, with BCT-124HDL cassette) 40 minutes (59.94i, 29.97PsF, with BCT-40HD cassette) 48 minutes (50i, 25PsF, with BCT-40HD cassette) 50 minutes (24PsF, 23.98PsF, with BCT-40HD cassette)
Approx. 3 minutes (with BCT-124HDL cassette)
Still to ±50 times normal speed playback (59.94i, 29.97PsF), Still to ±58 times normal speed playback (50i, 25PsF), Still to ±60 times normal speed playback (24PsF, 23.98PsF)
Still to ±50 times normal speed playback
Still to ±78 times normal speed playback
—
—
-1 to +2 times normal speed playback
-1 to +3 times normal speed playback
-1 to +3 times normal speed playback
—
—
Still to ±1 times normal speed playback
0.6 s or less (59.94i, 29.97PsF, from standby on), 0.7 s or less (50i, 25PsF, 24PsF, 23.98PsF, from standby on)
6 s or less (both L and S cassettes)
BNC x 1 (SMPTE 292M), Serial Digital (1.485 Gb/s)
BNC x 1 (SMPTE305M), 270 Mb/s
BNC x 2 (with a loop-through), Tri-level sync, 0.6 Vp-p, 75 Ω, sync negative or Black Burst or Composite, 0.3 Vp-p, 75 Ω, sync negative
BNC x 2, AES/EBU
XLR-3-pin type, female, x 5 Low off: -60 dBu, high impedance, balanced High off: +4 dBu, high impedance, balanced High on: -4 dBm, 600 Ω termination, balanced
XLR-3-pin type, female, x 1 (0.5 to 18 Vp-p,10 kΩ, balanced)
BNC x 3 (SMPTE 292M including one character out), Serial Digital (1.485 Gb/s)
BNC x 2 (SMPTE 305M), 270 Mb/s
BNC x 3 (SMPTE 259M including one character out), Serial Digital (270 Mb/s)
BNC x 3 (RS-170A, including one character out, one WFM out) Y: 1.0 Vp-p, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω
BNC x 3, for one set, 1.0 V p-p, 75 Ω,sync negative
BNC x 4, AES/EBU (CH 1/2, CH 3/4, CH 5/6, CH 7/8)
XLR-3-pin type, x 5, male, +4 dBm (600 Ω load), low impedance, balanced
XLR-3-pin type, male, x 1 (2.2 Vp-p, low impedance, balanced)
XLR-3-pin type, male, x 2 (+4 dBm at 600 Ω load, low impedance, balanced)
JM-60 Stereo phone jack (-∞ to -12 dBu at 8 Ω load, unbalanced)
D-sub 9-pin, Sony 9-pin remote interface
D-sub 9-pin, Sony 9-pin remote interface
D-sub 9-pin
D-sub 50-pin
D-sub 9-pin, D-sub 15-pin
D-sub 15-pin
"Memory Stick"™ slot
±3 dB/∞ to +3 dB, selectable
±3 dB/∞ to +3 dB, selectable
±3 IRE
±30°
±15 µs
±200 ns
—
Y: 74.25 MHz, R-Y/B-Y: 37.125 MHz
10 bit/sample (compression: 8 bit/sample)
Coefficient recording system
S-I-NRZI PR-IV
Reed-Solomon code
Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB
56 dB or more
1% or less
Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB
53 dB or more
2% or less
2% or less
20 ns or less
1% or less
Based upon RS-170A/CCIR R.624-3
48 kHz (Synchronised with video)
20 bit/sample
Below measurable level
20 dB (or 18 dB selectable)
T1=50 µs, T2=15 µs (on/off selectable in recording mode)
20 bit/sample
20 bit/sample
20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)
More than 95 dB (at 1 kHz, emphasis ON)
Less than 0.05% (at 1 kHz, emphasis ON, reference level)
Less than -80 dB (at 1 kHz, between any two channels)
100 Hz to 12 kHz ±3 dB
More than 45 dB (at 3% distortion level)
Less than 2% (T.H.D. at 1 kHz, reference level)
Less than 0.2%
More than 60 dB
Operation manual (1), Installation manual (1)

Digital Betacam playback (HDW-M2000P, HDW-M2100P, HDW-D2000)

VIDEO PERFORMANCE		
Bandwidth	Y	0 to 5.75 MHz +0.5 dB/-0.5 dB
	R-Y/B-Y	0 to 2.75 MHz +0.5 dB/-0.5 dB
S/N ratio		62 dB or more
K factor		1% or more
DIGITAL AUDIO (CH 1 TO CH 4)		
Frequency response (0 dB at 1 kHz)		20 Hz to 20 kHz +0.5 dB/-1.0 dB
Dynamic range		95 dB (at 1 kHz, emphasis ON)
Distortion (T.H.D. at 1 kHz, reference level)		0.05% rms (emphasis ON)
Wow & flutter		Below measurable level
ANALOGUE AUDIO (CUE TRACK)		
Frequency response (0 dB at 1 kHz)		100 Hz to 12 kHz +3 dB/-3 dB
S/N ratio (at 3% distortion level)		45 dB (at 1 kHz)
Distortion (T.H.D. at 1 kHz, reference level)		2% or less
Wow & flutter		Less than 0.2% (DIN 45508 weighted)

MPEG IMX playback (HDW-M2000P, HDW-M2100P, HDW-D2000)

VIDEO PERFORMANCE		
Bandwidth	Y	0 to 5.75 MHz +0.5 dB/-2.0 dB
	R-Y/B-Y	0 to 2.75 MHz +0.5 dB/-2.0 dB
S/N ratio		56 dB or more
K factor (2T pulse)		1% or more
AUDIO PERFORMANCE		
Frequency response (0 dB at 1 kHz)		20 Hz to 20 kHz +0.5 dB/-1.0 dB
Dynamic range		90 dB or more (at 1 kHz, emphasis ON, 16 bits/48 kHz)
Distortion		0.05% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))

Betacam SX playback (HDW-M2000P, HDW-M2100P)

VIDEO PERFORMANCE		
Bandwidth	Y	0 to 5.5 MHz +0.5 dB/-3.0 dB
	R-Y/B-Y	0 to 2.0 MHz +0.5 dB/-3.0 dB
S/N ratio		56 dB or more
K factor		1% or less
AUDIO PERFORMANCE		
Frequency response (0 dB at 1 kHz)		20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)
Dynamic range		90 dB or more (at 1 kHz, emphasis ON)
Distortion		0.05% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))

Analogue Betacam SX playback (HDW-M2000P, HDW-M2100P)

		METAL TAPE	OXIDE TAPE
VIDEO PERFORMANCE			
Bandwidth	Y	30 Hz to 4.5 MHz +0.5 dB/-4.0 dB	30 Hz to 4.1 MHz +0.5 dB/-6.0 dB
	R-Y/B-Y	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB
S/N ratio	Y	51 dB or more	48 dB or more
	R-Y/B-Y	48 dB or more	45 dB or more
K-Factor (2T Pulse)		2% or less	3% or less
LF non-linearity	Y	3% or less	
	R-Y/B-Y	4% or less	
Y/C delay		20 ns or less	
VIDEO PERFORMANCE			
LNG	Frequency response	50 Hz to15 kHz +1.5 dB/-3.0	
	S/N ratio	72 dB or more	50 dB or more (Dolby NR off)
	T.H.D.	1% or less	2% or less
	Wow & Flutter	0.1% rms or less	
AFM*	Frequency response	20 Hz to 20 kHz +0.5 dB/-2.0 dB	
	S/N ratio	85 dB or more	
	T.H.D.	0.5% or less	

Specifications

HDW-S280

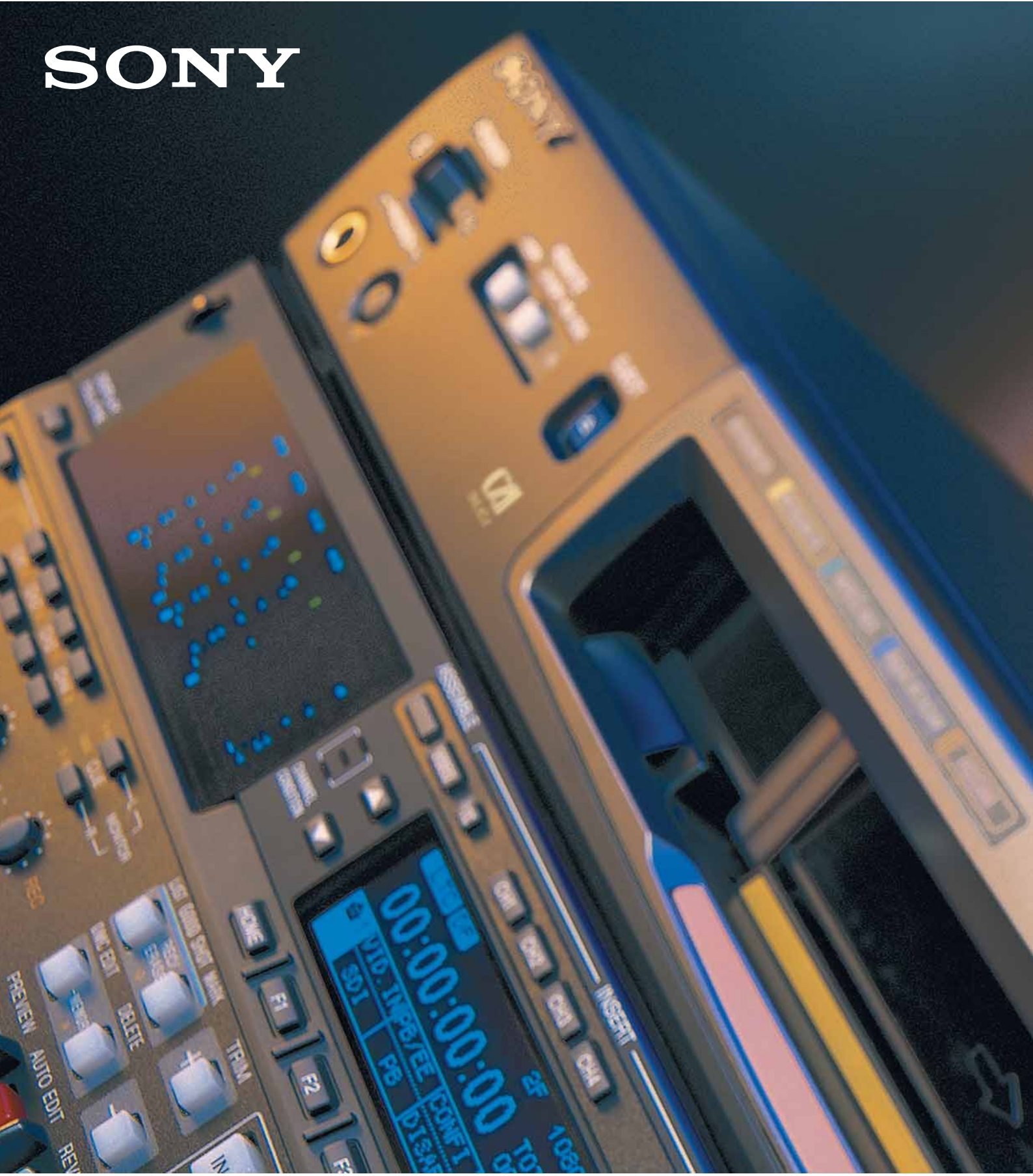
GENERAL		
Power requirements		100 to 240 V, 50/60 Hz
Power consumption		80 W (AC operation), 60 W (DC operation)
Operating temperature		+5 to +40 °C (41 to 104 °F)
Storage temperature		-20 to +60 °C (-4 to +140 °F)
Humidity		25 to 80%
Mass		6 kg (13 lb 4 oz)
Dimensions (W x H x D)		210 x 132 x 425 mm (8 ¾ x 5 ¼ x 16 ¾ inches)
Tape speed	HDCAM	96.7 mm/s (59.94i, 29.97PsF), 80.6 mm/s (50i, 25PsF), 77.4 mm/s (24PsF, 23.98PsF)
	Betacam SX	59.6 mm/s
	Betacam/Betacam SP	118.6 mm/s (59.94i), 101.5 mm (50i)
HDCAM Record/playback time		40 minutes (59.94i, 29.97PsF, with BCT-40HD cassette)
		48 minutes (50i, 25PsF, with BCT-40HD cassette)
		50 minutes (24PsF, 23.98PsF, with BCT-40HD cassette)
Fast forward/rewind time		Approx. 4 minutes (fast-forward), 3 minutes (rewind)
Search speed range	Shuttle mode	Still to ±10 times normal speed playback
	Jog mode	Still to ±1 time normal speed playback
Servo lock time		1.0 s or less
Load/unload time		7 s or less
INPUT/OUTPUT		
HD-SDI input		BNC x 1 (SMPTE 292M), Serial Digital (1.485 Gb/s)
Reference video input		BNC x 2 (with a loop-through), Tri-level sync, 0.6 Vp-p, 75 Ω , sync negative or Black Burst or Composite, 0.3 Vp-p, 75 Ω , sync negative
Analogue audio input (CH 1/2)		XLR-3-pin type, female x 2, +4/0/-3/-20/-60 dBu selectable, high impedance, balanced
Timecode input		BNC x1 (0.5 to 18 Vp-p, 10 kΩ, balanced)
HD-SDI output		BNC x 2 (SMPTE 292M), Serial Digital (1.485 Gb/s)
SD-SDI output		BNC x 2 (SMPTE 259M including one character out), Serial Digital (270 Mb/s)
Analogue composite output		BNC x 2 (RS-170A, including one character out) Y: 1.0 Vp-p, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω
Analogue audio output (CH 1/2)		XLR-3-pin type, male x 2, +4 dBm (600 Ω load), low impedance, balanced
Timecode output		BNC x1 (1.0 Vp-p, unbalanced)
Audio monitor output L/R		XLR-3-pin type, male x 2, +4 dBm (600 Ω load), low impedance, balanced
Headphones		JM-60 Stereo phone jack (-∞ to -12 dBu at 8 Ω load, unbalanced)
Remote (RS-422)		D-sub 9-pin, Sony 9-pin remote interface
Video control		D-sub 9-pin
DC output		Round shape 4-pin, female x 1, for RM-280 or BVR-3 controller
Others		"Memory Stick" slot
PROCESSOR ADJUSTMENT RANGE		
Video level		±3 dB/∞ to +3 dB, selectable
Chroma level		±3 dB/∞ to +3 dB, selectable
Set up/black level		±210 mV
Chroma phase/hue		±30°
System sync phase		±15 µs
System SC phase		±200 ns
Y/C delay		±100 ns
DIGITAL VIDEO PERFORMANCE		
Sampling frequency		Y: 74.25 MHz, R-Y/B-Y: 37.125 MHz
Quantisation		10 bit/sample (compression: 8 bit/sample)
Compression		Coefficient recording system
Channel coding		S-I-NRZI PR-IV
Error correction		Reed-Solomon code
ANALOGUE COMPOSITE OUTPUT PERFORMANCE		
Bandwidth		Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB
S/N ratio		53 dB or more
Differential gain		2% or less
Differential phase		2% or less
Y/C delay		20 ns or less
K Factor (2T Pulse)		1% or less
Output SCH phase		Based upon RS-170A/CCIR R.624-3
DIGITAL AUDIO PERFORMANCE		
Sampling frequency		48 kHz (Synchronised with video)
Quantisation		20 bit/sample
Wow & flutter		Below measurable level
Headrooms		20/18/16/12 dB selectable
Emphasis (ON/OFF selectable in REC mode)		T1=50 µs, T2=15 µs (on/off selectable in recording mode)
ANALOGUE AUDIO OUTPUT PERFORMANCE		
A/D quantisation		20 bit/sample
D/A quantisation		20 bit/sample
Frequency response		20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)
Dynamic range		More than 90 dB (at 1 kHz, emphasis ON)
Distortion		Less than 0.08% (at 1 kHz, emphasis ON, reference level)
Crosstalk		Less than -80 dB (at 1 kHz, between any two channels)
CUE TRACK		
Frequency response		100 Hz to 10 kHz ±3 dB
S/N ratio		More than 45 dB (at 3% distortion level)
Distortion		Less than 2% (T.H.D. at 1 kHz, reference level)
Wow & flutter		Less than 0.2%
Erase ratio		More than 60 dB
SUPPLIED ACCESSORIES		
		Operation manual (1), Installation manual (1), Connector cap (1)

BETACAM SX PLAYBACK VIDEO PERFORMANCE			
Bandwidth	Y	NTSC: 0 to 4.5 MHz +0.5 dB/-3.0 dB PAL: 0 to 5.5 MHz +0.5 dB/-3.0 dB	
	R-Y/B-Y	0 to 2.0 MHz +0.5 dB/-3.0 dB	
S/N ratio		56 dB or more	
K factor (2T pulse)		1% or less	
AUDIO PERFOMANCE			
Frequency response		20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)	
Dynamic range		88 dB or more (at 1 kHz, emphasis ON)	
Distortion		0.08% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))	
ANALOGUE BETACAM (NTSC) PLAYBACK VIDEO PERFORMANCE		**METAL TAPE**	**OXIDE TAPE**
Bandwidth	Y	30 Hz to 4.5 MHz +0.5 dB/-4.0 dB	30 Hz to 4.1 MHz +0.5 dB/-6.0 dB
	R-Y/B-Y	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB
S/N ratio	Y	51 dB or more	48 dB or more
	R-Y/B-Y	48 dB or more	45 dB or more
K-Factor (2T Pulse)		2% or less	3.5% or less
LF non-linearity	Y	3% or less	3% or less
	R-Y/B-Y	4% or less	4% or less
	Y/C delay	20 ns or less	20 ns or less
AUDIO PERFORMANCE			
LNG	Frequency response	50 Hz to15 kHz +1.5 dB/-3.0 dB	50 Hz to15 kHz ±3.0 dB
	S/N ratio	72 dB or more	50 dB or more (Dolby NR off)
	T.H.D.	1.5% or less	2% or less
	Wow & flutter	0.2% or less	0.2% or less
ANALOGUE BETACAM (PAL) PLAYBACK VIDEO PERFORMANCE		**METAL TAPE**	**OXIDE TAPE**
Bandwidth	Y	25 Hz to 4.5 MHz +0.5 dB/-4.0 dB	25 Hz to 4.1 MHz +0.5 dB/-6.0 dB
	R-Y/B-Y	25 Hz to 1.5 MHz +0.5 dB/-3.0 dB	25 Hz to 1.5 MHz +0.5 dB/-3.0 dB
S/N ratio	Y	48 dB or more	46 dB or more
	R-Y/B-Y	48 dB or more	45 dB or more
K-Factor (2T Pulse)		2.5% or less	4% or less
LF non-linearity	Y	3% or less	3% or less
	R-Y/B-Y	4% or less	4% or less
	Y/C delay	20 ns or less	20 ns or less
AUDIO PERFORMANCE			
LNG	Frequency response	50 Hz to 15 kHz +1.5 dB/-3.0 dB	50 Hz to15 kHz 3.0 dB
	S/N ratio	68 dB or more	62 dB or more (Dolby NR off)
	T.H.D.	1.5% or less	2% or less
	Wow & flutter	0.2% or less	0.2% or less

J-H1/J-H3

		J-H1	J-H3
GENERAL			
Power requirements		AC 100 V to 240 V 50/60 Hz	
Power consumption		50 W	60 W
Operating temperature		+5 °C to +40 °C (+41 °F to +104 °F)	
Storage temperature		-20 °C to +60 °C (-4 °F to +140 °F)	
Humidity		25 % to 80 % (relative humidity)	
Mass		7.5 kg (16 lb 9 oz)	
Dimensions (W x H x D)		307 x 100 x 397 mm (12 ⅛ x 4 x 15 ¾ inches)	
Tape speed	HDCAM	96.7 mm/s (29.97 Hz), 80.7 mm/s (25 Hz)	96.7 mm/s (29.97 80.7 mm/s (25 Hz) 77.4 mm/s (24 Hz)
Playback time		124 min (29.97 Hz, with BCT-124HDL) 149 min (25 Hz, with BCT-124HDL)	124 min (29.97 Hz, with BCT-124HDL) 149 min (25 Hz,with BCT-124HDL) 155 min (24 Hz, with BCT-124HDL)
Fast forward / Rewind time		Approx. 6 min with BCT-124HD	
Search speed	Shuttle mode	Still to ± 21 times normal speed playback	
	Jog mode	Still to ±1 time normal speed playback	
Servo lock time		1 sec or less (from standby on)	
Load/unload time		7 sec or less	–
INPUT/OUTPUT			
Digital HD video		–	BNC x 1, SMPTE-292M
Digital SD Video		–	BNC x 1, SMPTE-259M
Analogue HD video		BNC (x 3) Y: 0.7 vp-p, Pb/Pr: ±0.7vp-p 75 Ω	
		EIAJ RC-5237 connector, EIAJ CP-4120 standard	
Analogue SD video		BNC (x 1), Pin jack (x 1), 1.0 Vp-p, 75 Ω	
Computer display		D-sub 15 pin, XGA (1024 x 768 dots), RGB, 0.7 V	
i.LINK (Optional)		IEEE1394	
Timecode		–	BNC x 1, SMPTE 12M
Audio monitoring		Pin jack (x 2): -10 dBu at 47 kΩ load, unbalanced	
		XLR (male x 2) +4 dBm, 600 Ω load, low impedance, balanced	
Headphone		JM-60 stereo phone jack, -∞ to -12 dBu at 8 Ω, unbalanced	
RS-232C		D-sub 9 pin male (x 1)	
RS-422		–	D-sub 9 pin female (x 1), Sony 9-pin remote interface
Wireless remote		BIRCS	
EXT SYNC		BNC x 2	
HD ANALOGUE RESPONSE			
Output level		Y: 700 mV (±5 %) , Pb/Pr: 700 mV (±5 %) ,Sync signal: 300 mV (±5 %)	
Bandwidth		Y: 0 to 20 MHz + 1.0 dB / -3.0 dB , Pb/Pr: 0 to 7 MHz +1.0 dB / -3.0 dB	
S/N ratio		56 dB or more	
Output impedance		Y, Pb, Pr: 75 Ω (±5 %)	
Y/C Delay		Y, Pb, Pr: ±15 nsec or less	
XGA ANALOGUE RESPONSE			
Output level		R: 700 mV (±5 %), G: 700 mV (±5 %), B: 700 mV (±5 %)	
Resolution		XGA	
Refresh/rate		60 Hz	
H-Frequency		48.4 kHz	
SD COMPOSITE RESPONSE			
Output level		Y: 59.94i: 714 mV (±5 %), 50i: 700 mV (±5 %)	
		Sync: 59.94i: 286 mV (±5 %), 50i: 300 mV (± 5%)	
		Burst: 59.94i: 286 mV (±5 %), 50i: 300 mV (±5 %)	
Bandwidth		0.5 to 5.75 MHz + 0.5 dB/-3.0 dB	
S/N ratio		56 dB or more	
Y/C delay		20 nsec or less	
K Factor (2T Pulse)		1.0 % or less	
ANALOGUE AUDIO RESPONSE			
Output level		XLR: +4±0.5 dBm, -20 dBFS, 600 Ω terminated	
		PIN: +10±0.5 dBu, -20 dBFS, 47 kΩ terminated	
Frequency response		20 Hz to 20 kHz + 1.0 dB/-1.5 dB	
Dynamic range		More than 85 dB (at 1 kHz, emphasis ON)	
Distortion		Less than 0.1 % (at 1 kHz/-20 dBFS, emphasis ON)	
Wow & flutter		Below measurable level	
CUE AUDIO RESPONSE			
Sampling frequency		100 Hz to 10 kHz ±3.0 dB	
S/N ratio		More than 43.5 dB (3 % distortion level)	
Distortion		Less than 2 % (T.H.D. at 1kHz, reference level)	
Wow & flutter		Less than 0.18 %	
SUPPLIED ACCESSORIES			
		Operation manual (CD-ROM), Quick operation guide, Vertical stand (x 2), Infra-red remote controller	

SONY



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