SONY

High Definition Video System

Digital HDVS®

HDCAM™

Sony Digital Recorder and Player

HDW-2000 Series

1/2-Inch Platform Advances to Greater Heights

Since introducing its first models, Sony has continually enhanced the BETACAM™ Series of products, each offering the highest possible performance and always preserving a consistent half-inch platform. The excellence of the analog BETACAM™/BETACAM SP™ formats introduced an entirely new set of opportunities to ENG and EFP, while the use of digital processing in the Digital BETACAM™, BETACAM SX™, and MPEG IMX™ formats brought standardized 4:2:2 digital recording into both news gathering and field production. Today, each format is in service in a multiplicity of programming applications, offering the pinnacle of reliability and performance that only BETACAM technology provides.

In 1997 Sony revolutionized HDTV program origination with the introduction of the 1/2-inch camcorder the HDW-700. This was soon followed by the HDW-700A camcorder, which operates according to the updated 1080/60i production standard. This camcorder, in association with its editing VTR the HDW-500, extended the BETACAM format tradition into the realm of mobile HD program creation. In 1999 the HDCAM™ format was dramatically broadened to include the new multi-frame rate camcorder the HDW-F900 and its companion VTR the HDW-F500 – both responding to the breakthrough new ITU 709 global standard for international HD program origination. The pivotal inclusion of the new 24-frame progressive format in this standard constituted a central design imperative for the HDW-F900/F500 system and introduced to the world the first digital 24-frame motion picture capture system.

With the HDW-F900/HDW-F500 Series squarely addressing the needs of movie-making and high-end prime time television program and commercial production, Sony returned to the central agenda of a mainstream HD capture system in support of the emerging broader DTV broadcasting agendas around the world. This is based upon the SMPTE 274M HD production standard.
A second generation 1080/60i camcorder and VTR system has been developed which is intended as a more cost-effective and feature enhanced system specifically designed to streamline the migration to DTV. A central design strategy was to more firmly incorporate this new HDCAM system into the totality of Sony's 1/2-inch acquisition and editing platform. Accordingly, the new HDW-2000 Series VTR offers full HDCAM record and editing facilities, but also includes both the all-important legacy playback of all standard definition BETACAM formats and internal up-conversion of that playback to the 1920 x 1080 digital sampling format for playout in the HDTV format. The legacy playback includes analog BETACAM/SP, Digital BETACAM, BETACAM SX and the MPEG IMX 1/2-inch tape recordings. Thus a crucial bridge between SDTV libraries (and ongoing SDTV digital origination) has been realized. Recognizing the inevitable two-way flow of program material between SDTV and HDTV, the new HDW-2000 Series VTR also includes digital down-conversion as a standard feature, thus allowing the creation of "Super-sampled" digital 4:2:2 SDTV program material.

The HDW-2000 Series also provides the same reliability and operability inherited from the long-established BETACAM Series offering a powerful workhorse solution to HDTV environments as well as to current SDTV systems.

The HDW-750 camcorder is extremely compact and lightweight while maintaining the robust and reliable construction for which BETACAM technology is world-renowned.

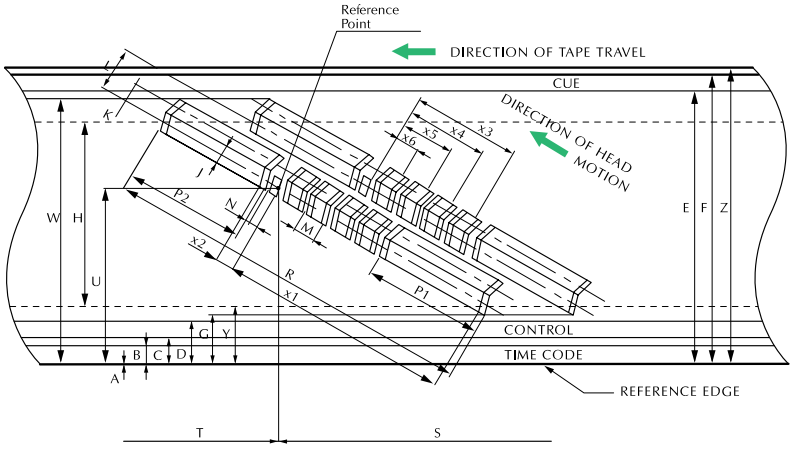
Some innovative new functions are added to meet various requirements in the field. The latest addition to the HDCAM Series, with its high quality, superb operability and added reliability is an economically well-balanced solution for next generation ENG and EFP programming.

*As for HDCAM tape cassettes, HDW-2000 Series is applicable for 50i and 59.94i operation only.

Features

High-Definition Picture Quality with HDCAM format

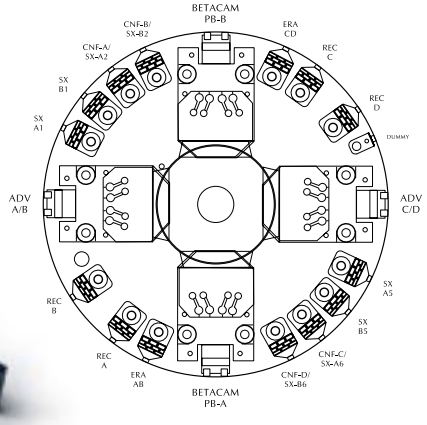
The HDW-2000 Series recorders/player adopt the proven HDCAM format, recording high-definition component digital signals using the state-of-the-art HDCAM compression technology. This excellent compression scheme maintains a high video bit rate of 140 Mbps (data rate on tape of 185 Mbps). The format combines superb picture quality with the high reliability and robustness of 1/2-inch tape integrated into a design approach inherited from the BETACAM series.



Compact, Affordable High-Definition Video Cassette Recorder/Player with Legacy Playback

The HDW-2000 Series high-definition VTRs are not only affordable, they also provide a smooth migration path into the HDTV world. Three different models are available to suit budgetary and operational needs. In addition to HDCAM recording/playback, the HDW-M2000 and HDW-M2100 are equipped with backward playback capability for current 1/2-inch tape formats; Digital BETACAM, MPEG IMX, BETACAM SX, BETACAM SP and BETACAM. However, the HDW-2000 eliminates this capability in order to provide utmost cost efficiency.
With its affordability and different choice of feature sets, the HDW-2000 Series is destined to be a true workhorse in broadcast stations and ENG applications.

HEAD POSITION



Drum Head Allocation

HDW-2000 Series Line-up

		Recording Format	Playback Format
HDW-2000	HD Digital Video Cassette Recorder	HDCAM	HDCAM
HDW-M2000 HDW-M2000P	HD Digital Video Cassette Recorder	HDCAM	HDCAM, Digital BETACAM, MPEG IMX, BETACAM SX, BETACAM SP, BETACAM
HDW-M2100 HDW-M2100P	HD Digital Video Cassette Player	——	HDCAM, Digital BETACAM, MPEG IMX, BETACAM SX, BETACAM SP, BETACAM

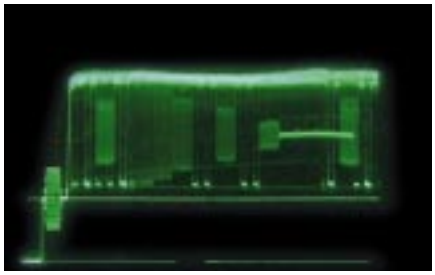
*The HDW-M2000 refers to both the HDW-M2000 and HDW-M2000P. The HDW-M2100 refers to both the HDW-M2100 and HDW-M2100P.

Wide Array of Signal Formats

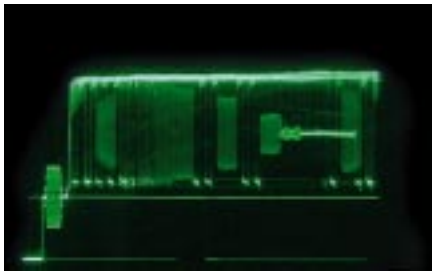
The HDW-M2000/M2100 can playback a wide variety of legacy SDTV VTR formats in addition to the HDCAM format. Since the HDW-M2000/M2100 can output signals in 1080i, 576i and 480i, each format is reproduced in its corresponding vertical resolution.

As an even greater advantage, the HDW-2000 Series has up and down converters built-in so a program originated for SDTV can be up converted for HDTV transmission, and materials that were made in HD format can be down converted as "Super-sampled" SD images. This is a distinct advantage of the HDW-2000 Series. The "Super-sampled" HD origination produces standard definition 480 and 576-line NTSC/PAL signals which are superior to those originated in standard definition (their horizontal and vertical MTFs are higher and the associated scanning aliasing is less). Furthermore, when the optional SDTI Interface Board HKDW-102 is installed, compressed HDCAM video and four channels of uncompressed audio can be transported as specified in SMPTE RS305. This enables efficient interface with other VTRs, nonlinear editing systems and other equipment. Furthermore, when the optional 720P/480P Output Board HKDW-103 is installed, progressive outputs of 480 and 720 are also available.

Multi-burst Chart



Conventional 480/576-line
Digital VTR



"Super-sampled" HDCAM
Down-Converted signals

1080/59.94i, 1080/50i Switchable Operation

All models of the HDW-2000 Series provide recording and playback capability of the HDCAM format in 1080/59.94i and 1080/50i frame rates. Furthermore, the HDW-M2000/M2100 allow legacy playback of both 480/59.94i and 576/50i on the same deck. This flexibility makes the HDW-2000 Series an extremely effective tool for international programming.

*The frame rate of the source tape cannot be converted at the output between 1080/59.95i and 1080/50i or between 480/59.94i and 576/50i.
*Playback of a 576-line analog Betacam tape on the HDW-M2000/M2100 (NTSC model), and playback of a 480-line analog Betacam tape on the HDW-M2000P/M2100P (PAL model) is for monitor purposes only.

Long Recording Time on a Single Cassette

Utilizing the HDCAM format's new high-density recording capability and compression technology, the HDW-2000 Series provides a long recording time of 124 minutes at 1080/59.94i and 149 minutes at 1080/50i per one L cassette. Small size cassettes can also be used, which provide 40 minutes recording at 1080/59.94i and 48 minutes at 1080/50i. This flexibility allows the HDW-2000 Series to cover a wide range of applications including news, sports and production.

Compact Design and Low Power Consumption

This Series features a compact 4RU-size* design and weighs only 23 kg (50 lb 11 oz) – 12 kg (26 lb 7 oz) lighter than the HDW-500 HD Video Recorder. It also has low power consumption of 220 W. This compactness and low power consumption are suited to not only studio use but also installation into OB-vans.

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

Versatile Interfaces

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

- HD SDI I/O
- SDI I/O (D1 component)
- Analog component
- Analog composite (NTSC/PAL)
- Digital Audio I/O(AES/EBU)
- Analog Audio I/O
- Audio Monitor (2-ch analog)

HDW-M2000

User-friendly Control Panel

Control panels are compact, yet comprehensive. There is a minimal learning curve since its design and functionality are inherited from universally used BETACAM SP VTRs. In addition, the control panel has a multi-function display that provides comprehensive information for quick access and easy control of a variety of functions. Dedicated control knobs and meter displays are included for each of the four audio channels.

Using the optional control panel HKDW-101, VTRs can be controlled from the same control panel simultaneously.

HKDW-101 with BKMW-102

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 drastically reduce the time required for periodic drum replacement.

Operational Convenience

Frame Accurate Editing

The HDW-2000 Series recorders enable insert or assemble editing with frame accuracy. Each channel of video and audio signal is independently editable. It is possible to execute precise editing on HDCAM tapes in machine-to-machine or A/B roll configurations.

High Speed Color Picture Search

Recognizable color pictures are provided in shuttle mode at speeds up to ±50 times normal playback.

Dynamic Tracking™ Playback

A Dynamic Tracking playback capability provides high quality pictures over the range of -1 to +2 times normal playback speed during playback of HDCAM tapes, -1 to +3 times for BETACAM/BETACAM SP/MPEG IMX/Digital BETACAM tapes, -1 to +2 for BETACAM SX tapes.

Digital Jog Sound

Reproduction of four (eight for MPEG IMX) channels of digital audio is achieved, in the Jog mode. With a responsiveness and sound quality reminiscent of BETACAM SP machines, this feature is helpful in quickly and precisely establishing an editing point while monitoring the digital audio signals which remain in absolute sync with the pictures.

Audio Crossfade Function

As with all Sony half-inch professional formats, the HDW-2000 Series recorders feature Digital Audio Crossfade to achieve 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 also provides a DMC playback capability, memorizing the tape speed trajectory over the DT speed range (-1 to +2 times normal speed).

Pre-read Editing

The HDW-2000 and HDW-M2000 recorders are equipped with advanced playback heads to enable pre-read editing. This function allows application including titling with a single VTR, A/B-roll with two VTRs, as well as audio mix and channel swap.

1080/1035 Line Conversion

The HDW-2000 Series provides bi-directional vertical filtering between the two active line standards of 1080 and 1035 and enhanced quality of variable speed Dynamic Tracking playback as standard.

Shot Marks

The HDW-2000 Series recorders can scan tapes with Shot Marks and automatically detect their positions.
After scanning, a list of all the marks is displayed on the video monitor, allowing easy cueing to any mark.

HDW-750 Menu

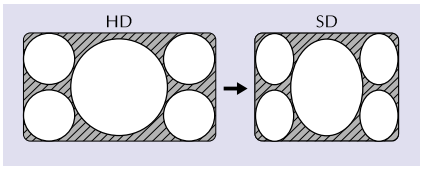
HDW-2000 Series Time Code List

HDW-750

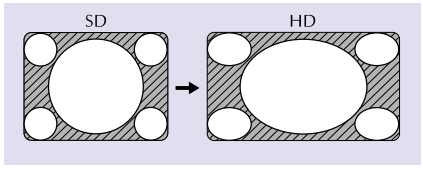
Selectable Picture Mode

Three modes of operation enable correct presentation, depending on the application required.

SQUEEZE mode

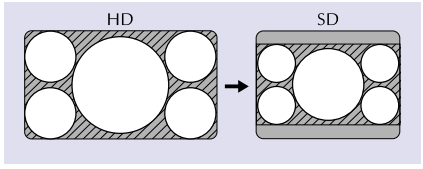


HD to SD, 16:9 HD picture is down-converted and output as a 4:3 SD picture.

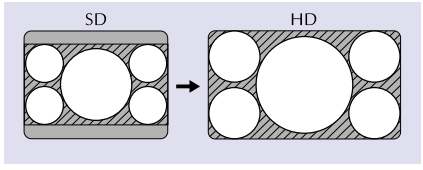


SD to HD, 4:3 SD picture is up-converted, then output as a 16:9 HD picture.

LETTER BOX mode

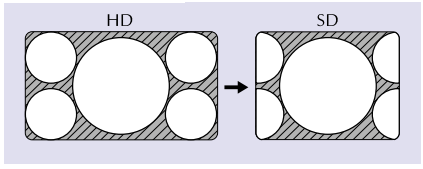


HD to SD, 16:9 HD picture down-converted to SD and output is presented in Letter-box on a 4:3 monitor.

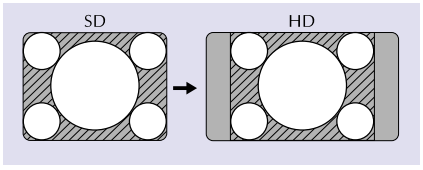


SD to HD, 4:3 SD picture is cropped and presented as a 16:9 picture.

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.

*The HDW-M2000 refers to both the HDW-M2000 and HDW-M2000P.

Content Information Management (Tele-File™ system and JZ-1 Videocassette Logging Software)

The Tele-File system is a non-contact read/write system for storing production-related data on an IC memory embedded in a 1/2-inch cassette label. This system allows operators to efficiently manage cassette content information such as Shot Marks, scene numbers, and cassette numbers. The HDW-2000 Series VTRs come equipped with a built-in reader/writer module, enabling data to be written to and read from a Tele-File label (option: MLB-1M-100) within the VTR. This system is especially useful for managing cue-up points, which increases the efficiency of locating editing points in subsequent operations. For further enhanced Tele-File system operations, the JZ-1 Videocassette Logging Software provides an easy-to-use GUI environment for creating edit logs as well as facilitating the creation of content-related Tele-File data. This is available by connecting a PC running the JZ-1 software to the HDW-2000 Series VTR.

Dolby®-E/Dolby AC-3 Support

The demand for Dolby-E and Dolby AC-3 is evolving as surround sound reproduction is used on various media such as DTV transmission and DVD. The HDW-2000 Series can record Dolby-E and Dolby AC-3 data (non-audio) streams on audio tracks.

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

Digital Audio and Ancillary-Data 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 are able to record non-audio data streams within the audio recording area by packaging the data within an AES/EBU wrapper. Furthermore, the HDCAM footprint allows packets of Ancillary Data to be recorded on the tape. This "Metadata" can consist of Closed Caption data, User Defined data, etc.

HDW-2000 Series Specifications

			HDW-2000	HDW-M2000/M2000P	HDW-M2100/M2100P
General	Power requirements		100 to 240 V, 50/60 Hz		
	Power consumption		220 W		
	Operating temparature		+5 to +40 °C (41°F to 104 °F)		
	Storage temparature		-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 540 mm (16 7/8 x 6 7/8 x 21 1/2 inches)		
	Tape speed	HDCAM	96.7 mm/s (60 Hz), 80.6 mm/s (50 Hz)		
		Digital BETACAM	—	96.7 mm/s	
		MPEG IMX	—	64.5 mm/s (60 Hz), 53.8 mm/s (50 Hz)	
		BETACAM SX	—	59.6 mm/s	
		BETACAM/BETACAM SP	118.6 mm/s (60 Hz), 101.5 mm (50 Hz)		
	Record/playback time		124 minutes (60 Hz, with BCT-124HDLC) 155 minutes (50 Hz, with BCT-124HDLC) 40 minnutes (60 Hz, with BCT-40HDC) 48 minnutes (50 Hz, with BCT-40HDC)		
	Fast forward/rewind time		3 minutes (with BCT-124HDLC)		
	Search speed range	Shuttle mode			
		HDCAM	Still to ±50 times normal speed playback (60 Hz), Still to ±58 times normal speed playback (50 Hz)		
		Digital BETACAM	—	Still to ±50 times normal speed playback	
		MPEG IMX	—	Still to ±60 times normal speed playback (60 Hz) Still to ±78 times normal speed playback (50 Hz)	
		BETACAM SX	—	Still to ±60 times normal speed playback (60 Hz) Still to ±78 times normal speed playback (50 Hz)	
		BETACAM/BETACAM SP	—	Still to ±35 times normal speed playback (60 Hz) Still to ±42 times normal speed playback (50 Hz)	
		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 (60 Hz, from standby on) 0.7 s or less (50 Hz, 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)		—
	SDTI input (with optional HKDW-102 installed)		BNC x 1 (SMPTE305M)		—
	Reference video input		BNC x 2 (with a loop-through), 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		—
	Analog 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 Gbps)		
	SDTI output (with optional HKDW-102 installed)		BNC x 2 (SMPTE 305M)		
	SDI output		BNC x 3 (SMPTE 259M including one character out), Serial Digital (270 Mbps)		
	Analog 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		
	Analog component output		BNC x 3, for 1 set, 1.0 Vp-p, 75 Ω, sync negative		
	Digital audio output (CH 1/2, CH 3/4)		BNC x 2, AES/EBU		
	Analog 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 (ISR)		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		
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 μ s		
	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		
	Quantization		10 bit/sample (compression: 8 bit/sample)		
	Compression		Coefficient recording system		
	Channel coding		S-I-NRZI PR-IV		
	Error correction		Reed-Solomon code		
Analog 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		
Analog 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 (Syncronized with video)		
	Quantization		20 bit/sample		
	Wow & flutter		Below measurable level		
	Headrooms		20 dB (or 18 dB selectable)		
	Emphasis (ON/OFF selectable in REC mode)		T1=50 μ s, T2=15 μ s (on/off selectable in recording mode)		
Analog audio output performance	A/D quantization		20 bit/sample		
	D/A quantization		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 truck	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 manula (1), Installation manual (1)		
Optional accessories			HKDW-101, Control Panel HKDW-102, SDTI Interface Board HKDW-103, 720P/480P Output Board BKMW-102, Remote Control Unit BKMW-103, Control Panel Extention Kit RMM-131, Rack Mount Kit RCC-5G, 9-pin Remote Cable HKDV-900, HD Digital Video Controller BVR-50, Video Controller BCT-124HDL/64HDL/40HD/22HD, HDCAM tape cassette BCT-HD12CL, Cleaning cassette		

Digital BETACAM playback (HDW-M2000/M2000P, HDW-M2100/M2100P)

Video performance	Bandwidth	Y	HDW-M2000/M2100: 0 to 5.75 MHz +0.5 dB/-0.5 dB HDW-M2000P/M2100P: 0 to 2.75 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
Analog 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		HDW-M2000/M2100: Less than 0.5% rms HDW-M2000P/M2100P: Less than 0.2% (DIN 45508 weighted)

MPEG IMX playback(HDW-M2000/M2000P, HDW-M2100/M2100P)

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 less
Audio perfomance	Frequency response		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, 16 bits/48 kHz)
	Distortion		0.05% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))

BETACAM SX playback (HDW-M2000/M2000P, HDW-M2100/M2100P)

Video performance	Bandwidth	Y	HDW-M2000/M2100: 0 to 4.5 MHz +0.5 dB/-3.0 dB HDW-M2000P/M2100P: 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		90 dB or more (at 1 kHz, emphasis ON)
	Distortion		0.05% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))

Analog BETACAM playback (HDW-M2000, HDW-M2100)

			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	
Audio performance	LNG	Frequency response	50 Hz to15 kHz +1.5 dB/-3.0 dB	50 Hz to15 kHz +1.5 dB/-3.0 dB
		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	1.0% 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	

Analog BETACAM playback (HDW-M2000P, HDW-M2100P)

			Metal tape	Oxide tape
Video performance	Bandwidth	Y	25 Hz to 5.5 MHz +0.5 dB/-4.0 dB	25 Hz to 4.0 MHz +0.5 dB/-6.0 dB
		R-Y/B-Y	25 Hz to 2.0 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% 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	
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% or less	2% or less
		Wow & Flutter	1.0% rms or less	
	AFM	Frequency response	20 Hz to 20 kHz +0.5 dB/-2.0 dB	
		S/N ratio	More than 72 dB (CCIR 468-3 weighted)	
		T.H.D.	Less than 0.5%	

Optional Accessories

HKDW-101,
Control Panel

BKMW-102,
Remote Control Unit

BKMW-103,
Control Panel Extension Kit

RMM-131,
Rack Mount Kit

RCC-5G,
9-pin Remote Cable

HKDV-900,
HD Digital Video Controller

BVR-50,
Video Controller

BCT-124HDL/64HDL/22HD,
HDCAM Tape Cassette

BCT-HD12CL,
Cleaning Cassette

HKDW-102 SDTI Interface Board
HKDW-103 720P/480P Output Board
MLB-1M-100 Memory Label (for Tele-File system)
JZ-1 Videocassette Logging software (for Tele-File system)

SONY

Distributed by

V-2007
MK7597V1SMC01APR

Printed in Japan