SONY

Digital Betacam Recorder

DVW-2000 Series

DVW-M2000
DVW-M2000P
DVW-2000
DVW-2000P

Digital BETACAM

DVW-M2000

DVW-2000

A New Plateau of Digital Betacam Studio Recorders - Delivering Proven Picture Quality and Reliability Together With Added Flexibility and Scalability

Since the introduction of the Digital Betacam format in 1993, Digital Betacam products have been widely accepted by a number of customers such as video production houses and broadcasters around the world. Its outstanding picture quality, multi-generation capabilities, and proven reliability have made the Digital Betacam format a standard for high-end video production applications.

One decade after its launch, Sony has further evolved its range of Digital Betacam products by enhancing their flexibility, scalability, and operability - the result is the new DVW-M2000 and DVW-2000 Studio Recorders. These recorders inherit all the advantages of previous models, DVW-A500, such as superb picture quality and outstanding video performance. What's more, the DVW-M2000 VTR also provides powerful playback capability for all Sony 1/2-inch standard-definition format tapes, allowing for continuous use of important archive materials and acquisition tools.*

*Furthermore, a plug-in HD upconversion option allows these VTRs to output HD signals of 1080/59.94i or 720/59.94P (DVW-M2000/2000), or 1080/50i (DVW-M2000P/2000P). This is possible not only from Digital Betacam playback, but also from the playback signals of other compatible formats** such as the Betacam™ and MPEG IMX™ formats, providing a very smooth migration to future HD operations. Further advancements such as metadata handling capability, flexible audio operation, and a compact body design are all incorporated in these VTRs to increase their operational convenience.*

The new DVW-2000 Series of Digital Betacam VTRs will continue to offer top-quality SD recording, while allowing use of SD archives and bridging the way to future HD operations.

*The DVW-2000 model records and plays back Digital Betacam tapes only.
**Upconversion from SD formats other than Digital Betacam is possible only on the DVW-M2000 model.

In this brochure, "DVW-M2000" and "DVW-2000" refer to both NTSC and PAL models.

MAIN FEATURES

DVW-2000 Series VTRs Line-up

Model Name	Record	Playback
DVW-M2000/M2000P	Digital BETACAM	Digital BETACAM, MPEG IMX, BETACAM SX, BETACAM SP, BETACAM
DVW-2000/2000P	Digital BETACAM	Digital BETACAM

Outstanding Picture Quality of the Digital Betacam Format

DVW-2000 Series VTRs use component digital recording, which provides superb picture quality, multi-generation capability, and editing performance. The use of a very mild compression ratio produces picture quality that is equivalent to baseband signals.

Powerful Legacy Playback Capability (DVW-M2000)

The DVW-M2000 VTR provides the powerful capability to playback all Sony 1/2-inch SD formats including Digital Betacam, MPEG IMX, Betacam SX, Betacam SP, and Betacam formats, allowing users to continue to utilize archive material. Furthermore, this allows a flexible choice of acquisition tools, ranging from analog Betacam and Betacam SX to MPEG IMX formats. This VTR can also be used as a multi-format feeder in the editing suite, minimizing the amount of equipment needed.

Optional HD Upconversion Capability*

One of the distinct advantages of the new DVW-2000 Series Recorders is the optional HD upconversion capability, providing 1080/59.94i or 720/59.94P (DVW-M2000/2000), or 1080/50i (DVW-M2000P/2000P) HD outputs. Furthermore, the DVW-M2000 VTR can output these HD signals when playing back any of its playback-compatible formats. This option allows smooth migration to today's and future HDTV operations.

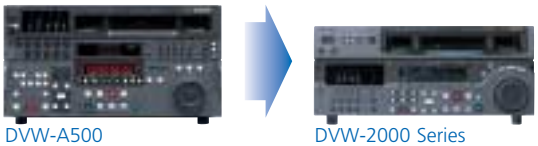
*Requires the optional BKMW-104 board.

MAIN FEATURES

Compact Body Design and Low Power Consumption

All VTRs in the DVW-2000 Series feature a compact 4U design* and weigh only 23 kg (50 lb 11 oz) - 12 kg (approx. 26 lb) less than the previous model, the DVW-A500 VTR - while incorporating additional functionalities.
They also achieve low power consumption of 200 W (DVW-2000)/220 W (DVW-M2000) - which is much lower than that of the DVW-A500 VTR.

*427 x 174 x 544 mm (16 7/8 x 6 7/8 x 21 1/2 inches)



DVW-A500 DVW-2000 Series

High-quality Digital Audio

DVW-2000 Series VTRs provide four-channels of independently editable, 20-bit digital audio.

Long Recording Time

The DVW-2000 Series VTR's long recording and playback times allow recordings of up to 124 minutes on a large cassette and up to 40 minutes on a small cassette.

Versatile Interface

The DVW-2000 Series VTRs come equipped with a wide array of interfaces as standard. These include SDI I/O, analog component I/O, digital and analog audio I/O, and time code I/O. Analog composite I/O and a 50-pin parallel remote interface are also included as standard.
By adding the optional BKMW-104 board, HD-SDI output is available.
This allows DVW-2000 Series VTRs to be easily integrated into a variety of systems.

DVW-M2000 Front Panel

COMPREHENSIVE EDITING FEATURES

Frame-accurate Insert/Assemble Editing

DVW-2000 Series VTRs enable insert and assemble editing with ±0 frame accuracy. This allows precise editing on DVW tapes in machine-to-machine or A/B-roll configurations.

Pre-read Editing Capability

These VTRs are equipped with advanced playback heads to enable pre-read editing. This provides single-VTR titling, audio mix/swap, and voice over with no delay between video and audio. In addition, A/B-roll editing with two VTRs is available.

Digital Audio Jog Sound

These VTRs provide complete reproduction of four channels of digital audio in Jog mode during normal playback speed, whether forward or reverse. This feature is helpful for quickly and precisely establishing an editing point while monitoring the digital audio signals, which remain in absolute sync with the pictures.

High-speed Picture Search

DVW-2000 Series VTRs provide a high-speed picture search capability:

* Digital Betacam tape: ±50 times (in color)
* MPEG IMX tape: ±78 times (in color)
* Betacam SX tape: ±78 times (in color)
* Betacam SP/Betacam tape: ±35 times (NTSC)/ ±42 times (PAL) (up to ±10 times in color)

Variable Speed Playback

DVW-2000 Series VTRs provide variable speed playback, from -1 to 3 times (in Digital Betacam/MPEG IMX/Betacam SP/ Betacam format) or from -1 to 2 times (Betacam SX format) normal speed.

Dynamic Motion Control (DMC) Functionality

Equipped with Dynamic Motion Control functionality, these VTRs provide programmable slow-motion playback. This can be controlled via the control panel of the VTR or from an external controller such as a Sony BVE Series Editor or DTR-3000 Slow Motion Controller.

DVW-M2000 Rear Panel

EASY OPERATION

Easy Setup Using "Memory Stick"™ Media

Equipped with a Memory Stick slot inside their front panels, the DVW-2000 VTRs provide Memory Stick functionality, which allows setup files to be saved on and recalled from a Memory Stick media. These files can later be copied onto another DVW-2000 Series VTR, enabling quick and consistent setup of multiple VTRs.

"Memory Stick" Slot

Metadata Functionalities

DVW-2000 Series VTRs can handle various kinds of metadata, which can be used in subsequent production processes to drastically increase productivity:

* Shot Mark handling capability, for quick cue-up to user-defined shot points
* UMID capability to automatically generate and record UMID - the globally unique material identifier used for the identification of picture/audio material (standardized in SMPTE330M)
* Built-in Tele-File™ module to enable cassette content information to be written to or read from a Tele-File label (Optional: MLB-1M-100)

Easy Maintenance

Most of the circuitry of DVW-2000 Series VTRs is arranged on plug-in boards to allow quick and easy maintenance. The drum assembly has been designed for simple, low-cost maintenance by adopting the upper drum mechanism and auto adjustment function used in Sony MPEG IMX and Betacam SX VTRs.
This helps to drastically reduce the frequency of periodic scanner replacement as compared to previous Digital Betacam models. Another advanced tool for easy maintenance is the optional BZNW-1000 ISR™ Proxy Software. This runs on a standard PC, and enables remote maintenance and monitoring of the DVW-2000 Series VTR over an Ethernet network*.

*To connect DVW-2000 Series VTRs to a network, an RS-232C/Ethernet hub is required. For recommended models, please contact the nearest Sony office.

BZNW-1000 ISR Proxy Software

Other Features

* Optional control panel for remote controls

BKDW-101 with BKMW-102 case

* Built-in signal generator
* Easy integration into Flexicart™ and LMS Systems

SPECIFICATIONS

		DVW-M2000/M2000P	DVW-2000/2000P
General			
Power requirements		AC 100 V to 240 V, 50/60 Hz	
Power consumption		220 W	200 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		20% to 90% (relative humidity)	
Mass		23.5 kg (52 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	Digital Betacam	96.7 mm/s	
	MPEG IMX	64.467(NTSC)/53.776(PAL) mm/s	–
	Betacam SX	59.515 (NTSC)/59.575 (PAL) mm/s	–
	Betacam/Betacam SP	118.6 (NTSC)/101.51 (PAL) mm/s	–
Recording/playback time (Digital Betacam)		Max. 124 min with BCT-D124L cassette	
Fast forward/rewind time		Approx. 3 min with BCT-D124L cassette	
Search speed range	Digital Betacam	±50 times normal playback speed	
	MPEG IMX	±78 times normal playback speed	–
	Betacam SX	±78 times normal playback speed	–
	Betacam/Betacam SP	±35 (NTSC)/±42 (PAL) times normal playback speed	–
Servo lock time		0.5 (NTSC)/0.7 (PAL) s or less (from standby on)	
Load/unload time		6 s or less	
Output signals			
Analog composite input		BNC (x2, including one loop through out), 1.0 Vp-p, 75 Ω, sync negative	
Analog composite output		BNC (x3, including one character out), 1.0 Vp-p, 75 Ω, sync negative	
Analog component input		BNC (x3, for 1 set, Y/R-Y/B-Y),Y: 1.0 Vp-p, 75 Ω, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω	
Analog component output		BNC (x3, for 1 set, Y/R-Y/B-Y),Y: 1.0 Vp-p, 75 Ω, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω	
SDI input		BNC (x2, including one active through out), SMPTE 259M (ITU-R BT.656-3), 270 Mb/s	
SDI output		BNC (x3, including one character out), SMPTE 259M (ITU-R BT.656-3), 270 Mb/s	
HD-SDI output (option)		BNC (x3)	
Analog audio input		XLR (x4) (4CH: channel selectable)	
Analog audio output		XLR (x4) (4CH: channel selectable)	
Cue audio input		XLR (x1, only Digital Betacam recording)	
Cue audio output		XLR (x1, only Digital Betacam playback)	
Digital audio input		BNC (x2), 4 channels, AES/EBU, default 48 kHz (32 to 48 kHz with sample rate converter), complies with AES-3id-1995	
Digital audio output		BNC (x4), 8 channels, AES/EBU, 48 kHz fixed, complies with AES-3id-1995	BNC (x2), 4 channels, AES/EBU, 48 kHz fixed, complies with AES-3id-1995
Remote control	Remote (RS-422A)	D-sub 9-pin (x2), Sony 9-pin remote interface	
	RS-232C (ISR*)	D-sub 9-pin (x1), RS-232C interface	
	Parallel remote	D-sub 50-pin (x1)	
	Video control	D-sub 15-pin (x1, for connection with BVR-50/50P Video Controller) D-sub 9-pin (x1, for connection with HKDV-503/900 Video Controller)	
	Control panel	Circular connector 10-pin	
Time code input		XLR (x1)	
Time code output		XLR (x1)	
Memory card insertion slot		"Memory Stick" slot (x1)	
Monitor output L/R		XLR (x2) (channel selectable)	
Phones		JM-60 Stereo phone jack	
Processor adjustment range			
Video level		±3 dB/ -∞ to 3 dB selectable	
Chroma level		±3 dB/ -∞ to 3 dB selectable	
Set up/black level		±30 IRE/±210 mV	
Chroma phase/hue		±30°	
System sync phase		±15 µs	
System SC phase		±200 ns	
Y/C delay		±100 ns (Betacam/Betacam SP playback only)	–
Composite input level		±3 dB	
Digital video performance			
Sampling frequency		Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz	
Quantization		10 bits/sample	
Error correction		Reed-Solomon code	
Digital input to analog component output		D/A quantization: 10 bits/sample, Bandwidth: Y: 0 to 5.75 MHz +0.5/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5/-2.0 dB, S/N ratio: 62 dB or more, K-factor (2T pulse): 1% or less	
Analog component input to analog component output		A/D and D/A quantization: 10 bits/sample, Bandwidth: Y: 0 to 5.75 MHz +0.5/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5/-2.0 dB, S/N ratio: 56 dB or more, K-factor (2T pulse): 1% or less, LF non-linearity: 3% or less	
Analog composite input to analog composite output		A/D and D/A quantization: 10 bits/sample, Bandwidth: 0 to 5.75 MHz +0.5/-2.0 dB, S/N ratio: 56 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	
Digital audio performance			
Sampling frequency		48 kHz (synchronized with video)	
Quantization		20 bits/sample	
Analog input to analog output		Frequency response (0 dB at 1kHz): 20 Hz to 20 kHz +0.5/-1.0 dB, Dynamic range (at 1 kHz, emphasis ON): More than 95 dB, Distortion (at 1 kHz, emphasis ON, reference level): Less than 0.05%, Cross talk (at 1 kHz, between any two channels): Less than -80 dB, Wow & flutter: Below measurable level	
Head room		20 dB (18 dB selectable)	
Emphasis (ON/OFF selectable in REC mode)		T1=50 µs, T2=15 µs	
Supplied accessories			
		PSW 4x16 Rack mount screw (x4), Operation manual (x1), Installation manual (x1)	

*ISR: Interactive Status Reporting

OPTIONAL ACCESSORIES

BKDW-101
Control Panel

BKMW-102
Remote Control Unit

BKMW-103
Control Panel Expansion Kit

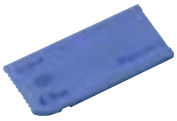
BKMW-104
HD Upconverter Board

RCC-5G
Remote Cable

RMM-131
Rack Mount Kit

BVR-50/50P
Video Controller

MLB-1M-100
Tele-File Label



MSA-8A/16A/32A/64A/128A
"Memory Stick" Media

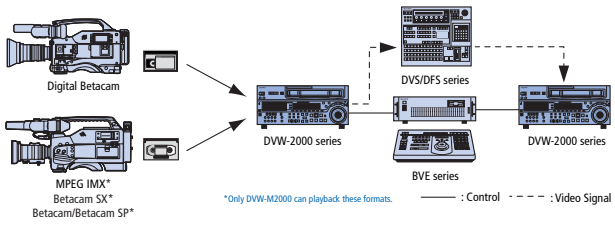
BZNW-1000
ISR Proxy Remote Monitoring and Maintenance Software

BCT-D6/D12/D22/D32/D40
Digital Betacam Cassette (Small)

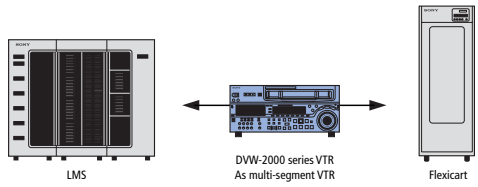
BCT-D34L/D64L/D94L/D124L
Digital Betacam Cassette (Large)

SYSTEM CONFIGURATIONS

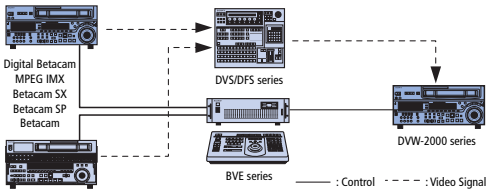
Acquisition



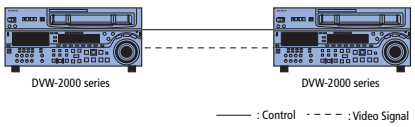
In Flexicart and LMS Systems



Linear A/B roll System



Two-machine Editing



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