# SONY®

**DVCAM** ™

Digital Videocassette Recorder

# DSR-1800/1800P

Digital Videocassette Player

# DSR-1600/1600P



**M**aster Series

For

Professional

Results

# New, Powerful Partners for

# Professional Editing

Video production styles continue to evolve in response to the rapid and tremendous growth in visual communication. In this fast-changing environment, the need is for equipment that meets the crucial demands for both higher productivity and greater creativity in professional video production.

Since its launch in 1996, Sony DVCAM equipment has been satisfying these demands. It has brought many notable benefits: excellent picture and sound quality, high-performance editing capabilities, system versatility and professional reliability to mention a few. Based on the DVCAM format, the DSR range of VTRs and Camcorders covers a wide range of applications from field acquisition through editing to transmission.

Now, two new models join the DSR family, the DSR-1800* Editing Recorder and the DSR-1600** Editing Player. These VTRs provide excellent performance in an editing environment. They have a full range of analog and digital interfaces, a responsive search dial function, and many other powerful features. A key advantage is their playback and editing compatibility with DV (25 Mb/s) family formats, including consumer DV (SP mode) and DVCPRO.

Filled with professional features and offering great flexibility, the DSR-1800 and the DSR-1600 are the perfect choice for today's demanding video production applications.

 * In the following text, 'DSR-1800' refers to both the DSR-1800 (NTSC model) and the DSR-1800P (PAL model).
** In the following text, 'DSR-1600' refers to both the DSR-1600 (NTSC model) and the DSR-1600P (PAL model).

Digital Videocassette Recorder

# DSR-1800

*Master*
*Series*
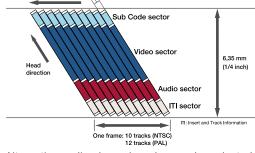
# Main Features

## The DVCAM Format for Professional Performance

The DSR-1800 and the DSR-1600 employ the DVCAM format, the professional extension of the worldwide standard DV format. The DVCAM format uses 8-bit digital component recording with a 5:1 compression ratio and a sampling rate of 4:1:1 (for NTSC) / 4:2:0 (for PAL). The unique compression algorithm provides excellent picture quality and superb multi-generation performance. The DVCAM format has a wider track pitch of 15 µm (compared with 10 µm for the DV format) which gives higher reliability for professional editing.

It also offers superior digital audio performance, providing a wide dynamic range and excellent signal-to-noise ratio, comparable to CD quality. Alternative audio channel modes can be selected: a two-channel mode with 48 kHz/16-bit recording or a four-channel mode with 32 kHz/12-bit recording. DVCAM cassette tapes are available in two sizes: standard and mini. The standard-size cassette provides a recording time of up to 184 minutes while the mini-size cassette provides up to 40 minutes.

Mini-size cassette    Standard-size cassette

Tape direction    15 µm
Sub Code sector
Video sector
Head direction
Audio sector
ITI sector
6.35 mm (1/4 inch)
ITI: Insert and Track Information
One frame: 10 tracks (NTSC)
12 tracks (PAL)

## Playback and Editing Compatibility with DV (25 Mb/s) Family Formats

For maximum versatility, the DSR-1800 and the DSR-1600 are designed to playback DV (25 Mb/s) format recorded tapes without a mechanical adapter – and without requiring menu switching of playback modes before use. This playback versatility includes consumer DV recorded tapes (SP mode) and even DVCPRO* recorded tapes. Moreover, it is possible to use these tapes directly as editing source material with ±0 frame accuracy.

\* Playback signal of a DVCPRO recorded tape is not available via the SDTI (QSDI™) or i.LINK™ (DV In/Out) interface.

Digital Videocassette Player

# DSR-1600

# Main Features

## Excellent Editing Performance

### Outstanding Audio Editing Capabilities

Thanks to newly developed digital processing, the DSR-1800 offers excellent four-channel audio editing capabilities. An audio cross-fade function is available for clean audio transitions at editing points. Audio mix/swap and over dubbing are provided without any delay between the video and audio signals. In addition, the four audio channels can be edited independently, which makes the DSR-1800 ideal for creating or editing video material with multi languages or a variety of audio sources.

### Excellent Digital Slow Motion and Jog Sound

The DSR-1800 and the DSR-1600 offer a variable speed playback function with a range of -0.5 to +0.5 times normal play speed. Within this range, they play back noiseless, digital slow-motion pictures as well as clear jog sound, making it easy to locate editing points quickly and accurately. Moreover, this feature is available even for other DV (25 Mb/s) format recorded tapes like consumer DV (SP mode) and DVCPRO.

### DMC (Dynamic Motion Control)

Equipped with the DMC function, the DSR-1800 and the DSR-1600 allow the playback speed of a specific section of tape to be varied over the range of -0.5 to +0.5 times normal speed. These speed variations and the start and end points of the tape section are stored for later playback. This feature can also be used with other DV (25 Mb/s) format recorded tapes like consumer DV (SP mode) and DVCPRO.

### Frame Accurate Editing Capability

The DSR-1800 and the DSR-1600 can be connected with Sony VTRs and editing controllers through their RS-422A interface. In addition, i.LINK®-based control is available*. Both interfaces ensure frame accurate editing.

\* Requires the optional DSBK-1803 i.LINK/DV Input/Output Board.

i.LINK is a trademark of Sony used only to designate that a product contains an IEEE 1394 connector. All products with an i.LINK connector may not communicate with each other. Please confirm interoperability with third party manufacturers. For more information contact Sony at 1-800-686-7669.

## Versatile Interfaces

### Analog Interfaces

Incorporating a comprehensive range of analog interfaces for both video and audio, the DSR-1800 and the DSR-1600 interface with current analog equipment to ensure smooth upgrading to digital systems. Composite, component, S-Video (Y/C) for video, and audio interfaces (via XLR connectors) are provided.

### Digital Interfaces (Options)

The DSR-1800 and the DSR-1600 can also have a full range of digital interfaces such as SDI, SDTI (QSDI™) and i.LINK™ (DV In/Out), as well as an AES/EBU digital audio interface. These are available with the following optional boards:

■ SDI and AES/EBU:   DSBK-1801 for DSR-1800
                     DSBK-1601 for DSR-1600 (output only)
■ SDTI (QSDI):       DSBK-1802 for DSR-1800
                     DSBK-1602 for DSR-1600 (output only)
■ i.LINK (DV In/Out):   DSBK-1803 for
                     DSR-1800 and DSR-1600 (output only)

By taking advantage of these digital interfaces, the DSR-1800 and the DSR-1600 offer full access to a wide variety of digital editing systems. These include SDI-based editing systems with Betacam SX® or Digital Betacam® VTRs, SDTI (QSDI)- or i.LINK-equipped nonlinear editing systems, and many more.

• The SDTI (Serial Data Transport Interface) is defined as SMPTE 305M.
• The SDTI (QSDI) is the DV compressed signal interface which is defined as SMPTE 322M.
• i.LINK stands for IEEE 1394-1995 standards and their revisions.
 is the logo for products that implement i.LINK.



**Front View of DSR-1800**

## Comprehensive, Convenient Functions

### 16:9 Aspect Ratio Capability
By receiving a wide aspect ID signal, the DSR-1800 and the DSR-1600 record (DSR-1800 only) and play back 16:9 aspect ratio pictures captured with the Sony DXC-D35WS Digital Video Camera, and the DSR-500WS and DSR-PD100A DVCAM Camcorders.

### VITC (Vertical Interval Time Code)
In addition to time code conforming to the SMPTE (for NTSC)/EBU (for PAL) format, the DSR-1800 and the DSR-1600 support VITC. This time code is recorded on the video tracks and inserted in the vertical blanking interval. The time code can also be read at low speeds and during still playback.

### Video Process Control
The DSR-1800 and the DSR-1600 are both equipped with the Video Process Control function, enabling greater control of both analog and digital outputs. The Video Process Control can also be adjusted with an optional UVR-60 TBC Remote Control Unit, when connected to the Video Control port (D-sub 15-pin) on the rear panel.

### Channel Condition Monitoring
The DSR-1800 and the DSR-1600 have a three-color channel condition indicator, with each color representing a particular error rate threshold level. This function enables operators to quickly recognize the condition of the VTR and tape.

### Built-in Signal Generator
Equipped with a built-in signal generator, the DSR-1800 can generate color bars or black burst for video, and 1 kHz tone or silent signal for audio.

### Flexible Input Selection
The DSR-1800 allows flexible combinations* of video and audio signals to be input. It is possible to simultaneously select the digital interface for video and the analog interface for audio.

* i.LINK interface cannot be combined with other signal interfaces.
  When SDTI (QSDI) is selected as the audio input, the video signal is presumed to be SDTI (QSDI). However, when it is selected as video, other signal interfaces can be selected for the audio input.

## Sophisticated Mechanisms

### Quick, Responsive Mechanism
Quick mechanical response is an essential requirement for professional video production. The DSR-1800 and the DSR-1600 provide this through the use of a reliable direct reel and drum motor mechanism. In switching from Still mode to Play mode, the response is exceptionally quick. Fast forward and rewind speeds are an impressive 85 times play speed, with a maximum search speed of 60 times during color playback. In editing environments, where speed is of vital importance, this mechanism frees editors from the frustration of slow operation and speeds the editing process.

### Three-size Cassette Compartment
The triple-size cassette compartment ensures compatibility with DV (25 Mb/s) format recorded tapes of all sizes. This innovative feature makes it possible to use standard- and mini-size consumer DV (SP mode) and DVCAM cassettes as well as medium DVCPRO cassettes without a mechanical adapter. The cassette compartment is also designed for high durability, providing optimum performance in demanding editing environments.
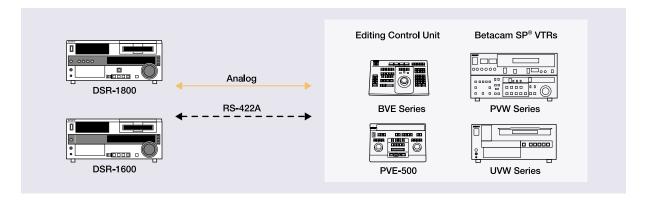
**Rear View of DSR-1800 (with full options)**

## Other Features...

■ ClipLink™ Operation
■ Full Tape Dubbing with ClipLink Log Data
■ Auto Repeat/Power-on Playback Function
■ Closed Caption Function (NTSC models only)
■ Time Code Input/Output
■ Record Inhibit Function (DSR-1800 only)
■ Built-in Character Generator
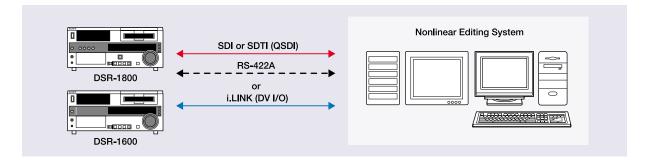■ Universal Powering System: AC 100 V to 240 V

# Application Examples

## Feeder/Editor for Linear Editing Systems

■ Easy to integrate into a current analog editing system through the use of analog interfaces
■ Ideal first unit for smooth migration into a digital production system



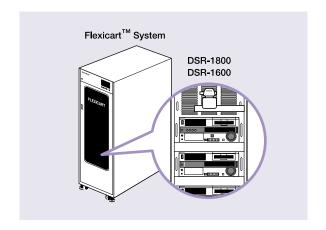## Feeder/Editor for Nonlinear Editing Systems

■ Superior multi-generation picture and sound quality by use of SDI, SDTI (QSDI)
  and i.LINK interfacing through the entire production process
■ Ideal as a feeder/editor machine in a nonlinear editing system



## Program Playout

■ Ideal for automatic program/commercial playout, by installing in
  a Flexicart™ system

# Peripheral Equipment & Optional Accessories

**DSR-500WS**
Digital Camcorder

**DSR-300A**
Digital Camcorder

**DSBK-1801**
SDI/AES/EBU Input/Output Board
(for DSR-1800)

**DSBK-1802**
SDTI (QSDI) Input/Output Board
(for DSR-1800)

**DSBK-1803**
i.LINK/DV Input/Output Board
(for DSR-1800 and DSR-1600)

**DSBK-1601**
SDI/AES/EBU Output Board
(for DSR-1600)

**DSBK-1602**
SDTI (QSDI) Output Board
(for DSR-1600)

**BVE-2000**
Editing Control Unit

**PVE-500**
Editing Control Unit

**DVS-2000C**
Digital Video Switcher

**BVS-3200C**
Video Switcher

**DFS-700**
DME Switcher

**UVR-60**
TBC Remote Control Unit

**RMM-130**
Rack Mount Kit

**RCC-5G/10G/30G**
9-pin Remote Control Cable

**CCF-3L/CCFD-3L**
DV Cable (6-pin to 6-pin/6-pin to 4-pin)

**PDVM-12ME/22ME/32ME/40ME**
Digital Videocassette (Mini size)
**PDV-34ME/64ME/94ME/124ME/184ME**
Digital Videocassette (Standard size)

**PDVM-32N/40N**
Digital Videocassette (Non-IC type/Mini size)
**PDV-64N/124N/184N**
Digital Videocassette (Non-IC type/Standard size)

**PDVM-32MEM/40MEM**
Digital Videocassette (Master tape/Mini size)
**PDV-64MEM/124MEM/184MEM**
Digital Videocassette (Master tape/Standard size)

**PDVM-12CL**
Cleaning Cassette Tape (Mini size)
**PDV-12CL**
Cleaning Cassette Tape (Standard size)

# Specifications

| | | DSR-1800 | DSR-1800P | DSR-1600 | DSR-1600P |
|---|---|---|---|---|---|
| **GENERAL** | | | | | |
| Power requirements | | AC 100 V to 240 V, 50/60 Hz | | | |
| Power consumption | | 100 W (with all options) | | 70 W (with all options) | |
| Operating temperature | | 41˚F to 104˚F( 5˚C to 40˚C ) | | | |
| Storage temperature | | -4˚F to 140˚F(-20˚C to 60˚C) | | | |
| Operating humidity | | Less than 80% | | | |
| Storage humidity | | Less than 90% | | | |
| Weight | | 28 lb 10 oz  (13 kg ) | | | |
| Dimensions (W x H x D) | | 16 7/8 x 6 7/8 x 15 3/4 inches ( 427 x 174 x 400 mm ) | | | |
| Tape speed | | 28.193 mm/s | 28.221 mm/s | 28.193 mm/s | 28.221 mm/s |
| Recording/Playback time | Standard size | 184 min. with PDV-184ME/184N/184MEM | | | |
| | Mini size | 40 min. with PDVM-40ME/40N/40MEM | | | |
| Fast forward/Rewind time | Standard size | Less than 3 min. with PDV-184ME/184N/184MEM | | | |
| | Mini size | Less than 1 min. with PDVM-40ME/40N/40MEM | | | |
| Search speed | Shuttle mode | Still to ±60 times normal speed | | | |
| | Digital slow mode | ±0.5 times normal speed | | | |
| **VIDEO PERFORMANCE** | | | | | |
| Bandwidth (via analog component I/O) | | | | | |
| | Luminance | 30 Hz to 5.0 MHz ±1.0 dB | 25 Hz to 5.0 MHz ±1.0 dB | 30 Hz to 5.0 MHz ±1.0 dB | 25 Hz to 5.0 MHz ±1.0 dB |
| | Chrominance | 30 Hz to 1.5 MHz +1.0/-5.0 dB | 25 Hz to 2.0 MHz +1.0/-2.0 dB | 30 Hz to 1.5 MHz +1.0/-5.0 dB | 25 Hz to 2.0 MHz +1.0/-2.0 dB |
| S/N ratio (via analog component I/O) | | More than 55 dB | | | |
| K-factor (K2T, KPB) | | Less than 2.0% | | | |
| Y/C delay | | Less than 30 ns | | | |
| **AUDIO PERFORMANCE** | | | | | |
| Frequency response | 2CH mode (48 kHz/16-bit) | 20 Hz to 20 kHz +0.5/-1.0 dB | | | |
| | 4CH mode (32 kHz/12-bit) | 20 Hz to 14.5 kHz +0.5/-1.0 dB | | | |
| Dynamic range | | More than 90 dB | | | |
| Distortion (THD + N) | | Less than 0.05% | | | |
| **INPUT SIGNALS** | | | | | |
| **VIDEO (ANALOG)** | | | | | |
| REF. Video (BNC x 2, loop-through connection) | | 0.286 Vp-p, 75 Ω, sync negative | 0.3 Vp-p, 75 Ω, sync negative | 0.286 Vp-p, 75 Ω, sync negative | 0.3 Vp-p, 75 Ω, sync negative |
| Video (BNC x 2, loop-through connection) | | Composite, 1.0 Vp-p, 75 Ω, sync negative | | – | |
| Component (BNC x 3) | | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (75%)<br>B-Y: 0.7 Vp-p, 75 Ω (75%) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (100%)<br>B-Y: 0.7 Vp-p, 75 Ω (100%) | – | |
| S-Video (DIN 4-pin x 1) | | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.286 Vp-p, 75 Ω (at burst level) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.3 Vp-p, 75 Ω (at burst level) | – | |
| **VIDEO (DIGITAL)** | | | | | |
| SDI (BNC x 2, active-through connection)<br>using optional DSBK-1801 for DSR-1800/1800P | | Conforms to Serial Digital Interface (270 Mb/s), SMPTE 259M | Conforms to Serial Digital Interface (270 Mb/s), ITU-R BT.656 | | |
| SDTI (QSDI) (BNC x 1)<br>using optional DSBK-1802 for DSR-1800/1800P | | Conforms to SDTI (270 Mb/s), SMPTE 305M/322M | | – | |
| i.LINK (DV In/Out) (6-pin x 1)<br>using optional DSBK-1803 for DSR-1800/1800P | | IEEE 1394-based | | – | |
| **AUDIO (ANALOG)** | | | | | |
| Audio (XLR 3-pin female x 4) | | -6/0/+4 dBu (selectable by menu),<br>-60 dBu (high impedance)/600 Ω OFF/ON | -6/-3/0/+4 dBu (selectable by menu),<br>-60 dBu (high impedance)/600 Ω OFF/ON | – | |
| **AUDIO (DIGITAL)** | | | | | |
| AES/EBU (BNC x 2)<br>using optional DSBK-1801 for DSR-1800/1800P | | 75 Ω, unbalanced | | – | |
| **TIME CODE** | | | | | |
| Time Code In (BNC x 1) | | 0.5 Vp-p to 18 Vp-p, 3 kΩ unbalanced | | – | |
| **OUTPUT SIGNALS** | | | | | |
| **VIDEO (ANALOG)** | | | | | |
| REF. Video (BNC x 1) | | 0.286 Vp-p, 75 Ω, sync negative | 0.3 Vp-p, 75 Ω, sync negative | 0.286 Vp-p, 75 Ω, sync negative | 0.3 Vp-p, 75 Ω, sync negative |
| Video 1/2(SUPER) (BNC x 2) | | Composite, 1.0 Vp-p, 75 Ω, sync negative | | | |
| Component (BNC x 3) | | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (75%)<br>B-Y: 0.7 Vp-p, 75 Ω (75%) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (100%)<br>B-Y: 0.7 Vp-p, 75 Ω (100%) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (75%)<br>B-Y: 0.7 Vp-p, 75 Ω (75%) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>R-Y: 0.7 Vp-p, 75 Ω (100%)<br>B-Y: 0.7 Vp-p, 75 Ω (100%) |
| S-Video (DIN 4-pin x 1) | | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.286 Vp-p, 75 Ω (at burst level) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.3 Vp-p, 75 Ω (at burst level) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.286 Vp-p, 75 Ω (at burst level) | Y: 1.0 Vp-p, 75 Ω, sync negative<br>C: 0.3 Vp-p, 75 Ω (at burst level) |
| **VIDEO (DIGITAL)** | | | | | |
| SDI (BNC x 2) * using optional DSBK-1801 for DSR-1800/1800P and DSBK-1601 for DSR-1600/1600P | | Conforms to Serial Digital Interface (270 Mb/s), SMPTE 259M | Conforms to Serial Digital Interface (270 Mb/s), ITU-R BT.656 | Conforms to Serial Digital Interface (270 Mb/s), SMPTE 259M | Conforms to Serial Digital Interface (270 Mb/s), ITU-R BT.656 |
| SDTI (QSDI) (BNC x 1) * using optional DSBK-1802 for DSR-1800/1800P and DSBK-1602 for DSR-1600/1600P | | Conforms to SDTI (270 Mb/s), SMPTE 305M/322M | | | |
| i.LINK (DV In/Out) (6-pin x 1) * using optional DSBK-1803 for DSR-1800/1800P and DSR-1600/1600P | | IEEE 1394-based | | | |
| **AUDIO (ANALOG)** | | | | | |
| Audio (XLR 3-pin male x 4) | | -6/0/+4 dBu (selectable by menu) | -6/-3/0/+4 dBu (selectable by menu) | -6/0/+4 dBu (selectable by menu) | -6/-3/0/+4 dBu (selectable by menu) |
| Monitor (RCA x 1) | | -11 dBu, 47 kΩ, unbalanced (-20 dBFS) | -9 dBu, 47 kΩ, unbalanced (-18 dBFS) | -11 dBu, 47 kΩ, unbalanced (-20 dBFS) | -9 dBu, 47 kΩ, unbalanced (-18 dBFS) |
| Headphone (JM-60 headphone jack x 1) | | -∞ to -13 dBu, 8 Ω, unbalanced (-20 dBFS) | -∞ to -11 dBu, 8 Ω, unbalanced (-18 dBFS) | -∞ to -13 dBu, 8 Ω, unbalanced (-20 dBFS) | -∞ to -11 dBu, 8 Ω, unbalanced (-18 dBFS) |
| **AUDIO (DIGITAL)** | | | | | |
| AES/EBU (BNC x 2) * using optional DSBK-1801 for DSR-1800/1800P and DSBK-1601 for DSR-1600/1600P | | 75 Ω, unbalanced | | | |
| **TIME CODE** | | | | | |
| Time Code Out (BNC x 1) | | 2.2 Vp-p, 75 Ω, unbalanced | | | |
| **REMOTE** | | | | | |
| RS-422A | | D-sub 9-pin (female) x 1 | | | |
| Video Control | | D-sub 15-pin (male) x 1 | | | |
| CONTROL S (SIRCS) | | Stereo mini jack x 1 | | | |
| **SUPPLIED ACCESSORIES** | | | | | |
| AC power cord x 1 | | | | | |
| Operating instructions x 1 | | | | | |