SONY®

Digital Videocassette Recorder
DSR-85

DVCAM ™

DVCAM
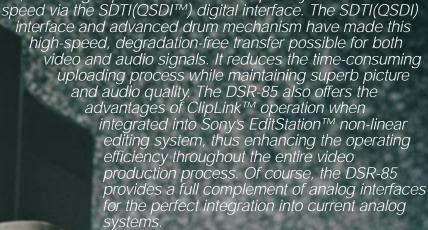DIGITAL VIDEOCASSETTE RECORDER DSR-85

DVCAM—Digital Innovation

Digital technology has opened up new opportunities in every business arena and professional video production is no exception. The migration toward digital brings great advances in image quality and equipment versatility.

The DVCAM™ format, originated in 1996, offers professional reliability and system flexibility which meets the demanding requirements of video professionals. Incorporating excellent editing capabilities, great picture and multigeneration quality, and superb tape durability, the DVCAM format offers exceptional digital performance. In terms of flexibility, DVCAM VTRs offer several integration alternatives by incorporating both digital and analog interfaces for totally digital systems or hybrid analog systems. DVCAM VTRs incorporate a dual-size cassette mechanism which accepts both mini and standard cassette tapes (without an adaptor) for record or playback for up to 3 full hours! In addition, both Sony's professional DVCAM format and consumer DV format use advanced metal evaporated tape. This enables consumer DV recorded tapes to play back in DVCAM VTRs and vice versa.

The DSR-85, the top of the line DVCAM VTR, offers high speed data transfer capability at four times speed via the SDTI(QSDI™) digital interface. The SDTI(QSDI) interface and advanced drum mechanism have made this high-speed, degradation-free transfer possible for both video and audio signals. It reduces the time-consuming uploading process while maintaining superb picture and audio quality. The DSR-85 also offers the advantages of ClipLink™ operation when integrated into Sony's EditStation™ non-linear editing system, thus enhancing the operating efficiency throughout the entire video production process. Of course, the DSR-85 provides a full complement of analog interfaces for the perfect integration into current analog systems.

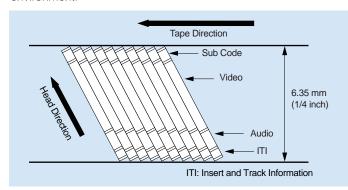* The SDTI (Serial Data Transport Interface) is defined as SMPTE 305M.

The SDTI(QSDI) is the DV signal interface which conforms to the SDTI.

Features

The DVCAM Recording Format - Digital Recording for the Next Generation

The DSR-85 offers superb picture quality, multi-generation capability and production flexibility thanks to the adoption of the new DVCAM digital recording format, which has been newly developed by Sony for the professionals in the digital environment.

Tape Direction

Sub Code

Video

6.35 mm (1/4 inch)

Head Direction

Audio

ITI

ITI: Insert and Track Information

Playback Compatibility with Home-Use "DV" Format

The DVCAM digital recording format for video professionals is an extension of the consumer DV format. Therefore, it maintains playback compatibility with the consumer DV recordings and has the advantage that both standard and mini cassettes can be used in the same machine.
By maintaining a wider track pitch, the DVCAM format ensures high reliability for the professional editor.

The DVCAM Component Digital Recording Format

The DVCAM format uses 8-bit component digital recording with a 5:1 compression ratio and sampling at the rate of 4:1:1 to provide superior picture quality and multi-generation capability. The DVCAM format employs an intra frame compression scheme which is ideal for editing applications. Based on DCT (Discrete Cosine Transform) techniques, each frame consists of 10 tracks. Each track has ITI (Insert and Track Information), Audio, Video, and sub code areas. The ITI, which is a reference signal for a precise tracking, and Time Codes on the sub code area assure highly accurate editing performance. This technique provides much greater operational flexibility and complex multi-layering.

High Quality Digital Audio

The DSR-85 provides two selectable audio channel modes, two channels and four channels.
In order to ensure superb audio performance with a wide dynamic range and an excellent signal-to-noise ratio, the PCM (Pulse Code Modulation) digital stereo recording system is used in both modes; 2CH of 16 bit, 48kHz sampling frequency and 4CH of 12 bit, 32kHz sampling frequency.

Excellent Performance by the Professional DVCAM Tapes

To gain maximum performance from high density digital recording, new Advanced Metal Evaporated cassette tapes have been developed for the DVCAM format. The result is superior recording quality by increasing the RF video output by +4.5dB compared to that of Hi-8 metal evaporated tape. Higher durability is also ensured for professional editing applications by enhancing protection with DLC (Diamond Like Carbon) coating. Each cassette has a 16kbit IC memory, which stores data to enhance editing efficiency. Two cassette sizes are available; DVCAM Standard cassette provides a maximum recording time of 184 minutes (PDV-184ME) and the DVCAM Mini cassette records up to 40 minutes (PDVM-40ME).
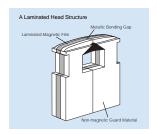

<Cassette memory>

Increased Efficiency for Editing Environment with High Speed Data Transfer

Thanks to a newly developed drum mechanism and the advantage of the compressed data transfer via a SDTI(QSDI) interface in addition to the benefits of the DVCAM format, the DSR-85 enables highly efficient editing by transferring the compressed data at four times normal speed between the DSR-85 and Sony's ES-7 EditStation system, which brings you time-saving editing with superb picture quality.

Newly Developed Drum Mechanism with Unique Head Construction

The small head drum system in the DSR-85 results in a very compact transport mechanism with 21.7mm in diameter while incorporating 14-head and 14-channel rotary transformers. A new development is a laminated head structure with magneto-static coupling film and metallic bonding. The high quality amorphous twin-heads ensure reliable, efficient recording and playback with low noise. To enable data to be transferred from the DSR-85 at four times normal speed, the head drum rotates at up to 18,000 rpm.

A Laminated Head Structure

Metallic Bonding Gap

Laminated Magnetic Film

Non-magnetic Guard Material
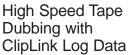
SDTI(QSDI) Digital Interface

The DSR-85 is equipped with a SDTI(QSDI) interface which handles compressed video as well as sub code data and digital audio signals of the DVCAM recording format.
The SDTI(QSDI) interface allows degradation-free transfer of both video and audio signals. When integrated into the nonlinear editing system with the ES-7 EditStation system, the DSR-85 is capable of four times normal speed data transfer via the SDTI(QSDI) interface.

ClipLink Operation

The ClipLink system is a comprehensive data management system of the shooting information which is necessary for the total digital production process, ranging from acquisition to editing. Incorporated into Sony DVCAM cassettes is an IC memory chip which holds shot list information, called ClipLink Log Data.

When the cassette is loaded into the DSR-85, the ClipLink Log Data is uploaded into the Sony EditStation system for immediate viewing of the images on the GUI (Graphical User Interface) screen before actually being recorded onto the hard drive. Then only the selected clips on the GUI screen may be uploaded for time and space-saving of efficiency of the hard drive. When integrated into the ES-7 EditStation nonlinear editing system, the DSR-85 executes high-speed transmission of the selected ClipLink data at four times normal speed, at which time the actual editing work can be started immediately. When combined with the ES-7, unprecedented productivity can be brought into the editing process.

High Speed Tape Dubbing with ClipLink Log Data

The DSR-85 has a high speed tape dubbing function which allows you to make a dub of the recorded DVCAM tape information (video/audio/sub code) along with the ClipLink Log Data contained in the memory IC in the DVCAM cassette tape. The dubbing is accomplished via the SDTI(QSDI) interface and the RS-422A. Dubbing can be done at normal or four times normal speed and is initiated by the menu button on the subcontrol panel.

Versatility for Current System Environments

The DSR-85 has been specially designed for easy integration into existing analog editing systems. In addition to versatile digital interfaces, the DSR-85 provides full analog interfaces.

Remote Control via RS-422A

The DSR-85 is equipped with an RS-422A serial communication port to interface with Sony VTRs and editing controllers such as the PVE-500. In addition to VTR control functions, the interface also enables the transfer of ClipLink Log Data from the cassette memory in the DVCAM cassette to a Sony EditStation system.

Analog Interfaces

The DSR-85 provides a full complement of analog I/O for video and audio, which offers compatibility with conventional analog equipment, such as Betacam SP™, Hi-8™ and S-VHS for a smooth and gradual transition to digital systems.

For video, composite, component and S-video connections are provided. Four channel or two channel (selectable) inputs and outputs are provided for audio.

Comprehensive Editing Features

Built-in SMPTE Time Code Generator/Reader

A built-in time code generator and reader are in the DSR-85 to offer precise video editing.

The time code conforms to the SMPTE standard. Time code written in the sub code is controlled via the RS-422A interface port.

Input/output of time code is possible with the optional DSBK-130 Time Code Input/Output Board.

Time Base Corrector

The DSR-85 is equipped with a built-in time base corrector for all analog outputs giving highly stable video signals. Sync and SC phase adjustment is made from the front panel, while the TBC control is possible with the optional UVR-60 TBC Remote Control Unit.

Digital Slow Function

The Digital Slow function takes advantage of digital processing for playback 0 to 0.25 times normal playback speed both in forward and reverse, realizing noiseless slow-motion images. Either frame or field accurate playback is possible.

Frame Accurate Editing Capability

When connected to RS-422A equipped editing controllers, the DSR-85 functions as an editing recorder for assemble or insert editing. Frame accurate editing is assured in both modes, thanks to the sophisticated servo control and built-in time code generator/reader.

In the insert mode of the DSR-85, video, audio and time code can be inserted independently or in any combination. In the assemble mode, all of the prerecorded signals (video, audio and time code) are erased and replaced with new signals.

High-Speed Picture Search

The DSR-85 offers high speed picture search which provides a recognizable picture at various speeds over a range of up to 32 times normal speed, in both forward and reverse, to quicken editing operations.

In JOG mode, frame accurate picture search is possible. These functions are available using the optional DSRM-10 Remote Control Unit or with editing controllers equipped with RS-422A capability.

*The search speed varies with the type of controllers. In case of the DSRM-10, the search speed is up to 16 times.

Jog Audio

It is possible to reproduce four channels or two channels of digital audio from the speed of 1/30 to 1 times normal playback speed, both in forward and reverse, in the JOG mode. This feature is helpful for quickly and precisely designating editing points while monitoring the digital audio signals. The audio data is held in the memory and output according to search speed for enhanced recognition.

Sony Integrated Remote Control System (SIRCS)

The DSR-85 is equipped with SIRCS (Sony Integrated Remote Control System) interface on the front panel, enabling connection of the optional DSRM-10 Remote Control Unit for controlling jog, shuttle, playback, record, pause, fast forward and rewind functions.

Serial Digital Interface (SDI)

The SDI (Serial Digital Interface) which conforms to the SMPTE 259M broadcast standard, is supported by the optional DSBK-120 SDI I/O Board for simple connection with SDI equipped devices such as D-1 and Digital BETACAM™ VTRs.

User Friendly Operation

Ease of Initial Set-up for Convenient Operation

The DSR-85 is provided with an initial setup menu system. The setup menu is programmed in the form of a layer structure. By simply going through the menu using the subcontrol panel, users can easily initialize the VTR. This setup menu allows many detailed operational parameters to be preset. Once the menu is set, the DSR-85 will memorize the options and retain them in memory even after the power is turned off. By using these memorized set-up parameters, the DSR-85 can be immediately set up for a specific application.

Built-in Character Generator

The DSR-85 has a built-in character generator which superimposes characters on the video signal output from the VIDEO OUT 2 terminal. The time code data (TC, User bit), VTR operation status, menu items, and all alarm, warning, and error messages can be shown on a monitor.

Legible Front Panel Display

The DSR-85 has a large, highly visible display on its front panel. This display shows a variety of information such as audio and video input modes, normal/high-speed modes, ClipLink data and cassette memory for users to see the VTR status at a glance.

Consumer DV Playback

The DSR-85 has the capability to playback the consumer DV cassettes, thus enabling broader acquisition of program material without the need for a special adapter.

*The DSR-85 does not support LP mode of the consumer DV.

Reliable, Responsive and Serviceable

The DSR-85 was designed with a highly responsive mechanism, which is an essential factor for efficient editing operation. In addition, maintaining excellent responsive performance, the DSR-85 offers ease of servicing and maintenance by incorporating self-diagnostics, an error log and hours meter.

Quick Responsive Mechanism

The DSR-85 assures high reliability in all professional applications through U-loading, direct reel drive, and an electronic tension servo. The FF/REW speeds are impressive 85x, while maximum search speed is 32x with color playback.

Self-Diagnostics and Error Log

Should an error be detected, an error message will be displayed which will identify the problem area. In this way, down-time can be minimized. Moreover, the error log function makes it easier to detect the error by retaining the past status data of the DSR-85 in memory.

Hours Meter

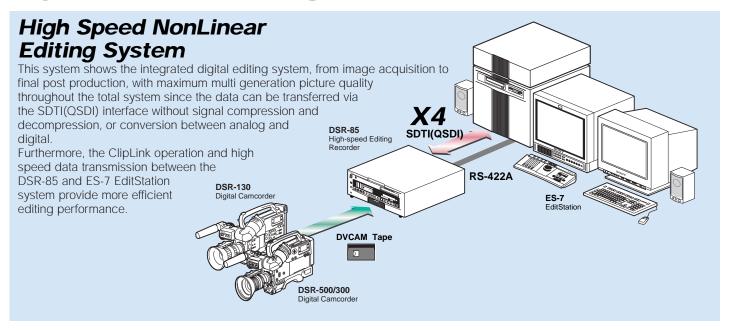An hours meter is also provided to assure simplified maintenance by showing total operating time, drum rotation time, transport operation time, and number of thread/unthread operations. This information can be shown on a monitor screen and the front panel display of the unit.
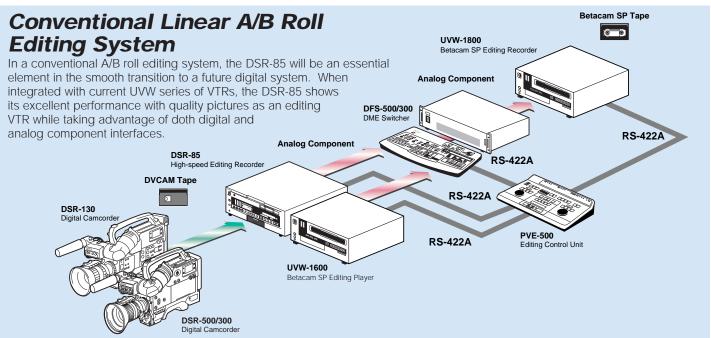
Appealing, Simple, Design

The attractive and functional appearance of the DSR-85 has evolved through long years experience. It was designed to complement the Sony EditStation systems and other Sony equipment for heightened esthetics demanded by creative professionals.

The DSR-85 is four units high and is EIA standard 19-inch rack mountable with Sony's optional RMM-130 Rack Mount Kit.
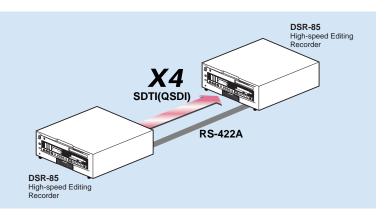
System Configurations

High Speed NonLinear Editing System

This system shows the integrated digital editing system, from image acquisition to final post production, with maximum multi generation picture quality throughout the total system since the data can be transferred via the SDTI(QSDI) interface without signal compression and decompression, or conversion between analog and digital.

Furthermore, the ClipLink operation and high speed data transmission between the DSR-85 and ES-7 EditStation system provide more efficient editing performance.

DSR-85
High-speed Editing Recorder

X4
SDTI(QSDI)

RS-422A

ES-7
EditStation

DSR-130
Digital Camcorder

DVCAM Tape

DSR-500/300
Digital Camcorder

Conventional Linear A/B Roll Editing System

In a conventional A/B roll editing system, the DSR-85 will be an essential element in the smooth transition to a future digital system. When integrated with current UVW series of VTRs, the DSR-85 shows its excellent performance with quality pictures as an editing VTR while taking advantage of doth digital and analog component interfaces.

Betacam SP Tape

UVW-1800
Betacam SP Editing Recorder

Analog Component

DFS-500/300
DME Switcher

RS-422A

DSR-85
High-speed Editing Recorder

Analog Component

DVCAM Tape

DSR-130
Digital Camcorder

RS-422A

RS-422A

PVE-500
Editing Control Unit

RS-422A

UVW-1600
Betacam SP Editing Player

DSR-500/300
Digital Camcorder

High Speed Digital Dubbing System

Dubbing at four times normal speed can be done between two DSR-85 VTR's without the need for any additional controller. The recorded DVCAM tape information (video/audio/sub code) along with the ClipLink Log Data in the memory IC can be bubbed, and the dubbed tape can be used for nonlinear editing with Sony EditStstion systems.

DSR-85
High-speed Editing Recorder

X4
SDTI(QSDI)

RS-422A

DSR-85
High-speed Editing Recorder

Peripheral Equipment

DSR-130
Digital Camcorder
(Consists of DSR-1 Digital Videocassette
Recorder and DXC-D30 Digital Camera)

DSR-300
Digital Camcorder

ES-7
EditStation system

DSBK-120
SDI Input/Output Board

DSBK-130
Time Code Input/Output Board

DSRM-10
Remote Control Unit

RMM-130
Rack Mount Kit

UVR-60
TBC Remote Control Unit

PVE-500
Editing Control Unit

DFS-500
DME Switcher

RM-450A
Editing Remote Controller

RCC-5G/10G/30G
Remote Control Cable (5 m, 10 m 30 m)

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

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

PDVM-32MEM/40MEM (Mini size)
PDVM-64MEM/124MEM/184MEM
(Standard size)
Digital Video Cassette (Master Tape)

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

Specifications

GENERAL

Power requirements	AC 100 to 120 V, 50/60 Hz
Power consumption	185 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)
Operating humidity	Less than 80 %
Storage humidity	Less than 90 %
Mass	21 kg (46 lb 4 oz)
Dimensions (W x H x D)	427 x 174 x 494 mm excluding external projections (16 7/8 x 6 7/8 x 19 1/2 inches)
Tape speed	28.193 mm/s
Recording/Playback time Standard size: Mini size:	More than 184 min. w/PDV-184ME/184N More than 40 min. w/PDVM-40ME/40N
Fast forward/Rewind time Standard size: Mini size:	Less than 3 min. w/PDV-184ME/184N Less than 1 min. w/PDVM-40ME/40N
Search speed When controlling via RS-422A:	Search speed is up to 32 times, forward and reverse.
When controlling via optional DSRM-10: JOG mode: SHUTTLE mode: Digital slow mode: JOG audio mode:	Frame by frame to x2, forward and reverse 8 steps, still to x16 normal speed, forward and reverse 3 steps, still, x1/5 and x1/10 normal speed, forward and reverse x1/30 to x1, forward and reverse

VIDEO PERFORMANCE

Band width (via analog component I/O) Luminance:	30 Hz to 5.0 MHz ±1.0 dB 5.75 MHz +0/-3.0 dB (Typical measurement)
Chrominance:	30 Hz to 1.5 MHz +1.0/-5.0 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 85 dB
Distortion (THD + N)	Less than 0.05 %

INPUT SIGNALS

\<VIDEO>
ANALOG

REF. VIDEO (BNC x2, loop-through connection)	Composite, 1.0 Vp-p, 75 Ω, sync negative
VIDEO (BNC x2, loop-through connection)	Composite, 1.0 Vp-p, 75 Ω, sync negative
COMPONENT (BNC x3) Y: R-Y/B-Y:	1.0 Vp-p, 75 Ω, sync negative 0.7 Vp-p, 75 Ω (75 %)
S-Video (DIN 4-pin x1) Y: C:	1.0 Vp-p, 75 Ω, sync negative 0.286 Vp-p, 75 Ω (at burst level)

DIGITAL

SDI* (BNC x2, active-through connection)	Conforms to Serial Digital Interface (270 Mbps),SMPTE259M * Using Optional DSBK-120 (SDI Input/Output Board)
SDTI(QSDI) (BNC x1)	Conforms to SDTI (270 Mbps), SMPTE 305M

\<AUDIO>
ANALOG

AUDIO (XLR 3-pin female x4)*	-9 dBu to 28 dBu, 600 Ω/10 KΩ, balanced

DIGITAL

AES/EBU (XLR 3-pin female x2)	110 Ω, balanced

\<TIME CODE>

Time Code In* (BNC x1)	0.5 Vp-p to 18 Vp-p, 3 kΩ, unbalanced *Using Optional DSBK-130 (Time Code Input/Output Board)

OUTPUT SIGNALS

\<VIDEO>
ANALOG

REF. VIDEO (BNC x1)	0.286 Vp-p, 75 Ω, sync negative
VIDEO 1/2 (SUPER) (BNC x2)	Composite, 1.0 Vp-p, 75 Ω, sync negative
COMPONENT (BNC x3) Y: R-Y/B-Y:	1.0 Vp-p, 75 Ω, sync negative 0.7 Vp-p, 75 Ω (75 %)
S-Video (DIN 4-pin x1) Y: C:	1.0 Vp-p, 75 Ω, sync negative 0.286 Vp-p, 75 Ω (at burst level)

DIGITAL

SDI* (BNC x2)	Conforms to Serial Digital Interface (270 Mbps), SMPTE 259M * Using Optional DSBK-120 (SDI Input/Output Board)
SDTI(QSDI) (BNC x1)	Conforms to SDTI (270 Mbps), SMPTE 305M

\<AUDIO>
ANALOG

AUDIO (XLR 3-pin male x4)	4 dBu, 600 Ω loading, low impedance, balanced
AUDIO MONITOR (RCA phono jack x1)	-6 dBu, 47 kΩ, unbalanced
HEADPHONES (JM-60 headphone jack x1)	-16 dBu, 8 Ω, unbalanced

DIGITAL

AES/EBU (XLR 3-pin male x2)	2 to 7 Vp-p, 110 Ω, balanced

\<TIME CODE>

Time Code Out* (BNC x1)	2.2 Vp-p, 600 Ω, unbalanced *Using Optional DSBK-130 (Time Code Input/Output Board)

REMOTE

RS-422A	9-pin multi connector (x1)
TBC	D-sub 15-pin connector (x1)
CONTROL-S (SIRCS)	Stereo mini jack (x1)

SUPPLIED ACCESSORIES

AC power code (x1)
Operating instructions (x1)
RCC-5G 9-pin remote control cable (x1)
ClipLink Guide (x1)

*0 dBu = 0.775 Vrms

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