SONY

NTSC

Digital Videocassette Recorder

DSR-1

DVCAM™

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.

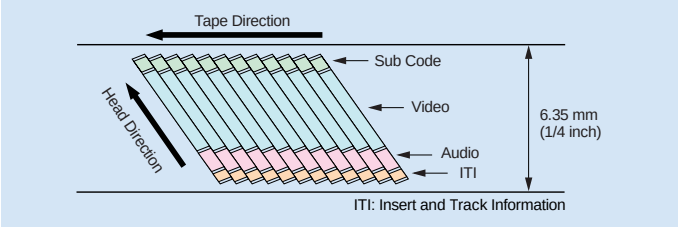
The DVCAM™ format, originated in 1996, offers professional reliability and system flexibility which meets the demanding requirements of video professionals. Incorporating excellent editing capabilities, great picture and multigeneration quality, and superb tape durability, the DVCAM format offers exceptional 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 recording 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-1 is a dockable DVCAM recorder which incorporates both a Pro 50-pin analog and a Pro 76-pin digital interface for docking to a variety of cameras including the DXC-D35 and DXC-D35WS digital cameras and the DXC-327A, DXC-327B, DXC-537A and DXC-637 analog cameras. When the DSR-1 is combined with the DXC-D35/D35WS digital camera, it provides a completely digital signal path between the camera and recorder. Incorporating such professional features as high quality XLR connectors (audio selectable in two or four channels mode), a ClipLink™ data management system, a built-in SMPTE Time Code generator and reader, built-in self-diagnostics, and low power consumption for extended field recording, the DSR-1 offers outstanding performance for the gamut of professional applications.

Features

The DVCAM Recording Format - Digital Recording for the Next Generation

The DSR-1 offers superb picture quality, multi-generation capability and production flexibility thanks to the adoption of the DVCAM digital recording format, which has been developed by Sony for video professionals in the digital environment.



Digital Component Recording for Excellent Picture Quality

The DVCAM format uses 8-bit digital component recording with a 5:1 compression ratio that is identical to the DV format. It also offers a sampling rate of 4:1:1 for excellent picture quality and superb multi-generation performance. The DVCAM format utilizes an intra-frame compression scheme and is based on DCT (Discrete Cosine Transform) techniques with each frame consisting of 10 tracks. Each track has video, audio, ITI (Insert and Track Information) and sub-code sectors. It is the combination of ITI – a reference signal used for precise tracking – and time code on the sub-code sector that helps to assure highly accurate editing performance.

High-Quality Digital Audio

The DVCAM format also offers superior digital audio performance that is comparable to CD quality, thanks to a wide dynamic range and excellent signal-to-noise ratio. There are two selectable audio channel modes: a two-channel mode with 48 kHz/16-bit recording or a four-channel mode with 32 kHz/ 12-bit recording.

Playback Compatibility with the DV Format

The DVCAM format is the professional extension of the worldwide standard DV format, with which it maintains playback compatibility. Thus all DVCAM equipment is capable of playing back DV recorded tapes* without any mechanical adaptors. A wider track pitch of 15 µm (compared with 10 µm for the DV format) and greater recording speeds give the DVCAM format higher reliability for professional editing.

* SP mode only

Excellent Performance from Professional DVCAM Tapes

To gain maximum performance from high-density digital recording, advanced Metal Evaporated tape technology has been developed for the DVCAM format. The use of Sony's pure cobalt advanced evaporated coating gives both high output and a high C/N (Carrier-to-Noise) ratio, resulting in superb quality pictures and a low error rate.
A DLC (Diamond Like Carbon) protective layer provides an enhanced protection of the tape surface that is essential to avoid the possibility of tape damage during long editing sessions. Finally, DVCAM tapes provide a low frequency of dropout and superior thermal stability.
A variety of cassette types is available to suit different applications. These include types with or without an IC Cassette Memory, as well as a Master Grade tape. The built-in 16-kbit Cassette Memory stores ClipLink Log Data, Index Pictures, Photo mode and other shooting data that enhance editing efficiency. The tapes without IC Cassette Memory fit a wide range of applications with affordable price. The Master Grade tape, which uses Sony Hyper Evaticle II Magnetic Particle technology to provide higher output and lower noise, is equally suitable for high-speed data transfer applications as well as for making master recordings.

Recording Capability of Up to Three Hours

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. These long recording times are achieved in very compact cassettes with a tape width of only 1/4 of an inch (6.35 mm).

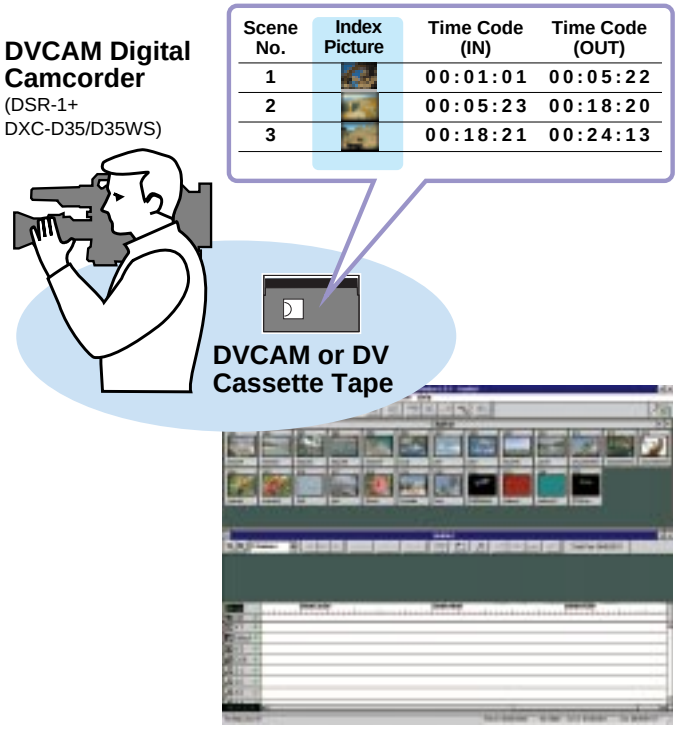

<Cassette memory>

Advanced Features for a Dockable Camcorder

ClipLink System

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. When the DSR-1 is docked to the DXC-D35/D35WS Digital Camera, it functions as a DVCAM digital camcorder. As such, it automatically generates two kinds of useful information while shooting, which dramatically enhances the editing efficiency later on in the editing studio. One is the recording of an Index Picture which is a miniature digital picture of the video image of each MARK IN point. These Index Pictures are recorded on the DVCAM tape. Up to 198 Index Pictures can be recorded onto a DVCAM cassette tape and up to 45 Index Pictures can be recorded onto a home-use DV cassette tape. The other information is the ClipLink Log Data, which represents reference data needed for editing such as reel numbers, scene numbers, take numbers, time code of MARK IN/MARK OUT and Cue points. This ClipLink Log Data is stored in the cassette memory with an IC memory chip incorporated into Sony DVCAM or DV cassettes.
The ClipLink Log Data can be instantly uploaded to the Sony EditStation systems from the DVCAM VTRs, so that the selection of usable video scenes can be easily done by viewing them on the GUI (Graphical User Interface) screen of the EditStation systems.

The ClipLink system in combination with Sony's new digital products such as the DXC-D35/D35WS, DSR-85 Digital Videocassette Recorder, and the ES-7 EditStation system will remarkably enhance the productivity and operating efficiency throughout the entire production process.
The ClipLink system can even be used when the DSR-1 is docked to analog component cameras, allowing storage of the Index Pictures at REC IN points onto the tape and the time codes into the cassette memory.



Camera Setup Data File System (Camera Data Recording)

When the DSR-1 is connected to the DXC-D35/D35WS Digital Camera, the camera setup file data set for a specific shooting condition can be recorded directly on the video auxiliary area of the DVCAM tape via Pro 76-pin Digital. The stored set-up data can then be copied onto other DVCAM tapes so that a specific camera set-up can be copied to other cameras.
This system makes it easy to uniformly set up several cameras simply by using duplicated tapes.

Dual Interface Mechanism Gives Choice of Dockable Cameras

The DSR-1 has both Pro 76-pin Digital and Pro 50-pin connectors which allow direct connection with Sony digital (DXC-D35/D35WS/D30*/D30WS*) and analog (DXC-327B/637*/537A*/327A*) cameras to meet the demands of a variety of shooting situations.
This versatility is achieved by the newly developed dual interface mechanism. This unique seesaw construction allows the use of both the analog Pro 50-pin and the Pro 76-pin Digital interfaces. The Pro 76-pin allows closer communication between the digital camera and the VTR in operations such as ClipLink system, Camera setup data recording on tapes and time code display on the viewfinder in playback mode. In addition, the new design improves the reliability of the connection.


<Pro 76-pin Digital>


<Pro 50-pin>

* These cameras are no longer sold, but current owners can still connect with the DSR-1P.

Perfect Camcorder Operation when Combined with the DXC-D35/D35WS

When connected to the DXC-D35/D35WS Digital Camera, the DSR-1 demonstrates optimum performance in terms of an ideal digital acquisition tool, since both video and audio signals are digitally processed, thus staying in the digital domain from image and sound acquisition to recording. This camcorder provides the benefit of digitally preserving the original picture and sound quality, without degradation, throughout the production process from acquisition through editing to program distribution.


◆DSR-1 and DXC-D35

Unique, yet Excellent Design

Compact and Lightweight Design

Due to innovative Sony mechanical and electronic advances such as a magnesium diecast body and small drum mechanism, the DSR-1 is remarkably small, lightweight, yet very durable: approx. 3.1 kg (6 lb 13 oz), including BP-L40 battery. Thus, when the DSR-1 is connected to the DXC-D35 to become a two piece camcorder, it is remarkably well balanced. Its operating weight is approximately 5.9 kg (13 lb).

Low Power Consumption

Owing to low power consumption of only 24.8 W, one fully charged Sony BP-L40 battery gives continuous operation for approximately 75 minutes when docked to the DXC-D35.

Dual Cassette Mechanism

The DSR-1 accepts both DVCAM Mini cassette tapes and DVCAM Standard cassette tapes without any adaptor. This is a first in the history of dockable recorders or camcorders.

Versatile Features

Record Review Function

By simply pressing the Rec Review button while in the Rec pause mode or in the Stop mode, the DSR-1 plays back the last scene and stops at the end of the previous recording. The Rec Review time can also be extended up to a maximum of approximately 10 seconds.

Frame Accurate Back Space Editing

Automatic back space editing with instant start provides sequential recording, without picture breakup at the transition points. The time code regeneration function, when used with the Rec Review function, enables the DSR-1 to record continuous time code at any editing point.

Viewfinder Playback Capability

The DSR-1 offers viewfinder playback for field verification. In playback or Rec Review mode, the recorded luminance signal can be monitored in the viewfinder, while audio playback is available via an earphone or the built-in loudspeaker.

Built-in SMPTE Time Code Generator and Reader

The DSR-1 provides a built-in time code generator and reader which conforms to the SMPTE standard. User bits are also available. Both the time code and the user bits are recorded in the sub code area while being able to be read at any playback speed. The time code lock to either external time code or another DSR-1 is possible for multi-camera operation. Furthermore, the DSR-1 has both time code preset and regeneration capabilities.

Time Base Stabilizer

The DSR-1 is equipped with a built-in time base stabilizer which provides stable pictures without any additional equipment.

Easy Full Color Picture Playback in the Field

The DSR-1 provides full color picture playback capability without any playback adaptor; a great advantage for field verification of the recording as well as permitting direct microwave transmission.

* Simulated picture

Interchangeable Batteries

The DSR-1 is equipped to accept the BP-L40/L60A/L90A range of Lithium-ion batteries for extended operating time. With an optional adaptor, the DSR-1 can also accept NP-1B batteries.

Others

•Easy Integration with Anton/Bauer® Equipment
•Versatile Signal Interfaces

The DSR-1 is equipped with various signal interfaces such as S-video and composite outputs. For audio interfaces, an earphone output, unbalanced phono output and balanced XLR type audio inputs are provided.

•Equipped with a DC Out for the Wireless Microphone
•Built-in External Microphone Power Supply (+48 V)
•Built-in Loudspeaker

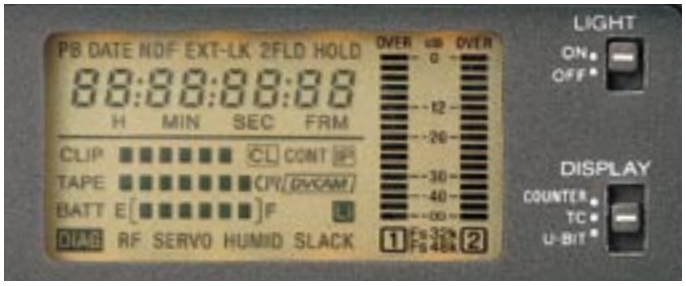
User Friendly Operation

VTR Full Function Control

Eject, Rewind, Play, Fast Forward, and Stop function buttons are located on the top of the unit and are covered with a lid to prevent accidental access. During Rec mode, all function buttons are automatically inhibited. The Rec mode can also be activated with the trigger buttons on the front of the camera or on the zoom lens grip.

Comprehensive LCD Display

An 8-digit LCD display provides an extensive range of critical information about the VTR operation. In addition to time data (including time code, counter and user bit data), remaining tape and battery capacity, the ClipLink operation status is also displayed via a bargraph meter. A digital audio meter allows precise adjustment of the audio recording level.



Menu Selection

Various VTR menus such as cumulative hours (head drum operating hours, tape transport operation hours, total operation hours), ClipLink On/Off mode, selections of audio mode, drop-frame/non-drop-frame mode, Anton/Bauer Logic Series® Digital battery capacity indication settings and stand-by period setting can be shown on the LCD display for easy access to the various menus.

Reliable and Serviceable

Built-In Self-Diagnostics and Hours Meter

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.
Furthermore, an hours meter is provided to indicate the elapsed time of time-critical operations such as accumulated drum rotation time. It can easily be displayed on the LCD display via menu selection.

Peripheral Equipment

DXC-D35WS*
Digital Video Camera

DXC-327B*
Color Video Camera

BP-L40
Rechargeable Lithium-ion Battery

<BP-L60A> <BP-L90A>

BP-L60A/L90A
Rechargeable Lithium-ion Battery

NP-1B
NiCd Rechargeable Battery

<BC-L100>

BC-L50/L100
Battery Charger for BP-L40/L60A/L90A

DC-L1
Battery Adaptor for NP-1B

DC-520
Battery Case for NP-1B

BC-1WD
Battery Charger for four NP-1Bs

WRR-810A
UHF Synthesized Tuner

*A BTA-801 is required when the WRR-855A is attached to the DSR-1

WRR-855A
UHF Synthesized Diversity Tuner

CMA-8A
AC Adaptor (used with the optional CCQX-3 cable)

*Camera adaptor is optional.
DSR-1 is directly connected to the cameras.

Specifications

GENERAL

Power requirements	DC 12 V +5/-1 V
Power consumption	12 W
Operating temperature	0 to 40 ˚C (32 to 104 ˚F)
Storage temperature	-20 to 60 ˚C (-4 to 140 ˚F)
Operating humidity	Less than 85%
Storage humidity	Less than 90%
Mass	3.1 kg (6 lb 13 oz) including BP-L40
Dimensions	118 (W) x 185 (H) x 185 (D) mm (4 3/4 x 7 3/8 x 7 3/8 inches)
Tape speed	28.193 mm/s
Recording/Playback time	Standard size: 184 min. w/PDV-184ME Mini size: 40 min. w/PDVM-40ME
Fast forward/Rewind time	Standard size: Approx. 12 min. w/PDV-184ME Mini size: Approx. 3 min. w/PDVM-40ME
Continuous recording time	Approx. 75 min. w/BP-L40 (DSR-1 + DXC-D35)

VIDEO PERFORMANCE**

Band width	
Luminance	30 Hz ~ 5.0 MHz ±1.0 dB 5.75 MHz +0/-3.0 dB (Typical measurement)
Chrominance	30 Hz ~ 1.5 MHz +1.0/-5.0 dB
S/N ratio	More than 55 dB
K-factor (K2T, KPB)	Less than 2.0%
Y/C delay	0 ± 30 nsec.

AUDIO PERFORMANCE**

Frequency response	
2 CH mode (48 kHz/16 bit)	20 Hz ~ 20 kHz +0.5/-1.0 dB
4 CH mode (32 kHz/12 bit)	20 Hz ~ 14.5 kHz +0.5/-1.0 dB
Dynamic range	More than 80 dB
Distortion (THD+N)	Less than 0.08%

SIGNAL INPUTS

GEN LOCK VIDEO IN (BNC)	1.0 Vp-p, 75 Ω
EXT AUDIO IN CH-1/2 (XLR 3-pin female)	-60 dBu, 3 kΩ/+4 dBu, 10 kΩ
TIME CODE IN (BNC)	0.5 Vp-p ~ 18 Vp-p, 10 kΩ

SIGNAL OUTPUTS

VIDEO OUT (BNC)	1.0 Vp-p, 75 Ω
S-VIDEO (4-pin)	
Y	1.0 Vp-p, 75 Ω, sync negative
C	0.286 Vp-p, 75 Ω
AUDIO OUT CH-1/2 (RCA PIN)	-10 dBu , 47 kΩ
TIME CODE OUT (BNC)	1.0 Vp-p, 75 Ω

OTHERS

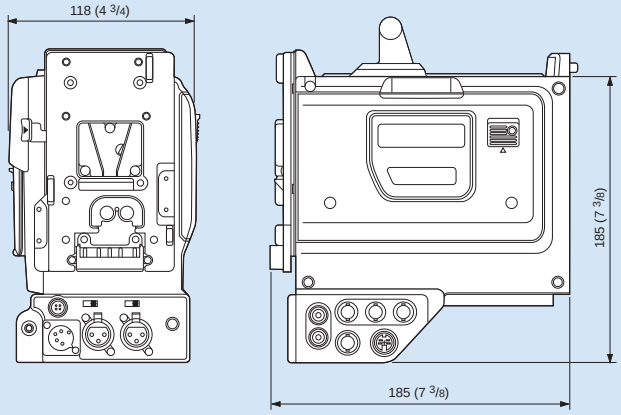
ANALOG I/F	Pro 50-pin
DIGITAL I/F	Pro 76-pin
DC 12 V (rear)	XLR 4-pin (male)
DC OUT	4-pin
EARPHONE OUT	Stereo mini jack

SUPPLIED ACCESSORIES

Shoulder strap
Connector cap
Lithium battery (type CR2032)
M4 x 6 screws (2)
M4 x 12 screws (2)
Operating instructions
ClipLink guide

DIMENSIONS

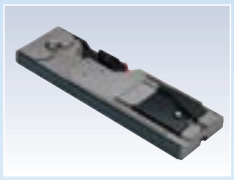
unit: mm (inches)



* 0 dBu = 0.775 V rms
** The Video and Audio Performance specifications were measured by playing back material on a DSR-85 (via analog component out) that had been recorded on the DSR-1.

CCQX-3
Power Supply Cable for CMA-8A

AC-550
AC Adaptor



VCT-U14
Tripod Adaptor

WRT-810A/830A
UHF Wireless Microphone

LC-421
Carrying Case for DSR-1 and DXC-D35

LCR-1
Rain Cover

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

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

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

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

SONY

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