3CCD Digital Camcorder

SONY®

DVCAM

DSR-400
DSR-450WS

Adding a New Level of Robustness to DVCAM Acquisition

DSR-450WS

DSR-400

Since introducing its first models, Sony has continuously enhanced its DVCAM™ Series of products, each offering state-of-the-art technology to meet specific customer needs in applications from video journalism and event videography to newsgathering and independent movie-making.

With DVCAM applications on the increase, Sony now introduces the DSR-400 and DSR-450WS Digital Camcorders – the ultimate DVCAM camcorders. Packing the latest CCD and digital-processing technology into a newly designed, heavy-duty chassis, these camcorders provide the ruggedness, convenient functions and operational comfort that the DVCAM format has demonstrated in the field.

The cost-effective DSR-400 adopts three 2/3-inch type Power HAD™ EX CCDs with a 4:3 aspect ratio. It offers new exiting features such as a swing-out 2.5-inch[1] type color LCD monitor, Memory Stick™ slot, user assignable function-buttons, and battery-remaining display function for added operational convenience and creative versatility.

Quality, Creativity, and
– the DSR-400 and DSR-450WS

The widescreen DSR-450WS adopts three 2/3-inch type Power HAD EX CCDs with a 16:9 aspect ratio to shoot in both 16:9 and 4:3 aspect ratios. In addition to the DSR-400 features, the DSR-450WS further offers 24P (23.976P) progressive mode with 2-3 pull-down, selectable gamma with a film-like gamma setting, and a slow shutter feature – unique functions that enable even greater shooting creativity. The DSR-450WS also supports an 8-pin remote-control feature as standard and SDI output and analog composite input capabilities with the use of two optional boards.
The DSR-400 and DSR-450WS herald a new level of quality, reliability, versatility, and convenience for the best results in DVCAM acquisition.

[1] Viewable area measured diagonally.

DSR-400 & DSR-450WS Common Features

Two Models Designed to Meet the Specific Customer Needs in a Variety of Applications

Camera Features

2/3-Inch Type Power HAD EX CCD

The DSR-400 and DSR-450WS are equipped with proven state-of-the-art three-chip 2/3-inch type Sony Power HAD EX CCDs. This CCD imager achieves a high sensitivity of F11, an excellent signal-to-noise ratio of 65 dB and a remarkably low smear level of -140 dB (typical), allowing the DSR-400 and DSR-450WS to produce pictures of stunning quality.

12-Bit A/D Conversion

The DSR-400 and DSR-450WS incorporate a high-integrity 12-bit A/D conversion circuit so that images captured by the Power HAD EX CCDs are processed with great precision. This high-resolution A/D conversion allows the image to be reproduced faithfully in both mid-to-dark tone and bright areas of the picture.

Advanced Digital Signal Processing (ADSP)

A key to quality in DSP cameras is how many bits are used in their video process, such as gamma correction. The ADSP of the DSR-400 and DSR-450WS uses more than 30 bits in its nonlinear process, minimizing round-off errors to maintain the high quality of the Power HAD EX CCDs. The ADSP also enables highly sophisticated image controls, such as the multi-matrix function, triple skin tone detail control, and adaptive highlight control.

Assign Buttons

Playback Contorol Buttons
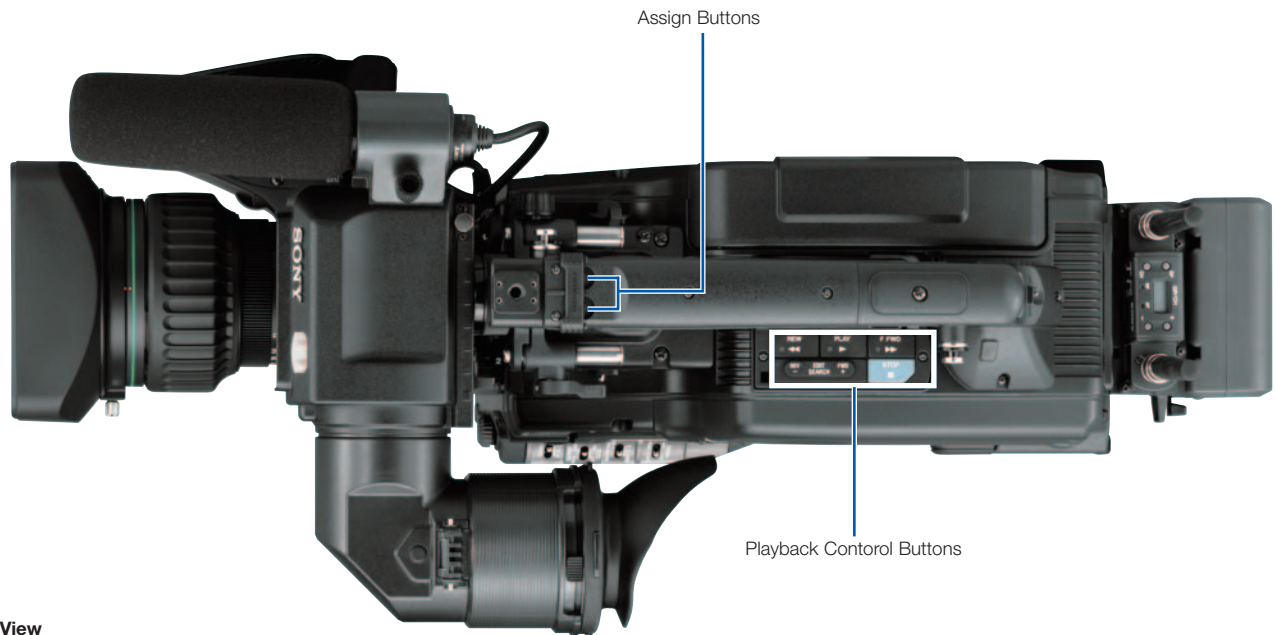
Top View

Rear Connector Pannel for the DSR-400

Rear Connector Pannel for the DSR-450WS

Recorder Features

## DVCAM/DV Selectable Recording

The VTR sections of both the DSR-400 and DSR-450WS use the Sony DVCAM format, providing the video and audio quality, and reliability necessary for professional use. For excellent picture quality, superb multi-generation capabilities, and excellent production flexibility, these camcorders feature 8-bit component digital recording, with a 5:1 compression ratio and a sampling rate of 4:1:1.

The DSR-400 and DSR-450WS can use both mini-size (PDVM Series) and standard-size (PDV Series) cassettes.

If you need a longer recording time, the DSR-400 and DSR-450WS can also record and playback DV format signals (SP mode only)[2], providing a maximum recording time of 276 minutes when using the PDV-184 ME standard-size cassette.

[2] The transition from cut to cut may not be smooth when recorded in DV (SP) format. In between scenes where the recording format is changed from DV to DVCAM, or vice versa, the transition may not be smooth either. This is a normal and expected phenomenon.

Mini-size Cassette

Standard-size Cassette

Track Pattern of the DVCAM Format
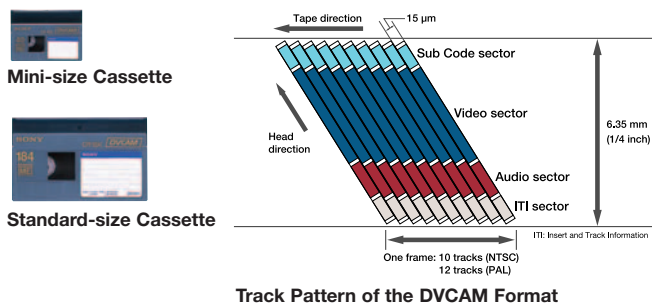
High-Quality Audio Recordings

Audio can be recorded in either 16- or 12-bit resolution. The recording format provides two channels in 16-bit mode and four channels in 12-bit mode. Two channels can be recorded in either 48 kHz/16-bit or 32 kHz/12-bit mode by the camcorder. If recordings are made on two channels in 32 kHz/12-bit mode, then another two channels are available for use with a studio VTR.

Digital Output to External Devices

The DSR-400 and DSR-450WS are equipped with a 6-pin i.LINK™ [3] interface (DV output only) for digital signal output. This enables recording to compatible DV and DVCAM VTRs using just one i.LINK cable, which simultaneously carries digital video/audio and control signals. Connect the DSR-400 or DSR-450WS to the Sony DSR-2000A Studio VTR, for instance, and simple cut editing can be performed without signal deterioration. Or for backup recording connect to a Sony DSR-50 portable DVCAM recorder, and control its REC On/Off function remotely with the REC On/Off button of the DSR-400 or DSR-450WS.

[3] 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 refer to the documentation that comes with any device having an i.LINK connector for information on compatibility, operating conditions and proper connection. For information on any Sony device having an i.LINK connection contact your local Sony Representative.

Quick FF/REW Capabilities

The DSR-400 and DSR-450WS can fast-forward and rewind tapes at extremely high speeds. They can fast-forward and rewind the PDVM-40ME mini-size cassette in approximately 40 seconds, and the PDV-184 ME standard-size cassette in approximately 2 minutes and 30 seconds.

DSR-450WS with a PDV-184ME Cassette Inserted

Operational Convenience

Rugged and Ergonomic Design

The design of the DSR-400 and DSR-450WS is based on years of Sony experience in camera ergonomics, and provides high mobility, balance, and physical robustness. All switches and indicators, a viewfinder, and a swing-out LCD monitor are in the most logical places and are positioned for optimum functionality and ease of use. Rear-panel connectors are located well away from the battery pack, making it easy to connect cables. Operators will immediately feel at home with the DSR-400 and DSR-450WS, which take user comfort to new levels.

Compact, Lightweight and Low Power Consumption

The DSR-400 and DSR-450WS are designed to be very compact and lightweight, for a high level of mobility in the field. They weigh approximately 14 lb 5 oz (6.5kg) including the DXF-801 viewfinder, microphone, BP-GL65 battery, mini-size DVCAM cassette and VCL-917BY lens (supplied with the DSR-400K package). With its new-generation LSI, these camcorders achieve a low power consumption of approximately 17 W (with the DC 12 V power supply, REC mode, viewfinder off and LCD monitor off).

User-friendly Menu Controls

The DSR-400 and DSR-450WS offer an easy-to-use menu system to facilitate detailed camera settings. Setup parameters are well organized in a two-layer menu system: a user menu and a sub menu. The user menu allows access only to the standard setup functions needed by the camera operator, and can be customized for fast access to the menus they use frequently. The sub menu makes all menus accessible, each of which is categorized into groups such as operation, paint, maintenance, file, and diagnosis. Menu pages can be displayed in the camcorder viewfinder and LCD monitor as well as on an external monitor screen via the monitor output, and the menu control system can be operated easily using a rotary switch on the camcorder.

Optical ND Filter and Electric CC Filter

Using the DSR-400 and DSR-450WS, optimum light and color control is easily achieved using an optical ND (Neutral Density) filter wheel and electronic Color Correction. The use of electronic Color Correction allows all filters in the filter wheel to be of the ND type, providing the operator with greater flexibility in depth-of-field and exposure control.

Battery-remaining Display

With a Sony Professional Info Battery, the remaining capacity is automatically detected and transmitted to the DSR-400 and DSR-450WS. The remaining capacity is indicated in the camcorder viewfinder and LCD monitor in 10% steps.

Intelligent Light System

An optional portable light (maximum 50 W) can be attached to the camcorder, using a standard lighting connector and specially designed short cable for operation from the camcorder battery. The light can be switched on and off manually, or automatically synchronized with the camcorder's REC start function.

2.5-inch Type*[4] Color LCD Monitor

The DSR-400 and DSR-450WS include a swing-out color LCD monitor with a resolution of 214,000 pixels, which allows for viewing of the input source during recording, or checking the playback picture on location. Status indications such as time code, two-channel audio level meters, and tape - and battery-remaining capacity can also be displayed. In addition, camera set-up menus can be displayed.

*[4] Viewable area measured diagonally.

Supplied DXF-801 Viewfinder

The DXF-801 Viewfinder is a 1.5-inch*⁴ type black-and-white viewfinder supplied with the DSR-400 and DSR-450WS, and includes the following features:

■ Automatic scan-size switching between 16:9 and 4:3 (DSR-450WS only)

■ VF light (LED) – lights up the iris ring area of the lens for operation in dark conditions (high/low/off)

■ Display switch – turns off character superimposition on the viewfinder

■ Tally lamp levels (high/low/off)

■ Vertical and horizontal detail level control via peaking potentiometer

■ Two red REC tally lamps

■ Diecast aluminum body

■ Wide range of diopter adjustments

*⁴ Viewable area measured diagonally

Assignable Function

Functions frequently used in the field, such as markers, ATW, recording review, record start/stop, and turbo gain functions, can be assigned to four Assign Buttons (push buttons), allowing the operator to make rapid changes when working in the field.

Turbo Gain

The Turbo Gain function boosts the gain level up to +36 dB at the touch of an Assign Button. This makes it possible to shoot in extremely low-light conditions. The gain level of the Turbo Gain function is selectable.

Camera Adaptor for Wireless Microphone Receiver

The optional CA-WR855 is an adaptor to hold a Sony WRR-855 Wireless Microphone Receiver*⁵. It can be directly attached to the DSR-400 or DSR-450WS via a V-shoe attachment, providing a direct connection interface for audio/power. A Lithium Ion Battery Pack can also be attached to the rear panel of the CA-WR855 via a V-shoe attachment, allowing for easy battery replacement even when the WRR-855 is mounted. The DSR-400 and DSR-450WS can also accommodate the WRR-861 Wireless Microphone Receiver*⁶ using the A-8278-057-A Mounting Bracket (service part).

*⁵ The WRR-855 refers to both WRR-855A and WRR-855B.
*⁶ The WRR-861 refers to both WRR-861A and WRR-861B.

Adjustable Shoulder Pad

The position of the shoulder pad can be adjusted– either forwards or backwards without using a screwdriver – to provide operators with a comfortable and well-balanced camera.

Memory Stick System Stores Camera Setup Parameters

The DSR-400 and DSR-450WS incorporate the Sony Memory Stick system for the storage and recall of setup parameters. This is an easy, effective system for storing and recalling camera parameters for individual scenes, plus individual operators' camera-setup preferences including assignable button settings.

The Memory Stick media is an optional accessory.

Creative Versatility

TruEye Processor

The Sony TruEye™ processor is one of the most innovative features of Sony digital signal processing technology. This technology makes it possible to virtually eliminate hue distortion, particularly obvious in high light conditions that result from conventional RGB analog or digital processing. By processing the video signal data at three levels – brightness, hue, and saturation – similar to how the human eye works, the TruEye feature assists in the reproduction of natural skin tones.
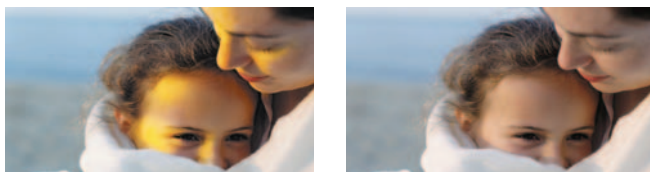
Conventional Video Equipment   **TruEye**   "Simulated images"

Adaptive Highlight Control

The DSR-400 and DSR-450WS provide multiple knee-points/slopes for superb overexposure control. The camcorder analyzes the highlight areas of a scene and automatically sets and optimizes multiple knee points/slopes accordingly.

This allows for the reproduction of extremely difficult images (such as an interior scene that includes a brightly sunlit window) with much more overexposure latitude. This function applies only to input video levels in excess of the knee point; the middle- and low-luminance parts of the video signal are unaffected by this control.
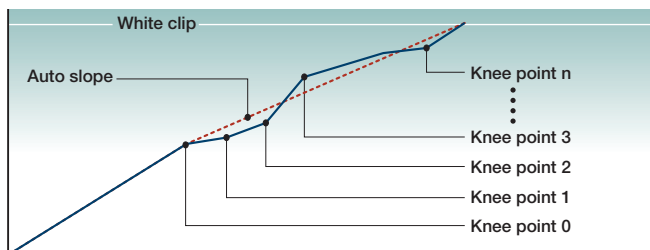
White clip

Auto slope

Knee point n

Knee point 3
Knee point 2
Knee point 1
Knee point 0

fig 5 Knee Curve Image

Triple Skin Tone Detail Control

The DSR-400 and DSR-450WS come equipped with a Triple Skin Tone Detail Control function, which allows for independent detail control over three specified colors. This enhances the capability of Skin Tone Detail correction - enabling one color selection to be used for reducing the detail level of skin color, and two other selections to be used for either increasing or decreasing the detail level of two other objects.

Electronic Soft Focus

The Electronic Soft Focus included in the camcorder applies an effect similar to using an optical soft-focus filter – but in a much more convenient way. Electronic Soft Focus uses the detail signal to reduce, rather than increase, the sharpness of the picture. By subtracting the detail signal from the original signal (as opposed to adding it as in conventional image enhancement), Electronic Soft Focus is able to provide a picture that is "softer" than that achieved when detail is switched off completely. Electronic Soft Focus can be used in conjunction with Skin Tone Detail to change only the sharpness within a specific color or hue range.

Variable Black Gamma Range

The Variable Black Gamma Range function allows for fine adjustment of tonal reproduction in the shadow area. This feature can help to bring out details from the dark parts of the picture without affecting mid-tones while maintaining the absolute black level. The variable range is LOW, low MID, High MID and HIGH.

Auto Tracing White Balance (ATW)

The DSR-400 and DSR-450WS offer an Auto Tracing White Balance function that automatically adjusts the camera's color temperature in real time with a change of the lighting. This is especially useful when a shoot is performed across different environments, such as from indoors to outdoors.

Multi-matrix Function

The Multi-matrix function enables color adjustments to be applied over a color and/or hue range as specified by the operator. The color spectrum is divided into 16 areas of adjustment, where the hue and/or saturation of each area can be adjusted. This provides interesting in-camera color effects – similar to secondary color correction.

Multi-matrix ON "Simulated images"

Color Temperature Control

It is possible to dial in the required color temperature of the camera. The overall color balance of the picture can be changed to make it warmer or colder. This feature can be used very creatively, particularly in scenes with mixed color lighting.

Interval Recording

Interval recording is a useful function, which intermittently records signals at pre-determined intervals, ideal for recording over long periods.

Other Convenient Functions

In order to provide the flexibility required for professional shooting, the DSR-400 and DSR-450WS offer a variety of convenient functions:
- Programmable gain (-3/0/3/6/9/12/18/24/30/36 dB)
- Dual zebra (70 IRE to 90 IRE or more than 100 IRE)
- Marker (center, safety zone, 4:3/13:9/14:9 aspect (DSR-450WS only))
- Edit search – for easy access to edit points
- Stereo audio output (pin jacks)

DSR-450WS Additional Features

Enabling Even Greater Shooting Creativity

Switchable Aspect Ratio
Wide-aspect CCDs and digital signal processing allow the DSR-450WS to operate in both widescreen (16:9) and standard (4:3) aspect ratio modes. When shooting in 16:9 mode, it is also possible to display both 16:9 and 4:3 safety zones in the supplied DXF-801 viewfinder.

Progressive Mode with Film-like Images
Incorporating Sony Power HAD EX CCDs, the DSR-450WS generates 24P (23.97P) and 30PsF (29.97) progressive images delivering outstanding clarity as well as cinematic look and motion. For 24P output the DSR-450WS allows selection of pull-down modes: Standard (2-3, 2-3 cadence) or Advanced (2-3, 3-2 cadence).

Camera Motion: 23.976P
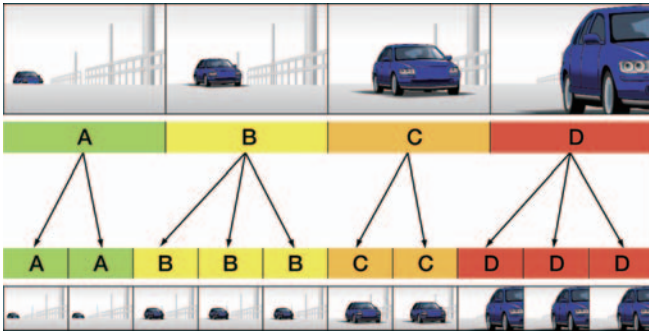
VTR Recording: 59.94i
Normal Pull Down illustrated

Selectable Gamma Table Including Film-Like Gamma
A selectable gamma table is provided to easily give a specific look to a picture by selecting from multiple fixed gamma patterns including so-called film-like gamma. Five patterns of film-like gamma and six patterns of standard gamma can be selected.

Slow Shutter
In addition to Turbo Gain, the DSR-450WS features another convenient function for shooting in low-light conditions. Slow Shutter allows the operator to use shutter speeds longer than the frame rate.

- NTSC: 1/30, 1/15, 1/10, 1/7.5, 1/6, 1/4.3, 1/3.8, and 1/1.9 seconds (1 to 8 and 16 frame accumulation)

The Slow Shutter can be used either alone or together with an electric gain-up function depending on the shooting situation or the operator's preferences.

Versatile Interfaces
The DSR-450WS provides an analog composite output as standard, with an SDI output board (the CBK-SD01) available as a plug-in option. An optional composite input board (the CBK-SC01) is also available for pool feed applications. These optional boards install within the camcorder chassis to eliminate the need for an external camera adaptor unit, maintaining the compactness and balance of the camcorder.
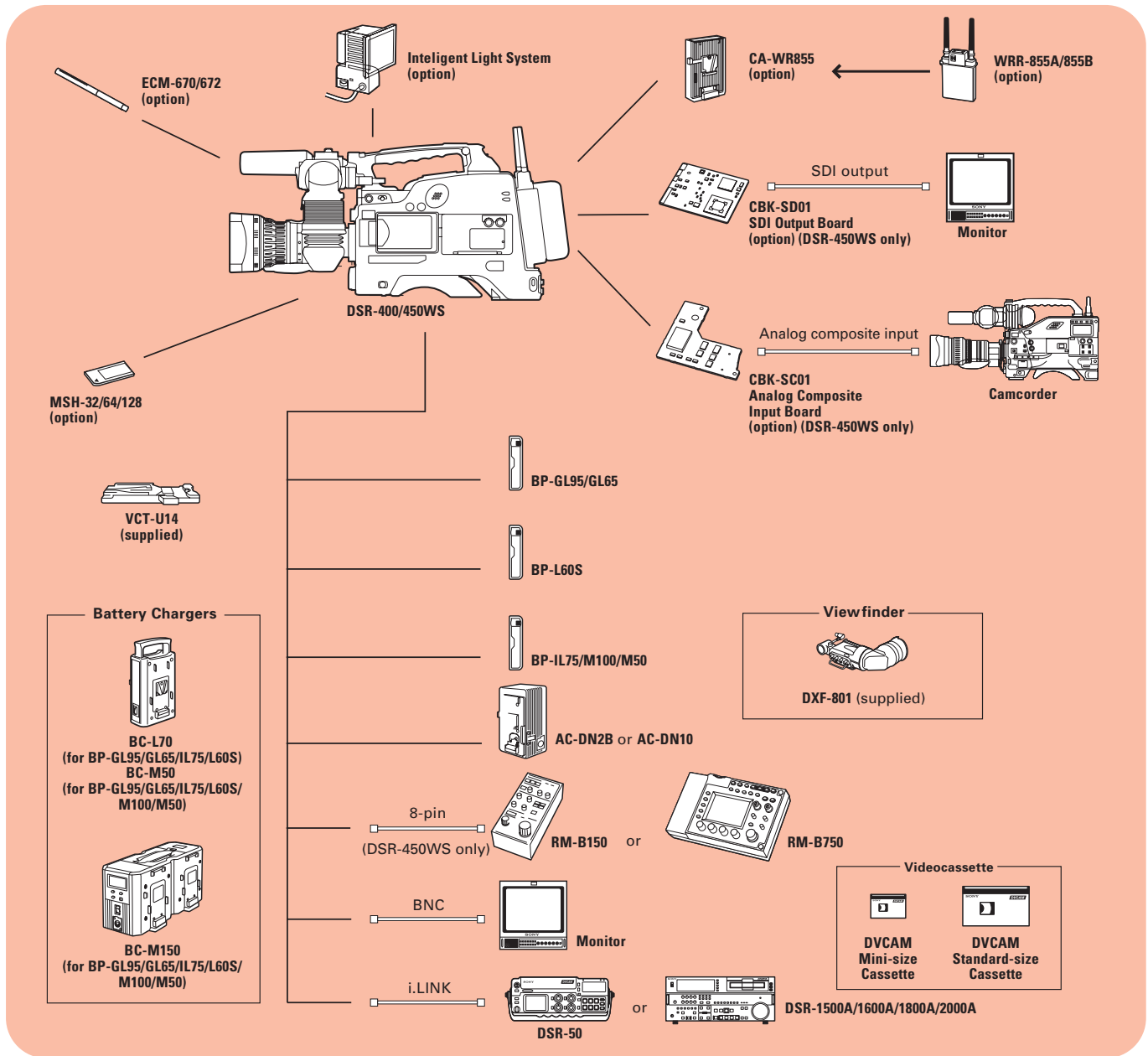
Camera Remote Control via Sony RM-B150/B750
Camera settings and basic VTR functions can be remotely controlled using an optional RM-B150 or RM-B750 Remote Control Unit via its 8-pin remote connector.

DSR-450WS with the RM-B750

System Diagram

ECM-670/672
(option)

Inteligent Light System
(option)

CA-WR855
(option)

WRR-855A/855B
(option)

SDI output

CBK-SD01
SDI Output Board
(option) (DSR-450WS only)

Monitor

DSR-400/450WS

Analog composite input

CBK-SC01
Analog Composite
Input Board
(option) (DSR-450WS only)

Camcorder

MSH-32/64/128
(option)

BP-GL95/GL65

VCT-U14
(supplied)

BP-L60S

Battery Chargers

BP-IL75/M100/M50

Viewfinder

DXF-801 (supplied)

BC-L70
(for BP-GL95/GL65/IL75/L60S)
BC-M50
(for BP-GL95/GL65/IL75/L60S/
M100/M50)

AC-DN2B or AC-DN10

8-pin

(DSR-450WS only)

RM-B150   or

RM-B750

Videocassette

BC-M150
(for BP-GL95/GL65/IL75/L60S/
M100/M50)

BNC

Monitor

DVCAM
Mini-size
Cassette

DVCAM
Standard-size
Cassette

i.LINK

or

DSR-1500A/1600A/1800A/2000A

DSR-50

Dimensions

9 3/4 (245)

20 1/4 (514)

8 1/2 (215)

10 5/8 (268)

5 3/4 (146)

13 (328)

21 (532)

The zoom lens (VCL-917BY) in the drawing is supplied
with the DSR-400K only.

unit: inch (mm)

Product Configuration

	DSR-400L	DSR-400K	DSR-450WSL
DVCAM camcorder (4:3 model)	●	●	–
DVCAM camcorder (4:3/16:9 model)	–	–	●
DXF-801 Viewfinder (with Microphone Holder)	●	●	●
VCT-U14 Tripod Adaptor	●	●	●
External Microphone	●	●	●
Shoulder Strap	●	●	●
VCL-917BY Zoom Lens	–	●	–

Optional Accessories

CBK-SC01
Analog Composite Input Board for DSR-450WS

CBK-SD01
SDI Output Board for DSR-450WS

CA-WR855
Camera Adaptor for WRR-855A/855B

WRR-855A/855B
Wireless Microphone Receiver

A-8278-057-A

WRR-861A/861B
Wireless Microphone Receiver (requires A-8278-057-A bracket)

ECM-670/672
Electret Condenser Microphone

DXF-51
5-inch* type B/W Viewfinder (requires optional accessory shoe kit A-8274-968B)

RM-B750
Remote Control Unit

RM-B150
Remote Control Unit

BP-GL95/GL65
Lithium Ion Battery Pack

BC-L70
Battery Charger

BC-M150
Battery Charger

AC-DN10
AC Adaptor

AC-DN2B
AC Adaptor

LC-400BP
Carrying Case (Soft)

A20x8.6BRM-SD
2/3-inch Type Format 20x Lens from Fujinon

YJ19x9B KRS
2/3-inch Type Format 19x Lens from Canon

CCFD-3L
i.LINK Cable (6-pin with lock** to 4-pin)
CCF-3L
i.LINK Cable (6-pin with lock** to 6-pin)

MSH-32/64/128
Recording Memory Stick Media

LC-424TH
Carrying Case

* Viewable area measured diagonally.
** The connector on one end of the cable has a lock mechanism, and is connected to an i.LINK connector with the same lock mechanism.

Specifications

GENERAL		DSR-400	DSR-450WS
Power requirements		DC 12 V (11 to 17V)	
Power consumption		Approx. 17 W (with DC 12 V power supply, REC mode, viewfinder off, LCD monitor off)	
Operating temperature		+32 to +104 °F (0 to +40 °C)	
Storage temperature		-4 to +140 °F (-20 to +60 °C)	
Operating humidity		25 to 85%	
Weight		Approx. 14 lb 5 oz (6.5 kg) (with viewfinder, microphone, BP-GL65 battery, mini-size DVCAM cassette, VCL-917BY lens)	
Continuous operating time		Approx. 300 min. with BP-GL95 battery, REC mode	

SIGNAL INPUTS/OUTPUTS		DSR-400	DSR-450WS
Video inputs	Analog composite	—	BNC, 1.0 Vp-p, 75 Ω (with the CBK-SC01)
	Genlock video	BNC, 1.0 Vp-p, 75 Ω	
Audio input (CH-1/2)		XLR-3 (2), female, -60 dBu/+4 dBu, 10 kΩ, balanced	
Microphone input		XLR-3, female, -60 dBu	
Time code input		—	BNC, 0.5 to 18 Vp-p, 10 kΩ
Video outputs	SDI	BNC, 0.8 Vp-p, 75 Ω (with the CBK-SD01)	
	i.LINK	—	i.LINK, 6-pin IEEE 1394-based
	Analog composite	BNC, 1.0 Vp-p, 75 Ω	
Audio output (CH-1/2)		Pin-jacks (2), -10dBu, 47 kΩ	
Time code output		BNC, 1.0 Vp-p, 75 Ω	
Monitor output		BNC, 1.0 Vp-p, 75 Ω	
Earphone output		Mini-jack	

OTHER INPUTS/OUTPUTS	DSR-400	DSR-450WS
Lens	12-pin	
VF	—	20-pin
Remote	8-pin	
Wireless microphone	7-pin	
Light	2-pin, DC 12 V, max. 50 W	
DC input	XLR-4-pin, male, DC 11 to 17 V	
DC output	4-pin (for wireless microphone receiver), DC 12 V (max. 0.2 A)	
Battery terminal	5-pin	

CAMERA PERFORMANCE		DSR-400	DSR-450WS
Pickup device	Pickup device	3-chip 2/3-inch type Power HAD EX CCD	
	Aspect ratio	4:3	16:9/4:3 switchable
	Total picture elements (H x V)	1038 x 1008	
	Effective picture elements (H x V)	980 x 988	
Optical system	Spectral system	F1.4 prism (with quarts filter)	
	Built-in filters	1: Clear, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND	
	Lens mount	2/3-inch type Sony bayonet mount	
Electrical characteristics	Signal system	NTSC color system	
	Scan format	525/59.94i	525/59.94i, 525/29.97P, 525/23.976P
	Sync system	Internal and External with the VBS or BS signal	
	A/D conversion	12 bits	
	Sensitivity	F11 (typical) (2000 lx, 89.9% reflectance)	
	Minimum illumination	0.5 lx (F1.4 lens, +36 dB gain, shutter off)	0.5 lx (F1.4 lens, +36 dB gain, shutter off) 0.03 lx (with slow shutter mode at 16 frames accumulation)
	Smear level	-140 dB (typical)	
	Video S/N ratio	65 dB (typical)	
	Horizontal resolution	920 TV lines	850 TV lines (4:3 mode), 800 TV lines (16:9 mode)
	Vertical resolution	450 TV lines (with EVS), 400 TV lines (without EVS)	450 TV lines (with EVS) and 400 TV lines (without EVS) at 525/59.94i mode 485 TV lines at 525/29.97P and 525/23.976P modes
	Shutter speed	1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 s	1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 s at 525/59.94i mode 1/40, 1/60, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000 s at 525/29.97P mode 1/32, 1/48, 1/96, 1/125, 1/250, 1/500, 1/1000, 1/2000 s at 525/23.976 mode
	ECS	60 to 6000 Hz	60 to 6000 Hz at 525/59.94i mode 30 to 7000 Hz at 525/29.97P mode 24 to 5000 Hz at 525/23.976P mode
	Slow shutter	—	1/30, 1/15, 1/10, 1/7.5, 1/6, 1/4.3, 1/3.8, 1/1.9 s (1 to 8, 16 frames)
	Gain selection	-3, 0, 3, 6, 9, 12, 18, 24, 30, 36 dB (for GAIN LOW, GAIN MID, GAIN HIGH and GAIN TURBO positions)	

Note: row "Sensitivity" in DSR-400 column: 0.5 lx (F1.4 lens, +36 dB gain, shutter off)

VIDEO PERFORMANCE		DSR-400 / DSR-450WS
Recording format	Video	DVCAM/DV (SP) (25 Mb/s)
	Audio	2 ch/16-bit/48 kHz, 2 ch/12-bit/32 kHz
Record/playback time		DVCAM: 184 min (with the PDV-184ME), DV SP: 276 min (with the PDV-184ME)
Fast forward time		Approx. 45 s (with the PDVM-40ME), approx. 2 min 30 s (with the PDV-184ME)
Rewind time		Approx. 45 s (with the PDVM-40ME), approx. 2 min 30 s (with the PDV-184ME)
Recommended recording media		PDV-184ME/124ME/94ME/64ME/34ME/184N/124N/94N/64N/34N, PDVM-184ME/124ME/94ME/64ME/34ME/184N/124N/94N/64N/34N
Sampling frequency		Y: 13.5 MHz, R-Y/B-Y: 3.375 MHz
Quantization		8 bits

AUDIO PERFORMANCE	DSR-400 / DSR-450WS
Frequency response	48 kHz: 20 Hz to 20 kHz +0.5/-1.0 dB, 32 kHz: 20 Hz to 14.5 kHz +0.5/-1.0 dB
Dynamic range	More than 80 dB
Distortion (at 1 kHz, emphasis ON, reference level)	Less than 0.12% (at 1 kHz, reference level, 48 kHz)

BUILT-IN LCD MONITOR	
	2.5-inch type color LCD monitor, resolution: 214,000 (964 x 222) pixels

VIEWFINDER	DSR-400 / DSR-450WS
CRT	1.5-inch type monochrome
Indicators	REC TALLY (2), TAKE TALLY, BATT, SHUTTER, GAIN UP
Horizontal resolution	600 TV lines

MICROPHONE	
	Electret condenser microphone (detachable)

VCL-917FY LENS (for the DSR-400K package)	
Weight	Approx.3 lb 3 oz (1.45 kg) (including a lens hood)
Dimensions (W x H x D)	5 5/8 x 4 x 8 5/8 inches (139.8 x 99.5 x 218.9 mm)
Zoom ratio	17:1
Focal length	3/8 to 6 1/8 inches (17:19 to 155 mm)
Zoom control	Servo/Manual switchable
Iris control	Servo/Manual switchable
Angle of view (H x V)	Wide: 32 1/8 x 24 1/8 inches (815 x 611 mm) Tele: 1 7/8 x 1 7/16 inches (47 x 36 mm)
F-number	F1.9
Minimum object distance	35 1/2 inches (0.9 m)

eco info

**Lead-free solder is used for soldering all the parts including circuit component electrodes.
Halogenated flame retardants are not used in the printed wiring boards.(100%)**

SONY®

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