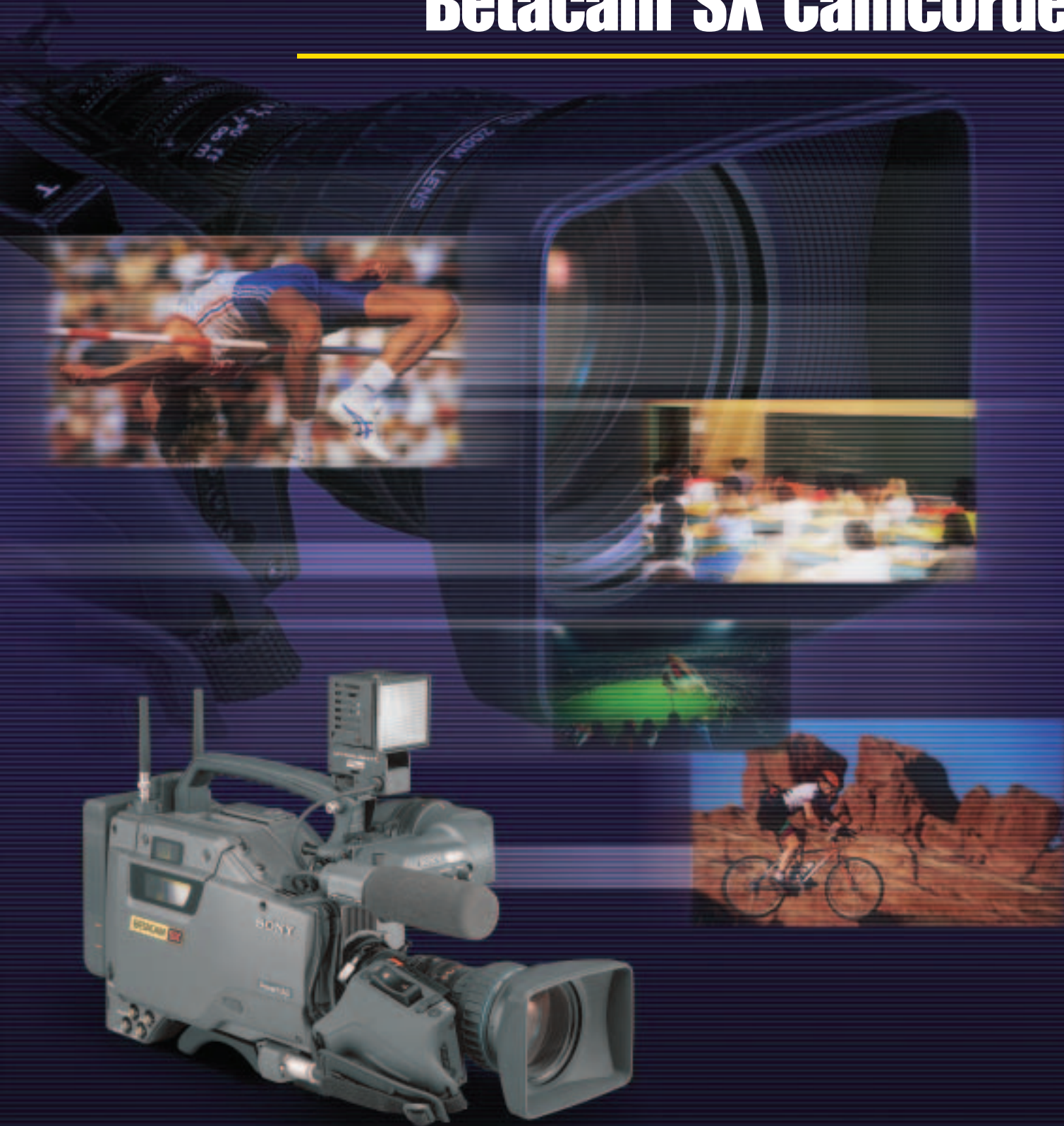


**SONY**<sup>®</sup>

NTSC/PAL

**BETACAM SX**<sup>®</sup>

# Betacam SX Camcorders



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## Betacam SX Camcorders

DNW-7/7P Version 2 2/3-inch type IT CCD Model (4:3)

DNW-9WS/9WSP 2/3-inch type IT CCD Model (4:3/16:9 switchable)

DNW-90WS/90WSP 2/3-inch type FIT CCD Model (4:3/16:9 switchable)

Since their introduction in 1996, Sony Betacam SX camcorders have brought the new and convenient advantages of digital acquisition into the field, packing excellent picture performance, high reliability and straightforward operability into a compact design that creates new opportunities for cost-effective digital ENG and EFP applications. Recognizing the ever-increasing demand for higher quality in today's productions, Sony continues to strengthen this line with two upgraded models, the DNW-7 and DNW-7P.

The Betacam SX camcorder family offers three models. The upgraded DNW-7\* is equipped with 2/3-inch type 400K (NTSC)/470K (PAL) Power HAD™ IT CCDs, achieving an extremely high sensitivity of F13 and a low smear level of -130 dB. The DNW-90WS\* is equipped with 2/3-inch type 520K (NTSC)/620K (PAL) Power HAD FIT widescreen CCDs, and the DNW-9WS\* is the IT version of this model. Both the DNW-90WS and the DNW-9WS are switchable between 16:9 and 4:3 aspect ratios.

All of these camcorders deliver operating simplicity in a compact, rugged, all-in-one design that reduces the package weight to enable easy portability in the field. Smaller in size and weight than analog 1/2-inch models, they include a color video playback capability, achieved without the need for an external adaptor, plus many other invaluable features, such as a wireless microphone receiver slot and an intelligent light system.

Betacam SX camcorders provide another important feature, too - the ability to record shot marks and REC start marks that, when identified during editing, allow editors to get started faster and save time by choosing only these selected scenes.

For performance, reliability and mobility, Betacam SX camcorders are the ideal solution for use in mainstream ENG, EFP and general acquisition applications.

\*Unless otherwise stated, all references to specific models refer to both the NTSC and PAL versions. (i.e., DNW-7 refers to both the DNW-7 Version 2 and DNW-7P Version 2)



## Main Features

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### High-Quality Digital Video and Audio Recording

Sony Betacam SX camcorders deliver the superb video quality of the Betacam SX format, recording 8-bit, 4:2:2 component digital signals using MPEG-2 4:2:2 Profile@ML compression technology. The audio system provides four uncompressed 16-bit audio channels.

### Compact and Lightweight Design

Sony Betacam SX camcorders are designed to be both compact and lightweight, providing a high level of mobility in the field. The combined weight with a viewfinder, microphone, lens, BP-IL75 battery and BCT-62SXA cassette tape is approximately 6 kg (13 lb 3 oz).

### Extended Recording Times

The long recording time of Betacam SX camcorders enables you to capture up to 62 minutes on a 1/2-inch S-cassette. This is achieved using the efficient MPEG-2 4:2:2 Profile@ML compression algorithm, which ensures the optimum balance of image quality and recording time.

### Color Video Playback Capability

Betacam SX camcorders allow you to play back color video together with two audio channels without using an external adaptor. This capability makes it easy to verify recordings in the field. Recordings can also be reviewed in the camcorder viewfinder while monitoring audio via an earphone or the speaker built into the side of the camcorder.

## Creative Versatility

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### TruEye™ Processing

Sony TruEye processing is an innovative digital signal processing feature used in Betacam SX camcorders, making it possible to virtually eliminate the hue distortion common to conventional RGB analog and digital processing, particularly in highlighted areas. By processing the video signal data using three parameters - brightness, hue and saturation - similar to how the human eye works, the TruEye feature is especially effective for the reproduction of natural skin tones.



Conventional Camera



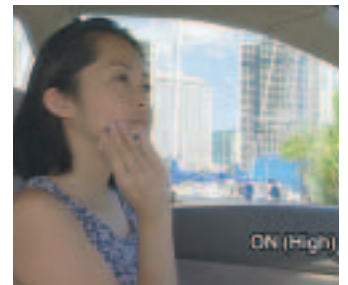
TruEye

### DynaLatitude™ Feature

Betacam SX camcorders offer another unique feature called DynaLatitude, which adaptively manages the contrast of each pixel according to a histogram of the entire video signal level distribution. The DynaLatitude feature offers a whole new dimension of contrast control over conventional methods, optimizing the video level distribution to best utilize the limited contrast range of the video signal.



Conventional Camera



DynaLatitude

### Auto Tracing White Balance (ATW)

Betacam SX camcorders offer an Auto Tracing White (ATW) Balance function that automatically adjusts the camera's color temperature in real time with the change of the lighting. This is especially useful when a shoot is performed across different environments, such as when moving from indoors to outdoors.



## Operational Versatility

### User-Friendly Controls

Sony Betacam SX camcorders have been designed with special care to ensure simple operation. Switches are located in similar positions to analog Betacam SP® camcorders, ensuring that operators familiar with such camcorders will immediately find these models easy to use. Setup parameters are well organized in a two-layer menu system, categorized into User Menus and Engineer Menus. User Menus allow access to only the standard setup functions needed by the camera operator. Engineer Menus allow access to all camcorder setup functions. Menu pages can be displayed in the camcorder viewfinder as well as on a monitor screen via the video outputs, and the menu control system can be operated easily using a rotary switch on the camcorder.

### Color Filters

These camcorders are equipped with four types of color filter: 3200K, 5600K + 1/8ND, 5600K and 5600K + 1/64ND.

### Turbo Gain

A Turbo Gain function is available to boost the gain level up to +42 dB at the touch of a button. This makes it possible to shoot in extremely low-light conditions.



### Setup Card System Stores Camcorder Settings

Sony Betacam SX camcorders incorporate the Setup Card system for the storage and recall of setup parameters. This is an easy, effective way to store and recall parameters for individual scenes, or individual operator setup preferences.



### Intelligent Light System

An optional portable light (max. 30 W) can be attached directly to the camcorder using a standard light connector. This intelligent light system can be powered from the camcorder's battery, and can either be switched on and off manually, or automatically synchronized with the camcorder's REC start function.



### Variable-Speed Electronic Shutter

In order to capture clear images of subjects moving at high speed, Betacam SX camcorders offer a choice of shutter speeds:

1/100, 1/125, 1/250, 1/500, 1/1000 and 1/2000 s (NTSC)  
1/60, 1/125, 1/250, 1/500, 1/1000 and 1/2000 s (PAL)





### Slot-In Wireless Microphone Receiver

An optional Sony wireless microphone receiver, the WRR-855A/855B, slots directly into the camcorder body without requiring a cable connection. This maintains the camcorder's balance and keeps the body compact.



### Comprehensive LCD Displays

The LCD displays on Betacam SX camcorders provide important information on the VTR operating status, such as the time code, CTL and user-bit data, tape remaining and battery capacity. A digital-audio-peak meter allows precise adjustments of audio-recording levels.



### Camera Control Via 6-pin Remote Connector

An optional remote control unit, the Sony RM-P9, enables you to remotely control the camcorder's basic functions via a 6-pin remote connector.



### Two-Channel Audio Output

A two-channel audio line output is available from the 5-pin XLR connector on the rear of the camcorder. The two analog audio output channels can be selected between either Channel-1/2 or Channel-3/4.



## Shot Mark and Shot Data Handling

Betacam SX camcorders are capable of recording shot marks (time codes for 'good' shots) and shot data (date, shot ID, cassette number, etc.) to tape. When a tape containing these shot marks is played back on a Sony DNW-A25WS/A25WSP portable editing recorder, the shot mark positions are automatically scanned and detected, and a list of all marks is generated for display on a video monitor. This allows operators to easily select and cue-up to the required scene. Shot marks and shot data can therefore be utilized in a wide range of applications to enhance the efficiency of the production chain.

Time code	
Current cursor position number/total number of marks memorized	
Selection mark: Shows the cue up shot mark.	
Mark type: R (REC Start), S1 (Shot Mark 1), S2 (Shot Mark 2), V (Virtual Shot Mark)	

DNW-A25WS Shot Mark List

## Wide Range of Optional Accessories

You can increase the versatility and operability of Sony Betacam SX camcorders even further with a wide variety of available accessories. Three types of camera adaptors are available: the CA-701 for SDI output and four-channel audio input, the CA-702/702P for external SDI input and 26-pin connection with portable VTRs, and the CA-755/755P for use with camera control units (CCU-550D/550DP) via a triax connector. In addition, a handheld remote control unit and a range of other accessories are also available.



Setup Card  
**BSC-1-Pack**



Camera Adaptor  
**CA-701**



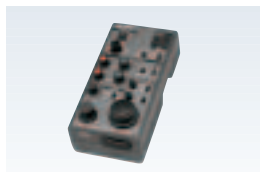
Camera Adaptor  
**CA-702/702P**



Camera Adaptor  
**CA-755/755P**



Camera Control Unit for CA-755/755P  
**CCU-550D/550DP**



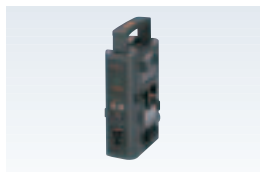
Remote Control Unit  
**RM-P9**



Rechargeable Lithium-ion Battery Pack  
**BP-IL75**



Rechargeable Nickel Metal Hydride Battery  
**BP-M100**



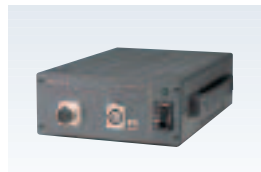
Battery Charger for BP-IL75 and  
BP-M100 Battery Pack  
**BC-M50**



Battery Charger for BP-IL75 and  
BP-M100 Battery Pack  
**BC-M150**



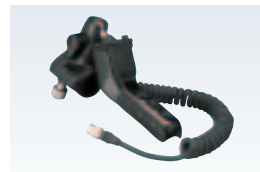
AC Adaptor  
**AC-DN2B**



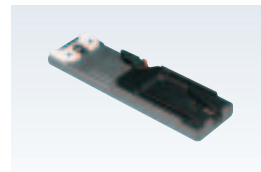
AC Adaptor  
**AC-550/550CE**



Viewfinder Rotation Bracket  
**BKW-401**



Return Video Selector  
**CAC-6**



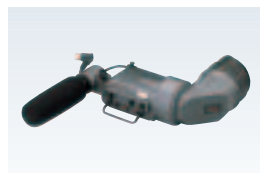
Tripod Adaptor  
**VCT-14**



5-inch B/W Viewfinder  
**BVF-55/55CE**



1.5-inch 4:3 B/W Viewfinder  
**BVF-10/10CE**



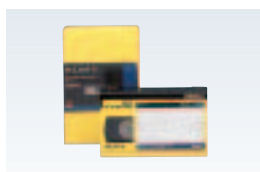
2-inch 16:9 B/W Viewfinder  
**BVF-20W/20WCE**



Wireless Microphone Receiver  
**WRR-855A/855B**



Dual Diversity Microphone Receiver  
**WRR-862A/862B**



Betacam SX Video Cassette  
**BCT-12SXA/22SXA/  
32SXA/62SXA**



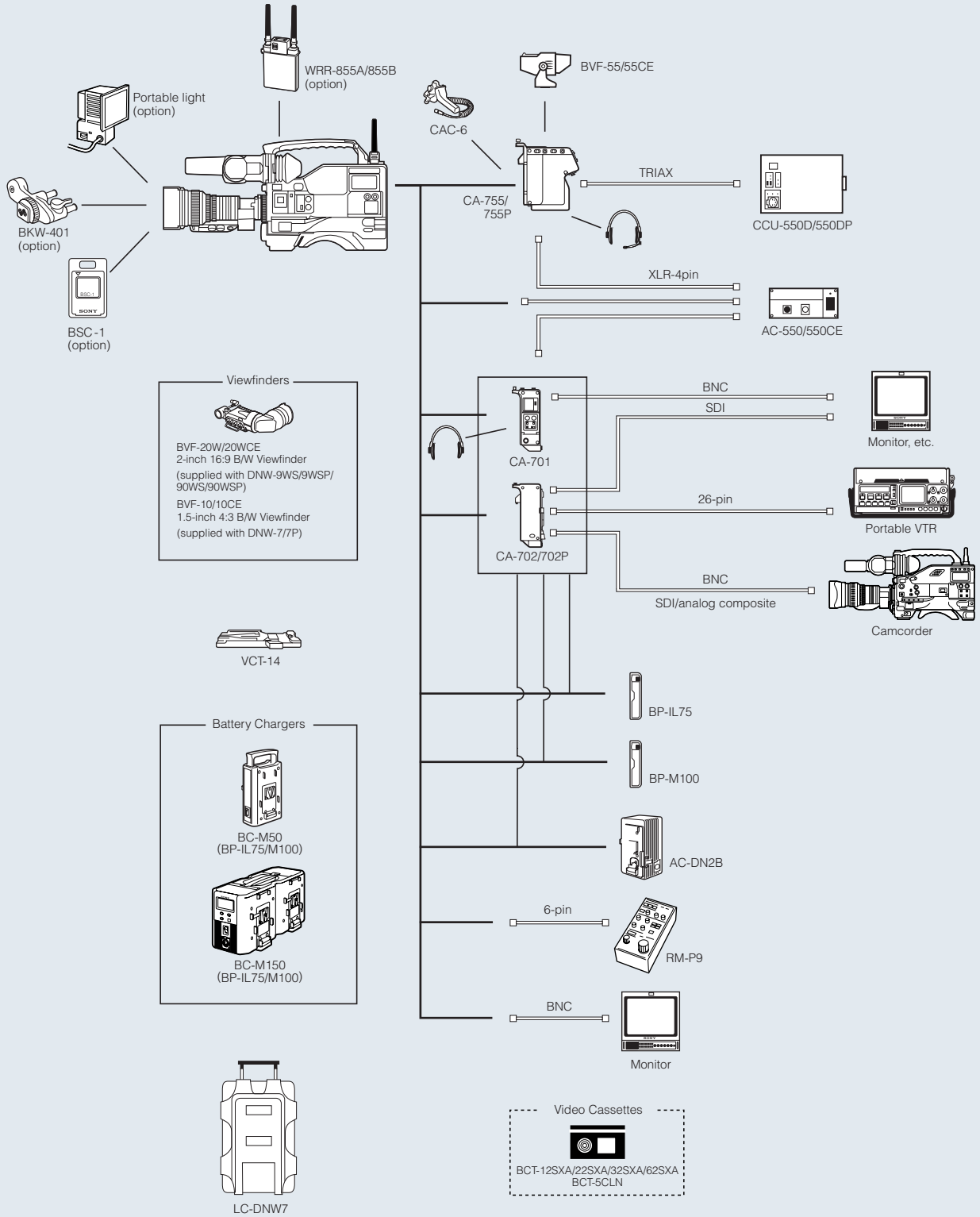
Cleaning Cassette  
**BCT-5CLN**



Carrying Case (Hard)  
**LC-DNW7**

- 1-547-341-12** Fog-Proof Filter
- A-8262-537-A** Viewfinder Eyepiece (high magnification)
- A-8262-538-A** Viewfinder Eyepiece (low magnification)
- A-8267-737-A** Viewfinder Eyepiece (standard magnification, with special compensation for aberrations)
- A-8314-798-A** Viewfinder Eyepiece (high performance, x3)
- X-3608-271-1** Standard Viewfinder Lens
- A-8278-057-A** Mounting Bracket for WRR-862A/862B

# System Configuration



# Specifications

	DNW-7/7P Version 2	DNW-9WS/9WSP		DNW-90WS/90WSP	
		16:9 MODE	4:3 MODE	16:9 MODE	4:3 MODE
<b>General</b>					
Weight		Approx. 8 lb 13 oz (4.0 kg)			
Operating weight		Approx. 13 lb 3 oz (6.0 kg)			
Power requirements		DC 12 V +5.0 V/-1.0 V			
Power consumption	29 W	31.5 W		32 W	
Operating temperature		0 °C to +40 °C (+32 °F to +104 °F)			
Storage temperature		-20 °C to +60 °C (-4 °F to +140 °F)			
Humidity		25 to 85% (relative humidity)			
Continuous operating time with BP-IL75	Approx. 150 min	Approx. 140 min			
Signal inputs	Genlock video input	BNC (x1), 1.0 Vp-p, 75 Ω			
	Time code input	BNC (x1), 0.5 to 18 Vp-p, 10 kΩ			
	Audio input (CH-1/2)	XLR-3-31 type (x2), -60 dBu/+4 dBu selectable, high impedance, balanced			
	Mic input	XLR-3-31 type (x1), -60 dBu/+4 dBu selectable, high impedance, balanced			
Signal outputs	Video output	BNC (x1), 1.0 Vp-p, 75 Ω, sync negative			
	Test output	BNC (x1), 1.0 Vp-p, 75 Ω, sync negative			
	Time code output	BNC (x1), 1.0 Vp-p, 75 Ω			
	Earphone	Mini-jack			
	Audio output	XLR 5-pin male (stereo)			
Other inputs/outputs	Lens	12-pin			
	Remote	6-pin			
	Light	2-pin, DC 12 V, max. 30 W			
	DC input	XLR 4-pin (for the optional AC-550/550CE)			
	DC output	4-pin (for wireless microphone receiver), DC 12 V			
<b>VTR section</b>					
General					
Recording format	Betacam SX				
Tape speed	59.515 mm/s (NTSC)/59.575 mm/s (PAL)				
Playback/Recording time	Max. 62 min with BCT-62SXA cassette				
Fast forward time	Approx. 5 min with BCT-62SXA				
Rewind time	Approx. 5 min with BCT-62SXA				
Sampling frequency	Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz				
Quantization	8 bits/sample				
Error correction	Reed-Solomon code				
Video performance	K-factor (2T pulse)	1% or less			
	Y/R-Y/B-Y delay	15 ns or less			
Digital audio performance	Sampling frequency	48 kHz (synchronized with video)			
	Quantization	16 bits/sample			
	Frequency response	20 Hz to 20 kHz +0.5 dB/-1.0 dB			
	Dynamic range (emphasis ON)	More than 85 dB			
	Distortion (at 1kHz, emphasis ON, reference level)	Less than 0.08%			
	Cross talk (at 1kHz, reference level)	Less than -70 dB			
	Wow & flutter	Below measurable limit			
	Head room	20 dB			
Emphasis (ON/OFF selectable)	T1 = 50 μs, T2 = 15 μs				
* The specifications given above were measured by CA-701, Camera Adaptor.					
<b>Camera section</b>					
Camera					
Pickup device	3-chip 2/3-inch type Power HAD 1000 IT CCD	3-chip 2/3-inch type Power HAD 1000 16:9/4:3 Widescreen IT CCD	3-chip 2/3-inch type Power HAD 1000 16:9/4:3 Widescreen FIT CCD		
Picture elements	NTSC: 811 (H) x 508 (V) PAL: 795 (H) x 596 (V)	NTSC: 1038 (H) x 504 (V) PAL: 1038 (H) x 594 (V)			
Optical system	F1.4 prism system				
Built-in filters	1: CLEAR 2:5600 K+1/8 ND 3:5600 K 4:5600 K+1/64 ND				
Shutter speed	NTSC: 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s) PAL: 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s)				
Gain	-3, 0, +3, +6, +9, +12, +18, +24, +30, +36, +42 dB (select in camera set up menu for L/M/H/TURBO)				
Clear scan	NTSC	CLS: 60.0 to 10156 Hz (263 steps)	CLS: 60.1 to 7000 Hz (260 steps)	CLS: 60.1 to 7000 Hz (260 steps) ECS: 30.4 to 58.3 Hz (248 steps)	
	PAL	CLS: 50.0 to 10101 Hz (312 steps)	CLS: 50.2 to 9000 Hz (310 steps)	CLS: 50.2 to 9000 Hz (310 steps) ECS: 25.4 to 48.7 Hz (295 steps)	
Lens mount	Special bayonet mount				
Sensitivity (2000 lx, 89.9% reflective)	F13	F9			
Minimum illumination	Approx. 0.18 lx (F1.4 lens, +42 dB Turbo Gain)	Approx. 0.35 lx (F1.4 lens, +42 dB Turbo Gain)			
Smear level	-130 dB	-120 dB	-140 dB		
Video S/N ratio (typical)	63 dB (NTSC)/61 dB (PAL)				
Vertical resolution	NTSC: (without EVS) 400 TV lines, (with EVS) 450 TV lines PAL: (without EVS) 480 TV lines, (with EVS) 530 TV lines				
Registration	0.05% (all zones, without lens)				
Geometric distortion	Below measurable level (without lens)				
Warm-up time	2 s				
Modulation depth at 5 MHz	60% (typical)	70% (typical)	55% (typical)	70% (typical)	55% (typical)
	Viewfinder				
CRT	1.5-inch monochrome	2-inch monochrome			
Controls	BRIGHT control, CONTRAST control, PEAKING control, TALLY, ZEBRA, DISPLAY switches				
Horizontal resolution	600 TV lines	450 TV lines	600 TV lines	450 TV lines	600 TV lines
Microphone	Ultra-directional (detachable)				
<b>Supplied accessories</b>					
Shoulder Belt (1), Microphone (1), XLR Cap (4), Maintenance Manual Part 1 (1), Operation Manual (1)					

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