

SONY®

PAL

BETACAM SX™

Betacam SX™ Camcorder

DNW-7P/9WSP/90P/90WSP



The Digital Camcorders for superior System Performance

For many years Sony Betacam® and Betacam SP® camcorders have set international standard for field acquisition equipment. Their excellent picture quality, reliable performance and compact design allowed a generation of ENG and EFP crews to shoot on location more creatively.

Today, digital technology is bringing revolutionary changes and advantages to the broadcast industry. Computerized non-linear editing and digital signal compression have radically increased studio editing power and transmission speed, networking interface and hard disk storage capacity are now critical factors in newsroom, post production and broadcast operations. All-digital acquisition tools are a vital part of this digital revolution. Sony provided Betacam SX™ digital camcorders.

The digital recording format used in Betacam SX camcorders is based on MPEG-2 4:2:2 Profile at Main Level that maintains digital component broadcast-quality pictures from camera through post production and on-air playback.

The Betacam SX camcorder range offers an unprecedented combination of advantages for ENG and EFP applications. In size and weight, they are amazingly compact and light incorporating a built-in Colour Playback capability, optional Slot-in Wireless Microphone Receiver and Internal Light System to improve mobility and lighten the load of crews working in the field.

Sony Betacam SX camcorders are designed to add important digital acquisition benefits to the news acquisition process, where saving time is critically important. In performance, reliability and portability, these new camcorders draw on the proven experience of Sony to bring superior digital advantages to ENG and EFP applications.



The Betacam SX format represents the latest step in the development of Betacam technology, drawing on the long experience of Sony in serving the ever-changing, real-world needs of the broadcast community. It combines the proven performance of 1/2-inch analogue Betacam SP format with the digital technology leadership gained in the development of the D-1, D-2 and Digital BETACAM® formats.

Broadcast Picture Quality with MPEG-2 4:2:2 Profile at Main Level

The Betacam SX format records 8-bit, 4:2:2 component digital signals using an advanced compression algorithm. These recordings maintain high picture quality without visible artifacts, at a compression ratio of 10:1 for cost-effective digital non-linear editing and archival storage. The Betacam SX format also preserves 608 active lines per frame along with vertical blanking. The format gives outstanding picture quality, with excellent luminance detail and colour resolution. Its 10:1 compression ratio allows either single channel high-speed transmission or simultaneous 2-channel transmission of different video source signals within a limited band width, facilitating the use of contribution links.

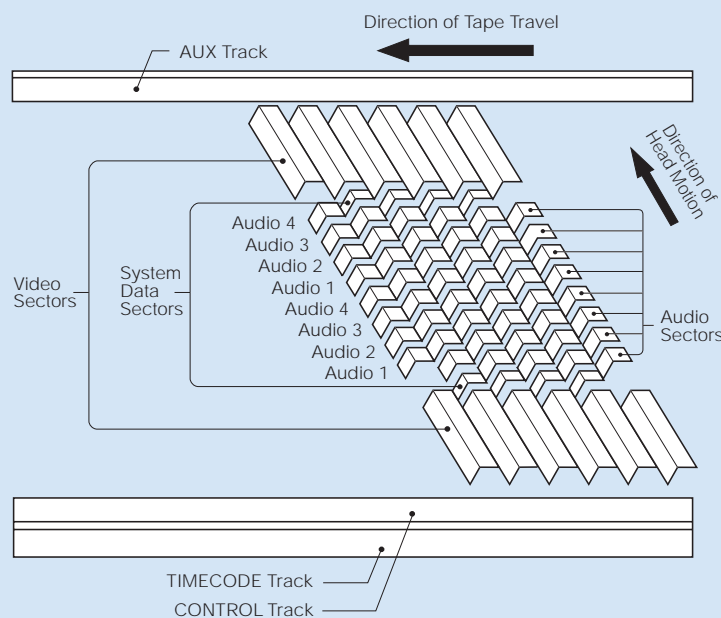
General	Tape width	12.65mm (1/2 inch)
	Tape material	Metal particle tape
	Recording/playing time	Max. 62 min. with S-cassette
	Tape speed	59.575mm/s
	Track pitch	32µm
	Tracks per frame	12 (625/50), 10 (525/60)
	Longitudinal tracks	Time code / Control / Aux
	Video ancillary data	1 line/field
Extension data	20 byte/frame	
Video	Compression	MPEG-2 4:2:2P@ML
	Compression ratio	Approx. 10:1
	Active lines per frame	608 lines (625/50), 507 lines (525/60)
	Sampling frequency	Y: 13.5MHz R-Y/B-Y: 6.75MHz
Quantization	8 bits/sample	
Audio	Compression	None
	Sampling frequency	48kHz
	Quantization	16 bits/sample
	Channels	4

Betacam SX in Action: the Robust Tape Format

The robust tape format of Betacam SX records 8-bit, 4:2:2 component digital video signals and supports four channels of 16-bit/48kHz digital audio. Its powerful ECC (Error Correction Code) automatically compensates for

off-tape data errors caused by burst errors during recording and playback. This ensures virtually dropout-free acquisition of important news programme material.

Tape Format



Compatibility with Analogue

Betacam and Betacam SP Formats

The Betacam SX format is designed to maintain compatibility with current analogue systems. This analogue compatibility provides a logical, cost-efficient migration path towards a totally digital environment.

Analogue Playback Capability

The 1/2-inch tape size used by Betacam SX format uses the same size 1/2 cassette as current Betacam and Betacam SP equipment, making possible Betacam SX playback compatibility with analogue Betacam and Betacam SP recordings made on oxide or metal tape. Using advanced Hybrid Recorders that combine video tape transports and hard disk drives, the Betacam SX system allows existing analogue Betacam and Betacam SP archive material to be accessed and digitized for non-linear editing.

Wide Range of Recording Media

Current BCT-MA and UVWT Series Betacam SP metal tape cassettes can be used for Betacam SX recording, assuring a wide availability of recording media. For superior digital performance at reduced cost, a metal particle tape has also been developed for Betacam SX recording.

Tape	VTR		Betacam		Betacam SP		Betacam SX	
	REC	PB	REC	PB	REC	PB	REC	PB
Betacam	yes	yes	yes	yes	no	yes		
Betacam SP (oxide)	no	yes*	yes	yes	no	yes		
Betacam SP (metal)	no	no	yes	yes	yes	yes		
Betacam SX (metal)	no	no	no	no	yes	yes		

*Modification kit is required.

Analogue and Digital Interfaces

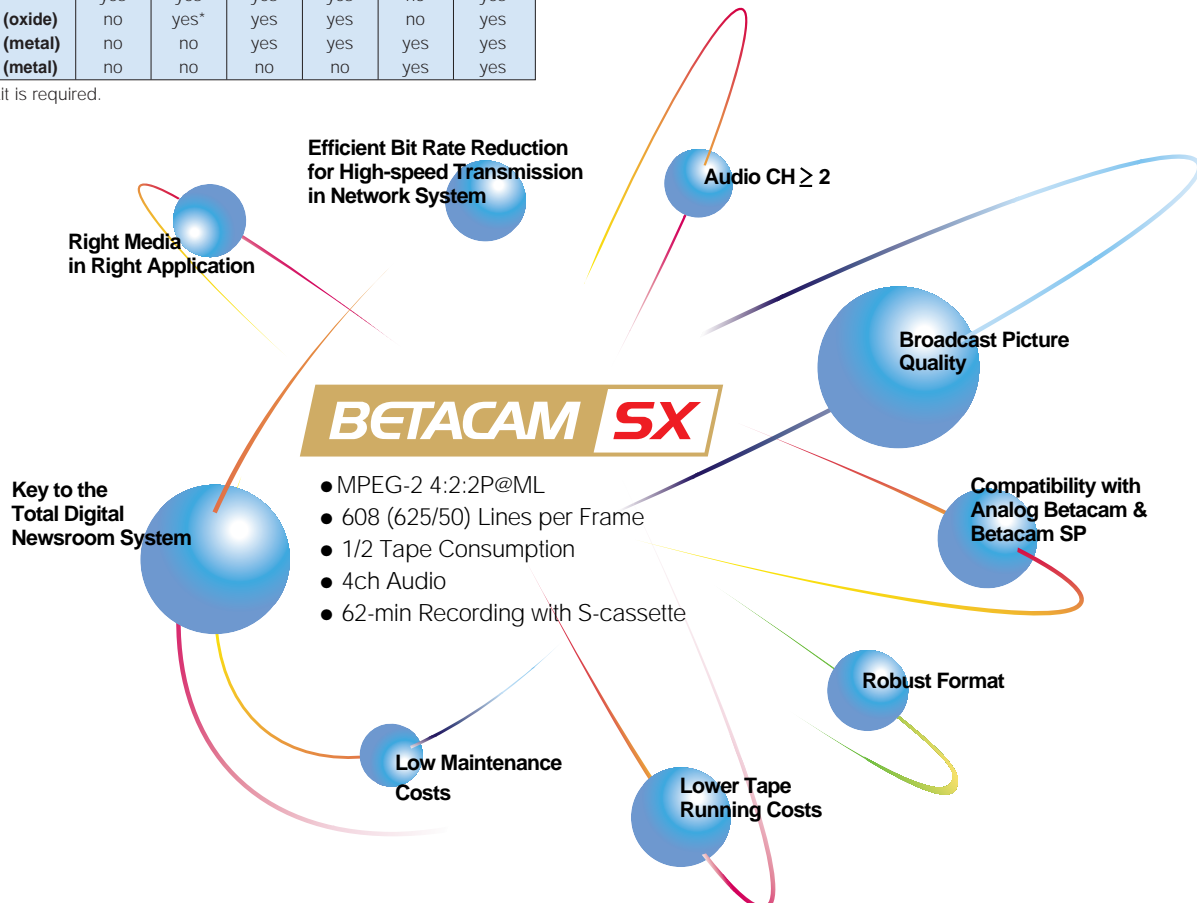
Betacam SX products provide both digital and analogue interfaces. Digital outputs make extensive use of SDI with its four embedded audio channels, while analogue inputs and outputs allow coexistence with existing analogue systems in the studio and in the field.

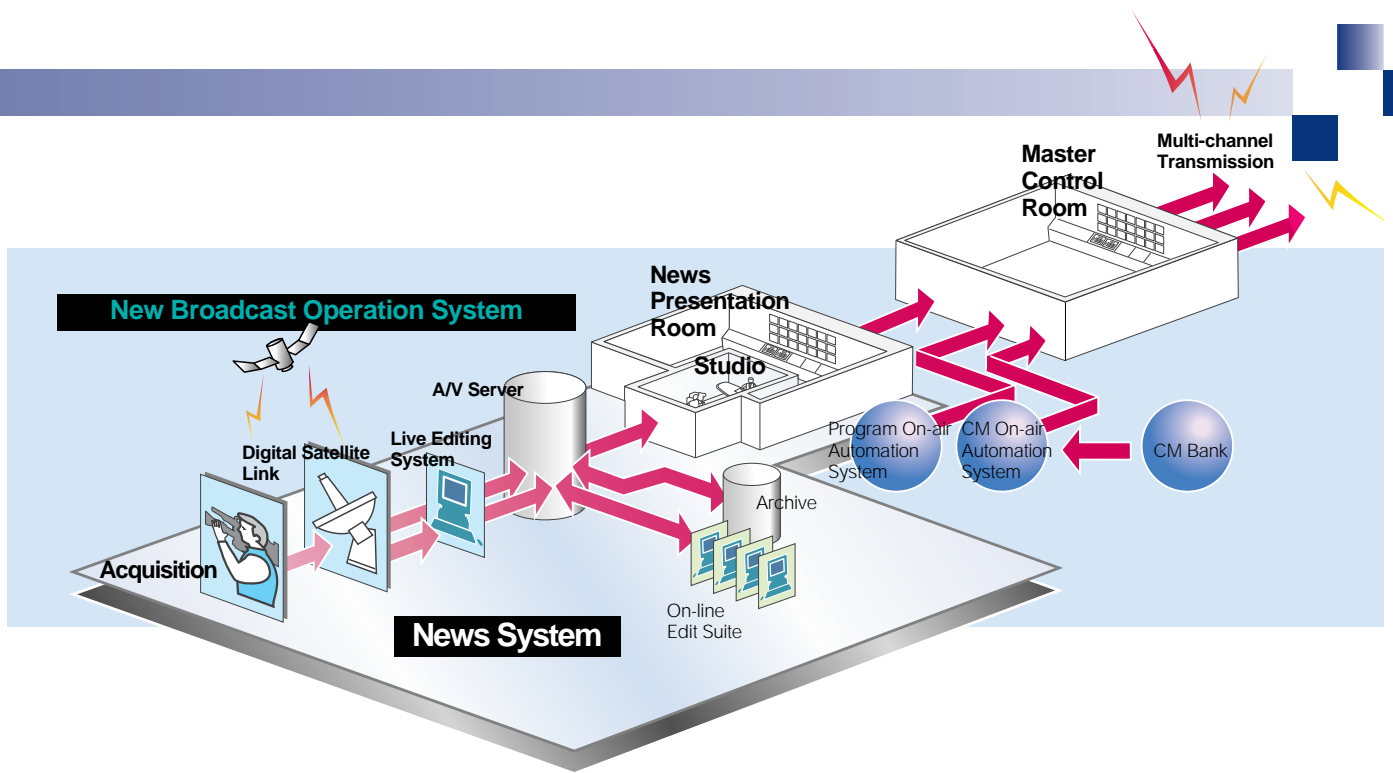
The Cost Efficiencies of Betacam SX Products

Betacam SX equipment is designed to deliver not only unsurpassed digital picture and sound performance but also to achieve significant long-term saving in both media and hardware costs.

Lower Tape Running Costs

The advanced signal compression technology of the Betacam SX format has brought the important advantage of longer tape recording times: up to 62 minutes on a single S-cassette. Powerful error correction capability enables the Betacam SX format to handle a high bit-rate signal within narrow tracks, allowing the development of low-cost, high-quality Betacam SX tape. Compared to conventional Betacam SP tapes, tape consumption can actually be reduced by almost one-half which means that ENG acquisition and studio archival tape costs can be greatly reduced, while picture quality is maintained.





Reduced Maintenance Costs

Betacam SX equipment also incorporates an Automatic Alignment System that maximizes accurate tape recording and reproduction of digital data. An Automatic RF Equalizer optimizes the gain and phase of off-tape RF signals. These automatic systems minimize the need for time-consuming manual equalization and servo system adjustments, which can lower maintenance costs.

Betacam SX: the Key to the Digital Newsroom

Betacam SX format is the key to the Sony approach to the digital newsroom.

The amount of compression has been carefully designed to maintain high picture quality during every phase of end-to-end broadcast news operations, from camera through post production to on-air playback.

The compression algorithm of MPEG-2 4:2:2 Profile at Main Level is universally employed within the full Betacam SX product range, as well as by the digital,

disk-based A/V Servers in the Sony system. This means that, throughout the total newsroom system, no encoding/decoding is needed, and picture quality is not compromised.

The Right Media in the Right Application

Sony expertise in every aspect of video technology has led to a careful evaluation of the running costs, recording times, mobility factors, and industry-wide compatibility of both tape and disk media.

In the Betacam SX system, Sony employs tape media for camcorder applications where the requirement is for low running costs, longer recording time, physical robustness and higher mobility and uses disk media for in-house applications where high-speed random access and non-linear operations are of prime importance. As part of a total system approach, Sony Betacam SX camcorders have brought the acquisition process into the digital age. They are designed to let you move ahead now without compromising the full functionality and cost efficiency that are needed in the digital world.



The Betacam SX Camcorder Line-up

The Betacam SX line-up includes the DNW-7P, 9WSP, 90P and 90WSP camcorders.

DNW-7P: This Betacam SX camcorder is equipped with 2/3-inch 470K Power HAD™ 1000 IT CCDs. It incorporates 10-bit/28 MHz full digital signal processing in the camera section and Betacam SX digital recording in the VTR section. The DNW-7P brings cost-effective, fully digital operation to day to day ENG acquisition assignments and EFP shooting applications.



DNW-9WSP: This Betacam SX camcorder is switchable between 4:3 standard and 16:9 widescreen ratios. It is equipped with 2/3-inch 620K switchable 16:9/4:3 Widescreen Power HAD 1000 IT CCDs. It incorporates 10-bit/36 MHz full digital signal processing in the camera section and Betacam SX digital recording in the VTR section. The DNW-9WSP is the latest member of the line-up of Betacam SX camcorders. Its high technology design provides an excellent cost performance ratio.



DNW-90P: This Betacam SX camcorder is equipped with 2/3-inch 620K Power HAD 1000 FIT CCDs. It incorporates 10-bit/36 MHz full digital signal processing in the camera section and Betacam SX digital recording in the VTR section. Its superior low-light shooting capability and spectacular digital image quality make it the high-performance choice for both high-end ENG and EFP shooting situations.



DNW-90WSP: This Betacam SX camcorder is switchable between 4:3 standard and 16:9 widescreen ratios. It is equipped with 2/3-inch 620K switchable 16:9/4:3 Widescreen Power HAD 1000 FIT CCDs. The DNW-90WSP gives superior-quality digital recording in both screen aspect ratios, and makes it easy to bridge the transition from 4:3 world to the growing world of widescreen 16:9.



* Lens, light, battery and WRR-855A are options.

** Lenses with 'shrinker' function are recommended for the WS model.

General Features

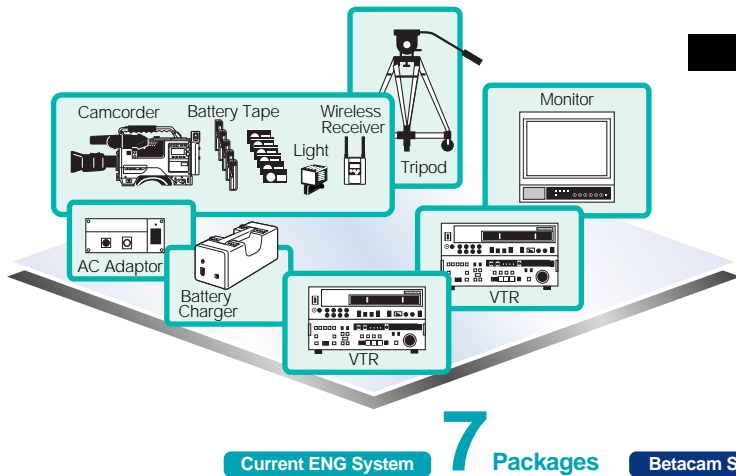
Compact and Lightweight Design, Approximately 6kg

Betacam SX camcorders are designed to bring both superior digital performance and high mobility to single camcorder operations in the field, even when shooting under difficult conditions. The smaller diameter recording head drum developed by Sony has made possible to develop a design more compact than analogue Betacam SP camcorders, with a shorter overall length and lower centre of gravity for excellent balance.

The DNW-7P/9WSP/90P/90WSP weigh approximately 6kg (13 lb. 3 oz.) including battery, tape and lens.

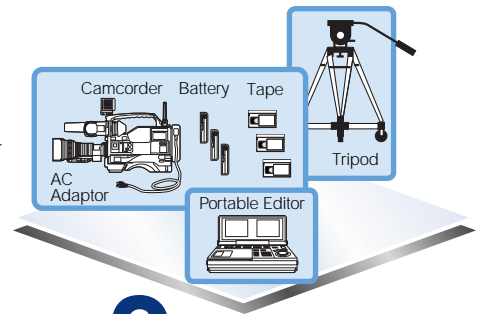
Reduced Weight and Fewer Elements in the Total Crew Package

Betacam SX camcorders are not only smaller and lighter, they also achieve further reductions in the total shooting system needed by news acquisition crews. Betacam SX camcorders provide colour playback without an external adaptor—and longer recording of up to 62 minutes on a single S-cassette, so fewer tapes are required. They can incorporate an optional Slot-in Wireless Microphone Receiver and Internal Light System, reducing further the equipment load that must be carried in the field.



Current ENG System **7** Packages

Acquisition Crew Package



Betacam SX System **3** Packages

Weight: **1/3** of the Current ENG System

Longer Recording Time, Up to 62 Minutes on a Single Cassette

Betacam SX camcorders combine the performance of digital recording with the convenience of an efficient data-handling format that gives up to 62 minutes of recording on a single 1/2-inch S-cassette. Compared to analogue Betacam SP equipment, Betacam SX camcorders can reduce tape consumption by nearly half.

<Tape Recording Time List>

Models	Betacam SP Recording Time (min)	Betacam SX Recording Time (min)
BCT-5MA	6	12
BCT-10MA	12	22
BCT-20MA	24	42
BCT-30MA	36	62
UVWT-10MA	12	22
UVWT-20MA	24	42
UVWT-30MA	36	62
BCT-12SX	-	12
BCT-22SX	-	22
BCT-32SX	-	32
BCT-60SX	-	60
BCT-62SX	-	62

Betacam SX Tape Plus Use of Current Metal Particle Tape

Conventional Betacam SP metal particle tape (BCT-MA/UVWT) can be used in Betacam SX camcorders, so tape is always readily available—and with Betacam SX camcorders, recording time is almost double the stated duration of the tape. To achieve even higher performance and cost efficiency, a Betacam SX tape has also been developed.



Features

16:9/4:3 Switchable (DNW-9WSP/90WSP)

The DNW-9WSP and the DNW-90WSP are equipped with 2/3-inch 620K switchable 16:9/4:3 Widescreen Power HAD 1000 CCDs. They give superior quality digital recording in both aspect ratios.

Wide Selection of Viewfinders

The DNW-7P and DNW-90P are equipped with a lightweight 1.5-inch monochrome viewfinder; the DNW-9WSP and the DNW-90WSP come with a wide 2-inch monochrome viewfinder, allowing easy focusing even in 16:9 widescreen mode. There is also an optional 1.35-inch colour viewfinder available, the BVF-VC10W. Using this colour viewfinder provides colour



BVF-VC10W

playback through the camcorder viewfinder, as Betacam SX camcorders do not require an external adaptor. And when shooting with the BVF-VC10W, colour objects are more clearly identifiable.

Comprehensive Menu Control

Setup parameters are well organized in a two-layer menu system, categorized as User Menus and Engineer Menus. User Menus allow access to only the standard setup functions needed by operators. Engineer Menus allow access to all camcorder setup functions. Menu pages are visible in



the camcorder viewfinder and may also be displayed on a monitor screen through the video outputs. The setup control system is easily operated using a rotary switch on the camcorder.

Audio Level Adjustment

The audio level of the front microphone can be easily and accurately adjusted with the rotary control located under the lens converter of the camcorder. Positioning the control in this location helps to prevent an operator's hands from accidentally touching the lens or entering the frame.

Setup Card for Uniform Camcorder Settings

The Betacam SX camcorder family allows a large number of setup parameters to be stored on a removable Setup Card.

These cards allow operators to set up camcorders more quickly, easily and accurately in the field. Several different camcorder settings can be stored on Setup Cards prepared in the studio. Setup Cards also aid in matching the setup of multiple camcorders, when shooting in several remote locations or when time passes between shooting assignments on a single story or production.



Low Acoustic Noise

A sophisticated noise barrier incorporated in the VTR section improves camcorder operator's comfort and helps to prevent transport noise pickup by the onboard microphone during shooting.

Colour Filters

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



Colour Playback without an External Adaptor as well as Viewfinder Playback on Location

Betacam SX camcorders allow colour playback together with two audio channels without an external adaptor, making it easy to verify recording results and send recordings to the studio via microwave transmission. Recordings can also be reviewed in the camcorder viewfinder while audio is monitored via an earphone or the speaker built in to the side of the camcorder.

Variable Speed Electronic Shutter



In order to capture clear images of high-speed moving subjects without motion blur, Betacam SX models have several shutter speeds available: 1/60, 1/125, 1/250, 1/500, 1/1000 and 1/2000 of a second.

Diagnostic Information for Easy Maintenance

The DNW-7P/9WSP/90P/90WSP models incorporate a sophisticated diagnostic system to detect malfunctions within the camcorder. Digital signal processing improves the ability to specify the precise location and nature of a fault; camera faults are indicated by warning lights in the viewfinder, and VTR faults are indicated on the camcorder LCD display.



Turbo Gain: High Sensitivity

The Turbo Gain function of Betacam SX camcorders quickly raises the gain level to +42 dB at the touch of a button on the side of the camcorder, allowing immediate adjustment in extremely low light shooting conditions. By combining DPR Plus (Dual Pixel Readout Plus) technology with a conventional electronic gain-up function, a high signal-to-noise ratio is obtained with only small loss of resolution in the Turbo Gain mode. The maximum gain level of the Turbo Gain mode is +36 dB/+42 dB selectable.



*DPR Plus: The technology which can gain four times normal sensitivity by reading out the electric charge of four adjoining CCD pixels.

TruEye™ Process

In conventional RGB analogue digital processing, some non-linear signal processing occurs after gamma correction, such as knee and white clip, and this can result in hue errors a phenomenon that is particularly obvious in extreme highlight conditions. This significant problem is virtually eliminated by the TruEye process which manages video signal data according to three factors: luminance, hue and saturation, so that colour reproduction, even with a very wide dynamic range, approaches the faithfulness of the human eye. TruEye processing prevents colour shifts occurring above the non-linear processing threshold (the knee point). The factory preset value of the knee point can be reduced from 98 % to 85 %, extending the dynamic range.



DynaLatitude™

With the TruEye system, the Betacam SX camcorders offer another unique feature, DynaLatitude Function. This adaptively manages the contrast of each pixel according to a histogram of video signal level distribution. DynaLatitude brings a further dimension to the technologies, such as Dynamic Contrast Control (DCC), that controls the dynamic range of the normal video signals. DynaLatitude optimizes the video level distribution to expand the limited range of the normal video signals. DynaLatitude is switchable in four steps: LOW, MID, HIGH and OFF via a menu control system and a graphic display in the viewfinder.



Auto Tracing White Balance (ATW)

DNW-7P/9WSP/90P/90WSP camcorders are all equipped with Auto Tracing White Balance (ATW) capability, which provides automatic adjustment of white balance according to the overall scene lighting conditions. When lighting conditions change quickly for example, moving from indoors to outdoors white balance is rapidly readjusted with this ATW function.



Comprehensive LCD Display

The extensive LCD displays on Betacam SX camcorders provide critical information on VTR operating status; Time code, CTL and User-bit data, Tape Remaining and Battery Capacity are displayed via a bargraph meter. A digital audio peak meter is provided to monitor audio recording level.



Stereo Audio Line Output (5-pin XLR)



The 5-pin XLR connector on Betacam SX camcorders carries two analogue audio output channels. Either CH-1/2 or CH-3/4 can be selected through the VTR menu.

User-friendly Controls

Betacam SX camcorders are carefully designed for simple operation. Switches are located in similar positions on both Betacam SX and Betacam SP camcorders, so operators accustomed to using Sony analogue equipment will immediately find these new digital camcorders familiar and easy to use.

Fail-safe Audio Recording

Through the VTR menu, four channels of audio can be assigned according to the user's needs. When Parallel mode is selected, the same signals are recorded by CH-1/CH-3 and CH-2/CH-4. In Separate mode, CH-3 automatically records the front microphone and CH-4 records the wireless microphone. This function ensures that vital sounds will not be accidentally missing from audio recording; even when an external microphone is not connected, audio from the front microphone and the output of the wireless microphone will still be captured on audio channels 3 and 4.

AC Adaptor



The optional AC-DN1/DN2A AC Adaptor attaches directly to the Betacam SX camcorders to provide uninterrupted shooting capability in situations such as special events or extended conference sessions. The AC-DN1/DN2A can also be used to charge the lithium-ion batteries in an

emergency.

6-pin Remote Interface

Remote control of the basic functions and adjustments of Betacam SX camcorders can be accomplished by connecting the RM-P9 Remote Control Unit via a 6-pin remote interface.

TC REGEN Function

A time code regenerator is included to provide continuous time code recording in the REGEN mode so that time code editing can begin immediately after shooting.

Multiple Tally Functions

In addition to tally functions on the front and back of the camcorder, Betacam SX models have a camera tally on the viewfinder at the side of the eyepad, so the operator can see if the tally is on even when looking into the viewfinder from a distance.

Superimposed Camera ID on Colour Bars

For easy confirmation of which camcorder was used for an individual recording, a Camera ID can be superimposed on colour bars. The Camera ID is set using the system control menu.



Test Output

The DNW-7P/9WSP/90P/90WSP all incorporate a test output port, providing composite video, red, green or blue signals for camera testing.



Slot-in Wireless Microphone Receiver (Built-in UHF Synthesizer Receiver Unit)

An optional WRR-855A Wireless Microphone Receiver can be fitted directly into all four Betacam SX camcorders using a slot-in mechanism that gives a cableless interface between the camcorder and the receiver. This

system increases mobility by maintaining compact overall dimensions even when the receiver is attached to the camcorder.



Internal Light System

An optional Anton/Bauer Ultralight can be directly attached to the camcorder using a standard lighting connector and a specially designed very short cable. This internal light system can be powered from the camcorder's lithium-ion battery. The Lighting can be switched on and off manually or automatically synchronized with the REC. Start function of the camcorder.



*Anton/Bauer products may not be available in some countries.

Lithium-ion Battery

Lithium-ion batteries provide higher capacity in a smaller, lighter size. Betacam SX camcorders will operate for more than two hours using a fully charged BP-L60A Lithium-ion Battery. Using a BP-L90A Lithium-ion Battery, three hours of recording can be achieved. Lithium-ion batteries can be attached directly to the camcorder using the V-shoe attachment, which facilitates

quick, easy battery changes. With an optional adaptor, current NP-1B and BP-90A Ni-Cd batteries can also be used, allowing users to take advantage of existing battery and charging equipment for greater system flexibility.



Vertical Loading Cassette Compartment

The cassette compartment does not pop up during cassette loading and ejecting, which helps to prevent damage to the cassette compartment mechanism. Cassettes are loaded vertically through a narrower entry that helps to keep out dust particles. The window on the cassette case positioned, to make it easy for the operator to see how much tape remains for recording.

Record/Review Function

Recordings can be quickly checked by pressing the RETURN button on the side of the lens while the camcorder is in the REC. Pause mode. The tape automatically rewinds for about two seconds, the end of the last scene will be played back, and the tape will stop precisely at its previous position. Pressing the RETURN button and holding it longer can extend the tape rewind time up to a maximum of approximately ten seconds.



Genlock Capability/Camera Return

A genlock capability is incorporated within these camcorders to allow them to be integrated into multi-camera systems. Camera Return video can also be accessed through the same connector.

Camcorder Performance Features in a Sony Betacam SX System

Data on Tape to Speed the Edit Search Process

Betacam SX camcorders allow automatic and manual recording of shooting data on tape. Data such as Date, Time, Shot ID, Cassette Number and Shot Number can all be recorded during the shooting process. Shot Data can be used to retrieve material during editing.



Good Shot Mark and REC. Start Mark

Betacam SX camcorders provide an innovative function to speed the editing process: the ability to identify good takes while shooting in the field. A REC. Start Mark is automatically placed on the tape each time the VTR Start button is pressed while the VTR is in standby mode. A Good Shot Mark can be added at any time by pressing the RETURN button on the side of the lens while in recording mode.



When tapes are played back with Betacam SX VTRs, these VTRs can scan through the tape and detect all the REC. Start Marks and Good Shot Marks recorded on the tape. After detecting the marks, a list of all the marks is displayed on

the LCD screen, allowing easy cueing to any mark. In addition, when in Play, Shuttle, Jog and Still modes, these portable editors can memorize additional marks, called Virtual Shot Marks, entered by the operators. Using this list of marks, the tedious searching process is completely eliminated from tape-to-tape news editing.



Shot Mark List

And when tapes are copied onto DNV-A100P/ A50P Digital Video Hybrid Recorders built-in hard drive, these marks will appear highlighted as picture stamps on the GUI of the DNE-700 Digital News Editing System. Using picture stamps also helps to eliminate time consuming searching from non-linear news editing and saves hard disk space by downloading only the scenes selected by editors.



This Shot Mark Handling functions of the Betacam SX helps to speed-up whole the newsroom operation.



Shot Mark Log

CA-701 Camcorder Adaptor

4-Channel Audio Input and SDI Output Capability

The optional CA-701 Camcorder Adaptor can be attached to the DNW-7P/9WSP/90P/90WSP via the camcorder's built-in 40-pin connector, enabling simultaneous 4-channel audio recording by providing access to audio channels 3 and 4. In addition, two SDI outputs are provided, allowing direct connection to the other digital equipment via a single coaxial cable offering full digital component operation in an SDI environment.

General	Power requirements: Power consumption: Operating temperature: Storage temperature: Humidity: Mass: Dimensions (W/H/D):	Approx. DC 12V +5.0V/-1.0V Approx. 7W 0°C to +40°C (+32°F to +104°F) -20°C to +60°C (-4°F to +140°F) 25% to 85% (relative humidity) Approx. 1.0kg (2 lb 3 oz) 157x195x65mm (6 ¹ / ₂ x7 ¹ / ₂ x2 ⁵ / ₈ inches)
Connectors	AUDIO IN: AUDIO OUT: DC IN: DC OUT: HEADPHONE: SDI OUT: CAMERA:	XLR-3-31 type (x2) XLR 5-pin male (stereo) XLR 4-pin male, 11 to 17V 4-pin, 11 to 17V, max. 0.1A Stereo standard phone jack BNC (x2), 0.8Vp-p, 75Ω 40-pin (DNW-7P/9WSP/90P/90WSP)
Supplied accessories	Operation manual (1) Maintenance manual (1)	



CA-702P Camcorder Adaptor

External Input and Analogue Component/SDI Output Capability

The optional CA-702P Camcorder Adaptor can be attached directly to the camcorder 40-pin connector. With this adaptor fitted, both analogue composite and SDI signals can be input for recording on the camcorder VTR, and output for external use. The input signal is connected via a BNC connector, with A/D conversion automatically being selected when an analogue composite signal is detected. A second BNC connector provides an SDI output from the camcorder. An industry-standard 26-pin connector is also provided on the CA-702P. This provides both an analogue and an SDI output so that either a BVW-50P Betacam SP or DWV-250P Digital BETACAM portable recorder can be connected via a 26-pin cable for duplex recording. These comprehensive features have many applications in the field acquisition.

General	Power consumption: Mass: Dimensions (W/H/D):	MAX. 5.5W Approx. 0.9kg(2 lb) 165x195x65mm(6 ¹ / ₂ x7 ¹ / ₂ x2 ⁵ / ₈ inches)
Connectors	DC IN: DC OUT: SDI/Composite IN: SDI OUT: EARPHONE: VTR:	XLR 4-pin 4-pin BNC (x1) BNC (x1) Mini-jack CCZ 26-pin
Supplied accessories	Operation manual (1) Maintenance manual (1)	



CA-755P Camcorder Adaptor

Studio Camera Integration with Triax System

The DNW-7P/9WSP/90P/90WSP are easily integrated into a studio setup with other portable cameras using a Triax system. The optional CA-755P Camera Adaptor is directly attached via the built-in 40-pin connector; camera setup parameters such as gamma, detail, iris control, electronic shutter on/off, shutter speed, etc., can then be remotely controlled from a CCU-550P or CCU-700AP Camera Control Unit.

Notice:When the CA-755P is attached to the camcorder, playing or recording with the camcorder is unable. Also, the internal light system can't be used while the CA-755P is attached to the camcorder.

General	Power consumption: Mass: Dimensions (W/H/D):	Approx. 13W Approx. 1.9kg (4 lb 3 oz) 145x185.3x167mm(5 ⁷ / ₈ x7 ¹ / ₂ x6 ⁵ / ₈ inches)
Connectors	DC IN: RET OUT: RETURN CONTROL: EARPHONE: CAMERA: CCU: INCOM/PGM:	XLR 4-pin, 11.5V to 17V BNC (x1), 1.0Vp-p, 75Ω 6-pin Mini-jack, 8Ω 40-pin (DNW-7P/9WSP/90P/90WSP) FISCHER type Headset XLR 5-pin
Supplied accessories	Operation manual (1) Maintenance manual (1) Cable clamp (1) M3/M4 screws for cable clamp (2x2)	
Optional accessories	Extension board EX-454	



Optional Accessories



Setup Card
(Package of four Setup Cards and a soft case)
BSC-1-Pack



Rechargeable Lithium-ion Battery
BP-L90A



Rechargeable Lithium-ion Battery
BP-L60A



Battery Case for an optional BP-90A NiCd Battery
DC-L90



Battery Case for an optional NP-1B NiCd Battery
DC-L1



Battery Charger for four BP-L60/A and BP-L90/A
BC-L100CE



Battery Charger for two BP-L40 and L60/A and BP-L90/A
BC-L50CE



Battery Charger for four BP-90A and four NP-1B Batteries
BC-410CE



Battery Charger for four NP-1B Batteries
BC-1WDCE



AC Adaptor
AC-DN2A



AC Adaptor
AC-550CE



Slot-in Wireless Microphone Receiver
WRR-855A



Interface Box
VA-DN1



Remote Control Unit
RM-P9



Camera Control Unit
CCU-550P



5-inch Viewfinder
BVF-55CE



Return Video Selector
CAC-6



Tripod Adaptor
VCT-14



Viewfinder Rotation Bracket
BKW-401



Viewfinder Eye-piece
Far sight : **A-8262-537-A**
Low magnification : **A-8262-538-A**
Standard magnification with special compensation for aberrations : **A-8267-737-A**



Viewfinder Eye-piece
(High performance (x3): **A-8314-798-A**)



1.35-inch 16:9 Colour Viewfinder
BVF-VC10W



1.5-inch 4:3 B/W Viewfinder
BVF-V10CE
(supplied with DNW-7P/90P)



2.0-inch 16:9 B/W Viewfinder
BVF-V20WCE
(supplied with DNW-9WSP/90WSP)



Carrying Case
LC-DN7



Video Head Cleaning Cassette
BCT-D12CL

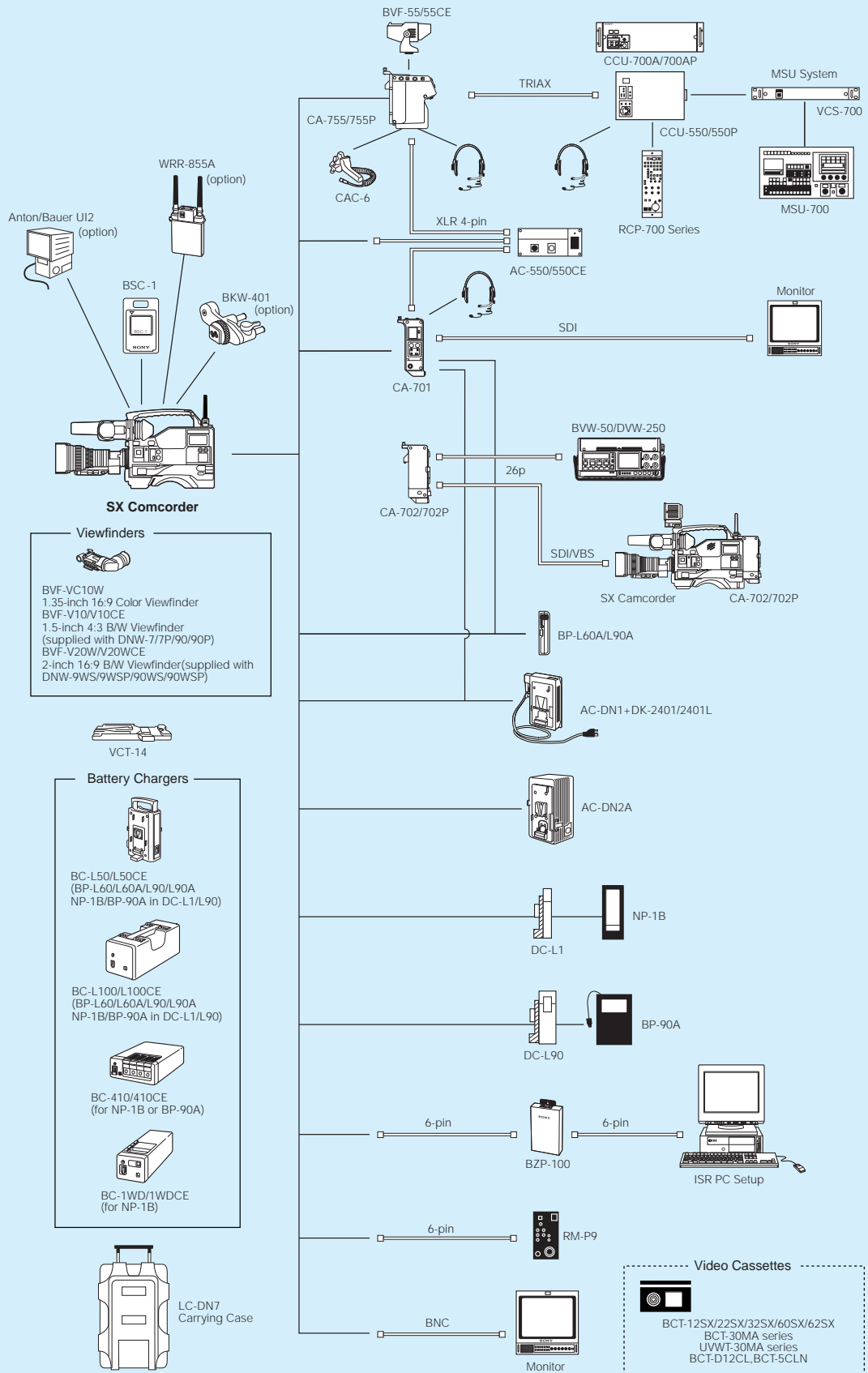


Video Head Cleaning Cassette
BCT-5CLN



Betacam SX Video Cassette
BCT-12SX/22SX/32SX/60SX/62SX

System Configuration



Specifications

DNW-7P/9WSP/90P/90WSP Camcorders

Camera	DNW-7P		DNW-9WSP		DNW-90P		DNW-90WSP	
			(16:9 MODE)	(4:3 MODE)			(16:9 MODE)	(4:3 MODE)
General								
Mass	Approx. 4.0Kg (8 lb 13 oz)							
Operating weight	Approx. 6.0Kg (13 lb 3 oz)							
Power requirements	DC 12V +5.0V/-1.0V							
Power consumption	29W		31.5W		31W		32W	
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	Approx. 120 min (with BP-L60A) Approx. 165 min (with BP-L90A)		Approx. 110 min (with BP-L60A) Approx. 165 min (with BP-L90A)		Approx. 110 min (with BP-L60A) Approx. 165 min (with BP-L90A)		Approx. 105 min (with BP-L60A) Approx. 160 min (with BP-L90A)	
Signal inputs	Genlock video	BNC (x1), 1.0Vp-p, 75 Ω						
	Time code input	BNC (x1), 0.5 to 18Vp-p, 10 kΩ						
	Audio (CH-1/2)	XLR-3-31 type (x2), -60 dBu/ +4 dBu selectable, high impedance, balanced						
	Mic input	XLR-3-31 type (x2), -60 dBu/ +4 dBu selectable, high impedance, balanced						
Signal outputs	Video output	BNC (x1), 1.0Vp-p, 75 Ω, sync negative						
	Video test output	BNC (x1), 1.0Vp-p, 75 Ω, sync negative						
	Time code output	BNC (x1), 1.0Vp-p, 75 Ω						
	Earphone	Mini-jack						
	Audio output	XLR 5-pin male (stereo)						
Others	Lens	12-pin						
	Remote	6-pin						
	Light	2-pin, DC 12V, max. 30W						
	DC input	XLR 4-pin (for the optional AC-550CE)						
	DC output	4-pin (for wireless microphone receiver), DC12V						
VTR section								
General								
	Recording format	Betacam SX						
	Tape speed	59.575 mm/s						
	Playback/Recording time	Max. 62 min. with BCT-62SX cassette						
	Fast forward time	Approx. 5.5 min. with BCT-62SX						
	Rewind time	Approx. 5 min. with BCT-62SX						
	Recommended tape	Sony Betacam SX cassette (BCT-62SX series), Sony Betacam SP cassette (BCT-30MA series/UVWT-30MA series)						
	Sampling frequency	Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz						
	Quantization	8bits/sample						
	Error correction	Reed-Solomon code						
Video performance	K-factor (2T pulse)	1 % or less						
	Y/R-Y/B-Y delay	15ns or less						
Digital audio performance	Sampling frequency	48 kHz (synchronized with video)						
	Quantization	16bits/sample						
	Frequency response	20 Hz to 20 kHz +0.5 dB/-1.0 dB						
	Dynamic range (emphasis ON)	More than 85 dB						
	Distortion (at 1 kHz, emphasis ON, reference level)	Less than 0.08 %						
	Cross talk (at 1 kHz, 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 via CA-701 Camera Adaptor.								
Camera section								
Camera	Pickup device	3-chip 2/3-inch Power HAD 1000 IT CCD	3-chip 2/3-inch Power HAD 1000 16:9/4:3 Widescreen IT CCD	3-chip 2/3-inch Power HAD 1000 FIT CCD	3-chip 2/3-inch Power HAD 1000 FIT CCD	3-chip 2/3-inch Power HAD 1000 FIT CCD	3-chip 2/3-inch Power HAD 1000 FIT CCD	3-chip 2/3-inch Power HAD 1000 FIT CCD
	Picture elements	795 (H) x 596 (V)				1038 (H) x 594 (V)		
	Optical system	F1.4 prism system						
	Built-in filters	1: CLEAR 2: 5600K + 1/8ND 3: 5600K 4: 5600K + 1/64ND						
	Shutter speed	1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s)						
	Gain Selection	-3, 0, +3, +6, +9, +12, +18, +24, +30, +36, +42 dB, (select in camera setup menu for L/M/H/TURBO)						
	Clear scan	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 (2000lx, 89.9 % reflective)	F10				F9		
	Minimum illumination	Approx. 0.3 lx (F1.4 lens, +42 dB Turbo Gain)				Approx. 0.35 lx (F1.4 lens, +42 dB Turbo Gain)		
	Video S/N ratio (typical)	61 dB						
	Vertical resolution	(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 sec.						
	Modulation depth at 5 MHz	60 % (Typical)	70 % (Typical)	55 % (Typical)		70 % (Typical)	70 % (Typical)	55 % (Typical)
Viewfinder	CRT	1.5-inch monochrome	2-inch monochrome			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		600 TV lines	450 TV lines	600 TV lines
	Microphone	Ultra-directional (detachable)						
Supplied accessories								
Shoulder belt (1), Microphone (1), XLR cap (4), Maintenance Manual Part 1 (1), Operation Manual (1)								

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