# SONY®

# Betacam SX Studio VTRs

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## DNW-A75/A75P Editing Recorder (with Analog Betacam/Betacam SP Playback Capability)
## DNW-75/75P     Editing Recorder
## DNW-A65/A65P Editing Player (with Analog Betacam/Betacam SP Playback Capability)

Betacam SX® VTRs were developed as 'digital replacements' for their analog predecessors, Betacam® and Betacam SP® VTRs.  Built on the same 1/2-inch platform, the Betacam SX format is based on an MPEG-2 4:2:2 Profile@ML-based compression algorithm.  This delivers the excellent picture quality of 8-bit, 4:2:2 digital recording while the balance between bit rate and GOP structure was chosen to provide the optimum combination of high picture quality and low running costs.  This approach has been proven in many installations worldwide, and has made Betacam SX VTRs the ideal solution for use in mainstream ENG, EFP and general post-production applications.

The Betacam SX series offers a choice of three studio VTRs to suit a variety of budgets and operational needs.  These choices are the DNW-A75* and DNW-75* Editing Recorders, and the DNW-A65* Editing Player.  The DNW-A75 and DNW-75 provide all the important features required for program production, including frame-accurate video/audio insert editing, preread editing, DMC (Dynamic Motion Control), 525/625 operation, variable speed playback, and Shot Mark support, and the DNW-A65 Editing Player shares their playback related features.

A unique advantage of the Betacam SX series is the 'legacy playback' capability provided by the DNW-A75 and DNW-A65, which allows the playback of analog Betacam and Betacam SP tapes.  This not only eliminates the dubbing process required in digitalizing analog archives, but also keeps analog Betacam camcorders earning revenue.

The future of digital broadcasting is with MPEG-2 and the Betacam SX is built on this technology.  An optional SDTI-CP** output board (BKNW-124) can be installed in any of these three decks, providing a link to the open world of MPEG-2.

Not just another digital solution… Betacam SX technology is the system that takes care of the past and brings you into the future.

 *In the following text, "DNW-A75", "DNW-75" and "DNW-A65" refer to both NTSC and PAL models.

**SDTI-CP is defined by SMPTE 326M.

## Main Features

### High-quality Digital Video and Audio Recording

Betacam SX VTRs deliver the exceptional video quality of the Betacam SX format, recording 8-bit, 4:2:2 component digital signals using MPEG-2 4:2:2 Profile@Main Level compression technology.  The audio system also includes four, 16-bit, uncompressed audio channels.

### ±0 Frame Insert/Assemble Editing (DNW-A75/75)

The DNW-A75 and DNW-75 recorders enable insert and assemble editing with ±0 frame accuracy.  This enables precise editing on Betacam SX tape in machine-to-machine or A/B roll configurations.

### Preread Editing Capability (DNW-A75/75)

Both these models are equipped with Preread capabilities, which have proved invaluable in Digital Betacam series VTRs.  Preread heads are located ahead of the record heads on the drum scanner, and previously recorded video and audio signals are read by these Preread heads.  These signals can then be processed by external equipment and recorded back onto the same track.  This capability is ideal for titling, color correction and layering for video, and mixing or sweetening for audio.

# Main Features

## Betacam/Betacam SP Playback Capability (DNW-A75/A65)

As with many Betacam SX products, the DNW-A75 and DNW-A65 have the capability to play back analog Betacam and Betacam SP recordings made on oxide or metal particle tape. This enables existing Betacam SP camcorders to be used for acquisition, and eases the integration of analog Betacam and Betacam SP material that users already have. Playback of AFM (Audio FM) channels 3 and 4 is also available.



Betacam SP Tape                    Betacam Tape

## Variable Speed Control

The range of the Variable Speed Control is from -1 to +2 times normal playback speed for Betacam SX and -1 to +3 times for Betacam and Betacam SP*.

*Betacam and Betacam SP playback is possible on the DNW-A75 and DNW-A65 only.

## DMC (Dynamic Motion Control)

Equipped with the Dynamic Motion Control functions, these VTRs provide slow-motion playback from the control panel or from external controllers such as Sony BVE series editors or the DTR-3000 Slow Motion Controller.

## Shot Mark Handling

A significant feature of Betacam SX series VTRs is the Shot Mark system, providing a method for qualitative decisions made in the camcorder to be utilized during the logging and editing processes. These VTRs can scan the tapes and automatically detect Shot Marks recorded on the tape. After scanning, a list of all detected marks is displayed on a monitor connected to the video output, allowing easy cueing to any mark.

Betacam SX studio VTRs are also capable of generating Shot Marks for recording to a tape or for temporary storage in an internal memory (Virtual Shot Mark). These features can dramatically speed up the edit search process.

## 525/60 or 625/50 Operation

Betacam SX VTRs are easily switched from 525/60 to 625/50 operation. In addition, analog Betacam and Betacam SP monitoring* is available for both 525/60 and 625/50 modes. This enables these VTRs to work in international environments.

*DNW-A75 and DNW-A65 only

## Versatile Interfaces

As standard, the DNW-A75 and DNW-75 recorders are equipped with analog composite and component video I/O, component SDI I/O, four channels of analog audio I/O, AES/EBU I/O, and two audio monitor outputs as standard. In addition, RS-422A, RS-232C, parallel 50-pin remote and parallel 15-pin video processor remote



**DNW-A75** Front Panel

control interfaces are provided. Time Code I/O is also included.

The DNW-A65 player includes the above interface outputs.

An SDTI-CP output with option board BKNW-124 is available to allow connection with a range of SDTI-CP equipped MPEG devices. Playback of Betacam SX recordings at twice normal play speed is provided.

## Operation in Flexicart® and LMS Systems

These Betacam SX studio VTRs can be used in Flexicart or LMS systems.

LMS          Flexicart

## High-speed Color Picture Search

Shuttle Search Speeds:

| | |
|---|---|
| Betacam SX mode: | ±78 times normal play speed |
| Betacam/Betacam SP mode*: | ±35 times normal play speed (NTSC) |
| | ±42 times normal play speed (PAL) |

*DNW-A75 and DNW-A65 only

## Long Recording and Playback Time

These Betacam SX VTRs provide the long time recording* and playback times of 194 minutes using an L-cassette and 62 minutes using an S-cassette.

*DNW-A75 and DNW-75 only

## Control Panel Flexibility

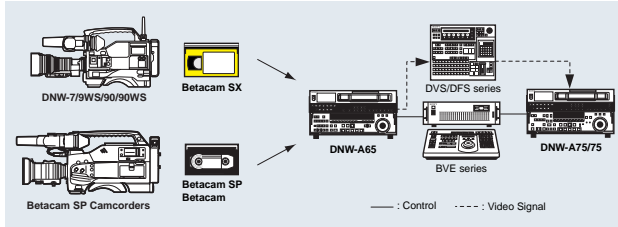The remote control panel cable of these VTRs can be extended up to 10 m via an optional extension kit.
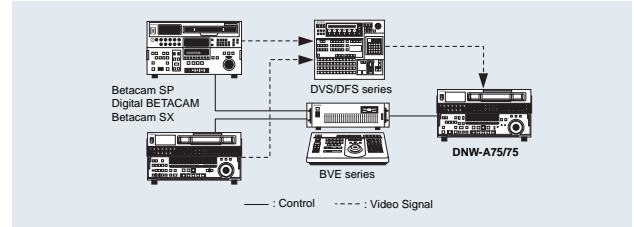
**DNW-A75** Front Sub-panel

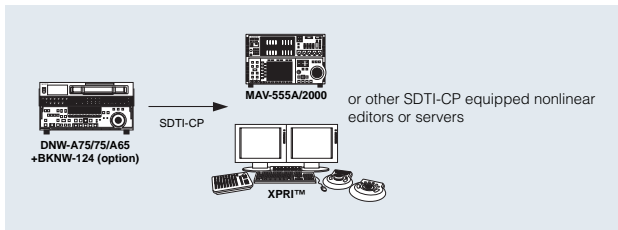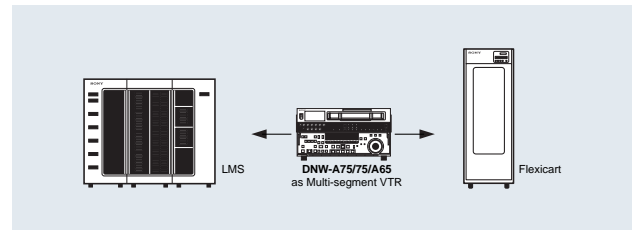**DNW-A75** Rear Panel

# System Configuration

## Acquisition



DNW-7/9WS/90/90WS

Betacam SX

Betacam SP Camcorders

Betacam SP Betacam

DNW-A65

BVE series

DVS/DFS series

DNW-A75/75

——— : Control   - - - - : Video Signal

## Linear A/B roll System



Betacam SP
Digital BETACAM
Betacam SX

BVE series

DVS/DFS series

DNW-A75/75

——— : Control   - - - - : Video Signal

## MPEG Interoperability



DNW-A75/75/A65
+BKNW-124 (option)

SDTI-CP

MAV-555A/2000

or other SDTI-CP equipped nonlinear
editors or servers

XPRI™

## In Flexicart & LMS



LMS
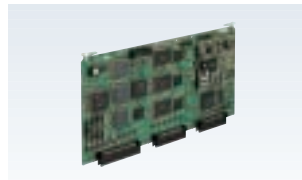
DNW-A75/75/A65
as Multi-segment VTR
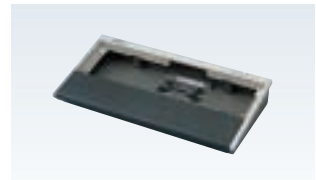
Flexicart

# Optional Accessories



Video Process Controller
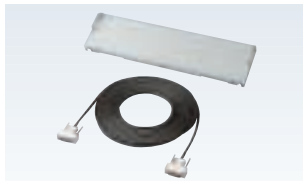**BVR-50**



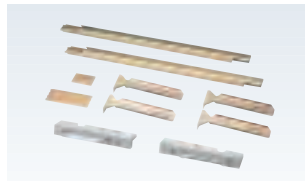Dynamic Motion Controller
**DTR-3000**



SDTI-CP Output Board
**BKNW-124**



Control Panel Case
**BKNW-121**



Control Panel Extension Kit
**BKNW-122**



Rack Mount Kit
**RMM-111**



Betacam SX Video Cassette (Small)
**BCT-12SXA/22SXA/32SXA/
60SXA/62SXA**

Betacam SX Video Cassette (Large)
**BCT-64SXLA/94SXLA/
124SXLA/184SXLA/194SXLA**



Cleaning Cassette
**BCT-5CLN**
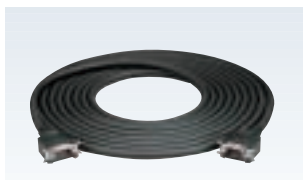


Remote Cable
**RCC-5G/10G/30G**

**Maintenance Manual** (Part 2)

# Specifications

| | | DNW-A75/A75P<br>Editing Recorder | DNW-75/75P<br>Editing Recorder | DNW-A65/A65P<br>Editing Player |
|---|---|---|---|---|
| **General** | | | | |
| Power requirements | | AC 100 V to 240 V, 50/60 Hz | | |
| Power consumption | | 215 VA | 184 VA | 195 VA |
| Operating temperature | | +41°F to +104°F (+5°C to +40°C) | | |
| Storage temperature | | -4°F to +140°F (-20°C to +60°C ) | | |
| Humidity | | 25 to 80% (relative humidity) | | |
| Weight | | 62 lb 13 oz (28.5 kg) | 58 lb 13 oz (26.7 kg) | 61 lb 10 oz (28 kg) |
| Dimensions (W x H x D) | | 16 7/8 x 9 3/8 x 20 3/4 inches (427 x 237 x 524 mm) | | |
| Tape speed | Betacam SX | 59.515 mm/s (525 mode), 59.575 mm/s (625 mode) | | |
| | Betacam/Betacam SP | 118.6 mm/s (DNW-A75)/<br>101.5 mm/s (DNW-A75P) | – | 118.6 mm/s (DNW-A65)/<br>101.5 mm/s (DNW-A65P) |
| Digital playback time | | Max. 194 min with BCT-194SXLA cassette | | |
| Fast forward/rewind time | | Approx. 3 min with BCT-194SXLA cassette | | |
| Search speed range | Betacam SX | ±78 times normal playback  speed | | |
| | Betacam/Betacam SP | ±35 (NTSC)/42 (PAL) times normal playback speed (except for DNW-A75/A75P) | | |
| Servo lock time | | 0.5 s or less (from standby on) | | |
| Load/unload time | | 6 s or less | | |
| **Input/output signals** | | | | |
| Analog composite input | | BNC (1 with active through out), 1.0 Vp-p, 75 Ω, sync negative | | – |
| Analog composite output | | BNC (x3, including one character out), 1.0 Vp-p, 75 Ω, sync negative | | |
| Analog component input | | BNC (x3 for 1 set, Y/R-Y/B-Y), Y:1.0 Vp-p, 75 Ω, sync negative, R-Y/B-Y:0.7 Vp-p, 75 Ω | | – |
| Analog component output | | BNC (x3 for 1 set, Y/R-Y/B-Y), Y:1.0 Vp-p, 75 Ω, sync negative, R-Y/B-Y:0.7 Vp-p, 75 Ω | | |
| SDI input | | BNC (x2, including one active through out), SMPTE 259M (ITU-R BT.656-3), 270 Mb/s | | |
| SDI output | | BNC (x3, including one active through out), SMPTE 259M (ITU-R BT.656-3), 270 Mb/s | | |
| SDTI-CP output (option) | | BNC (x2), Max. x2 speed SMPTE 326M | | |
| Analog audio input | | XLR (x4, CH1/2/3/4) | | – |
| Analog audio output | | XLR (x4, CH1/2/3/4) | | |
| Headphone output | | Standard jack (x1), stereo | | |
| Analog audio monitor output (L/R) | | XLR (x2) | | |
| Digital audio input (CH1/2, 3/4) | | BNC (x2), AES/EBU | | – |
| Digital audio output (CH1/2, 3/4) | | BNC (x2), AES/EBU | | |
| Remote control | Remote | D-sub 9-pin (x2, IN/OUT), Sony 9-pin remote interface | | |
| | RS-232C | D-sub 9-pin (x1), RS-232C interface | | |
| | Video Process | D-sub 15-pin (x1) | | |
| | Connector for Control Panel | Mini D-sub 29-pin (x1) | | |
| | Parallel Remote | 50-pin (x1) | | |
| Reference input | | BNC (x1), 0.3 Vp-p, 75 Ω, sync negative (with loop through out) | | – |
| Time code input | | XLR (x1) | | – |
| Time code output | | XLR (x1) | | |
| **Processor adjustment range** | | | | |
| Video level | | ±3 dB/∞ to +3 dB selectable | | |
| Chroma level | | ±3 dB/∞ to +3 dB selectable | | |
| Setup/Black level | | ±30 IRE/±210 mV | | |
| Chroma phase/hue | | ±30° | | |
| System sync phase | | ±15 μs | | |
| System SC phase | | ±200 ns | | |
| Y/C delay | | ±100 ns (Betacam/Betacam SP playback only) | – | ±100 ns (Betacam/Betacam SP playback only) |
| Digital video performance | | | | |
| Composite input level | | ±3 dB | | |
| Sampling frequency | | Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz | | |
| Quantization | | 8 bits/sample | | |
| Error correction | | Reed-Solomon code | | |
| Digital input to analog component output | | K-factor (2T pulse): 1% or less | | – |
| Analog component recording playback | | Input A/D quantization: 10 bits/sample<br>K-factor (2T pulse): 1% or less<br>LF non-linearity: 3.0% or less | | |
| Analog composite recording playback | | Differential gain: 2% or less<br>Differential phase: 2° or less<br>YC delay: 20 ns or less<br>K-factor (2T pulse): 1% or less | | |
| **Digital audio performance** | | | | |
| Sampling frequency | | 48 kHz (synchronized with video) | | |
| Quantization | | 16 bits/sample | | |
| Frequency response (0 dB at 1 kHz) | | 20 Hz to 20 kHz +0.5 dB/-1.0 dB | | |
| Dynamic range (at 1 kHz, emphasis ON) | | More than 90 dB | | |
| Distortion (at 1 kHz, emphasis ON, reference level) | | Less than 0.05% | | |
| Cross talk (at 1 kHz, between any two channels) | | Less than -80 dB | | |
| Wow & flutter | | Below measurable level | | |
| Head room | | 20 dB (18 dB selectable) | | |
| Emphasis (ON/OFF selectable in REC mode) | | T1=50 μs, T2=15 μs | | |
| **Supplied accessories** | | | | |
| | | PSW 4 x 16 Rack Mount Screw (x4), Operation manual (x1), Maintenance manual (x1) | | |

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