SONY

CINE ALTA™

HDCAM™



Sony Digital Recorder

HDW-S280

A Compact HDCAM recorder with 24P-recording capability – Opening New Horizons in Field and Studio HD Productions

In recent years, high-definition content creation has become increasingly commonplace in a variety of applications - from prime-time dramas, documentaries and sports, to digital cinema productions. From the outset, Sony has responded to this trend by supplying a range of HDCAM products, and by offering the stunning 24P-recording format, recognized by the CineAlta name.

In line with this commitment, Sony has now added the HDW-S280 compact recorder – the first affordable HDCAM deck to offer 24P-recording capability.

Packed into a compact half-rack-wide chassis only 3U high, the HDW-S280 recorder provides an assortment of features, such as interlace/progressive switchable recording with selectable frame rates, legacy playback of Betacam SX, Betacam SP and Betacam tapes, and up-/down-conversion capabilities.

Despite its small size, the HDW-S280 front panel incorporates a 3.5-inch* 16:9 color LCD display for monitoring video, VTR status and setup menus. And, for enhanced installation flexibility, the unit can be AC, DC or battery driven.

With such a rich set of features built into an extremely mobile design, the HDW-S280 recorder offers new opportunities in a range of field and studio HD productions.

* Viewable area, measured diagonally



Main Features

High-Definition Pictures Using the HDCAM Format

The HDW-S280 recorder* adopts the proven HDCAM format to record 1920 x 1080 resolution, high-definition component digital signals. The HDCAM format uses an extremely intelligent compression scheme with a video bit rate of 140 Mb/s (data rate on tape of 185 Mb/s). This allows the format to integrate superb picture quality onto a highly robust and cost-effective 1/2-inch tape with a design inherited from the Betacam Series.

* The HDW-S280 recorder accepts S-cassette only.

Interlace/Progressive Switchable Recording and Playback

An important element that makes the HDW-S280 so versatile is its ability to record and play back material recorded in multiple signal formats. The HDW-S280 supports both interlace and progressive recording modes with selectable frame rates; 1080/59.94i, 1080/50i, 1080/29.97PsF, 1080/25PsF, 1080/24PsF* and 1080/23.98PsF*. With the progressive recording capability, the HDW-S280 recorder can be used to acquire film-like images for movies, dramas and documentaries.

* The HDW-S280 does not offer the 3-2 pull-down capability. Therefore, 1080/24PsF and 1080/23.98PsF playback cannot be converted to 1080/59.94i and 1080/50i output.

Powerful Legacy Playback Capability

The HDW-S280 recorder is equipped with a powerful legacy playback capability for Betacam SX, Betacam SP and Betacam format tapes. This allows for flexible use of acquisition tools in the field, and easy integration into existing editing environments.

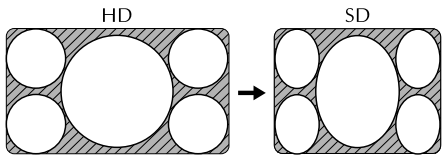


Up- and Down-conversion Capabilities with Selectable Picture Modes

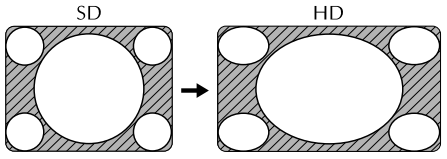
The HDW-S280 can output 480/59.94i and 576/50i signals in SD-SDI or analog composite from HDCAM playback*. It can also output 1080i signals in HD-SDI from SD legacy playback. These up- and down-conversion capabilities provide unlimited operational flexibility. When monitoring such converted signals, the picture display mode can be selected from the following depending on the type of application.

* 1080/24PsF and 1080/23.98PsF playback cannot be converted to 480/59.94i and 576/50i output.

SQUEEZE mode

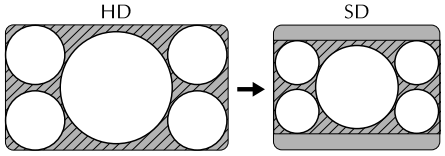


HD to SD, 16:9 HD picture is down-converted and output as a 4:3 SD picture.

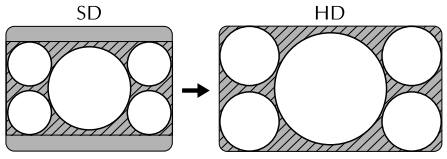


SD to HD, 4:3 SD picture is up-converted, then output as a 16:9 HD picture.

LETTER BOX mode

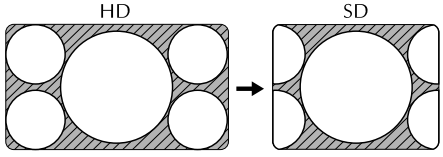


HD to SD, 16:9 HD picture down-converted to SD and output is presented in Letter-box on a 4:3 monitor.

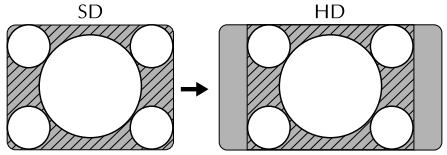


SD to HD, 4:3 SD picture is cropped and presented as a 16:9 picture.

EDGE CROP mode



HD to SD, edges of a 16:9 HD picture are cropped in the down-converted 4:3 SD picture.



SD to HD, 4:3 SD picture up-converted as a 16:9 HD picture, however the sides are cropped.

Operational Features

Highly Compact and Portable Design

The HDW-S280 recorder is characterized by its highly compact and lightweight design, allowing for use in the field, and in confined spaces ranging from OB trucks and helicopters to nonlinear editing desktops. The unit is only 3U high and has a half-rack width, and weighs just 6.0 kg (13 lb 4 oz). A carrying handle at the top and a tilt stand further enhance its mobility and field operability.



User-friendly Control Panel Design

The control panel of the HDW-S280 is compact yet easy to use, providing good access to each VTR control. A Jog/Shuttle dial is provided for quick and precise picture search operations. The HDW-S280 recorder is also equipped with a 3.5-inch* 16:9 color LCD display, allowing users to view playback material and VTR setup menus without the use of an external video monitor – a feature especially convenient for field operations. At the push of a button, the LCD panel's display mode can be easily switched between video monitor with superimposed time code and audio level meters, or system status/menu control mode. Dedicated audio control knobs are also provided on the compact front panel.

* Viewable area measured diagonally.



System status view



Front Panel (Video Monitor View)

AC/DC or Battery-powered Operation

The HDW-S280 recorder can operate on AC, DC and battery* power, greatly increasing its flexibility for field productions. The recorder also achieves low power consumption, enabling up to 80 minutes of operating time using the optional BP-GL95 battery.

* To use with a battery, the optional BKP-L551battery adaptor is required.



HDW-S280 with BP-GL95 battery

Back-space and Assemble Editing Functions

The HDW-S280 recorder provides two types of editing capabilities. An automatic backspace editing with instant-start feature allows sequential recording, without picture interference at transition points. In addition, assemble editing – including two-machine editing – is also possible*.

* Frame accuracy is ±1 frame.

Sequential Recording Function

The HDW-S280 recorder provides recording of up to 50 (24PsF)/48 (50i)/40 (59.94i) minutes on an S-sized cassette. Should a longer record time be required, two decks can be connected to record across two tapes without a break in the recording. When the tape remaining time of one deck reaches two minutes, the other deck automatically starts recording. Since the tape in the deck on standby can be exchanged while the other deck is recording, a limitless recording time can also be achieved.

Search Functions – Jog and Shuttle Modes

The HDW-S280 recorder delivers recognizable color pictures in shuttle mode at speeds of up to ±10 times normal playback. Jog operation is also possible, at up to ±1 time normal playback speed.



Versatile Interfaces

The HDW-S280 recorder features a wide range of interfaces including:

- HD-SDI input and output
- SD SDI output
- Analog composite output
- Analog audio input and output
- Analog audio monitor output
- Reference input
- Time code input and output
- RS-422 9-pin remote interface

Easy Setup Using "Memory Stick™" Media

Operators can store and recall VTR setup parameters onto optional Memory Stick media, enabling quick and consistent setup of multiple VTRs.



Metadata Recording

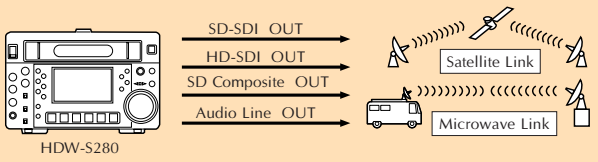
The HDW-S280 recorder is capable of recording metadata including UMID (Unique Material IDentifier) and shot marks, which are used for quick cue-up to scenes of interest. This metadata capability improves overall efficiency across the production process.



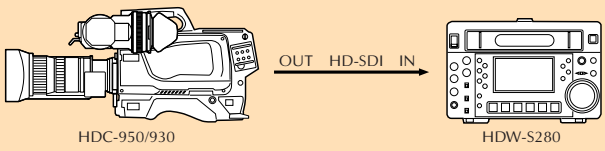
Rear Panel

System Configurations

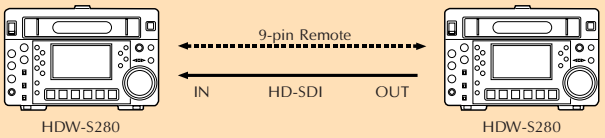
Transmission



Acquisition

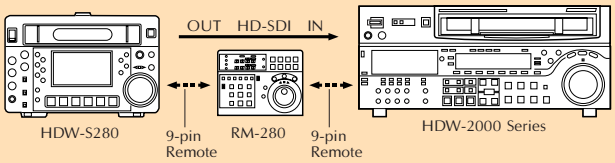


Two-machine Editing

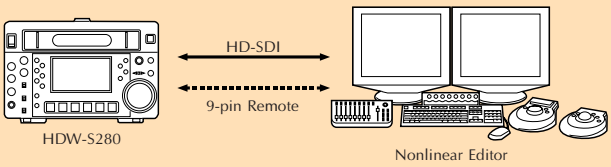


∗ Assemble editing only. Frame accuracy is ±1 frame.

Editing with RM-280 Editing Controller



Nonlinear Editing



Optional Accessories



BCT-6HD/12HD/22HD/32HD/40HD,
HDCAM Tape Cassette



BCT-HD12CL,
Cleaning Cassette



RCC-5G,
9-pin Remote Cable



HKDV-900,
HD Digital Video Controller



RM-280,
Editing Controller



BKP-L551,
Battery Adaptor



BP-GL95/GL65,
Lithium-ion Battery Pack



BP-M100/M50,
Nickel Metal Hydride Battery Pack



BC-M150,
Battery Charger



BC-L70,
Battery Charger

Specifications

General	Power requirements		100 to 240 V, 50/60 Hz
	Power consumption		80 W (AC operation), 60 W (DC operation)
	Operating temperature		+5 to +40 °C (41 to 104 °F)
	Storage temperature		-20 to +60 °C (-4 to +140 °F)
	Humidity		25 to 80%
	Mass		6 kg (13 lb 4 oz)
	Dimensions (W x H x D)		210 x 132 x 425 mm (8 3/8 x 5 1/4 x 16 3/4 inches)
	Tape speed	HDCAM	96.7 mm/s (59.94i, 29.97PsF), 80.6 mm/s (50i, 25PsF), 77.4 mm/s (24PsF, 23.98PsF)
		BETACAM SX	59.6 mm/s
		BETACAM/BETACAM SP	118.6 mm/s (59.94i), 101.5 mm (50i)
	HDCAM Record/playback time		40 minutes (59.94i, 29.97PsF, with BCT-40HD cassette)
			48 minutes (50i, 25PsF, with BCT-40HD cassette)
			50 minutes (24PsF, 23.98PsF, with BCT-40HD cassette)
	Fast forward/rewind time		Approx. 4 minutes (fast-forward), 3 minutes (rewind)
	Search speed range	Shuttle mode	Still to ±10 times normal speed playback
		Jog mode	Still to ±1 time normal speed playback
	Servo lock time		1.0 s or less
	Load/unload time		7 s or less
Input/output	HD-SDI input		BNC x 1 (SMPTE 292M), Serial Digital (1.485 Gb/s)
	Reference video input		BNC x 2 (with a loop-through), Tri-level sync, 0.6 Vp-p, 75 Ω , sync negative or Black Burst or Composite, 0.3 Vp-p, 75 Ω , sync negative
	Analog audio input (CH 1/2)		XLR-3-pin type, female x 2, +4/0/-3/-20/-60 dBu selectable, high impedance, balanced
	Timecode input		BNC x1 (0.5 to 18 Vp-p, 10 kΩ, balanced)
	HD-SDI output		BNC x 2 (SMPTE 292M), Serial Digital (1.485 Gb/s)
	SD-SDI output		BNC x 2 (SMPTE 259M including one character out), Serial Digital (270 Mb/s)
	Analog composite output		BNC x 2 (RS-170A, including one character out) Y: 1.0 Vp-p, sync negative, R-Y/B-Y: 0.7 Vp-p, 75 Ω
	Analog audio output (CH 1/2)		XLR-3-pin type, male x 2, +4 dBm (600 Ω load), low impedance, balanced
	Timecode output		BNC x1 (1.0 Vp-p, unbalanced)
	Audio monitor output L/R		XLR-3-pin type, male x 2, +4 dBm (600 Ω load), low impedance, balanced
	Headphones		JM-60 Stereo phone jack (-∞ to -12 dBu at 8 Ω load, unbalanced)
	Remote (RS-422)		D-sub 9-pin, Sony 9-pin remote interface
	Video control		D-sub 9-pin
	DC output		Round shape 4-pin, female x 1, for RM-280 or BVR-3 controller
	Others		"Memory Stick" slot
Processor adjustment range	Video level		±3 dB/∞ to +3 dB, selectable
	Chroma level		±3 dB/∞ to +3 dB, selectable
	Set up/black level		±210 mV
	Chroma phase/hue		±30°
	System sync phase		±15 µs
	System SC phase		±200 ns
	Y/C delay		±100 ns
Digital video performance	Sampling frequency		Y: 74.25 MHz, R-Y/B-Y: 37.125 MHz
	Quantization		10 bit/sample (compression: 8 bit/sample)
	Compression		Coefficient recording system
	Channel coding		S-I-NRZI PR-IV
	Error correction		Reed-Solomon code
Analog composite output performance	Bandwidth		Y: 0 to 5.75 MHz +0.5 dB/-2.0 dB, R-Y/B-Y: 0 to 2.75 MHz +0.5 dB/-2.0 dB
	S/N ratio		53 dB or more
	Differential gain		2% or less
	Differential phase		2% or less
	Y/C delay		20 ns or less
	K Factor (2T Pulse)		1% or less
	Output SCH phase		Based upon RS-170A/CCIR R.624-3
Digital audio performance	Sampling frequency		48 kHz (Syncronized with video)
	Quantization		20 bit/sample
	Wow & flutter		Below measurable level
	Headrooms		20/18/16/12 dB selectable
	Emphasis (ON/OFF selectable in REC mode)		T1=50 µs, T2=15 µs (on/off selectable in recording mode)
Analog audio output performance	A/D quantization		20 bit/sample
	D/A quantization		20 bit/sample
	Frequency response		20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)
	Dynamic range		More than 90 dB (at 1 kHz, emphasis ON)
	Distortion		Less than 0.08% (at 1 kHz, emphasis ON, reference level)
	Crosstalk		Less than -80 dB (at 1 kHz, between any two channels)
Cue track	Frequency response		100 Hz to 10 kHz ±3 dB
	S/N ratio		More than 45 dB (at 3% distortion level)
	Distortion		Less than 2% (T.H.D. at 1 kHz, reference level)
	Wow & flutter		Less than 0.2%
	Erase ratio		More than 60 dB
Supplied accessories			Operation manual (1), Installation manual (1), Connector cap (1)

BETACAM SX playback			
Video performance	Bandwidth	Y	NTSC: 0 to 4.5 MHz +0.5 dB/-3.0 dB
			PAL: 0 to 5.5 MHz +0.5 dB/-3.0 dB
		R-Y/B-Y	0 to 2.0 MHz +0.5 dB/-3.0 dB
	S/N ratio		56 dB or more
	K factor (2T pulse)		1% or less
Audio perfomance	Frequency response		20 Hz to 20 kHz +0.5 dB/-1.0 dB (0 dB at 1 kHz)
	Dynamic range		88 dB or more (at 1 kHz, emphasis ON)
	Distortion		0.08% or less (at 1 kHz, emphasis ON, reference level (+4 dBm))

Analog BETACAM (NTSC) playback				
			Metal tape	**Oxide tape**
Video performance	Bandwidth	Y	30 Hz to 4.5 MHz +0.5 dB/-4.0 dB	30 Hz to 4.1 MHz +0.5 dB/-6.0 dB
		R-Y/B-Y	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB	30 Hz to 1.5 MHz +0.5 dB/-3.0 dB
	S/N ratio	Y	51 dB or more	48 dB or more
		R-Y/B-Y	48 dB or more	45 dB or more
	K-Factor (2T Pulse)		2% or less	3.5% or less
	LF non-linearity	Y	3% or less	3% or less
		R-Y/B-Y	4% or less	4% or less
	Y/C delay		20 ns or less	20 ns or less
Audio performance	LNG	Frequency response	50 Hz to15 kHz +1.5 dB/-3.0 dB	50 Hz to15 kHz ±3.0 dB
		S/N ratio	72 dB or more	50 dB or more (Dolby NR off)
		T.H.D.	1.5% or less	2% or less
		Wow & flutter	0.2% or less	0.2% or less
Analog BETACAM (PAL) playback				
			Metal tape	**Oxide tape**
Video performance	Bandwidth	Y	25 Hz to 4.5 MHz +0.5 dB/-4.0 dB	25 Hz to 4.1 MHz +0.5 dB/-6.0 dB
		R-Y/B-Y	25 Hz to 1.5 MHz +0.5 dB/-3.0 dB	25 Hz to 1.5 MHz +0.5 dB/-3.0 dB
	S/N ratio	Y	48 dB or more	46 dB or more
		R-Y/B-Y	48 dB or more	45 dB or more
	K-Factor (2T Pulse)		2.5% or less	4% or less
	LF non-linearity	Y	3% or less	3% or less
		R-Y/B-Y	4% or less	4% or less
	Y/C delay		20 ns or less	20 ns or less
Audio performance	LNG	Frequency response	50 Hz to 15 kHz +1.5 dB/-3.0 dB	50 Hz to15 kHz 3.0 dB
		S/N ratio	68 dB or more	62 dB or more (Dolby NR off)
		T.H.D.	1.5% or less	2% or less
		Wow & flutter	0.2% or less	0.2% or less

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