

SRW-5000/5500/5800

HD Digital Videocassette Recorder



SONY

www.sonybiz.net/hdcamsr



CAI
CINEALTA™

HDCAM SR™



CINEALTA™ LIBERATING MOVIE MAKERS

CineAlta — a name that proudly symbolises the bond between cinematography and Digital high definition imaging. It distinguishes a Sony family of products and systems that offer new levels of creativity in the production, post-production and exchange of motion pictures. It also brings together the quality and universality of 24-frame cinematography with the real-time capabilities, efficiency and flexibility of Digital high definition technology. And it stimulates the convergence of Motion Picture Film and Digital high definition production on a global basis.

CineAlta products, delivering cinema-quality pictures at selectable frame rates, are simplifying International Programme Exchange by minimising the need for standards conversion. They are also opening up entirely new possibilities for international co-production. Movie making has been liberated by the creative empowerment of the cinematographer. It is facilitated by real-time HD image evaluation on-set, instant replay of full-colour high resolution digital "takes," real-time image optimisation while shooting, a 50-minute shooting load and most importantly, by the significant cost-benefits associated with this digital medium.

CineAlta products provide a seamless bridge between 24-frame film originals and a final 24P digital master, giving each frame of film a one-to-one correspondence with progressive HD frames. The CineAlta environment readily interfaces with the computer graphics world, liberating post-production. And the final liberation is achieved through the direct colour conversion of progressive 24P masters to film and to a host of other international digital HDTV and SDTV distribution formats.

HDCAM SR VTRS — SOLID CHOICE FOR TODAY AND TOMORROW

TODAY'S ENVIRONMENT

Today, content is distributed in diverse formats and via diverse channels such as D-Cinema, cell phones and international content syndication. In this environment, it is critical that the content owner produces and stores valuable content at the highest possible quality levels, in order to guard against multi-compression artifacts and to prolong content longevity. It is also important to store prime content on optimum media. Video tapes remain the most cost-effective and extremely reliable, digital storage medium. The Sony HDCAM SR™ VTR – at the pinnacle of the Sony digital HD VTR lineup – meets all of these vital criteria. It is the best possible choice for today and tomorrow and a solution that is worth more than the investment itself.

DIGITAL CINEMA INNOVATION

The epoch-making launch of the Sony HDW-F900 CineAlta camcorder introduced a new, innovative way to produce movies using 24-frame-based video. Today, a number of films are produced digitally using this method. Premium digital cinema cameras including Arriflex D20, Panavision Genesis™ and Sony F35/F23 cameras all record on the HDCAM SR portable VTR. 3D live action content such as features and concerts are also recorded onto HDCAM SR recorders with 3D camera rigs based on Sony camera technology. The combination of RGB imaging and the operational convenience of real-time recording and playback has empowered cinematographers and directors to create images that could not be achieved with traditional technologies.

TV

Over 5000 units of HDCAM SR VTRs are in use worldwide. Key factors in this widespread adoption are visually lossless compression (4:2:2) and 12-channel audio recording. Also, despite extremely high bit-rate HDCAM SR recording, these decks are extremely robust and as equally bullet-proof as other Sony 1/2-inch VTRs such as the proven BETACAM™ and Digital BETACAM™. In fact, a host of stations now go on-air directly from the HDCAM SR deck. In non-linear-based environments, the HDCAM SR deck plays a vital role, enabling high-speed material transfer at twice normal speed between the deck and servers or non-linear editing systems via a Dual-link HD-SDI interface. Yet, transfer via the HD-SDI provides greater reliability than via normal computer networks which are vulnerable to unpredictable network traffic problems.

LOOKING AHEAD TO THE FUTURE

For years, Sony has had a vision of providing a total 1080 50P/60P production tool set ranging from camera and switcher to VTR and display. With the latest remarkable developments in consumer display technology, the general public can now watch 1080 50P/60P progressive imagery in the living room. Due to limitations in aerial transmission bandwidth, it's likely that 1080-interlaced and 720-progressive transmission standards will co-exist into the foreseeable future. With this in mind, Sony is giving on-going support to 1080 50P/60P-based production as the ideal production solution for premium content such as sports, concerts and documentaries.

For ODS (Other Digital Stuff: alternative content to feature movies) – and in particular the recently discussed large-venue screening issues including digital cinema – HDCAM SR products offer key capabilities such as extreme image quality and 12-channel audio.

Last but not least, 4K digital projection has been making in-roads into premium theatres. In future, 4K content production will grow rapidly. However, right now, 4K Digital Intermediate is an engineering challenge for post-production facilities that are struggling to secure processing/network bandwidth/storage space. HDCAM SR VTRs provide the solution with outstanding capabilities such as 4K uncompressed data recording onto tape and conversion of 4K image file recording to HD video recording. These capabilities serve to significantly lower the barriers to handling 4K image files.

Simply put, choosing HDCAM SR VTRs means that the future is assured.



SRW-5500



SRW-5000



SRW-5800

FEATURES AND **BENEFITS**



HDCAM SR FORMAT RECORDING

1080 RECORDING AND PLAYBACK

The SRW-5000/5500/5800 records full HD images with exceptionally high picture quality using 1080 x 1920 active pixels as specified by the ITU Common Image Format (CIF). The entire range of both interlaced and progressive frame rates is available, from 50i/60i and 24/25P through to 50P/60P*, covering high-end HDTV production applications and commercial and cinema productions.

The SRW-5000/5500/5800 records top-quality 4:2:2 Y/Cb/Cr component or full-bandwidth 4:4:4 (RGB) 10-bit recordings**, both with very mild compression.

The SRW-5000/5500/5800 also offers up to 12 channels of 24-bit audio at 48 kHz, to meet the needs of the most demanding audio recording tasks in digital-content mastering. Each channel is independently editable.

The SRW-5000/5500/5800 is the optimal VTR for any movie-making task – from acquisition and editing to telecine transfers and digital mastering.

* The 50P/60P recording capability is available on the SRW-5800 with the optional HKSR-5803HQ board.

**The 4:4:4 recording capability is available on the SRW-5000/5500 with the optional HKSR-5003 board or the SRW-5800 with the optional HKSR-5803SQ/5803HQ board.

720P RECORDING AND PLAYBACK

In standard configuration, the SRW-5000/5500/5800 also records in 4:2:2 720/59.94P or 720/50P formats. These formats can be used for DTV programming and transmission applications. As with the 1080 format, users still have up to 12 channels of independently editable 24-bit audio available when operating in 720P format. In addition, 720P/1080i and 720P/480i or 576i bidirectional format conversion can be accomplished in these VTRs.

DOUBLE-DATA-RATE RECORDING (SRW-5800 ONLY)

The SRW-5800 provides a recording capability at a high data rate of 880 Mb/s with the addition of the optional HKSR-5803HQ board. This was only previously available on the SRW-1 HDCAM SR Portable VTR. With this high bit rate of 880 Mb/s, high-quality recording is available in three different recording modes: 4:2:2/1080/60P and 50P mode, 4:4:4 High Quality (HQ) mode and Dual Stream mode.

4:2:2/1080/60P and 50P Mode

The 4:2:2/1080/60P and 50P recording mode is highly compatible with computer graphics, games and other progressive-based programmes such as demonstration reels for flat-panel displays. Material with a lot of fast-moving scenes like sports is well suited to the 4:2:2/1080/60P and 50P mode. Also, when converting material originated in 1080/60P or 50P format to 720P format, this mode offers exceptional picture performance due to the original high resolution of 1920 x 1080. Another benefit of using the 4:2:2/1080/60P and 50P recording mode is that it enables image creation with extremely high-quality slow-motion effects.

4:4:4 High Quality (HQ) Mode

The 4:4:4 High Quality (HQ) mode enables 880 Mb/s 4:4:4 RGB recording with a milder compression ratio of 2:1. This is ideal when highest possible image quality is the top priority.

Dual Stream Mode

The Dual Stream mode enhances flexibility and creative versatility. This mode allows the SRW-5800 to record the images of two cameras simultaneously, making it possible for users to shoot two different scenes simultaneously or achieve 3D stereo shooting. The SRW-5800 can also play back material shot in Dual Stream mode with the SRW-1.

Supported Recording Signal Formats

System Format	Signal Format	Frame Rate	Recording Mode	SRW-5000 SRW-5500	SRW-5800
1080	4:2:2	60/59.94/50P	Double-data-rate (880 Mb/s)	—	●*
		30/29.97/25 /24/23.98PsF 60/59.94/50i	Standard (440 Mb/s)	●	●
		30/29.97/25 /24/23.98PsF 60/59.94/50i (Dual Stream)	Double-data-rate (880 Mb/s)	—	●*
	4:4:4 HQ	30/29.97/25 /24/23.98PsF 60/59.94/50i	Double-data-rate (880 Mb/s)	—	●*
	4:4:4 SQ	30/29.97/25 /24/23.98PsF 60/59.94/50i	Standard (440 Mb/s)	●**	●***
720	4:2:2	59.94/50P	Standard (440 Mb/s)	●	●

*Requires optional HKSR-5803HQ board.

**Requires optional HKSR-5003 board.

***Requires optional HKSR-5803SQ or HKSR-5803HQ board.

HIGH-SPEED MATERIAL TRANSFER

The SRW-5800 with the optional HKSR-5803HQ Advanced HQ Processor board allows single stream 4:2:2 material to be transferred to servers and non-linear editing systems at twice the normal speed using a standard Dual-link HD-SDI interface. This is achieved by playing back tapes at 880 Mb/s (double the recorded 440 Mb/s speed) and transferring the data using two linked HD-SDI cables. This capability can greatly reduce the time required for material ingest.

HDCAM FORMAT* RECORDING (SRW-5500 ONLY)

In addition to the HDCAM SR format, the SRW-5500 enables HDCAM™ recording and playback in all frame rates specified by the HDCAM format, including 1080/23.98, 24, 25, 29.97, 30PsF and 1080/50, 59.94, 60i. It supports the full editing capability of HDCAM format recordings, including independent editing of the four audio channels.

This HDCAM recording capability offers a cost-effective yet high-quality alternative, operating in the full quality of the industry-standard Common Image Format (CIF).

* The HDCAM format does not support 720P recording and RGB 4:4:4/1080 recording.

INTERNAL FORMAT CONVERSION

The SRW-5000/5500/5800 is equipped with an internal down converter that provides SDTV outputs from 1080 and 720 recordings. By adding optional plug-in boards, users can give the SRW-5000/5500/5800 extended format-conversion capabilities such as 2-3 pull-down, conversion from 1080 to 720 and vice versa and 4:2:2 to 4:4:4 and vice versa. For further details, please refer to the format conversion chart on page eight.

LEGACY PLAYBACK

Not only is the SRW-5000/5500/5800 an affordable VTR for use in digital cinematography and high-end HD production, it also provides a smooth migration path for organisations with legacy systems by retaining current acquisition tools and archives in action. The SRW-5000/5500/5800 can play back HDCAM and Digital BETACAM* tapes, making it an ideal and cost-effective solution for facilities involved in demanding high-end film and HD work.

*Please refer to the Supported Formats table.

Supported Formats

	Recording Format	Playback Format (Standard)	Playback Format (Option)
SRW-5800	HDCAM SR	HDCAM SR	HDCAM Digital BETACAM (HKSR-5802)
SRW-5500	HDCAM SR HDCAM	HDCAM SR HDCAM	Digital BETACAM (HKSR-5002)
SRW-5000	HDCAM SR	HDCAM SR HDCAM	Digital BETACAM (HKSR-5002)
SRW-1	HDCAM SR	HDCAM SR	—



LONG RECORDING TIME ON A SINGLE CASSETTE*

Utilising the technologically advanced HDCAM SR format's high-density recording capability and compression technology, the SRW-5000/5500/5800 is capable of recording up to 155 minutes at 1080/24PsF and up to 124 minutes at 1080/59.94i or 720/59.94P on a single L-sized cassette. S-sized cassettes can also be used, offering up to 50 minutes of recorded material at 1080/24PsF and up to 40 minutes at 1080/59.94i or 720/59.94P.

* When the SRW-5500 records in HDCAM format, it provides the same recording times as in HDCAM SR format.

EASY MAINTENANCE

Drum maintenance is always a concern for VTR users. As with most Sony VTRs, the SRW-5000/5500/5800 drum assembly has been designed with an auto-adjustment function, so that maintenance can be performed in minimal time.

USER-FRIENDLY CONTROLS

The front control panel of the SRW-5000/5500/5800 is extremely user friendly, with a design and functionality inherited from the widely used HDW-F500. In addition, the control panel has a large 6.4-inch* type LCD display that provides comprehensive information. These include colour thumbnails for quick location of parameters, which is used in combination with eight menu buttons placed along the side of the display.

* Viewable area measured diagonally.



OPERATIONAL FEATURES



DIGITAL JOG SOUND

In Jog mode, all 12 audio digital channels of the HDCAM SR format or all four channels of the HDCAM format can be reproduced with a responsiveness and sound quality reminiscent of analogue audio. This feature is essential to quickly and precisely establish an editing point while monitoring digital audio signals which remain synchronised with the pictures.

DYNAMIC MOTION CONTROL (DMC) PLAYBACK*

The SRW-5000/5500 also provides a DMC playback capability, memorising tape-speed trajectory over the dynamic tracking-speed range (-1 to +2 times normal speed).

* The SRW-5800 does not support this capability for HDCAM SR format.

PRE-READ EDITING*

The SRW-5000/5500 is equipped with advanced playback heads that allow pre-read editing, enabling functions such as titling and voice-over with a single VTR.

* The SRW-5800 does not support this capability.

FRAME-ACCURATE INSERT/ASSEMBLE EDITING

The SRW-5000/5500/5800 recorder is capable of insert or assemble editing with frame accuracy. Each channel of video and audio is independently editable and users can execute precise editing on HDCAM SR or HDCAM* tapes in machine-to-machine or A/B roll configurations.

* SRW-5500 only

HIGH-SPEED COLOUR PICTURE SEARCH

The SRW-5000/5500/5800 provides recognisable colour pictures in Shuttle mode at speeds of up to 42 times normal playback for HDCAM SR format* and at speeds of up to 50 times normal playback for HDCAM and Digital BETACAM formats.

* When recorded with Double-data-rate mode, the speed is 1/2.

NOISELESS PICTURE PLAYBACK

The SRW-5000/5500 comes with a Dynamic Tracking™ playback capability that provides high-quality pictures in a range of -1 to +2 times normal playback speed during the playback of HDCAM SR tapes, while the SRW-5800 provides -0.5 to +1 with Non Tracking.

Noiseless Picture Playback Capability

	SRW-5000/5500	SRW-5800
HDCAM SR	-1 to +2 (DT)	-0.5 to +1 (NT)
HDCAM	-1 to +2 (DT)	-1 to +2 (DT)
Digital BETACAM	-1 to +3 (DT)	-1 to +3 (DT)

DT: Dynamic Tracking
NT: Non-Tracking

CONFIDENCE PLAYBACK

Separate dedicated playback heads immediately follow the recording heads so that actual audio and video recorded to tape can be monitored while recording. Confidence playback can be used to verify the quality of a recording without interrupting production.

PROGRAM PLAY FUNCTION WITH AUDIO PITCH CORRECTION*

The SRW-5000/5500 has a Program Play function** that allows video recordings to be played back at up to ±5% normal speed, with appropriate audio pitch correction. These VTRs also perform audio pitch correction at up to ±5% when playing back tapes recorded at a frequency different to the one set for system playback in the VTR***.

* The SRW-5800 does not support this capability.

** The Program Play function requires the optional HKSR-5001 board and is available when the VTR is set to 4:2:2/1080/59.94i or 4:2:2/720/59.94P mode.

*** Available only when the difference of these frequencies is within 5% (23.98 frames ↔ 24 frames, 23.98/24 frames ↔ 25 frames or 29.97 frames ↔ 30 frames).

AUDIO OUTPUT CHANNEL SELECTION

The SRW-5000/5500/5800 is equipped with a unique internal audio-output router, which enables flexible audio-output channel routing without the use of an external audio-routing device. Any channel from the 12* available on HDCAM SR tape can be assigned to the HD-SDI (Ch 1-12) and SDI (Ch 1-8) embedded audio-output channels. This feature provides the flexibility needed when recording audio to different tape formats.

*Four channels on HDCAM/Digital BETACAM tape.

DUAL-SYNC OPERATION

A unique feature of the SRW-5000/5500/5800 allows users to seamlessly integrate the VTR into a 59.94 editing environment. In doing so, users can directly perform insert editing – from a 23.98PsF master tape to either a 1080/59.94i or a 525/59.94i recording – without having to first dub the master to 59.94 format. This is achieved by supplying dual reference signals, one to lock the servo of the SRW-5000/5500/5800 to a 23.98-Hz signal and one to lock the playout circuitry to a 59.94-Hz reference signal.

OFF-SPEED PLAYBACK CAPABILITY

In order to play back material at different speeds for applications such as slow-motion or fast-motion, the SRW-5000/5500/5800 is equipped with a built-in off-speed playback capability.

HDCAM SR Off-speed Playback Capability

4:2:2 mode

Recorded tape	System setting	HD-SDI OUTPUT									
		1080					720				
		23.98PsF	24PsF	25PsF 50i	29.97PsF 59.94i	30PsF 60i	50P	59.94P	60P	50P	59.94P
1080	23.98PsF	●	●	▲	▲	▲	◆	◆	◆	-	-
	24PsF	●	●	▲	▲	▲	◆	◆	◆	-	-
	25PsF	▲	▲	●	▲	▲	◆	◆	◆	-	-
	50i	▲	▲	▲	●	●	◆	◆	◆	-	-
	29.97PsF 59.94i	▲	▲	▲	●	●	◆	◆	◆	-	-
	30PsF 60i	▲	▲	▲	●	●	◆	◆	◆	-	-
	50P	◆	◆	◆	◆	◆	●	▲	▲	-	-
	59.94P	◆	◆	◆	◆	◆	▲	●	●	-	-
	60P	◆	◆	◆	◆	◆	▲	●	●	-	-
720	50P	-	-	-	-	-	-	-	-	●	▲
	59.94P	-	-	-	-	-	-	-	-	▲	●

4:4:4 mode

Recorded tape	System setting	HD-SDI OUTPUT				
		1080				
		23.98PsF	24PsF	25PsF 50i	29.97PsF 59.94i	30PsF 60i
1080	23.98PsF	●	●	▲	▲	▲
	24PsF	●	●	▲	▲	▲
	25PsF	▲	▲	●	▲	▲
	50i	▲	▲	▲	●	●
	29.97PsF 59.94i	▲	▲	▲	●	●
	30PsF 60i	▲	▲	▲	●	●

● Normal playback
 ● 0.1% off-speed playback
 ▲ Video and Audio off-speed playback
 ◆ Video off-speed playback
 ◆ Video off-speed playback (23.98/24/25/29.97/30 PsF recorded tape only) RGB 4:4:4 HQ mode and RGB 4:4:4 SQ mode are incompatible. SRW-5000/5500 does not support RGB 4:4:4 HQ mode.

PLAYBACK OF TAPES RECORDED BY SRW-1

The SRW-5000/5500/5800 VTR is capable of playing back tapes recorded by the SRW-1 recorder in the following unique modes:

- Dual Stream mode: The SRW-5800 can play back material shot by the SRW-1 in Dual Stream mode. The SRW-5000/5500 can play back either channel A or channel B of Dual Stream 4:2:2 recording. The stream to be played back is user selectable via the menu.
- 1080/4:2:2/60P mode*: The SRW-5000/5500/5800 can play back a 1080/60P tape in 24P, 25P and 30P mode, producing the desired slow-motion effect in playback at normal speeds. It is also possible to play 60P recordings in normal speed by playing back every other frame, so only 30 frames in total are played back. The SRW-5800 can also play back in 1080/60P mode, offering smooth pictures for playing back fast-moving scenes.
- Select FPS mode*: The SRW-5000/5500/5800 can play back a tape recorded with the Select FPS function at 24P, 25P and 30P mode, both in 4:2:2 and 4:4:4, producing the desired slow- and fast-motion effect in playback at normal speeds.

* For material recorded in this mode, audio playback is not available.

STORAGE OF SETUP/SYSTEM MENUS IN VTR MEMORY BANKS

The SRW-5000/5500/5800 VTR allows operators to effectively manage its menus using VTR memory banks. Up to eight groups of parameters in the System Menu and Setup Menu can be individually saved in the VTR's internal memory as a bank memory. They can also be saved onto Memory Stick™ media, enabling these groups of parameters to be copied onto other SRW-5000/5500/5800 VTRs for quick and consistent setup of multiple VTRs*. The operator can select a suitable name for each bank memory.

* This capability is not fully supported when exchanging data between the SRW-5000/5500 and SRW-5800.

ETHERNET-BASED BANK MEMORY SELECTION

An Ethernet interface is provided on the SRW-5000/5500/5800 VTR, enabling operators to remotely set up VTRs using a standard web browser on a PC. The VTR automatically generates SRW.html files that indicate the bank settings currently saved on the VTR. By accessing the VTR via an Ethernet interface, operators can see the parameters in each of the listed bank memories and select a bank they want to use.

INTERNAL FORMAT CONVERSION CAPABILITY

REC/PLAYBACK TAPE FORMAT			HD-SDI OUT		SD-SDI OUT	HD-SDI (format conv. out) (requires optional HKSR-5001)	
HDCAM SR	1080/4:4:4 SQ** HQ****	23.98PsF	1080/4:4:4	23.98PsF	—	1080/4:2:2/23.98PsF	
		24PsF		24PsF	—	1080/4:2:2/59.94i	
		25PsF		25PsF	625/50i*	1080/4:2:2/24PsF	
		29.97PsF		29.97PsF	525/59.94i*	1080/4:2:2/60i	
		30PsF		30PsF	—	1080/4:2:2/25PsF	
		50i		50i	625/50i*	720/4:2:2/50P	
		59.94i		59.94i	525/59.94i*	1080/4:2:2/29.97PsF	
		60i		60i	—	720/4:2:2/59.94P	
		1080/4:2:2****		50P	1080/4:2:2	50P	625/50i*
	59.94P	59.94P	525/59.94i*	59.94P	525/59.94i*	1080/4:2:2/59.94i	
	60P	60P	—	60P	—	1080/4:2:2/60i	
	720/4:2:2	50P	720/4:2:2	50P	625/50i	1080/4:2:2/50i	
	59.94P	59.94P	525/59.94i	59.94P	525/59.94i	1080/4:2:2/59.94i	
	HDCAM SR or HDCAM	1080/4:2:2	23.98PsF	1080/4:2:2	23.98PsF	—	1080/4:2:2/23.98PsF
			24PsF		24PsF	—	1080/4:2:2/59.94i
25PsF			25PsF		625/50i	720/4:2:2/60i	
29.97PsF			29.97PsF		525/59.94i	1080/4:4:4/24PsF	
30PsF			30PsF		—	720/4:2:2/50P	
50i			50i		625/50i	1080/4:4:4/25PsF	
59.94i			59.94i		525/59.94i	720/4:2:2/59.94P	
60i			60i		—	1080/4:4:4/29.97PsF	
50i			50i		625/50i	1080/4:4:4/30PsF	
59.94i			59.94i		525/59.94i	720/4:2:2/50P	
Digital BETACAM***	625	50i	1080/4:2:2	50i	625/50i	720/4:2:2/50P	
		720/4:2:2	50P	—	1080/4:4:4/50i		
	525	59.94i	1080/4:2:2	59.94i	525/59.94i	1080/4:2:2/50i	
		720/4:2:2	59.94P	—	720/4:2:2/59.94P		

SRW-5800 only.

* Requires optional HKSR-5001 board.

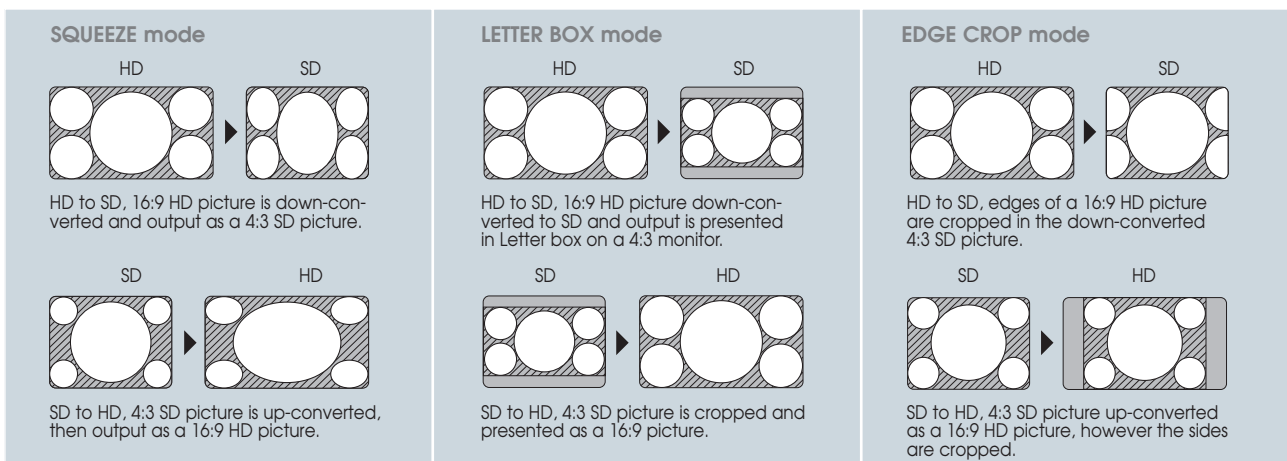
** Requires optional HKSR-5003 board for SRW-5000/5500 or HKSR-5803SQ board for SRW-5800.

*** Requires optional HKS 5002 board for SRW-5000/5500 or HKSR-5802 board for SRW-5800.

**** SRW-5800 only. Requires optional HKSR-5803HQ board.

SELECTABLE PICTURE MODES

Three modes of operation, SQUEEZE, LETTER BOX and EDGE CROP, are available to provide correct presentation for each application type.



VERSATILE INTERFACES

The SRW-5000/5500/5800 features a wide range of interfaces including:

- HD-SDI I/O
- HD-SDI (format conversion) out
- SD-SDI out
- SD composite out
- AES/EBU digital audio I/O
- Analogue audio out (one to four channel): for SRW-5000/5500 only
- Analogue audio monitor out
- Analogue monitor out(cue)
- Analogue audio in(cue): for SRW-5500 only
- Ethernet port
- RS-422 9-pin and 50-pin control interfaces
- Video control



SRW-5500 Rear Panel



SRW-5800 Rear Panel

BUILDING AN INNOVATIVE WORKFLOW WITH THE SRW-5800 NETWORK CAPABILITY

The SRW-5800 provides a highly advanced network capability with the addition of the optional HKSR-5804 board*, introducing a new network-based workflow to the DI (Digital Intermediate) domain, along with higher levels of efficiency.

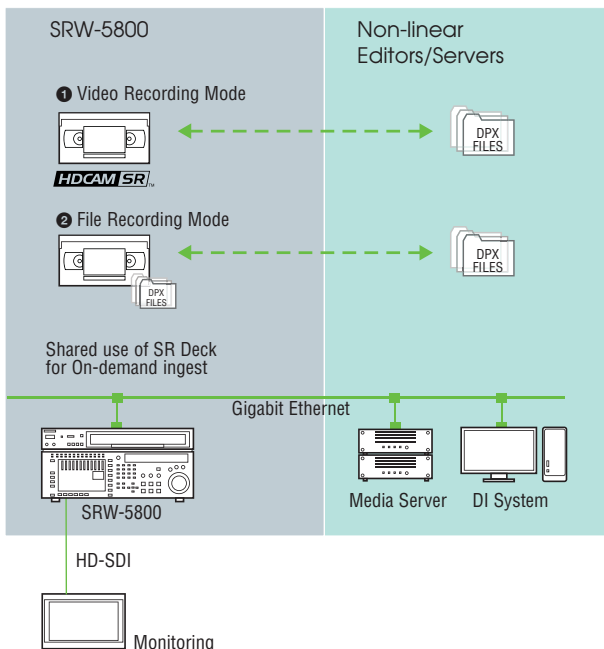
This capability comprises a variety of unique and powerful functions, such as DPX file conversion to and from the HDCAM SR HD video format, as well as 2K (2048 x 1556)/4K (4096 x 3112) uncompressed data recording. Gigabit Ethernet is supported on the SRW-5800, allowing fast transfer of even the largest files.

The SRW-5800 mounts a shared drive over a GbE network. In this case, no special driver software or application is required and the major operating systems including Microsoft Windows, Linux and Macintosh are supported. Users can simply utilise a normal Internet browser for control.

DPX FILE IMPORT/EXPORT

The SRW-5800 in this configuration can create DPX files while playing back an HDCAM SR tape and can directly transfer these files to PCs, workstations or servers on the network. Conversely, DPX files from a networked device can be recorded to the SRW-5800 in HDCAM SR video format. These capabilities eliminate the need for external video to data conversion interfaces.

Networked System



4K/2K TO HD RESIZING

The SRW-5800 recorder allows 4K/2K files transferred from other devices to be resized to 1920 x 1080 and recorded in HDCAM SR format.

4K/2K UNCOMPRESSED DPX DATA RECORDING

The SRW-5800 can also record uncompressed 4K/2K DPX data as image data onto an HDCAM SR tape. It can record DPX data of flexible image size on the tape, from HD to Maximum up to 4K full-aperture (4096 x 3112) size. These tapes are therefore a suitable interchange medium between DI facilities. While ingesting data files from the tapes, users can monitor the 4K/2K images on an HD display thanks to the resizing function.

SRW-5800 Option Configuration

Option Configuration	SR Video (4:2:2)	SR Video (4:4:4)	Uncompressed 2K/4K DPX File
HKSR-5804*	Yes	No	No
HKSR-5804* + HKSR-5803SQ*	Yes	Yes (SQ)	No
HKSR-5804* + HKSR-5803HQ*	Yes	Yes (SQ/HQ)	Yes

* Planned to be available in Autumn 2008.

HDCAM SR FAMILY

SRW-1/SRPC-1

The SRW-1 HD Portable Digital Video Recorder with the SRPC-1 HD Video Processor is the one recorder in the HDCAM SR lineup created specifically to support digital production. A major characteristic of the SRW-1 is its highly portable size, yet it has stunning recording capabilities: 1080 50P/60P, SR Motion and RGB 4:4:4 recording. This VTR is designed to be dockable on the F35 and F23 Digital Cinema Camera, establishing a cable-free and portable full-bandwidth 4:4:4 capturing system.

FEATURES

- Full-bandwidth RGB 4:4:4 recording
- 1080 50P/60P recording
- Dockable with the F35/F23* camera
- Variable frame rate image recording — from 1 fps to 60 fps both in 4:2:2 and 4:4:4 mode
- 720P recording and playback
- 12 channels of 24-bit audio
- Highly compact and portable design

* When the SRW-1 is docked with the F35/F23 camera, the SRPC-1 is not connected.



SRW-1 with SRPC-1

F35/F23 DIGITAL CINEMATOGRAPHY CAMERAS

The F35/F23 are Sony's inspiring Digital Cinematography Cameras which provide impressive image quality with intuitive operation familiar to film camera users. Both cameras can be docked directly onto the SRW-1 recorder, establishing a highly compact, lightweight and cable-free camera for a high level of mobility in shooting.

The F35 uses one super 35-mm sized CCD and utilises the PL lens mount system, while the F23 uses three 2/3-inch type CCDs with the Bayonet mount.

FEATURES

- Full-bandwidth RGB 4:4:4 HD digital image capturing
- Dockable with the SRW-1
- Variable frame rate image capturing – from 1 fps to 60 fps both in 4:2:2 and 4:4:4 mode*
- State-of-the-art imagers – Progressive, 1920 x 1080 full HD resolutions:
F35: One Super 35-mm sized CCD
F23: Three 2/3-inch type CCDs
- Lens mount system
F35: PL mount, a standard for film cameras, providing a broad range of film lenses
F23: Bayonet mount
- Compact and lightweight
F35/F23: 5 kg (11 lb) without a viewfinder
- 14-bit A/D converter
- Compatible with Film Camera Accessories

* *Up to 50 fps with the F35.



F35 with SRW-1



F23 with SRW-1

HDCAM SR TECHNOLOGY

The HDCAM SR format is based on cutting-edge technology. It is not a rehashed and repackaged technology solution developed in previous decades. The HDCAM SR format has been designed to maximise the data-transfer rate without sacrificing any operational features. It's a design you'd expect from a Sony 1/2" tape format, with all the useful playback and editing features common to existing Sony tape formats. And although the SRW-5000/5500/5800 features and capabilities have seen great improvements, the physical size and the

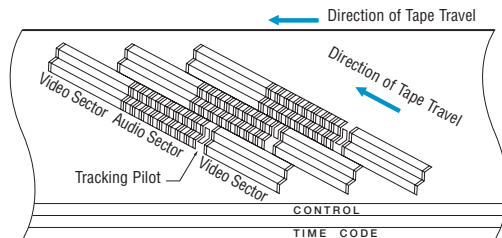
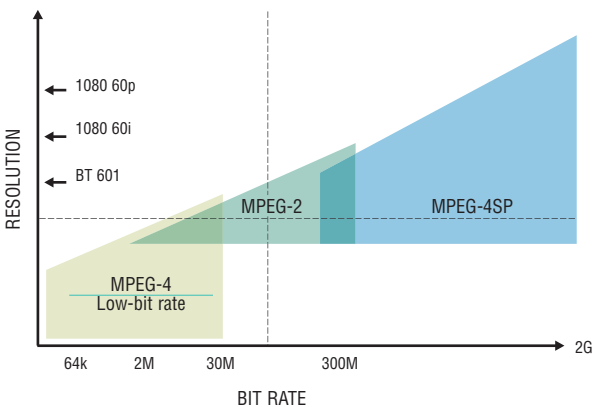
power consumption of the VTR remain modest enough to achieve easy portability. In order to meet the format's mission-critical requirements, every aspect of magnetic tape-recording engineering and digital-signal processing technology has been carefully reassessed and integrated. Even with these great technological improvements, anticipated system operating costs are reasonable.

CREATING VISUALLY LOSSLESS IMAGES: THE MPEG-4 STUDIO PROFILE (SP)

Yet another industry first from Sony is an integrated video encoding/decoding chipset that conforms to MPEG-4 SP (Studio Profile: ISO/IEC 14496-2:2001-1). The Studio Profile was created to specifically address the requirements of high resolution image-production applications. It is free from GOP (Group Of Pictures) structures and is scalable in its pixel count (SDTV, HDTV, Film-resolution data), bit depth (10- or 12-bit) and colour resolution (component or RGB). In order to achieve maximum compression efficiency, the HDCAM SR format resorts to intra-frame compression for progressive images. Intra-field compression is used for interlaced images. Special attention has been paid to multi-generation dubbing performance and, in common with industry-standard Digital BETACAM VTRs, the SRW-5000/5500/5800 is capable of consistent dubbing without using a separate interface for a native stream. This is only possible thanks to the high performance of the MPEG-4 SP, which offers reproduction of visually lossless images.

MORE DATA, SAME LONG RUNNING TIME: THE NEW FOOTPRINT

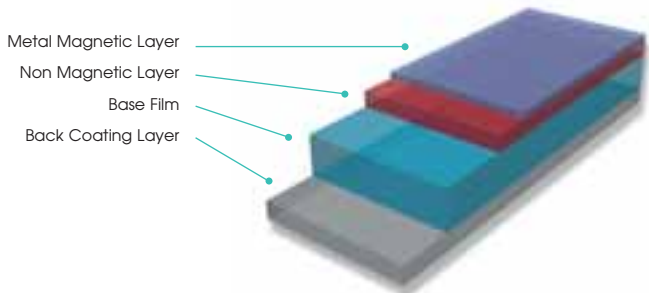
Each picture frame consists of 24 helical tracks (or 12 tracks per segment/field) in which data is shuffled to protect the recording from occasional burst errors. Recordings are further protected by highly robust error-correction and concealment techniques perfected through years of Sony digital-VTR development. Thanks to the finer track pitch and shorter minimum recording wavelength, the data-packing density of the HDCAM SR format is 3.5 times that of the HDCAM format. Frame-accurate editing is guaranteed by the intelligent allocation of pilot signals for precise head-to-tape tracking.



MORE POWER, MORE STABILITY: THE NEW TAPE FORMULA

A newly developed, ultra-fine-grain magnetic particle used on HDCAM SR tapes creates the very thin magnetic layer required to achieve a minimum recording wavelength of 0.29µm. This minimum wavelength allows the tape to hold more data and increases the tape transfer rate, resulting in increased performance. Not only that, but stable and consistent playback results are provided through a new proprietary manufacturing process that minimises tape deformation. What's more, because the tape medium is designed with a highly rigid new base film material treated with antioxidants, the HDCAM SR tape is also ideal for archiving purposes.

TAPE STRUCTURE



OPTIONAL ACCESSORIES

For SRW-5000/5500/5800



HKSR-5001
Format-Converter Board



**BCT-6SR/33SR/40SR/
BCT-64SRL/94SRL/124SRL**
HDCAM SR Video Cassette Tapes



**BCT-D6/D12/D22/D32/D40/D34L/
D64LD94L/D124L/D12CL**
Digital Betacam Tapes



BCT-HD12CL
Video Head Cleaning Cassette

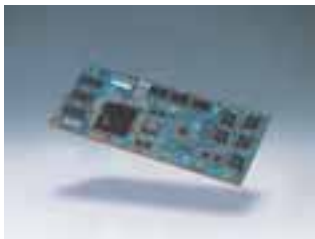


RMM-110
Rack-Mount Kit



RM-280
Editing Controller

For SRW-5000/5500



HKSR-5002
Digital BETACAM Processor Board



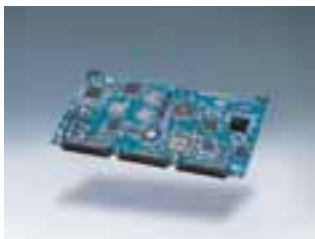
HKSR-5003
RGB Processor Boards

For SRW-5500

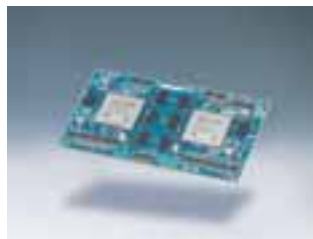


**BCT-6HD/12HD/22HD/40HD/
BCT-34HDL/64HDL/94HDL/124HDL**
HDCAM Cassette Tapes (For SRW-5500)

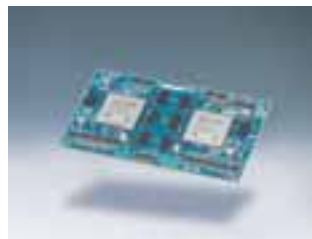
For SRW-5800



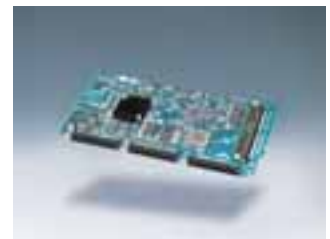
HKSR-5802
Digital BETACAM and HDCAM
Processor Board



HKSR-5803HQ
Advanced HQ Processor Board



HKSR-5803SQ
RGB SQ Processor Board



HKSR-5804*
File Transfer Processor Board

* Planned to be available in autumn 2008.

* Viewable area measured diagonally.

**These cannot be used in the direct docking configuration of the F23 and SRW-1.

SRW-5000/5500/5800 SPECIFICATIONS

	SRW-5800	SRW-5500	SRW-5000
General			
Power requirements	100 to 240 V AC (±10%, 50/60 Hz)		
Power consumption	380 W (with all option boards installed)	320 W (with all option boards installed)	
Operating temperature	+5 °C to +40 °C (+41 °F to +104 °F)		
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)		
Operating humidity	25% to 80% (relative humidity)		
Mass (approx.)	30 kg (66 lb 2 oz)		
Dimensions (W x H x D excluding protrusions)	427 x 218 x 544 mm (16 7/8 x 8 5/8 x 21 1/2 inches)		
Tape speed	HDCAM SR: 94.1 mm/s (24 Hz) HDCAM: 77.4 mm/s (24 Hz) Digital BETACAM: 96.7 mm/s		
HDCAM SR/HDCAM* recording/ Playback time	155 min with BCT-124SR cassette (24 Hz) with BCT-124SRL or BCT-124HDL tape**	155 min with BCT-124SR cassette (24 Hz) with BCT-124SRL or BCT-124HDL tape	
Digital BETACAM playback time	124 minutes with BCT-D124L tape		
Fast-forward/rewind time	Approx. 4 min with BCT-124SR cassette		
Search speed range	Shuttle mode	HDCAM SR: Still to ±50 times normal playback speed (24 Hz)	
		HDCAM: Still to ±60 times normal playback speed (24 Hz)	
	Variable mode	Digital BETACAM: Still to ±50 times normal playback speed	
		HDCAM SR: -0.5 to 1 times normal playback speed	HDCAM SR: -1 to 2 times normal playback speed
Jog mode	HDCAM: -1 to 2 times normal playback speed		
	Digital BETACAM: -1 to 3 times normal playback speed		
Noiseless picture playback	HDCAM SR	-0.5 to +1 times normal playback speed -1 to +2 times normal playback speed (Dynamic Tracking Range) (Non Tracking Range)	
	HDCAM	-1 to +2 times normal playback speed (Dynamic Tracking Range)	
	Digital BETACAM	-1 to +3 times normal playback speed (Dynamic Tracking Range)	
Servo-lock time	1.0 sec or less (from standby on)		
Load/unload time	7.0 sec or less		
Input/Output			
HD-SDI input A	BNC (1+ 1 for monitoring loop-through), Serial digital (1.485 Gb/s), SMPTE 292M/BTA S-004/ITU-R.BT 709		
HD-SDI input B (optional HKSR-5803SQ/HQ required for SRW-5800) (optional HKSR-5003 required for SRW-5000/5500)	BNC (1+ 1 for monitoring loop-through), Serial digital (1.485 Gb/s), SMPTE 292M/BTA S-004/ITU-R.BT 709		
HD/SD reference video input 1	BNC (1+ 1 for loop-through), Tri Level sync, 0.6 Vp-p, 75 Ω, sync negative or Black Burst, 0.286 Vp-p, 75 Ω, sync negative		
HD/SD reference video input 2 (optional HKSR-5001 required)	BNC (1+ 1 for loop-through), Tri Level sync, 0.6 Vp-p, 75 Ω, sync negative or Black Burst, 0.286 Vp-p, 75 Ω, sync negative		
Digital-audio input (CH1/2, CH3/4, CH5/6, CH7/8, CH9/10, CH11/12)	BNC (x6, AES/EBU), unbalanced		
Analogue audio input (Cue)****	—	XLR-3-pin, female x1	—
Time-code input	XLR-3-pin type, (female x1), 0.5 to 18 Vp-p, 10 kΩ, balanced		
HD-SDI output A	BNC (2 + 1, with character out), Serial digital (1.485 Gb/s), SMPTE 292M/BTA S004/ITU-R.BT 709		
HD-SDI output B (optional HKSR-5803SQ/HQ required for SRW-5800) (optional HKSR-5003 required for SRW-5500/5000)	BNC (2 + 1, with character out), Serial digital (1.485 Gb/s), SMPTE 292M/BTA S004/ITU-R.BT 709		
Format-converter output (optional HKSR-5001 required)	BNC (x2), with character out		
SD-SDI output	BNC (2 + 1 with character out), D1 serial digital (270 Mb/s), SMPTE 259M		
Analogue composite output	Composite: BNC (x1 with character out) 1.0 Vp-p, 75 Ω, sync negative) SD sync: BNC (x1, Black Burst, 0.286 Vp-p, 75 Ω, sync negative)		
Analogue reference output	1125 Sync: BNC (x2), Tri Level sync, 0.6 Vp-p, 75 Ω, sync negative		
Digital-audio output (CH1/2 CH3/4 CH5/6 CH7/8 CH9/10 CH11/12)	BNC (x6), AES/EBU, unbalanced		
Analogue-audio output (CH1/2/3/4)	—	XLR-3-pin type, (male x2), +4 dBm, (with a 600 Ω load), low impedance, balanced	—
Analogue-audio output (Cue)***	XLR-3-pin type, (male x2), +4 dBm, (with a 600 Ω load), low impedance, balanced		
Monitor output (L/R)	XLR-3-pin type, (male x2), +4 dBm, (with a 600 Ω load), low impedance, balanced		
Time-code output	XLR-3-pin type, (male x1), 2.2 Vp-p low impedance, balanced		
Phones	JM-60 stereo phone jack, -? to 12 dBu (with an 8 Ω load), unbalanced		
Remote 1 input	D-sub 9-pin, (female), Sony 9-pin remote interface		
Remote 1 input/output	D-sub 9-pin, (female), Sony 9-pin remote interface		
Video control	D-sub 9-pin, (female), (for optional HKDV-900)		
Parallel remote	D-sub 50-pin, (female)		
Ethernet	10Base-T modular jack, 1000Base-T modular jack (optional HKSR-5804 required)	10Base-T modular jack	
Digital-Video Performance			
Sampling frequency	HDCAM SR: Y: 74.25 MHz, Cb/Cr: 37.125 MHz, G/B/R: 74.25 MHz HDCAM: Y: 74.25 MHz, Cb/Cr: 37.125 MHz		
Quantisation	10 bits/sample		
Compression	HDCAM SR: MPEG-4 Studio Profile HDCAM: Coefficient Recording System		
Channel coding	S-NRZ		
Error correction	Reed-Solomon code		
Error concealment	Adaptive three-dimensional		
Analogue Composite-Output Performance			
Bandwidth	Y: 0 to 5.75 MHz +0.5 dB/-3.0 dB		
S/N ratio	56 dB or more		
Y/C delay	15 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 (synchronised with video)		
Quantisation	HDCAM SR: 24 bits/sample HDCAM: 20 bits/sample		
Wow & flutter	Below measurable level		
Headroom	20/18/16/15/12 dB selectable		
Analogue Audio-Output Performance			
D/A quantisation	24 bits/sample		
Frequency response	20 Hz to 20 kHz, +0.5 dB/-1.0 dB (0 dB at 1 kHz)		
Dynamic range	More than 100 dB		
Distortion	Less than 0.05% (At 1 kHz, reference level)		
Crosstalk	Less than -80 dB (At 1 kHz, between any two channels)		
Supplied Accessories			
	Operation manual, installation manual		

* The SRW-5000 and SRW-5800 do not support HDCAM recording.

** 1/2 when double-data-rate recording/playback (880 Mb/s)

*** HDCAM and Digital BETACAM playback only.

**** HDCAM recording only.

As to supported formats and required options, please refer to Supported Formats table on page five.

SERVICES FROM **SONY**

Services from Sony

> Working with you, working for you

Recognising that every company and every challenge is unique, we offer a complete and comprehensive range of services all the way through consulting, planning, financing, implementation, training, servicing, maintenance and support. Choose exactly what's right for you, when and where you need it.

> Professional Services

Tailor-made design, installation and project management of audio-visual and IT (AV/IT) systems using skills developed over 25 years of systems integration.

> Financial Services

Innovative and flexible finance solutions designed to meet budgetary and financial requirements and constraints, enabling businesses to always have the most current technology.

> Training Services

A range of off-the-shelf or customised training services from basic operation through to high-level technical maintenance.

> Support Services

Fully integrated and customised support for products and systems throughout their operational life, combining proactive and reactive technical services.

Not all services are available in all countries. If you'd like to find out more about what we do, who we do it for and how we do it, visit www.sonybiz.net or contact Sony's local office.

SONY

Specialist Dealer

Specialist Dealers receive extensive training on all Sony's products and services. They combine this with an in-depth knowledge of the market, ensuring you get advice that meets your needs before and after purchase. To find your nearest Specialist Dealer visit our "dealer locator" at:

www.sonybiz.net/dealer



SONY

www.sonybiz.net/hdcamsr

© 2008 Sony Corporation. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Features and specifications are subject to change without notice. All non-metric weights and measurements are approximate. 23.98P, 24P, 25P, 29.97P and 30P are used as generic names in this literature for the industry standard 23.98PsF, 24PsF, 25PsF, 29.97PsF and 30PsF (Progressive Segmented Frames), respectively. Sony, HDCAM SR, HDCAM, BETACAM, Digital BETACAM, CineAlta, Dynamic Tracking and Memory Stick are trademarks of Sony Corporation. All other trademarks are property of their respective owners. CA SRW-5000/5500/5800/GB- / /2008