

SONY

Media & Application Solutions Division

HDCAM SR Tape
Reuse and Handling Guideline

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HDCAM SR Tape Overview

When Sony set out to develop the HDCAM SR format it became evident that a new breed of tape would be required to support the demanding specifications of the format. Building on years of experience in Metal Tape Technology, unique manufacturing processes were developed in true Sony tradition that resulted in a high capacity media with physical & magnetic properties that had never been seen before. Without these advancements it would be impossible to introduce such a data intensive format. Achieving high-density recording, in a cassette size sufficiently small enough to enable practical application, required a media as sophisticated as the format it supports. This was accomplished with the release of HDCAM SR Tape in 2003.

Although magnetic tape has proven itself to be a durable and reliable media from acquisition to archive, tape recycling is dependent upon the video tape recorder condition, workflow, handling, shipping and environment it was subjected to prior to reuse.

HDCAM SR Tape Reuse

During development and production testing, HDCAM SR tape has been demonstrated to withstand reuse for 50 times or more with no appreciable decrease in performance. However, there is no guaranteed number of reuses stated or implied. The tape performance, after multiple reuses, is highly dependent on the condition of the video tape recorder (VTR), how it was maintained, and tape usage environment. One “reuse” is typically defined as one “Record ⇌ Rewind ⇌ Play ⇌ Rewind” cycle. Additionally, if the tape is leaving your facility, the condition of the VTR, or tape evaluator it will be used on, the workflow, handling, and shipping environment become areas of concern. Tape damage resulting from these factors is the most common cause of user issues. After use, obtaining a more stable tape condition can often be achieved by rewinding tapes in an HDCAM SR VTR in “soft rewind mode” which increases the probability of an even and smooth tape wind appearance. The “soft rewind mode” can be found in the VTR setup menu: 021. Please maintain the VTR in accordance with the HDCAM SR VTR maintenance manual provided by Sony and insure that the most current firmware versions are installed.

During normal operation, i.e. while the tape is being used in a properly aligned and maintained HDCAM SR VTR, there are no extra precautions in FF or RW that need to be employed. Once the tape is done being used however, Sony recommends specific handling guidelines for best results prior to storing, transporting, and reusing HDCAM SR tape. This paper explains these guidelines.

Care & Handling Recommendations

HDCAM SR tape has a total thickness of 11µm, approximately 22% thinner than HDCAM tape, and has a much smoother surface to support a video transfer rate more than 3x that of HDCAM. A 124 minute HDCAM SR cassette houses 528 feet more tape than a 124 minute HDCAM cassette.

1) PROPER REWIND

Fast-forward the cassette to the end and then rewind it in the 8x shuttle mode for small cassettes and “soft rewind mode” for large cassettes (see Appendix) prior to ejecting the cassette from the VTR. The 8x shuttle mode leaves the capstan and pinch roller engaged resulting in optimized wind quality and

pack tension. VTR winding speeds of 8x or less will reduce “hop strands” and “stepped winds” and the potential for edge damage if the cassette is dropped.

Hop strand at 50x rewind NOT ACCEPTABLE



No hop strand at 8x rewind ACCEPTABLE



2) ALBUM CASE USE

Place the cassette in its album case and store vertically.

3) OUTGOING INSPECTION

Perform outgoing inspection before shipping tape(s).

- a. Check for Damage
 - Are there cracks/marks on the flanges & teeth inside the cassette?
 - Are there loose parts rattling around the cassette?
- b. Check the Wind Condition
 - Is there slack in the tape (i.e., folding) or is the wind cinched? Tension on VTR may need adjustment.
 - Is there evidence of hop strand?
 - Is the wind stepped? Wind is too loose.
 - Does the wind have a “spoked” appearance? Wind is too tight.

4) SHIPPING

Pack tapes for shipment as follows:

- a. Ship the tape in the album case.
- b. Remove slack in tape by turning supply hub.
- c. Pack album case(s) in a plastic bag to minimize contact with dust or debris.
- d. Surround the album case with plenty of protective cushioning material (e.g. bubble wrap), especially if individually packed.

In order to reduce the force on a reel flange, it is better to put the master carton into an outer box with more cushion (bubble wrap) at tape upper reel flange side compared to the opposite side of the outer box. Therefore, the inner box will not be located at the center of the outer box. Be sure to use cushioning material as opposed to empty album cases in the inner box.

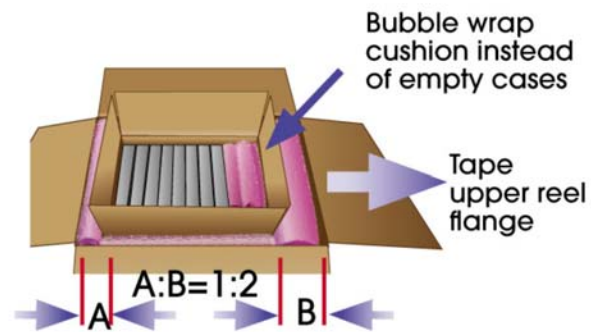
When Transporting a Full Master Carton

- Use an additional box as an outer box and protect the master carton with bubble wrap, a urethane sheet or sponge mat. Place the master carton in the outer box, making sure the tape reel flange is completely protected.



When Transporting a Half-Full Master Carton

- Never fill empty space in the master carton with empty tape cases. Always use bubble wrap, a urethane sheet or sponge mat especially around the tape reel flange. Package the outer box in the same manner as the half-full master carton.



When Transporting Single Tapes

- Make sure the tape is bubble wrapped, protected by a urethane sheet or sponge mat, and placed vertically in an outer box. Add additional urethane sheets or sponge mats for protection.



Packaging Summary

In order to reduce the force on a tape reel flange, the use of an additional box as an outer box, along with a cushioning material (bubble wrap), is recommended. Add additional cushion to the upper reel flange side of the outer box (at ratio of 2:1) compared to the opposite side of the outer box. This is necessary so the inner box is not located at the center of the outer box. Always use cushion material on the upper reel flange side of the inner box, as opposed to empty cassette cases.

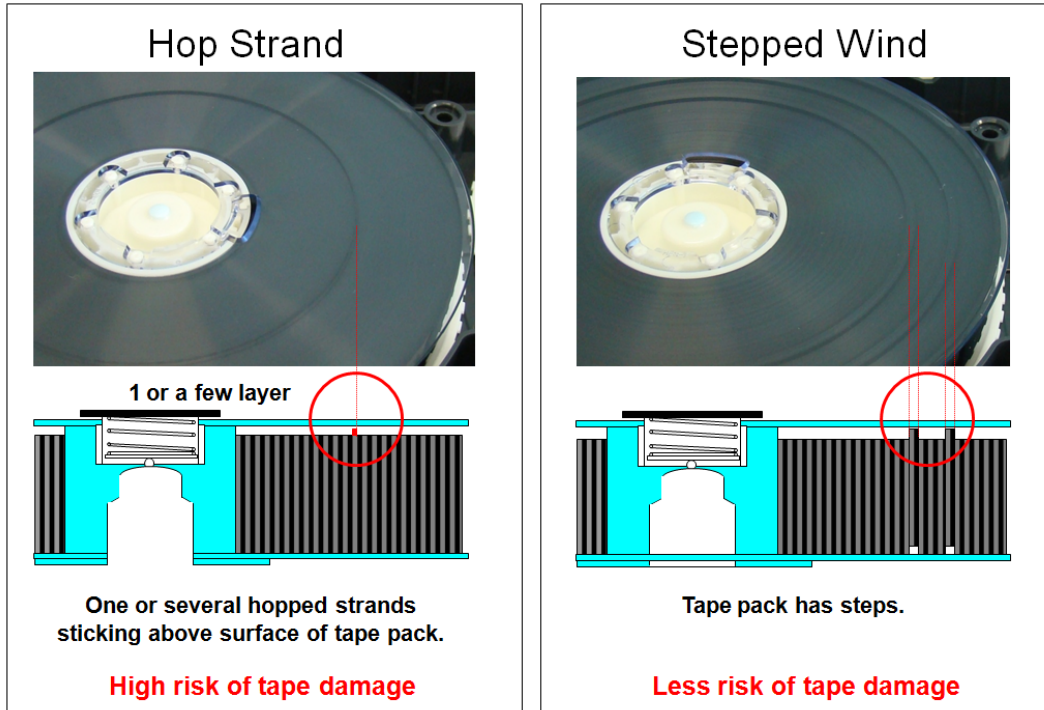
Prior to shipment it is highly recommended to:

- 1) Fast-forward the cassette to the end and completely rewind it in the 8x shuttle mode for small cassettes and "soft rewind mode" for large cassettes (see Appendix) before ejecting the cassette from the VTR.*
- 2) Pack cassettes with the same orientation, i.e. upper reel flange of all tapes facing in the same direction.*

5) INCOMING INSPECTION

Perform incoming inspection upon receipt of tape(s).

- a. Similar to incoming inspection, check for:
 - Wind condition
 - Hop Strand
 - Stepped Wind
 - Cleanliness
 - Damage to album box or cassette



Note

The appearance of hop strand, although not cosmetically appealing, is not a reason to reject the cassette. But, if the cassette with hop strand winds is shipped, or transported within a facility, and then dropped, tape edge damage may occur resulting in playback problems such as channel condition error. For this reason, it is recommended that the cassette be visually inspected for wind quality upon ejecting an HDCAM SR cassette from a VTR. If hop strands are evident, it is recommended to fast-forward the cassette to the end and then rewind in the 8x shuttle mode. This practice will insure minimal occurrence of hop strand and maximum protection against any rough handling or adverse environmental conditions prior to its next use. This practice is especially important with larger cassettes that have greater mass.

- b. If damage is found:
 - Contact sender and pass on these recommendations.
 - Run the tape in play mode (versus FF) to the end, then rewind in 8x shuttle mode for small cassettes and “soft rewind mode” for large cassettes (see Appendix).

Evaluate the Evaluator

The above mentioned guidelines can be used as selection criteria in selecting an organization for tape evaluation and recycling. If these recommendations are followed, especially with regard to wind quality and shipping, there is a better chance your recycled HDCAM SR tape will perform satisfactorily.

As is the case with VTRs, the use of certain tape evaluation equipment for inspection and refurbishing can pose potential problems as well. Many of these machines are designed primarily for in-house recycling and evaluation of magnetic tapes. When used as production machines for high volume evaluations, it is of the utmost importance that they be maintained in strict accordance with the manufacturer's recommendations in order to minimize the potential for damaging the tape during the evaluation process.

Incoming inspection of wind quality is critical in assessing the condition of your tape when received from an evaluator. The highest level of wind quality is obtained in an HDCAM SR VTR when rewound using the soft rewind mode. Tape evaluation equipment typically is not equipped with this capability thereby requiring extra care in shipping to and from their tape evaluators' facility. Otherwise, wind condition (tensions) may not be adequate to insure the optimum tape wind integrity before reuse.

It is recommended that recycled tapes be marked, labeled, or branded in a manner agreed upon by the end user and evaluator to insure traceability within a facility.

Degaussing, or bulk erasing, HDCAM SR tapes requires a degausser capable of 5000 oersteds, at a minimum. This will help to ensure maximum erasure of the signal on the tape.

HDCAM SR Tape TeleFile and Degaussing

The TeleFile is not affected by degaussing. The TeleFile automatically stores: 1) cassette thread counts since it was first used; 2) serial number of last VTR(s); 3) and editing in/out points in the form of time code. When the TeleFile reaches capacity, the oldest information is automatically discarded. The TeleFile can be reformatted in an HDCAM SR VTR to erase all the data.

Sony Quality Support














In an effort to maintain a high quality level of recycled product in the field, Sony authorized professional media dealers who wish to offer HDCAM SR tape evaluation services are offered the opportunity to submit samples of their evaluated tape to Sony's Technical Service Department for quality checks. The longest length tapes to be recycled are preferred. Additionally, Sony currently is offering end users of its HDCAM SR tape the option of submitting random samples of incoming evaluated tape, up to 2% of the shipment quantity received, for a second level quality check at no charge. Contact your Sony representative to arrange for this service.

Please note that while Sony currently offers these services to help our customers minimize the possibility of end user problems with reused tape, Sony does not guarantee that evaluated reused tape will be error or problem free.

If there are any questions relating to this guideline please contact your Sony representative to arrange for a more detailed explanation from our Technical Service Department.

Sony reserves the right to modify or cancel these support services at any time.

General Tape Care & Handling Recommendations

 <p>Always keep the tape wound back Make sure the tape is neatly and completely wound back after use⁽¹⁾</p>	 <p>Keep the tape in a safe place Protect from hard impacts</p>	 <p>Keep a clean store room Store tapes in a clean area, free from smoke, dust, food and drink</p>
 <p>Do not stack horizontally Stacking may cause cassette distortion</p>	 <p>Store at recommended temperature and humidity Temperature: 59 to 77°F (15 to 25°C) Humidity: 40 to 60%</p>	 <p>Keep the tape away from Magnetic fields Do not expose tapes to strong magnetic fields including speakers and electric motors</p>
 <p>Don't open the lid and touch the tape Tape will be damaged easily</p>	 <p>Clean the tape transport and head drum of the VTR frequently per your VTR's guidelines⁽²⁾</p>	 <p>Periodically Rewind or Forward Tape Reverse the winding every 1 to 3 years</p>
 <p>Store tapes vertically in their case Cases help preserve quality</p>	 <p>Beware of condensation Allow time to adjust to higher temperature and humidity. Wipe away condensation</p>	 <p>Affix labels carefully</p>
 <p>Transport tapes carefully Do not throw tapes. If dropped, inspect for damage</p>		<p>(1) If you notice an HDCAM SR tape with unsatisfactory wind condition, prior to shipment, storage or archiving, use 'Soft Rewind' mode (Menu 021 = ON) by pressing SHUTTLE & PREROLL buttons.</p> <p>(2) If you see any channel condition errors (red light) on your SRW VTR, use Sony head cleaning tape BCT-HD12GL. If this does not resolve the error, please contact the nearest authorized Sony professional customer service center.</p>

Appendix

Soft Rewind SOFTWARE UPGRADE—VERSION 4.10

SONY

HD Digital Videocassette Recorder



WORLDWIDE TECHNICAL BULLETINS FOR BROADCAST AND PROFESSIONAL PRODUCTS

Broadcast Products
Technical Bulletin 20-2010-156

DATE: November 15, 2010

SUBJECT: SOFTWARE UPGRADE—VERSION 4.10

MODEL: SRW-5000
SRW-5000/0
SRW-5000/1
SRW-5000/10
SRW-5000/2
SRW-5500
SRW-5500/0
SRW-5500/1
SRW-5500/10
SRW-5500/2

DESCRIPTION

Software version 4.10 is available.

SOFTWARE REQUIRED

Part No.	Description	Qty.
FSRW5K410	SRW-5000/5500 Software V4.10	1

ORDERING INFORMATION

To order upgrades, contact:

Sony SoftwarePLUS®
Call: (800) 538-7550
Web: www.sony.com/softwareplus

NOTE: The software is available for download only from the website above.

SERIAL NO:

SRW-5000	All
SRW-5000/0	All
SRW-5000/1	All
SRW-5000/10	All
SRW-5000/2	15,001-15,006
SRW-5500	All
SRW-5500/0	All
SRW-5500/1	All
SRW-5500/10	All
SRW-5500/2	15,001-15,030

NEW FUNCTIONS

SELECT FPS Audio Playback

Audio signals recorded on tape using SELECT FPS can be output during playback rather than muted.

Set MENU: 843 to ENABLE (See Figure 1.)



Figure 1

HDVM10-075

SOFT REWIND

SOFT REWIND mode is added to prevent "step wind" which can occur during high speed rewind of large tapes. This is caused by airflow within HDCAM-SR L-cassettes while in rewind mode.

Set MENU: 021 SOFT REWIND to ON. Then, press the PREROLL and SHUTTLE buttons simultaneously. Tape will FFWD to EOT and then enter SOFT REWIND mode. This function operates only for HDCAM-SR L-cassettes. (See Figure 2.)



Figure 2

SOFT REWIND mode is added to MENU: 407 AUTO REWIND. When this mode is selected, tape is automatically rewound in SOFT REWIND mode when tape reaches tape end. (See Figure 3.)



Figure 3

2k 1080 Input Signal ID

2k 1080 input signal identification is added.

If an HD SDI signal of 2k 1080 format (which can be recorded by SRW-5800) is input, a WARNING signal (Invalid SDI Input) is issued and the video signal is muted.

NOTE: This function is available only when IRC-6 is installed.

UPGRADE PROCEDURE

Prepare Memory Stick

1. Format a memory stick as follows:
 - a. Insert a memory stick in the MS slot of the SRW unit.
 - b. Press SETUP > MEMORY CARD > FORMAT CARD.
 - c. Follow the formatting instructions on the control panel.
 - d. Remove the memory stick.
2. Using a computer, copy V4.10 software and PLD firmware to the formatted memory stick in the following folder:
MSSONY\PRO\VTR\SRW5000
3. Reinsert the memory stick in the MS slot of the SRW unit.

NOTE: The memory stick should contain only software that is required for the installation. All software placed in the directory will be downloaded. If the memory stick contains other software or unrelated data, the upgrade may fail.

Upgrade SYS1, SYS2, CP ROMs

Upgrade SYS1, SYS2, and CP ROMs (including the boot block) as follows:

SYS1 ROM (Boot)	V1.050
SYS2 ROM (Boot)	V1.030
CP ROM (Boot)	V1.040

1. Press SFT + DIAG > SFT + F8 (MAINTE) > SET + F2 (ROM MAINTE) > F1 (SYS1 ROM).
The application and boot blocks are displayed simultaneously.
2. Select A: Ver.4.000, B: 1.05, and download the files.
Press SFT + center cursor.
3. After downloading the SYS1 ROM, return to step 1 and download the SYS2 ROM, and then the CP ROM respectively.
4. Press F10 (EXIT) twice.

Upgrade Rest of Software and PLD Firmware

Upgrade the rest of the software and PLD firmware as follows:

1. Press SFT + DIAG > SFT + F8 (MAINTE) > F2 (ROM MAINTE) > SFT + 0 (A) > F1 (ALL DATA).
2. Confirm that all target ROMs and PLDs are displayed and downloaded.

3. Press SFT + center cursor.
4. Confirm that the message "DOWNLOAD COMPLETE xx files downloaded" is displayed.
NOTE: "xx" refers to the number of files downloaded, depending on the number of options installed.
5. Press F10 (EXIT) twice.
6. Confirm that the SRW unit starts after a reboot.

NOTE: Contact your Sony regional service center to upgrade SS PLD3A/4A in units with the suffix -D SS-95 board. Applicable units are as follows:

Model	Serial No.
SRW-5000	12,558–12,584
	15,002–15,004
SRW-5500	14,715–14,757
	15,001, 15,002
	15,004–15,015, 15,016

CONFIRMATION

1. Press SFT + DIAG > F1 to display the ROM VERSION screen.
2. Confirm that the software versions are the same as the versions listed in Table 1.

NOTE: The versions in red are new with V4.10.

LATEST SOFTWARE VERSIONS

Table 1

Software	Version	Software	Version
SYS1 ROM	4.100	APR PLD6	3.100
SYS1 Boot	1.050	DPR PLD1	1.000
SYS2 ROM	4.100	TEST SIG	1.300
SYS2 Boot	1.030	FC ROM	4.020
CP ROM	4.100	FC CTRL	4.010
CP Boot	1.040	FC PLD1	3.630
SV ROM	4.100	FC PLD2	3.600
EQ ROM	3.500	FC PLD1A	4.050
CP PLD	1.000	FC PLD2A	4.020
SYS PLD1	1.210	APR PLD1A	4.010
SYS PLD2	1.021	APR PLD2A	4.101
SYS PLD3	1.010/1.330	APR PLD3A	4.010
SYS PLD4	1.010/1.330	APR PLD4A	4.000
EQ PLD1	1.030	APR PLD5A	4.000
EQ PLD2	1.050	APR PLD6A	4.000

Table 1

Software	Version	Software	Version
EQ PLD3	1.000	EQ PLD1A	4.000
EQ PLD4	1.000	EQ PLD2A	4.000
HPR PLD1	3.230	SS PLD1A	4.000
HPR PLD2	3.500	SS PLD2A	4.000
HPR PLD3	1.000	SS PLD3A	4.100
HPR PLD4	1.000	SS PLD4A	4.100
HPR PLD5	3.701	HIF PLD1A	4.000
IRC PLD1	3.500	HIF PLD2A	4.002
IRC PLD2	3.520	HIF PLD4A	4.010
IRC PLD3	1.000	HIF PLD5A	4.000
IRC PLD4	1.000	VPR PLD1A	4.000
HIF PLD1	3.500	VPR PLD2A	4.100
HIF PLD2	3.500	VPR PLD3A	4.000
HIF PLD4	1.000	VPR PLD5A	4.010
HIF PLD5	1.000	HPR PLD1A	4.000
VPR PLD1	3.230	HPR PLD3A	4.000
VPR PLD2	3.600	HPR PLD4A	4.010
VPR PLD3	1.000	HPR PLD5A	4.001
VPR PLD4	1.000	HPR PROC	1.010
VPR PLD5	1.000	IRC PLD1A	4.100
APR PLD1	2.700	IRC PLD2A	4.000
APR PLD2	3.600	IRC PLD3A	4.000
APR PLD3	1.000/3.010 ¹	IRC PLD4A	4.010
APR PLD4	1.000/1.010 ²	IRC PROC	1.010
APR PLD5	2.500/1.000/ 3.000 ³	CP PLD1A	2.000

1. Units with serial numbers 12,001 and higher are shipped with V3.010.
2. Units with serial numbers 12,001 and higher are shipped with V1.010.
3. Units with serial numbers 12,001 and higher are shipped with V3.000.

MEDIA & APPLICATION SOLUTIONS DIVISION

HDCAM SR Tape Reuse and Handling Guideline

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