

**IU Media Digitization Studios**  
**VHS videotape preparation and digitization workflow**  
(Applies to VHS, S-VHS and VHS-C)  
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**1 Prepare the tape:**

- 1.1. Retrieve tape from the processing room.
- 1.2. Examine the videotape case or sleeve for cracks or evidence of stress that may indicate past damage to the cassette inside. Examine the cassette for problems or physical damage such as breakages, mold, plasticizer residue, cracks, chips, broken flap mechanisms or the sound of loose debris inside the cassette body. If defects are found, assess the damage and determine if a quick repair or cleaning is possible or if additional in-depth processes may be necessary (re-housing, mold remediation, disassembly to correct a problem in the pack, etc.).
- 1.3. Repair any breakages, mangled, torn or stretched tape with a ½" splicing block, splicing tape and a razor. Use vertical butted splices with no overlapping videotape at the splice and no splicing tape exceeding over the top or bottom of the tape edge. The splicing tape should never come in contact with the video heads.
- 1.4. Be sure that the record inhibit tab has been broken out to prevent accidental erasures during digitization.
- 1.5. Examine label placement on the tape. Confirm that labels are not peeling. If they are, remove them and carefully place them inside the cassette case. Remove any labels that may impede mechanical operation or become detached when inserted into a VTR. Look out for any gooey adhesives left over from an old label that may inhibit normal mechanical function in a VTR. Remove with alcohol if necessary.
- 1.6. Review label information that may indicate the video standard of the recording. If there are any references to standards other than NTSC (such as PAL or SECAM), the media should be removed from the immediate workload and alert the processing specialist. Update the POD Recording Standard field accordingly. MDPI is not currently equipped to play or digitize any video standard other than standard definition NTSC.
- 1.7. Clean the tape in Memnon's Indelt cleaning machine:
  - i) Make sure tape is fully rewound
  - ii) Insert cassette
  - iii) Press "Auto" button (machine will clean forwards, reverse, then eject cassette)
- 1.8. Insert the tape into a VTR and play to identify the media.

1.9. Listen for any mechanical sounds such as squealing or chirping that may indicate that soft binder/sticky shed syndrome is present. Sticky shed can also result in video image banding caused by friction that prevents the VTR from tracking the picture properly. If sticky shed is present, eject the tape and bake. If the tape will not load or thread, it could be a severe case of sticky shed syndrome or a mechanical problem. A bake and/or rehousing will likely remedy the problem.

1.10. Baking:

- i) Disassemble cassette and place the spools only in the oven.
- ii) Gradually heat oven from room temperature to 123 degrees F
- iii) Keep oven at a steady 123 degrees F for 48-72 hours
- iv) Power down oven and allow tapes to cool without opening door for 24 hours
- v) Reassemble cassette and clean again in the Indelt machine

1.11. Determine the format type (VHS, S-VHS, VHS-C), audio configuration (normal, HiFi tracks), recording speed (SP-standard play, LP-long play, EP/SLP-extended play/super long play), and determine which deck can best accomplish the transfer.

- i. The Panasonic AG-7350 plays VHS, S-VHS, VHS-C and S-VHS-C tapes recorded at both standard play (SP) and extended play (EP) speeds. The AG-7350 will NOT play long play (LP) speed tapes. The AG-7350 has an illuminated indicator for S-VHS recordings and HiFi audio. The unit will play SP speed tapes with both normal and HiFi audio, but it will NOT reproduce HiFi audio from EP tapes, even if there are HiFi tracks recorded.
- ii. The Sony SVO-9600 plays VHS, S-VHS, VHS-C and S-VHS-C tapes recorded at the standard play (SP) speed only. The SVO-9600 will NOT play long play (LP) or extended play (EP/SLP) speed tapes. The unit will play tapes with both normal and HiFi audio. The SVO-9600 has an illuminated indicator for S-VHS recordings.
- iii. The Panasonic AG-W3 deck can play VHS and VHS-C tapes of all three speeds; standard play (SP), long play (LP) and extended play (EP/SLP). It cannot play S-VHS or S-VHS-C tapes properly. The AG-W3 will display illuminated indicators for HiFi recordings. It can play both normal and HiFi audio tracks but there are limitations. The deck has four separate RCA audio outputs that are controlled by the remote control's audio output setting; either normal or HiFi audio can be played but not both simultaneously. The deck has an auto-sensor and will default to HiFi if a tape had both normal and Hifi tracks. The remote can over-ride the auto-sensor if normal tracks are desired. If there are no Hifi tracks, the auto-sensor will output the normal\* tracks. The AG-W3 does not have S-VHS video output capability, just composite only. Although MDPI does not currently use it, the AG-W3 can also play and convert videotapes from other television standards such as PAL and SECAM. This function is very useful when identifying content during tape prep.

iv. All the decks will play VHS-C tapes but require the cassette adaptor.

1.12. Make note of the program duration.

If there is no discernible video or audio on the tape, it may have other problems; such as a very unstable RF signal, it could be blank or a different non-video, non-standard VHS format or TV standard (ADAT digital multi-track audio, M, W-VHS, D9; PAL or SECAM).

1.13. Note any damage found, repairs, baking, and cleaning in the Physical Object section of the POD with comments as needed.

## **2 Preparing the VTR for digitization:**

2.15. The VTR tape path should be cleaned prior to each tape playback.

2.16. Power down the VTR.

2.17. If accessing the tape path is difficult, unhook all power, audio and video connections from the back of the VTR, taking note of cable labels and connection locations. Remove the VTR from the rack to a location with good lighting and easy, comfortable access, such as a clean counter top.

2.18. Remove the VTR cover.

2.19. Clean the scanner drum and heads with a TexWipe dampened with acetone. TexWipes are lint free and are not likely to catch on the edge of the heads like a cotton swab will. The important part of video head cleaning is to not move the heads up and down, but rather hold the TexWipe stationary, then slowly rotate the head drum to clean the head. Clean any additional metal parts that come in contact with the tape with TexWipes dampened with acetone. Foam swabs can be used if preferred due to limited access in the tiny spaces of consumer decks.

2.20. Do not use acetone on rubber or plastic parts or audio heads. These surfaces can be cleaned with isopropyl alcohol. Ideally rubber parts like pinch rollers should be cleaned with Head, Red & Roll Cleaner when available. This cleaner will not dry the rubber out as alcohol tends to do over time.

## **3 VTR Signal routing:**

3.1. Insert the cassette into VTR and rewind

3.2. Choose a Time Base Corrector to patch the VTR into (for this example we will use the DPS-235 labeled as TBC 3 on the patch panel).

- 3.3. In the back of the racks, patch the S-Video OUT from the VTR to the S-Video IN on the DPS-235 TBC. (The S-Video signal will give you a cleaner signal than composite out). \*If digitizing an LP or EP HiFi tape from the Panasonic AG-W3 deck, the composite video output will have to be utilized out of the patch panel source and into the composite TBC INPUT.
- 3.4. On the front of the DPS-235 TBC unit:
  - i) Press the "Select" button until "Unit1" is illuminated.
  - ii) Press the "Input" button until "S-VHS" is illuminated to access the S-Video or \*NTSC if a composite path is required.
- 3.5. Patch TBC 3 OUTPUT into A/D VIDEO IN (this sends the output of the DPS-235 TBC into the AJA HD10AVA converting the signal from analog to digital SDI).
- 3.6. Patch the A/D VIDEO OUT 1 into the SDI CAPTURE CARD for capture station 1 (this sends the converted SDI signal into the Blackmagicdesign Decklink Studio 4K capture card).
- 3.7. Patch the CAPTURE SDI OUTPUT into the VTM-203 DIGITAL C INPUT (this sends the output of the capture card into the Videotek VTM-203 Waveform/Vectorscope which feeds the Dell computer display on the console for signal monitoring and setup).
- 3.8. Patch the CAPTURE ANALOG OUTPUT to the TEKTRONIX ANALOG INPUT (this sends the analog output of the capture card to the rack mounted analog Tektronix 1730 Waveform Monitor and Tektronix 1720 Vectorscope).
- 3.9. On the XLR audio patch panel, patch VTR Source channels 1 and 2 into Capture 1 Audio DA IN channels 1 and 2. Patch Capture 1 Audio DA OUT channels 1 and 2 into TO A/D channels 1 and 2. (This routes the VHS audio to the analog to digital convertor and also sends the audio signal to the Mackie audio board to allow monitoring during digitization.)
- 3.10. If the VHS tape has both normal and Hi-Fi audio, all 4 tracks will need to be digitized. Special cabling will be required from the Panasonic AG-7350, to provide balanced audio playback levels for the Hi-Fi tracks. RCA cables out of the VTR Hi-Fi outputs will need to be routed through a Henry Engineering impedance converter to accompany the balanced audio levels of the normal channels. The Hi-Fi tracks should then be patched to channels 3 and 4 into the Capture station.

#### **4 Video TBC and audio setup:**

- 4.1. To see the video and audio levels for setup, launch the "Blackmagic Media Express" tool from the start menu of the Capture work station, then press the "Log and Capture" tab. With the source tape in play, you should now see video passing and all audio channel levels visible on the meters.

- 4.2. Optimize tracking adjustment for playback.
- 4.3. Start with the DPS-235 Proc Amp settings adjusted to the unity/default settings position for video, black, chroma and hue settings (green light).
- 4.4. Play the tape and view the SDI signal through the Videotek VTM-203 Waveform/Vectorscope set to YCbCr/YC (parade display)..
- 1.1. There are seldom reference color bars on VHS tapes, but if they exist set the TBC proc amp settings; set-up (black) level to zero, video gain to 100, chroma level and hue set to align to the graticule of the vectorscope, with the red vector being the priority.
- 1.2. Check the program content and be sure there is no clipping of the video signal happening due to high luminance levels. Lower video gain if necessary. Luminance levels may exceed 100% by a few units as long as they are not hard clipped which occurs at or over 110%, and can result in a loss of image detail. Check the tape in several locations and be sure to view an area with higher luminance levels, such as a daytime sky or bright light fixture. Adjust if black levels are crushed and if chroma over-saturation creates excessive video noise.
- 1.3. When no color bar reference is present on a tape, the TBC should be adjusted to the preset mode as a starting point. Use the same process as above to best preserve a good range of the luma and chroma signal. Observe playback and adjust to prevent crushed black levels, excessive video gain (hard clipping) or chroma over-saturation.
- 1.4. If video levels are questionable, it is a good idea to also check the raw black and luminance levels coming straight from the tape with no TBC processing; with the VTR patched directly to the analog Tektronix 1730 Waveform Monitor. The levels will be a bit unstable but you can see the relationship of black and luminance levels. Raw chroma and hue levels can best be viewed similarly, but by getting a visual of saturation (chroma) and red-green (hue) relationship on the Sony BVM-1911 video monitor. Make the necessary adjustments to the TBC proc amp settings based on what is observed from the raw signal analog data and visual cues relative to color.
- 4.5. Verify that all audio content is visible on the meters of the “Blackmagic Media Express” tool and that it is audible through the first two faders of the Mackie 802 VLZ4 audio board. Check audio locally through the VTR jack with headphones and compare to what is coming through the audio board. With all video and audio levels set, you are ready to digitize.

## 5 **Digitization:**

- 5.1. Quit the Blackmagic Media Express tool. Quit any other applications that may be using computer resources.

- 5.2. Launch the Recorder tool icon on the capture station desktop.
- 5.3. Scan the bar code of the tape or case with the scanner and verify that the numbers appear in the barcode field. By default the system will place the bar code in the file name field.
- 5.4. On the Audio pulldown menu, select “4 Audio Channels (4 Mono Streams)” for ALL tapes.
- 5.5. Press the #2 to prep to record, then the red circle to start the digitization.
- 5.6. Press play on the VTR.
- 5.7. Monitor video and audio and note any anomalies with time codes in the comments field of the Digital Workflow section of the POD.
- 5.8. Fill out and verify all appropriate fields in the POD.
- 5.9. When the program has ended, press “Pause”.
- 5.10. Press the #3 “Combine”, then the “Combine Parts” circle.
- 5.11. Rewind the source tape.
- 5.12. Do a spot check QC of the digital file in VLC Player:
  - i) Verify audio sync with picture.
  - ii) Verify time code notes of anomalies found and compare with source if necessary.
  - iii) Isolate audio channels to confirm all are present.
  - iv) Check MediaInfo and verify all 4 streams are present.
- 5.1. At the end of the day, place all files for completely digitized objects into the Input folder.
- 5.2. Double check that all mandatory POD fields have been completed.
- 5.3. Launch the Packager and lock the desktop before leaving for the day.