IU Media Digitization Studios
8mm videotape preparation and digitization workflow
(Applies to Video8, Hi8 and Digital8)
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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 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 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 moved to the left, filling the opening, 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. Sometimes tapes have no labels. If a temporary label is needed to match the tape and case, make one and apply it in a safe location. Bar codes are applied by the SMARTeam to the case of 8mm tapes only and not to the tape itself, due to space limitations. Be extra careful not to get tapes and cases mixed up.

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. Identify the media.

1.7.1. Insert in a VTR and 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. Baking 8mm metal evaporated tapes (ME) is NOT recommended per IASA technical recommendations.

1.8. Baking:
- i) Place entire cassette in the oven.
- ii) Gradually heat oven from room temperature to 110 degrees F
- iii) Keep oven at a steady 110 degrees F for 24 hours
- iv) Power down oven and allow tapes to cool without opening door for 24 hours
- v) Fast forward and rewind the cassette a couple of times to exercise the pack

1.9. Determine the format type; Video8, Hi8 or Digital8. (Note: the Sony EVO-9850 will play both Video8 and Hi8 with and without PCM audio but not Digital8. When playing, the deck will automatically sense whether the tape is Video8 or Hi8 and illuminate the Hi8 indicator. If there is good video present but no Hi8 indicator lit, the tape is a Video8. If there is PCM audio present the PCM indicator will be illuminated.)

1.10. The Sony GV-D200 will play Video8, Hi8, or Digital8, but will not output audio tracks other than the normal channels. To determine the format type of a tape on the GV-D200, insert into the deck and play while viewing the video output with the display button engaged. Once the VTR has identified the format type it will display 8, Hi8, or Digital8 along with the speed at which the footage was recorded (usually Standard Play/SP, occasionally Long Play/LP).

1.11. Make note of the program duration.

1.12. 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-8mm video format or TV standard (DA-88 digital multi-track audio, 8mm data backup (Exabyte) or 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:

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

2.2. Power down the VTR.

2.3. 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.

2.4. Remove the VTR cover.

2.5. 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 an 8mm deck. 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 8mm 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)

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.

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 Blackmagic Design 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 8mm 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 8mm tape has both normal and PCM audio, all 4 tracks will need to be digitized. Special cabling will be required to access the additional channels. The EVO-9850 provides appropriate playback for PCM. XLR cables out of the VTR PCM outputs will need to be to accompany the normal channels. The PCM tracks will 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 four audio channel levels visible on the meters.

4.2. Start with the DPS-235 Proc Amp settings adjusted to the unity/default settings position for video, black, chroma and hue settings (green light).

4.3. Play the tape and view the SDI signal through the Videotek VTM-203 Waveform/Vectorscope set to YCbCr/YC (parade display).

4.4. On 8mm tapes there are seldom reference color bars, 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.

4.5. 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 slightly exceed 100% by a few units as long as they are not hard clipped which occurs at or over 110%, which can result 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.

4.6. If 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.

4.7. 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.

4.8. 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:

a) Select "2 Audio Channels (1 Stereo Stream)" for normal 2 channel tapes (DEFAULT)
b) Select "4 Audio Channels (4 Mono Streams)" for tapes with normal and PCM audio

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. Spot check 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 on files with PCM audio.

5.13. Double check that all mandatory POD fields have been completed.

5.14. Copy the mkv preservation file to the Transcode/Dropbox for processing.