

**IU Media Digitization Studios**  
**Open reel tape preparation and digitization workflow**  
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**1. Prepare the tape (AV Specialist)**

- 1.1 After opening box, note the condition of the pack. Examine the tape for any visible problems such as popped strands, spoking, curling, mold, foreign matter or any other problems that the engineer might want to know about. Examine the reel to make sure it is in good shape and will not break during transfer. If reel is broken, replace it with new reel. Make sure the broken reel remains with the new reel and tape box.
- 1.2 Determine if the tape stock is an off brand or major brand. Off brands may be made of cheaper materials or slit inaccurately, possibly creating a problem during winding or playing.
- 1.3 Determine tape base material: acetate, PVC, polyester or paper. Determine if it could possibly be prone to binder breakdown. If tape is polyester based it may be prone to Sticky Shed Syndrome (SSS) - Ampex 406, 407, 456, 457 / Capitol Q15 / Scotch 226, 227, 806, 807, 808, 809 are all examples of tapes that have historically had problems with SSS. If tape is acetate, determine if it might have vinegar syndrome by smelling. There are no brands that are consistently prone to VS so smell test is the only determiner.
  - 1.3.1 Using the Memnon oven, bake the tape if tape shows signs of SSS or if the tape is a brand that is prone to these problems. Baking tape procedure as follows:
    - a. Place tapes in oven.
    - b. Oven gradually increases to 123 degrees F over the course of one hour.
    - c. Most tapes should bake for 48 hours.
    - d. Take the tapes out of the oven when oven is near room temperature.
- 1.4 Place tape on machine and library wind onto 10.5" metal reel
- 1.5 Check beginning and end of tape to make sure there is enough leader to play content at beginning and end. Add leader tape as needed.
- 1.6 Measure tape for base thickness using caliper gauge. Determine if it is standard, long, double or triple play.
- 1.7 During second wind, listen in various places on the tape to try and determine number of directions recorded and the sound field (stereo or mono). Use magnetic viewer to help determine if quarter, half or full track. If not sure of sound field or direction make a note for the engineer who has the proper head stack for determining this.
- 1.8 Determine tape speed. If different from POD information, change the POD to reflect actual speed recorded.

- 1.9 Library wind the tape 3-4 times before transfer. Never fast wind a double or triple play tape, if Library wind is not available, use 30 ips or 15 ips playback speed to wind the tape.
- 1.10 Repair any breakages using splicing tape. Remove old splicing tape and clean glue residue with Ronsonol (lighter fluid) if needed. If many splices were made due to brittle tape or bad splices, make a note in comments field in the digital workflow section of POD.
- 1.11 For tapes recorded in multiple directions, use data gathered from all of the previous steps to attempt to determine which direction the tape should be played first. This may require consideration of written notes on the tape box, evidence from playback, as well as the location of the barcode on the flange which is placed by the SMART team on the side that represents their best guess of the first direction to be played.
- 1.12 Wind tape back onto original reel leaving it “tails out” so the engineer can simply wind the tape back onto metal 10.5” reel and begin digitization with the direction (that is, side or track) meant to be played first.
- 1.13 Clean tape path with 99% isopropyl alcohol and swab after every tape.
- 1.13 Place tapes on the designated shelf for engineers to digitize. Place initials on the sticky note indicating the tapes have been prepared.

## **2. Digitize**

- 2.1 Retrieve assigned group of tapes from the ingest area.
- 2.2 Calibrate machine with appropriate playback speed MRL tape using the Studer CPU level controller.
- 2.3 Load tape for transfer onto the tape machine.
- 2.4 Wind tape to the heads out position. Winding breaks down existing print-through and static buildup on the tape. Check levels every 5 – 10 minutes of content, and adjust for appropriate level using the uncalibrated mode. This allows us to apply gain when necessary to the signal without taking the overall reproduction levels out of alignment.
- 2.5 While setting levels, adjust the playback head azimuth while wearing headphones to find the best high frequency response.
- 2.6 Peaks in the digital domain should hit approximately -12 to -7 dBfs.
- 2.7 Clean the tape path with 99% isopropyl alcohol before transferring the tape.
- 2.8 Digitize entire tape to Wavelab & Tascam simultaneously at 24/96k, with no other software running on the capture computer.

- 2.9 If the transfer hits any digital zero peaks, then it must be stopped and retransferred. Playback level should be adjusted accordingly.
- 2.10 Use the file name: **MDPI\_bar code #\_01\_pres**
- 2.11 Top & Tail – edit the file so that there is 2 seconds of silence before the content begins and after it ends.
- 2.12 Fill out and verify appropriate fields in the POD
- 2.13 Note times of any speed changes, signal chain, added gain, or audio characteristics worth pointing out in the comments field of the Digital Workflow section of the POD.
- 2.14 Operating level should be determined for each playback level and/or machine used in the transfer.
- 2.15 When a recording changes speed, continue recording the incorrect speed for 5 seconds then stop both the playback machine, and the Wavelab recording. Adjust the tape machine to the appropriate speed and rewind. Begin recording a new file on each device capturing 5 seconds of silence and then 5 seconds of content before the speed change occurs. Take note of the time & speeds of each change. If the recording has a gap of 60 seconds or more in between speed changes, a second overlap which captures the 10 seconds of content before the speed change occurs is not necessary. However, the 5 seconds of silence before resuming is required. Take note of the gap in the comments field as well. State that a second overlap was not necessary.
- 2.16 Record all audio in the forward direction. In the digiprov metadata, indicate start and end times of any reverse audio content that occurs in the file.
- 2.17 If a correction needs to be made after digitization, navigate back to the original file on the studio's local audio drive. Make corrections specified by Quality Control to the file and re-save. Also note any changes in the Digital Provenance section of the POD. Once this is complete, notify the Processing Specialist to "clear the path" in the POD, so that the corrected file can be resubmitted successfully through the packager.
- 2.18 At the end of the day, place all files for completely digitized objects in the "completed items" folder on the workstation desktop. For example, if one object has two faces, and production masters for both, four files will need to be uploaded together. If an object has had one face digitized, and has a second that has not been digitized, it should not be placed in the completed items folder. The Packager script needs all of the associated items of an object present at the time of processing in order to run properly. Objects for the same barcode cannot be run multiple times without being removed from the SDA first. This can be requested to the Processing Specialist if needed.

### **3. Interstitial Errors**

- 3.1 Copy the Tascam audio files to the PC and run the Interstitial Error Detection software. Direct the software to the 2 destination folders of audio files (the Wavelab file and the Tascam file) and save the manifest to an appropriate location. The software will verify that the two files match, and report any errors found.
- 3.2 When an error is found, verify the sample where it is reported. Take a screenshot, and save it to a folder along with the Interstitial manifest, and the corrupted audio file labeled: **MDPI\_bar code#\_01\_INT**
- 3.3 Use the Tascam backup file as the new preservation master.
- 3.4 For mixed speed tape with multiple files, check files with Interstitial Error Detection software before stitching together into a Preservation Master.

### **4. Production Masters**

- 4.1 Create a production master file when you have a file containing a mixed speed, or reversed content. If the tape has neither of these, creating a production master is not necessary since it will be created by the Packager application.
- 4.2 Create production master files by editing out the sections containing inappropriate playback speeds. Preserve any gaps in content. There should be no incorrect speeds in a production master file.
- 4.3 Digitally reverse any audio content that occurs in the file so that it will all play back in the forward direction. If there is any content overlap that goes both forwards and backwards simultaneously on the same track, do not reverse the content for the production master. The integrity of the forwards (primary) content should not be compromised.
- 4.4 Save file as a production master: **MDPI\_bar code #\_01\_prod**