Montana State University Library Digitization Procedures

Note: This is a working document and is in no way a final, finished procedures document. Changes will be made periodically and subsequent versions will be made.

Introduction

This document was created to help ensure the standardization of digitization procedures at MSU Library. It is to be used as a guide for all those working on digitization projects within the Digital Library Initiatives and/or Special Collections and Archival Informatics departments. The information in this document references the Federal Agencies Digitization Guidelines Initiative (FADGI) but is tailored to our unique needs, equipment, and personnel at MSU Library. We are not currently a FADGI-compliant digitization program but we can work towards that goal as our digitization program grows and matures. When in doubt, refer to FADGI's guidelines which are referenced throughout this document. All FADGI digitization documentation can be found on their website at www.digitizationguidelines.gov.

What is FADGI?

FADGI stands for Federal Agencies Digitization Guidelines Initiative. According to their website, the FADGI "is a collaborative effort by federal agencies formed as a group in 2007 to articulate a common sustainable set of technical guidelines, methods, and practices for digitized and born digital historical, archival and cultural content."

The FADGI is comprised of two working groups. "The Still Image Working Group concentrates its efforts on image content such as books, manuscripts, maps, and photographic prints and negatives. The Audio-Visual Working Group focuses its work on sound, video, and motion picture film."

> *"FADGI IS A COLLABORATIVE EFFORT STARTED IN 2007 BY FEDERAL AGENCIES TO ARTICULATE COMMON SUSTAINABLE PRACTICES AND GUIDELINES FOR DIGITIZED AND BORN DIGITAL HISTORICAL, ARCHIVAL AND CULTURAL CONTENT. TWO WORKING GROUPS STUDY ISSUES SPECIFIC TO TWO MAJOR AREAS, STILL IMAGE AND AUDIO-VISUAL."*
> *-FADGI*

FADGI participants include LOC, National Archives, NASA, The National Parks Service, and the Smithsonian Institute, just to name a few. To get a better idea of FADGI's impact and involvement with the Library of Congress, visit *FADGI Program: Impacts and Benefits* at www.digitizationguidelines.gov/about/FADGI-Impacts.html.

Still Images

When digitizing materials such as photographs, negatives, manuscripts, bound or unbound volumes, newspapers, maps, etc. please refer to FADGI's *Technical Guidelines for Digitizing Cultural Heritage Materials.*

Each type of material has a different set of digitizing specifications depending on a number of factors. For instance, photographic prints may be scanned at 600 ppi whereas photographic transparencies need to be scanned at 4000 ppi. Another example is bound vs unbound materials. Bound volumes must be scanned using the overhead book scanner so as not to damage the binding but unbound volumes may be scanned on the flatbed scanners. It's important to identify what type of material is being digitized and follow the specifications unique to each material. It's not a 'one size fits all' type of situation.

FADGI uses a star rating system to delineate the performance level of digitizations in accordance to their guidelines. Our goal is to always shoot for a 4-star rating or better. Sometimes equipment limitations and server space will prevent us from achieving a 4-star rating but it is important to make sure that we get as close as we can.

Photographic Transparencies: 35mm to 4"x5"

Performance Level:

	1 Star	2 Star	3 Star	4 Star
Master File Format	TIFF	TIFF	TIFF	TIFF
Access File Formats	All	All	All	All
Resolution	1000 ppi[1]	2000 ppi[1]	3000 ppi[1]	4000 ppi[1]
Bit Depth	8	8	16	16
Color Space	Grey Gamma 2.2 SRGB Adobe 1998 ProPhoto ECIRGBv2	Grey Gamma 2.2 SRGB Adobe 1998 ProPhoto, ECIRGBv2	Grey Gamma 2.2 Adobe 1998 ProPhoto, ECIRGBv2	Grey Gamma 2.2 Adobe 1998 ProPhoto ECIRGBv2
Color	Grayscale or Color as appropriate	Grayscale or Color as appropriate	Grayscale or Color as appropriate	Grayscale or Color as appropriate

Still Image Digitizing Workflow

Before a digitization project begins, the Digital Operations Manager and the Archivist/Curator will follow the *Preservation Master Procedures* as laid out in the *MSU Digital Preservation Procedures* document. A technician/student employee with then follow these steps:

1. Identify the type of still image being digitized and find the section concerning that material in the *Technical Guidelines for Digitizing Cultural Heritage Materials*.
2. Read through the notes section and make sure to follow any specific digitizing procedures concerning said material.
3. Only use imaging technologies recommended for that material unless otherwise instructed by the Digital Operations Manager or Archivist/Curator.
4. Locate appropriate imaging technology documentation as

CHECK YOUR COMPUTER/EQUIPMENT SETTINGS AND MAKE SURE THEY MATCH MINIMUM FADGI SPECIFICATIONS FOR THE MATERIAL BEING DIGITIZED!

5. Ensure the cleanliness of said imaging technology, making sure it is free of physical artifacts.
6. Identify digitization specifications for that material and make sure to change any computer/equipment settings BEFORE starting any digitizing operations.
7. Proceed to digitize materials, making sure to apply any color correction filters as instructed by the Digital Operations Manager.
8. Save master files with the correct naming schema as supplied by the Archivist/Curator or Digital Operations Manager. File naming standards can be found in the *MSU Digital Preservation Procedures* document. Save master files to a particular folder on the server as instructed by the Archivist/Curator or Digital Operations Manager.

Audio-Visual

FADGI guidelines are not as cleanly laid out for audio-visual as they are still images. This is because there are so many variables when it comes to digitizing and archiving audio-visual materials. FADGI specifications concerning audio-visual digitization are wordy and can be confusing. Most decisions concerning audio-visual materials, depending on project specifics, will be made on a case by case basis by the Digital Operations Manager. When formatting motion picture content one can refer to the latest version of FADGI *AS-07: MXF Archive and Preservation Format Application Specification*.

At this time (Fall, 2018), the MSU library is not able to preserve a/v materials in a FADGI suggested uncompressed MXF format due to extremely large file sizes (around 650GB/hour) and long encoding times.

In general, born-digital a/v collections that are produced in house will be archived using h.264 encoding in an .mp4 wrapper with aac audio encoding at 48khz and 320kbps bitrate. If a collection is small, the successor to the h.264 codec, HEVC h.26**5** will be used because of its superior compression efficiency. However, h.26**5** is extremely processor hungry and cannot be used for all collections (until our computers are upgraded) because of its extremely long encoding times. Analog to digital conversions (such as VHS tape) will also be archived using the aforementioned specifications or a JPEG2000 codec in an MXF wrapper, with uncompressed 48-96khz 24bit audio if the video being digitized is of significant value. Born-digital collections that are not produced in-house will retain their original formatting and not be "normalized" unless the original formatting is proprietary and at risk for extinction.

Video Specifications:
Be sure to "match source" in terms of frame rate and resolution.

Best Quality- Very rare or important digital videos
- Codec: JPEG2000
- Wrapper: MXF
- Broadcast Level: 6 or7 (lossless)
- Chroma Sampling: RGBA 4:4:4:4 12bit
- Audio: uncompressed 48-96khz, 24bit

Better Quality- Small digital video collections that aren't affected by long encoding times

- Codec: h.265
- Wrapper: mp4
- Target bitrate: 10 Mbps
- Max bitrate: 14 Mbps
- Additional settings: Render at maximum depth, highest quality, use maximum render quality
- Audio: AAC, 48khz, stereo, high quality 320kbps bitrate

Medium Quality- Most digital video collections

- Codec: h.264
- Wrapper: mp4
- Target bitrate: 16
- Max bitrate: 20
- Additional settings: Render at maximum depth, highest quality, use maximum render quality
- Audio: AAC, 48khz, stereo, high quality 320kbps bitrate

Audio Specifications:

Ideally all audio should be archived as uncompressed BWF (broadcast wave format) and utilize BWF MetaEdit software to embed metadata. Refer to FADGI guidelines:
http://www.digitizationguidelines.gov/guidelines/digitize-embedding.html

- Uncompressed .bwf
- 48-96khz, 24bit