



THE UNIVERSITY OF BRITISH COLUMBIA



Indigitization - Slides Digitization Manual

Compiled by Jennifer Deol

University of British Columbia

Supervisor: Sarah Dupont

LIBR 569A: Professional Experience

August 10, 2018



Contents

Formats Covered in this Manual	3
Before Getting Started	3
Selection, Examination and Condition Assessment	3
Cleaning Procedure for Slides	4
File Management.....	5
Physical Storage of Slides	6
Scanning.....	8
Before Getting Started	8
Setting Colour Profile	8
Guidelines for Determining Resolution	9
Scanning Slides	10
Scanning 35mm Slides.....	13
Making a Contact Sheet	16
Post-Scanning Digitalization Workflow	17
Saving for Preservation and Access	17
Saving & File Formatting	18
Metadata.....	19
Digitizing Fragile and Large Slides	21
Glossary of Terms.....	22
Additional Resources.....	23
References.....	24
Appendix A: Condition Assessment Report – Storage Unit.....	25
Appendix B: Condition Assessment Report – Slides	26



Formats Covered in this Manual

Format	Brief description
35mm slides	Small, positive pieces of film, normally about 1.375" by .875", held by rectangles of cardboard or plastic
6x6cm slides	Medium format slides
Odd sized slides (i.e., magic lantern slides)	Anywhere from medium to large format slides

Before Getting Started

Selection, Examination and Condition Assessment

Selection of materials to digitize (Adapted from Indigitization Toolkit, 2018)

The purpose for digitization projects and daily scanning activities generally fall into one of the following categories:

- Information Sharing: To enable users to directly access and use, a range of materials where copyright and agreements allow
- Supporting Research: To build a critical mass of digital content to support research, programs, and activities.
- Preservation: To preserve rare and fragile materials and those at risk of format obsolescence, while also improving access to their content by providing digital copies of the items for use.

The value (or worth) of the materials, as well as the positive aspects of access to them in electronic form, will rationalize the amount of time and effort spent in accomplishing a digitization project. All digitization activities and projects need to consider the following selection criteria

- **Value**
 - **Informational Value** – records that provide significant information on key people, places, events, objects, periods, activities, processes, and projects, etc.
 - **Administrative Value** – records that have functional usefulness to an organization
 - **Archival Value** – rare or unique cultural material with intrinsic value to its users
- **Use and Demand**
 - Highly used or accessed materials
 - Materials that are currently difficult to access
- **Risk**
 - Materials at risk of loss or deterioration
 - Rate of technological change
- **Rights**
 - Intellectual property rights and moral considerations
 - Materials made available for research
 - Information in the public domain



Examination (Adapted from Haberle & Korn, 2012)

The condition and order of the slides should be noted before beginning the digitization process as well. To understand the scope and nature of the event being documented and digitized, the contents of all files and slides for a given event should be examined to determine image orders, duplicates, modifications or any damage to the slide. The chronological sequence of these slides may also be significant to note, especially slides that are of dynamic time-based performances or events.

Begin by separating and grouping slides for your project and making note of the following:

1. Group slides by source or donor. If the source is unknown, the slide can be grouped by the image content/ event
2. Names on the labels that processed and mounted the slide (usually printed on the emulsion side of the mount)
3. Additional information on slide mount (i.e., photographer name, date)
4. General content (i.e., multiple photographs of the same instance taken from different perspectives, distinct lighting/ coloration / quality that sets images apart from others)
5. Duplicates (i.e., mounts that have the word duplicate printed on the emulsion side, generally don't have a frame number embedded in the film when removed from mount and/or have increased contrast compared to original)
6. Mounting material (i.e., cardboard, plastic)
7. Any other additional information, such as information about legal rights for the slide

Once sorted and prioritised, it is recommended to conduct a condition assessment report of the slides. For project management purposes, when you have more than one person working on a digitizing project, it is good practice to note who digitized items, on what date, and what condition the items were in to keep a paper trail.

For an example of condition assessment reports see **Appendix A: Condition Assessment Report – Storage Unit** and **Appendix B: Condition Assessment Report – Slides** you can use as a template and adapt for your project. It is recommended that the project manager edit these templates as required for the specific needs of the digitization project. These procedures and forms were developed as a template that you may use for your condition assessment. There are many ways to conduct a conditions assessment, and this method – using a paper template – is simply one of them. You may also want to consider entering the information into an excel spreadsheet or some other electronic format.

At this stage any necessary treatment to stabilise or prepare the slides for digitization should also be carried out. The most common treatment required is cleaning and repair. Cleaning of the glass slides involves removal of any surface dirt, fingerprints, accretions and adhesive marks from the glass that would otherwise obscure the image when it is digitised (see Cleaning Procedure for Slides section)

Cleaning Procedure for Slides (Adapted from Lawson, et al. (n.d.); Franklin Furnace Archive, 2012; Kennedy, 2012)

Standard Physical Cleaning

Prior to scanning, clean slides using a dry lens brush (preferably anti-static) followed by a few blasts of pressurized air to blow dust off the item being scanned. Keep the slides clean throughout the process and ensure there are no fingerprints or debris on the scanner surface glass or the slide.



Fingerprints and dust can significantly reduce the quality of an archival image. They are most noticeable on small items that are greatly enlarged, such as slides, and can be very difficult to correct after scanned. While dust cannot be eliminated entirely, you should take every effort to reduce it in the workplace and on the slide throughout the digitization process. It is recommended to use cotton gloves when handling slides and to work in a clean, dust free environment when handling and scanning slides.

Intensive Physical Cleaning

If dust or fingerprints persists, use a soft cloth (a PEC*PADs wipe), or negative/film cleaning solution, such as PEC-12, which works exceptionally well for dirty slides.

File Management (Adapted from Franklin Furnace Archive, 2012, Lai et al., 2016)

Long-term preservation of digital master files requires a storage and migration strategy. It is good practice to store digital objects in several places with a consistent naming scheme for long-term accessibility and findability. The first step is to determine where you will store your images (i.e., network server, external hard drives, a database, etc.). Some questions to think through:

- Will you store them on the local computer temporarily because the scans will be faster?
- Will you move the files to a networked drive, or a portable storage drive?
- Will you scan directly to networked location?

Next, decide the folder structure for the images:

- Will you create a project hierarchy or use an arbitrary numbering system?
- Avoid deep folder hierarchies.
- Be consistent (don't use special characters in the folder names).
- Determine your file naming strategy before you start your project.
- Consider using the scanning software's ability to auto generate numbers. Using this sequencing ability of auto generated numbers can help prevent duplicate numbers and can speed up processing. For example, the Epson scanner allows you to create a prefix and a three digit number that is auto generated as in:
Prefix: abc02 Start Number: 001 for a filename abc02001.tif or Prefix: 2016-06-12_ Start number: 001 for a filename 2016-06-12_001.tif.
- Follow file-naming best practices (below).

We recommend the following file-naming conventions and best practices:

- Keep file names short, but use adequate identifying information.
- Use characters (a-z) and (0-9) and avoid upper-case.
- Do not use spaces or special characters (such as / . , " ' ? ! % * ^ @ [] etc.).
- Use underscores or hyphens to separate elements in the file name and help to make them more readable.
- If using dates use YYYYMMDD or YYYY-MM-DD.
- Use the period (.) only before the file extension as in .tiff or .jpg and always make sure the file extension is included in the filename.
- Use filenames that correspond to the original media, if practical for the prefix (converting spaces to underscores, developing project codes to shorten and avoiding special characters, and then use the automated numbers for sequences, where possible.



- For corrected and access versions, maintain the original filename for the master and add codes for the type. For example, for a corrected master you could add a “c” as in 2016-06-12_001c.tif.

Additional Resources to consult for File Management best practices:

See *Indigitization Toolkit Section B5: Naming Conventions*: <http://indigitization-toolkit.sites.olt.ubc.ca/files/2018/03/B5-2018.pdf>

Indigitization Toolkit Section F: File Management: <http://indigitization-toolkit.sites.olt.ubc.ca/files/2018/03/K1-2018.pdf>

Physical Storage of Slides (Adapted from Archival Methods, 2017; The U.S. National Archives and Records Administration, 2017).

Due to cost and physical storage capacity, you will have to consider whether you will retain or dispose the physical slide material after the content has been digitized. It is important to keep in mind that digital image file management requires a deep and longstanding institutional commitment. Routine back-up procedures of digital files are not sufficient to permanently preserve the digital files you create.

This is because the digital content may become unusable due to current hardware and/or software becoming obsolete in the future. The risk of loss is also high, especially when migrating digital files to future systems for maintenance, functionality and accessibility as new technologies arise. If you are able to commit to the long-term and sustainable digital preservation and accessibility plan of these digital files then perhaps you can consider disposing of the physical slides.

Note: To learn more about digital preservation, see **Indigitization Toolkit Section I. Digital Preservation**: <http://www.indigitization.ca/indigitization-toolkit/digital-preservation/>

Slides take up minimal space, and preservation best practice is to retain the analogue version for future reference or use and can serve as a back-up if the digital copy becomes mis-filed or lost. If you need to dispose of the physical slides, ensure you have thought about a data management plan to account for changing technology and future digitization needs.

If you decide to retain the physical slides in-house, slides can be stored the same way as photographic prints or negatives. If you have the budget for it, best practice is to use high-quality papers and plastic which pass the ANSI IT9.16 Photographic Activity Test (PAT).¹ Plastic boxes made of polypropylene are usually safe to store slides.

Slides can also be stored in plastic slide pages (a type of pocket page which holds 20 slides) and placed in [3-ring archival binders](#), acid-free boxes or stored in metal or cardboard slide boxes.

¹ The PAT was developed by the American National Standards Institute (ANSI) and is a test that determines whether or not a storage material will cause fading or staining in photographs.



Bulk storage options

[35mm slide storage system](#): this compact “box-within-a-box-within-a-box” system can safely store up to 1200 cardboard or plastic-mounted slides, or about 600 glass-mounted slides. A [35mm slide 2400 slide storage kit](#) is also available for purchase.



(Source: <https://www.archivalmethods.com/blog/preserving-35mm-slides/>)

Storing glass slides (Adapted from <http://www.ala.org/alcts/preservationweek/advice/lanterns>)

Glass slides are best stored in four-flap wrappers (to prevent scratching the glass) and vertically in boxes. You will want to store the slides vertically rather than horizontally because glass is heavy. Particularly, old glass is very brittle and the bottom slide could crack under the weight of fellow slides in the pile. If your slides don't take up the entire box, put in some sort of spacer or padding so that the slides don't slide down. Label the box as having glass to prevent damage during future handling.

Tip: Negatives and slides should be stored in a cool, dry location.

If you do not have much budget or storage space, storing slides in the ring cases that come with them in plastic boxes in cool, dark, dust free environments is acceptable but is not recommended for long-term preservation of slide material. Other methods described above are more suitable for long term storage than the ring case.

Note: For an in-depth introduction to preservation of images, negatives and slides see “*Paper, glass, plastic: Identification and care of photographic negatives (2017)*” presentation in *Additional Resources* section.



Scanning

Before Getting Started (Adapted from Kennedy, 2012; Lai et al., 2016; Indigitization Toolkit, n.d.)

Equipment Needed:

Scanner

Computer

Software:

Scanning software

Editing software

Storage

Selecting a Scanner

For plastic and other reflective items like slides, most recent scanners can produce adequate archival images. For medium formats like 6x6 slides and odd-sized formats mid-level consumer grade flatbed scanners can produce adequate images for good practices. For 35 mm negatives or slides a more expensive scanner and a slide holder is needed to meet the criteria for best practices.

Recommended: *The Epson Scanner*

The Epson Scanner scans 35-mm filmstrips, 35-mm slides, medium format film, 4x5 inch film, and odd-sized film and slides.

Note: For an equipment and step-by-step guide for scanning using the Epson Expression 10000XL Scanner see “Photographic Image Digitization Workshop Manual Part 2: Scanning with the Epson Expression 10000XL Scanner.”

Nikon Film Scanner

Nikon film scanners work best for 35 mm film and slides and easily meet the resolution criteria for best practices. Unfortunately, Nikon has stopped manufacturing film scanners and the limited market for film scanners makes it unlikely that other companies will develop high-end film scanners in the future. Used and refurbished Nikon scanners can be found.

Cleaning and set-up procedure for scanner

It is important throughout the digitization process that you keep the scanner free of any dust, debris and fingerprints. You can use compressed air spray to remove dust. Be sure to use as directed so that no canister residue lands on the scanner glass.

To remove grease and fingerprints, use pre-treated E-WIPES lens or scanner wipes, or a small amount of glass cleaner on a soft lint-free cloth. Dry the document table glass afterwards. Never spray glass cleaner directly on the document table. Always spray it on a cloth first, and then wipe the glass.

Do not place the scanner on an unstable surface.

Setting Colour Profile (Adapted from Lai et al., 2016; Nault Norton-Wisla, 2017)

Setting the color profile is critical to digital capture and can be set within the scan software prior to digital scanning. A color profile simply describes the range of colors, or gamut, that a camera can see, a printer can print, or a monitor can display. They are used so that we can get as close to some proximity of a colour standard across monitors and printers.



Color profiles are device-independent and determine a color range you can work in. They allow you to edit images in a controlled, consistent manner. We recommend Adobe RGB, which allows for greater color information to be captured about the original item and allows for conversion or downsizing to a narrow space later. Not all hardware and software combinations produce the same color and tonal conversion, and even this workflow will not always produce the same results across all output devices.

Recommended colour profile for colour images: Adobe RGB 1998 is recommended for colour images.

Recommended colour profile for black-and-white images: Gray Gamma 2.2 is recommended for grayscale images.

Setting the Colour Profile for an Epson Scanner

Colour profiles can be set in the scan software (i.e., EPSON Scan) configuration settings before you start scanning.

1. Open scan software from desktop application. A scan window will appear
2. Click the **Configuration** button at the bottom of the scan window. Configuration dialog box will open.

Colour Images

Adobe (RGB) 1998 is the recommended color profile for colour images.

3. Choose the **Color** tab.
4. Select the **ColorSync** radio button option
5. For Source (Scanner): select **EPSON Standard**
6. For Target: select **Adobe RGB**
7. Auto Exposure Level should be **Low**
8. Click **OK** to set this configuration.

Black-And-White Images

Gray Gamma 2.2 is the recommended color profile for grayscale images.

3. Choose the **Color** tab.
4. Select the **Color Control** radio button option
5. Uncheck the, **Continuous auto exposure** box
6. For Display Gamma: select **2.2**
7. Auto Exposure Level should be **Low**.
8. Click **OK** to set this configuration.

Guidelines for Determining Resolution (Adapted from Lai et al., 2016; Nault Norton-Wisla, 2017)

Resolution is the number of pixels in each dimension that can be displayed and is measured in pixels using units DPI or PPI (pixels per inch). For instance, a 100 x 100 pixel image that is printed in a 1-inch square could be said to have 100 dots per inch (DPI) or 100 pixels per inch (PPI). Used in this way, the measurement is meaningful when printing an image. Good quality photographs usually require a minimum of 300 dots per inch when printed.

In order to produce an archival quality image file that will print at good quality up to 12 inches at the longest side, use the following table to determine the scan DPI or PPI resolution size:



Table: Spatial Resolutions for Slides (Adapted from Kennedy, 2012; Photo Digitization Guide)

Slide Sizes	Original Longest Side	To print longest side to 12" at 300 dpi scan at dpi/ppi:	(RECOMMENDED) To print longest side to 12" at 600 dpi scan at dpi/ppi:	Scanner Type + Scanner Mode
35 mm slide	36 x 24 mm	2700	5400	Epson & Nikon; use slide holder to scan
6 x 6 Slide	56 x 56 mm	1632	3264	Epson; use flat bed
Larger, or Odd-sized slides	measure longest side	Use size for Photograph*	Use size for Photograph*	Epson; use flat bed

*to see various photograph resolutions, see pg. 15 of *Photograph Image Digitization Workshop Manual* (from Lai et al., 2016)

To set the colour profile go into the scanner software and select "Resolution" and input appropriate PPI.

Scanning Slides (Adapted from Lai et al., 2016)

1. Turn on the scanner.
2. Check the calibration to ensure scanner is performing optimally.
3. Ensure the scanner and slides are clean, give the scanner document glass a quick blast of canned air to clean dust particles off.
4. Load the slides into the appropriate slide film holder landscape oriented, shiny side face-down and emulsion side face-up. Be sure to have a proper grip on glass slides when handling as they may slip from your grasp due to the fabric of your gloves and get damaged.
5. Ensure slides in film holder are also clear of any dust, debris and fingertips. Follow procedures to ensure your scanner is clear of any dust or debris (see section **Before Getting Started**).
6. Lay the loaded slide holder onto scanner glass so arrow mark from the film holder matches up with the arrow mark on the scanner.
7. Close scanner lid and scan.
8. Open scanner's scan program from desktop applications and follow instructions to set preview, colour-profile, resolution and file saving settings. Then hit **OK**.
9. The scanner will start batch scanning any images you have marquee-ed.
10. When finished, remove the film holder from scanner glass.
11. Return the slides to its place of storage.
12. Turn off the scanner.

Note: Avoiding newton rings for glass slides can be tricky. Newton's Rings are a distortion that looks like moiré silk caused by the two layers of glass of the slide. There are two ways that you can avoid the Newton's rings to get a good scan. First, you can scan on a flatbed scanner that has the capability of scanning with transmitted light (scanning light in the lid shining through the slide to the scanner) using a mount to raise the slide off of the scanner glass. A second way is to place the glass slide on a light box and shoot with a camera with no other flash or light source. With both of these methods, be sure to check the digital image to ensure that the color is correct. If not, you may have to adjust this in Photoshop or some other photo manipulation program but save the original scan or camera raw image as a master.

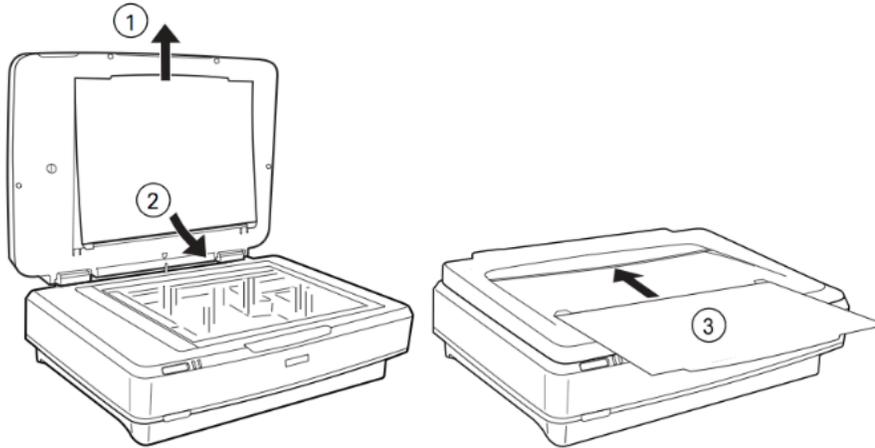
Alternatively, you can purchase anti-newton glass slide mounts.

(Adapted from <http://www.ala.org/alcts/preservationweek/advice/lanternslides>)



Use the Transparency Mode

1. Remove the white reflective document mat, by sliding it upward.
2. And freeing the bottom edge, then lowering and slide it out completely.
3. Place the mat in the storage slot on top of the scanner lid.



4. Insert the transparency guide onto the back edge of the document glass so that the alignment pins of the guide fit into the holes on the scanner.

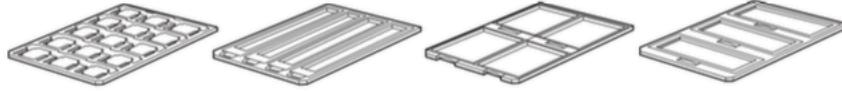


Transparency guide



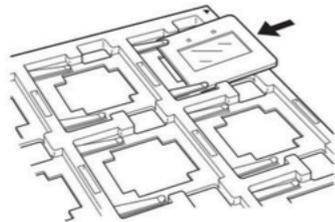
Use the Appropriate Film Holder for the Film Media

Use the appropriate film holders to scan 35 mm slides, 35 mm film strips, 4 x 5 inch film, and medium format (120/220) 6x6, 6x9, 6x12 film.

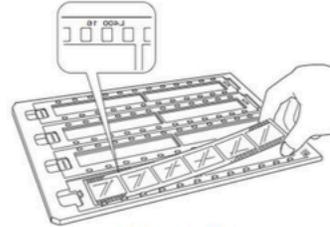


Load the Film, Slides, and Transparent Media with the Matt Emulsion Side Up (shiny base side down)

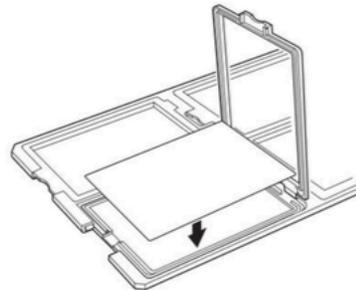
When film is examined under bright light, the image on the emulsion surface will be in slight relief, with bumps and hollows where the image has been developed. The opposite surface (the film base) will be reflective and smooth. Insert film with the emulsion up.



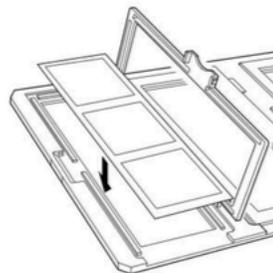
35 mm slides



35 mm strips



4 x 5 inch film



Medium format film

For odd sized film, see the section on [Scanning Odd-Sized Film](#).



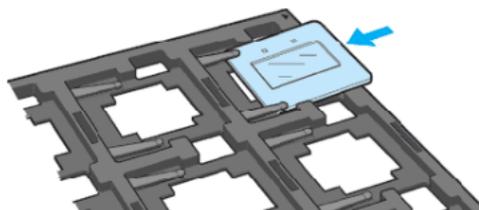
Scanning 35mm Slides

A step-by-step guide of scanning 35mm slides adapted from “Photographic Image Digitization Workshop Manual Part 2: Scanning with the Epson Expression 10000XL Scanner” pg. 9-12.

Scanning 35 mm Slides

1. Choose the 35mm slide film holder.

On a flat surface, load the slides into the holder, landscape oriented, shiny side face-down, and emulsion layer face-up.



2. Give the scanner document glass a quick blast of canned air to clean the dust off.

3. Lay the loaded 35 mm slide holder onto the document glass so that the arrow mark from the holder matches up with the arrow mark on the transparency guide.

(You can use up to two loaded 35 mm slide holders if you have a lot of slides to scan.)



4. Close the lid on the scanner.

5. Open scanner software (i.e. Epson Scan) and select professional mode from dropdown box.

6. Insert the following colour profile, resolution and additional image adjustments. See Epson Scan window for an example of the information you want to set in the scan software dialogue box.



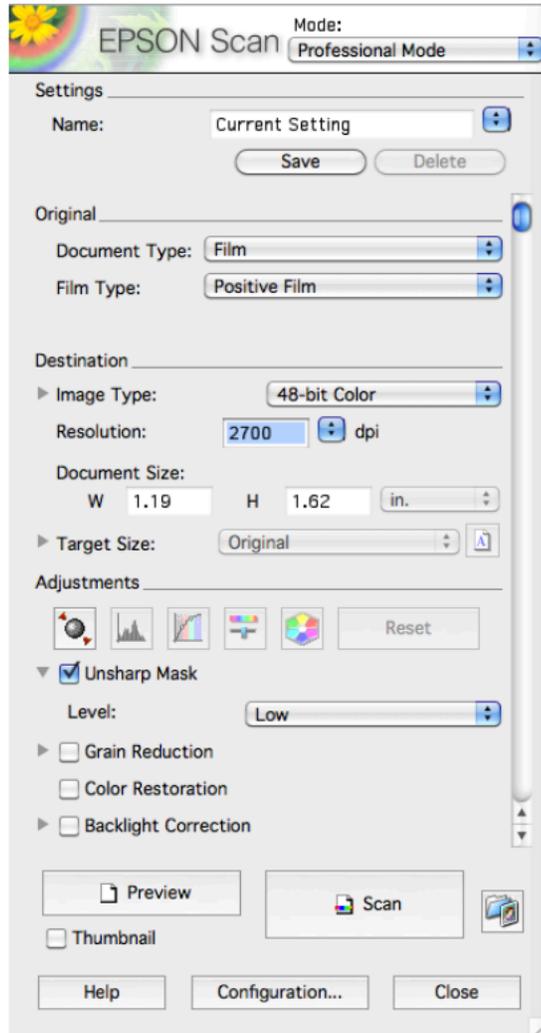
Original _____
Document Type: **Film**
Film Type: **Positive Film**

Destination _____
Image Type:
48-bit Color for colour
16-bit Grayscale for B&W
Resolution: **2700** dpi

Adjustments _____
Unsharp Mask should be checked.
Level: **Low**

*No other Adjustment should be checked.

Do not check the Thumbnail box.
(the Thumbnail option tends to crop the image.)



8. Click the **Preview** button.
The scanner will create a preview and a Preview window will open.

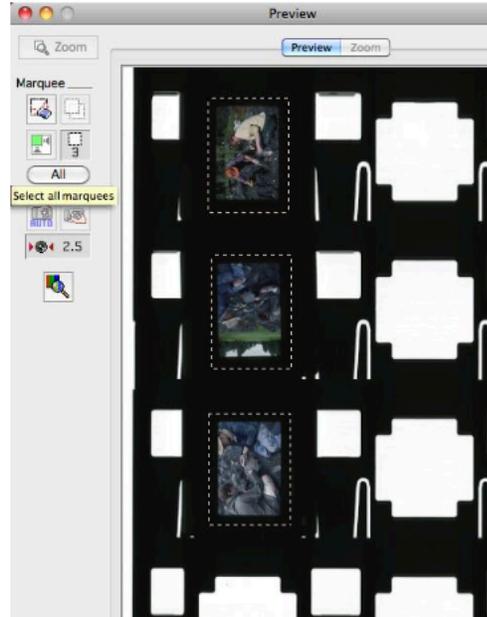


9. In the Preview window, click and drag the mouse to draw a 'marquee' box around each image, starting with the top, left image working down, and across to the bottom right.

Ensure that the marquee is over the entire image with no cropping.

Note: Any marquees you create will be scanned in the order you create the marquee.

You can switch between each marquee crop box and make a box active by clicking one time inside an inactive crop box. An active crop box will have 'marching ants' around it. The active crop box can be modified by grabbing one of its edges and dragging it to a new position.



Click the 'Zoom' button  to magnify the view of the active crop box. This will help you make precise adjustments. Click the 'Preview' tab to zoom back out and preview all our marquee selections.

10. When you are finished creating marquees and adjusting the crop boxes, and are ready to scan, click the 'All' button in the Preview window.

This will select all your marquees, and all the marquees should be active now and have an outline made in dashes around them. Only one will have 'marching ants' though.

11. Click the **Scan** button at the bottom of the EPSON Scan window to start the scan process.



12. A File Save Settings dialog box will open.

For Location,

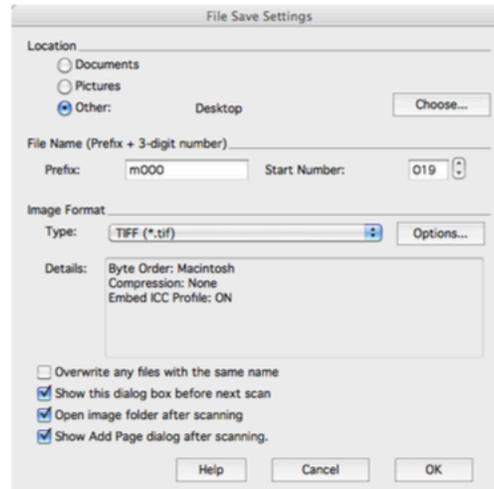
Other

and click **Choose** to navigate to the appropriate folder on the network server. Use the browse button to navigate to it.

For File Name, under Prefix, enter the file naming convention prefix.

Change the Start Number to be whatever sequential number you are on.

Set the Image Format to
Type : **TIFF (*.tif)**



Don't check Overwrite any files with the same name.

13. Click **OK**

The scanner will start batch scanning any images you have marquee-ed.

14. When it has finished, remove the Film Holder from the scanner glass

15. Return the slides to their storage sheet.

16. Turn off the scanner.

Making a Contact Sheet (Kennedy, 2012; Lai et al., 2016)

Contact sheets contain thumbnails of each scanned image of your project. For project management workflow purposes, when working with slides you may want to make contact sheets so you can track the numbers you have assigned to the slides; however, this is optional and **generally for smaller slide digitization projects. You do not have to do one.**

1. Follow directions for slide scanning.
2. Scan all slides according to slide scanning instructions in section **Scanning Slides** above
3. Write file names on the slides in pencil (Note: use pencil only, do not use ink or pen to write on slides as it will damage the slide).



4. Label the slide storage unit (i.e., a slide sleeve, box or carousel) with file name range. *Note that the individual file name for a given slide deck is written on the slide itself and the file name range is written on the sleeve or box or carousel, or whatever a group of slides are stored in).*
5. Apply appropriate metadata template to uncorrected (preservation copy) files in Adobe Bridge (or Photoshop).
6. Open files in Photoshop. Perform necessary orientation, cropping, and attach colour profile for each individual digitized slide to be saved.
7. Save (preservation copy) file to the folder where the master images are stored.
8. Perform any additional corrections to file; levels and curves adjustments as needed as per (Part 4: Post-Scanning, Image Adjustment and Correction) then Save As file to appropriate corrected folder with file name+c (if using “c” to indicate “corrected”).
9. Consider using a spreadsheet to record the image description. Name the spreadsheet to reflect the project or collection you are working on and the date you begin (YYYYMMDD format). *Note that this step is not necessary. Depending on what kind of collection management/digital collection software you use, the data may be able to be batch uploaded into a system directly. If you do not have a system in place yet, this is a way to record the data in such a way it can be added to a system at a later date.*
10. Save contact sheet to the appropriate folder and consider including the range of file numbers assigned to these images in the contact sheets as part of the file name.
11. Print out a copy of the contact sheet.
12. File with slides after scanning and numbering.

Post-Scanning Digitalization Workflow

Saving for Preservation and Access (Kennedy, 2012; Lai et al., 2016; Indigitization Toolkit, n.d.)

For each object scanned, you will produce two files:

- **Digital Master** (also referred to as uncorrected version) = the adjusted, but uncorrected scanned image file, frequently called the uncorrected master in this manual for preservation of original slide.
- **Access Master** (also referred to as correction version) = a copy of the digital master which is corrected to enhance access and/or downsized for publishing or printing. Also referred to as the corrected master or edited master, this is a lower res version for accessibility and use.

Digitization must strive to preserve to the greatest extent possible the authenticity and integrity of the original information. Adjustments made to the Digital Master image are made to optimize image quality and bring all images to a common rendition, to produce the most accurate visual representation of the original.

Post-Scanning Adjustments include:

- Cropping the image
- Rotating and straightening the image
- Assigning a color profile

Note: For a step-by-step image adjustment to Digital Master using Photoshop see “Photo Digitization Guide Section G2” pg. 8-12: <http://www.indigitization.ca/indigitization-toolkit/photograph-digitization/>



Digital enhancements may be performed only on copies of the digital master file to improve access. The digital master file must be kept unaltered. Corrections are made to an Access Master, or derivative file of the Digital Master image to enhance the visual image and make it more accessible and viewable, and for the purpose of reproducing for specific print or display.

Post-Scanning Corrections include:

- Tone correction (levels, tone balance, contrast, highlights, shadows)
- Color correction (white balance, saturation)
- Touching up, dust and scratch removal
- Sharpening the image

Note: For a step-by-step image adjustment to Access Master using Photoshop see “Photo Digitization Guide Section G2” pg. 12-27: <http://www.indigitization.ca/indigitization-toolkit/photograph-digitization/Saving & File Formatting> (Lai et al., 2016; Indigitization Toolkit, n.d.)

Now that you have created a digital and access masters, you are ready to save your files. The standard format for archiving master images is uncompressed TIFF. TIFF files are a universally accessible and lossless format that generally does not degrade the quality of the image over time (Kennedy, 2012; Lai et al., 2016).

Saving in JPEG and PDF is not recommended. While JPEG format may be appropriate for master images in certain situations (i.e., JPEG files may also be used for master images if digital storage space is a limitation), JPEG format compresses the image and produces slight degradation each time the image is modified and re-compressed. Repeated editing of an image can cause significant degradation over time.

The PDF format is increasingly used to share and store electronic documents; however, PDF files from scanning are images in compressed formats with parameters that are not easily understood or controlled.

The following tables contain standards summarized from various industry standards that should be followed for all digitization projects if possible. By adhering to these accepted standards, we are able to:

- Ensure that the digital files created through digitization are of high quality and meet national and international standards, and
- Maintain the integrity and longevity of the digital files for long term digital preservation.

These standards are subject to change as technology and practice evolve. Furthermore, each digitization project is unique in its setting and goals. The ultimate objective is to have a preservation master copy that is a faithful reproduction of the original from which additional copies can be made.

Film, negatives, and slides				
	Preservation and Access Master	Print Access	Screen Access	Thumbnail
File format	TIFF	JPEG or PNG	JPEG or PNG	JPEG or PNG
Resolution	800 – 1200 dpi	150 – 300 dpi	150 dpi	150 dpi
Bit depth	24 bit RBG colour or 8 bit grayscale	24 bit RBG colour or 8 bit grayscale	24 bit RBG colour or 8 bit grayscale	24 bit RBG colour or 8 bit grayscale



Dimensions	4000 – 6000 pixels across the long edge	3000 pixels across the long edge	800 pixels across the long edge	200 pixels across the long edge
Compression	Uncompressed	Lossless compression	Lossless compression	Lossless compression

Saving for print

Note: If you are saving to print or use in a document, you may want to make the image smaller, to exactly the print size you need.

1. From the menu, choose Image->**Image Size**.
 - a. The **Image Size** dialog box will appear. Ensure that all three boxes at the bottom are checked; **Scale Styles**, **Constrain Proportions**, and **Resample Image**.
2. Change the Document Size to the appropriate size you want to print to in inches or cm or mm. The Resolution should be a minimum of 72 pixels/inch, but ideally for print you would want to use 300 pixels/inch.
3. Change the very bottom dropdown choice to:
 - a. **“Bicubic Sharper”** (best for reductions) if you are making the image (and file size) smaller.
4. You shouldn’t be enlarging, but if you are, choose **Bicubic Smoother** (best for enlargement), if you are making the image (and file size) larger.
5. Click **OK**.
6. If you are happy with the size and quality of the resulting image, choose the **Save As** option from the menu bar **File ->Save As**
 - a. From the **Save As** dialog, there are a number of file formats to choose from, including JPEG, PNG, and TIFF. These are all acceptable for print or use in documents.

Saving for web

1. If you want to product an image for the web, choose
 - a. **File->Save for Web and Devices**
2. The **Save for Web & Device** dialog box will appear.
 - a. From here there are a number of options you can choose. You should specify the exact Image Size width and height in pixels, and you can preview any combination of choices. And you can save to a number of default web optimized preferences for GIF, JPEG and PNG.
3. After you have entered your desired options, hit the **Save** button and your choice of web optimized image will be created. You will be asked where you want to save the image.

Metadata (Lai et al., 2016; Indigitization Toolkit, n.d.,)

Metadata is structured information that describes and makes it easier to find, use, or manage an information resource. Metadata is often called data about data or information about information. For example, metadata recorded for a digital image or photograph would include data about the content of the image, the photographer, the date of creation, date(s) of modification, technical information such as resolution, file type, file format, and its relationship with other related files and their locations.

For more information about working with and managing metadata for a digitization project see: <http://indigitization-toolkit.sites.olt.ubc.ca/files/2018/03/H-2018.pdf>



Best practices for creating metadata for photographic material

Avoid using grammatical markings that may be translated by different programs, like backslash (/), colons (:), and semicolons (;) as they may cause problems if merged into another database. Spaces or safe markings, such as a dash, are OK. In file naming, insure that file extensions are included with a preceding period (.). Avoid periods in other positions in the file name.

In addition to the unchangeable embedded technical metadata, it is possible to append additional metadata that is embedded in the image file. This additional metadata is editable. Using Adobe Bridge, it is possible to create individualized templates and apply them to batches of images.

To create a metadata template:

1. Start Photoshop from the Applications on the desktop. Adobe Bridge will open with an image browser window. Or, open Photoshop directly.
2. Navigate to the folder that contains the images to which you want to append metadata (see Directory section following). Previews of the images/files will appear in the “Content” column. If you select one particular image, a larger thumbnail and its metadata will appear on the right.
3. Open the Create Metadata Template dialog box from the menu bar.
 - a. Choose Tools -> Create Metadata Template...
 - b. The Create Metadata Template dialog box will appear.
4. Enter the appropriate metadata to the fields into the **IPTC Core** section.

Creator:	Name of Photographer (<i>if known, otherwise leave blank</i>)
Creator: Job Title	i.e., “Photographer” (<i>leave blank is no name in Creator field</i>)
Source:	i.e., “UBC Irving K. Barber Learning Centre (IKBLC)”
Copyright Notice:	i.e., Copyright held by ...[Owner of material or Photographers Name] (<i>leave blank if not know</i>)
Copyright Status:	This should be determined in advance for collections, fonds, or individual images as required. If copyrighted, select “Copyrighted” from the drop down list; if not known leave default “Unknown”
Rights Usage Terms:	(contents dependent on project; leave blank if unknown or undecided at point of scanning)

5. Click the Save button to save the Template. Check to make sure the template is saving to the Templates folder.

Note: For a sample metadata template see: <http://indigitization-toolkit.sites.olt.ubc.ca/files/2018/03/H4-2018.pdf>

Apply Metadata to Digital Master Image

Later, when you use the Digital Master to create any corrected versions, all derivative copies will inherit the metadata intact. This way the Digital Master and subsequent access images, or any derivatives, will have consistent metadata.

Completing a spreadsheet for each project or collection digitized

In order to keep track of digitizing an “item-level” spreadsheet can be completed for each project or collection. The following outlines how to complete the spreadsheet.



Note: If the data in each spreadsheet might be imported into another management system or database, consider using the old Excel format (Excel 97-2003 Workbook) and make sure all the data cells are set as “text” or make sure that the data type for any set of cells will transfer properly to the other system. Date and number fields can be challenging to make compatible.

Digitizing Fragile and Large Slides (Adapted from Kennedy, 2012)

If your slides are fragile or too large for your scanner, digitization using a digital camera to capture the slide image is the most common option. The decisions about color mode, color space, resolution, and bit depth apply with a camera and the same criteria are used. A digital camera used with a copy stand or book cradle is a good option for digitizing items that are too fragile or too large to scan. The camera should be an SLR or have a similarly large sensor.

*Note: For a step-by-step guide for scanning using a camera see **Sustainable Heritage Network: How to scan with the Camera resource** under **Additional Resources** section below.*

The best practice is to set the master image size to match the size of the original item. Good practice is to record the sizes of the originals in the documentation for an image and change the default size later only if needed to reproduce the original size.

The resolution settings for cameras are described in terms of total pixels on each side of the image rather than pixels per inch. Cameras are categorized according to the maximum total number of pixels in an image. A useful guideline is that a 6 or 7-megapixel image is needed to have 3000 pixels on the longest side and an 11 or 12 megapixel image is needed to have 4000 pixels on the longest side. The possible settings for resolutions on a camera are limited to fixed values.

A digital SLR camera corresponding to 35 mm can produce good quality images for archival purposes. A minimum of 12 megapixels are needed for standard sized documents, and greater megapixels are preferred for oversize or highly detailed photographs or documents. The prices are currently beyond the range of most people or organizations with budget limitations.

Saving a camera image

Many cameras do not produce TIFF files as output. The common options are RAW and JPEG. RAW images are directly from the camera sensor with little processing. The main processing to produce the final image must be done in a later step with Photoshop Camera Raw or with software provided with the camera. Working with RAW images provides the maximum control but also requires the greatest expertise and time. RAW images are proprietary and are not suitable for archival purposes. After the image has been processed, it can be saved in TIFF format.

***Note** if your camera does not provide TIFF files for digitization and you cannot download the Photoshop Camera Raw software, high quality JPEG output files may be used as the master images rather than converting the JPEG files to TIFF. The drawback with JPEG format is it compresses the image and produces slight degradation each time the image is modified and re-compressed.*



Glossary of Terms

Contact sheet is a positive print of all the negative images/slides from one deck, made by a contact printing **process** so that all the images are the same size and are side by side to see which are the best images on a film/deck of slides.

DPI stands for dots per inch, and is a measurement of resolution for referring to the number of physical dots of ink in a printed document (the higher the DPI, the better the tonality of the image). The DPI setting of the scanner relates to the final real size of the image.

PPI stands for pixels per inch, and is a measurement for a digital image (the higher the dpi, the better the quality of the digital image). The PPI setting of the scanner relates to the final pixel size of the digital image.

Grayscale refers to an image in which the value of each pixel is a single sample composed exclusively of shades of grey.

JPEG stands for Joint Photographic Experts Group and refers to a type of graphics file format commonly used for images, photographs, etc.

Resolution is the number of pixels in each dimension that can be displayed or the density of pixels in the image.

TIFF stands for Tagged Image File Format and refers to a type of file format for storing images.



Additional Resources

Digitizing magic lantern slides URL: <http://www.ala.org/alcts/preservationweek/advice/lanternslides>

This website provides guidelines and standards for digitizing magic lantern slides and can be referenced when working with odd-sized glass slides.

Digitization Best Practices (York University) URL:

<https://www.library.yorku.ca/web/collections/digitalscholarship/digitization-best-practices/>

This website provides a high-level overview of considerations for digitization projects, as well as links to further resources.

Image Digitisation Manual 2007 URL:

http://www.slq.qld.gov.au/_data/assets/pdf_file/0006/63879/SLQ_PQ_image_digitisation_manual_-_complete.pdf

The manual provides information on the key aspects of planning and conducting a digitization project.

Metadata best practices and guides URL: <http://indigitization-toolkit.sites.olt.ubc.ca/files/2018/03/H1-2018.pdf>

Part of the Indigitization toolkit, this detailed guide is a good introduction to working with metadata for community digitization projects.

Guides to Quality in Visual Resource Imaging, (Digital Library Federation) URL:

<http://old.diglib.org/pubs/dlf091/dlf091.htm>

These guides were written for those who have already decided what they will digitize and what purposes the digital images will serve and cover project planning, scanner selection, imaging system set-up, and the resulting digital masters. The website has not been maintained since 2010.

Library of Congress Sustainable Formats Digitization Image Standards URL:

<https://www.loc.gov/preservation/digital/formats/intro/intro.shtml>

This site provides analysis of the technical aspects of digital formats and Library of Congress standards for digitizing images.

Sustainable Heritage Network (n.d.) How to scan with a camera URL:

<https://www.sustainableheritagenetwork.org/system/files/atoms/file/HowToScanWithTheCamera3.pdf>

A visual step-by-step guide for scanning using a camera.

Fischer, M., (2017) Paper, glass, plastic: Identification and care of photographic negatives. ATALM annual conference. Retrieved from Sustainable Heritage Network URL:

<https://www.sustainableheritagenetwork.org/digital-heritage/paper-glass-plastic-identification-and-care-photographic-negatives>

In this video, Monique Fischer, Senior Photograph Conservator at the North East Document Conservation Center (NEDCC), offers an in-depth introduction to the preservation of negatives, including their identification, deterioration, and care. Some of the topics covered include: how to recognize various formats, the preservation problems associated with each format type, storage concerns and preservation priorities, environmental guidelines and proper care and handling.



References

- Archival Methods. (2015). Part 7: Preserving 35mm slides. *American Family Archives*. Retrieved from <https://www.archivalmethods.com/blog/preserving-35mm-slides/>
- Kennedy, J. (2012). Preserving history: how to digitally archive and share historical photographs, documents, and audio recordings. Retrieved from https://archivehistory.jeksite.org/chapters/chapter2.htm#_Toc427475837
- Haberle, M., & Korn, J. (2012). Best practices and guidelines: Digitization at Franklin Furnace Archive, Inc. Retrieved from http://franklinfurnace.org/online_event_archives/best_practices/DigBestPractices_v20_20120719.pdf
- The U.S. National Archives and Records Administration. (2017). What is the best way to store negatives and transparencies? Retrieved from <https://www.archives.gov/preservation/storage/negatives-transparencies.html>
- Lai, A., Padilla, E., Stevenson, A. & Cherry, A., (2016). Photographic image digitization workshop manual. *Indigitization Futures Forum*.
- Irving K. Barber Learning Centre, Museum of Anthropology & Geoffrey R. Weller Library (n.d.). Indigitization Toolkit. Retrieved from <http://www.indigitization.ca/indigitization-toolkit/>
- Nault, J. & Norton-Wisla, L. (2017). Image digitization: best practices and training. International Conference of Indigenous Archives, Libraries and Museums. Sustainable Heritage Network. Retrieved from <https://www.sustainableheritagenetwork.org/system/files/atoms/file/ATALM%202017%20Image%20Digitization%20on%20a%20Budget%20Workshop.pdf>



Appendix A: Condition Assessment Report – Storage Unit

Assessment Date: _____

Project Name: _____

Digitization Tech: _____



Storage Unit Condition
Number of slides in unit:
Storage unit container Type: (i.e., 3-ring binder sleeves, slide carousels, cardboard/plastic box, etc.):
Is the storage unit container broken or damaged?
Is the storage unit container well supported to protect slides?
Additional storage unit notes:

Storage Unit Label Notes
Date on label:
Photographer/donor/ lab/ primary participant name(s):
Label summary and relevant label notes:



Appendix B: Condition Assessment Report – Slides

Assessment Date: _____

Project Name: _____

Digitization Tech: _____



Slides
Number of slides in unit:
Storage unit container Type: (i.e., 3-ring binder sleeves, slide carousels, cardboard/plastic box, etc.):
Are any of the slides damaged or broken?
Are there any duplicate slides?
Additional slide notes:

Slide label notes
Date on label:
Photographer/donor/ lab/ primary participant name(s):
Label summary and relevant label notes: