This guide outlines general considerations for the digitization of materials intended for inclusion in the USCDL
INTRODUCTION
The purpose of this guide is to provide an overview of the USC Digital Library (USCDL) Imaging & Media Lab’s guidelines for digitization. Included are procedures for digitization of rare materials ranging from photographic prints and written manuscripts to audio-cassettes and phonograph records. This document outlines general guidelines and instructions and assumes that digitization practices will vary depending on the type and condition of the original material.

THE GOAL OF ARCHIVAL DIGITIZATION
Ideally, digitization should be a one-time event – where the original material is digitized according to “archival standards” and then returned to storage. The goal of digitization is to provide a surrogate copy of the original. While this ‘surrogate copy’ does not replace the original, it should be able to accurately represent as much of the information contained in the original as possible. The following list of basic procedures should assure that digital surrogates are high quality, accurate representations of originals; and that workflows are predictable and efficient.

BEFORE YOU BEGIN
Before beginning digitization, consider organizing your original materials as follows:

By Collection
In a typical production facility there are usually multiple projects happening at any given moment. Materials should be clearly labeled, and delivered in a way that protects them and clearly identifies them.

By Format
Separate formats such as prints from negatives to streamline scanning batches by material types.

By Size
Separate scanning batches by the original material’s size. This will reduce set-up time between scans.

The Imaging & Media Lab uses a tracking form to document materials delivered to and from the Imaging Lab. It can be found at http://digitallibrary.usc.edu/docs. If you are delivering materials to the Imaging & Media Lab, please fill out the tracking form before delivery. Materials brought to the Lab without the tracking form will not be accepted.

PREPARING YOUR WORKSPACE
The ideal digitization environment should include the following:

• Daylight balanced lighting (for color neutrality during post-processing)
• An ability to control ALL lighting (including lighting from windows or adjacent spaces)
• Air filtration to minimize dust and particulate matter
• Neutral colored walls and floors – 18% neutral gray is optimal
• Sturdy furniture and stands (tables that don’t shake, heavy duty stands with sand bags, isolated tables and stands for sensitive equipment like turntables and film-scanners) that helps minimize movement of digitization tools
• Secure entries and exits
• Local temperature control
PREPARING OBJECTS FOR SCANNING

For most transparent media, the Imaging & Media Lab cleans surfaces with anti-static cloths or brushes, and then with compressed air. For certain collections or projects we clean with chemical based film cleaners, but only after getting an approval from the curator or project sponsor.

When digitizing opaque materials, such as photographic prints, manuscripts, and books, it is optimal to have the object lay on a flat and even surface. Customized book cradles are used to keep the book opened during digitization.

FLATBED SCANNING

Ensure that your flatbed scanner is clean and dust free prior to scanning. If you are working on a scanner that is used to scan multiple formats, it is usually a good idea to double-check software presets before each scanning session. For example, you might want to double check settings like pixels-per-inch (ppi/dpi), sharpening (we tend to avoid sharpening during digitization), rotation, etc. since they might differ from scan to scan.

Please see our Recommended Practices for Digitization document (found at http://digitallibrary.usc.edu/docs) for specific settings.

Before doing a large batch of images, it is good practice to carefully examine the first scan at 1:1 in Adobe Photoshop and look for the following:

- The original was scanned in its entirety.
- The focus is sharp from corner to corner.
- The pixel resolution is appropriate for the size of the original material.
- The file has been assigned the correct color space (either Adobe RGB 1998 or ProPhoto RGB) and has been digitized at the correct bit-depth
- There are no artifacts or abnormalities in the file. (For example, crisp vertical or horizontal lines that are not in the original material – an indication that there is dust or debris on the CCD).

COLOR & COLOR SPACE

Color capture is recommended in cases where color is an important attribute of the material. If an original photo-print is tinted (overly warm-toned like sepia or cold toned like selenium) digitize it as RGB. The Imaging & Media Lab recommends using Adobe RGB 1998 or ProPhoto RGB for your color images. Avoid using sRGB IEC1966-2.1 or device specific color spaces for your ‘archival’s files.

If a black & white print does not have an obvious colorcast to it you may capture it as grayscale. Black & white prints can be scanned as 8-bit. Negatives, color prints, paintings, drawings, should always be digitized and archived as 16-bit.
COLOR TARGET/GRAySCALE

Photographic prints should be scanned with a color target in the image. Color targets such as the Kodak Q13/Q14 Color Separation Guide and Gray Scale, Macbeth ColorChecker, and QP Card (shown below) are recommended. Color targets will allow you to assign common values to color and tonal values during post processing. Only a small sliver of the scale is necessary to provide an accurate color reference or a measurement scale.

![QP Card](image)

Suggested values:  BLACK = 5-20   GRAY 110-130   WHITE = 245-254

This reproduction is for example only. Do not cut out and use for production.

• For horizontally oriented images, USCDL places the QP card along the left side of the image. The horizontal image below is an example of this placement.
• For vertically oriented images, USCDL places the QP card at the bottom of the image. The vertical image below is example of proper placement of the color target.

![Images](images)

These images are examples of proper QP card placement and cropping. Images are from the California Historical Society Collection.

BORDERS & CROPPING

Scan each object in its entirety. The edge of the object should be visible and cropped leaving an approximate quarter inch sliver of the QP Card and a small border of black background.

BIT DEPTH

The bit depth of the files you create will vary depending on the type(s) of original material you digitize. For instance, if you are digitizing a report and the goal is to capture the textual information, capturing the material as bi-tonal or 8bit grayscale will suffice. If you are capturing photo-
graphic negatives or manuscripts, we highly recommend that your archival digital files are 16bit grayscale, or 48bit RGB.

**Resolution**

The resolution (pixels per inch) of your archival digital files is determined by the size and quality of the original objects you are digitizing. The USCDL’s *Recommended Practices for Digitization* gives baseline resolutions for various kinds and sizes of original items. Please consult it prior to digitizing your materials, and if you have questions, contact digitalimaging@usc.edu.

**Post Processing**

Post-processing is required for two reasons, 1) to verify proper exposure, sharpness, tonal range, color balance and orientation, and 2) to ensure that the digital image is free of image artifacts (lines, clusters of ‘bad pixels’, clipped areas, etc.). The primary tool the Imaging & Media Lab uses to post-process images is Adobe Photoshop CS4.

Post-processing should ideally be performed with calibrated monitors and in a controlled lighting environment. When possible, the original material should be placed in a calibrated viewing light box (if paper or vellum) or on a daylight balanced lightbox (if it is transparency film) next to your calibrated monitor. The image to the right is an example of such a setup.

Calibrated monitors should have the following values:

- Target gamma – Gray Gamma 2.2
- Target white point – D65

Post-process digital images according to the values on the color target. If no target was included in the scan, find the brightest white and darkest black in the image and use those points as your reference. We recommend the following values:

- White should have a value between 245-254.
- Middle Gray should value between 110-130.
- Black should have a value between 5-20.
  (in the Adobe Photoshop “info” palette set the color picker to “actual color” or “RGB Color”)

**Contact Us**

If you would like to discuss a USCDL digitization project or have questions not addressed in this document, please do not hesitate to contact us @ digitalimaging@usc.edu.