Imaging Standards

IMAGING STANDARDS

1. Purpose
The purpose is to provide guidelines to the photographer in order to maximize useful information capture, facilitate color management, encourage uniformity of style, provide users with standard color reference information, and to facilitate comparisons between different capture methods employed.

Selection of images is discussed elsewhere; in this context, however, it will be useful to remind the photographer to work with as much per-image information as the selecting curator/cataloguer has provided: not just the folio number of the selected image, but also the caption that may explain why that particular folio was chosen. Such knowledge will be of service in decisions about lighting, etc. to bring out certain features (and such knowledge will also allow the photographer to catch mistakes in recto/verso designation, and so on).

STANDARD REFERENCE TARGETS

2. Uses of Targets

As each manuscript image is captured, the image should include standard reference targets to provide integral (i.e., within the image) documentation of the conditions of image capture. These targets should include a grayscale, a set of standard color patches, and a linear scale. Measurements made from these targets may be used in a color management process to impose uniform standards of color reproduction, and the targets will also be useful for tracking the results of any further image processing. Image users will be able to employ them for making judgments about the color reproduction of the images and of their own display systems.

3. The Q-13 Targets

The Kodak Color Separation Guide and Gray Scale (Small), Q-13, is a set of two standard targets, each measuring about 8" by 2.4." One is a 20-step grayscale, with each succeeding step darker by (nominally) 0.10 density units than the previous one. The second target is a set of standard color patches (primaries, white, black). This target also includes a linear scale (inches and cm) in its margin; and the grayscale steps are each 1 cm wide, providing an implicit linear measure. The Q-14 is a larger version of the same targets.

4. The Neutral Gray Card

Although the Q-13 grayscale includes an 18% reflectance step, it may be useful for some color management purposes to include a larger area of standard neutral gray. The Kodak Gray Card (R-27) is a standard neutral gray card of 18% reflectance. It is suggested that the Q-13 (and the R-27 where needed) be accepted as the basis of the standard reference targets to be included in each document image.

5. The Linear Scale

Each image should include an explicit linear scale in centimeters. A white plastic ruler about 6" long is appropriately sized for most images; such a scale should be included whenever the scale in the margin of the Q-13 is not visible in the image.

USING THE STANDARD TARGETS

6. Which Portions to Include

The two Q-13 targets together measure 8" x 2.4" x 2 targets for a total area of about 40 square inches. For images of smaller documents, it will be desirable to place the two targets at the edge of the image so that only a narrow slice of each target appears, with the remainder of the targets' area cropped from the image layout. Presumably a small area of each patch is sufficient to allow digital measuring for color management. In this way it should be possible to limit the targets to perhaps 8" by 0.3" each. It may be necessary to mark the edges of the grayscale to identify particular patches, as the step numbers will not be visible from the margin. Similarly, the gray card can be partially included along an edge of the image.

7. The Combined Target

A one-piece combined target can be assembled by layering the ruler, the grayscale, and the color patches so that only 1/3 of an inch or so of the long edge of each target is visible. If a graycard is used, the three layered targets can be placed over the graycard, so that the edge of the graycard appears behind the grayscale. This combined target can be positioned along one edge of an image with the three or four targets visible but occupying only an 8" by 1.3" image area.

8. Targeting for Close-ups

Close-up detail images present special targeting problems, because of the size of the Q-13 scales. It may be considered sufficient to include sections of the ruler and of the grayscale in the image, including the 18% gray patch, to provide minimal brightness, color balance, and linear scale references within the close-up image itself, and to rely on measurements from related images (taken under similar conditions) for more complete color information. If it is considered essential to include more complete targeting within the close-up images, it may be necessary to manufacture a smaller combined target with fewer and/or smaller patches than the Q-13 set.

9. Lighting the Targets

Targets will need to be imaged in the same light as the document being copied (under cover glass, if any, for example). Care must be taken to avoid surface reflections from the semi-glossy Q-13 targets.

10. Height of the Targets

The targets will need to be in the same focus as the document, which may entail raising them by means of small stacking blocks (made, for example, of mat board) to the same surface as that being photographed. In the case of an opening leaf of a thick codex there may be a small tower of said stacking blocks that thus invisibly support the targets at the correct height.

11. Target Upkeep and Identification

The Q-13 targets should be replaced regularly as they fade or become soiled. For color management and other critical purposes it is helpful to be able to identify individual target examples. An unobtrusive number written in black ink in the margin will make them easily differentiable.

12. Target Patch Marking
It is also helpful (for purposes of color measurements) to make small marks along the edges of the grayscale to identify particular patches. A mark on the patches corresponding to 0.0 ("A"), 0.7 ("M"), 1.6 ("B") densities serves to identify these patches when the markings on the margin of the grayscale are not included in the image. The edge marks can be made with black marking pen or by notching the edge with a punch (useful for the dark "B" patch), and need not be large enough to be visually intrusive.

Another possible marking on the Q-13 combined target is a directional arrow which will help in the scanning and mounting of the image. This implies the use of at least two Q-13 combined targets, since the one placed below an object will have an arrow that parallels the markings of the ruler, while the arrow on a Q-13 combined target that is placed to one side of the object will be perpendicular to the ruler's markings.

13. Preferred Target Positioning in Image Layout
The positioning of the targets will depend on the size, shape, and construction of the document being imaged. For purposes of uniformity of presentation and ease of image set-up, targets should be arranged along one edge of the image frame, using the combined arrangement; or, in images of larger documents, they may be arranged in line along one edge, rather than combined. We can establish standard (preferred) placements: place targets on right or bottom edge; for in-line targets, place grayscale white patch adjacent to black color patch and place gray card adjacent to blue color patch. Q-14 targets, which are similar to Q-13 targets, will probably only be used in a few cases for exceptionally large documents (perhaps 20 inches or more long).

14. Provisions for Eventual Cropping
Image layout should include a sufficient gap between targets and documents, so that targets can be cropped out if desired, without crowding the image rectangle containing the document. A suggested gap of 1/4 inch at the edge of a 6 x 8 inch document should be adequate if the edges are aligned with the scanning axes of the image; proportionately more or less space is needed for larger or smaller documents.

LIGHTING

15. Flat Copy Lighting
A widely accepted arrangement of illumination for copy photography of flat reflection copy is to arrange four floodlights (tungsten or strobe) at the sides of a vertical copystand, with two on each side directed down at the copyboard at a 45 degree angle. This arrangement is effective for providing uniform illumination levels over a wide area, and for minimizing surface reflections from glossy originals (or from cover glass) at the camera position. This standard arrangement should be effective for most manuscript images to be captured.

16. Variations on Flat Copy Lighting
Some images may call for varied approaches to lighting. Instead of the standard floodlights, large, diffuse sources such as "softboxes" may be used to soften shadows and minimize wrinkles. Images which include shiny metallic effects such as gold leaf depend on surface reflections, so that an additional light source near the camera is desirable. Surface texture features which the standard lighting tends to mask, may be emphasized by using highly directional lighting, especially at a low (grazing) angle.

Cuts, wrinkles, inscribed guidelines, repairs, etc. can be hidden or highlighted by adjusting the lighting. Directions of the curator will be particularly helpful: on occasion the purpose is to emphasize, not mask a defect.

17. Three-dimensional lighting
Photographic lighting for three-dimensional objects is usually based on directing a strong, "main" light on the subject from one side and a weaker, "fill" light from the other side, to use light and shadow to define the surfaces of the subject. Additional lights may be used create highlights to define edges or textures, or to separate the subject from the background. This approach may be useful for photographs of bindings, for example. It is desirable to use a strong enough fill light to limit the contrast in the image in order to avoid the extremes of light and dark. "Softbox" style lighting is often very effective for three-dimensional effects.

DOCUMENT IMAGE COMPOSITION

18. Preferred Background Paper
Backgrounds should be chosen to give a common style to images and to provide edge contrast for the documents. A medium gray background is preferred for photographic reasons over a white one, because the white one will create unnecessary flare in the camera/scanner optics. Also, very bright image tones are difficult to color balance if they are not perfectly neutral. Savage #60 "Focus Gray" is an available background paper of about 50% reflectance and a fairly neutral tint. It is suggested that "Focus Gray" or equivalent be used as the standard background.

19. Other Background Considerations
[What follows may be undesirable in production-mode photography, when there is little time to handle each item singly.]

For some images it may be desirable to use a different background. In photographing single leaves, a light-toned

background may reflect a considerable amount of light back up through the document, so that a document field will be substantially lighter photographed against a white background than against a gray one. The gray background will tend to reduce the contrast of the text, and the document may appear unnaturally dark. Also, some parchment documents have irregular areas of translucency. For these reasons, it may be desirable to photograph some single leaves against a white background for best text capture, depending on the opacity of the documents.

20. Basic Layouts
Most of the images in the project should fall into one of the following categories of layouts:

1. One side of one loose leaf
2. One side of one leaf in a bound volume
3. One two-page opening from a bound volume
4. Three-dimensional layouts (mostly for bindings)
5. Close-up versions of 1-4 for detail.

Except for close-ups, each image would include all 4 edges of each leaf or bound book; this implies inclusion of the gutter and some of the facing leaf in a bound book. To avoid shadows, it is desirable to photograph bound leaves with the binding gutter running horizontally rather than vertically, so light runs parallel to the gutter.

When photographing leaves in books, please show the edges of the book, rather than inserting background paper behind the exposed pages to hide bookmarks, shadows, etc.; the principle is to represent the manuscript as a 3-dimensional object, as a reader would see it (not flattened and cropped as in a postcard or poster).

In the case of detail shots, it is always preferable to photograph both the full page (or opening, or full side of the binding) and the detail, so that the user will be able to visually situate the detail in the whole.

21. Image Orientation in Photography
In order to maximize the size of the document in the image, images should be composed in either landscape (horizontal) or portrait (vertical) to match the shape and orientation of the document.

Documents and targets (the color bar, gray scale, ruler) should be aligned with the axes of the scanned image (i.e., unskewed).

22. Bookmarks
The bookmarks which may be used to mark pages to be imaged can create special problems of composition, as any left in place will show at the top of the image, and will be difficult to crop out. If they are to be excluded, the photographer may be able to remove them from their places before beginning with a volume, or may fold them and hide them in place. Bookmarks are most easily handled when thin, smooth paper stock is used. It is recommended that they be of acid-free paper in case they are left in the codex by mistake.

DIRECT DIGITAL CAPTURE / SCANNING

23. Scanning
Given the limitations of readily available equipment, and the size of many medieval manuscripts [>10"], we encourage participants to scan their items at the highest resolution available to minimize future handling. All images should be scanned as .tiff files, in sRGB color space (24-bit color).

POST-PHOTOGRAPHY PROCESSING

24. Orientation of Scanned Images
Viewing orientation of the images should replicate the experience of the actual user of the manuscript. Therefore, when the codex's flyleaves or cover are from another manuscript and are used perpendicularly to the codex itself, said flyleaves, etc. should be oriented in what appears at first glance to be sideways (the viewer may rotate his screen if he needs to see the flyleaves, etc. in the orientation they had in their own original context).

25. Cropping
The color bar + gray scale + ruler are necessary components of each image and should not be cropped for DS. Participating institutions may wish to crop this target for other or in-house purposes (hence the usefulness of always placing the target in one of two positions; see above). In addition, the Digital Scriptorium image should retain the sense of three-dimensionality offered by the slopping book edge, the gutter, the edges of the leaf; therefore, cropping in the final image should be limited to excessive amount of grey background.

26. Processing of Derivative Sizes
Digital Scriptorum will mount 4 resolutions of the images, and therefore will require the following derivative files (notation is width x length):

Large - 2048 x 3072 pixels
Medium - 1024 x 1536 pixels

Small - 512 x 768 pixels
Thumbnail - 128 x 192 pixels

All derivative files should be JPEGs with a medium compression level or, if you are using Photoshop, an "image quality level" of 5. Mild sharpening of the .jpg files is recommended. In Photoshop, use the 'unsharp/mask' function under the sharpening routines menu with the following settings:

Amount = 50%
Radius = 1.0
Threshold = 0.0

If you are using a different image manipulation software package, please contact us, and attach a sample of the sharpened image for review.

For display concerns, it is more important to be consistant with the width than the length, therefore, on resizing the image, specify the width, and let the length fall where it may (e.g. the thumbnail should be 128 pixels wide - and anywhere in the neighborhood of 192 pixels long).

Please look at the Digital Scriptorium website to see how to handle certain situations mentioned in the general instructions. If desired, see the following list of sample images and the directions on how to view them easily:

1. Go to: http://sunsite.berkeley.edu/scriptorium/form_msimage.html
2. In the slot for shelfmark, type in the first shelfmark listed below.
3. On the resulting screen, choose "View all images for this manuscript."
4. Choose the desired folio number in the desired size.
5. For all successive images, simply change the 4-digit image ID number in the url in the white strip at the top of the image.
6. If desired, change the image size in the same manner: by inserting "small" or "medium" or "large" in the apposite part of the image ID in the url.

Plimpton MS 116, f. 20
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.5305&size=small
Single-page image showing all four sides of the leaf.

Plimpton MS 274, Face
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.5487&size=small
Landscape (horizontal) image.

Plimpton MS 165, f. 96
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.6646&size=small
Uneven edges of parchment. Purpose of image is to show defect.

Western MS 37, ff. 120v-121
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.6771&size=small
Hole outlined in red. Purpose of image is to show defect.

Plimpton MS 021, Binding
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.5514&size=small
Distortion caused by removal of a bookplate. Purpose of image is to show defect.

Plimpton MS 252, Binding
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.5985&size=small
Thongs from binding.

Plimpton MS 077, Binding
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.4141&size=small
Pastedown from another manuscript, used perpendicularly to the present codex, with that orientation maintained in the DS image.

Western MS 31, p. vii
http://www.columbia.edu/cgi-bin/dlo?obj=COLUMBIA.DS.6265&size=small
Flyleaf from another manuscript used perpendicularly to the present codex, but retaining the host codex's orientation.