CALIBRATING YOUR IMAGES

When you acquire images either from a digital camera or from a film scanner, the images are not scaled for one-to-one (1:1), life-size output. Pictures taken with a camera (film or digital) involve variable distances from lens to object, thus allowing you to photograph variable-sized areas. For example, you could photograph a single fingerprint, sequential fingerprints, a palm print, footprint, etc.

In contrast, if you are scanning images using a flatbed scanner, there is no depth of field – the object is placed directly on the face of the scanner and you specify the size of the area (size) to be scanned. As a result, images acquired using these particular digital devices are acquired as true, life-size images. Unless you are scanning an image that has been enlarged, such as a latent fingerprint that was photographed and then printed as an 8 by 10 inch photograph, which may or may not be to a particular scale. Upon scanning this photograph, it would be necessary to rescale the image to print a life-size image or to send the image to an automated fingerprint identification system (AFIS).

But returning to our original scenario, let's say you are using a 6 megapixel digital camera. The CCD chip has a resolution of 2008 pixels by 3000 pixels. You can photograph a two-inch by three-inch area or you can photograph a four by six inch area; it makes absolutely no difference to the camera. But the camera, not being the brightest crayon in the box, has no idea how large the area is that it just captured. All it knows is that you captured an area that consists of 2008 pixels by 3000 pixels.

Using Adobe® Photoshop®, you can accurately calibrate any image as long as the image has a scale in it. As an alternative to this method, you can also use an image calibration utility, such as the ***Foray Technologies*** Image Calibration Utility. Both techniques use the same theory — counting the number of pixels from one known point on the scale to another known point on the scale, thus determining the number of pixels per inch for resolution.

> ***NOTE:*** There are three elements that make up image size of any digital image. First there are the "measurable" physical attributes: width and height. Then there is a more obscure dimension known as resolution (AKA pixels per inch). By knowing one of the measurable attributes, you can determine the other two attributes of image size.

So how do you calibrate your images? Using Adobe Photoshop, it is a simple, four-step process. First you crop the image, then you tell the computer what this distance is, and the computer does the rest. Here are the actual steps to perform this process.

CALIBRATION: STEP-BY-STEP

1. Crop the image based on a known distance using crop tool – type the letter C or choose the crop tool from the toolbar. (***NOTE***: The larger the selection, the more accurate the results.)

    a. Using the crop box, select a portion of the scale in the image. For best practices, please ensure that the marching ants from the crop box are going through the center of the scale bars on the scale.

    b. After you have highlighted the desired distance on the ruler, press the Enter key to complete the crop function.

2. From the Image menu, choose Image Size. When the image size dialog box appears:

    a. Ensure that the Resample function has been disabled — a checkmark should ***NOT*** appear in the box to the left of the word Resample.

    b. Enter the known distance of the cropped area. (***NOTE***: Please be sure to verify that you enter the appropriate measurement – width of the scale is going lengthwise across the page and height if the scale is going vertically from top to bottom on the screen.)

    c. Highlight the value contained in the resolution field by placing your cursor over the contents of that field and double clicking the left mouse button.

    d. Copy the resolution value by pressing Ctrl and typing the letter C.

    e. Click Cancel to close the Image Size dialog box.

3. Undo the cropping by pressing the Ctrl and Alt keys, and typing the letter Z (also known as Step Backwards).

4. From the Image menu, choose Image Size. When the image size dialog box appears:

    a. Ensure that the Resample function has been disabled — a checkmark should ***NOT*** appear in the box to the left of the word Resample.

    b. Highlight the value contained in the resolution field by placing your cursor over the contents of that field and double clicking the left mouse button.

    c. Paste the resolution value obtained in Step 2 above by pressing Ctrl and typing the letter V.

    d. Click OK to close the Image Size dialog box.

Congratulations! You have successfully calibrated your image!