

~ Moneta Gallery Coin Scanning Primer ~

This primer will show you how anyone can create great looking coin photographs using a few computer related components. While the process may look difficult at first, after you accomplish the first few images, the methods will become second nature.

Coin images can be divided into two broad uses; one for printing on paper (and for inventory software), and the other for use on the Internet. Fortunately, the methods and tools used here will produce images for both purposes almost simultaneously. I hope that this primer will inspire you to document your collection so that you will be able to create your own database for insurance purposes, study, and for presentation on the Moneta Museum Gallery.

The methods presented here for producing excellent images is not the only one that will work. I find that they are the most straightforward but you may discover alternative methods that work better for you. It wasn't too long ago that a film camera, specialized lenses, copy stand, and various lighting setups were required to produce a decent photo. Thankfully, that expensive and time consuming method can be set aside for most subjects (some high relief items, like ancient Greek coins, may still require this method). Even this method will have been replaced with today's digital cameras that allow easy image manipulation in the computer.

The process detailed here uses your computer, flatbed scanner, and a couple of computer programs which you may already have. Your scanner should have been packaged with scanning software and the only other software needed is a photo manipulation program such as PhotoShop® by Adobe Software. Each step also presents footnotes to detailed considerations that can be studied by those who have never attempted this before. The detailed presentation also graphically shows you the standards which the Moneta Gallery expects to see in order to have your coin photos included in the Museum Gallery.

Since your equipment is different than mine I will present an outlined sequence of steps that you will have to apply to your own equipment and software. However, since I'm using a Canon® scanner and bundled software (Scan Gear Toolbox), and PhotoShop, both common elements, you may be able to jump right in without a lot of interpolation.

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Spend some time in the Moneta Museum Gallery and you will notice that each intermediate size image also presents the original photo file information pertaining to photo dimensions and file size. When your finished coin photo is 'uploaded' to the Museum database it can be presented in three different image formats. The uploaded image is the one that can be expanded to its original size in a pop-up box. The Museum database also creates an intermediate image and a 'thumbnail' image that is quite small. So the sequence is: **1)** You select a main category (i.e., Ancient or World), and then the subcategories until you get thumbnail images; **2)** You then select a thumbnail coin image and the intermediate image and coin record appears along with the photo dimensions and file size; **3)** under the intermediate size image you are given the option to enlarge the photo to the full original size.

Our Target: An image that will be acceptable for Moneta Museum Gallery.

From the host of items already in the Museum you can see the average image dimensions are in the area of 700 – 800 dpi (dots-per-inch) in the horizontal direction and something about half that vertically (i.e., 700 x 350). The file size can vary a little more, from around 50 k to maybe 70 k. This appears to me to be a good balance between magnified viewing and the time it might take for the image to appear on download. The following outlines the equipment setup:

The Computer: To prevent frustration the computer has to be a relatively modern machine, but even more importantly, it needs plenty of chip memory on the motherboard. You may get by with a machine that has only 256MB of RAM on board, but 512MB would be painless, so upgrade that if you can. My computer runs at 1.8GHz and operates PhotoShop just fine. Your hard drive should have plenty of storage space, particularly if you want to store the original image for use in printed media and you have a large collection to document. Before you begin the image creation you'll want to set up a file area with several sub-folders. What I did is create a main folder called "Coin Photos" with subfolders entitled something like 'Work Area', 'TIFF', and 'Web'. In reality you'll probably want to create even more file areas to sub-categorize your large collection for easy location later on. You can read more on this in the detailed processing information to follow.

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The Scanner: This is where the magic is created! It surprises me how many people don't have a scanner. It expands the use of a computer many times. It will turn your computer into a copy machine, a FAX machine, and into an excellent coin photo creator. Hopefully your computer is using MicroSoft Windows XP. In any case, if you are inspired to go out and obtain a flatbed scanner for the first time you'll want to make sure it is compatible with your computer and operating system. Again, hopefully your computer is new enough to feature a USB 2.0 port so the scanner you get will interface with that port at the highest transfer speeds. You will want a scanner that has a true resolution of at least 1200 x 600 dpi or higher (forget any specs. that claim astronomical resolutions that are 'interpolated'). A SCSI interface will work quickly too (as you'll find out – 'quick' is a relative word in scanning), but it is not as common today as USB. My Canon scanner (model: D1250 U2F) came with software that allows the full functionality of the scanner. I use the advanced scanning features that allow 'fine tuning' such as scanning only a 3" x 3" square (or smaller) at a resolution that I think is required for the size of the coin. This can be as low as 600 dpi for a large coin up to 1200 dpi for a small one. Actually, I use a middle resolution that is 720 dpi most of the time. More on all this later...

The Scanner Software: Scan Gear Toolbox 3.1, for instance, has an icon driven page that pops up when the program is called up. Features you may see are for 'Copy', 'Mail', 'OCR', 'Scan', and 'Photo'. We're concerned with 'Scan' for the purposes of coin photography. When you choose that the Scan screen appears. Here you will have to select a file name for your first scan (i.e.; 5c1934ob; this helps ID the coin later as a 1934 nickel obverse). Then you have to tell the computer where to send the image. You have to choose (or Browse) for the file you have created as a 'work-area'. You may also be offered the chance to call up the scanned image in your photo processing software (i.e. PhotoShop). Make sure you select the proper file; it should end with an extension of .exe indicating it's the executable file for the program.

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SCANNING an Image: If everything has been properly accomplished for your set-up then it's time to create an image!

1. Place the coin, obverse face down on the clean, dust free, glass scanning surface. Top dead center and about ¼ inch from the edge. Align the axis of the coin perpendicular to the edge as best you can (later you can rotate the image as required with the image software). Never scan the coin in a 2x2 or flip! That would be ridiculous!
2. You can choose to leave the scanner lid open for a black background or closed for a white background. You could attach a colored background but even the smallest texture will show in the scan. Personally, I like black since it's much easier on the eyes (except while you're scanning!) and provides a better contrast. Use both and see what you like.
3. Hit your SCAN button. You should get a screen that represents the scanner bed and some options to select before actual scanning takes place. You can choose color or gray scale (if you want a B/W image). I always pick color. Output Resolution: I use 720 dpi for most coins (you could pick 1200 for very small coins or 600 for large ones). Now, hopefully, you get to decide on a scan window size. This is critical otherwise you will be scanning an entire scan bed rather than just the area where the coin is placed. Let's start big with a 3" x 3" square. With that you will be able to click and drag the square to the approximate location on the bed. Let the top edge of the square butt up to the top edge of the bed. With that done click the SCAN button with your mouse. Your scanner will do a few measurements before the scan (slowly) begins to creep under your coin.
4. When the scanner reaches its programmed limit it will return and your first image should pop up on the image software you have selected. Your software must be capable of 'layers' (one for each side of the coin). Does the coin need a slight rotation? Yea, usually. Select 'Image' and find 'Rotate Canvas'. Select 'Arbitrary', to rotate a degree or few either CW or CCW.
5. Now it's time to do our first of many 'crop' operations. Select the 'crop' tool and you will be able to click to the top left of the coin image and drag it down to the bottom right of the image. Leave plenty of space (an apparent 1/8 to ¼ inch) on all sides except the right side. Cut that very close to the coin. You'll cut it close on the left side on the reverse image so that when the images are combined into one there is very little space between them, this saves very valuable file space. Now find 'Image' and hit 'Crop'.

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6. You can now minimize that image in preparation for the reverse scan. Call up your scanner software so that it appears over your image software (isn't Windows XP great?). Then simply follow steps 2 – 5 again, but this time designate "rx" on the end of your file name and crop the image on the left side instead of the right. When that's done you'll have two images that need to be brought into one with another (a bit of ZEN there).
7. Call up your first (obverse) image. Make sure your navigation arrow cursor is selected as the main one rather than the 'crop tool' cursor you used previously. Now, select 'Image' and 'Canvas Size' for the obverse image. A 'Canvas Size' box should appear. We're concerned with the Horizontal Width; it will already be huge but we are going to double it! So, a width of 12" will be manually selected to now be 24" or slightly greater. There needs to be an "Anchor" selected from the nine square grid before you hit OK. Select the "Anchor" in the top left square, very important, and then hit OK. *(Why? Remember, we scanned at 720 dpi and ALL computer monitors operate at 72 dpi, a factor of x10 greater than the screen). This is the kind of resolution you need for anything that will be printed on paper later on. We are still working, until the bitter end, on raw TIFF files.*
8. Now we have a canvas we can work with! Click (maybe twice) the reverse image, and, holding the left mouse button down, drag the reverse onto the white area of the obverse image. Naturally, the two images must overlap a bit. Using the cursor arrow buttons on the keyboard you can make slight adjustments required to merge the two images closely without overlapping the coins. The vertical alignment should be adjusted so the top edges are very even, I actually use a plastic ruler on the screen to align them perfectly. This looks better and saves file space. Don't worry about any white areas, we're cropping again. Also, don't worry about background tone variations.
9. No, we do not have ONE image yet. Once the alignment in step eight is perfect, seek out command: 'Layer' and move down to find 'Flatten Image'. Presto! You now have a single image of both sides of a coin. Life is so much simpler this way. It's still too big and probably ragged at the edges. Find the 'Crop' tool again and widdle the image to an evenly spaced, but small, area around the coin.

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10. Now it's time to do some screen clean-up. Get rid of the reverse image by closing the file but do not ever SAVE the changes; just a good habit to get into. The original reverse image is saved in the 'work area' for total deletion later on.
11. Here I do some tonal adjustments of the image before I save it. Make the image larger, say about 40% of its true screen size. Click 'Image' and then 'Adjustments' and then 'Levels'. A lot of great work is done here and I'm in a gray area of telling you how to do it. It varies with every photo. You'll see a 'Histogram', something like peaks and valleys of a landscape. Essentially what I find is that the three sliding adjustments require that the left and right ones be brought to the edges of the 'landscape', This will appear to mess up your image (usually makes it lighter) but the middle adjustment will make it all better. With fine tweaking you'll find the sweet spot of image magic. The tone will be true to the coin in good light and contrast will bring up the details. Click OK to set it forever.
12. With THE one image on screen and selected we want to 'Save As' the raw TIFF image. Save it to your TIFF file for later use or in case the up coming image manipulation goes sour. Name it something you'll recognize but take off the "ob" ending. If an 'Image Compression' option comes up I would save it without any compression – keeping every single detail of the original.
13. OK, the image can now be made ready for the Internet. The fine images you produce will be worth the effort once you see how great they look and higher bids you'll receive on your auction lots. Currently, we're in 720 dpi TIFF and monitors can only use 72 dpi. First, open the 'Image' menu and click 'Image size...', you'll be reminded just how big this file is. At the 'Width' input change the pixel number to something between 600 and 800 pixels, the height is fixed in proportion to the width so no adjustment is necessary. To do so would create an oblong image. I pick 700 and height adjusts to 356 and then I click 'OK'. Instantly the image becomes small, too small to work with. So simply adjust the image size to 100% using the slider on the 'navigator' box or the bottom left size ratio box can be manually modified to read 100%.
14. Now you'll probably see some specks in the background and maybe even some dust. But first we want to do some more image adjustments. Go to 'Image' and then 'Adjustments' and then down to 'Brightness & Contrast'. Slide the 'Contrast' bar first, usually a +20 or less will produce a true and rich color balance. After that a 'Brightness' adjust is usually unnecessary or a very small amount (+/- 5 points) will do the trick. OK.

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15. At that, most tonal differences between the two background halves disappear. For perfection you can color sample the background and use a small fuzzy style pen to erase the background spots. Dust and other removable stuff on the coin can be removed using the 'Healing' band aide tool. See your software documentation for details on this operation. Back to arrow cursor and you are ready for the final image enhancement.
16. Select 'Filter' from the menu bar and follow down until you reach 'Sharpen' and click that just once. Remember, you can usually 'Undo' an operation from the 'Edit' menu. Do you like the clarity of your image? You could click again but that is usually overkill. A tad over sharp may be alright because we have not 'Save for Web' yet and that will erase some of your glorious detail. Happy with your final image? Then it's time to save it for good a second time.
17. Go to 'File' and follow down to 'Save for Web...'; Here is where the image is converted to a Internet compatible photo, small enough to upload and download, yet retaining most of the detail of the original TIFF. Some settings on this box will include 'JPEG' rather than TIFF or GIF. 'Optimized' window should be checked and '2 Up' selected at the image tab. This will show side-by-side images of your original (maybe around 750 k in size, still too big!), and the JPEG window of the results of sliding 'Quality' up and down. I find that a 'Quality' compression number between 45 and 55 is about the norm. You want to see a final k size of 50 k to 70 k. Even at that, with an image that is not degraded by much, a 70 k file size will require 26 seconds to download at 28.8 Kbps. Luckily, most of us are on broadband now and an image download of that size is nearly instantaneous. The other problem for the site administrator is the total size of all the photos and how much bandwidth and server acreage he can afford per month.
18. When, after a few weeks or so of effort, and you have the best portions of your collection documented on the Internet, Please consider a donation to Moneta-Coins to help keep this noble effort alive and growing. Invite everyone to see, you'll find that viewing your collection has never been better. Enjoy!

The following is a 'Quick Card' of the preceding eighteen step method.

Moneta Gallery - 'Quick Step Card' for Scanning Coins

1. Prepare file storage areas on your hard drive. Scan coin close to the 'top' of the scanning bed, (lid open for black background, if you like).
2. Use 'Rotate' command to assure straight up & down photo axis.
3. 'Crop' this image, not too tightly, except on the *right* side for obverse and on the *left* side for the reverse side of the coin. Ditto for the reverse image.
4. With the obverse image selected expand the horizontal *canvas size* to twice the present pixel width.
5. Select the reverse image and drag and drop on to the white area of the expanded obverse image. Use ruler and fine adjust cursor keys to fine tune the alignment (i.e., butted close together and even vertically).
6. 'Flatten' (merge) the two images into one. Close any other open images w/o saving.
7. 'Crop' one final time with an equal, but small space around the image.
8. While still in .Tif format accomplish basic image 'level' adjustments.
9. 'Save As...' this big (printable), image in your TIF storage area.
10. With original still on the screen, reduce 'Image Size...' to something like 600 dpi to 800 dpi in horizontal width of pixels. Increase screen image size to 100%.
11. Adjust 'Contrast' and fine tune 'Brightness'; clean up any background specs.
12. 'Sharpen' the image, if required, for best detail.
13. 'Save for Web...', optimize, and scale 'Quality' of compression to create an acceptable image that is between 50k and 70k in final file size (Quality setting is usually between 45 and 55). Save to your image to the 'Web' file area.

