

Louisiana Photographic Society

Educational Program

Digital Panoramic Images

Camera Settings:

1. Switch the camera to manual operation and select proper shutter speed and aperture opening for normal exposure.
 - a. Do not use polarizing or any color enhancing filters.
2. Pan the camera from one end of the panoramic scene to the other to be sure the exposure latitude is no more than 1 F-Stop.
 - a. If the F-Stop latitude is greater than 1 you may want to use a neutral density filter of 1 or 2 F-Stop reduction.
3. Set up the tripod and adjust for horizontal level using the bubble level gauge. If shooting without a tripod make sure that you select a landmark in the scene to keep the camera horizontal while taking pictures.
4. Take three to four pictures covering the entire scene. For this example we will use three images. Allow at least 15% to 20% overlap for each picture.
 - a. Shoot at the lens focal length of 35 mm or greater. Greater the focal length smaller the lens distortion of the images. During the panorama stitching process image distortion plays an important part. Images with high distortion are at times difficult to align during the stitching process.
 - b. Take an additional set of pictures at + 0.5 F-Stop or -0.5 F-Stop to bracket the exposure if desired.
5. If you are shooting a vertical panoramic scene then make sure the camera is vertically aligned.

Photoshop Techniques:

1. Decide what size panorama you wish to create. Refer to your printer manual to see what is the largest panorama you can print. For Epson 2000P the largest size is 13"x 41". For this example we will use this size.
2. Open all images and crop them to the size of 13"x19" at 300 ppi and 8 bits. Save these images and number as Image 1, 2 and 3.
 - a. Image 1 is the first image starting from the left side of the panorama.
 - b. Do not adjust these images for color, contrast or brightness. If necessary this will be done once the panorama is stitched together.
 - c. You may use high resolution images such as 500 ppi and 16 bits; however this may slow down the computer considerably.
3. Go to File >New. This will open a box for the New Canvas. Type in the name of the panorama. To allow some room to work with select 15"x 43". Select 300 ppi and 8 bit exactly the same as that of the individual images. Select color mode as RGB Color and background as white. Click OK. This will open a blank white scene canvas.
4. Click on the Image 1.
5. Select Move Tool from the Tool Palette and drag the image into the panorama canvas. Move tool will transfer a copy of the image 1 to the panorama canvas. Minimize Image 1.

6. Position the image at the far left side of the canvas leaving about 1" space at the top, bottom and the left side of the image.
7. Click on Image 2.
8. Select Move Tool from the Tool Palette and drag the image into the panorama canvas. Minimize image 2 and enlarge the panorama.
9. Go to Layer Palette. Make sure Image 2 is selected. At the top of the Layer Palette go to Opacity and reduce the opacity of the image to 50%. Now you can see Image 1 through Image 2.
10. Select Move Tool and position Image 2 on top of Image 1 with about 20% overlap. Enlarge the image as necessary using the Zoom Tool from the Tools Palette. With Move Tool selected move Image 2 around using the arrow keys of the key board till you find a narrow vertical area where you see both images merge and align with each other. Due to lens distortion the entire image will not merge, however within the overlap area you will see a very narrow vertical area where both the images match up.
11. Go to Layer Palette. Make sure Image 2 is highlighted. At the bottom of the Layer Palette click on the Blend Tool. This tool looks like a small circle within a rectangle.
12. Go to the Tools Palette and click on the Brush Tool. Look up the top Tool Bar and select brush size between 70 and 100. Select Mode as normal and Opacity and Flow as 100%.
 - a. Before selecting the Brush Tool make sure Foreground Background Color Tool shows black square on top of the white square. This tool looks like two squares slightly superimposing each other at the corner. If black square is not on top click on the arrows to switch the colors.
13. Go to the panorama canvas. With the Brush Tool selected click and hold at the top of the panorama where two images are aligned. Drag the brush all the way to the bottom of the panorama along the image alignment line.
 - a. If you erased a part of the image by mistake go to two small black and white squares in the Tools Palette and switch white square on top of black square. Select the Brush Tool and apply it on the erased area of the image you wish to restore. Reverse the squares.
14. Go to Layer Palette and click on the "eye" of Image 1. This will blind Image 1 and the line that we just drew using the Brush Tool will be clearly visible. Using the Brush Tool erase the part of Image 2 on the left side of the line.
15. Go to Palette Tool. Click on the "Eye" of Image 1 making it visible on the canvas. Click on Image 2 in the Layer Palette. Go to the top of the Layer Palette and reset the opacity to 100%.
16. We finished merging Image 2 with Image 1.
 - a. At this point do not adjust the image color, contrast or brightness. If desired we will address this after completing the stitching of all images.
17. Save the Panorama.
18. Now we will repeat the same process for Image 3 following above steps. This will complete the panorama.
19. Save this panorama image with all the layers.
20. Look at the panorama closely to make sure the contrast of all three images are matching up. If not:
 - a. Go to Layer Palette and click on the image requiring adjustment. Start from the left of the panorama.
 - b. Go to top Tool Bar and select Layer>New Adjustment layer>Curves.

- c. Adjust the curve of the image so it matches with adjacent image.
21. At this point the panorama should appear seamless throughout the image. Save the panorama with all the layers. (Panorama File #1)

Refining of the Panorama:

1. Go to top Tool Bar and select Layers. Do Layer>Flatten Layers and flatten the panorama.
2. Save the panorama as a separate file.
3. Crop the panorama for 13” x 41” size.
 - a. If the panorama is not perfectly horizontal then rotate it before cropping.
 - b. Go to Image>Rotate Canvas>Arbitrary. This will open a Rotate Canvas box. Select angle of rotation and the desired direction. Click OK, crop and save.
4. Refine the panorama by following the work flow process.

Work flow Process:

- a. Levels Adjustments: Go to Layer>New Adjustment Layer>Levels. This will open the levels box with histogram.
 - i. Review the histogram. Two small triangles at the bottom of the histogram should be at the edge of the histogram. If not move the triangles at the respective edge of the panorama. This will improve the brightness of the image.
 - ii. Remove any color cast by adjusting Red Green and Blue Channels or use one or more of the eye droppers. There are three eye droppers - black, gray and white. Select black eye dropper and click on the black part of the panorama. Repeat the same for white and gray eye droppers. Click OK and close Levels Box.
 - b. Curves Adjustments: Go to Layer>New Adjustment Layer>Curves. If necessary adjust the diagonal straight line into “S” shape to improve image brightness and contrast.
 - c. Selective Colors Adjustments: Layer>New Adjustment Layer>Selective Colors. This will open the Selective Color Options box. Fine tune colors as appropriate.
 - d. Image Sharpness Adjustments: Make sure panorama layer in the Layer Palette is active by clicking on it. Go to the top Tool Bar and select Filter. Filter>Sharpen>Unsharp Mask. This will open Unsharp Mask box. Check the Preview box. Adjust Amount between 100 to 200. Adjust Radius between 1 to 5 and Threshold between 0 to 3. These are general guidelines. Depending upon the image size and quality these settings may vary. Try readjusting each variable then click on Preview box to see the panorama before and after applying these changes. Enlarge the image if necessary to see the changes up close.
5. Save the panorama as a separate file with all adjustment layers. (Panorama File #2)
 6. Flatten the Panorama. Save as the final flattened panorama. (Panorama File #3)
 7. Now we have three panorama files saved at various stages of the panorama construction. If we need to make any refinements later these files may be useful.

The Printer settings:

1. Calibrate the computer CRT if the last calibration is older than one month or the setting on the CRT has been adjusted since the last calibration.
2. Print a small test print to check the panorama quality.

3. Printer Settings:
 - a. Go to the top Tool Box and select File and click on Print with Preview. This will open the Print settings box.
 - b. Enter image size. For example 6" x 19" and position it to the top of the page.
 - c. Select Color Management.
 - d. For Print select Document.
 - e. In the Option box select:
 - i. Color handling: Let Photoshop Determine Color
 - ii. Printer Profile: Recently calibrated CRT profile OR if you have created a specific printer/paper/ink profile.
 - iii. Rendering Intent: Relative Colorimetric.
 - iv. Check Black Point Compensation box.
 - f. Print a proof copy of the panorama.
 - g. You may have to go back to appropriate saved Panorama images to make any adjustments if necessary. If image looks good then save the changes made to the previous files. Save and archive all three panorama files along with the four original images.
4. Print the Panorama:
 - a. Refer to the printer manual and set up the printer to print using roll paper and load roll paper. In paper Size option box find User Option where you will be able to select the panorama size of 13" x 41".
 - b. Make sure the ink cartridges have enough ink before starting to print.
 - c. You can also send out your image to professional printers. They can print any size panoramas up to 40" x 72".

These are the basic steps to get you started in creating excellent panoramic images. Once you have mastered these basic techniques you will be able to continue to further refine your camera as well as Photoshop techniques to sharpen your skills in creating eye-popping panoramic images. If I can be of any help please contact me at 225-751-8822 or lateldigital@cox.net.

Jay S. Patel
Education Coordinator
Louisiana Photographic Society
April 12, 2007