

Oregon seascape: 14 images shot on a digital camera and put together with PhotoVista.



360° PANORAMA IMAGING

*With the Noblex
Panorama Camera
and Photo Vista
Software*



This is a 360° image made from four originals shot on the Noblex camera and assembled in PhotoVista.



This is the first image of four shot on the Noblex camera to produce the above 360° panorama. This shot was facing east.

Scott Adams

WHEN LOOKING BACK through the history of photography, panoramic images have documented just about everything from wars to Mars. These strange looking cameras have the ability to see beyond the scope of the human eye. One of the more interesting types of panoramas covers 360°. There are few cameras that can accomplish this task, and they are usually very expensive. The images are very impressive, but usually out of reach for the normal photographer—until now!

Recently, the landing of a spaceship on Mars was viewed by all as we watched pictures being transmitted back to Earth. Some of the final color images sent were in a very wide panoramic format. If you jumped on the Internet when those pictures first came in, you would have noticed that the panoramas were made up of several individual images pasted together. If you logged on a few days later, you would have seen the same images, but without seams. How do they do that?

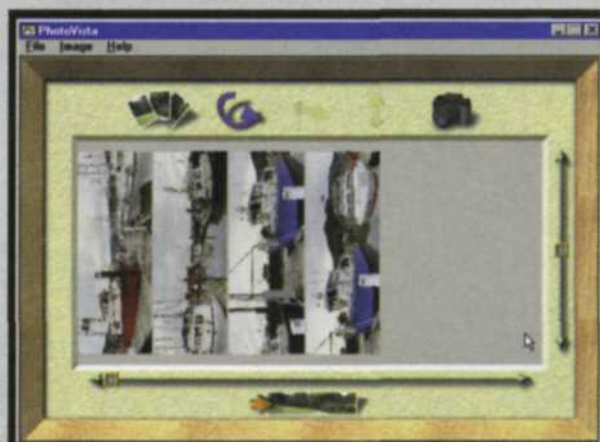
Well, a few digital years back, it was accomplished by visually aligning each image, using digital touch-up tools and massive editing time. Today's sophisticated software automatically aligns and blends these parts into one high-quality panoramic image. When I first ran into one of these programs called PhotoVista, from Live Picture Corporation, I couldn't believe my eyes. I was so impressed with the results, I called my editor and told him about my discovery. He said, "Go forth son and spread the panoramic word."

The Noblex Panorama Camera

Well, after considerable testing and research, I have found four ways to create 360° panoramic images. The obvious choice is to use a 360° pan camera. Since these cameras are rare and impractical for most photo applications, photographers are not going



This image of Mount Hood was created with 3 frames made with an ordinary 35mm SLR and reassembled in PhotoVista.



Screen image in PhotoVista shows four Noblex images before stitching.



to rush out and buy one.

The second method is using panoramic cameras covering less than 360° in conjunction with PhotoVista software. The Noblex Panorama camera uses a rotating lens to cover a 136° angle of view on standard 35mm film. The resulting images are 24x66mm and can be printed on any 2 1/4 enlarger. The Noblex acts like a superwide-angle camera except that the negative aspect ratio is greater than most wide-angle pictures. A special viewer atop the camera gives you a 90% view of the actual scene. Shutter speeds are set with a dial on the front and f-stops are changed using a rotating dial on the front of the lens. A bubble level on top lets you level the camera as you look through the viewer or from above when the camera is attached to a tripod. After trying both ways, I found that I could level the camera faster if I handheld the camera. Special hand grips on each side are designed to help keep fingers out of the picture.

By taking a picture at each compass point, you can create a 360° picture with the Noblex. Holding the camera pointing north, watch the bubble level until it is centered and then shoot. Rotate to the east, south, and west for a total of four photos. Process the film and scan the images via a flatbed scanner with a transparency adapter or with a film scanner. If you have a film scanner that will not scan a full 66mm image (most don't), then scan each half as an image. Call one *NorthL* and the other *NorthR*. Make sure you don't change the size of each scan as the PhotoVista software requires identical-size images for processing. Perform an autoexposure on the first image, but turn it off for the rest of the scans to keep consistency from one image to the next.

Live Picture's PhotoVista Software

Now it is time for the latest, greatest software to go to work. The eight scanned images are loaded into the PhotoVista software and rotated so that they are end to end. A quick preview of the images determined there was a clear overlap of each image.

PhotoVista works best if there is a 30-40% overlap of image data. First, you tell the program which lens you used to photograph the images. A number of standard focal lengths are listed, or you can enter a custom focal length. Press the "stitch" button and it will ask you if you want a full blended 360° panoramic image. If you want to view the 360° image as a virtual reality image on your computer or on the Internet, you would say "yes." If you just want a flat, 2D panoramic image that shows 360°, you would say "no." You can change your mind even after the image is made, so the choice is not critical.

During the stitch process, the software looks for similar pixels in the first two images and aligns them. It then takes the right edge of this composite and aligns the third image. The program works its way through the images until all are aligned. In the final process the program matches image density, blends edges and adjusts for specific lens distortion. When the image is complete, you can use your computer mouse to move the picture in a circular motion. The result is much like being in a virtual reality scene. There are no seams, so you can go around and around and never find an end to the scene. If you want to print the 2D image, I would recommend an ink jet printer, that allows banner paper so you can print the entire image on one piece of paper.

Using a Standard 35mm

The third method of making 360° pans is much like the second except that you use a standard 35mm camera. With this method you will have to mount the camera on a tripod because of the number of images required for a single 360° pan. The odds of you handholding 12-16 images perfectly level are slim



The Noblex Panorama camera.



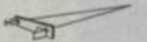
A Full 360° image taken with a Nikon N8008 and 20mm AF-Nikkor lens. 14 images were stitched together with PhotoVista.

to none. You will have to use a bubble level for your tripod before you take the shots, and level the camera in all positions. This may sound simple but it is the most difficult part of taking the images. Manual exposure is necessary, so pick the best part of the pan and meter for that area. Pan the image from left to right and overlap each image by 30–40%. Once the film is processed, scan your images. If you have a bulk scanner, focus and perform an autoexposure on the first image and do a batch scan on the rest. Enter the focal length of your camera lens and start the stitch. One interesting method of developing panoramas with your 35mm camera, is to shoot vertical images. If you use a very wide lens, such as a 14mm or 20mm, it will still only take 10–14 images to make the full 360° pan. When you view the results on your computer, you can pan left, right or up and down in a virtual reality scene. You can look down towards your feet or up at the sky as you pan left or right. You really feel like you are part of the scene, and you can do it all with your standard 35mm camera!

The fourth method is using a digital camera. This method is identical to the third method except that you save yourself the film-processing time and you don't have to scan the images into your computer. Just download the images into your computer and let the stitch begin. Many digital cameras don't have manu-

al control over exposure, so just let the camera do its thing. I ran tests with Agfa, Kodak, and Fuji digital cameras, and found that the PhotoVista software could compensate for exposure differences between individual images, and still come up with one very nice 360° panoramic image.

As you can see there are lots of options for creating 360° panoramas. Each has its advantages, but all methods result in 360° pans. No matter which method you use, I think you will be impressed with the results.



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