

CREATING WELL-FOCUSED MODEL RAILROAD PHOTOS with a CELL PHONE CAMERA

CameraPixels App and Helicon Focus Make It Possible

By Brooks Stover /photos by the author



It would be impossible to get this photograph with everything in focus from the figures in the foreground to the trees in the distance with a single exposure with anything but the most sophisticated conventional camera. However, using the CameraPixels app and Helicon Focus software, this image, and the others in this article, were created with an older iPhoneXs Max. While using these tools won't alone produce a good photograph, they do provide a way to address one of the biggest challenges of photographing model railroads namely getting all elements in the scene in sharp focus.

One of the biggest challenges when photographing model railroads is getting a whole scene in focus. There are lots of technical reasons why this is such a problem but it's not necessary to understand the science to recognize the problem. The amount of a photograph that is in focus is referred to as the 'depth of field' or DOF. When taking a single photograph, the camera is focused on one point and the areas some distance in front of and some distance behind that focus point will appear sharp. Areas farther from the focus point will be out of focus, spoiling the quality of the image. In this article I describe one approach to getting an entire scene in focus when using a cell phone camera.

Photo Stacking

Software now exists that can combine a series of photos of the same scene, each taken with a different focus point, and merge them together, taking the in-focus parts of each image to create a single image that is totally in focus. The process is called 'image stacking'. There are a number of such programs, and one popular one is Helicon Focus. The program can be downloaded at www.heliconsoft.com. An annual subscription can be purchased for about \$30. Helicon Focus is extremely easy to use. One simply loads a series of photos into the program which can be done with a single click, and then another click on the "Render" button produces a merged image in a second or two. It really seems like magic!



Elk River Coal & Lumber 3-truck Climax #19 idles at the company's open air engine house at Swandale, WV in the summer of 1964. Notice that everything from the rocks in the foreground to trees in the distant upper right corner are nicely focused. This image was created in Helicon Focus by merging 10 focus-bracketed images taken on an iPhone Xs Max using the CameraPixels app. A few lighting adjustments of the merged image were made in Photoshop Elements 2022.

Focus Bracketing with CameraPixels App

To work, Helicon Focus needs a series of photos of the same scene taken from exactly the same place, but each with different parts in focus so it can combine the in-focus parts of each image into a single image completely in focus. Now the obvious question is “How do I get a series of photos like that?” Once again, the gurus of technology have come to the rescue for us mere mortals. The technique of taking a series of photos, each with a different focus point, is called ‘focus bracketing’ and there is now an app that you can download into your cell phone that will allow it to take a series of ‘focus bracketed images’ with a single press of the shutter release.

The app is called CameraPixels and it is downloadable from the app store. I generally have trouble making apps work as intended but this one is very straightforward. The basic version of CameraPixels is free and the deluxe version isn’t needed for our purposes. The CameraPixels website (www.camerapixels.app) has excellent tutorials but here is a walk through of the few simple steps needed to get a series of focus-bracketed images. The settings suggested here are the ones I’ve been using.

1. Open CameraPixels app on your phone. (See image on following page.)
2. Tap on **MODE** on upper left of the screen, scroll down to the BRACKETING section and select **FOCUS BRACKET**. Escape by touching the screen
3. Tap on **SET** on lower left of the screen.
 - a. Under **IMAGE** set RESOLUTION to 3.1 MP, set CROP to your preference, set QUALITY to 100%, set STABILIZATION to “On”.
 - b. Under **FOCUS BRACKET**, set IMAGE COUNT to 10, set MIN DISTANCE to 0, set MAX DISTANCE to 100.
 - c. Under **INTERVALOMETER** (no, I don’t know what that means!) set TIMER to 3 seconds, set BRACKET COUNT to SINGLE and set LAPSE to 3 sec.
 - d. Tap **SAVE AS PRESET** to save these settings and return to main screen.
4. (Optional, but recommended) Tap on **ISO** in the center to the left of the photo screen. It will turn red indicating it is now in manual mode. Use the slider to set the ISO to the lowest value available on your camera. This will ensure the most noise-free im-



This is my iPhone Xs Max mounted on a tripod with a mount specifically designed to hold cell phones. These are available for about \$20 and attach to a standard tripod threaded fastener. The screen is the screen that appears when you open the CameraPixels app. After touching "MODE", select "Focus Bracketing". Touching "SET" allows selecting the number of images desired, the nearest and farthest focusing points as well as a few other options. Center left of the screen, ISO shows in red indicating it is in manual mode. It has been set to 16, the lowest value available on this camera. White balance (AWB), Focus (AF) and shutter speed (SEC) show in white meaning they're in auto mode. Exposure compensation (EV) has been set to 0.

ages your phone can record. Lowering the ISO will slow the shutter speed and so should only be done when the phone is stabilized on a tripod.

NOTE: AWB (Auto White Balance), SEC and AF should show in white indicating these are in auto mode. If they are red, double tap to return them to auto mode. You may want to manually adjust the AWB setting if you aren't happy with the white balance in auto mode.

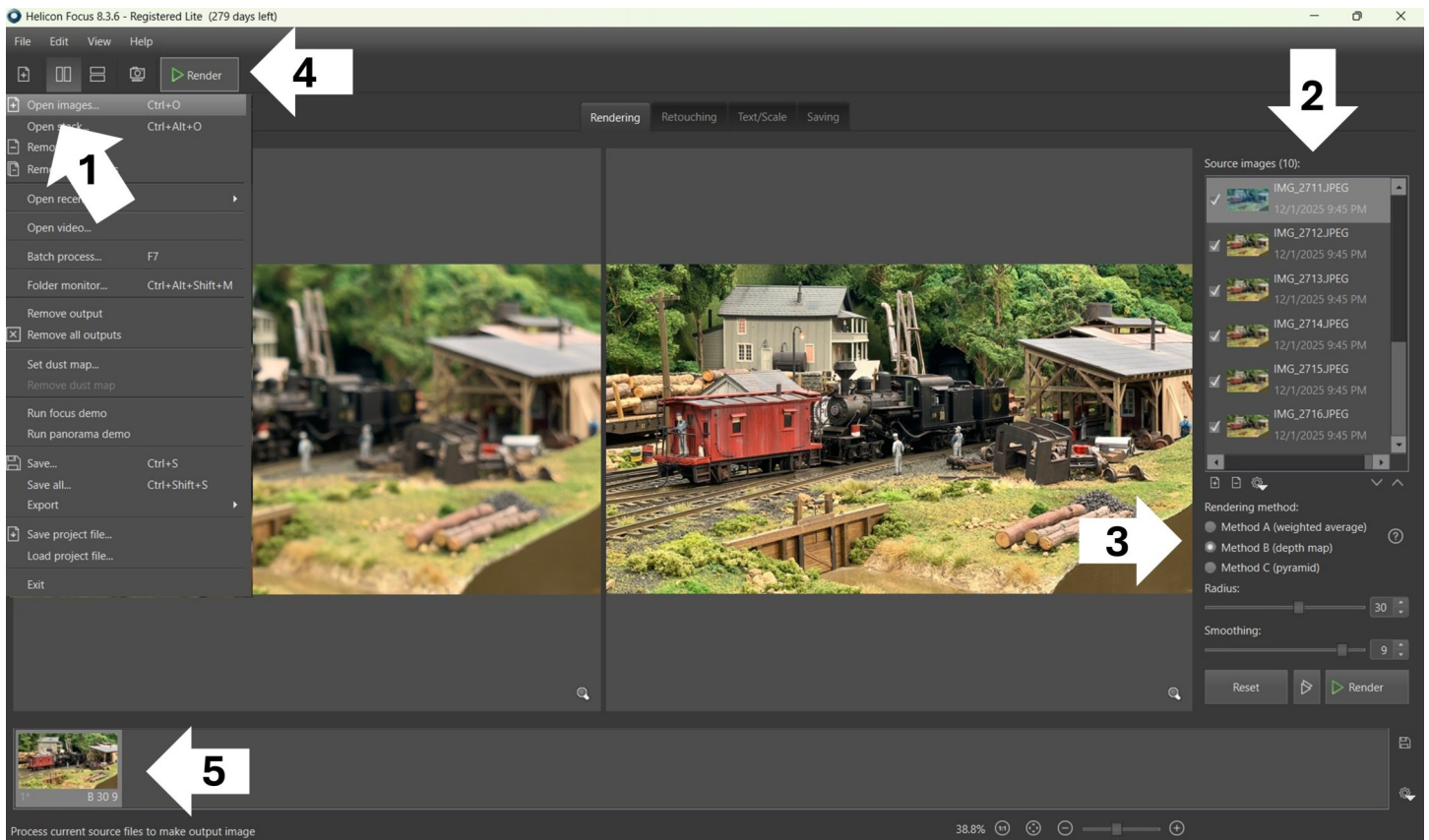
5. With the phone on an appropriate tripod or otherwise stabilized, compose the scene in the screen.

6. Press the shutter release button. The camera will automatically take 10 photos at 3 second intervals, each with a focus point slightly farther into the scene. It's just that easy.

Helicon Focus

Transferring the 10 photos to Helicon Focus will depend on how and where your phone saves photos. If you save them to iCloud you can download them to your PC from there. I believe there are ways to air drop images directly from your phone to your PC but I've not done that.

In Helicon Focus (**next page**) click on File, then from the drop-down menu select "Open Images"(1). Select the 10 images you just took with CameraPixels and they will automatically load into Helicon Focus. The 10 images will appear on the right of the screen (2).



Using Helicon Focus is very straight forward. Click on “FILE”, then select “Open Images” from drop down (1). When the selected images are loaded they appear on the right (2). Select the Rendering Mode (3) and then Click on “RENDER” (4). In a second or two the merged image will appear on the right and as a thumbnail in the lower right (5). Click on the thumbnail to save the image where you want it.

In the lower right side of the screen below the 10 images you will see three different methods Helicon Focus can use to merge (render) the photos (3). I have had the most success with Method B but clicking the question mark icon will open an explanation of the three methods and you’ll want to experiment. I also leave Radius and Smoothing set at the default levels but you may want to experiment here as well.

Now for the fun! Simply press the “RENDER” button with the green arrow in the upper left tool bar (4) and... presto... a perfectly focused image will appear in a second or two! It will appear on the right of the main screen and in a thumbnail in the lower left (5). Simply click on the thumbnail and select “Save”. I think you’ll be pleased with the result.

Additional Adjustments

While it’s likely that the image you have created will more than meet your expectations, after some experience you may decide that you’d like to make additional adjustments to the image such as adjusting the lighting in some areas or adjusting the color saturation. Phones tend to reproduce highly saturated colors as that’s what folks like in their selfies. Photoshop or other similar software can be used for this final tuning.

Final Recommendations and Considerations

Most phone cameras today have more than one lens. Each lens has a different aperture. You can find the aperture of each of the lenses on your phone on the internet and it’s good to know. You might find that lenses with the smaller apertures (largest F-stop numeric value) will provide better results because each exposure will have a greater DOF. However, the smaller apertures on phones are often on the widest angle lenses which may distort objects near the edges of the image.

Will the pictures taken with a phone be as good as ones taken with conventional cameras? The answer may be a matter of opinion and some high-end phone cameras create excellent images. What is for sure is that photos created by merging focus-bracketed images, even those taken with a cell phone, can have stunning DOF. For some that makes a better photo. For others, a softly focused background better reinforces the sense of distance and makes the scene more realistic. Of course, a great composition is critical to the success of any photograph and neither the camera nor the app can help you with that.

I want to thank Tony Koester for suggesting I look into CameraPixels and Tom Johnson for providing a sort of ‘beginner’s guide’ which jump started my foray into using the app.

