

## Extended Focus in Macro Photography

By Neal Immega

The problem with macro photography is that the photographer can never get enough depth of field to properly image his subject. Even cost-is-no-object photographers find that they can not buy lenses with extremely large F-Stops (small iris) without running into the diffraction limitation. A F-64 lens is at the limit and even it does not have enough depth of field.

The obvious answer is to take multiple pictures of a spiny trilobite with the focus at different positions and combine them. You can do this with Adobe Photoshop but the software is expensive and the process a pain. I have found an excellent solution to the problem with the CombineZ5 (for version 5) program written by Alan Hadley. Better still, it is free. An excellent review of three of the programs than will combine photos can be found at

[http://www.outbackphoto.com/workflow/wf\\_72/essay.htm](http://www.outbackphoto.com/workflow/wf_72/essay.htm)

The techniques section at outbackphoto.com is full of useful techniques that you may have never thought of. I highly recommend the web site.

CombineZ5 is a program written by Alan Hadley and is featured on the website of

<http://www.hadleyweb.pwp.blueyonder.co.uk/CZ5/combinez5.htm>

Since web sites change a great deal it is useful to know that you can find by putting "CombineZ5" into Google. You should check this site occasionally because Mr. Hadley is actively developing new software all the time. You may download all the software from this site. I have mirrored the software on the Houston Gem and Mineral Society site because it is so useful and I want to make sure that we have a working copy. Temporarily we will have the program and data files at the paleo page <http://www.hgms.org/paleo.html>

Shoot your pictures from a tripod. You may take your successive focus pictures by moving the focus screen so that the auto focus point is on different parts of the trilobite or you may change the focus setting from near to farther away. I have found it hard to take more than 4 pictures that are significantly different with my Minolta A200 lens at a 200 mm setting.

Download the software, helpfiles, and the examples. CombineZ5.exe does not need to be installed. It just runs. You will need to have fftw3.dll in the same place at combinez5.exe and maybe gdiplus.exe if you have an older machine. You may download the zip file or the unzipped version if you can tolerate the bigger file.

You will need to install a macro that I have customized for large pixel files: "Do Stackbig.mac"

Do the following steps.

- Execute combinez5.exe

- Load in A.jpg from the eldredgeops example with File/New and then find A.jpg

- Macro/Edit Macros

- Click on Do Stack

- Load Macro

- Pick Do Stackbig.mac (from the combinez5 program directory) then OK

- X (cancel) the macro list

- Exit the program with File/Exit

Lets run the Elredgeops example. You will be using 800x600 pixel files to speed up the processing. The program handles 8 megapixel files just fine but they take longer. The files are labeled A, B, C with the A file

having the area closest to the lens in focus. You may have your files names with letters or numbers but they must sort in focus order, near to far.

## **Simple Case**

File/new - load A,B,C jpg

Macro/Do Stackbig

You will be presented with an image. If this is satisfactory, then you are nearly done.

Save the final picture with Save Frame As or you may save all the steps with Export Rectangles.

The program can adjust easily for size and position differences, but if you have a tilt between images, you will need a manual process.

## **Manual Align**

When CombineZ5 runs, it makes a log window called "CombineZ5 Progress".

Scroll through the file and find the "Align all Frames" section, "Second Pass".

If the scale = 1.0000, the auto align process worked perfectly.

Suppose it is less. Look at the images with the Up/Down Arrow keys and see if they are too bad.

You might want to zoom in by making a box with the cursor and clicking right on the mouse.

Suppose you need to do a manual align. Reload your files.

Read the helpfile 18points.htm. Basicly you pick two points on image A and the same two points on image B and tell the program to register the points on top of each other. Do A and B and then B and C in that order.




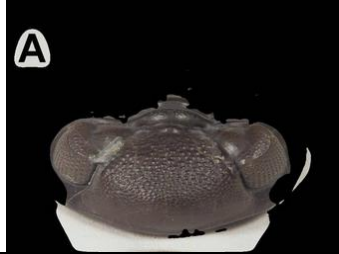
Then go run


Macro/Do Stackbig

## **Editing**

Likely you will find that the program does a nearly perfect job of selecting which file has in focus pixels.

That is not to say that it is perfect. Suppose you need to edit the images. You will see these headings at the top of the CombineZ5 window. I have labeled each file internally with the letter A B and C.

Command	Vfull	Vfullplane	A1	picture
File/New load your images				
Macro/Do Stackbig	New-out999		New-out999	
This is your unedited output				
P				This turns on the editing mask.
Edit the masks as you see fit.				
Up/Down to C mask		Picture	C	
Frame – new from visible		Copy998-picture	Copy998-picture	
Up/Down to B mask		Picture	B	
Frame - new from visible		Copy997-picture	Copy997-picture	
Up/Down to A mask		Picture	A	
Frame – new from visible		Copy996-picture	Copy996-picture	
P				Turns off the masks.
Up/Down to C mask	Copy998-picture		Copy998-picture	
Frame – make transparent (no)	Copy998-picture		Copy998-picture	Makes the black areas null.
Stack – choose frames – don't use frames below	Copy998-picture		Copy998-picture	.

Rectangle – paste active over	Copy998- picture		Copy998- picture	Only add the 3 frames with the masks
Frame – new from visible	Copy995- picture		Copy995- picture	

Note that the editing process produces a picture that is not as polished as the one produced automatically. It has shadows where the other one is smooth. Do as Save As to get the final output.

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Run the spiny trilobite and see what you get.

