

# Batch Processing

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# Introduction

Batch processing is the sequential application of a set of transformations to a list of files. Some common examples of batch processing might be to convert a group of files for posting on the web, printing a series of images or applying the same set of transformations to a series of images and saving the results.

## Creating and Running a Batch Process

A batch operation can be as simple as converting a list of images to JPEG files for the web or printing them. Or, it can involve performing a complicated series of operations on a series of images and then saving them in another folder.

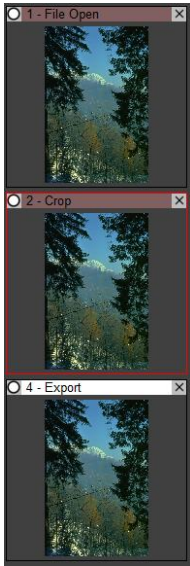
The **File Open** transformation works in conjunction with other batch transformations (all of which are found in the **Transformation** menu under **Batch**). These transformations currently include:

- Export – resizes and saves image files to a folder
- Print – prints image files
- Process or Skip – provides manual control over a batch process
- Slide Show – displays images full screen in a slide show

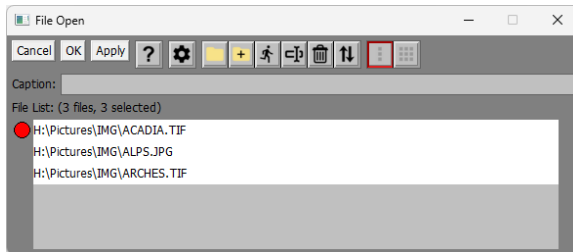
These transformations simply pass their input image through to their output image. But, if a batch process is running, they also export, print or display their input image as a side-effect.

### Overview




To process a series of images, you need to create an image tree that starts with a File Open transformation and includes one or more batch transformations. Optionally, you can include other transformations in between if you want to do additional processing on the images such as cropping, adding text or sharpening. The File Open transformation creates a new top-level image. After creating this new image, you can create additional transformations below it, typically ending with one or more Export, Print or Slide Show transformations.



The batch process is controlled from the File Open transformation. To change the set of files you want to process or to initiate batch processing, first double-click on the File Open thumbnail in the image browser.




## Selecting Files

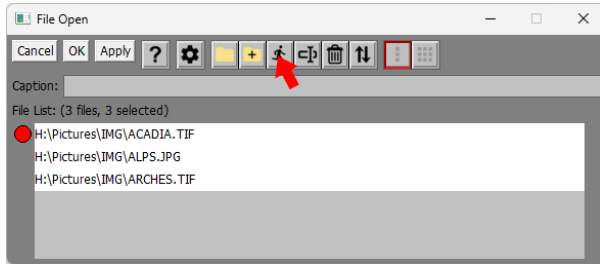
To add to the file list, click the  button, and choose the rest of the images you want to process. To remove files from the list, first select them and then click the  button. To clear the current list and select a new set of files, click the  button.

Or, you can streamline the process by using the File Open List command instead of File Open. This lets you select all the images at once and opens just the first one. The rest are added to the file list.

## Starting the Batch Process

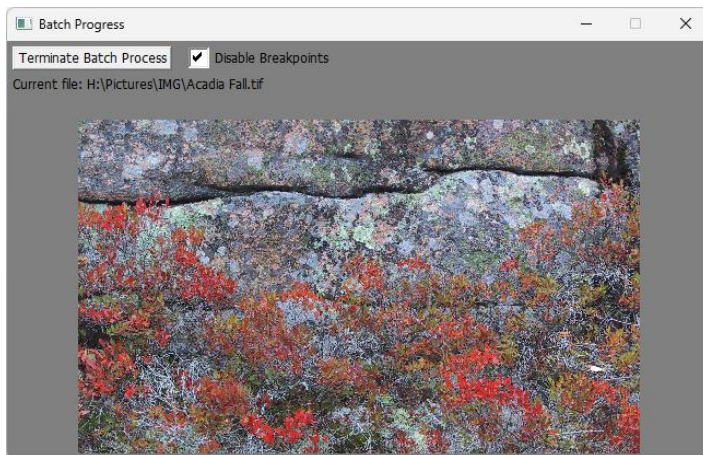
Note: the buttons that initiate a batch process are grayed out unless there are at least two files in the list.

To initiate batch processing on the selected files, click the  button.



One by one, each selected image is opened, starting with the first one, and the image tree is recalculated. Since a batch process is active, this causes any Export, Print or Slide Show transformations to export, print or display their input images. In the absence of an Export, Print or Slide Show transformation, the batch process will simply recalculate the workspace for each file in turn and then discard all the results. In this case, a warning is issued. You may ignore the warning and continue however if you wish.

A Batch Status dialog box is displayed during batch processing. This dialog box displays the pathname and a thumbnail of the file currently being processed.



Clicking the Terminate Batch Process button causes the batch process to terminate at the next transformation. You can minimize the Batch Status dialog box if you want to get it out of the way or resize it to make the thumbnail image larger or smaller or to make enough room to display a long pathname. You can also disable or enable breakpoints (see below) via the Disable Breakpoints checkbox.

## Multiple Batch Processing

Occasionally, tasks require processing more than one list of files at a time. For example, suppose you want to combine a series of left/right stereo image pairs into anaglyphs and print them at a specific size. To do this as a batch operation, you need to be able to load files from two different file lists before recalculating the image tree – one list for the left images and one for the right images. Other tasks such as compositing images or combining several images into a Layout may require more than two file lists.

Picture Window checks to see if there is more than one File Open in the image tree having a file list with more than one image selected. If so, it enables the Single Batch/Multiple Batch tool bar:



This tool bar gives you two different options for batch processing when multiple File Opens are present:

**Single Batch** – ignores all but the current File Open and processes the selected files in its file list one image at a time.

**Multiple Batch** – runs all the File Opens in parallel, loading the next selected file from each one, and then recalculating the image tree to propagate the changes. This process continues until any of the lists runs out of selected files. When you initiate batch processing, you will get a warning unless all the File Opens have the same number of selected files, as this may indicate you are missing some files you intended to process.

If your workspace includes File Opens you want to exclude from multiple batch processing, deselect all but one of the files in their file lists, and they will be ignored.

## Breakpoints

You may need to manually adjust some settings during a batch workflow -- for example to adjust a cropping rectangle or do some cloning or speck removal. To accomplish this, set breakpoints on each transformation you want to be able to adjust and the batch workflow will pause at each breakpoint and display the transformation dialog box so you can modify its settings. Then click OK or Cancel to resume the batch. In batch mode, there is no Apply button, and the image browser and main tool bars are disabled. As a convenience, you can use the keyboard shortcuts F1 or F2 instead of clicking OK or Cancel. In addition the F5 keyboard shortcut resets the transformation settings to their default values.

Breakpoints are also a good way to test a batch process before adding the File, Print or Slide Show transformation, to avoid saving or printing any files until you are sure it is working.

## Setting and clearing breakpoints

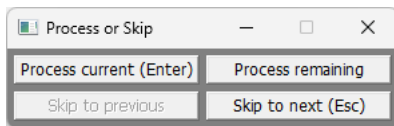
You can set a breakpoint on a transformation either by right-clicking its thumbnail in the Image Browser and selecting Toggle Breakpoint from the popup menu, or via the Edit/Toggle Breakpoint command from the main menu. Once a breakpoint is set, the image thumbnail in the Image Browser will have a red outline. To delete all breakpoints, use the Edit/ Delete All Breakpoints command. Breakpoints on bypassed transformations are ignored.

You can enable or disable all breakpoints using the Edit/Disable Breakpoints command from the main menu. When breakpoints are disabled, the bright red thumbnail outline in the image browser is changed to pale red and breakpoints are ignored.

You can also enable or disable all breakpoints from the Batch Progress window. This lets you disable all future breakpoints when paused at a breakpoint.

### Process or Skip transformation

Normally, batch processes run automatically, only pausing at any breakpoints you have set. To get more control over which images are processed and which are skipped, you can insert a Process or Skip transformation downstream from the File Open transformation. When no batch process is running, this transformation simply passes its input image to its output image. When a batch process is running, however, it displays the following dialog box which supplies several different manual controls:



Clicking the Process current button (or pressing the Enter key) causes the current image to be processed and then advances to the next selected file and once again displays the dialog box.

Clicking the Skip to next button (or pressing the Esc key) skips over the current image and advances to the next selected file, if any.

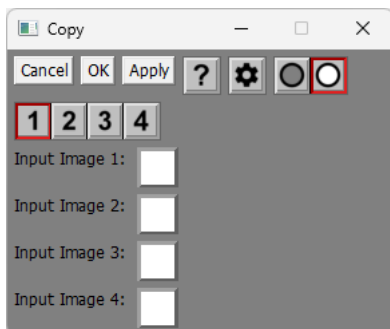
Clicking the Skip to previous button returns to the previous selected file, if any.

Clicking the Process remaining button causes all remaining selected files to be processed and the dialog box is not displayed again.

Placing a Process or Skip transformation right after the File Open lets you decide whether or not to process each image. Placing it right before the Export or Print transformation lets you check the processed file and decide whether or not to save or print it.

### Copy transformation

Another way to make batch processes more interactive is to use the Copy transformation.

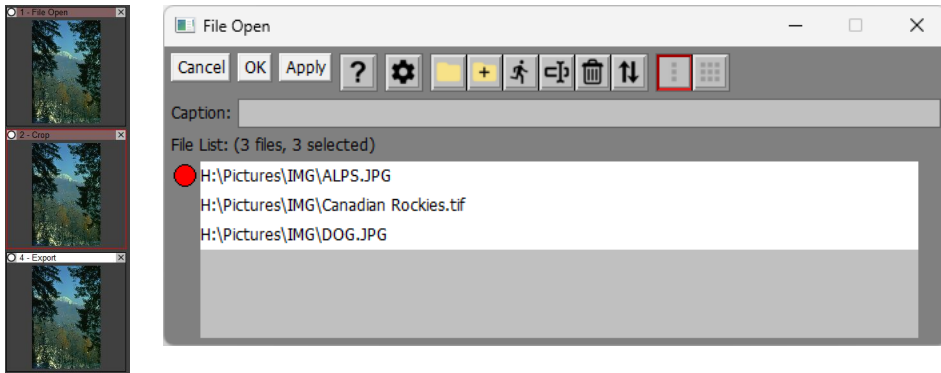



For example, say your processes an image in two different ways. Using a Copy transformation, you can decide while a batch process is running which version you want to save or print. To do this, insert a Copy transformation and set two of its inputs to the two processing versions, and then place a breakpoint on the Copy transformation. When you run the batch process it will pause at the breakpoint and you can switch back and forth between the two versions and pick the one you want to continue with. The output of the Copy transformation is a copy of whichever input you select.



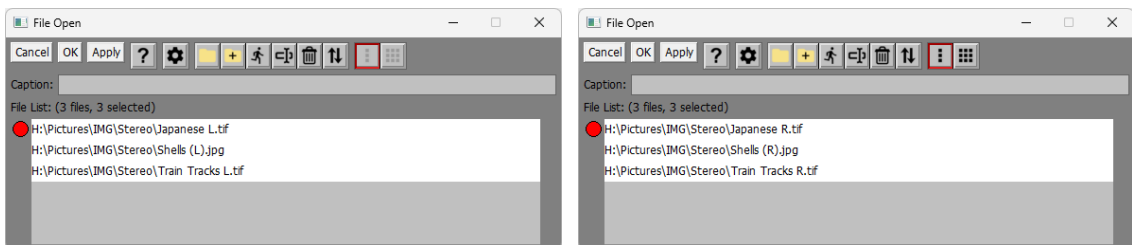
## Batch Workflow Examples

Here is an example of a batch workflow that opens three files, pauses with a breakpoint to let you crop each one manually, and then saves the resulting image as a new file:

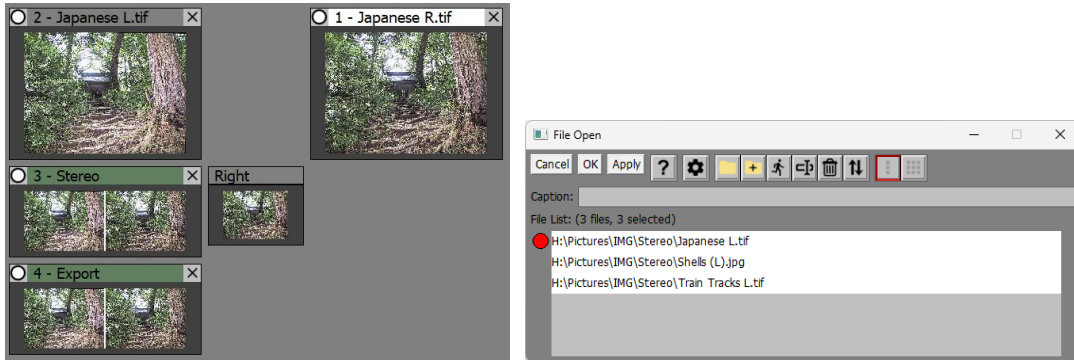


Note that all three files in the file list are shown as selected, but you can deselect any files you want to skip. To start the batch process, click the  button in the File Open dialog box. This passes each file in the list, one at a time, to the Crop transformation below it. Because a breakpoint is set on Crop (indicated by the red outline), processing will pause to let you specify the cropping rectangle manually. When you click OK (or press F1), the cropped image is then passed to the Export transformation which writes it out as a file. If you click Cancel (or press F2), no changes are made to the cropping rectangle. The Crop transformation has an option in its Settings menu to reset the cropping rectangle each time when a batch process is running.

Next, let's look at an example of multiple batch processing that formats two lists of stereo image pairs for side-by-side viewing and exports them as JPEGs. The first step is to create two File Opens, one for the left images and one for the right images. This can be done using File Open List command to select the set of images you want to process. The two file lists must be in the same order, or the wrong left and right images will be processed together.



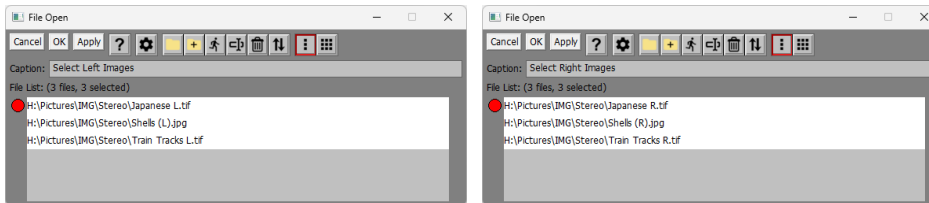
Add the Stereo transformation after the left image File Open and an Export transformation after the Stereo transformation:




Next, double click on the left image File Open to open its dialog box and click the Multiple Batch button to enable multiple batch processing:

Finally, initiate batch processing by clicking the  button. Once the dust settles, you should have a set of processed images in the folder you exported the image to.

If you want to save this workspace for use with other lists of files, first assign captions to each of the File Opens as this will cue you when Picture Windows asks for files as to which file list it is asking you to select.



Next, save a workspace script without image names. This will save the File Opens with empty file lists. When the script is loaded, it will then ask a list of left and a list of right files. After the files are selected, double clicking on the left File Open and clicking the  button runs the batch process on the file lists.

## Differences between Batch Mode and Normal Mode

While Picture Window is running in Batch mode, it works a little differently.

The Image Browser, main tool bars and main menu are all disabled to prevent disturbing the batch process by changing the image tree while it is running.

Whenever a breakpoint is reached for a transformation, its Apply button is removed and OK and Cancel are used to continue or to terminate the batch process.

Progress indicators are not displayed.

## Tips

There is a separate setting in the Color Management settings dialog box that lets you specify an alternative value of the Ask on Mismatch setting that overrides the normal setting during the execution of a batch process. Asking about profile conversion every time a new file is opened can interrupt unattended batch operation. To avoid this, choose a different setting for the batch version of Ask on Mismatch.

As an aid in testing batch processes, you can insert a Bypass transformation (which just passes its input through to its output) and set a breakpoint on it. This causes batch execution to pause at the breakpoint so you can see the results of all the transformations up to the Bypass. Then, at the breakpoint, click OK or Cancel to continue.

You can save a batch process as a workspace script and use it again later. If you save the workspace script without image names, when you run the script, it will ask you for the name(s) of the files you want to open. After the script is loaded, you can double click the File Open and run the batch process on the selected files.