

ENROUTE QUICKSTITCH

Introduction

Enroute Imaging's QuickStitch combines photos into stunning wide angle panoramas in seconds.

Powerful, yet deceptively simple, QuickStitch is designed for hand-held shots. It's the only software that "stitches" horizontally and vertically, and it's automatic-forget the hassle of selecting lenses or overlap points. QuickStitch has features unavailable in other panorama creation software.



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Enroute QuickStitch

Minimum System Requirements

	Windows Version	Macintosh Version
Operating system:	Windows 95/98 or NT 4.0	System 7.5 or later
Processor:	Pentium	Power PC
RAM:	16MB	20MB, virtual memory on
Screen colors:	256	256
Screen resolution:	800x600 sugg., 640x480 min	800x600 sugg., 640x480 min.
Disk space: (for software)	30MB	36MB

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GETTING STARTED

Windows Installation:

- 1) Insert Disk 1 of the Digital Image Productivity Software Suite.
- 2) Click the Start menu and select Run.
- 3) Click on Browse, then double-click on the QuickStitch folder.
- 4) Click on Setup.exe, then click open.
- 5) Click on OK to begin installation.
- 6) Follow the prompts in the installer.

Using QuickStitch:

A QuickStitch short cut icon will be installed under "Programs" in the Windows 95 Start Menu. To access it, press Start, Programs, QuickStitch.

To run QuickStitch directly from the CD-ROM:

- 1) Choose Run on the Windows 95 Start Menu
- 2) Type D:\QSTITCH.EXE and press Enter (replace D: with the letter of your CD-ROM drive if it is not D).

If QuickStitch is running from the CD-ROM, it will be much slower than the installed version.

Macintosh Installation

- PowerPC Required
 - QuickStitch for Macintosh works only on Macintosh computers with PowerPC microprocessors
- 1) Insert your Digital Image Productivity Software Suite into your CD-ROM drive.
 - 2) Double-click on the folder containing QuickStitch.
 - 3) Double-click on the QuickStitch icon.
 - 4) Follow the on-screen instructions.

Special Notes for Macintosh Users

Locating Sample Images

Included with this distribution is a set of sample images. When QuickStitch starts, the file finder component of QuickStitch will be viewing the desktop directory. Use this tool to navigate to the Sample Images directory. This directory will be located on your CD or in the location to which you copied the CD distribution.

Macintosh Memory Consumption

Unlike traditional image processing applications that operate on a single image at a time, QuickStitch must operate on several images at once to produce a panorama. Depending on the size and number of input images and the quality of output desired, QuickStitch's memory requirements range from modest to substantial. The recommendations contained herein apply only to Mac-style computers (PC's running Windows 95 have virtual memory on by default).

The basic memory recommendations are simple and are summarized as:

Turn on virtual memory and set it to at least 20 MB above your real memory

If QuickStitch fails because of lack of memory anytime other than during a stitch operation, increase the memory allocation in the preferences dialog box

Unless you have a lot of memory in your system (more than 30 MBytes), you should turn on virtual memory and set the amount of virtual memory to at least 20 MBytes more than your real (installed) memory. Note that if you are running Connectix RamDoubler, it is not possible to turn on virtual memory. In this case RamDoubler acts in much the same way as virtual memory.

QuickStitch can run out of memory in two ways. First, the user interface can run out of memory if the grid contains many images or particularly large images. It can also happen if you have generated several panoramas that are sitting open in their viewer windows. The second way QuickStitch can run out of memory is during the panorama generation process (after you hit the "Stitch" button and before a panorama is displayed).

The first step in both situations is to access the Memory control panel, make sure virtual memory is turned on and turn up the size of the virtual memory (see your computer's documentation for advice on virtual memory). You will have to restart your machine if virtual memory is not already turned on. Having given yourself more virtual memory, if you run out of memory while in the user interface (before pressing "Stitch"), then bring up the Get Info box and increase the memory preference.

Keep in mind that the Mac system itself may be using anywhere from 10 to 15 MBytes. If you don't use virtual memory, you will need to add QuickStitch's requirement (explained below) to the requirements of the Mac system and all other currently-running programs to obtain the amount of real memory needed.

Some settings within QuickStitch also affect memory consumption. In the Stitch Options dialog box, you can select either "Gradual" or "Sharp" blending. Sharp blending takes substantially more memory than does Gradual blending. Another option in this dialog is output image size; selecting a larger size will frequently result in more memory consumption. For more details, see the Help topics regarding Stitch Options.

This version of QuickStitch has a preset memory preference of 15 MBytes (with a minimum requirement of 8 MBytes). This preference has been set high enough to accommodate the sample images, which range from 320x240 to 1024x768 pixels in size. This amount of memory is sufficient to stitch all included images at medium resolution using gradual blending. It is also sufficient to generate many, but not all, of the panoramas at large output resolution.

Other strategies for dealing with low memory include:

- reduce the output resolution (in Stitch Options)
- use gradual blending (in Stitch Options)
- include fewer input images
- reduce the size of any RAM disk(s) in use
- close some viewer (output) windows
- close other applications that are running on your computer and taking up memory. Note that QuickStitch's own demo programs and help windows count as other applications. Quit these if memory is a problem.

Processing Speed

Processing speed is affected by:

- clock speed of your microprocessor
- number of included images (the more, the slower)
- resolution of the input images (the higher, the slower)
- type of output projection (cylindrical is slightly slower than perspective)
- size of the output image (the larger, the slower)
- stitching options (sharp blending is slower than gradual blending)

The panorama generation process is extremely floating point intensive. Newer computers with better floating point performance will see a significant improvement in performance over those with mediocre floating point capability.

Known Incompatibility

Occasional crashes have been observed when the following Macintosh programs are turned on:

- Balloon Help
- PlainTalk (speech recognition and text-to-speech)

If you experience problems, turn these off when running QuickStitch.

PROPER PICTURE-TAKING

Below are a few tips to remember when taking panoramic pictures.

The process of generating panoramas matches elements in one picture with those in another. These suggestions ensure that there are enough common elements between scenes.

1. Stand in one spot and rotate camera around one position
2. Hold camera close to the eye for best results
3. Be at least 15 ft. from subject (closer shots work best with a tripod)
4. Avoid scenes with lots of motion, such as moving cars or people
5. Hold camera level to avoid tilting and blurring
6. Overlap image pairs 50% or more (as shown below).

When shooting large scenes, take photos in this sequence to ensure proper overlap.

SOURCE PICTURE REQUIREMENTS

Below are the requirements for all source images used in making panoramas. Please note that although QuickStitch is designed for stitching hand-held images, a tripod will usually result in better stitching results.

Pictures must be taken with a digital camera or scanned from a photograph. If images are scanned, the center of the scanned image should remain at the center of the original image. In other words, it is not a good idea to use an off-center crop of a scanned image.

- Pictures must be in BMP or JPG format.
- Pictures must ALL be the same size.
- Pictures must ALL be shot at the same level of zoom.

Pictures should overlap by 50% or more. Good results can often be obtained with overlaps as low as 35%, but in general, the more overlap the better. In other words, overlapping a pair of images by, say, 65% will almost always work better than overlapping an image pair by 35%.

Each picture must be taken from the same location and with the camera in roughly the same position. See here for more tips on taking perfect pictures.

Photos should also be relatively free of camera-caused distortion. For instance, fisheye lenses cause severe bending and elongating at the edges and cannot be used.

Scenes should be "interesting," i.e. should have some structure that QuickStitch can use to determine where they overlap. For example, pictures of a blue sky or open ocean have little to discern one area from another.

The camera should be held relatively level when

taking pictures. For scenes closer than 15 feet away, use a tripod for best results.

START USING QUICKSTITCH

Step 1 - Find Images

Using the "Find Images" box left of the grid, navigate to the folder(s) containing images to stitch. The current folder is shown in the upper box, and available image files are listed in the lower box.

Navigation

Use the dropdown list in the upper box to quickly navigate between distant folders and drives, or double-click on folders in the lower box to move to adjacent folders.

Image Preview

You can see a preview of any supported image by highlighting its filename with the mouse. The preview will appear in the Image Preview Area next to the grid.

Step 2 - Moving Files to the Image Grid

Before stitching, you must re-assemble the panoramic scene on the Image Grid. Place the images you want to stitch on the grid by dragging or adding them:

Dragging

Click on an image filename with the left mouse button. A preview of that image will appear in the Image Preview Area. Drag the filename into any grid cell by holding the left button and moving the mouse to the grid. Release the mouse button to drop the image into place. Note that you can begin dragging even before the preview image appears.

Drag and Drop

QuickStitch supports drag and drop from other folders and programs. To drag images into QuickStitch, select them with the left mouse button and drag them onto the QuickStitch grid.

Adding

Click on an image filename with the left mouse button. A preview of that image will appear in the Image Preview Area. Then push the button to place a copy of that image on the grid. Note that you can push before the preview image appears.

Removing

To remove an image from the grid, select it and press the button. Pressing will not delete the image file.

Press the button to remove all images and start over.

Click here to learn how to arrange images on the grid.

Click here to learn how to resize the grid.

Step 3 - Making a Panorama (Stitching)

Once the original scene has been reassembled on the Image Grid, push the button to create the panorama.

When the button is pressed, a status bar indicates stitching in progress. To stop stitching in progress, push the Cancel button.

Generally, more images require more time, but the

total stitching time depends on many other factors including:

- a. number of input images
- b. input image size and resolution
- c. available computer memory
- d. hard disk space and swap file size
- e. blending style and projection type selected

When stitching has completed, the panorama appears in a separate Viewer Window.

Stitching Options

A number of options are available which have a significant impact on how your panorama is generated. Prior to stitching, push the button to choose how images are to be stitched and displayed.

Step 4 - Panorama Viewer Window

The panorama Viewer Window displays the stitched panoramic result. If the panorama doesn't fit in the Viewer Window, use the scrollbars to move around the scene or press one of the buttons on the toolbar.

If your panorama doesn't look right, try changing the stitching options or check the Frequently Asked Questions list.

Viewing the panorama

Commands under the View menu let you define window size and select various levels of zoom.

Zoom 1:1 – resizes the panorama to its original size. If Large or Extra Large output image size is selected, the panorama may not fit in the Viewer Window.

Fit Image To Window – shrinks or expands the panorama to fit snugly in the Viewer Window. For other zoom levels, use the buttons on the Viewer Window toolbar.

Zooming the panorama

Use the buttons on the toolbar to view your panorama at different levels of magnification. To view the panorama at its actual size, select Zoom 1:1 from the View menu in the Viewer Window.

To shrink or expand a panorama to fit snugly in the Viewer Window, select Fit Image To Window under the View menu.

NOTE: Zooming affects only the view of the image—it does not change the actual size of the panorama.

Cropping the panorama

Cropping allows you to create rectangular output images by cutting away unwanted portions of a panorama. To crop your panorama:

Push the button on the toolbar or select Show Crop Rectangle Outline from the Edit menu. The crop region appears as a rectangular dotted line with red "grab handles" at the sides and corners.

Move the entire crop region without changing its shape by selecting and dragging on or within the dotted lines.

Resize the crop region using the "grab handles" on

each corner and side. When the mouse pointer is moved over a grab handle, the pointer turns into a double arrow. Hold down the left mouse button and drag the crop outline's shape into place.

When ready, push the button on the toolbar or select Crop on the Edit menu.

Select Undo from the Edit menu to bring back the cropped portion.

Rotating the panorama

There are two ways to rotate your panorama before cropping, printing or saving it. The panorama can be rotated in small increments using the toolbar at the bottom of the Viewer Window. Or, use the Image menu option to make 90, 180 or 270 degree clockwise rotations.

Small Rotations

To rotate a panorama by roughly 2 degrees in either direction, use the buttons on the toolbar.

Large Rotations

Automatic clockwise rotations of 90, 180 and 270 degrees are accessible under Rotate on the Image menu.

Flip and Reverse

To flip the panorama upside down, push the button on the toolbar or choose Flip from the Image menu.

To view the panorama "backwards," i.e. from the reverse side, push the button on the toolbar or select Reverse from the Image menu.

Sharpening the panorama

Besides rotating and cropping, QuickStitch lets you enhance a panorama by "sharpening" the picture contrast.

To add sharpening to your panorama:

Select Sharpen from the Image menu. Choose the desired level of sharpening and press OK.

To cancel the sharpened effect, choose Undo from the Edit menu.

NOTE: This function is not available in the Macintosh version.

Step 5 - Saving the panorama

To save your panorama as a separate image file, select Save As from the File menu or press on the Viewer Window toolbar.

Choose the desired file type from the "Save as type" box and enter a filename in the "File name" box. The appropriate filename extension (BMP or JPG) will be added if you do not specify it.

For all file types, the size of the resulting image file will depend on the output image size chosen in stitching options and how much of the panorama was cropped prior to saving.

If JPG file type is selected, you will be prompted to choose an image quality from 1 to 10. Lower numbers will use more JPG compression, thereby



creating a smaller file. Larger numbers will compress the image less but generally preserves better image quality.

Step 6 - Printing the panorama

Panoramas can be printed on any printer that supports Windows 95, although best results will be obtained from laser and color printers.

To print, select Print from the File menu or press CTRL-P on the keyboard. Select the desired printer (and options, if necessary) and choose OK to send the image to your printer. Press Close to return to the panorama Viewer Window.

To set printing options, select Print Setup from the File menu.

FREQUENTLY ASKED QUESTIONS (FAQ)

Q. My panorama doesn't look very good. BRIEFLY, what can I do about it?

- If objects in your panorama are blurry, try using Sharp blending.
- If the exposure looks different between matching images, try using Gradual blending.
- If parts of the panorama seem out of place, you may not have arranged pictures properly on the grid.
- If the edges expand into a "bow-tie" effect, trying using Cylindrical projection.

See below if you're experiencing other effects...

Q. My pictures didn't stitch together well. What can I do about it?

If stitching isn't seamless, it is almost always because the input images do not fit together well. This is generally due to one or more of the following:

- Not enough overlap between successive photos – at least 30% overlap is usually required, and best results are obtained with around 50%.
- Too much movement of the camera between shots – the camera should stay in one position if possible.
- Images are out of order – click here for an easy way to check for directional continuity.
- Camera was held too far from the eye, resulting in too much arm movement between shots (and therefore too much camera movement).
- Too much tilt on the camera between shots – the camera should be held relatively level to avoid tilt and blur.
- Not enough structure in the scene – scenes containing, for example, lots of blue sky, water or nondescript grassy fields don't have enough information for QuickStitch to match up corresponding image components.
- Movement in the scene, especially at the edge of one or more photos – if movement occurs at a critical place of overlap, QuickStitch may be unable to

determine how photos fit together.

- Different zoom levels in the same scene – if your camera has a zoom lens and the zoom was changed while taking shots for the same panorama, QuickStitch will be unable to stitch your pictures.

So what can I do about it? Try using Sharp blending in order to eliminate ghost images and some overlap errors. The panorama may not be perfect, but you may be able to touch it up with photo-editing software.

Also, some problems can be corrected by eliminating one or two photos from the scene. Try experimenting by removing photos that may not fit well with others.

Q. Stitching didn't work at all. What can I do about it?

If stitching fails completely, there are three possibilities:

1. Source images did not fit together well (see above for reasons why).
2. Exposure was very different between matching images, and QuickStitch was unable to determine how they fit together.
3. A fisheye lens (or other distortion-causing lens) was used.

Q. So what can I do about it?

Unfortunately, the only option is to take another set of photos, this time following the hints on proper picture-taking.

Q. Why does my panorama appear blurry or have ghost images?

Your input images do not fit together well, or there was movement in the scene while you were taking photos. Try using Sharp blending under Stitch Options to correct this. See also the picture-taking tips for hints on avoiding these problems.

Q. Horizontal lines seem to curve away from the camera. Why?

This is an effect of Cylindrical projection, which is best for horizontal scenes with a wide field-of-view. Select Perspective projection under Stitch Options to eliminate this effect.

Q. I see a "bow-tie effect" that looks funny. Why?

This is an effect of Perspective projection over a wide field-of-view. In order to preserve straight lines over the entire panorama, QuickStitch must "stretch" the edges a bit. Select Cylindrical projection under Stitch Options to eliminate this effect.

Q. How close can I be to elements in my scene?

We recommend that you stay at least 15 feet from your subject, but this is just an approximation – sometimes it is OK for scene elements to be closer. The 15-foot rule is designed to lessen an effect known as motion parallax. Motion parallax occurs when, by virtue of rotating your camera between shots, elements in the scene are uncovered or hidden by foreground elements. This is less likely to happen when using a tripod.

Q. Can I take pictures indoors?

Yes, but since indoor shots generally include nearby objects, it becomes even more important to hold the camera level and rotate it around one position. Motion parallax, described in the FAQ topic above, is generally more of an issue as well. Follow these links for more information on taking good pictures and possibly using a tripod.

Q. I ran out of memory or crashed while running QuickStitch on the Mac. What do I do?

QuickStitch can run out of memory in two ways. First, the user interface can run out of memory if the grid contains many images or particularly large images. It can also happen if you have generated several panoramas that are sitting open in their viewer windows. The second way QuickStitch can run out of memory is during the panorama generation process (after you hit the "Stitch" button and before a panorama is displayed).

The first step in both situations is to access the Memory control panel, make sure virtual memory is turned on and turn up the size of the virtual memory (see your computer's documentation for advice on virtual memory). You will have to restart your machine if virtual memory is not already turned on. Having given yourself more virtual memory, if you run out of memory while in the user interface (before pressing "Stitch"), then bring up the Get Info box and increase the memory preference.

Other strategies for dealing with low memory include:

1. reduce the output resolution (in Stitch Options)
2. use Gradual blending (in Stitch Options)
3. include fewer input images
4. reduce the size of any RAM disk(s) in use
5. close some viewer (output) windows
6. close other applications that are running on your computer and taking up memory

Q. How do I get pictures into my computer?

If you are using pictures from a digital camera, see the manufacturer's instructions on loading these pictures onto your computer. This generally involves some software (and perhaps cables) that came with the camera.

Q. But what if I'm using scanned images?

To scan regular photographs, refer to the scanner manufacturer's instructions. Once your scanned images have been saved to disk in BMP or JPG format, QuickStitch can use them.

Q. It's hard to tell how my pictures should be arranged before stitching. Is there an easy way to check?

With a series of images that look a lot alike, it is easy to misalign them in the grid. A quick way to check for directional continuity is to click on the upper left image in the grid, hold down the CTRL key, and use the arrows keys (up, down, left, right) to scroll through the images in the grid. You should see continuous

motion (left to right or top to bottom) in the Preview Area as you scroll through the images.

Q. How should I take pictures?

See here for a complete explanation, or see here for a visual demonstration.

Q. Should I be using a tripod?

A tripod generally produces better input photos (and therefore better panoramic results) because it reduces the amount of camera movement between shots, but it is not required unless you are within about 15 feet of the scene. QuickStitch is designed to work well with hand-held shots, provided some simple guidelines are followed.

Q. What if I have more than 4 images across (or up and down)?

Enlarge (zoom out) the grid. You can have up to 6 images in any direction.

Q. What if I have more than 6 images across (or up and down)?

QuickStitch supports only 6 images in any direction.

Q. What is the maximum field-of-view I can stitch?

The maximum for Perspective projection is 120 degrees, but a Cylindrical projection can go as far around as you want. However, over a wider field-of-view it becomes more important not to reposition the camera between shots. See here for tips, or use a tripod for very wide shots.

Q. Where are my source pictures (the pictures I want to stitch)?

Pictures imported from a digital camera are often saved into the folder holding the camera software. Use the Find Images box to navigate to the folder containing your camera software, or use Windows' Find command (on the Start menu) to locate your files. Then, navigate to your images in QuickStitch using the Find Images area.

Q. I can't see certain image files in the Find Images file list. Where are they?

QuickStitch supports only Windows Bitmap and JPEG images that end with BMP and JPG filename extensions, respectively. Files of other types will not show up in the Find Images window.

Q. When I click on a filename, an image appears in the image Preview Area, but when I try to move that image onto the grid, nothing happens. What's going on?

You can't drag images out of the Preview Area. Instead, drag images into the grid from the Find Images area or from the desktop. Use the Preview Area to see images by clicking on a filename (or grid image).

Q. The image preview does not appear in the Preview Area, or it appears as a black square.

QuickStitch is experiencing a rare conflict with your graphics display adapter, which usually happens only in 256 color mode. Try the following in order until the problem is solved:

1. change the display mode to 16, 24, or 32-bit color

depth using the Display icon in the Control Panel

2. switch your graphics adapter setting to standard VGA or Super VGA using the Display icon in the Control Panel
3. if you know where your images go, the fact that they show up black in the grid does not affect stitching or the display of the output. If the above steps don't work, a final workaround is simply to ignore it

Q. How many viewer windows can be open at once?

Up to 9, and each window can contain panoramas made from different image sets.

Q. I got an error message. What does it mean?

See the Error/Warning Messages section of the QuickStitch on-line help file for a description of each message.

Q. I'm in the viewer window (looking at the panorama), but how do I get back to the first (grid) window?

The grid window is always present. It may, however, be hidden under the viewer window or other windows on the computer desktop. It also may be minimized to the taskbar (PC only). To show the grid window, adjust the position of other windows or maximize it from the taskbar.

TECHNICAL SUPPORT

Technical support is available to registered users Monday through Friday between 8:00am and 5:00pm Pacific Time.

Before you call

Our experience has shown that most questions are answered in one or more of the following resources. Please review them before calling for support.

Frequently asked questions - includes reasons why panoramas may not look right and how to improve results

Taking pictures correctly - a short but detailed explanation included in this manual

Taking pictures correctly - a visual demonstration included on your QuickStitch CD

How to use QuickStitch - a visual demonstration included on your QuickStitch CD

What QuickStitch can do - a visual demonstration included on your QuickStitch CD

Examples - a tutorial with example photos and explanations of stitching options included on your QuickStitch CD

Information to have ready before calling:

Please have the following information available before calling. This makes it easier for us to diagnose your problem and will shorten the length of your call.

1. version of QuickStitch (found on the Help contents page)
2. operating system - Windows 95/98, Windows NT 4.0, or Macintosh PowerPC
3. computer brand and model
4. camera model number
5. size and number of input images
6. amount of RAM
7. other applications running at the time

You may reach live technical support operators by calling (503) 684-3142. Please note that this is a toll call within the United States and Canada.