Panoweaver

User Manual

www.easypano.com

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Welcome

This document explains the installation and operation of Easypano Panoweaver 9. It is intended for both newbies and professionals who engage in online panorama and virtual tour building.

Conventions and Definitions

We use the following typographical conventions and definitions in this document:

Typeface or Icons	Purpose
Italic	Used to emphasize new terms and concepts at the point where they are introduced. Also used to designate the quoted terms or menus of the software.
Note	Used to arouse the readers' attention towards certain operations or things they should consider.
Tip	Used to offer some extra techniques on how to use Panoweaver.

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Copyright Announcement

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Feedback

We welcome your comments and feedback on this manual. Please send your comments to us by email: support@easypano.com or visit the Help Desk or select *Help > Bug Report/Feature Request* to submit.

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Introduction

Introduction

Panoweaver can stitch normal or fisheye images into 360° giga pixel panoramic images. Compared with traditional plane image, panoramic image provides 360° field of view to make viewer feel like in the scene physically. As a result, it is widely used in exhibition business, for instance, real estate, tourist scene, automobile, hotel, campus, culture site and gymnasium. In addition, panoramic image can also be used as a record tool in emergency plan, real estate management, map and other business. Compared with words and plane image, panoramic image is more vivid to record comprehensive information.

Panoweaver 9 comes in two editions: Standard, Professional.

What's New

What's New in Panoweaver 9

Added features
[+] add the function of removing the tripod by viewpoint correcting perfectly
[+] add batch processing
[+] optimize HTML5 format
[+] remain the shooting time of the source image in Pano Exif
[+] Support stitching Giga pixels panorama
[+] Support GPU stitching acceleration
[+] Support stitching images into little planet panorama
[+] Optimize manual stitching interface (The figure tabs of images which contain matching points are marked red)
[+] Support customizing temporary document menu
[+] Support importing image folder in Batch Processing
[+] Support batch stitching images in bracket exposure

Improved features
[*] largely improve the function of removing mistaken matching points automatically
[*] solve the problem of the randomness of the matching points
[*] optimize the UI of HDR module
[*] Enhance program stability
[*] Improve image stitching quality

[*] optimize stitching gap
[*] Support saving user configuration, including Mask, Hotspot, Ceiling/Floor and panorama images
[*] Optimize Menu layout

Fixed bugs
[-] solve the problem that the location of the center of circle cannot be modified
[-] solve the problem that Distance in the Matching Point Table is not display
[-] solve the problem that the preview image is different from the saved or published one in some case
[-] solve the problem that the hotspot can only be added in panorama document
[-] solve the problem that the coverage of the spherical and the cubic panorama are different while the angle of Ceiling/Floor is the same
[-] solve the problem that the project cannot be saved after modifying the mask
[-] solve the problem that the triple state of the hotspot is hotspot is constant
[-] solve the problem that the auto matching point is deleted after adding the point manually.
[-] solve the problem that the project cannot be opened after moving the file
[-] Address the error of opening activation window in some cases.

For the latest info about What's New, please refer to What's New.

Edition Comparison

In order to cater for different user groups, Panoweaver 9 is designed to develop two editions involving Professional, Standard. The two editions (Pro and standard) possess almost the same functions for new features, which are all powerful and professional tools to stitch Giga Pixels panoramas. For the sake of simplicity, this manual refers to Panoweaver when discussing functionality that is common to Professional and standard version. Below is the comparison between the two editions.

Panoweaver 9 Edition Comparison

Features	Panoweaver 9 Professional	Panoweaver 9 Standard
New Features		
Giga pixels panorama *New* GPU stitching acceleration *New* Stitch images into little planet panorama *New*	YES	YES
Branding Free(URL link on context menu)	YES	-
Gyro effect	YES	YES
Batch stitch, publish, and Spherical/Cubic conversion	YES, 300 groups	-
Mask function	YES	-
Transition effect from Little Planet to Normal view by right click menu in FlashVR and SWF tour	YES	YES
Sharing functions in EP-Sky and Facebook	YES	YES

Key Features			
Support all kinds of camera (normal lens, wide angle lens, raynox lens, sunex lens and fisheye lens)		YES	YES
Source image type	Full circular / Drum / Full rame /Cube face / Raynox / Camera Raw	YES	YES
	Wide-angle/Normal	YES	YES
Publishing format	Flash /HTML5 / QTVR /Java applet / Shockwave Flash (Standalone SWF)	YES	YES
Auto stitch spherical, cylindrical panorama and little planet panorama New		YES	YES
Manual stitching *Enhanced*		YES	YES
Support two blenders: PWBlend and SmartBlend (support in PW 900 later version)		YES	YES
Stitch multiple rows of images		YES	YES
Stitch 16 bit image		YES	YES
Create HDR image to solve overexposure/ underexposure problem		YES	-
Enhanced Features			
Removing tripod		YES	-
Google/Bing Map *		YES	YES
Add hotspot to panorama		YES	YES
Stitching of big-sized panorama		YES	YES
Provide selection of stitching parameters		YES	YES
Output of six cube face images		YES	YES
Full screen	Flash / Java applet / QTVR	YES	YES
Customize ceiling/ foor logo		YES	YES
Customize Loading Window for Flash VR and Standalone swf output		YES	-
Swf progress bar		YES	YES
Background music		YES	-
Support adding print, email to, show help, play sound buttons		YES	YES
Generate files for autorun CD		YES	YES
Save project and user settings (like mask, ceiling/floor, hotspot, panoramas) *New*		YES	YES
Reset size stitching parameters of panorama when save and publish. *optimized*		YES	YES
Automatic Little Planet Ceiling/Floor		YES	-
Add Longitude,Latitude and NorthPan information to EXIF in panorama		YES	YES

* Google map is available to users who have already had valid API key. Bing map is for all users.

Get Help

Easypano provides a variety of options for getting help and learning Panoweaver. Before you contact technical support, have you:

- Referred to the information of this Panoweaver 9 user manual (To start the online Help, select *Help* > *Help Topics* from the main menu or press F1).

- Read the Troubleshooting section of this manual.

- Visited the support column for updated troubleshooting information: The FAQ and Knowledge Base section of the Support column deal with issues that are outside of the scope of the standard documentation, such as compatibility issues, licensing questions, and a variety of common problems.

- Visited the Help Desk or select *Help* > *Bug Report/Feature Request* for technical support.

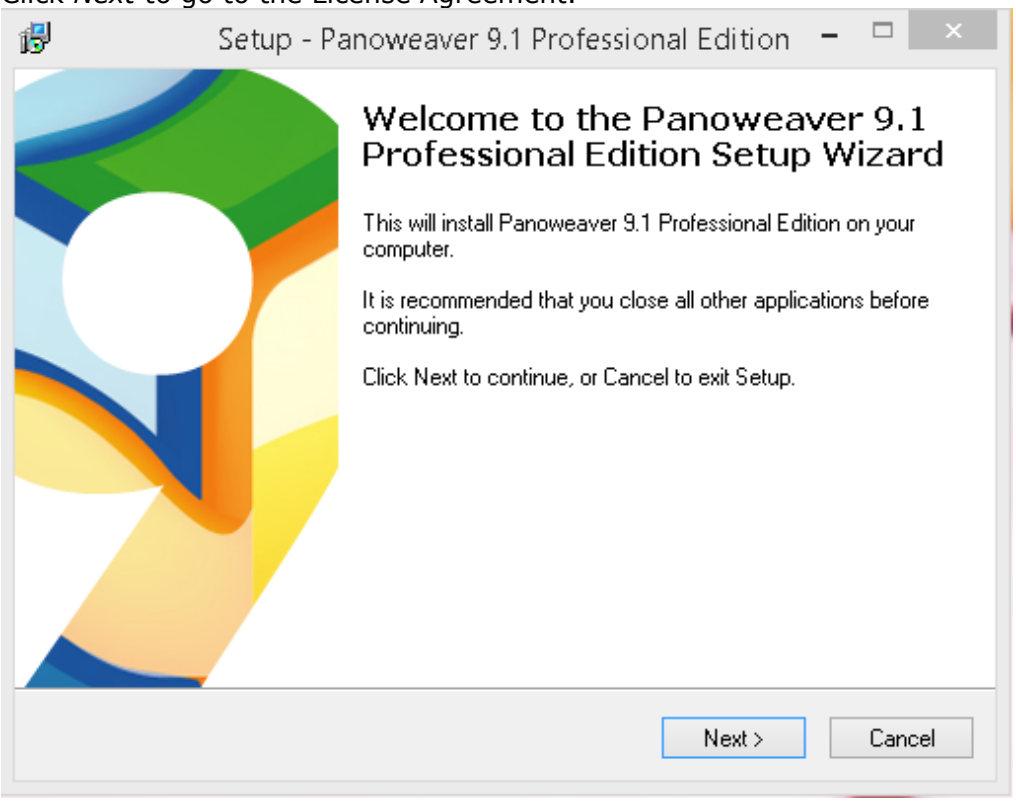
If you still have problems after the above steps, you could email to us: support@easypano.com
or contact us via other ways.

Install Panoweaver 9

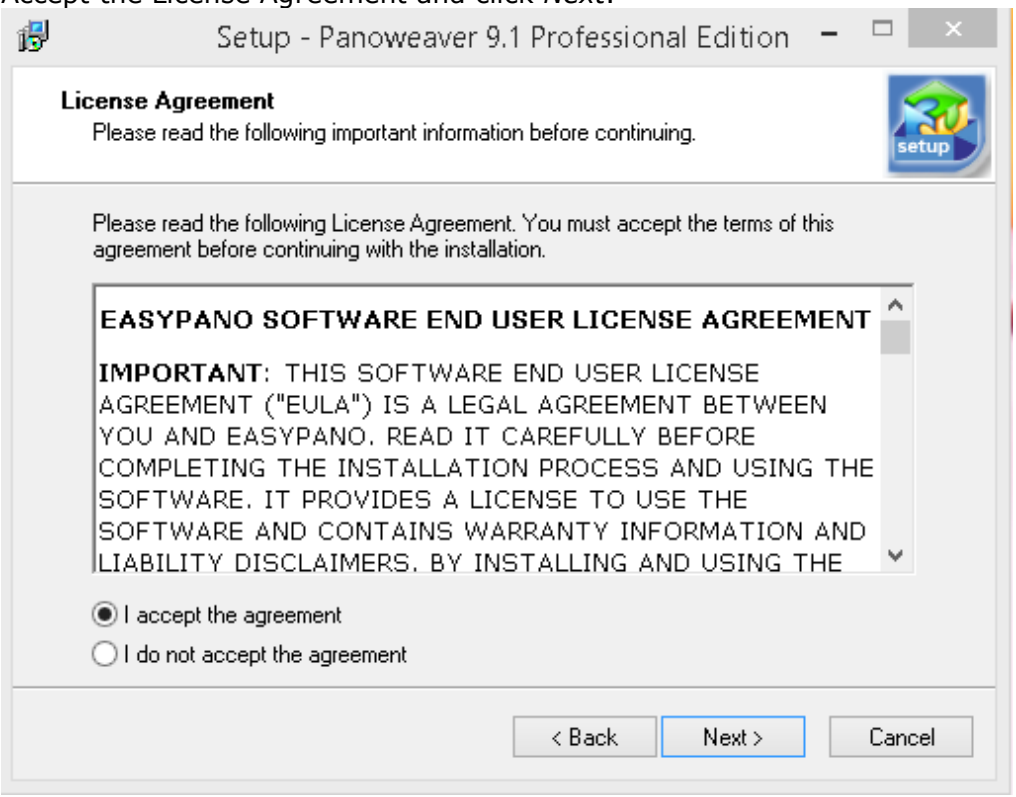
Install Panoweaver 9 Trial Version

- Download the trial version of Panoweaver 9 from Easypano website.
- Close all other Macintosh applications which are currently running.
- Double click the Panoweaver installation package to run the installation application.

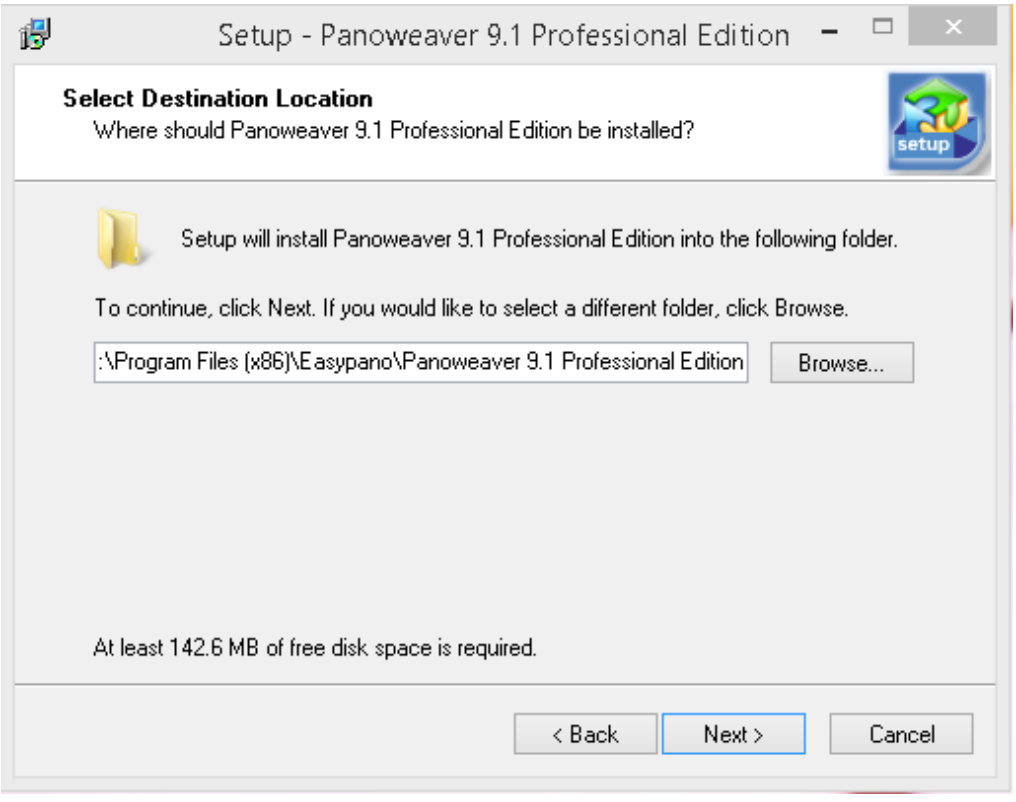
1. Click *Next* to go to the License Agreement.



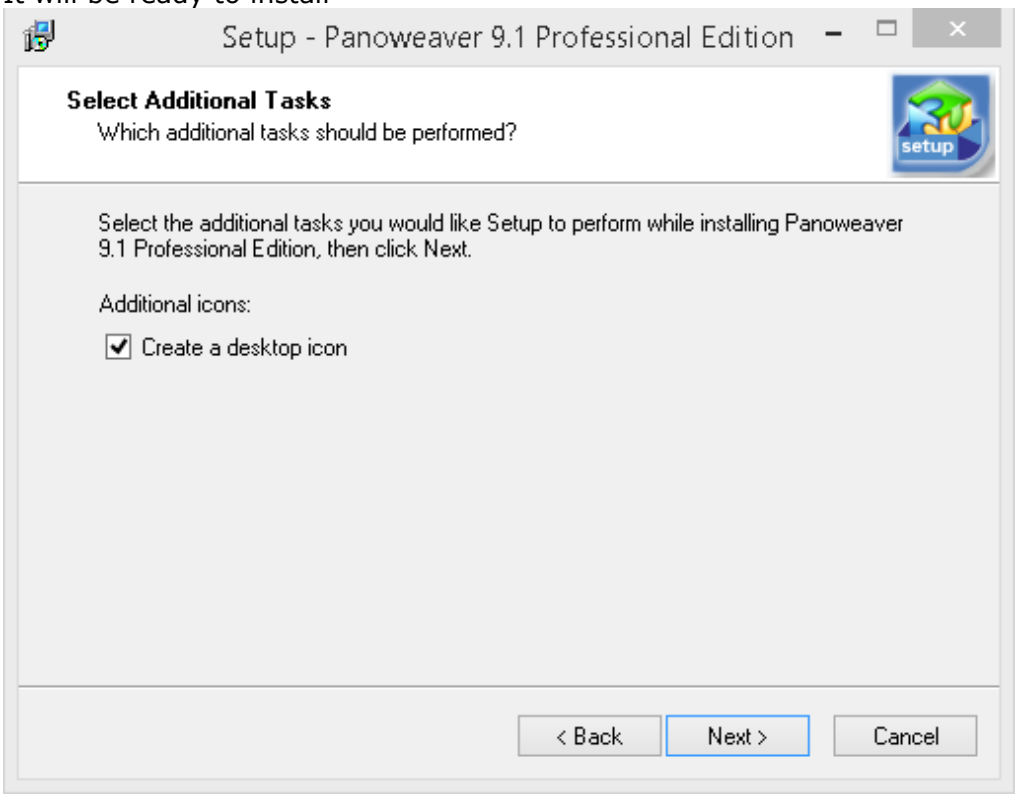
2. Accept the License Agreement and click *Next*.



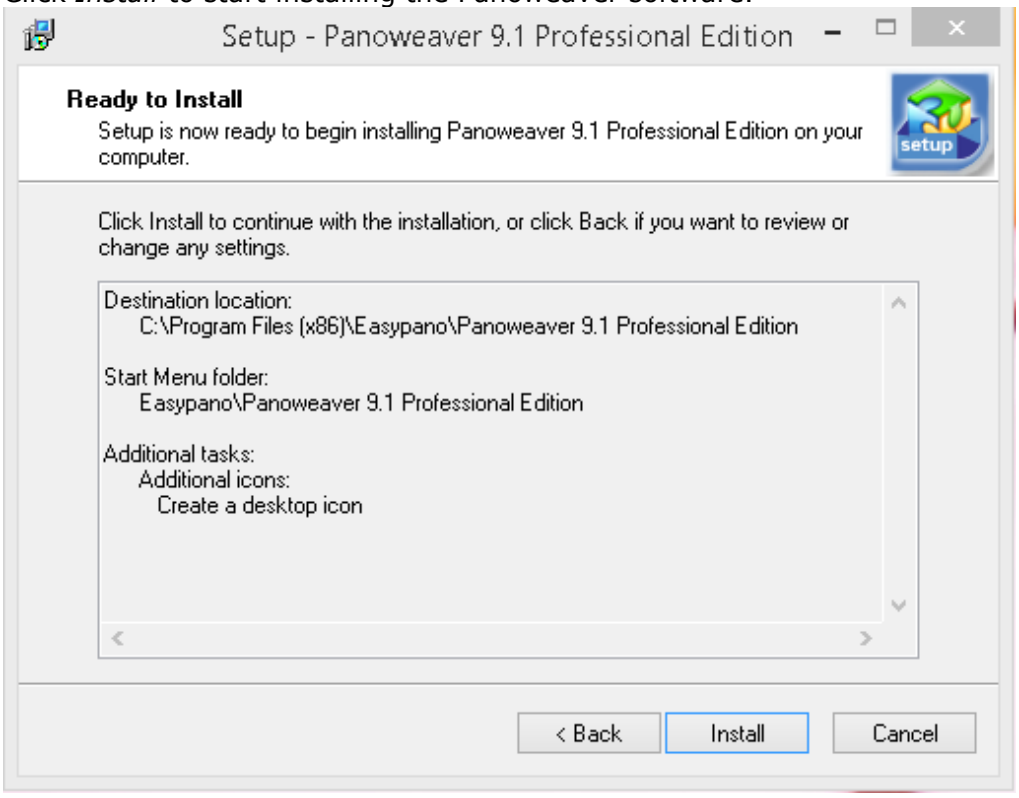
3. Select the folder where you wish to install Panoweaver then click *Next* to continue.



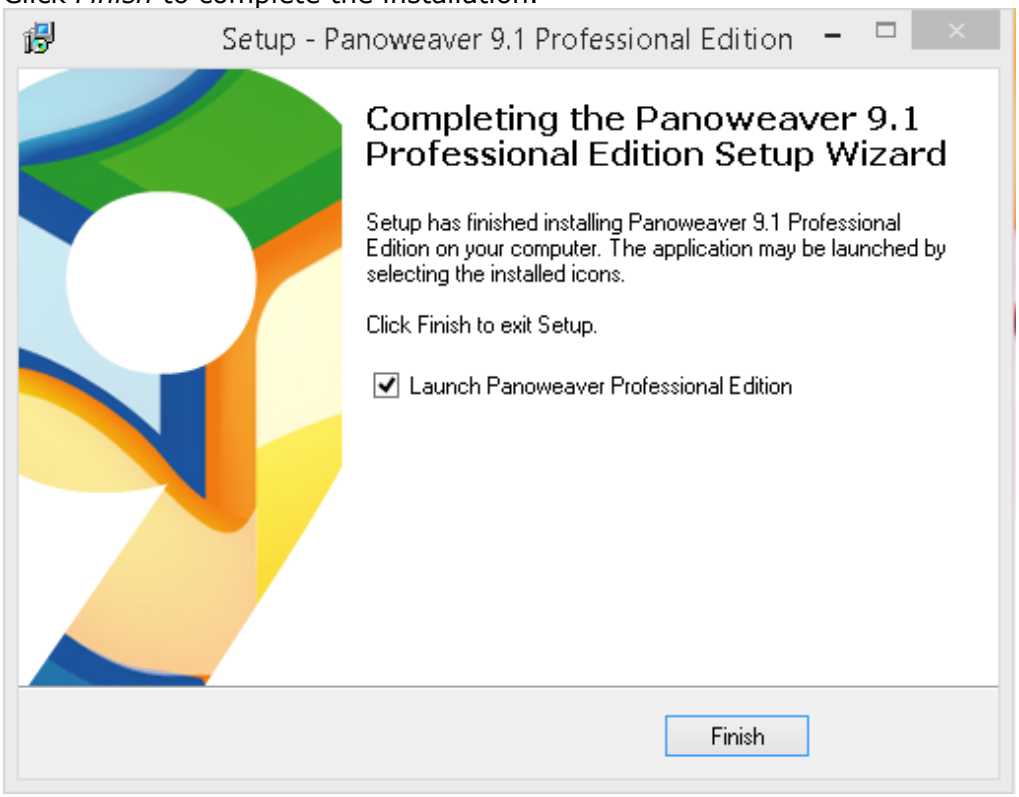
4. It will be ready to install



5. Click *Install* to start installing the Panoweaver software.



6. Click *Finish* to complete the installation.



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Uninstall Panoweaver 9

There are two ways to uninstall Panoweaver:

- Use shortcut in *Start* menu. *Start>Programs>Easypano>Panoweaver 9 Professional Edition>Uninstall*.
- Click *Add/Remove Program* in *Control Panel* to uninstall.

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System Requirements

System Requirements

For Windows
For Macintosh

For Windows

System Requirements (For Windows)

To use Panoweaver 9 in Windows, you need:

Operating System
- Microsoft Windows XP/Vista/7/8

Computer Hardware
- PIII 800MHz, AMD 2800+ or faster processor
- 2G RAM or more
- Network card or modem must be installed
- 10G of free hard disk space or more (20G of free hard disk or more is required for generating HDR image)
- Video display of 1024x768pixels or higher (1024x768 is suggested), 16-bit colors or higher supported
- Nvidia or AMD GPU is required for stitching acceleration

 **Note:** 2G RAM or more is recommended to stitch panorama over 10000*5000 or to get HDR image.

Others

- OpenGL 1.2 or above is required

To view panoramas in Windows, you need:

Operating System
- Microsoft Windows XP/Vista/7/8

Computer Hardware
- PII 400MHz or faster processor
- 1G free memory
- Video display of 1024X768 pixels or higher (1024x768 is suggested), 16-bit colors or higher supported

Others
- Microsoft IE6.0, Chrome10.0, Firefox 4.0, Safari5.0 or later version .
- To view Flash VR, flash player 11.0 is necessary. Please download Flash Player 11.0 and install it.
- To view QTVR, QuickTime 6.0 or later version is necessary. Please download QuickTime player.
- To view HTML5, IE10.0, Chrome21.0, Safari5.0 or later version are necessary.

For Macintosh

System Requirements (For Macintosh)

To use Panoweaver 9 in Macintosh, you need:

Operating System
- Macintosh OSX 10.6 / 10.7/10.8 or later version

Computer Hardware
- G4 or higher
- 1G RAM or more
- Network card or modem must be installed
- 100M of free hard disk space or more (300M of free hard disk or more is required for generating HDR image)
- Video display of 1024X768 pixels or higher (1024x768 is suggested), 16-bit colors or higher supported

Note: 2G RAM or more is recommended to stitch panorama over 10000*5000 or to get HDR image.

Others

- OpenGL 1.2 or above is required

To view panoramas in Macintosh, you need:

Operating System

- Macintosh OSX 10.6/10.7/10.8 or later version

Computer Hardware

- G3-400MHz or faster processor
- 1G free memory
- Network card or modem must be installed
- 100M of free hard disk space or more (300M of free hard disk or more is required for generating HDR image)
- Video display of 800x600 pixels or higher (1024x768 is suggested), 16-bit colors or higher supported

Others

- Microsoft IE6.0, Chrome10.0, Firefox 4.0, Safari5.0 or later version.
- To view Flash VR, flash player 9.0 is necessary. Please download Flash Player 9.0 and install it.
- To view QTVR, QuickTime 6.0 or later version is necessary. Please download QuickTime player.

Activate Panoweaver 9

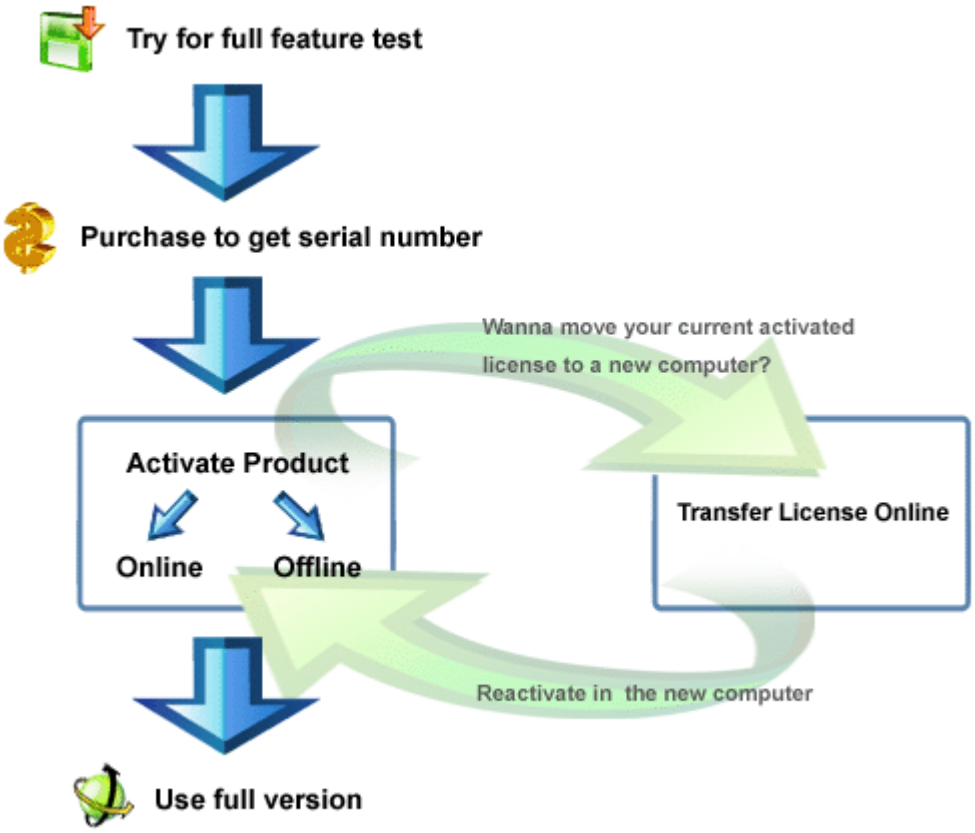
Activate Panoweaver 9

Purchase

To use the full features of Panoweaver, you need to buy a license key to activate the software. Visit Easypano Online Store to get information on purchasing.

Product Activation

To fight against piracy and better protect Easypano copyright as well as users' interests, we adopt a stricter license policy. Easypano customers have to activate the product to make it fully functional. The Easypano Product Activation System does not collect or utilize personal information, such as your name and contact information. Product Activation is completely secure and anonymous. No personal information is ever collected or requested. During activation, the product does not scan your hard drives or collect any data other than the minimum information required to verify your license. Please see our Privacy Policy.



Online Activation

If the computer you are running Easypano software is connected to Internet, please proceed with the online activation. Activation over the Internet is a one-time operation. Simply enter your product serial number and activate for full use in seconds, secure and anonymous.

Note: Online Activation requires network card and Internet connection.

- Start Panoweaver 9
- Choose *online activation* in the popup window and then click *Continue*
- Input the license key which you've purchased and click *Continue*
- The online activation is accomplished.

Offline Activation

In case you need to run Easypano products in a computer without Internet connection, you can find some other computer with Internet available to activate the product via Email or Easypano website submission. Since Internet is quite pervasive nowadays, we assume all the customers can access the Internet by certain means, either in a net cafe, or another computer.

Basically offline activation still requires internet connectivity, however not necessarily in the computer running the software.

A general procedure for offline activation:

1. Start Panoweaver 9.
2. Choose *offline activation* in the popup window and then click *Continue.*
3. Choose step 1 to create an ARF file and click *Continue.*
4. Input the license key you've purchased and select the right directory to save this ARF; and click *Continue.*

5. An ARF file is created and saved in the relative path.
6. Click the link to open the registration html page. Fill out one or two available Email and upload this ARF.
7. An ALF file is created and sent to the relevant Email.
8. Log in to your email-box and save this ALF to your local.
9. Restart the activation procedure from *Help* menu.
10. Choose *offline activation*; and click *Continue.*
11. Choose step 3 and click *Continue.*
12. Import ALF to activate the software and click *Continue.*
13. Offline activation is accomplished.

Note: Offline Activation requires network interface card installed.

Please make sure the computer on which you install Panoweaver 9 and create Activate Request File, meets following requirements.

1. Network card is installed.
2. TCP/IP protocol is installed.
3. Network card is not disabled.

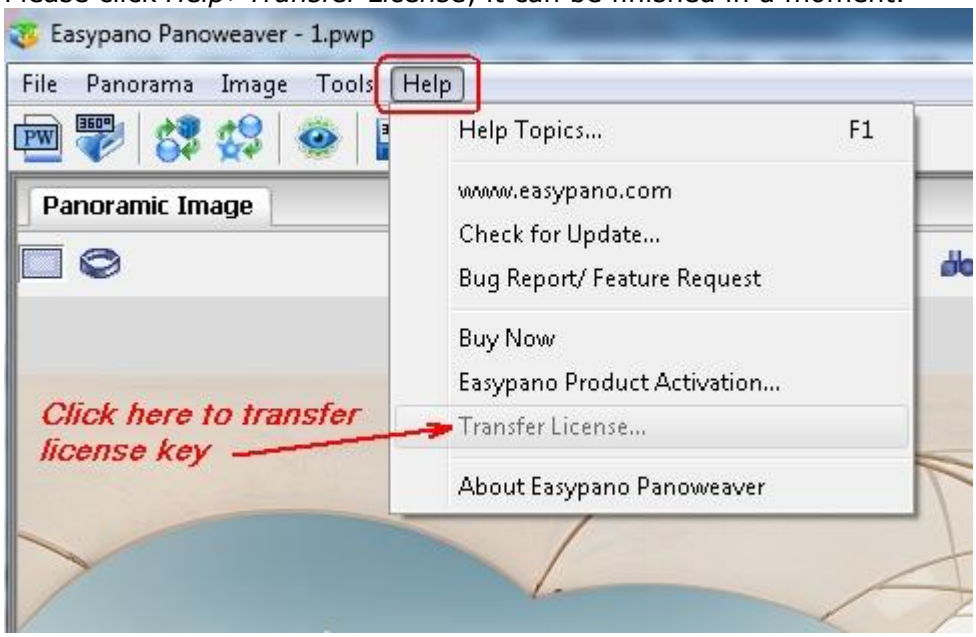
Transfer License Key

If you want to move your software from current computer to a new one or plan to upgrade your hardware, transferring license should be done in advance. This feature deactivates the product on your current machine so it can be reactivated on the new or upgraded computer.

Transfer License Mechanism:

1. Run Transfer License
2. Activation ID and Serial Number are uploaded to Easypano Activation Server
3. Activation Server checks the Activation ID
4. Activation Server deactivates the current product and gives feedback to you.

Please click *Help>Transfer License*, it can be finished in a moment.



Note: Internet connection is required to transfer license. In case you need transfer license offline, say the original computer can not be accessed or crashed, please directly contact support@easypano.com. An inclusion of your serial number in the email will be more helpful. Easypano support will transfer your license in original computer so that you can reactivate in another one.

Tip: Only when the product was activated, can users proceed to transfer license.

Basic Knowledge of Panoweaver 9

Basic Knowledge of Panoweaver 9

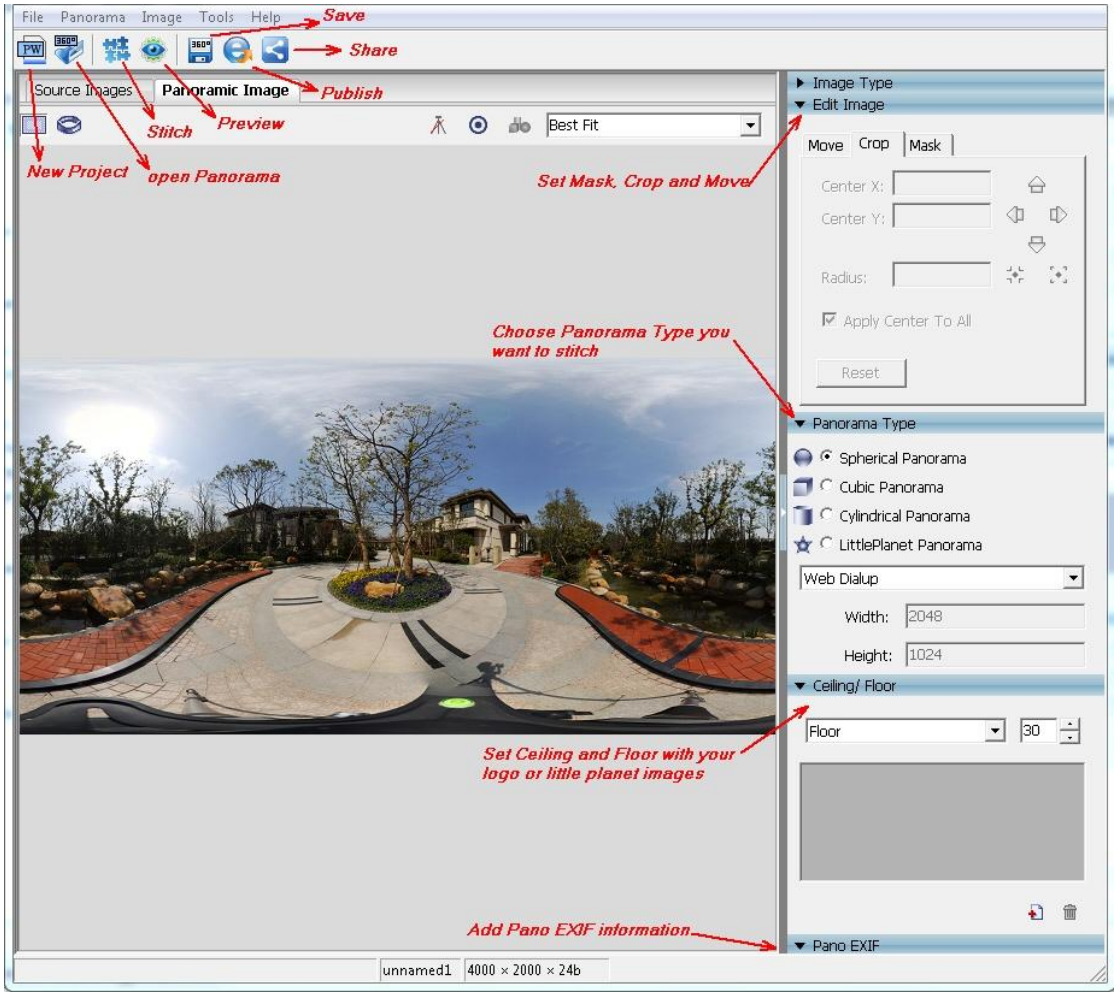
About Panoweaver Project File

Project and project parameters of Panoweaver can be saved, you may save the unfinished panoramic image as a .pw file and continue to edit it later. The project parameters may also be saved as .pwp file with a file folder, containing the customized information (parameters) of *Ceiling/Floor, Mask, Hotspot* and *Images*. For details, please refer to Project.

User Interface

User Interface

User Interface of Panoweaver 9 mainly includes 5 parts: *Menu Bar*, *Toolbar*, *Image Show and Operation Area, Panel* and *Status Bar*.

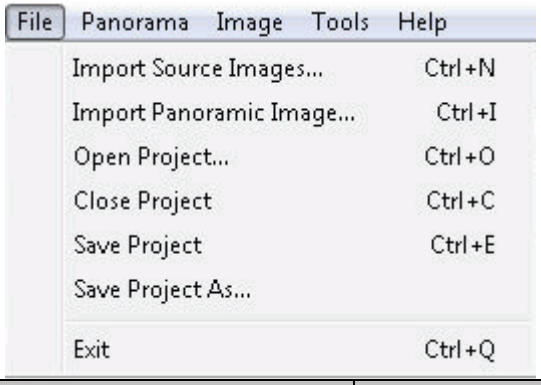


Click to Import Source images for panorama stitching;	
or click to Import Panoramas to remove tripod or add hotspots.	

Menu Bar

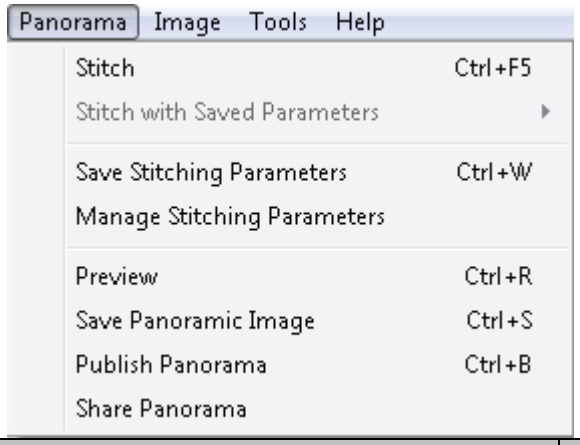
This section gives an overview of the menu commands and related keyboard shortcuts of Panoweaver 9. If a shortcut is available, it is shown next to the function.

1. File menu



File menu	Feature Description	Shortcuts
Import Source images	Start a new project (import images)	Ctrl +N
Import Panoramic Image	Load panoramic image	Ctrl + I
Open Project	Open an existing project (.pw file)	Ctrl +O
Close Project	Close the current project	Ctrl +C
Save Project	Save the current project	Ctrl + E
Save Project As	Save the current project under a different name	-
Exit	Exit Panoweaver	Ctrl + Q

2. Panorama menu



Panorama menu		Feature Description	Shortcuts
Stitch		Stitch panorama directly	Ctrl + F5
Stitch with saved Parameters	Last Parameter	The parameter saved last time after stitching	Ctrl + L
	Former Parameter	List all the saved parameters in the Manage Stitching Parameters window	
Save Stitching Parameters		Save Stitching Parameters after finish stitching and name the parameter	Ctrl + W
Manage Stitching Parameters		Make adjustments to the Stitching Parameters	-
Spherical/Cubic Conversion		Convert from cubic panorama to spherical one or vice versa	Ctrl + F9
Preview		Preview a panorama	Ctrl + R
Save Panoramic Image		Save the generated panoramic image	Ctrl + S
Publish Panorama		Publish a panorama	Ctrl + B
Share Panorama		Share a panorama to EP-Sky	-

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3. Image menu

Image menu		Feature Description	Shortcuts
View	Zoom In	Zoom in the image	Ctrl + +
	Zoom Out	Zoom out	Ctrl + -
	Best Fit	Display an image at a proper percentage depending on the size of display window.	Ctrl + 0
Rotate	90CW	90 degree	-

		clockwise rotation	
	90CCW	90 degree counterclockwise rotation	-
	180	180 degree rotation	-

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4. Tools menu

Tools menu		**Feature Description**
Language	System Defaults	System default language
	Multilanguage List	Choice of multilanguage
Batch Processing		Batch stitch or edit panoramas
Create HDR Image		Click to execute .exe program of Create HDR Image (not supported in standard edition)
Advanced Settings		Advanced Settings

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5. **Help menu**

Help menu	**Feature Description**	**Shortcuts**
Help Topics	Opens the help file of Panoweaver	F1
www.easypano.com	Visit easypano.com website for more information	-
Check for Update	Check if there is an updated version available	-
Bug Report/ Feature Request	Submit Bugs or feature requests	-
Buy Now	Purchase in online store	-
Easypano Product Activation	Activate Panoweaver with your serial number	-
Transfer License	Transfer license to a new computer	-
About Easypano Panoweaver	Copyright information of Panoweaver	-

Note: Some of the drop-down menu functions are available directly through toolbar icons.

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Image Show and Operation Area

Image Show and Operation Area

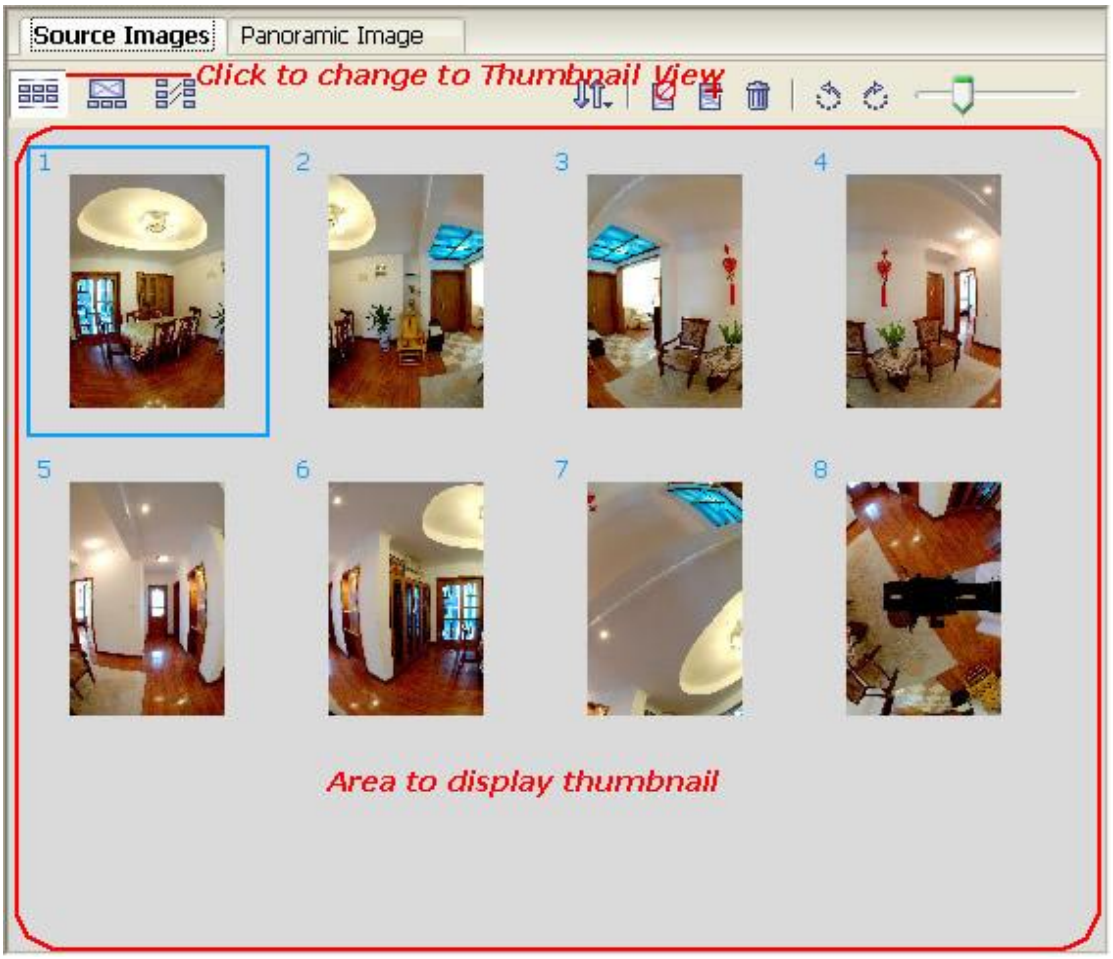
Image show and operation area shows selected still or panoramic images. You may make the manipulations such as zoom, rotation and edit within this area.

Source Images Tab
Panoramic Images Tab

Source Images Tab

Thumbnail View
Editable Original Image View
Matching Points Editing View

Thumbnail View



Feature Description

: Sort all images by a certain order (by Name, by Date, by Load Order). The order will be a reference to stitching.

: Exclude the selected image from stitching process (The disabled image is grayed out).

: Add one or more images to the current project.
: Delete the selected images.
: Rotate the selected images 90 degree counterclockwise.
: Rotate the selected images 90 degree clockwise.

: Adjust size of thumbnails. The display dimension range of a single thumbnail image is 75x75~290x290, 120x120 by default.

Tip: The first thumbnail image is selected by default. Select one or more images and drag to change position.

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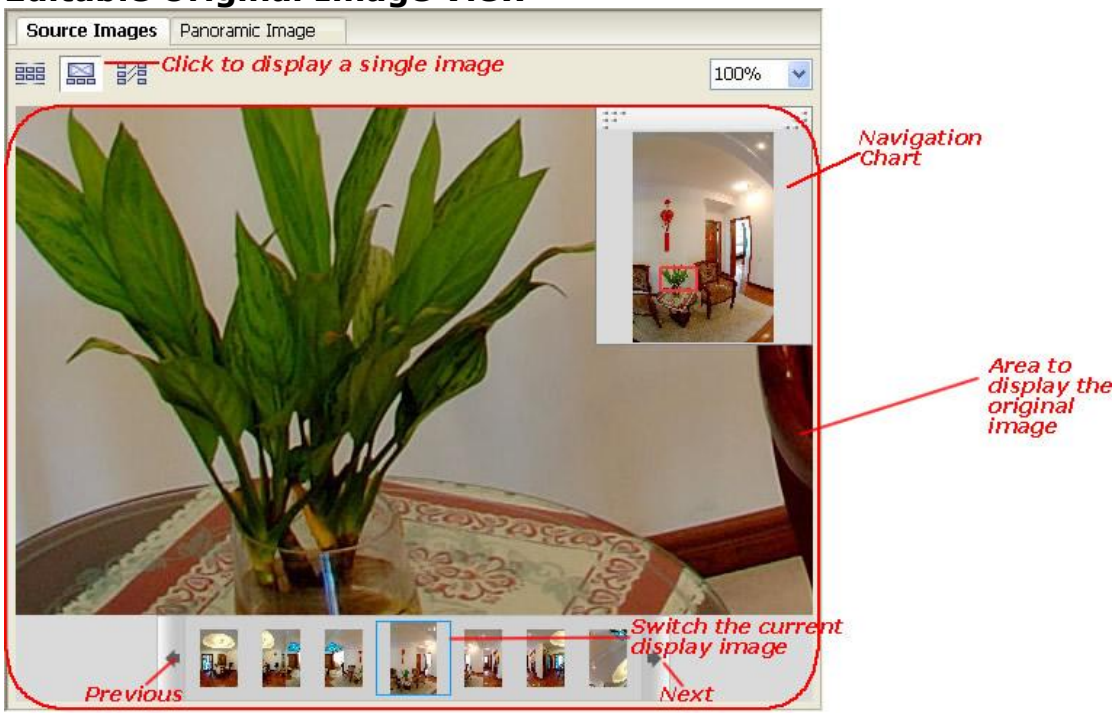
Editable Original Image View



Feature Description

100%: Set the image display proportion. The available range is 3%~800%.
Best Fit: Display the image at a proper percentage depending on the size of display window.
Navigation chart: Navigation Chart shows thumbnail of the image in Image Show Area. Drag the **Move** handle to move the chart.

How to zoom in/zoom out image?

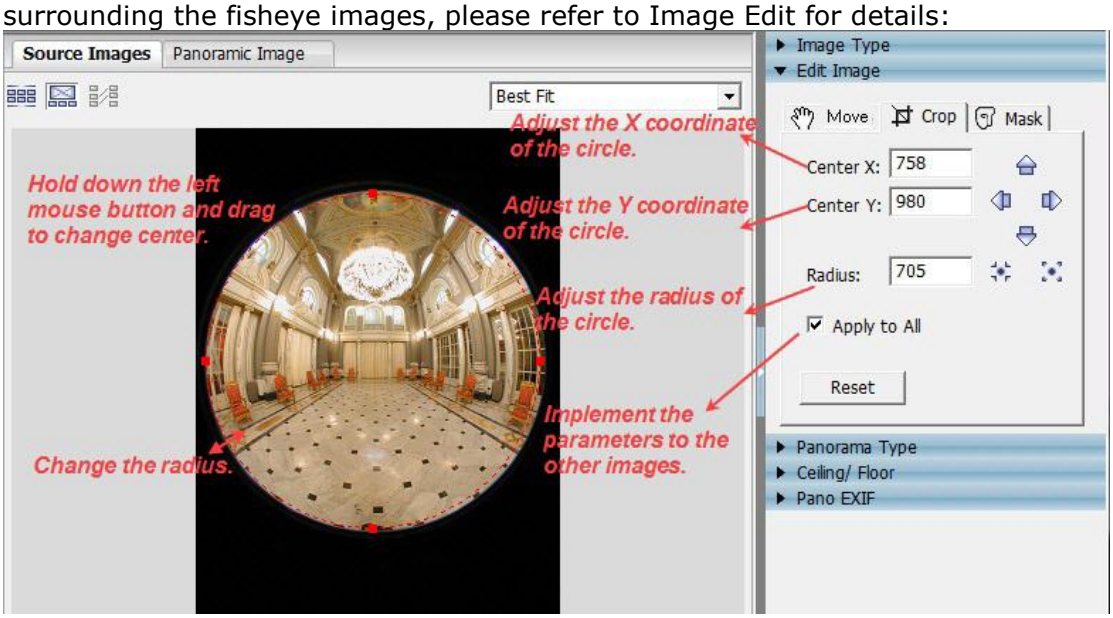
- Use Ctrl+ "+" (zoom in) and Ctrl+ "-" (zoom out).
- Use Image>View>Zoom In/Zoom Out in Menu bar.
- Click arrow under 100%, select scaling value in drop down list.
- Locate the mouse in the combobox and roll the mousewheel to scale the image.
- Double click the figure under 100%, revise it and then press enter.

How to move image within Image Show Area?

- Hold down left mouse button and drag;
- Use Navigation Chart button. If you move Navigation Chart, image's location in Image Show Area will change simultaneously.

Tip:

If the imported images are Circular or Drum images, you need to adjust a Circle surrounding the fisheye images, please refer to Image Edit for details:



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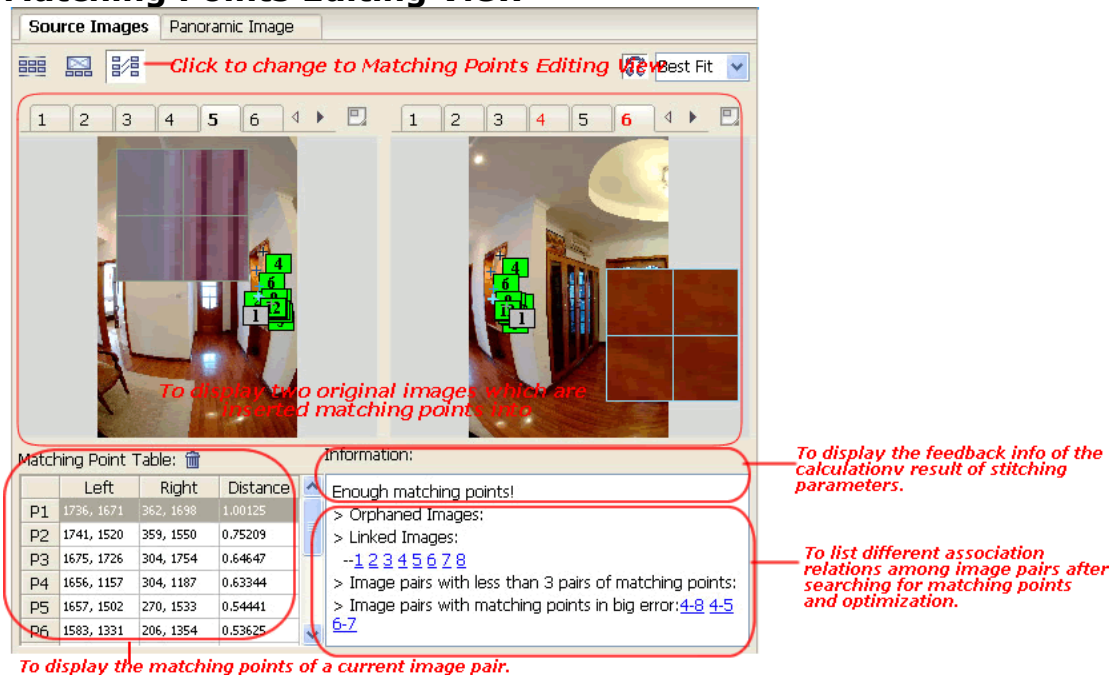
Matching Points Editing View

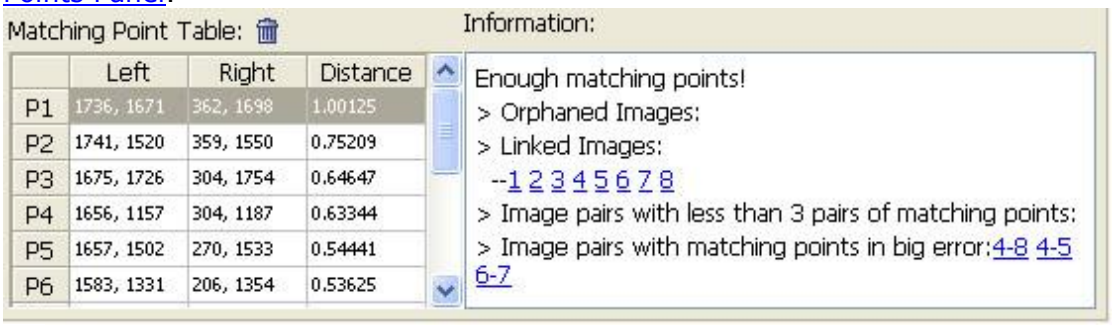


Feature Description

/ : Auto match/Disable auto match. After placing one matching point, move the mouse pointer to the expected location of the matching point automatically.

100% : Display the image at a proper percentage depending on the size of display window.

As to how to use the matching points panel below, please refer to Use Matching Points Panel.



Tip: When you click the image tag on the left, it will be marked in black, and the related images on the right side will marked in red.
Note: If the matching points in *Matching Point Table* is marked in red, it means the distance is too large, deleting the pair of points before stitching. If the effective matching points are less than three pairs, insert matching points manually.

Related Topics:
When should I insert matching points?

In case it is difficult for Panoweaver to search out the matching points automatically, it will remind you to insert matching points manually. For example, the overlap area of two images is a white wall, which has no obvious similar parts, which is difficult for Panoweaver to locate matching points.

If your images are already loaded, but you want Panoweaver to stitch the images more accurately, you may insert matching points. You must insert at least 3 pairs of matching points manually, and then stitch the panorama.

How to insert and edit matching points?

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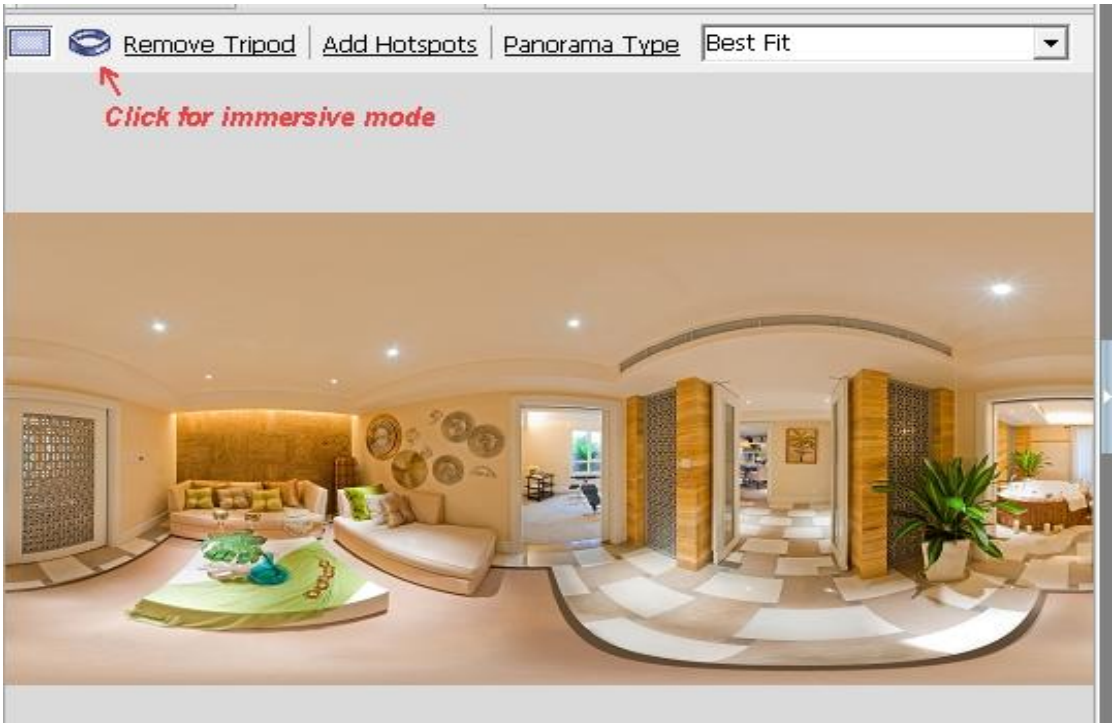
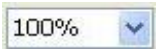
Panoramic Images Tab

Panorama in Flat View



Feature Description



:

Best Fit: Display the image at a proper percentage depending on the size of display window.

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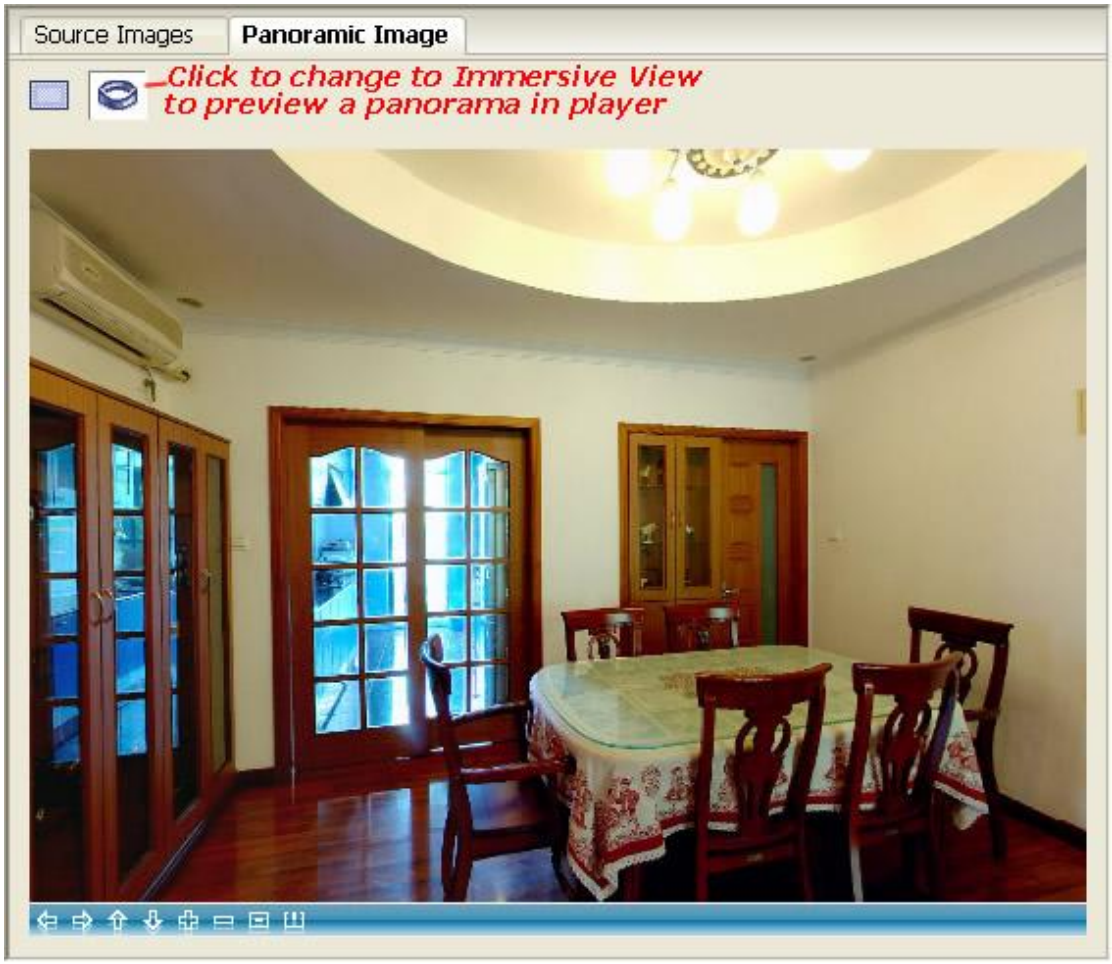
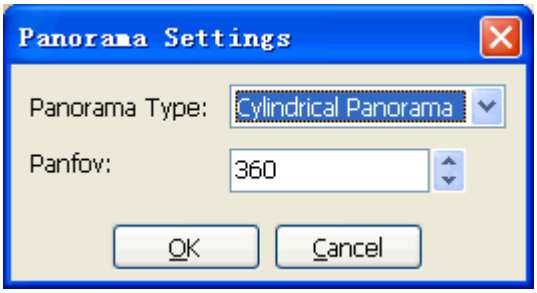
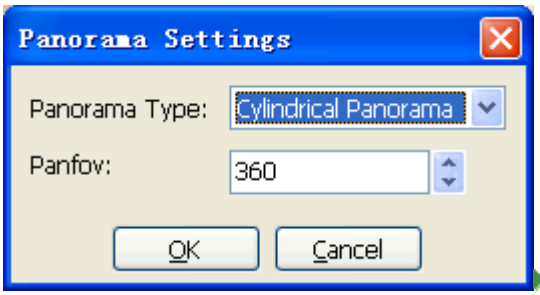
Panorama in Immersive View

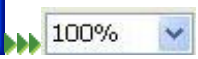


: To set panorama properties



- If previewing an imported panoramic image, the button is active, otherwise, it's disabled.
- As for Panorama Type, there are 4 options available--spherical, cylindrical , cubic panorama and Little Planet panorama.
- **Panfov:** If the imported panoramic image is spherical or cubic one. 360 is by default. If the imported panoramic image is a partial cylindrical one, and the panfov can be customized.





: The option is disabled.
See Preview Panorama.

Note:

1. Select *File>Preview* or click on Preview button from toolbar to enter *Immersive View* to preview a panorama.
2. Support preview of spherical (with ratio of 2:1 or 1:1), cubic or cylindrical panorama.

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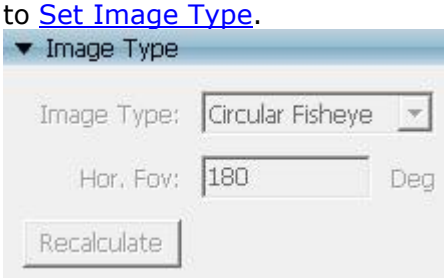
Panel

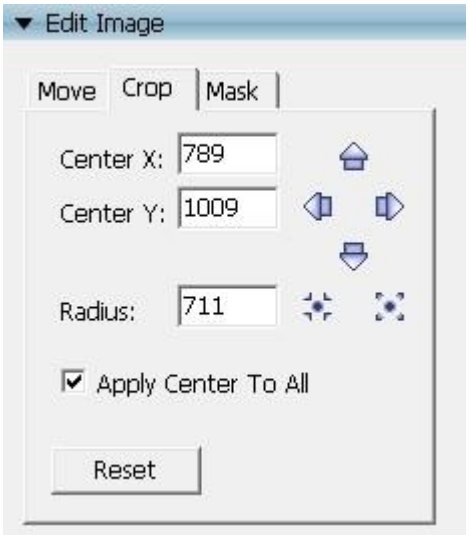
Image Type

Set image type in this panel, and the info displayed in Image Type and Hor. FOV fields is calculated according to the read EXIF data info. For details, please refer to Set Image Type.



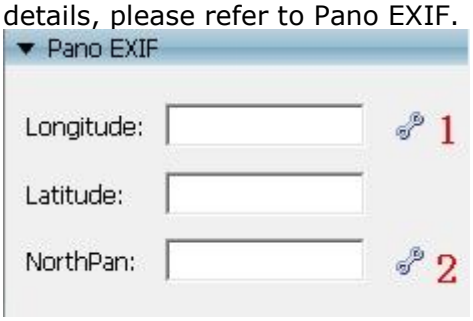
Edit Image

You are able to adjust Center and Radius of fisheye enclosing ,Masking ,Crop,in this panel. For details, please refer to Image Edit.



Pano EXIF

Set EXIF information in this panel, You can set the panorama Longitude , latitude and NorthPano in formation in EXIF in the panorama you are stitching .in the For details, please refer to Pano EXIF.

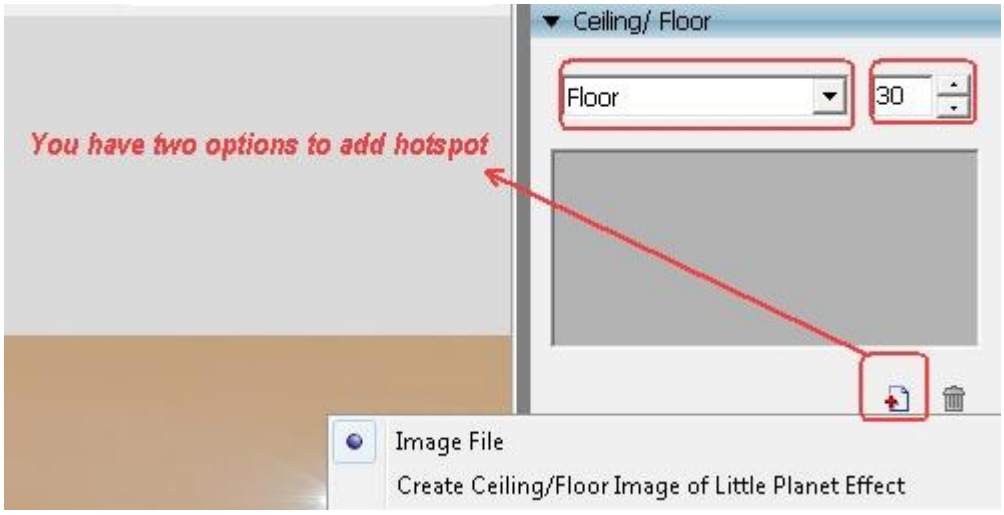


Panorama Type

You are able to set type and size of the panoramic image that you want to get in this panel. For details, please refer to Set Panorama Type.

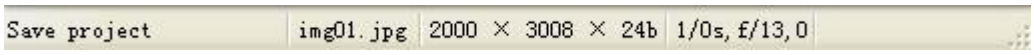
Ceiling/Floor
You are able to add or remove Ceiling/Floor logo in this panel.

You can add customize logo of you company or ”r;Create by Little Planet”:



Status Bar

After each operation is finished, relative information will show on this bar. If you click a picture, the operation info, name of the picture, format, size and shutter, aperture, compensation value will be shown in this bar.



My First Panorama

My First Panorama

Shoot Images

Before we get to stitching however, it's important that we start with proper source images. Panoweaver 9.00 supports normal lens, wide-angle lens and fisheye lens. It can handle almost every kind of image (one row or multiple rows of images), in any orientation.

Shoot with Normal Lens or Wide-angle Lens

Basic steps:

1. Set your photographic equipment in place: a tripod, a pano head and a camera.
2. Adjust the nodal point.
3. Shoot images.

Tip: 1. To get the best result inside a building for professional use, please note:

- A tripod and a panoramic pano head are suggested while shooting. Handhold shooting is not suggested.
- As well, the nodal point should be adjusted precisely.

2. If you want to shoot far away objects outside a building and only one row of pictures for stitching, handhold shooting can also be applied.

For the best results please remember the following key points:

- **All images should be taken from the same viewpoint.**

This is the most important thing to consider when photographing for panoramas. A panorama can only be successfully stitched from images that are taken from exactly the same viewpoint. If the camera has been moved between shots, *parallax error (the perspective changes between shots and foreground objects will move relatively to background objects)* may be caused, which should be avoided at any cost. You can shoot hand held, but using a tripod makes it much easier to maintain the camera position. You can see the effects of parallax error with the experiment

For a camera, the *nodal point (The nodal point differs for each lens; rotating the camera around different points until the images show no parallax errors. Several tutorials can be found by searching the web. If you don't know the nodal point of your lens, as a rule of thumbs it's usually located somewhere between the middle and the front between the middle and front of the lens)* of the lens should be kept in the same position. Unfortunately the nodal point never coincides with the camera's tripod mount hole. For proper nodal point alignment on a tripod therefore a panoramic head should be used, which shifts the axis of rotation of the camera to a desired point. The severity of parallax errors depends on the proximity of objects to the camera. A scene with only far away objects is forgiving to nodal point misalignment. Therefore, if you are unsure of the nodal point

alignment of your camera, it's best to start with a landscape scene, not a panorama taken inside a building.

Tip: How to find the nodal point of a lens?

- **Lock the camera's exposure and white balance.**

Although Panoweaver compensates for exposure differences, you will get the best results if there are no brightness or color differences in the images.

Please use the sample normal images taken handheld, with a digital SLR camera. Download the images for this tutorial.

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Shoot with Fisheye Lens

Basic steps:

1. Decide the type of fisheye image that you want to shoot.
2. Select proper photographic equipment. Please refer to **Main Photography Equipment**.

- **Digital camera (abbreviation as DC):** Theoretically, both digital camera and film camera work with fisheye lens to shoot fisheye images. However, Digital cameras are much convenient since the images can be transferred to computer directly without scanning the negatives as film camera. So digital camera is better. Recommended: Nikon D70, D100 and Canon 10D, 20D and 300D.
- **Fisheye lens:** Fisheye lens can capture an FOV (field of view) of over 180 degrees. A panorama can be stitched from 2 or more fisheye images. Sigma 8mm F4 EX DG Circular Fisheye lens is recommended.
- **Pano Head:** Also known as Panoramic Tripod Head or Rotator is installed on a tripod when shooting to eliminate the displacements between fisheye images so that the panorama can be stitched seamlessly. Different pano head matches different DC. The pano head from Kaidan, Agnos and Manfrotto are compatible.
- **Tripod:** A tripod is an adjustable three-legged stand used for supporting photography equipment when shooting. Because fisheye lens covers a wide range of shooting area, it calls for tripod with a not-too-long handle; otherwise, the long handle will cover a wide area in the stitched panorama and is difficult to be erased. Stableness of the tripod is also important. The tripod from Manfrotto and Bogen are recommended.
- **Recommended:** DSLR + Sigma 8mm lens and stitch 4+T drum fisheye image.

3. Shoot fisheye image. Please refer to Workflow of Shooting Fisheye Images.

Type	Qt. of Image	Way of Shooting
Drum	4, 4+T, 4+B, 4+T+B	4 pictures in portrait mode
Full Frame	6, 6+T, 6+B, 6+T+B	6 pictures in portrait mode
	4, 4+T, 4+B, 4+T+B	4 pictures in landscape mode
Full Circular	1, 2, 3	as you like

Tip: T refers to Top fisheye image which can be obtained through rotating camera up to shoot. **B** refers to Bottom fisheye image which can be obtained through rotating down to shoot.

For more details, please see Panorama Photography

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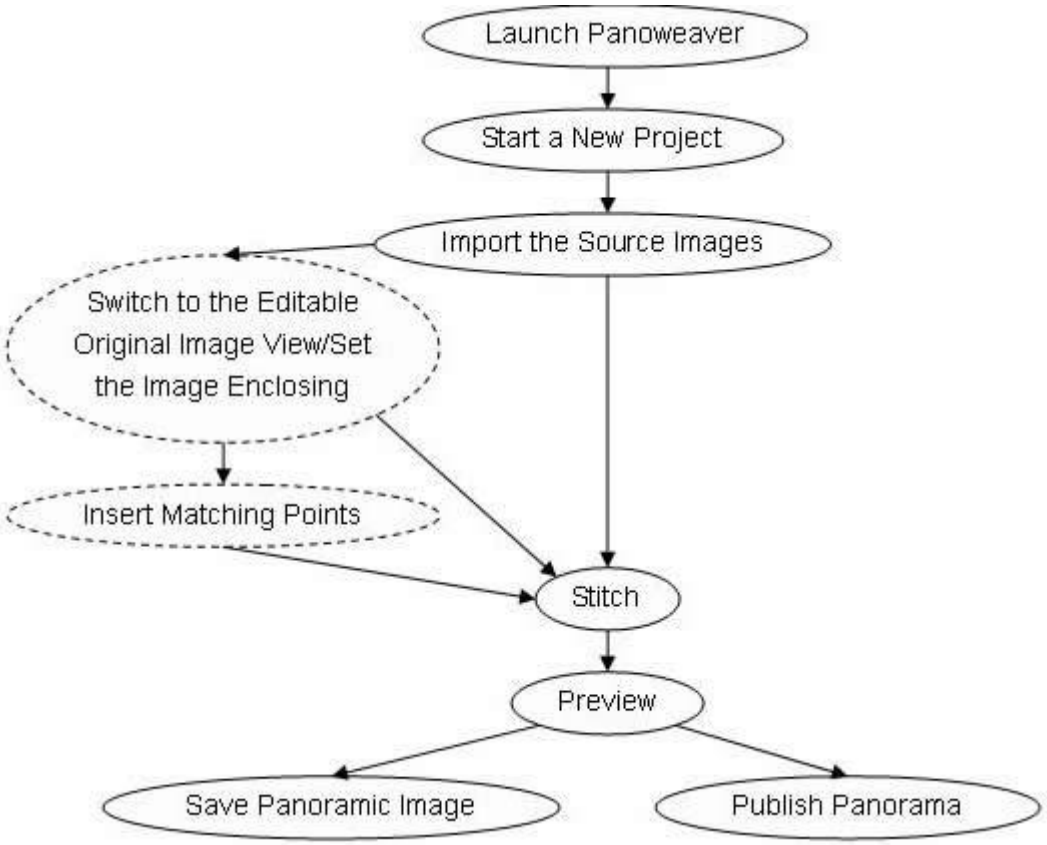
Stitch Panoramic Image

Even if this is your first time to use Panoweaver, you don't have to worry about the manipulation because Panoweaver will stitch images automatically. Just follow the default settings, and then you will obtain a satisfactory panorama within several minutes.

Basic steps:



1. Select *File>New project* or click on toolbar to import the source images.
2. Select *Panorama>Stitch* or click on toolbar to stitch the images.
3. Select *File>Preview* or click on toolbar to preview panorama.
4. Select *File>Save Panoramic Image* or click on toolbar to save panorama.
5. Select *File>Publish* or click on toolbar to publish panorama.
6. Select File>Share or click on toobar to share panorama .

Application

After publishing panoramic image, you are able to upload it to website (refer to Upload to Website); or you may import panoramic image into Tourweaver to make virtual tour (refer to Make Virtual Tour with Tourweaver).

Use Panoweaver 9

Import image

Select *File>New project* or click  on toolbar to import the source still images. Finally click Open:

1. Select file format (jpg, .tiff, .bmp, or png).
2. Select source images from file list.
3. Click Open.

Types	Remarks
Camera Raw (*. NEF; *. CRW; *.CR2;*. Dng;*. ORF; *ARW)	
JPEG Image Format (*. jpeg; *. jpg)	By default
Portable Network Graphics (*. png)	8bit
Tiff Image Format (*. tiff; *. tif)	8bit/16bits
Windows Bitmap (*. bmp); Pict for Macintosh (*. pict)	8bit
All Image Format	

For details about RAW, please refer to Import Raw File.

Note: Cube Face requires 6 square images (the ratio of width to height is 1:1). These images can be obtained by modeling or by cubic panoramic image stitching. The importing sequence should be front, right, back, left, top and bottom. The sketch map is

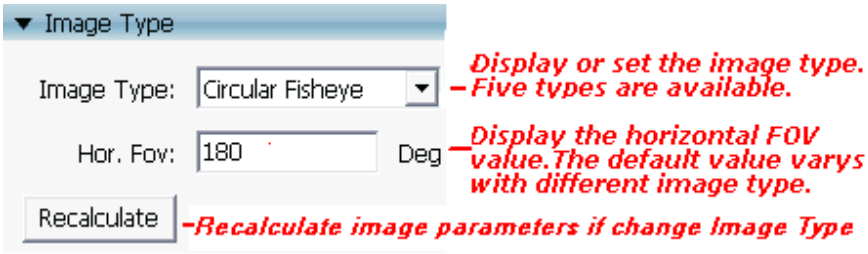
Stitch Panoramic Image

Stitch Panoramic Image

Parameters Setting about Stitching

Parameters Setting about Stitching

Set Image Type



Basic Steps:

1. Select the calculation method of camera and lens parameters. When *Automatic* is selected, automatic calculation will be displayed in the items 2 and 3. When *Custom* is selected, the items 2 and 3 are editable.

2. **Image Type:** To display or set the image type, including *Circular Fisheye* image, *Drum Fisheye* image, *FullFrame Fisheye* image, *Wide-angle* image and *Normal* image.

Image Type	**Default Hor. FOV (degree)**
Circular Fisheye	180
Drum Fisheye	120
FullFrame Fisheye	88
Wide-angle/Normal	50
Raynox	188

Note: Only stitching of three raynox images is supported.

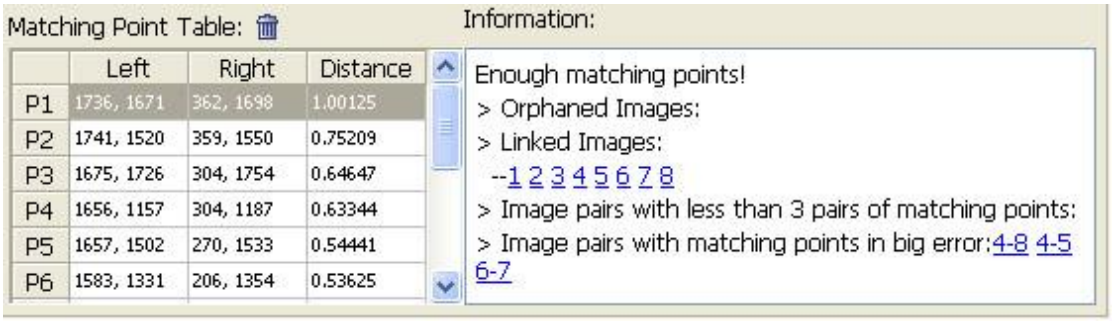
3. **Hor. Fov:** To display or set the horizontal FOV value. The default horizontal FOV varies with different image types. See the above chart.

Note: If EXIF data was not found in the image(s), a dialog box will pop up like below. Please select an image type in this kind of situation.

Note: Information about the camera and the lens can be stored in the EXIF data inside a JPEG file, but not all cameras include the EXIF data. Further, EXIF data may be lost if the image is modified in a graphics application. If the data can't be found in the image during reading the info about *EXIF* data, a dialog box will pop up with prompt info "**EXIF data was not found in the image(s). Please select the image type**!", then please select an image type by yourself.

Use Matching Points Panel

You may see matching points' parameters of each pair of images in this panel in Editable Original Image View under Source Images Tab. For details of inserting matching points, please refer to Insert Matching Points.



1. Matching Point Table:
To display the matching points of a current image pair. For the details about operations on matching points, please refer to Insert Matching Points.

2. To display the feedback info of the calculation result of stitching parameters.
There are two kinds of tips to remind you what to do next after stitching.

- #0200011Calculation of stitching parameters fails! It may be caused by: a) existing orphaned images; b) matching points of image pairs with big error or with less than 3 pairs. Please try another stitch after adjusting the points.
- Enough matching points!

3. **To list different association relations among image pairs** after searching for matching points and optimization. Click on the number hyperlink beside these items, the corresponding image will display in the show area on the left side.

- **Orphaned Images:** The images listed under this item don't have any matching point with other images.
- **Linked Image:** The images are linked through matching points.
- **Image pairs with less than 3 pairs of matching points:** To list all the image pairs with less than 3 pairs of matching points. In this case, you need to add a few matching points by hand. If the number of the matching point pairs in an image pair is greater than or equal to 3, then the image pair will be listed under *Linked Images*.

Tip:

- When the matching points change or images are added/deleted, the list info will change accordingly. For example, the no. 6 image first is listed under the item *Orphaned Images*. After matching points are added to the image, it will automatically go under the item *Linked Images*. and the related image figure tabs will also marked red.
- If all the images are listed under the item *Linked Images*, and under the other items, there isn't any listed image, in this case, a successful stitch will be easily achieved.

Set Panorama Type

You are able to set type and size of the panoramic image that you want to get in this panel. There are three types: Spherical Panorama, Cubic Panorama, Cylindrical Panorama, Little planet panorama.

Preview Size: indicate the size of previewing panorama in preview window and image show and operation area, instead of the actual output size. To view the photo in set output size, you need to save the stitched panorama then view.

Set panoramic image type.

- **Spherical Panorama:** The ratio of width to height is fixed at 2:1.
- **Cubic Panorama:** The ratio of width to height is fixed at 6:1.
- **Cylindrical Panorama:** No fixed ratio.
- **Little Planet Panorama:** 1:1

Panorama Size:

- **Web Dialup**--1,000,000 pixels by default
- **Web Broadband**--8,000,000 pixels by default
- **CD**--20,000,000 pixels by default
- **Print**--30,000,000 pixels by default
- **Custom**--It is allowed to customize the pixels

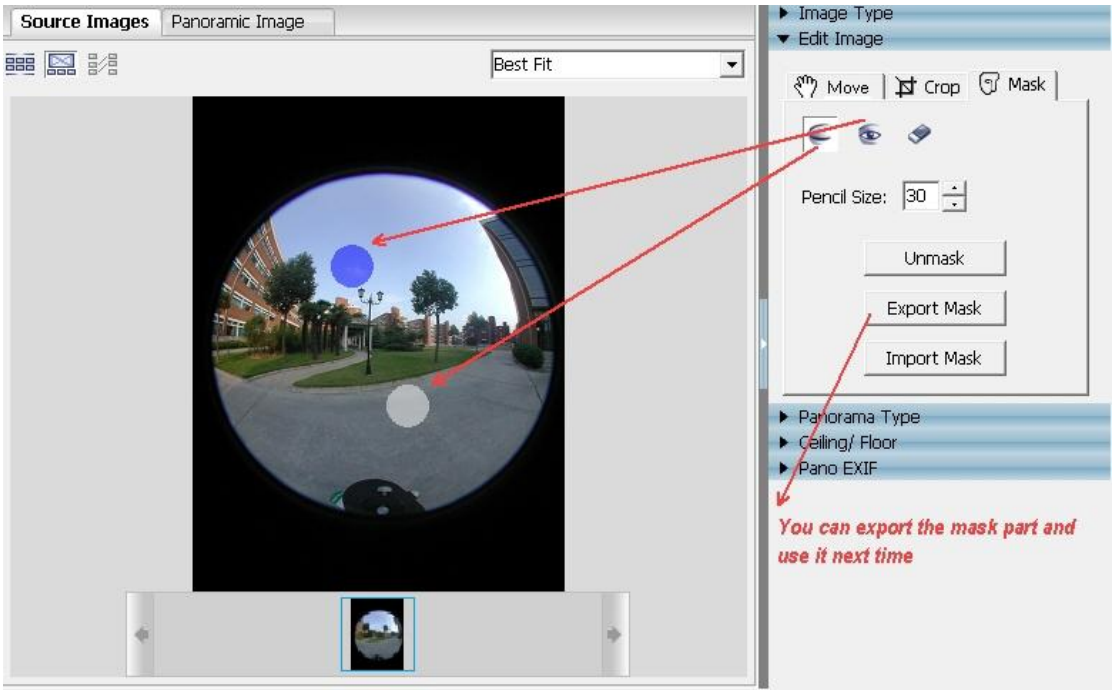
Set Image Edit

Image Edit includes Photo crop and Masking.

1. Masking

Removing tripod is a very powerful and useful function for removing tripod automatically but if the object you want to remove is not in the bottom of the panorama,Masking is a very powerful tool to create perfect panorama.

Look at the red circle in the panorama, you will see a man is partly visible .The reason would be when shooting fisheye photos he was walking or moving .if you want to remove it or let it perfect visible . You can use masking to make it. Generally speaking, moving objects when shooting can cause stitching problems like the panorama above.



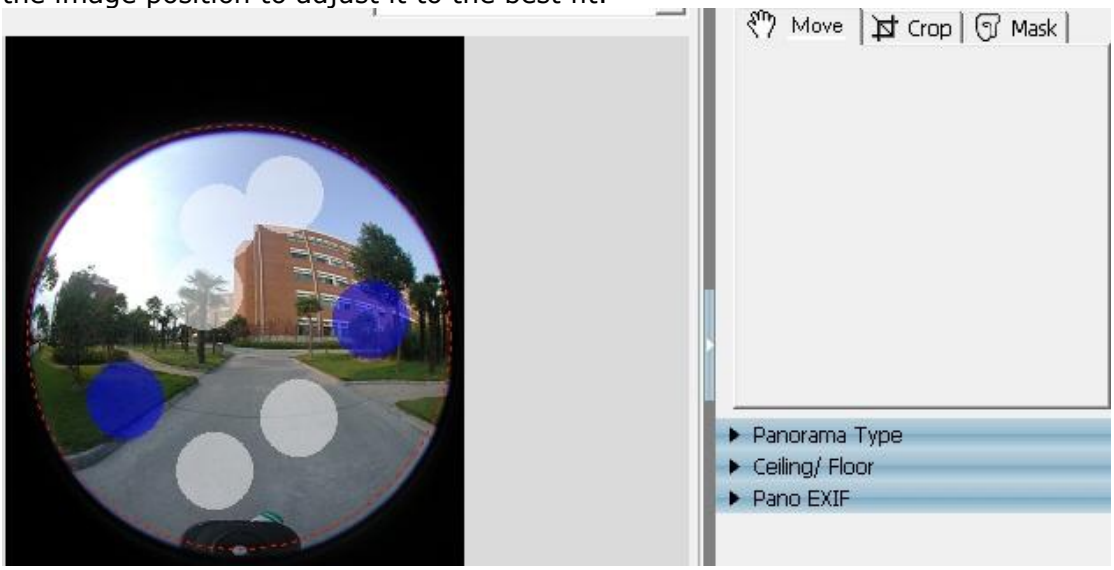
Masking in panoweaver8 can be used to prevent these problems. You can tell the blender precisely which part of the images should or should not be visible in the blended panorama.

【Hide " "】	Click this to edit area(Semitransparent part) you want to hide after stitching .
【Show " "】	Click this to edit area (Blue area)you want to show after stitching
【Eraser " "】	Click this to clear the area you have selected for both hide and show area.
Shape	The shape of the masking brush. You can choose square or round.
Size	The size of the masking pen.
Reset	If you want to reset masking part, click it.
Export mask	Produce a png image which is same size as the original image .The black area means hide part and the blue area means show area .If you will use this mask part next time or many times, then export it for next time using.
Import mask	If you want to stitch the previous panorama or every image need the same mask area, click it to import the mask you save last time and you will save a lot of time to stitch the panorama.

1 Click mask to begin masking setting mode. 【Hide " "】is editable as default .
2 Semitransparent area (1) :Hide area means part of this image will hide after stitching.
3 Blue area (2): show area means this part should be shown after stitching.

2. Move

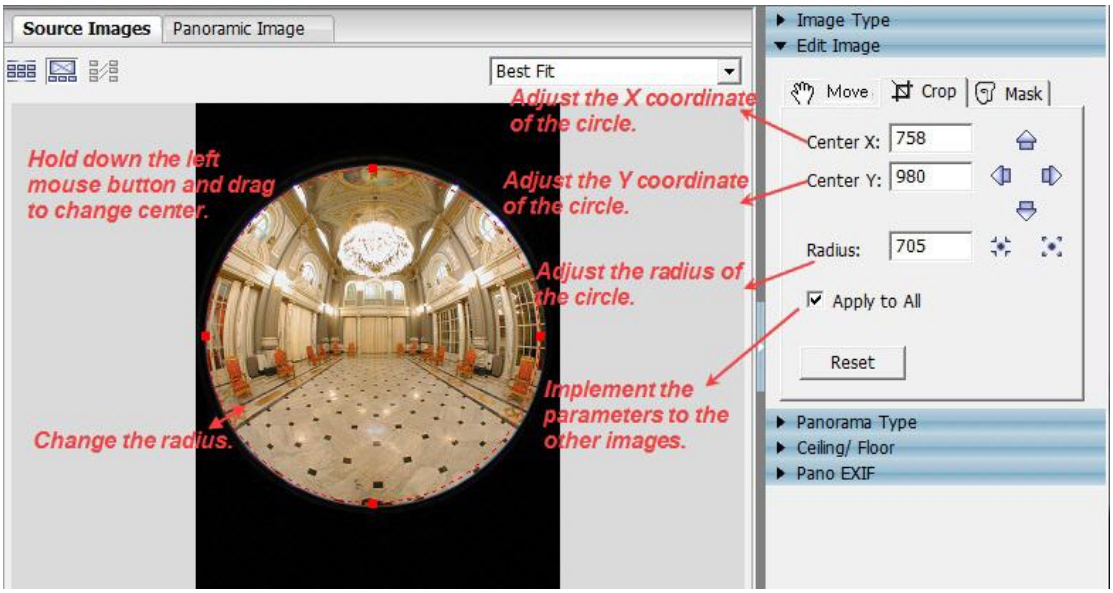
Click  you can view the both hide area and show area, and also to move the image position to adjust it to the best fit.



3. Crop

If the source images are fisheye images, you also need to set fisheye image enclosing:

This is an important step to get the high quality panorama for fisheye images. This function is only applicable to drum and full circular images.



Basic Steps:

1. Select an image and zoom it to proper size in *Image Show and Operation Area*.
2. Drag the yellow circle properly around the fisheye image in the panel to change radius. Press Ctrl+Left Mouse Key to change center.
3. Adjust *Center X*, *Center Y*, *Radius* to locate the yellow circle around the fisheye image, no more and no less. *Center X* stands for the x coordinates of the enclosing. *Center Y* is the y coordinates of the enclosing, while *Radius* refers to the circle's radius. Click , yellow circle moves up; click , yellow circle moves down; click , yellow circle moves left; click ,

yellow circle moves right; click , yellow circles zooms in; click , yellow circle zooms out.

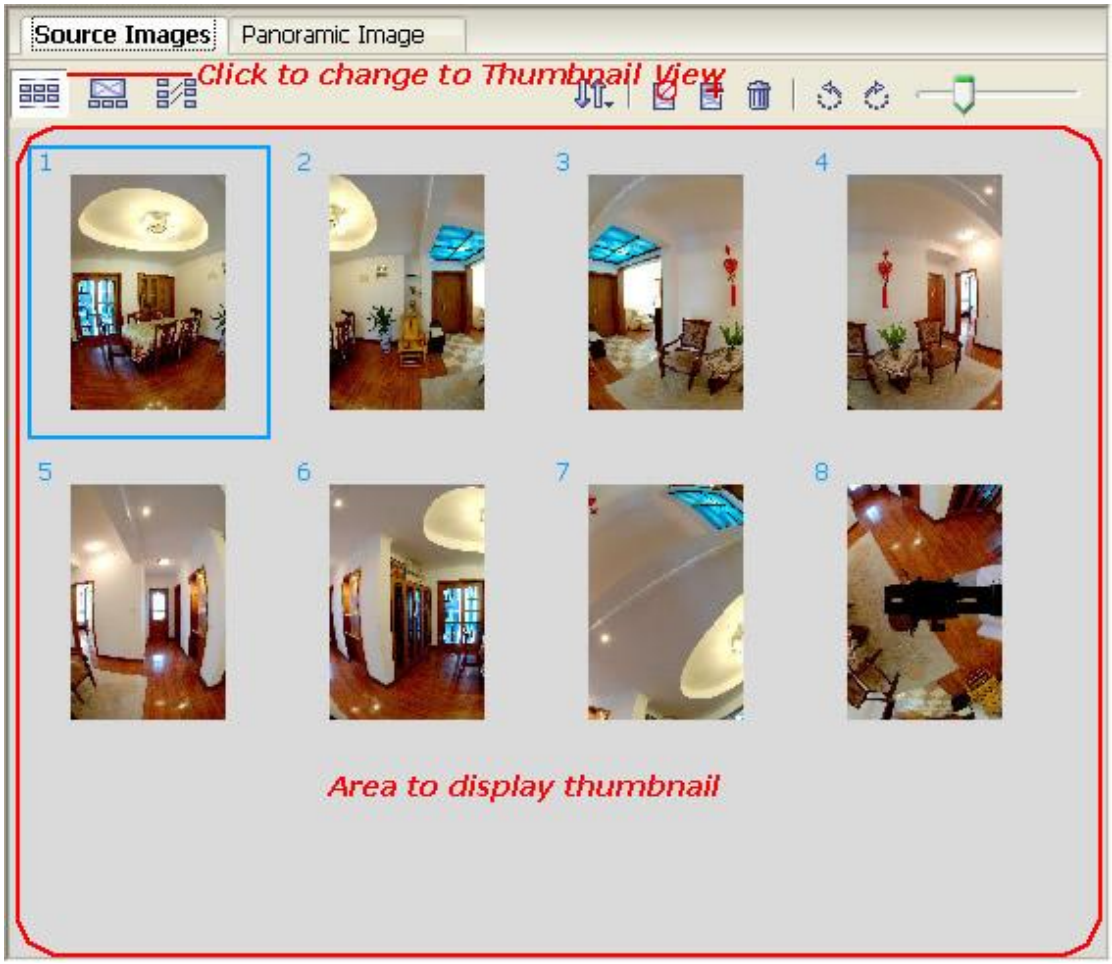
4. Generally, if a group of fisheye images are shot with the same equipment, the setting parameters of one image are applicable to the other images. After you adjust the yellow circle, you may select *Apply to All Images* to implement the parameters to the other images.

Tip: If you want to use parameters of the latest fisheye image as initial value in new image, please select *Last Used* in Advanced Settings. Panoweaver will apply the parameters to current image. Usually, the default item is *Auto-calculated*, that is, Panoweaver will select the location and size of yellow circle automatically whenever you import fisheye images. For details, please refer to Advanced Settings.

Basic Steps before Stitching

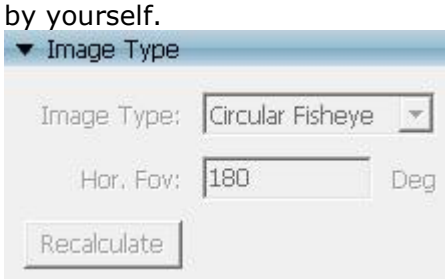
General Steps Before Stitching:

1. In *Image Show and Operation Area*, under *Source Images Tab*, select, delete and rearrange the source images for a panorama.



Refer to Image Show and Operation Area section in this tutorial for the detailed operation.

2. After loading the source images, the camera and lens data of the images will be read and displayed in the *Image Type* panel. If the data can't be found in the image during reading the info about EXIF data, then please select an image type by yourself.



Refer to Image Type section for the detailed operation.

3. In *Panoramic Type* panel, set the type of panoramic image.

Refer to Panorama Type for the detailed operation.

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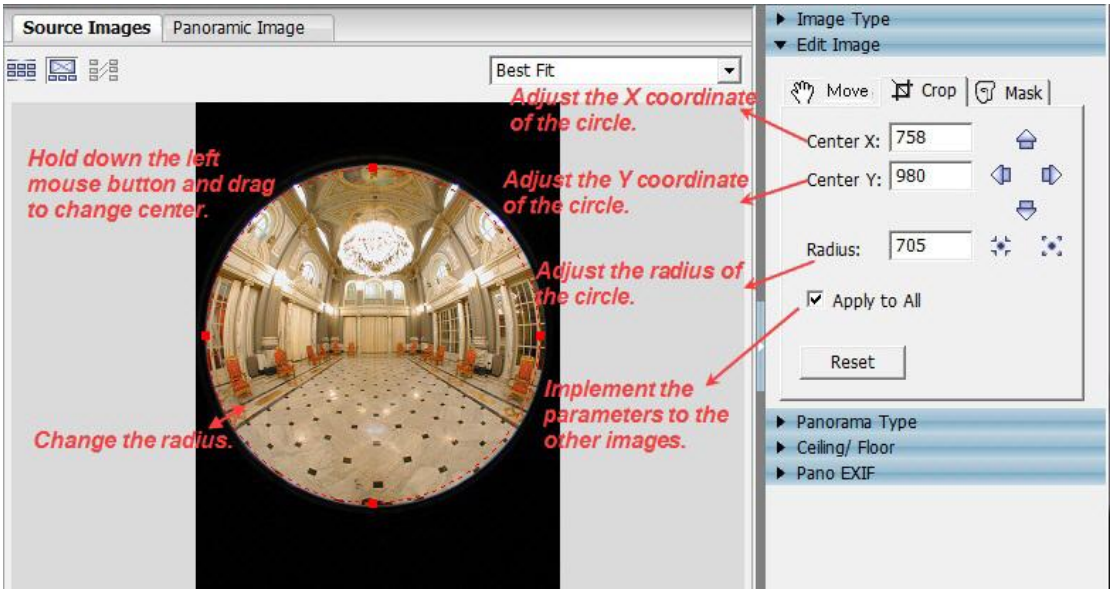
Special Steps Before Stitching:

If the source images are fisheye images, you also need to set fisheye image enclosing:
This is an important step to get the high quality panorama for fisheye images.
This function is only applicable to drum and full circular images.



Refer to Set Fisheye Image Enclosing for the basic steps.

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Stitch

After making settings for the loaded images, choose *Panorama>Stitch, Panorama>Stitch with Former Parameters* or press directly to stitch a panorama automatically. If the matching point pairs are not enough, inserting matching points is necessary.

Insert and Edit Matching Points
How to Stitch with Parameters

Insert and Edit Matching Points

What are matching points?
Matching points are a pair of points in the overlap area of two adjacent fisheye images. Inserting matching points is to search out several pairs of the same points on two neighbor fisheye images, and each pair of points will superpose after stitching.

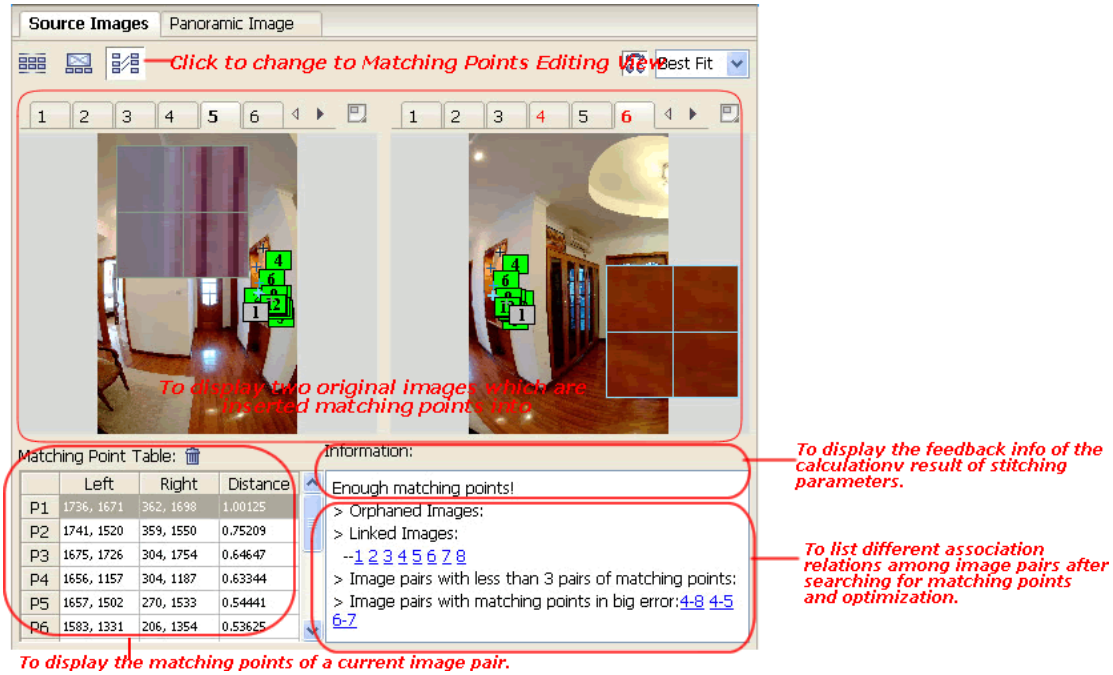
When should I insert matching points?
In case it is difficult for Panoweaver to search out the matching points automatically, it will remind you to insert matching points manually. For example, the overlap area of two images is a white wall, which has no obvious similar parts, which is difficult for Panoweaver to locate matching points.

If your images are already loaded, but you want Panoweaver to stitch the images more accurately, you may insert matching points. You must insert at least 3 pairs of matching points manually, and then stitch the panorama.

Basic steps to insert matching points:

1. Click  to *enter Matching Points Editing View* under *Source Images Tab*.
2. The *Matching Points Editing Area* consists of two image panels to show two neighbor images at the same time. Figure tags on the top of both panels represent the orders of images, the related images(with matching points) tag figures are marked red.
3. In two neighbor images, each pair of matching points has the same color and tag number. When Panoweaver stops stitching to remind you to add matching points, matching points in these images become green, and the mismatching points in these images become red, other points you add are in other colors. The location of each pair of points is shown as coordinates (x, y) and recorded in matching points list in *Matching Points Panel*.
4. When the cursor moves to a certain part of the image, that part will be magnified, then you can view the image clearly and add matching points easily. Click on the image to insert a matching point, and then cursor will relocate its corresponding point on the other image. Auto leaping may not be very accurate, so you need to adjust it manually. If you want to insert matching points manually without auto stitch, click  at the bottom of the editing area to cancel auto leap.
5. There must be at least 3 pairs of matching points in each pair of images. These 3 pairs of matching points should not be too near. It will get the best result if they are in top, middle and bottom of the image separately.

   After inserting matching points, click  to stitch.



Select Matching Points

- Method 1: Click in left image, and corresponding tab on the right image will be also selected. Selected tabs are in editable status.
- Method 2: Click one line in Matching Points list. Selected line will become dark, and corresponding matching points are in editable status.

Move Matching Points

The pair of points will not move at the same time.

- Method 1: Click on the image, hold down left mouse button and drag it.
- Method 2: Edit the coordinates' value in matching points list within Matching Points panel.
- Method 3: Click on the image, press arrow "↑ /↓ /← / →" key on keyboard to move 5 pix; type Ctrl + "↑ /↓ /← / →" to move 1 pix at a time.

Delete Matching Points

Matching points exist in pair and will be deleted in pair.

- Method 1: click in one image and its corresponding matching point in the other image will be selected automatically. Click in *Matching Points Panel* or use Delete key.
- Method 2: Click a line (represents a pair of matching points) in matching points editing list, and then color of this line became darker. Please click to delete matching points.

Tip: Zoom out two images to get the rough overlap locations and insert several pairs of matching points. Then zoom in two images, click one line in the list of Matching Points to select a pair of matching points. Finally the selected pair of matching points will show in view port automatically and you are able to locate the matching points accurately.

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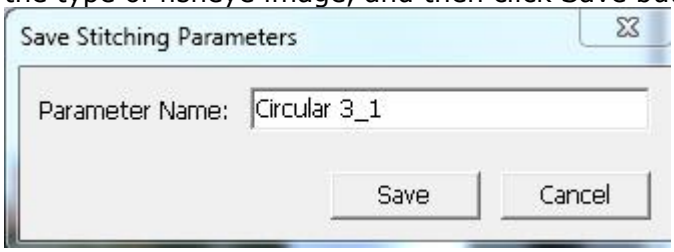
Stitch with Parameters

Save Stitching Parameters

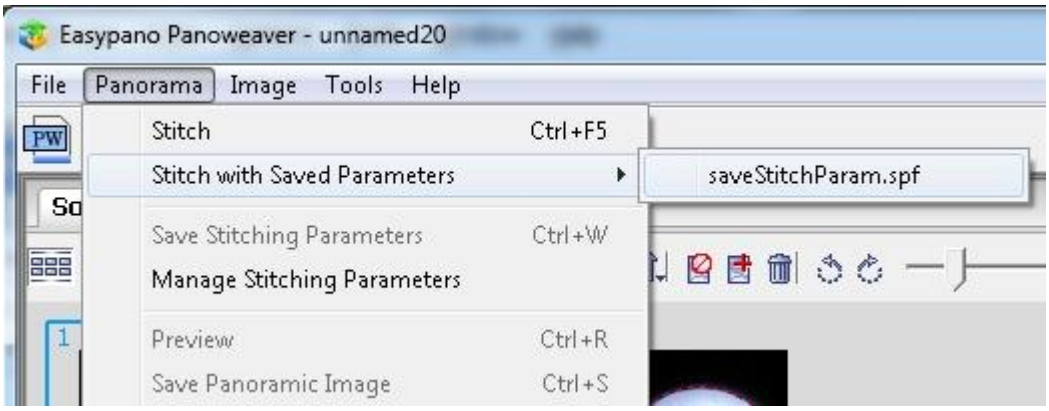
You may save the parameters if satisfied with the stitched image. And you will save much time by importing saved parameters directly when you stitch images shot with the same equipment and settings.

Steps: Choose *Panorama>Save Stitching Parameter* or use shortcut *Ctrl + W*, enter a name in the pop-up window, for instance, you may name parameters as the type of fisheye image, and then click Save button.



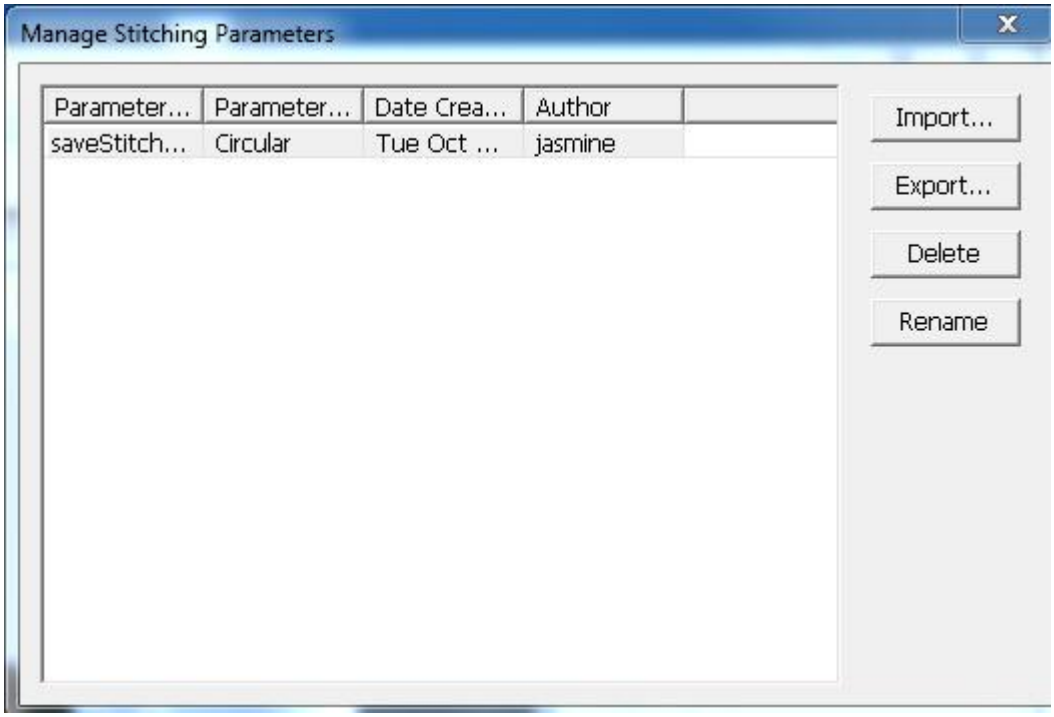
Stitch with Former Parameters

Parameters of images shot with the same equipment and settings are the same. As a result, you may save satisfied parameters and apply them to the images shot with the same equipment and settings. After importing fisheye images, choose *Panorama>Stitch with Former Parameters* to stitch.



Manage Stitching Parameters

You may also choose *Panorama>Manage Stitching Parameters* in menu bar to manage saved stitching parameters.



- **Import:** You may import external parameters, for example, parameters sent by others, into Panoweaver. Click *Import* button, or click the right mouse button to select Import.
- **Export:** Select a parameter, and then right click or click *Export* button. You may also export and save parameters to local hard disk, and send them to others.
- **Delete:** Select a parameter, and then right click or click *Delete* button.
- **Rename:** Select a parameter, and then right click or click *Rename* button.

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Edit Panoramic Images

Edit Panoramic Images

Select *File>Import Panoramic image* or click  on toolbar to import the panoramic image.

How to Remove Tripod
Add Ceiling/Floor
Add Google Maps

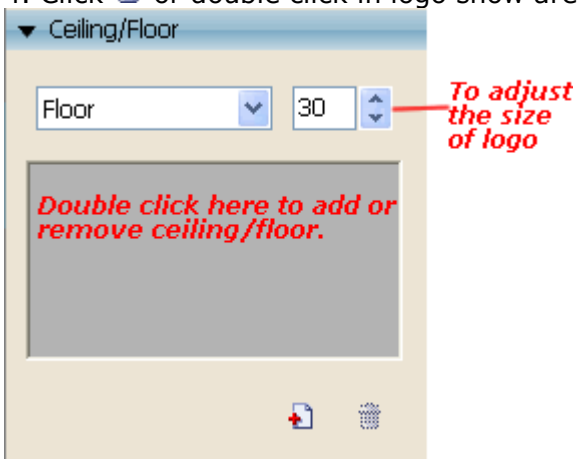
How to Remove Tripod

 In the latest Panoweaver the tripod can be removed by viewpoint correcting:
Remove the tripod by viewpoint correcting

FOV of fisheye lens is so wide that tripod is usually captured in the images, which may destroy the perfection of your images. You may take a nadir image (90° down view picture) to cover the tripod, or remove tripod from the panoramic image by some image editing software.

Add Logo

1. Open *Ceiling/Floor* panel.
2. Select *Floor* from the drop down list.
3. Click or double click in logo show area to import your image. You may enter a number (0~90), or click the arrow at the right side of the figure to adjust the size of logo. Please preview it in panoramic image show area.
4. Click or double click in logo show area to remove logo.



Tip:

- If you stitch drum or full frame without ceiling, there will be seams in the top (sky) area. You may add top (ceiling) to cover it. The method is the same as adjustment of bottom.
- If you want to apply parameters of top/bottom used last time, please set it in *Tools>Advanced Settings*. For details, please refer to Advanced Settings.

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Use Other Image Editing Software to Retouch

If you don't want to add a logo to cover the tripod, you may also remove it from the image in this way: first, convert spherical panoramic image into cubic, or stitch fisheye image into cubic panoramic images directly in Panoweaver. Then save the cubic panorama to your local and import it into other image editing software (for example, Photoshop) to remove tripod. Please refer to the following steps:

1. Move the tripod out of where it stands after shooting the fisheye images.

2. Use your camera with common lens to shoot a plane image of the floor where you put tripod:

3. Get a cubic panoramic image: Use Panoweaver to stitch fisheye image into cubic panoramic image directly. Or stitch a spherical panoramic image, then choose *Panorama> Spherical/Cubic Conversion* to convert it into cubic panoramic image.

4. Save the cubic panoramic image to your local. The picture below is an example of cube face with tripod:

5. Import both the cubic panoramic image and the image shot in Step 2 into Photoshop, retouch the plane image and make it exactly cover the tripod. The following picture is the result:

6. Save panoramic image and re-import it into Panoweaver to publish.

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Remove Tripod from Panorama by Using Additional Shot

Shooting Tip:

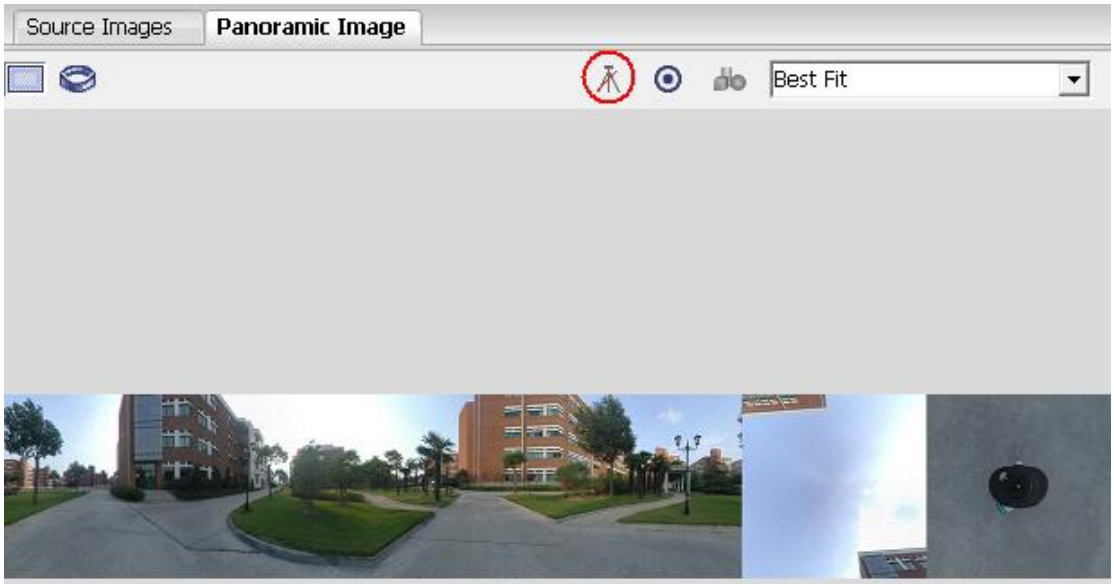
1. Shoot additional ceiling/floor shots without tripod to replace the original shots.

2. When shooting ceiling/floor, shooting position should be almost the same with the original position. The degree difference between the two positions should be limited in 20 degree.
3. Then click *Stitch* to get a panoramic image with tripod removed.

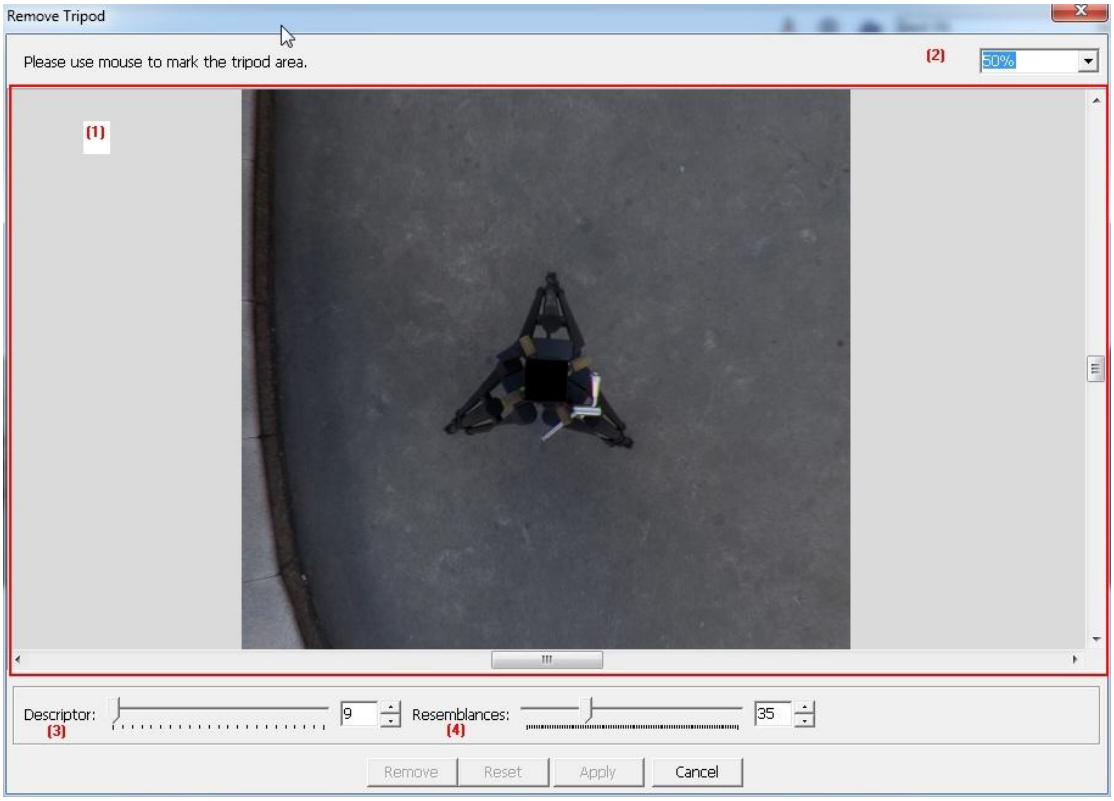
Top

Use Panoweaver to remove tripod

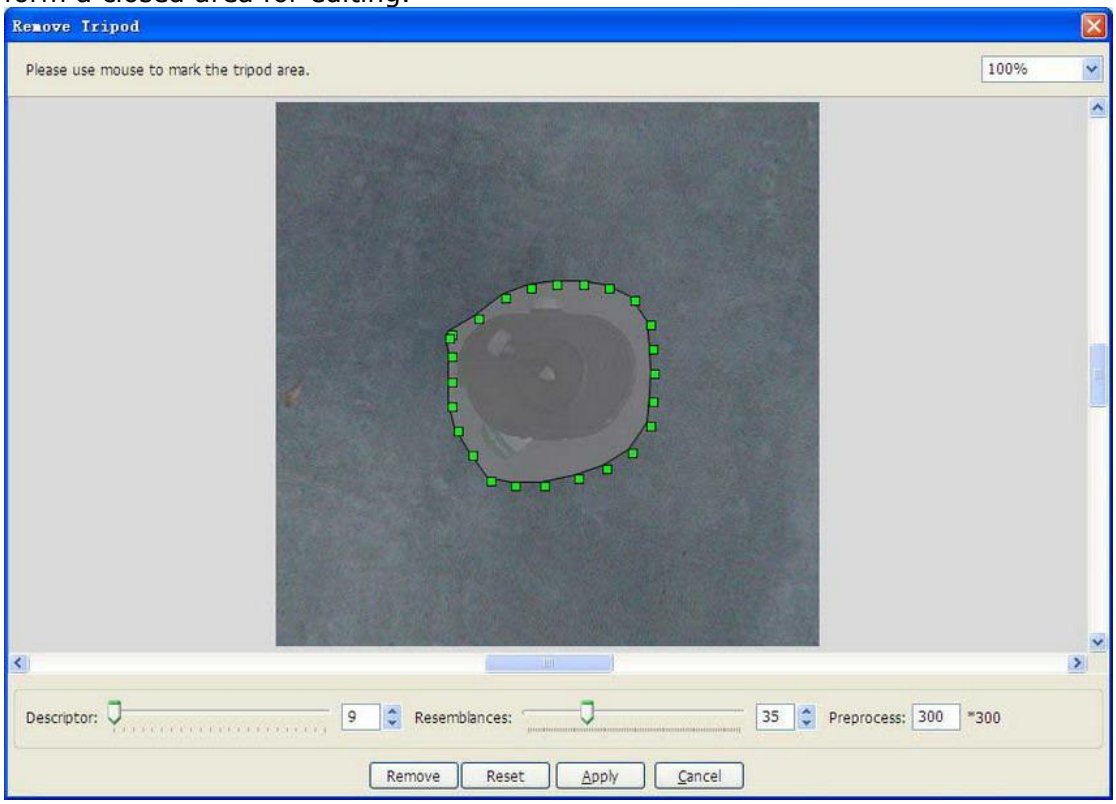
1. To remove tripod you need switch to panorama editing mode by clicking on tool bar to open a cubic panorama with Panoweaver (if it is a spherical one, convert it to cubic first by clicking on tool bar), and go to Panoramic Image view tab. Under Flat view of this cubic panorama, click Remove Tripod button:



2. A window called *Remove Tripod* pops up.



(1) This area displays the nadir part of the cubic panorama (width:height=1:1). Mouse cursor turns to brush in this area. Hold left mouse button to circle the area that you would like to edit. The starting point and end point will be connected to form a closed area for editing.



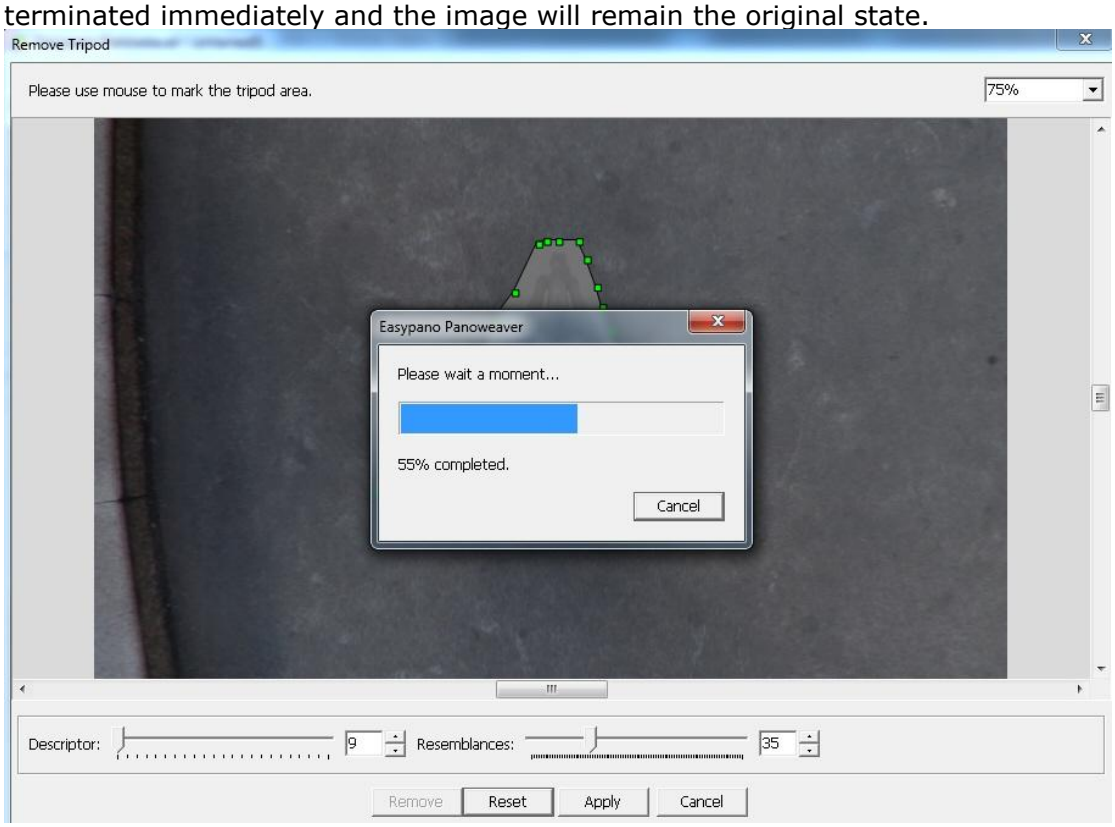
(2) Select displaying percentage for the image. This value ranges from 3% to 800%. Best fit means the image will be displayed according to the size of the current window. You can press Ctrl + + to zoom in and Ctrl + - to zoom out.

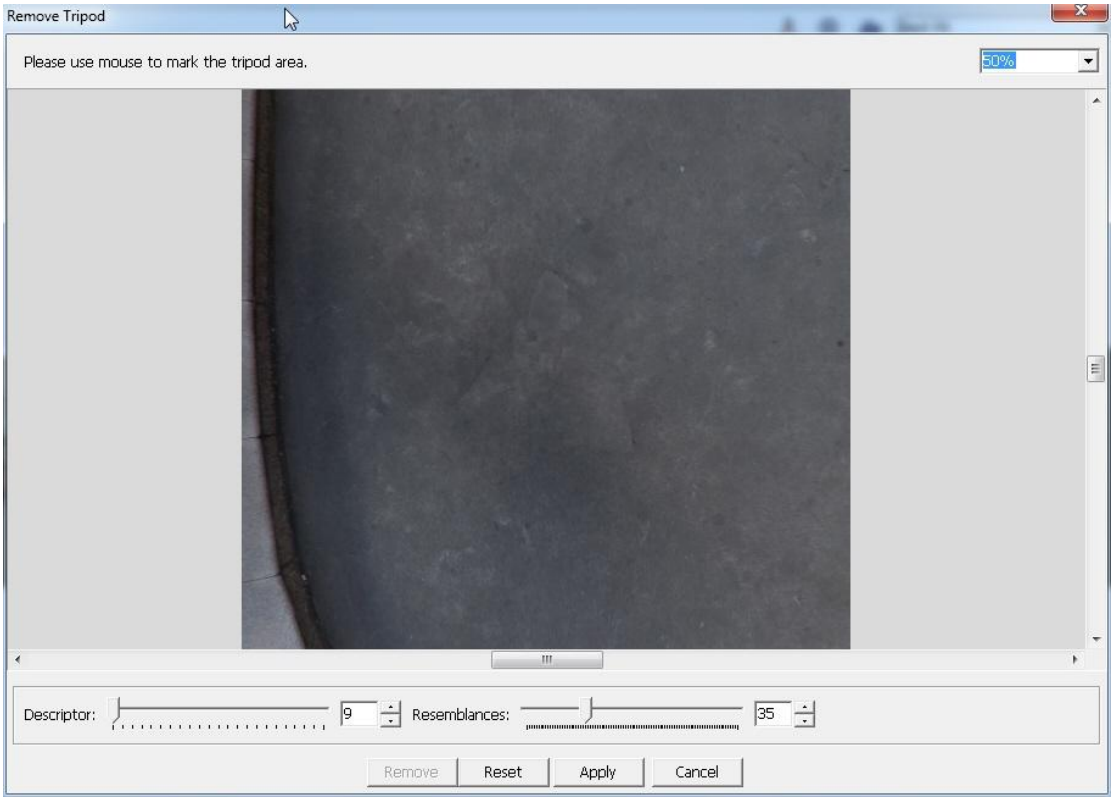
(3) **Descriptor** determines the robust value of the selected area, ranging from 9 to 31. The bigger the value is, the more accurate the found resemblance would be and the more precise the retouching result is.
(4) The **Resemblances** value defines the searching scope for resemblances. This value ranges from 10 to 100, with 35 as the default value.
Tip: Panoweaver will provide a *Decriptor* and *Resemblance* value by default, but when retouching tripod with complex texture, you need to find the best combination of Decriptor value and Resemblance value to generate the best retouching result.

Tip: Too large size will affect processing speed, but will generate a better retouching result.

3. Remove

After all the above areas are set, click this button to remove the tripod. When clicking the cancel button in the processing window, this remove action can be terminated immediately and the image will remain the original state.





Reset
When this button is pressed, the circle you have selected will disappear and the image display area goes back to original state. Also, the values you have set for *Descriptor, Resemblances* and *Preprocess* return to default value.

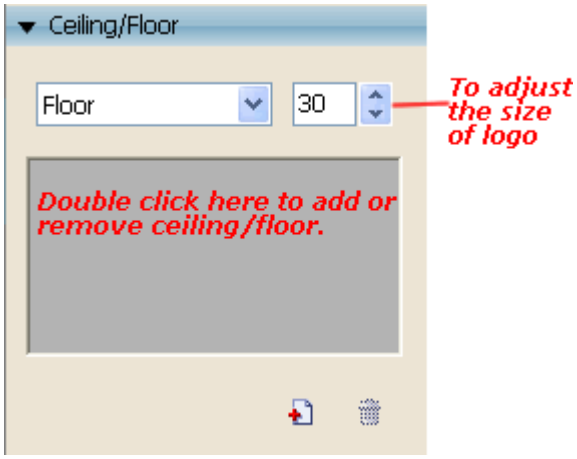
4. Apply
Finally, press this button to save the changes to panorama. Press cancel button to abandon all the changes.

Top

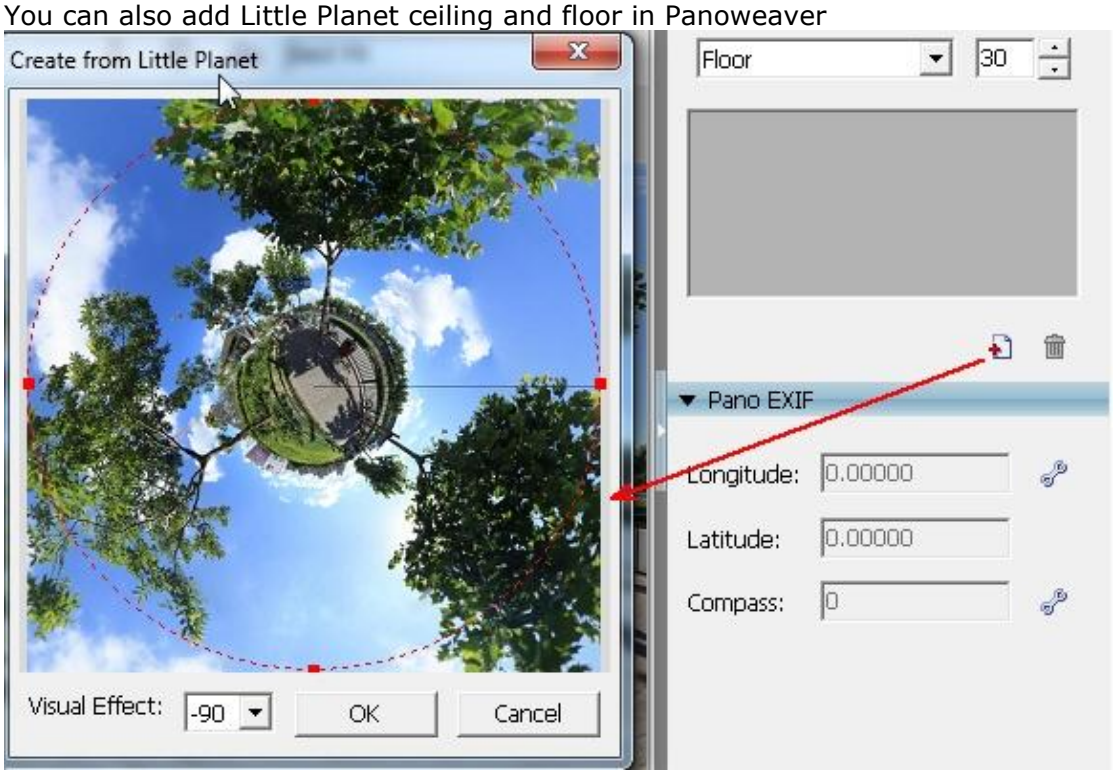
Add Ceiling/Floor

How to add a floor (logo) to a panoramic image

1. Open *Ceiling/Floor* panel.
2. Select *Floor* from the drop down list.
3. Click or double click in logo show area to import your image. You may enter a number (0~90), or click the arrow at the right side of the figure to adjust the size of logo. Please preview it in image show area.
4. Click or double click in logo show area to remove logo.



You can also add Little Planet ceiling and floor in Panoweaver



Tip:

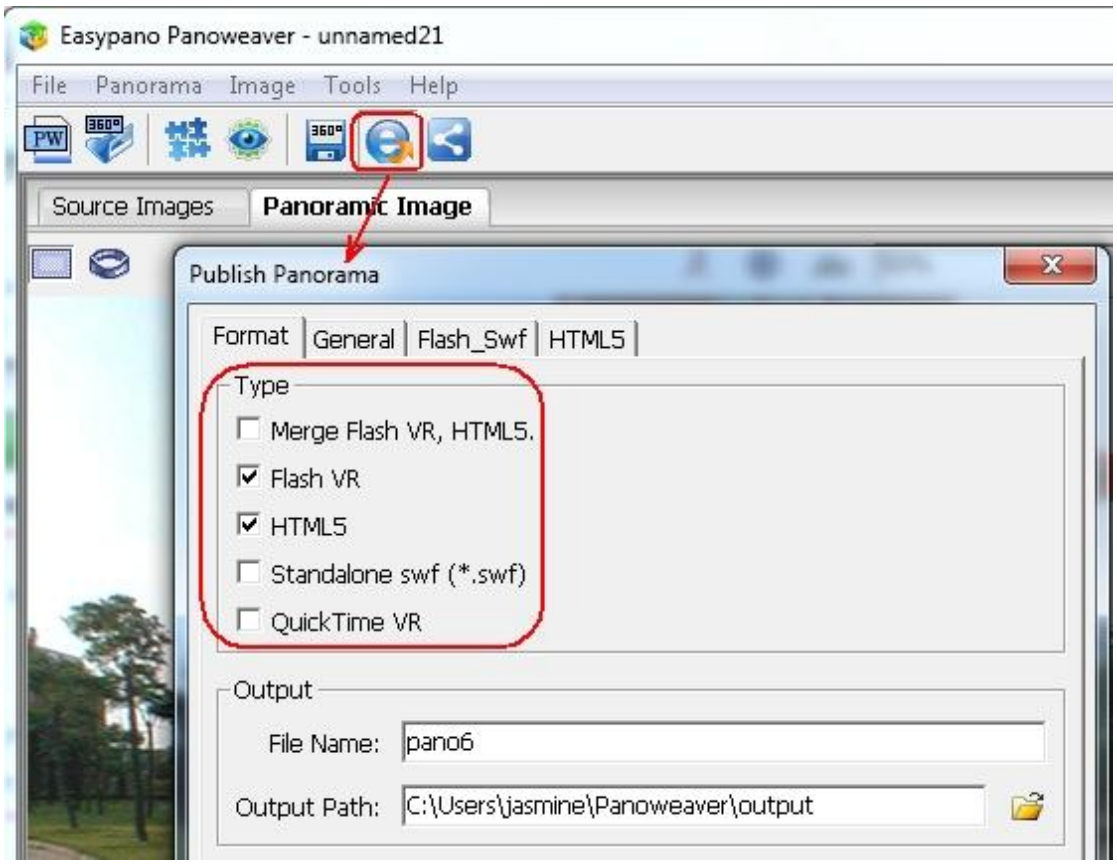
- If you stitch drum or full frame images without ceiling, there will be seams in the top (sky) area. You may add top (ceiling) to cover it. The method is the same as adjustment of bottom.

Add Google Maps

With Panoweaver, you could include a Google Maps window direct on the viewer.

1. Choose format you want to publish

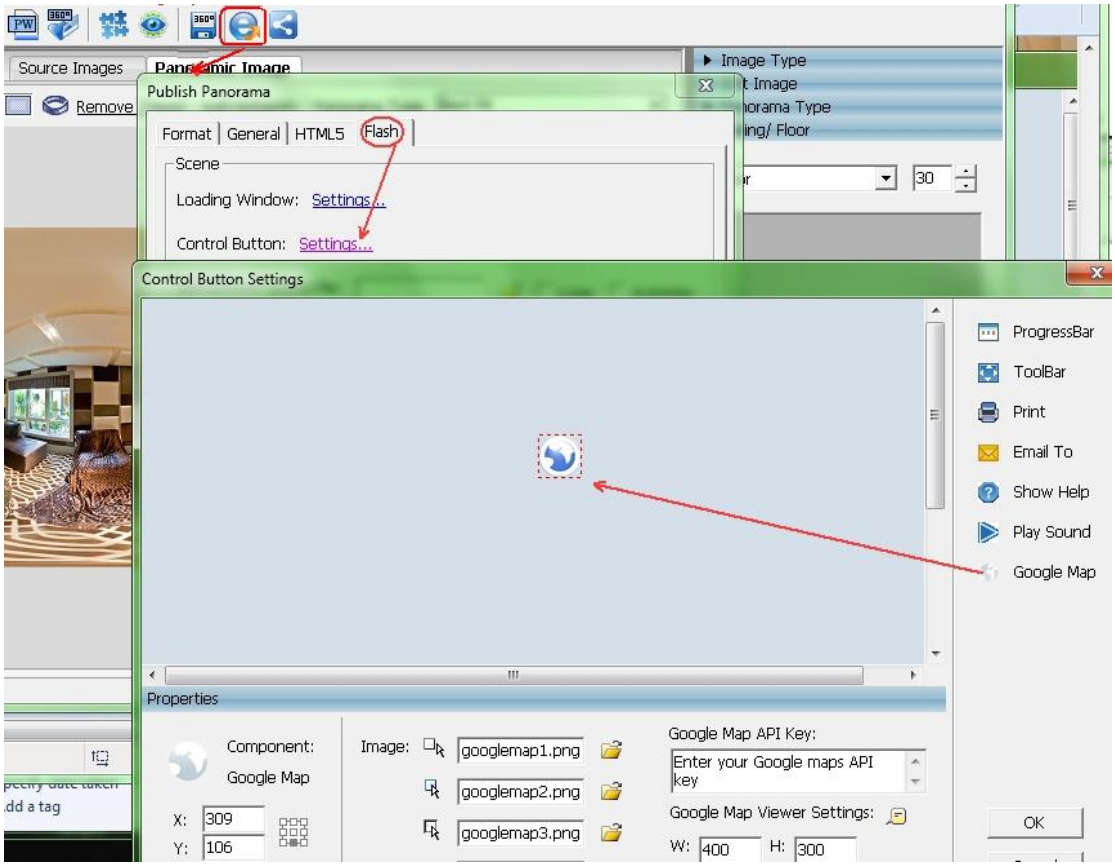
After you have finished stitching, press and it will come out a setting window ”Publish Panorama” then click ”format” to choose the format you want publish.



Note: Only flash and standard alone format support Google map

2. **Set Google Maps**

1.After you choose flash and standard alone format then click flash or standard alone
2. Click control button setting it will come out a control button setting Window.
3 .Click Google Maps icon and drag it to the control button setting

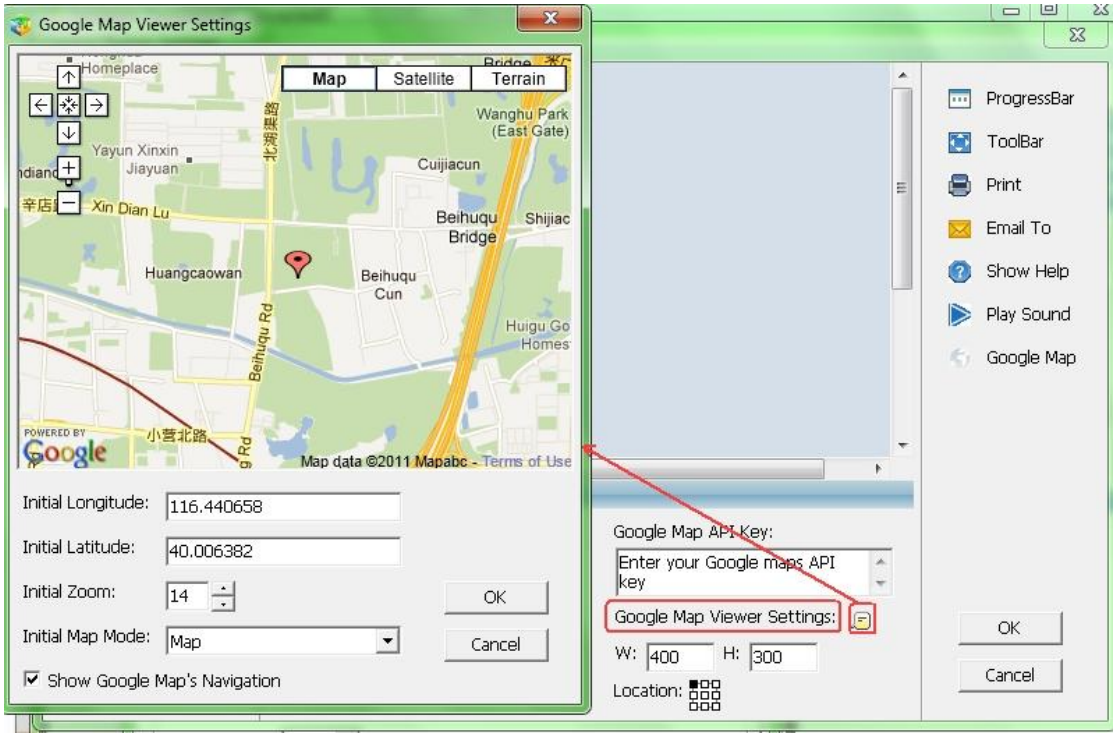


3.**Set Google Maps Properties**

W/H/X/Y: They could all be adjusted.
Google maps API key: to use the Google maps services a Google maps API key is needed! **Sign Up for the Google Maps API**

Note: When you apply the Google map API key, they need you input a web site URL. Make sure the website URL you put is same as the web site you want to upload the published flash.

4. Set Google Maps Viewer
Click **Google Map viewer setting icon,** it will come out a Google map viewer settings

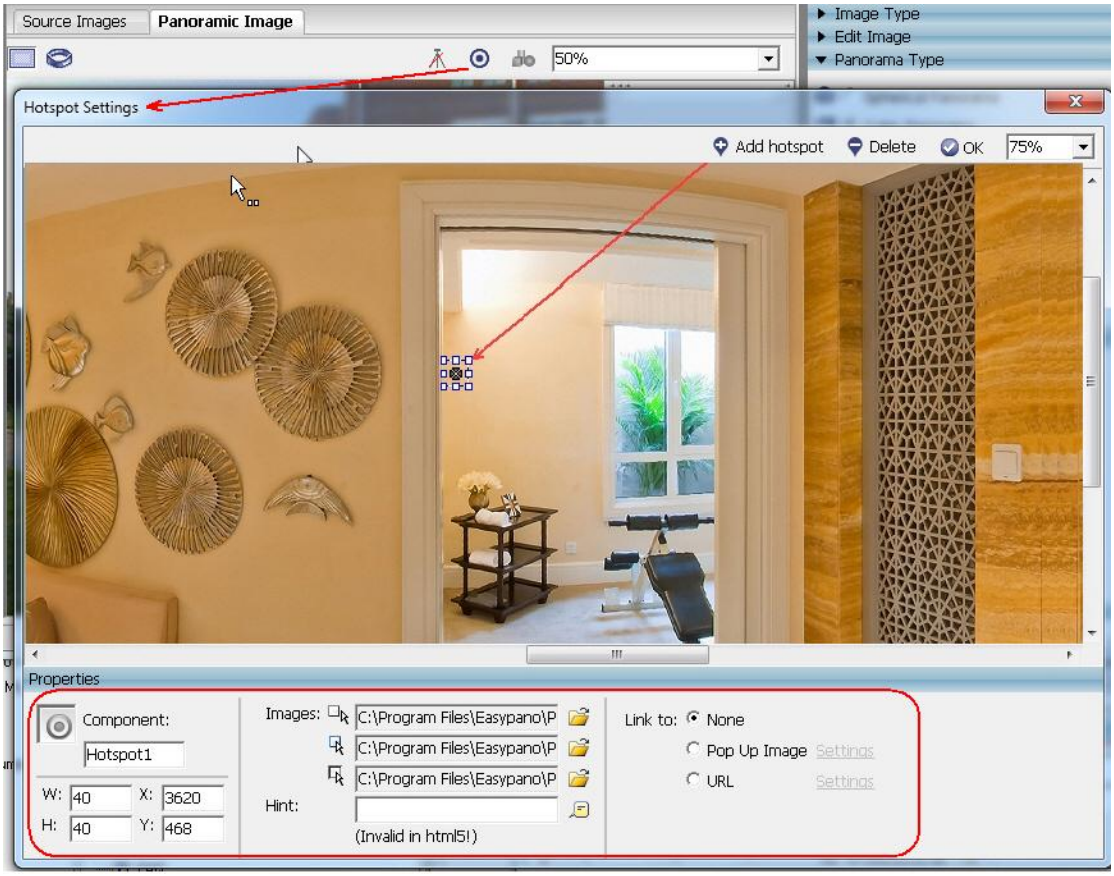


Current Center Position: The current map position. Display Latitude and Longitude of the current center position.
Start Zoom Level: Initial zoom level, 14 is by default.
Display Initially: There are four options to choose from: Traffic, Map, Satellite, Earth. If you'd like to display navigation controls on Google maps, then tick the option Display Navigation controls on Google Maps.

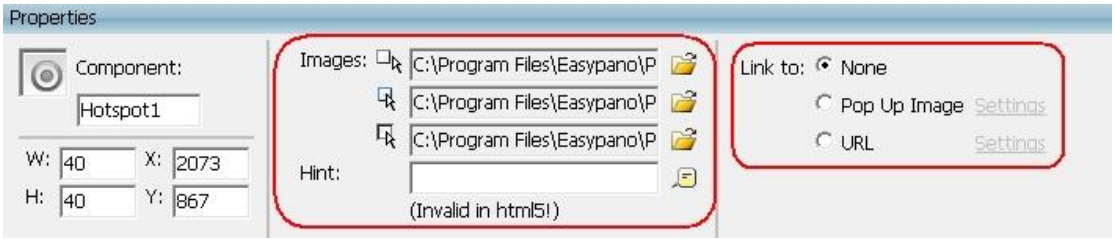
Add Hotspot to Panorama

Add Hotspot to Panorama

In Panoweaver 9, you could add hotspots to a panoramic image. Steps are as below:
1. Click on "Add Hotspots" button in Flat View under Panoramic Image tab.
2. Add hotspots to the panoramic image in the popup *Hotspot Settings* window.

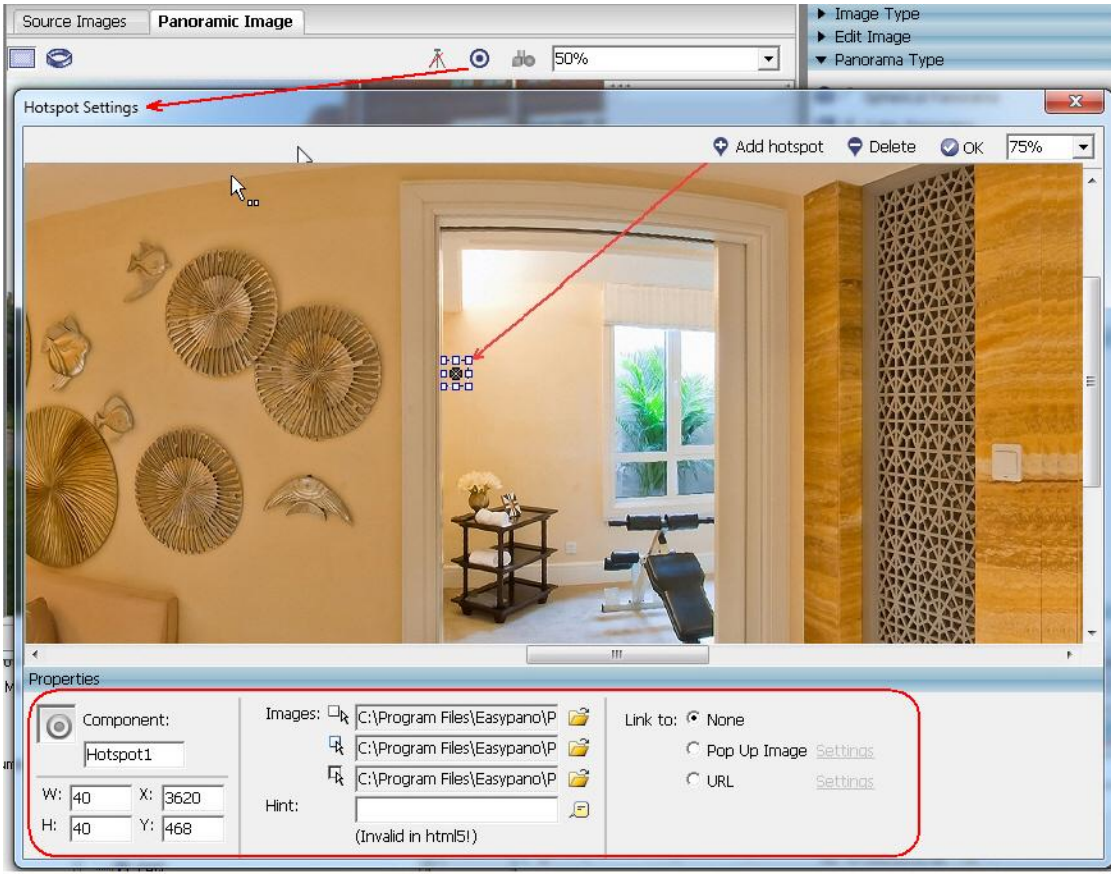


3. And make settings to hotspots in the properties panel, such as adding a certain action like "Link to URL".



Edit Hotspot

Click *Set Hotspots* button in Flat View under Panoramic Image tab to go to the hotspot settings window.



Add Hotspot

1. Click on *Add Hotspot*
2. Then move your mouse on the panoramic image and press left mouse button to add a hotspot. And the properties panel will display its properties and action.

Delete Hotspot

Method 1: Select a hotspot, and click Delete Hospot.
Method 2: Select a hotspot, and press Delete button on your keyboard.

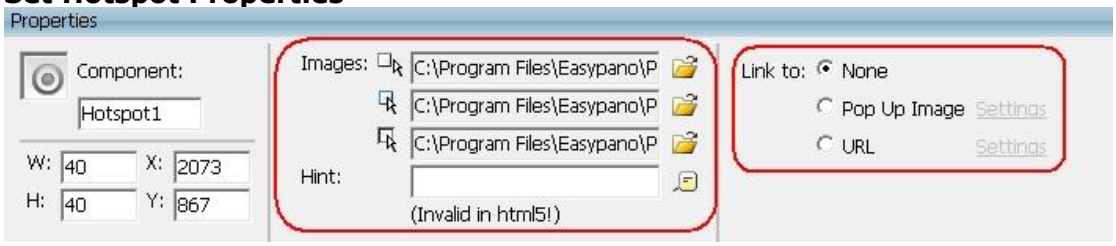
Select Hotspot

Click a hotspot on a panoramic image or Click the hotspot name in Hotspot List. Selecting multiple hotspots is supported.

Move Hotspot

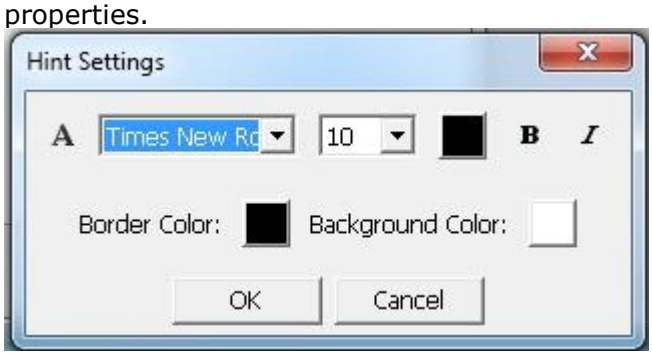
- After selecting one or more hotspots, hold the left mouse key and drag.
- Use arrow keys to move the selected hotspots.
- Move a single hotspot by changing the X,Y coordinates of it in the properties panel of the hotspot.

Set Hotspot Properties

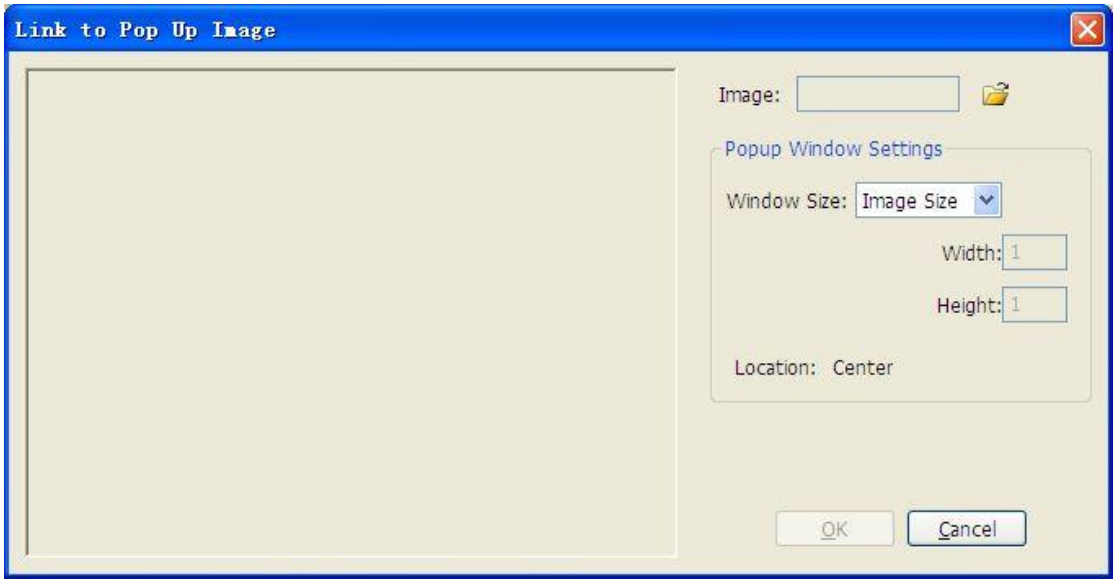


Component: Display hotspot name.
W/H: To set hotspot area.
X/Y: Set x,y coordinates of hotspot.

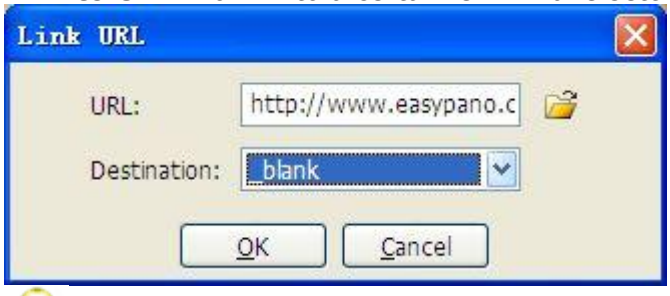
Icon: Set icon for hotspot. Two types: Text and images (hotspot image by default or hotspot images located at [InstallDir] \Libraries\Image\Hotspot).
Text: If you want to get a text hotspot or a text-image hotspot, please type text here and click to set font, size, align, etc for the text.
Hint: You can also set font, size and color for the hint text. Click to set hint properties.



Link to None: To set hotspot action. None represents the hotspot doesn't link to anything.
Link to Popup Image: You can add Pop up Image action to Hotspot. After this action is added to hotspot, when clicking on the hotspot, the relative image will be shown in a popup window right beside the mouse. The setting window is shown as below:



Link to URL: To link to a certain URL. Make setting as following:

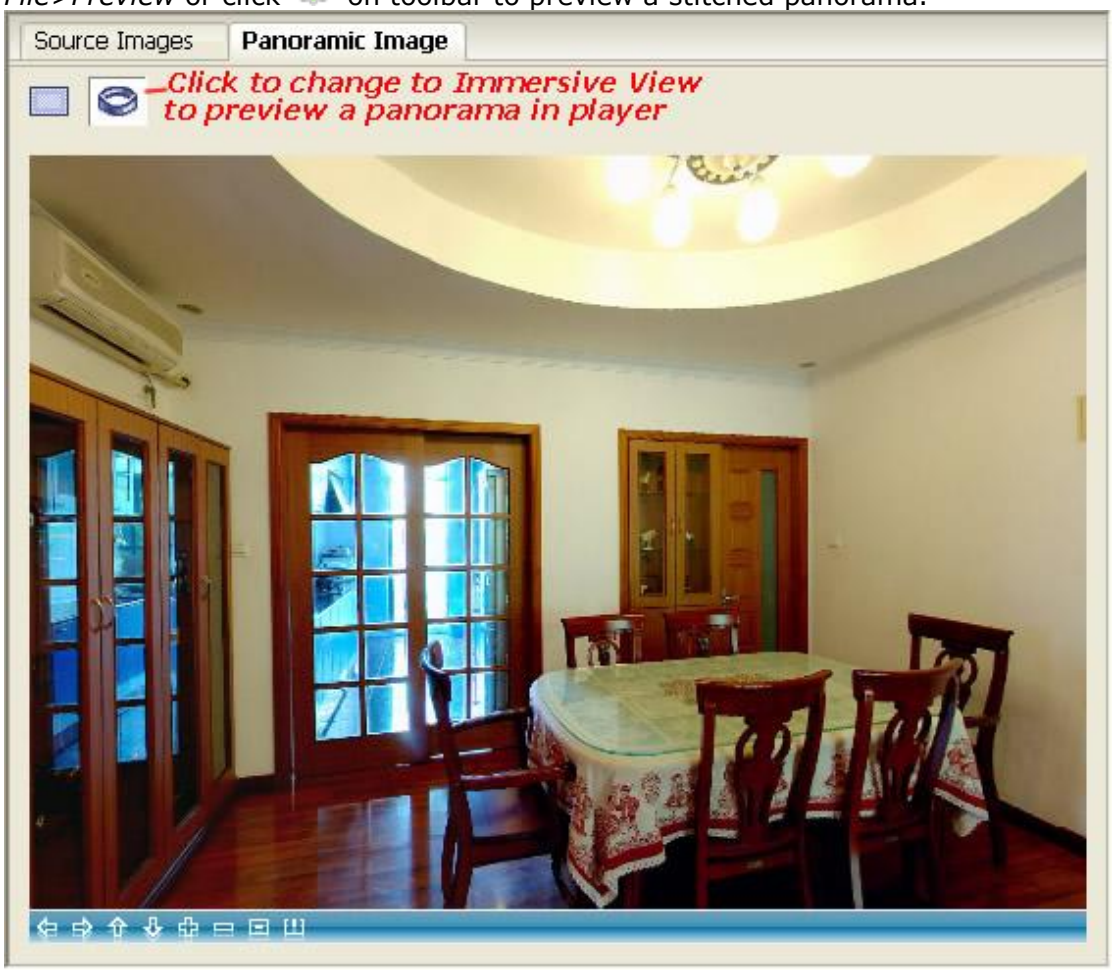


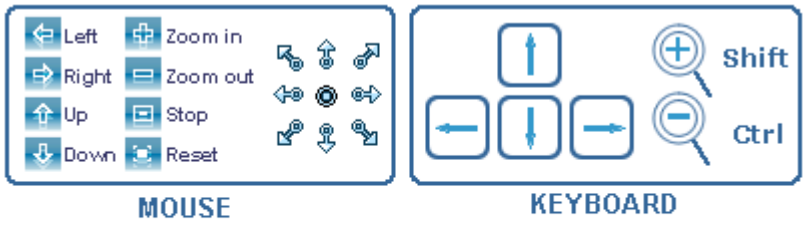
Note: When multiple hotspots are selected, in the properties panel, W/H, Icon, Text and Hint are editable, while other options are not editable.

Note: The edited hotspots can only display in hotspot panel, which don't display in panoramic image area or under preview mode.

Preview Panorama

You may preview panoramic image before publishing it if you have stitched it. You may retouch it in time if you are unhappy with the results. Select *File>Preview* or click on toolbar to preview a stitched panorama.





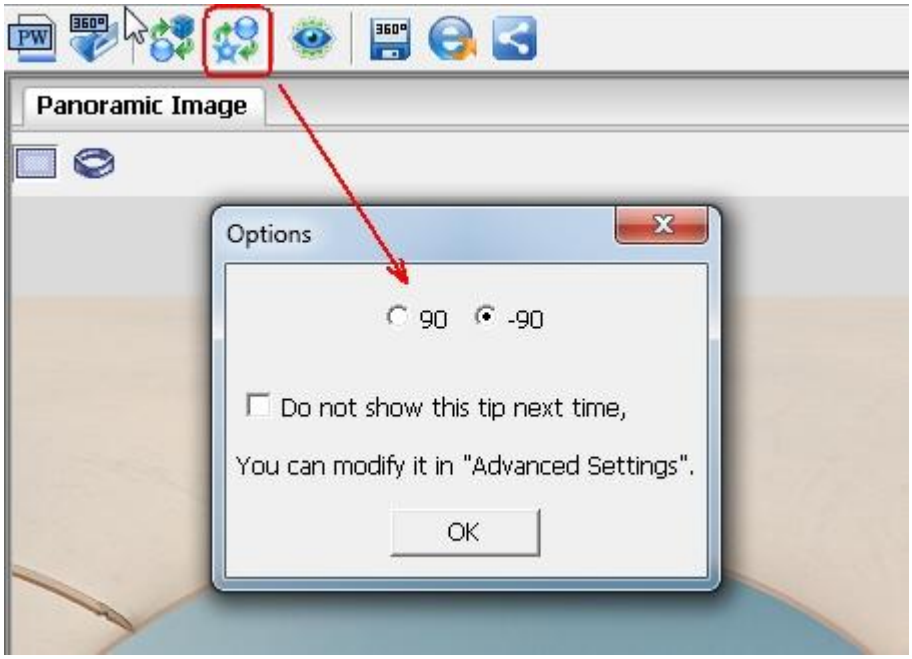
Related Topics:
Panorama in Immersive View

Little Planet Panorama

Panoweaver support directly stitch photos into Little Planet Panorama and convert spherical panorama into Little Planet.

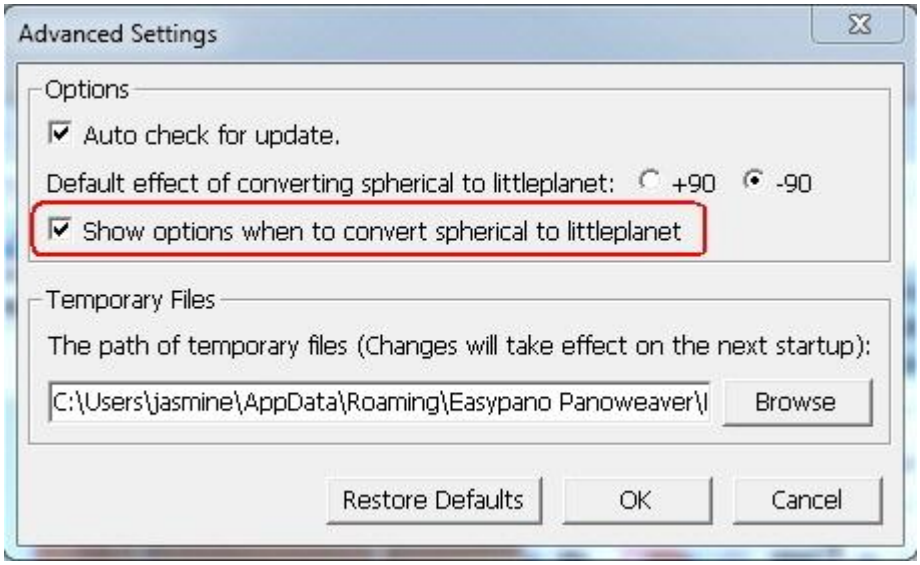
Click the spherical panorama will turn to ”Little Planet”

Tips: If you first use this feature, click , it will comes out a popup window as blow



(1) If you choose 90 from top to bottom view angle.
(2) If you choose -90 from bottom to top view angle.

(3) If you check *Do not show this tip next time*. when you click next time, the popup window will not appear again. If you want to reset it, go to *Advanced Setting* to change it .

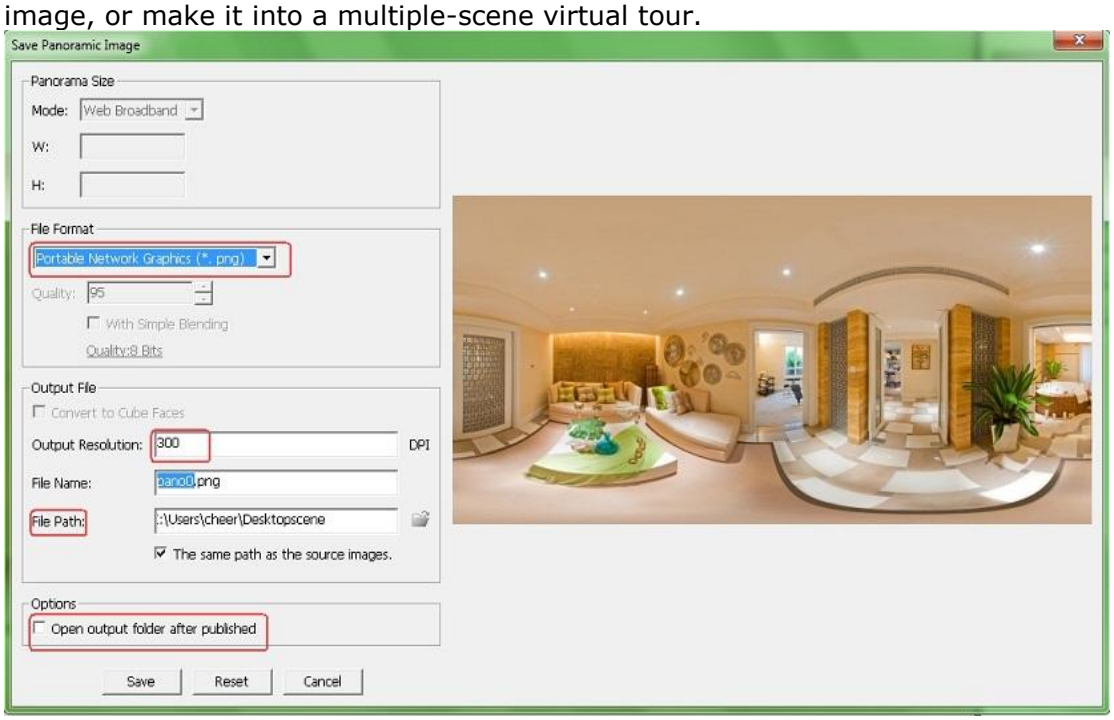


Tips: After the Spherical panorama is being turned to Little Planet, it will not support ”cubic to spherical” ”add ceiling and floor” ”add 'hotspot”.

Save Panoramic Image

Save Panoramic Image

Choose *File>Save Panoramic Image* or click on toolbar, select proper format and enter file name, click *Save* button. You may retouch or print saved panoramic image, or make it into a multiple-scene virtual tour.



You may save the panoramic image as the following formats:
Windows Bitmap (*. bmp), JPEG Image Format (*. jpeg; *. jpg), Photoshop (*. psd), Portable Network Graphics (*. png), Targa Files (*. tga), Tiff Image Format (*. tiff; *. tif).

 **Note:** Most of the above formats belong to 8-bit image. Panoweaver can also save 16-bit for Tiff image and HDR images.

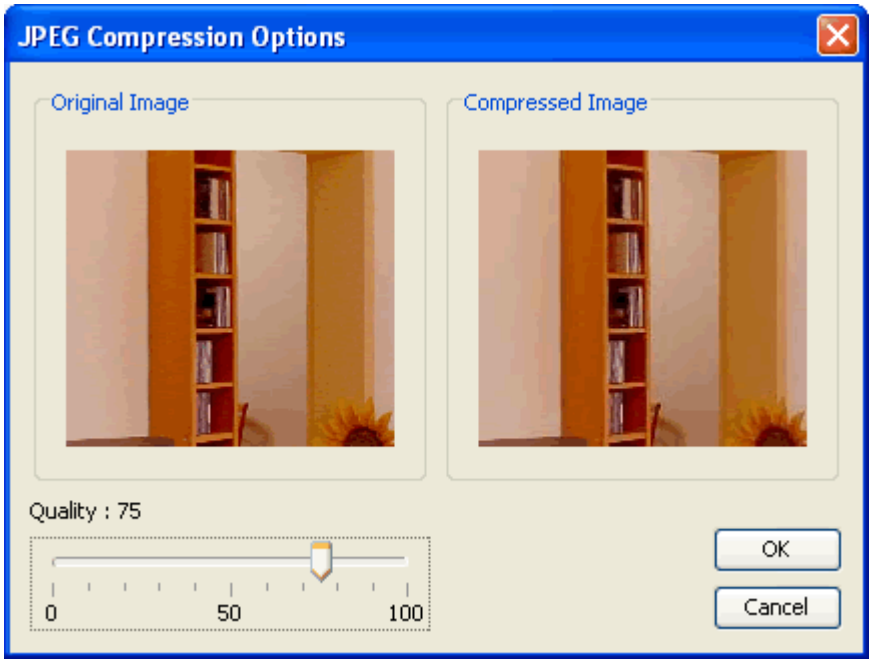
2. Set panoramic image size.

Panoweaver provides several sizes for common use. Select from the drop down menu to decide the image size. Certainly you may also customize size by yourself.

Web Dialup	Spherical Panorama	1400x700
	Cubic Panorama	2400x400
	Little planet	700x700
	Cylindrical Panorama	25% of Max Width x 25% of Max Height
Web Broadband	Spherical Panorama	4000x2000
	Cubic Panorama	7200x1200
	Little planet	2000X2000
	Cylindrical Panorama	50% of Max Width x 50% of Max Height
CD	Spherical Panorama	6000x3000
	Little planet	3000X3000
	Cubic Panorama	9600x1600
	Cylindrical Panorama	75% of Max Width x 75% of Max Height
Print	Spherical Panorama	8000x4000
	Little planet	4000X4000
	Cubic Panorama	12000x2000
	Cylindrical Panorama	100% of Max Width x 100% of Max Height
Custom	Spherical Panorama	You may set width and height without limitation, as long as computer supports. 16000*8000 or bigger. Maximum size for spherical panorama is 40000*20000. If bigger than 16000*8000, preview, publish are not supported, you could save it and view it in other software.

Adjust JPEG quality

If the format you select is JPEG, click *Quality* button to adjust image quality in the pop-up window.



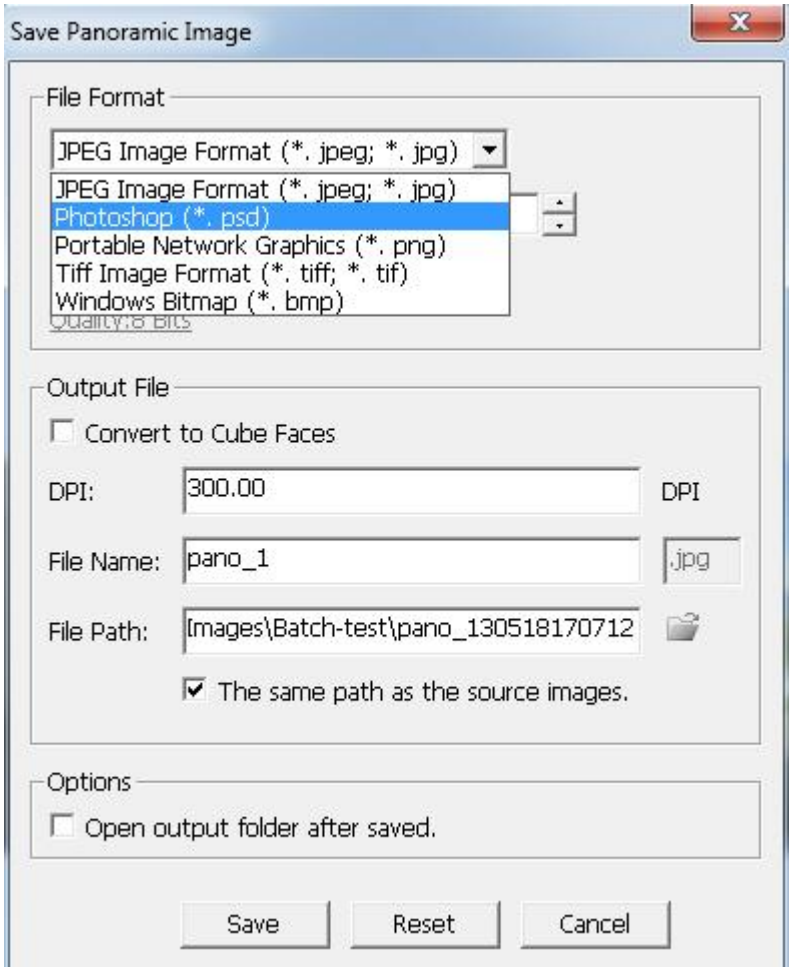
Move the slider, or use arrow key to adjust JPEG quality. You may preview the result in *Compressed Image* area. JPEG quality is closely related with file size, so please select a proper value balancing file size and image quality (85 is recommended for common users).

Convert Cube Faces
If the current panorama is cubic one, you could tick this option to convert it into 6 images with ratio 1:1.

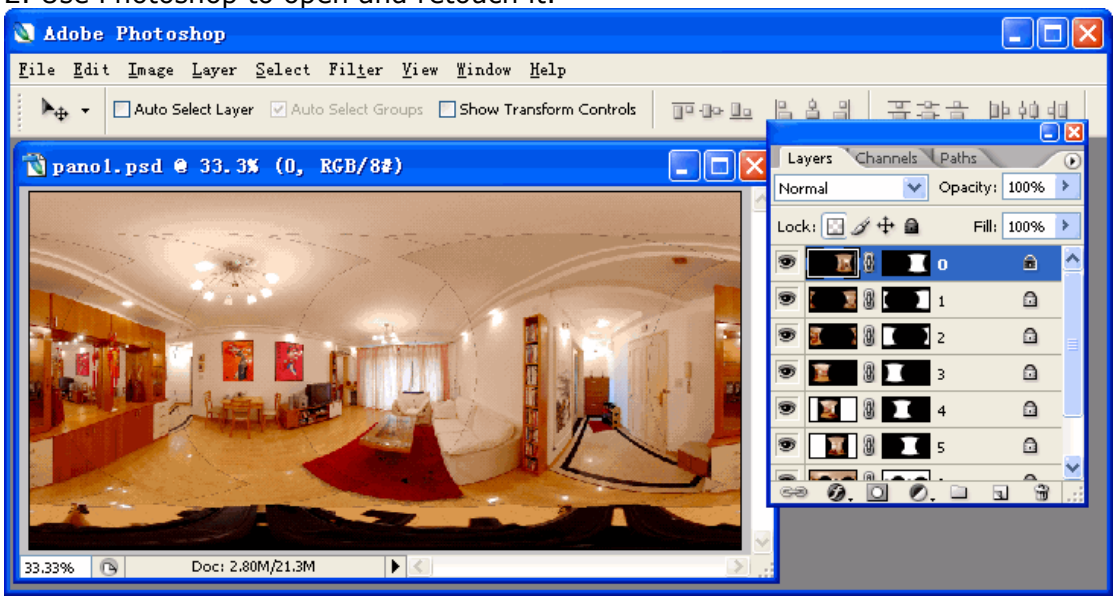
Retouch Image

If you are unhappy with stitched panoramic image, please save it first and then import it into Photoshop or other image editing software to retouch, finally re-import it into Panoweaver to publish. Take Photoshop as an example.

1. Save panoramic image as PSD format.



2. Use Photoshop to open and retouch it.



3. Re-import retouched panoramic image into Panoweaver and publish it. Choose *File>Import Panoramic Image* or click  on toolbar.

Print Panoramic Image

Panoweaver does not support Print function, so you have to print it in other image editing software.

1. Save panoramic image to hard disc.

2. Use Photoshop, Firework, ACDSee or other similar software to open it. Choose *File>Print.*

Make Virtual Tour with Tourweaver

For most users, single panoramic image created by Panoweaver is far from meeting demand. What they want is a virtual tour which contains multiple panoramic images, interactive maps, word description, etc. Easypano Tourweaver is the best choice.

For details about Tourweaver, please visit:
http://www.easypano.com/how-to-make-a-virtual-tour.html

Download Trial Version at:

http://www.easypano.com/virtual-tour-software.html
Click this image to view virtual tours made with Tourweaver using the panoramic images stitched in Panoweaver as source images.
http://www.easypano.com/gallery/tourweaver600/tw650demo/tour.shtml

Tourweaver 6.50 sample tour

Publish Panorama

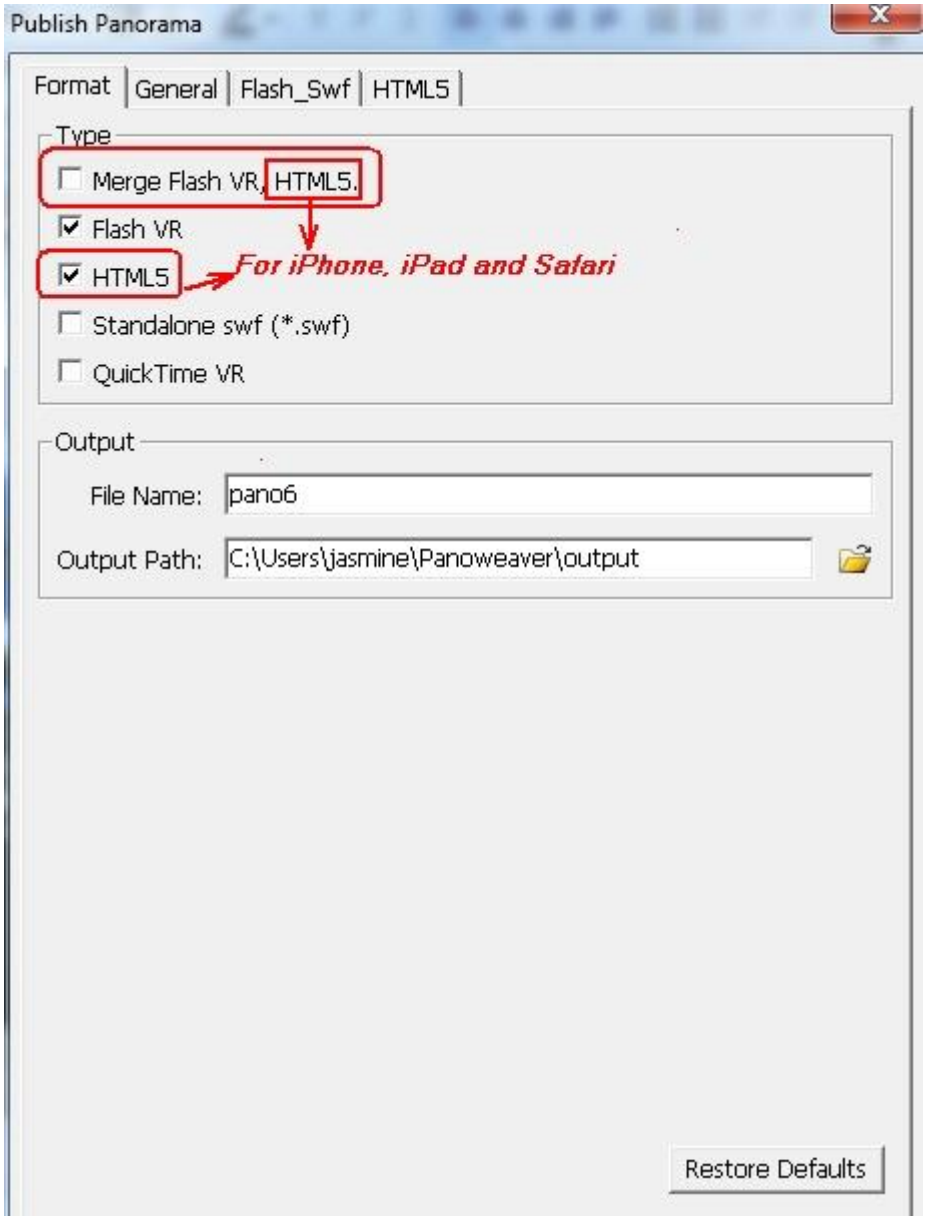
Publish Panorama

After stitching, choose **File> Publish Panorama** or click on toolbar to publish Panorama.

Basic Steps:

1. Select publishing format.
2. Enter file name.
3. Select output path.
4. Set general publishing parameters in General.
5. Set individual parameter for each publishing type.
6. Click *Publish*.

Publishing Format



Type:
You may publish as Shockwave Flash (.swf), Flash VR, HTML 5 or QuickTime VR, or both of them at the same time.

File Name:
Name the published file, for example pano1 (Please don't use space in the file name).

Output Path:
Specify output path for the file you want to publish, for example, C:\Program Files\Easypano\Panoweaver 9\output\; System will establish a folder with the same name as the file, so output path becomes: C:\Program Files\Easypano\Panoweaver 9\output\pano1\. System for your convenience will establish sub folders "_swf", "_flash", "_applet" and "_qtvr" under this folder, so files will be saved separately in the sub folders.

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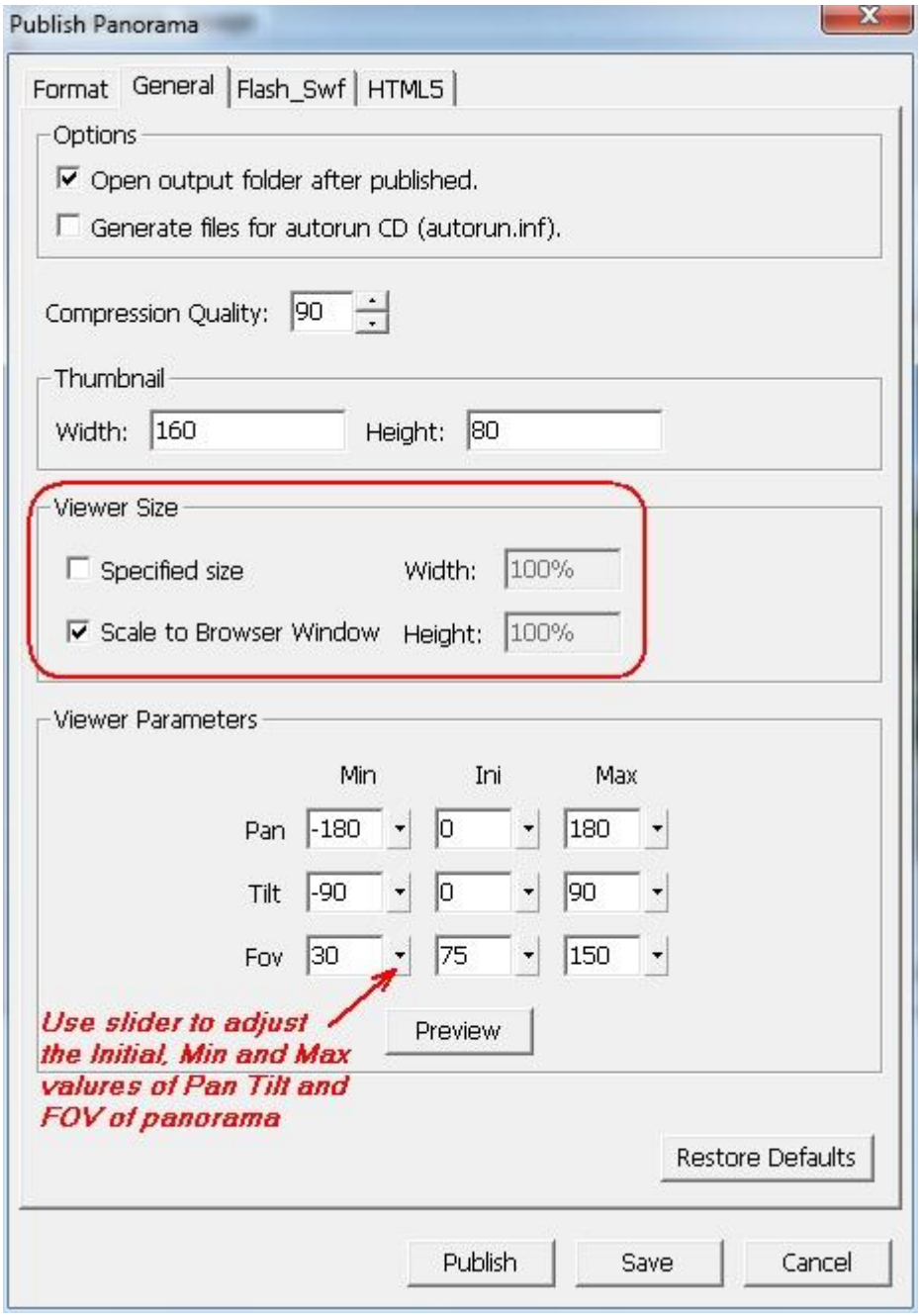
General Properties



Options:

- Open output folder after published.
- Generate files for autorun CD (autorun.inf): If this option is selected, Panoweaver will generate an autorun.inf file for autorun CD.

Compression Quality:
Click *Quality* button to adjust image compression quality and display compressed size of file in the pop-up window. Refer to Adjust JPEG quality.

Thumbnail:
Thumbnail of panoramic image in html page. Customize the size of thumbnail in index.html in the published files. The default size of the thumbnail is 160x80 pix.

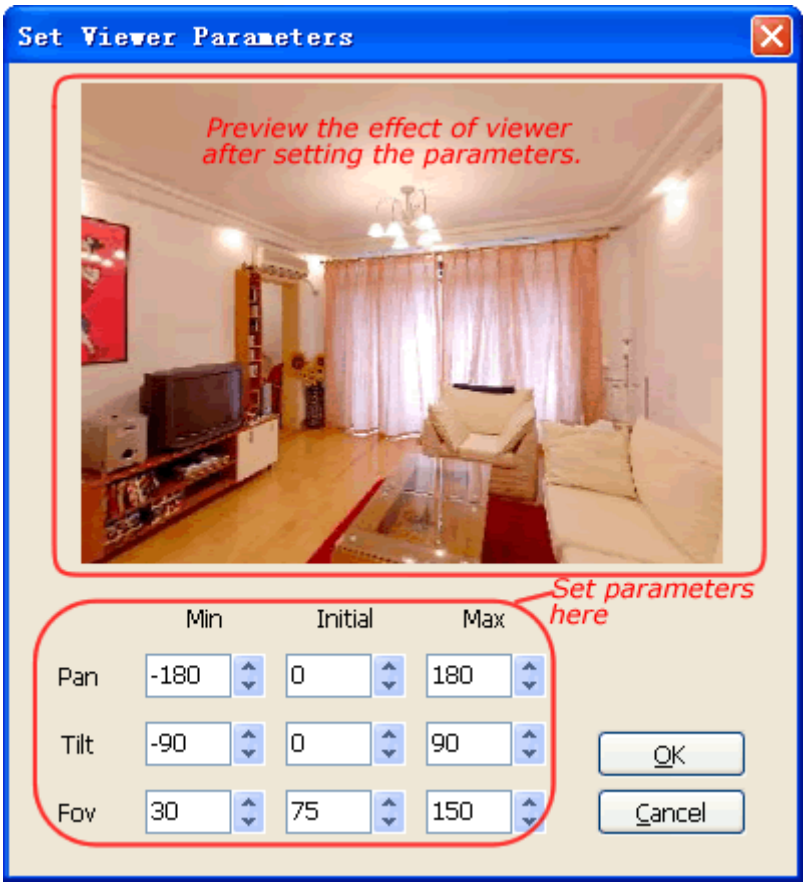
Viewer Size:
Set the size of viewer.

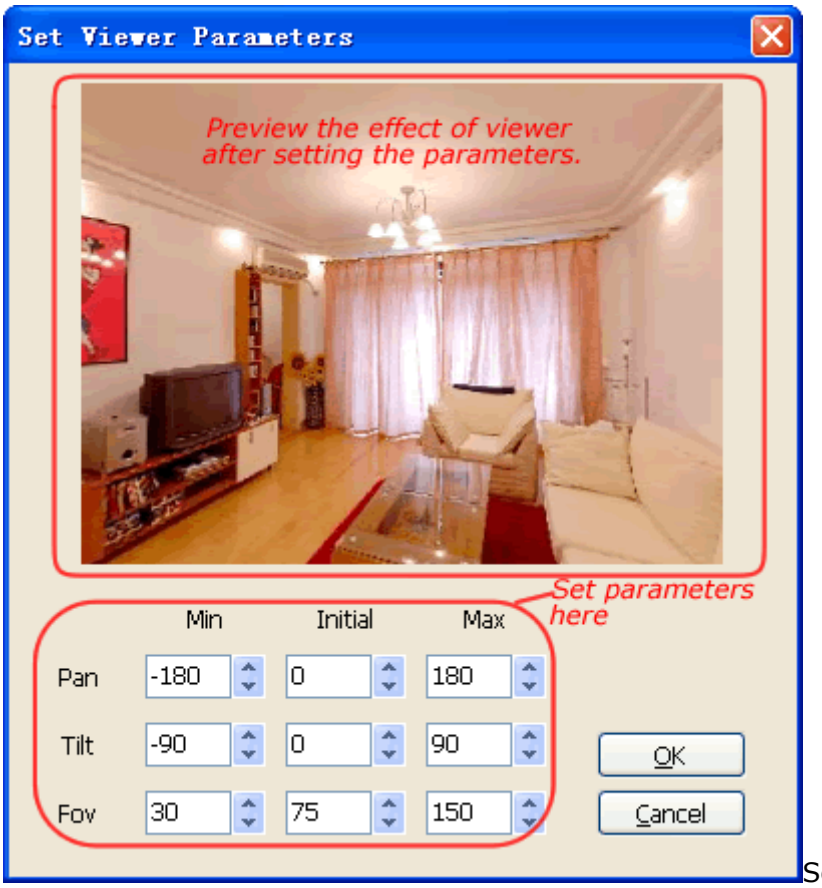
- Recommended: Panoweaver will calculate a recommended size of viewer in accordance with the size of panoramic image. Please refer to the following table:

Purpose	Recommended Size of Viewer
Web Dialup	400*300
Web Broadband	640*480
CD	800*600
Print	1024*768
Custom	Panoweaver calculates the size of viewer according to the size defined by users.

- Custom: User defines the size of viewer by himself.

Viewer Parameters:





Set the initial, max and min values of *Pan, Tilt, FOV (Pan refers to horizontal angle of view. Tilt refers to vertical angle of view. FOV refers to field of view. The smaller FOV is, the nearer scenes seem to be. The larger FOV is, the farther scenes seem to be)* of panorama when playing.

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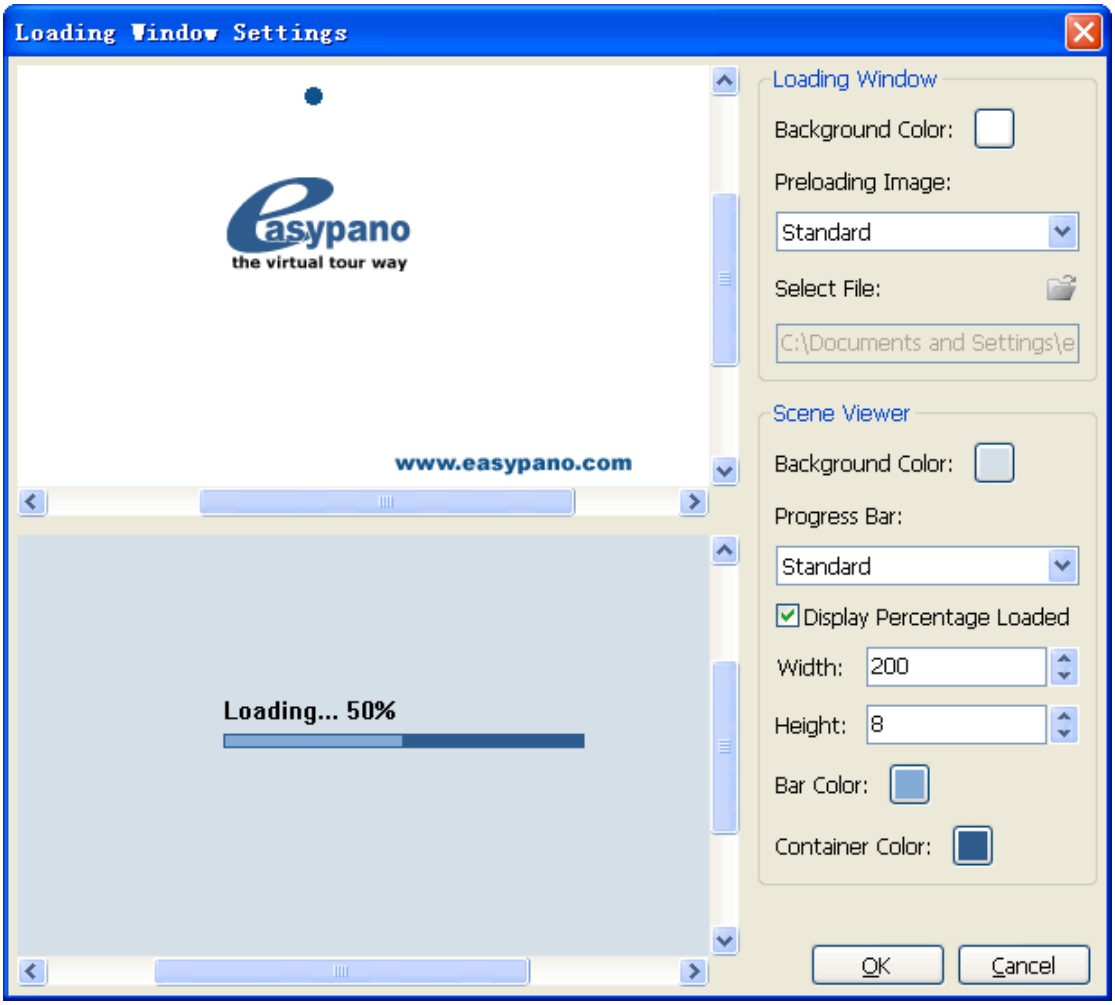
Flash VR

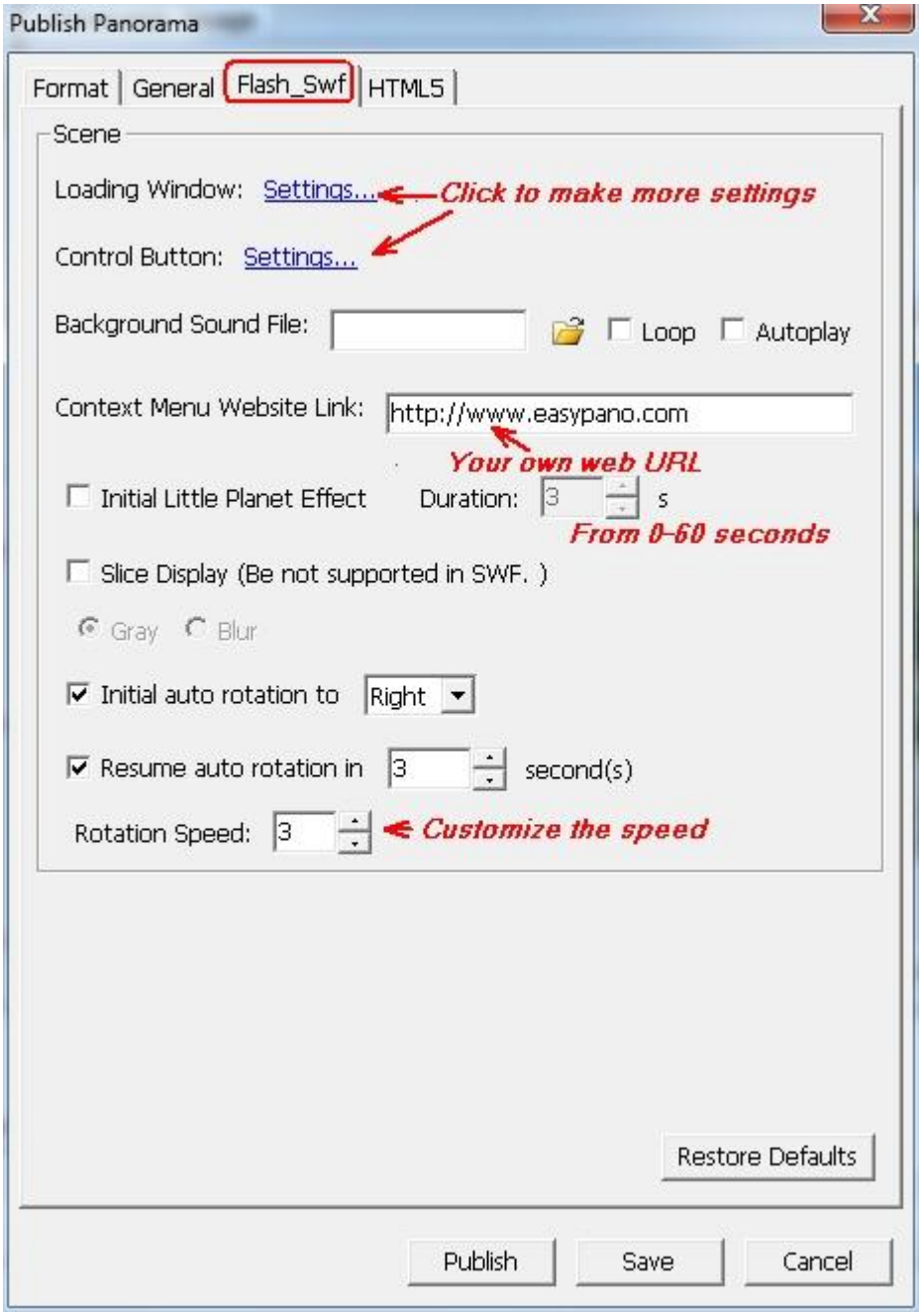
Loading Window:

Background Color:
Set the background color of loading window.
Preloading Image:
It allows users to modify or set preloading image. To set the style of preloading image among None, Standard and Custom.

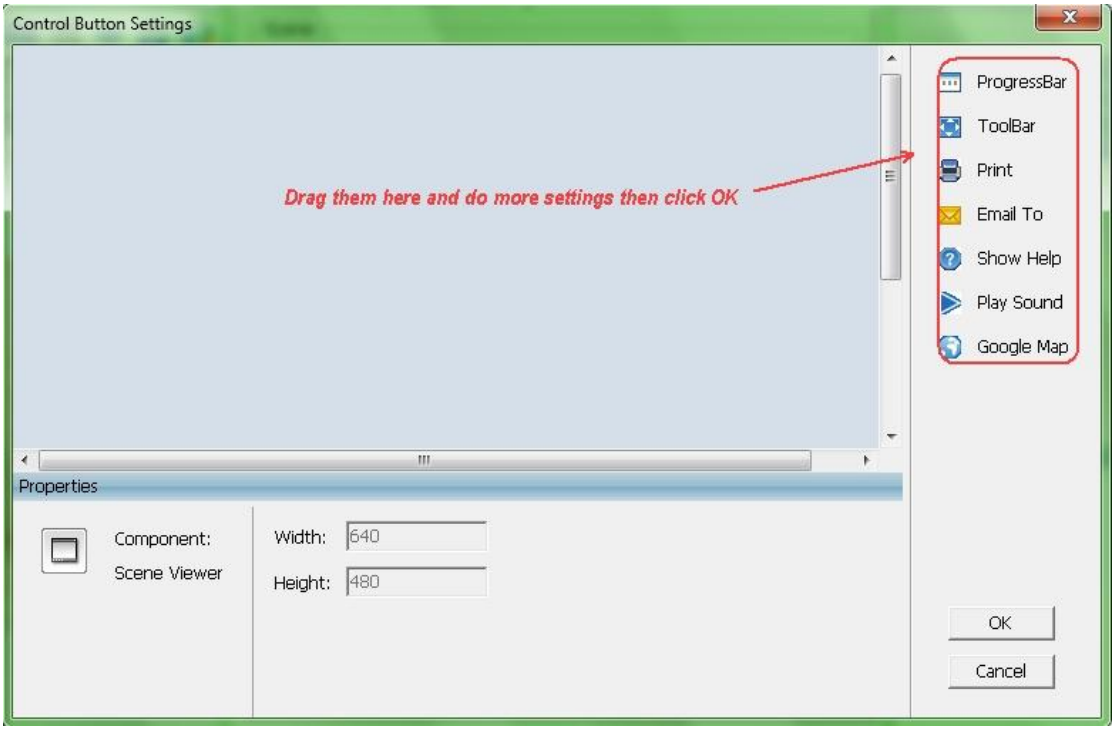
- Select None. It indicates there's no preloading image in Loading Window.
- Select Standard. The default preloading image will appear in Loading Window.
- Select Custom. You could customize a preloading image. Click to select a file you like (supported formats: .swf, .jpg, .bmp, .gif).



Click the hyper text *Settings* and a dialog box will pop up. You are able to customize *Loading Window*.



Control Button: To set toolbox, buttons and their position on scene viewer. Click the hyper text *Settings* and a dialog box will pop up.



The components like *Progress bar, Toolbar, Print, Email To, Show Help* or *Play Sound* can be added to scene viewer.

Add Components to Scene Viewer

1. Click a certain component from Toolbox.
2. Click the blank part of Main Window to place the component.

Note: Each component can only be added once.

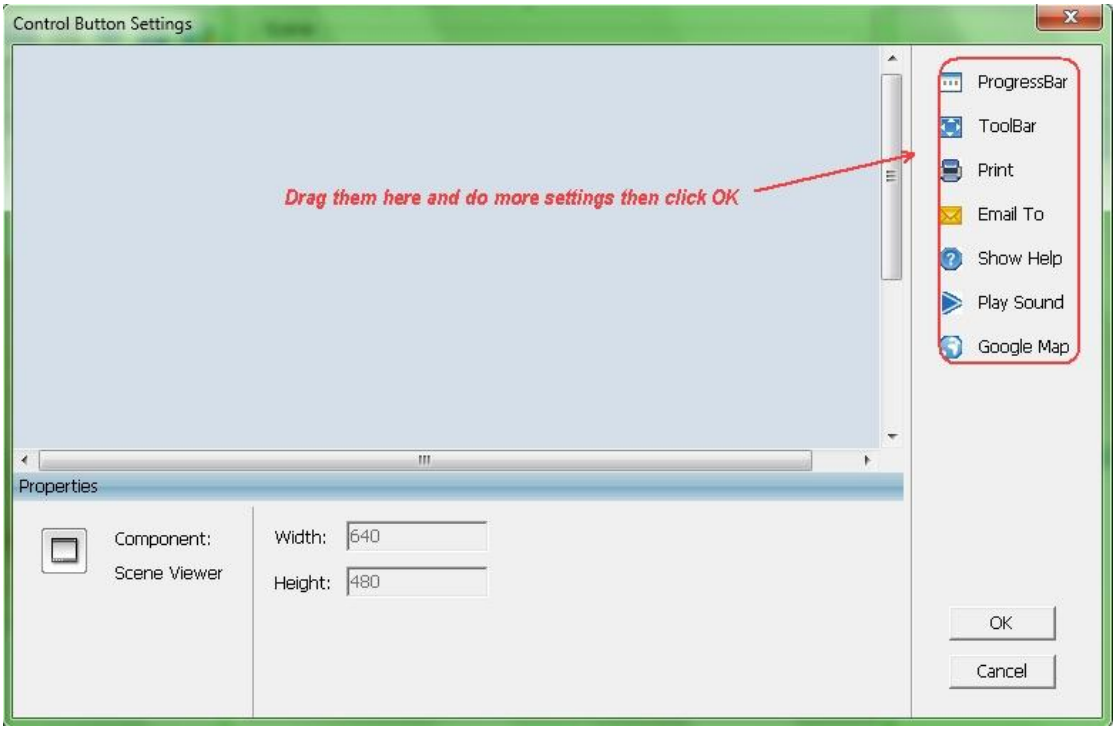
Delete Component

Select a component in scene viewer, and then click Delete.

Set Properties for Components

Set Properties for Progress Bar

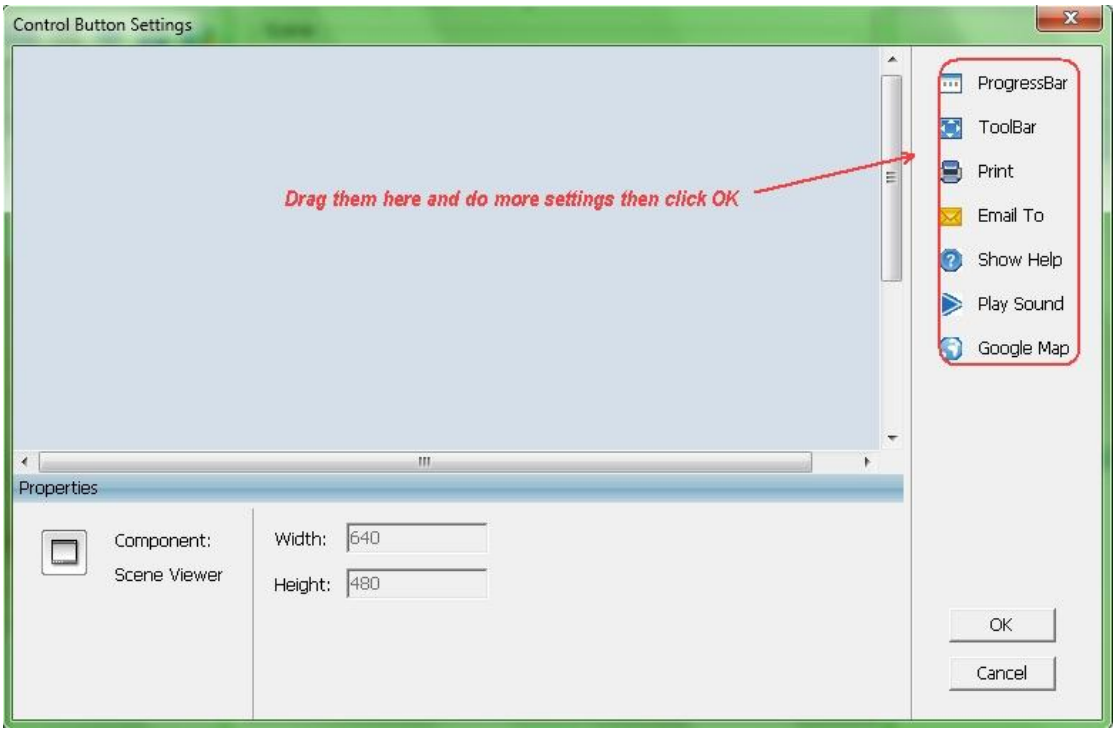
To set progress bar style.



- To set the style of the progress bar
among Standard, Custom (only for pro and batch edition)
among None, Standard in Standard edition (None indicates progress bar and percentage loaded are not displayed; Standard indicates displaying a standard bar and percentage loaded; Custom: You could import a progress bar with .swf format.)
- Display Percentage Loaded: If selected, the progress bar will display the loading percentage, if not selected, the loading percentage won't be displayed.
- Width/Height represents width and height of progress bar.
- Bar Color represents the color of progress bar.
- Container Color represents the color of container.

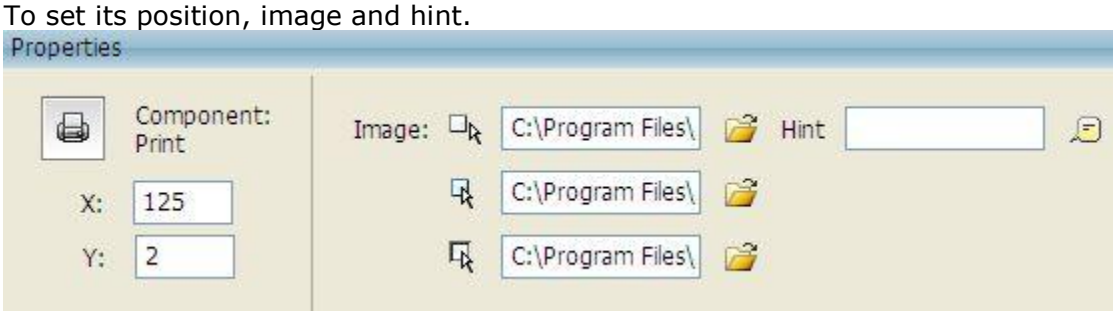
Set Properties for Toolbar

To set its position and import a toolbar style.



Set Properties for Print

To set its position, image and hint.



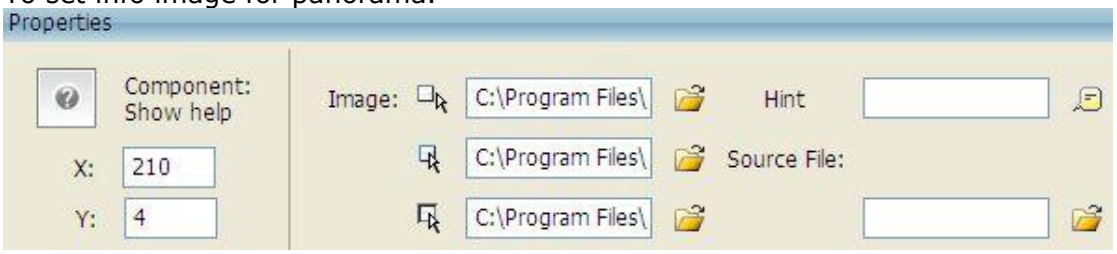
X/Y: To set Print button position or just drag the button in Scene Viewer to adjust its position.

Image: You can also customize the Print button appearance by importing three images for the three states of the button. Each button possesses three states including normal state, over state and down state. When you select xx_1.jpg as the image for normal state, the program will search xx_2.jpg and xx_3.jpg in the same folder automatically; and add them as the images of over state and down state. Therefore you may use the same prename for the three state images like xx_1.jpg, xx_2.jpg and xx_3.jpg to save your time when importing them.

Hint: If you want some hints to appear when putting mouse over the button, you can input the tips here; and you can also customize font, size, color etc.

Set Properties for Show Help

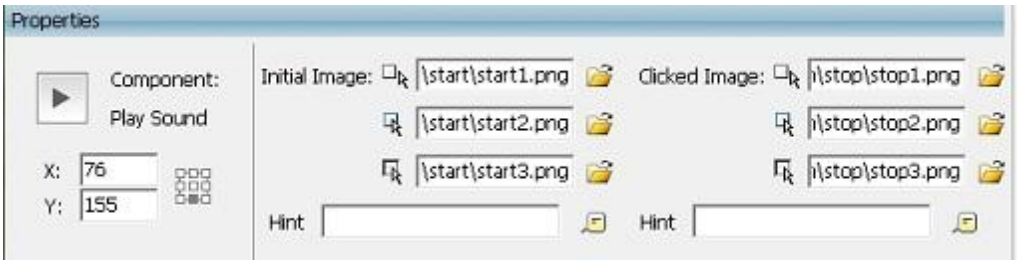
To set info image for panorama.



As to settings for X/Y, Hint, Image, please refer to Print properties setting.

Source File: To import an image file.

Set Properties for Play Sound



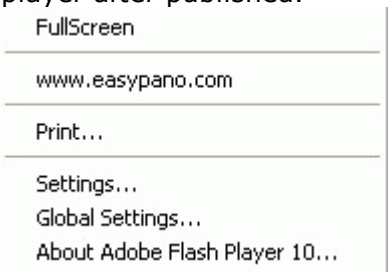
As to X/Y, Hint settings, please refer to Print properties setting.

Image:

Type of Play Sound button is toggle button, so two sets of images are required. You can customize play image and stop image of the button

Background Sound:
Add background sound for the panorama. If Loop is selected, the sound will be always repeated.
Autoplay: to set whether to play sound initially.

Context Menu Website Link: To set URL link on the right click context menu of player after published.



Resized to 50% for non-fullscreen mode:
If selected, the scene viewer will play the panoramic image in reduced size (50% of original panoramic image) in the normal mode compared with the full screen mode. If not selected, the panoramic image played in the scene viewer is of original size both in normal mode and full screen mode.

Slice Display:
Refer to Slice Display in *Easypano Virtual Tour Player* section.

Initial Auto Rotation:
Refer to Initial Auto Rotation in *Easypano Virtual Tour Player* section.

Rotation Speed:
You may set the rotation speed of panoramic image. Default speed is 20 frames/ second.

Click the thumbnail below to view the Flash panorama.

Note: Please download and install the latest version of Flash 9 player if you cannot view the panorama.

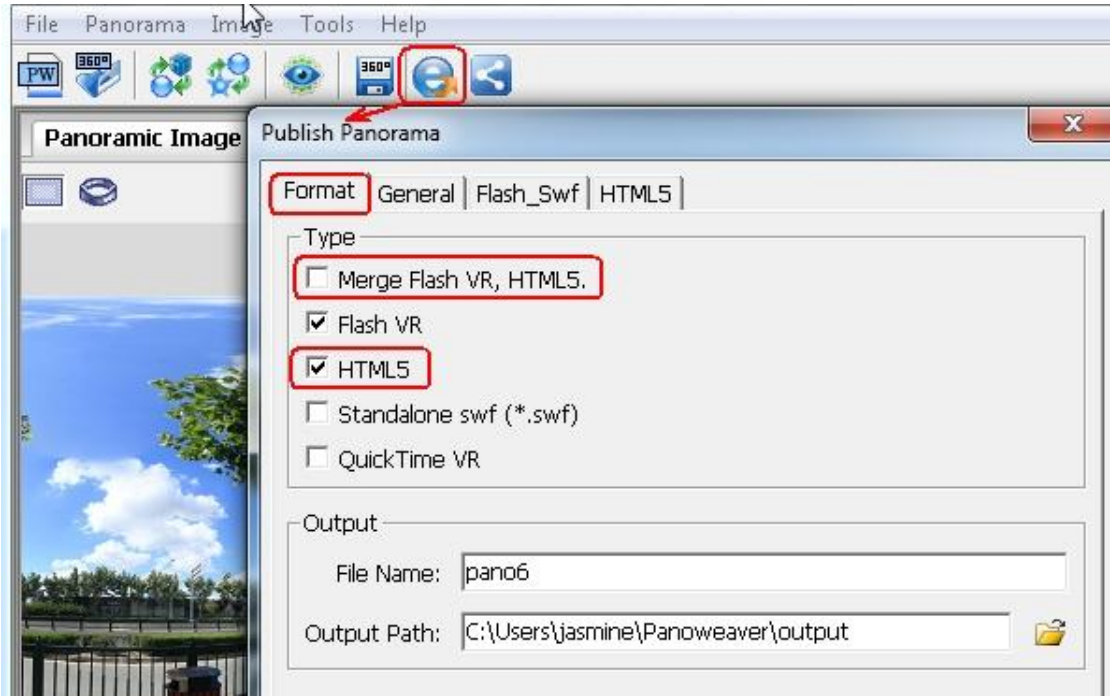
Standalone SWF

As to the settings, please refer to Flash VR

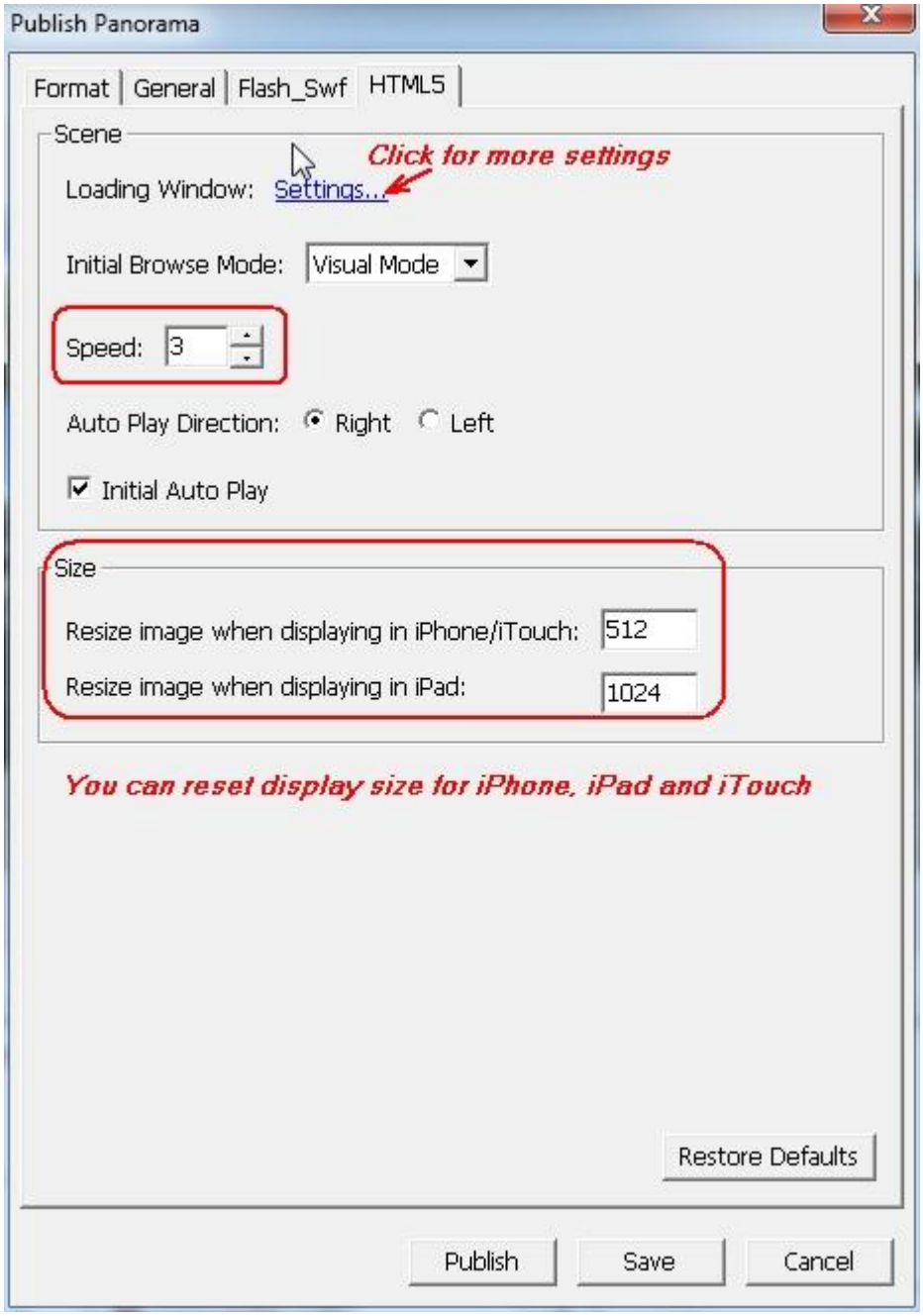
Publish HTML5 tour

You can publish single tour as HTML5 format which people can view it by iPad,iPhone ,iTouch and Safari.

1. Choose "HTML5 "or "Merge Flash VR & HTML5 in the format setting



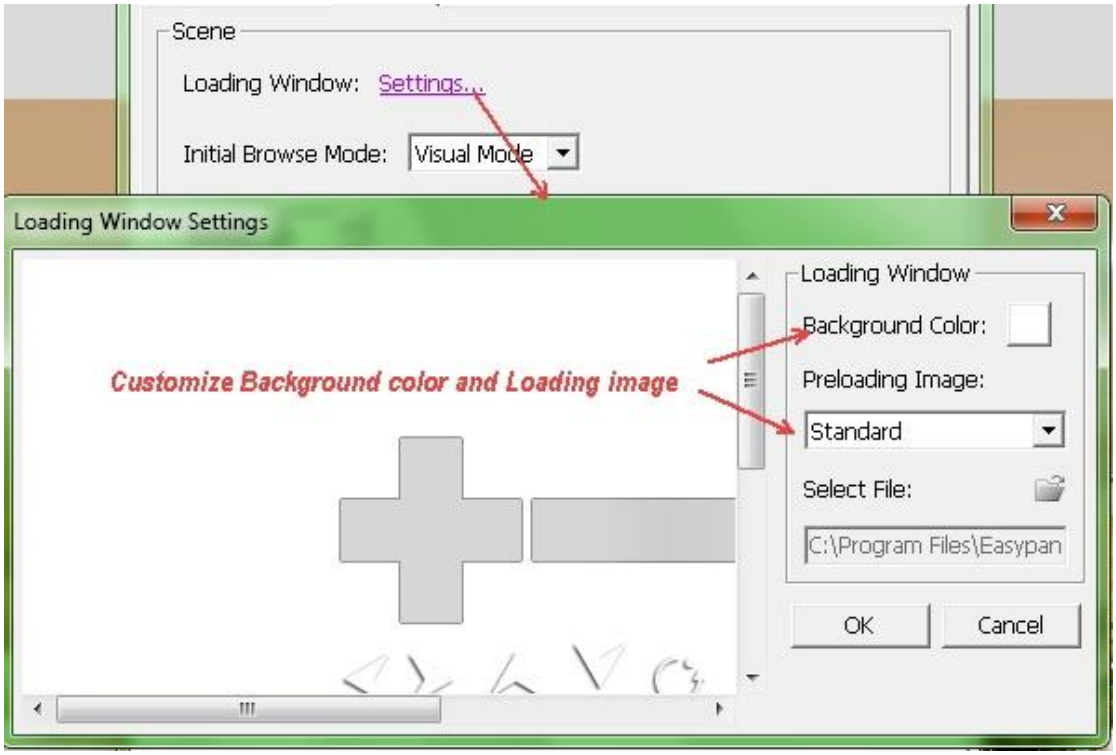
Click "HTML5" for advanced setting:



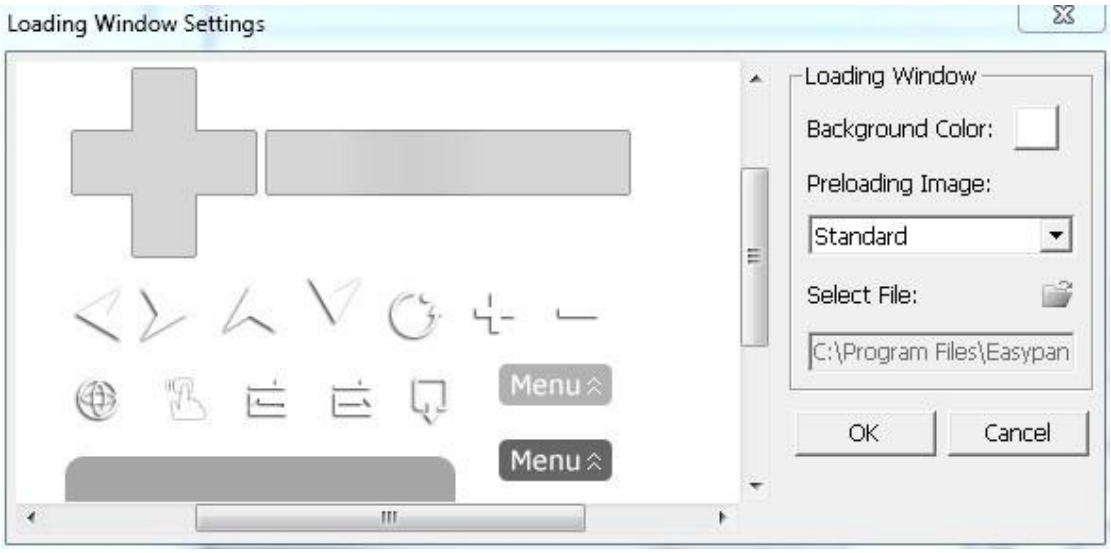
Loading Window: You can set background or pre loading image by this.
Speed : You can set the spin of the rotation .
Size: If you want to people view your tour by different Apple products,you can reset displaying size for iPad,iPhone and iTouch

Loading Window Settings:

You can also do more setting for the Loading Window



Toolbars on Loading Window



Tips: Gyro effect is supported in panoweaver, when you view virtual tour on iPad or iPhone, you can turn on Gyro effect by clicking  button to drive the virtual tour, which makes the virtual tour rotate automatically when your hands move.

Click  to turn off Gyro.

You can also set your drag direction preference by clicking button  (opposite to drag direction) or  (same with drag direction) when viewing published virtual tours.

Quick Time VR

To play your QTVR panorama on start, please tick the check box of *General Setting*.

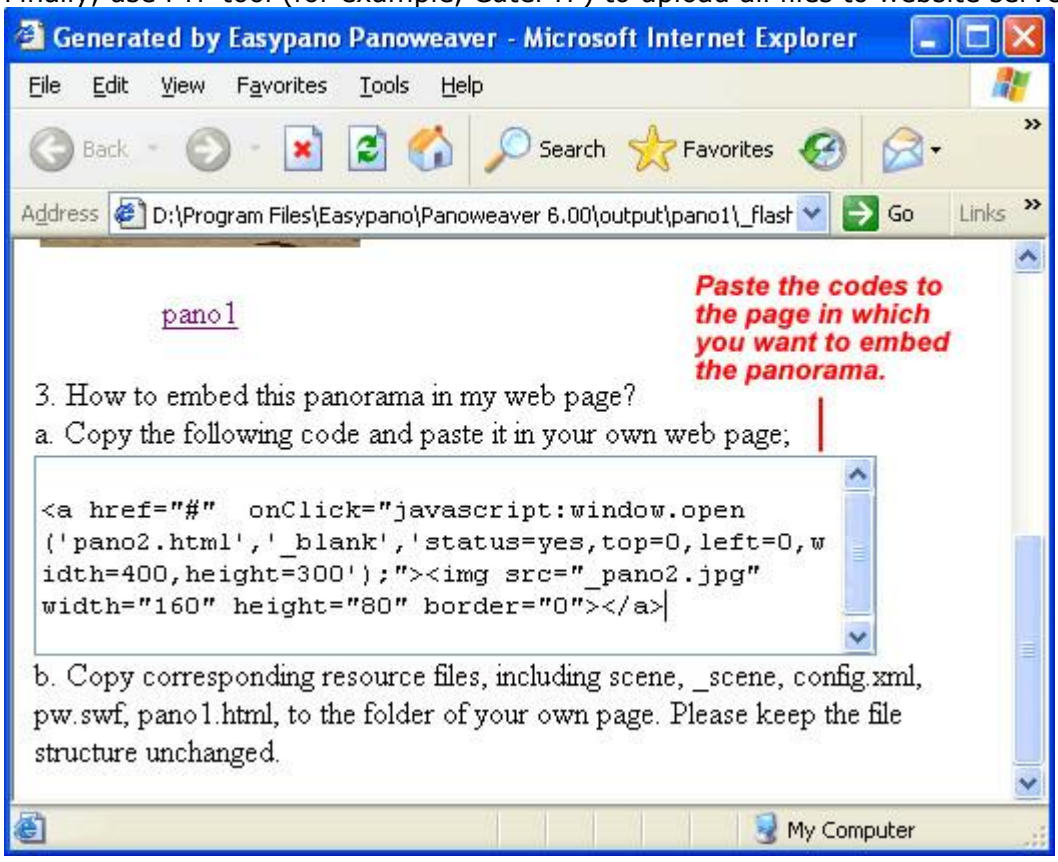
Upload to Website

There are steps to upload panorama to website:

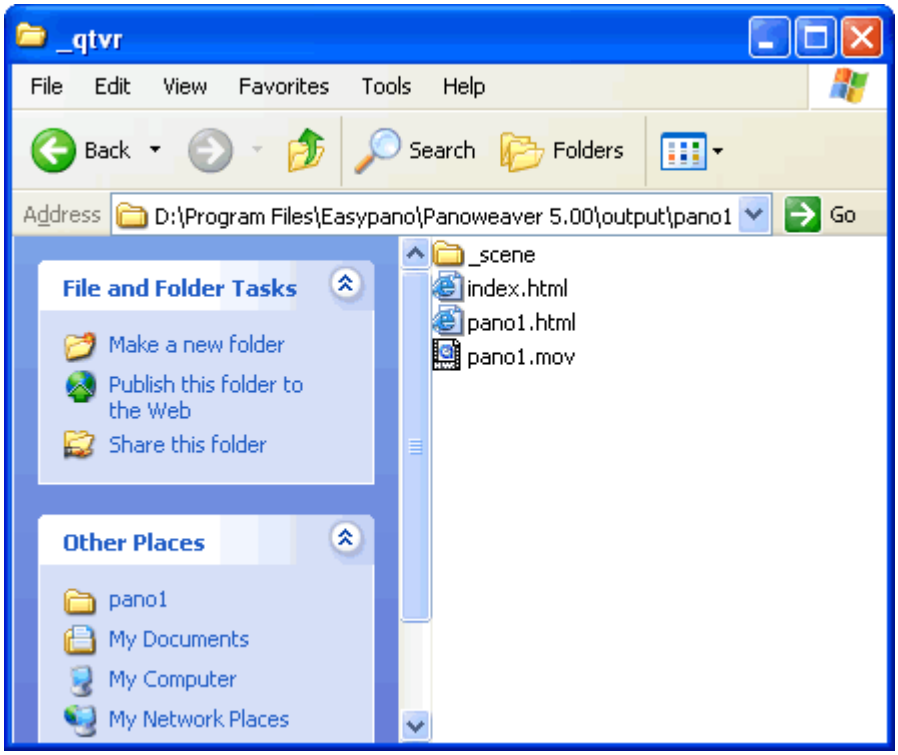
1. Publish panorama into a specified local folder of this site.
2. Upload the published files to the relative destination on your server.

If your website is maintained by others, you have to send the files to them to upload instead.

How to embed panorama into webpage:
Use webpage editing software (for example, Dreamweaver) to open the webpage which you want to embed the panorama, for example, home.html.
Double click to open the published html file index.html. In this html file you will see the steps.
Copy the codes generated in the text area of index.html (see image below), paste them to webpage home.html, and save it to the same folder with all published files.
Finally, use FTP tool (for example, CuteFTP) to upload all files to website server.



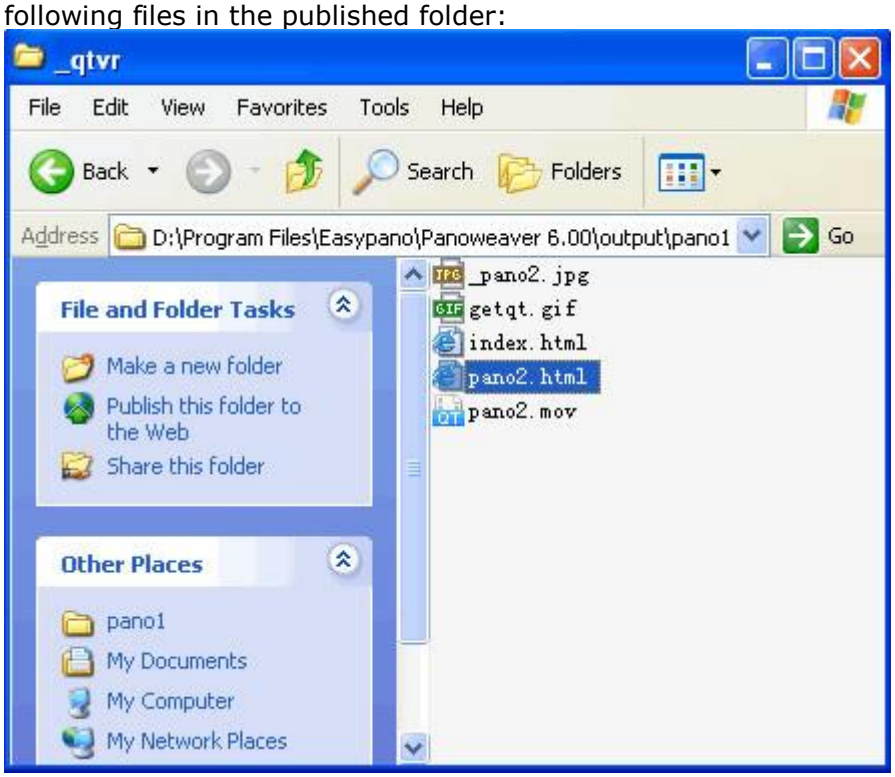
QuickTime VR
Same as Easypano Virtual Tour Player, after you publish panorama as QuickTime VR format, you will find the following files in the published folder:



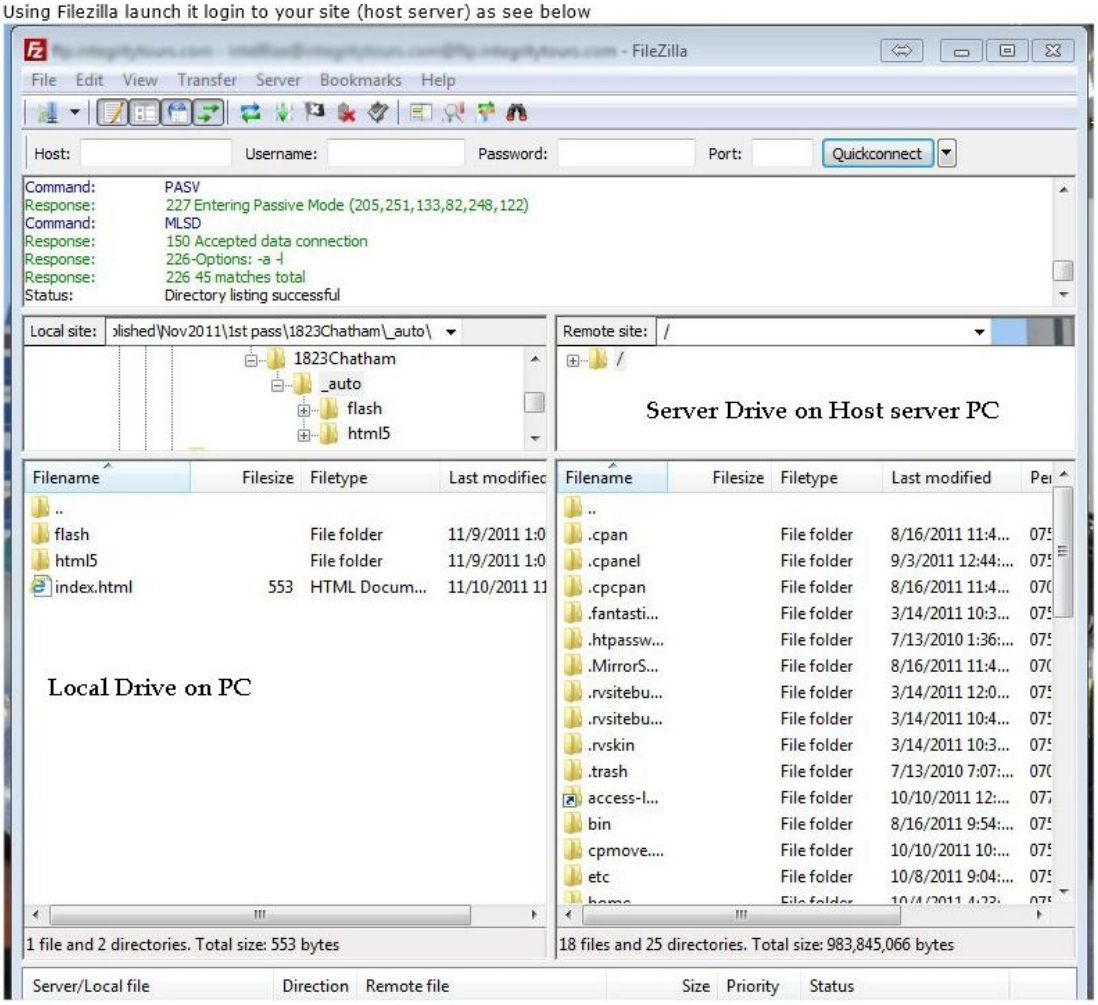
Steps to embed the QTVR panorama into webpage

Flash VR

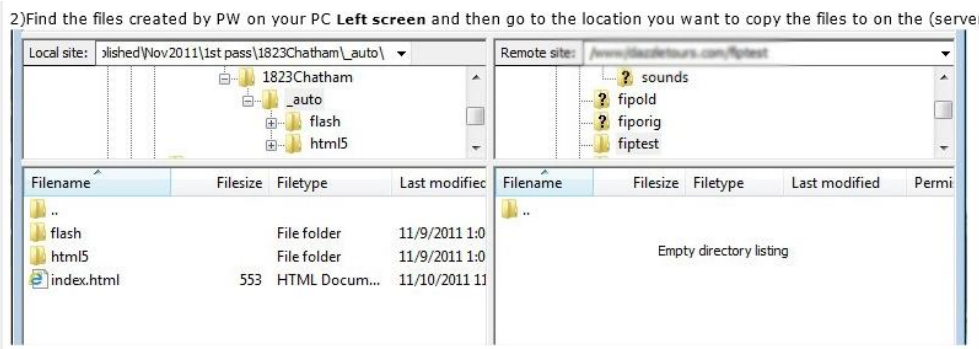
Panoweaver 9 enables you to publish panorama as Flash VR, you will find the following files in the published folder:



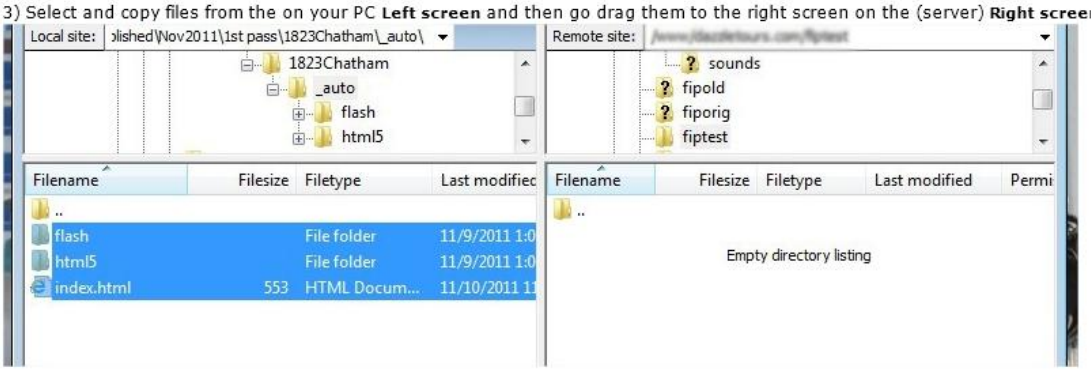
Using Filezilla launch it login to your site (host server) as see below



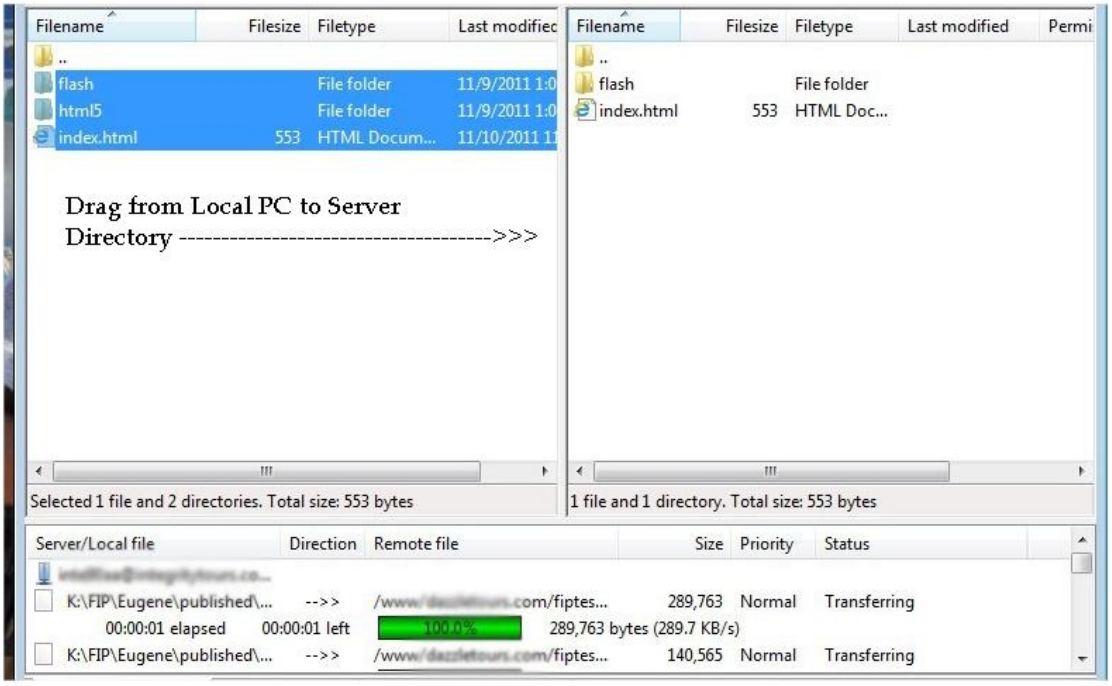
2)Find the files created by PW on your PC **Left screen** and then go to the location you want to copy the files to on the (server) **Right screen**



3) Select and copy files from the on your PC **Left screen** and then go drag them to the right screen on the (server) **Right screen**



4) The your structures is completed and should look somewhat like the following picture below



Steps to embed the Flash VR into webpage

Standard alone SWF

Panoweaver enables you to publish panorama as .swf, use it as other swf files.

Project

You may save unfinished panoramic image as a .pw file(a project) or .pwp with a file folder before quitting Panoweaver. In this way, you can just open the project and resume your work instead of importing fisheye images or adjusting parameters again once you don't finish the work. This function will save much time and energy for you.

Save Project

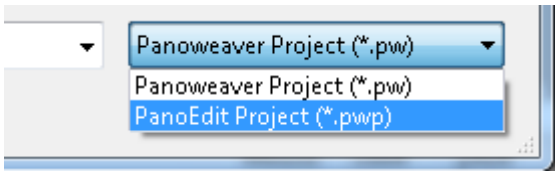
1. Choose *File>Save Project* or click  on toolbar;
2. Enter output path and file name in the pop-up dialog box;
3. Click *OK* to save it as .pw file.

Tips: You may save project as .pwp file which contains parameters you set on *Ceiling/Floor, Hotspots, Mask, and* Panoramas.

Import Project

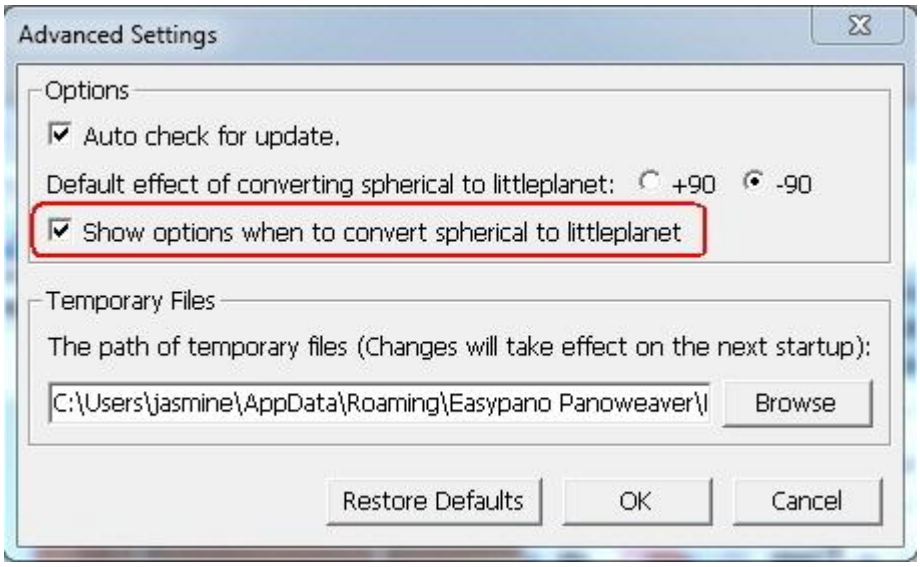
To open a project or project file folder:

- Select at *File>Open Project* and choose a .pw file, or click  on toolbar;
- Or open a .pwp file linked with panorama parameters show as below:



Advanced Settings

Select *Tools>Advanced Settings*, and Advanced Settings dialog box will pop up. You are able to set general parameters and apply Smartblend plugin.



Auto check for update:
If you check this item, program will automatically check for update information and remind you to update Panoweaver once Easypano release minor or major update or upgrade.

Default effect of converting spherical to littlePlanet:
If you choose +90, the view angle is from top to bottom, While choosing -90, the view angle is from bottom to top.

Show options when to convert spherical to little planet
If you check this item, the little planet converting option window will popup every time when you convert spherical panorama to little planet.

Temporary Files
Users are allowed to customize temporary files save path.

Blender: (support in later version of PW900)
Blender determines which application will be used for *blending (Blending is the process of merging the warped source images into a single panoramic image)* and attempts to create a seamless overlap between images. Panoweaver includes its

own blender-**PWBlend**, which is sufficient for nearly every panorama. Additionally, the other blending plugin is supported as well: **SmartBlend**.

Set SmartBlend plugin in the popup window by clicking on button "Browse" . You could use *SmartBlend (Smartblend is an application for seamless image blending. Main goal of smartblend is panoramic image blending, but it can be used for others, for example seamless texture creation, montage of photos, collage. Smartblend allow stitching many of "problem" shots (paralaxed, with moving objects or exposure difference). And the function of the smartblend plugin is to allow the client who requires the blending of Smartblend to stitch images or panoramas using it as a plugin. For more information, please visit http://smartblend.panotools.info)* as a plugin for stitching in this section. For more info regarding the blending plugin, please visit http://www.easypano.com/showkb_285.html.

Get HDR Image

Get HDR Image

Type of digital support	Bit depth per color channel	Bit depth per pixel	Maximum dynamic Range	Note
JPEG or 8-bit TIFF	8	24	255:1	$256=2^8$
12-bit CCD	12	36	4,096:1	
14-bit CCD	14	42	16,384:1	
16-bit TIFF	16	48	65,536:1	"Real" maximum limited by dynamic range of capturing device
HDR image (e.g. Radiance RGBE format)	32	96	infinite	"Real" maximum limited by the captured dynamic range

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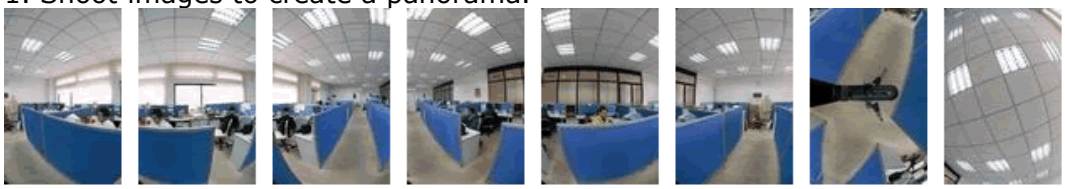
Why to use HDR Image

When you take a picture inside of a room, the bright windows always get dazzling white since the camera and display are simply incapable of displaying the luminosities in the real world. While HDR images captures wider color range, which helps photographers get better images, solving the over exposure and under exposure problem in photography, especially digital photography. For some users, they can save the 32 bit HDR as well and make some further editing.

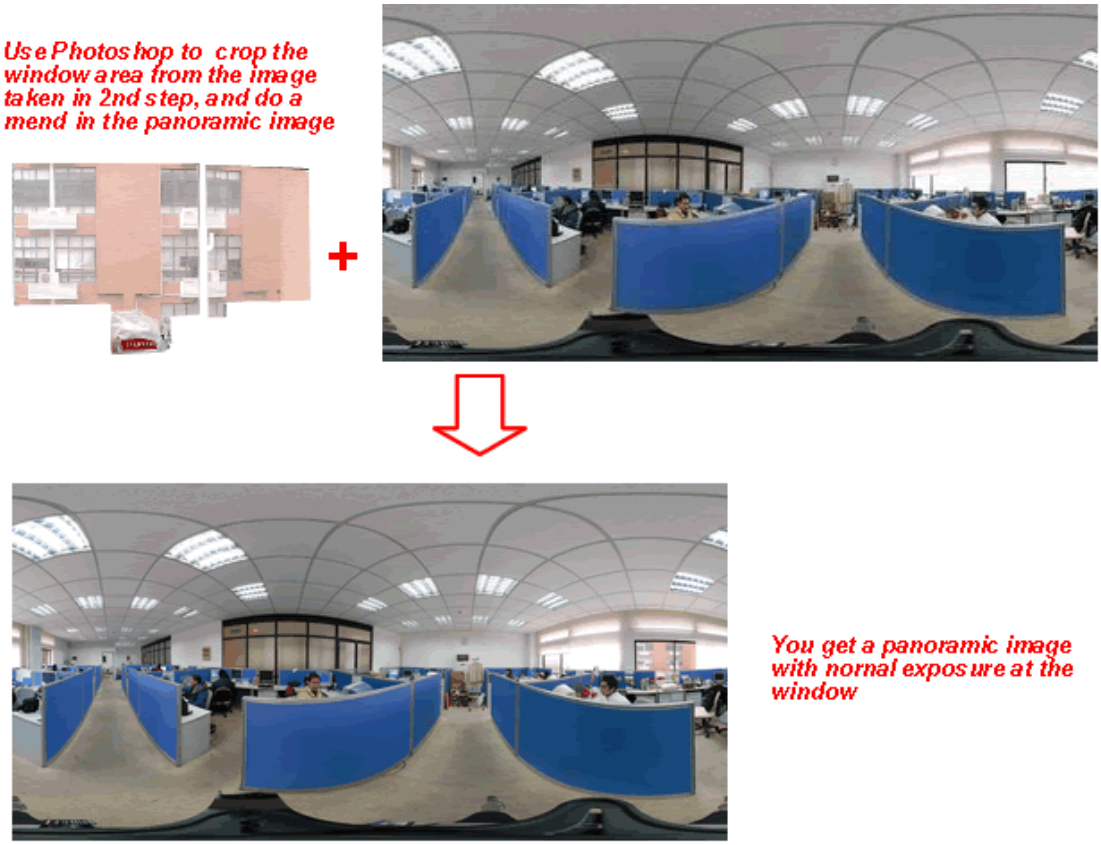
Let's see the traditional troublesome way to solve the over/ under exposure problem first.

1. Shoot images to create a panorama.



2. Take an extra image in the direction of the over exposure window at an appropriate EV which allows users to see the window through clearly.

3. Use Photoshop to take out the window area and make a mend in the panoramic image got in 1st step. After all the heavy work, then you will get a panoramic image of good result. See below.



You have to spend hours for every panoramic image with the method above. While with HDR, you can get a good result image without troublesome work. Panoweaver automatically makes an HDR image, which stores wider luminosity range than that can be displayed. You can simply adjust on the HDR image in the software and get a perfect image quickly. Below is an image converted directly from HDR without any other editing work. Please refer to How to Get HDR Image for details of generating HDR with Panoweaver 7.00.

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How to get HDR panoramic image with Panoweaver 9 ?

There are two methods. One is to import Camera Raw file and to stitch it into 16 bit panoramic image. The other is to get HDR image from bracket exposure, that

is, to shoot several groups of images of the same object with different exposure value, batch stitch them and then combine them to get HDR image.

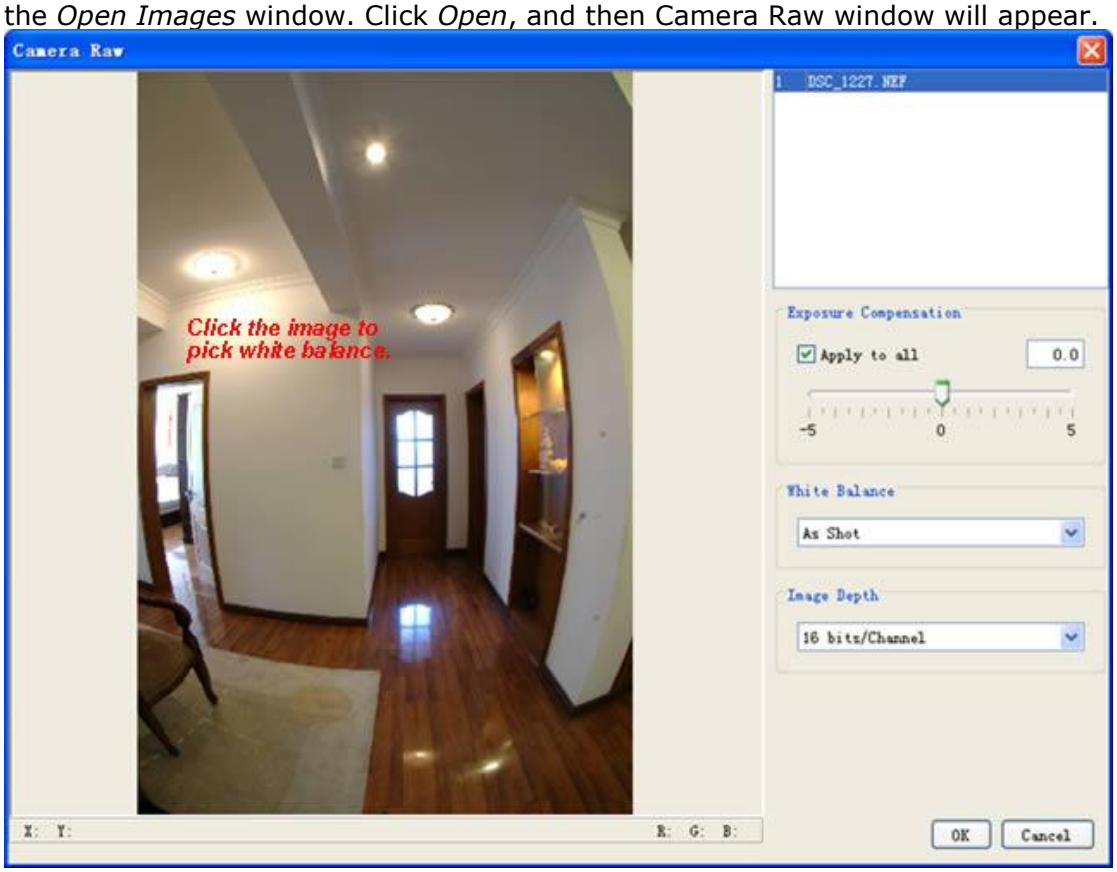
Get HDR Image from Camera Raw File

About Camera Raw

In addition to JPEG, TIFF, digital camera can also save picture as *Camera Raw file (Raw is not a kind of image format, accurately speaking, it is the record of original information generated when CCD captures picture)*. Camera Raw has not been processed in any form and it has to be converted into common format, for instance, TIFF, to edit. Camera Raw contains the highest quality information when CCD captures picture. Panoweaver allows users to import Camera Raw to get high quality panoramic image.

Steps:

1. Choose *File>New Project or*  on toolbar, set file format as Camera Raw in the *Open Images* window. Click *Open*, and then Camera Raw window will appear.



2. Adjust *Exposure Compensation* and *Gamma* to a satisfactory value, select "16bits/channel" in *Image Depth*, and then click *OK*.

3. Choose *Panorama>Stitch* or click  on toolbar to stitch fisheye image.

4. Click *File>Save Panoramic Image* to save it as 16-bit tiff format.

5. Panoweaver 9 does not support publishing of 16 bit images. You must convert it into 8 bit image before publishing. *HDR to LDR* option will assist you to convert the image. Choose *Image>HDR to LDR*, the program will convert it automatically.

Note: 8 bit images show "24b" in status bar, and 16 bit images show 48b.

Source Image	DSC_1227.jpg	2000 * 3008 * 24b
Source Image	DSC_1228.NEF	3039 * 2014 * 48b

Get HDR Image from Bracket Exposure

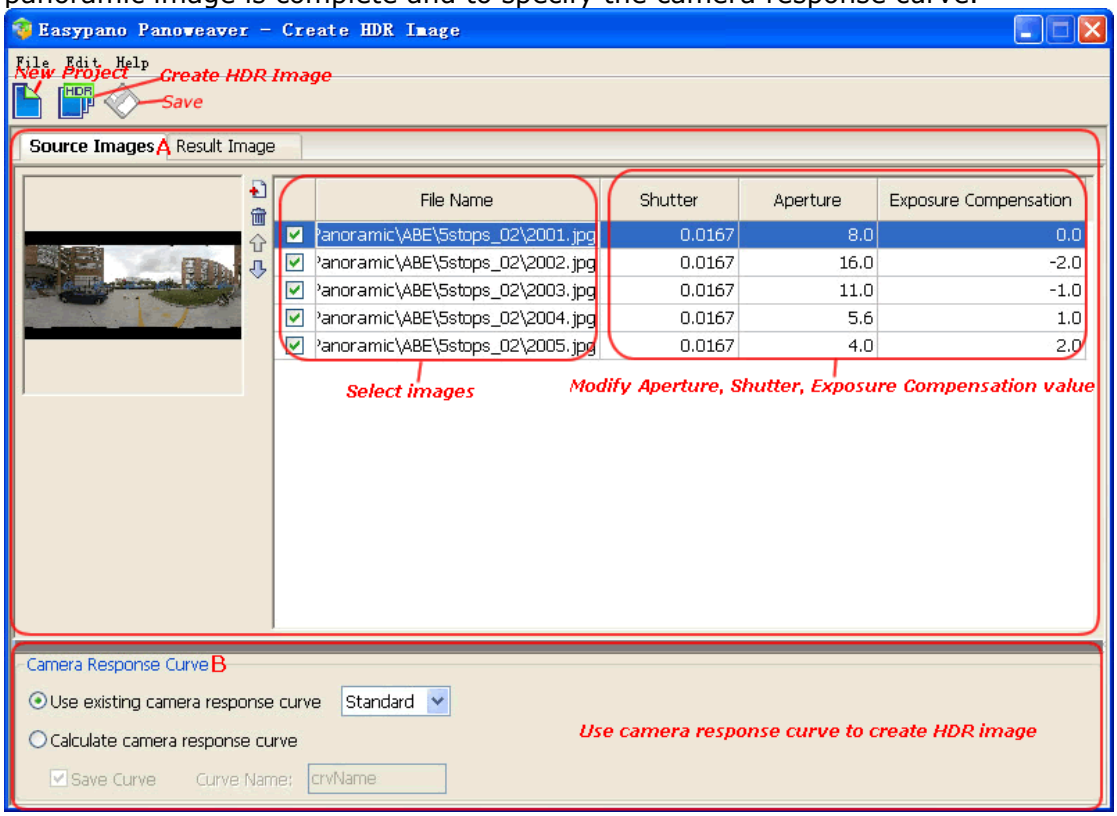
Bracket Exposure (The term bracketing usually refers to exposure bracketing: the photographer chooses to take one picture at a given exposure, one or two brighter, and one or two darker, in order to select the most satisfactory image. Many professional and advanced amateur cameras, including digital cameras, can automatically shoot a bracketed series of pictures. Exposure bracketing is indicated when dealing with high-contrast subjects and/or media with limited dynamic range, such as transparency film or CCD sensors in many digital cameras.)
When camera's auto metering system cannot calculate Exposure Value (EV) correctly, you may shoot several images (3 images are recommended). Set a "camera estimated" correct exposure value 0 EV and take the first image. Then take a second and third image at +2EV (over exposed) and -2EV (underexposed). From these images you may choose one with the best exposure effect. Panoweaver 9 just takes advantage of the bracket exposure. At each direction, you may shoot several images with predefined exposure values, and then place images with the same exposure value into the same group to stitch them; finally, you may combine the stitched panoramic images to create HDR images.
Basic Steps with Panoweaver Professional Edition
How to combine the generated panoramic images into an HDR Image
Combine multiple groups of images with multiple stops into an HDR Image

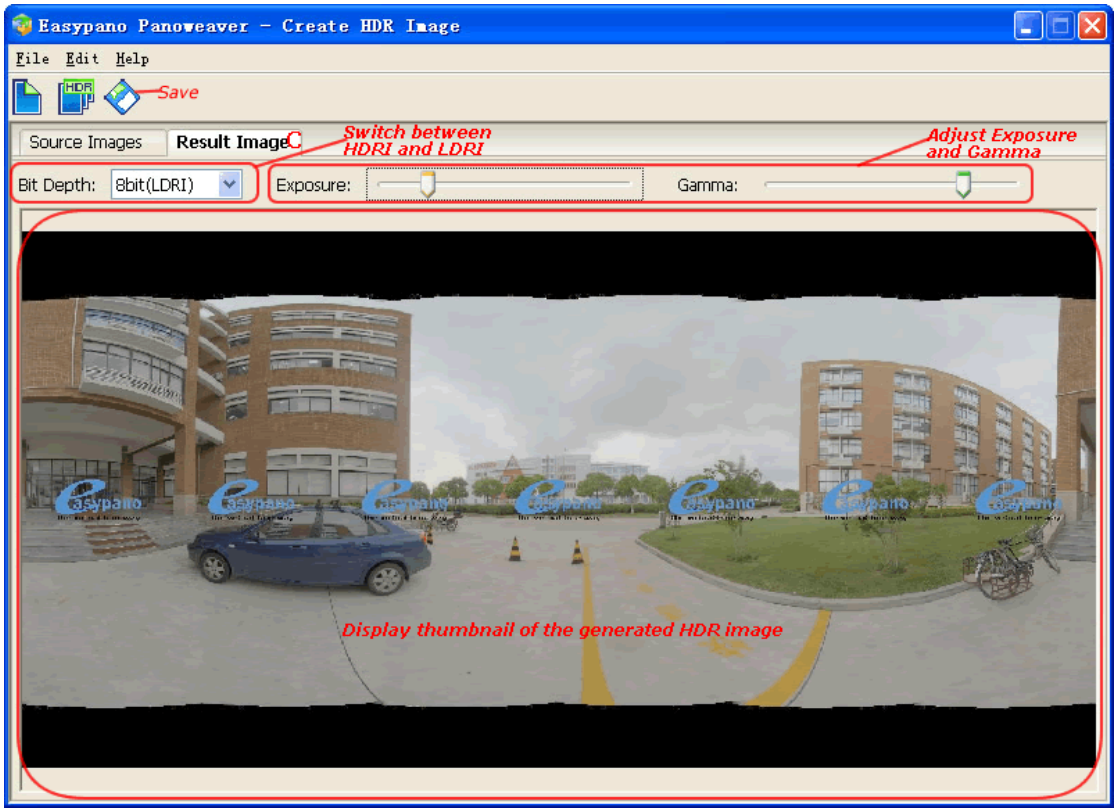
Basic Steps with Panoweaver Professional Edition

1. Shoot several groups of image (e.g. three groups) with three stops. Import each group of images into Panoweaver 9 pro and stitch to get three panoramic images.
2. Access *Tools>Create HDR Image* to execute the .exe program, or access *Start* menu: *Start>Programs>Easypano>Panoweaver 9 Professional Edition>Create HDR Image,* then the *Create HDR Image* window will pop up.
3. Import the three panoramic images into *Create HDR Image* window and click to create an HDR image. Refer to How to combine the generated panoramic images into an HDR Image for the details.

How to combine the generated panoramic images into an HDR Image

After stitching each group of images, click on *Create HDR Image*, a window will pop up. Before combining, you need to check if *EXIF* information of each panoramic image is complete and to specify the camera response curve.





A: Source Images: select the images first and check the EXIF info before combining (Images formats like *. jpeg; *. jpg; *. tiff; *. tif; *. png; *. bmp are supported).

B: Camera Response Curve: specify the camera response curve for generating an HDR image.
C: Result Image: edit or save the generated HDR image.

A: Source Images

- Select a file in File name to preview the image at the left side. The selected images will be combined into an HDR image.
- You may view and modify aperture, shutter and exposure compensation value in *Create HDRI* window.

How to Edit EXIF information?

Click table cell and the figure will become editable. You may enter a value directly or click the arrow of the drop down list to select one.

Note: File name (image name) cannot be edited. Images in the same group should have the same parameters.

B: Camera Response Curve

You have to select or generate one *camera response curve (Camera response curve refers to light inductor's response to light with different intensity)* before stitching HDR image.

- If you select **Use existing camera response curve**, please use the specified value in drop down list to stitch HDR image.
- If you select **Calculate camera response curve**, the system will calculate curve value before creating HDR image.
- You may save this curve value by selecting **Save Curve** and specify its name in **Curve Name**. Once the curve value is saved, next time you may use it directly from the drop down list below **Use existing camera response curve**. The curver value can be saved to a file with extension .crv.

C: Result Image

- After the process finishes, thumbnail of the HDR image will appear under the Result Image tag, with ratio 2:1.
- Switch between 32bit (HDRI) and 8bit (LDRI) under **Bit Depth**.
- Adjust **Exposure** and **Gamma** by moving sliders after tone mapping.
- You may save the HDR to local by clicking **Save** icon. Select 32bit (HDRI) from the Combobox, then click **Save**. You may also select 8bit (LDRI) option to convert HDRI to LDRI then save it. A dialog will pop up after clicking **Save**, please refer to Save Panoramic Image for the details.

Tip: To combine panoramic images of different exposure value together to create an HDR image, access *Start>Programs>Easypano>Panoweaver 9 Professional Edition>Create HDR Image* to open the *Create HDR Image* window, then load the images directly by clicking *New* icon, finally click to create an HDR image.

How to combine multiple groups of images with multiple stops into an HDR Image

1. Open *Create HDR Image* window, access *Tools>Batch Fusion.* Then Batch Fusion window will pop up, import multiple groups of images with multiple stops

(e.g. 3 stops), select the corresponding stops, set output format and output path, then click OK. Then three HDR images will be generated.

Tip: By accessing *Tools>Memory Settings,* you could set memory size which is used when creating HDR image (ranging from 512M to 2048).
2. Start Panoweaver program, import the three HDR images to Panoweaver.
3. Stitch the three images into one HDR panoramic image.

Top

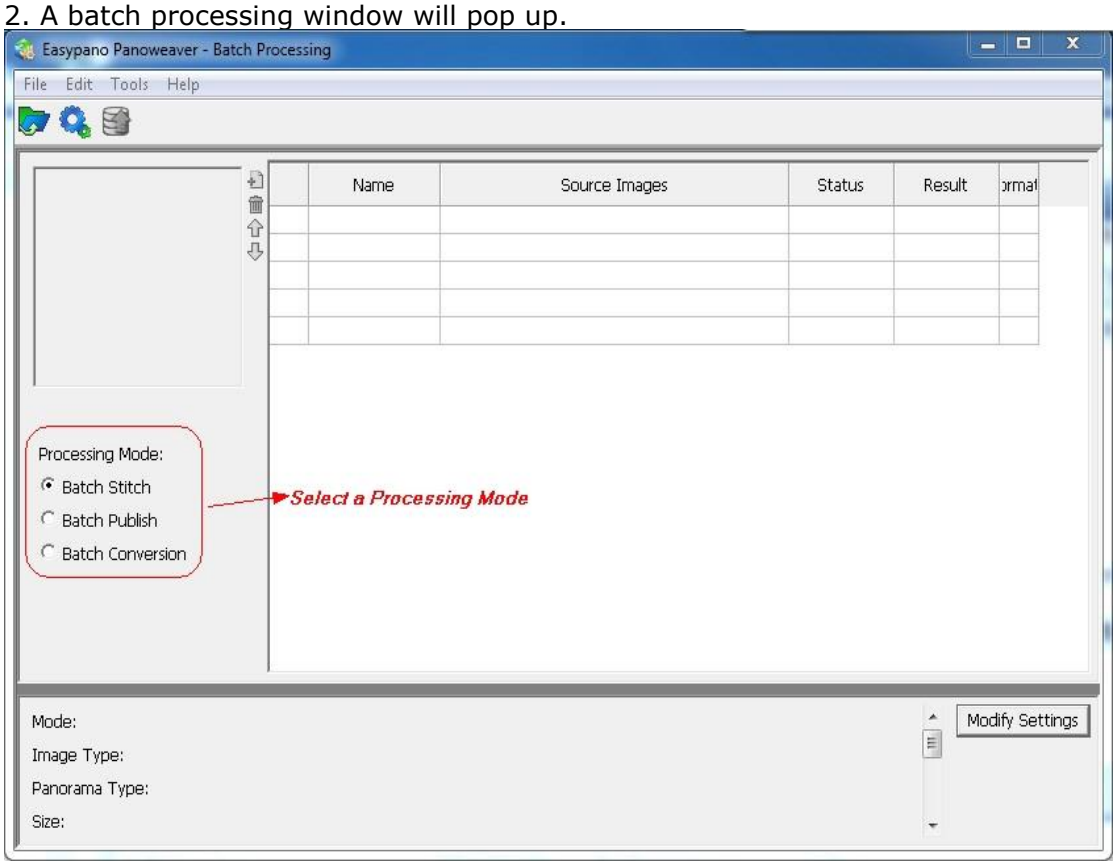
Batch Processing Panoramas

Basic Steps of Batch Processing

Batch Processing includes Batch Stitch, Batch Publish and Batch Spherical/Cubic Conversion.

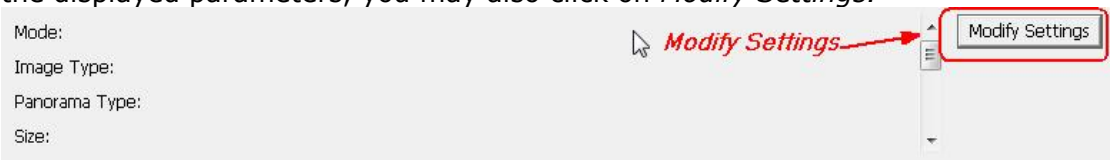
Basic Steps:

1. Start *Panoweaver >Tool>Batch Processing* or click the *Panoweaver Batch processing* icon on your desktop .
2. A batch processing window will pop up.

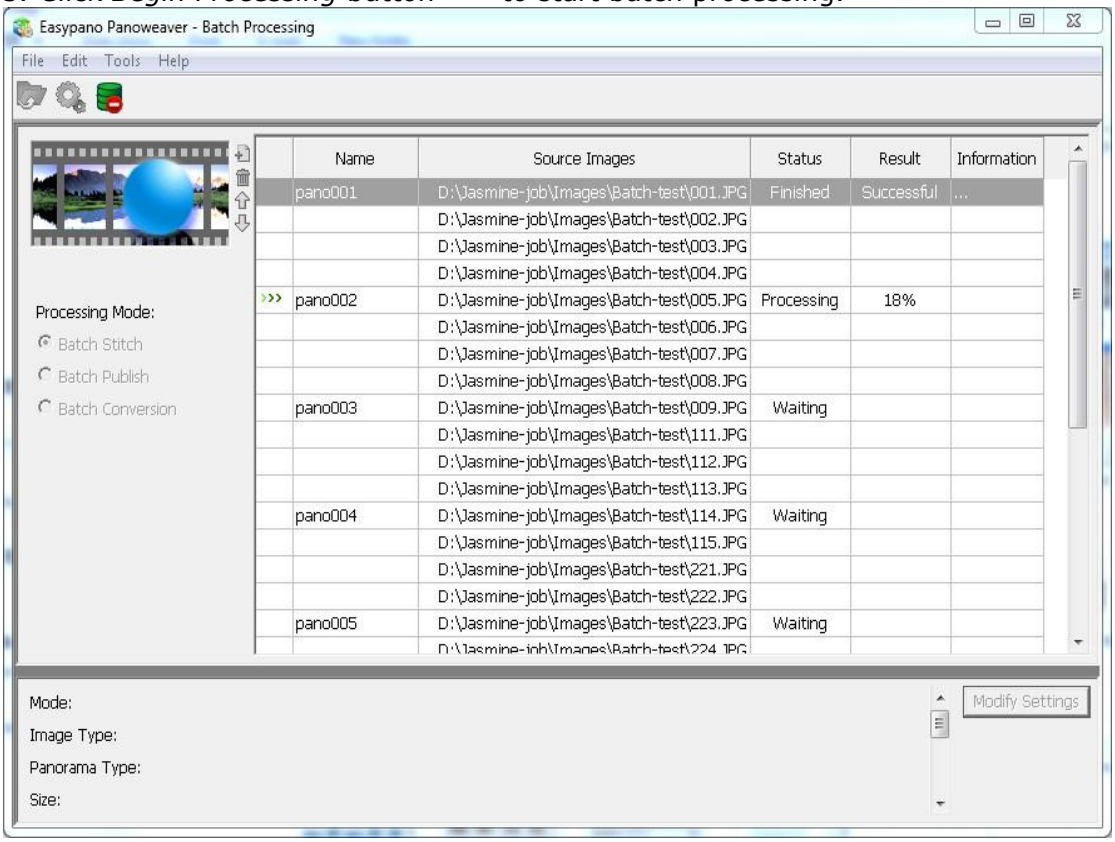


3. Select a processing mode, the default mode is *Batch Stitch*. Then Click on *Import Images* button to import images.

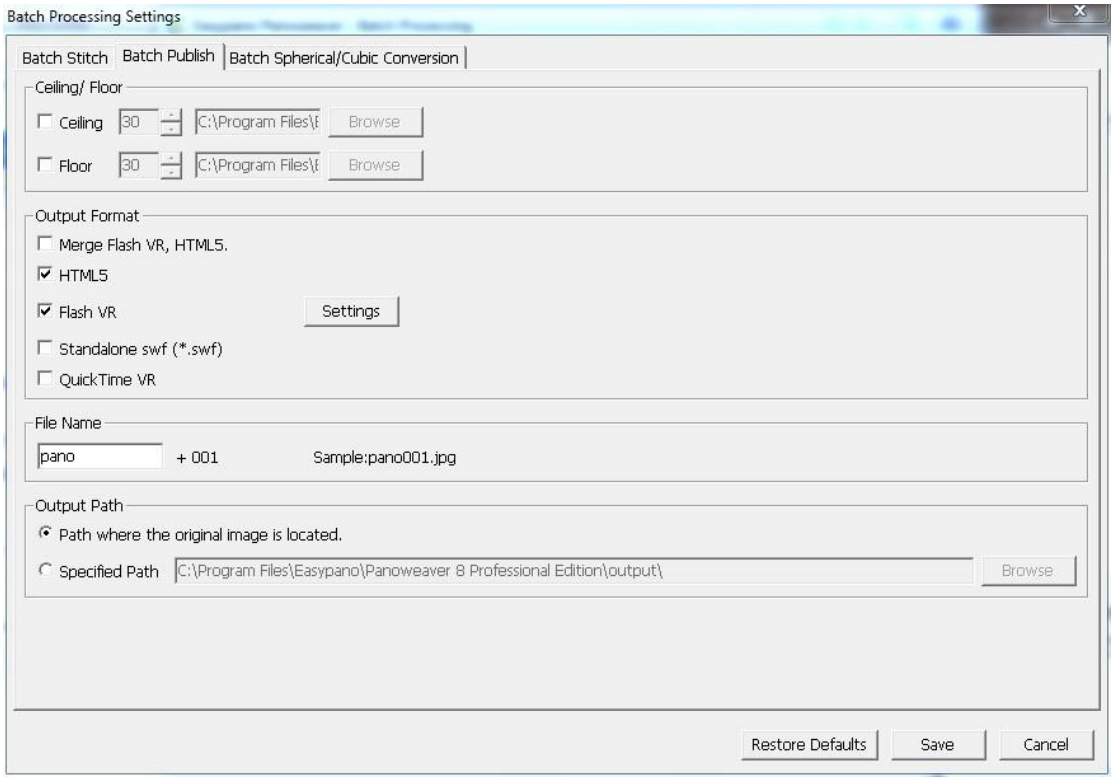
4. Click *Batch Setting* button to customize each parameters. At the bottom of program interface, the parameters items will display. If you want to change the displayed parameters, you may also click on *Modify Settings.*



5. Click *Begin Processing* button to start batch processing.



6. Click *Modify Settings* or *Batch publish* after batch stitch completes, make settings under *batch publish Panel* to batch publish the generated panoramic images.



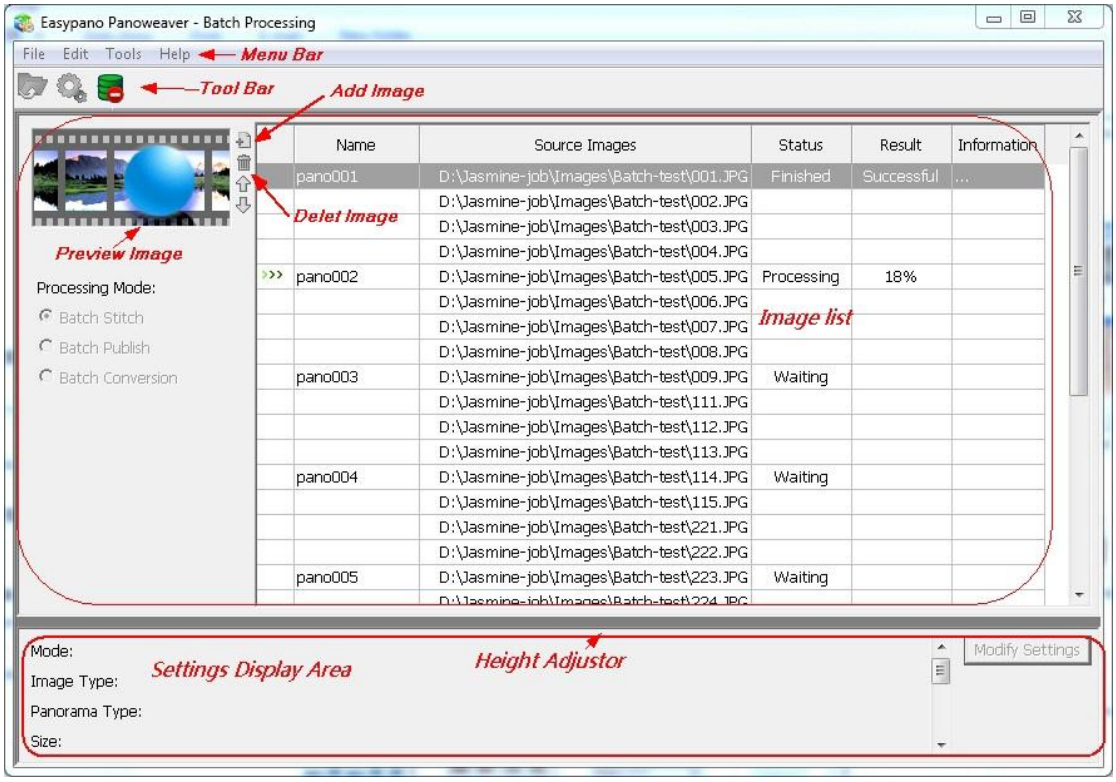
Tips: More details about Batch Processing and Batch Stitching, refers to Batch Processing and Batch Stitching

Batch Stitching

Batch stitching is available in Panoweaver Professional Edition. If you want to stitch several groups of images of the same type quickly, choose *Start> Program> Easypano> Panoweaver Professional Edition>Tool> Batch Processing* to select *Batch Stitch* or click *Batch Processing* icon on desktop to make settings, then Panoweaver will complete all work for you automatically according to your settings.

Note: Support up to 300 sets of images batch stitching.

Basic steps of batch stitching:
1. Import multiple images.
2. Choose *Image Type* that will be used to stitch panoramas.
3. Click *Begin Processing* to start batch stitching.



Import Images: Click the button to import images.

Modify Settings: click the button to modify batch setting.

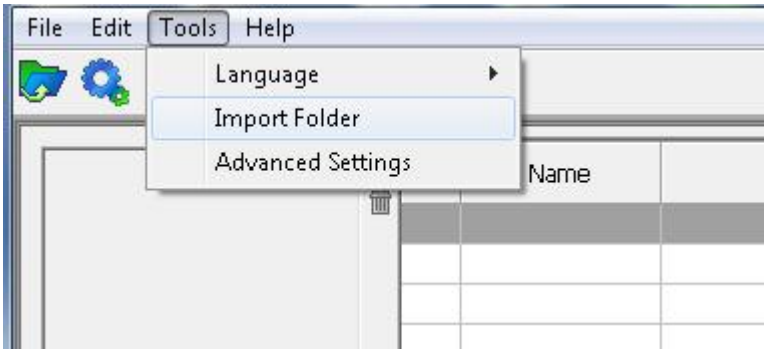
Begin Processing: click the button to begin processing.

Cancel Processing: Click the button to cancel processing.

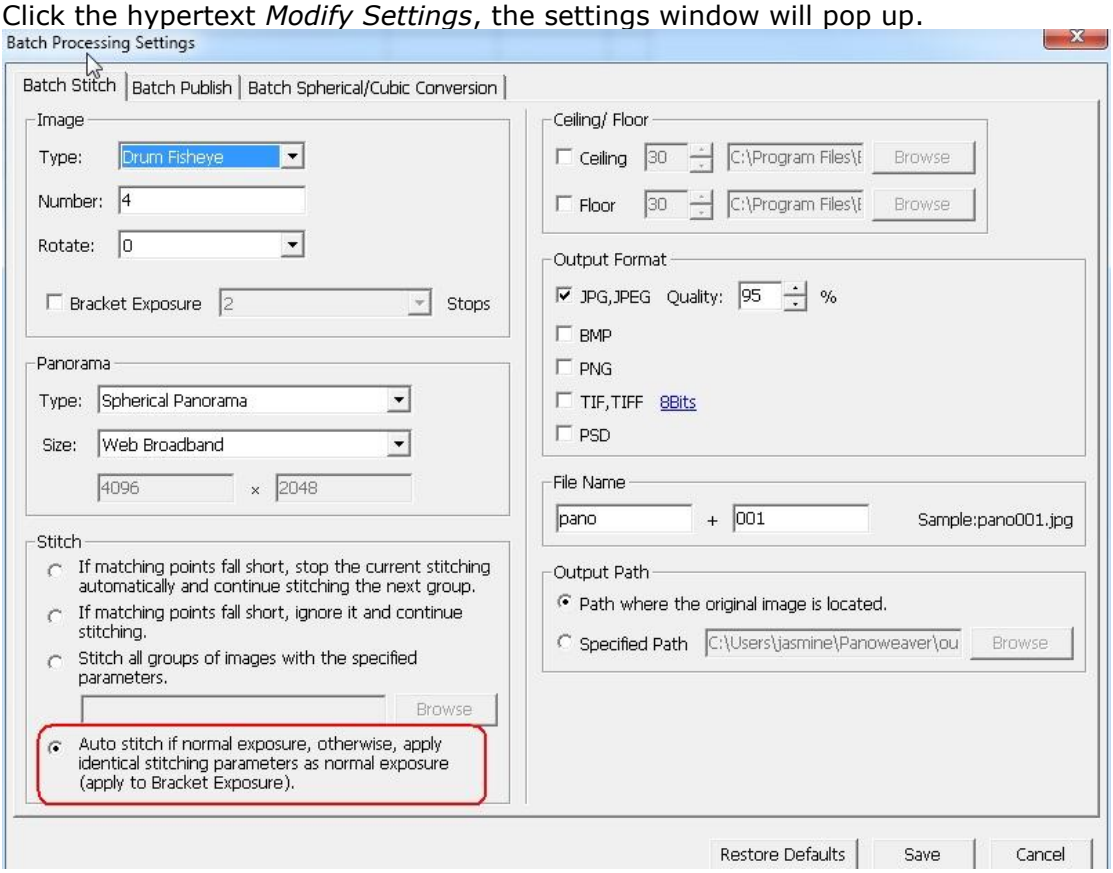
To select a processing mode for stitching, and make settings to each mode.

Tip: If the imported source images are fisheye images including *Full Circular Fisheye Image*, *Drum Fisheye Image*, and *Full Frame Fisheye Image*, select a image type to create spherical or cylindrical panoramas. To convert from cubic panorama to spherical one or vice versa, select *Batch Spherical/Cubic Conversion*. To batch publish panorama, refer to Publish Panorama.

Tip: You may also import images folder to facilitate your images editing process. Click *Tools>Import Folder* to select a source image folder. Show as image below.



Click the hypertext *Modify Settings*, the settings window will pop up.



Note: If check the last item of *Stitch* (show as above), the bracket exposure images will stitch with the normal exposure image stitching parameters.

As to the settings made to Image Type, Panorama Type, Stitch, Blender, Ceiling/Floor, Output Format, File Name and Output Path, please refer to Stitch Panoramic Image. Make your own settings if necessary.

Panorama Size:
Web Dialup--1,000,000 pixels by default
Web Broadband--8,000,000 pixels by default
CD--20,000,000 pixels by default
Print--30,000,000 pixels by default
Custom--It is allowed to customize the pixels

File Name: How to name a file?

Item 1+ Item 2
File name of the first image in each group
User-defined

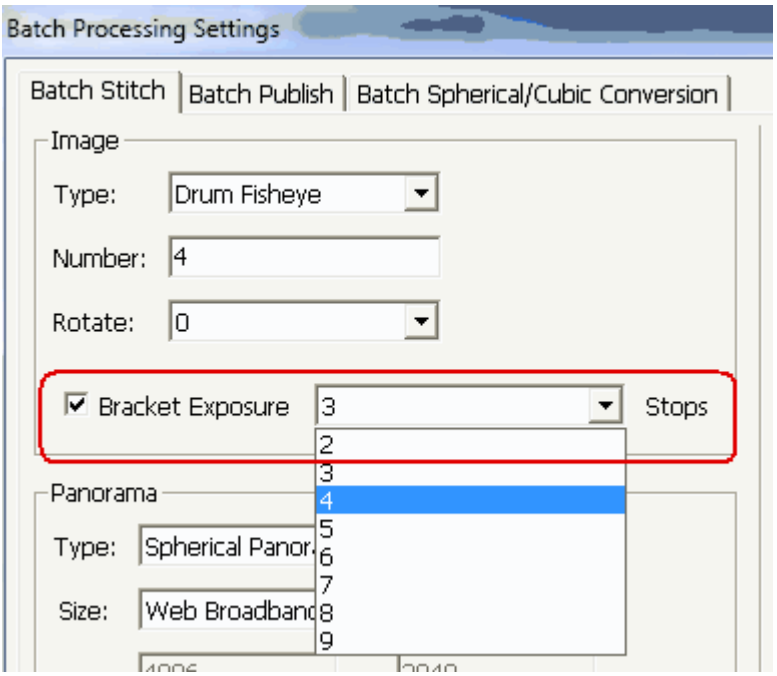
Tip: After the batch stitching finishes, you can get a HDR panoramic image with the generated panoramic images. For details about how to create HDR, please refer to How to combine the generated panoramic images into an HDR Image.

Basic Steps with Panoweaver Batch Processing Settings

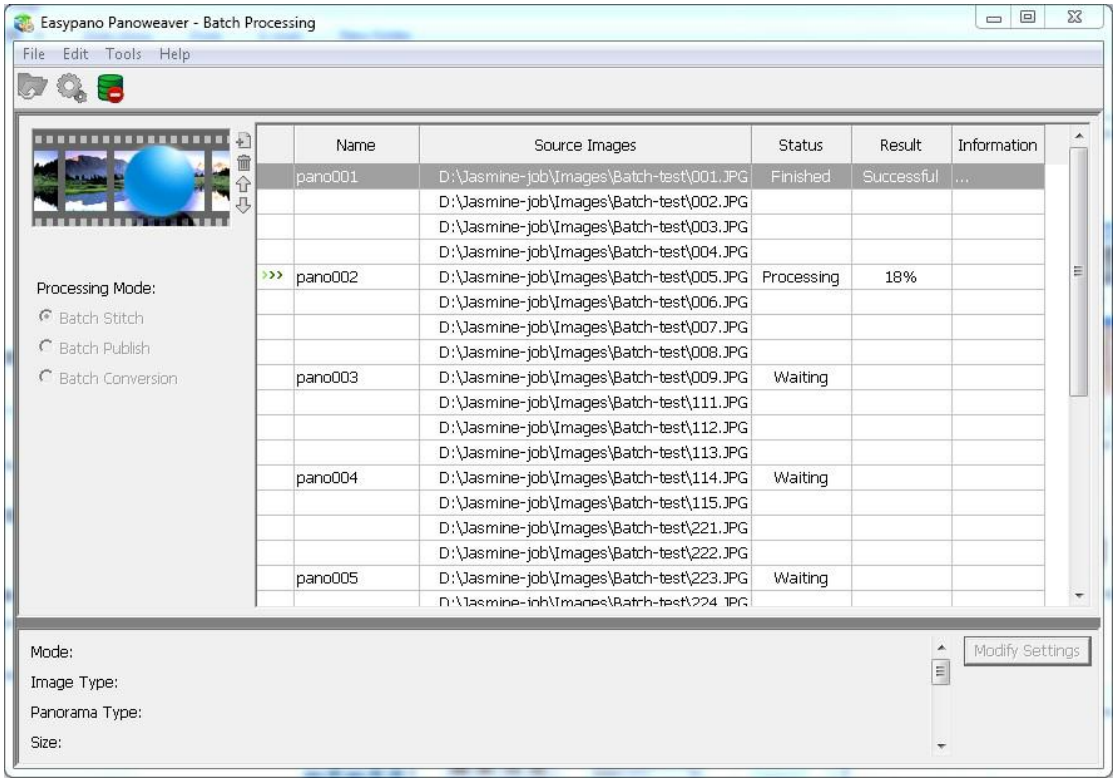
1. Access *Start* menu: *Start>Programs>Easypano>Panoweaver 9 Professional Edition>Tool>Batch Processing*. The *Batch Processing* window will appear. Or in Panoweaver Professional, access *Tools>Batch Processing* to open *Batch Processing* window

2. Click to import all sets of source images.

3. Click *Modify Settings* button and Make some adjustments in the Batch Processing Setting window (Check the *Bracket Exposure* box and select the corresponding stops)



4. Click *Begin Processing* button to batch stitch panoramas.



5. After finished batch processing, you will find the stitched results in the source image folder or you set a specific path for you panoramas.

Tips: In the Batch Processing Setting window, you can select *batch publish* or *batch cubic/spherical conversion* to publish or convert your stitched panoramas. You can stitch 300 groups of images into panoramas at one time.
More details about batch stitching , please refer to Batch Stithing.

FAQ

General Questions:

⊡How to know if my Panoweaver is the latest version?

Choose *Help>Check for Update* to check online.

⊡How to use GPU stitching acceleration?

GPU stitching acceleration only applies to a computer installed with GPU (Graphics Processing Unit). Program will check GPU during installation and use GPU to fast stitch photos it is avalable. If your computer does not have a GPU, program will automatically stitch with your CPU. (New installed GPU requires to reinstall program)

⊡How to report BUG to Easypano?

Choose *Help>Bug Report/Feature Request*, enter it in the pop-up window.

⊡What should I know to shoot fisheye image with Ceiling/Floor?

If you want to shoot fisheye images with Ceiling/Floor, you should shoot images in horizontal direction first. After shooting the last image, rotate camera up to shoot ceiling; then rotate down to shoot floor.
Note: You should shoot Ceiling/Floor images at the same location of the last image of horizontal direction, and do not move tripod or camera. For details, please refer to How to Shoot Fisheye Images.

⊡How to activate Panoweaver?

First you need to buy Panoweaver to get one license key. Enter this license key to activate Panoweaver at the first time you start to use it. Panoweaver will prompt what to do next.
Tip: The license key is able to be used on two computers at the same time. But you need to transfer license key or to buy volume license if you want to use this license key on a third computer.

⊡When should I make HDR image from Raw format? When should I make HDR image from bracket enclosing?

If there is moving object in the scene, Raw format will get better effect.
If all objects in the scene are still, bracket enclosing will get better effect.

⊡I have used auto-match function when inserting matching points, why it is still not accurate?

Panoweaver allows the misalignment of the location of auto-matched points as long as they are within certain range. If misalignment is really serious, please check: (1) if the two images are adjacent;(2) for Circular and Drum type, are the center of the circle and radius set correctly.

If you encounter a problem when using Panoweaver which is not answered in this online help, visit the Panoweaver Support page at http://www.easypano.com/faq.html or http://www.easypano.com/kb.html. Here you'll find an up to date list of frequently asked questions and answers, and links to additional resources.

Panorama Photography

Panorama Photography

Shoot Normal Images

Panoweaver supports normal lens, wide-angle lens and fisheye lens. It can handle almost every kind of image (one row or multiple rows of images), in any orientation.

Workflow of Shooting Normal Images

Shoot with pano head and tripod
1. Set your photographic equipment in place: a tripod, a pano head and a camera. Attach the Pano Head to the Tripod to make sure the pano head can spin smoothly around the tripod axis.
2. Attach the Camera to the Pano Head: Assure the camera body and horizontal line in a right angle. Locate nodal point to keep the camera in a fixed position to avoid parallax error. Refer to How to locate nodal point?
3. Calculate the rotation degree and the number of rows required for stitching and shoot images.

Tip: To stitch a 360 degree panoramic image, the number of shots required for stitching varies with different cameras and lens. A calculating tool is available as below:
loading multimedia control...

Shoot hand held
1. Calculate the rotation degree: to calculate the rotation degree when shooting each shot (360/the minimum number of shots, for example, if the minimum number of shots after calculation is 12, then the rotation degree should be 30).

Tip: If the calculation result is shooting at least 11 images, shooting 12 images is suggested to get a better stitching result.
2. Hand hold a camera, keep the camera in the same spot for every shot and proceed in a straight line. Don't move the camera up and down between shots to follow an up and down horizon. Ideally, use a tripod.

Tip:
1. To get the best result inside a building for professional use, please note:
A tripod and a panoramic pano head are suggested while shooting. Handhold shooting is not suggested. As well, the nodal point should be adjusted precisely.
2. If you want to shoot far away objects outside a building and only one row of pictures for stitching, handhold shooting can also be applied.

Note: For the best results, take photos using the following tips:

1. Keep the camera in the same spot for every shot. The distance between camera and floor should be kept unchanged.
2. Make sure that there is some overlap from photo to photo. For example, if you are sweeping from left to right, locate an object in the right side of your viewfinder on the 1st shot. Then make sure you can see that same object on the left side of your viewfinder on the 2nd shot. Continue this for each shot. Ideally, you should have about 25%-40% of each frame overlapping the previous frame.
3. Based on the calculated number of shots required for stitching, shooting more images than required is suggested.
4. Shooting photos clockwise is suggested.
5. Lock the camera's exposure and white balance for all shots. This will help to avoid substantial changes in lightness/darkness from frame to frame. If you can't or don't want to do this, and there are substantial variations in lightness from frame to frame, take your shots with more overlap (e.g., 50% overlap from shot to shot). This will minimize the amount of lightness change from any one shot to the next shot. If you can, also lock your white balance for all shots.
6. Beware of objects which move between shots. Clouds move, trees sway in the wind, and people move around. If people and/or things are moving, take your shots as quickly as possible to minimize the amount of variation between frames.
7. Don't zoom in or out between frames.

Shoot Fisheye Images

Shoot Fisheye Images

This chapter guides you to shoot fisheye images step by step from selecting equipments to photography tips. The stitched panorama quality greatly relies on the shot images' quality. Therefore, it is strongly recommended you have a detailed understanding on digital photography and the instruction manual of the digital camera. As there is a saying, "Practice makes perfect".

Main Photography Equipment

Main Photography Equipment

The typical package of equipment for shooting fishey image

Equipment	Middle Resolution	High Resolution
Digital Camera		
	Nikon D90/D300	Nikon D3
Fisheye Lens		
	Sigma 8mm F3.5(or F4) EX DG Fisheye	
Pano Head		
	MrotatorTCPShort	
Tripod		
	Manfrotto 190CL	

- Digital camera (abbreviation as DC): Theoretically, both digital camera and film camera work with fisheye lens to shoot fisheye images. However, Digital cameras are much convenient since the images can be transferred to computer directly without scanning the negatives as film camera. So digital camera is better. Recommended: Nikon D70, D100 D7000 and Canon 10D, 20D and 300D 500D 600D.

- Fisheye lens: Fisheye lens can capture an FOV (field of view) of over 180 degrees. A panorama can be stitched from 2 or more fisheye images. Sigma 8mm F4 EX DG Circular Fisheye lens is recommended.

- Pano Head: Also known as Panoramic Tripod Head or Rotator is installed on a tripod when shooting to eliminate the displacements between fisheye images so that the panorama can be stitched seamlessly. Different pano head matches different DC. The pano head from Kaidan, Agnos and Manfrotto are compatible.

- Tripod: A tripod is an adjustable three-legged stand used for supporting photography equipment when shooting. Because fisheye lens covers a wide range of shooting area, it calls for tripod with a not-too-long handle; otherwise, the long handle will cover a wide area in the stitched panorama and is difficult to be erased. Stableness of the tripod is also important. The tripod from Manfrotto and Bogen are recommended.

- Recommended: DSLR + Sigma 8mm lens and stitch 4+T drum fisheye image.

Digital Camera and Fisheye Lens

A normal 35 mm camera lens covers an area with 40 degrees HFOV (horizontal field of degree) and 27 degrees VFOV (vertical field of degree). It needs many pictures to make a 360x180 panorama and is very inconvenient either in shooting pictures or in stitching. While with over 180 degree view of angle, the fisheye lens

can meet our demands. There are three types of fisheye images shot with different equipment combination.

1. Full Circular Fisheye :

See equipment combination to get full circular fisheye images.

2. Drum fisheye image:

See equipment combination to get drum fisheye images.
Sigma 8mm f4 ex circular fisheye lens
Specifications
Focal length: 8mm
Provides approx. 180 degree view angle
10 elements in 6 groups
Dimensions (approx.): 73.5 x 61.8 mm
Weight (approx.): 400g

Sigma 8mm f4 Ex circular fisheye lens

3. Full frame fisheye images

See equipment combination to get full frame fisheye images.
AF DX Fisheye-Nikkor 10.5mm f/2.8G ED, more at http://nikonimaging.com/global/products/lens/af/dx/af_dx_fisheye105mmf_28g_ed/index.htm

Specifications
Focuses down to 0.14m/0.46 ft.
Full-frame fisheye images with a picture angle of 180 degree (diagonal)
10 elements in 7 groups
Filter attachment size: Rear-attachment type 27mm
Hood: Built-in

AF DX Fisheye-Nikkor 10.5mm f/2.8G ED

Pano Head

Pano Head is also called tripod panoramic head, or rotator. To understand the function of pano head, "nodal point" should be explained first. The nodal point is a special point in space, where light enters the lens converges into a point and then diverges to impact on the recording medium. As one rotates a camera and shoots a sequence of images to later be stitched together, all of the images must be shot with the camera rotating about its nodal point! The pano head is just used for this purpose. About panoramic head you may refer to http://www.easypano.com/panoramic-head/ or http://www.easypano.com/JTS-Rotator-SPH.html for details.

A panoramic head is an additional piece of equipment to put on top of a tripod which can be small or very large. It allows the camera to be located so that one of the nodal points of the lens is perfectly on the axis of rotation.

It will cause parallax to shoot with DC and fisheye lens without using pano head. More illustration please refer to Easypano knowledge base, http://www.easypano.com/panorama-photography.html.

Note: Above panorama image is stitched from images shot without using a pano head. There are obvious misalignments caused mainly by "parallax". By using a pano-head, the camera can be rotated to take a set of pictures for making a panorama without suffering from "parallax".

If you want to know how to adjust pano head, you may also refer to http://www.panoguide.com/howto/panoramas/setup_panohead.jsp

Tripod

A tripod is an adjustable three-legged stand used for supporting photography equipments when shooting. Because fisheye lens covers a wide range of shooting area, it calls for tripod with a not-too-long handle; otherwise, the long handle will cover a wide area in the stitched panorama and is difficult to be erased. Stableness of the tripod is also important. The tripod from Manfrotto and Easypano JTS-Rotator SPH are recommended.

Compatible Equipment

Refer to http://www.easypano.com/pw6-equipment.html for details.

The typical package of equipment for shooting fishey image

Equipment	Middle Resolution	High Resolution
Digital Camera		
	Nikon D90/D300	Nikon D3
Fisheye Lens		
	Sigma 8mm F3.5(or F4) EX DG Fisheye	
Pano Head		
	MrotatorTCPShort	
Tripod		
	Manfrotto 190CL	

Workflow of Shooting Fisheye Images

Workflow of Shooting Fisheye Images

Other Accessories

In addition to preparing all the necessary equipment such as DC, fisheye lens, pano head and tripod, preparing some other accessories will facilitate the photography process.
Enough battery: Make sure to charge your battery and enough spare batteries are available.

- Enough memory cards: Estimate the shot images amounts and the memory of the flash card then calculate your needed card numbers. The original flash card with the camera is generally 16M. You may purchase different memory card as 128M, 256M, etc.
- Computer: Computer is necessary sometimes to store more images. Make sure your computer has been installed with USB driver and Nikon View software, also with the power cable, USB cable/serial cable, card reader, etc.

- Camera remote cord: Remote cord is helpful in prevent the camera from shivering during shooting. Please inquire the local camera store for more information.

- Camera bag: A camera bag can be considered for convenience. Inquire the local camera shop for more information.

Check your equipment before hand:

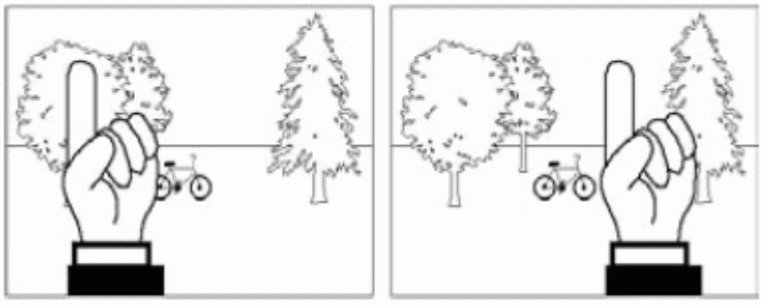
- Check for enough battery.
- Observe your fisheye lens and clean it with lens tissue if any smudge.
- Ensure the tripod stable and level.

Assemble the Equipment

Pano Head can be classified as two types: lens specific pano head and non-lens specific pano head. The former is applied to certain lens and cameras, which is simple to install since there will be no need locating a nodal point. The latter can be used to all the lenses & cameras, however you need to locate the nodal point yourself. Please refer to http://www.easypano.com/panoramic-head/

How to Locate the Nodal Point

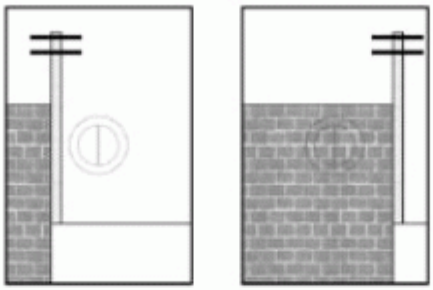
This is one of the most frequently asked questions when it comes to stitcher-based panorama creation. Once you understand the basics, you'll be able to easily locate the nodal point for any camera and lens combination. Simply speaking, the nodal point is the point inside your camera where the light rays converge and flip over. When shooting a panorama it's necessary to rotate about this point to eliminate the image mismatch caused by parallax error. It's also worth noting that the nodal point is not the same as the film plane, which is often marked on the underneath side of many 35mm cameras. Generally, for most 35mm cameras and lenses, the nodal point is located somewhere towards the center of the lens barrel. Parallax error can be easily demonstrated by this simple experiment. Close one eye and hold your index finger upright about six inches away from your open eye. Rock your head from side to side. Notice how your finger moves with respect to the background. This relative movement is due to the fact that you're not rotating your head around your eye's nodal point, which is somewhere in the center of your eyeball. Instead, you're rotating about your spine which is several inches to the rear and off to one side. It is this relative side-to-side motion that we will strive to eliminate when setting up a camera for VR panoramas.



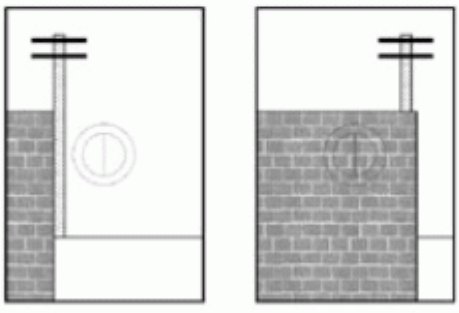
Parallax error can be easily demonstrated. It's the relative movement caused by a shifting point of view. In this example, you eye is moving with respect to your hand and the background.

Step 1: The side-to-side adjustment
Once your camera is fastened to your camera bracket, move to the front of the tripod head so you're looking into the lens. Adjust the camera bracket so that the center of the lens is directly over the pivot axis of the tripod head. Try to be as accurate as possible. You should strive to get this adjustment within plus/minus a 1/16th of an inch.

Step 2: Fore-Aft Adjustment
This step is most easily accomplished out of doors. Find a vertical edge or line, such as a doorway or edge of a building. Locate your camera and tripod about 2-1/2 feet away, or as close as possible with the edge still in focus when you look through the viewfinder. Look through the camera's viewfinder, find another vertical edge or line that is far away, such as another building or telephone pole. Align the two objects and rotate the pan head so they are in the left hand side of the viewfinder. Rotate the pan head so the two objects move over to the right hand side of the viewfinder. Unless you've managed to unwittingly locate the right location, you should notice the two objects will move with respect to each other as you rotate the pan from left to right. Slide the camera to the front or rear as required to eliminate this relative movement.



Looking through the viewfinder align a close object (brick wall) with a faraway object (telephone pole).As you rotate the camera from side-to-side there should be no relative movement between the two objects as shown to the right.



If, as shown above, the two objects move with respect to one and another in the viewinder, slide the camera fore or aft in order to eliminate this movement. Here, the telephone pole has moved behind the brick wall.

Step 3: Record Your Results.

After you've discovered the two location dimensions, be sure to record the settings. The Kiwi has convenient indicator scales for this purpose. These numbers represent the nodal point for this given camera and lens combination. If you change cameras or lenses, this procedure may have to be repeated.

Step 4: How About Rangefinder Cameras?
A rangefinder camera is a camera where you look through a separate viewfinder and not through the actual lens. The process is basically the same. Locate the Side-to-Side adjustment as discussed in Step 1. When it comes to the Fore-Aft adjustment, you won't be able to look through the viewfinder to determine the proper setting since the viewfinder is a separate optical path that doesn't really "see" the same image as the film. Instead, you'll have to start with the bracket all the way to the front and take pairs of test shots. Each pair will have the vertically aligned objects in the left and then the right side of the viewfinder. After each pair of photos, slide the bracket rearward and repeat the process. Slide the bracket the same increment each time (i.e. 10mm). Be sure to record the scale setting for each pair of images. Process the film, or in the case of digital cameras, download the images to your computer. At the end of this process you will be able locate the pair of images with the least relative movement. If no single image is optimum, you may need to interpolate between two images to find the closest value.

Note: This part is an abstract from Kaidan User Manual. Thanks Kaidan. You may also refer to http://www.360texas.com/Tips/nodalpts.htm for some instruction on Nodal Point location.

Adjust Camera and Shoot Image

Preset Camera
Presetting once is enough when shooting many images for different scenes.
Set as fisheye mode (Optional)

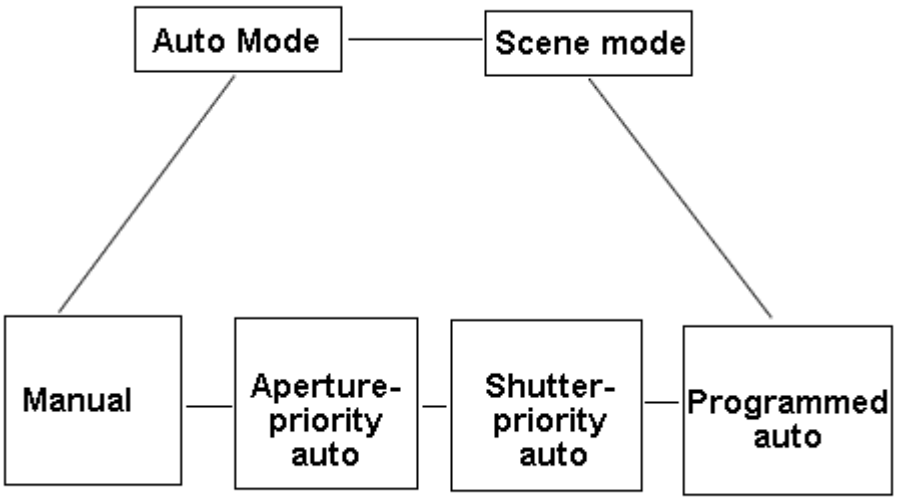
Note: DSLR camera need not adjust this.
For Nikon Coolpix series and some cameras with no fisheye mode, you need to set manually before shooting. Here is a brief instruction.

Camera Model	Instruction on selecting lens
Nikon Coolpix 5400 /8700/8400	Go to the menu and select *Lens>Fisheye*
Nikon Coolpix 4500/995	Go to the menu and select Lens>Fisheye1 for full circular fisheye shooting; OR Lens>Fisheye2 for full frame fisheye shooting.
Nikon Coolpix 5700 and the DC with no fisheye mode	Macro mode :zoom locked at wide angle Exposure metering: Center-Weighted Flash modes: Flash Cancel

Adjust the exposure mode
The word "photography" derives from the Greek and means, literally, "light writing." Lighting is mainly controlled by aperture and shutter speed. The shooting modes available in most digital cameras range from Auto mode, Scene

mode, Programmed auto, Shutter-Priority auto, Aperture-priority auto and Manual mode. The latter four modes act on panorama shooting and so does the Panorama Assist Mode.

Note: Please DO NOT use Auto mode for panorama shooting.



If you are experienced in photography, Manual mode is recommended to choose appropriate aperture and shutter speed according to the environmental light.

If you are a green hand, a usual advice is to choose Aperture priority auto mode. Set a larger F value to get a small aperture so that a deeper "Depth of Field" (DOV) is achieved with a much wider scope of clear area in the image. (The larger F value is, the smaller the aperture is.) For example, F5.0 or F6.0 is better than the default F2.5 or F3.3.

Please pay attention if the environmental light is a little dark. Small aperture may result in longer exposure time, i.e. shutter speed. The reason is the flash light doesn't take effect with fisheye lens since fisheye lens covers a much wider FOV than traditional camera lens. Over 1/4 of the shutter speed may bring obvious noise in the image. So you have to find a proper value to balance the aperture and shutter speed.

Note: A stable tripod is extremely important if the exposure time is very long.

Adjust image size and quality

The fisheye image resolution and quality determine to a great extent the panorama quality. The better the fisheye image is, the better the stitched panorama is. Of course it occupies more space. So it is recommended to use the largest resolution available when shooting.

As to the image quality, "FINE" is all right. "High" can be applied for acquiring high quality images. If selecting High, the image size is about 10M so a bigger memory card is required. The original file format is TIFF. Camera Raw Image is also available in some cameras.

Adjust Camera
Redo the following steps to adjust the camera every time shooting a different scene.

Adjust white balance
White balance is a name given to a system of color correction to deal with differing lighting conditions. Normally our eyes compensate for different lighting conditions, but when taking pictures with a digital camera the camera has to find the "white point" (the assumption that a white object must appear white) to correct other colors cast by the same light. Inappropriate white balance may bring about more blue or more red than the original color.

General users can select Auto on White Balance menu. The professionals may select "White Bal Preset" or self-adjust the white balance.

Adjust the aperture
In panorama photography, greater DOV (Depth of Field) helps to acquire a clear image in a wider range. Therefore it is important to use a smaller aperture in panorama photography than in ordinary photography. To decreases the aperture, please increase the F to a value as high as F5.0 or F6.0.

Adjust the shutter speed
As mentioned in previous chapter, over 1/4 of the shutter speed may bring obvious noise in the image. Therefore if the shutter speed is more than 1/4 second under Aperture priority auto mode, we suggest you switch to Manual mode.

Adjust the exposure compensation
After setting the aperture and shutter speed, if the image in the monitor is too dark, choose a positive value for exposure compensation. Similarly, if the image in the monitor is too bright, raise exposure compensation until the desired effect is achieved.

Note: When shooting two or three fisheye images of the same scene, do not change the exposure compensation value. Otherwise it will cause distinct seam in the stitched panorama. The following image is an example. In addition, do not raise the exposure compensation to a much higher value. It may cause over exposure so that the stitched panorama from fisheye images will have a distinct "blue seam".

Note: The above panorama image is stitched from images shot with different exposure compensation value. There are obvious image brightness differences in the two fisheye images' area.

Set AE Lock (Optional)

Note: DSLR camera need not adjust this.

Setting *AE Lock* (Automatic Exposure Lock) is one of the most significant steps in panorama shooting. AE lock is the ability to lock the cameras calculated exposure settings (aperture, shutter speed, and sensitivity) over a series of images. When stitching images together each image should have the same exposure. The flash is turned off while *AE Lock* is in effect.

Note: Above panorama image is stitched from images shooting without using AE Lock. There are obvious image brightness difference in the two fisheye images' area and two obvious blue seams resulting from difference exposure value of two fisheye images.

After setting the proper aperture and exposure compensation, turn to AE Lock > ON in the menu.

Shoot Fisheye Images
Please take the following steps strictly.

1. Shoot the first fisheye image
Place the point of interest in the center of the viewfinder then half press the shutter to focus.

2. Shoot the other consecutive fisheye image
To guarantee the tripod stableness, hold it with one hand. Turn the pano head gently with the other hand. Rotate appropriate degrees and take the images around 360 degrees.

Note: It is suggested the images be shot clockwise, otherwise, you may have to reverse the sequence when loading images in Panoweaver.

3. Shoot top/bottom fisheye (optional)
Please shoot Top/Bottom fisheye image on the last rotation. For 4 fisheye, please rotate pano head up and down to shoot at the 4th location. For 6 fisheye, please shoot up and down at the 6th location. You should stay with the last rotation. Shooting in some other location will cause an incorrect stitching.

4. Shooting another scene
After shooting a scene, cover the fisheye lens cap. Move all the equipment to the other scene you want to shoot.

Note: Turn the "AE Lock Off" otherwise the shutter speed and aperture are locked. The shooting procedure is the same as stated above.

5. Import the images to the computer
After Finishing, import the fisheye images to computer through DC or card reader. If the original image has much noise or is not sharp enough, it can be retouched in any image editing application such as Photoshop, Fireworks etc.

Shoot Bracket Images
Auto bracket exposure is a method to obtain the image with the highest quality. Usually camera processes bracket exposure quickly. To shoot the first image, use standard exposure value obtained by camera automatically. To shoot the second image, use exposure value which is lower a number than that of the first one. To shoot the third image, use exposure value which is higher a number than that of the first one.

Exposure Value is usually abbreviated as EV and its unit is pace.
EV is a calculation method to express aperture and shutter. For instance, EV=13 means several groups of shutter/aperture values of the same EV as 13, such as 1/30sec, f/16; 1/15, f/22; 1/125, f/8, etc. Please refer to the picture below:

ev	apter ture	1	1.4	2	2.8	4	5.6	8	11	16	22	32
shutter	tv/av	0	1	2	3	4	5	6	7	8	9	10
1	0	0	1	2	3	4	5	6	7	8	9	10
1/2	1	1	2	3	4	5	6	7	8	9	10	11
1/4	2	2	3	4	5	6	7	8	9	10	11	12
1/8	3	3	4	5	6	7	8	9	10	11	12	13
1/15	4	4	5	6	7	8	9	10	11	12	13	14
1/30	5	5	6	7	8	9	10	11	12	13	14	15
1/60	6	6	7	8	9	10	11	12	13	14	15	16
1/125	7	7	8	9	10	11	12	13	14	15	16	17
1/250	8	8	9	10	11	12	13	14	15	16	17	18
1/500	9	9	10	11	12	13	14	15	16	17	18	19
1/1000	10	10	11	12	13	14	15	16	17	18	19	20

The smaller EV value is, the more light camera will take in.

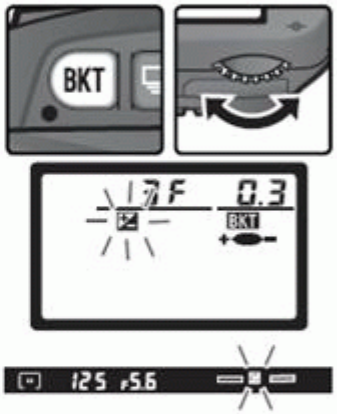
In some old cameras, first set exposure bracket (for instance, press "BKT" button in Nikon Camera), and then adjust EV, finally press shutters 3 times consecutively.
Different cameras have different EV mode, most of which are between -2EV to 2EV. The quantity of images is also different. Some cameras shoot 3 images and some shoot 5 images.

In most new camera, you just need to set EV and then press shutter once.

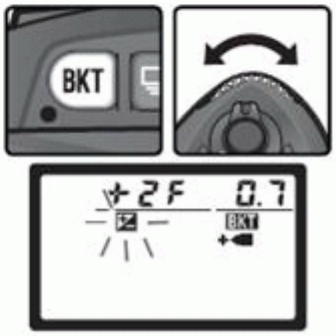
Exposure and Flash Bracketing

1 Select the type of bracketing to be performed using Custom Setting 12 (**BKT set**; 146). Choose **AE & flash** to vary both exposure and flash level (the default setting), **AE only** to vary only exposure, or **Flash only** to vary only flash level.

2 Pressing the BKT button, rotate the main command dial until BKT is displayed in the control panel and the ± icons in the control panel and viewfinder start to blink.

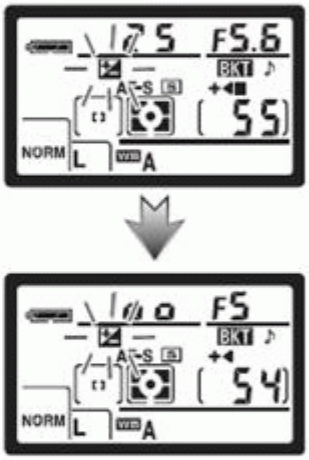


3 Press the BKT button and rotate the sub-command dial to choose a bracketing program (90–91).



4 Compose a photograph, focus, and shoot. The camera will vary exposure and/or flash level shot-by-shot according to the bracketing program selected. Modifications to exposure and flash level are added to those made with exposure compensation (86) and flash exposure compensation (102).

While bracketing is in effect, the icons in the control panel and viewfinder will flash. A segment will disappear from the bracketing progress indicator (, , or) after each shot. The middle segment () disappears when the unmodified shot is taken, the segment when a shot with negative compensation is taken, and the segment when a shot with positive compensation is taken. Bracketing begins again when all shots in the sequence have been taken.



To cancel bracketing, press the BKT button and rotate the main command dial until BKT is no longer displayed in the control panel. The program last in effect will be restored the next time bracketing is activated. Bracketing can also be cancelled by selecting **WB bracketing** for Custom Setting 12 or by performing a two-button reset (111), although in this case the bracketing program will not be restored the next time bracketing is activated.

Camera Raw Image
A raw image file contains minimally processed data from the image sensor of either a digital camera, image or motion picture film scanner.

Raw functions in the same way as film of traditional camera so it contains most colors and the widest layers. The excellent feature of Raw is that it saves original CCD data to make it much easier for users to edit, keeping the original message without revising.

Usually, non-Raw image, even if TIF format has been processed by digital camera. As a result, those formats are featured by producers. This is the reason why we say "Colorful Sony and Blue Fuji".

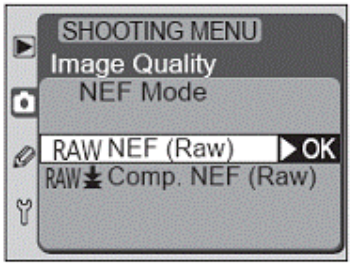
Take Canon D100 as example to explain how to set camera to shoot Raw image.

The Image Quality Menu

Highlight **Image Quality** in the shooting menu (136) and press the multi selector to the right.

The menu shown at right will be displayed. After pressing the multi selector up or down to highlight the desired option, press the multi selector to the right to put your choice into effect and return to the shooting menu.

Selecting **NEF (Raw)** from the image quality menu displays the menu of NEF mode options shown at right. Highlight the desired NEF mode and press the multi selector to the right.



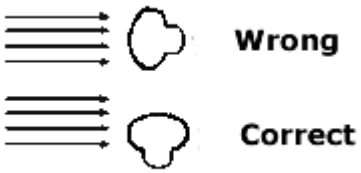
Photograph Tips

Photograph Tips

Lighting

- Flashlight will get disabled when using fisheye lens. Selecting a better light is vital to get a better image. 10 am to 2 pm is fine for outdoor shooting since it is sunshiny. Turn the light on when shooting indoors.
- DO NOT get overexposure; otherwise, the fisheye images will have a distinct blue or dark seam.
- To get a deeper "Depth of Field", we suggest a larger F value i.e. smaller aperture and a longer exposure time. However, exposure time should be less than 1/4 to avoid stuck Pixel.
- Use the Aperture Exposure Lock setting on a digital camera to capture equal lighting between hemisphere pictures. If there is a primary light source, place it on the seam. This will balance the light between the hemispheres and keep overexposure to a minimum. Close blinds or curtains and turn all room lights on to even out the lighting on sunny days.

- Indoor lighting: We often encounter a serious color differences in two interior shots. Here is the way to avoid this. Enable your Automatic Exposure LOCK AE-L and Automatic Focus Lock AF-L.
- Turn you back to the primary light (Sun or bright window), and turn 90 degrees to your left or right and take your first image. Take each image through to the end of the image sequence. Turn Off or disable AE-L and AF-L.



Components

- Place the point of interest in the center of the image. Never put it on the seam of the fisheye images.
- Choose appropriate distance and shooting angle to prominently show your emphatic object in the image.
- Pay attention to motion, especially at the image seam. People or animals moving across the seam when you take a picture can appear blurred in the final panorama image.
- Make sure to keep any part of your body out of the image area because the fisheye lens captures 183 degrees of the area surrounding the camera.

Others

Noise Reduction

Noise can be summarized as the visible effects of an electronic error (or interference) in the final image from a digital camera. It is related with the temperature, sensitivity of the sensor (CCD/CMOS) and shutter speed.

Source 1: ISO sensitivity of the sensor (CCD/CMOS): High worse low better. Auto shooting mode will automatically increase ISO value when the light is dark thus more noise occurs.
Solution: ISO 100 is recommended. Auto shooting mode will automatically increase ISO value when the light is dark.
Please refer to
http://www.dpreview.com/learn/Glossary/Digital_Imaging/Noise_01.htm.

Source 2: CCD Temperature
Noise is exponentially related to temperature - it DOUBLES for every 6 or 8 degrees C temperature rise (depending on the CCD).
Solution: Store it in a shady cool place before shooting. Do NOT keep the camera on for a long time since it will increase the temperature. Turn it off and let it cool down before another shot.
More in http://www.dpreview.com/news/0005/00050104ccdtemperature.asp.

Source 3: Exposure time longer than 1/4s, even to 1-2/s, stuck pixel, i.e. noise, will appear in the image.

Solution: Take a second frame known as "dark frame" with the lens covered and the shutter closed for the same amount of time as the main image. This dark frame will be used to identify and subtract "stuck pixels". Edit the images in Photoshop or other software packages to get a cleaner one. http://www.dpreview.com/learn/key=noise+reduction has the detail.

Depth of Field

Depth of Field: Depth of field is the range of distance (measured along the lens axis) for which the subject is rendered acceptably sharp in the photographic image.
The following chart gives the relationship between DOV and its determining factors.

		Depth of Field	Remark
F value: ↑ larger	Aperture: ↓ smaller	↑ deeper	Decrease the aperture, i.e. increase the F value to get a deeper DOV when shooting panorama.
Focal length: ↑ greater		↓ shallower	Wide-angle lens has deeper DOV while telephoto lens has shallower DOV.
Distance from the lens to the subject: ↑ farther		↑ deeper	The closer you are to the subject the shallower the depth of field, the farther from the subject, the greater the depth of field.

Shutter speed

Shutter speed type	Required setting or equipment	Applied occasion
Bulb,1s,1/2s	Cameral stableness specially needed, using tripod	For dark scene
1/4,1/8	Tripod needed	
1/15,1/30,1/60,1/125, 1/250,1/500		For common shooting
1/1000	Set larger aperture size, shallower DOV and accurate focus	Used for sports photography as skiing, basketball.
1/2000-1/8000	Telephoto lens equipped	Ultra high speed shooting, such as sport shooting.

The quality of stitched panorama greatly relies on the photography, for instance the lighting, contrast, brightness, noise etc. So more knowledge about photography is of great help.

Glossary

B

blending: Blending is the process of merging the warped source images into a single panoramic image

Bracket Exposure: The term bracketing usually refers to exposure bracketing: the photographer chooses to take one picture at a given exposure, one or two brighter, and one or two darker, in order to select the most satisfactory image. Many professional and advanced amateur cameras, including digital cameras, can automatically shoot a bracketed series of pictures. Exposure bracketing is indicated when dealing with high-contrast subjects and/or media with limited dynamic range, such as transparency film or CCD sensors in many digital cameras.

brightness: Brightness differences can be prevented by switching the camera to manual exposure mode (the "M" mode on SLR cameras). Unfortunately most digital compact cameras don't offer a manual exposure mode and a gradual change in brightness cannot be avoided

C

Camera Raw file: Raw is not a kind of image format, accurately speaking, it is the record of original information generated when CCD captures picture

camera response curve: Camera response curve refers to light inductor 扭 response to light with different intensity

color differences: Color differences can be prevented by locking the white balance. Most cameras have several white balance presets, such as "sunny" or "overcast". Choose the preset that is most appropriate to the scene

N

nodal point: The nodal point differs for each lens; rotating the camera around different points until the images show no parallax errors. Several tutorials can be found by searching the web. If you don't know the nodal point of your lens, as a rule of thumbs it's usually located somewhere between the middle and the front between the middle and front of the lens

P

Pan, Tilt, FOV: Pan refers to horizontal angle of view. Tilt refers to vertical angle of view. FOV refers to field of view. The smaller FOV is, the nearer scenes seem to be. The larger FOV is, the farther scenes seem to be

parallax error: the perspective changes between shots and foreground objects will move relatively to background objects

parallax error with the experiment: stretch your arm in front of you and point your index finger upwards. Close one eye, and note the position of your index finger relative to the background. Now close this eye and look with your other eye: as you can see your finger points at a different spot in the background. It's not difficult to visualize that it would be impossible to

stitch two such images without misaligning either the foreground (your finger) or the background

PWBlend: Panoweaver's own blender-PWBlend, which is sufficient for nearly every panorama

S

SmartBlend: Smartblend is an application for seamless image blending. Main goal of smartblend is panoramic image blending, but it can be used for others, for example seamless texture creation, montage of photos, collage. Smartblend allow stitching many of "problem" shots (paralaxed, with moving objects or exposure difference). And the function of the smartblend plugin is to allow the client who requires the blending of Smartblend to stitch images or panoramas using it as a plugin. For more information, please visit http://smartblend.panotools.info

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