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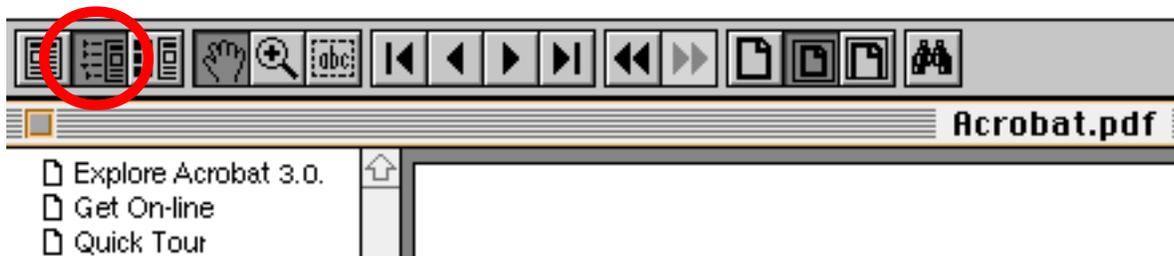
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Please Read

About This Adobe Acrobat Document

- Go through this **Example** in minutes—and you're on your way!
- **Underlined** items within the **Example** are **Interactive**. Clicking on them will take you to additional information about that topic.
- The **Table of Contents** is also interactive. Clicking on a topic in the **TOC** will take you to that section.

TIP: To interact with the Table of Contents, view this PDF file in bookmark view (see circle on screen below), Click on TOC and go directly to the Table of Contents.

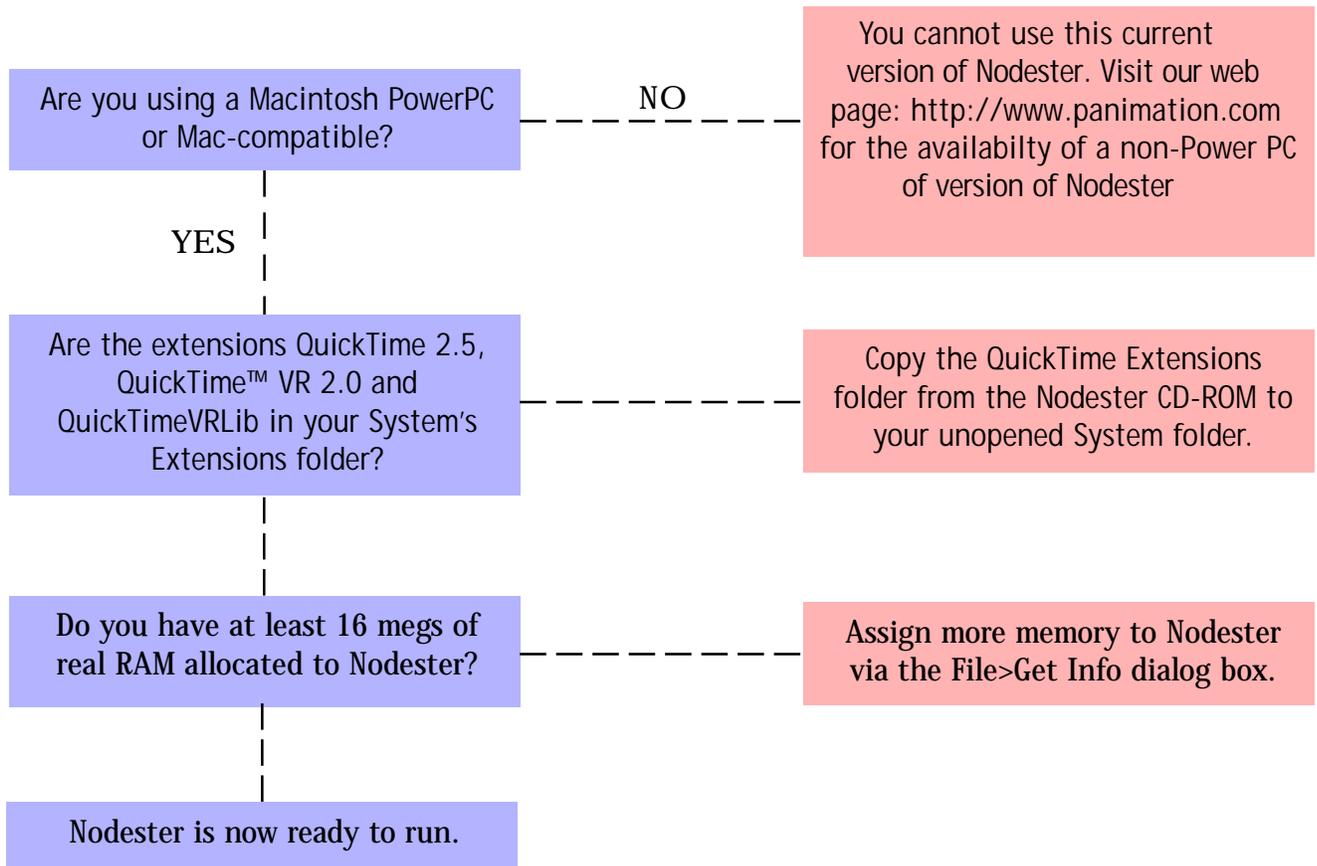


- The **Index** is Interactive also. Just click on any index word and it will take you to the first occurrence of that word.

TIP: Click on the Index from the bookmark (TOC) for quick access, then click on the Index word.

About the Gift Shop Example included on the CD ROM

The example pictures were created using an Apple QuickTake 150 camera with a Kaidan WideTake lens, a Kaidan QuickPan tripod attachment and a Bogen tripod. Since the QuickTake is a consumer-level digital camera, the pictures from it do not have the highest possible image quality. Film cameras and professional-level film and digital cameras offer superior image quality, but for our example we wanted to use images that more closely resemble “typical use” pictures. These pictures were also slightly degraded because they have been reprocessed using JPEG compression at a 75% quality level. This is because the original images were encoded using the proprietary QuickTake Codec that we cannot distribute. The JPEG compression was needed to keep the size of the example files reasonable.

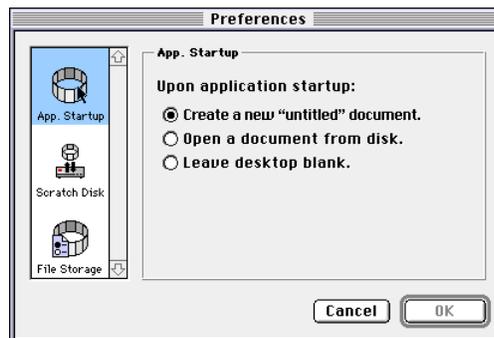


- Nodester requires at least 16Mb of RAM allocated to itself, more if you are working with higher-resolution pictures, very large source images, or more than 12-16 frames. Larger focal length lenses can also affect your memory needs.
- For QTVR playback outside of Nodester, you will need either MoviePlayer or QTVR Player (both from Apple and included on this CD-ROM) on your hard drive. These are small applications designed to let you quickly play your QTVR panorama movies. After the QTVR 2.0 extension is installed, you will find that any application that supports Quicktime (such as SimpleText) will now be able to play QTVR movies. After installing the above extensions, be sure to restart your computer
- Nodester is designed to do its best image work in 24 bit color (16.7 million colors, monitor set to millions in the Monitors Control Panel). Nodester will also work in thousands or 256 levels of color.

Setting Preferences

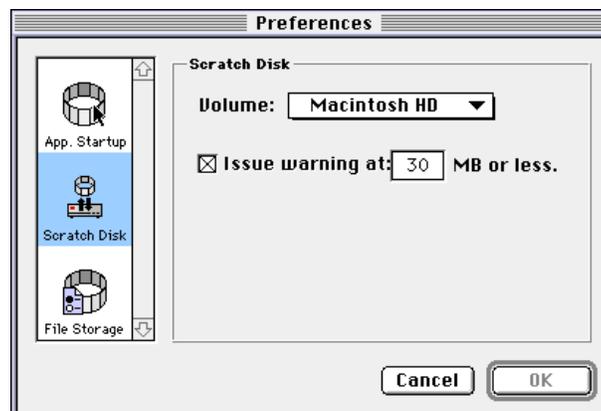
Application Startup Prefs

1. Edit>Preferences>**App. Startup**
2. Configure what will appear upon program startup.



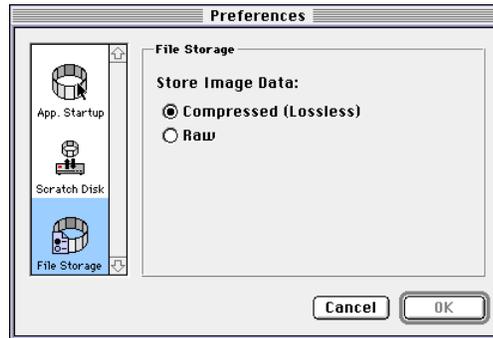
Scratch Disk prefs

- Edit>Preferences>**Scratch Disks**
- Nodester **Does NOT** support **Application Virtual Memory**.
- Nodester does use a scratch disk (the system disk as default) as a Swap Disk to automatically save images during node processing. The scratch disk temporarily stores the work as it is processed. Once the SAVE button is pressed, those changes are updated to the stored node file on the hard drive.
- The Scratch Disk feature also enables a recovery file (found in the Trash) should the program or system crash. Drag the file from the Trash to the hard drive, then open it from Nodester.
- The auto save processes according to the speed of the scratch disk. A faster drive, therefore, speeds up processing between saves.
- Adequate disk space must be available for Nodester to use the Scratch Disk. We recommend allocating as much real RAM as possible.
- Restart the program after switching Scratch Disks.



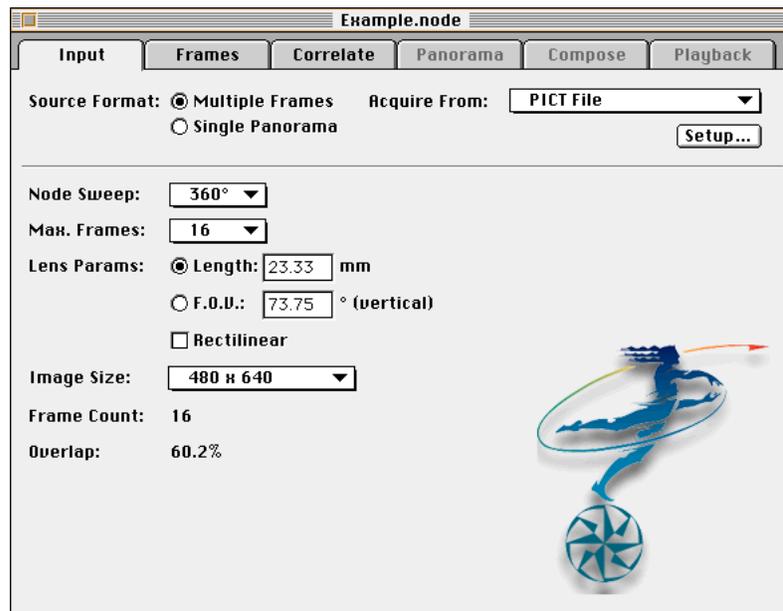
File storage prefs

- Edit>Preferences>**File Storage**
- File Storage preferences control performance during processing, NOT the quality of image.
- The Compressed (Lossless) selection does compress the file to decrease the node file's size. Raw does NOT compress the file, but processes Faster. There is NO loss of data using Raw storage.



Step One The INPUT Panel

Upon launching Nodester, notice that the **Input Panel** is the only accessible panel. Other panels will highlight as essential panoramic information is established panel by panel.



Source Format

- **Multiple Frames** enables capture or import of many frames either one by one or all at once.
- **Single Panorama** enables the import of one completed panorama generated by another application.

TIP: Name your source images with a number convention in order starting with: 01abc, 02abc, etc. This will allow the sequential import of images into the frames.

Node Sweep

Node Sweep is the amount of image capture area in degrees. Typically, nodes are captured at 360 degrees (full circle) or 180 degrees (half circle). Nodester allows custom settings for any degrees.

TIP: When shooting with a tethered digital camera, leave the Max. Frames setting at the camera mount setting for a full 360 degrees (example: Peace River 360 degrees, leave Max. Frames at 18). Nodester will **automatically adjust the Frame Count** when the Node Sweep is less than 360 degrees (example: at 18 Max. Frames and 180 degrees Node Sweep the Frame Count will be autoset to 9).

Max. Frames

When using a tripod, **Max. Frames** is the number of frames taken from the camera mount in a 360 degree node sweep. This is either fixed or adjustable, and varies with the camera mount (example: the Peace River camera mount has 2 detent wheel settings of 18 and 12 shots for a 360 degree sweep. Other wheel settings

IMPORTANT:**Getting the Most Out of a Scene**

In order to achieve the best correlation between panoramic frames, it is best when the first two images are high contrast with objects in the foreground scene.

This will provide the subsequent images with detail to correlate the images in the entire sequence.

Also, the first image should be a “Dead Area” of activity, so that the next images will create stimulating visual activity into the panoramic scene.

IMPORTANT: The Clockwise Rule

All panoramas **MUST** be **Photographed in a Clockwise Direction** from the camera mount. Otherwise, NO QTVR panoramic will occur in the Playback Panel after Composing.

can be obtained).

When importing images, the Max. Frames needs to be a number that will **achieve a 40 percent or greater overlap** (see Overlap readout at the bottom of the Input Panel). To achieve this, continue to increase the number of Max. Frames, until the overlap is at least 40 percent.

Lens Parameters

Nodester expects a lens rating equivalent to a 35mm camera. If you know the 35mm equivalent focal **Length**, type it in the first field. If you know the **Field Of View (Vertical)** type it in the second field. Otherwise, FOV will be automatically calculated from the length.

- If you have no idea of the Lens Length start at 45mm
- Lens length of 38-40mm is considered a low F.O.V. capture
- Video capture is 45mm
- Apple QuickTake 100 & 150 is 50mm
- Nodester’s default lens setting is for images taken from a Kodak Photo CD

Rectilinear refers to “degree of perfection” of a lens to capture boundaries (the very edges of an image). Professional quality lenses ARE rectilinear, and capture a near perfect rectangular frame. Most other lenses ARE NOT rectilinear and so this option should usually be unchecked. If you are unsure, uncheck the Rectilinear box.

Specify the **Image Size** of your digital camera capture or scanned file import (Photo CD, etc.). It is best to choose an image size that closely matches the size at which images were captured (example: 480 x 640). If you choose a size other than the original fixed capture size, the source images will be **Scaled** proportionally accordingly to the size you’ve input.

TIP: Always shoot images in a Vertical (or Portrait) orientation. Perimeter image detail is often lost in the correlation process with images that are wider than the height.

Select the input source from the **Acquire From** pop-up menu. Configure the acquisition selection by clicking on **Setup Button**. For this example, choose ‘PICT’ file.

TIP: Import or shoot one image and **Check the Orientation** and **Rotation** of the first image before importing all your images. Start in the Frames Panel, import or shoot, then select the frame and click the Edit Button.

If all of the selections have been made, the **Frames Panel** will highlight. Proceed by clicking on the Frames Panel.

Step Two The FRAMES Panel

The **Frames Panel** imports images into the selected **Compass target frame** and creates a **Thumbnail View** of each image, starting at zero and rotating clockwise. The exact number of frames and the degree sweep are determined by the settings you chose in the Input Panel.

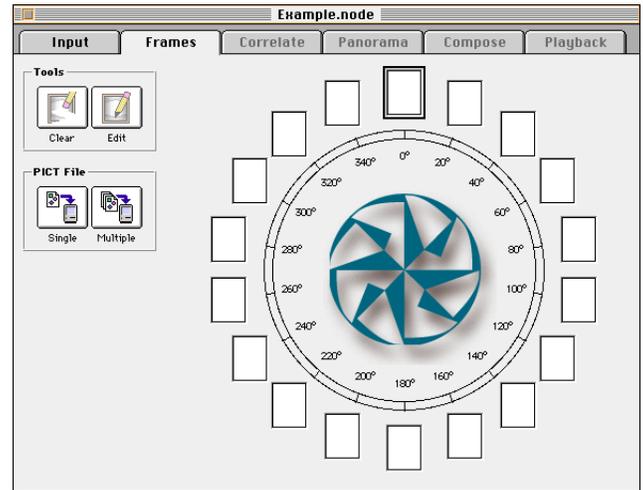
The Target Frame is the highlighted frame shown by a double pixel border. All acquisitions begin on the zero degree frame. (12 o'clock position)

Import images into Nodester. Depending on the Acquire Type selected in Input Panel, click on the Grabber Buttons as follows:

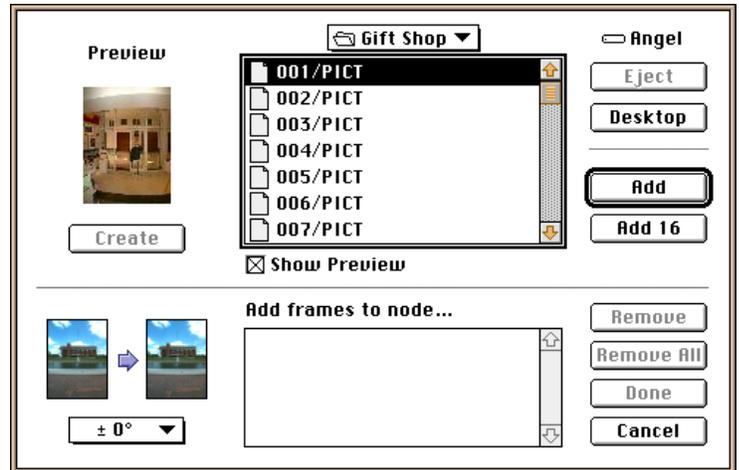
- **PICT File** (as used in this example) – **Single** or **Multiple** Button imports one or a series of PICT images. Once images are imported or shot, the target frame will automatically advance in clockwise order. Any frame may be manually highlighted by clicking the frame, or use the Tab and Shift Tab convention.
- **Apple QuickTake 100 & 150** – **Snapshot** takes one shot per mouse click. **Interactive** shoots the entire sequence, then imports. **Download** brings images already shot and stored in the camera into Nodester directly.
- **Video Grabber** – **Snapshot** takes one frame per mouse click. **Interactive** allows you to shoot the entire sequence, then import your chosen frames.

IMPORTANT: A Word About Digital Cameras

Almost all digital cameras can export their files as PICT images, so don't be alarmed if you see that there is no "import" option for your particular make of camera. If your camera is not one of the QuickTake family from Apple or the PDC-2000 from Polaroid, you should use the PICT or PhotoCD import options. The special options offered to these digital cameras are due to the presence of "tethered control" plug-in modules being present in the Plug-Ins folder in Nodester. More tethered-control modules for other digital cameras will be available soon and posted to our web site. Check - <http://www.panimation.com> for updates.

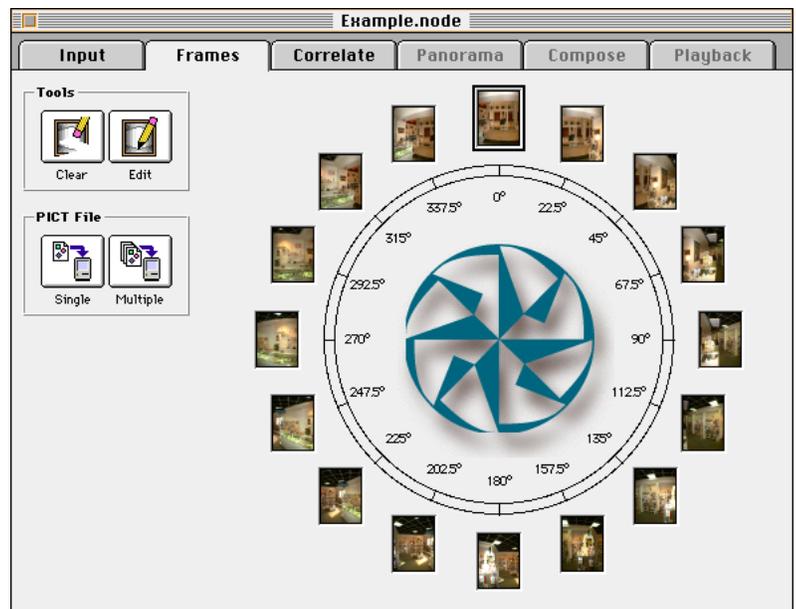


1. **Locate** the Gift Shop folder inside the Nodester **Tutorial Folder**.
2. Click the **Add 16 Button** as a shortcut to fill the entire node with the specified number of images. Since there are 16 frames per node, the button reads 'Add 16'. If there were 18 frames per node it would read 'Add 18'. Otherwise, clicking the **Add Button** will add one image at a time to the list. Click the **Done Button** when finished compiling the list to import into the current node.
3. **Save>File** this node as a **Nodester File**. Once imported, Nodester saves images into the work file on the drive. If you do not save the file, your work (not the images themselves, but all that you do to them) will be **lost** if there is a crash or power outage.
4. Select a frame, then click on the **Edit Button** to perform **Minor Editing** functions such as lighten, darken, cloning and text.
5. After **Importing Multiple** images, each frame will show a thumbnail of that image.



TIP: Edit allows the image or parts of the image to be selected by using the selection marquee, then Copy>Paste. To select the entire image use Edit>Select All.

IMPORTANT: An Image Position Test
 Import one image before importing the entire node set. Look and check to see if the **Orientation** of the image is correct. If it is not, it may be changed in the **Acquire From>Setup Button** of the **Input Panel**.



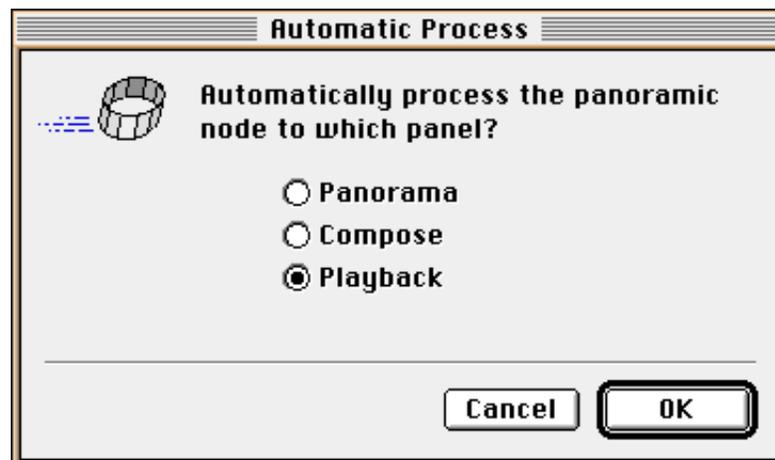
6. The **Clear Button** deletes an image.

TIP: Export the image as a PICT file while in the Frames panel as a **single image** or in the Panorama panel (Step Four) as a **single panorama** image.

TIP: Once you have your settings all set up the way you want, save your node file as a **Stationery File** to retain these settings. You may wish to name the new stationery file after the camera you've used (Nodester comes with a few stationery files for various cameras). Later, you can open the stationery node file as a template for future work. You can save your node file as a stationery file at any point, but it's best to save it at the end of the process, before you export. The stationery file will save all your inputted information like pan and tilt settings, zoom factors, preferred codec and so on. The stationery file defaults to the Stationery Templates folder.



7. **Edit>Automatic Process** allows Nodester to perform the panels work automatically, once the Input panel information has been established. Choose how far Nodester is to process in the dialog box.



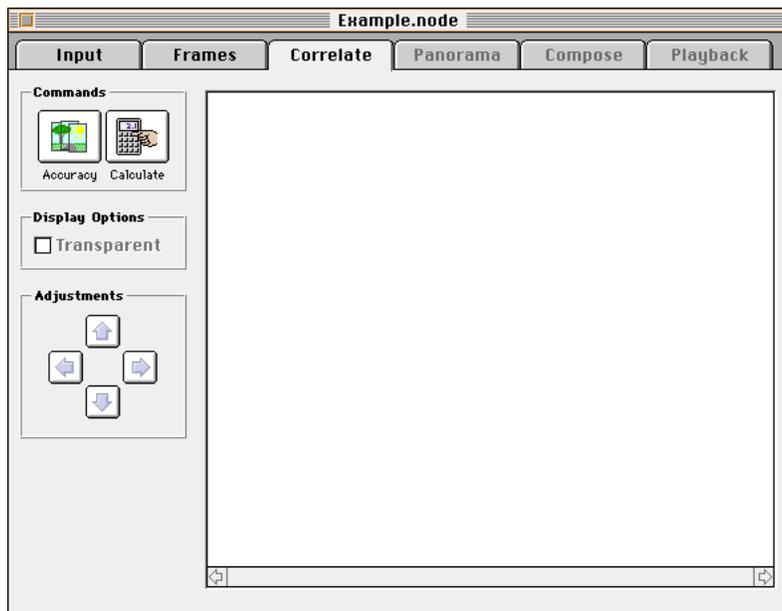
Step Three The CORRELATE Panel

Click on the Correlate Tab. The **Correlate Panel** is now available.

Note 1:

The correlation panel is **initially blank**.

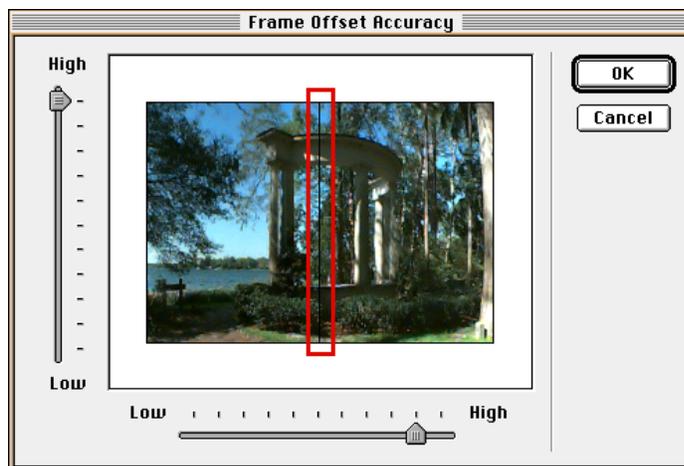
1. **Correlate** is a two step process.
 - a. Determine the accuracy or fineness of the correlation needed between images.
 - b. Calculate or process the images at the accuracy settings.
2. Use the **Accuracy button** to instruct the correlation engine as to the degree of the correlation fineness at the edges of adjoining images. Do **not** adjust the accuracy for this example.



Note 2:

Given normal shooting constraints, the default accuracy is programmed to give optimum results.

3. If the **Horizontal Spacing** between each frame is **NOT consistent** (e.g. the second frame is 20° to the right of the first but the third is 25° to the right of the second) you may need to 'Loosen Up' the horizontal accuracy by dragging the slider to the left towards low. This tells the correlation engine that the frames may NOT consistently spaced and that it needs to work harder to find the absolute correlation point. Only move the slider **ONE detent at a time** either horizontal or vertical adjustment.

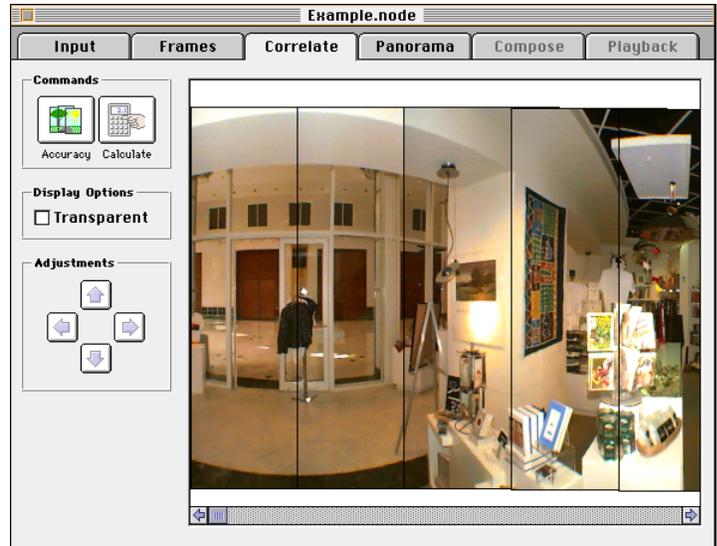


The **Vertical Spacing** addresses the same inconsistency spacing problem.

Important: A Note About Camera Mounts

If a tripod attachment such as the **QuickPan** from **Kaidan** or a **3Sixty Peace River** mount is used, this setting rarely needs changing.

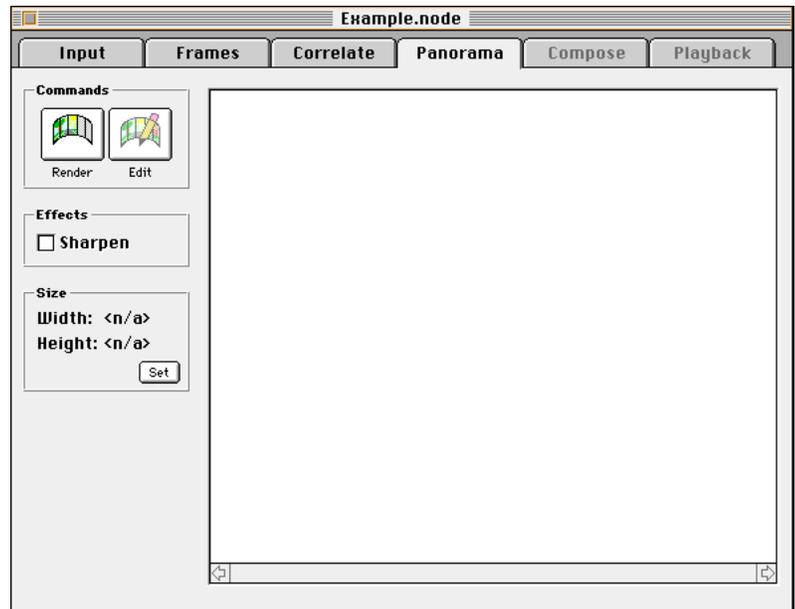
4. Click the **Calculate Button** to begin the correlation process, then an image will appear for inspection.
5. **Transparent** allows a visual display of the “**Overlap**” of adjacent images.
6. To **Fine-Tune** the correlation, click on the frame that needs adjustment. Notice the **Marquee Extends** to the end of the all frames to the right—because the correlation of these frames is usually accurate. This allows for total sequence adjusting. Now, use the **Adjustments Box** or **Keyboard Arrows** to adjust the image by one pixel per click. Shift-click to move panels 10 pixels at a time.
8. If the accuracy is adjusted, **Recalculate** the correlation. Click on the Calculate button to **Recalculate** the changes. We made no adjustments on this example, despite the fact that a small amount of “stair stepping” exists. The default settings can compensate for such minor imperfections automatically.



TIP: Vertical Spacing problems MAY result from NOT having the camera mounted on a true perpendicular to the mount. Some digital cameras with odd shaped cases may obstruct true alignment. This condition causes “**Stair Stepping**” due to one image being lower (tilted) than the next. If this persists, loosen the vertical accuracy setting (one detent at a time).

Step Four The PANORAMA Panel

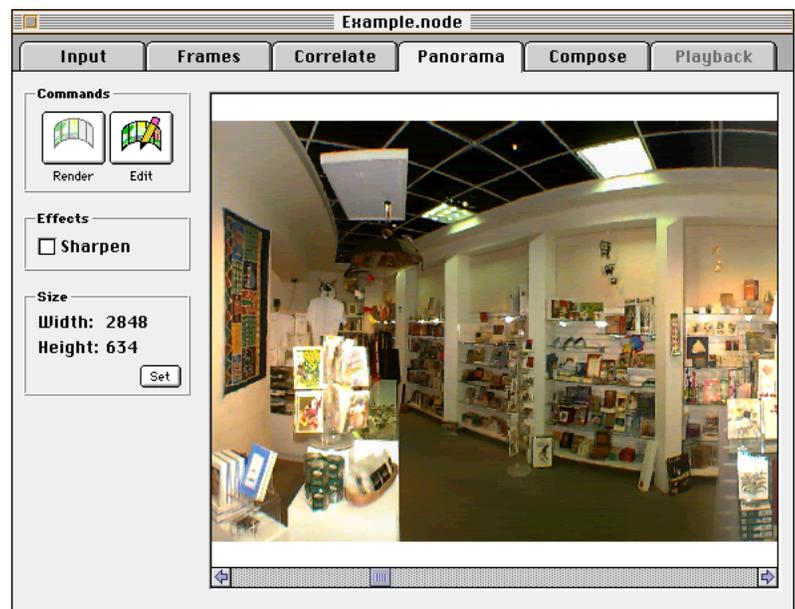
1. Click the **Panorama tab**.
2. The panorama panel is initially blank. Click the **Render button** to blend all frames together to form one single panoramic image.
3. After **rendering**, the panel will appear as one **seamless panoramic image**. Scroll to view. It's NOT yet a QTVR movie.
4. Click the **Edit button** for minor touchup such as blur, sharpen and clone. The Edit Mode also allows you to create and place **Hotspots**. See next page for a discussion of hotspots.



TIP: **Edit** allows the image or parts of the image to be **Selected** by using the selection marquee, then **Copy>Paste**. To select the entire image use **Edit>Select All**.

TIP: **Export** (not **Save**) the image as a PICT file while in the Frames panel as a single image or in the Panorama Panel as a single panorama image.

5. (Optional) Use the **Effects Sharpen Button** to enhance the Contrast of the image. It works as an Unsharp Mask Sharpen and can only be applied one time. If it Sharpens too much, uncheck the box and Render again.
6. (Optional) Use the **Set Button** under **Size** to **Scale** or **Crop** the dimensions of the panorama.

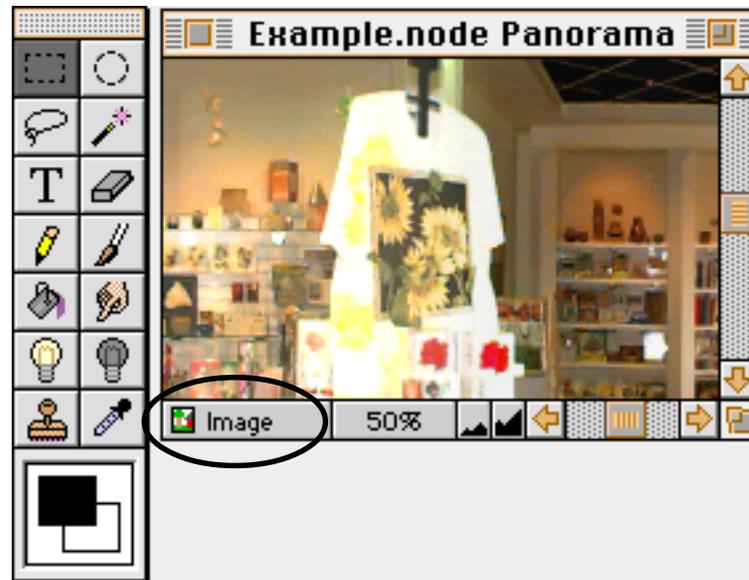


Important: A Word About Adding Text

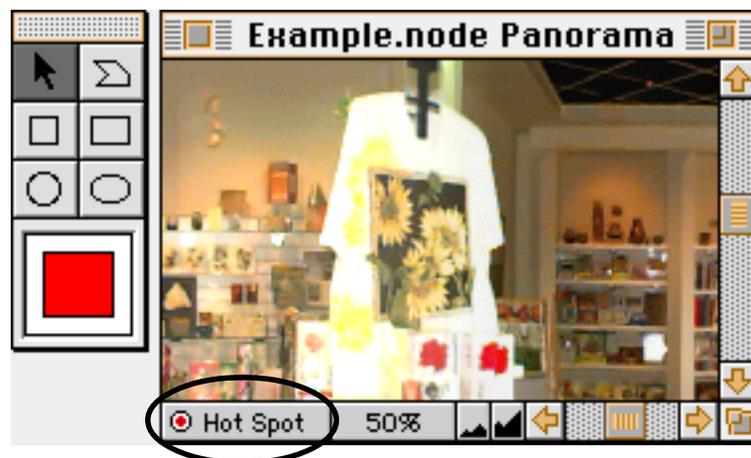
Text can be added to a single image in the Frames panel (edit mode) or to the panorama in this stage (edit mode). It is **best** to add text banners in the Panorama panel, as text may be corrupted during correlation if placed in a single frame in Frames Panel.

CREATING AND DEFINING HOTSPOTS

The **Hot Spot Editor Tool Palette** allows each shape tool to define Hotspot areas. **Turn on the Hot Spot Editor** by clicking the Image Icon at lower left hand corner of the edit image window.



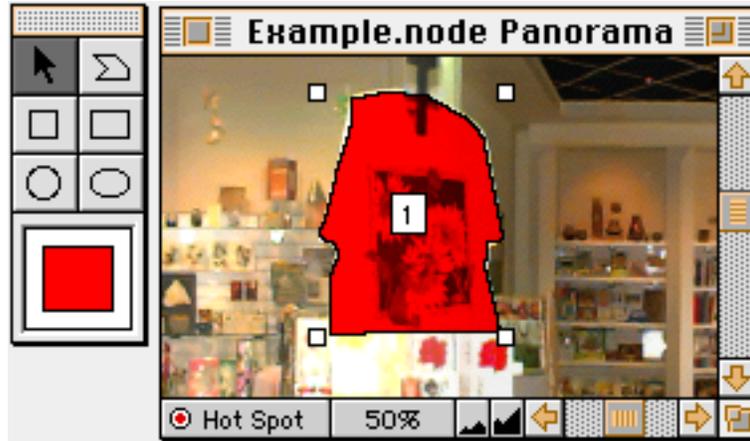
The **Hot Spot Editor Tool Palette** will appear after clicking on the Image Icon



Hot Spot Tools allow various shapes to define areas of Hotspots. On the next page is an example of the polygon shape. Double click to close the last point to the first. Nodester assigns consecutive numbers to Hotspots. You can change the color of the Hotspot by clicking on the color chip. There is no limit to the number of colors or nodes.

After you have drawn your hotspot, double-click on it to bring up the **Hot Spot Dialog Box**. Here you will be able to enter information about what you plan to link the hotspot to.

TIP: Hotspots must be activated within authoring software which supports QTVR playback. Nodester ONLY establishes the Hot Spot — it does not connect the corresponding files (apart from with HTML).



Navigable Object Hot Spot allows you to link another QTVR file to this one through either HTML or through a linking program such as Apple’s QTVR Authoring Suite of tools, Macromedia’s Director or mFactory’s mTropolis program.

Still Object Hot Spot allows a Photo or Artwork to be displayed when clicked.

Kind: Type:

Name: ID:

Miscellaneous Hot Spot acts as a Place Holder when it is not known which type of link will be established.

Kind: Type:

Name: ID:

Other Hot Spot allows a link to a specific file type. When Other: is chosen, the Type: box becomes active. Key in the four-letter File Type (such as GIFF for a .gif file) in the Type box.

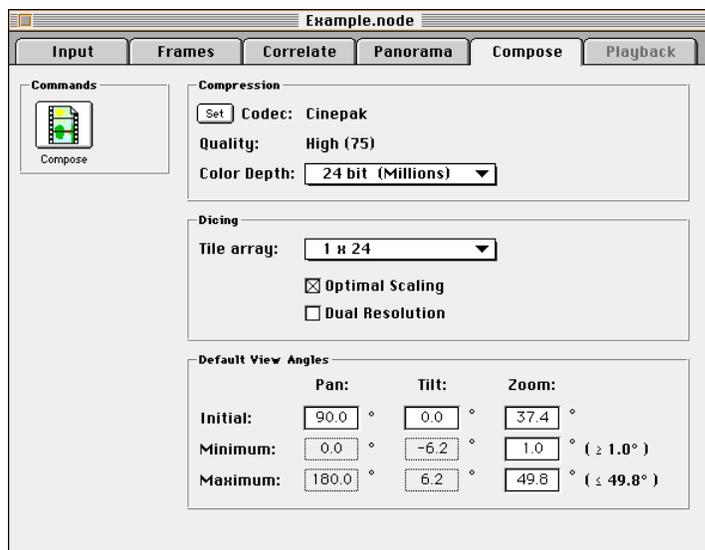
Kind: Type:

Name: ID:

- TIP:** The last thing you do in the Panorama panel is add the Hot Spots! Changes to the Pano (apart from in the later panels) after the Hot Spots are made will cause the Hot Spot information to be erased.
- TIP:** Hot Spots are embedded in the exported QTVR movie file. Once a movie has been exported, the hotspots cannot be accessed from the Nodester file. QTVR will display the Hot Spots during playback.

Step Five The COMPOSE Panel

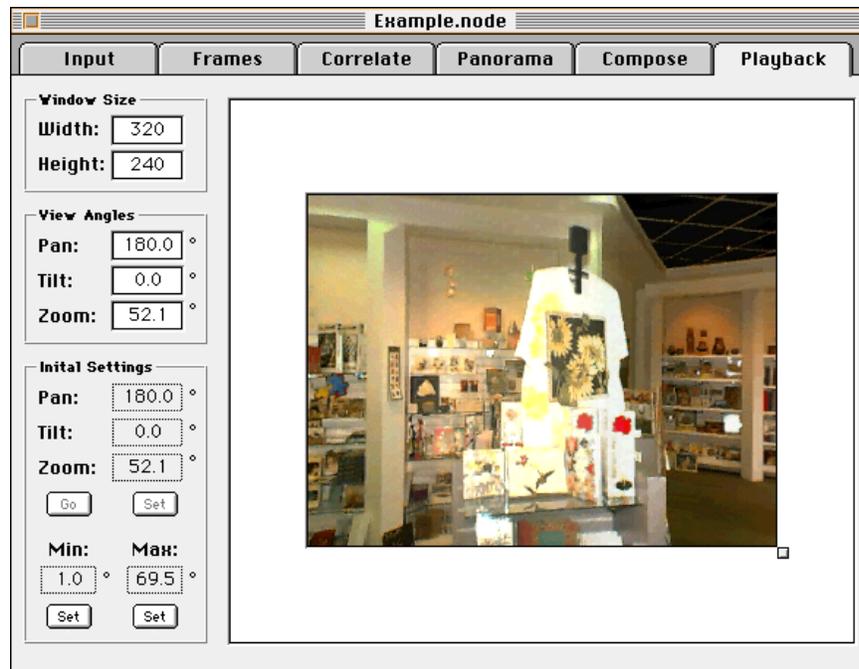
1. Click on the **Set Button** to choose the **Codec** (Compressor/Decompressor) to be used for compressing the QTVR movie. Using different codecs will affect the file size and quality of your QTVR movie. Cinepak is the default and works well for most applications. Cinepak is also, at this time, the only codec that is certain to play back QTVRs properly on non-Mac OS machines. If you intend to develop QTVR for cross-platform viewing (i.e. the Web or a hybrid CD-ROM), we recommend that you leave the program **defaults: Cinepak, Best Depth and High Quality**, for the example.



2. Choose a **Compression Quality** to compose the QTVR movie. Depending upon the Codec chosen, you may not necessarily see a difference. With Cinepak we have found that 75 gives the best performance, and so we have set it as the default.
3. Choose the **Color Depth**. Nodester is optimized for 24-bit color (16.7 million colors).
4. Choose the type of **Tile Array** (defined space) for **Dicing** (slicing up in sections for on screen redraw viewing). QTVR expects the movie to be 'chopped up' or 'diced' into smaller pieces within a tile (rectangle) for quicker screen redraw when panning inside a window. This pop up controls the number of those chunks or divisions. For this example, leave the setting at **Default of 1 x 24**.
5. **Optimal Scaling** adjusts panoramic images by rounding off the image dimensions to an even number of pixels and allows maximum viewing of embedded scaled images.
6. **Dual Resolution** allows QTVR to contain two versions of the same image. One at the higher resolution set at the Input Panel and a "piggy back" low resolution image. The low resolution will stand in during low memory situations and continue playing a quarter size pano version with lesser resolution quality. Choosing this option does, however, increase the QTVR file size by 25%.
7. **View Angles**
 - a. **Pan** enables view control of the horizontal plane by degrees.
 - b. **Tilt** enables view control of the vertical plane by degrees, where 0 degrees is the horizon and positive is an upward direction and negative is a downward direction from the horizon.
 - c. **Zoom** enables view control as to how far in the viewer can zoom. Use this control to prevent the viewer zooming so far in that pixelization occurs. Try 15 degrees.
8. Click **Compose** to compress the file.
9. After composing, the **Playback Tab** will be available to view the panorama in QTVR.

Step Six The PLAYBACK Panel

1. After **Compose** is complete, click the **Playback Panel**.
2. To **Playback** the QTVR, click and hold inside the playback panel. Directional cursors will appear to steer your panoramic movement left/right and top/bottom. You will only get left/right movement, unless the window is smaller than the full height and width, then top/bottom movement will occur.
3. **Resize** the playback panel window by clicking and dragging the **Resizing Handle** in the lower right corner of the window. Also, specific window dimensions or default settings may be keyed into the width and height boxes within **Window Size**.

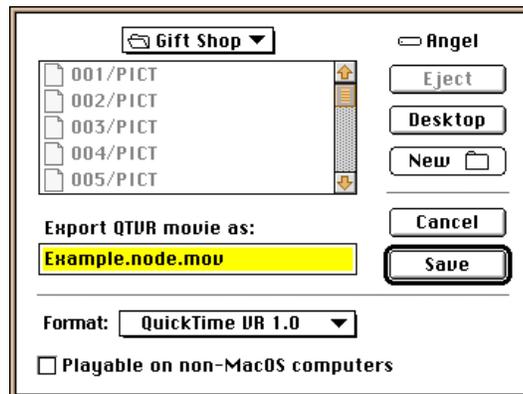


IMPORTANT: The following settings (i.e. View Angles and Initial Settings) only appear if you have the QTVR 2.0 extension (from the CD-ROM) installed on your computer's Extensions Folder.

4. **View Angles** display the settings as the pano is moved inside the view window or settings may be keyed into the pan, tilt and pan boxes.
5. **Initial Settings** allow control over appearance of the pano when first opened after being exported as a QTVR file format. To set the initial settings, first experiment with various settings by moving the QTVR cursors inside the Playback Panel, then click on the **Set Button** directly under the Initial Settings Zoom box. If you wish to go back to the original settings, click the **Go Button**.

Export your File as a QTVR Movie

1. **Test** the QTVR Panorama in the Playback Panel window as needed, then **Export>File as QTVR Movie File Format** (QTVR 1.0 or QTVR 2.0).



2. QTVR Panoramas may be played back from the **Apple** or **inside** a **QuickTime Player** (provided the QTVR System Extension is installed).
3. Check the **Playable on Non-Mac OS computers setting**: if you want this QTVR movie to play on other Operating Systems that support QTVR playback. Checking this box will **flatten** the movie.

IMPORTANT: Virtual Documentation on the Web site (<http://www.panimation.com>)

The interactive example and levels of supporting information will reside on the Panimation web site as a virtual updating document. As Nodester develops and users send in tips, tricks and techniques, all of this will be placed on the Web site for public download.

IMPORTANT: The Users Tips, Techniques & Features Web Site Bank

We encourage all of you to email us on a regular basis with your findings and requests. We will compile tips and techniques for every aspect of QTVR development (cameras, shooting, mounts, software, and software feature requests). This Web Bank of entries will benefit all QTVR developers.

IMPORTANT: Send Samples of your QTVR Panorama Movies to Panimation

Please send your best panoramas to Panimation. We will be creating a gallery of examples for future CD-ROMs and our Web site. We appreciate seeing what people are doing with our software! We can accept panoramas as compressed attachments or by mail on floppy discs. Please include your email address.

Camera Mounts

We at Panimation feel strongly that your best QTVR panoramas are achieved using the best equipment to record precisely aligned images. Nodester is one component of your "toolbox" -- a quality (QTVR-oriented) camera mount or rig should be another.

KAIDAN

<http://www.kaidan.com>
703 East Pennsylvania Blvd.
Feasterville Business Campus
Feasterville, PA 19053
Voice 215.364.1778
Fax 215.322.4186

PEACE RIVER STUDIOS

<http://www.PeaceRiverStudios.com>
9 Montague Street
Cambridge, MA 02139-3721
Voice 617.491.6262
Fax 617.491.6703



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