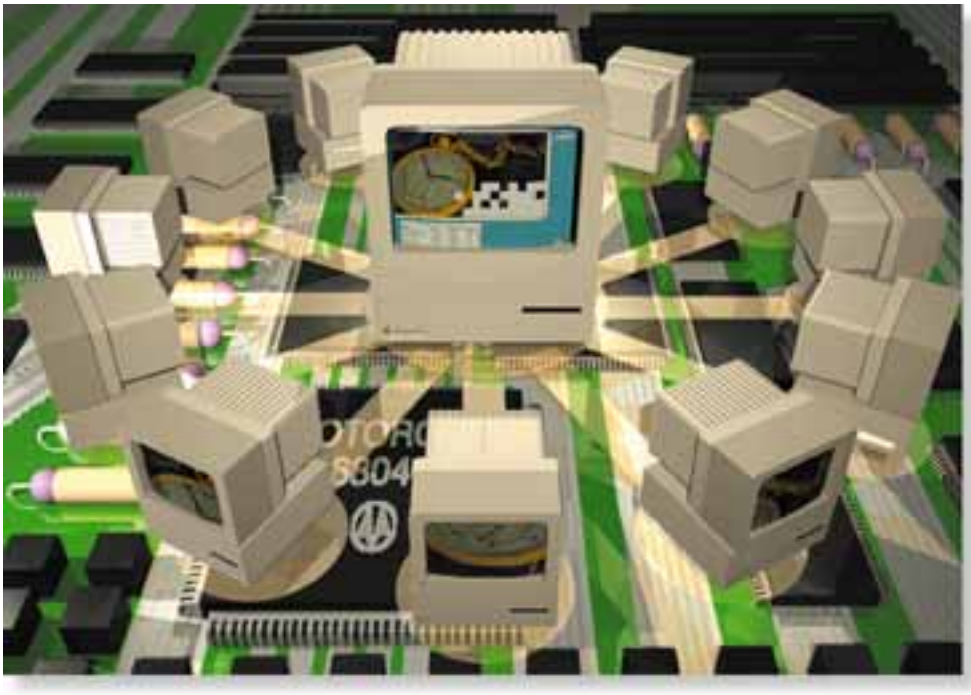

Specular BackBurner™ User's Manual

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BackBurner™ Installation Instructions

SYSTEM REQUIREMENTS

Hardware

BackBurner will work with any Power Macintosh or Macintosh II, Quadra, or Centris class machine with an FPU. Eight MB of RAM and a hard drive are required to run BackBurner. BackBurner requires at least a 12 inch monitor.

Software

The BackBurner System requires System 7.0 or higher for all machines (including the controlling machine) involved in the rendering process.

Network

A network is required for BackBurner to function as a distributed renderer. BackBurner can use any System 7-compatible/AppleTalk network. This includes (but should not be limited to) Localtalk, Ethertalk, and Tokentalk. BackBurner is capable of working over multiple zones on a network.

INSTALLING THE BACKBURNER SYSTEM

For BackBurner to function as a distributed network renderer, you will need to designate one machine as the controlling Macintosh, and a machine or group of machines that will be used as the remote rendering Engines. Note

that if you are planning to use BackBurner as a local renderer (non-distributed), then you need only install the BackBurner application.

The BackBurner Engine and Agent are necessary for any machine to function as a BackBurner Engine. The BackBurner Agent controls the interaction between the BackBurner application and the BackBurner Engine.

You will need to install a BackBurner Agent and BackBurner Engine for each machine that you wish to contribute to the rendering process.

To install an entire BackBurner system:

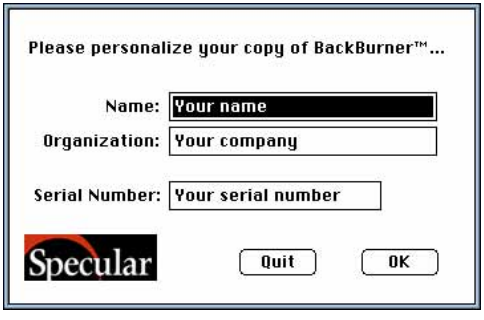
NOTE: If you are upgrading from a previous version of BackBurner, be sure to remove all old BackBurner components before installing the new version, including the Application, Engine, Agent, AutoBurner, and BackBurner Helper (located in the Extensions folder).

1. **Insert the BackBurner CD-ROM.**
2. **Double-click the BackBurner installer icon.**
3. **Click "Continue" at the startup screen.**
4. **Click "Continue" after reading the notes and license agreement.**
4. **Click "Install" at the standard installation screen.**

This will install everything needed for the machine to be both a controlling Macintosh and a remote rendering Engine.

Registering the BackBurner application

Launch BackBurner by double-clicking on the BackBurner icon. If this is your first time launching the BackBurner application, you will be asked to register your copy. Your registration number is found on your BackBurner registration



card. (If you are upgrading from a previous version of BackBurner, use your original application serial number.) Enter your name and organization along with this number to register your copy of BackBurner.

NOTE: Be sure to enter your serial number exactly as it is printed on your registration card, including the dashes.

To install only the BackBurner application on the controlling Macintosh:

1. **Insert the BackBurner CD-ROM.**
2. **Double-click the BackBurner installer icon.**
3. **Once at the "Standard Install" screen, click the "Custom" button for a custom installation.**
4. **Choose the "BackBurner Application" option and click "Install."**

This will install the BackBurner application only.

To install only the BackBurner Engine on a remote Macintosh:

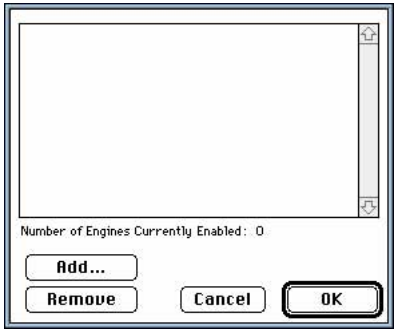
1. **Insert the BackBurner CD-ROM.**
2. **Double-click the BackBurner installer icon.**
3. **Once at the "Standard Install" screen, click the "Custom" button for a custom installation.**
4. **Choose the "BackBurner Engine" option and click "Install."**

This will install the BackBurner Agent Control Panel, the BackBurner Engine, and the AutoBurner™ After Dark™ Screen saver Module.

ENABLING NETWORK RENDERING

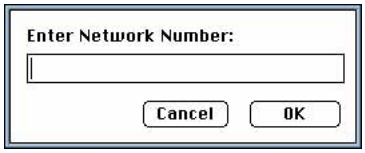
In order for remote Macintoshes to contribute to a rendering, BackBurner must be enabled to use the network. This is done by registering your BackBurner Engines with appropriate serial numbers which can be purchased directly from Specular. Once you have your BackBurner Engine serial number:

1. **Choose "Serialize Network Engines..." from the Engine menu. You will be presented with a dialog box listing all of the BackBurner Engine serial numbers currently enabled.**



The Serialize Network Engines dialog box lists all of the BackBurner Engine serial numbers currently activated.

2. **Click "Add" to enter a new serial number, and type your BackBurner Engine serial number in the text box.**
   NOTE: Be sure to type the serial number exactly as printed, including dashes and capitalization.



Enter your BackBurner Engine serial number to enable network rendering.

3. **Click "OK" to exit from each dialog box.**
   You can add more Engines at any time by purchasing more serial numbers and entering them with this method. You can remove an Engine serial number from the list by selecting the number and clicking "Remove." This can be useful if you own multiple copies of BackBurner and want a different copy to use a particular Engine serial number.

NETWORK CONFIGURATION FOR BACKBURNER

BackBurner requires a network to be used as a distributed renderer. Feel free to skip this section if you are planning to use BackBurner as a local renderer (non-distributed) only.

After installing the BackBurner System onto the controlling machine and the machines that will contribute to the rendering process, you should double-check that the network is set up correctly for BackBurner to function.

BackBurner and AppleTalk

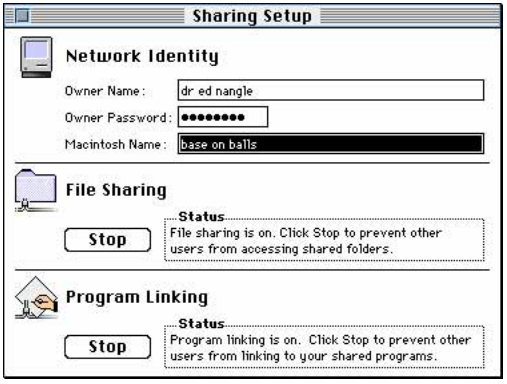
AppleTalk must be active in order for BackBurner to work across a network. To see if AppleTalk is active, select Chooser from the Apple ( ) menu. If AppleTalk is inactive, then click on the Active button.

PROGRAM LINKING

Program Linking allows the different components of the BackBurner System to communicate with each other under System 7. In order for BackBurner to function, Program Linking must be turned on for every Mac involved in the rendering process. There are two places where Program Linking must be enabled for BackBurner to work.

1. Sharing Setup

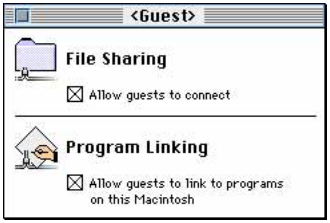
The Sharing Setup Control Panel contains the "master switches" for both File Sharing and Program Linking. Program Linking must be turned on here for BackBurner to recognize this machine as a rendering resource. To turn on Program Linking from Sharing Setup, open the Sharing Setup Control Panel from the Finder. The Control Panel will show Program Linking as currently turned on or off. If Program Linking is off, then clicking once on the "Start" button will turn it on. Note that File Sharing does not need to be turned on for a BackBurner Engine to operate.



2. The Users and Groups Control Panel

BackBurner requires that each machine functioning as a BackBurner Engine have Guest level Program Linking access enabled. This is done in the Users and Groups Control Panel.

To set Program Linking, open the Users & Groups Control Panel and double-click on the <Guest> icon. Check the box labeled "Allow guests to link to programs on this Macintosh" if it is not already checked.



INSTALLING THE AUTOBURNER SCREEN SAVER

It is possible to have the BackBurner Engine activated by a screen saver that resides on the remote machine. When using the screen saver, the people on remote machines do not have to be concerned with turning the Engine on or off. The Engine will only become active when their machine is idle.

The following describes only the installation of the AutoBurner screen saver. For more information about using AutoBurner, consult Chapter 5: The BackBurner Engine and Agent.

The AutoBurner screen saver is a module for use with the After Dark screen saver package by Berkeley Systems. To use this module, simply drag it to the folder "After Dark Files" in the System Folder. You will also need to select the module from within the After Dark Control Panel. Lastly, you will want to turn on "SystemIQ activity monitor" from inside the After Dark Control Panel if it is not already active. To access this option, click on the WHEN button inside the After Dark Control Panel. Please consult your After Dark User's manual for more information on the operation of After Dark.

1 Understanding BackBurner

What is BackBurner?

BackBurner is a stand-alone application that renders Infini-D Scene files. By itself, BackBurner can be used as a background renderer and batch file processor for Infini-D.

In addition, BackBurner is a distributed network renderer for Infini-D. It is designed to take an Infini-D Scene file and distribute the time-consuming task of rendering the file across a network.

Each machine on the network is given parts of the image to render, and returns each portion as soon as it is complete. This process continues until the image is finished. For animations, each frame is treated as an individual image. BackBurner renders the individual frame, dividing up the task among the available machines, and then proceeds to the next frame.

BackBurner is a fault-tolerant system. This means that machines that are contributing to the rendering task can become available or unavailable at any time in the rendering process, without affecting the final rendered image or images. For instance, a machine contributing to the rendering task can even be rebooted in the middle of a rendering. BackBurner will notice that the machine has stopped working and redistribute the work to the other available machines.

A **job** is defined as any rendering task for BackBurner to process, including both single images and complete animations. BackBurner will show the available machines for rendering and distribute the job among them. To render an image or animation, the user opens an Infini-D file from within BackBurner or drags the file onto the BackBurner icon from the Finder. Either of these actions will create a job within BackBurner. Lastly, BackBurner will save the image file or files in the format specified by the user.

What is distributed processing?

As you continue to use your computers to perform more and more difficult tasks, the time it takes to perform those tasks becomes a critical issue. You cannot take on a job or project if you know that the resources are not available to complete the work on time.

Despite the recent advances in hardware, supercomputers are still prohibitively expensive and lack the graceful and intuitive interface of your Macintosh. The Macintosh, however, lacks the raw computational power of the average high-end graphics workstation. One way to compensate for this lack of computing power is to have multiple machines work together on a complex problem. For certain computationally intense problems it is possible to divide the work load among multiple machines or processors. This is called **distributed processing** or parallel processing.

3D rendering is particularly well suited for distributed processing. Even on high-end workstations, rendering images can still take days. By distributing the task of rendering an image across multiple machines or processors, considerably more detailed 3D images and animations can become viable production elements for even a small studio or work group.

To get a solid grasp of the distributed processing idea, imagine that you are in charge of producing a large mosaic mural using ceramic tiles. As head of the production, you plan the overall design of the mural. After you finished the design you would give each person on your production team the task of painting a group of the tiles. You would give them a basic sketch of the individual tiles they were responsible for and an idea of the colors you had in mind. Each person could then go off and work on their tiles independently. When their tiles were complete, they could bring them back to you to be assembled into the complete mural.

Obviously the more people you have, the faster the mural would be completed. It is also important to note that none of the workers need to worry about what the other workers on the project are doing. In addition, if one worker cannot finish the job, his or her work can be reassigned since there is a single person in charge of the whole project.

Distributed rendering is very similar to creating a mosaic mural. With distributed rendering, a centralized machine divides the task of rendering a 3D model among a group of machines on a network. Each machine is given a portion or "tile" of the 3D image to render. When it is finished, it returns the portion to the central machine to be assembled into the complete picture.

The advantages listed for the mural example also apply to distributed rendering. For example, when you have more machines contributing to the rendering task, the rendering will be completed more quickly. In addition, the central machine knows what each machine is working on and can redistribute work to other machines if one machine goes down or becomes unavailable.

What BackBurner is not

BackBurner is not a model creation or an animation scripting system. While BackBurner can temporarily change many of the parameters related to rendering an Infini-D Scene file, it cannot change model, surface or animation information. In order to modify these portions of the Scene you will need to open the file in Infini-D.

BackBurner's Components

The BackBurner System is made up of two parts: BackBurner and the BackBurner Engine. The BackBurner application controls the process of network rendering. All file handling, rendering parameters and job control are accessed in BackBurner. The only required file on the controlling Macintosh is the BackBurner application itself.

Each Macintosh that is contributing to the task of rendering a file is called a **BackBurner Engine**. These are also referred to as **remote Engines** or **remote renderers**. In order for a machine to participate in the rendering process, it must have both the **BackBurner Agent** and the **BackBurner Engine** on the machine. The BackBurner Agent acts as an intermediary between the BackBurner application and the BackBurner Engine. The Agent also manages the Engine's interaction with the machine it resides on, controlling the amount of memory that is available for rendering and when that Engine is available to contribute to a job. You will need one copy of the BackBurner Agent and BackBurner Engine for each Macintosh you wish to participate in a rendering.

It should also be mentioned that the BackBurner application can render a file without the use of additional Engines. In fact, this is the case until you enable network rendering with a BackBurner Engine serial number.

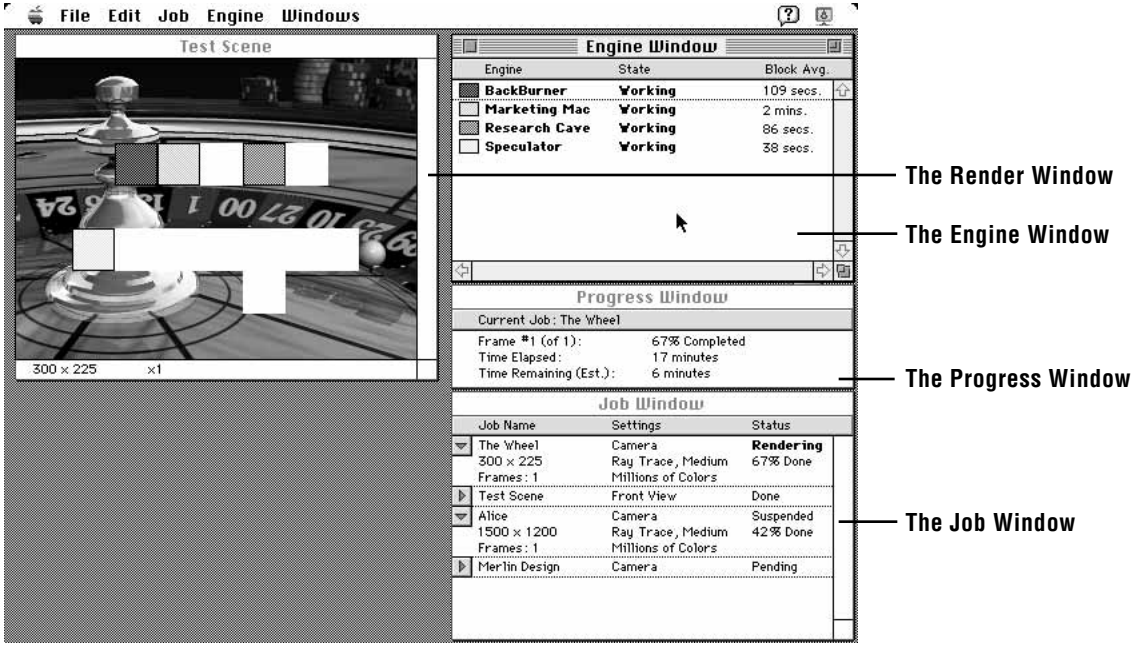
You may wish to have the machine on which you have installed the BackBurner application also available as a BackBurner Engine to other BackBurner users. In this case you will need to install the BackBurner Agent and Engine in addition to the BackBurner application.

2 Tutorial

This section is a brief walk-through of the steps necessary to render an image using the BackBurner system. After installing the BackBurner system on the controlling Macintosh and any machines that you wish to use as BackBurner Engines, launch BackBurner.

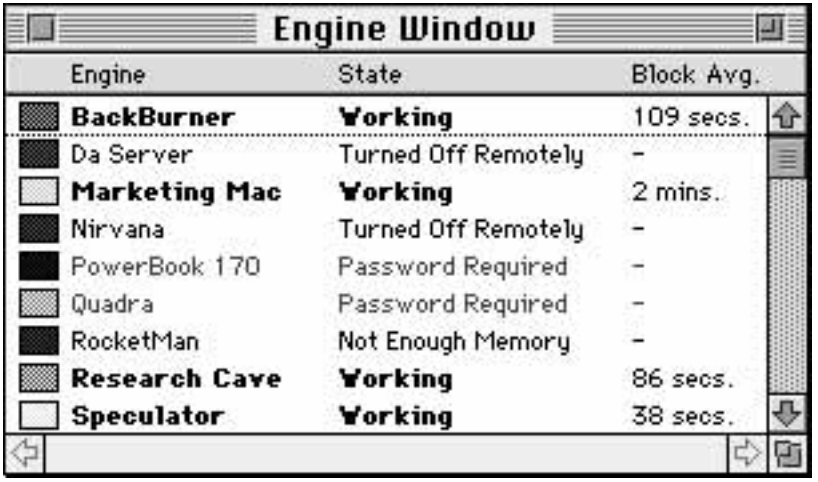
The BackBurner Environment

After registering BackBurner, you will see three windows: the Engine window, the Progress window and the Job window. Any of these windows can be closed or hidden using Close from the File menu, by selecting the window from the Windows menu, or by clicking in the close box of the window.



The Engine window

The Engine window shows the BackBurner Engines that are currently available for rendering and their status. The Engines are listed alphabetically, with each one being assigned a color to represent it. Remember that BackBurner has a rendering engine built into the application, so it will always be listed first, above the dotted line, in the Engine window.



It can take a few moments for each BackBurner Engine on your network to appear and be ready for rendering. At first, only the BackBurner rendering engine will appear in the list. Soon after, however, BackBurner will start to locate available Engines for rendering and automatically initialize them. These delays will be most noticeable on large networks, especially if a BackBurner Engine is located in a different AppleTalk zone from the BackBurner application.

Available Engines are displayed in bold type for easy identification. All other Engine states are displayed in normal type. If no Engines appear in the Engine window, please consult Appendix C: Troubleshooting, for more information.

Note: you do not have to wait for an Engine to appear in the list to start rendering. An Engine can start contributing to the rendering process at any time. If you have not enabled network rendering with a BackBurner Engine serial number, only the built-in rendering engine will be available.

Engine Messages

Each Engine should display the following messages after starting up the program:

Found Agent Indicates that BackBurner has found a machine with a BackBurner Agent.

Speaking To Agent Indicates that BackBurner is determining if the Engine is available or not. If the Engine is not running, BackBurner will instruct the Agent to launch the Engine.

Validated By Agent Indicates that, according to the Agent, the Engine is now available.

Initiating Contact Indicates that BackBurner is contacting the Engine directly to see if it is available for work.

Ready Indicates that the BackBurner Engine is ready to receive rendering information and process it.

If the messages "Engine Not Found" or "Not Enough Memory" appear, then you may have the remote machine configured incorrectly. If the message "Busy" is displayed, then someone may already be running BackBurner on your network. Lastly, if the message "Password Required" appears, then you may need to reconfigure the Users and Groups for the remote machine. If you continue to have problems, consult Appendix C: Troubleshooting. For a complete list of Engine messages, please consult Appendix A: BackBurner Messages.

Average Block Time

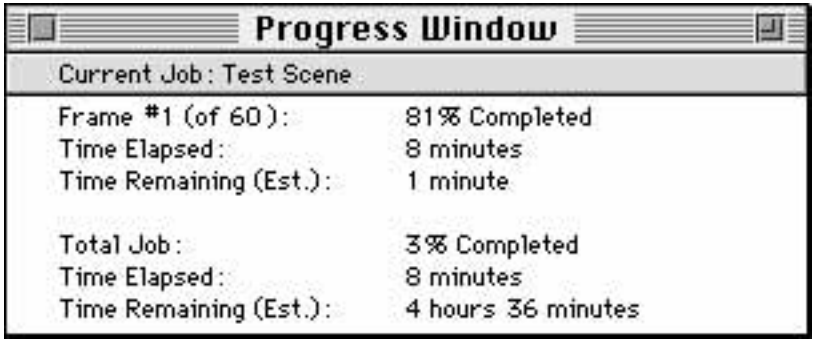
The Engine window contains the list of machines with BackBurner Engines located on them and the current status of each Engine. The Engine window will also show how long it takes each machine to render a single block as averaged over the last several blocks. This number is shown in the Engine window under "Block Avg."

A low block average number for an Engine generally indicates that the machine is performing very efficiently. Specifically, however, it indicates that the machine is either very fast, that the rendering task is very simple, or both. Conversely, a high number can indicate a slow machine, a difficult rendering task and/or a slow network.

The Progress window

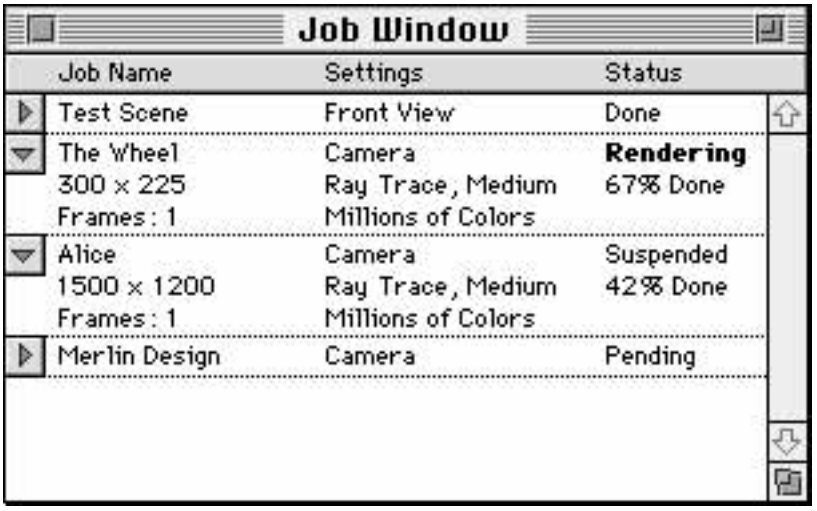
While the image or animation is rendering, the Progress window gives feedback on how much of the image is completed, how long it has taken so far, and an estimation of how long the image will take to complete.

For still images, the estimate is based on the average time to complete a block (averaged over the total number of blocks completed). In the case of animations, the overall estimate is based additionally on the average time needed to complete the previous frames.



The Job window

The Job window contains a list of all the jobs and their current status. In addition, the Job window allows you to control and change the order of job processing. This window's information can be printed or saved as a text log file for use in a word processing package (such as SimpleText, Microsoft Word™ or WordPerfect™) or printed from within BackBurner. This information could, for instance, be used to track billable hours on a project.



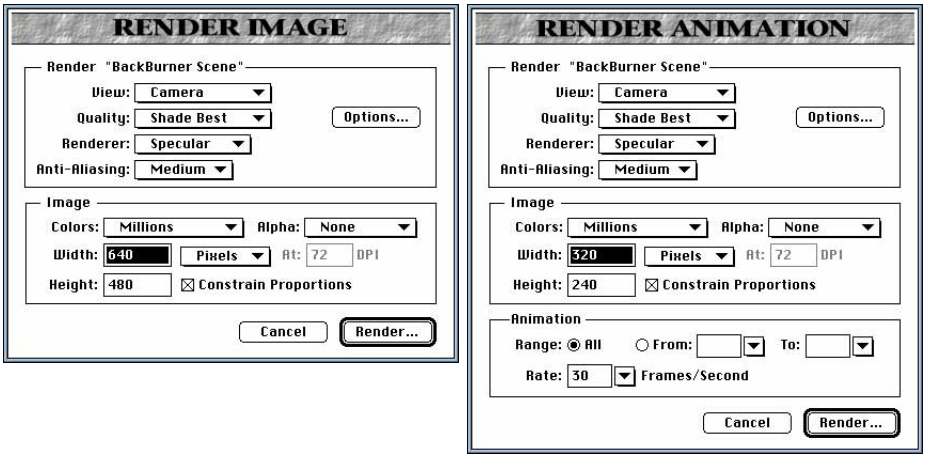
Rendering a file

To render a file, select the Open... command from the File menu. Select any Infini-D file that you have available on any hard drive or volume. You may want to begin with a simple Scene to get immediate feedback on the rendering process.

The Render Settings dialog

After loading the file, BackBurner will bring up the Render Settings dialog box. The dialog box that comes up depends upon the Infini-D scene file you open for rendering. If there is any animation information in the scene, BackBurner presents the Render Animation dialog box which contains the animation settings. If it is a still image the Render Image dialog box appears, which excludes this part.

This dialog contains all the information about how to render a file. The first time you run BackBurner, it will open the file with the rendering options as they were saved in Infini-D. Any of the parameters, however, can be changed here without affecting the Infini-D file.



View

Selects the Infini-D View window that will be used in the rendering.

Quality

Selects the rendering mode to be used in processing the file. All Infini-D rendering modes are available, including Bounding Box, Wireframe, Shade Fast, Shade Better, Shade Best and Ray Trace.

Renderer

This pop-up menu is present to remain consistent with Infini-D which allows you to use QuickDraw 3D renderers. Since BackBurner is not an "interactive" application, QuickDraw 3D provides little benefit and is not used.

Anti-Aliasing

Anti-aliasing is the process of removing sharp edges or "jaggies" from a rendered image. In general, higher anti-aliasing levels result in smoother,

higher-quality images. High anti-aliasing levels, however, can take significantly longer to render. BackBurner has three different anti-aliasing settings to provide you with an acceptable trade-off between the quality of the image and the time it takes to render it.

Options

Each rendering mode has different options available, such as reflections and dithering. Ray tracing, for instance, provides transparency. For detailed information on these features, consult Chapter 7: Reference.

Width and Height

Sets the width and height of the rendering in pixels or inches. There is also a Constrain Proportions checkbox available. With Constrain on, you can easily set a larger or smaller rendering size and the image's aspect ratio will remain constant.

You can specify the image size in inches based on an arbitrary dpi setting here as well. Measurement in inches is most useful for images that will be printed. For more information on how to use the dpi setting for print, please see Chapter 6: Advanced Topics.

Colors

Sets the color depth for the image or animation's output. Available color modes includes Black and White, 4, 16, 256, Thousands, and Millions of colors.

Alpha Channel

When the color mode is set to Millions, an 8-bit alpha channel can also be output. Both Straight and Multiplied alpha channels are supported. For more information on alpha channels, please consult Chapter 6: Advanced Topics.

Animation information

If the Infini-D file selected contains animation information, then controls for deciding which frames to render will appear at the bottom of this dialog. Use the "All" setting to render the complete animation, or select specific start and end frames. You can also specify the number of frames per second.

The Save As... dialog box

After you have set the rendering parameters for the job and clicked on the RENDER button, you will be prompted for a place to save the image or images. In addition to specifying a location, you can also select the output format (PICT, Compressed PICT, PICS, TIFF or QuickTime) for the file or files. The OPTIONS button will become active when you select a format that has options associated with it. Currently, only compressed PICT, PICS and QuickTime files have options. (For details on the options for those formats, see Chapter 7: Reference.)

When you have chosen the appropriate file format options, entered a file name, and specified a location to save the file, click the Save button..

The Rendering window

After setting up the file for rendering, a fourth window will appear in the BackBurner environment to give visual feedback on the rendering process. The new job will also be added to the Job window.

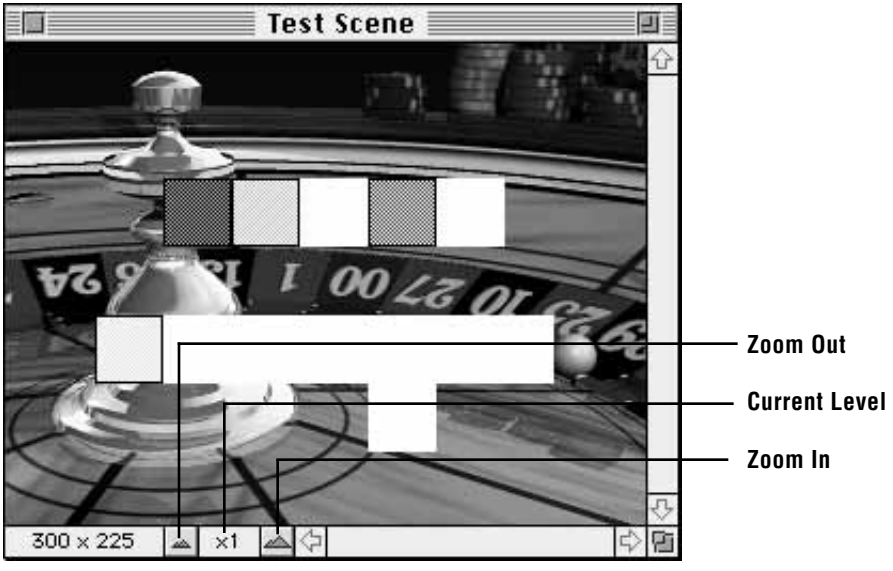
Each of the BackBurner Engines being used in the rendering is represented in the Engine window by a different color "block." These colors are also used in the Rendering window to show the areas of the image that are being processed by each machine. This makes it easy to identify the part of the image a machine is working on and the relative speed of each machine.

There are 24 possible colors for BackBurner Engines. In situations where there are more than 24 machines available, Engines will have repeated colors.

Each machine is sent a block of the image to render. As soon as the block is complete, the Engine sends it back to the controlling Macintosh. This block is immediately displayed in the Rendering window. This process continues until the image is complete. While the image is rendering, the Block Avg. column of the Engine window will update to show the changes in the speed of each machine.

Magnification in the Rendering window

The Rendering window can be moved, resized and zoomed like standard Macintosh windows. It is also possible to enlarge or reduce the image being rendered, even while it is still rendering. Note that enlarging or reducing the



Rendering window has no affect on the final output.

To magnify, or zoom in, on the image being rendered, select the Enlarge icon (an icon representing a large mountain range) located at the bottom of the Rendering window. You will notice that the number to the left of the icon will change to reflect the change in magnification. Use this feature to take a closer look at a specific part of the image. Note that the more you magnify the Rendering window, the more pixilation you will see. This has no affect on the final output of the image or images.

You can also reduce the image using the icon to the left of the magnification/reduction level. This feature can be used to view renderings whose size exceeds the size of your monitor. For example, if you were rendering a file at 2000 by 1000 pixels, then the resulting image would not fit on a standard Apple 14" monitor. There are nine levels of magnification, from 16x to 1/16x.

If the Scene has animation information, after finishing the first frame, the Rendering window will turn "gray" with the current frame visible behind a gray overlay. This will not affect the output of the animation. In addition to providing visual feedback that BackBurner has finished the first frame and is starting on the second frame, this feature also makes it easier to see the rendering progress between frames.

Stopping a rendering

BackBurner will continue until it has completed the image, but you can stop or abort the rendering by selecting "Suspend Job" or "Abort Job" from the Job menu at anytime.

NOTE

Aborting a job does not save any part of a currently rendering image. Frames of an animation that have already been completed, however, are saved on the disk. A dialog box will appear asking you to confirm that you wish to stop a rendering. Use with caution!

3 Handling Jobs

BackBurner is capable of queuing up a list of Infini-D Scene files for rendering. All of BackBurner's job queuing features are controlled through the Job window and the Job menu. You could use the queuing feature to set up, for example, a group of files to be rendered unattended after you have left for the day.

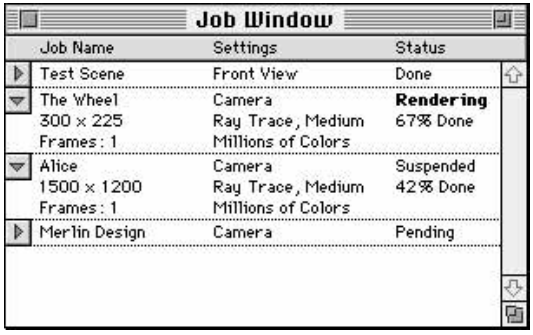
Rendering multiple files

To add a file to the Job window, use the Open command to select the file to be rendered. BackBurner will open the file, prompt you to set the rendering parameters for the file, and then add the job to the Job window list.

Note that BackBurner can only render one job at a time. BackBurner will begin rendering the first file opened, but you can continue to add jobs to the queue. Each job will automatically be started and rendered in turn.

Understanding the Job window

The Job window contains a list of all the jobs for BackBurner to render and, depending on the setting in the Preferences dialog, the jobs already completed. The order in which the files will be rendered is determined by the order of the jobs in the Job window. Jobs are processed, in order, from top to bottom. Jobs that are finished or done end up naturally at the top of the list. Jobs that are aborted are moved to below the last done or aborted job. In either case where a job is done or aborted, the Job will be listed in gray lettering. The gray lettering indicates that the Job cannot be moved in the Job window. Old jobs can, however, be duplicated.



For each job, there is the name of the job (taken from the Infini-D Scene file name) and the status of the job. There are five possible states for a job:

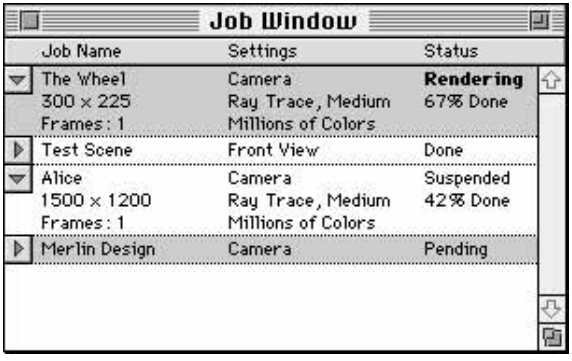
State	Definition
Rendering	BackBurner is currently rendering this job.
Pending	The job is waiting in line to be rendered.
Suspended	The job was started and then suspended. Suspended jobs may be resumed.
Done	The job was completed. Done jobs are listed in gray lettering. Done jobs cannot be moved, but can be duplicated.
Aborted	The job was stopped. Aborted jobs are listed in gray lettering. Aborted jobs cannot be resumed. Aborted jobs also cannot be moved, but can be duplicated.

Working with the Job window

BackBurner does not limit you to simply queuing up jobs for rendering. Any job can be changed, stopped, reordered, suspended, or resumed. All of these actions are performed in the Job window and Job menu.

Selecting a job or jobs

In order to perform any action on a specific job (such as suspending it), the job must be selected in the Job window. Clicking once on a job selects it. BackBurner also allows you to select multiple jobs in order to perform an action on a group of jobs.



To select multiple jobs, hold down the SHIFT key and select the other jobs. To select a discontiguous group of jobs, hold down the COMMAND key while clicking on other jobs in the Job window.

If no job is selected then any actions will, by default, be performed on the currently rendering job, if there is one.

Changing the rendering settings for a job

Any of the rendering settings can be changed after a job has been started. Changing these settings, however, will force BackBurner to start the job over from the beginning. This could be frustrating if, for instance, you were on the last frame of a 200 frame animation. Use caution when deciding to change the rendering settings of a job. You may wish to duplicate a job before changing

the settings to ensure that the job is not forced to restart.

Selecting a job and selecting Edit Settings... from the Job menu will bring you to the Render Settings dialog box. Double-clicking on a job produces the same effect. If the job you selected was the currently rendering job, you will be asked to confirm that you wish to change the rendering parameters of a job before proceeding. If the job you selected was in any other state, then the changes will simply be registered.

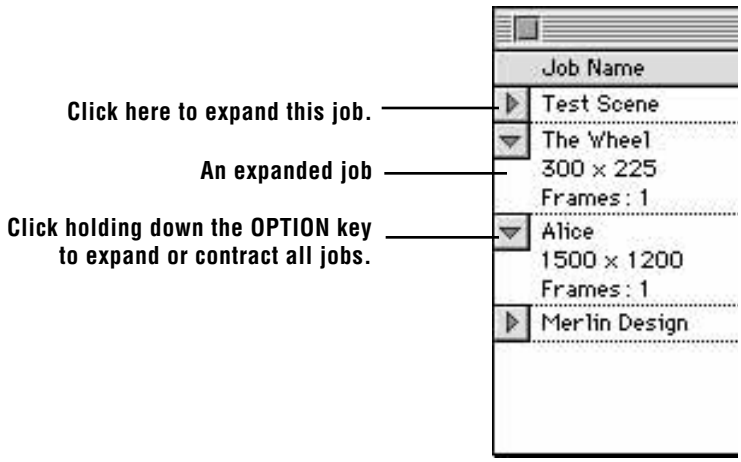
This is the same dialog that appears when you initially open a file to render.

Once you have decided on the new rendering settings for the job, click OK. BackBurner will prompt you for a name for the rendered file and for where to save the file. Clicking on the SAVE button will register the changes with BackBurner.

Clicking on the CANCEL button, either from the Render Settings dialog or from the Save As dialog, will cancel the changes to the job. BackBurner will continue the job from where it was left off before entering the dialog.

Expanding a job

It is also possible to see the settings for any of the jobs in the Job window. To the left of each job name is an arrow. Similar to the Finder in System 7, clicking once on the arrow expands the job listing to show some of the rendering parameters. Clicking again collapses the job parameters to only the first line. Option-click on any job to expand or collapse the entire list.

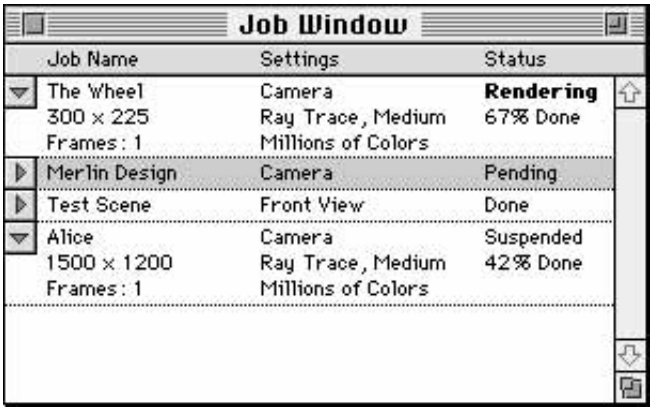


Moving a job

It is also possible to move jobs in the Job window. This allows you to control the order in which jobs will be processed. To move a job, simply click on it and drag. As you drag up or down, a line will appear between the other jobs as you pass over them. This line indicates the insertion point for the moved job. If you let go of the mouse button while this line is visible, then the job

you are moving will be inserted at that place in the Job window.

Moving a job in front of the current rendering job will suspend whatever job was being rendered. BackBurner will then start to render the moved job. You can also duplicate this action by selecting any job and selecting Render Now from the Job Menu.



Suspending a job

Any job may be suspended while rendering. Unlike aborting a job, suspending a job allows you to restart that job at a later time without having to start the rendering process over from the beginning. For instance, suppose you were halfway through rendering a large image and someone came to you with a file that needed to be processed immediately. Rather then having to lose what you had already rendered, you could suspend your file, render the person's file, and then pick up your rendering from where you suspended it.

To a suspend a job, simply select the job and select Suspend from the Job menu. Note that if you drag a job to the top of the Job window or select Render Now from the Job menu, then the current job will automatically become suspended.

Resuming a job

To resume a suspended job, select the job and select Resume Job from the Job menu. Note that Resume Job will be placed where Suspend Job was in the Job menu. BackBurner will automatically pick up the job from where it was originally suspended.

Note that while many jobs can be suspended, you can only resume one job at a time. Resuming a suspended job automatically suspends the job that is currently rendering.

Aborting a job

Any job or jobs may be aborted or stopped by selecting the job or jobs and selecting Abort Job from the Job menu. Note that aborted jobs cannot be resumed, but, because they remain in the Job window (unless the "Remove Old Jobs" preference is checked), they can be duplicated.

Removing a job

The list of Jobs in the Job window is stored so that when you launch Back-Burner, all the jobs rendered in your last session will still be there unless the "Remove Old Jobs" preference has been checked. While this is useful in many

cases, you may want to remove old entries to make the Job window more readable.

Any job or jobs may be removed from the Job window by selecting the job or jobs and selecting Remove Job from the Job menu.

Removing a job removes all record of the job from the Job window. This command is most useful in cleaning up your Job window of jobs that have been finished or aborted. Using this command on the currently rendering job, or on a suspended job, will abort the job and remove it from the list.

The Remove Old Jobs command from the Job menu removes all jobs that are either done or aborted in a single command. This command can be duplicated by selecting all done and aborted jobs and selecting "Remove Job" from the Job menu.

Saving and printing the Job list

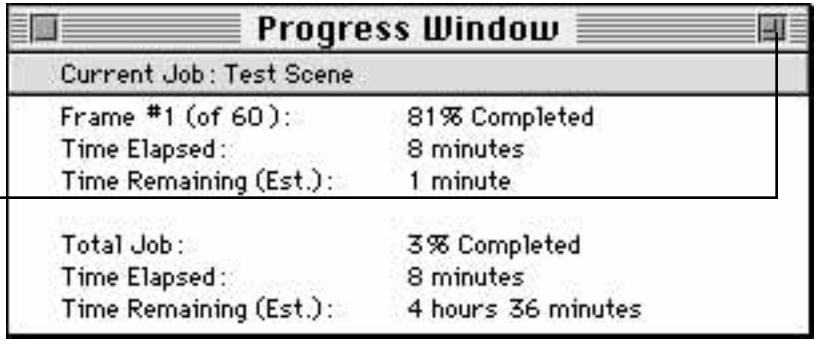
BackBurner allows you to save or print all of the rendering and timing information about jobs. This could be used, for instance, for keeping accurate billing records on what files were processed and how long each of them took. The log file also contains all of the rendering parameters information.

To save the log file, select Save Job list as TEXT from the File menu. This will save a text document that can be brought into any word processor (such as SimpleText, Microsoft Word, or WordPerfect).

Selecting Print Job List from the File menu will simply print the same file to your selected printer. The Page Setup... menu item will let you change the setup of the currently selected printer.

The Progress window

While a job is rendering, the Progress window contains all the time-related information about the job. The name of the current rendering job is displayed below the drag bar of the window.



Click here to show only the top half of the Progress Window.

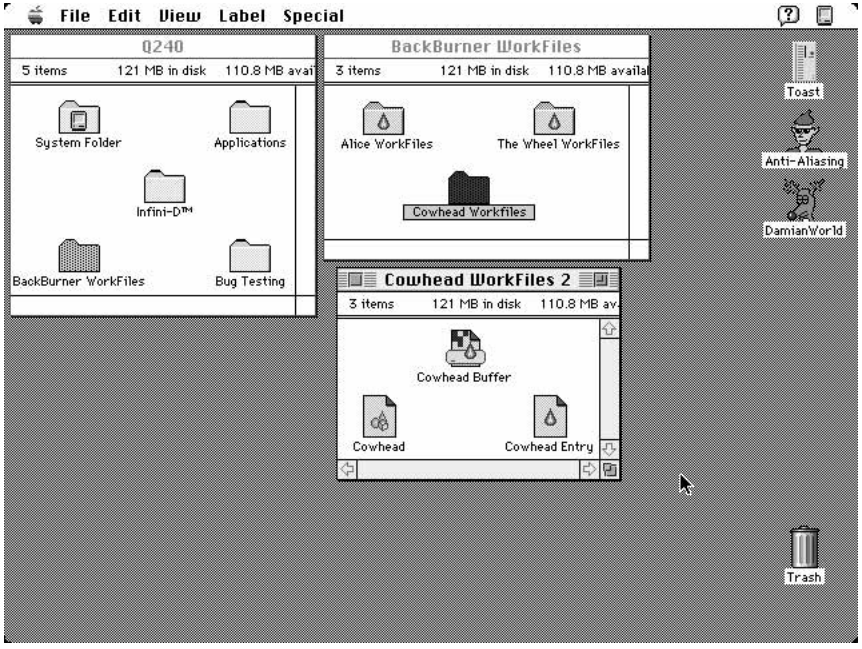
The top half of the Progress window is dedicated to information about the currently rendering frame. This includes what frame is being rendered, the percent of the frame that has been completed, the amount of rendering time that the frame has taken so far, and an estimate about how much rendering time is left.

The bottom half of the Progress window contains information related to the job as a whole. Note that if you are rendering only a single frame, then the numbers in the top half of the window and the bottom half will be identical. If you are rendering an animation, however, the top half contains information about the current frame, and the bottom half contains information about the entire job. This information includes the percent of the total job that has been completed, the total amount of rendering time that the job has taken so far, and an estimate about how much rendering time is left.

The time remaining estimates listed in the Progress window are based on the percentage of the job that BackBurner has completed, and how long it took it to complete that percentage.

BackBurner Workfiles

Whenever BackBurner begins a job, it creates a folder on a hard drive that contains all of the information about that rendering. This folder, called "BackBurner Workfiles," contains a folder for each job in the job list. The name of this folder is the abbreviated name of the Scene file, with "Workfiles" added onto the end of the name. In this folder is all the information about a job,



including the image maps and information about the current status of the rendering. Workfiles provide three key benefits: the ability to render an image larger than RAM allows, the ability to resume a job across rendering sessions, and the ability to recover and restart a crashed rendering.

Large images and Workfiles

When you render an Infini-D Scene file from within Infini-D, the size of the image you can render is limited to the amount of RAM you have in your machine and the amount of RAM you have allocated to the Infini-D application. BackBurner, in contrast with this, can render large images (up to 4096 x 4096 pixels) with a limited amount of available RAM in the machine. BackBurner accomplishes this by only keeping a portion of the rendered image in RAM at any one time. The rest of the rendering information is stored on disk in the Workfiles folder. Note that BackBurner does, however, need to hold the entire model in memory at all times. While BackBurner can render images larger than available RAM would allow, BackBurner will always render faster with more available RAM.

Workfiles and suspended renderings

The second key advantage to rendering with BackBurner is the ability to suspend a rendering and restart it at a later time. In addition to being able to suspend and restart a rendering while running BackBurner, it is also possible to quit BackBurner, launch the application again at a later time and resume a rendering.

Being able to suspend a rendering across sessions is also useful when trying to render a Scene on a machine other than the machine where the Scene was created. When you render an Infini-D Scene file from within Infini-D, image maps are not stored with the Scene file, but their location on the hard drive is. While this is convenient in Infini-D, it makes rendering on machines other than your own risky. Imagine if you wanted to use a service bureau to render a large animation and after two days of rendering you discovered that you had forgotten one image map so the rendered image came out incorrect. BackBurner takes care of this automatically by creating Workfiles for each job.

If, as in the case above, you wanted to send a job to a service bureau to be rendered, the easiest way to insure that the rendering will go smoothly is to first set the job up in BackBurner on your machine. After the job has started rendering, suspend it. Now that the job is suspended, simply open the BackBurner Workfiles folder and drag the folder for the particular job to a disk to be sent to the rendering bureau. You can be confident that the job will be rendered to your exact specifications. You may also remove the job from your own job list.

Opening Workfiles from within BackBurner

Workfiles can also be opened from within BackBurner. Opening a BackBurner Workfile adds the job that the Workfile represents, and continues the job from

wherever it was suspended. To open a BackBurner Workfile, select Open... from the File menu. BackBurner Workfiles will appear in the Open dialog along with any Infini-D Scene files.

Crash recovery

As a side benefit, crash recovery is also possible with the Workfiles. Remember that Workfiles contain all the information, including the current status, about a job. If the machine that is running the BackBurner application crashes, you will be able to pick up the job from approximately where you left off.

Workfiles and disk usage

One potential problem with the Workfile system, however, is that more drive space is required to render a file with BackBurner than with Infini-D. Fortunately, it is possible to select the drive to be used for storing the Work files from the Preferences... dialog.

The item labeled "Place To Put Workfiles" has a menu that lets you select whether you wish to use the Scene's folder, or a particular hard drive or volume to store the Workfiles. If you select a volume, the Workfiles will be placed on the main level of a selected hard drive or volume. If the BackBurner application resides on the volume being used for Workfile storage, the Workfiles will be placed in the folder containing BackBurner.

Drag and drop operation of BackBurner

BackBurner allows you to "drag and drop" an Infini-D Scene file onto the BackBurner application in the Finder. In most applications, dragging and dropping a file on an application simply means to open the file with the selected application. BackBurner interprets this action slightly differently than the standard Open command from within BackBurner.

When you select the Open command from within BackBurner, the application prompts you to set all of the parameters for rendering the file. An Infini-D Scene file, however, contains most of these parameters. You can configure BackBurner to either inherit a Scene's parameters or define a set of default parameters to be used in rendering the file. Dragging and dropping a file onto BackBurner bypasses the rendering parameters dialog box and adds the file to the job list with either the Scene's parameters or with the default rendering parameters.

The drag and drop approach to opening a group of Infini-D Scene files allows you to quickly queue up a large number of jobs for rendering. Jobs that are dragged and dropped on BackBurner are added to the list in the order they were created. Recent files will appear below old files.

In addition to being able to drag a file or a group of files to BackBurner and have them automatically loaded, it is also possible to drag and drop a Workfile or a group of Workfiles onto BackBurner. Since all the rendering settings have

already been determined for these files, BackBurner will simply add the job or jobs to the job list and begin rendering.

NOTE: BackBurner creates several files in each Workfile folder. When dragging and dropping a Workfile onto BackBurner, use the file that has the name of the scene you are rendering with the word "Entry" at the end. (Example: A scene named "The Wheel" would have a Workfile named "The Wheel Entry.")

Custom settings

BackBurner's default setting for drag and drop operation is to use the Infini-D Scene file parameters. You can also define a custom Scene set up for BackBurner to use in the Preferences dialog box.

In the Default Job Settings section of the dialog, select "Custom Settings" from the Render Settings menu.

The button labeled SET... will now become active. Clicking on the button will bring you to the Render Settings dialog box. This dialog is almost identical to the Edit Settings... dialog, but does not actually add a job. Rather, the setting you define here will be used as the default rendering setting for any file that you drag and drop onto BackBurner.

Default output format

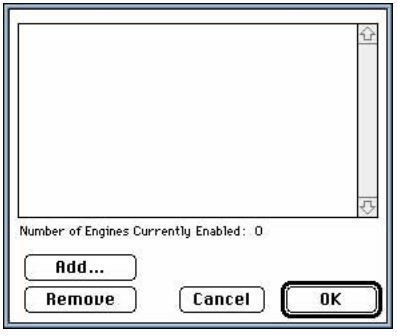
It is possible to set BackBurner's default output format for stills and animations in the Preferences dialog. In the Default Settings section of the dialog, use the items labeled Format For Stills and Format For Animations to select the desired default output format in each case. All of the formats available in the output dialog are also available here.

4 Working with Engines

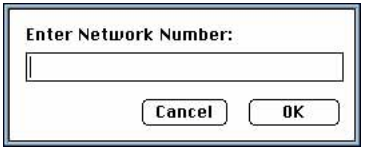
Enabling Network Rendering

Before BackBurner will recognize any remote Engines on a network, it must first be enabled for network rendering. (Without enabling network rendering, only the built-in rendering Engine is available.) Network rendering is enabled by purchasing BackBurner Engine serial numbers and serializing your BackBurner Engines. BackBurner Engine serial numbers come in 1-pack, 5-pack, 10-pack, or 20-pack quantities. You can have a single serial number which enables BackBurner to use one remote Engine, or you can have a single serial number which enables 20 remote machines. If you have seven remote Macs, for example, you would have a 5-pack serial number and two 1-pack serial numbers.

The benefit of this system comes into play when administering a BackBurner rendering network. Assume, for example, that you have ten Macs on a network, but there are usually only five available at any given time. You can install the BackBurner Engine software on all ten machines, but only purchase a 5-pack Engine serial number. BackBurner will use the first five available machines. If you add more Macs to your network, or the existing ones become available, you can purchase more Engine serial numbers and add them to BackBurner.



To enable network rendering, choose "Serialize Network Engines..." from the Engine menu. A dialog box appears that shows you a list of all the serial numbers currently enabled and totals the number of engines enabled.



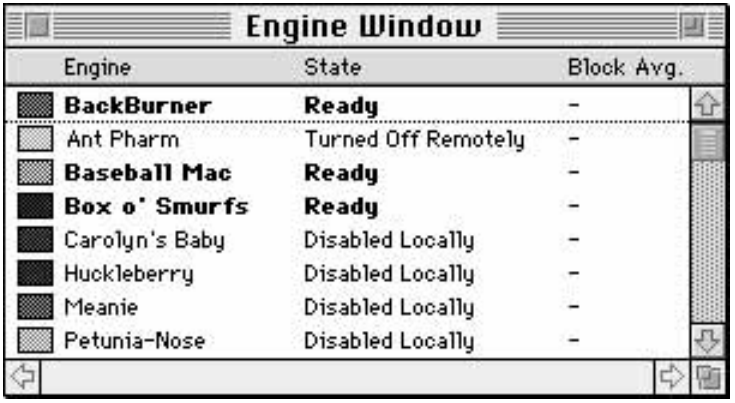
To add a serial number to the list, simply click “Add” and enter the serial number in the text box.

NOTE: Be sure to type the number exactly as it is printed, including the dashes and capitalization.

Any number of Engines can be enabled by adding serial numbers to this list. You can remove an Engine serial number from BackBurner at any time by selecting the number in the list and clicking the “Remove” button.

The Engine window

The Engine window in BackBurner provides feedback about the BackBurner Engines involved in the rendering process. The Engine window also allows you to determine which machines participate in the rendering process. It is possible, for instance, to disable an Engine or group of Engines that you do not wish to use in processing a job.



BackBurner has a rendering Engine built into it that is always displayed with the name “BackBurner” at the top of the Engine window (above the dotted line). All remote Engines are displayed below the dotted line. Remote Engines are listed in the Engine window alphabetically.

Engines displayed in bold type are available or ready for rendering. Engines displayed in red text require a password to be entered for access to the machine. Note that successfully connecting to a machine does not guarantee that the Engine will be available.

Like the Job window, you must select an Engine or group of Engines to perform an action. As in the Job window, it is possible to select multiple Engines by selecting Engines with the SHIFT key held down, and multiple, discontiguous Engines with the COMMAND key held down. You can also select an Engine using the up and down arrow keys on your keyboard.

Disabling/EnablinganEngine

To disable an Engine, select the Engine and choose Disable Engine from the Engine menu. This will disable the Engine and the menu item will change to Enable Engine. In addition, the Engine status will change to "Disabled locally."

To enable an Engine, select the Engine and choose Enable Engine from the Engine menu. The selected Engine will now come back on line.

Note that if multiple Engines are selected, some disabled and some not, the menu and action will be based on the first selected Engine.

There is sometimes a delay from the time you disable or enable an Engine to the time when it actually becomes disabled or enabled. This is due to the time it takes for a message to be sent to the remote Engine. Do not worry if the Engines do not immediately become disabled or enabled.

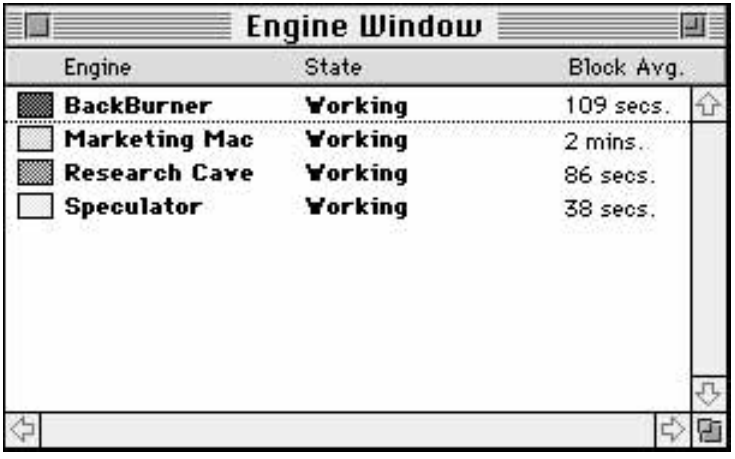
Disablinglocalrendering

You may wish to disable the rendering engine within BackBurner itself. This would allow you, for instance, to continue working in Infini-D at full performance, (minus the processing time required to manage the distribution process) while utilizing the rendering resources of your network. Disabling the renderer or Engine built into the BackBurner application itself is no different than disabling any other Engine.

To disable BackBurner's renderer, select BackBurner in the Engine window and choose Disable Engine from the Engine menu. To enable the Engine, simply select Enable Engine from the Engine menu.

DisplayingEngines

By default, BackBurner displays all Engines, regardless of their status. After using BackBurner for an extended period of time, however, you may wish to only view Engines that are available for rendering or are currently working (those shown in bold). To only view working Engines, select the Display All Engines item from the Engine menu. The check will no longer appear next to the item. To view all Engines again, simply select the menu item again.



NOTE

An engine that requires a password for access or that is locally disabled will not appear with the Display All Engines menu item off.

EnginesandAverageBlockTime

The Engine window will also show how long it takes each machine to render a single block as averaged out over the last several blocks. This number is shown in the Engine window under “Block Avg.”

A low number under the Block Avg. for an Engine generally indicates that the machine is performing very efficiently. Specifically, however, it indicates that the machine is either very fast, that the rendering task is very simple, or both. Conversely, a high number can indicate a slow machine, a difficult rendering task and/or a slow network. You can use this number as a general way to compare the relative speed of Engines on your network.

The Block Avg. number indicates the total time for rendering the block, including the time to transmit information to the Engine and for the Engine to send back the finished block. Therefore, this number also reflects the speed of the network being used for rendering.

Note that the rendering time for each block is independent of all other blocks, in both the same Scene file and across Scene files. A block that contains reflective or transparent surfaces, for instance, will take longer than a block that has no objects in it.

The Engine Information dialog

Selecting an Engine and choosing Engine Info... or double-clicking on a listed Engine from the Engine menu brings up the Engine Information dialog box. This dialog provides all of the information related to an Engine, including the status of the Engine, the name of the machine it resides on, the zone of its AppleTalk network, (if any) the number of blocks that the Engine has rendered in the current job and the average time per block (averaged over a number of blocks).

Note that rendering does not stop while in this dialog box. You can also look at the previous or next Engine from the Engine window without having to exit the dialog. Use the PREVIOUS and NEXT buttons in the bottom of the dialog to look at other Engines. When you have finished looking at the parameters of the Engines, click the DONE button.

The arrow keys can also be used to look at other Engines, with the left arrow for PREVIOUS and the right arrow for NEXT.

Passwords and the Engine Information dialog

The remote machine you are using may or may not have Guest level Program Linking enabled. BackBurner will first try to log into the remote machine with Guest level access. If Guest is not available, then BackBurner will try to log in using the User name as defined in the Sharing Setup Control Panel. If that does not work, then BackBurner will try and log in using all the User names you have successfully used in the past.

If none of these options work, then the BackBurner Engine will display the message “Password Required” (in red text) under Status in the Engine window.

To log into these machines, select the Engine and select Engine Info... from the Engine menu or simply double-click on the Engine.

The Engine Information dialog will appear as usual, but it will also have a CONNECT button available. To log into the machine, click on the CONNECT button. You should be prompted for a User name and password.

If you have the checkbox labeled “Remember name and password” checked, then, after you enter the name and password, BackBurner will remember the information you used and automatically log you into that machine the next time you run BackBurner. Additionally, BackBurner will remember this name and password for use in connecting to other machines.

Regardless of whether you tell it to remember the name and password information, however, BackBurner will retain the information until the program is quit.

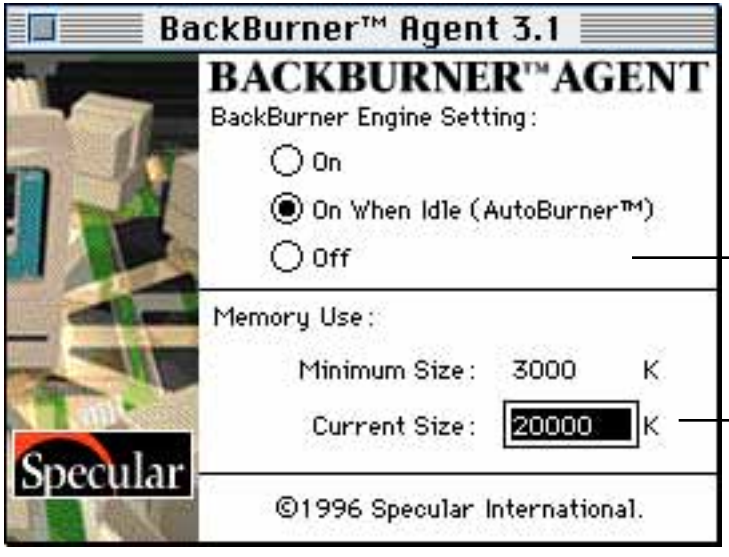
5 The Engine and Agent

The BackBurner Agent

The BackBurner Agent controls the interaction between the BackBurner application and the BackBurner Engine located on the remote machine. The Agent is necessary to turn the Engine on or off and to set the available memory for the Engine. The Agent also must be present for the machine to be recognized at all by the BackBurner application controlling the rendering.

To open the BackBurner Agent, select Control Panels from the Apple ( ) menu on the remote machine and then open the BackBurner Agent.

The Agent can be ON, ON WHEN IDLE, or OFF. When ON, the BackBurner Agent will activate the BackBurner Engine when it receives a message from the BackBurner application on the controlling machine. When OFF, the BackBurner Agent will ignore the message to turn on the Engine, and the message "Turned Off Remotely" will appear in the Engine window of the BackBurner application. The third mode, ON WHEN IDLE, is designed to only turn on the BackBurner Engine when the AutoBurner screen saver is activated on the remote machine.



AutoBurner: the BackBurner screensaver

The advantage of using the screen saver is that your remote machines can be used normally and become a BackBurner rendering resource when they are idle. You will also not have to tell people at those machines to turn on the Agent. Instead, you can have them just leave their machines on. The Agent will activate when they are not working and will quit as soon as they resume work. AutoBurner is an After Dark™ screen saver module.

Note that the BackBurner screen savers take away little or no processing time from the machine being used for rendering.

Memory configuration of the BackBurner Engine

In addition to describing when the BackBurner Engine is available, the BackBurner Agent controls the amount of memory the Engine will use on the remote machine for rendering. The amount listed in the Agent is the amount of free memory required to launch the Engine. If the memory is not available on the remote machine, then the message "Not Enough Memory" will be listed in BackBurner's Engine window. The default minimum memory setting for the Engine is 5 megabytes.

Each Engine must have enough memory to hold the entire Infini-D Scene file in memory. A large Scene file, for instance, that takes 8 megabytes of RAM to be loaded into BackBurner must also have 8 megabytes of RAM available on the remote machines.

With the BackBurner Agent set to "ON," BackBurner Engines will never use more memory than the amount listed for the Current Size in the Agent. For example, if you set the memory size to 5 megabytes, the BackBurner Engine will never use more than 5 megabytes.

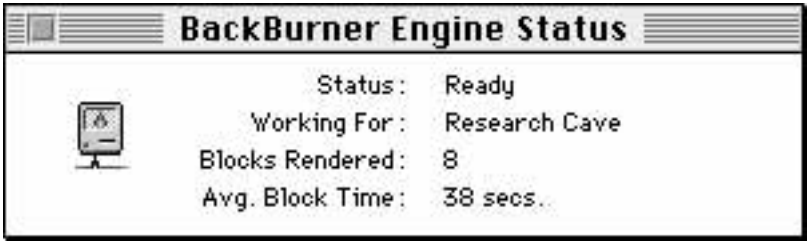
If the BackBurner Agent is set to "ON WHEN IDLE," then when the remote machine becomes idle, the BackBurner Engine will ignore the current memory configuration and use all available memory. For example, suppose the Agent on a remote machine was configured to use 8 megabytes of RAM, but the machine had 20 megabytes of RAM actually available. When the machine became idle the BackBurner Engine would launch using all 20 megabytes. If someone moved the mouse, the memory would become free again for other applications to use.

If BackBurner cannot launch the Engine due to memory problems, it will display the message "Not Enough Memory" in the Engine window. Note that BackBurner will periodically check the remote machine to see if it is possible to launch the Engine.

If you are unsure as to what memory configuration to use for BackBurner Engines, we advise that you install and use AutoBurner all the time. This will ensure that you have enough memory to render without reconfiguring the Engine, and that the people on the remote machines will be able to work uninterrupted.

The Engine Status window

The BackBurner Engine Status window appears on machines being used for rendering when the BackBurner Engine is launched. The window includes information about the status of the Engine, what machine it is working for, the number of blocks rendered so far, and the average time, in seconds, per block. The "Working For" field contains the name of the machine running the Back-Burner application. For a complete list of messages for the BackBurner Engine Status window, please consult Appendix B: BackBurner Engine Messages.



Like a normal application, it is possible to switch in and out of the BackBurner Engine from the Finder's Application menu. When the BackBurner Engine is selected, the BackBurner Engine Status window comes to the front. There are three menu items associated with the Engine application.

Open Status window opens the BackBurner Engine Status window if it is closed. Close Status window closes the BackBurner Engine Status window if it is open.

Quit forces the BackBurner Engine to quit and sets the BackBurner Engine Setting in the BackBurner Agent Control Panel to OFF. The Engine will ask you to confirm that you wish to quit before quitting.

6 Advanced Topics

The previous chapters have dealt with understanding how BackBurner works and how to get the application and other parts related to BackBurner up and running. This chapter covers advanced topics related to BackBurner, and should be read after you have familiarized yourself with the product and how it works.

Speed: How fast should BackBurner render?

The performance of BackBurner on a network directly relates to the speed of the machines being used, and the traffic and configuration of the network. On a basic level, if you are running BackBurner on a single PowerMac 7100, and you add another PowerMac 7100, you should see your rendering performance roughly double. In actuality, due to the overhead of distributing the work, the performance will be slightly less than twice as fast.

The Formula

We have worked out the following point scale and formula to calculate the approximate speed increase that you should be seeing. Please note that the following is only a way to estimate the rendering performance. Other factors that will affect the actual performance include the complexity of the Infini-D Scene file, large image maps, and network speed and traffic.

Point rating for each Macintosh:

MacIIci	1
MacQuadra	2
PowerMacintosh7100/66	5
PowerMacintosh8500/120	8

Total rendering points = Controlling Macintosh + All Macs available for rendering

Rendering multiplier=Total rendering points/Controlling Macintosh

An Example

The available machines with BackBurner Engines on them include a Quadra 900 and two Power Mac 7100s. The controlling machine is a Power Mac 8500.

Total rendering points: 2 + 5 + 5 + 8 = 20 points

Rendering multiplier: 20 / 8 = roughly 2.5 times faster than the single Power Mac 8500.

Network speed

Network speed will always affect BackBurner's performance, but it becomes a particularly important issue with Scene files that contain large image or texture maps (larger than 500 by 500 pixels). When BackBurner starts the rendering process, it sends the complete Infini-D Scene file, minus the image maps, to every Engine being used. The Engines then "request" blocks of the image maps as they need them. With a large image map, these blocks can be quite large and therefore take a significant amount of time to transmit over the network. While LocalTalk is sufficient for most rendering jobs, EtherTalk, with its high data transfer rates, will give better performance with such files.

Network traffic will also affect the speed of BackBurner. If your network is also being used to access a file server, for example, then BackBurner will be slower when server activity is high.

Performance on remote machines

The performance of other applications on a machine being used as a BackBurner Engine is directly related to the types of applications being run on that machine and the speed of that machine.

"Low-processing power" applications such as word processors, spreadsheets, and flat-file databases can run comfortably on a Quadra with the BackBurner Engine running in the background. Processor-intense applications such as 32-bit paint programs, 3D applications and relational databases require a Power Mac to have adequate performance while running the BackBurner Engine in the background.

The performance also relates to the amount of memory available on the remote machines. In general, the more memory available, the better the performance of the foreground applications with the BackBurner Engine running.

There may, in fact, always be some sluggishness when running the BackBurner Engine. If you are having difficulty, we recommend that you use the AutoBurner screen saver and have your machine available for rendering only when idle.

Using multiple BackBurner applications

It is possible to run more than one copy of the BackBurner application on the same network. In this case, the allocation of BackBurner Engines happens on a first-come-first-served basis. This means, for instance, that one person could run the BackBurner application two minutes before the second person runs it and get all available Engines. The second person, in this case, would see each Engine in the Engine window with the message "Busy."

Needless to say, this could be quite frustrating for the second person running BackBurner, especially on a large network with multiple AppleTalk Zones. There are two solutions to the problem. The first person running BackBurner could select a group of Engines in the Engine window and select Disable Engine from the Engine menu. This would disable the Engines for the first person, but make them available for use by the second user.

The second solution only works in the case where the users have all the Engines divided across two different Zones. Both users can choose to only look for Engines in their local Zones. This would mean that Engines in a second Zone would not be recognized.

The option to look only in a local Zone is found in the Engine menu. The Look In All Zones menu item is checked by default. Selecting this item will uncheck it, causing BackBurner to look only in the local zone for Engines. Note that Engines already found across Zones will continue to be used unless disabled locally.

Centralized rendering

A good approach to network rendering is to have a single person responsible for rendering all files. The drag and drop nature of BackBurner makes it very easy for this person to set a group of files rendering in a single action.

The optimal setup for centralized rendering is to have a shared folder on the controlling machine in which the other people place the files they wish to have rendered. The person in charge of rendering selects these files and drags them to the BackBurner application. Note that BackBurner can open them using either a default rendering setup or the rendering parameters found in the file itself. Either of these options can be set in the Preferences dialog box.

For example, Damian is the designated rendering controller for his office. He creates a shared folder called "To Be Rendered" on his machine. Other people around the office work with Infini-D and create files to be rendered and place the Infini-D files and any associated texture maps in this folder. At the end of the day, Damian selects all of the Infini-D files in the Finder and drags them onto the BackBurner application. BackBurner opens all the files and queues them for rendering. Later, after the rendering is complete, people can claim their output from either that same folder, or from another shared folder called "Finished Rendering."

Poor uses for BackBurner

While rendering Best Shaded or ray traced images and animations are excellent uses for of BackBurner, you may find that some types of rendering jobs, especially on simple scenes, are best handled within Infini-D. For instance, rendering a series of Wireframe spheres in a simple animation would be faster to do in Infini-D. These rendering options, however, are included with BackBurner so that you could, for example, render such files in the background while continuing to work with Infini-D. Using BackBurner for lengthy complex wireframe previews is also perfectly reasonable.

Rendering for print

BackBurner is ideal for rendering Infini-D files for print because you can specify the image rendering size in inches based on an arbitrary dots-per-inch setting. Combine this with BackBurner's ability to reduce a large image to be viewable on a 640 by 480 monitor, and BackBurner becomes essential for anyone rendering for print.

If you are creating an image that will be used for print media, you first have to determine the resolution you need for your renderings. To calculate the resolution in dots per inch, (dpi) a standard method is to choose a dpi that is double the line-screen output you intend to use in printing. For example, many people use a 150 line screen when outputting to an imagesetter.

150 x 2 = 300 dpi image.

Now that you know the resolution (in this case, 300 dpi) you can then enter that value into the DPI text box in the Render Settings dialog box (you will need to select "Inches" from the pop-up menu.) Finally, enter the dimensions, in inches, for the width and height of the desired printed image size.

For example: if you wanted to render an image for a brochure that would be 3 inches by 4 inches when printed, you would select "Inches," enter 300 in the DPI text box, and enter 3 inches for width and 4 inches for height.

Note that BackBurner does not actually export the image at 300 dpi. Rather, it calculates the size of the image, in pixels, for you using the formula outlined above. If, as in the earlier example, you rendered a 3 by 4 inch image at 300 dpi, the resulting output would be 900 by 1200 pixels (3" x 300 dpi = 900 pixels, 4" x 300 dpi = 1200 pixels.) If you wish to change the dot per inch setting of the image, you will need to bring the image into an image manipulation package such as Adobe Photoshop™.

Alpha channel

Macintosh image files (PICT, Compressed PICT, TIFF, PICS, and QuickTime) can contain 24 bits of color information. An additional 8 bits of color information is available for use as an alpha channel. The alpha channel is extremely

useful for compositing multiple images together or compositing computer graphics onto video. There are two different methods of creating alpha channels from within BackBurner.

Straight alpha channel

The Straight alpha method outputs the alpha channel as a separate channel. This method works well when you need to composite multiple images together using a program like Adobe Photoshop, or if you want to key 3D graphics over live video with crisp edges using hardware like a TrueVision NuVista+™ video card. Note, however, that when you use a straight alpha channel, images may look jagged in programs that do not support an alpha channel.

Multiplied alpha channel

The Multiplied alpha method outputs the alpha channel much like straight alpha, except that the multiplied method also integrates the alpha information into each of the red, green and blue color channels. This makes images appear correctly anti-aliased even if the program that is viewing the image does not support alpha channels. It does however, modify the red, green and blue channels. Compositing with a multiplied alpha channel can produce unexpected or unwanted results because the anti-aliasing information will be used twice: once in the multiplied alpha and once in the composite.

NOTE

Using a background color other than black can produce unexpected or unwanted results when compositing with other images.

7 Reference: Menus & Dialogs

The File Menu

Open(Command-O)

Opens an Infini-D Scene file for rendering within BackBurner, and produces the Render Settings... dialog box. BackBurner Workfiles can also be opened with this menu item. See “BackBurner dialog boxes” later in this chapter for more information.

Closewindow(Command-W)

Always closes the front-most window.

SaveJobListasTEXT(Command-S)

Saves detailed rendering information for the list of jobs in the Job window to a text file. User will be prompted for file name and location.

PageSetup…

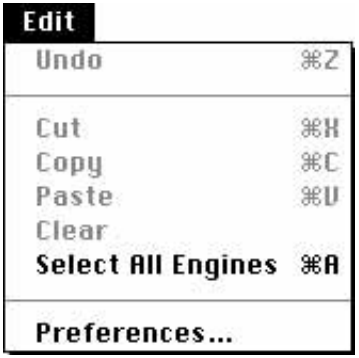
Brings up the standard Macintosh Page Setup dialog box for the selected printer. See the Macintosh System Reference Guide for details.

PrintJobList(Command-P)

Prints the rendering information for all of the jobs listed in the Job window.

Quit(Command-Q)

Quits the BackBurner application.



The Edit Menu

Undo(Command-Z)

Cut(Command-X)

Copy(Command-C)

Paste(Command-V)

These commands are not used within BackBurner.

Clear

Clears the selected job or jobs from the Job window.

SelectAll(Command-A)

Selects either all the BackBurner Engines in the Engine window, or all the jobs in the Job window depending on which is currently the active window.

Preferences...

Opens the Preferences... dialog box. This dialog contains all the Preferences related to the BackBurner application. See BackBurner dialog boxes, later in this chapter, for more information.

The Job Menu

DuplicateJob(Command-D)

Duplicates the currently selected job or jobs. The rendering parameters are also duplicated.

EditSettings...(Command-E)

Opens the Render Settings dialog box for the selected job. Note that this will restart the selected job if that job is in progress. This dialog contains all information related to a rendering job. See "BackBurner dialog boxes", later in this chapter, for more information.

RenderNow/ResumeNow(Command-R)

Starts or resumes the currently selected job. If another job is currently rendering, then that job is suspended and the selected job is rendered.

SuspendJob/ResumeJob(Command-J)

Suspends the current job. Suspended jobs can be restarted with the Render Now command.

AbortJob(Command-K)

Aborts or stops the currently rendering job. The current image information is not saved, but frames already rendered will still be present on disk. Aborted jobs cannot be resumed.

RemoveJob(Command-L)

Removes a job from the Job window. This command will also abort a job if the job is currently rendering.

Remove Old Jobs...

Removes all jobs with the status of Done or Aborted from the Job window.

The Engine Menu

Disable/EnableEngine(Command-H)

Disables or enables the selected Engine or Engines. Disabled Engines display the message “Disabled Locally” in the Engine window. Disabled Engines do not contribute to the rendering process. Disabled Engines are available to other Macintoshes running another copy of the BackBurner application.

GetEngineInfo...(Command-I)

Opens the Engine Information dialog box for the selected Engine. See “Back-Burner dialog boxes” later in this chapter, for more information.

SerializeNetworkEngines...

Brings up a dialog box which shows all of the currently enabled BackBurner Engine serial numbers, and allows you to add or remove them.

DisplayAllEngines

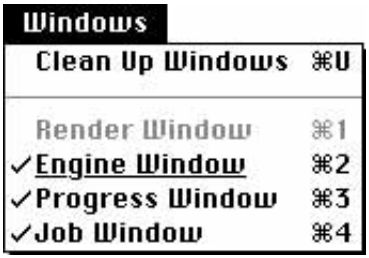
When checked, BackBurner will show all Engines found over the network. When not checked, BackBurner will display only those Engines that are available for work or are currently working.

UseRemoteEngines

When checked, the BackBurner application will distribute rendering tasks among available BackBurner Engines. BackBurner only renders locally when this menu item is not checked.

LookInAllZones

When checked, BackBurner will look in all Zones of the current AppleTalk network for BackBurner Engines. When not checked, BackBurner will only look in the Zone that the machine running the BackBurner application is in. This menu item has no effect on Engines already found.



The Windows Menu

CleanupWindows(Command-U)

Places the Engine, Progress and Job windows at their default screen placement and size.

RenderWindow(Command-1)

Opens the Render window if it is closed. Makes the Render window active if it is currently inactive. Hides the Render window if it is currently open and active. An underline indicates that the window is currently active.

EngineWindow(Command-2)

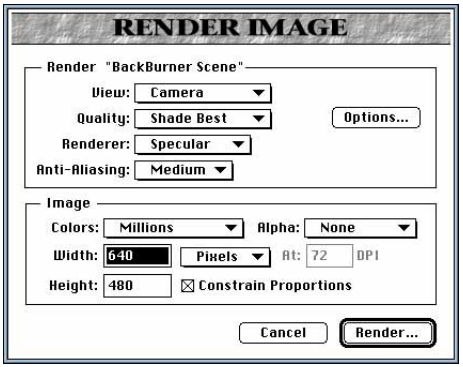
Opens the Engine window if it is closed. Makes the Engine window active if it is currently inactive. Hides the Engine window if it is currently open and active. An underline indicates that the window is currently active.

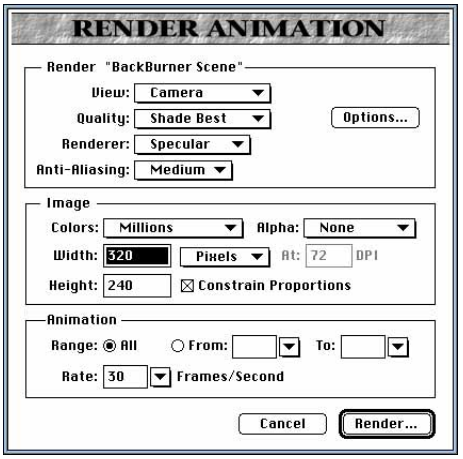
ProgressWindow(Command-3)

Opens the Progress window if it is closed. Makes the Progress window active if it is currently inactive. Hides the Progress window if it is currently open and active. An underline indicates that the window is currently active.

JobWindow(Command-4)

Opens the Job window if it is closed. Makes the Job window active if it is currently inactive. Hides the Job window if it is currently open and active. An underline indicates that the window is currently active.





The Render Settings dialog box

View

Selects the Infini-D View window that will be used when rendering.

Quality

Selects the rendering mode to be used in processing the file. All Infini-D rendering modes are available, including Bounding Box, Wireframe, Shade Fast, Shade Better, Shade Best and Ray trace.

Renderer

This pop-up menu is present to remain consistent with Infini-D which allows you to use QuickDraw 3D renderers. Since BackBurner is not an “interactive” application, QuickDraw 3D provides little benefit and is not used.

Anti-Aliasing

Anti-aliasing is the process of removing sharp edges or “jaggies” from a rendered image. In general, higher anti-aliasing levels result in smoother, higher-quality images. High anti-aliasing levels, however, can take significantly longer to render. BackBurner has three different anti-aliasing settings to provide you with an acceptable trade-off between the quality of the image and the time it takes to render it.

Options

Each rendering mode has different options available, such as reflections and dithering. Ray tracing, for instance, provides transparency. For detailed information on these features, see the Rendering Options dialog box later in this chapter.

WidthandHeight

Sets the width and height of the rendering in pixels or inches. There is also a Constrain Proportions checkbox available. With Constrain Proportions on, you can easily set a larger or smaller rendering size and the image's aspect ratio will remain constant.

You can specify the image size in inches based on an arbitrary dpi setting here as well. Dots per inch is most useful for images that will result in a printed image. For more information on how to use the dpi setting in print, please see Chapter 6: Advanced Topics.

Colors

Sets the color depth for the rendered image or animation. Available color modes include Black and White, 4, 16, 256, Thousands, and Millions of colors.

AlphaChannel

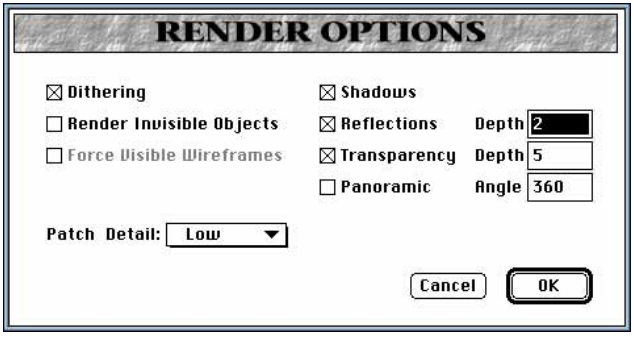
When the color mode is set to Millions, an 8-bit alpha channel can also be created. Both Straight and Multiplied alpha channel are supported. Selecting an alpha channel will automatically set the background color for the rendered file to black. For more information on alpha channel, please consult Chapter 6: Advanced Topics.

Animationinformation

If the Infini-D file selected contains animation information, then controls for deciding which frames to render will appear at the bottom of this dialog. Use the "All" setting to render the complete animation, or select specific starting and ending frames. You can also specify the number of frames per second.

The Render Options dialog box

Each rendering mode has different options available. Please consult your Infini-D User's Manual for more information on each option.



Dithering

Dithering is used to approximate 24-bit color images in an 8-bit color mode by using colored patterns. If you are planning on viewing your images or animations on an 8-bit monitor, we recommend that you keep the Dithering option checked.

Render Invisible Objects

When this option is checked, BackBurner will render invisible objects such as Lights and Cameras. This option is available in all rendering modes.

Force Visible Wireframes

In some cases a wireframe rendering may be unusable because the color of the wireframe render's lines will be too dark to see against a dark background. Force visible wireframes makes all wireframes visible against the current background color of the Scene. In other words, if the background was black, the wireframes would be white. If the background was white, however, this option would make all the wireframes black. As the name implies, this option is only available in Bounding box and Wireframe rendering modes.

Shadows

This option turns the ability to cast shadows on or off for all objects in a Scene. Available only in Shade Best and Ray trace.

Reflections

This option turns reflection on or off for all objects in a Scene. It is sometimes useful to turn this off for ray traced test renderings to reduce rendering time. This option is only available in ray tracing. This option does not affect the use of Environment Maps in the Shaded modes.

You can also set the maximum number of reflections by entering a number in this text box. For more information on the maximum number of reflections, consult your Infini-D User's Manual.

Transparency

Turns transparency on or off for all objects in a Scene. As with the reflections option, this can be useful in ray traced test renderings to reduce rendering time. This option is only available in ray tracing.

You can also set the maximum number of levels of transparency by typing a number in this box. For more information on the maximum number of levels of transparency, consult your Infini-D User's Manual.

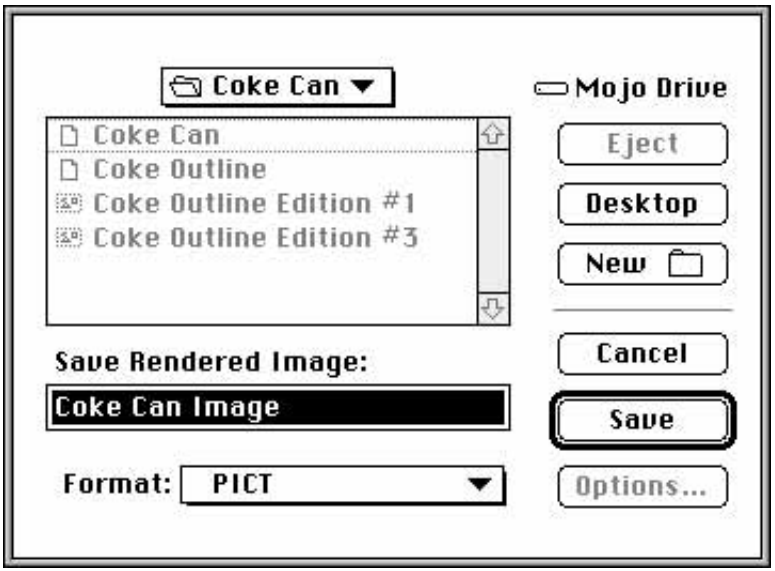
Panoramic

With this option checked, BackBurner will render the image (or every frame of the animation) as a panorama for use with QuickTime Virtual Reality. In order for this checkbox to be active, the current view must be a Camera view, and

the rendering quality must be Ray Trace. The degrees text box allows you to set how much of the scene is rendered. For further information on setting up and rendering panoramic scenes for use with QuickTime VR, consult the Infini-D 3.1 addendum.

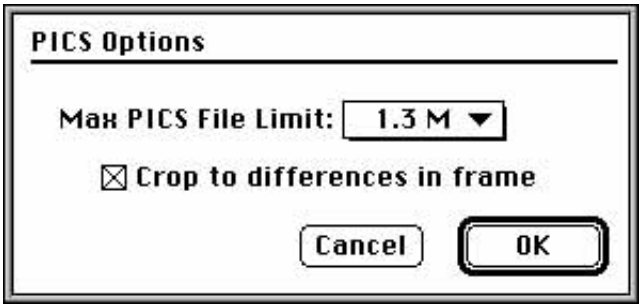
PatchDetail

This pop-up menu allows you to set the level of detail for rendering SplineForm objects. Higher patch detail settings create more polygons and therefore will make your SplineForm objects appear much smoother when shaded. (Patch Detail does not affect ray tracing.) However, higher patch detail can also greatly increase rendering times.



The Save As... dialog box

After you have set the rendering parameters for the job and clicked the RENDER button, you will be prompted for a place to save the image or images. In addition to specifying a location, you can also select the output format (PICT, Compressed PICT, PICS, TIFF or QuickTime) for the file or files. The OPTIONS button will become active when you select a format that has options associated with it. Currently, only Compressed PICT, PICS and QuickTime files have options.



Output Options - PICS Files

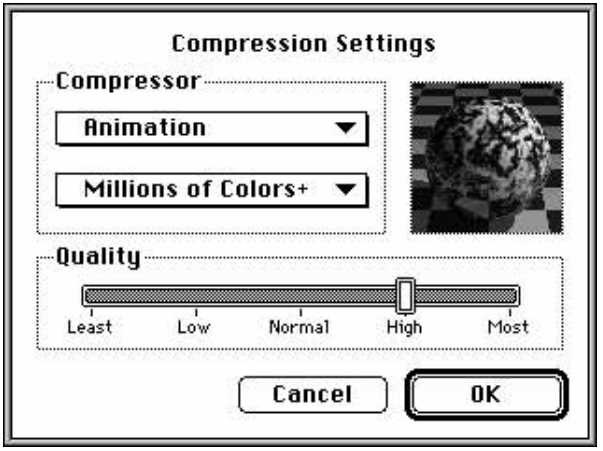
There are two options available for PICS files: Max PICS File Limit and Crop to differences in frame.

MaxPICSFileLimit

The limit on the size of a PICS file on the Macintosh is 16 megabytes. To allow the user to divide a large animation into smaller PICS files, BackBurner has the ability to divide an animation into a series of PICS files. The limit set here specifies the maximum size of each PICS file.

Croptodifferencesinframes

When this option is turned on, BackBurner will automatically crop the image rendered to the area of the frame that is different from the previous frame. This can conserve disk space when saving and conserve RAM used when playing the animation back. With this option off, BackBurner will render the entire image frame for every frame in the sequence.



Output Options - QuickTime files

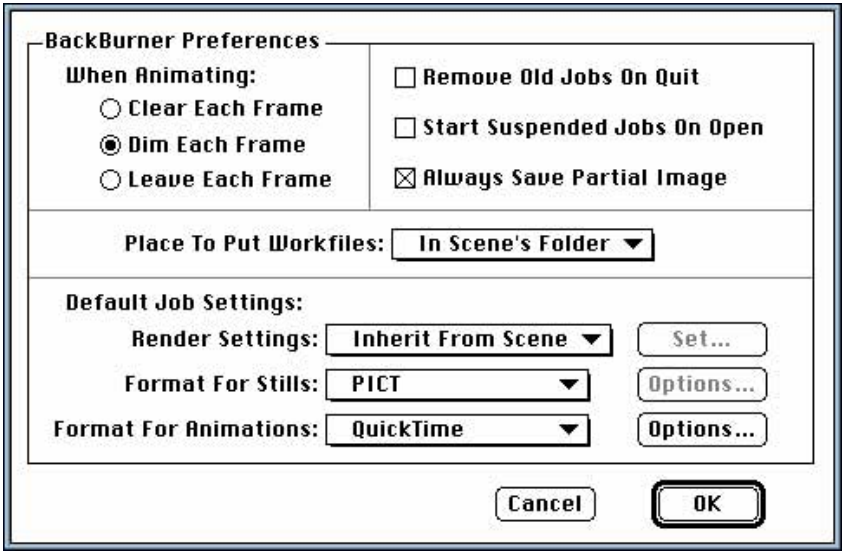
If you choose the QuickTime format, you will be able to set various options for compressing the movie file. To learn more about these various compression options, please refer to the QuickTime Manual that comes with Apple's QuickTime System Extension.

The Engine Info dialog box

This dialog box contains the name, machine type, AppleTalk zone, state, blocks rendered and average seconds per block for the selected Engine.

"Name" is based on each Macintosh's name as set in Sharing Setup on the remote machine. The average block time is calculated over a number of blocks.

In the case where a password is required to access a remote machine, a CONNECT button will appear in this dialog. Clicking on this button will allow you to enter a user name and password for the remote machine. See Chapter 4: Working With Engines, for more information about user names and passwords.



The BackBurner Preferences dialog box

This dialog box contains the preferences that allow you to customize the way you work with the BackBurner application.

WhenAnimating

This item determines the way in which BackBurner will visually show that it has completed one frame of an animation and moved on to the next frame.

There are three options:

ClearEachFrame

After completing a frame, BackBurner will clear the Rendering window.

DimEachFrame

After completing a frame, BackBurner will "gray" the current frame and begin rendering the next frame over it. This is the default setting.

LeaveEachFrame

After completing a frame, BackBurner will simply overlay the blocks of the next frame. This mode shows the least contrast between frames.

Removeoldjobsonquit

When checked, BackBurner will automatically remove jobs that are Done or Aborted from the Job window.

StartSuspendedJobsonOpen

When this option is checked, BackBurner will automatically start rendering any suspended job when it is launched.

This is most useful in a BackBurner setup where you have a machine dedicated to running BackBurner. With this option on, if the machine crashes for any reason, you can simply re-boot the machine and launch BackBurner. Your jobs will then automatically continue rendering. You could further automate the process by placing BackBurner or an alias to BackBurner in the Startup Items folder of the machine.

With this option off (the default), suspended jobs will remain suspended until you restart them.

AlwaysSavePartialImage

This preference is turned on by default. With this function active, BackBurner saves the current part of the rendered image into a temporary file on your hard disk. This allows you to suspend a rendering job and resume it at a later time. It is also what makes BackBurner crash-proof; you can never lose the part of the image that you see. However, this also results in constant disk access which can impede rendering speeds, especially if the image (and therefore the temporary file) is large.

Turning this preference off can greatly improve rendering speeds. BackBurner does not need to take the time to create the temporary file on disk, write rendered blocks into it, or read from it to update the image window. Remember that if you suspend the rendering once it has begun, you will lose everything in the current frame. (When rendering animations, you will still have all the frames prior to the current one.) We do not recommend turning this preference off when rendering large images, spooling long animations, or queuing several scenes to be rendered.

PlacetoputWorkfiles

Selects the drive or volume to be used for the storage of the BackBurner Workfiles.

DefaultJobSettings

This section allows you to specify default render settings.

RenderSettings

This allows you to choose whether BackBurner will use the rendering settings of the Infini-D Scene file or a custom set of settings when files are “dragged and dropped” onto the BackBurner application.

The Infini-D settings brought into BackBurner include the active View, the size of that View, and the rendering mode for that View.

If you select “Custom Settings,” then the SET button will become active. Clicking on the SET button will bring you to the Custom Rendering Settings dialog box. This dialog is similar to the Render Settings dialog, but does not create a job. Instead, the settings defined here will be used when an Infini-D Scene file is “dragged and dropped” onto BackBurner’s icon.

FormatForStills

The default format for stills rendered with BackBurner can be set here. Options for the formats are detailed in the "Save As dialog: Output Formats" section of this chapter.

FormatForAnimations

Here you can choose the default format for animations rendered with BackBurner. Options for the formats are detailed in the "Save As dialog: Output Formats" section of this chapter.

Appendix A
BackBurner Messages

Found Agent
Indicates that the BackBurner application has found a BackBurner Agent on a remote machine.

Speaking To Agent
Indicates that BackBurner is determining if the Engine is running or not. If the Engine is not running, BackBurner will instruct the Agent to launch the Engine.

Validated By Agent
Indicates that the BackBurner Engine is functional and capable of doing work.

Initiating Contact
Indicates that BackBurner is sending its first message to the BackBurner Engine.

Contacted
Indicates that BackBurner has contacted the BackBurner Engine.

Ready
Indicates that the BackBurner Engine is ready to process a job. Ready Engines are displayed in bold.

Sending Objects
Indicates that BackBurner is distributing the object database to the available Engines.

Working
Indicates that the BackBurner Engine is processing a block.

Turned Off Remotely
Indicates that the BackBurner Engine has been turned off on the remote machine from the BackBurner Agent Control Panel.

Disabled Locally
Indicates that the BackBurner Engine has been disabled from the BackBurner application. Locally disabled Engines are available to other BackBurner applications. Disabling an Engine does not shut down the BackBurner Engine on the remote machine.

Password Required
Indicates that a BackBurner Engine needs a password to be accessed. Also indicates that Guest level Program Linking is not available.

No Serial Number
Indicates that there are not enough serial numbers entered to use this Engine (see Enabling Network Rendering in Chapter 4).

Not Enough Memory
Indicates that there was not enough memory to launch the BackBurner Engine on the remote machine.

Busy
Indicates that the BackBurner Engine is in use by another BackBurner application.

Engine Not Found
Indicates that although the BackBurner Agent was found on the remote machine, the BackBurner Engine file could not be found. Both are necessary for the remote machine to function as an Engine.

Unavailable
Indicates that the BackBurner Engine is unavailable for an unknown reason.

Timed Out
Indicates that the BackBurner Engine has not responded in the last several minutes and is therefore not contributing to a rendering task.

Not Responding
Indicates that the BackBurner Engine is not responding. This could indicate that either the remote machines has crashed, or that a network bridge is down or has crashed.

Agent Malfunction
Indicates that the BackBurner Agent has had some type of malfunction. Contact technical support.

Unknown
Indicates that the BackBurner Agent or Engine has failed for an unknown reason. Contact technical support.

Appendix B
BackBurner Engine Messages

Ready
Indicates that the BackBurner Engine is ready to process a job.

Receiving Objects
Indicates that the BackBurner Engine is receiving the object database from the BackBurner application.

Working
Indicates that the BackBurner Engine is processing a block, or section of a rendering job.

Low Memory
Indicates that the BackBurner Engine cannot contribute to a rendering task because it has little or no memory available to process the job.

Scene Too Complex
Indicates that the BackBurner Engine does not have enough memory to render the Scene. The Engine should be given more memory in the BackBurner Agent Control Panel. This is different from “Not Enough Memory” which means that the Macintosh does not have enough memory to run the BackBurner Engine.

Appendix C
Troubleshooting

Problem
BackBurner not recognizing Engines.
Engines do not appear in Engine window.

Check
Are you on a network?
Is the network connected to your machine?
Is AppleTalk active?
Is Program Linking enabled on the remote machine?
Is Program Linking enabled for “Guest”?
Has network rendering been enabled?
Is “Use Remote Engines” checked in the Engine menu?

Problem
BackBurner Engines not contributing to the rendering task.

Check
Is the Use Remote Engine menu item checked in the Engine menu?
Are the remote machine(s) still running?

Problem
BackBurner always asks for User Name and password on remote machines.

Check
Is program linking enabled on remote machine for Guests?
Is “Remember name and password” checked in the Connect dialog box?

Problem
BackBurner Engines are always “Busy.”

Check
Is someone else running the BackBurner application on the same network?

Problem
BackBurner Engines display message “Not Enough Memory.”

Check
Is the BackBurner Engine assigned enough memory?
Are you using AutoBurner?

Problem
Can’t seem to get my fish moved.

Check
Do you have fish?
Do you have the right water purifier?
Are there multi-colored pebbles in the fish tank?
Have you called Johnston & Young’s Fish Moving Service (no questions asked)?