WAVES

MULTIRACK

Outboard Processing Host for Live Applications

WAVES

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Chapter 1

Introduction

1.1 Welcome

Thank you for choosing Waves! In order to get the most out of Waves MultiRack, please take the time to read through this manual.

In conjunction, we also suggest you become familiar with www.wavesupport.net. There you will find an extensive **Answer Base**, the latest **Tech Specs**, detailed **Installation** guides, new **Software Updates**, and current information on **Authorization** and **Registration**.

By signing up at www.wavesupport.net, you will receive personalized information on your registered products, reminders when updates are available, and information on your authorization status.

1.2 Product Overview

MultiRack is a host platform for Waves audio processing plug-ins, designed especially for live sound applications. It provides a software equivalent to outboard hardware processing Racks, and signal flow to and from your console is similar to what you're accustomed to with traditional hardware Racks. MultiRack allows you to program up to 1000 Snapshots per Session, so you can seamlessly change setups between or even within songs.

Chapter 2

Quickstart Guide

The Quick Start section contains all you need to know to configure your system and to get up to speed with the application.

We will follow these steps as we get started:

1. Connect your console to the sound card or external I/O
2. Create a new Session and set the preferences
3. Add new Racks and set their audio signal flow
4. Add plug-ins for sound processing
5. Setting up side chain
6. Create Snapshots for easy recall of Racks and processors
7. Organize Racks into groups for ease of operation and latency management
8. Set up your MIDI environment for remote control

After the Quick Start chapter is a detailed description of MultiRack's interface, so if you have a question about a particular button, function, or feature, this is the place to look. At the back of this manual, you'll find details of MultiRack's application menus.

Follow the steps in the Quick Start guide, and then experiment with a Session of your own. It won't be long until you're managing complex concert setups with much greater ease than ever before.

Please note: Throughout this manual, keyboard shortcuts indicating Ctrl/Cmd refer to Windows (Ctrl) and Mac (Cmd) respectively.

2.1 Connect Your Console to the Sound Card or External I/O

Before starting the application, connect your console to your sound card or external I/O. It's useful to make a chart of the connections, so that when you assign Racks to specific I/O channels, you won't need to look behind your console.

MultiRack signal flow to and from your console is similar to what you're used to with external hardware processors: Some connections will be from aux sends on your console, with returns on faders; others will be from channel inserts. You may also choose to connect via a patch bay or router.
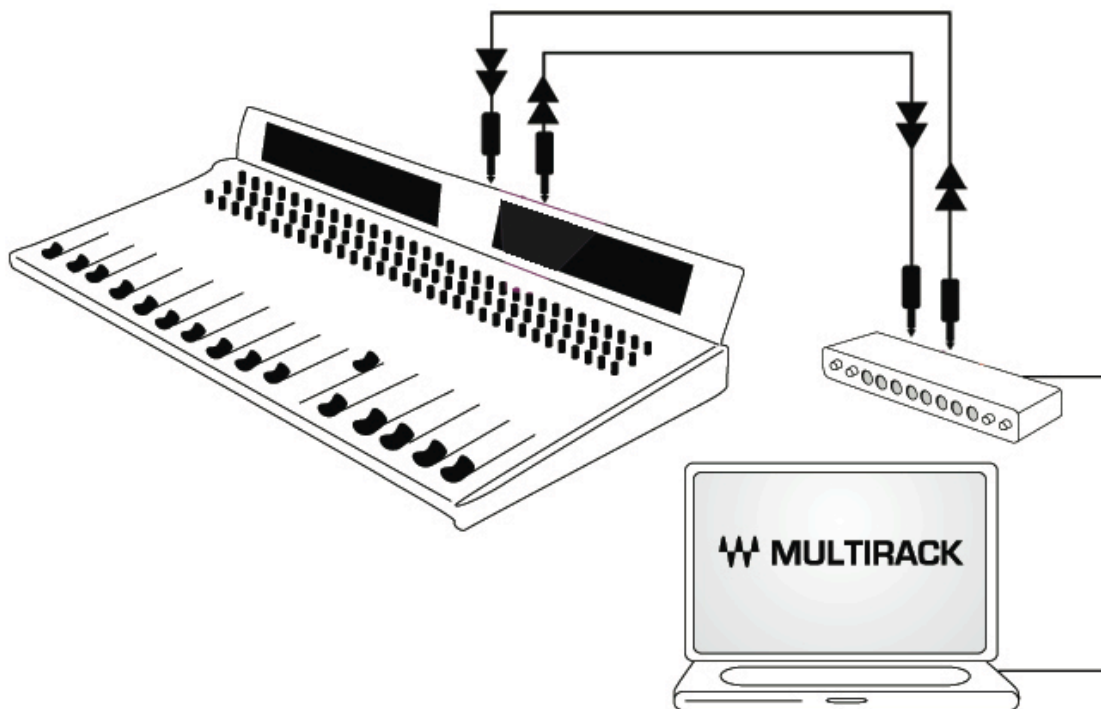
Here are some flowchart examples of MultiRack connections. For more about Rack I/O configurations, see the detail section **"MultiRack Window: Setting up Your Processing Environment."**

Mono Aux Send from Console → [Mono-to-Stereo Rack] → Stereo Return to 2 channels or FX Return

Stereo Aux Send from Console → [Stereo Rack] → Stereo Return to 2 channels or FX Return

Channel Insert Send → [Mono Rack] → Channel Insert Return

Master Insert Send → [Stereo Rack] → Master Insert Return

Stereo Drum group Insert Send → [Stereo Rack] → Stereo Drum group Insert Return

2.2 Create a New Session and Set the Preferences

A **Session** is a collection of Racks, each of which contains plug-in processors. It holds the "architecture" of your setup (input and output routing, how many Racks, in what order, which plug-ins and their order, etc.), as well as Rack I/O levels and plug-in settings. Normally, a Session will contain the setup for an entire show, while Snapshots are used to change settings between or within songs.

MultiRack will initially open with a blank Session. Afterward, it will open to the most recent Session.
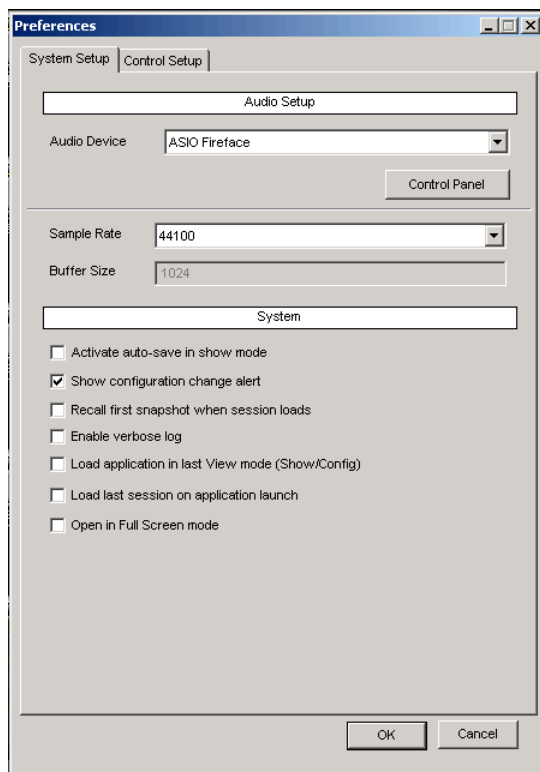
Get started by accessing the **Preferences** window: Ctrl+P in Windows/Cmd+, on Mac). Set the audio I/O device by clicking the Audio Device dropdown and choosing from the available devices. (MultiRack supports Windows ASIO and Mac CoreAudio sound cards.)

The rest of the Preferences can be set later.

2.3 Add Empty Racks

A Rack is a chain of plug-ins used to process an audio signal, whether mono, stereo, or mono-to-stereo. In the hardware world, signals flow from a console's channel insert or aux track, are processed with a collection of outboard gear, and then returned to the console. MultiRack follows the same principle, except that processing takes place in virtual Racks filled with plug-in processors rather than in hardware racks.

The first step in building a MultiRack processing setup is to add empty Racks.
Double click on the area that says **Double Click to Add Rack**.
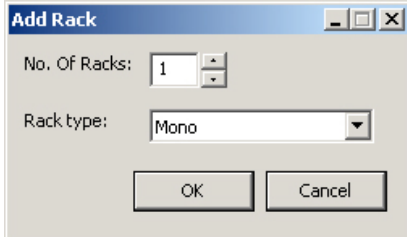
This will reveal a dialogue box that asks how many Racks you want to add, as well as what type of Rack (Mono, Stereo, or Mono-to-Stereo). Don't worry about making the wrong choice; you can always change this setting later.

Now you'll see one or more empty Racks. Define the audio input and output channels of each Rack by clicking on the left (input) and right (output) side rails of the interface. The Audio I/O pull-down menu will open. The number of channels available depends on the I/O device you are using. Set the channel(s) for both input (left side rail) and output (right side rail) for each of the Racks you've created.

You may decide later to change a Rack's input from mono to stereo, or to mono-to-stereo. Use the Switch Rack Type pull-down to modify the input and/or output.

As you add Racks, a blank area will appear beneath the newest Rack. Double click in area to add more Racks, up to a maximum of 64.

Just as it's important to write on the scribble strip of your console to identify the source of each channel, it's equally useful to name the Racks of your MultiRack Session. Label a
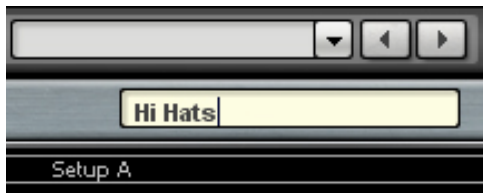
Rack by clicking, then typing, in the Rack name text cell at the top of the Rack. In this example, we've labeled the Rack "Hi Hats."

To delete a Rack, right click on it and choose **Delete Rack** from the menu, or choose **Delete Selected Racks** from the **Edit** menu.

This is a good time to **Save** your Session. Look in the **File** menu for the command, or type *Ctrl/Cmd+S.*

2.4 Add Plug-ins for Sound Processing

Once you've created Racks and assigned their I/O channels, it's time to add plug-ins to each Rack. A Rack can hold up to eight plug-in processors, and the signal will always flow from left-to-right.

Click on the small arrow near the Input Fader to add a plug-in from the pull-down list. Plug-ins are organized by type of processor. Add another plug-in by clicking on the arrow to the right of the first plug-in, and so forth. You can always rearrange the plug-in order by clicking on a processor and dragging it to the desired position.

To view a plug-in and adjust its parameters, double click on the box representing it. The plug-in's interface will appear below the Rack. This view is called **Rack View**. Set the plug-in as desired. At the top of the interface of all Waves plug-ins is the WaveSystem toolbar, which is used to load or save your favorite settings for that plug-in. Learn more about the WaveSystem Toolbar in this manual's section entitled "Rack View: Using Your Plug-ins."

To exit Rack View and return to MultiRack window, double click on any empty area at the top of the Rack, or click the red [X] button on the right. To move to another plug-in interface, simply double click on the plug-in you'd like to see. You can also navigate between the plug-ins in a Rack by using the left/right arrows on your keyboard. To delete a plug-in, right click on it and choose **Remove Plug-in**. (This action is undo-able.)

2.5 Setting up Side Chain

New in version 2.0, the Rack supports side chain input. Each Rack can be set to receive side chain from any of the IO device inputs (one of the inputs set in the Connections window). Side chain is used by some plug-ins to modify their behavior, e.g. to allow ducking by a compressor plug-in. A stereo Rack can receive a stereo or mono side chain signal, a mono or mono-to-stereo Rack can receive mono side chain signal.

In the Rack's top section there is a new drop-down menu titled "Side Chain". In this menu you set the input that will be feeding the side chain signal to the respective Rack.

Select the input source you want to feed as side chain to the Rack.

Insert a side-chain capable plug-in. A side-chain capable plug-in is marked SC.
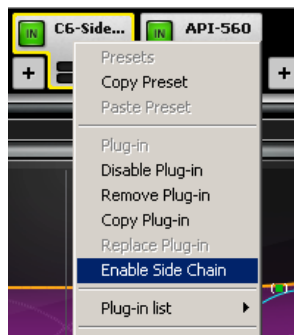
Right-click on the plug-in and select Enable Side Chain from the right-click drop down menu. This will enable side chain for that respective plug-in. A side chain enabled plug-in is marked by a yellow In button (regular In button color is green).

The same device input can be used for Rack input and side chain simultaneously.

Note that the same side chain signal can be fed to more than one plug-in in the Rack.

2.6 Snapshots

With MultiRack, you can easily store and recall Snapshots of the Racks and the plug-ins they contain. A Snapshot is sort of a "super preset," a picture of all of the Racks in your MultiRack Session. It contains the following parameters:

- Rack input and output gain
- Rack in/out and mute states
- Current plug-in parameters

Snapshots are contained and saved as part of a Session file. A single Session file can contain up to 1000 Snapshots. Snapshots can also be exported to or imported from files in order to integrate them into a Session.

Use Snapshots to change the state of Racks (mute/out), levels, and most importantly, the settings for the plug-ins. Snapshots do not change the physical configuration of a Session, so you cannot use a Snapshot to change the audio I/O, the Rack order, or the plug-ins in a Rack. However, since Snapshots can take plug-ins in and out of the processing path, you can insert several plug-ins into a Rack, and then control which are in use in specific Snapshots.
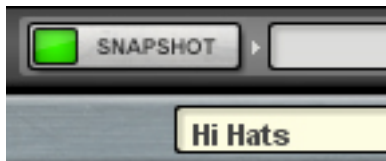
Snapshots are stored, recalled, and managed in the **Snapshot Pane**. To open this window, click the **Snapshots** button.
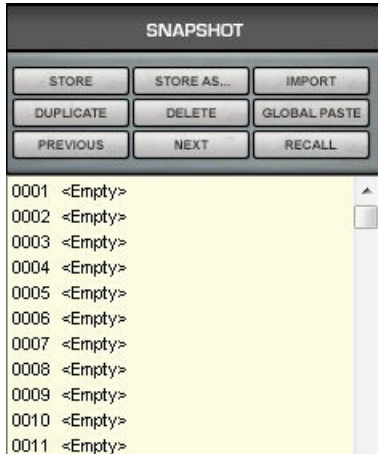
Here, you can store up to 1000 Snapshots. We'll discuss the Snapshots Pane in greater detail later in this manual. For now, it's sufficient to know that first you should set your I/O levels and plug-in parameters as desired, then click on a Snapshot register where you want to store the information.
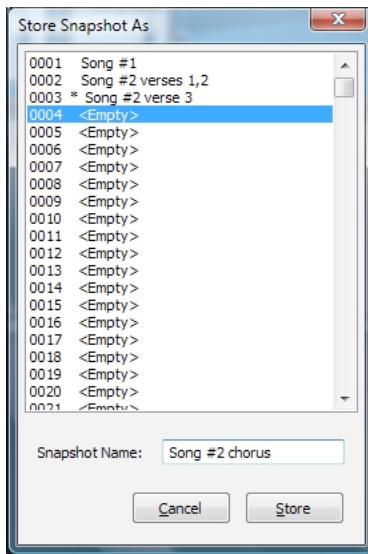
Click **Store As…**. This will reveal the **Store Snapshot As** window.

Type a name for this Snapshot and click **Store**. In the image to the left, we're adding a Snapshot for the chorus of "Song #2," and storing it into Snapshot slot #0004.

To recall a Snapshot, double click on a defined Snapshot in the Snapshot Pane, or select the desired Snapshot, then click on **Recall**. The functions in the Snapshot Pane are pretty logical, so you can learn how it works through experimentation. Refer to the next section of this manual, "MultiRack Windows and Controls," for more details about these features.

2.7 Create Processing Groups

Since MultiRack allows you to build Sessions of up to 64 Racks, each of which are specific processing chains, you may choose to organize related Racks into groups to better manage your Session. Grouping Racks offers a few advantages:

• Group related Racks together (such as all drum channels), and they will share a common group name.
• Groups are color-coded, making visual identification of similar Racks much easier.
• Grouped tracks can be latency-aligned, offsetting unequal delays caused by each channel's chain of plug-ins, which may have different latencies.

Create a group by clicking on the grouping pull-down menu and choosing **Open Group**

Properties window. Here you create Rack groups and determine if and how Racks within the group will be latency-aligned.

In this example, we named the group "Drums." Each new group is automatically assigned a color. (We will discuss latency alignment in more detail in the section "Group Properties Window: For Organization and Latency Alignment.") For now, choose **Auto**, which sets the latency of all Racks in the group to match that of the Rack with the greatest latency.

Close the window.

To add more Racks to a group, click on the grouping pull-down menu, where the group

name will appear, and then select the group that you want the Rack to belong to.

2.8 Saving in MultiRack

MultiRack offers four different levels of "Save," enabling you to quickly and confidently store and recall needed Session information. From most specific to most general, here are your options for saving information:

- Per **Plug-in**: Each plug-in has its own **WaveSystem Toolbar**, so you can load and save your favorite plug-in settings without affecting the rest of the processing environment. Say you have a C4 preset that you'd like to use for the bass. Simply load the preset from the C4's WaveSystem Toolbar's Load menu.
- Per **Rack**: There's a WaveSystem Toolbar at the top of each Rack, so you can load and save settings for an entire Rack, independent of the Snapshots.
- **Snapshots** are used to store your plug-in and Rack settings.
- **Sessions** hold the settings for every plug-in, Rack and Snapshot, and contain the information about the architecture and signal flow for the entire setup.

2.9 Recall Safe Mode

There are times when you don't want certain Racks or specific plug-ins to be affected by Snapshot changes. The **Recall Safe Mode** allows you to select the Racks and/or plug-ins that won't be affected as you change Snapshots that would normally affect them. The recall-safe option applies within the Session (not a specific Snapshot).

To set a Rack or plug-in to **Recall Safe**:
- Select **Recall Safe** in the Snapshots menu, or type Ctrl/Cmd+Shift+R.
- Racks: Select a Rack or multi-select several Racks, then right click in any empty area of the Rack. Select *Recall Safe* from the pull-down menu. A Rack's blue input/output rails indicate that it is in Recall Safe.
- Plug-ins: Select the plug-in or plug-ins you want to set to Recall Safe. Right click on any of the selected plug-ins and choose *Recall Safe* from the pull-down menu. Recall Safe plug-ins glow blue.
- To remove a Rack or plug-in from Recall Safe mode, de-select *Recall Safe* from the right click menu in Recall Safe mode.
- Plug-ins or Racks that are set to Recall Safe can be edited. However, their Recall Safe status can be viewed only while in Recall Safe mode.
- Selecting **Recall Safe** in the Snapshots menu does not activate or de-activate Recall Safe. Rather, it only allows you to see plug-ins and Racks and set them to Recall Safe.

When you turn **Recall Safe** mode off, Racks and plug-ins which have been Recall Safe remain so; they just don't glow blue.

2.10 Overview Window: Viewing the Status of All of Your Racks

Once you've filled several Racks, you'll want a convenient way to keep track of everything happening within your processing environment. To get an overview of your Racks, select **Overview** from the **View** menu. This will reveal the **Overview Window**, where you'll see a condensed view of each Rack.

The **Overview Window** tells you if a Rack or an individual plug-in is functioning, and it enables you to turn on or off, bypass, or mute a Rack. Clipping is also indicated for each Rack.

Use the **Overview Window** when you want to keep an eye on the entire processing setup. Since each mini-Rack in the Overview Window displays clipping information, you can easily watch out for over-level clipping across your entire setup.

2.11 Controlling MultiRack with MIDI

Since FOH situations demand that you keep your hands on the console and your eyes on the show, you may not always want to control MultiRack using a mouse and a computer display. Instead, you may choose to control MultiRack using your digital console or other familiar MIDI hardware controller for greater efficiency.

The following MultiRack functions can be controlled via MIDI:

- Navigation between Racks and between plug-ins
- Global controls such as Rack or Plug-in On/Off, Mute, etc.
- Selected Plug-in parameter controls
- Snapshot recall

How is MIDI Used with MultiRack?

Important MultiRack functions can be assigned to a MIDI hardware controller using the Remote Controller Editor, which is supplied with MultiRack. Assigning is simple: On the Editor's interface, select the MultiRack function you wish to control, and move the desired knob or press the desired button on your MIDI controller to establish an assignment. Even when you have Racks full of processors, you can only control the plug-in that's currently being displayed. This way, you always know which plug-in parameter you're adjusting. So when controlling MultiRack via MIDI, you will always first select the Rack and plug-in you want to address, and then adjust its parameters.

The Controller Strip

A MultiRack Session can have up to 64 Racks, each containing up to eight plug-ins. Since every plug-in has several parameter controls, remote control of so many different variables could be a logistically complex task, and would require users to re-map MIDI links each time the configuration changes. MIDI mapping is simplified in MultiRack by using a matrix that sits between the plug-in and the MIDI controller. This matrix assigns key parameter control knobs and buttons to fixed matrix positions so that MIDI assignments always make sense, regardless of type of processor. For example, when using dynamics processors, the matrix usually assigns the first variable MIDI position to Threshold, the second to Ratio, the third to Attack, and so forth. With EQ processors, the first variable position is usually Input Gain, followed by Band One Gain, Band One Frequency, etc. The matrix is reflected in the

Controller Strip, which can be displayed at the bottom of the Rack View page by choosing **Show Controller Strip** from the **View** menu or by using the shortcut *Ctrl/Cmd+Shift+C.*


The Controller Strip shows up to eight variable controls (top row) and eight switches for the displayed plug-in that can be remotely controlled via MIDI. Many plug-ins have more than eight variable and or discrete controls; to assign these additional controls, extra Controller Strip pages are provided. Use the Remote Controller Editor's **Next/Previous** buttons to navigate to the relevant page of Controller Strip parameter controls.

MultiRack's standardized Controller Strip means that the relationship between hardware and software need be set only once. The specific parameter control will change with each type of plug-in, but the logic will remain consistent within groups of Waves plug-ins.

Assigning Hardware Control with the Remote Controller Editor

Use the Remote Controller Editor to map relationships between hardware MIDI controllers and numerous MultiRack functions. Its interface displays MultiRack functions that can be controlled directly via MIDI, including the eight continuous and eight discrete controls of the Controller Strip. You can assign up to 46 MIDI links to desired MultiRack controls using a standard MIDI "Learn" routine:

There are three categories of MIDI controlled MultiRack functions that you can assign with MIDI Remote Control:
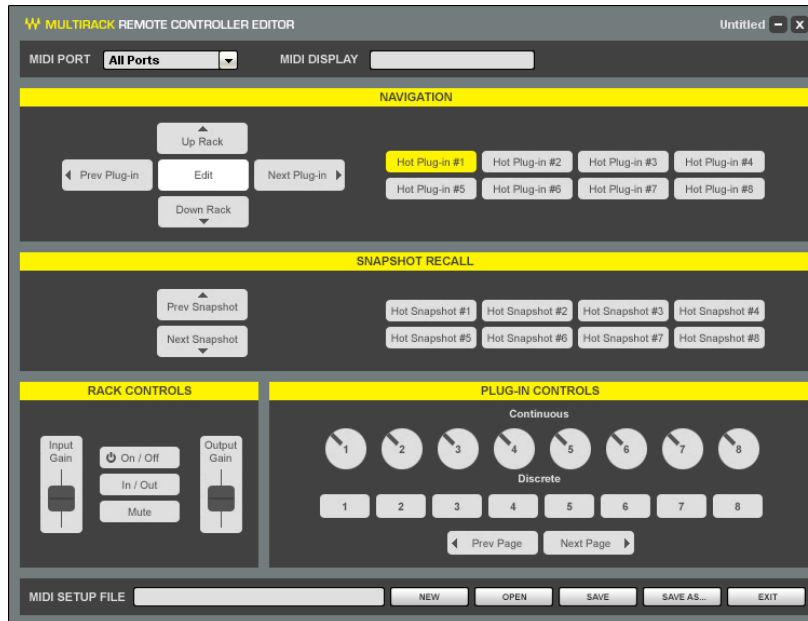
- **Navigation** Use MIDI buttons to navigate between and within Racks to select and edit the specific plug-in to control. You can additionally assign up to eight Hot Plug-ins that can be recalled by touching the assigned MIDI controls. In this way you can access critical plug-ins without having to navigate to them.

- **Plug-in/Rack Controls** Once a Rack and a plug-in are selected, you have direct control over the Rack (levels, on/off, in/out, etc.), as well as control over the plug-in parameters. Plug-in control is available for the eight knobs and eight buttons shown on the plug-in's Controller Strip.
- **Snapshot Recall** This provides control for Next and Previous Snapshots. You can also directly recall specific "Hot" Snapshots.

To assign MIDI controls, launch the Remote Controller Editor by clicking **Editor** from the **Control Setup** tab of the **Preferences** window**.**

**Select a MIDI port**. Use the pull-down menu to choose the port your MIDI controller is connected to.

Assign hardware controllers to the navigation tools:
- Click on any of the five navigation keys (Up Rack, Down Rack, Prev Plug-in, Next Plug-in, or Select).
- Choose the hardware control you want to assign and move or press it to communicate with the Remote Controller Editor. You'll see floating text above the selected parameter, indicating the MIDI command assigned to the respective parameter.
- This completes the assignment of the MIDI switch or variable controller. Proceed with the other navigation functions.

Follow the same procedure for the eight continuous parameter controls and eight discrete switches of the Controller Strip. Remember, the specific plug-in parameter controls and switches will change with type of plug-in, but the position and the assigned knob on your MIDI hardware controller will remain fixed.
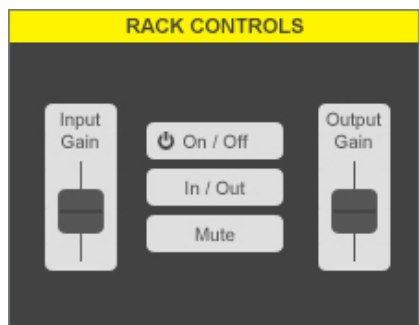
You can assign control of a Rack's Input and Output Gain, as well as Rack On/Off, Rack In/Out and Mute.

Remotely Triggering Snapshots
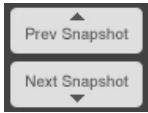
Assign hardware switches to control the Previous and Next Snapshot function. When using remote MIDI control to scroll to a Snapshot, the Snapshot will become active immediately.

By creating Hot Snapshots, you can assign up to eight Snapshots to specific MIDI switches. This is useful for very important or frequently used Snapshots.

In the Snapshots pane, select a Snapshot you want to make Hot. Right click on the Snapshot name and choose a Hot Snapshot number from the pull-down menu. Once you create a hot Snapshot, the assignment procedure is the same as with other MIDI trigger assignments. Hot Snapshots are displayed in red in the Snapshots Pane and their Hot Snapshot number is indicated on the right side of the window.

Hot Plug-in Mode

You can designate up to eight plug-ins as "Hot Plug-ins." Hot Plug-ins can be directly recalled via MIDI, in much the same way that Hot Snapshots are used. To make a plug-in Hot:

- Select **Hot Plug-in Mode** from the **Edit** menu
- Select a plug-in you want to designate as hot.
- Right click on the plug-in and choose a Hot Plug-in number (1-8) from the submenu

Set a Hot Plug-in
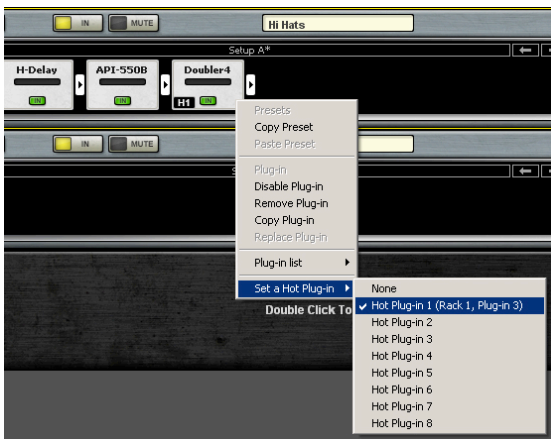
The plug-in will now display a numbered marker (H1, H2, …) indicating its Hot Plug-in designation.

Once you complete the assignments, save the MIDI/Keyboard Setup file, using the **Save** or **Save As…** buttons at the bottom of the interface.

You are now finished with the Remote Controller Editor and may close the application.
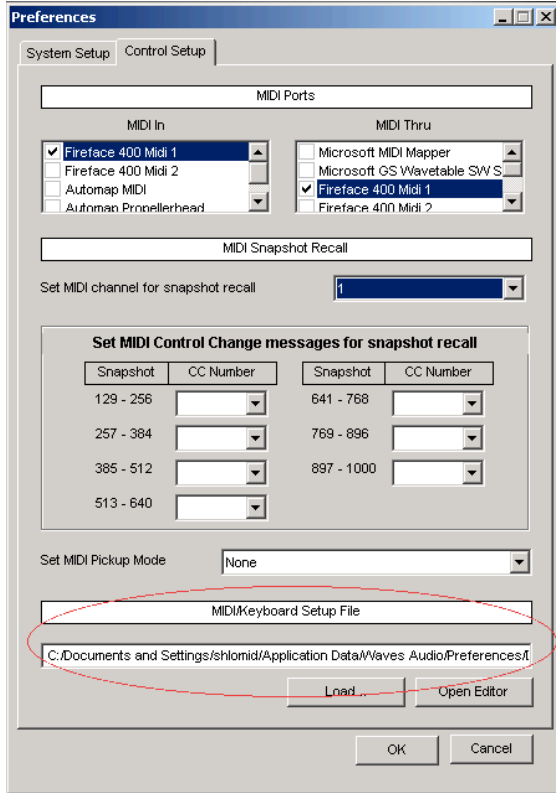
Return to MultiRack and open the **Control Setup** tab of the **Preferences** window. Browse to your newly created MIDI control file in the window, **MIDI/Keyboard Setup File.**

Select the desired MIDI/Keyboard Setup file. The mapping you assigned with Remote Controller Editor will become available to MultiRack.

MIDI control setup is discussed in greater detail in the section "The Preferences Window."

2.12 Show Mode

Show Mode is a "safe mode," used during performances, that lets you adjust parameters within plugins, but not change routing, configuration, and other settings that could cause problems in a live situation. When Show is selected you're locked out from much of the interface - select Setup to return to the Setup mode.

To move between Setup and Show modes, **double-click** the Setup/Show button.

2.13 Shortcuts That Are Always Available

Right click on any blank area of the Rack's interface and you'll have quick options to perform a number of common tasks:

- Rack On/Off
- Rack In/Out
- Mute Rack
- Copy Rack
- Duplicate Rack
- Delete Rack
- Assign Processing Groups

2.14 Automatic Recovery

As MultiRack is an application for live usage, it is equipped with an automatic recovery mechanism. This means that if MultiRack quits unexpectedly, it will automatically re-launch and re-open the same Session file it was running when it crashed, with the same Snapshot that was recalled when the crash occurred (if applicable).
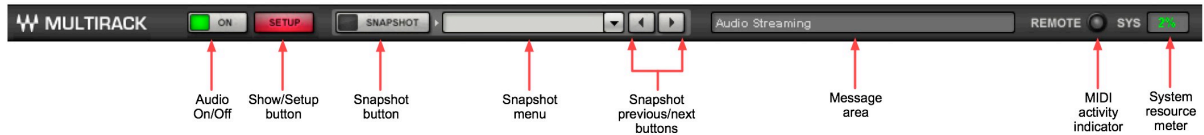
Chapter 3

MultiRack Windows and Controls Explained

In this section, we take a look at each of MultiRack's windows in greater detail. If you've not read the first section of this manual, "MultiRack Quick Start," please do so before continuing. There are terms and concepts discussed in the Quick Start that are essential to understanding MultiRack workflow.

3.1 Status Bar

At the top of the interface, above all of the Racks, is the **Status Bar**, with which you select modes and monitor system status. This information bar is visible from any view.

Audio **On/Off** button	Turns the audio engine on and off. Use this button to reset the engine if audio has become corrupted, or if the application is unresponsive.
Show/Setup button	Double-clicking this button switches between **Setup** mode, in which you can change any setting, including audio I/O, Rack order, and number of plug-ins, and **Show** mode, where you can adjust plug-in parameters but not the "structural" aspects of the Racks. **Show** mode is designed for performance and stability, and protects you by preventing changes that might bring about clicks, audio drops, instability or glitchy behavior. If you find you cannot cut, paste, or move Racks, you're likely in **Show** mode. Return to **Setup** mode to change the layout of your Racks. **Setup** mode allows you to edit all of the application's editable parameters. It's intended for use while setting up the live Session, connecting the Racks, adjusting the audio processing parameters, setting up remote options, etc.
Snapshot button	This opens the Snapshots pane, where you name, manage and recall Snapshots. You can also open the Snapshots pane by typing *Ctrl/Cmd+Shift+O.*

Snapshot button	This opens the Snapshots pane, where you name, manage and recall Snapshots. You can also open the Snapshots pane by typing *Ctrl/Cmd+Shift+O.*
Snapshot pull-down menu	Displays the current Snapshot and allows you to quickly recall any Snapshot directly.
Snapshot previous/next buttons	Click the left arrow to recall the previous Snapshot, and the right arrow to recall the next Snapshot, in sequential order.
Message area	Error and alert messages are displayed in this area.
MIDI	This indicator flashes when MultiRack receives a remote/MIDI message.
SYS (system resources meter)	This meter displays MultiRack's overall system resources consumption, as a percentage and in color. A red indicator indicates significant audio dropouts. This warning will hold for one second.

3.2 A Quick Look at the Windows

The MultiRack interface consists of just five windows, each of which displays details about your Session. Here is a brief description of the windows, after which each will be described in more detail.

MultiRack Window

This is the main user window, where up to 64 Racks are connected and controlled. Here you add Racks, fill Racks with plug-ins, adjust levels, and generally get organized.

Rack View Window

This window opens when you double click on a plug-in within a Rack. It displays the selected plug-in interface, as well as the Rack where it's located. This is where you edit plug-in parameters, import your favorite plug-in presets, and control the levels of individual plug-ins. In this view, each plug-in has its own WaveSystem toolbar for loading and saving plug-in presets.

Group Properties Window
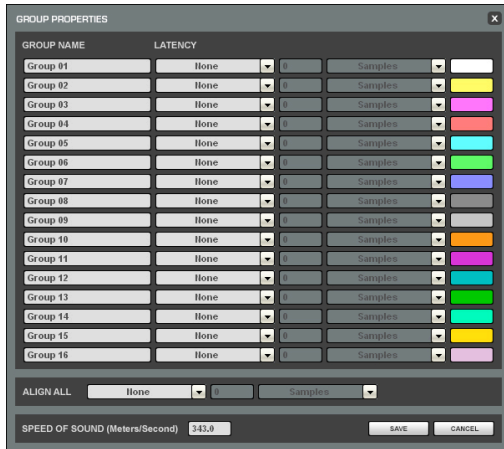
Here you group sets of Racks for easier organization and to adjust for latency alignment between the group's Racks.

Snapshots Pane
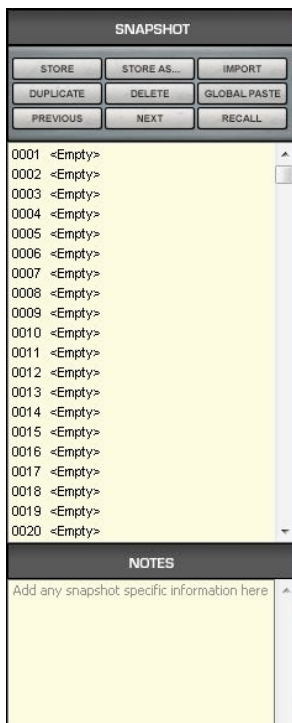
Lists all Session Snapshots and allows Snapshot management. Here you can store, rename, move, duplicate, and recall Snapshots.

Preferences Window
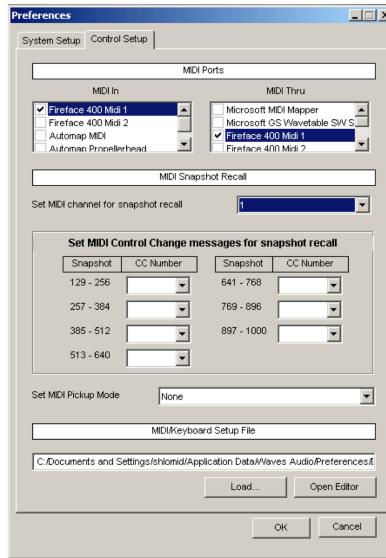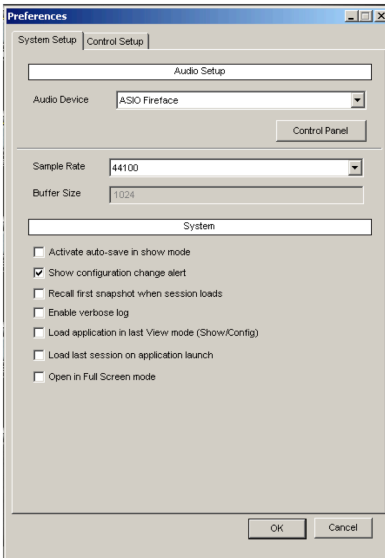
Contains all application and global settings that affect the entire application. This window is accessed from the Edit menu (PC) or Apple menu (OS X).

3.3 The Windows in Detail

MultiRack Main View: Setting Up Your Processing Environment

This is the view where you'll probably spend most of your setup time. It's here that you build Racks of processors.
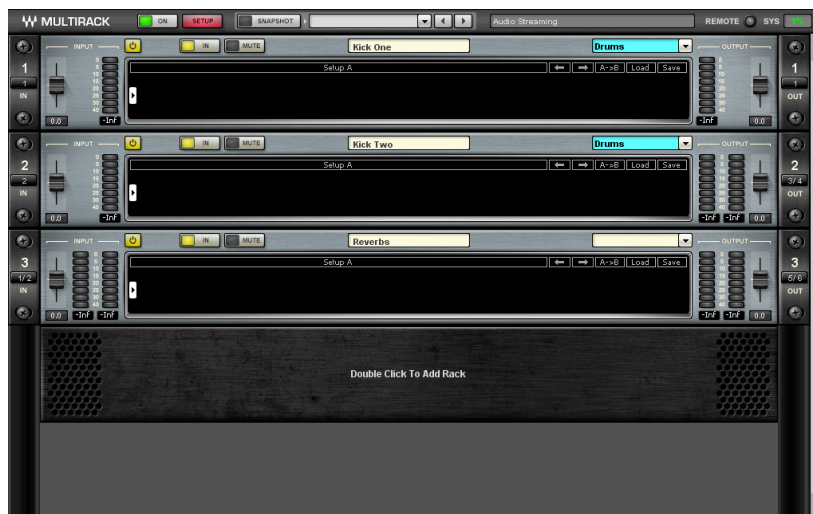
Racks are stacked one below another; there are no unoccupied slots between Racks. By default, MultiRack opens with the last Session used.
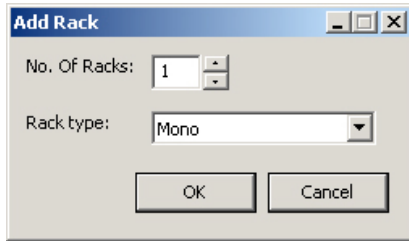
To add a Rack, double click on the area below an existing Rack (if one exists).

The **Add Racks** dialog window will appear. It allows you to add Racks below the last Rack in the Session. The numeric field specifies the number (1-64) of new Racks to be added. From the drop-down menu choose the Rack type: mono, mono-to-stereo, or stereo.

When a new Rack is added, its default setup is:

No plug-ins; Gain at 0dB; Rack on; Rack in; Mute off; No group; Untitled name; No input; No output.

To select a Rack, click anywhere on the Rack.

To select multiple Racks, *Ctrl/Cmd+Click* on the Racks you want to select, or click/draw a rectangle over the contiguous Racks you want to include.

**To move a Rack or Racks**, select or multi-select, then drag and drop. You can also cut and paste Racks. As Racks move, their I/O settings follow them. Several Racks moved at the same time will clump together and move as one unit, and all Racks below this group will move downward to make room for the new arrivals.

The Rack Control Strip

At the top of each Rack is a status bar that you use to control, name and put it into processing groups. The control strip has the following windows and buttons:
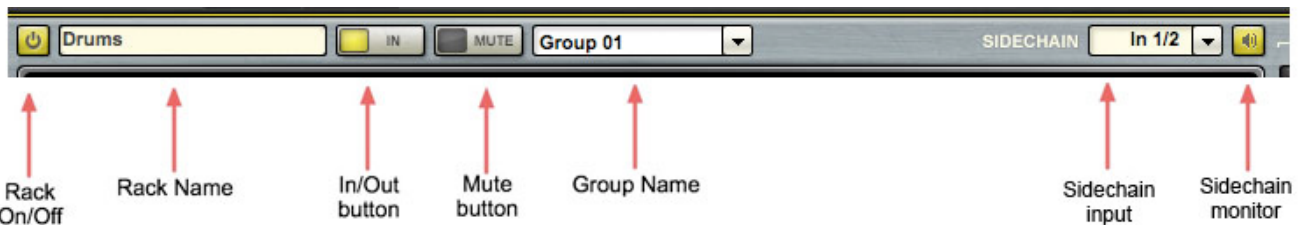
On/Off	Disables a Rack and removes it from CPU processing. Mutes all signals routed to the Rack. Turning off an unneeded Rack results in better CPU management of the system.

| In/Out	Disables the Rack's plug-ins and passes the signal directly from *Rack input* to *Rack output*. Typically used for "before and after" comparison or to bypass processing.
Mute	Silences the Rack, but doesn't remove it from CPU processing. Muting is performed on the Rack's input to allow reverb tails and delay taps to fade gracefully.
Rack Name ("Kick One" in this example)	The user-defined name of the Rack. Double-click to enter a new name or use the pull-down menu to open another Rack.
Group Name ("Drums" in this example)	Refers to the name of the processing group, if any, to which the Rack has been assigned. Use the pull-down menu to assign the Rack to another processing group.
Side chain (input)	Lists all available inputs. Use the pull-down menu to select the input you intend to use as side chain to any of the plug-ins inserted in this Rack. All side-chain capable plug-ins inserted in this Rack share the same input. **Note that it is possible to use a mono side chain signal in a stereo Rack**
Side chain (monitor)	Press this button to listen to the side chain signal. Side Chain is monitored through the Rack's output.

Selecting Racks and Using Keystroke Commands

You can copy, paste, delete, duplicate, and perform other operations on a Rack or Racks you have selected.

- To select a Rack, click on any empty area of the Rack.
- To select multiple adjacent Racks, click on a Rack, then Shift+Click on the most distant Rack of the group you want to select.
- To select multiple non-adjacent Racks, Ctrl/Cmd+Click on several Racks.
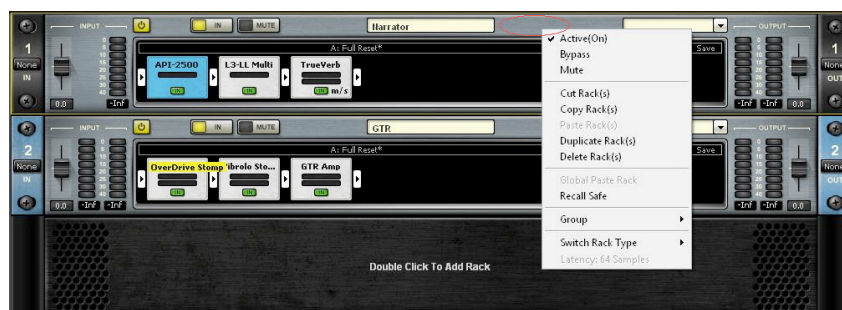
Right click on the top part of a selected Rack and you will see a pull-down menu that offers several functions:

Active(On)	Turns Rack on/off, disabling and removing it from the CPU. This is useful for greater CPU efficiency when a Rack is not needed.
Bypass	Disables the Rack's plug-in processing and passes signal from Rack input to Rack output.
Mute	Mutes entire Rack but doesn't remove plug-ins from CPU.
Cut Rack(s)	Cuts the Rack and its contents and places them in the computer's clipboard.
Copy Rack(s)	Copies the Rack and its contents into the computer's clipboard.
Paste Rack(s)	Pastes the Rack, including its content and state.
Duplicate Rack(s)	Creates a copy of the Rack, including its content and state.
Delete Rack(s)	Deletes the Rack. Racks below this Rack will move upward.
Global Paste Rack	Copies the Rack's parameters from the <u>recalled</u> Snapshot and pastes them into the <u>selected</u> Snapshots when "Global Paste" is selected in the Snapshot Pane. For example, if your singer has a cold and you need to EQ the vocals differently, Global Paste allows you to change specific settings, then embed these parameter changes into all of the Snapshots you've made, rather than having to adjust each Snapshot separately. The Global Paste function is discussed in detail in the "Snapshots" section of this manual.

Recall Safe	Places the selected Rack or plug-in into a "safe" mode that protects it from Snapshot recalls. Recall Safe Racks or plug-ins are unaffected by all Snapshot recalls, even if a Snapshot has parameters that should be changed on Snapshot recall This command is allowed only when **Recall Safe Mode** is selected in the **Snapshots** menu.
Assign the Rack to a processing group	Presents a list of available processing groups from which to choose.
Switch Rack type	Allows you to change the Rack configuration (mono, stereo, mono-to-stereo).

Right-click on a plug-in icon and you will see a pull-down menu that offers several functions:
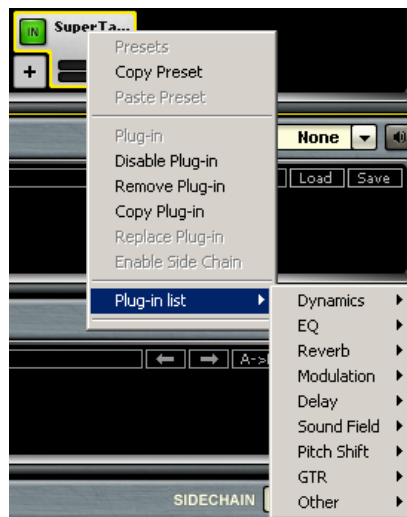
Copy Preset	Copies the plug-in's preset
Paste Preset	Pastes the plug-in's preset to another plug-in instance
Disable Plug-in	Disables the plug-in and takes it off the computer's CPU (the plug-in doesn't take any CPU resources)
Remove Plug-in	Removes the plug-in from the Rack
Copy Plug-in	Copies the plug-in including its configuration

Replace Plug-in	Replaces the plug-in with a copied plug-in
Enable Side Chain	Enables side chain functionality for the plug-in (applies only if the plug-in is side-chain capable)
Plug-in list	Allows you to replace the selected plug-in with one of the listed plug-ins

Input and Output Sections
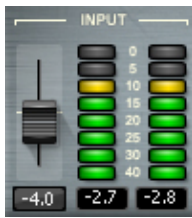
 At the far left of a Rack is its **Input Rail**, where audio is selected from outside sources. Here you choose an input source, and indicate mono or stereo.

To the right of the Input Rail is the **Input Audio Fader,** with a range of ±18dB.

On the far right side of each Rack are the **Output Rail** and the **Output Audio Fade**r. Rack audio input and output levels are stored within Snapshots.

Each Rack can be connected to input and output channels as follows:

• A mono Rack can connect to a single input channel and a single output channel.

• A stereo Rack can connect to a consecutive-pair of input channels and a consecutive-pair of output channels.

• A mono-to-stereo Rack can connect to a single input channel and to a consecutive-pair (starting with odd) output channels.

• A physical input channel can be connected to more than a single Rack, feeding them simultaneously.

• A physical output channel can be connected to only one Rack. Two or more Racks cannot share the same output.
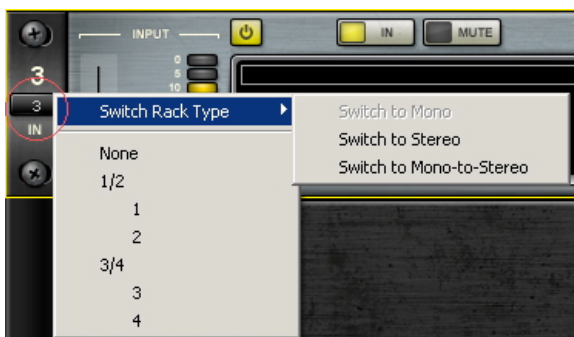
 Use the same menu with which you set the input/output channels to switch the channel configuration of the Rack.

Adding Plug-ins to a Rack

To add a plug-in to a Rack, click on the small arrow to the right of the **Input Fader**. Select a plug-in from the pull-down menu. An icon representing the plug-in will appear on the Rack, along with a new small arrow that you can click to add a new plug-in to the right of the existing one.

Signal flow within a Rack is always from left-to-right.

While in the Main view, you can always change the plug-in sequence within a Rack by grabbing a plug-in and moving it to the desired location. Each plug-in icon has an **In** switch with which you can bypass that processor without disengaging it from the Rack. There is also a level meter on the icon that shows plug-in output level.

Rack View: Using Your Plug-ins

Double click on a plug-in's icon to open its interface and enter MultiRack's Rack View.

Here you adjust each plug-in. If you're already familiar with Waves plug-ins, this window will be very easy to use. At the top of each plug-in's window is a WaveSystem Toolbar, used to load, save, and compare processor settings. The layout of the WaveSystem Toolbar may vary from one plug-in to another. Use this toolbar to save plug-in or Rack-specific presets.

WaveSystem Toolbar Buttons

Undo	Undoes the last change(s) you made within the plug-in.
Setup A **(Setup B)**	Toggles between two setups, allowing you to compare different settings. This facilitates quick A/B comparisons and lets you determine which of two settings works best without having to save a preset. An asterisk (*) on the button indicates that changes have been made since a preset was loaded.
A►B; B►A	Copies the current settings to the second setup register. The direction of copying is from the currently shown setup to the one not shown.
Load	Here you load factory presets, user presets, and other preset files. Factory presets are permanent elements of the **Load** popup menu, created by Waves. They cannot be changed or deleted. You can turn the current settings of the plug-in you're using into a user preset by clicking the **Save** button. User presets can be changed and deleted, and the preset files you save through the WaveSystem toolbar will appear as **Load** menu presets until you close the preset file or close the plug-in. Some plug-ins have a very large library of presets, too large to display on the main pull-down menu. To load these library files or load presets from external files, select "Open Preset File." Waves preset files are saved with an .XPS extension. To delete a user preset, hold Ctrl/Cmd+click on the **Load** menu. You will be given the option of deleting the user preset.

Save	Save your plug-in presets here. You can save the current parameters as a user preset in the Preset menu, or create a new file. If you choose to save the preset as a new file — outside the plug-in's Preset menu — WaveSystem will ask you where you want to put it.
? (Help)	Opens the PDF manual for the current plug-in.
![Waves logo]	Clicking on the Waves logo will bring up the "About This Plug-in" page, providing information about the plug-in.

There are several quick ways to move from one plug-in to another within a Rack:

- Use your keyboard's left and right arrows. This will move you through the list of plug-ins in the Rack, opening each plug-in interface as it is selected. Note: If the current plug-in contains a <u>selected</u> value window, this will not work, and it may change the parameter within the selected value window.

- Click on another plug-in icon. This will move you directly to the new plug-in and open its window.

Controller Strip

Selecting **Show Controller Strip** from the **View** menu while in Rack View reveals a floating window at the bottom of the screen that indicates which parameters of the current plug-in are currently accessible for MIDI remote control.

The upper row displays eight continuous controls (usually relating to knobs or faders); the bottom row represents eight discrete buttons or toggles. Some plug-ins use more than eight variable controls or discrete switches. For these plug-ins, additional Controller Strip pages are available. The Remote Controller Editor allows you to assign a MIDI switch to navigate to Controller Strip pages where the desired controls are displayed.

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Group Properties Window: For Organization and Latency Alignment

This window allows you to group several Racks together. Racks often have something in common, and it may make sense to assign all of these similar Racks to a group. Grouping all of the channels of your brass section, or drums, or audience, then assigning these groups a color, helps you to keep track of Racks in concert situations. Also, each rack will display the name of the group, further aiding quick visual organization.

Plug-ins may impose a delay (known as "latency") as signal passes through them. Often, this is not a problem. However, there are times you will want to time-align all of the Racks in a group, to compensate for different processor latencies that may cause phase-related problems.
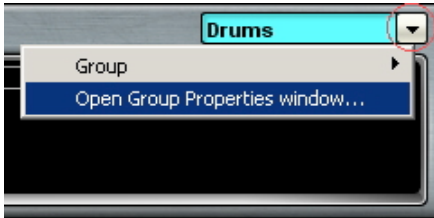
Use the **Group Properties** window to create groups of Racks and align their latencies. Open this window from the pull-down menu located at the top of a Rack or from the **Edit** menu.

You can also open this window from the **Edit** menu (Ctrl/Cmd+G).

In the **Group Properties** window, you can create up to 16 processing groups, each of which can contain any number of Racks.
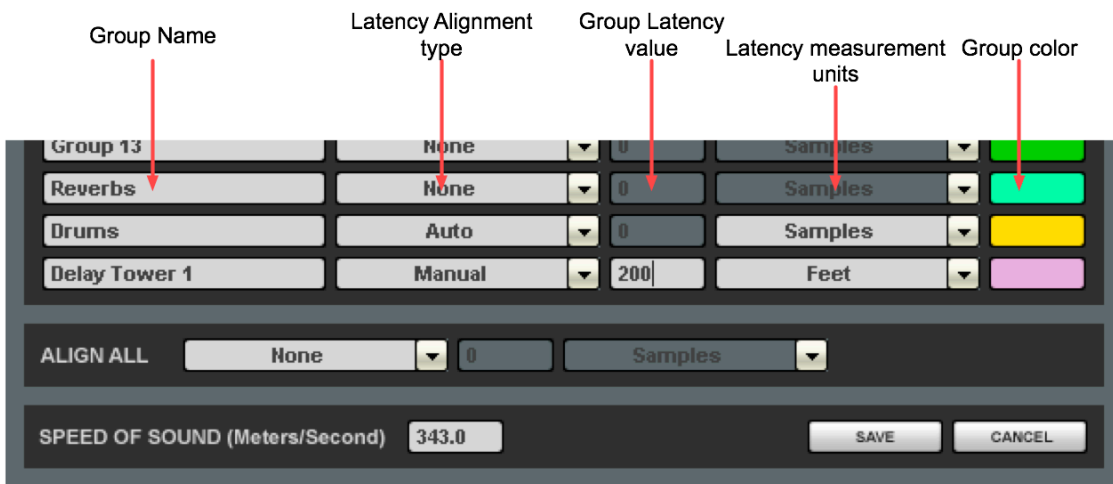
Create a group by double clicking on a Group Name cell and typing the name you want to assign the group. Now, decide how you want to align the processors within the group.

None	A group is created, but there is no latency alignment.
Auto	The group is delayed to match the latency of the Rack in the group with the greatest total latency.
Manual	Manually delay the group by a specific value by entering it in the **Latency** field. The value is displayed in samples, milliseconds, meters or feet, depending on your choice in the pull-down window. The minimal value allowed for this setting matches the latency of the Rack in the group with the greatest total latency.

Groups are color-coded to make for easier identification. Color selection is based on placement in the list, and is not user-definable. At the bottom of the Group Properties page is the Align All section.

Here you can align all of the groups of Racks in order to create a unified timing for all channels. The **Auto** setting will offset all of the groups to match the timing of the group with the greatest latency, while **Manual** will delay all groups by a specific value.

Below the Align All section is the "Speed of Sound" setting. This parameter control, expressed in meters per second, allows you to calibrate MultiRack's latency controls to match measured speed of sound. The speed of sound at sea level, at a temperature of 20 degrees Celsius and dry air, is 343 meters per second.

Snapshot Pane: Automating Your Racks

One of the main benefits of a plug-in based processing host for live applications is the ability to create detailed presets and recall them live, during concerts. The **Snapshot Pane** is where you store, recall and manage the Snapshots that contain all of the parameters of the plug-ins that make up your processing Racks. It's here where your programming efforts pay off.

Snapshots contain the following parameters:

- Rack input and output gain
- Rack in/out, mute and on/off states
- Current plug-in parameters
- Side Chain settings

Snapshots are contained and saved as part of a Session file. A single Session file can contain up to 1000 Snapshots, which are displayed as a vertical play list. Snapshots can also be exported to or imported from files in order to integrate them into a Session.
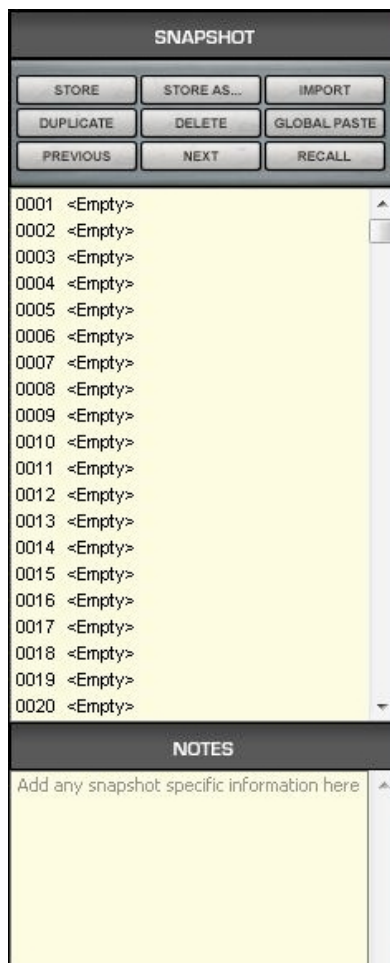
Use Snapshots to change the state of Racks (Mute/In/Off), levels, and, most importantly, the settings for the plug-ins. Snapshots do not change the physical configuration of a Session, so you cannot use a Snapshot to change the audio I/O, the Rack order or the plug-ins embedded in a Rack.

To open the Snapshot Pane, click the **Snapshots** button on the Status Bar or select **Open Snapshot Pane** from the **Snapshots** menu (F7). The Snapshot Pane can hold up to 1000 Snapshots (the maximum per Session).

To save a Snapshot of your existing Rack environment, click **Store** or **Store As**. As with most programs, these two commands do the same thing with empty Snapshot registers, but if a Snapshot already exists, **Store** will overwrite the current Snapshot, while **Store As** will allow

you to create a new name without overwriting the Snapshot and store the Snapshot in an empty slot in the "playlist."

If you're saving a new Snapshot, the **Store Snapshot As** pane will open. Choose the list position where you want to save the new or modified Snapshot and click **Store**. If you are overwriting an existing Snapshot, you will see this warning:
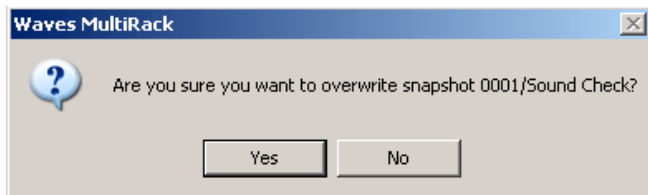
Once you have named a few Snapshots, the Snapshot Pane may look like this:

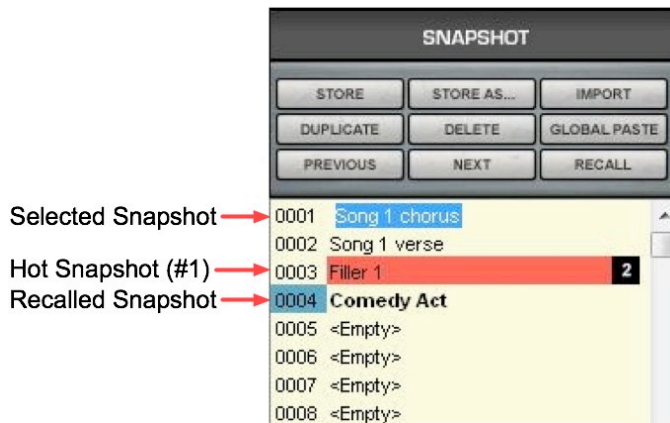Note that selected Snapshots are highlighted, and the currenlty recalled Snapshot's name appears in boldface and its number is highlighted in green. At the bottom of the pane is an area where you can write notes about the selected Snapshot.

To recall a Snapshot, either double-click on its name, or select the Snapshot and then click **Recall**.

It's often useful to create a copy of a Snapshot to use as a starting point for creating similar setups. Copy a Snapshot by selecting it, then clicking **Duplicate**. The copy will appear at the end of the Snapshot list. The word "Copy" will be appended to the Snapshot name; right-click and choose "Rename" to choose a new name for the new Snapshot.

Select a Snapshot and click the **Delete** button to permanently remove it from the Snapshot List.

Global Paste enables you to copy a plug-in's or a Rack's parameters into one or more other Snapshots. This is useful when you've set up several Racks filled with plug-ins and you decide to change plug-ins settings across several Snapshots. Say, for example, that after several rehearsals you arrived at the perfect plug-in settings for a particular instrument, an instrument that is included in numerous Snapshots. Rather than opening each of the Snapshots, making the desired adjustments and then overwriting the Snapshots, use **Global Paste** to globally make the changes:

1. Begin by clicking **Global Paste**. The button will flash to indicate that the Snapshot Pane is in the Global Paste mode.
2. Select the target Snapshot or Snapshots that you want to modify. To select multiple Snapshots, Ctrl/Cmd+Click on the desired target Snapshots, or Shift+Click to select several contiguous Snapshots.
3. In the Rack windows, select the plug-in or Rack whose state you want to copy to the selected Snapshots. Right-click on the plug-in and choose **Global Paste Plug-in/Rack** from the menu. Repeat this for each of the plug-ins or Racks whose settings you want to Global Paste.
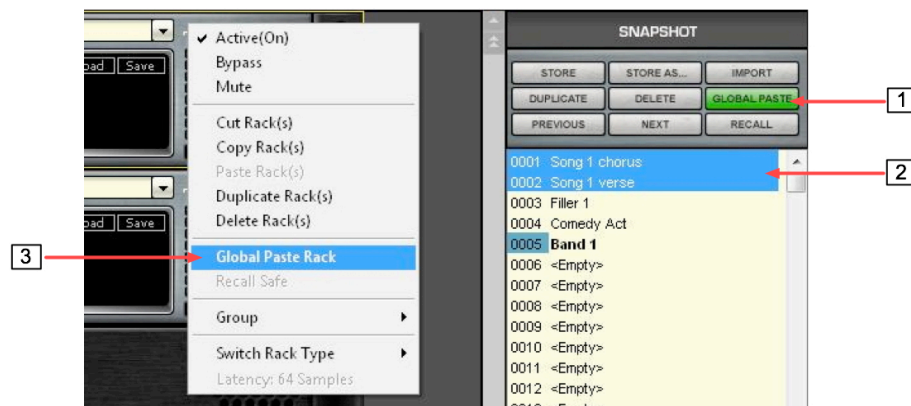
4. Press the **Global Paste** button in the Snapshot Pane once again to end the process.

Import allows you to add Snapshots from another MultiRack Session.

- Click on the **Import** button. A browser window will appear.
- Locate the MultiRack Session that contains the Snapshot you want to import into the current Session. The **Import Snapshot** window will appear.
- Choose the Snapshot(s) you wish to add, and then click Import.

Remember, Snapshots contain information about parameters, not configurations, so the source and target Sessions must have the same plug-in content and order in each Rack.

Hot Snapshots

A Hot Snapshot is a Snapshot that can be recalled directly via a dedicated user-specified MIDI control message or a keyboard key (see the MIDI remote control section for more details). Unlike other Snapshots that are recalled via MIDI program/control change messages or the **Previous/Next** buttons, Hot Snapshots can also be directly recalled anytime. Therefore, a Hot Snapshot can be moved to another slot while maintaining its Hot Snapshot designation and remote control association. (Note: Designating a Snapshot as Hot does not void the option to recall it via its index number by MIDI program change or via the Previous/Next buttons.)

To designate an *active* Snapshot as "Hot," right click on the Snapshot name and choose an available Hot Snapshot number. The Snapshot name will be highlighted in red and the number of the Hot Snapshot will appear next to its name. Use the Remote Controller Editor to assign Hot Snapshots to specific MIDI switches on your hardware controller.

Preferences Window: Global Controls

Enter the Preferences window from the Edit menu (PC) or MultiRack menu (OS X) ,or by typing "Ctrl+P" (PC) or "Cmd+," (Mac).

There are two tabs in the Preferences window:

• System Setup

• Control Setup

System Setup – Audio Section

On this simple page, you choose the device (sound card) you will use for MultiRack's audio input/output. If you have more than one available audio device, clicking on the window will reveal a pull-down list of available options from which to choose your I/O. System sample rate and buffer size are also set here.

System Setup – System Section
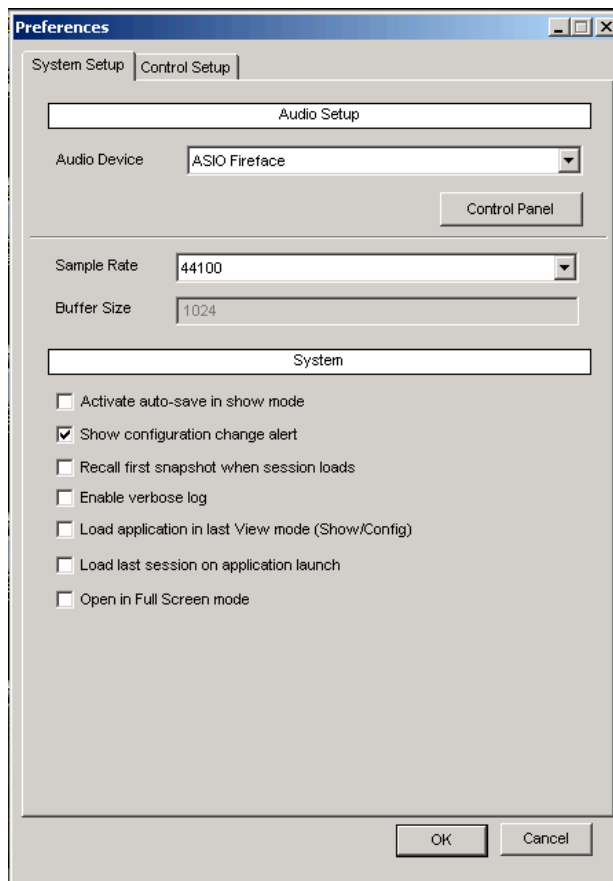
The System section allows you to set certain application-wide preferences:

Activate auto-save in Show mode. You may not want to use MultiRack's auto-save feature during a concert, so as to avoid any processing interruptions, De-select this box to turn off auto-save.

Show configuration change alert. Selecting this option will result in a warning each time you attempt to modify any Rack configuration. This is helpful when you are learning the application, but may prove annoying for more seasoned users.

Recall first Snapshot when Session loads. If you regularly start your shows with the first Snapshot, this is a good choice.

**Enable verbose log.** This option places MultiRack in a "debug" mode that outputs what is called a "verbose data file". It's used to collect data that technical support may require. When selected, the message area of the Status Bar displays a flashing message: "Verbose Output." The output file is titled "DebugMultiRack_date<dd.mm.yyyy>.txt.

Load application in last View mode If you want MultiRack to remember the last mode (Show/Setup) you were in, choose this option.

Load last session on application launch If you select this option, MultiRack will always open with the last session you used when you exited the application.

Open in Full Screen mode Selecting this option will cause MultiRack to open in Full Screen mode.

Control Setup Tab
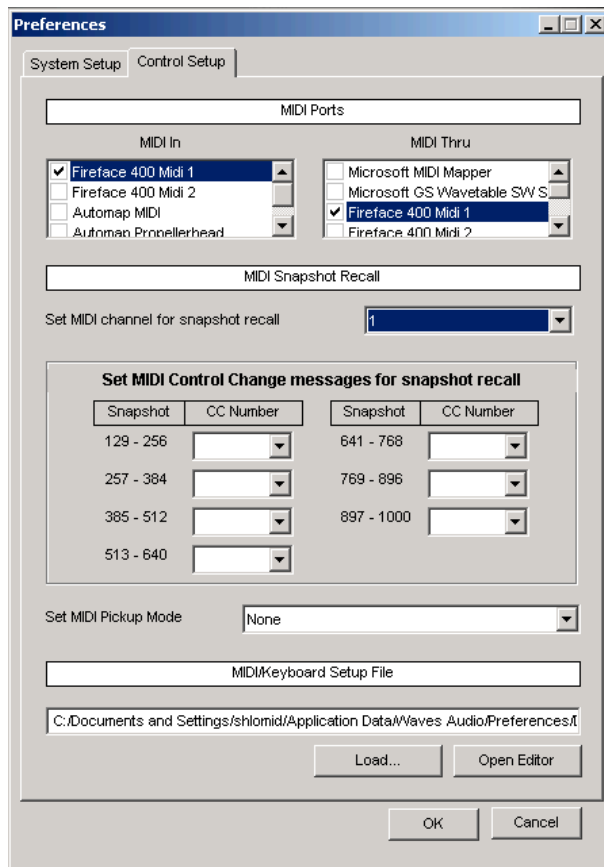
- Use this page to control how MultiRack interacts with outside MIDI controllers. **MIDI In** and **MIDI Thru** display all MIDI ports available to the application. MultiRack receives MIDI on its selected **MIDI In** ports and echoes incoming MIDI to selected **MIDI Thru** ports.

- **Set MIDI channel for snapshot recall** determines which MIDI channel (none; 1-16) will be used to initiate/recall stored Snapshots. MultiRack will recall Snapshots #1-128 on receiving MIDI program change messages (#0-127) on the set MIDI channel.

- **Set MIDI Control Change messages for snapshots recall** determines which control messages — sent on the above-set MIDI channel — will be used to initiate/recall Snapshots #129-1000. For example, if you select Control Change message #7 to recall Snapshots 129-256, then sending CC#7 with value *0* will recall Snapshot #129. Value *2* will recall Snapshot #130, and so forth.
- **Set MIDI Pickup Mode** determines how MultiRack will respond to parameter changes. When *None* is selected, all user changes are directly reflected in the interface. *Takeover* move means that existing parameter values will not change until you have "swept" over it in either direction.
- **MIDI/Keyboard Setup File** allows you to browse to the control file created in the Remote Controller Editor. Choose the file that contains the MIDI mapping for your hardware setup.

You can open the Remote Controller Editor from this page. If you opened the editor from the Control Setup Tab and MultiRack is still open, settings will automatically update as the file is modified.

Chapter 4

MultiRack Menus

MultiRack is controlled mostly from within its five windows, so there are very few application menus. Most menu commands offer keystroke shortcuts, so it's worthwhile studying the menus in order to learn how to quickly navigate through MultiRack's commands.

4.1 File Menu

Menu Item	Definition	Keyboard shortcut	Comments
New Session	Opens a new Session in default setting	Ctrl/Cmd+N	
Open Session	Opens a Session file	Ctrl/Cmd+O	
Open Recent Session	Lists recent Session files		
Close Session	Closes the Session	Ctrl/Cmd+W	
Save Session	Saves the Session to the same file	Ctrl/Cmd+S	
Save Session As…	Saves the Session under a different name		
Exit	Closes the application	Ctrl/Cmd+Q	Windows only. On OS X this command is in the MultiRack menu.

4.2 MultiRack Menu (OS X only)

Menu Item	Definition	Keyboard shortcut	Comments
About MultiRack	Reveals information about current version of MultiRack.		
Preferences…	Opens the application's Preferences window	Cmd+,	
Quit MultiRack	Closes the application.	Cmd+Q	

4.3 Edit Menu

Menu Item	Definition	Keyboard shortcut	Comments
Undo	Undoes the last action	Ctrl/Cmd+Z	
Redo	Redoes the last Undo action	Ctrl/Cmd+Y	
Cut	Cuts selection to copy buffer	Ctrl/Cmd+X	Applies to selected plug-ins, Racks, and Snapshots
Copy	Copies selection to copy buffer	Ctrl/Cmd+C	Applies to selected plug-ins, Racks, and Snapshots
Paste	Pastes clipboard to selection	Ctrl/Cmd+V	Applies to selected plug-ins, Racks, and Snapshots
Duplicate	Duplicates selected Rack or plug-in	Ctrl/Cmd+U	
Delete	Deletes the selected Rack or plug-in	Delete	
Select All	Selects all Racks. Applicable only in MultiRack window.	Ctrl/Cmd+A	
Deselect All	Deselects all Racks. Applicable only in MultiRack window.	Ctrl/Cmd+D	

Invert Selection	Selects all deselected Racks; deselects all selected Racks. Applicable only in MultiRack window.	Ctrl/Cmd+I	
Add Rack(s)…	Opens the Add Racks dialog window. Applicable only in MultiRack window.	Ctrl/Cmd+R	
Preferences	Opens the Preferences window	Ctrl/Cmd+P	Windows only. On OSX this command is in the MultiRack menu (Cmd+,).
Hot Plug-in Mode	Enables Hot Plug-in mode	Alt+H	
Group Properties …	Opens the Group Properties window	Ctrl/Cmd+G	

4.4 Audio Menu

Menu Item	Definition	Keyboard shortcut	
Turn Audio On/Off	Turns MultiRack's audio engine on and off	Ctrl/Cmd+Alt+J	
Rack(s)			
Active	Turns the selected Rack(s) on and off		
Bypassed	Bypasses the selected Rack(s)		
Mute	Mutes the selected Rack(s)		

4.5 View Menu

Menu Item	Definition	Keyboard shortcut	
Mainview Mode	Displays the Session in the Main view	F4	
Overview Mode	Displays the Session in Overview Mode	F5	
Rackview Mode	Displays the Rack view and its housed plug-in's interface	F6	
Show Mode	Switches MultiRack to Show Mode	Ctrl/Cmd+Alt+S	
Setup Mode	Switches MultiRack to Setup Mode	Ctrl/Cmd+Alt+T	
Show Controller Strip	Opens the Controller Strip in the Rack view.	Ctrl/Cmd+Shift+C	
Full Screen	Displays the interface in full screen.	F8	

4.6 Snapshots Menu

Menu Item	Definition	Keyboard shortcut	Comments
Open Snapshot Pane	Opens/closes the Snapshot Pane in MultiRack window.	F7	
Store Snapshot	Stores Snapshot parameters. If a Snapshot already exists in the selected register, "Store" will overwrite.	Ctrl/Cmd+Shift+S	
Store Snapshot As…	Saves current		
Recall Previous Snapshot	Recalls the previous Snapshot in the play list.	Ctrl/Cmd+Shift+<	Previous is relative to the currently recalled Snapshot
Recall Next Snapshot	Recalls the next Snapshot in the play list.	Ctrl/Cmd+Shift+>	"Next" is relative to the currently recalled Snapshot. If the next Snapshot slot is empty, Next jumps to the next occupied slot.
Recall-Safe Mode	Recall-Safe mode allows the user to set the plug-ins or Racks that are recall-safe.	Ctrl/Cmd+Shift+R	
Global Paste Mode	Turns Global Paste Mode on and off	Ctrl/Cmd+Shift+G	
Import…	Opens a Session file to allow you to import snapshots from	Ctrl/Cmd+Shift+I	
Move Snapshot(s) To…	Moves the selected Snapshot(s) to a user-specified location in the Snapshot list.		

4.7 Help

Menu Item	Definition	Keyboard shortcut	Comments
Read MultiRack manual	Opens MultiRack PDF manual	Ctrl/Cmd+Alt+?	If the help manual is unavailable, visit www.waves.com.
Go to Waves web site	Launches the default browser with the URL www.Waves.com		
About MultiRack	Opens page containing information about current version of MultiRack		In OS-X, this item is in the Apple menu