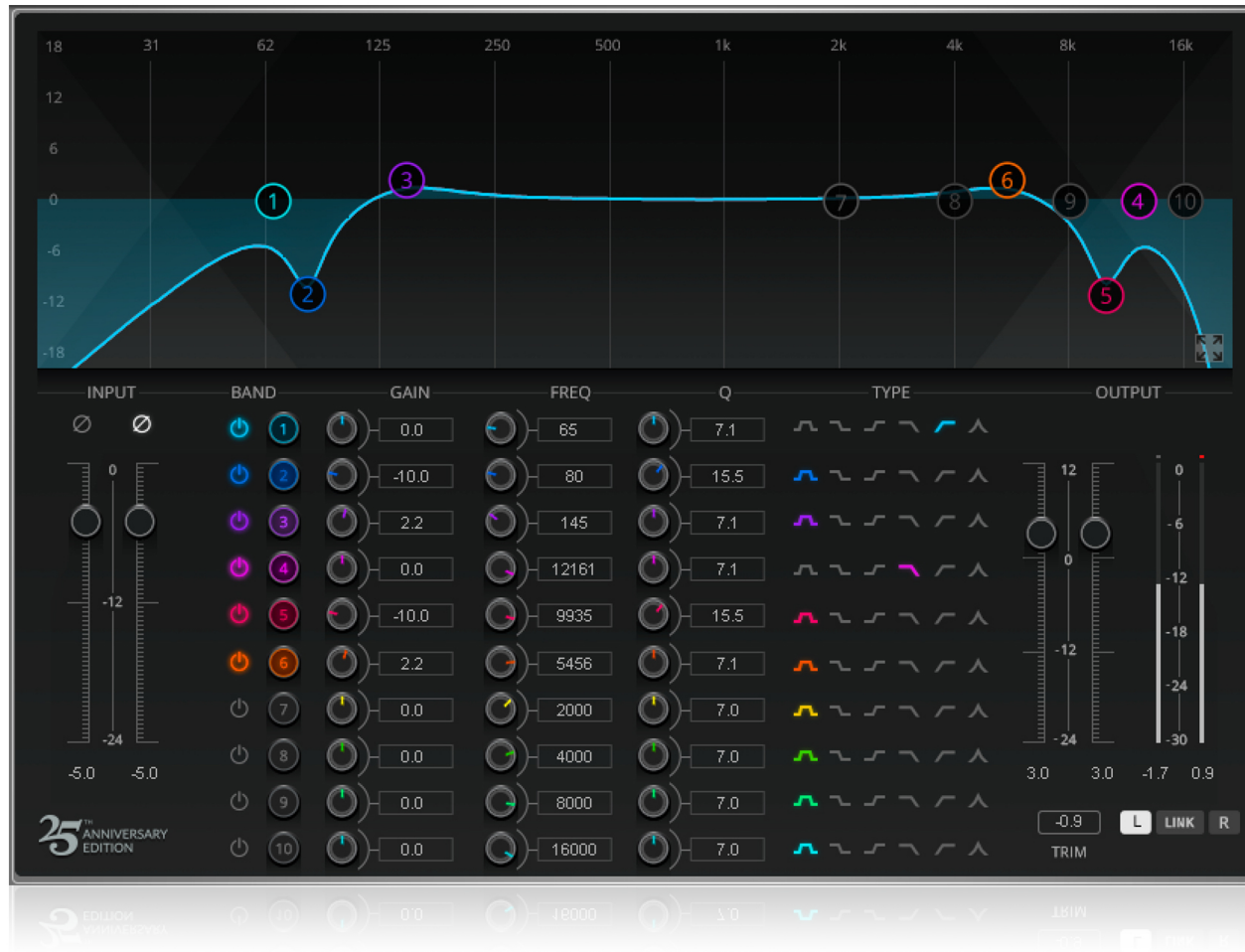




# Q10 Equalizer

## User Guide



# Waves Q10 Paragraphic Equalizer

## User Guide

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## Welcome

Thank you for choosing Waves! In order to get the most out of your Waves plugin, please take some time to read through this user guide. We also suggest that you become familiar with [www.waves.com/support](http://www.waves.com/support). There you will find an extensive answer base, the latest tech specs, detailed installation guides, new software updates, and current information on licensing and registration.

Sign up at the support site and you will receive personalized information about your registered products, reminders when updates are available, and information on your authorization status.

## Chapter 1 About the Q10

The Q10 is a multiband parametric equalizer that provides up to ten bands of flexible equalization. It is configurable as either two independent mono equalizers or as a precisely ganged stereo equalizer. For years, the Q10 has been the go-to tool for surgical repairs of problematic sounds in the studio and in the field. It is also valuable as a gentle coloring tool. Each band offers six different filter types and complete control of gain, frequency, and Q. Unlike most multiband equalizers, each Q10 band can use any filter type, so there is immense flexibility when shaping a signal. Q10 offers extremely large Q values and large boosts and cuts, so you can fix and focus sounds that a conventional EQ could not touch. It lets you create special effects and spectral modifications that range from subtle to extreme.

Waves introduced the Q10 in 1993 and was the first parametric equalizer plugin on the market. It quickly set the standard for multiband EQs and became an industry staple. It has become an essential tool for cleaning and shaping sound. Over the years, there have been a few under-the-hood updates to the Q10, but the look and flow were left largely unchanged. To celebrate the 25th anniversary of this tried-and-true workhorse, we've made some improvements, added a few features, and created a new, modern look.



## What's new?

If you're used to the Q10, the 25<sup>th</sup> Anniversary edition won't present any surprises. Its new functions are intended to provide easier control and better performance. Here are the new features:

- **Q10 proportional Q filters** When the Proportional filter type is selected, the Q value is proportional to gain adjustment. As a band's gain increases, the Q value increases and the filter narrows.
- **Smoothing** Ensures that sound remains glitch free when controls are moved
- **Double precision processing** Lets you choose between 32-bit floating point processing and double-precision 64-bit processing.
- **Selectable band control** Choose between viewing all parametric band controls in one view or focusing on a selected band. Both views show the complete graphic display.
- **A new interface** We've given this tried-and-true warrior a cleaner, easy-to-use interface

## Q10 components

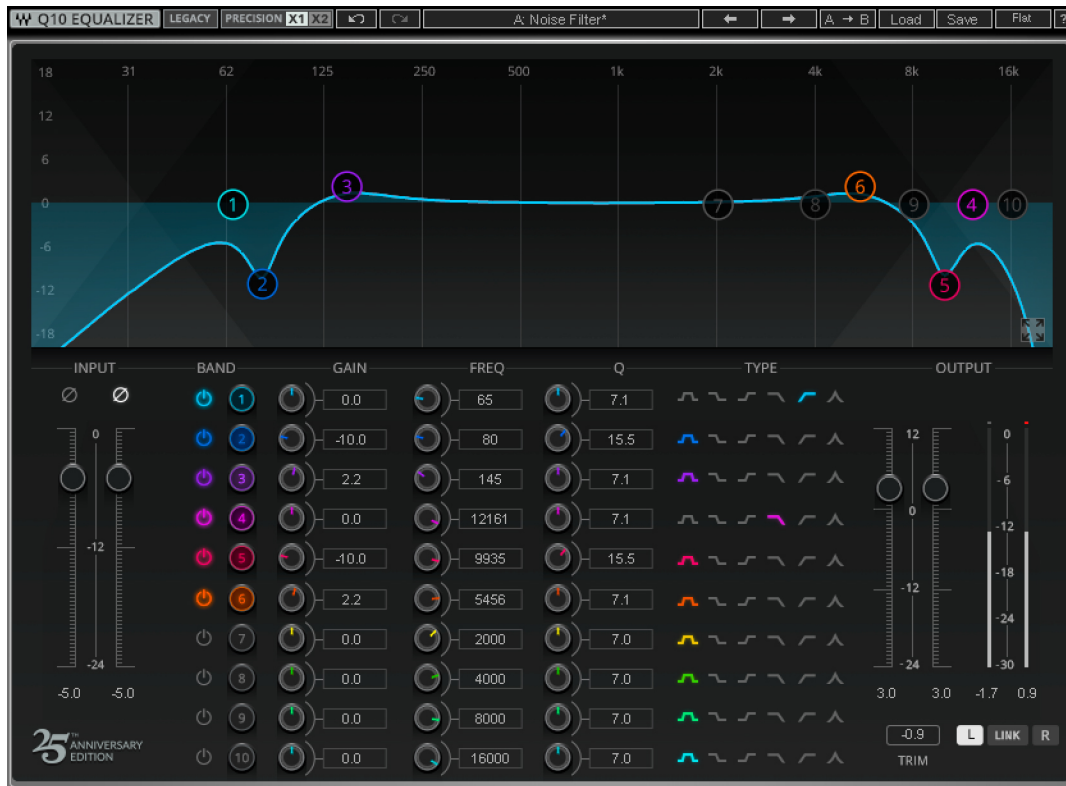
Q10 has a mono component and a stereo component. Controls are identical for each. With either component, you can choose between one, two, three, four, six, eight, or ten bands.

The 25<sup>th</sup> anniversary edition Q10 offers two interface looks. The default view is a modern interface that resembles other current Waves plugins. You may, however, choose to use the tried-and-true classic Q10 interface. Toggle between the two using the Modern/Legacy button on the WaveSystem Toolbar.

Controls and functionality are very similar in the Modern and Legacy interfaces, and you can switch between one and the other without affecting EQ performance.



# Q10 Interfaces



Q10 Stereo Component, Modern Interface



Q10 Stereo Component, Legacy Interface



## Chapter 2 Using Q10

The Q10 interface consists of three sections: a graphic display for viewing and controlling the bands, a parametric EQ section, and input and output sections. Parameters can be entered directly into parametric value boxes and by moving graphic band markers on the graphic display. Changes made on one section are reflected in the other.



In this example, Band 5 is shown in the Focus view. All other bands are hidden.

Use the value boxes to enter specific values. This is useful when, for example, creating a harmonic filter that has very predictable frequency values.

Drag across the graph to locate sounds “on the fly.” When creating a deep cut, it is often useful to use a very high Q and a large boost to find the problematic sound and then turn the boost into a very deep cut.

There are several ways to use the Q10. One is to refer to the exhaustive collection of Q10 presets, find one that closely matches what you need, and then adjust parameters needed. Presets are loaded, saved, and managed from the WaveSystem Toolbar, which is above the interface. If you know the EQ values you want to load, you can enter or copy the values to the value boxes. And surely the most common way to establish values is head straight for the band markers on the graph and experiment.



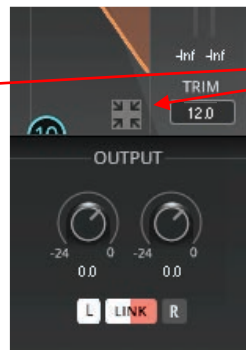
## Using the Parametric Controls

The Parametric Control section is a table with value windows for Frequency, Gain, and Q. A value is shown for each of the equalizer bands, along with the band's filter type and In/Out button. In the Modern interface, there are two Parametric Control views.

### Choosing a View



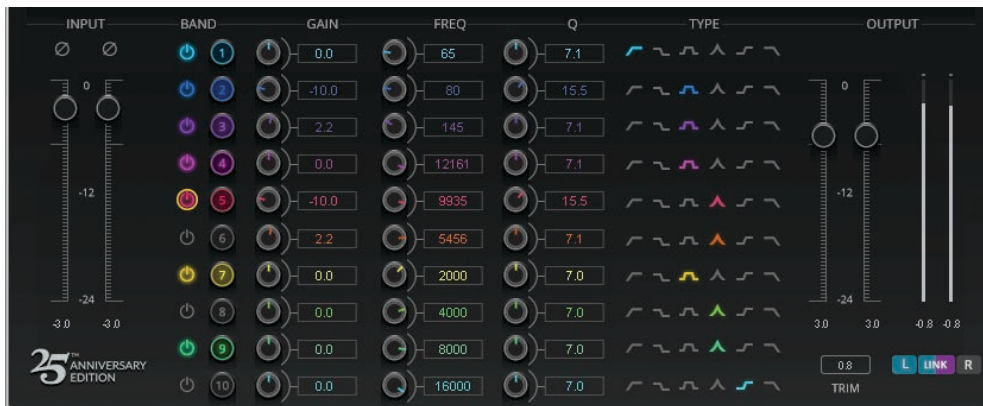
Full View



Focused View

Toggle between the Full and Focused views using the **Collapse/Expand** buttons on the right side.

- In **Full View** the band control for all of the bands are visible. A Q10 will display ten rows of controls, a Q6 will display six, and so forth. This is akin to the classic Q10 band control view.
- In **Focused View** the band controls of only selected band are shown. This allows for a larger graphic display section and an uncluttered view.



Parametric Controls—Full View



Parametric Controls—Focused View



## Input

Input signal is controlled from the Input Fader on the left side. The input signal should not be excessively loud since, under certain circumstances, internal clipping can occur. With high-level files (already normalized or with high peaks), several situations can occur that can cause peaks that did not exist in the unequalized signal. This is true even for filters that have no gain (e.g. a high-pass filter) or for filters with a cut. To show this kind of clipping, meters would be needed between each band of the equalizer. Therefore, if you are using a sound file with very high levels, reduce the Input faders from -3 dB to -6 dB to allow for internal peaks.

Control the Input level in the DAW or other source, or with the Q10 Input control. In the Full view, this control is presented as a fader or a pair of faders. In the Focused view, the input level is controlled with knobs. Control values are the same in Modern and Legacy views.

Input controls are separate for left and right. To move L/R together, click and draw a box around the two faders or knobs. The controls will move together until you click elsewhere.

## Band Control Row

The parametric controls enable you to adjust processing parameters without touching the graph, so it's useful for precise, delicate control. Double-click on a band selector to turn the band on or off. Only one band is selected at a time.

### **Band On/Off**

Each band has an on/off button. Next to it is the band number icon. Turning off a band dims the corresponding band marker in the graph and disables whatever influence the band has on the overall graph. Expect the graph to change when a band is turned on or off. In the Focus view, click on the number button to cycle through all of the bands and correspondingly change the focus.

When making crucial adjustments it is very useful to listen to the EQ output with individual bands on or off. This provides a very different comparison than bypassing the entire plugin (something you should also do frequently to understand how you are influencing the signal).





## Gain

Band Gain can be adjusted in increments of 0.1 dB, between -18.0 dB and +18.0 dB. Click and drag vertically on the knob or value box to change Gain value. You can also select the value box and type in a number or use the up/down arrows on the keyboard. Gain controls are up/down.

## Freq

The Frequency control (Freq) value box displays the center frequency for each band when a bell or bandpass filter type is selected. When in low/high pass or low/high shelf modes, the frequency parameter sets the corner frequency of the filter. Traditionally, the corner frequency of a filter is defined by its -3 dB point.

The Frequency control values are adjustable in one sixteenth tone steps (96 steps per octave), rounded to the closest integer. The left/right arrow keys may be used to step the selected Frequency value in one sixteenth tone increments.

Frequency is controlled in the same manner as Gain control, but all adjustments are left/right.

## Q Control

Q refers to the width of the filter. The higher the Q setting, the narrower the band of frequencies that are affected. For typical EQ applications, Q values between 0.5 and 6 are common. But for specialist applications such as notching out specific frequencies (e.g. hum), much higher values of Q (up to 100) may be used. You may choose to use a high Q setting to locate a specific sound and then widen the filter to achieve a smoother effect.

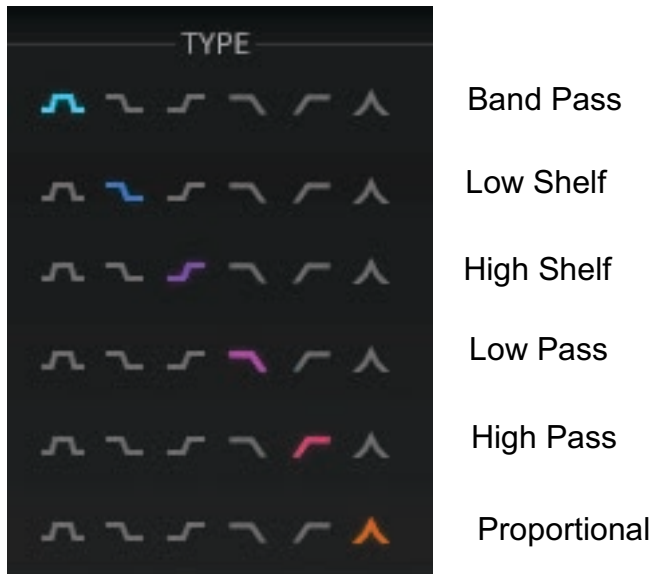


## Filter Type

The Filter Type radio buttons select the type or mode of filter used for each band. The selected type is indicated by an icon representing the filter curve.

To select between filter types in the Legacy view, click repeatedly on the Type icon. This will step through the filters in the following order: parametric (bell), low shelf, high shelf, low pass, and high pass. You can also CMD+click (Mac) or Ctrl+click (Windows) on the filter type button to reveal a popup menu of filter types for direct selection.

The default Type is the bell (or band pass) filter, which is used to provide parametric equalization or to construct notch filters.



## Band Pass (Bell) Filters

Bell filters boost or cut a certain frequency range. The indicated frequency is the peak of the bell filter, so this is the frequency that will get the most boost or cut from the filter. Bell filters can be wider or narrower according to the defined Q value.

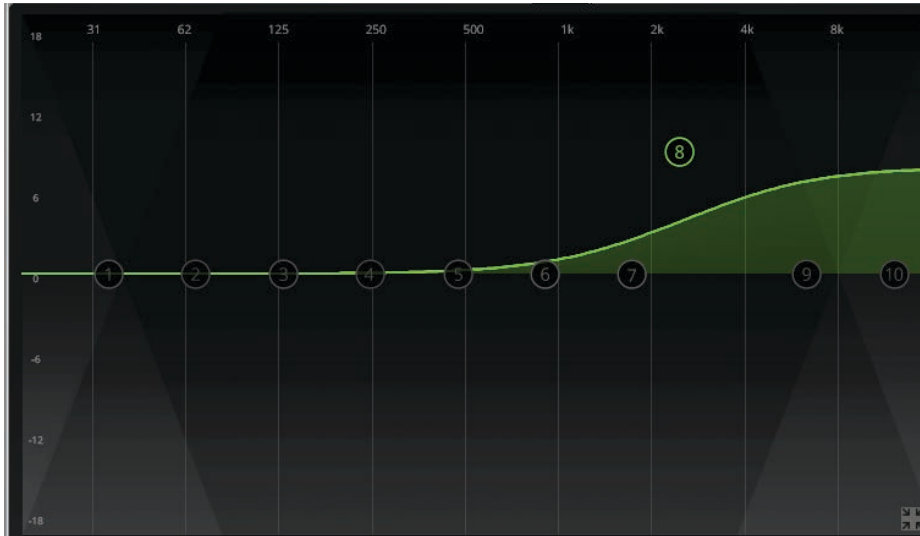


Q is a way to define the frequency width of the boosting or cutting bell filter. It may be represented by the mathematical relationship:  $F_c/F_w$  (center frequency divided by frequency width at -3 dB point), both measured in Hertz.

Low Q values yield the widest bells, which are good for enhancing a complete range, similar to Hi Fi tone controls. High Q values offer the narrowest filters, which are useful for eliminating a specific problematic resonance.



## Shelf Filters



Like the Pass/Cut filter, the Shelf filter can boost or cut above or below a specified frequency. Rather than rolling off to infinity, the shelf will roll off or up to the designated gain indicated in the shelf.

The Shelf filter's cutoff frequency is located in the middle of the slope. So if the specified frequency is 3000 Hz and the gain is set to +6 dB, then the gain at 1000 Hz will be at about +3 dB, as demonstrated here.

The Q control does not affect Shelf filter types.

## Cut/Pass Filters



To attenuate unwanted low-frequency audio, such as rumbles, use the high-pass filter. To attenuate unwanted high-frequency disturbances, such as hissing or screeching, use the low-pass filter.

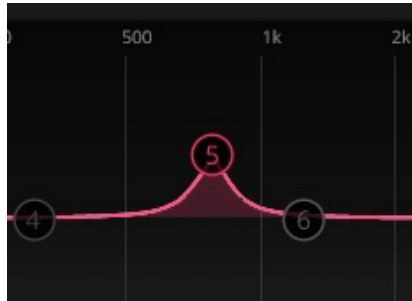
The Pass/Cut filter type has a roll-off response of -12 dB per octave. The cutoff frequency represents the point where the roll-off is -3 dB.

The Q control does not affect Pass/Cut filter types.



## Proportional Q Filters

If the Proportional filter type is selected, the Q value is proportional to gain adjustment. As a band's gain increases, the Q value increases and the filter narrows.



Gain +6 dB, Freq 635 Hz  
Q 8



Gain +18 dB, Freq 635 Hz  
Q 8

Proportional Q filters provide a convenient tool for tuning the center frequency of a bell filter. Dial in a high gain and the filter narrows considerably. Locate the correct frequency, then lower the gain, and the filter widens. There are many other applications. Compare the Band-pass filter and the Proportional Q filter to understand how they differ.

## Arrow Keys

You can use the keyboard arrows to adjust parameters in a selected value box. Click on a value box or band marker to select it. Left/Right arrows control Frequency or Q, and up/down arrows control Gain. Pressing an arrow key once will change the selected value(s) by the smallest available increment. Press and hold for continuous change.



## Using the Graphic Controls

Adjusting values directly on the Graphical Display is the most intuitive way to use the Q10, since you get immediate feedback. Each band is represented by a band marker with its own number and color. Move the cursor up and down to adjust Gain. Move left and right to adjust Frequency and Q.

### Graphic control modifiers

Key/Movement Combination	Action
Click on a band marker	Selects the band
Double-click on a band maker	Turns band on or off
Command + click on band marker	Switches between filter types
Alt+ drag band marker horizontally	Changes Q width
Lock into one parameter without changing the other by holding the Control key down while moving the mouse. For instance, either before or after clicking on a Band Marker, click+hold the Control key. Then, move the mouse to adjust Frequency without changing the Gain. Release the Control key. Then, press it again and this time move the mouse to adjust the Gain without changing the Freq.	
Hold Ctrl, move band marker horizontally	Movement on horizontal axis only. Vertical axis is locked
Hold Ctrl, move band marker vertically	Movement on vertical axis only. Horizontal axis is locked
Shift and drag over several band markers	Multiple bands can be selected and manipulated simultaneously by holding down the Shift key as you select the Band Markers you wish to control, or by drag-selecting a group.



## Channel marker linking



In the stereo component, the two sides of a channel can be controlled together or independently.

The Link buttons beneath the output faders set whether left or right are controlled separately or linked together. When the values of left and right differ you will see their markers diverge.

Link/unlink behavior is the Graphic Display and the Parametric section.

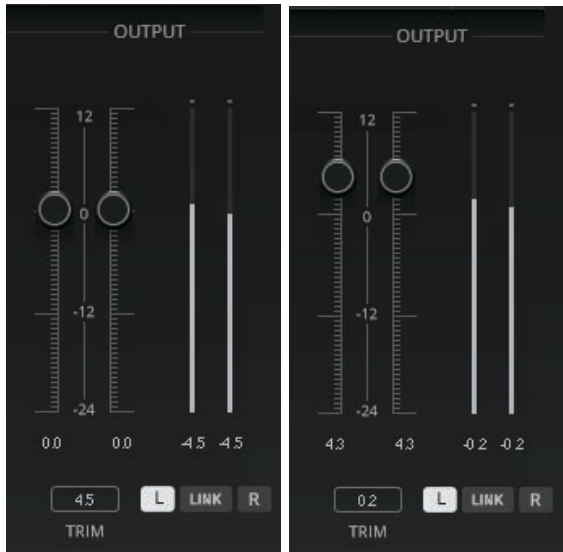
## Trim

The Trim button is used to adjust the output signal to its maximum level without clipping. In this example, it shows a headroom of 4.5 dB. The value is positive (and the clip light is not illuminated), which means that the faders can be moved upward 4.5 dB without any clipping. This is sometimes called “margin” and simply shows how close the signal has come to 0 dBFS.

To Trim the faders, simply click the Trim button once. The faders will move upward by the value shown in the value box. Maximum positive trim is 12 dB. This results in the highest gain possible without clipping. To reset the output fader, ALT+click on its fader button. Left and Right output faders are adjusted separately, so select both by drawing a box around both faders.

If the output signal is already clipped, the Trim value will be negative and the clip indicator above the meters will be illuminated. Clicking Trim will reduce the fader level by the current over-level amount to avoid clipping.





### Upward Trimming

Left: Headroom of 4.5 dB is seen in peak hold indicators and on the Trim button. This means that the Output fader can be raised by this amount without clipping.

Right: After click the Trim button, the Output fader is raised by 4.5 dB, resulting in a headroom of 0.2 dB.

## Setup library

A wide selection of configurations is available in the Setup Library, which is a collection of presets. These presets can be used as is, or modified for specific applications and then saved as user presets. Presets are loaded, saved, and managed with the WaveSystem Toolbar, which is located above the Q10 interface. Download the WaveSystem user guide from the Waves download page at <https://www.waves.com/downloads/manuals>.

Categories of setups include multimedia, pseudo stereo, band limiting, pre/de-emphasis, plateau filters, tilt filters, crossovers, harmonic combs (hum removal), and so on. The library includes comprehensive documentation that offers practical hints and insights into the use of each setup in the library, as well as historical and practical use of equalization. It was written by Michael Gerzon, and it contains many amazing and powerful hints.<sup>1</sup>

<sup>1</sup> Michael Gerzon, a pioneer in noise shaping and best known for developing Ambisonics and the Soundfield Microphone, was instrumental in creating many mainstays of modern musical production techniques. He collaborated with Waves in creating the L1 Compressor and the Q10 Paraphrastic Equalizer.





The Setup Library and the related documentation are copied to your host computer when the plugins are installed. To load a preset from the Setup Library, click on the Load button in the WaveSystem toolbar, select “Open Preset File. Navigate to the Q10 Setups Library.

Mac presets: /Applications/Waves/Data/Setup Libraries/Q10 Setups Library

PC presets: \Program Files (x86)\Waves\Data\Setup Libraries\Q10 Setups Library

The Setup Library documentation is located here:

Mac: /Applications/Waves/Plug-Ins V9/Documents

PC \Program Files (x86)\Waves\Plug-Ins V9\Documents

Most of the setups are user-adjustable. Included are corrective applications such as hum or hiss reduction, plus creative effects such as AM radio or telephone simulation, pseudo-stereo, comb filtering and so on. There are also several utility filter configurations, including brickwall crossover filters and other special equalizer characteristics.

Presets are accessed through the WaveSystem Toolbar.



# Chapter 3 Controls and Displays

## Parametric Controls

### Full View



#### Band ON/Off

Turns a band on or off. Glows when band is on.

Range: On or off

Default: Off

#### Band Number ID

Full view: Function is identical to the Band On/Off button

Focus view: Cycles through the bands. Number indicates selected band.

Default: Band 1



**Gain**

Rotary control and value box. Drag over knob or value box to adjust gain.

Range: -18 dB – +18 dB

Default: 0 dB

**Frequency (Freq)**

Sets frequency value. Drag over knob or value box to adjust frequency.

Range: 16 Hz–21,357 Hz

Default frequencies:

Band	Frequency	Band	Frequency
1	31	6	1000
2	62	7	2000
3	125	8	4000
4	250	9	8000
5	500	10	16000

**Q**

Sets Q value. Drag over knob or value box to adjust Q.

Range: 0.5–100

**Filter Type**

Sets filter type.

Range: Bell, Low Shelf, High Shelf, Low-pass, High-pass, Proportional Q

Default: Bell (all bands)



## Focus View

In the Focus View, only one band's parametric controls are visible at once. All controls are the same as in the Full View, except the Band Number ID button. Click the Band Number ID button to move selection to the next band.



# Graphic Controls

Full View



## Band Markers

1–10 band markers, determined by module loaded. Each band marker has identical functionality:

### Gain

Drag marker vertically to adjust gain.

Range: -18 dB to +18 dB

Default: 0 dB

### Frequency (Freq)

Drag marker horizontally box to adjust frequency.

Range: 16 Hz–21,357 Hz

Default frequencies:

Band	Frequency	Band	Frequency
1	31	6	1000
2	62	7	2000
3	125	8	4000
4	250	9	8000
5	500	10	16000



## Q

Hold Alt/Opt while dragging horizontally to adjust Q.  
Range: 0.5–100

## Filter Type

Sets filter type. CMD/Ctrl+Click on marker to select filter type for that band.  
Range: Bell, Low Shelf, High Shelf, Low-pass, High-pass, Proportional Q  
Default: Bell (all bands)

**Link/Unlink Bands** (Link control is beneath the Output meter)



When a band is linked, L+R are linked together (see Band 7 in the detail above). When Link is deselected, L and R move independently (see Band 9 above).

## View Select

Click the Expand/Collapse button to select between the Full and Focused Views.



Expand/Collapse button



## Focused View

The Focused View is identical to the Full view, except that the graphic display area is significantly larger.



## Meters and Faders

### Input Fader

Controls the input to the plugin.

Range:  $-\infty$  – 0

Default: 0

L and R are controlled separately. Draw a box around the two faders to link them.

Separate phase reverse per channel.



Full View



Focused View





## Output Section

The Output section consists of three parts.



### Output fader

Range: -24 dB — +12 dB

Default: 0 dB

### Trim

Sets output fader to maximum level without clipping.

Range: -12 dB (lower to eliminate clipping) to +12 dB (increase level to maximum)

Value box indicates headroom. This is the amount of trimming needed.

### Output meter

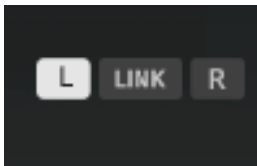
Range: -infinity — 0 dBFS

Peak hold value box is located below the meter.

Clip indicator is located above the meter.

Click on peak hold value box to clear peaks and clips.

## Link



The Link buttons enable the left and right sides of a signal to be controlled separately or together.

Applicable only on stereo components.

Controls located beneath the meters.

Selection	Function
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L	Only left side is controlled
L+Link	Sides move together. Action follows L Band Marker.
R	Only right side is controlled
R+Link	Sides move together. Action follows R Band Marker.

