Waves F6
Floating-Band Dynamic EQ
User Guide

Introduction

Thanks for choosing Waves! In order to get the most out of your new Waves plugin, please take a few minutes to read this user guide.

To register and activate your new products, check for upgrades and manage your account, log into your Waves account and click My Account. If you don't have a Waves account, click Create Account in the top right corner of the Waves.com home page.

Download and install your new Waves software with the Waves Central application, which you can also use to download the latest version of plugins, move licenses from your Waves Cloud to any computer, and make offline installers so you can install current software on computers not connected to the internet.

Finally, we suggest that you visit Waves Support, where you'll find an extensive answer base, system and host requirements, troubleshooting guides, and much more.

About the F6 Floating-Band Dynamic Equalizer

F6 is a dynamic equalizer that features six floating, fully-adjustable parametric filters with dynamics, as well as HP and LP filters. It provides multiband compression, equalization, expansion, and de-essing in one interface.

Plugin highlights include:
- M/S band mode for mid/side processing
- Compression and expansion
- Split/Wide side chain modes for processing flexibility
- Internal and external side chain
- Low CPU consumption
- Zero latency
- Parallel processing
- Side chain solo
- Smooth: no artifacts when adjusting parameters
- Simple interface: well suited for touch displays

Waves F6 Real Time Analyzer (RTA)

To increase F6's precision and ease of use, we added a simple-to-use, feature-rich Real Time Analyzer (RTA) that creates a real-time visual map of your audio. This provides a fast and accurate way to interpret the signal and set F6 parameters. It also gives you immediate feedback about how your settings are affecting the sound. RTA is highly adjustable and all of its controls are visible at all times on a toolbar; you can easily change how the sound is being interpreted, in real time.

Why Use a Dynamic EQ?

EQs have been used for about a hundred years to change the color of a signal. They increase or decrease the gain at selected frequencies. They can affect a wide range of frequencies or very specific ones, and they usually offer a choice of curves. EQs can precisely boost or cut a sound, or smoothly color a track. While they work, the difficulty is that once you set the gain, Q, and frequency, an EQ is "deaf" to what's going on in the music and it affects everything at the selected frequency. So a high-frequency notch intended to tame a screechy violin string will simultaneously remove the detail and overtones of the instrument when lower notes are played.

Multiband compressors, such as Waves C4, address this problem by dividing the frequency spectrum into segments that are defined by crossover points. Dynamic processing takes place between these crossovers and each includes the traditional dynamics controls: threshold, gain, range, attack, and release. It's like having a number of dynamics processors working on one signal at designated frequencies. Because multiband processors are based on crossovers, rather than specific frequency bands, they are smooth across all of the signal's frequencies. Hence, they are useful in shaping a mix and coloring an instrument. But this smoothness may not be what you want when carving an instrument out from a busy mix, or pushing it back so it blends better.

This is where a dynamic EQ, such as the Waves F6, comes in. Like a multiband EQ—say the classic Q10—it has free-floating bands that can be set to any frequency, EQ type, gain, and Q. A dynamic EQ can do all of this, but it can also be set to act only when the signal moves beyond a defined threshold at the chosen frequency. Specific instruments, or specific sounds of an instrument, can be isolated and manipulated. Guitar plucks can be controlled with respect to the tonal sounds without dulling the strings. A dark kick can be enhanced without affecting the rest of the mix. An inarticulate instrument can be made solid, without making the mix brittle. Each band offers all of the standard controls of a dynamics processor.

Each band of the F6 can process a signal in left/right stereo or in M/S (mid/side). This lets you control EQ for the center of a mix—the singer, for example—without affecting the color or shape of the overall stereo image. For further control, a side chain signal is sent to each band, so you can choose if that band's frequency and its dynamics processing are triggered internally or externally.

Dynamic EQs are precision tools that let you control specific instruments or an entire mix in a very precise manner; reach for them when your static EQ is effective but is causing damage to the overall color of the sound. Use a dynamic EQ when compressors, limiters, or de-essers step on too much of the sound. Use the F6 when you need to selectively control an instrument's sound or its place in the space of the mix.
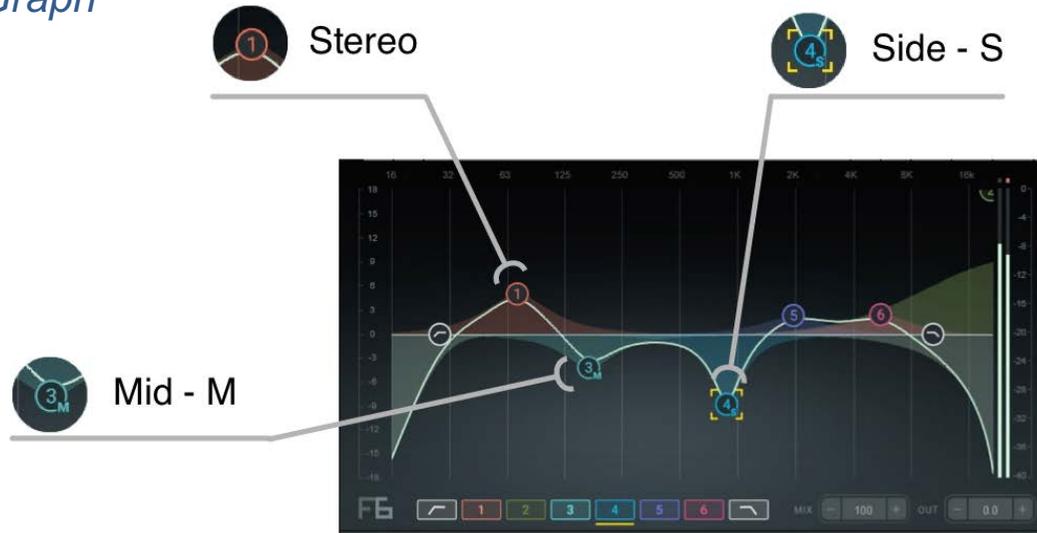
Components

There are four F6 components:

      (1) Mono

      (2) Mono RTA (includes real-time analyzer)

      (3) Stereo

      (4) Stereo RTA (includes real-time analyzer)

Mono and stereo interfaces are identical, except that the mono component does not include the Band Mode switch.

F6 Interface

Graph

The Graph displays filters (Band Markers) and shows the effects of dynamic processing. Frequency is shown on the horizontal scale and amplitude on the vertical scale. The Total Curve Line provides a summary of the filters and dynamics for all bands.

Each band is represented by a Band Marker with its own number and color. Click on a band to select it. Selecting a Band Marker will display all available band controls in the Band Controls section. You can also select a band by choosing a filter in the Band Selectors row. Double-click on a marker to turn its band on or off. You can drag Band Markers 1–6 to any place on the graph, whereas HP and LF filters can move only on the frequency (horizontal) scale. Many Band Marker functions can be controlled with modifier keys.

Key/Movement Combination	Action
Command+Click on Band marker	Switches filter types
Hold Alt+move marker horizontally	Changes Q width
Hold Ctrl+move marker horizontally	Movement on horizontal axis only, vertical axis is locked.
Hold Ctrl+move marker vertically	Movement on vertical axis only, horizontal axis is locked.

In the stereo component, a filter can be applied to the stereo or mid or side channels using the Band Mode switch. This assignment is indicated on the Band Marker with a small letter: **M** (mid), **S** (side) or no letter (Stereo). Band Type is selected in the Band Controls row.

Band Selectors Row
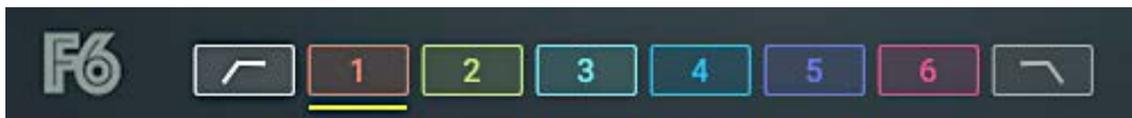
When you choose a band in the Band Selector row, all available band controls will appear. These controls enable you to adjust processing parameters without touching the Graph, so it's useful for precise, delicate control. Double-click on a band selector to turn the band on and off. Only one band is selected at a time.

Band Controls

Bands 1-6

These controls are available for the selected band. The value of a continuous control is indicated on its knob.

Control	Range	Action
Band On/Off	On or Off	Turns off processing for selected band
Band Mode (Stereo component only)	ST, M, S	Sets what the filter affects: stereo, mid, or side channel
Band Type	Low shelf, Bell, or High shelf.	Sets EQ type
Frequency	16 Hz to 21,000 Hz	Sets band frequency
Q	0.4 to 60	Sets band width
Gain	-18 dB to +18 dB	Sets band gain
Range	-18 dB to +18 dB	Dial negative range for compression and positive range for expansion
Threshold	-60 dB to 0 dB	Center knob sets the level at which dynamic processing begins.
SC Input Meter (surrounds Threshold knob)	-60 dB to 0 dB	Displays the band's SC input. Since the input to a band is always internal or external SC, this meter effectively indicates the band's input.
Attack	0.5 ms to 500 ms	Sets attack for dynamic process of selected band

Control	Range	Action
Release	5 ms to 5000 ms	Sets the release time for dynamic processing of the selected band. Actual release time depends on the amount of gain reduction/expansion applied. A greater gain reduction/expansion setting will result in a longer actual release time than set here.
Side Chain Solo*	On or Off	Auditions the band's SC source
Side Chain Source	Internal or External	SC source select
Side Chain Mode	Split or Wide	In **Split** Mode, filtered audio will affect dynamics of the selected band. In **Wide** Mode, Full Range audio will affect dynamics of the selected band.

*Side Chain Solo can be activated by clicking on the Solo toggle in the Band Controls row. The solo toggles off when you select another band. Solo can also be activated by right-clicking and holding a band marker. Move the marker while holding right-click and you can solo other frequencies.

What you hear when soloing a band depends on Band's SC Source and SC Mode.

HPF/LPF

High pass and Low pass filters can be applied to a signal.

Control	Range	Action
Band On/Off	On or Off	Turns off HP and LP filters for the band
Band Mode (Stereo Component only)	Stereo, Mid, or Side	Select what the filter is applied to
Frequency	16 Hz to 1,000 Hz	HP/LP filter frequency settings
Q	6 dB, 12 dB, 18 dB, 24 dB per octave	Sets steepness of filter
Solo	On or Off	Solos the selected filter

Global Controls

Control	Range	Action
Global Release	Automatic Release Control (ARC) or Manual	Sets the type of release for dynamics processing. When Global Release is set to **ARC**, the ARC engine will calculate the shortest possible release time based on the signal's envelope. This value will always be shorter than the Release setting for the band.
Global Arrows	Up/Down arrows Range depends on the control	Use these arrows to link certain controls on all bands, regardless of which band is selected. Move the arrows up and down to adjust the control above it. Controls that can be linked: Gain, Range, Threshold, Attack, and Release

Output Section
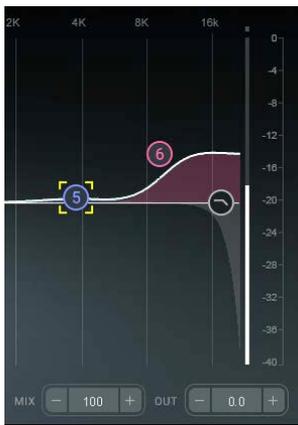
Control	Range	Action
Mix	0: unprocessed sound 100: fully processed sound	Controls the mix between processed and unprocessed audio (also called parallel processing).
Out	-18 dB to +18 dB	Controls plugin's output gain
Output Meter	-40 dBFS to 0 dBfFS	Displays output level

F6 in Use

The F6 Floating-Band Dynamic EQ is very flexible since the frequency, width, sidechain mode, and EQ type of each band can be set independently of others. This lets you assign separate EQ and dynamic processes to different frequency bands of a signal. With the M/S mode, you can control dynamic EQ processing in different parts of the sound image. This opens many opportunities. Here's one example:

Let's say that the instruments and the lead vocal are competing with each other for the same space in a mix. This is, of course, pretty common. You can use F6 to carve out a spot for the lead vocal without affecting the stereo width of your mix while maximizing the blend (glue) between the instruments and the lead vocal.
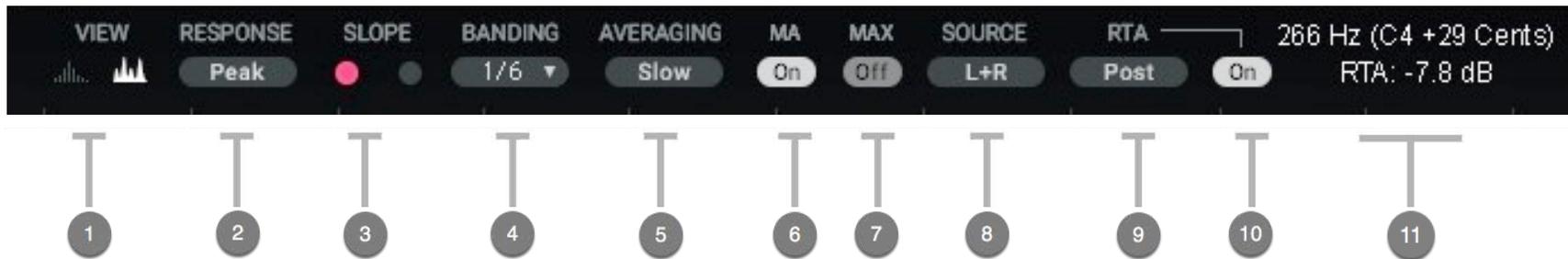
Here's a way to sort it out:

1. Group the instruments to a stereo buss.
2. Insert the F6 stereo component on this buss.
3. Route the lead vocal to the F6 as an external side chain.
4. In this example, we'll use Band 4 for processing as follows:
   a. Switch Band 4 Mode to M (Mid Channel)
   b. Switch Band 4 SC Source to EXT
   c. Set Band 4 Frequency to 1600 Hz
   d. Widen the Q to 0.6
   e. Set Range to -2.5 dB
5. Now play your audio (instrument and lead vocal together).
6. The lead vocal's input level is indicated on the Threshold SC Meter. The positon indicator on the Threshold knob indicates whether Band 4's Threshold is above or below the lead vocal's input level.
7. Slowly lower the Threshold level. When Threshold falls below the level of the lead singer, the band's compressor will begin to attenuate the mid channel. The amount of attenuation is indicated by the Total Curve on the Graph.
8. Adjust parameters per your liking.

F6 Real Time Analyzer

The F6 Real Time Analyzer is feature-rich tool that provides a visual map of your audio. It offers several methods of interpreting the contents of your audio signal. This enables a faster and more accurate way to set F6 parameters. It also provides immediate feedback about how your settings are affecting the sound.

The F6 Real Time Analyzer is based on tried and true FFT (Fast Fourier Transform) technology .

|		Determines how frequency information is displayed. It does not affect the performance of RTA.
1	**View**	**Filled** shows the analysis chart as a solid area. **Bar** shows the chart as bars. Bars/octave defined with the Banding control. Filled View Bar View
2	**Response**	Sets how RTA reacts to audio: Peak Mode or RMS Mode

3	**Slope**	Sets how RTA displays energy:
		    Pink Slope shows RTA as equal energy per Octave.
		    White Slope shows RTA as equal energy per Frequency

4	**Banding**	Sets the display frequency resolution (spectral resolution): *bars/octave* 1/24, 1/12, 1/6, 1/3, and octave
5	**Averaging**	Sets the speed at which RTA reacts to the signal: Fast, Medium, Slow, and Slowest
6	**MA** **(moving average)**	Displays a line that represents the average level
7	**MAX**	Displays a line that represents the peak curve

8	**Source**	Toggle through RTA monitoring modes (Stereo Component only): L only, R only, L+R (mid), and Sides (L-R)
9	**RTA**	Four states: Pre EQ, Post EQ, Side Chain, and Off
10	**RTA On/Off**	Turns RTA processing on or off. Hides RTA display.
11	**Coordinates**	Mouse/Cursor coordinates are displayed to indicate Frequency/Note with RTA's dB value.
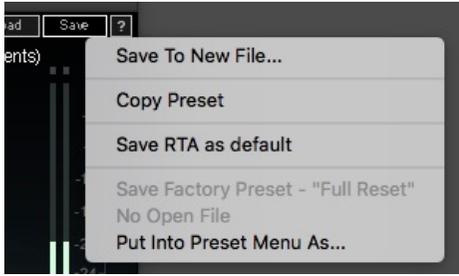
You can save the current RTA settings as the Default preset. Each new F6-RTA instance with open with these settings.

Save and load presets with the WaveSystem Toolbar.

F6-RTA is available in mono and stereo components.