Waves API 2500

User Manual
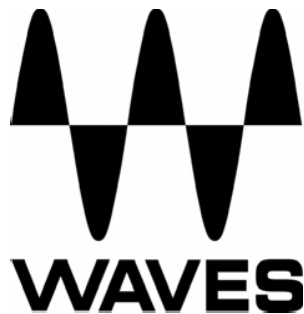
TABLE OF CONTENTS

Chapter 1 – Introduction

1.1 Welcome

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

To install software and manage your licenses, you need to have a free Waves account. Sign up at www.waves.com. With a Waves account you can keep track of your products, renew your Waves Update Plan, participate in bonus programs, and keep up to date with important information.

We suggest that you become familiar with the Waves Support pages: www.waves.com/support. There are technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

1.2 Product Overview

The API 2500 is a versatile dynamics processor that lets you shape the punch and tone of mixes with absolute accuracy. Its dual channel design lets the 2500 also function as two separate mono channels via a single compression setting. Using auto-makeup gain, you can adjust Threshold or Ratio while automatically maintaining a constant output level. With both Feed Back and Feed Forward compression types, the API 2500 boasts a wide range of incredibly musical parameters which have made it a favorite of engineers the world over.

1.3 Concepts and Terminology

There are 3 main parameters that set the API 2500 from other compressors: Thrust, Compression Type, and its adjustable Knee. When used in conjunction with one another, these parameters give the API 2500 unprecedented flexibility.

Knee
Sets the knee, the manner in which the compressor begins to reduce the gain of the signal.

- In the **Hard** position, gain reduction begins immediately at the set ratio.

- In the **Med** position, there is a slight fade-in to the set ratio.

- In the **Soft** position, there is an even more gradual fade-in to the set ratio.

Compression KNEE at the Threshold Point
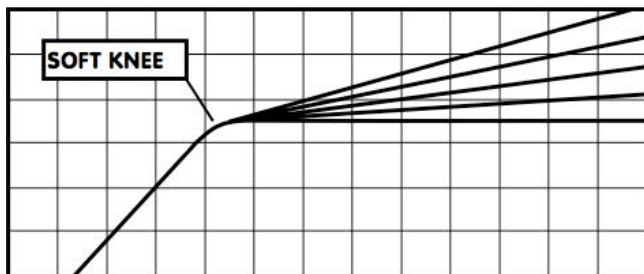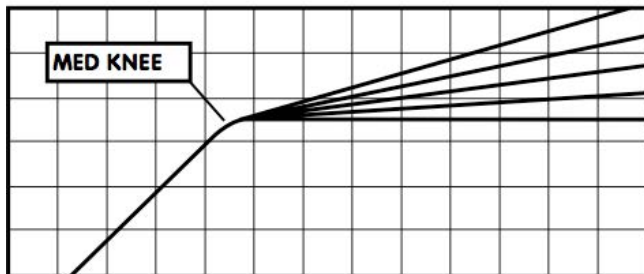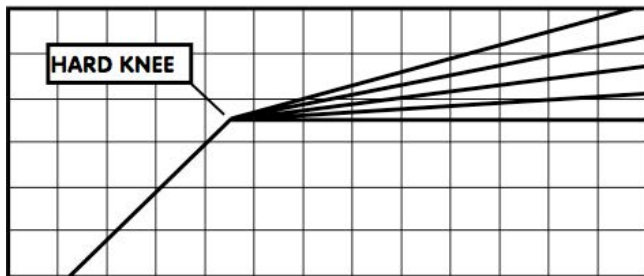
Thrust

Sets the Thrust, a proprietary process that inserts a High Pass Filter at the RMS detector input, limiting compression response to lower frequencies while applying additional compression to higher frequencies.

- In **Norm** mode, there is no filter and the 2500 functions like a normal compressor.

- In **Med** mode, there is a slight attenuation of the low frequencies and a slight boost of the high frequencies, with a flat mid range affecting the signal into the RMS detector. This reduces pumping caused by low frequencies and increases the RMS detectors' sensitivity to higher frequencies, affecting higher frequency signal peaks.

- In **Loud** mode, a gradual linear filter attenuates level by 15dB at 20hz and increases level by 15dB at 20khz. This decreases low frequency pumping while increasing higher frequency compression.
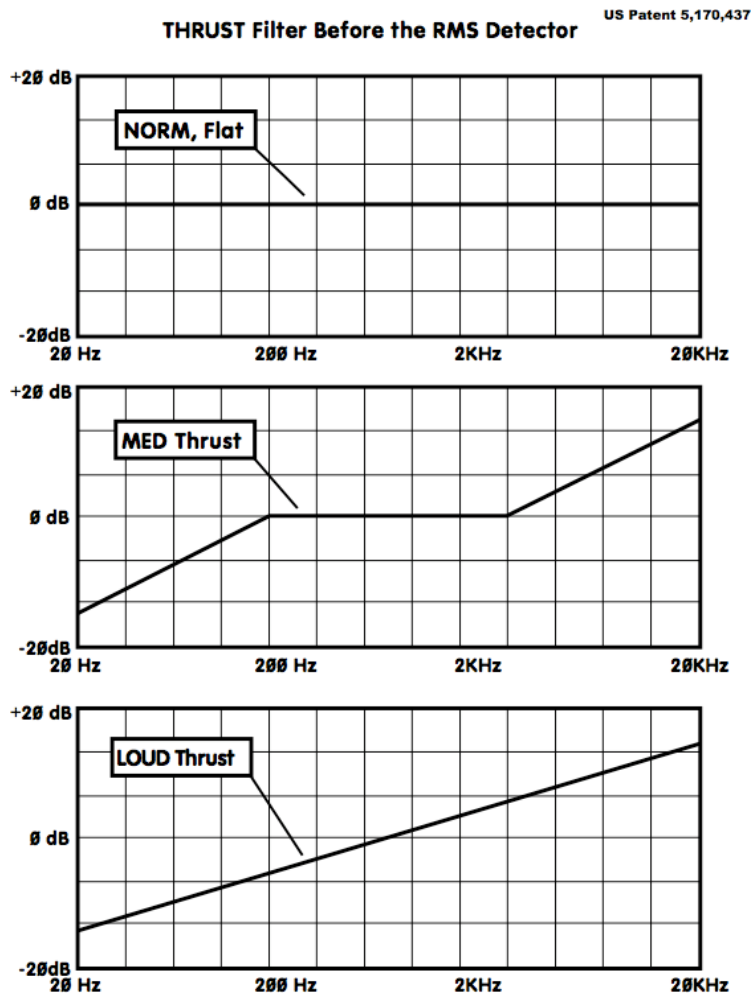
THRUST Filter Before the RMS Detector — US Patent 5,170,437

Type

Sets the Compression type, which determines the signal source being fed to the RMS detector.

- In **New** (Feed Forward) mode, the compressor works like newer VCA-based compressors. The RMS detector sends a signal to the VCA that is an exact ratio of the desired compression, set by the ratio control.

- In **Old** (Feed Back) mode, the RMS detector receives a signal from the VCA output, and then feeds the VCA a signal based on the set signal ratio.

"NEW" or FEED FORWARD type COMPRESSION
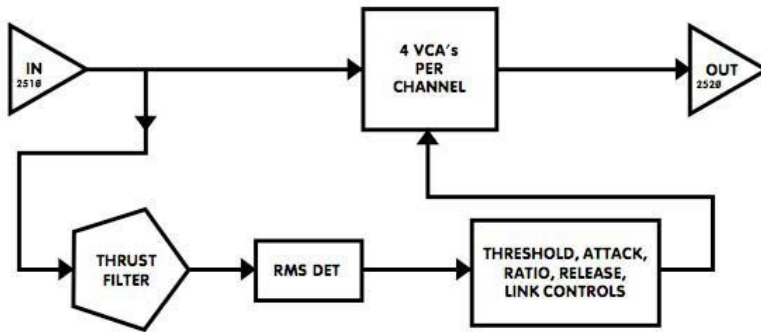
"OLD" or FEED BACK type COMPRESSION
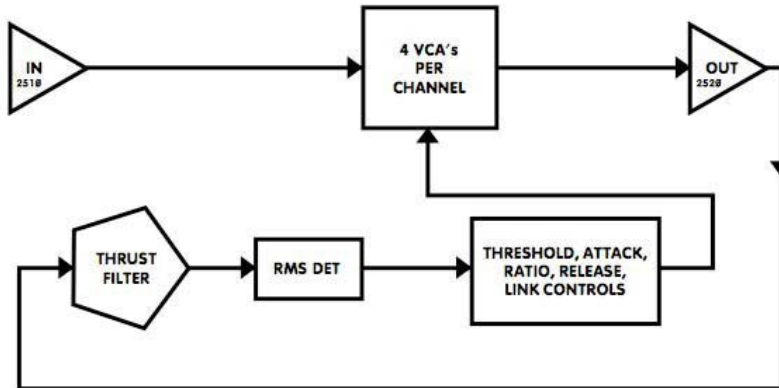
1.4 Components

WaveShell technology enables us to split Waves processors into smaller plug-ins, which we call **components**. Having a choice of components for a particular processor gives you the flexibility to choose a configuration suitable for your material.

The API 2500 has two component processors:

API 2500 Stereo – A stereo compressor that may also be used as two parallel mono processors.

API 2500 Mono – A mono compressor with an external sidechain option.

Chapter 2 – Quick Start Guide

For those of you who are experienced users of audio signal processing tools, we recommend that you approach the API 2500 as you would any compressor which you are already familiar. Keep in mind that its Thrust, Compression Type, and Knee parameters offer capabilities that transcend other, more conventional, processors.

Newer users should explore the API 2500's preset library and use its presets as starting points for their own experimentation. These presets also serve as a valuable introduction to compression techniques in general, and offer a glimpse into the workflow of professional audio engineers.

We encourage all users to experiment with the API 2500's settings in order to better understand its unique processing power.

Chapter 3 – Controls and Interface

3.1 Compressor Section

Threshold
Sets the point at which compression begins. Threshold for each stereo channel is set independently, since each channel has its own RMS detector, even in Link mode. In Auto Gain Make-up mode, the Threshold also affects the gain. Threshold is a continuous control.

    Range
    +10dBu to -20dBu   (-12dBFS to -42dBFS)
    Default
    0dBu

Attack
Sets the attack time of each channel.

    Range
    .03ms, .1ms, .3ms, 1ms, 3ms, 10ms, 30ms
    Default
    1ms

Ratio
Sets the compression ratio of each channel. In Auto Gain Make-up mode, Ratio also affects the gain.

    Range
    1.5:1, 2:1, 3:1, 4:1, 6:1, 10:1, inf:1
    Default
    4:1

Release
Sets the Release time of the compressor. When set to Variable, Release time is controlled by the Variable Release control, located to the right of the Release control.

    Range
    .05sec, .1sec, .2sec, .5sec, 1sec, 2sec, Variable
    Default
    .5sec

Variable Release
Controls the release time with a continuously variable knob. (Please note: Release control must be set to Variable.)
    Range
    .05 seconds to 3 seconds in steps of 0.01ms
    Default
    .5sec

3.2 Tone Section

Knee
Sets the Knee, the manner in which the compressor begins to reduce the signal gain.

> **Range**
> Hard, Med, Soft
> **Default**
> Hard

Thrust
Sets the Thrust, a proprietary process that inserts a High Pass Filter at the RMS detector input, limiting compression response to lower frequencies while applying additional compression to higher frequencies.

> **Range**
> Loud, Med, Norm
> **Default**
> Norm

Type
Sets the Compression type, which determines the signal source being fed to the RMS detector.

> **Range**
> Feed Back, Feed Forward
> **Default**
> Feed Forward

A note about Sidechain:
Sidechain lets you trigger the compressor using an external source, which is fed into the RMS detector and controls the compression of the input signal. Sidechain may only be used in New (Feed Forward) mode. An external sidechain trigger cannot be used in Old (Feed Back) mode; attempting to do so automatically switches the compressor to New (Feed Forward) mode.

3.3 Link Section

L/R Link

Sets the percentage of linkage between the left and right channels. While in Link mode, each channel is still controlled by its own RMS detector, which prevents loading and slaving from either side.

> **Range**
> IND, 50%, 60%,70%,80%,90%,100%
> **Default**
> 100%

Shape

Uses HP and LP filters to adjust the shape of L/R linking. This enables you to remove particularly high or low frequencies when adjusting the linking. Shape can be used, for example, to prevent percussive instruments on one channel from coupling and causing unwanted compression on the other channel. When HP and LP are both selected, a band pass filter is used to determine the shaping of L/R linking. Click on the Shape button to cycle between the four filter options.

> **Range**
> HP, LP, BP (band pass), Off
> **Default**
> Off

3.4 Meter Display

Meters

The API 2500's Meters display dBFS. The Gain scale displays the amount of gain reduction during compression with the 0 point located at the far the right, which allows higher gain reduction scale resolution.. The API 2500 is capable of up to 30dB of reduction.

> **Range**
> 0dB to -24dB (Gain Reduction mode)
> -24dB to 0dB (Input and Output modes)

Switchable Display Modes
> **Range**
> GR, Out, In
> **Default**
> GR

Clip LED

Between the two Meters is a Clip LED which indicates input or output clipping. Since the LED shows both input and output clipping, you must determine which of the two levels is excessive. The Clip LED can be reset by clicking on it.

3.5 Output Section

Analog
Turns the Analog modeling on and off.

> **Range**
> On/Off
> **Default**
> On

Output
Controls the makeup gain.
> **Range**
> +/-24dB
> **Default**
> 0dB

Make-Up

Turns Auto Make-Up Gain on and off.

> **Range**
> Auto, Manual
> **Default**
> Auto

In

Acts as a master bypass for the entire compression chain. When set to Out, all compressor functions are bypassed.

> **Range**
> In/Out
> **Default**
> In

Mix

Controls the balance between the compressed and the uncompressed signal.

> **Range**:
> 0% to 100% (0.1% increments)
> **Default**:
> 100%

Trim

> Sets the output level of the plugin.

> **Range:** -18 to +18 dB (in 0.1 dB steps)
> **Initial Value:** 0
> **Reset Value:** 0

3.6 WaveSystem Toolbar

Use the bar at the top of the plugin to save and load presets, compare settings, undo and redo steps, and resize the plugin. To learn more, click the icon at the upper-right corner of the window and open the WaveSystem Guide.

Appendix A – API 2500 Controls

Control	Range	Default
Threshold	+10dBu to -20dBu	0dBu
Attack	.03ms, .1ms, .3ms, 1ms, 3ms, 10ms, 30ms	1ms
Ratio	1.5:1, 2:1, 3:1 4:1 6:1 10:1 inf:1	4:1
Release	.05sec, .1sec, .2sec, .5sec, 1sec, 2sec, Var	.5sec
Release Variable	.05 to3sec in steps of 0.01ms	.5sec
Knee	Hard, Med, Soft	Hard
Thrust	Loud, Med, Norm	Norm
Type	FeedBack, Feed forwards	Feed Forwards
L/R Link	IND, 50%,60%,70%,80%,90%,100%	100%
Link Filter	Off, HP, LP, BP	Off
Make-up	Auto, Manual	Auto
Meter	GR, OUT, IN	GR
Analog	On/Off	0deg
In	In/Out	In
Output	+/-24dB	0dB
Mix	0–100%	100%
Trim	-18 dB to +18 dB	0dB