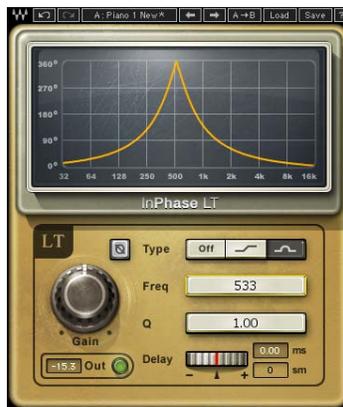
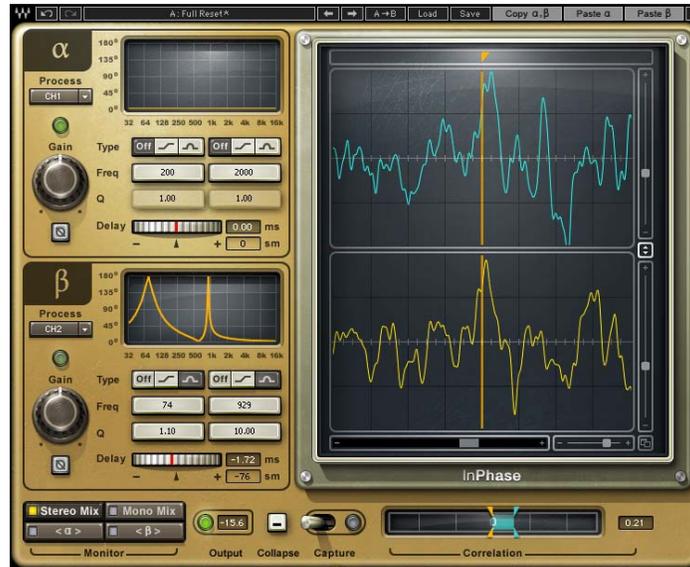


# WAVES InPhase USER GUIDE



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# 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](http://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](http://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

InPhase is an innovative, easy-to-use plugin that corrects phasing issues between tracks.

Phasing can occur throughout the production process:

- In recording, when multiple signals are combined: Like individual drum mics and overheads; guitar amps and DIs; and sources recorded with more than one microphone.
- In mixing, when phasing issues that weren't addressed during recording need to be corrected.
- In mastering, when the final stereo mix has phasing problems.

To help you restore phase coherence, InPhase features high resolution dual waveform displays; phase shift filters with adjustable frequency and Q; and an intuitive correlation meter which shows you just how much your tracks are in—or out of phase. You can move your waveforms manually or using the delay control, and even align them in

relation to a sidechain input. InPhase includes mono, stereo, and dedicated live components, plus InPhase LT, a simplified version that gives you easy access to creative phase manipulation.

Phasing can cause drops in volume and wreak havoc on your frequency response and stereo image; InPhase gives you the power to get your tracks back on track.

## 1.3 Concepts and Terminology

Phasing is a phenomenon which occurs when two or more signals are summed together. For this reason, when discussing phasing issues, we are always referring to the relationship between two or more signals.

InPhase uses **allpass filters** to correct phasing issues between tracks. An allpass filter is a signal processing filter that affects only the phase, not the amplitude of the frequency-response of a signal.. A 1st order allpass filter is defined by the frequency at which the phase shift is exactly 90°; a 2nd order filter is defined by the frequency at which the phase shift is 180° and by the rate of phase change, hence its Q factor.

## 1.4 Components

WaveShell technology enables us to split Waves processors into smaller plugins, which we call **components**. Having a choice of components for a particular processor gives you the flexibility to choose the configuration best suited to your material. InPhase includes the following components:

- InPhase Mono
- InPhase Stereo
- InPhase LT Mono
- InPhase LT Stereo
- InPhase Live Mono
- InPhase Live Stereo
- InPhase Live LT Mono
- InPhase Live LT Stereo

Please note: All components have 20 ms latency, excluding Live components, which have no latency.

## Chapter 2 – Quick Start Guide

There are three basic ways to work with InPhase:

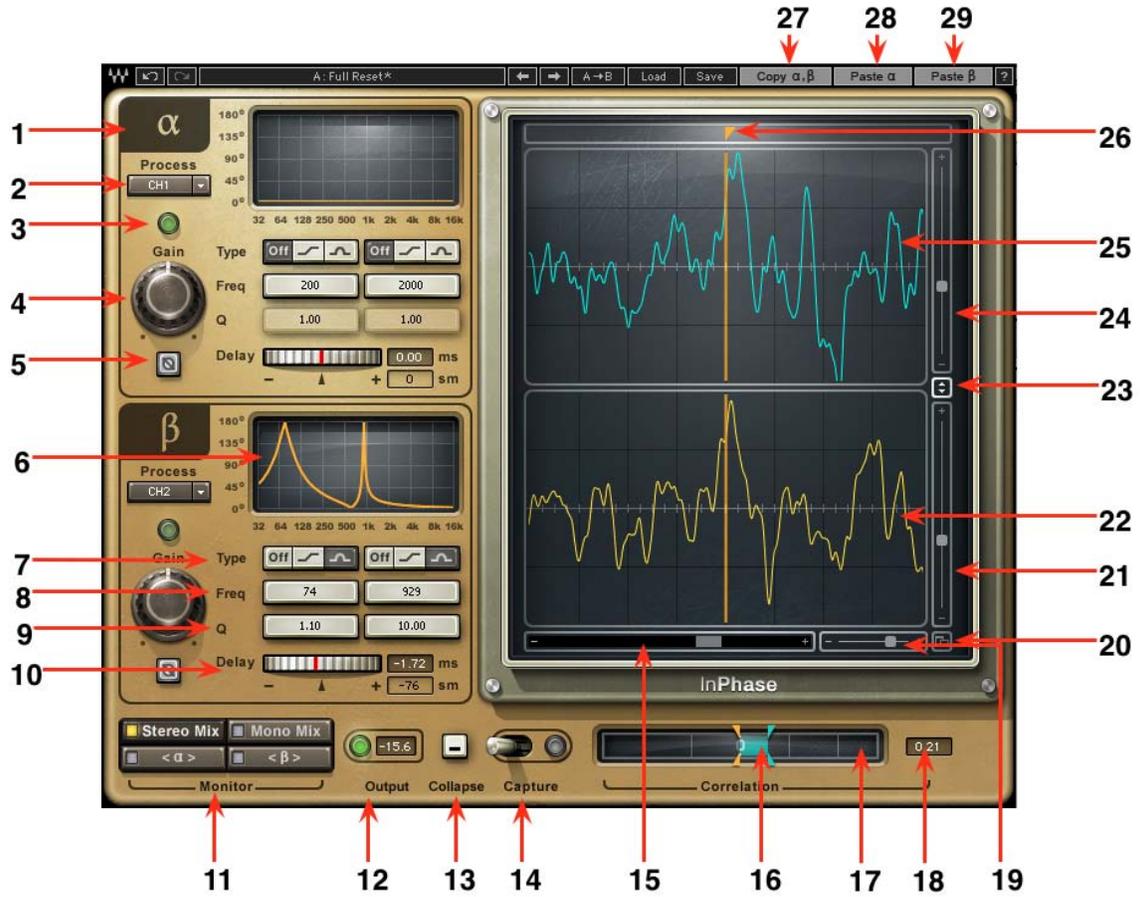
1. [Using InPhase to correct the phase relation between two mono tracks.](#)
2. [Using InPhase to correct the phase relation between the left and right channels of a stereo track.](#)
3. [Using InPhase to align a stereo track to a sidechain reference.](#)

Detailed examples for each of the above scenarios are provided in the Appendix section of this manual. We recommend that you read through them in order to gain a basic understanding of the InPhase workflow. Video demonstrations of these examples are also available at [www.waves.com](http://www.waves.com).

Additionally, the InPhase LT components may be used for creative phase manipulation.

# Chapter 3 – Interface and Controls

## 3.1 Interface



## 3.2 Controls

### 1. Processing Sections

InPhase has two processing sections: In Stereo components, they are called Alpha and Beta; in Mono components, Alpha and SC.

### 2. Process Controls

In Stereo components, the Alpha and Beta **Process** controls let us choose what to process. When CH1 is selected in the Alpha section, it will force CH2 to the Beta section. This setup is recommended for stereo tracks or dual mono tracks such as bass amp and bass DI.

In Stereo components, when CH1/2 is selected in the Alpha section, the sidechain input is forced to the Beta section. This setup is recommended when processing signals in relation to a signal routed to the plugin via sidechain.

In Mono components, the audio is forced to the Alpha section and the sidechain input is forced to the Beta section. This setup is recommended when processing signals in relation to a signal routed to the plugin via sidechain.

*Please note:* In Logic, if using Sidechain, send the audio track to a bus and use that bus as the sidechain source.

**3. Activity LED** shows when there is input signal activity.

**4. Gain** controls the level of the signal going into the processing section.

**5. Phase Invert** flips the phase by 180 degrees.

**6. Phase Shift Curve Window** displays the phase shift curve across the frequency line, and updates in real time as parameters change.

**7. Type** sets the phase shift filter type, and toggles between Off, Shelf (using the 1<sup>st</sup> order allpass filter) and Bell (using the 2<sup>nd</sup> order allpass filter.)

**8. Frequency** selects the frequency at which the phase shift is 90° using the 1<sup>st</sup> order (Shelf) allpass filter or 180° using the 2<sup>nd</sup> order (Bell) allpass filter.

**9. Q** sets the width of the 2<sup>nd</sup> order (Bell) allpass filter: A narrower Q results in a faster phase transition toward the selected frequency, leaving a larger portion of the frequency intact.

**10. Delay** lets us move the signal up to 20 milliseconds in either direction. (Live components forward only.) We recommend adjusting the pure delay *before* adding any phase shift to the process.

**11. Monitor** selects the output monitor configuration.

- When Stereo Mix is selected, the Alpha and Beta section signals, in stereo, are monitored. (When CH1/2 in relation to SC is selected, monitored output signal is attenuated by 6 dB to compensate for the level increase caused by track summing.)
- When Mono Mix is selected, the Alpha and Beta/SC section signals, summed to mono, are monitored. (Monitored output signal is attenuated by 6 dB to compensate for the level increase caused by summing to mono.)
- When Alpha is selected, the Alpha section signal only is monitored.
- When Beta/SC is selected, the Beta section signal only is monitored.

**12. Output LED** displays the peak signal output level.

**13. Collapse** closes the waveform display section.

**14. Capture** has two modes, Automatic & Manual, which capture up to two seconds of signal at 44.1/48 kHz or one second at 88.2/96 kHz.

- **Automatic** – When you click Capture, the mechanism will wait for a signal peak above -40 dBFS. When the first peak exceeds -40 dBFS, it will automatically capture the next one or two seconds (depending on the sample rate), and then stop.
- **Manual** – Click Capture to begin capturing, and click it again to stop.

In both modes, Capture time is limited to one or two seconds, depending on sample rate.

**15. Scroll Bar** scrolls the x axis of the captured waveform.

**16. Correlation Meter** displays the general correlation value metering between the captured Alpha and Beta waveforms, at the output of the delay and phase processing applied. The values move between 1 and -1; the higher the value, the better the correlation.

- 0 indicates no correlation between the signals.
- 1 indicates maximum correlation (identical signals).
- -1 means the signals are completely out of phase.

**17. Correlation Markers** display the maximum value of the correlation meter. Blue represents peak correlation value; orange represents negative peak value. If the negative correlation exceeds the positive, try flipping the phase on one of the sections.

**18. Correlation Value Box** displays the current correlation value, and updates in real time.

**19. Zoom X** zooms in on the x axis, at up to sample resolution.

**20. Reset Zoom** resets the zoom to its default setting.

**21. Zoom Y Beta** zooms in on the Beta section y (amplitude) axis.

**22. Beta Waveform** is the waveform captured in the Beta section.

**23. Zoom Y Link** links Zoom Y Alpha and Zoom Y Beta.

**24. Zoom Y Alpha** zooms in on the Alpha section y (amplitude) axis.

**25. Waveform Displays** show the captured waveforms. The display updates in real time according to the processing applied, excluding gain changes.

**26. Marker** sets the center position for the zoom.

Scrolling doesn't change the marker position and, in certain situations, will place it outside the visible area. The marker also helps us align the peaks of the waveforms. Holding Alt/Option will help you move the Marker when the cursor is on the waveform display.

**27. Copy Alpha Beta** copies the plugin settings to the InPhase clipboard. to easily move settings between stereo and mono components.

**28. Paste Alpha** pastes the settings of the Alpha section from the InPhase clipboard. It is possible to paste the Alpha settings to the same plugin instance or to any other open InPhase plugin instance.

**29. Paste Beta** pastes the settings of the Beta section from the InPhase clipboard. In the mono component, settings are pasted to the Alpha section. It is possible to paste the Beta settings to the same plugin instance or to any other open InPhase plugin instance.

### **3.3 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 – Routing and Usage Examples

All examples are made using Pro Tools.

### Example 1 – Aligning Two Mono Tracks Using Sidechain

Watch the video: <http://www.waves.com/content.aspx?id=11963>

This example uses two tracks, bass amp and bass DI.

- Open the InPhase Mono component on the bass amp track
- Send the bass DI track to Bus 1
- Assign the InPhase sidechain key input to receive from Bus 1.
- Click Capture and play a short loop.
- Once the capture is complete, you'll see the bass amp waveform in the Alpha section display and the bass DI in the Sidechain (SC) section display.
- In the monitor section, click Mono Mix to monitor both tracks summed to mono.
- On the Waves System Bar, click Copy A>B to toggle between A, the processed signal, and B, the unprocessed signal.
- Set the marker to the beginning of a note with a clear start point.
- Zoom in to get a good look at the note's first transient, which will be our sync point.
- Set the marker to the zero cross point of the bass DI track in the SC section.
- Use the Alpha section delay control to align the zero crossing of the Alpha waveform to the SC section, or grab the waveform to move it manually.
- Look at the correlation meter and make sure you're on the blue, positive side of the meter.
- Play back your loop and, using the A-B setup, toggle between the processed and unprocessed signals to make sure track alignment has improved.
- If you experience energy loss in a certain frequency range a result of the delay adjustment, turn on the first phase shift filter by clicking on the Shelf or Bell toggle, then sweep to find the spot where the desired frequency returns.
- Toggle between A and B to make sure the summing of the two tracks is improved.
- If needed, adjust a second frequency range using the second phase shift filter.
- Toggle between A and B to hear the improvement.

## Example 2 – Aligning Two Mono Tracks Routing to a Stereo Aux

Watch the video: <http://www.waves.com/content.aspx?id=11964>

This example uses two tracks, bass amp and bass DI.

- Open an Aux track and assign Bus 1-2 as its input.
- Set the output of the bass amp to Bus 1 and the output of the bass DI to Bus 2.
- Open the InPhase Stereo component on the Aux.
- Click Capture and play a short loop.
- Once the capture is complete, you'll see the bass amp waveform in the Alpha section display and bass DI in the Beta section display.
- In the monitor section, click Mono Mix to monitor both tracks summed to mono.
- On the Waves System Bar, click Copy A>B to toggle between A, the processed signal, and B, the unprocessed signal.
- Set the marker to the beginning of a note with a clear start point.
- Zoom in to get a good look at the note's first transient, which will be our sync point.
- Set the marker to the zero cross point of the bass DI track in the Beta section.
- Use the Alpha section delay control to align the zero crossing of the Alpha waveform to the Beta section, or grab the waveform to move it manually.
- Look at the correlation meter and make sure you're on the blue, positive side of the meter.
- Play back your loop and, using the A-B setup, toggle between the processed and unprocessed signals to make sure track alignment has improved.
- If you experience energy loss in a certain frequency range a result of the delay adjustment, turn on the first phase shift filter by clicking on the Shelf or Bell toggle, then sweep to find the spot where the desired frequency returns.
- Toggle between A and B to make sure the summing of the two tracks is improved.
- If needed, adjust a second frequency range using the second phase shift filter.
- Toggle between A and B to hear the improvement.
- Copy the settings to the Waves clipboard by clicking Copy Alpha, Beta on the Waves System Bar.
- Open the InPhase Mono component on the bass amp track.
- Click Paste Alpha on the Waves System Bar to paste the Alpha section settings from the clipboard.
- Assign the bass amp and DI outputs back to the main mix outputs.

### Example 3 – Aligning a Stereo Track

Watch the video: <http://www.waves.com/content.aspx?id=11965>

This example uses a stereo piano track.

- Open the InPhase Stereo component on your stereo track.
- In the process pull down menu of the Alpha section select CH1, which will force CH2 to the Beta section.
- Click capture and play a short loop.
- Once the capture is complete, you'll see the left channel of the stereo piano waveform in the Alpha display and the right channel in the Beta display.
- On the Waves System Bar, click Copy A>B to toggle between A, the processed signal, and B, the unprocessed signal.
- Set the marker to the beginning of a note with a clear start point.
- Zoom in to get a good look at the note's first transient, which will be our sync point.
- You'll see that the Alpha waveform is early compared to the Beta, so we will adjust the Beta waveform to match the Alpha.
- Set the marker to the zero cross point of the Alpha track.
- Use the Beta section delay control to align the zero crossing of the Beta section to the Alpha section, or grab the waveform and move it manually.
- Look at the correlation meter and make sure you're on the blue, positive side of the meter.
- Play back your loop and, using the A-B setup, toggle between the processed and unprocessed signals to make sure track alignment has improved.
- If you experience energy loss in a certain frequency range a result of the delay adjustment, turn on the first phase shift filter by clicking on the Shelf or Bell toggle, then sweep to find the spot where the desired frequency returns.
- Toggle between A and B to make sure the summing of the two tracks is improved.
- If needed, adjust a second frequency range using the second phase shift filter, in this case around 120 Hz.
- Toggle between A and B to hear the improvement.

## Example 4 – Aligning a Stereo Track to a Sidechain Offline

Watch the video: <http://www.waves.com/content.aspx?id=11966>

This example uses an overheads track which we will align to the snare top track.

- Find a short overheads loop which contains a snare hit.
- From the offline menu(AudioSuite), select InPhase Stereo.
- Set the InPhase sidechain key input to receive from the snare top track.
- In the Alpha section process pull down menu, select CH1/2, which will force the SideCh to the Beta section.
- On the Waves System Bar, click Copy A>B to toggle between A, the processed signal, and B, the unprocessed signal.
- Click capture and play the loop you selected.
- Set the marker to the beginning of a snare hit.
- Zoom in to get a good look at the note's first transient, which will be our sync point.
- Set the marker to the peak point of the first transient on the snare track in the Beta section.
- Grab the waveform and move it manually, or use the Alpha section delay control to align the zero crossing of the Alpha section to the Beta section.
- Look at the correlation meter and make sure the value has improved toward the blue, positive side of the meter.
- Play back your loop and, using the A-B setup, toggle between the processed and unprocessed signals to make sure track alignment has improved.
- If you hear that some of the snare's body has disappeared, turn on the first phase shift filter, select the bell shape with a narrow Q setting, and sweep to find a spot that brings back the missing frequencies.
- Toggle between A and B to make sure the summing of the two tracks is improved.
- To bring back any mids/high mids that have also disappeared, turn on the second phase shift filter and sweep to find a spot that brings back the missing frequencies.
- Toggle between A and B to hear the improvement.

- The snare now has more snap and punch.
- Now all we need to do is process the track.