WAVES Reel ADT Artificial Double Tracking Plugin User Guide

ABBEY ROAD Reel ADT
USER GUIDE

Contents

Reel ADT Artificial Double Tracking Plugin

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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**. 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 other 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

Waves: Abbey Road Reel ADT is the first plugin to successfully emulate Abbey Road Studios' pioneering process of Artificial Double Tracking. The effect that became an integral part of Abbey Road's signature sound was initially created at the famed studios in the 1960s to meet the needs of some very special clients: The Beatles.

Reel ADT puts the magic of that era in your hands within seconds. Using its intuitive controls, you can advance or push back the doubled signal to achieve genuine, lush-sounding delay and pitch variations. You can also drive each of the signals separately to add beautiful tape saturations.

With its authentic modeled valve tape machine sound and faithful emulation of wow and flutter, this extraordinary plugin can enhance any track with the impression of two separate takes, giving you results as close as possible to real double tracking. Other classic Abbey Road tape effects such as flanging and phasing can also be achieved with ease.

All the character, depth and panoramic sound of this inimitable classic effect can now be created digitally, simply and for real: Reel ADT.

1.3 About ADT

ADT was invented at Abbey Road Studios in the mid-1960s to produce a double tracking effect without the need to record two separate tracks.

The Original Setup

The original setup consisted of two tape machines:

Source Tape Machine: This was a valve tape machine with a unique feature. Most professional tape machines had three heads (ERASE, RECORD/SYNC and PLAY) and one output amplifier to switch between the RECORD/SYNC head and the PLAY head, depending on whether the machine was being used for recording/overdubbing (the RECORD/SYNC head) or for mixing (the PLAY head). Abbey Road tape machines, by contrast, had two output amps: one for the RECORD/SYNC head, another for the PLAY head. Using an Abbey Road model, it was therefore possible to output two instances of the same original signal simultaneously. Due to the physical gap between the two heads, there would be a slight delay between the two instances.

This delay, along with the ability to play both outputs simultaneously, were the vital features that made ADT possible. These unique features of Abbey Road's tape machines may also explain why other studios were not able to recreate the Abbey Road ADT effect very convincingly.

ADT Tape Machine: This was a second valve tape machine with Varispeed control (a VCO, or voltage-controlled oscillator, coupled with a powerful amp). The signal from the RECORD/S YNC head of the SOURCE tape machine would feed into this second tape machine. The ADT tape machine would be in INPUT/RECORD mode, so the signal fed into it would come straight back off the tape. This would create yet another delay, due to the gap between the RECORD/SYNC head and the PLAY head of the second tape machine.

The delays caused by the head gaps in the two machines realigned the two signals, so that they were nearly simultaneous. The Varispeed could be used to fine-tune the length of delay and even to advance the effected sound before the source sound.

The two resulting signals would then be fed into a mixing console. Different results could be achieved, depending on how the two signals were panned in the stereo field. When both signals were panned to or near the center, the result would be a distinctive, if not entirely naturalsounding effect (this unnatural sound was, however, part of what made the technique so appealing). However, when the signals were panned left and right in the stereo field, the double tracking effect could sound very convincing indeed. This version of ADT was often used to create lush-sounding stereo imaging when using a four-track tape as the source for a stereo mixdown.

It was common practice to constantly move around the Varispeed of the second tape machine. This was done by hand, using the VCO remote control. Depending on the direction in which the knob was turned and the speed at which this was done, subtle (or, if so desired, very unsubtle) movements could be created between the two sources. This is what made the effect sound so organic, as even certain words or phrases within a single vocal take could be treated differently. The fact that each of the two tape machines had its own variations of wow and flutter, not to mention a different motor running at a slightly different speed, only enhanced this lush organic effect. The resulting sound is the most legendary of all Abbey Road tape effects.

How ADT Was Invented

When working on 'Tomorrow never Knows', John Lennon complained about the tedious task of recording a doubled vocal take—a technique that was widely used in those days to boost and enrich vocal parts. He needed to match the second take as closely as possible to the lead take, which took considerable time and effort on his part. In response, Abbey Road technical engineer Ken Townsend came up with ADT. Townsend understood that to achieve a natural-sounding effect, simply applying a different EQ or compression would not do; worse, it would create phasing problems. What he needed was a process that would alter the timbre, time and pitch of the vocal take. He realized that changing the tape speed back and forth would create all those effects simultaneously.

The technique he finally came up with worked as follows. When mixing a song, the track to be artificially doubled —usually a vocal track, though any other track could be treated similarly—would be routed from the recording head of the multitrack tape, which was ahead of the playback head, and fed to the recording head of the second tape machine. An oscillator would then be used to vary the speed of the second machine, providing more or less delay depending on how quickly or how slowly the second machine was being run in relation to the first. This signal would then be routed from the playback head of the second machine to a separate fader on the mixer. The tape operator had to 'ride' the Varispeed (VCO) control in order to create the desired effect; any mistake along the way would require another take.

The introduction of ADT was a milestone in the history of sound recording, and the technique was used heavily on many historic recording sessions at Abbey Road Studios. Over the years, many recording engineers have tried to replicate the effect, but with only partial success, largely because a definitive description of the exact process used at Abbey Road has until now been a closely guarded secret.

Other Related Effects

ADT led Abbey Road's engineers to experiment with a number of secondary effects. Two of these—flanging and phasing—are possible with the current plugin.

Flanging:

As noted in the Quick Start section of the present manual, the classic ADT sound is achieved with about 15 milliseconds of advance or delay between the two signals. When the two signals are placed closer together, however—between 0 and 5 ms (with the Varispeed controller used to continuously vary the speed within that range)—the frequencies of the two signals combine to create a series of peaks and dips in the audio spectrum. This effect, known as flanging, was another firm Beatles favorite at Abbey Road.

It is worth noting that flanging almost certainly originated somewhere else, albeit using different methods and with slightly different results. Most Abbey Road engineers were not aware of previous experimentation with flanging, however, and were under the impression that the effect and its name were invented at Abbey Road.

Phasing:

Phasing used the same set-up as flanging, but with the signal from the second tape machine phase-reversed by 180 degrees, giving a deeper effect. When the two signals reached the point of zero delay, their waveforms were at equal strength but at opposite polarity, resulting in almost total cancelation. In contrast to flanging, then, which was an addition of signal frequencies, phasing was a subtraction of signal frequencies, creating more of a 'ducking' effect.

1.4 Concepts and Terminology

Understanding the following terms will help you achieve the best results using your ADT plugin:

- SRC (or Source) refers to the unmodulated signal.

- AD T refers to the effect side of the plugin, i.e. the modulated signal.
- Display Area refers to the top section of the plugin, where the user can see the overall modulation of the ADT channel. This includes Varispeed modulation, LFO modulation, and smoothing, the latter a modeling of the physical engine acceleration.
- Varispeed refers to the control used to vary the speed of the modulated ADT signal manually.
- LFO is an automatic way of modulating the ADT signal. It uses a low-frequency oscillator to ride the signal automatically.

1.5 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. AD T includes the following components:

- ADT Mono
- ADT Mono-to-Stereo
- ADT Stereo
- ADT 2V Mono-to-Stereo
- ADT 2V Stereo
- ADT Live Mono
- ADT Live Mono-to-Stereo
- ADT Live Stereo
- ADT Live 2V Mono-to-Stereo
- ADT Live 2V Stereo

AD T 2V adds a second ADT modulation of the signal, allowing you to control each of the two modulated signals independently in order to generate a richer doubling effect.
Please note that both ADT Stereo and ADT 2V Stereo give users the option of either selecting just one of the input stereo tracks, Left or Right, or summing both stereo tracks to mono (dividing the result by two to maintain perceived loudness).
AD T Live components have been added to meet the requirements of live performances by providing especially low latency for live shows. ADT's regular (non-live) components rely on latency to advance the ADT signal relative to the source signal. To minimize latency in a live setting, the ADT Live components do not offer the option of advancing the ADT signal ahead of the source. In ADT Live, the ADT signal can only be delayed relative to the source. To allow
preset sharing between the ADT and ADT Live components, the Live components automatically translate negative ADT values to positive values.
Apart from the differences noted above, the ADT Live components are exactly the same as the Reel ADT's regular components.

## Chapter 2 – Quick Start (featuring the Mono-to-Stereo Component)

- Open the ADT plugin on a vocal track.
- Grab the ADT control in the display area above the ruler and play around with it until you get a good-sounding static double effect. Recommended ranges are -10 to -15 ms (with the ADT signal playing in advance of the source) and 10 to 15 ms (with the ADT signal playing after the source).
- Experiment with the LFO, preferably on a random shape, and play with the range (recommended range is 3-8 ms) until you get a good doubling effect that does not sound synthetic or unnatural.
- Try using the Varispeed control with wide range settings to emphasize word endings or to adjust the effect to

your liking.

- Add some drive to taste.
- To maximize the doubling effect, adjust the overall level of each channel so that the ADT and SRC channels both have the same apparent loudness.
- Experiment with the panning between the two signals. You will get a different sound if the signals are on top or close to one another, as opposed to panned mid to hard left and right.

Chapter 3 – Interface and Controls

3.1 Interface (featuring the Stereo Component)
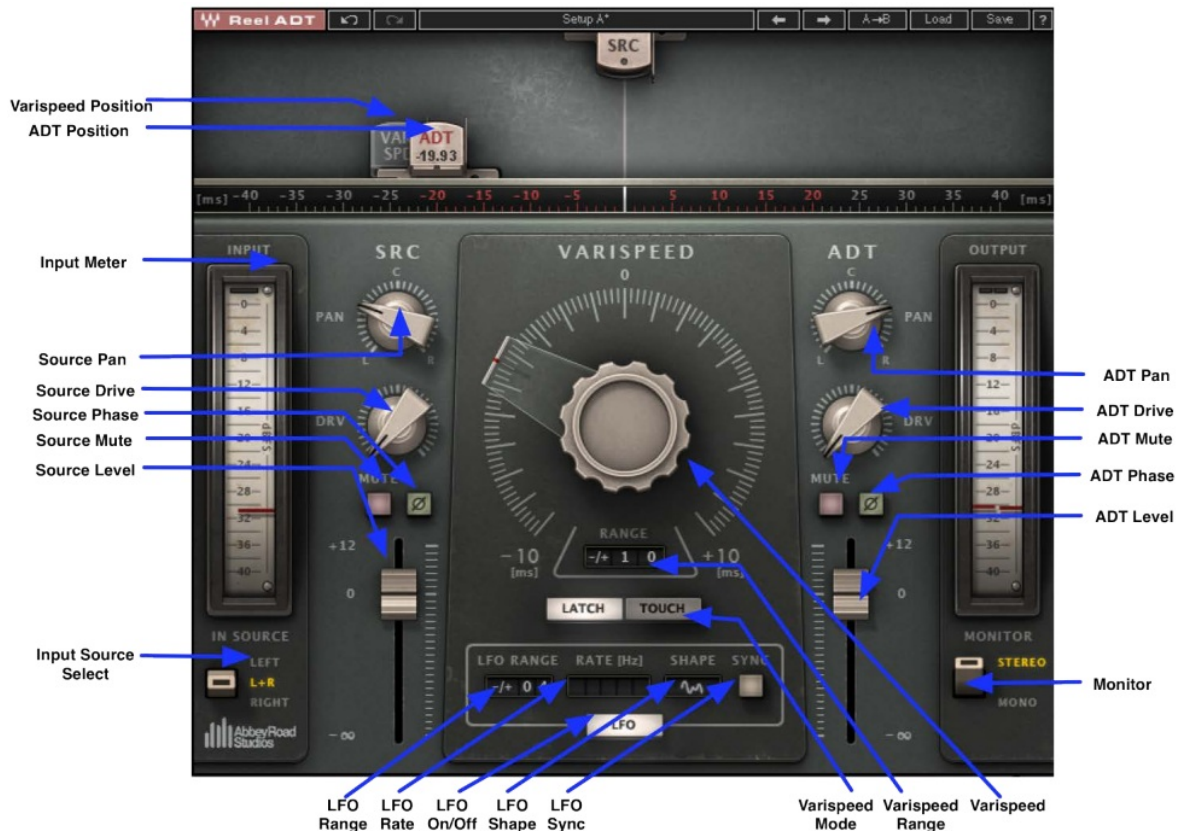
3.2 Controls
General Controls
ADT Position
Bounds the Varispeed playing range and determines whether the ADT signal plays before, around, or after the source. To move the ADT position, click on the ADT tape head in the display area.
Please Note: In ADT Live, the ADT signal can play only after the source.
Input Source
Determines which of the stereo channels is sent for ADT processing. Click Left to select the left channel, Right to select the right channel, and L+R to sum both channels to mono, dividing the result by two to maintain perceived loudness.
Monitor
Lets you monitor the plugin's output in mono, helping you track the amount of phasing introduced by the process.
Varispeed Section
Varispeed
Controls the time movement of the ADT. Varispeed has the same function as the voltagecontrolled oscillator used in the original ADT setup to shift the speed (and hence time) of the doubled track. The Varispeed range is variable to give the best resolution and control over the desired movement.
Range: Variable between -/+20 ms and -/+1 ms, in 1 ms increments.
Please note: For ease of use, the Varispeed control can be assigned to MIDI. Check your DAW to find how to assign MIDI controls.
Varispeed Mode
Determines Varispeed's working mode:
Latch: When you rotate the Varispeed control and then release it, the control stays on the released value.

Touch: When you rotate the Varispeed control and then release it, the control jumps back to 0.

LFO Section

LFO On/Off

Turns the LFO on or off. The LFO will automatically modulate the delay time of the Varispeed.

LFO Range

Sets upper and lower limits for the LFO cycle. E.g., select 3 to limit the LFO cycle to -/+3 ms.

Range: Variable between -/+20 ms and -/+1 ms, in 1 ms increments.

LFO Shape

Determines the shape of the LFO cycle: sine, triangular, reverse sine, reverse triangular, or random.

LFO Rate (Hz)

Sets the rate at which the LFO completes the range selected in the LFO Range control.

LFO Rate (Bars) (only when LFO Sync mode is on)

Sets the rate at which the LFO completes the range selected in the LFO Range control, only in terms of bars rather than Hz. For example, when the selected range is -/+3, LFO Sync is on; if the user selects 6 bars, the LFO will take 6 bars to complete a full cycle of -/+3 ms.

Range: ¼, ½, 1, 1½, 2, 2½, 3, 3½, 4, 6, 8, 9, 12, 16

LFO Sync

When Sync is on, the LFO rate is set automatically by calculating the session's tempo, measure, and resolution and the selected Rate (Bars) setting. For example, the user can set the LFO Rate to 4 bars, and the plugin will calculate the actual rate needed to make this happen.

SRC (Source) Control Section

SRC Pan

Controls the position of the source signal in the stereo image.

Range: 100L–100R

SRC Drive

Controls the amount of tape saturation.

Range: 0–30

SRC Mute

Mutes the source signal in the output.

SRC Phase

Inverts the phase of the source signal (see ADT phase below).

SRC Level

Controls the level of the source signal.

Range: +12 to -Inf dB (continuous control, 0.1 dB resolution)

Please note: The ADT output is normalized in order to maintain constant gain when the ADT and SRC channels are panned hard left and hard right.

ADT Control Section

AD T Pan

Controls the position of the ADT signal in the stereo image.

Range: 100L–100R

ADT Drive

Controls the amount of tape saturation.

Range: 0–30

ADT Mute

Mutes the ADT signal in the output.

ADT Phase

Inverts the phase of the ADT signal. Use this to create a Phasing effect when the two signals are very close to one another (between 0 and 5 ms).

ADT Level

Controls the level of the ADT signal.

Range: +12 to -Inf dB (continuous control, 0.1 dB resolution)

Please note: The ADT output is normalized in order to maintain constant gain when the ADT and SRC channels are panned hard left and hard right.

ADT 2 Control Section (Only in Reel ADT 2V)

ADT 2 Pan

Controls the position of the ADT signal in the stereo image.

Range: 100L–100R

ADT 2 Drive

Controls the amount of tape saturation.

Range: 0–30

ADT 2 Mute

Mutes the ADT signal in the output.

ADT2 Phase

Inverts the phase of the ADT 2 signal.
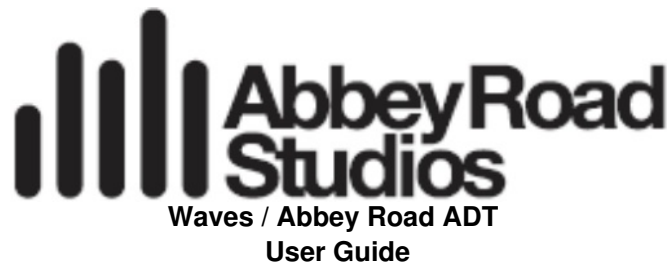
ADT 2 Level

Controls the level of the ADT signal.

Range: +12 to -Inf dB (continuous control, 0.1 dB resolution)

Please note: The ADT output is normalized in order to maintain constant gain when the ADT and SRC channels are panned hard left and hard right.

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.

Waves / Abbey Road ADT
User Guide

Documents / Resources

WAVES/ABBEY ROAD **Reel ADT** USER GUIDE	[**WAVES Reel ADT Artificial Double Tracking Plugin**](#) [pdf] User Guide Reel ADT, Reel ADT 2V, Reel ADT Artificial Double Tracking Plugin, Artificial Double Tracking Plugin, Double Tracking Plugin, Tracking Plugin, Plugin