HappyRoad ADT Pro — User Manual

One voice. Two tape machines. A whole lot more human.

By Lit Factory NYC · Version 0.1.0 · macOS AU / VST3

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1. Introduction and product concept

In 1966 at Abbey Road Studios, technical engineer Ken Townsend invented Automatic Double Tracking (ADT) to spare John Lennon from having to manually sing every vocal part twice.

Townsend's breakthrough was rerouting the sync playback head of a primary multitrack recorder into the record head of a secondary tape machine, varying the secondary machine's motor speed with a variable-frequency oscillator, and blending the resulting delayed, moving signal back alongside the direct track.

HappyRoad ADT Pro is the complete tape doubling suite:

- **Independent dual tape engines:** Two discrete motorized tape paths (Machine A and Machine B) with independent pan, level, and phase invert.
- **Variable tape speed, lag time, and wow/flutter:** From a disciplined second take to a wild, wandering double.
- **Germanium tape drive:** Authentic vintage saturation modeling the warm drive characteristics of classic consoles and tape heads.
- **Transient Decoupler:** Keeps vocal consonants and guitar pick attacks crystal-clear while applying full ADT doubling to the sustained body.
- **Formant Shift (±2.0 st):** Shifts the resonant character of the double without altering musical pitch, creating subtle male/female vocal variations.
- **Phase Safe stereo engine:** Phase-aware stereo widening that helps keep stereo doubles mono-compatible on phones and mono speakers. Always check your mix in mono.
- **Flexible 3-channel routing matrix:** Independent control over Dry, Machine A, and Machine B levels, pan positions, and polarity.

It is the sound of the world's most famous double-tracking effect—with modern control over every millimeter of tape.

2. Installation and supported formats

System requirements

- **macOS:** macOS 11 or later is the baseline stated on the product page. The plug-ins are universal binaries (Apple Silicon and Intel) built with a macOS 10.15 deployment target; release testing so far has been performed on macOS 15.x (Intel) only. The package you download is the authority.
- **Plug-in Formats:** 64-bit Audio Units (AU v2) and VST3.
- **DAW compatibility:** any host that loads standard AU or VST3 effect plug-ins. Individual DAWs have not been separately certified.

Installation steps

1. Run the supplied macOS installer package (`Happy_Road_ADT_Pro-0.1.0-macOS-Installer.pkg`), which installs the AU and VST3 plug-in bundles into `/Library/Audio/Plug-Ins/Components/` and `/Library/Audio/Plug-Ins/VST3/` .
2. Restart your DAW or run its plug-in rescan.
3. Insert **HappyRoad ADT Pro** as an effect on any mono or stereo track or auxiliary return.

HappyRoad ADT Pro is completely separate from HappyRoad ADT ’66, allowing both editions to be installed and used simultaneously.

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3. Getting started

1. Insert **HappyRoad ADT Pro** on an audio track in your DAW.
2. If this is your first time using the plug-in, click **LIT FACTORY NYC** at the top or bottom of the window to open the About & License panel, enter your serial key, and click **Activate**.
3. Set **LAG TIME** to **0.0 ms** (center) and **HUMANIZE** to **20%**.
4. Set **MIX** to **50%** and **TAPE DRIVE** to **0%**.
5. Start playback: hear the direct sound and the motorized double interact.
6. Slowly adjust **LAG TIME**:
    - Turn clockwise (positive values up to +40 ms) to push the tape double behind the direct sound.

    - Turn counter-clockwise (negative values down to –15 ms) to pull the double ahead of the direct performance.
7. Click the **ADVANCED** drawer tab at the bottom to expand the deep tone shaping and routing matrix.

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4. Control reference

Primary controls

Control	Parameter ID	Range	Default	Description
POWER	`power`	Off / On	On	Bypasses or engages the plug-in engine.
LAG TIME	`lagTime`	–15.00 ms to +40.00 ms	0.00 ms	Sets the time offset of the tape double relative to the direct performance.
HUMANIZE	`humanize`	0.0% to 100.0%	20.0%	Controls the depth of random tape motor speed drift, wow, and flutter.
TAPE DRIVE	`drive`	0.0% to 100.0%	0.0%	Drives the virtual record head into warm germanium-style tape saturation.
MIX	`mix`	0.0% to 100.0%	50.0%	Equal-power blend between the direct sound and the tape doubling engine.

LAG TIME (–15 ms to +40 ms)

Controls the relative time difference between the direct signal and the virtual tape heads:

- **Negative Lag (–15 ms to 0 ms):** The double arrives *before* the direct sound. This creates uncanny immediacy and presence, pushing vocals forward in the mix.
- **0.0 ms (Default):** Flange and comb-filtering territory. The double moves dynamically around the direct signal via motor drift.
- **Positive Lag (0 ms to +40 ms):** The double trails behind the direct performance. At 10–20 ms, this produces the authentic Abbey Road ADT pocket. Above 25 ms, it transitions into distinct slapback doubling.

HUMANIZE (0% to 100%)

Simulates the mechanical motor speed instability of real analog tape transports:

- **0%:** Precise, static delay time without random drift.
- **20% (Default):** Subtle tape wow and flutter reminiscent of a finely calibrated studio machine.
- **50%–100%:** Increased motor drift and wandering speed, creating the loose, organic feel of two distinct human takes.

TAPE DRIVE (0% to 100%)

Models nonlinear tape compression, harmonic generation, and high-frequency soft saturation:

- **0%:** Clean, uncolored tape head response with standard bandwidth limiting.
- **20%–40%:** Warm tape compression that thickens midrange presence and tames harsh vocal sibilance.
- **60%–100%:** Rich, vintage saturation with grit and punch.

MIX (0% to 100%)

Smooth equal-power crossfade between the direct performance (0%) and the double output (100%).

Advanced drawer controls (Tone & transient shaping)

Click the **ADVANCED** button at the base of the interface to reveal the secondary control tier:

Control	Parameter ID	Range / Choices	Default	Description
TRANSIENT DECOUPLER	`transientDecouple`	0.0% to 100.0%	0.0%	Keeps sharp transient attacks dry while applying ADT doubling only to the sustained body.
FORMANT SHIFT	`formantShift`	−2.00 st to +2.00 st	0.00 st	Modifies the resonant vocal tract character of the double without altering pitch.
PHASE SAFE	`phaseSafe`	Off / On	Off	Engages intelligent phase alignment to prevent mono cancellation.
PHASE MODE	`phaseSafeMode`	Adaptive / Strict Mono	Adaptive	Selects between dynamic correlation tracking (Adaptive) and strict mono sum alignment.

TRANSIENT DECOUPLER (0% to 100%)

When doubling percussive instruments or fast vocals, delayed attacks can cause distracting flamming or blurred consonants.

- At **0%**, the entire signal is doubled equally.
- As the Decoupler is raised toward **100%**, transient attacks (consonants, guitar pick strikes, drum attacks) remain clean and centered, while the body and decay of the notes receive full tape doubling.

FORMANT SHIFT (–2.0 to +2.0 semitones)

Adjusts the acoustic resonant frequencies (formants) of the doubled tape paths without pitch-shifting the musical notes:

- **Negative values (–2.0 st):** Lowers formants, giving the double a deeper, chestier, more masculine timbre.
- **Positive values (+2.0 st):** Raises formants, producing a brighter, lighter, more feminine double.
- Allows a single singer to create natural, distinct-sounding backing vocal stacks.

PHASE SAFE & PHASE MODE

- **Phase Safe (On/Off):** Monitors phase correlation between channels and helps reduce destructive comb filtering when stereo doubles are collapsed to mono.
- **Adaptive:** Continuously tracks phase interaction and applies micro-adjustments only when phase cancellation is detected, preserving maximum stereo width during stereo playback.
- **Strict Mono:** Preserves the original mono fold-down and keeps the additional doubling in the stereo sides. Check the result in mono; no setting can guarantee identical results in every listening condition.

Routing Matrix (Row 2 of Advanced Drawer)

HappyRoad ADT Pro features an independent 3-channel mixer governing the **Dry**, **Double A**, and **Double B** signal paths:

Channel	Parameter	Parameter ID	Range	Default
DRY	Level	`dryLevel`	–inf (–60.1 dB) to +6.0 dB	0.0 dB
	Pan	`dryPan`	L 100% (–1.0) to R 100% (+1.0)	Center (0.0)
	Polarity	`dryPolarity`	Normal / Inverted	Normal
DOUBLE A	Level	`doubleALevel`	–inf (–60.1 dB) to +6.0 dB	0.0 dB

Channel	Parameter	Parameter ID	Range	Default
	Pan	`doubleAPan`	L 100% (–1.0) to R 100% (+1.0)	L 100% (–1.0)
	Polarity	`doubleAPolarity`	Normal / Inverted	Normal
DOUBLE B	Level	`doubleBLevel`	–inf (–60.1 dB) to +6.0 dB	0.0 dB
	Pan	`doubleBPan`	L 100% (–1.0) to R 100% (+1.0)	R 100% (+1.0)
	Polarity	`doubleBPolarity`	Normal / Inverted	Normal

- **Level Sliders:** Smooth dB-scaled gain adjustment. Moving to the absolute bottom (–60.1 dB) fully mutes the respective channel.
- **Pan Sliders:** Positions each path anywhere across the stereo panorama.
- **Polarity Invert (Phase Invert):** Inverts audio phase (180°) on that specific path. Inverting one double head often produces wide, dramatic spatial effects or clears up low-mid build-up.

Display & Metering

- **VU / Tape Speed Display:** Click anywhere on the backlit meter face to toggle between:
  - **VU Mode:** Displays signal levels with authentic ballistic meter damping.
  - **Tape Speed Mode:** Displays real-time virtual tape transport speed (7.5, 15, and 30 ips), reflecting motor fluctuations and wow/flutter.

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5. Recommended workflows

Lead vocal insert

- Insert HappyRoad ADT Pro on the lead vocal channel.
- Set **Lag Time** to **10–14 ms**, **Humanize** to **25%**, and **Tape Drive** to **20%**.
- Open the Advanced drawer, set **Transient Decoupler** to **30%** to keep consonants crisp.
- Set **Double A Pan** to **L 80%** and **Double B Pan** to **R 80%**.
- Adjust **Mix** to **40%–50%**.

Stereo acoustic guitar widening

- Record an acoustic guitar with a single microphone.
- Insert HappyRoad ADT Pro on the track.
- Keep **Dry** centered (0 dB).
- Pan **Double A** to **Hard Left** and **Double B** to **Hard Right**.
- Set **Lag Time** to **18 ms** and **Humanize** to **35%**.
- Set **Formant Shift** to **+0.5 st** on the double to simulate a subtly different instrument.

Parallel doubling bus (Send / Return)

- Create a dedicated stereo auxiliary return track.
- Insert HappyRoad ADT Pro on the return.
- In the Routing Matrix, mute the **Dry** path (drag Dry Level to bottom) or set **Mix** to **100%**.
- Send audio from lead vocals, background vocals, and solo guitars to the bus.
- Control overall doubling thickness using the DAW's aux return fader.

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6. Practical examples

The Lennon Vocal ('67 Abbey Road)

- **Lag Time:** +12.0 ms
- **Humanize:** 35%
- **Tape Drive:** 20%
- **Formant Shift:** 0.0 st
- **Transient Decoupler:** 0%
- **Result:** Warm, organic tape doubling that sits directly in the sweet spot of 1960s psychedelic rock.

The Ghost Double

- **Lag Time:** +25.0 ms
- **Humanize:** 20%
- **Tape Drive:** 15%
- **Formant Shift:** –1.0 st

- **Transient Decoupler:** 60%
- **Double A:** –3.0 dB, Pan L 70%
- **Double B:** –3.0 dB, Pan R 70%
- **Result:** A shadowy, warm double that tucks neatly behind the lead vocal without competing for clarity.

Wide Double-Tracked Acoustic

- **Lag Time:** +16.0 ms
- **Humanize:** 40%
- **Tape Drive:** 10%
- **Transient Decoupler:** 40%
- **Dry:** 0.0 dB, Center
- **Double A:** 0.0 dB, Hard Left (L 100%)
- **Double B:** 0.0 dB, Hard Right (R 100%)
- **Result:** A single acoustic guitar performance instantly sounds like two distinct takes tracked in a rich acoustic space.

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7. Stereo and mono considerations

Tape doubling creates stereo width by placing delayed, phase-shifted signals across the left and right speakers.

When a stereo mix is summed to mono:

- Static delays can cause comb filtering, making vocals sound hollow or thin.
- With HappyRoad ADT Pro, **Humanize** constantly shifts the delay time, preventing static comb notches from settling on specific frequencies.
- For complete peace of mind, engage **Phase Safe**. In **Adaptive** mode, the engine dynamically aligns phase correlation during mono collapse to help keep fundamental frequencies and low-end warmth solid on smartphones and mono speakers.

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8. Host automation, lookahead latency, and session recall

Lookahead PDC latency (Plugin Delay Compensation)

HappyRoad ADT Pro allows **negative Lag Times** down to **–15 ms** (meaning the tape double plays *before* the dry track).

To achieve negative time offsets in real-time DAW environments, the plug-in reports a fixed **20.0 ms lookahead latency** to the host DAW:

- **44.1 kHz:** 882 samples
- **48.0 kHz:** 960 samples
- **96.0 kHz:** 1920 samples
- **192.0 kHz:** 3840 samples

Your DAW's automatic Plugin Delay Compensation (PDC) will align all tracks perfectly. When monitoring live inputs in real time with low buffer sizes, engage your DAW's low-latency monitoring mode if needed.

Host automation & session recall

- All 14 primary and advanced parameters are fully exposed for DAW automation.
- Parameter values are smoothed with zero zipper noise.
- Complete state is recalled when opening your DAW project.

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9. Licensing, activation, and deactivation

HappyRoad ADT Pro is licensed software. Without an activated license, audio passes through dry and unprocessed (the plug-in never mutes your session).

Activating your license

1. Open HappyRoad ADT Pro in your DAW.
2. Click **LIT FACTORY NYC** at the bottom right of the window to open the About & License window.
3. Enter the serial key received in your purchase confirmation email.
4. Click **Activate**. The status changes to **LICENSE STATUS: ACTIVATED** once it succeeds.

5. Click **Close** to return to the controls.

Offline authorization & machine transfer

- Your license is stored locally on your computer as a certificate. After activation, everyday use does not need an internet connection until the certificate's expiry date, which is set by the activation server. If it expires, the plug-in asks you to reconnect, and you activate again from the **LIT FACTORY NYC** panel.
- To transfer your license to another computer, open the About & License window, click **Manage License**, then **Confirm Deactivate**. You can then activate your key on the new machine. Your license includes a limited number of computer activations, shown in your purchase confirmation.

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10. Troubleshooting

Why is my track delayed when I insert the plug-in?

HappyRoad ADT Pro uses a 20.0 ms lookahead buffer to support negative lag times (–15 ms). Ensure your DAW has **Plugin Delay Compensation (PDC)** enabled. When PDC is active, your DAW aligns all tracks automatically.

The vocal sounds hollow when played on a phone

Engage **Phase Safe** in the Advanced drawer. This tracks phase correlation and helps reduce phase cancellation during mono summing; confirm by listening in mono.

Consonants or guitar picks sound like a double-hit (flam)

Raise the **Transient Decoupler** slider in the Advanced drawer. This isolates the initial attack transients and keeps them centered and dry, while applying the doubling effect only to the sustained notes.

How do I reset a knob to its default value?

Double-click any knob or fader to instantly return it to its factory default position.

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11. Version information

- **Current Version:** 0.1.0
- **Release Status:** Pre-release (licensed plug-in)
- **Architecture:** Universal Binary (x86_64 and arm64 Apple Silicon)
- **Framework:** Custom C++17 audio engine built on JUCE

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12. Support and links

Lit Factory NYC

- **Website & Store:** litfactorynyc.com
- **HappyRoad ADT Pro Product Page:** litfactorynyc.com/store/happy-road-adt-pro
- **HappyRoad ADT ’66 (Free Edition):** litfactorynyc.com/store/happy-road-adt-66
- **Technical Support & Feedback:** support@litfactorynyc.com

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