Applied Psychoacoustics Lab (APL)

DUOPAN

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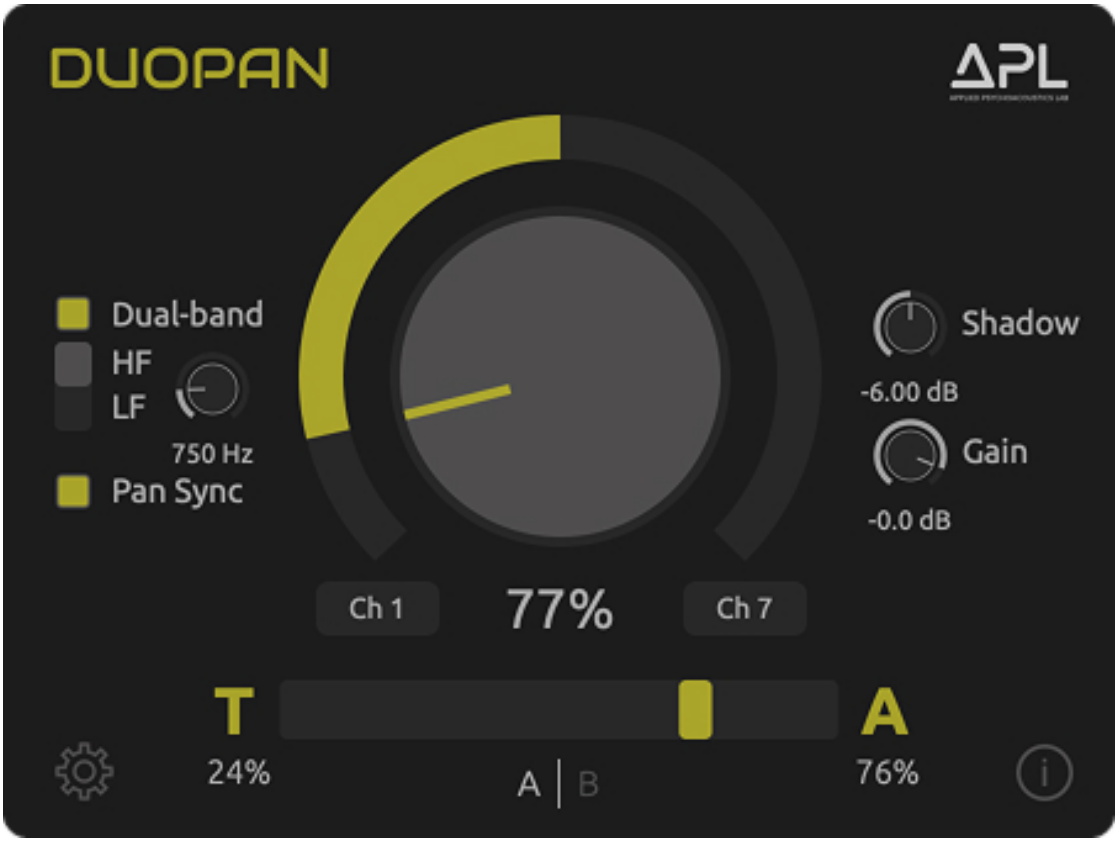
v1.0.0 (Early Access)

USER MANUAL



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1 INTRODUCTION

Thank you for choosing APL DUOPAN. DUOPAN is a new psychoacoustic panner designed to bring natural spatial width and depth to your mixes, optimised for headphone listening, yet translating beautifully to loudspeakers.

Conventional panning can sound unnatural on headphones, with images appearing inside the head and making it difficult to achieve smooth, linear movement across the stereo field. DUOPAN solves this. Built on our advanced psychoacoustic model of Time/Amplitude panning and spectral shaping, DUOPAN gives you an entirely new way to sculpt and correct stereo images. The flexible Time/Amplitude ratio control lets you strike the perfect balance between spaciousness and focus. On headphones, it achieves a binaural-like imaging, placing sounds slightly outside the head for a more natural and immersive experience.

DUOPAN can also correct spatial imbalance issues in stereo recordings and route its output to any pair of loudspeakers within a multichannel mix.

KEY BENEFITS:

- Delivers a more spacious and natural stereo image.
- Places hard-panned sounds outside the head on headphones (binaural-like).
- Pans a stereo track more naturally without narrowing its width.
- Corrects unbalanced stereo images (e.g., correcting the snare position in a drum overhead recording).
- Enables more precise and creative panning.
- Widens the sweet spot for multiple listeners in large listening spaces (e.g. live venue and cinema).

MAIN FEATURES

- **Flexible control of Time (T) and Amplitude (A) cues** for panning – Powered by our psychoacoustic model: Increase Time for a more spacious sound (and more externalised on headphones), adjust Amplitude for sharper imaging. In large venues, time-based panning also helps listeners on the far side experiences a more balanced and even mix.
- **Dual-band panning** – Apply independent T/A settings to low and high frequencies with an adjustable crossover, unlocking new levels of precision and creative flexibility in stereo imaging.
- **Shadow** – Reduces high-frequency energy on the side opposite to the pan direction, solidifying the stereo image and simulating the natural head-shadow effect in headphone listening.
- **Multichannel routing** – On multichannel tracks, the stereo output can be routed to any pair of loudspeakers (Immersive-ready!).

2 ACTIVATION

DUOPAN is activated via iLok. Once you have checked out DUOPAN on our website, you will receive an email including the licence code and software download link. To activate DUOPAN, you need to redeem the code on the iLok License Manager software, which you can download from https://www.ilok.com/#!license-manager. There are two activation methods available: iLok dongle (gen 2 or 3) and computer. If you activate it on an iLok dongle, you can connect it to and use DUOPAN on any computer that the software has been installed on. If the licenses is activated directly on your computer, you can use DUOPAN only on that machine.

Executing the installer file (.pkg for Mac OS and .exe for Windows) will automatically install Virtuoso in the default plugin folder:

- Mac OS - VST3 and AU: Macintosh HD/Library/Audio/Plug-Ins
- Mac OS - AAX: Macintosh HD/Library/Application Support/Avid/Audio
- Windows: C:\Program Files\Common Files\VST3

3 OVERVIEW

This section overviews the main features of DUOPAN. A tutorial/demo video is also available at https://youtu.be/vrPWPb8JDhs

3.1 Stereo Image Shaping with T/A Ratio Control

Unlike conventional panners that rely only on amplitude differences, DUOPAN lets you pan using both time (T) and amplitude (A) cues based on our advanced psychoacoustic model for stereo imaging. You can go 100% time, 100% amplitude, or anywhere in between for a given image position. More time yields a more spacious image, while more amplitude gives sharper imaging. Think of it as choosing between XY (amplitude-based), AB (time-based), or ORTF (combined) stereo mic techniques—now available at the turn of a knob.

3.2 Dual-Band T/A Panning

The Dual-Band feature unlocks new creative possibilities for panning while giving you precise control over the phantom image. It lets you apply the T/A ratio differently to low and high bands, with an adjustable crossover frequency. For instance, you might use more Amplitude on higher frequencies for a sharper image, while applying more Time to lower frequencies for a more spacious feel — or vice versa. The Pan Sync button synchronises the pan positions of the low and high bands

3.3 Binaural-like Imaging on Headphones

One powerful application of DUOPAN is making hard left/right panning sound far more natural on headphones. Conventional extreme panning often feels like the sound is stuck inside the ear canal due to the lack of natural time-delay cues. By introducing a controlled amount of Time delay along with an Amplitude difference, DUOPAN moves the sound slightly outside the head, creating a natural sense of width, similar to listening to a real sound source. For creative use, you can even automate the T/A ratio to make sounds move seamlessly from inside the head to a spacious, outside-the-head placement. or vice versa.

3.4 Head-shadow Effect Simulation

The **Shadow** knob reduces high-frequency energy on the side opposite to the pan direction, mimicking the natural head-shadow effect that occurs in real acoustic listening. This makes the stereo image more solid, stable, and realistic, especially on headphones. It can also enhance localisation cues and give the mix more depth and presence.

3.5 Multichannel Routing

DUOPAN allows you to route its stereo output to any pair of loudspeakers within an available multichannel setup in your DAW. When inserted on a multichannel track, it provides available output

channel options in the dropdown menu for each output. This feature makes it compatible with surround and immersive setups including Dolby Atmos, giving you full control over where your stereo image is placed in the listening environment.

4 CONTACT

If you have any questions regarding Virtuoso, please send us a message to support@apl-hud.com

To report bugs, please use this form: https://forms.gle/L1pySQLAdfuS4CFX7

Visit our website: www.apl-hud.com

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