POWERHOUSE

WAVETABLE + GRAIN SYNTH BY LESSONS IN LIVE

USER MANUAL

Four wavetable oscillators that sweep through their tables or turn into a cloud of grains, one powerful filter for all of them with Ladder, Acid and Vintage characters, modulation you drag straight onto any knob, an arpeggiator, a step sequencer with a chord on every step, nine effects with an XY pad, MPE, and 160 presets to start from.



WHAT'S NEW IN 1.0.1

- **Audio Unit for Logic Pro and GarageBand:** the Mac installer now also installs Powerhouse as an Audio Unit (see Installing).
- **A new FX page:** the nine effects are cards in the order the sound goes through them, each with a small screen that shows what it does.
- **XY pad + ADD:** choose what X and Y move from a menu, the filter first, now also its **FAT** and **DRIVE** switches.
- **Warmer factory presets:** 95 presets reworked, deeper and wider (the filter lower with its envelope opening the sound, oscillators stacked in octaves, more space on the chords). If you had 1.0.0, Powerhouse updates the factory presets you haven't changed the first time you open it; presets you edited and saved stay as they are.

INSTALLING

First quit Ableton Live (or Logic Pro, GarageBand and any other music software), so the plug-in can be replaced cleanly.

Mac (macOS 11 or later, Apple Silicon and Intel): unzip `Powerhouse-<version>-Installer.zip`, open the `.pkg` inside and follow the steps. The installer is signed by Lessons in Live and notarized by Apple, so macOS opens it without any warning. It installs the VST3 into `/Library/Audio/Plug-Ins/VST3`, the **Audio Unit** for Logic Pro and GarageBand into `/Library/Audio/Plug-Ins/Components` (if you only use Live, you can untick it under Customize) and, if you tick it under Customize, a stand-alone app into `/Applications` (to play Powerhouse with a MIDI keyboard without a DAW).

Windows (64-bit Windows 10 or 11): unzip `Powerhouse-<version>-Windows-Installer.zip` and run the installer inside. The installer isn't signed for Windows, so Windows may say "Windows protected your PC" or that it doesn't know the publisher: click **More info**, then **Run anyway**. It installs the VST3 into `C:\Program Files\Common Files\VST3` and, if you keep it ticked, a stand-alone app.

Then, on both:

1. Open Live. If Powerhouse doesn't appear under **Plug-Ins › Lessons in Live Instruments**, open Live's Settings › Plug-Ins (Preferences in Live 11), make sure **Use VST3 Plug-In System Folders** is on, and click **Rescan**.
2. Drag **Powerhouse** onto a MIDI track. It opens with the pad **Big Bad Tide**: play some chords. On a Mac, Live can list Powerhouse twice, as a VST3 and as an Audio Unit: use the VST3, so your sets also open on Windows.
3. Powerhouse starts as a free **30-day trial** with everything working; the strip under the tabs shows the days left. After the trial it keeps working in **demo mode**, with a short silence every minute. Saved sets always open and play.
4. Activate it with a serial: click **BUY** in that strip (or the gear menu › Buy Powerhouse…) to get one on lessonsinlive.com. Then click **ENTER SERIAL** (or gear › Enter serial number…), paste the serial from your order e-mail (also under My Account on lessonsinlive.com) and click **Activate**. This needs an internet connection once; after that Powerhouse works offline and the strip disappears.

One serial works on two computers, for example your desktop and your laptop, Mac and Windows mixed. To move it to another computer, choose gear › Deactivate this computer first. Every copy of Powerhouse on one computer shares the activation, the presets and the favourites: activated in Live, it's activated in Logic too.

In Logic Pro: make a Software Instrument track, click its Instrument slot and choose **AU Instruments › Lessons in Live Instruments › Powerhouse › Stereo**. If it isn't there, open **Logic Pro › Settings › Plug-in Manager** (Preferences on macOS 12 and earlier), select Powerhouse under Lessons in Live Instruments and click **Reset & Rescan Selection** (if it isn't listed at all, quit and reopen Logic). Everything in this manual works the same in Logic; where it says Live's transport or tempo, read Logic's. The presets are in Powerhouse's own preset bar (Logic's preset menu only lists "Powerhouse").

In GarageBand: make a Software Instrument track, press **B** to open Smart Controls, click the **Inspector** button (i), then the instrument slot under **Plug-ins**, and choose **AU Instruments › Lessons in Live Instruments › Powerhouse**. If Audio Units aren't in the list, turn on **Enable Audio Units** in GarageBand › Settings › Audio/MIDI (Preferences on macOS 12 and earlier) and restart GarageBand.

Only using Live? Untick the Audio Unit when you install. If it's already installed, delete `Powerhouse.component` from `/Library/Audio/Plug-Ins/Components` and rescan in Live; but a set where you already used the Audio Unit copy needs it to open with Powerhouse.

Updates: when a new version of Powerhouse is out, a bar under the tabs says so. **DOWNLOAD** gets the installer for your computer: install it over the old version, your serial stays activated. **WHAT'S NEW** shows what changed, and **×** skips that version. Powerhouse asks lessonsinlive.com at most once a day, only while its window is open, and sends nothing about you or your computer. Gear › Check for updates now asks straight away; untick gear › Check for updates automatically to stop the daily check.

THE WINDOW

Across the top: the five pages (**SYNTH**, **ARP**, **FX**, **SEQ**, **SETTINGS**), the preset bar, **VOLUME** with its level meter (it lights red when the output clips; click the meter to reset it) and the **gear** menu. Along the bottom, on every page: the eight **MACROS**.

Drag the bottom-right corner of the window to make it any size from 60 to 125 % (SETTINGS › WINDOW SIZE has fixed steps too). Powerhouse remembers the size with the set.

Drag a knob up or down to turn it; **double-click** it to put it back to its default.

THE SYNTH PAGE

From left to right: four LFOs, four oscillators, then the filter, the amp envelope and the MODULATION section.

OSCILLATORS

Each of the four oscillators has its own on/off light and plays one of eight wavetables: **Basic** (sine, triangle, saw, square), **PWM**, **Harmonics**, **Vocal**, **Sync**, **FM**, **Reso** and **Spectral**. The display shows the table as a stack of frames; **POS** (or dragging in the display) sweeps through them, and that sweep is where wavetable sounds come alive: put an LFO or the mod envelope on POS.

- **OCT**, **SEMI**, **FINE**: pitch. **LEVEL** and **PAN**: the oscillator's place in the mix.
- **WARP** bends the waveform itself: **Bend**, **Sync** (hard sync), **Mirror**, **Pulse** (pulse width) and **FM**, by **AMOUNT**. It is oversampled, so it stays clean high up.
- **UNISON** stacks up to 7 copies, **DETUNE** spreads their pitch and **SPREAD** their stereo position: from a thick mono line to a wall of supersaws.
- **TO FILTER**: on, the oscillator goes through the filter; off, it bypasses it (handy for a clean sub under a filtered sound).

- **WT / GRAIN**: in **GRAIN** mode the oscillator plays the table as a cloud of short grains instead. **SIZE** is each grain's length, **DENSITY** how many start per second, **SPRAY** how far around POS they wander, **RANDOM** how much their pitch varies. Low density with long grains gives soft, breathing textures; high density with short grains a shimmering haze.

FILTER

One filter for all oscillators that are sent to it (the **OSC 1 2 3 4** buttons show and switch which ones go through it).

- **Types:** High Cut 12 and 24 dB, Low Cut 12 and 24 dB, Band Pass, Notch, Peak, and two combs (**Comb +** and **Comb –**: metallic, tuned resonances; with **KEY** at 100 % they follow the notes you play).
- **Character** (the menu next to the type): **Clean**, **Ladder** (Moog-style, round and fat), **Acid** (303-style: squelchy, it self-oscillates at high resonance and keeps the bass) and **Vintage** (a warm state-variable filter whose resonance sings rather than whistles). The characters shape the cuts and the band pass.
- **CUTOFF**, **RES**: frequency and resonance. **KEY**: how much the cutoff follows the keyboard. **VEL**: softer notes play darker. **ENV**: how far the filter envelope moves the cutoff (in semitones, up or down).
- **FAT** thickens the sound with gentle saturation before the filter; **DRIVE** (with its knob) pushes it harder. Both are oversampled.
- **FILTER ENVELOPE**: A, D, S, R for the cutoff.

AMP ENVELOPE

A, **D**, **S**, **R** shape every note's level; **VEL** sets how much velocity changes the loudness.

LFOS

Four LFOs in the column on the left. **SHAPE**: Sine, Triangle, Saw Up, Saw Down, Square, Random and Smooth Random. **SYNC** locks the **RATE** to Live's tempo (8 bars down to 1/32, with triplets); off, it runs free, from 0.05 to 20 Hz. **PHASE** sets where the wave starts, **SMOOTH** rounds off its edges (a smooth square, a gliding random). The display shows where each LFO is.

MODULATION

- **MOD ENVELOPE**: a second envelope (A, D, S, R) for anything you like: a pluck on POS, a sweep on WARP.
- **PLAYING**: how you play, as modulation sources: **VELOCITY**, **KEY** (which note), **RANDOM** (a new value every note), **WHEEL** (the mod wheel), **AFTERTOUCH**, and for MPE controllers **PRESSURE** and **SLIDE**.

MODULATION: DRAG AND DROP

Every LFO, the mod envelope, every PLAYING source, every macro and the XY pad's X and Y have a **DRAG** handle. Drag it onto any knob to connect them: a coloured ring appears around the knob, with a dot that shows the modulation moving.

- **Depth:** drag up or down on the coloured ring to set how far the source moves the knob, to either side, as in Serum (hold **Shift** for finer steps). Macros start at the full way from the knob's position to its end.
- **Right-click a knob** for its sources: change a depth or remove one, or connect a new source without dragging (**Modulate with** an LFO, a macro, the mod envelope, a PLAYING source, or **Put on the XY pad**).
- The **TARGETS** button on an LFO or the mod envelope (it shows how many there are) lists everything it moves, with depth and remove.

- Several sources can move the same knob; they add up and stay within the knob's range. Up to 48 connections per sound.

MACROS

The eight macros along the bottom move whatever you drag them onto, all at once: one knob for "brighter", "wider" or "dirtier". **Double-click** a macro's name to rename it; **right-click** it for its targets. Live can automate and MIDI-map them like any parameter. Most factory presets name and wire their first four macros (TONE, MOTION, SPACE, DIRT and so on): turn them first.

THE ARP PAGE

An arpeggiator: hold a chord and it plays the notes one after the other. Switch it on with the light next to **ARPEGGIATOR**. It runs with Live's transport, or from the first key when Live is stopped.

- **MODE**: Up, Down, Up Down, Down Up, Up & Down, As Played, Random, Chord. **OCTAVES**: 1 to 4. **RATE**: 1/32 to 1 bar, with triplets and dotted. **GATE**: note length. **SWING**. **STEPS**: the pattern's length. **LATCH**: the arp keeps going after you let go.
- The pattern, per step: its **type** (click a step: **NOTE** plays the next note, **REST** is silent, **TIE** holds the previous one, **CHORD** plays the whole chord), its **VELOCITY**, **OCTAVE** and **LENGTH**. Drag a bar to set it, or scroll over a step to change it.
- The dice (**TYPES**, **VELOCITY**, **OCTAVE**, **LENGTH**, **ALL**) roll a new pattern for that lane.

THE FX PAGE

Nine effects in a chain, laid out as a 3 × 3 grid of cards, then the XY pad on the right. The sound goes through them in the order of their numbers, **1 to 9** (left to right, top to bottom; the small arrows show the way). Each card has its on/off light, its menus in the header (STUTTER's two sit next to its knobs) and its knobs along the bottom; an effect that's off is dimmed, and you can still set it up before you switch it on.

Every card has a small screen that shows what the effect does with its current settings: CRUSH the stepped wave, DRIVE its curve, CHORUS the left and right sweeps, DELAY the echoes in time (left up, right down: PING PONG bounces them), REVERB the length of the tail (in seconds), STUTTER the repeated slices, FLANGER the comb it puts on the sound, REVERSE the backwards swells and GRAIN the cloud of grains (SPRAY scatters them, PITCH moves them up or down).

Effect	Knobs
CRUSH	BITS and sample RATE: from gentle grit to lo-fi crunch
DRIVE	TYPE (Soft, Hard, Fold, Tube), AMOUNT, TONE
CHORUS	RATE, DEPTH
DELAY	TIME (1/32 to a bar, in time with Live), FEEDBACK, PING PONG (repeats bouncing left and right), TONE
REVERB	TYPE (**Room**, **Hall**, **Plate**: three different spaces, lush and smooth), SIZE (also the decay time), DAMPING
STUTTER	LENGTH (the slice), REPEAT (how long it repeats it), DECAY, PITCH
FLANGER	RATE, DEPTH, FEEDBACK
REVERSE	LENGTH: plays what just happened backwards
GRAIN	MODE (Forward, Reverse, Both, Freeze), SIZE, DENSITY, PITCH, SPRAY, FEEDBACK: granular clouds of the whole sound

Every effect has a **MIX**.

XY PAD

Click **+ ADD** on the **X LEFT – RIGHT** or **Y DOWN – UP** list to choose what that axis moves: the **filter** (cutoff, resonance, drive, key, envelope, and the **FAT** and **DRIVE** switches, which turn on past the middle), the oscillators, the envelopes, any effect, the arp, the sequencer and more. A ticked item is already on that axis; choose it again to take it off. You can also drag a knob's **name** onto the pad (choose X or Y) or onto a list, or right-click any knob on any page › Put on the XY pad. Then move the dot: one gesture plays many knobs at once, each with its own depth fader (–100 to +100 %) in the list. X and Y also have DRAG handles, so you can drag them onto knobs like any modulation source, and Live can automate them.

THE SEQ PAGE

A 16-step sequencer with a chord on every step. Switch it on with the light next to **SEQUENCER**. It runs with Live's transport; when Live is stopped, it runs while you hold a key. The keys you hold don't sound themselves: they **transpose** the sequence (the lowest key, relative to C3).

- **RATE**, **STEPS** (length), **DIRECTION** (Forward, Backward, Ping Pong, Random), **SWING**, **KEY** and **SCALE** (Chromatic, Major, Minor, Dorian, Mixolydian, Major and Minor Pentatonic, Blues), **OCTAVE**.
- Per step: **STEP** on or off, **NOTE** (a degree of the scale: drag the bar or scroll over it), **CHORD** (a knob with 35 chord types, from Note, Octave and Power to Min 9, Dom 13 and 6/9), **VELOCITY** and **GATE** (length).
- The dice (**STEPS**, **NOTES**, **VELOCITY**, **GATE**, **ALL**) roll new values for that lane in your key and scale. They never change your chords.

While the sequencer is on, it has the keys and the arpeggiator waits.

THE SETTINGS PAGE

- **VOICES**: **POLY** plays chords on up to **VOICES** notes (1 to 16; fewer saves CPU). **MONO** plays one note and every key restarts the envelopes; **LEGATO** plays one note and a key pressed while another is held only changes the pitch, for smooth bass lines and leads.
- **GLIDE / PORTAMENTO**: **TIME** is how long a note slides to the next. **ALWAYS** slides between every note; **LEGATO** (fingered portamento) only slides when you play a key while another is still held.
- **PITCH / MPE**: **BEND RANGE** (the pitch wheel's reach, in semitones), **TUNE**, **TRANSPOSE**, and **MPE**.
- **PLUG-IN**: window size, the website, and **PANIC**, which stops every sounding note at once.

MPE

Switch **MPE** on in SETTINGS, and in Live right-click the device › Enable MPE Mode. Then every note bends by itself (over **MPE BEND**; 48 semitones suits most controllers) and each note's **PRESSURE** and **SLIDE** become modulation sources you drag onto any oscillator, filter or amp knob. Play it from a Push 3, a Seaboard, a LinnStrument or any MPE controller. 80 of the factory presets already respond: pressure opens the filter, slide moves the wavetable. With a normal keyboard, aftertouch drives PRESSURE.

PRESETS

Click the preset name for the menu: **Init**, your ★ **FAVORITES**, then the categories **Bass**, **Leads**, **Chords**, **Pads**, **Arps**, **Sequences**, **Textures** and **Effects** (160 factory presets, 20 each). ‹ › step through them all, and a preset changes without a click even while you hold a chord.

- **Favourites:** click the star in the name box to add the loaded preset to FAVORITES at the top of the menu (click again to remove it).
- **SAVE** asks for a name and a category and saves the sound, its modulation and its macro names. Your presets live in `~/Library/Lessons In Live/Powerhouse/Presets/` on a Mac (`%APPDATA%\Lessons In Live\Powerhouse\Presets` on Windows), one folder per category; gear › Show preset folder opens it.
- Gear › Restore missing factory presets puts back any factory preset you deleted.
- The **Arps** and **Sequences** presets play the arpeggiator or the sequencer: hold a chord or a key (or start Live's transport for the sequences).

TIPS

- **Where to start:** load a preset in the category you need and turn its macros first, then the filter and the POS knobs.
- **Make a pad evolve:** an LFO with a slow SYNC rate (4 or 8 bars) on POS, a second one with Smooth Random on CUTOFF, a little GRAIN on a second oscillator, REVERB Hall at a big SIZE.
- **Acid line:** one saw (Basic, POS around 67 %), filter High Cut 24 with the **Acid** character, RES around 70 %, ENV up, a short filter decay, LEGATO with a little glide; play it from the SEQ page.
- **CPU:** dense GRAIN oscillators with 16 voices are the heaviest thing in Powerhouse. Lower **VOICES** in SETTINGS for big pads, or freeze the track in Live.

IF LIVE WON'T START ON WINDOWS

If Live suddenly won't open, or says **libusb-1.0.dll was not found**, Microsoft Defender has most likely taken that file out of Live's Program folder. libusb-1.0.dll belongs to Ableton Live (Live uses it for USB controllers such as Push), and Defender sometimes mistakes it for a threat; Powerhouse only installs its own files. To get Live back:

1. Open **Windows Security › Virus & threat protection › Protection history** and click the entry for libusb-1.0.dll.
2. If it says Quarantined, choose **Actions › Restore**. If it says Removed, choose **Allow** and reinstall Live from your Ableton account (your sets, Packs and User Library stay where they are).
3. Start Live again.

Don't download libusb-1.0.dll from a "DLL download" website: the file from Live's own installer is the right one.