



# AMPZ

Neural Amp Modeler for iOS

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## User Manual

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LNH Enterprises LLC

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# Quick Reference Card

The Ampz main screen is organized into four horizontal rows. Here is a map of every control:

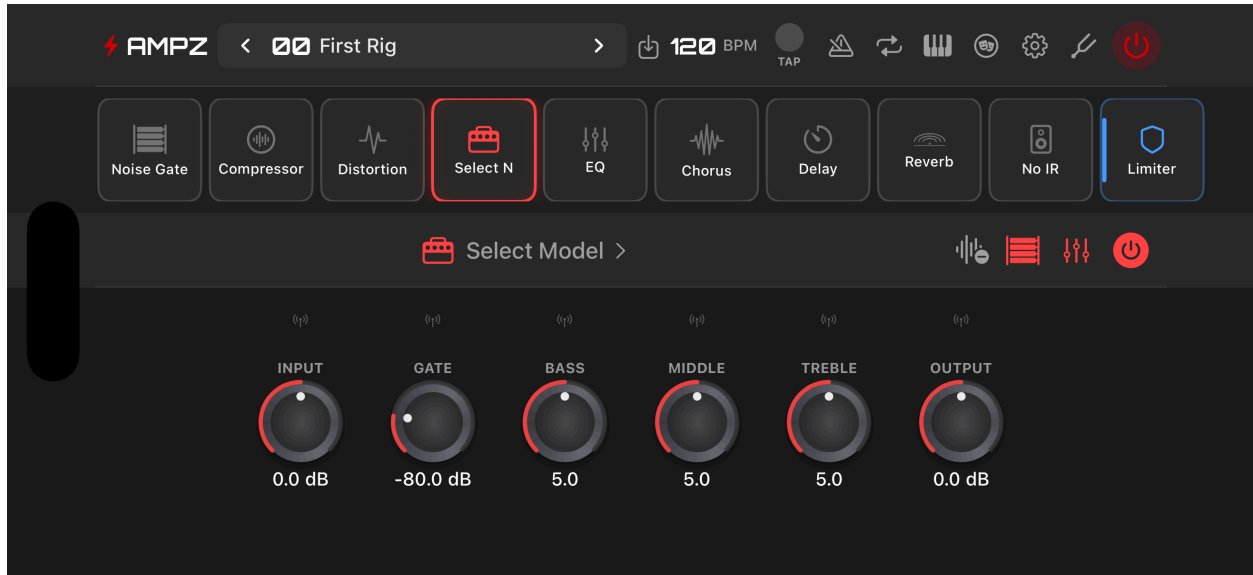





Figure 1: Ampz Main View

## Top Toolbar (Row 1) — Navigation and utilities

#	Control	Function
1		App logo / home indicator
2		Navigate presets (previous / next)
3	Preset number + name	Tap to open Preset Browser
4		Save current settings to a preset slot
5		Shows current tempo; tap green LED to set BPM
6		Toggle Drum Machine overlay
7		Toggle Looper overlay
8		Toggle MIDI Settings overlay
9		Toggle Live Performance mode

#	Control	Function
10		Toggle Settings overlay
11		Toggle Tuner overlay
12		Global bypass — disables all processing

**Effects Chain Strip (Row 2)** — 10 drag-to-reorder slots

Each slot is color-coded by effect category. Tap to select, double-tap to open the Effect Browser. Drag to reorder.

**Algorithm Bar (Row 3)** — Shows the selected algorithm for the active effect

**Parameter Area (Row 4)** — Knobs, sliders, and toggles for the active effect

# 1 Getting Started

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## 1.1 What is Ampz?

Ampz is a professional-grade guitar amp modeling app for iOS, powered by Neural Amp Modeling (NAM) technology. NAM uses deep neural networks (WaveNet and LSTM architectures) trained on real amplifier recordings to faithfully reproduce the sonic characteristics of physical guitar amplifiers — at a fraction of the cost and weight.

Ampz is designed for ultra-low latency performance. Using Apple's RemotIO Audio Unit with 64-sample buffers at 48 kHz, Ampz achieves buffer latency as low as 1.33 ms — making it feel as responsive as a real amplifier.

### Key Features:

- Real-time neural amp modeling with WaveNet/LSTM inference
- 10-slot effects chain with 17 effect types
- 100-slot preset system (factory + user presets)
- Dual-loop looper with circular waveform display
- Built-in drum machine with 6 pattern categories
- Chromatic tuner with adjustable reference pitch
- MIDI control with CC mapping and MIDI Learn
- Live performance mode with stomp-box grid
- Tone3000 integration for downloading community amp models

## 1.2 System Requirements

Requirement	Details
iOS Version	18.0 or later
Device	iPhone (optimized for iPhone 16 Pro)
Audio Interface	USB or Lightning compatible audio interface
Storage	50 MB for app + NAM models

**TIP:** A USB or Lightning audio interface with an instrument-level input is required for the best latency and signal quality.

## 1.3 First Launch & Audio Permissions

When you first open Ampz, iOS will request audio input access. **You must grant this permission** — Ampz needs audio input to process your guitar signal.

1. Tap **“Allow”** when the audio input permission dialog appears

2. Ampz will automatically configure the audio session for low-latency processing
3. The green LED in the toolbar pulses to confirm audio is running

## 1.4 Connecting Your Guitar

1. Connect your audio interface to your iPhone via USB or Lightning adapter
2. Plug your guitar into the interface's instrument input
3. Open Settings (gear icon) to select the correct input channel
4. Adjust the input gain on your interface — aim for a strong signal without clipping

**NOTE:** Ampz supports multi-channel USB and Thunderbolt audio interfaces. Use the Settings overlay to select which input and output channels to use.

## 1.5 Quick Start — Playing in 60 Seconds

1. Connect your guitar via a USB audio interface
2. Open Ampz — the NAM Amplifier slot is ready in the effects chain
3. Download a NAM model: tap the NAM slot, switch to the **Tone3000** tab, sign in, and download any amp model — or import a .nam file from your device via the **My Models** tab
4. Play a few notes — you should hear the amp model through your guitar signal
5. Add effects by double-tapping empty slots in the effects chain
6. Use the preset chevrons (◀ ▶) to browse presets, or tap the preset name to open the Preset Browser
7. Tap the bypass button (⏻) to toggle global bypass

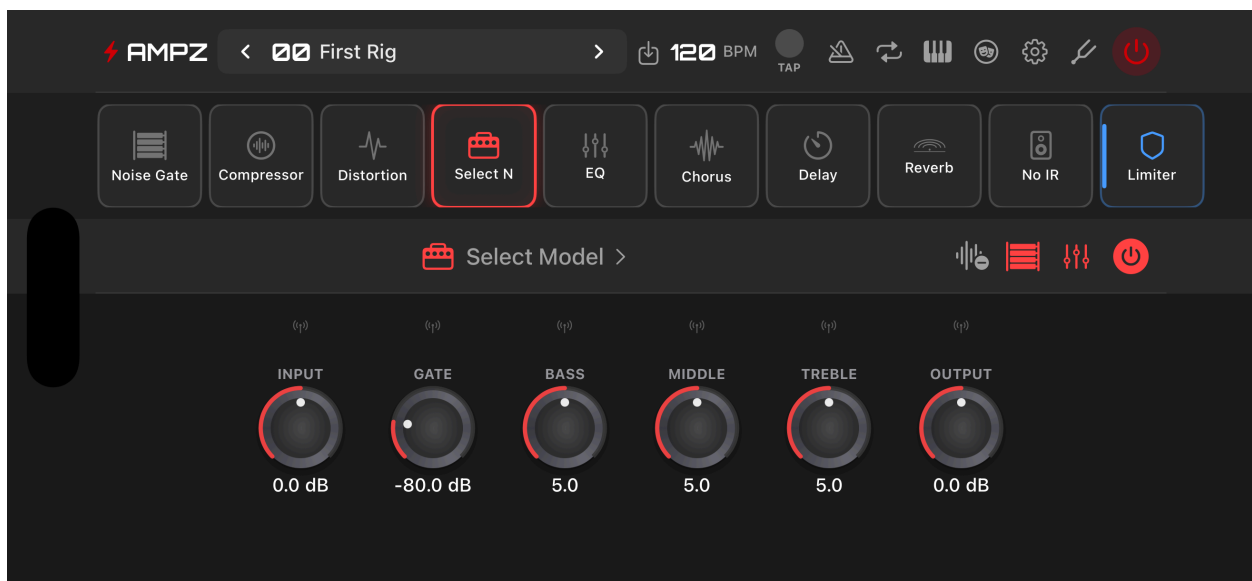


Figure 2: The Ampz main screen with all controls visible

## 2 The Main Screen

The Ampz interface is a single-screen design organized into four horizontal rows, optimized for quick access during performance.

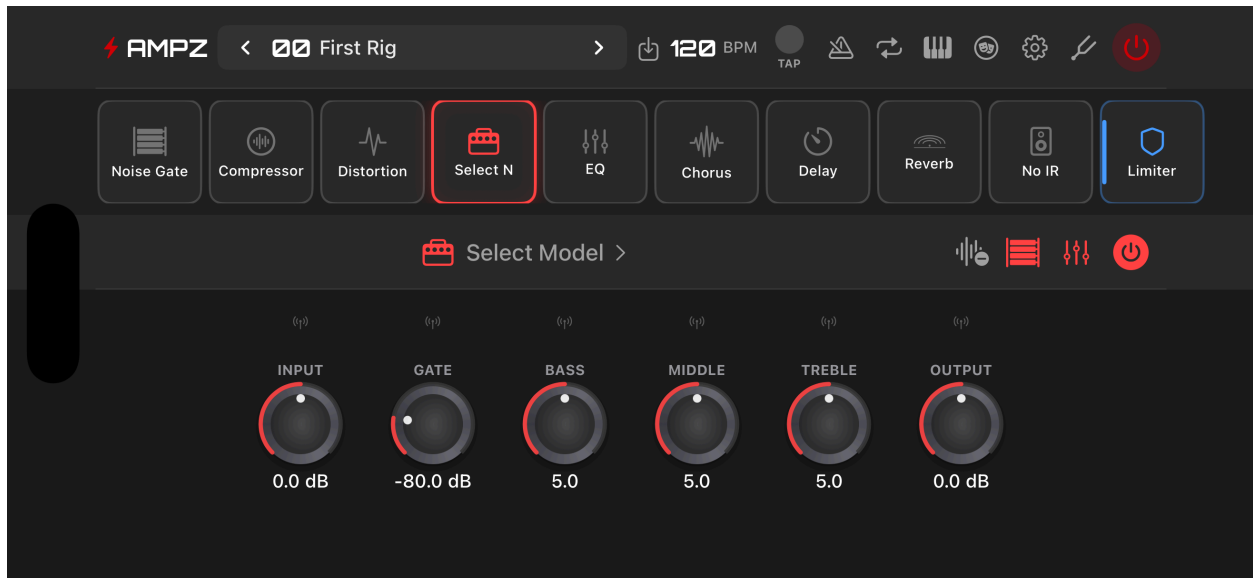


Figure 3: Main screen — four horizontal rows

### 2.1 Row 1: Top Toolbar

The top toolbar contains all navigation and utility controls in a compact 58-pixel strip.

#### 2.1.1 Logo & Preset Controls








- **Logo** (AMPZ) — App identity marker, always visible at the left edge.
- **Preset Navigation** — Chevron left (◀) and chevron right (▶) step through the 100 preset slots sequentially.
- **Preset Display** — Shows the current preset number (two digits, e.g., “00”) and name. Tap the display area to open the full Preset Browser.
- **Save** (📁) — Opens the Save Preset dialog to store the current effects chain state to any user slot.

#### 2.1.2 BPM & Tap Tempo

- **BPM Display** — Shows the current global tempo as a number (e.g., “120 BPM”).
- **Tap Tempo LED** — A pulsing green circle that flashes in time with the current BPM. Tap it repeatedly to set the tempo by tapping.

The global tempo drives tempo-synced effects (delay, tremolo, chorus), the drum machine, and the looper’s quantize feature.

### 2.1.3 Utility Buttons

Icon	Name	Function
	Drum Machine	Opens/closes the Drum Machine overlay
	Looper	Opens/closes the Looper overlay
	MIDI	Opens/closes the MIDI Settings overlay
	Live Mode	Enters/exits Live Performance mode
	Settings	Opens/closes the Settings overlay
	Tuner	Opens/closes the Tuner overlay
	Bypass	Toggles global bypass (all processing off/on)

When a utility button is active (its overlay is open), the icon highlights in the app’s accent color (red). Only one overlay can be open at a time — tapping a different utility button closes the current overlay and opens the new one.

## 2.2 Row 2: Effects Chain Strip

The effects chain strip displays all 10 effect slots as a horizontal row of colored cells. Each slot shows:

- **Effect icon** — The SF Symbol for the effect type
- **Short name** — Abbreviated effect name (e.g., “RVB”, “DLY”, “CMP”)
- **Category color** — A distinctive background tint identifying the effect category

### 2.2.1 Effect Category Colors

Category	Color	Effect Types
Dynamics	Blue	Noise Gate, Compressor, Limiter
Distortion/Overdrive	Orange	Screamer, Klear, Mouse, Fuzz 32, Turbo
Amplifier	Red	NAM Amp
Modulation	Purple	Chorus, Flanger, Phaser, Tremolo, Vibrato
Pitch Shift	Green	Poly Shifter
Wah/Synth	Cyan	Auto Wah, LFO Wah

Category	Color	Effect Types
EQ/Filters	Yellow	7-Band EQ, High Pass, Low Pass
Reverb	Teal	Room, Hall, Plate, Spring, Z-Verb
Delay	Mint	Digital, Tape Echo, BBD
Cabinet/IR	Brown	IR Loader

## 2.2.2 Slot Interactions

- **Tap** a slot to select it and view its parameters in Row 4
- **Double-tap** an empty slot to open the Effect Browser and add a new effect
- **Long-press and drag** to reorder effects in the chain
- A bypassed effect shows a dimmed icon

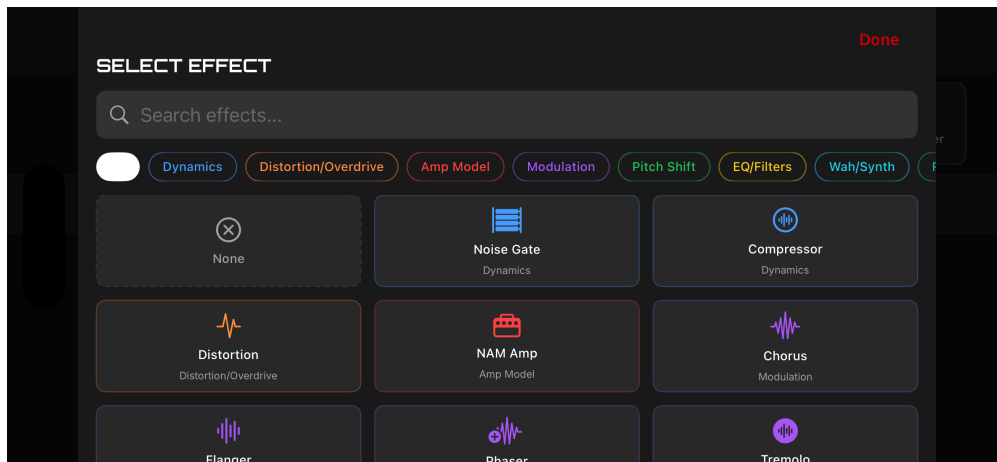


Figure 4: Effect Browser — double-tap a slot to add an effect

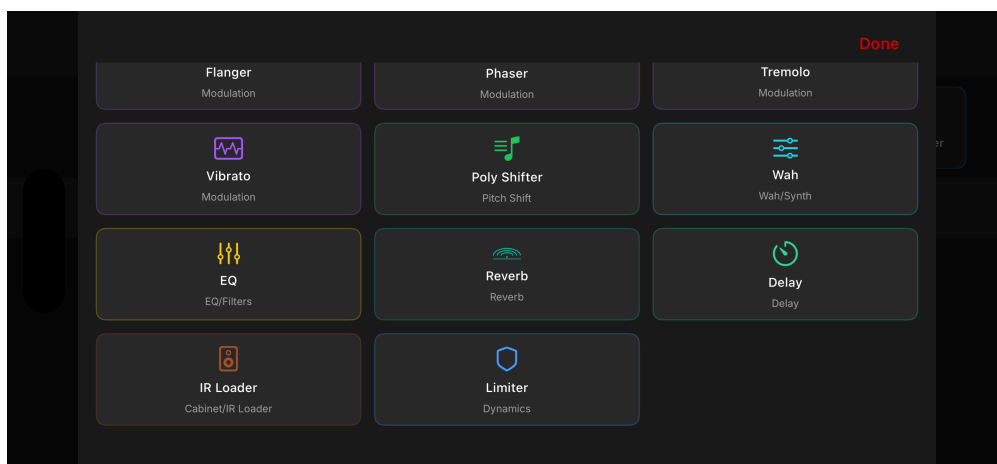


Figure 5: Effect Browser — browsing effect categories

## 2.3 Row 3: Algorithm Bar

When an effect that supports multiple algorithms is selected, the algorithm bar appears between the chain strip and parameter area. It shows the currently selected algorithm name (e.g., “Plate” for reverb, “Screamer” for distortion). Tap it to open the Algorithm Picker overlay, which lists all available algorithms with descriptions.

## 2.4 Row 4: Parameter Area

The parameter area fills the remaining screen space and displays controls for the currently selected effect:

- **Knob grid** — Rotary knobs for continuous parameters (drive, mix, decay, etc.)
- **Toggle switches** — For boolean parameters (e.g., tempo sync on/off)
- **Slider controls** — For parameters that benefit from linear input
- **Subdivision picker** — For tempo-synced effects, lets you choose note divisions

Each knob displays its parameter name, current value, and unit. **Double-tap** any knob or slider to instantly reset it to its midpoint value — useful for quickly returning a parameter to a neutral starting point.

## 3 NAM Amplifier

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### 3.1 What is Neural Amp Modeling?

Neural Amp Modeling (NAM) uses deep neural networks to capture the sonic behavior of real guitar amplifiers. During a training process, a reference amplifier is measured at thousands of signal levels and frequencies. The resulting neural network (using WaveNet or LSTM architectures) can then reproduce the amplifier's response in real time.

Ampz runs the NAM inference engine in C++ using the NeuralAudio library with Eigen linear algebra and Apple's Accelerate framework for SIMD optimization. The result is authentic amplifier tone with latency under 2.5 ms.

### 3.2 Getting NAM Models

Ampz does not ship with bundled NAM models — you bring your own. There are two ways to get models:

- **Tone3000** — Browse and download thousands of community-created NAM models directly in-app. Sign in with a free Tone3000 account, search by amp name, brand, or genre, and download with one tap.
- **Import from device** — If you already have .nam files (from ToneHunt, NAM community forums, or your own captures), import them via the iOS Files share sheet or “Open In” menu.

**TIP:** New to NAM? Start with the Tone3000 tab — search for amp styles like “clean twin”, “high-gain crunch”, or “classic British” to find community models that match your playing style.

### 3.3 Model Browser

Tap the NAM Amplifier slot to view its controls. The model browser provides two tabs:

- **My Models** — Lists all .nam files stored locally on your device. Import models by sharing .nam files to Ampz from the Files app or other sources.
- **Tone3000** — Browse and download community-created NAM models from the Tone3000 online platform. Requires authentication (free account).

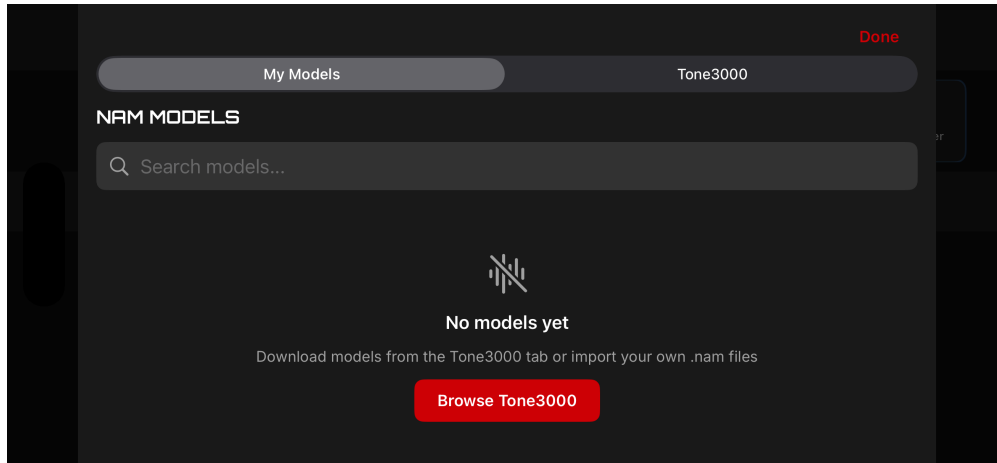


Figure 6: Model Browser — empty model list before importing

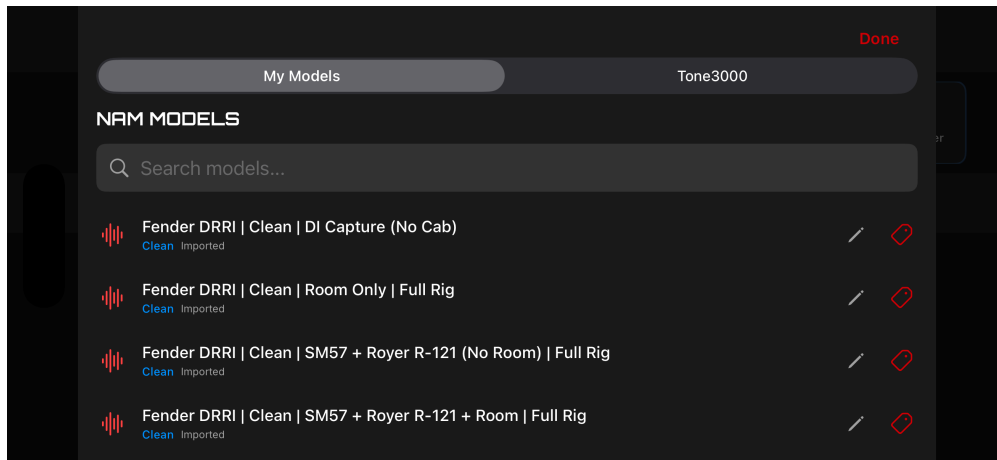


Figure 7: Model Browser — My Models tab with imported models

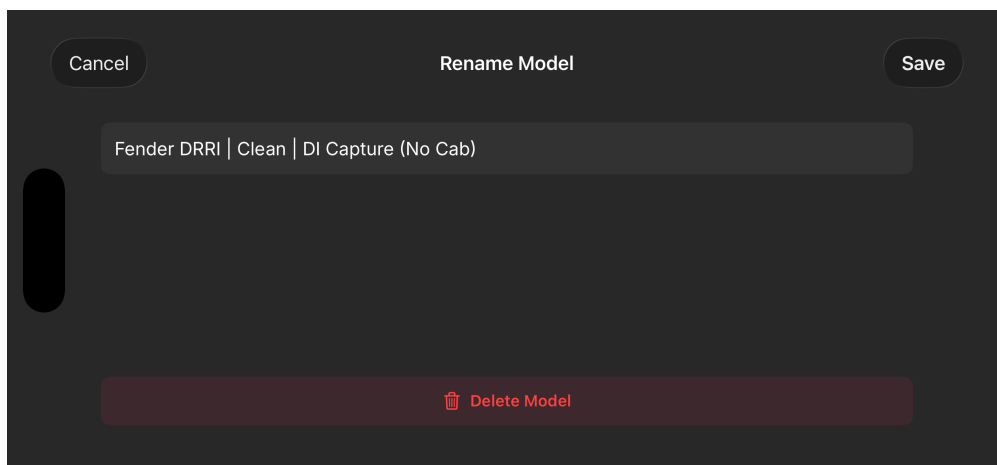


Figure 8: Renaming a NAM model

### 3.3.1 Tagging & Filtering Models

Organize your models with custom tags for quick filtering:

1. Tap the **tag icon** next to any model in the list
2. In the tag sheet, type a tag name (e.g., “crunch”, “recording”, “live”) and tap **Add**
3. Remove tags by tapping the × on any tag chip
4. Tap **Done** to save

When models have tags assigned, a row of filter chips appears below the search bar. Tap a tag chip to show only models with that tag. Tap **All** to clear the filter. Tags also work with search — typing a tag name in the search field will match models with that tag even if the model name doesn’t contain the search term.

**TIP:** Use tags to organize models by use case (e.g., “live”, “studio”), genre (e.g., “blues”, “metal”), or amp type (e.g., “Fender”, “Marshall”) for quick recall during sessions.

### 3.3.2 Deleting Models

To delete a single model, tap the pencil icon next to it, then tap **Delete Model** at the bottom of the rename sheet and confirm.

To delete multiple models at once, use multi-select mode:

1. Tap **Select** in the top-right corner of the My Models tab
2. Tap each model you want to remove — selected models show a filled red checkbox
3. Bundled (factory) models cannot be selected
4. Use **Select All** at the bottom-left to select every imported model
5. Tap the red **Delete (N)** button at the bottom-right
6. Confirm the deletion in the alert dialog

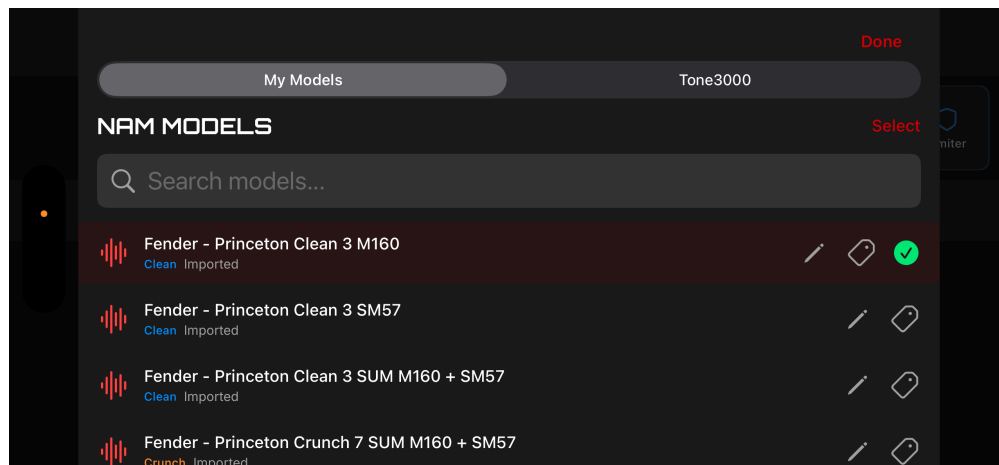


Figure 9: Multi-select mode — tap Select to enter, then choose models to delete

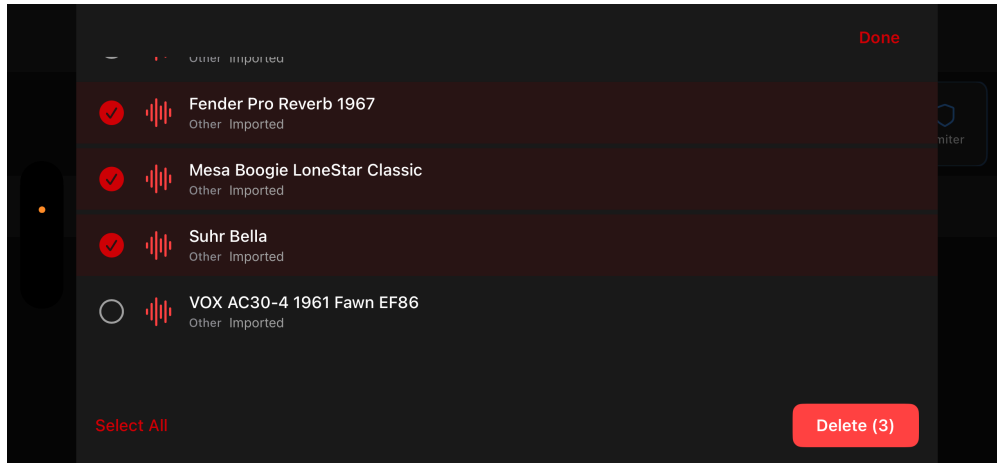


Figure 10: Selected models highlighted with red checkboxes and Delete button visible

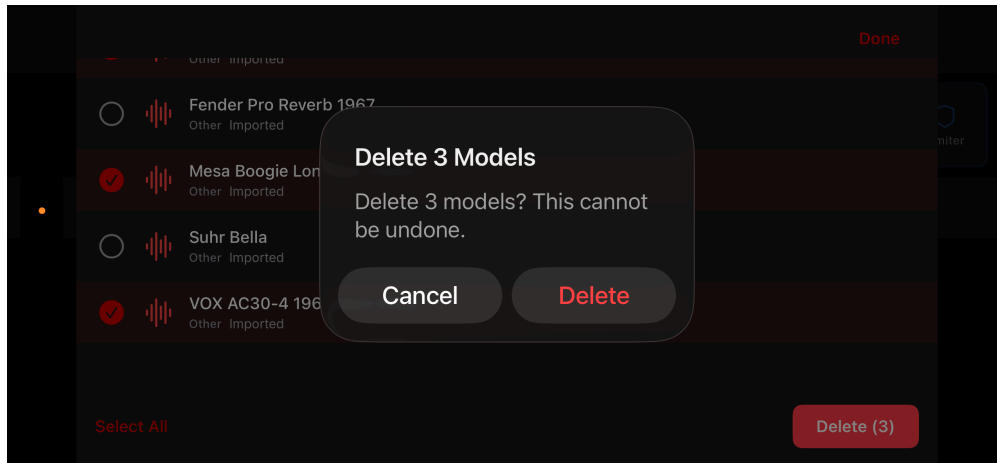


Figure 11: Confirmation alert before batch deletion

**NOTE:** If the currently loaded NAM model is among the selected models, Ampz will automatically unload it from the audio engine before deleting.

### 3.3.3 Importing .nam Files

1. Open the Files app or a file-sharing service
2. Locate the .nam file
3. Tap Share → Ampz, or use “Open In” → Ampz
4. The model appears in “My Models” and can be loaded immediately

### 3.3.4 Tone3000 Integration

Tone3000 is a community platform for sharing NAM models. From the Tone3000 tab:

1. Sign in with your Tone3000 account
2. Search for amp models by name, brand, or genre
3. Tap a model to preview details

#### 4. Download directly into Ampz

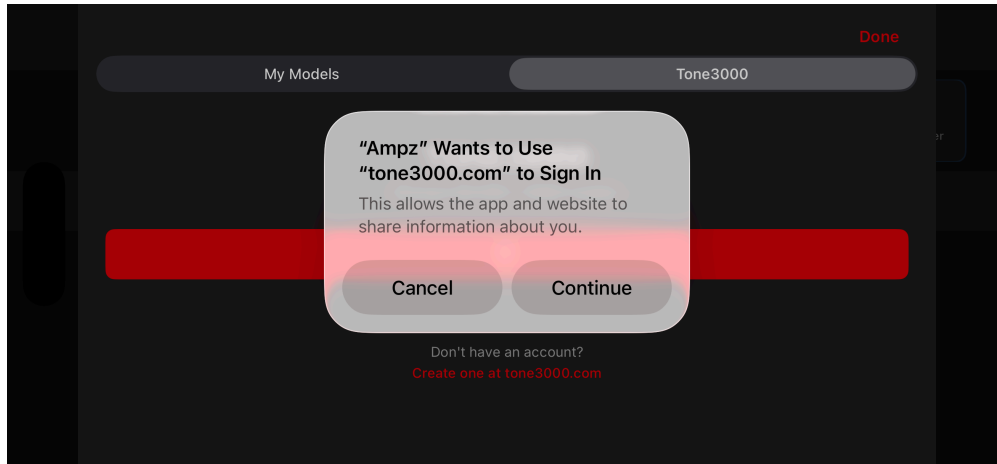


Figure 12: Tone3000 – initial redirect to sign in

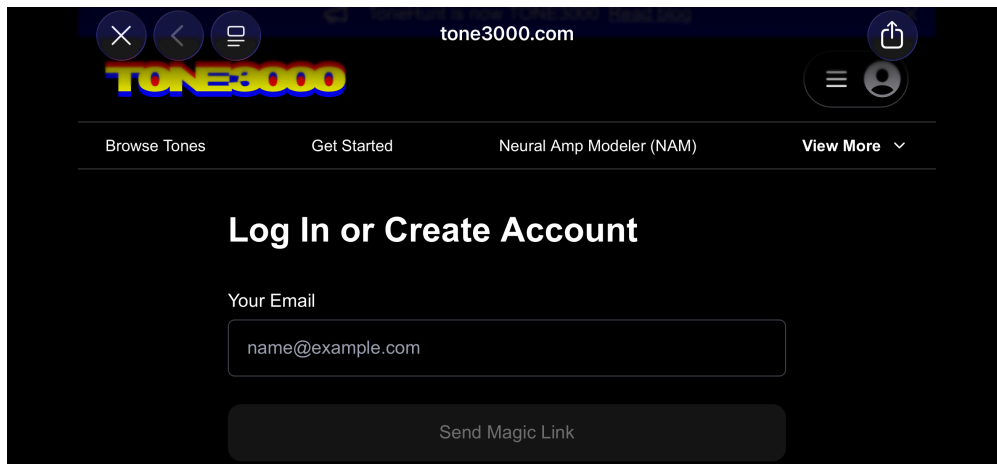


Figure 13: Tone3000 – website authorization

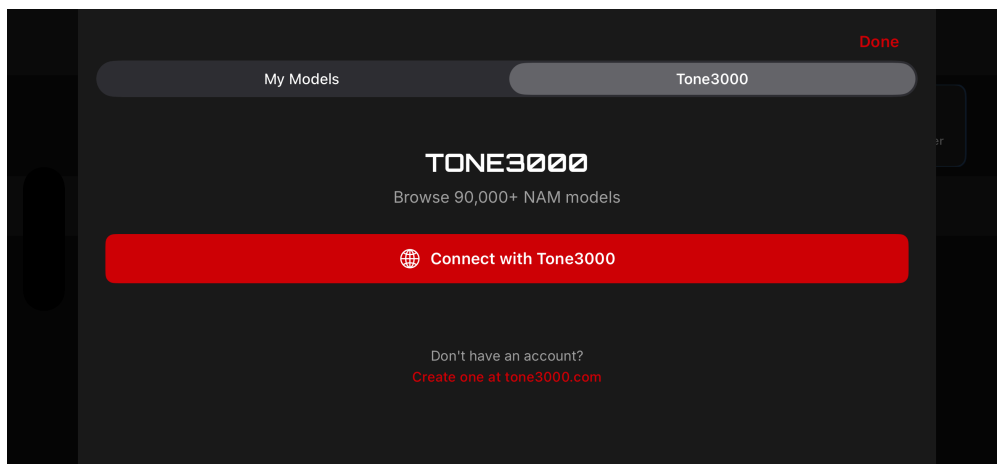


Figure 14: Tone3000 – login screen

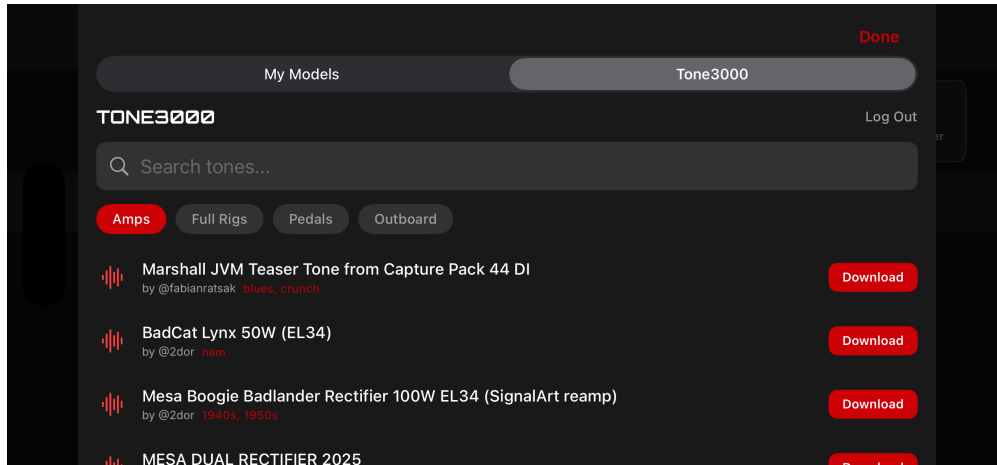


Figure 15: Tone3000 — browsing available NAM models

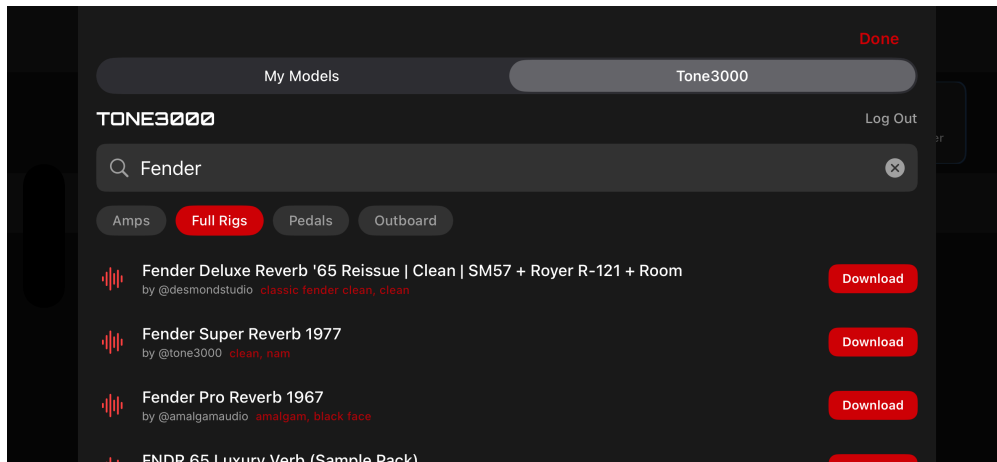


Figure 16: Tone3000 — searching for models in-app

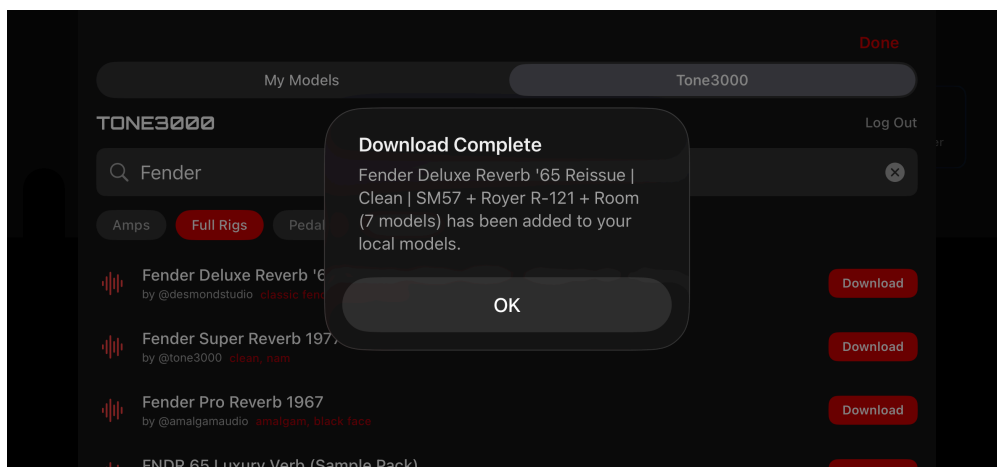


Figure 17: Tone3000 — download confirmation

### 3.4 NAM Controls

When a NAM model is loaded, the parameter area shows six rotary knobs and the algorithm bar provides four toggle icons.

#### Knobs:

Knob	Range	Description
INPUT	0–100%	Input level into the NAM model
GATE	0–100%	Input noise gate threshold — reduces hum and noise before the NAM model
BASS	±12 dB	Low-frequency EQ applied after NAM processing
MIDDLE	±12 dB	Mid-frequency EQ applied after NAM processing
TREBLE	±12 dB	High-frequency EQ applied after NAM processing
OUTPUT	0–100%	Output level after all NAM processing

#### Algorithm Bar Toggles:

Toggle	Default	Description
Normalize	On	Normalizes model output level to prevent volume jumps between models
Gate	On	Enables/disables the input noise gate
EQ	On	Enables/disables the 3-band EQ (Bass, Middle, Treble)
Bypass	Off	Bypasses the entire NAM amplifier slot

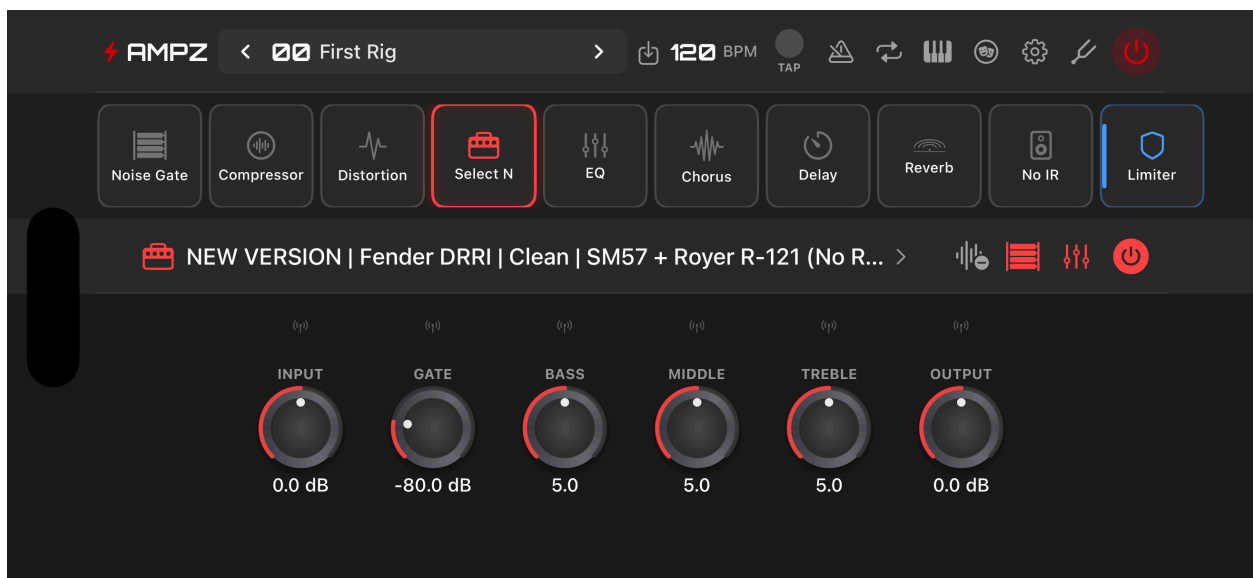


Figure 18: NAM Amplifier — knobs and algorithm bar toggles

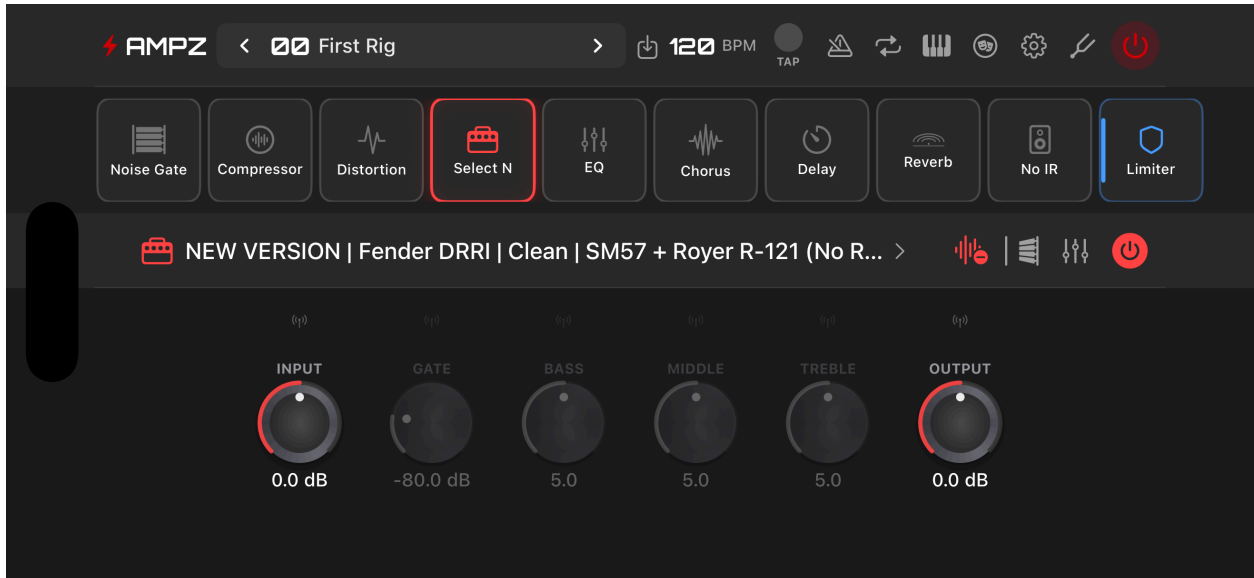


Figure 19: NAM Amplifier — with Gate and EQ toggled off

## 4 Effects Reference

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Ampz provides 17 effect types organized into 10 categories. Each effect can be loaded into any of the 10 chain slots and supports multiple algorithm variants.

### 4.1 Dynamics

#### 4.1.1 Noise Gate

Removes unwanted noise (hum, buzz) when you're not playing. The gate opens when the input signal exceeds the threshold and closes when it drops below.

Parameter	Range	Default	Description
Threshold	-80 to 0 dB	-40 dB	Signal level below which the gate closes
Attack	0.1–50 ms	1 ms	How quickly the gate opens
Release	5–500 ms	50 ms	How quickly the gate closes after signal drops
Range	0–96 dB	80 dB	Maximum attenuation when gate is closed

#### 4.1.2 Compressor

Reduces the dynamic range of your signal by attenuating loud peaks and boosting quiet passages. Essential for even sustain and consistent volume.

Parameter	Range	Default	Description
Threshold	-60 to 0 dB	-20 dB	Level above which compression begins
Ratio	1:1–20:1	4:1	Compression ratio (higher = more compression)
Attack	0.1–100 ms	10 ms	How quickly compression engages
Release	10–1000 ms	100 ms	How quickly compression releases
Gain	0–30 dB	0 dB	Makeup gain to compensate for volume reduction

### 4.1.3 Limiter

A hard ceiling on output level to prevent clipping and protect speakers. Acts as a compressor with an infinite ratio.

Parameter	Range	Default	Description
Threshold	-30 to 0 dB	-1 dB	Maximum output level allowed
Release	10–500 ms	50 ms	How quickly the limiter releases

**TIP:** Place the limiter at the end of your effects chain (slot 9) to protect your output from unexpected volume spikes.



Figure 20: Limiter parameters

## 4.2 Distortion / Overdrive

All five distortion algorithms use Wave Digital Filter (WDF) circuit modeling for authentic analog behavior.

### 4.2.1 Screamer

Mid-hump overdrive with WDF diode clipping. Inspired by classic green pedal circuits — warm, smooth, and musical.

Parameter	Range	Default	Description
Drive	0–100%	40%	Amount of overdrive / gain
Tone	0–100%	60%	Tilt EQ — lower values are darker, higher values are brighter
Level	0–100%	70%	Output volume

Parameter	Range	Default	Description
Mix	0–100%	100%	Dry/wet blend

### 4.2.2 Klear

Transparent overdrive with germanium diodes and an inverse-ganged clean blend. Preserves your original tone while adding harmonic richness.

Parameter	Range	Default	Description
Drive	0–100%	50%	Overdrive intensity
Tone	0–100%	50%	Brightness control
Level	0–100%	70%	Output volume
Mix	0–100%	100%	Dry/wet blend

### 4.2.3 Mouse

Hard-clipping distortion with shunt diodes and LM308 slew limiting. Aggressive, wide-range distortion from subtle grit to full saturation.

Parameter	Range	Default	Description
Drive	0–100%	35%	Distortion amount
Tone	0–100%	50%	Brightness control
Level	0–100%	50%	Output volume
Mix	0–100%	100%	Dry/wet blend

### 4.2.4 Fuzz 32

Germanium-voiced fuzz with two-stage asymmetric clipping and soft limiting for classic fuzz sustain. Warm, compressed, and musical across the full drive range. Includes a built-in output noise gate to tame the high-gain noise floor without choking sustain.

Parameter	Range	Default	Description
Fuzz	0–100%	60%	Fuzz intensity and sustain
Tone	0–100%	50%	Brightness (500–4500 Hz sweep)
Level	0–100%	70%	Output volume
Gate	0–100%	50%	Output noise gate threshold — higher values reduce more noise
Mix	0–100%	100%	Dry/wet blend



Figure 21: Fuzz 32 — Fuzz, Tone, Level, Gate, and Mix controls

#### 4.2.5 Turbo

LED-clipped distortion with LM308 slew limiting. Based on the same circuit topology as Mouse but with LED-style diodes for higher headroom — open, loud, and less compressed.

Parameter	Range	Default	Description
Drive	0–100%	35%	Distortion amount
Tone	0–100%	50%	Brightness control
Level	0–100%	50%	Output volume
Mix	0–100%	100%	Dry/wet blend

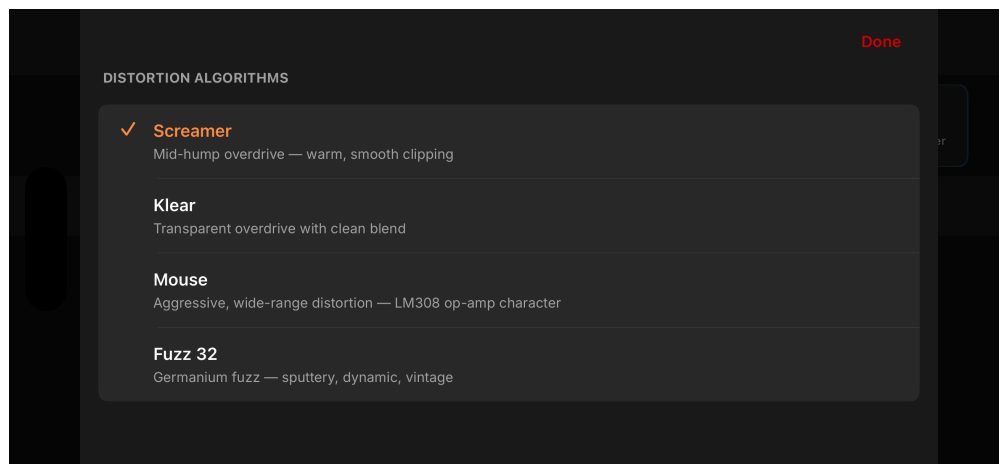


Figure 22: Distortion algorithm picker

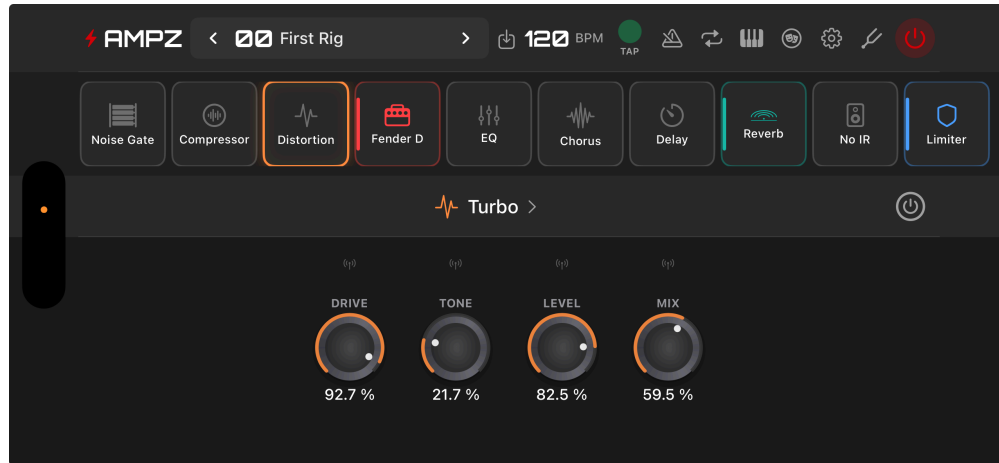


Figure 23: Turbo distortion — LED-clipped with high headroom

## 4.3 Modulation

### 4.3.1 Chorus

Adds width and shimmer by mixing the dry signal with pitch-modulated copies. Three algorithm variants:

- **Classic** — Traditional mono chorus with subtle shimmer
- **Dimension** — Wide stereo chorus inspired by classic 1980s rackmount units
- **Tri-Chorus** — Three-voice chorus for lush, thick, wide textures

Parameter	Range	Default	Description
Rate	0.05–10 Hz	0.8 Hz	LFO speed
Depth	0–100%	50%	Modulation depth
Mix	0–100%	50%	Dry/wet blend
Tone	0–100%	50%	High-frequency rolloff of wet signal

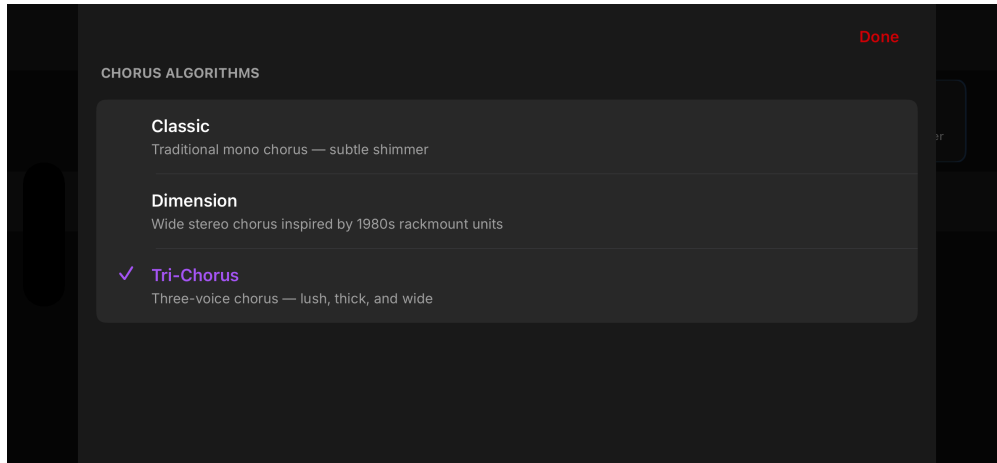


Figure 24: Chorus algorithm picker

### 4.3.2 Flanger

Stereo flanger with negative feedback for the classic “jet” sweep sound. Uses short modulated delay lines with phase-inverted feedback.

Parameter	Range	Default	Description
Rate	0.05–5 Hz	0.3 Hz	Sweep speed
Depth	0–100%	60%	Sweep range
Feedback	–100 to +100%	–50%	Resonance (negative = classic jet sound)
Mix	0–100%	50%	Dry/wet blend

### 4.3.3 Phaser

Multi-stage all-pass filter phaser with stereo sweep. Two algorithm variants:

- **4-Stage** — Smooth, subtle phase sweep (MXR Phase 90 style)
- **6-Stage** — Deeper, more pronounced phasing with richer notch patterns

Parameter	Range	Default	Description
Rate	0.05–5 Hz	0.5 Hz	Sweep speed
Depth	0–100%	70%	Modulation depth
Feedback	0–100%	50%	Resonance — higher values intensify the effect
Mix	0–100%	50%	Dry/wet blend

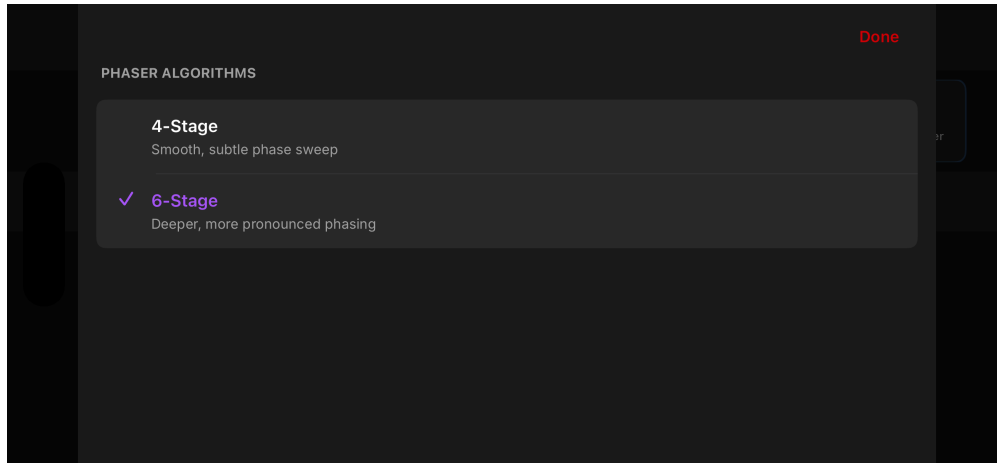


Figure 25: Phaser algorithm picker

### 4.3.4 Tremolo

Amplitude modulation — rhythmic volume variation. Two waveform shapes:

- **Sine** — Smooth, classic tremolo modulation
- **Triangle** — Sharper, more percussive volume pulsing

Parameter	Range	Default	Description
Frequency	0.5–20 Hz	4 Hz	Modulation rate
Depth	0–100%	50%	How deep the volume dips
Waveform	Sine / Triangle	Sine	Shape of the modulation wave

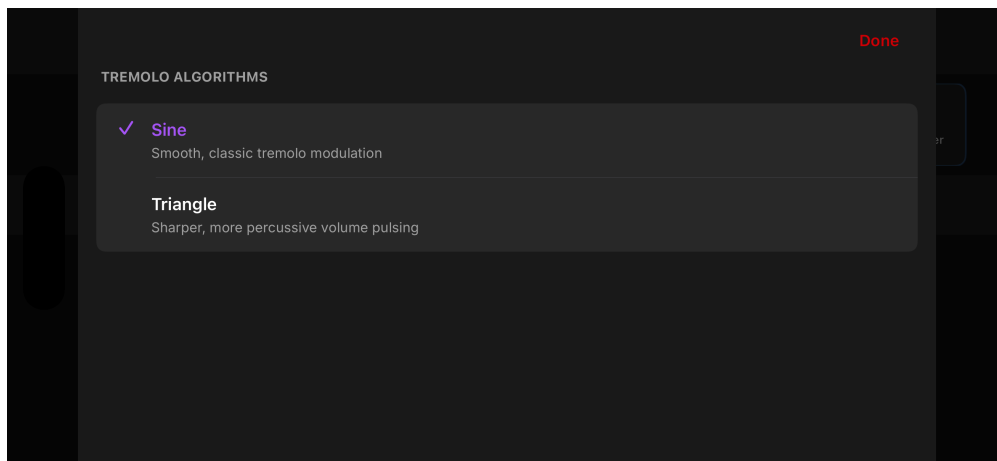


Figure 26: Tremolo algorithm picker

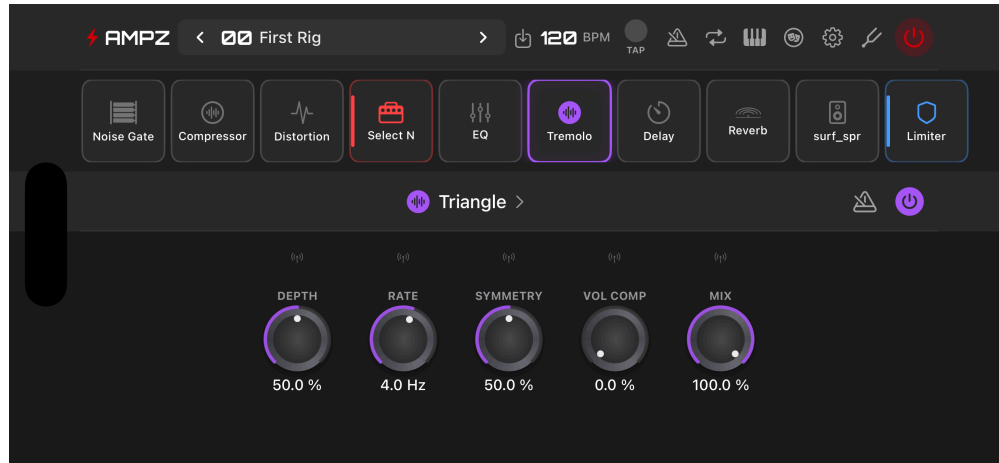


Figure 27: Tremolo effect parameters

### 4.3.5 Vibrato

Pure pitch modulation via a modulated delay line — 100% wet signal with no feedback. Two waveform shapes:

- **Sine** — Smooth pitch wobble
- **Triangle** — Angular pitch modulation

Parameter	Range	Default	Description
Rate	0.5–10 Hz	5 Hz	Modulation speed
Depth	0–100%	50%	Pitch variation amount
Waveform	Sine / Triangle	Sine	Modulation wave shape

## 4.4 Pitch

### 4.4.1 Poly Shifter

Polyphonic pitch shifting with two algorithm variants:

- **Pitch Shift** — Phase vocoder-based polyphonic pitch shifting. Handles chords cleanly.
- **Analog Octave** — Rectifier-based octave up/down with raw, gritty analog character.

Parameter	Range	Default	Description
Semitones	–24 to +24	0	Pitch shift in semitones
Cents	–50 to +50	0	Fine-tune in cents
Mix	0–100%	50%	Dry/wet blend

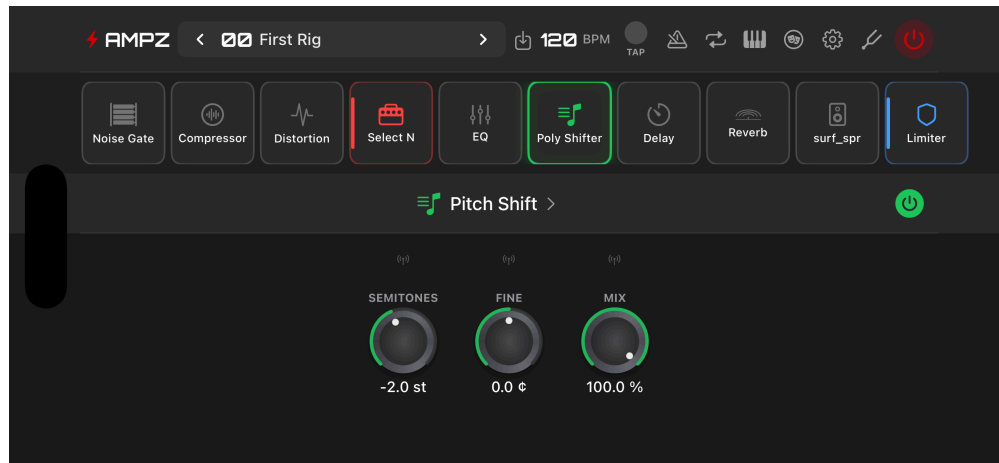


Figure 28: Poly Shifter algorithm options

## 4.5 Wah

### 4.5.1 LFO / Envelope

Two wah algorithms selectable from the algorithm picker:

- **LFO** — Cyclic wah sweep driven by an LFO oscillator. Rate and Depth control the sweep speed and range.
- **Envelope** — Touch-sensitive envelope filter (Mutron III style auto-wah). Responds to your playing dynamics — play harder for more wah sweep.

Toggle the **AUTO** button to switch between manual and automatic operation:

- **Auto OFF** — The Frequency knob directly controls the filter cutoff (manual wah).
- **Auto ON** — The selected algorithm (LFO or Envelope) sweeps the filter automatically. Additional parameters appear for the active algorithm.

Parameter	Range	Default	Description
Frequency	300–2800 Hz	800 Hz	Filter cutoff (manual) or sweep center (auto)
Q	1–20	5	Filter resonance — higher values give a more vocal, peaked sound
Rate	0.1–10 Hz	1 Hz	LFO sweep speed (LFO algorithm, Auto ON only)
Depth	0–100%	70%	Sweep range (Auto ON only)
Sensitivity	0–100%	50%	Envelope detection gain (Envelope algorithm, Auto ON only)
Attack	1–50 ms	10 ms	Envelope attack time (Envelope algorithm, Auto ON only)

Parameter	Range	Default	Description
Release	50–500 ms	200 ms	Envelope release time (Envelope algorithm, Auto ON only)
Direction	Up / Down	Up	Envelope sweep direction (Envelope algorithm, Auto ON only)
Mix	0–100%	100%	Dry/wet blend

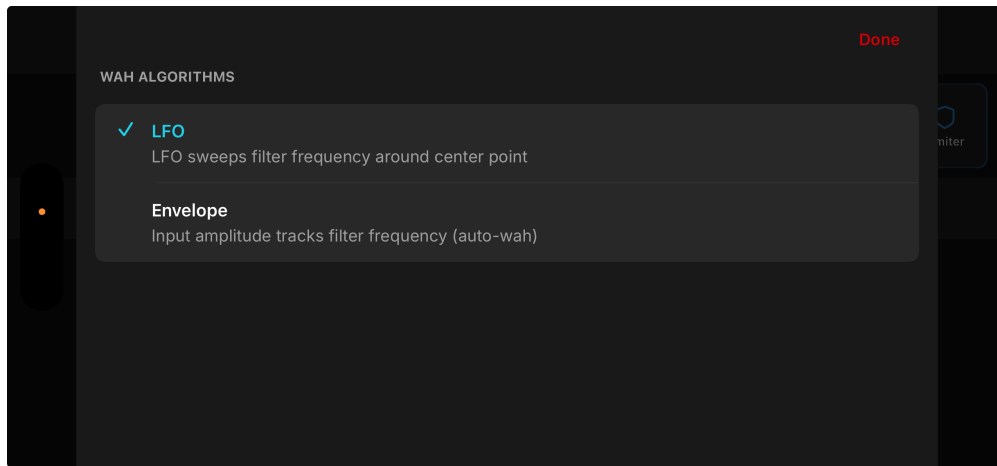


Figure 29: Wah algorithm picker — LFO and Envelope



Figure 30: Wah with Auto OFF — manual frequency control

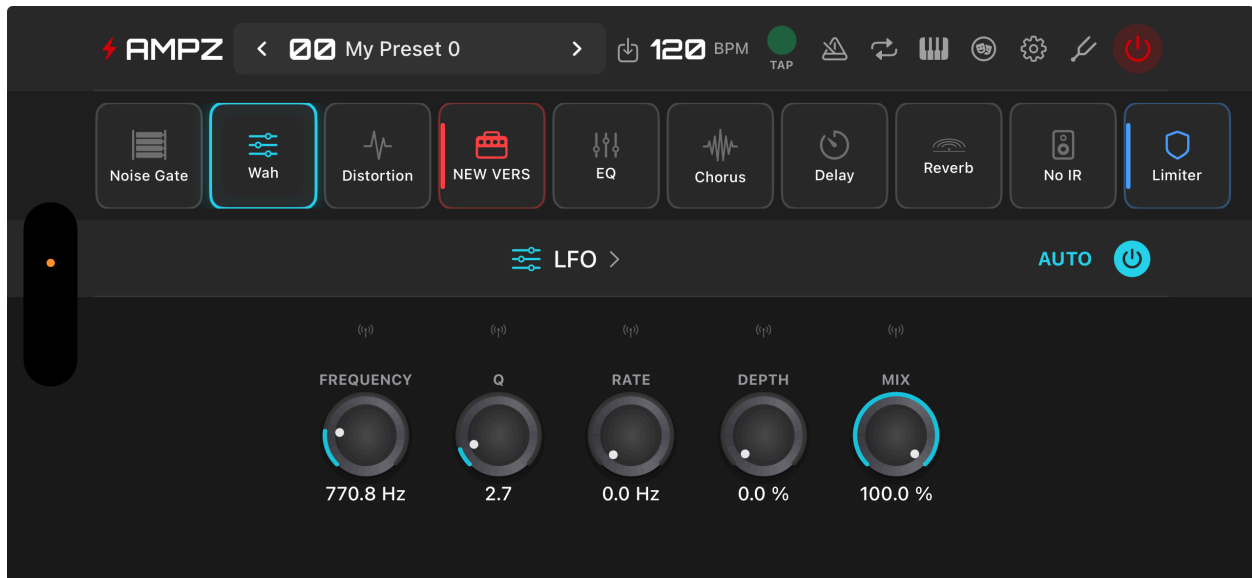


Figure 31: Wah with Auto ON – LFO Rate and Depth controls appear

## 4.6 EQ / Filters

### 4.6.1 7-Band EQ

Professional 7-band parametric equalizer with 5 parametric bands plus low and high shelving filters.

Band	Center Freq	Type
Band 1	80 Hz	Low shelf
Band 2	200 Hz	Parametric
Band 3	500 Hz	Parametric
Band 4	1 kHz	Parametric
Band 5	2 kHz	Parametric
Band 6	5 kHz	Parametric
Band 7	12 kHz	High shelf

Each band has a gain range of  $\pm 12$  dB. An output level control compensates for overall volume changes.

### 4.6.2 High Pass Filter

Butterworth 2nd-order high-pass filter for removing low frequencies (rumble, subsonic content).

Parameter	Range	Default	Description
Frequency	20–2000 Hz	80 Hz	Cutoff frequency — frequencies below this are attenuated

Parameter	Range	Default	Description
Resonance	0.1–10	0.707	Q factor — higher values create a resonant peak at cutoff

### 4.6.3 Low Pass Filter

Butterworth 2nd-order low-pass filter for removing high frequencies (fizz, harshness).

Parameter	Range	Default	Description
Frequency	200–20000 Hz	8000 Hz	Cutoff frequency — frequencies above this are attenuated
Resonance	0.1–10	0.707	Q factor — higher values create a resonant peak at cutoff

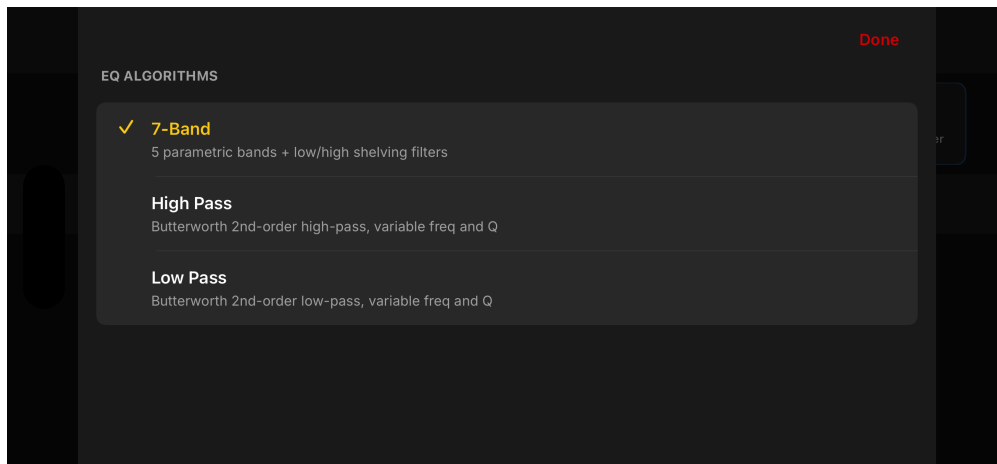


Figure 32: EQ algorithm picker



Figure 33: 7-Band EQ parameters

## 4.7 Reverb

Five reverb algorithms provide spaces ranging from tight rooms to expansive halls.

### 4.7.1 Room

Small reflective space with early reflections using the Freeverb algorithm. Tight and natural.

### 4.7.2 Hall

Large ambient space with long, evolving tails using the JPverb algorithm. Spacious and immersive.

### 4.7.3 Plate

Classic studio plate reverb — bright, dense, and lush. Uses the Dattorro plate algorithm for a smooth, metallic shimmer.

### 4.7.4 Spring

Physical spring model with characteristic drip, splash, and twang. Three spring types simulate different tank configurations:

- **Short** — Single spring, tight and quick decay. Classic Blackface amp character.
- **Long** — Two springs, diffuse and animated. Surf-style drip and wash.
- **Tank** — Three springs, vintage and lush. Rich, complex reverb tail.

#### Spring-Specific Parameters:

Parameter	Range	Default	Description
Type	Short / Long / Tank	Short	Spring tank configuration — affects diffusion and decay character
Tension	0–100%	50%	Spring stiffness — affects chirp oscillation rate
Crash	0–100%	30%	Transient crash sensitivity — simulates spring impact when picking hard

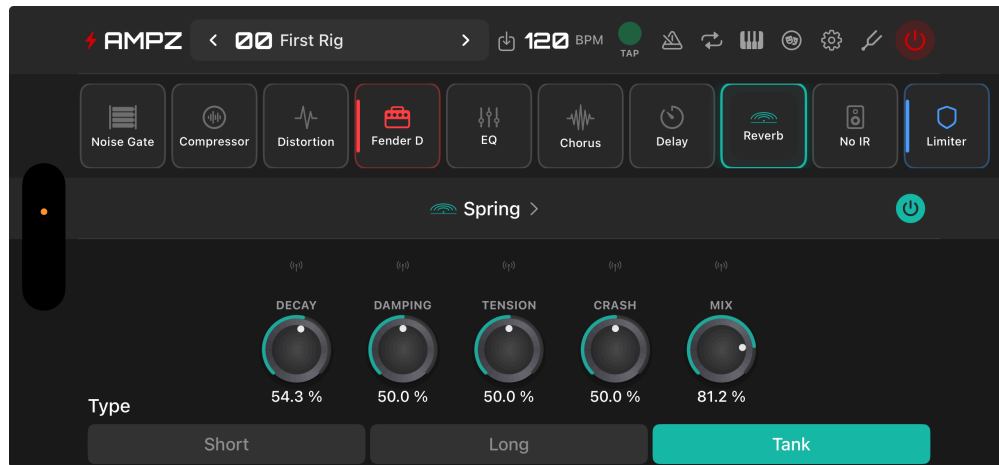


Figure 34: Spring reverb with Type selector and parameters

#### 4.7.5 Z-Verb

Broadcast-quality FDN (Feedback Delay Network) reverb with frequency-dependent decay. Based on Fons Adriaensen's Zita reverb. The most versatile and controllable algorithm.

##### Common Reverb Parameters:

Parameter	Range	Default	Description
Decay	0–100%	50%	Reverb tail length
Damping	0–100%	50%	High-frequency absorption — higher values darken the reverb
Pre-Delay	0–100 ms	20 ms	Gap before reverb begins — separates dry from wet
Size	0–100%	50%	Virtual room size
Mix	0–100%	30%	Dry/wet blend

**NOTE:** Reverb supports spillover (Effect Trails) — when enabled in Settings, the reverb tail decays naturally even when you bypass the effect or switch presets.

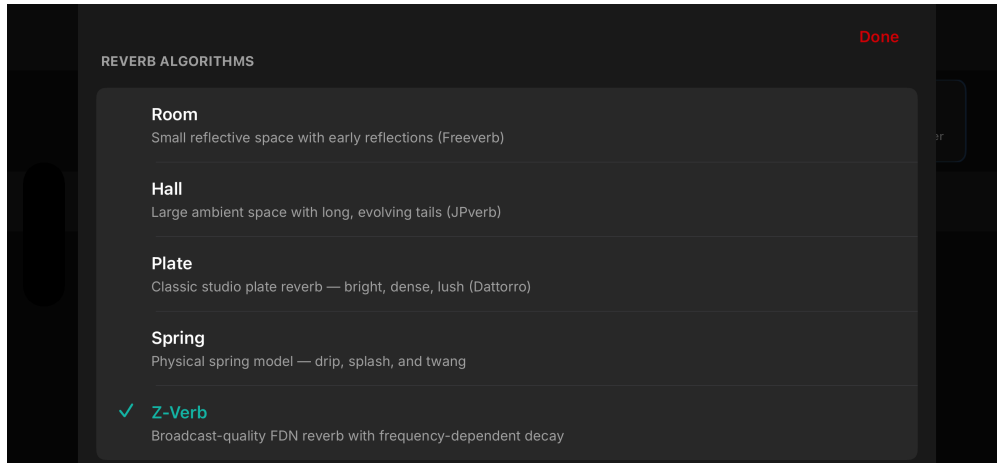


Figure 35: Reverb algorithm picker

## 4.8 Delay

Three delay algorithms cover the full range from pristine digital to warm analog.

### 4.8.1 Digital

Clean digital delay with pristine repeats and optional ping-pong stereo. Crystal-clear echoes.

### 4.8.2 Tape Echo

Warm, saturated repeats with wow and flutter modulation and degrading repeats. Each repeat loses high-frequency content, simulating magnetic tape saturation.

### 4.8.3 BBD (Bucket Brigade Device)

Analog bucket-brigade delay with bandwidth limiting. Lo-fi, band-limited character reminiscent of vintage analog delay pedals.

#### Common Delay Parameters:

Parameter	Range	Default	Description
Time	10–2000 ms	375 ms	Delay time between repeats
Feedback	0–100%	30%	How many repeats (higher = more echoes)
Mix	0–100%	30%	Dry/wet blend
Tone	0–100%	50%	Repeat brightness (Tape and BBD only)
Mod Rate	0–5 Hz	0.4 Hz	Wow/flutter speed (Tape and BBD only)
Mod Depth	0–100%	15%	Wow/flutter amount (Tape and BBD only)

**NOTE:** Delay also supports spillover — echoes trail off naturally when bypassed.

### 4.8.4 Tempo Sync

Delay, tremolo, and chorus support tempo sync. When enabled, the delay time locks to subdivisions of the global BPM:

Subdivision	At 120 BPM	Note Value
1/4	500 ms	Quarter note
1/8	250 ms	Eighth note
1/8 dotted	375 ms	Dotted eighth
1/16	125 ms	Sixteenth note
1/4 triplet	333 ms	Quarter triplet
1/8 triplet	167 ms	Eighth triplet

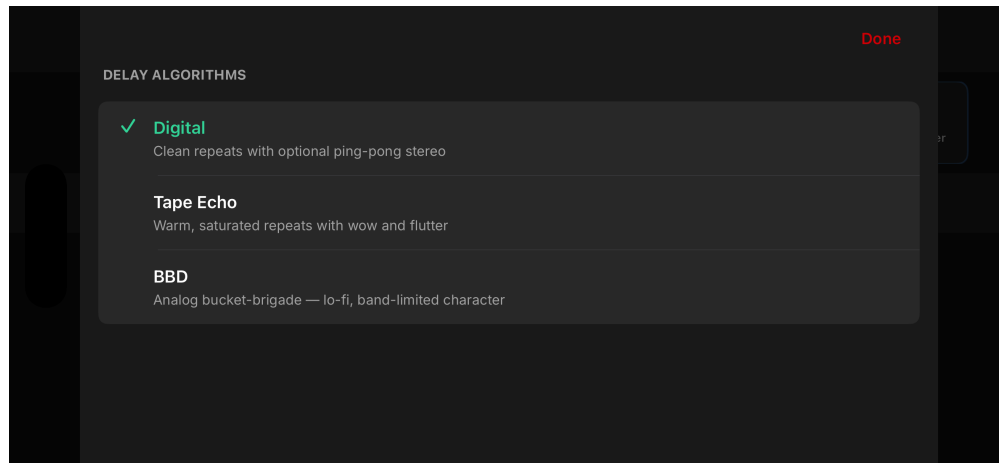


Figure 36: Delay algorithm picker

## 4.9 IR Loader

Loads impulse response (IR) files for cabinet simulation. IRs are short audio recordings that capture the frequency response of a guitar cabinet, microphone, and room.

Supports single and dual cab modes:

- **Single Cab** — Loads one IR file for straightforward cabinet simulation
- **Dual Cab** — Loads two IR files and blends them for complex tones

Supported file formats: .wav, .aif, .aiff

Ampz does not ship with bundled IR files. Import your own via the Files app share sheet, “Open In” menu, or download them from the Tone3000 tab.

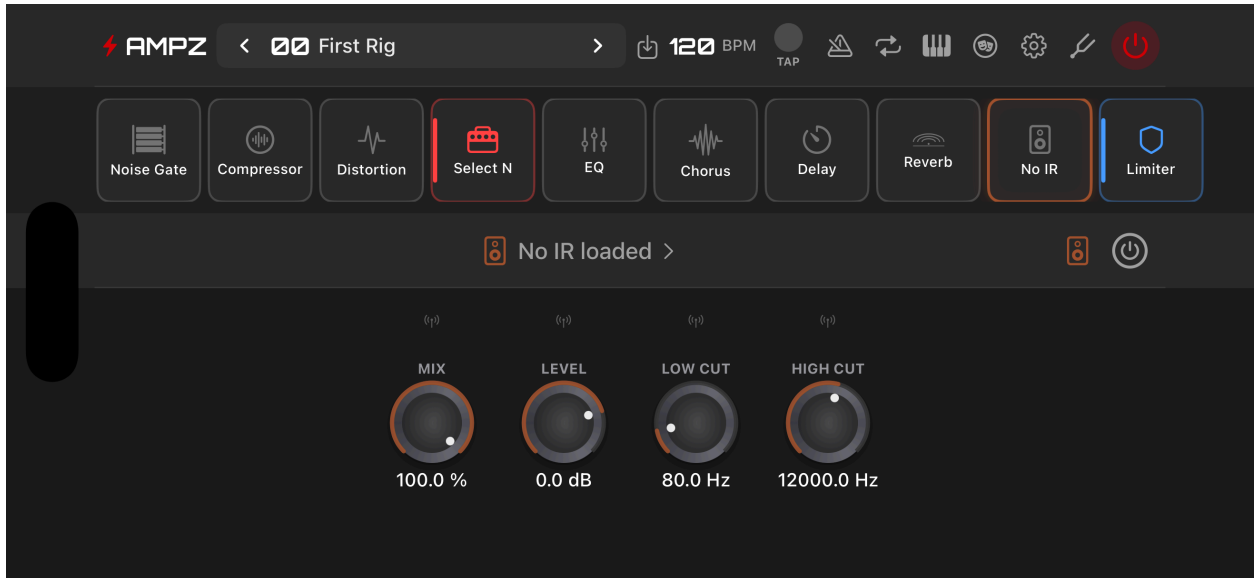


Figure 37: IR Loader effect slot

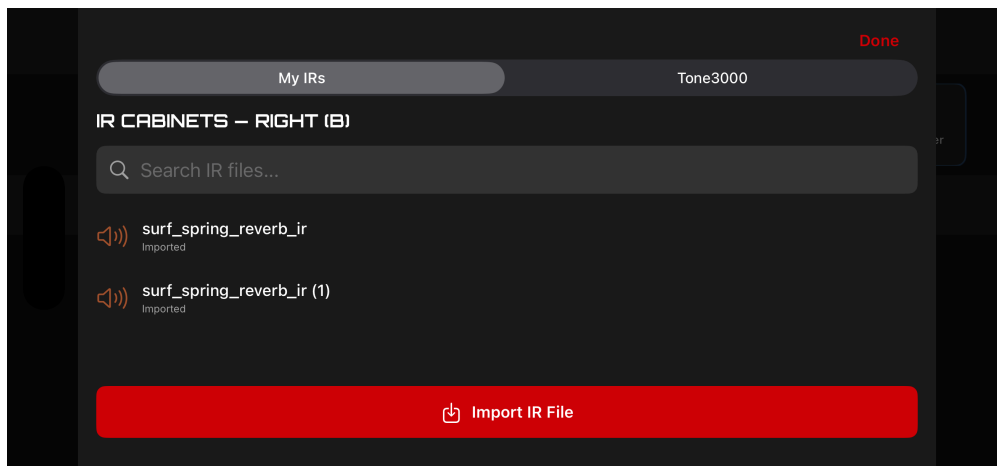


Figure 38: My IR files list

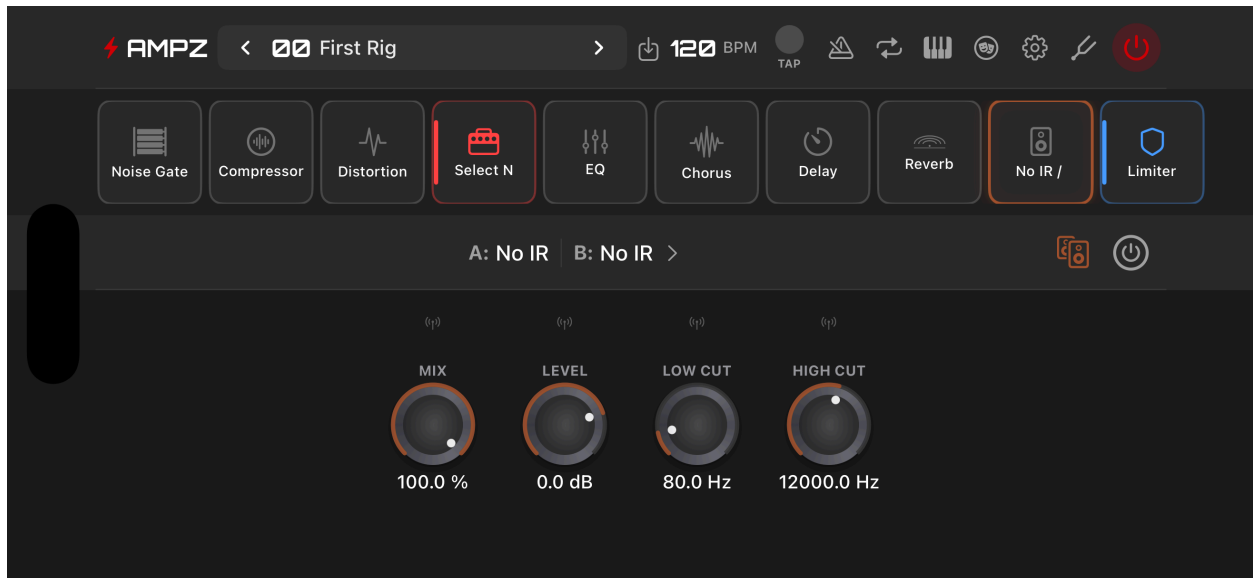


Figure 39: Dual IR toggle button

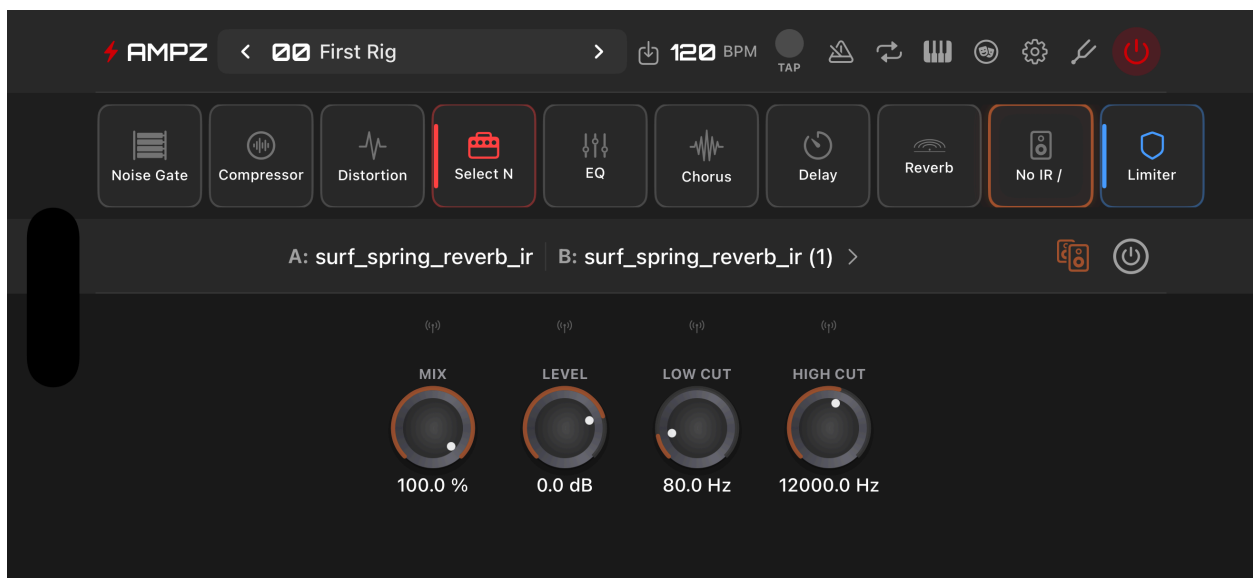


Figure 40: Dual IR view — blending two cabinet IRs

#### 4.9.1 Downloading IRs from Tone3000

You can also download IR files from the Tone3000 platform. Navigate to the Tone3000 tab, search for cabinet impulse responses, and download them directly into Ampz.

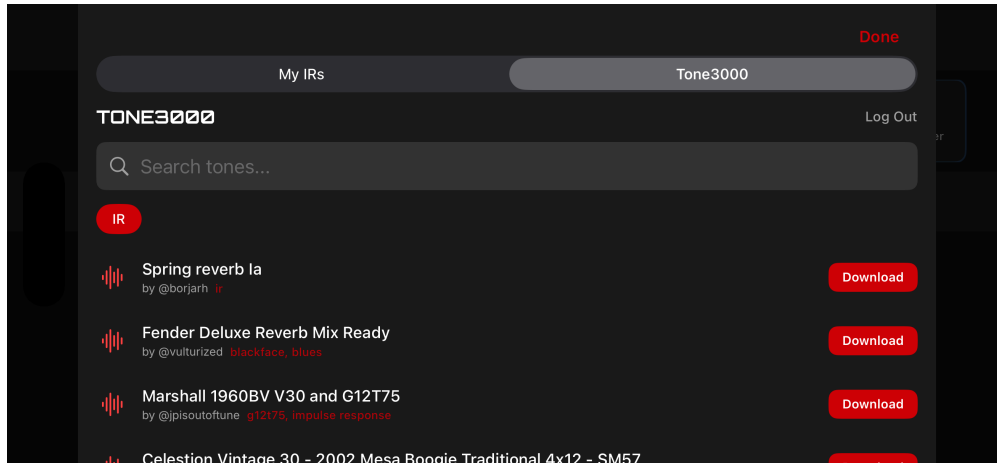


Figure 41: Tone3000 — searching for IR files

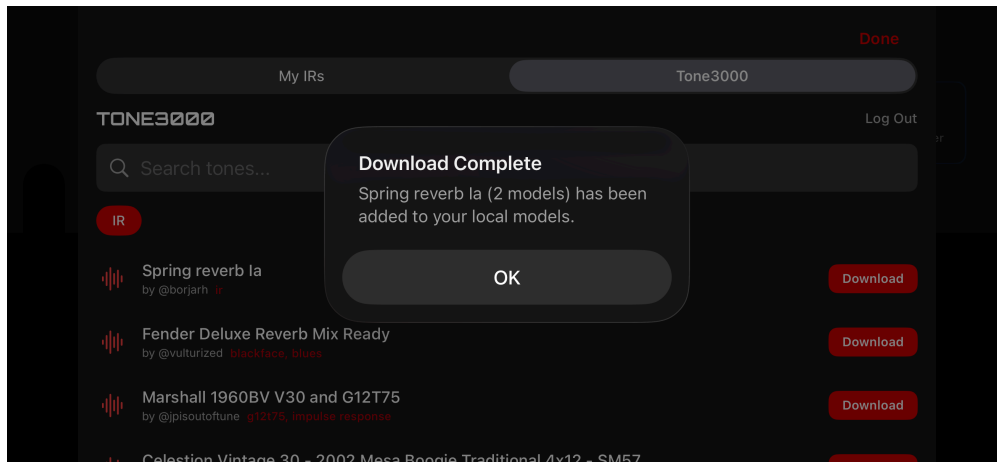


Figure 42: Tone3000 — IR download confirmation

# 5 Preset System

## 5.1 100-Slot Architecture

Ampz provides 100 preset slots numbered 00 through 99:

- **Slots 00–09** — Factory range (Slot 00 ships with the “First Rig” starter preset; all are user-overwritable)
- **Slots 10–99** — User presets (empty by default)

Each preset stores the complete state of your effects chain:

- All 10 effect slot configurations (effect type, algorithm, parameters)
- Slot enable/bypass states
- NAM model file reference
- IR file references
- Chain-level settings (enabled, bypassed)

## 5.2 Preset Browser

Tap the preset name/number display in the toolbar to open the Preset Browser overlay. The browser provides:

- **Search bar** — Filter presets by name
- **Category filter pills** — Filter by Factory, User, or Custom categories
- **4-column grid** — Visual preset cards showing number, name, and category color
- Tap a preset card to load it immediately

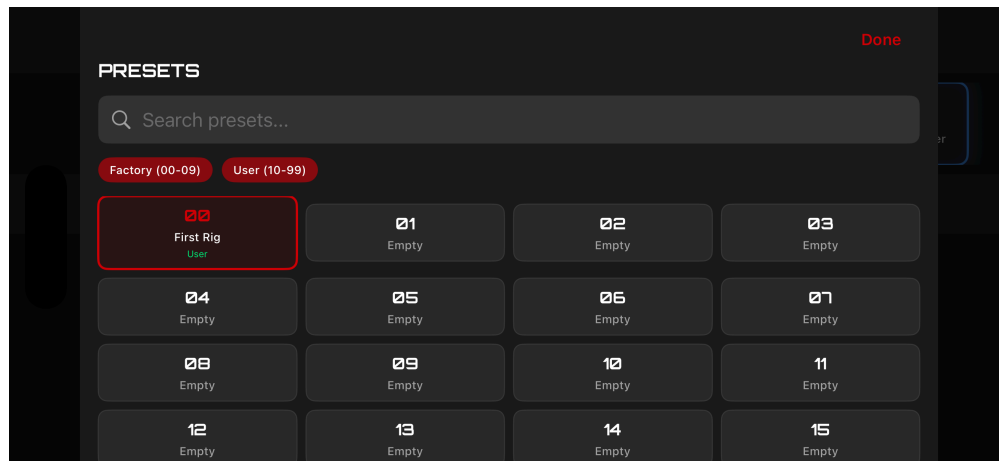



Figure 43: Preset Browser with category filter pills

## 5.3 Saving Presets

1. Configure your desired effects chain and parameters
2. Tap the save icon (  ) in the toolbar
3. Enter a name for your preset
4. Select a destination slot using the wheel picker
  - Empty slots show “Empty”
  - Occupied user slots show “(Overwrite)” in orange
5. Tap **Save**

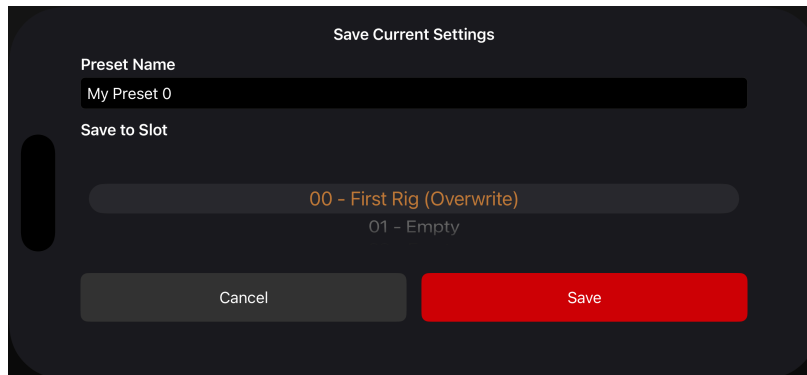


Figure 44: Saving a preset — slot picker with overwrite warning

**WARNING:** Factory presets in the initial slot (00) can be overwritten since “First Rig” is a user-editable starter preset. Always save to a higher slot number if you want to preserve it.

## 5.4 What Gets Saved

Data	Details
Effect chain	All 10 slots — type, algorithm, parameters, enable state
NAM model	File path and display name
IR files	File paths, names, sizes, checksums
Chain state	Global enable/bypass
Metadata	Name, created/modified dates, description

## 5.5 Import / Export

Presets are stored as JSON files and can be exported for sharing:

- **Export** — Creates a JSON file that can be shared via AirDrop, email, or file transfer
- **Import** — Load a shared preset file into any user slot

# 6 Looper

## 6.1 Overview

The Ampz looper provides two independent loops with a circular waveform display. Access it by tapping the repeat icon (🔄) in the toolbar.

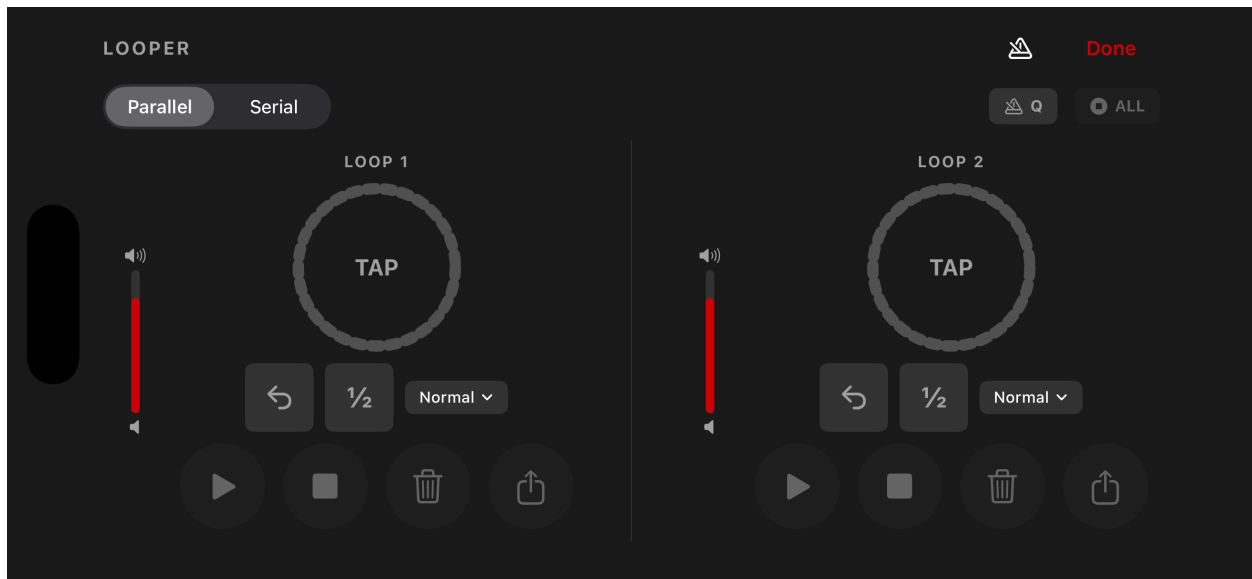


Figure 45: Looper — dual-loop interface with circular waveform displays

## 6.2 Dual-Loop Architecture

The looper contains two independent loop tracks (Loop 1 and Loop 2), each with its own:

- Circular waveform display showing recorded audio
- Record / Play / Stop / Clear controls
- Volume slider (vertical fader)
- Reverse and Half-Speed toggles
- Mode selector (Normal, One-Shot, Replace, Decay)

## 6.3 Recording Flow

1. **Tap the circle** to start recording — the border turns red and audio begins capturing
2. **Tap again** to stop recording and begin playback — the loop plays back continuously
3. **Tap while playing** to enter overdub mode — new audio layers on top of existing content
4. **Tap again** to exit overdub and resume playback

The looper records post-effects audio — your complete processed signal including NAM amp and effects.

## 6.4 Loop Modes

Mode	Behavior
Normal	Standard record → overdub → play cycle
One-Shot	Records one overdub pass and automatically returns to playback
Replace	Overwrites existing audio instead of layering
Decay	Previous audio gradually fades with each overdub pass

## 6.5 Routing Modes

A segmented control at the top switches between two routing modes:

- **Parallel** — Both loops play simultaneously, mixed together at the output. When drums are enabled, only the first recorded loop captures drum audio to prevent doubling — the second loop records guitar only.
- **Serial** — Loop 1's output feeds into Loop 2 (Loop 1 → Loop 2 → Output). Pending cues fire at the active loop's cycle boundary for seamless transitions.

## 6.6 Loop Controls

- **Reverse** (🔁) — Plays the loop backward in real time
- **Half Speed** (½) — Plays at half speed and one octave lower
- **Quantize** (Q) — When enabled, record start/stop snaps to BPM boundaries. A level picker appears with three options:
  - **Beat** — Snaps to the nearest beat
  - **Half Bar** — Snaps to 2-beat boundaries (half measure in 4/4)
  - **Bar** — Snaps to 4-beat boundaries (full measure in 4/4)
- **Stop All** — Stops both loops simultaneously
- **Export** (📄) — Exports the loop as an audio file via the iOS share sheet

## 6.7 Volume Control

Each loop has a vertical volume slider on its left side. Adjust independently to balance the mix between Loop 1 and Loop 2.

# 7 Drum Loops

## 7.1 Overview

The built-in drum loop player provides practice accompaniment with 160 professionally recorded WAV loops across 10 genres and 6 time signatures. Loops are time-stretched in real time to match your global BPM. Access it by tapping the metronome icon (🔊) in the toolbar.



Figure 46: Drum Loops — transport controls and loop selector

## 7.2 Loop Browser

Tap **Select Loop** to open the loop browser. Two rows of filter chips at the top let you narrow your search:

- **Genre row** — All, Blues, Country, Funk, Jazz, Latin, Metal, Pop, R&B, Reggae, Rock
- **Time signature row** — All, 3/4, 4/4, 5/4, 6/8, 7/4, 7/8

Both filters combine — for example, selecting “Rock” and “3/4” shows only rock waltz loops. Tap a selected chip again (or tap “All”) to clear that filter.

The list is organized by genre sections. Each loop row displays the pattern name, bar count, native BPM, time signature badge (for non-4/4 loops), and kit name.

## 7.3 Genres & Loop Count

Genre	Loops	Styles
Blues	11	Shuffle, slow shuffle, straight, waltz, 6/8, groove, intro, fill
Country	17	Basic, two-step, waltz, 6/8, verse, intro, fill, extended
Funk	15	Basic, linear, shuffle, waltz, groove, verse, intro, fill
Jazz	17	Swing, bossa, brushes, waltz, 5/4, 7/4, groove, verse, intro, fill
Latin	13	Bossa, samba, mambo, vals (3/4), 6/8, groove, verse, intro, fill
Metal	18	Basic, blast, breakdown, double, gallop, halftime, stomp, thrash, 6/8, 7/8
Pop	15	Standard, bounce, EDM, halftime, syncopated, tropical, waltz, 6/8
R&B	8	Basic, bounce, trap, waltz, groove, verse, fill
Reggae	6	One drop, steppers, waltz, intro, fill
Rock	30	Basic, anthem, breakdown, driving, double, halftime, hard, punk, shuffle, stadium, waltz, 5/4, 6/8

Many loops include alternate variants (labeled 1, 2, etc.) for variety within the same pattern style.

## 7.4 Transport Controls

- **Play/Stop button** — Large circular button to start or stop the loop. Green play icon when stopped, red stop icon when playing.
- **Volume slider** — Horizontal slider to adjust loop volume relative to guitar signal
- **Looper toggle** — Include drum audio in looper recordings when enabled

## 7.5 Integration

- **BPM Sync** — Loops are time-stretched to match the global BPM, which can be set via Tap Tempo. The native BPM is shown next to the loop selector for reference.
- **Looper Integration** — Toggle the “Looper” button to include drum audio in looper recordings. When enabled, the drum mix is captured alongside your guitar signal.

# 8 Tuner

## 8.1 Overview

The built-in chromatic tuner provides accurate pitch detection for tuning your guitar. Access it by tapping the tuning fork icon (🔊) in the toolbar.

## 8.2 Display

- **Note name** — Large display showing the detected note (C, C#, D, etc.) with octave number
- **Frequency readout** — Shows the exact detected frequency in Hz
- **Cents gauge** — A horizontal bar with color zones indicating tuning accuracy:
  - **Green (center)** — In tune (within  $\pm 5$  cents)
  - **Amber (inner)** — Close (within  $\pm 15$  cents)
  - **Red (outer)** — Out of tune (beyond  $\pm 15$  cents)
- **Cents value** — Numeric display showing exact offset (e.g., “+3 cents” or “-7 cents”)

A downward-pointing triangle indicator slides along the gauge to show your current tuning position.



Figure 47: Tuner — note display, cents gauge, and mute control

## 8.3 Controls

### 8.3.1 Mute Output

Toggle the **MUTE** button to silence the audio output while tuning. This prevents your audience from hearing tuning noises during a performance. The button turns red when active.

When you close the tuner overlay, mute is automatically disabled.

### 8.3.2 Reference Pitch

Adjust the reference pitch for A4 using the stepper control:

- Range: **430 Hz to 450 Hz**
- Default: **440 Hz** (standard concert pitch)
- Use lower values (e.g., 432 Hz) for alternative tuning systems
- Use higher values for orchestral tuning contexts

# 9 Live Performance Mode

## 9.1 Overview

Live Performance mode transforms the Ampz interface into a stage-optimized view designed for foot switching and low-light visibility. Access it by tapping the theater masks icon (🎭) in the toolbar.

## 9.2 Layout

### 9.2.1 Top Bar

- **“LIVE” indicator** — Amber text confirming you’re in Live mode
- **Audio LED** — Green dot when audio engine is running, red when stopped
- **NAM badge** — Green “NAM” label when a neural amp model is loaded
- **Tuner button** — Quick access to the tuner without leaving Live mode
- **Done button** — Returns to the normal interface

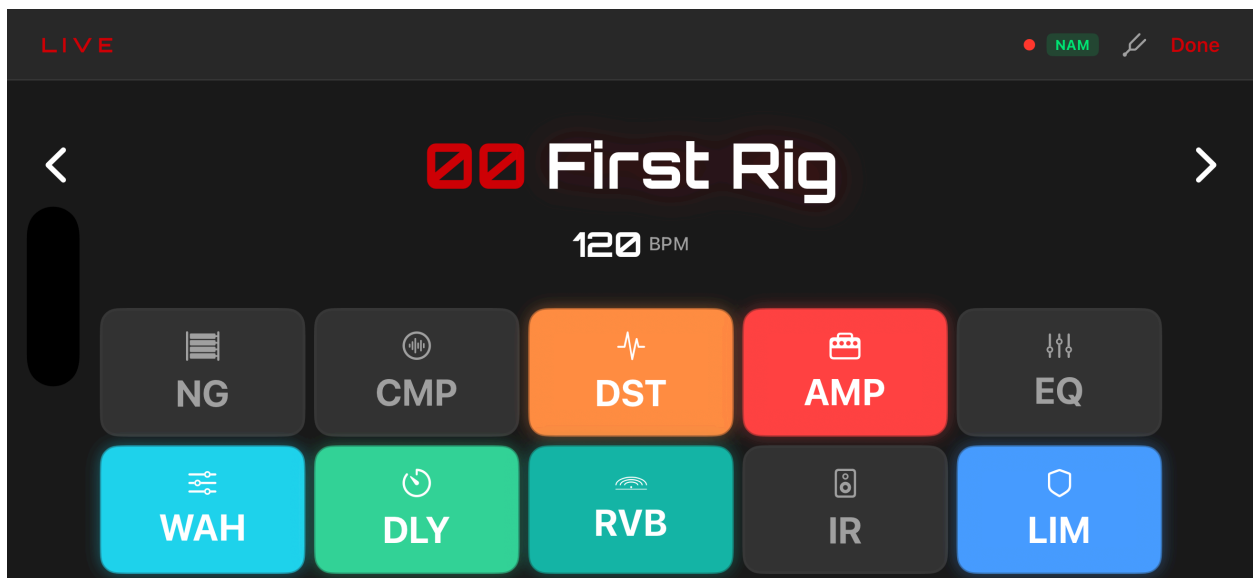


Figure 48: Live Performance Mode — stomp-box grid with preset display

### 9.2.2 Preset Display

A large, high-contrast preset readout with:

- Oversized preset number (44pt font)
- Preset name with glow effect for stage visibility
- Left/right chevrons for preset navigation (tap targets sized for foot switches)

### 9.2.3 BPM Display

Current tempo shown in large format below the preset name.

### 9.2.4 2x5 Stomp Grid

The bottom half shows a stomp-box grid:

- 10 cells arranged in 2 rows of 5, mapping to effects chain slots 0–9
- Each active cell shows the effect icon and an abbreviated name
- **Tap a cell to toggle bypass** on that effect
- Active effects light up with their category color
- Bypassed effects show as dim gray
- Empty slots show a dashed border with the slot number

## 9.3 Effect Abbreviations

Abbr	Effect	Abbr	Effect
NG	Noise Gate	WAH	Wah
CMP	Compressor	EQ	EQ
DST	Distortion	RVB	Reverb
AMP	NAM Amplifier	DLY	Delay
CHR	Chorus	IR	IR Loader
FLG	Flanger	LIM	Limiter
PZR	Phaser	PS	Poly Shifter
TRM	Tremolo	VIB	Vibrato

## 9.4 Screen Lock Prevention

Live Performance mode automatically disables the iOS idle timer, preventing the screen from dimming or locking during your performance. The idle timer is restored when you exit Live mode.

# 10 MIDI

---

## 10.1 Overview

Ampz supports comprehensive MIDI control for integrating with hardware MIDI controllers, foot switches, and other MIDI devices. Access MIDI settings by tapping the piano keys icon (🎹) in the toolbar.

## 10.2 Enabling MIDI

Toggle the **MIDI Enabled** switch to activate MIDI input processing. When disabled, all MIDI messages are ignored.

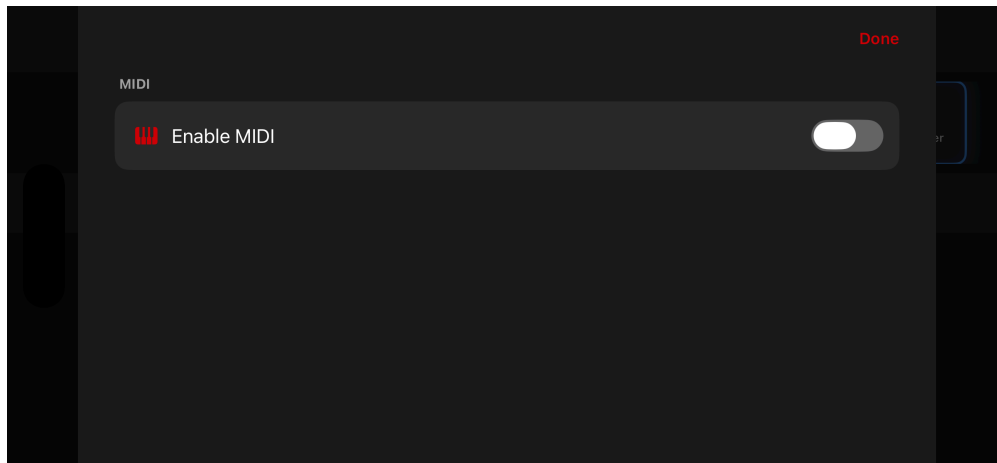


Figure 49: MIDI — enabling MIDI input

## 10.3 Device Discovery

When MIDI is enabled, Ampz automatically discovers connected MIDI devices:

- USB MIDI controllers connected via Lightning/USB-C adapter
- Network MIDI sessions
- Virtual MIDI ports from other apps

The Devices section lists all detected MIDI sources with their names.

## 10.4 Bluetooth MIDI

Tap **Bluetooth MIDI** to open the Bluetooth MIDI pairing interface. This allows you to connect wireless MIDI controllers and foot switches:

1. Enable Bluetooth on your iOS device
2. Put your MIDI controller in pairing mode

3. Tap the device name when it appears in the list
4. Once paired, the device appears in the Devices section

## 10.5 Program Change

When **Program Change** is enabled, receiving a MIDI Program Change message switches to the corresponding preset number:

- Program Change 0 → Preset 00
- Program Change 1 → Preset 01
- ...up to Program Change 99 → Preset 99

This allows you to switch presets from a MIDI foot controller.

## 10.6 CC Mappings

CC (Continuous Controller) mappings let you control effect parameters with MIDI knobs, faders, or expression pedals.

Each CC mapping connects:

- A **MIDI CC number** (0–127) to
- A **parameter** on a specific **effect slot**

Example: Map CC 1 (Mod Wheel) to the Reverb mix parameter, or CC 7 to the Delay feedback.

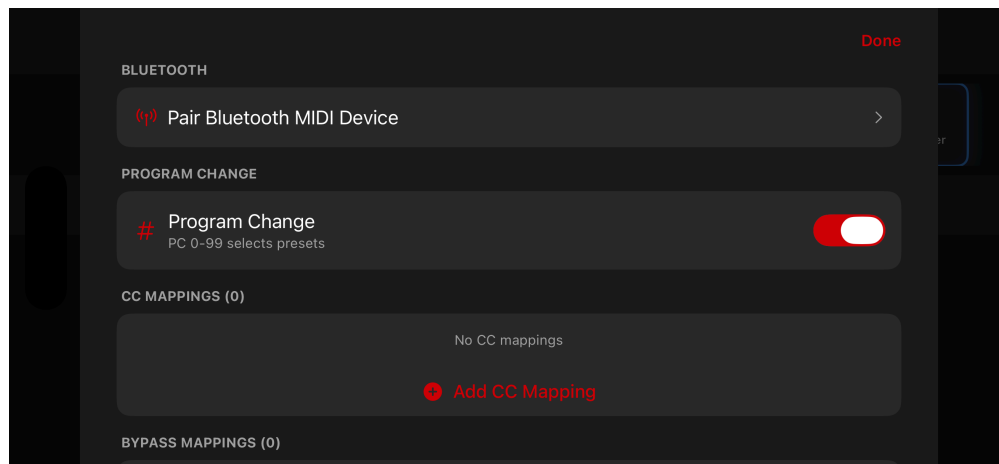


Figure 50: MIDI — Program Change and CC Mappings

## 10.7 Bypass Mappings

Bypass mappings let you toggle individual effect slots on/off with MIDI:

- Assign a MIDI CC number to an effect slot
- When the CC value exceeds 64, the effect is enabled
- When the CC value drops below 64, the effect is bypassed

## 10.8 Action Mappings

Action mappings assign MIDI CC numbers to app-level actions. Actions are **momentary triggers** — they fire once each time a CC message with a value of 64 or higher is received. CC values below 64 are ignored.

Action	Description
Tap Tempo	Set BPM by repeated CC triggers
Global Bypass	Toggle all audio processing on/off
Preset Up	Load the next preset slot
Preset Down	Load the previous preset slot
Tuner Toggle	Open/close the Tuner overlay
Loop 1 Record	Start/stop recording on Loop 1
Loop 1 Play	Start/stop playback on Loop 1
Loop 1 Clear	Erase Loop 1 audio
Loop 1 Reverse	Toggle reverse playback on Loop 1
Loop 1 Half-Speed	Toggle half-speed on Loop 1
Loop 1 Stop	Stop Loop 1
Loop 2 Record	Start/stop recording on Loop 2
Loop 2 Play	Start/stop playback on Loop 2
Loop 2 Clear	Erase Loop 2 audio
Loop 2 Reverse	Toggle reverse playback on Loop 2
Loop 2 Half-Speed	Toggle half-speed on Loop 2
Loop 2 Stop	Stop Loop 2
Stop All	Stop both loops simultaneously

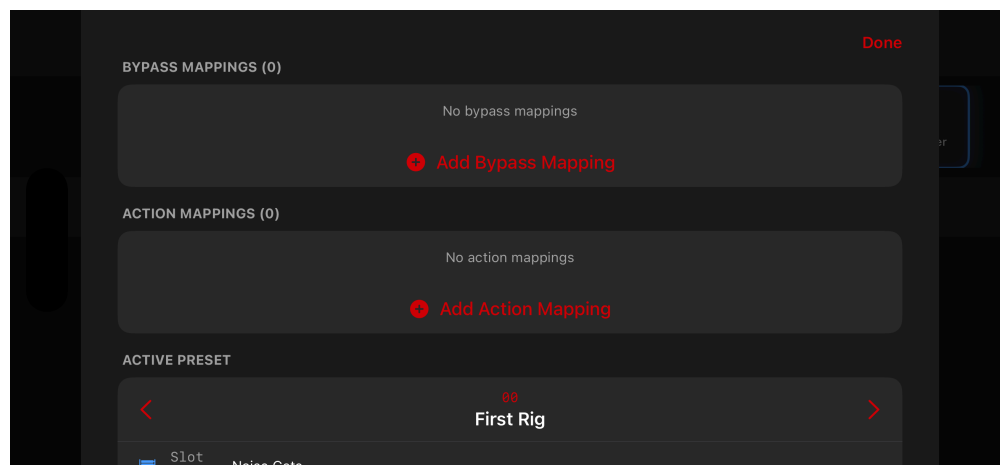


Figure 51: MIDI — Bypass and Action Mappings

### 10.8.1 Controller Configuration for Actions

Configure your MIDI foot controller buttons in **momentary** mode (sometimes called “trigger” or “pulse”) so that each press sends a single CC message with value 127. Do **not** use toggle mode (which alternates between 0 and 127 on successive presses) — toggle mode causes every other press to be ignored because the value-0 message falls below the threshold.

Mode	Behavior	Result
Momentary	Every press sends 127	Every press triggers the action
Toggle	Alternates 127 → 0 → 127 → 0	Every other press is ignored

**Note:** Bypass mappings support both momentary and toggle modes because they use separate on/off thresholds. Action mappings (looper, tap tempo, preset navigation) only respond to momentary triggers.

## 10.9 MIDI Learn

Instead of manually entering CC numbers, use MIDI Learn:

1. Tap **MIDI Learn** on any mapping row
2. Move the desired knob/fader/pedal on your MIDI controller
3. Ampz automatically captures the CC number and assigns it

# 11 Settings

Access settings by tapping the gear icon (⚙️) in the toolbar.

## 11.1 Audio Configuration

### 11.1.1 Input/Output Channels

When a multi-channel audio interface is connected, use the channel selector to choose which input and output channels Ampz uses. The interface name and available channels are displayed automatically.

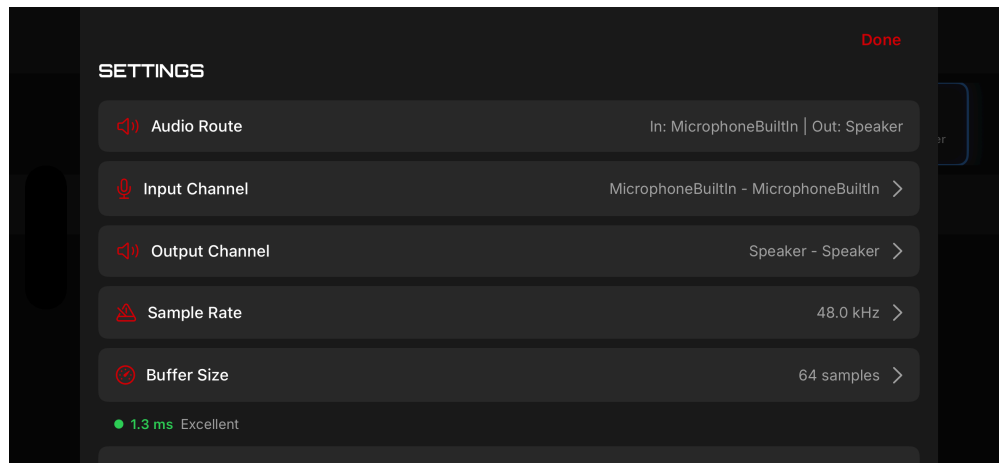


Figure 52: Settings — audio configuration

### 11.1.2 Sample Rate

Rate	Description
44.1 kHz	CD Quality — better device compatibility
48.0 kHz	Professional — lower latency (recommended)
96.0 kHz	Hi-Res — requires more CPU, may not be supported on all devices

### 11.1.3 Buffer Size

Size	Latency @ 48 kHz	Description
32 samples	0.67 ms	Ultra-low latency — requires powerful device
64 samples	1.33 ms	Professional — recommended balance
128 samples	2.67 ms	Standard — good for most devices

Size	Latency @ 48 kHz	Description
256 samples	5.33 ms	Safe – best compatibility

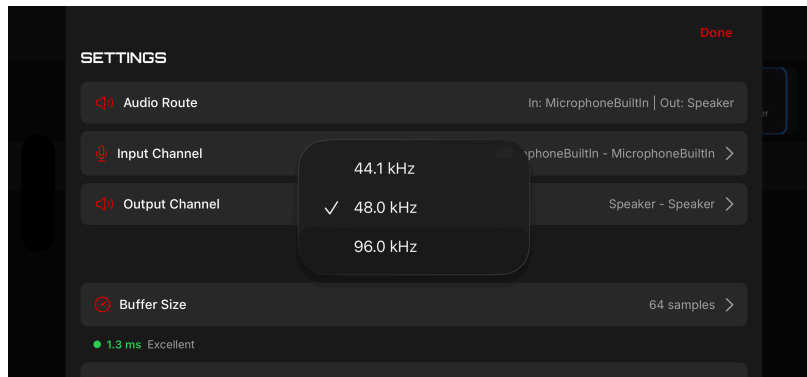


Figure 53: Settings — sample rate picker

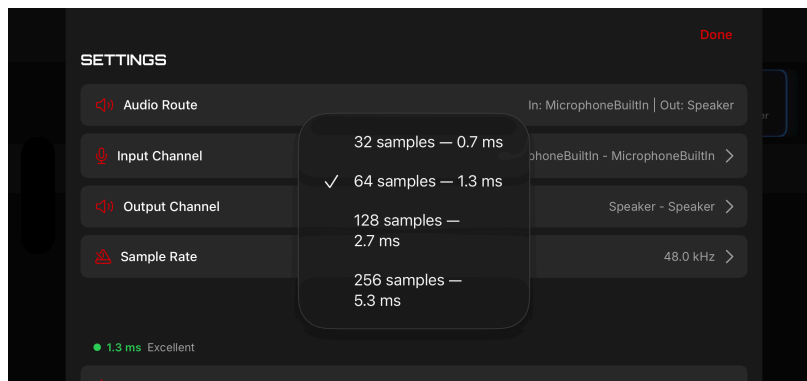


Figure 54: Settings — buffer size picker

### 11.1.4 Latency Display

The settings overlay shows computed one-way buffer latency based on your selected sample rate and buffer size, along with a performance rating:

- **Excellent** (green) —  $\leq 2.5$  ms
- **Good** (orange) — 2.5–5.0 ms
- **High** (red) —  $> 5.0$  ms

## 11.2 Background Audio

Toggle **Background Audio** to keep Ampz processing when the app is minimized or the screen is locked. Essential for live performance and practice sessions where you might glance at another app.

## 11.3 Effect Trails (Spillover)

Toggle **Effect Trails** to enable reverb and delay tail spillover. When enabled:

- Reverb tails decay naturally when you bypass the reverb or switch presets

- Delay echoes trail off instead of cutting abruptly
- Creates smoother transitions during live performance

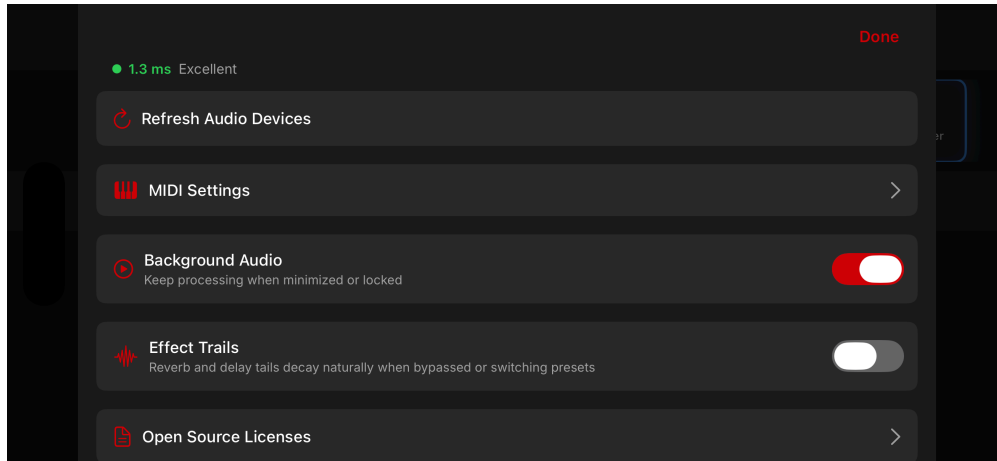


Figure 55: Settings — Background Audio, Effect Trails, and more

## 11.4 MIDI Settings

Tap **MIDI Settings** to navigate to the full MIDI configuration screen (see Chapter 10).

## 11.5 Open Source Licenses

Tap **Open Source Licenses** to view attribution and license information for open-source libraries used in Ampz:

- NeuralAudio (NAM processing)
- Eigen (linear algebra)
- And other components

# 12 Tips & Troubleshooting

## 12.1 Signal Chain Best Practices

A well-ordered effects chain makes a big difference in tone quality. Here's a recommended signal flow:

Slot	Effect	Why
1	Noise Gate	Remove noise before it gets amplified
2	Compressor	Even out dynamics before distortion
3	Wah / EQ	Shape the input signal
4	Distortion	Overdrive / fuzz on a clean, gated signal
5	NAM Amplifier	Core amp tone
6	Chorus / Flanger / Phaser	Modulation after amp sounds more natural
7	EQ	Post-amp tone shaping
8	Delay	Echoes after amp for cleaner repeats
9	Reverb	Space and ambience last
10	Limiter	Protect output from clipping

**TIP:** This is a starting point, not a rule. Experiment with different orders — putting reverb before distortion creates shoegaze textures, and compression after distortion can tighten up your sound.

## 12.2 Latency Optimization

Low latency is critical for feeling connected to your instrument. Here's how to minimize it:

1. **Use 48 kHz / 64 samples** — The recommended balance of quality and speed
2. **Use a USB audio interface** — Dedicated interfaces provide the lowest driver latency
3. **Close other audio apps** — Background audio processing competes for CPU
4. **Use Release builds for testing** — Debug builds add overhead (relevant for developers only)
5. **Reduce effects chain length** — Each active effect adds a small amount of processing time

## 12.3 Common Issues

### 12.3.1 No Audio Output

1. Check that audio input permission is granted (Settings → Privacy → Microphone → Ampz)
2. Verify the green LED is pulsing in the toolbar (audio engine running)

3. Check that Global Bypass (power button) is **not** active
4. If using an external interface, check the input/output channel selection in Settings
5. Try toggling the audio engine off and on (leave and re-enter the app)

### 12.3.2 High Latency / Crackling

1. Reduce buffer size in Settings (try 64 or 128 samples)
2. Lower the sample rate to 48 kHz if using 96 kHz
3. Close background apps that may be using audio
4. Restart the app to reset the audio session
5. On older devices, reduce the number of active effects

### 12.3.3 NAM Model Won't Load

1. Verify the .nam file is a valid NAM model (not corrupted during transfer)
2. Check that the file is in the correct format (JSON-based NAM format)
3. Try re-importing the model via the Files app
4. Some very large models may require more memory — try closing other apps

### 12.3.4 Preset Shows “Missing Files”

When a preset references a NAM model or IR file that has been moved or deleted:

1. Re-import the missing file
2. Or save a new preset with an updated file reference
3. Ampz will suggest alternative files with similar names if available

### 12.3.5 MIDI Controller Not Detected

1. Ensure MIDI is enabled in Settings
2. For USB MIDI: check the Lightning/USB-C adapter connection
3. For Bluetooth MIDI: verify Bluetooth is enabled and the controller is in pairing mode
4. Try disconnecting and reconnecting the MIDI device

**Ampz User Manual**  
Version 1.0 — March 2026

Developed by LNH Enterprises LLC

NAM Technology powered by NeuralAudio

For support and updates, visit the Ampz website.

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