

BLEVINS AUDIO

CRUMBLE

BOUTIQUE OVERDRIVE AMPLIFIER · PEDALS · STUDIO · AU · VST3

User Manual



WELCOME

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SECTION 1

Introduction

Crumble is a guitar amplifier plug-in in the tradition of the great hand-built American boutique overdrive amps: a thick, creamy, singing lead tone that stays clear and articulate and responds to every change in your picking, and a clean channel with real depth and sparkle.

It's built to be played live. At the Normal quality setting the whole amp adds about 0.06 ms of delay, so you can monitor through it in your recording app the way you'd play through a real amp.

Inside Crumble

- **A strobe tuner** that mutes the output while you tune.
- **A pedalboard** with six slots in front of the amp. Any of nineteen pedals can go in any slot, and you can drag pedals to change their order: boosts, overdrives, distortion, fuzz, compressors, a volume swell, an envelope filter, a graphic EQ, chorus, phaser, vibe, tremolo, a polyphonic octave, a delay and a tape echo.
- **A complete preamp** with two inputs (NORM and FET), Volume with a Bright switch, Deep and Rock/Jazz voicing, a Treble/Middle/Bass tone stack calculated from the real circuit, and the P.A.B. pre-amp boost.
- **A switchable overdrive section** with two extra cascaded tube stages, controlled by Level and Ratio.
- **A tube-driven spring reverb** ahead of the Master, with full control of the tank on the rear panel.
- **A power amp** with Master, Presence and natural power-supply sag.
- **Dual Amp:** add a second, completely independent amp and pan the two across the stereo field.
- **A studio strip:** quality switch, input trim, noise gate, cabinet (or your own impulse response), panning, a room reverb, output level and a Program EQ.
- **An opto leveler**, the **SD-2 studio delay** and the **SV-1 studio reverb**.
- **BOZEMAN** (new): a dual reverb module with twelve reverb types in each engine, plus Infinite and Freeze.
- Bypass switches on every module, factory presets in your recording app's preset menu, and a resizable window.

New in version 1.6

- **Quality switch** (NORMAL / HQ / HQ BOUNCE) on the studio strip. See *Quality: Normal, HQ and HQ Bounce*.
- **Nine new pedals:** Minotaur, Swirl, Cluck, Vermin, Bayou, Throb, Bloom, Contour and Oktave. The pedal menu is now grouped by type, with a short description of each pedal.
- **Drag to reorder:** drag a pedal by its body to move it along the board. Its settings move with it.
- **Midhump** has an 808 / TS9 / TS10 voicing switch, and **Echoes** has a FILTER knob that darkens the repeats.
- **USER IR** replaces DI on the cabinet selector: load your own cabinet impulse response. With one amp, the studio strip now shows a single, larger cabinet selector.
- **Program EQ** on the studio strip, in the style of the classic passive tube program equalisers.
- **1.6.1:** the octave pedal is now Oktave, a polyphonic octave that tracks chords. Sessions with the earlier octave pedal load Oktave in its place.
- Everything new starts switched off, so existing sessions and presets sound exactly as they did.

SECTION 2

Installing Crumble

Crumble comes as a standard Mac installer. It installs two versions of the plug-in, so it works in almost any recording app:

- **Audio Unit (AU)** for Logic Pro, GarageBand, MainStage and other AU hosts.
- **VST3** for most other recording apps that load VST3 plug-ins.

What you need

- A Mac running macOS 11 or later (Apple silicon or Intel; it runs natively on both).
- A 64-bit AU or VST3 host.

Install

- 1 Quit your recording app.
- 2 Double-click the installer (.pkg) and follow the steps. Click **Customize** if you only want some of the plug-ins.
- 3 Open your recording app. If Crumble doesn't appear, ask the app to rescan its plug-ins.
- 4 **Logic Pro:** on a guitar track's Audio FX slot, choose **Audio Units** › **Blevins Audio** › **Crumble**. **Other apps:** look in the VST3 list under **Blevins Audio**.

If something goes wrong

Problem	What to do
Crumble doesn't appear in Logic	In Logic, open Settings › Plug-in Manager , find Crumble, and click Reset & Rescan Selection .
Crumble doesn't appear in another app	Make sure the app is scanning /Library/Audio/Plug-Ins/VST3 , then rescan its plug-ins.

PLUG-IN LOCATIONS

The installer puts the Audio Unit in **/Library/Audio/Plug-Ins/Components** and the VST3 in **/Library/Audio/Plug-Ins/VST3**. To uninstall, delete **Crumble.component** and **Crumble.vst3** from those two folders.

SECTION 3

Quick start

Getting a great sound takes about a minute:

- 1 Plug in.** Connect your guitar to your audio interface's instrument (Hi-Z) input. Create an audio track for that input, turn on input monitoring, and add Crumble to the first effect slot.
- 2 Set the interface gain.** Strum hard and set your interface so its meter peaks around -12 dBFS. Leave Crumble's Input at 0 dB for now.
- 3 Tune up.** Press PEDALS and click the Strobe tuner's footswitch. Crumble goes silent while you tune. Click it again when you're done.
- 4 Start from the defaults.** Press AMP. Crumble loads with the overdrive on and every knob at a musical middle setting, into the 2x12 Open 12L cabinet with a touch of room.
- 5 Find your gain.** Use Level to set how much overdrive you want and Ratio to set how loud it is. Flip Overdrive off to hear the clean channel, and use Volume to set its edge.
- 6 Shape it.** Adjust Treble, Middle and Bass. Try the Rock/Jazz and Deep switches; they change the character more than any knob.
- 7 Place it.** Choose a cabinet on the studio strip, add some spring Reverb, then use Room Mix to put the amp in a space.
- 8 Polish it.** Press COMP, switch the opto leveler in and raise Peak Reduction until the meter shows 2–4 dB of gain reduction. Then try a little SD-2 delay (DELAY), SV-1 reverb (VERB) or BOZEMAN.

PLAYING LIVE

For the most immediate feel, set your recording app's buffer to 64 or 128 samples and leave the quality switch on NORMAL or HQ BOUNCE while you play.

SECTION 4

The window



The studio strip at the top, the module buttons, and the amp.

The studio strip is always at the top. Under it is a row of lighted push buttons: **PEDALS · AMP · COMP · DELAY · VERB · BOZEMAN**. Press one and that module appears below; the window resizes to fit it. Crumble remembers which module you had open, and the window size, with your project.

Bypass switches

Every module can be taken out of the chain while the sound keeps flowing through the rest. Bypassed panels are shaded so you can see at a glance what's out.

- **AMP BYPASS** (at the top of each amp, next to REAR PANEL) skips the whole amp, including its spring reverb. You hear the pedalboard going straight into the studio strip, so it's much quieter: that's your guitar's own level.
- **BYPASS** on the studio strip takes out the input trim, gate, cabinets, room and output.
- The opto leveler, SD-2 and SV-1 each have an IN / OUT switch; BOZEMAN has an ON switch; the Program EQ has IN.

Resizing

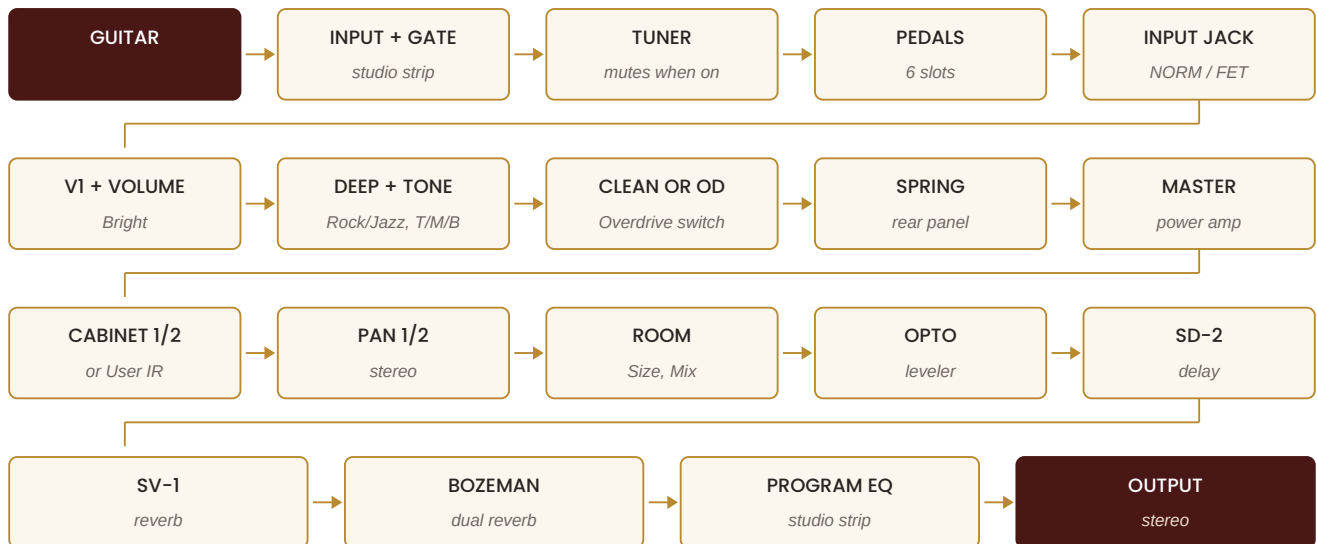
Drag the bottom-right corner to make Crumble any size you like. It keeps its proportions.

SECTION 5

Signal flow

Your guitar passes through Crumble in the same order as through a real amp, then into a speaker cabinet and a room. Anything early in the chain changes how hard later stages are driven.

From the input jack to the power amp: 4x oversampling, or 16x in HQ



- Volume and the input jack set how hard the second stage and the tone stack are hit.
- The tone stack comes before the overdrive. EQ changes what gets distorted, not just the final tone, so Middle and Bass have a big effect on how the overdrive feels. P.A.B. bypasses the tone stack.
- The spring reverb comes before the Master, so turning up the Master pushes the reverb into the power tubes too.
- With Dual Amp on, the pedalboard feeds both amps; each amp has its own cabinet and pan position.
- The cabinet, room, studio units and Program EQ come last. They shape what you hear but never change how the amp responds to your playing.

SECTION 6

Quality: Normal, HQ and HQ Bounce



The QUALITY buttons are at the top right of the studio strip.

The three QUALITY buttons choose how much Crumble oversamples the amp and pedals. Oversampling runs the distortion at a higher internal sample rate, so the harmonics it creates don't fold back as harsh, unrelated tones (aliasing). It matters most on high notes driven hard.

Setting	What it does	When to use it
NORMAL	4x oversampling, exactly as earlier versions. About 0.06 ms of delay.	Playing live and tracking; lowest CPU
HQ	16x oversampling: about 24 dB less aliasing on hard-driven high notes. Roughly four times the CPU for the amp and pedals, and one sample more delay.	Mixing a part with lots of high, saturated lead lines
HQ BOUNCE	NORMAL while you play; HQ automatically when you bounce or export	Best of both: light on CPU while you work, highest quality in the final file

- HQ BOUNCE always reports the HQ delay to your recording app, so the bounced file lines up perfectly.

WHICH ONE SHOULD I USE?

Leave Crumble on HQ BOUNCE. You play through the lighter Normal setting, and every bounce or export is made at HQ without you having to remember. The setting is saved with your project.

SECTION 7

The pedalboard



Oktave, Minotaur, Midhump, Swirl, Throb and Echoes on the board.

Six pedal slots sit between the tuner and the amp's input, wired left to right. Any pedal can go in any slot. Click a pedal's footswitch to switch it on; its LED lights. Drag a knob to turn it (its value pops up while you drag), and double-click to reset it.

The strobe tuner

The Strobe tuner is always first on the board. Click its footswitch to tune; the output is muted while it's on, so you can tune silently mid-song. The display shows the note and how many cents sharp or flat you are. The strobe stripes drift left when you're flat, right when you're sharp, and stand still (and turn green) when you're in tune. **CAL** sets the reference pitch from A = 430 to 450 Hz (default 440).

Choosing a pedal

Click the menu under a slot and pick a pedal. The menu is grouped into Drive, Dynamics, Filter and EQ, Modulation, Pitch and Delay, with a short description after each name. The new pedal starts at its own default settings, and the swap fades smoothly so there's no click. Choose **Empty Slot** to leave a slot open. You can use the same pedal more than once.

The default board is Lift, Midhump, Halo, Shimmy, Echoes and Wobble, all switched off.

Moving pedals

Drag a pedal by its body (not a knob or the footswitch) to the left or right. The other pedals slide over to make room, and the pedal keeps all its settings in its new position. Order matters: a compressor before a drive evens out what the drive sees, Sweep before a drive sounds synthy, and Oktave tracks best first in line.

Tempo sync (Echoes and Spool)

Echoes and Spool each have a small SYNC button. With it on, Time steps through note values (from 1/32 triplet up to a whole note, including dotted and triplet values) and follows your project's tempo (120 BPM in the standalone app). The current time or note value is shown above the knob. Switch either delay off and its echoes ring out naturally.

SECTION 8

Pedal guide

Knob values are 0–10 like the real pedals. Pedals marked **new** arrived in version 1.6.

Drive

Pedal	Style	Controls	What it's for
Lift	Clean boost	Boost (0 to +20 dB), BRIGHT	Pushes the amp harder without changing its voice. BRIGHT adds sparkle for darker guitars.
Halo	Transparent overdrive, clean blended with the drive	Gain, Treble, Output	Low Gain gives a fat, clean boost; higher Gain blends in smooth, open overdrive.
Minotaur new	Germanium-diode overdrive in the style of the gold boutique classic	Gain, Treble, Output	Low Gain is a clean boost with a little hair; high Gain is warm, mid-forward overdrive with some clean always underneath.
Midhump	Mid-hump overdrive with a vocal midrange push	Drive, Tone, Level, 808 / TS9 / TS10	Classic in front of an already-driven amp: Drive low, Level high. 808 is the original sound; TS9 is brighter and edgier; TS10 is smoother and tighter, with a slightly more compressed feel.
Bayou new	Blues overdrive, in the style of the blue amp-in-a-box pedals	Level, Tone, Gain	Amp-like breakup that sags and breathes, and cleans up when you pick softly or roll back your guitar's volume.
Vermin new	Op-amp distortion in the style of the classic black box	Dist, Filter, Volume	From gritty overdrive to thick, compressed distortion. Filter goes from bright to dark.
Sizzle	Two-stage fuzz	Fuzz, Tone, Volume	From gritty and splattery to thick, saturated sustain. Tone goes dark to cutting.

Dynamics

Pedal	Style	Controls	What it's for
Squeeze	The COMP module's optical compressor as a pedal	Squeeze, Gain, Mix, LIMIT	Even out picking, add sustain. Mix below 10 blends in the dry signal (parallel compression).
Cluck new	Squash compressor in the style of the red country classic	Output, Sens	The snappy pick attack, then the squish, then long sustain. Sens sets how hard it squashes.

Pedal	Style	Controls	What it's for
Bloom new	Auto volume swell	Sens, Attack (about 30 ms to 2 s), Mix	Fades each new note or chord in like a volume pedal. Sens sets how hard you pick to retrigger it.

Filter and EQ

Pedal	Style	Controls	What it's for
Sweep	Envelope filter that opens as you dig in	Cutoff, Reso, Env, Drive, 4-POLE	Quack, auto-wah and synth tones. 4-POLE on is steep and vocal; off is gentler.
Contour new	10-band graphic EQ	Ten faders from 31 Hz to 16 kHz (± 12 dB each), Level (± 12 dB)	Shape the guitar before the amp: a mid boost to push a lead, a low cut to tighten a drive. Centred faders leave the sound untouched.

Modulation

Pedal	Style	Controls	What it's for
Shimmy	Warm, analog-style chorus	Rate (0.08–6 Hz), Depth, Mix	Shimmering cleans and wide, watery leads.
Swirl new	Four-stage phaser, orange one-knob style	Speed, SCRIPT	The swirling swoosh on cleans and funky rhythm parts. SCRIPT on is the early, smoother circuit; off is more pronounced.
Throb new	Photocell vibe	Speed, Intens, Volume, VIBRATO	The lopsided, throbbing pulse of the lamp-and-photocell classics. VIBRATO on gives pure pitch wobble.
Wobble	Tremolo	Rate (0.5–12 Hz), Depth, Shape	Low Shape for a vintage amp-style pulse; high Shape for a stuttering, chopped effect.

Pitch and delay

Pedal	Style	Controls	What it's for
Oktave new	Polyphonic octave down	Direct, Oct 1, Oct 2	Adds one (Oct 1) and two (Oct 2) octaves below. Tracks chords and bends cleanly. Direct is your original signal.
Echoes	Delay with darkening repeats	Time (20–1200 ms), Repeats, Mix, Filter, SYNC	Slapback, rhythmic delays and long ambient trails. Filter is off fully left; turn it up to darken the repeats only.
Spool	Tape echo with wow and flutter	Time (40–1000 ms), Repeats, Mix, Wow, SYNC	Warm, smeared repeats. Wow sets the tape's age; Repeats near the top self-oscillates.

SECTION 9

Pedalboard recipes



Cluck, Bloom, Vermin, Bayou, Contour and Spool.

Sound	Settings
Clean boost into the lead channel	Lift on: Boost 4, BRIGHT on, in front of the amp's drive channel.
Tight, focused lead	Midhump on (808): Drive 2, Tone 5, Level 7, into the drive channel set moderately.
Stacked drives	Minotaur (Gain 3, Output 7) into Bayou (Gain 5, Level 5) into a clean amp turned up just short of breakup.
Country chicken-pickin'	Cluck (Output 6, Sens 6) into the clean channel, with a Spool slapback (Time 110 ms, Repeats 2, Mix 3).
Fuzz lead	Sizzle on: Fuzz 7, Tone 6, Volume 5, into the clean channel.
Seventies rhythm	Swirl on (SCRIPT on, Speed 3) into the amp at edge of breakup.
Throbbing blues-rock lead	Throb (Speed 4, Intens 6) after Vermin (Dist 6, Filter 4), into the clean channel.
Funky quack	Squeeze (Squeeze 6, Gain 4) into Sweep (Cutoff 2, Reso 7, Env 8, Drive 1, 4-POLE on). Clean channel.
Violin swells	Bloom (Sens 5, Attack 6, Mix 10) into Echoes (SYNC 1/4 dotted, Repeats 5, Mix 4); BOZEMAN Hall.
Huge octave riff	Oktave first on the board: Direct 7, Oct 1 7, Oct 2 3, into the drive channel.
Mid-push for solos	Contour: 500 Hz and 1K up 3, 31 and 62 Hz down 4, Level up 2. Switch it on for the solo.
Ambient swell	Echoes on: SYNC, 1/4 dotted, Repeats 6, Mix 4; SV-1 in, Shimmer, Decay 8 s, Mix 35%.
Surf tremolo	Wobble on: Rate 6 Hz, Depth 7, Shape 2; spring Reverb 5 on the amp.

SECTION 10

The amp face

Drag a knob up and down to turn it; its value pops up while you drag. Double-click a knob to return it to its default. Click a toggle to flip it.

Control	What it does
NORM / FET inputs	Click a jack to plug in. FET adds a clean JFET boost (about +6 dB, a little more sparkle) before the first tube.
Volume	First-stage volume: your main gain on the clean channel, and how hard the overdrive stages are hit.
Bright	Treble boost around the Volume control. Strongest at low Volume; fades out as Volume goes up.
Deep	Lets more low-mid body through to the tone stack. Thicker and warmer when on.
Rock / Jazz	Tone-stack voicing. Rock has a gentle mid scoop. Jazz is flatter and more open.
Treble, Middle, Bass	Passive tone stack. The controls interact like the real circuit: turning Middle down also makes Treble and Bass sound bigger.
P.A.B.	Pre-amp boost. Bypasses the tone stack completely for a flatter, hotter signal (Treble, Middle and Bass stop working while it's on).
Overdrive	Switches between the clean channel (off) and the overdrive channel (on).
Level	Drive into the two overdrive stages. Low settings are tighter and more upper-mid; higher settings get fuller, thicker and more compressed.
Ratio	Output level of the overdrive section. Use it to balance the lead against the clean channel.
Reverb	Spring reverb level.
Master	Power-amp level. Higher settings bring in output-tube compression and sag.
Presence	Upper treble and bite from the power amp's feedback loop.
Standby / Play	Standby mutes the amp and dims the power lamp; Play is normal operation.
REAR PANEL, AMP BYPASS, DUAL AMP	Turn the amp around to the spring controls, bypass the amp, or add a second amp.

SECTION 11

The switches in depth

Bright

A small capacitor across the Volume control lets treble skip past it. When Volume is low, most of your signal is turned down but the treble isn't, so the sound gets much brighter. As Volume goes up, the difference disappears, and at full Volume Bright does almost nothing. Use it to add sparkle to a quiet clean sound, and leave it off when the Volume is high or the overdrive is on.

Deep

With Deep off, the coupling network ahead of the tone stack trims some low-mids (about 6 dB below roughly 400 Hz). Turning Deep on lets that body through. On a clean sound it adds warmth; into the overdrive it makes the distortion thicker and heavier. With humbuckers, try it off; with single coils, try it on.

Rock / Jazz

Changes a resistor in the tone stack. Rock gives a mild mid scoop, which sounds fuller and rounder. Jazz keeps the response almost flat, so it sounds more open, more even and more "hi-fi." It's the bigger tonal switch of the two, so try both on every sound.

P.A.B.

Bypasses the tone stack entirely. A passive tone stack always loses level, so taking it out of the circuit makes the signal both flatter and hotter, which pushes the overdrive harder. Treble, Middle and Bass have no effect while P.A.B. is on.

Overdrive

Selects which path reaches the power amp: the clean recovery stage (off) or the two extra cascaded overdrive stages (on). Switching is smooth, so you can automate it to move from rhythm to lead mid-song.

NORM / FET input

Not a switch on the panel, but it works like one: click the jack you want to use. The FET input is a clean solid-state booster ahead of the first tube. It's great for single coils, or for an extra push into the overdrive without changing your other settings.

SECTION 12

The overdrive section

The overdrive channel adds two tube stages in series after the tone stack. Two knobs control it, and they do very different jobs:

Knob	Controls	Think of it as
Level	How hard the two overdrive stages are driven, and how full they sound	Gain: how much distortion
Ratio	How loud the overdrive channel is afterwards	Channel volume: how loud the lead is

How Level changes the character

At low Level settings, the overdrive stages cut some low end so the distortion stays tight, focused and upper-mid forward, good for rhythm parts and edge-of-breakup tones. As you turn Level up, more low-mids come through and the distortion becomes thicker, smoother and more compressed: the long, singing sustain these amps are known for.

Gain comes from several places

- **Volume:** the front-end level.
- **FET input and P.A.B.:** both add level before the overdrive.
- **Middle, Bass and Deep:** more low-mids into the overdrive means a thicker, heavier distortion.
- **Level:** the overdrive's own drive.
- **The pedals:** drive and boost pedals (Lift, Halo, Minotaur, Midhump, Bayou, Vermin, Sizzle) push the input harder.

THE CLASSIC APPROACH

Keep Level moderate (4–6) and let your guitar's volume knob do the work. These amps clean up beautifully when you roll back the guitar's volume, and Crumble does too: one setting can cover rhythm and lead.

BALANCING CLEAN AND LEAD

Set your clean sound first with Overdrive off. Then switch Overdrive on and use Ratio, not Master, to match or exceed the clean level. Master changes both channels.

SECTION 13

Reverb, Master, Presence and Standby

Reverb

A three-spring, tube-driven tank, fed from the preamp and mixed back in before the Master, so higher Master settings drive the reverb into the power tubes along with your dry sound. The front-panel Reverb knob sets how much you hear: 1–3 gives subtle depth, and 5 and above gives an obvious spring sound. The tank's own character is set on the rear panel.

Master

Sets the level into the power amp. Low settings keep the power amp clean and tight. As you turn it up, the output tubes start to compress and the power supply “sags” on hard picking, which softens the attack and makes notes bloom. Use the Output knob on the studio strip, not Master, to set the level going into your recording app.

Presence

Adds or removes upper treble (around 4 kHz and above) from the power amp. Lower settings are rounder and warmer; higher settings add bite and help a lead cut through a band. Presence affects both channels.

Standby / Play

Standby mutes the amp without bypassing the plug-in, just like the standby switch on a tube amp. The power lamp dims and the faceplate darkens slightly.

SECTION 14

The rear panel: spring reverb



Click **REAR PANEL** at the top of the amp to turn it around. The back of the chassis holds the control plate for the built-in three-spring reverb. Click **FRONT PANEL** to go back. Everything on the rear panel is saved with your project and can be automated.

Control	Range (default)	What it does
Dwell	0–10 (3.5)	How hard the tank is driven. More Dwell gives a denser, more saturated, more compressed reverb; less is cleaner and more transparent.
Decay	0.5–6 s (2.0 s)	How long the springs ring after you stop playing.
Tension	0–10 (4)	Spring tension. High settings are tighter and brighter, with shorter chirps; low settings are looser and longer, with more “boing.”
Tone	0–10 (3.5)	Brightness of the reverb return. Lower settings sit the reverb further behind the guitar.
Splash	0–10 (3)	How much pick attack reaches the springs. Low settings soften hard transients so the tank doesn't “crash”; 10 gives the full vintage splash and drip.

TAMING THE SPLASH

If the reverb crashes when you dig in, lower Splash first, then Tone. For a lush, smooth tail behind a lead, try Dwell 3, Decay 2.5 s, Tension 4, Tone 3, Splash 2. For a vintage surf-style drip, try Dwell 6, Decay 3 s, Tension 3, Tone 7, Splash 10.

SECTION 15

Dual Amp

Press **DUAL AMP** on the amp to add a complete second amp. It appears stacked under the first, labelled AMP 2. Both amps are fed by the pedalboard and are completely independent: every knob and switch, the rear-panel spring controls, standby and bypass.



With Dual Amp on, the studio strip shows a cabinet and pan for each amp.

- On the studio strip, the single cabinet selector splits into **CABINET 1** and **CABINET 2**, each with its own **PAN** knob.
- When both amps are on, each is turned down 3 dB so switching the second amp in doesn't make a big jump in level.
- With a single amp and Pan at centre, Crumble sounds exactly as it always has.
- Dual Amp uses about twice the processing of one amp.

TRY THIS

Amp 1 clean (Overdrive off, Jazz) panned left into the 1x12 Open; Amp 2 with Overdrive on, Rock, panned right into the 2x12 Open 65W. Play one part and hear it spread across the speakers.

SECTION 16

The studio strip

The panel at the top of the window holds the things a real amp doesn't have: the parts of your studio around it.

Control	Range	What it does
QUALITY	Normal, HQ, HQ Bounce	How much the amp and pedals are oversampled. See <i>Quality: Normal, HQ and HQ Bounce</i> .
Input	−12 to +12 dB	Trims your guitar level before the amp. Raise it for quiet pickups, lower it for hot active pickups.
Gate	Off, −90 to −30 dB	Noise gate before the amp. Turn it up until hum and hiss disappear between notes, then back off slightly so sustain isn't cut short.
Cabinet	4 cabinets + User IR	Chooses the speaker cabinet. Turn the selector or click a name. With Dual Amp on there is one per amp.
Pan	Left to right	Where each amp sits in the stereo field.
Room Size	0–100%	Size of the room reverb, from a small booth to a large live room. Larger rooms also decay longer.
Room Mix	0–100%	How much room sound is blended in. 10–20% places the amp naturally; higher settings give an obvious ambient sound.
Output	−24 to +12 dB	Final level into your recording app. Use this to match the bypassed level or to leave headroom.
BYPASS	on / off	Takes the input trim, gate, cabinets, room and output out of the chain.
EQ	open / close	Opens the Program EQ panel along the bottom of the strip.

SECTION 17

Cabinets and your own impulse responses

Each cabinet is modelled after the speaker and cabinet types most often paired with this style of amp. Open-back cabinets include the sound reflecting off the wall behind the cabinet, which gives them an airy, three-dimensional quality. The closed-back cabinet is tighter and punchier.

Cabinet	In the style of	Sound	Try it for
1x12 Open	Oval open-back 1x12 with a heavy-magnet 12-inch speaker	Wide, airy, smooth top end	Clean jazz and fusion, low-volume intimacy
2x12 Open 12L (default)	Open-back 2x12 with heavy-magnet 12-inch speakers	Full, even, big low-mids, very smooth highs	The all-round classic; singing leads
2x12 Open 65W	Open-back 2x12 with British-voiced 65-watt speakers	Midrange bark and presence	Blues, crunch, leads that need to cut
4x12 Closed	Closed-back 4x12 with heavy-magnet speakers	Tight, thumpy, focused low end	Heavier overdrive, rock rhythm
User IR	Your own impulse response	Whatever you load	Your favourite cabinet captures

Loading an impulse response

- 1 Turn the cabinet selector to **USER IR**. A **LOAD IR...** button appears.
- 2 Click it and choose a WAV or AIFF cabinet impulse response (up to 1 second long).
- 3 The file name appears on the panel. Click the clear button next to it to unload the file.

- Impulse responses are level-matched to the built-in cabinets and add no delay.
- The impulse response is saved inside your project and presets, so it travels with them even if the original file moves.
- With no file loaded, USER IR passes the raw amp sound with no cabinet, for your own loader after Crumble.
- Sessions that used DI in earlier versions load as USER IR with no file, and sound the same.

SECTION 18

The Program EQ



Click EQ on the studio strip to open the Program EQ.

A broad, musical equaliser in the style of the classic passive tube program equalisers, near the very end of the chain (after BOZEMAN, before Output). Click **EQ** on the studio strip to open it and **IN** to switch it on. It's out by default, and every knob at 0 leaves the sound untouched.

Section	Control	Range (default)	What it does
Low frequency	Low Freq	20, 30, 60, 100 Hz (30)	Chooses the low frequency for both Boost and Atten.
	Boost	0–10 (0)	A broad shelf boost of the lows.
	Atten	0–10 (0)	A cut just above the boost frequency.
High frequency boost	High Freq	3, 4, 5, 8, 10, 12, 16 kHz (10 kHz)	Centre of the high boost.
	Boost	0–10 (0)	How much the highs are lifted.
	Bandwidth	0–10 (5)	Width of the boost: low is a narrow peak, high is broad and airy.
High atten	Atten Sel	5, 10, 20 kHz (10 kHz)	Frequency of the high shelf cut.
	Atten	0–10 (0)	How much the top is shelved down.

THE CLASSIC LOW-END TRICK

Turn up Boost and Atten together at 60 or 100 Hz. The boost lifts the deep lows while the cut just above it clears out mud, for a big but tight bottom end.

- **Airy top:** High Freq 12 kHz, Boost 3, Bandwidth 7, Atten Sel 20 kHz, Atten 2.
- **Tame fizz:** Atten Sel 5 or 10 kHz, Atten 2–4.

SECTION 19

The opto leveler



A leveling amplifier in the style of the vintage optical tube compressors heard on countless guitar, bass and vocal recordings. Instead of a fast electronic detector, an optical compressor uses a light and a light-sensitive cell, which gives it a famously smooth, musical response. Press COMP to see it.

Control	What it does
In / Out	Switches the leveler in. It's out by default, so it never changes your sound until you switch it in.
Meter and meter switch	GR shows gain reduction (how much the leveler is turning you down); OUT shows output level (0 VU $\approx$ -18 dBFS).
Peak Reduction	How much compression. Turn it up until the meter shows the amount of gain reduction you want.
Gain	Make-up gain through the tube output stage (-12 to +24 dB). High settings add a little tube warmth.
Comp / Limit	Comp is gentle, roughly 3:1. Limit is firmer (about 12:1) and holds peaks more tightly.
HF Emphasis	Makes the leveler react more to treble. Turn it up to tame bright pick attack and harsh peaks without dulling the overall tone.
Mix	Blends the compressed and uncompressed sound (parallel compression). Lower settings keep your pick attack while still adding sustain and body.

How it behaves

The attack is soft (about 10 ms), so some of your pick attack always gets through. When you stop playing hard, the first part of the release is quick, and the rest lets go slowly over a second or more. The harder and longer it has been working, the longer it takes to recover.

Use	Peak Red.	Mode	HF Emph.	Mix	Aim for
Gentle polish	30–40	Comp	0	100%	1–3 dB GR
Sustaining lead	50–65	Comp	2	100%	4–6 dB GR
Clean funk / chords	45–55	Limit	4	60%	3–5 dB GR
Squashed parallel	80–100	Limit	3	35–50%	8+ dB GR

SECTION 20

The SD-2 studio delay



A stereo delay in a rack unit, after the opto leveler, with much more control than the Echoes pedal. Press DELAY to see it.

Control	What it does
In / Out	Switches the SD-2 in. It starts with an empty buffer each time.
Style	Digital: clean, exact repeats. Tape: wow and flutter, gentle saturation and softened highs that darken with each repeat. Analog: darker, warmer repeats with a little chorus. Diffuse: repeats that smear toward a reverb.
Routing	Stereo: left and right delays fed by their own channels. Ping-Pong: repeats bounce between left and right. Dual: both sides hear the guitar, each at its own time, for a wide double-tracked sound.
Time L / Time R	1 ms to 2 s each. With SYNC on they become note values that follow the project tempo (shown in the display).
Feedback	Number of repeats, up to near-infinite.
Low Cut / High Cut	Filters inside the feedback loop, so each repeat gets thinner or darker.
Mod Rate / Mod Depth	Gentle pitch movement on the repeats, for chorus-like width.
Drive	Saturates the repeats; they get grittier the harder they hit.
Duck	Turns the repeats down while you're playing and lets them bloom when you stop, so delay never clutters a part.
Width	Mono (0%) to full stereo (100%).
Mix	Blend of dry and delayed signal.

SECTION 21

The SV-1 studio reverb



A stereo studio reverb in a rack unit, after the SD-2. It's for big, lush spaces: halls, plates and shimmering ambient tails. Press VERB to see it. It starts switched out; the green LED lights when it's in.

Control	Range (default)	What it does
Pre-Delay	0–250 ms (20)	Gap before the reverb starts. 20–60 ms keeps your notes clear in front of the tail.
Size	0–100% (60)	Size of the space.
Decay	0.2–20 s (2.5)	How long the tail lasts. In Shimmer mode, the tail is capped at about 7 s so it can never run away.
Diffusion	0–100% (70)	Density. Low settings let individual reflections through; high settings give a smooth wash.
Damping	0–100% (40)	How much faster the high frequencies die away. Higher is darker and more natural.
Low Cut	20–600 Hz (80)	Removes low end from the reverb so it doesn't muddy the guitar.
High Cut	1–20 kHz (9k)	Removes top end from the reverb for a warmer, vintage sound.
Mod Rate	0.05–5 Hz (0.6)	Speed of the gentle movement inside the tail.
Mod Depth	0–100% (40)	Amount of movement. Adds lushness and a subtle chorus to long tails.
Width	0–150% (100)	Stereo width of the reverb, from mono to extra-wide.
Mix	0–100% (25)	Balance of dry signal and reverb.

Algorithm	Character	Try it for
Hall	Big, smooth concert hall with gentle early reflections	Lead lines, ballads, anything that needs depth
Plate	Dense, bright, instantly smooth, like a studio plate	Clean chords, funk, shimmer on single notes
Chamber	Warmer, with more early reflections: a live echo room	Natural ambience, rhythm parts, blues
Shimmer	Hall with an octave-up halo that blooms above the notes	Swells, ambient pads, volume-knob textures

SECTION 22

BOZEMAN dual reverb



Engine A on top, engine B below.

BOZEMAN is a reverb module with two complete reverb engines, A and B, each able to run any of twelve reverb types. It sits after the SV-1 and before the Program EQ, so you can use it alongside the SV-1 or instead of it. It's off when you first open Crumble.

The top bar

Control	What it does
ON	Switches BOZEMAN in. When you switch it off, the tail already in the air rings out naturally.
ROUTING	Parallel: A and B each hear the guitar and are mixed together. Series: A feeds B, so B reverberates A's tail (try Swell into Hall, or Magneto into Cloud).
HOLD	Off: normal. Infinite: the tail never dies away, and keeps taking in what you play, so you can build up layers. Freeze: holds the current tail forever and stops listening, so you can play over a frozen pad.
TEMPO SYNC	Pre-Delay (and Magneto's echo time) becomes a note value that follows your project's tempo.
MIX	Balance of dry signal and BOZEMAN (default 35%).
B ON	Switches engine B on. With it off, only engine A runs.

TRY THIS

Parallel; A = Room (Decay 20%, Size 40%) for body, B = Shimmer +Oct (Decay 70%, Amount 40%, Level -8 dB) for a halo, Mix 30%. Hit Freeze at the end of a chord and solo over it.

SECTION 23

BOZEMAN engines and types

Each engine has the same controls. Click the type display to choose from a menu, or step with the arrows; changing type crossfades so it never clicks.

Control	Range (default)	What it does
Decay	0–100% (50%)	Length of the tail; the time shown depends on the type (0.3–20 s for Hall).
Pre-Delay	0–1000 ms (A 20, B 40)	Gap before the reverb starts. On Magneto it sets the echo time.
Tone	Dark – FLAT – bright	Overall colour of the reverb; centre is flat.
Mod	0–100% (30%)	Movement inside the tail, for lushness and chorus.
Two type knobs	0–100%	Names change with the type (see below).
Level	–24 to +6 dB (0)	Level of this engine.
Pan	Left to right (centre)	Where this engine's reverb sits.

Type	Type knobs	Character
Room	Size, Early	A natural room, booth to live room; Early sets the early reflections.
Hall	Size, Low End	A big, smooth hall; Low End sets how long the lows ring.
Plate	Size, Low End	A dense, bright studio plate.
Spring	Tension, Dwell	A three-spring tank, from tight and bright to loose and boingy.
Swell	Rise, Mode	Fades in behind every note. Mode REVERSE swells the dry note too (Mix 100% for backwards swells).
Bloom	Length, Feedback	The tail keeps growing after each note, and re-blooms with Feedback.
Cloud	Size, Diffuse	A huge, soft, endless ambient wash.
Chorale	Vowel, Reso	A hall with a gliding, choir-like vowel; play harder and it opens up.
Shimmer	Voices, Amount	Pitch-shifted voices climb in the tail; Voices picks one of eight intervals (+Oct, +5th, –Oct and more).
Magneto	Heads, Repeats	Tape-loop echo with one to four heads and wow, diffused into a reverb.
Nonlinear	Shape, Diffuse	Gated and reverse effects: Reverse, Swoosh, Ramp or Gate; Decay is the length.
Reflections	Position, Distance	Places your guitar in a room: left to right, near to far.

SECTION 24

Factory presets and starting points

Open the preset menu at the top of the plug-in window in your recording app. **Crumble Default** returns every control to its starting position. Each factory preset sets every control on the amp, pedals, rear panel and studio units, so nothing carries over from what you had before.

SAVING YOUR SOUNDS

Every control, including pedal order and loaded impulse responses, is saved with your project and in your recording app's presets, and every knob and switch can be automated.

Steak & Potatoes — The meat-and-potatoes clean: clean channel in Jazz, scooped mids, a little spring reverb, and the opto leveler smoothing it all out. Pedals off.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
4.3	5.2	1.8	2.8	4.6	4	2.1	7.2	5.2

Switches: NORM · Bright off · Deep off · Jazz · PAB off · Overdrive OFF · 2x12 Open 12L · Opto IN

Americana Anna — Steak & Potatoes with the Midhump pedal on for grit and Echoes set to a short slapback.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
4.3	5.2	1.8	2.8	4.6	4	2.1	7.2	5.2

Switches: NORM · Midhump ON · Echoes ON (96 ms) · Jazz · PAB off · Overdrive OFF · 2x12 Open 12L · Opto IN

Use Your Volume Knob — The overdrive channel set right at the edge, so your guitar's volume knob takes you from clean to singing lead. Rock voicing, dry amp, short room.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
4.9	4	4.5	2.8	4.6	5.8	0	7.2	3.6

Switches: NORM · Bright off · Deep off · Rock · PAB off · Overdrive ON · 2x12 Open 12L · Opto IN

Wong Way — A tight, punchy clean in Rock voicing with a small room and a bit more leveling. Great for funky rhythm parts.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
4	4	4.5	2.8	4.6	5.8	0	7.2	3.6

Switches: NORM · Bright off · Deep off · Rock · PAB off · Overdrive OFF · 2x12 Open 12L · Opto IN

Starting-point settings

Places to start, not final answers: adjust Volume or Level and the tone controls to suit your guitar.

Warm jazz clean — Neck humbucker, fingers or a light pick.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
4	4	6	4	0	0	3	4	3

Switches: NORM · Bright on · Deep on · Jazz · PAB off · Overdrive OFF · 1x12 Open · Room 15%

Sparkling edge-of-breakup — Single coils; dig in to make it bark, play softly for clean.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
7	6	5	4	0	0	2	6	6

Switches: NORM · Bright off · Deep off · Rock · PAB off · Overdrive OFF · 2x12 Open 65W · Room 12%

Blues crunch — Bridge pickup; roll the guitar volume back to 7 for rhythm.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
5	6	6	4	3.5	5	2	5	5

Switches: NORM · Bright off · Deep off · Rock · PAB off · Overdrive ON · 2x12 Open 65W · Room 15%

Singing sustained lead — Neck humbucker; long notes, light vibrato.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
5	5	7	4	6.5	5.5	2.5	5	4

Switches: FET · Bright off · Deep on · Jazz · PAB off · Overdrive ON · 2x12 Open 12L · Room 18%

Thick fusion lead — Hot and smooth; P.A.B. bypasses the tone knobs and pushes the overdrive.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
6	5	5	5	5	4.5	2	5	3.5

Switches: NORM · Bright off · Deep off · Rock · PAB ON · Overdrive ON · 2x12 Open 12L · Room 20%

Tight rock rhythm — Bridge humbucker, palm mutes.

VOL	TREB	MID	BASS	LEVEL	RATIO	REVERB	MASTER	PRES
5	6	5	3	7	5	0	6	6

Switches: NORM · Bright off · Deep off · Rock · PAB off · Overdrive ON · 4x12 Closed · Room 8%

SECTION 25

Tips and troubleshooting

If you hear...	Try this
Too much distortion, or it sounds fizzy	Lower Level, or lower Volume. Turn off FET, P.A.B. and Deep. Lower Treble or Presence. Check that your interface input isn't clipping. Try HQ.
Not enough distortion	Raise Level, then Volume. Use the FET input or P.A.B. Raise Input on the studio strip if your pickups are quiet.
Muddy or boomy	Turn Deep off, lower Bass, and try Rock instead of Jazz. Switch from the 4x12 Closed to an open-back cabinet.
Thin or harsh	Turn Deep on, lower Presence and Treble, raise Middle. Try the 2x12 Open 12L cabinet.
The lead is quieter or louder than the clean	Adjust Ratio (overdrive channel level), not Master.
Hum and hiss between notes	Turn up the Gate until the noise stops, then back off a little.
Output is too hot	Lower Output on the studio strip, not Master, so the amp's feel doesn't change.
No sound at all	Check that the tuner is off, the amp isn't in Standby, an input jack is plugged in, Master and Output aren't all the way down, and input monitoring is on. With USER IR selected, check the file loaded.
Very quiet sound	Check that AMP BYPASS is off: with the amp bypassed you hear only your guitar's own level.
The spring reverb crashes	On the rear panel, lower Splash, then Tone. Lowering Dwell also helps.
The opto leveler pumps	Lower Peak Reduction, switch to Comp, or lower Mix.
The delay or reverb sounds muddy	Lower Repeats or Mix on Echoes, raise Low Cut on the SD-2 and SV-1, or lower Low End on BOZEMAN's Hall and Plate.
BOZEMAN keeps building up	Hold is on Infinite or Freeze: set it to Off.
A delay between picking and hearing	Lower your recording app's buffer size, and play on NORMAL or HQ BOUNCE.
Crackles	Raise the buffer one step, switch from HQ to HQ BOUNCE, or freeze other tracks. Dual Amp uses about twice the processing of one amp.

SECTION 26

Specifications

Item	Value
Formats	Audio Unit (AU) and VST3 effect; universal binary (Apple silicon and Intel)
Channels	Mono or stereo in (summed to mono, like a guitar amp); stereo out
Processing	4x oversampling (16x in HQ) with minimum-phase, low-latency filters through the pedals and amp stages
Latency	About 3 samples (0.06 ms at 48 kHz) at Normal; one sample more at HQ and HQ Bounce
Tuner	Strobe tuner, mutes while on; reference A = 430–450 Hz
Pedals	Six slots, drag to reorder; nineteen pedals: clean boost, two transparent overdrives, mid-hump overdrive, blues overdrive, distortion, fuzz, two compressors, volume swell, envelope filter, 10-band graphic EQ, chorus, phaser, vibe, tremolo, polyphonic octave, delay and tape echo (both with tempo sync)
Preamp	Two triode stages, Deep coupling network, three-band passive tone stack (Rock/Jazz), clean recovery stage
Overdrive	Two additional cascaded triode stages with Level and Ratio
Reverb	Three-spring reverb, pre-Master, with rear-panel Dwell, Decay, Tension, Tone and Splash; room reverb on the studio strip
Power amp	Push-pull output stage with Presence and supply sag
Dual Amp	Second fully independent amp with its own cabinet and pan position
Cabinets	1x12 Open, 2x12 Open 12L, 2x12 Open 65W, 4x12 Closed, User IR (WAV/AIFF up to 1 s, saved with the project); no added latency
Program EQ	Passive-style low boost and atten (20/30/60/100 Hz), high boost (3–16 kHz) with bandwidth, high atten (5/10/20 kHz)
Opto leveler	Electro-optical model with program-dependent two-stage release, Comp/Limit, HF emphasis, tube make-up and parallel Mix
SD-2 delay	Stereo; Digital, Tape, Analog, Diffuse; Stereo, Ping-Pong, Dual; 1 ms–2 s per side; tempo sync
SV-1 reverb	16-line modulated feedback delay network; Hall, Plate, Chamber, Shimmer; decay 0.2–20 s
BOZEMAN	Two engines, parallel or series; twelve types each; Infinite and Freeze; tempo sync
Presets	Crumble Default plus four factory presets, available from your recording app's preset menu
Requirements	macOS 11 or later; a 64-bit AU or VST3 host

SECTION 27

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