

Desert Moon Audio

DESERT D

DD - 320

Stereo Dimension Chorus · Bucket-Brigade Delay Lines



Four buttons and no knobs on the front. Two bucket-brigade delay lines swept slowly in opposite directions, a compander around each, and an output matrix that puts the effect between the speakers instead of on them: everything gets wider and nothing wobbles. Desert D builds that circuit for real — the delay lines bucket by bucket, the compander stage by stage, the matrix wire by wire — and adds a lower panel of controls, every one of which rests at the front unit's own setting.

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A NOTE ON THE MODEL

Desert D is an original Desert Moon Audio design. The delay lines are true bucket brigades clocked at 40–100 kHz, the compander is a feedback compressor and a feed-forward expander built stage by stage, and each mode button has its own fixed sweep — how far and how fast — from the unit's mode table. Nothing in it is a chorus tuned to sound like one.

1.1 What Gets Installed

FORMAT	LOCATION
Audio Unit	/Library/Audio/Plug-Ins/Components/Desert D.component
VST3	/Library/Audio/Plug-Ins/VST3/Desert D.vst3
AAX	/Library/Application Support/Avid/Audio/Plug-Ins/Desert D.aaxplugin
VST3 (Windows)	C:\Program Files\Common Files\VST3\Desert D.vst3
AAX (Windows)	C:\Program Files\Common Files\Avid\Audio\Plug-Ins\Desert D.aaxplugin

After installing, restart your DAW or rescan its plug-in list. Desert D appears under **Desert Moon Audio**. Stereo tracks run each channel through its own delay line; a mono track feeds both lines and comes out stereo where the host allows it.

2.1 Five Minutes In

Put Desert D on a synth pad, a clean guitar or a stack of backing vocals. Leave everything alone: the box comes up in **Mode 1**. Play.

What you should hear: the sound gets wider and a little deeper, and nothing else changes. No warble, no swirl, no comb-filter sweep. That is the whole idea of this circuit — the two delay lines move so slowly and so little that you never hear pitch, and the output matrix puts the left line's copy into the right channel upside down, so the effect lives in the difference between the speakers and not in either of them. Switch your monitoring to mono: the widening folds away and the dry signal is left almost untouched. That is why it is safe on almost anything.

Each button latches on its own and **OFF** releases them all. Press **OFF**, then try **2**, **3** and **4** one at a time. Two sweeps further and lower; three is quicker and tighter; four is three with the effect turned up 10 dB, the one to reach for when the effect should be heard. Then leave **1** in and press **4** as well: buttons held in together make their own shade, and Desert D allows every combination, all fifteen.

Finally the lower panel. **WIDTH** past 100 stretches the effect beyond the speakers; **DOUBLE** puts a second unit in series; **DIMENSION** at zero turns the matrix off and leaves you an ordinary stereo chorus, so you can hear exactly what the matrix was doing.

2.2 Resizing

Drag the window's corner. The panel keeps its shape and every control scales together; the size is remembered per session. The **PANEL** button at the bottom-right of the rack unit folds the lower panel away when you only want the box on screen.

DEFAULTS

Double-click any knob to return it to its resting position. The host's own bypass control and the **POWER** switch on the panel drive the same parameter, so neither fights the other. The dry path is a straight wire at every oversampling setting: bypass comparisons are sample-aligned.

1.2 The 14-Day Trial

Desert D runs **fully featured for fourteen days** from the first time it loads — every control, every preset, nothing muted and nothing held back. The strip along the bottom edge of the panel — **TRIAL – 14 DAYS** — counts the days down. When the trial ends the plug-in stays in your sessions but passes audio through dry until a license is entered, so a session opened later is never damaged — just dry. Licenses are sold at **desertmoonaudio.com**.

1.3 Entering Your License

Your license key is in the order email: one long line beginning DMA1-. Click that strip, paste the key in and press **Activate**. The first activation on a machine takes one quick internet check, which registers this computer against your key; from then on the plug-in runs fully offline, apart from its once-a-day update check. There is no account and no dongle. One key covers every format — Audio Unit, VST3 and AAX — and is kept in
~/Library/Desert Moon Audio/Desert D/ on macOS.

1.4 Seats and Moving Machines

One key activates **up to four computers you personally own** — a studio desktop, a laptop and a couple of spares. To move to a new machine, open the preset bar's menu on the old one and choose **Deactivate This Machine...**; that hands the seat back at once and returns that copy to trial mode. If the old machine is gone — sold, wiped or dead — write to **info@desertmoonaudio.com** with your order number and the seat is released by hand.

1.5 Updates and Support

Updates are free for as long as you own the plug-in. Desert D checks once a day for a newer version and shows a small notice on the panel when one exists; download the current installer and run it over the top — nothing needs to be uninstalled and your presets stay where they are. Questions, problems or a lost key:
info@desertmoonaudio.com.



- 1 **Preset bar** — step, pick, save, revert, A/B, undo, redo.
- 2 **DOUBLE** — a second unit in series, with its lamp.
- 3 **DIMENSION MODE** — OFF and buttons 1–4, any combination.
- 4 **OUTPUT LEVEL** — ten LEDs, 0 dB at the unit's nominal level.
- 5 **POWER** — the host's bypass, with the pilot lamp.
- 6 **PANEL** — folds the lower panel away.
- 7 **RATE, DEPTH, SHAPE, TIME** — trims on the mode's own LFO.
- 8 **SYNC, DIVISION, WAVE** — tempo lock and LFO wave.
- 9 **LFO window** — both lines' sweep, and where they are now.
- 10 **INPUT STEREO / MONO** — sum the input to mono, or keep it stereo.
- 11 **LEVEL, MIX, DIMENSION, WIDTH** — the output matrix.
- 12 **WET ONLY** — the effect alone, for a send.
- 13 **INPUT, OUTPUT, AUTO GAIN** — levels.
- 14 **AGE, COMPANDER, NOISE** — the circuit.
- 15 **OVERSAMPLING** — 1×, 2× or 4×.

4.1 How the Signal Runs

Each channel: pre-emphasis, compressor, the bucket-brigade delay line with its anti-alias and reconstruction filters, expander, de-emphasis. Then the matrix: each channel's delayed copy is added to its own output and, above about 160 Hz, subtracted from the other's. The dry goes straight through. One oscillator sweeps both lines, one getting longer while the other gets shorter.

4.2 The Bucket Brigade

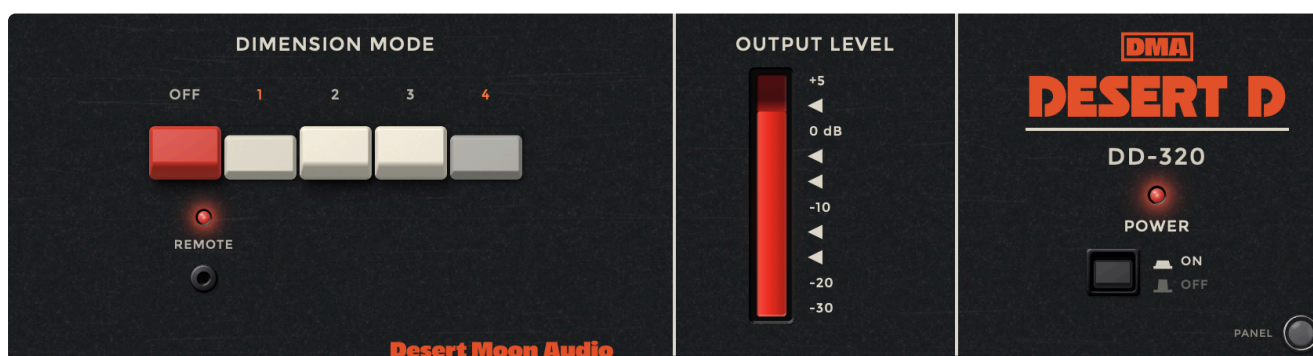
A bucket-brigade device is a row of 1024 capacitors and a two-phase clock. On every clock edge each capacitor hands its charge to the next, so a sample put in at one end comes out 1024 transfers later: the delay is set by the clock, 8 ms at 64 kHz, 12 ms at 43 kHz. Desert D does exactly this — not a smooth interpolated delay line with a filter on it. The buckets are real, the clock runs at 40–100 kHz above the audio rate, and the delay is the time 1024 transfers take at whatever the clock has been doing, so when the LFO speeds the clock up the pitch rises by the same physics as in an analog line. The line has soft headroom and a slightly one-sided bias, the source of the box's faint thickening on loud material. **AGE** narrows the line's bandwidth, tilts the bias and raises its noise.

4.3 The Compander

Bucket brigades are noisy, so Desert D wraps each one in a compander: one half compresses 2:1 (in decibels) going in, the other half expands 1:2 coming out, and the line's hiss is pushed down by the signal's own level. Both halves are modelled stage by stage. The compressor is the feedback type, so a transient after silence gets the full gain for the 2 ms its rectifier needs to catch up; that overshoot, squashed by the line's headroom, is the grit you hear on drums. The expander is feed-forward and tracks what comes out of the line one delay time later, which is why the box breathes the way it does. Switch **COMPANDER** off and the line is cleaner and flatter, and transients pass untouched.

4.4 The Matrix

Add the left line's copy to the left output and subtract it, above 160 Hz, from the right; mirror that for the right line. Summed to mono the top of the effect cancels, leaving the dry plus the wet bass; in stereo the difference between two copies moving opposite ways is the width. That is why the box widens without flanging, survives a mono check, and can modulate so slowly. **DIMENSION** is the amount of that cross-feed; **WIDTH** scales the difference once made.



The mode table: 1 sweeps 8–12 ms on a 4 s LFO, 2 sweeps 5–10 ms at 4 s, 3 and 4 sweep 6–9 ms at 2 s, and 4 lifts the wet from -10 dB to 0 dB. Buttons pressed together put their LFO resistors in parallel.

DIMENSION MODE 18 – 12 ms · 4 s

The subtlest. A long delay swept a little, slowly: width without any sense of movement. Where most sessions leave it.

DIMENSION MODE 25 – 10 ms · 4 s

A shorter delay swept further. Same slow LFO; the copy sits closer to the dry, so the effect is denser and a shade brighter.

DIMENSION MODE 36 – 9 ms · 2 s

Twice the LFO rate, a narrower sweep. The pitch movement is still tiny, but it is quicker, and the width begins to shimmer.

DIMENSION MODE 46 – 9 ms · 2 s · wet 0 dB

Mode 3's sweep with the wet turned up 10 dB, equal to the dry. The big one, and the button most often held in with the others.

COMBINATIONSany of 15

Each button's LFO resistor goes in parallel with the others', so a pair runs faster than either alone and sweeps a little further; any combination with 4 in it takes 4's wet level. 1+4 is a favourite: the long delay at full level. All four is the chewy one.

OFFinterlock

Releases all four buttons. The box passes dry at unity; the delay lines keep running, so re-pressing a button picks the sweep up where it was.

DOUBLEswitch

A second complete unit in series, its LFO a quarter cycle behind the first – the widest sound the unit makes. POWER already handles bypass, so this spot on the panel carries DOUBLE.

OUTPUT LEVEL-20 ... +6 dB

Ten LEDs, calibrated to the unit's nominal level: 0 dB is +4 dBu, which Desert D takes as -18 dBFS. The red pair means the delay line is being pushed into its headroom.

POWERON / OFF

The host's bypass. Every lamp goes out and the signal passes straight through: the input exactly as it arrived, whatever INPUT and OUTPUT are set to, so a bypass comparison is always honest.

INPUT STEREO / MONOlower panel

STEREO feeds each delay line from its own channel. MONO sums both inputs before the unit – mono in, stereo out – and keeps a mono source perfectly centred.



The front panel, running: DOUBLE in, mode 4 down, the meter at the box's nominal level, and the pilot lamp lit.



The additions live below the rack unit.

RATE ×0.25 – ×4

Multiplies the mode's own LFO rate; the centre is the box.

DEPTH 0 – 200 %

Scales the mode's sweep. Zero is a fixed delay — still wide, because the matrix still works — and 200 is more pitch than the front unit alone can make.

SHAPE triangle – trapezoid

The stage that turns the LFO's voltage into clock frequency flattens the triangle's peaks a little. Turned up, they flatten further: the pitch holds at each end and turns over faster.

TIME 50 – 200 %

Scales the mode's centre delay. Shorter is denser and more chorus-like; longer moves toward a doubling.

WAVE TRI · SIN · RMP · RND

Triangle is the box. Sine spends longer at the ends; ramp is a one-way drift and reset; random picks a new value each cycle and glides to it, for a width that never repeats.

SYNC · DIVISION 4 bars – 1/8

Locks the LFO period to the host tempo and its phase to the beat while the transport runs. The mode still sets the depth.

LFO WINDOW display

Both lines' delay over one cycle — left solid, right dashed — with the running position, and the sweep, rate and wet level the current buttons resolve to.

LEVEL · MIX · WET ONLY –20 – +6 dB · 0 – 100 %

LEVEL is wet level on top of the mode's own –10 or 0 dB. MIX blends between the dry and the box's own dry-plus-wet sum; 100 is the box. WET ONLY removes the dry: the effect alone, for a send.

DIMENSION 0 – 100 %

The anti-phase cross-feed. 100 is the box; at 0 each line feeds only its own channel: a plain stereo chorus, wider in mono, narrower in stereo.

WIDTH 0 – 200 %

Scales the stereo difference of the effect. Past 100 it reaches outside the speakers; at 0 the effect is mono, a subtle doubling.

INPUT · OUTPUT · AUTO GAIN ±24 dB

INPUT is level into the compander and the line's headroom: drive it for the thickening. It feeds the effect only, so the track gets thicker, not louder. OUTPUT trims after everything. AUTO GAIN level-matches the effect to the dry: a bypass compares width, not volume.

AGE · COMPANDER · NOISE the circuit

AGE is the line's condition: bandwidth, bias, hiss. COMPANDER takes the compander pair out. NOISE adds the line's hiss, breathing under the expander.

OVERSAMPLING 1× · 2× · 4×

The box runs at the oversampled rate; the dry stays a straight wire. A machine preference, not stored in presets.



The preset bar: previous, next, the readout, A/B, undo, redo, save, revert, menu.

The bar across the top carries the whole preset system. Arrows step through the factory bank and then your own; the readout names what is loaded, with a dot once a control has moved; click it for the full menu. **A/B** flips between two scratch settings — tweak one, flip, and hear them against each other; neither is saved. **Undo** and **redo** walk the edit history independently of the host's — a knob drag is a few steps, a preset load is one. The disk saves under a name; the ring puts back the loaded preset; the stacked bars open the menu.

Saved presets live in ~/Library/Application Support/Desert Moon Audio/Desert D/Presets as .ddpreset files — plain XML, safe to share, visible from every host. POWER and OVERSAMPLING are not part of a preset.

7.1 The Factory Bank

Front Panel The box as it powers up: mode 1, every trim at rest. MODE 1 · EVERYTHING AT CENTRE	Mode 2 · Mode 3 · Mode 4 The other three buttons, each alone, nothing else touched. ONE BUTTON · TRIMS AT REST
All Four (Chewy) Every button down: the fastest, widest thing the box does. 1 + 2 + 3 + 4	Vocal Halo A soft sine sweep under the voice, a little wider than the box. MODE 2 · SIN · LEVEL -3 · WIDTH 120
Pad Bloom Two units in series on a long, rounded sweep. 3 + 4 · DOUBLE · SIN · SHAPE 55 · TIME 130	Bass Fattener Mono in, the matrix at full so the low end folds to mono cleanly. MODE 2 · MONO · DEPTH 70 · WIDTH 90 · LEVEL -2
Clean Guitar Spread A quicker mode 3, pushed past the speakers, wet a touch up. MODE 3 · RATE ×1.5 · WIDTH 140 · LEVEL +2	Drum Bus Air The long line at full level, blended in and level-matched. 1 + 4 · DEPTH 60 · MIX 55 · AUTO GAIN
Synth Stack Two units in series, a sine sweep, very wide. 2 + 4 · DOUBLE · SIN · WIDTH 160	Mono Safe Keys Full matrix, a rounder LFO, wide in stereo and gone in mono. MODE 2 · DIMENSION 100 · WIDTH 130 · SHAPE 20 · LEVEL -2
Tape Age A worn line, hiss on, a random sweep, driven and trimmed back. MODE 3 · RND · AGE 70 · NOISE · SHAPE 45 · IN +6 · OUT -3	Clean Machine Compander out and a new line: the box at its clearest. MODE 4 · COMPANDER OFF · AGE 0 · WIDTH 115
Half-Bar Sway The sweep locked to half a bar, deep and slow. MODE 1 · SYNC 1/2 · SIN · DEPTH 120 · TIME 130	Four-Bar Drift A four-bar ramp on a long delay: a slow one-way drift. MODE 2 · SYNC 4 BARS · RMP · DEPTH 150 · TIME 150
Plain Stereo Chorus The matrix out: an ordinary stereo chorus that survives mono. MODE 4 · DIMENSION 0 · WIDTH 120 · LEVEL -2	Wide Send Effect only, hot and wide, for a send or a parallel channel. MODE 4 · WET ONLY · LEVEL +3 · WIDTH 150

8.1 Where It Goes

Backing vocals and strings: Mode 1 or 2, nothing else. The stack gets wider and more open and nobody can say what changed. **Synth pads:** Mode 4, or 3+4, with DOUBLE for the widest. **Bass:** MONO input, Mode 2, DIMENSION down to 40 and WIDTH around 60 so the low end stays put while the mids spread. **Clean guitar:** Mode 3 with WIDTH up; add a little AGE for a worn edge. **Drums:** 1+4 on the bus at a 55 % MIX with AUTO GAIN — the compander's grit on the transients is the point. **Lead vocal:** a send, WET ONLY, Mode 1, tucked 10 dB under.

8.2 The Mono Check

Fold the mix to mono with DIMENSION at 100 and the effect all but vanishes, leaving the dry signal — the matrix is built to fold away. If you want the effect to survive mono, lower DIMENSION: at 0 it is an ordinary chorus and sums like one.

8.3 Driving It

The meter's 0 dB is the box's nominal level. Above it, INPUT pushes the compressor's output into the delay line's headroom and the copy thickens; the red LEDs mean it is squashing. The dry signal is never touched by any of this, so even a hard-driven line only colours the effect.

9 Specifications

ITEM	VALUE
Bypass	Returns the input untouched and sample-aligned, at any trim setting
Formats	Audio Unit, VST3, AAX (macOS, universal); VST3 and AAX (Windows)
Delay lines	Two 1024-stage bucket brigades, clocked 40–100 kHz, anti-phase
Modes	1: 8–12 ms / 4 s · 2: 5–10 ms / 4 s · 3: 6–9 ms / 2 s · 4: mode 3, wet 0 dB · any combination
Compander	2:1 feedback compressor, 1:2 feed-forward expander, 2 ms / 20 ms rectifier
Cross-feed	Opposite channel's wet subtracted above 160 Hz (first order)
Nominal level	+4 dBu = -18 dBFS (meter 0 dB)
Latency	0 samples at every oversampling setting
Sample rates	44.1 – 192 kHz; oversampling 1×, 2×, 4×
Channels	Mono, stereo, mono in to stereo out
Trial	14 days, fully featured; then dry pass-through until licensed
License	One key, four computers, all formats; offline after activation

Desert Moon Audio

Desert D DD-320 · User Manual · Version 1.0.3

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