MODEL 24

FADED MEMORIES



OWNER'S MANUAL

A worn cassette, an early sampler, a dual phaser, a tape echo and a first-generation digital reverb in one fixed chain, with a single knob that ages them all at once. Built for pads, keys and groups that should sound like a memory of a 1982 film score.

TELEMETRY AUDIO

VERSION 0.1.0 · AU · VST3

MODEL 24

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“None of those machines was meant to colour the sound. Each one did, a little, in its own way — and the memory is how they stacked.”

CONVENTIONS

Control names appear in **bold**. Numbers in blue circles, such as 7, refer to the panel map in Chapter 04. Levels are in dBFS unless stated otherwise. A *stacked* knob is two controls on one shaft: the outer ring and the inner knob turn separately.

01

WELCOME

Faded Memories is a retro character processor built from five sections that always run in the same order: a cassette tape, an early sampler, a dual phaser, a tape echo and an '80s digital reverb. Each does a little. Together they take a clean, modern part and put it on a record that has been played too many times.

The **tape** warbles, wears and hisses: wow and flutter bend the pitch, **Age** dulls the top, swells the low end and, past halfway, lets the tape lose touch with the head. The **Resampler** records the result into a sampler from the 12-bit drum-machine era, or anywhere from late-'80s 16-bit down to a toy 8-bit keyboard. The **Modulation** section is two phasers that sweep together, apart or against each other, and that turn into a chorus or a flanger at the press of a key. The **Tape Delay** locks to your tempo, darkens every repeat and can run away into a squeal. The **Reverb** is a chamber or a hall voiced against an early digital unit, with a tempo-synced gate.

Above them sits **Intensity**, the master age control. It scales every wear amount in the chain at once without moving a single knob: from fresh at 0 %, through exactly as set at its centre, to doubled at 200 %. Every section is off or close to transparent at its quietest, and every choice was voiced against measurements of the engine and by ear against the records in Chapter 02.

WHAT IT'S FOR

Pads and strings. The home ground: slow phase, a long dark hall and a tape that never quite keeps time.

Keys and leads. Sampler grit and a chorus on electric piano, or a synth line through the flanger and a dotted echo.

Groups and buses. Put it across a whole keyboard bus and use the master **Mix** to blend the age in parallel. The dry signal rides the tape's motion, so the blend never turns into a chorus.

Drums and loops. 12-bit at 26 kHz, a gated reverb on the snare, and hiss under the fills.

> **AT A GLANCE**
>
> Cassette wow and flutter in cents · Age: head bump, worn top end and dropouts · signal-following hiss · tape first or last in the chain · 8× oversampled sampler front end · Resample from 16-bit / 44.1 kHz to 8-bit / 9.38 kHz, with μ-law · dual phaser of 4–12 stages, optical sweep, three modes · chorus and flanger · 4-second tape delay with tempo sync, Offset, saturation, runaway feedback and Ping-Pong · Chamber and Hall reverb with Era and a tempo-synced gate · Intensity master age · LED meters · resizable panel.

02

THE SOUND OF A MEMORY

SCORES FOR A FUTURE THAT NEVER CAME

Some records sound like recollections of themselves. Vangelis's score for **Blade Runner** (1982) sets the brass of his Yamaha CS-80 in huge, slightly dark spaces, reported to come from a Lexicon 224-series reverb, whose long tails move slowly inside themselves. Jean-Michel Jarre's **Oxygène** (1976) is a string machine through a small phaser, widely reported to be an Eminent 310 into an Electro-Harmonix Small Stone, swept so slowly and so deep that the pad seems to breathe.

Two decades later a generation raised on those sounds, and on the worn cassettes and VHS tapes they first heard them on, made records about the memory itself. Boards of Canada's **Wildlife Analysis** (1998) holds its chords on a tape that cannot keep time: slow, uneven drift, a soft rolled-off top and a noise floor. Air's **La Femme d'Argent** (1998) drives its Rhodes and bass lightly and lets its echoes run deep without ever wearing out.

THE MACHINES

Behind all of it is a short list of boxes. The **cassette deck**, whose capstan and pinch roller never quite agreed, so the pitch wandered slowly (wow) and shivered quickly (flutter), and whose tape lost its top end and its grip as it aged. The **early sampler**: 12-bit drum machines such as E-mu's SP-1200, recording at 26.04 kHz, and 8-bit instruments that companded with μ-law to stretch their few bits further. The **dual phaser**, after Musitronics' Mu-Tron Bi-Phase of the mid-1970s: two phase shifters whose sweeps, driven through lamps and photocells, could run together, apart or against each other. The **tape echo**, a loop of tape past a record head and a moving play head, whose repeats darken as they go round and squeal when pushed. And the first **digital reverbs**, such as Lexicon's 224 of 1978, band-limited to around 10 kHz by the converters of the day, with a slow modulation inside the tail to keep it from ringing.

WHY A CHAIN

None of those machines was meant to colour the sound. Each one did, a little, in its own way, and the character came from how they stacked: the reverb heard the echo, the echo heard the phaser, and the whole thing was sampled, or played back, from a tape that had seen better days. Faded Memories builds that rack into one plugin, in that order, with each section voiced so its quietest setting is neutral and its range covers everything from a hint to a ruin. The **Last** switch moves the tape to the end, as if the whole mix were being played back from it.

Yamaha, CS-80, Lexicon, 224, Electro-Harmonix, Small Stone, E-mu, SP-1200, Musitronics and Mu-Tron are trademarks of their respective owners, named here only to describe the history of the sound. Telemetry Audio is not affiliated with, endorsed by or sponsored by any of them, or by the artists named.

03

THEORY OF OPERATION

SIGNAL FLOW

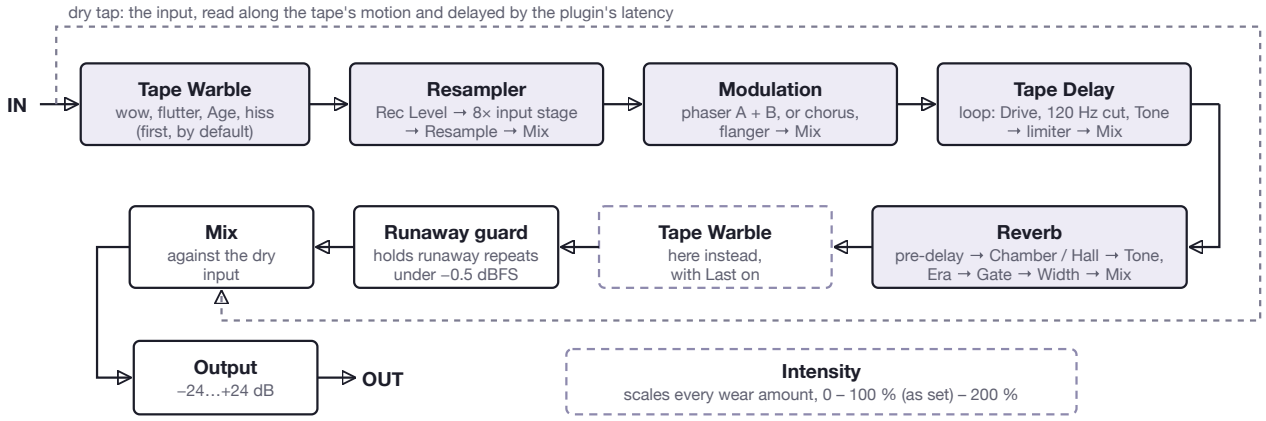


Figure 1. Signal flow. Shaded blocks are the five sections, each with its own on/off key, crossfading over 20 ms against a dry signal delayed to match. The dashed Tape Warble block is where the tape sits with **Last** on. Intensity reaches into every section; it is drawn apart because it moves no audio itself.

The plugin's latency is fixed: about 49 ms at every setting, with the tape first or last, so a host never has to re-align. Nearly all of it is the tape's room to move. The wow, flutter, dropouts, hiss and reverb motion draw from seeded random streams that restart when the transport starts, so a bounce repeats exactly, and each instance saves its own seed with the session.

THE RESAMPLER

Rec Level drives an input stage that passes the signal untouched up to 0.9 of full scale, then bends it into a ceiling with the firm, slightly soft knee of an overloaded converter. It runs eight times oversampled through linear-phase filters, with antiderivative antialiasing, so pushing it into overload thickens rather than fizzes. Afterwards the gain comes back out, with the level that clipped peaks cost added back, so loudness holds within about 2 dB from −24 to +24 dB and the knob sets how hard the sampler is hit, not how loud it is.

Resample walks one curve through published sampler specs. Between its anchors the bit depth moves in a straight line, the sample rate on a log scale and the quantization law as a crossfade, so automating it never steps. The anchors were spaced by ear so the whole travel does something: the stretches where only a high sample rate moves are short, and the 12-to-8-bit grit and the final drop get the room. The held steps fall wherever the sampler's own clock puts them, not on the session's sample grid, so 16-bit at 44.1 kHz sounds the same in a 48 kHz session as in a 44.1 kHz one.

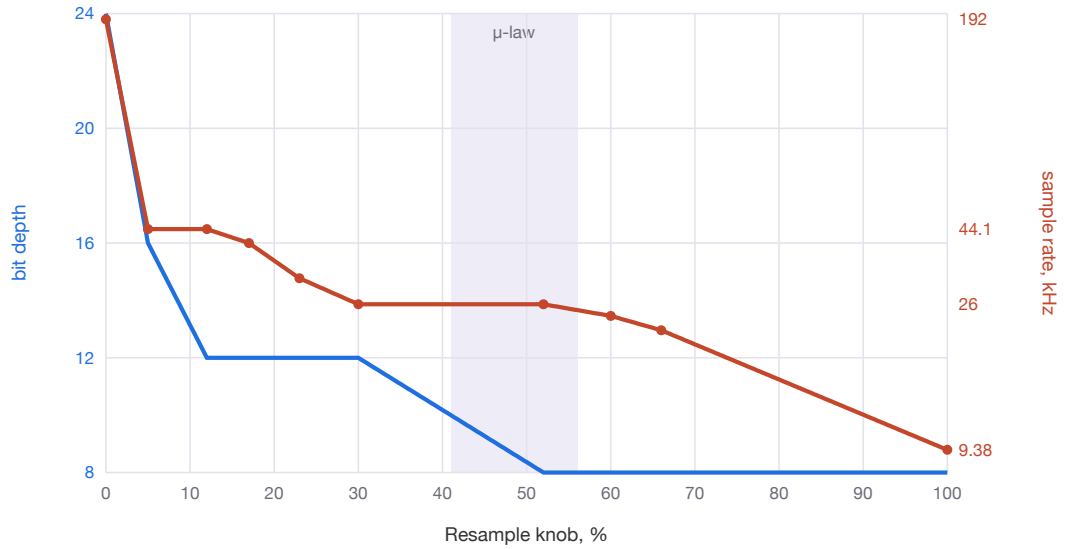


Figure 2. Resample's path, computed from the engine's own table: bit depth in blue, sample rate in red on a log scale, with a dot at each anchor. At 0 % the stage is skipped altogether. The shaded band is where μ-law companding is most of the sound, as on 8-bit samplers of the mid-'80s.

THE TAPE

The tape is a delay line read between samples, moved by **wow**, a slow sine with filtered random drift, and **flutter**, faster, smaller and more random. Their depths are set in cents, so they feel the same at every sample rate, and most of each knob's travel sits in the subtle range: wow reaches 50 cents at 100 %, flutter 80. The right channel's motion runs 1/400 of a cycle behind the left's, a little wider than one transport, so a mono sum barely changes.

Age is the tape's condition. It makes the motion less steady and lets the tape drift, then wears the sound:

AGE	HEAD BUMP, 100 HZ	TOP END, 5 KHZ SHELF	DROPOUTS
0 %	0.0 dB	0.0 dB	none
25 %	+0.8 dB	−3.8 dB	none
50 %	+1.5 dB	−7.5 dB	none
75 %	+2.3 dB	−11.3 dB	about one every 4 s
100 %	+3.0 dB	−15.0 dB	about one every 2 s

A dropout is a moment where a worn tape loses touch with the head: 30 to 250 ms long, 1.5 to 9 dB deep, mostly shallow, and duller the deeper it dips, with a quick fall and a slower recovery. Both channels drop out together, as on one tape.

Hiss is shaped like a cassette's playback: thin in the lows, brightest around 5 kHz, rolled off above 12 kHz, with its own noise on each channel. It follows the signal entering the tape: full once that signal reaches −40 dBFS, quieter in proportion below it, and gone a second after the signal stops, so a fading reverb tail

keeps a little under it. The knob is steep at the bottom: −73 dBFS RMS at 10 %, −58 at 40 %, where it starts to come through, −51 at 75 % and −48 at 100 %.

THE MODULATION

Two phasers of 4, 6, 8 or 12 allpass stages each, built as zero-delay-feedback filters so fast sweeps and heavy feedback stay stable. Each sweep runs through an optical response, like the lamp and photocells of the original: it rises in 5 ms and falls in 30, so it lingers near the top of its travel. **Mode** and **B Sweep** give the moving stereo image of the original dual units. The sweeps were tuned by ear against *Oxygène (Part IV)*.

Type turns the same two voices into a chorus or a flanger. Each row of stages becomes a short swept delay, fed back through the phaser's soft clip and blended with its input in equal parts, then scaled back to the input's level at any Feedback. The incoming voice starts from the plain input with its feedback eased in, so switching Type never jumps.

TYPE	CENTER, LEFT TO RIGHT	SWEEP AT DEPTH 100 %	FEEDBACK AT 100 %
Phaser	80 Hz to 5 kHz	±2 octaves	0.75
Chorus	40 ms to 4 ms	±½ octave	0.5
Flanger	12 ms to 0.3 ms	±2 octaves	0.9

THE TAPE DELAY

One play head on a tape loop of up to 4 seconds at any sample rate. A new time glides with a tape machine's inertia, in two smoothing stages, and never faster than 0.1 s of delay per second, so the repeats drop about two semitones as the time lengthens and rise about 1.7 as it shortens. What goes onto the tape saturates toward a ceiling **Drive** sets, from +6 dBFS, barely touching a full-scale signal, down to −6 dBFS, leaning a little to one side for even harmonics. Then it loses its lows below 120 Hz and its highs above **Tone**, so every repeat is darker than the last.

Near the top of **Feedback** the tape's high cut starts to resonate at Tone, as a pushed tape echo's preamp and heads do, so the loop gives back more than it takes at that pitch:

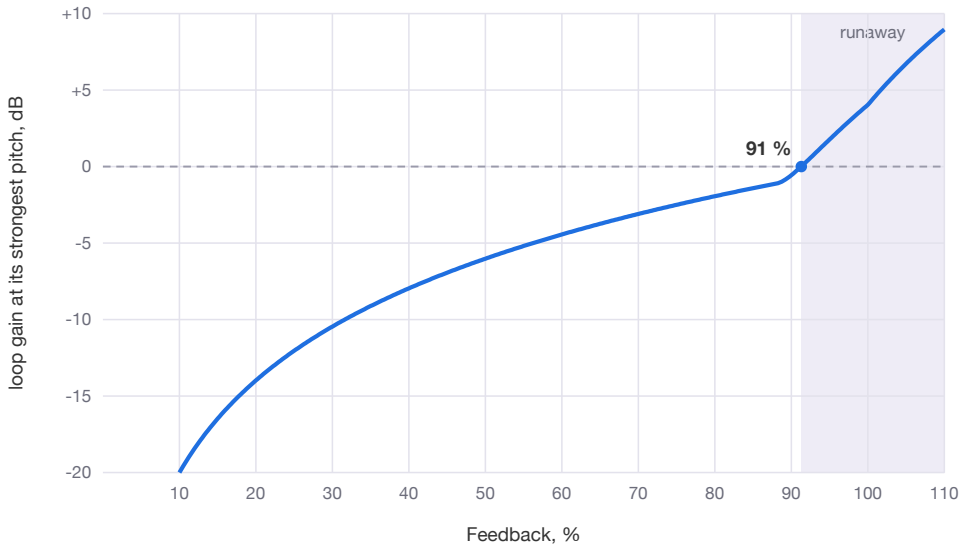


Figure 3. The loop's gain at its strongest pitch against Feedback, computed from the engine's constants. Below 0 dB the repeats die away. Above it, from about 91 %, they run away into a squeal at Tone's pitch until the tape's saturation holds them.

A safety limiter keeps runaway repeats from pushing the output past −0.5 dBFS. A runaway is one loud, steady pitch, which a long reverb after it could build up by as much as 8 dB, so a **runaway guard** holds the processed chain under the same ceiling for as long as the delay runs away, and for two seconds after. Below runaway it never acts. **Wobble** moves the head with the delay's own wow, 30 cents at 0.7 Hz at 100 %, and flutter, 12 cents at 7 Hz, so each trip round the loop wavers more.

THE REVERB

Two original voices informed by controlled captures of a reference unit. Each is a tank of eight differently timed delay lines mixed through a normalized Hadamard matrix, with separate bass, mid and treble losses inside the loop, so **Decay** sets a frequency-dependent decay rather than one time for everything. **Chamber** sums its input to mono and builds a sparse, decorrelated stereo space. **Hall** keeps the two inputs apart and adds a stronger cluster of early reflections. Only a voice holding sound runs; on a change of Mode the old voice rings out at its own pace while the new one fills.

MEASUREMENT	REFERENCE CHAMBER	CHAMBER	REFERENCE HALL	HALL
Energy before 50 ms	7.4 %	7.6 %	65.9 %	61.1 %
Energy before 100 ms	26.3 %	25.0 %	74.6 %	74.2 %
Low-band RT60	3.10 s	2.93 s	3.22 s	3.15 s
Mid-band RT60	2.31 s	2.35 s	2.43 s	2.45 s
High-band RT60	1.56 s	1.51 s	1.54 s	1.66 s

The first voicing against the reference, wet only at 48 kHz, Decay 2 s, Size 55 %; RT60 extrapolated from T20 fits in the 125–250 Hz, 500–1000 Hz and 4–8 kHz bands.

Listening then darkened it. A lowpass at **Tone** softens the whole wet return, early reflections included; a +2.5 dB shelf below 320 Hz adds body without lengthening the bass decay; and two short allpasses spread the late echoes outside the loop. **Era** moves one steep lowpass from about 18 kHz down to around 9 kHz, the bandwidth of the early units, and adds slow, seeded motion inside the tank. There is no added grain and no low cut.

The **Gate** opens on a jump in the reverb's input to more than twice its recent level, so it follows the hits however loud the material is, and treats hits closer than 30 ms as one. It stays open for its note value at the host's tempo, then closes over 10 ms.

INTENSITY

Intensity scales Wow, Flutter, Age, Hiss, Resample, Rec Level (by its distance from 0 dB), the delay's Wobble and the reverb's Era, each held within its knob's range. Hiss and Rec Level fall with the rest below 100 % but stay as set above it, because they wear on the ear soonest. The knobs never move: a faint ghost arc on each shows the amount actually in use. The master **Mix** scales Wow and Flutter too, so its dry side can ride the same motion and still be the steady input at 0 %.

BUILT FOR THE SESSION, NOT JUST THE DEMO

Every control is smoothed, and every switch crossfades: the section keys and the host's bypass over 20 ms against a dry signal delayed to match, the Last switch over 10 ms, Type, Mode and Stages through their own crossfades. The engine is checked by about 148,000 automated checks on every build, among them the null test at every sample rate from 44.1 to 192 kHz, block sizes from 1 to 2048 samples, every parameter automated mid-signal, mono compatibility and repeatable randomness. Every build passes Apple's auval in strict mode and pluginval at its highest strictness. One instance with every section on uses about 2.6 % of one core of an Apple M5 Max at 48 kHz, inside a budget of 10 % on the slowest supported Mac, an M1.

04

THE CONTROLS



Default settings, as shown: Tape Warble on (Wow 20 %, 0.60 Hz; Flutter 2 %, 8 Hz; Hiss 0; Age 20 %; First) · Resampler on (Rec Level 0 dB, Resample 5 %, Mix 100 %) · Modulation off · Tape Delay off · Reverb on (Chamber, Decay 2.8 s, Pre-Delay 40 ms, Size 15 %, Tone 3 kHz, Era 50 %, Width 100 %, Gate off, Mix 7 %) · Intensity 100 % · Mix 100 % · Output 0 dB.

HANDLING

Drag a knob up or right to turn it up; hold **Shift** for fine steps, or use the scroll wheel. Double-click a knob, or right-click it and choose Reset, to return it to its default. On a stacked knob, grab the **rim** for the outer control and the **middle** for the inner one. While a control moves, the program window shows its name and value. A section that is switched off greys out but stays live, so you can set it up before you bring it in, and a control that does nothing in the current mode greys out with its keys still showing their choice. The window resizes from 75 % to 150 % by dragging its corner and reopens at the size you left it.

TAPE WARBLE

1 TAPE WARBLE ON

On / Off

Switches the whole tape section in and out over 20 ms. Switched back on, it waits for the tape to fill before it fades in.

2 WOW / WOW RATE

0–100 % · 0.10–4.00 Hz

Wow (outer ring) is the slow pitch drift of a capstan that never quite holds speed, in a straight line to 50 cents at 100 %. **Wow Rate** (inner knob) sets how fast it drifts. The drift is never quite a sine: Age makes it less steady still.

Tip — 10–25 % is felt more than heard on a held chord; past 50 % it turns seasick.

3 FLUTTER / FLUTTER RATE

0–100 % · 4.00–20.0 Hz

Flutter (outer ring) is the fast, small, irregular wobble of a worn transport, to 80 cents at 100 %. **Flutter Rate** (inner knob) sets its speed. A little flutter makes sustained notes shimmer; a lot makes them warble.

4 HISS / AGE

0–100 % · 0–100 %

Hiss (outer ring) adds a cassette-shaped noise floor that follows the signal into the tape and fades a second after it stops. **Age** (inner knob) is the tape's condition: less steady motion and drift, a head bump at 100 Hz, a duller top end and, above 50 %, dropouts (see Chapter 03).

5 FIRST / LAST

host name: Last

First runs the tape before everything else, as if the source had been sampled from an old tape. **Last** moves it after the reverb, as if the whole mix were being played back from one, so the reverb tail wobbles along with the source. Switching fades over 10 ms and starts every section again from silence.

Tip — First suits a single part; Last turns the whole rack into one old recording.

RESAMPLER

6 RESAMPLER ON

On / Off

Switches the sampler section in and out over 20 ms.

7 REC LEVEL

–24 to +24 dB

How hard the sampler is hit. Record low and the bits get grainy; record hot and the input stage overloads with the knee of a real converter. The gain comes back out afterwards, so the loudness barely moves. The **OVER** LED beside it lights while the input stage is overloading, so you can set it by eye.

8 RESAMPLE

0–100 %

One knob through '80s sampler specs, marked at 16, 12 and 8 bits: late-'80s 16-bit at 44.1 kHz by default (5 %), the 12-bit drum-machine era at 26 kHz around 30 %, 8-bit μ-law around 52 %, down to 8-bit at 9.38 kHz. Two readouts under it show the bit depth and the sample rate in use; they trail the knob while it glides. 0 % is clean and skips the stage.

Tip — 12–30 % is the sweet spot for drums and keys that should sound sampled rather than broken.

9 RESAMPLER MIX

0–100 %

Blends the sampled signal with a dry signal put through the same delays and band limit, so any blend lines up at every frequency and never combs.

MODULATION

10 MODULATION ON

On / Off

Switches the phaser, chorus or flanger in and out over 20 ms. Off by default.

11 TYPE

Phaser / Chorus / Flanger

What the two voices are. In **Chorus** and **Flanger** each voice is a short swept delay instead of a row of stages: **Center** reads as a delay in milliseconds, Shape's **Square** key reads **Tri**, and **Stages** greys out. Switching crossfades over 20 ms.

12 RATE A / RATE B

0.05–18.0 Hz each

Rate A (outer ring) is voice A's sweep; **Rate B** (inner knob) is voice B's, used when Mode includes B and B Sweep is Free. It greys out otherwise. The sweeps run free, never synced to tempo.

13 CENTER / DEPTH

80 Hz–5 kHz · 0–100 %

Center (outer ring) is where the notches sit, or the delay a chorus or flanger sweeps around. **Depth** (inner knob) is how far the sweep travels either side, shared by both voices.

14 FEEDBACK

–100 to +100 %

Resonance, shared by both voices. Positive feedback sharpens the notches into a vocal whistle; negative inverts it for a hollower sound. It stops short of where the loop would ring on by itself.

15 MODULATION MIX

0–100 %

Blends the effect with the dry signal.

16 SHAPE

Sine / Square (Tri)

The sweep's wave. **Square** jumps between two settings, eased over 20 ms so it swoops rather than clicks. In Chorus and Flanger it becomes a triangle, **Tri**.

17 STAGES

4 / 6 / 8 / 12

Allpass stages in each phaser: more stages, more notches. 4 is the voicing of a small single phaser; 6 is the default. Phaser only.

18 MODE

Single / Series / Stereo

Single runs voice A alone. **Series** runs A into B for deeper, more complex notches. **Stereo**, the default, runs A on the left and B on the right, for a moving image that collapses gracefully in mono.

19 B SWEEP

Free / Link / Inverse

Free runs B at Rate B. **Link** makes B follow A. **Inverse** makes B follow A the opposite way, so one side rises while the other falls. Greyed in Single.

TAPE DELAY

20 TAPE DELAY ON

On / Off

Switches the echo in and out over 20 ms. Switched off, the repeats stop; switched back on, it starts from silence. Off by default.

21 FREE / SYNC

host name: Sync

Sync, the default, reads Time as a note value at the host's tempo; **Free** reads it in milliseconds. With no tempo from the host it keeps the last one it had, or 120 BPM.

22 TIME / OFFSET

1/64–1/1 or 20–4000 ms · ±50 ms

Time (outer ring) covers straight, dotted and triplet values from 1/64 to a whole note. A note too long for the 4-second tape at a slow tempo plays the next value that fits, and the readout names the one playing. **Offset** (inner knob) pushes the repeats ahead of the grid or drags them behind it. A change of time glides like a tape machine, bending the pitch of the repeats.

Tip — A few milliseconds of negative Offset makes a dotted echo feel urgent; a few positive makes it lazy.

23 TAPE DELAY FEEDBACK

0–110 %

How much of each repeat goes back onto the tape. Above about 91 % the repeats run away into a squeal at Tone's pitch, held by the tape's saturation and kept under −0.5 dBFS. Pull it back down and they fade away again.

24 TONE / WOBBLE

800 Hz–12 kHz · 0–100 %

Tone (outer ring) is the tape's high cut, so every repeat is darker than the last; near the top of Feedback it starts to resonate. **Wobble** (inner knob) is the delay's own wow and flutter, so each trip round the loop wavers a little more.

25 DRIVE

0–100 %

How early the tape saturates: from barely touching a full-scale signal at 0 % to crushing anything above −6 dBFS at 100 %. The repeats get rounder and denser, and the louder ones are tamed first.

26 PING-PONG

On / Off

Bounces the repeats from side to side in pairs, a left and a right at the same level, each pair quieter than the last. Switching moves the repeats already on the tape over 50 ms rather than cutting them.

27 TAPE DELAY MIX

0–100 %

An equal-power blend of the repeats with the dry signal, so the level holds steady across the knob. 15 % by default.

REVERB

28 REVERB ON

On / Off

Switches the reverb in and out over 20 ms.

29 CHAMBER / HALL

host name: Mode

Chamber, the default, is dense and quick to build, with sparse early reflections. **Hall** is larger and slower, with a strong cluster of early reflections and long tails. Switching lets the old voice ring out while the new one fills.

30 DECAY / PRE-DELAY

0.30–20.0 s · 0–250 ms

Decay (outer ring) is the midband decay time; the bass rings a little longer and the treble dies sooner. **Pre-Delay** (inner knob) holds the reverb back behind the dry signal, gliding over 50 ms, so attacks stay clear inside a big space.

31 SIZE

0–100 %

The space's proportions: the balance of early reflections to tail, how quickly it builds and diffuses, and its geometry.

32 TONE / ERA

1.5–18 kHz · 0–100 %

Tone (outer ring) darkens the tail inside the tank and the whole wet return. **Era** (inner knob) walks from a clean modern reverb to the band-limited, slowly moving texture of the first digital units.

Tip — Era 100 % with a long Hall and a dark Tone is the sound of a 1982 film score.

33 WIDTH

0–150 %

The wet signal's width: mono at 0, the voice's own stereo at 100 %, wider above, with its level kept steady.

34 GATE

Off, 1/64–1/2

A gated reverb at the host's tempo: each hit opens the gate for the chosen note value, then it closes in 10 ms. The readout shows the time at the current tempo, such as `1/8 · 250 ms`, and a green LED beside it lights while the gate is open. Off by default.

35 REVERB MIX

0–100 %

An equal-power blend of the reverb with the dry signal. 7 % by default.

MASTER

36 INTENSITY

0–200 %

The master age control. It scales every wear amount in the chain without moving any knob: 0 % is fresh, the centre (**AS SET**) is exactly as set, 200 % doubles it. The knob catches at its centre, and a faint ghost arc on each wear knob shows the amount actually in use. Automate it across a song to let a part age as it goes.

37 MIX

0–100 %

Blends the whole chain with the plugin's input for parallel use on a group. The dry side rides the tape's motion, so the two never drift apart into a chorus, and Mix sets how deep that wobble goes: at 0 % the input comes back steady and exact.

38 OUTPUT

−24 to +24 dB

The final level, after everything.

HEADER

39 INPUT METER

12 segments a side

An LED ladder for each channel of the plugin's input, falling at about 20 dB per second, with a peak-hold segment that waits 1.5 s and then falls. The **CLIP** LED latches when a sample reaches full scale; click it to clear.

40 PROGRAM WINDOW

with ◀ ▶ and Save

Shows the program, a control's name and value while it moves, and **BYPASS** while the host's bypass is on. The arrows and **Save** are for presets, which arrive in a later version.

41 OUTPUT METER

12 segments a side

The same ladder for the plugin's output, with its own CLIP LED.

05

STARTING POINTS

These are places to begin, not presets to obey. Start from the defaults, change only what is listed, then use Output to match levels before you judge the result. Each one turns on the sections it lists.

THE BREATHING PAD

CONTROL	SETTING	CONTROL	SETTING
Modulation	On, Phaser, Stereo	**Stages**	4
Rate A	0.08–0.15 Hz	**B Sweep**	Inverse
Depth	70–90 %	**Feedback**	40–60 %
Reverb	Hall, Decay 4 s	**Reverb Mix**	15–20 %

Slow, deep, resonant sweeps on a string pad, the two sides moving against each other, set back in a hall. Lower Feedback if the whistle gets too vocal.

FILM-SCORE BRASS

CONTROL	SETTING	CONTROL	SETTING
Reverb	Hall	**Decay**	8 s
Size	85 %	**Pre-Delay**	40 ms
Tone	3 kHz	**Era**	100 %
Reverb Mix	35–45 %	**Tape Delay**	On, 1/4D, Mix 10 %

A huge, dark, slowly moving space with the attacks kept clear by the pre-delay. The quiet dotted echo fills the gaps between phrases.

WORN TAPE CHORDS

CONTROL	SETTING	CONTROL	SETTING
Wow	35–50 %, 0.3–0.5 Hz	**Flutter**	5–8 %
Age	55–70 %	**Hiss**	40–50 %
Resample	20–30 %	**First / Last**	Last

Slow, uneven drift on held chords, a soft rolled-off top, the odd dropout and a noise floor under it all. With the tape last, the reverb tail drifts along with the chords.

WARM KEYS AND CHORUS

CONTROL	SETTING	CONTROL	SETTING
Rec Level	+6 to +12 dB	**Modulation**	On, Chorus
Rate A	0.4–0.8 Hz	**Modulation Mix**	40–60 %
Tape Delay	On, 1/8D	**Feedback / Mix**	25–35 % / 15–20 %

A lightly driven electric piano or bass, a gentle chorus and an echo that runs deep without wearing out. Watch the OVER light: a flicker on the peaks is plenty.

RUNAWAY ECHO

CONTROL	SETTING	CONTROL	SETTING
Tape Delay	On, 1/4	**Drive**	50–70 %
Tone	1.5–3 kHz	**Mix**	30–40 %
Feedback	automate 60 % → 105 % → 40 %	**Wobble**	20–30 %

The repeats swell, squeal at Tone's pitch, distort and fall apart as you bring Feedback down again. The limiter and runaway guard keep it under full scale; Tone picks the note it screams on.

GATED SNARE

CONTROL	SETTING	CONTROL	SETTING
Reverb	Hall	**Decay**	2.5–4 s
Size	60–80 %	**Gate**	1/8 or 1/16D
Pre-Delay	0–10 ms	**Reverb Mix**	25–40 %

A big room on every hit, cut off dead on the grid. Choose the note value by the tempo: the gate should close just before the next hit.

06

SPECIFICATIONS & INSTALLATION

INSTALLATION

Run **Faded Memories 0.1.0.pkg** and choose the formats you want. Each one installs system-wide, so macOS asks for your password:

FORMAT	LOCATION	HOSTS
Audio Unit	`/Library/Audio/Plug-Ins/Components`	Logic Pro, GarageBand, other AU hosts
VST3	`/Library/Audio/Plug-Ins/VST3`	Ableton Live, Bitwig, Cubase, Reaper, other VST3 hosts

The installer is signed and notarized by Apple. Logic scans Audio Units on launch. In Live, open **Settings** › **Plug-Ins** and click **Rescan**. Faded Memories appears under Telemetry Audio. A host running under Rosetta cannot load an Apple silicon plugin, and will simply not list it.

> **GAIN STAGING**
>
> Every section holds its own loudness: Rec Level takes its gain back out, the delay and reverb blend at equal power, and the tape adds no gain. So level changes mostly come from the Mix controls and from Output. Set the sections for character first, then use **Output** to match the bypassed level before you judge the result. The meters show input and output side by side.

SPECIFICATIONS

SPECIFICATION	VALUE
Plug-in formats	Audio Unit, VST3
Platform	macOS 13 (Ventura) or later; Apple silicon (arm64) only
Channel configurations	Mono in / stereo out; stereo in / stereo out
Sample rates	44.1–192 kHz; every depth, rate and time holds at every rate
Latency	About 49 ms (2,331 samples at 48 kHz), fixed for every setting, reported for delay compensation
Tail	12 s, plus the reverb's tail (2.6–74 s) and the delay's repeats; endless while they run away
CPU	About 2.6 % of one core (Apple M5 Max, 48 kHz, every section on)

Tape	Wow to 50 cents, 0.1–4 Hz; flutter to 80 cents, 4–20 Hz; head bump to +3 dB at 100 Hz; 5 kHz shelf to −15 dB; dropouts above Age 50 %; hiss to −48 dBFS RMS
Resampler	8× oversampled input stage with ADAA; 16-bit / 44.1 kHz to 8-bit / 9.38 kHz, linear or μ-law
Modulation	Two phasers of 4–12 stages, 0.05–18 Hz, Center 80 Hz–5 kHz; chorus 4–40 ms; flanger 0.3–12 ms
Tape delay	20 ms–4 s or 1/64–1/1 synced; Offset ±50 ms; Feedback to 110 %; 120 Hz low cut; Tone 800 Hz–12 kHz; limiter at −0.5 dBFS
Reverb	Chamber and Hall, eight-line tanks; Decay 0.3–20 s; Pre-Delay 0–250 ms; Era to a 9 kHz bandwidth; Gate 1/64–1/2
Metering	12-segment LED ladders, peak hold 1.5 s, CLIP at full scale; OVER and Gate LEDs
Panel	Resizable from 75 % to 150 % of 1000 × 560; size saved with the session

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