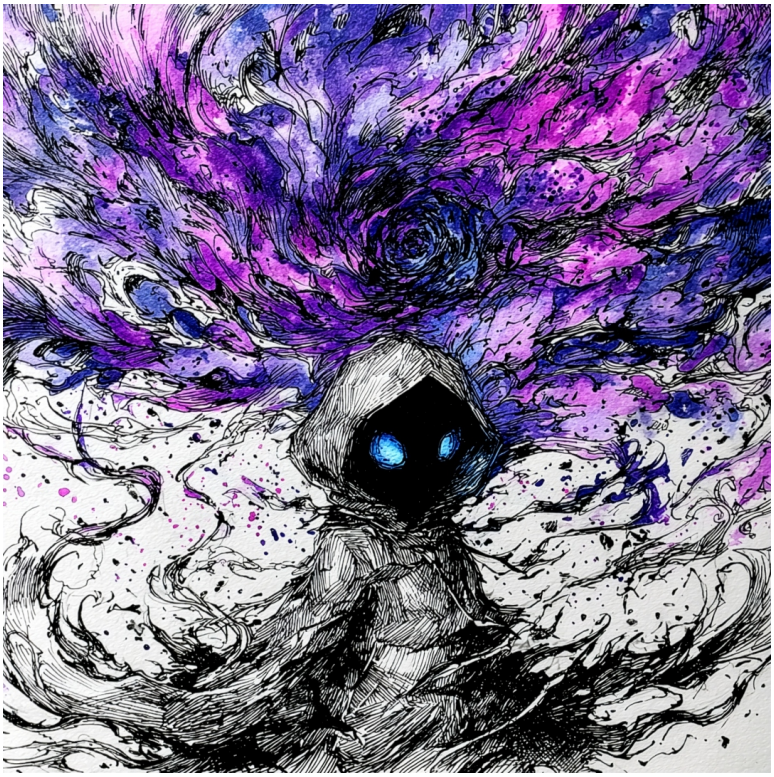

HumNyX Multi-FX Engine

VST3 Plugin — FX Reference Guide & Preset Documentation

Version 1.0

Overview

HumNyX Multi-FX Engine is a multi-effect audio plugin designed for creative sound destruction and atmospheric processing. It combines three distinct effect modules — MELT, GRIME, and ABYSS — into a single streamlined interface with real-time visual feedback and 8 handcrafted presets.

The plugin processes audio through a serial signal chain: Input Gain → MELT → GRIME → ABYSS → Dry/Wet Mix → Output Gain. Each module can be dialed from subtle enhancement to extreme destruction.

Signal Flow

Audio enters the plugin and passes through each stage in the following order:

- **INPUT GAIN** — Adjusts the signal level entering the FX chain (±12 dB range). Center position (50) is unity gain.
- **MELT** — Tape-style flutter and degradation processing
- **GRIME** — Harmonic saturation and bitcrushing
- **ABYSS** — Dark spatial reverb
- **MIX** — Blends the processed (wet) signal with the original (dry) signal
- **OUTPUT GAIN** — Final level control (±12 dB range)

Because the effects are in series, the order matters. MELT wobbles the pitch before GRIME crushes it, and ABYSS washes the combined result into space. This creates layered textures that would require multiple separate plugins to achieve otherwise.

MELT — Tape Flutter & Degradation

Color: Hot Pink | **Range: 0–100**

MELT simulates the imperfections of analog tape playback. It uses an interpolating delay line modulated by a low-frequency oscillator (LFO) to create pitch wobble and time instability, paired with a low-pass filter that darkens the tone as the effect intensifies.

How It Works

At its core, MELT is a modulated delay effect. A sine-wave LFO continuously varies the delay time, which creates subtle (or extreme) pitch fluctuations — the same mechanism that gives old tape machines their characteristic warble.

As the knob increases, four things happen simultaneously:

Parameter	Description
LFO Rate	Speeds up from 0.1 Hz (slow, gentle drift) to 6 Hz (fast, jittery flutter). Low values feel like a worn cassette; high values feel like a damaged tape deck.
LFO Depth	Increases from 0 to 15 ms of pitch modulation. This is the intensity of the wobble — subtle at low settings, dramatically detuned at high values.
Base Delay	Shifts from 3 ms to 10 ms. This adds a slight slapback quality and contributes to the perception of tape distance and degradation.
Low-Pass Filter	Rolls off from 20 kHz (fully open) down to 3 kHz. This simulates the high-frequency loss inherent in tape recording, making the sound progressively warmer and more muffled.

Use Cases

- **0–20:** Subtle analog warmth. Adds gentle pitch drift and mild high-frequency rolloff. Good for making digital instruments feel more organic.
- **20–50:** Lo-fi tape character. Audible wobble and noticeable darkening. Perfect for lo-fi hip hop, vaporwave, and retro aesthetics.
- **50–80:** Damaged tape machine. Heavy pitch instability and significant high-frequency loss. Sounds like a warped VHS or degraded cassette.
- **80–100:** Extreme degradation. Aggressive flutter and heavy filtering create an almost unrecognizable, underwater quality. Use for experimental textures and sound design.

GRIME — Saturation & Bitcrushing

Color: Cyan | **Range: 0–100**

GRIME adds harmonic density and digital destruction. It combines analog-style waveshaping saturation with digital bitcrushing (sample rate reduction + bit depth reduction) to create everything from warm overdrive to harsh digital artifacts.

How It Works

The effect has two stages that work together. First, a waveshaper adds harmonic saturation using a soft-clipping transfer curve. Then, a bitcrusher reduces the sample rate and bit depth to introduce quantization noise and aliasing.

The knob range is divided into three zones:

Zone	Description
0–30%: Clean Zone	Only waveshaping saturation is active. Drive increases from 0 to 15x. No bitcrushing. This range adds subtle warmth and harmonic richness without any digital artifacts.
30–70%: Transition	Saturation continues to increase (up to 35x drive). Bitcrushing begins gradually — sample rate drops by up to 5x and bit depth reduces from 16-bit to 10-bit. You start hearing digital grit layered over the saturation.
70–100%: Heavy Crush	Maximum saturation (up to 50x drive). Sample rate drops by up to 35x and bit depth crushes down to as low as 4-bit. This is extreme lo-fi territory — aggressive aliasing, harsh quantization noise, and heavy distortion.

Technical Details

- **Waveshaper:** Uses a soft-clipping curve: f(x) = (1+k)x / (1+k|x|), where k is the drive amount. This produces even and odd harmonics similar to tube saturation.
- **Bitcrusher:** Sample-and-hold reduces effective sample rate. Quantization to fewer bits creates staircase distortion. The combination produces the classic "retro digital" sound of early samplers and lo-fi gear.

Use Cases

- **0–25:** Warm saturation. Subtle harmonic enhancement that thickens sounds without obvious distortion. Great on vocals, synths, and drums.
- **25–50:** Gritty overdrive. Audible crunch and early digital artifacts. Good for adding edge to bass lines and leads.
- **50–75:** Lo-fi digital. Clear bitcrushing artifacts — sounds like early 90s samplers or a broken radio. Works well on percussion and sound effects.
- **75–100:** Extreme destruction. Heavy aliasing and quantization create harsh, abrasive textures. Use for industrial, noise, and experimental production.

ABYSS — Dark Spatial Reverb

Color: Purple | **Range: 0–100**

ABYSS is a Schroeder-style algorithmic reverb designed for dark, atmospheric spaces. It uses 4 parallel comb filters feeding into 2 series allpass filters, with low-pass filtering in the feedback path to create reverb tails that get progressively darker as they decay.

How It Works

The architecture follows the classic Schroeder reverb design, enhanced with a pre-delay stage and frequency-dependent damping:

Parameter	Description
Pre-Delay	10 ms to 80 ms. Controls the gap between the dry signal and the onset of reverb. Longer pre-delay creates a sense of a larger space and keeps the initial transient clean.
Comb Filters	4 parallel delay lines with delay times of 29.7, 37.1, 41.1, and 43.7 ms. These create the dense, recirculating reflections that form the body of the reverb.
Feedback	Ranges from 0.3 (short decay) to 0.95 (very long decay). Higher values produce longer reverb tails. At maximum, the reverb sustains for several seconds.
Damping Filter	Low-pass filter in the feedback loop rolls off from 8 kHz down to 2 kHz. This means high frequencies decay faster than low frequencies, creating progressively darker reverb tails — similar to how real rooms absorb treble.
Allpass Filters	2 series allpass stages (5 ms and 1.7 ms) smooth the comb filter output and increase echo density, making the reverb sound more natural and diffuse.
Wet Level	Scales from 0% to 80% as the knob increases, controlling how much reverb is mixed with the signal.

Use Cases

- **0–20:** Subtle room ambience. Short decay, minimal darkening. Adds spatial depth without being obvious. Good for making dry recordings feel more alive.
- **20–50:** Dark hall. Medium decay with noticeable high-frequency damping. Creates a moody, atmospheric space. Excellent for pads, vocals, and cinematic textures.
- **50–80:** Cavernous void. Long, dark reverb tails that wash the signal in space. The damping filter removes most brightness, leaving a deep, rumbling ambience. Great for drone, ambient, and dark electronic music.
- **80–100:** Infinite abyss. Extremely long decay with heavy damping. The reverb becomes a dark, sustained wash that can almost function as a pad on its own. Use for soundscapes, horror scoring, and experimental production.

Utility Controls

Three additional controls handle gain staging and wet/dry balance:

Control	Range	Description
MIX	0–100	Dry/Wet blend. At 0, you hear only the original signal. At 100, you hear only the processed signal. Values in between blend the two. This lets you use extreme effect settings while keeping the original signal present for clarity.
INPUT	0–100	Input gain from –12 dB (0) through 0 dB (50) to +12 dB (100). Boosting the input drives the effects harder — especially GRIME, which responds to signal level. Reducing it can tame overly hot signals before they hit the FX chain.
OUTPUT	0–100	Output gain with the same range as Input. Use this to compensate for level changes caused by the effects, ensuring your signal hits the next plugin or your mix bus at the right level.

Factory Presets

HumNyX Multi-FX Engine ships with 8 handcrafted presets designed to showcase the range of the plugin. Each preset is accessible via the buttons along the top of the interface.

PRESET	MELT	GRIME	ABYSS	MIX	CHARACTER
Clean	0	0	0	100	Bypass — no processing applied. Use as a reference point.
Dark Tape	45	15	30	75	Warm, worn cassette vibe. Gentle wobble, light saturation, medium reverb. Great for lo-fi vocals and keys.
Broken Radio	20	70	10	85	Heavy bitcrushing with mild flutter and minimal reverb. Sounds like a transmission through a damaged radio.
Cosmic Void	10	5	90	60	Massive dark reverb with subtle texture. Near-infinite decay creates a deep, enveloping space. Perfect for ambient pads.
VHS Memories	75	25	40	80	Strong tape wobble, moderate grit, atmospheric reverb. Evokes degraded VHS footage with nostalgic warmth.
Demon Core	50	95	60	90	Aggressive on all fronts. Heavy saturation, extreme bitcrushing, and deep reverb. Raw, industrial destruction.
Ghost Freq.	35	40	70	70	Balanced degradation across all three engines. Creates an eerie, spectral quality — like a transmission from beyond.
Midnight Haze	60	10	55	65	Tape-heavy with deep reverb and minimal distortion. Dreamy, dark, and atmospheric. Ideal for downtempo and chill.

All preset values can be adjusted after loading. The presets are starting points — dial them in further to fit your specific material and creative vision.

System Requirements

Specification	Details
Format	VST3
Platform	Windows 10+ (64-bit), macOS (Intel/Apple Silicon)
DAW Support	Ableton Live, FL Studio, Reaper, Cubase, Logic Pro, and any DAW supporting VST3
CPU	Minimal — all processing is lightweight and sample-accurate
Latency	Zero added latency (all processing is real-time)