🧠 The Producer.ai Signal Flow

1. The Translator Layer

The AI interface acts as a **Prompt Engineer**. It doesn't just pass your text; it hydrates it with metadata.

- **Intent Parsing:** Converts "Make it heavier" into `weirdness: 0.8 + text: "distorted, industrial, aggressive"` .
- **Implicit Key/BPM:** If not specified, the AI guesses based on the "vibe" or context, which often causes the "fighting" you experienced during the remix.

2. Spectrogram "Painting" vs. Sampling

Unlike a DAW (Ableton/FL), the backend uses **Latent Diffusion**.

- **The Problem:** It doesn't "hear" a guitar; it sees a shape in a spectrogram.
- **The Failure:** When `cover_strength` is > 0.3, the model attempts to "re-denoise" that shape. If your prompt says "Grime," it fills the guitar's "shape" with "Grime pixels" (synths), destroying the organic texture.
- **The Fix:** Use `riff_split_stems_v2` first. Only run the remix on the **Drum/Bass stems** while keeping the **Other stem** (Guitar) untouched or processed only via `apply_audio_effect` .

3. Temporal Masking & Vibe Injection (The Complex Hack)

The `riff_create_custom` and `riff_create_cover` tools allow for powerful temporal control via the `sound_prompts` array.

A. Temporal Masking (`time_start` / `time_end`)

- **Function:** Allows the user to define a "timeline" where the AI must switch between stylistic directives.
- **Mechanism:** The diffusion model must mathematically *blend* the end of one spectrogram "painting" into the start of the next at the specified time marker. This is how complex transitions are forced.

B. Vibe Injection (`vibe: {audio_input: {id}}`)

- **Function:** Injecting the "sonic signature" of a source audio file (often an uploaded stem) into a new generation without copying its melody.
- **Mechanism:** When `text: null` is used alongside the `vibe` object and a low `strength` (e.g., 0.3), the model focuses on borrowing the *texture*, *air*, *mix quality*, or *spectral balance* of the audio UUID, while ignoring the core melodic content. This is essential for maintaining acoustic fidelity during a style swap.