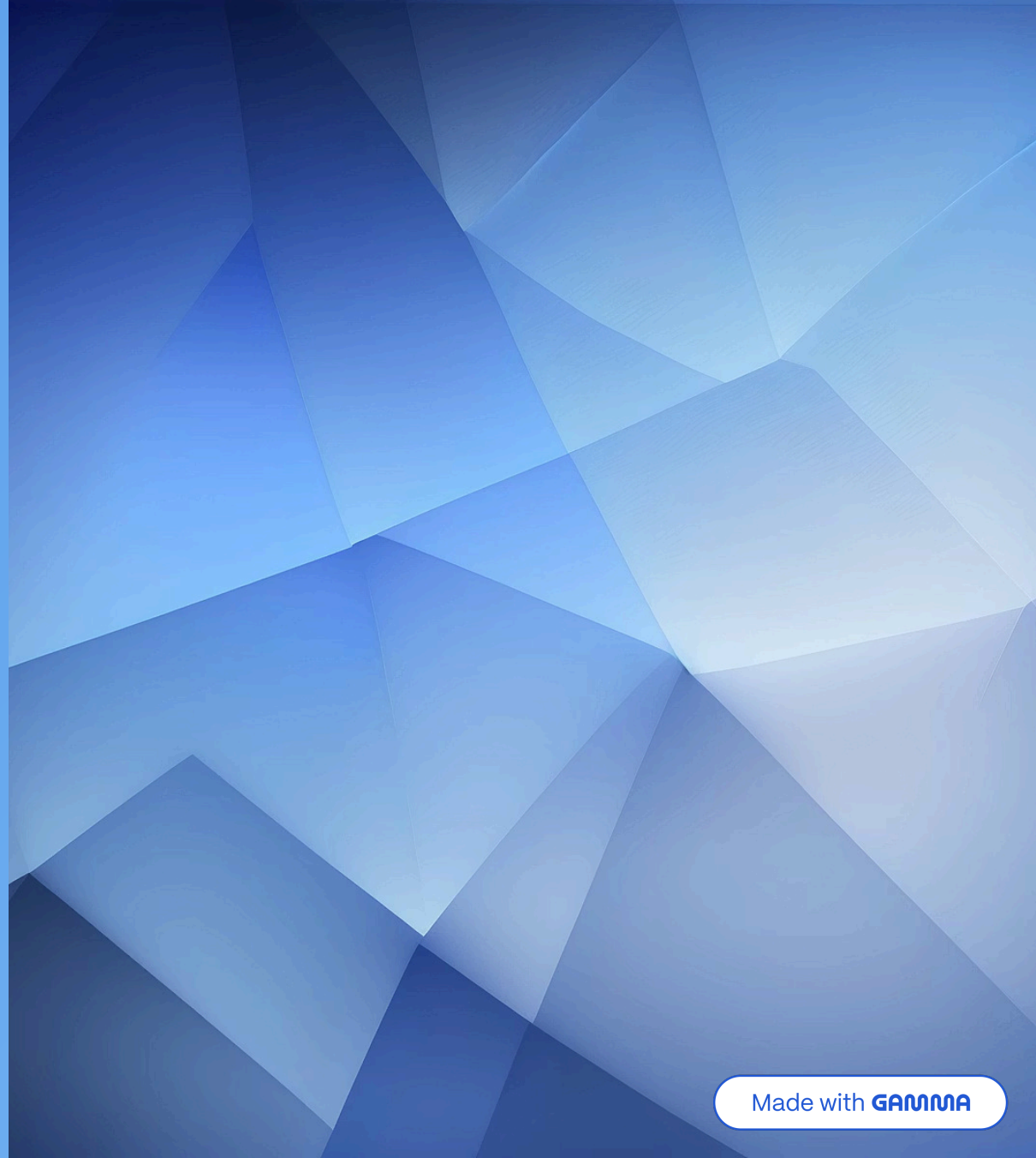
FX-Gen
Sound Designer's Manual

Version 1.0

Professional Audio Generation Suite by Todd-AO

This comprehensive manual will guide you through every aspect of FX-Gen, from initial installation to advanced sound design workflows. Whether you're creating explosive impacts, sci-fi transitions, or organic ambiences, FX-Gen provides the professional tools you need.

Table of contents



Installation

Install the Application

Open the **FX-Gen.dmg** disk image (double-click), then **drag the FX-Gen.app** into your **Applications** folder. Eject the disk image and navigate to your Applications folder.

First Launch
macOS Security Notice:

When launching FX-Gen for the first time, macOS may show a security warning:
This is an expected Mac OS security dialog. Clicl "**Open**" and the app will run.

> This only needs to be done once

System Requirements

Platform
macOS 13 Ventura or later

Processor
Apple Silicon (M1/M2/M3/M4/M5)

RAM
4 GB minimum (8 GB recommended)

Storage
500 MB free disk space (Fast SSD Recommended)

First Launch & License Activation

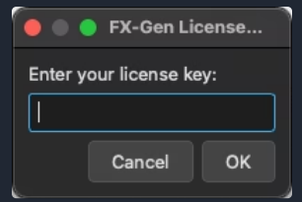
01

Launch **FX-Gen** from Applications

02

The app will show the activation warning

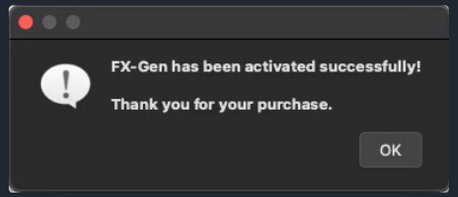
03



Paste your license key and click OK

04

The app is now activated



Ensure your Mac is connected to the internet for activation

Checking License Status

Go to **License** → **License Status...** to view your current activation status, type, and expiration date

Deactivating

Go to **License** → **Deactivate Product...** if you need to transfer your license to another computer

Quick Start Guide - The Professional Workflow

For most sound designers, the standard "power workflow" in FX-Gen follows these three simple steps:

1. **Drop Files:** Drag your raw recordings (the "ingredients") into the app for analysis.
2. **Select Profile:** Choose a Profile/Recipe from the dropdown to define the "style" of the sound.
3. **Generate:** Click the **Generate FX** button to produce unique variations based on that recipe.

Tip: You can create and save your own Profiles to build a signature sound library that you can recall instantly in future projects.

Setting Up Directories

Before you can begin generating audio, you must configure your working environment. FX-Gen uses a nested directory structure centered around a single **Cache Root**. This main folder acts as the "brain" of the application, housing all analysis data, final exports (**Outputs**), and high-fidelity stems (**Intermediate**)

1. Cache Root (The Main Directory)

The **Cache Root** is the primary folder for your project. It stores the foundational data FX-Gen needs to function, including spectral analysis metadata and detected frequency layers.

- **Internal SSD (Recommended for Speed):** For the fastest processing performance, you can use a folder on your internal SSD.
- **External Drives:** If using an external drive, a **Thunderbolt SSD** is strictly recommended to prevent system bottlenecks.
- **Storage Warning:** The Cache folder can become **exceptionally large** very quickly. We recommend periodically monitoring the folder size or choosing a drive with at least 500GB of available overhead to ensure uninterrupted workflow.

2. Outputs Folder (Final Renders)

Located at `{Cache Root}/outputs/`, this folder is the final destination for your sound design variations.

- **Fixed Path:** To maintain system integrity and link each sound to its original "Recipe," the Output folder is a fixed sub-directory within the Cache Root and cannot be moved independently.

3. Intermediate Folder (The Designer’s Stems)

Located at `{Cache Root}/intermediate/`, this folder is a critical resource for professional sound designers.

- **Analog Tape Sync:** Before the final mix is rendered, FX-Gen creates individual, high-fidelity files for every frequency layer. These "stems" are sample-accurate and perfectly aligned with the master output.
- **DAW Integration:** You can drag these intermediate files directly into a DAW to perform manual mixing, custom spatialization, or further spectral processing.

What's Inside Your Cache Root?

Once configured, your Cache Root will automatically organize the following system folders:

- **/analysis:** Spectral metadata for your source files.
- **/audio:** Base audio files and extracted layers.
- **/intermediate:** High-fidelity stem layers for manual mixing.
- **/layers:** Detected frequency-specific data.
- **/outputs:** Your final rendered variations and recipes.
- **/profiles:** Your custom user settings and FX presets.

Input Audio Files: Your Raw Ingredients

In the FX-Gen ecosystem, your input audio files are the **raw ingredients** for your sonic recipes. The quality and character of your final output depend exclusively on the quality of these source files.

Selecting High-Quality Ingredients

- **Source Quality:** Just as a chef relies on fresh products, FX-Gen requires clean, high-fidelity recordings to produce professional-grade textures.
- **Impact on Output:** The fidelity of your final "dish" is a direct reflection of your source material. We recommend using high-sample-rate recordings with minimal background noise for the best spectral analysis results.

Drag and Drop Processing

FX-Gen is designed for a seamless, tactile workflow:

- **Intuitive Import:** Simply drag **.wav** files directly onto the FX-Gen window to begin the "cooking" process.
- **Automatic Analysis:** Once dropped, files are instantly processed, analyzed, and broken down into their component frequency layers.
- **Layer Caching:** These analyzed "ingredients" are then cached, allowing you to quickly experiment with different generation strategies and recipes.

Technical Requirements for Input

To ensure consistent processing, FX-Gen automatically optimizes all ingredients to a professional standard upon import:

- **Format:** Standard **WAV** files.
- **Sample Rate:** Automatically upsampled to **96kHz** for maximum frequency detail.
- **Bit Depth:** Converted to **32-bit float** to preserve extreme dynamic range during FX processing.
- **Channels:** Standard **Stereo (2 channels)** configuration.

Main Interface Overview

The FX-Gen interface is designed for professional sound design workflows. The top menu bar provides access to key tools and settings.

Top Menu Bar

License

- **License Status....** View current activation details.
- **Activate Product....** Enter your license key to unlock FX-Gen.
- **Deactivate Product....** Remove license from this machine.

Tools

- **Recall Recipe....** Load a specific generation recipe by its unique ID code.
- **Batch Queue Generator....** Queue multiple jobs for automated processing.
- **Cache Management** Opens a window to view, backup, search, filter, playback, and delete analyzed audio source records.
- **FX tabs status....** Real-time report showing which effects and tabs are currently active.
- **Archive Recipes and Cache...** Packages custom profiles, recipes, logs, and analyzed audio layers into a single file for project backup or transfer.
- **Restore Recipes and Cache...** Imports a previously archived environment file to restore profiles, recipes, and analyzed audio data.

User Settings

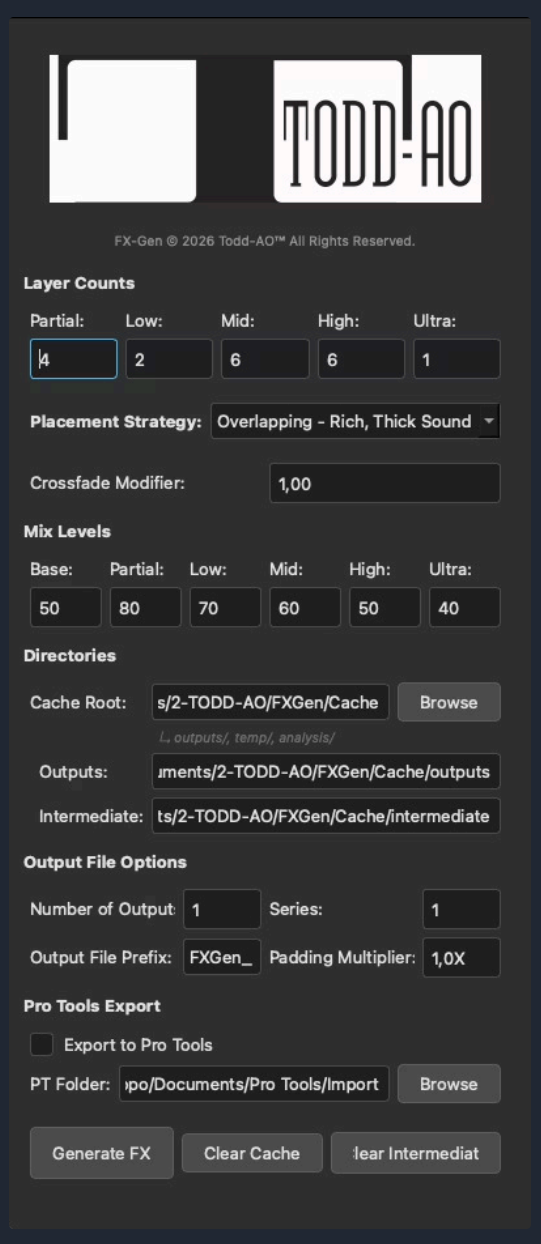
The **User Settings** menu provides central control for managing FXGen sound design profiles. This menu allows you to save and update current archetype settings, load existing configurations, or import and export profile files for sharing between systems. It also includes utility options to reset application preferences by deleting the Plist or quickly accessing the local directory where all profile JSON files are stored.

Help

The **Help** menu provides essential resources for learning the application, troubleshooting, and leveraging AI for sound design.

- **Copy System Prompt for LLM...** Copies the specialized instructions required to help an AI (like Gemini or ChatGPT) generate valid FXGen profile files. Users can paste this prompt into an LLM, receive a JSON code block in return, save that text as a `.json` file, and then use **User Settings > Import Profile...** to add it to their library.
- **Export Debug Logs...** Packages the application's internal activity logs into a file. This should be used when reporting a bug or requesting support so the technical team can analyze any errors or performance issues.

Main Control Panel



The left panel contains the core parameters for shaping the generation process, managing density, and configuring your output files.

Layer Counts

This section controls the density and complexity of each generated sound by specifying how many audio samples are pulled from your analyzed library for each frequency or functional band:

- **Partial**: Short, transient "stinger" layers that add initial impact and detail.
- **Low**: Sub-bass and low-frequency weight to provide "heft."
- **Mid**: The "body" of the sound, containing most of the character and texture.
- **High**: Upper-frequency detail, providing clarity and "air."
- **Ultra**: High-frequency transients, "shimmer," or "sizzle" for a crisp finish.
- *Tip: Higher counts create thicker, more cinematic sounds, while lower counts provide more focus and transparency.*

Placement Strategy

This defines how the selected layers are arranged on the timeline relative to the **Base** sound:

- **Stacking**: Tight clusters that align layers for maximum impact and punch.
- **Spread Out**: Distributes layers across the timeline for maximum separation and clarity.
- **Overlapping**: Blends layers together for a rich, continuous, and thick texture.
- **Replicate Base**: Forces layers to strictly follow the volume envelope of the Base sound.
- **Specialized Pattern**: Includes options like *Sword Peak Sync* for aligning blade impacts or *Vehicle* patterns (e.g., *Pass-By*, *Landing*) for specialized motion effects.

Crossfade Modifier

Adjusts the length of transitions between overlapping layers.

- **Lower values (e.g., 0.5)** preserve original transients for a sharper, "snappier" sound.
- **Higher values (e.g., 2.0)** create longer, smoother crossfades, ideal for continuous textures, ambiences, or drones.

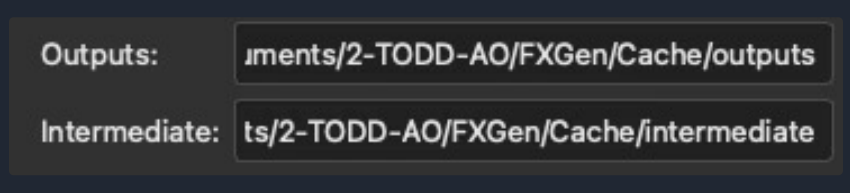
Mix Levels

Relative volume controls (0–100%) for each layer group. These use **Perceptual Scaling** to move the audio in natural-sounding decibel increments rather than just linear percentages.

- **Base**: Sets the primary foundation volume.
- **Partial to Ultra**: Individual level controls to balance the frequency content of your final mix.

Output File Options

- **Number of Outputs**: Specifies how many unique variations to generate in a single batch.
- **Series**: When set above 1, FX-Gen merges multiple unique variations into a single "Series" file (e.g., a single .wav containing 5 unique variations of a sword hit).
- **Output File Prefix**: The base text for your file names (e.g., `Impact_` or `Magic_`).
- **Padding Multiplier**: Extends the file duration (from 1.0x to 20.0x) to ensure reverb, delay, or long decay tails are never cut off by the end of the file.



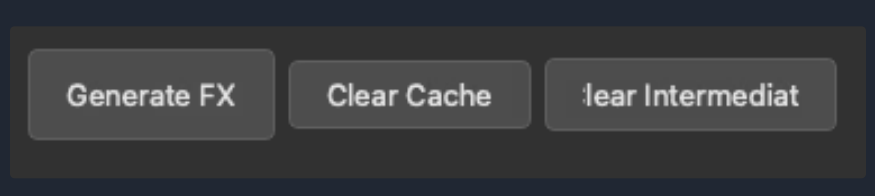
> ***Pro Tip:*** *After producing sounds, simply click on the* ***Outputs*** *or* ***Intermediate*** *paths directly to immediately open that folder in* ***Finder****.*

Pro Tools Export

- **Export to Pro Tools**: When enabled, copies generated files to a designated import folder for your DAW.
- **PT Folder**: Click **Browse** to set the destination folder that your Pro Tools session or "Auto-Import" is monitoring.

Action Buttons

- **Generate FX**: Starts generating Output files.
- **Clear Cache**: Delete all analyzed audio records if you want to start with a fresh library of sounds.
- **Clear Intermediate**: Deletes the temporary processing files created during generation to keep your drive space clean.



Preferences Overview

Configure application-wide settings to fine-tune FX-Gen's internal engine, performance optimization, and file handling. You can access the Preferences window through the **FX-Gen** main menu or by using the standard Mac shortcut `Cmd + ,` (Command + Comma).

Post-Processing

This tab manages how FX-Gen handles files after the initial audio rendering is complete.

Temp File Management

Auto-crop temp files: Automatically removes silence from the start and end of individual layers. This makes your intermediate files much cleaner and easier to review.
Silence threshold: Defines "silence" in decibels (e.g., -50 dB). Anything below this level is trimmed away.

Audio Export

Enable click removal: Automatically detects and reduces digital pops or clicks that can occur during aggressive layering.
Median filter: An aggressive click-removal option that can be useful for noisy source material but should be used sparingly to preserve high-frequency detail.

Performance

Configure how FX-Gen leverages your computer's hardware for maximum speed.

Async I/O Settings

Enable async file I/O: Allows the app to write files to your drive while simultaneously processing the next sound, significantly reducing total generation time.

Worker threads: Set the number of threads for file operations (typically 4 is ideal for most modern systems).

Memory Management:

Auto-cleanup on exit: When enabled, FX-Gen will automatically empty your temporary folders when you quit the application, keeping your storage lean.

Audio Processing

Advanced controls for the core analysis and mixing engine.

Mixing Settings

Control the "DNA" of the mixer, including the Minimum layer duration (source of truth for layer detection) and Base crossfade times for smooth transitions.

FX Processing

Fine-tune the internal windows for Click detection and Envelope smoothing. These are technical parameters that ensure individual audio layers blend perfectly.

WAV Splitter

A powerful feature that automatically scans long recording files (like a single file containing 50 sword hits) and splits them into individual "takes" based on silence breaks. This saves hours of manual editing by turning one long WAV into multiple usable layers.

General

Basic application behavior and diagnostic settings.

User Interface

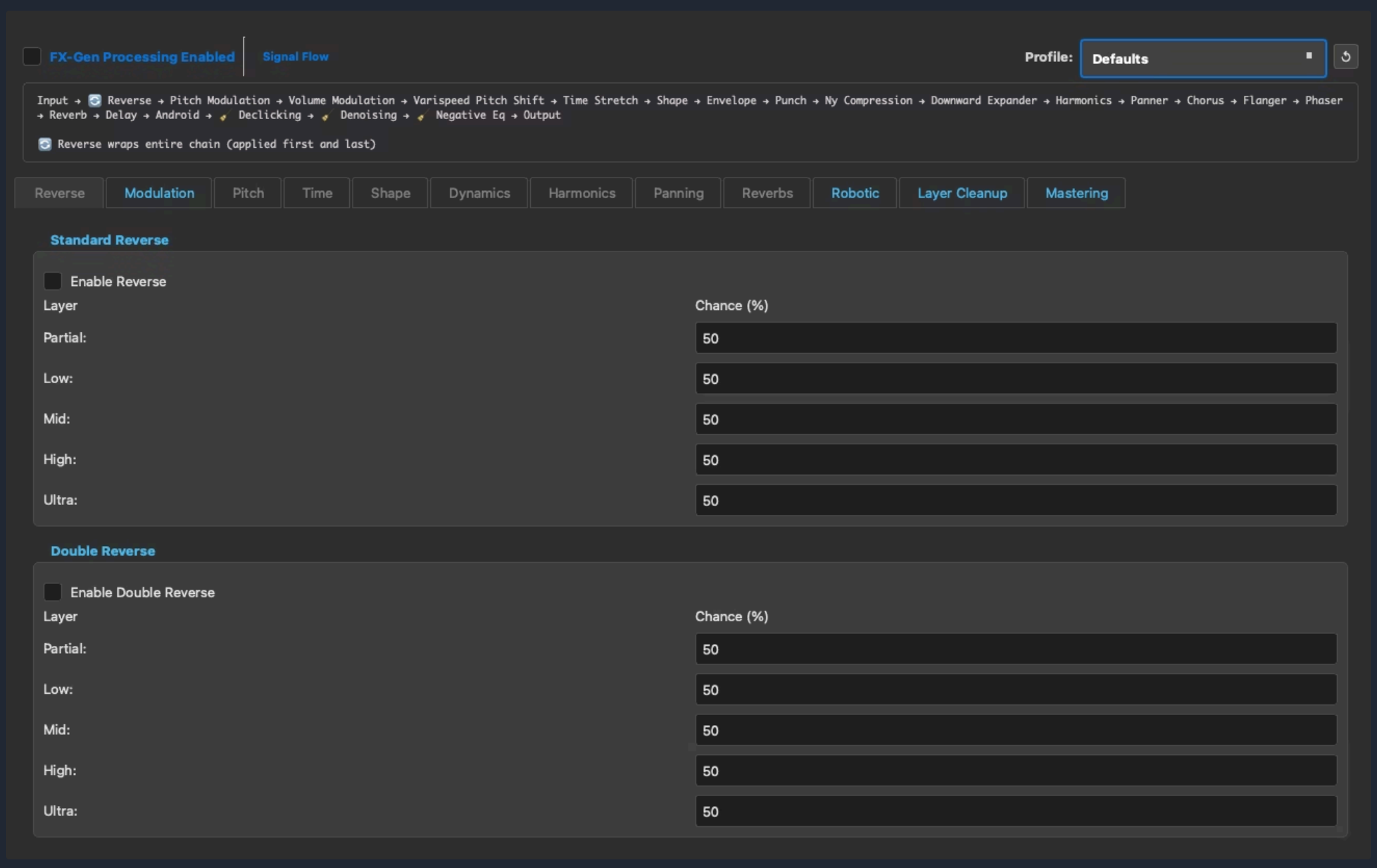
Customize your experience by enabling or disabling **Confirmation dialogs** before starting a generation run or choosing to show **Detailed status messages**.

Logging

Adjust the level of detail for background log files—useful if you need to provide diagnostic information for technical support.

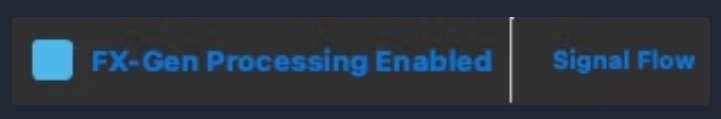
Processing Tabs & Signal Flow

This section is the "Engine Room" of FX-Gen. Located in the center and right of the interface, it allows you to shape the sonic character of every individual layer before they are mixed together.



FX-Gen Processing Enabled (Checkbox)

This is the master bypass for the entire Signal Flow chain.



- **When Checked (Enabled):** FX-Gen applies the full suite of DSP effects (Pitch, Time Stretch, Reverb, etc.) to each layer based on your current settings.
- **When Unchecked (Disabled):** The app will still generate an output file, but it will be a "Dry Mix." The engine will still select layers and arrange them on the timeline, but no effects will be applied. This is useful for quickly auditioning your raw source material placement without any processing.

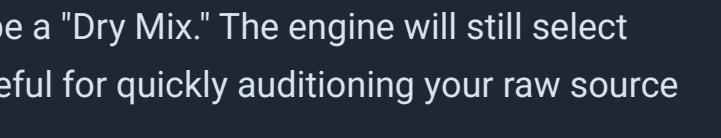
The Processing Tabs

Instead of a single complex screen, FX-Gen organizes its DSP chain into logical tabs (e.g., **Reverse, Modulation, Pitch, Time, Shape, Dynamics,** etc.).

- **General Purpose:** Each tab represents a stage in the "Signal Flow" shown at the top of the section.
- **Manual Control:** You can click through these tabs to manually adjust parameters like Pitch Chance, Reverb Decay, or Robotic textures. Any change you make here will be applied to the next batch of generated sounds.

Profiles & Sound Sets

The **Profile** box (located at the top right of the Signal Flow area) is the most important tool for a fast and consistent workflow.

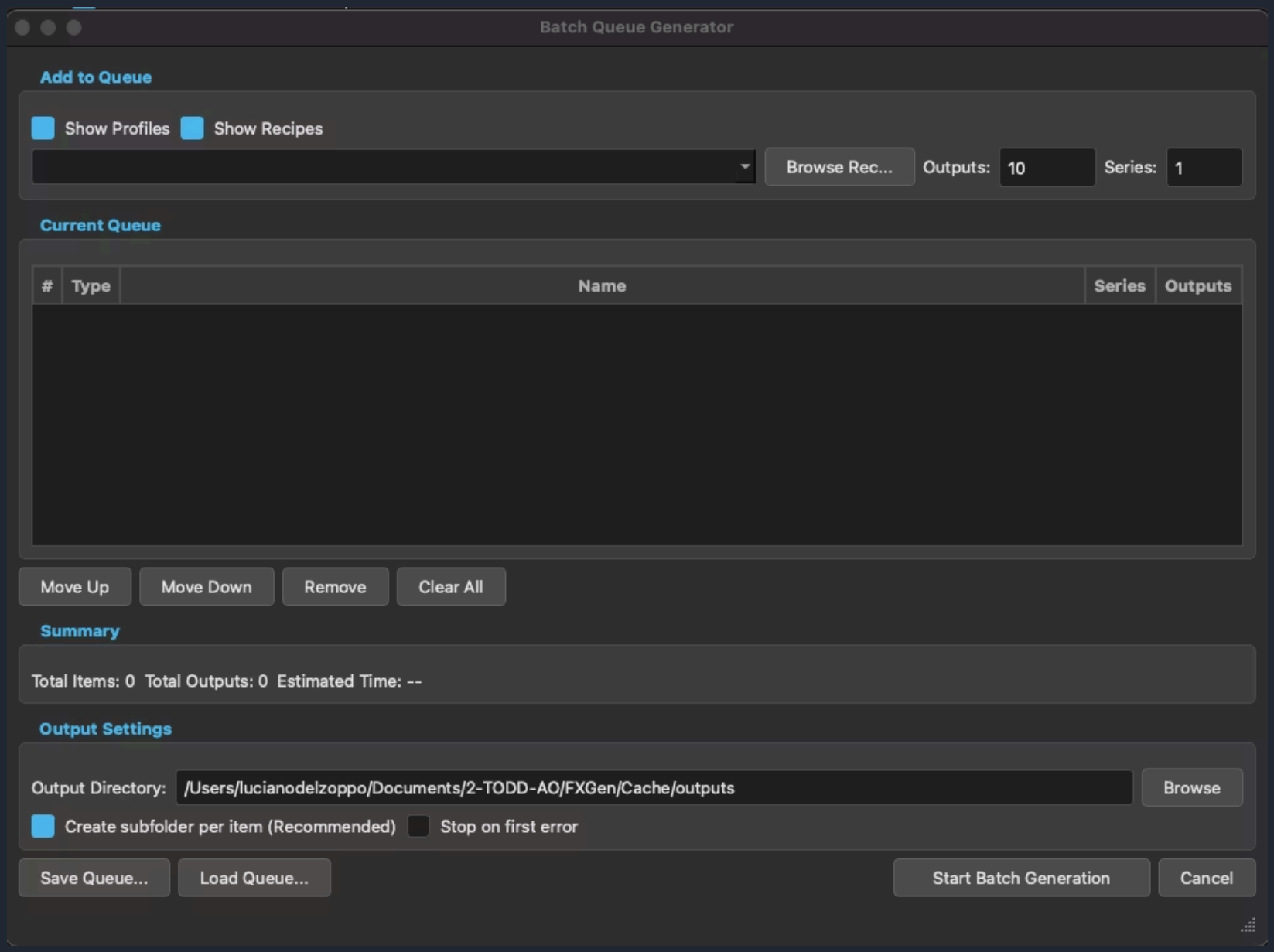


Understanding Profiles (Presets)

A Profile is a complete "Recipe" that stores every single setting in the Processing Tabs. Rather than manually setting dozens of knobs every time you want a "Robot Impact" or a "Cinematic Whoosh," you simply select a Profile.

- **Selecting a Profile:** Clicking the dropdown instantly reconfigures all Processing Tabs to match that specific sound archetype.
- **Customizing:** Selecting a Profile is often just the starting point. You can choose a preset "Recipe" and then modify individual values in the tabs to tweak the sound to your specific project needs.

Batch Queue Generator

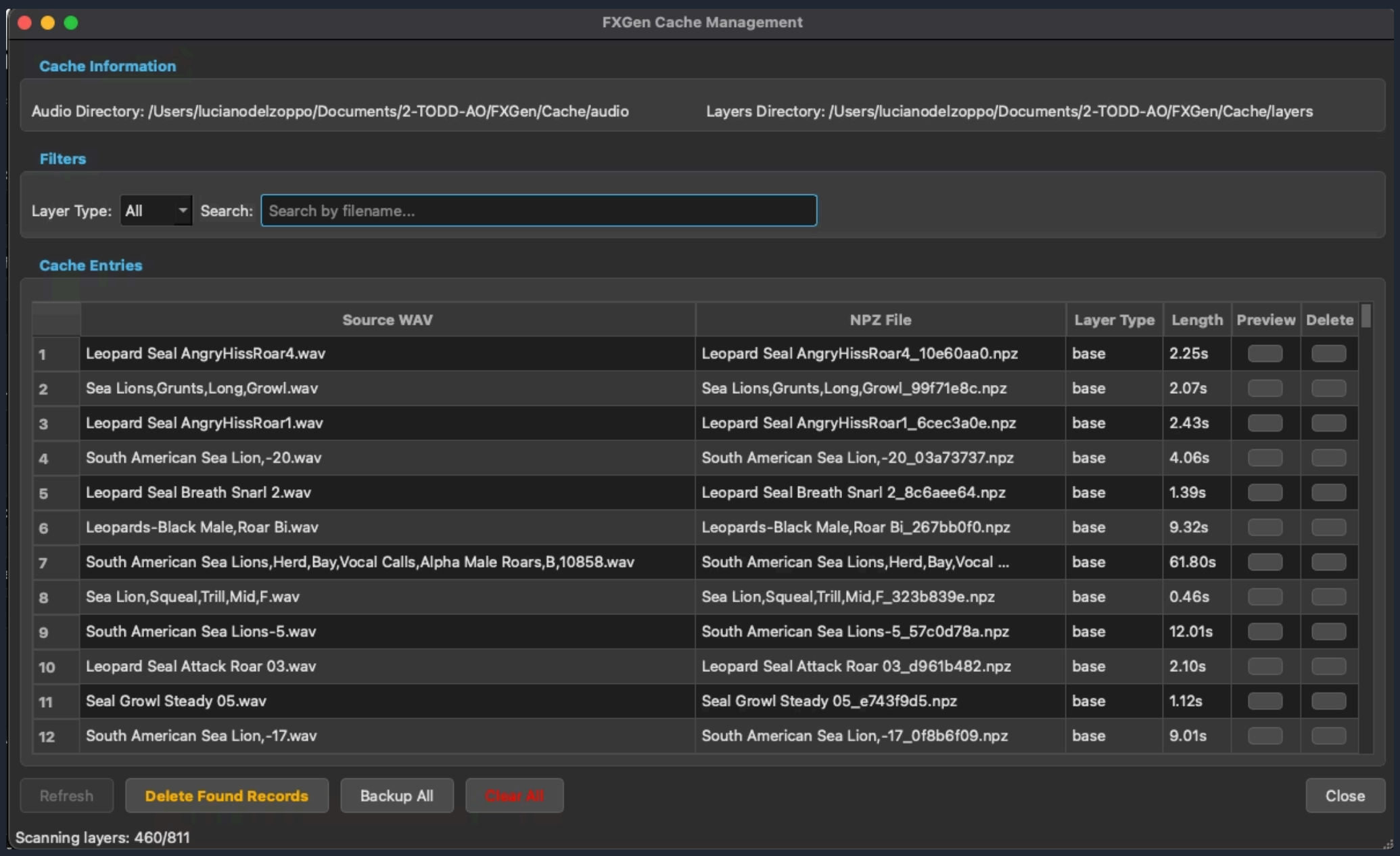


Access: Tools > Batch Queue Generator

The Batch Queue Generator is a powerful "set and forget" utility that allows you to queue up multiple generation jobs for overnight processing or large-scale project deliveries. You can mix and match different Profiles and Recipes in a single queue.

- **Add to Queue**: Use the dropdown to select a **Profile** (Archetype) or a specific **Recipe** (ID code). You can filter the list using the "Show Profiles" and "Show Recipes" checkboxes.
- **Outputs & Series**: Define how many variations you want for each item.
  - *Example: Queue "Robot_Slam" for 20 outputs and "Sword_Clang" for 50 outputs.*
- **Current Queue**: View and organize your pending jobs. You can use the **Move Up/Down** buttons to change processing order or **Remove** items if you change your mind.
- **Output Settings**: Choose a destination folder for the entire batch.
  - **Create subfolder per item**: (Recommended) This keeps your project organized by placing the results of each queued item into its own named directory.
- **Save/Load Queue**: If you have a recurring set of needs for a project, you can save your entire queue list to a file and reload it later.
- **Summary**: Displays the total count of variations and a time estimate for the entire run.

Cache Management



Access: Tools > Cache Management

The Cache Management window is the librarian of your sound design engine. Since FX-Gen analyzes your audio once and stores it in high-performance ".npz" files for instant recall, this window allows you to manage that library without digging into system folders.

- **Cache Information**: Shows exactly where your analyzed "Audio" (Base layers) and "Layers" (Effect layers) are stored on your drive.
- **Filters**: Quickly find specific sounds by filename or layer type (Partial, Low, Mid, High, Ultra, Base).
- **The Cache Table**:
  - **Source WAV**: The original filename you imported.
  - **NPZ File**: The internal FX-Gen analysis file.
  - **Layer Type**: Shows which frequency or functional band the engine has assigned to this sound.
  - **Length**: The duration of the analyzed layer.
  - **Preview (▶️)**: Audition the analyzed layer immediately. FX-Gen automatically reconstructs and filters the audio during preview so you hear exactly what it will sound like in a mix.
  - **Delete (🗑)**: Remove a specific file from your analyzed library.
- **Action Buttons**:
  - **Delete Found Records**: Deletes only the items currently visible based on your filters (useful for bulk cleanup).
  - **Backup All**: Packages your entire analyzed library into a single archive for project handovers or machine transfers.
  - **Clear All**: Wipes the entire cache—essentially "formatting" your FX-Gen library to start fresh.

Software Updates

FX-Gen features an integrated update system to ensure you always have the latest features and stability fixes.

- **Automatic Check:** FX-Gen automatically checks for available updates on launch.
- **Manual Check:** Go to **Help** → **Check for Updates...** to check manually.
- **Notifications:** A dialog will appear if a new version is available, with options to download or view the changelog.

Legal & Acknowledgements

Copyright & Trademarks

End User License Agreement (EULA)

- Your use of this software is subject to the **FX-Gen End User License Agreement**.
- By activating or using this software, you agree to be bound by the terms of the EULA.
- Unauthorized copying, reverse engineering, or distribution of this software is strictly prohibited.

Third-Party Software Credits

FX-Gen utilizes open-source technology to deliver its professional capabilities:

- **Qt Project**: User Interface framework (via PySide6), used under LGPL v3.
- **NumPy & SciPy**: Advanced DSP and mathematical calculations.
- **SoundFile**: High-fidelity audio input/output.
- **PyTorch**: AI/ML Inference Engine for Profile Generation.

Development Team

- **Concept Design & Main Coder**: Rob Nokes
- **Secondary Coder**: Luciano Del Zoppo
- **Engineering**: Google DeepMind / Todd-AO Engineering
- **Sound Design Archetypes**: Rob Nokes
- **Software testing**: Frederic Dubois