**MP3 Equalizer Visualizer**

**User Manual by Tracy Rose**

Welcome to the **Amplitude Depth 3D Plot MP3 Player**! This interactive web application lets you play audio files (MP3, WAV, or OGG) while visualizing their frequency spectrum in a stunning 3D plot. You can manipulate specific frequency ranges to mute or highlight them, both in the audio output and the visual display. This user-friendly manual will guide you through using the player effectively.

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**Getting Started**

To use the Amplitude Depth 3D Plot MP3 Player, you need:

* A modern web browser (e.g., Chrome, Firefox, Edge, or Safari).
* An audio file in MP3, WAV, or OGG format.
* A device with audio output (speakers or headphones).
* An internet connection to load the required libraries (Three.js and OrbitControls).

Simply open the application in your browser, and you’re ready to explore!

**Interface Overview**

The interface is divided into two main sections:

**1. Sidebar (Left)**

* **Frequency Control Panel**: Contains checkboxes to mute or highlight specific frequency ranges and a button to unselect all options.
* **Unselect All Button**: Clears all selected frequency controls for a fresh start.

**2. Main Content (Right)**

* **Top Controls**:
  + **Title**: Displays "Amplitude Depth 3D Plot."
  + **File Input**: Allows you to upload an audio file.
  + **Audio Player**: Standard controls to play, pause, and seek through the audio.
  + **Rotation Toggle Button**: Starts or stops the 3D plot’s rotation.
* **Visualizer Canvas**: Displays the interactive 3D frequency plot.

The 3D plot uses three axes:

* **X-Axis (Red)**: Represents frequency (logarithmic scale, from 20Hz to 20kHz).
* **Y-Axis (Green)**: Represents amplitude (volume intensity).
* **Z-Axis (Blue)**: Represents depth (loudness perception).

**Uploading and Playing Audio**

1. **Upload an Audio File**:
   * Click the **Choose File** button (or equivalent, depending on your browser) in the top controls.
   * Select an MP3, WAV, or OGG file from your device.
   * Only one file can be uploaded at a time.
2. **Play the Audio**:
   * Once the file loads, the audio player will display below the file input.
   * Use the player’s controls:
     + **Play/Pause**: Start or pause playback.
     + **Seek Bar**: Drag to jump to a specific part of the audio.
     + **Volume**: Adjust the playback volume.
3. **Notes**:
   * If the audio doesn’t play, click or tap anywhere on the page to activate the audio context (some browsers require user interaction).
   * Only audio files are supported. Uploading other file types will display an error.

**Controlling the 3D Visualization**

The 3D plot visualizes the audio’s frequency spectrum in real-time, with points representing frequency bins colored by amplitude and optionally highlighted for specific ranges.

**1. Rotate the Plot**

* **Automatic Rotation**:
  + By default, the plot rotates slowly for a dynamic view.
  + Click the **Stop Rotation** button to pause rotation (the button changes to **Start Rotation**).
  + Click **Start Rotation** to resume.
* **Manual Rotation**:
  + Click and drag the plot to rotate it manually.
  + Use your mouse wheel or pinch gestures to zoom in/out.
  + The plot won’t rotate automatically while you’re dragging.

**2. Understanding the Plot**

* **Points**: Each point represents a frequency bin’s amplitude.
* **Colors**: Default colors range from blue (low amplitude) to bright hues (high amplitude). Highlighted ranges use distinct colors (e.g., hot pink for 100–400Hz).
* **Axes Labels**:
  + Frequency markers (e.g., 20Hz, 1kHz, 20kHz) are shown along the X-axis.
  + Labels like “Bass,” “Mids,” and “Highs” help identify frequency regions.
  + “Loud” and “Quiet” mark amplitude levels on the Y-axis.
  + “Forward” and “Back” indicate depth on the Z-axis.

**Using Frequency Controls**

The **Frequency Control** panel in the sidebar lets you manipulate specific frequency ranges. Each range has two options:

* **Mute**: Removes the frequency range from the audio output (affects what you hear).
* **Highlight**: Colors the frequency range in the 3D plot (affects what you see).

**Available Frequency Ranges**

|  |  |  |  |
| --- | --- | --- | --- |
| Range | Frequency | Mute Effect | Highlight Color |
| Human Voice | 100–400Hz | Mutes low vocal frequencies | Hot Pink |
| Higher Human Voice | 800–1500Hz | Mutes mid vocal frequencies | Yellow |
| Presents | 1500–5000Hz | Mutes presence/clarity | Bright Orange |
| 5kHz–8kHz | 5000–8000Hz | Mutes upper-mid frequencies | (No highlight option) |
| Remainder | 8000–12000Hz | Mutes high frequencies | Bright Yellow |
| Deep Cut | 12000–20000Hz | Mutes ultra-high frequencies | Orange |

**How to Use Frequency Controls**

1. **Select a Range**:
   * Check the box next to the desired option (e.g., “Mute Human 100–400Hz” or “Highlight 100–400Hz”).
   * Hover over a label to see a tooltip with its effect.
2. **Apply Multiple Controls**:
   * You can select multiple mute and highlight options simultaneously.
   * For example, mute 100–400Hz and highlight 1500–5000Hz to focus on mid-range visuals while silencing low vocals.
3. **Unselect All**:
   * Click the **Unselect All** button at the top of the sidebar to clear all checkboxes.
   * This resets the audio to its original state and removes all highlights from the plot.
4. **Effects**:
   * **Mute**: Instantly removes the selected frequency range from the audio. Muted ranges also appear flat (amplitude = 0) in the plot.
   * **Highlight**: Colors the selected range in the plot for easy identification, without affecting the audio.

**Example Use Case**

* Want to isolate high frequencies? Check “Mute Human 100–400Hz,” “Mute Higher 800–1500Hz,” and “Mute Presents 1500–5kHz” to silence lower ranges, and check “Highlight 12K–20kHz” to visualize the highs in orange.

**Tips and Troubleshooting**

**Tips**

* **Experiment Freely**: Try different combinations of mute and highlight options to understand how frequencies shape the audio.
* **Zoom and Rotate**: Use manual controls to inspect specific parts of the 3D plot closely.
* **Audio Interaction**: If audio doesn’t play, click or tap the page to enable playback (a browser security feature).
* **File Size**: Smaller audio files load faster. For best performance, use files under 10MB.

**Troubleshooting**

* **No Audio**:
  + Ensure your device’s volume is up and not muted.
  + Click or tap the page to activate the audio context.
  + Verify the file is a valid MP3, WAV, or OGG.
* **Plot Not Displaying**:
  + Refresh the page to reload the visualizer.
  + Ensure your browser supports WebGL (most modern browsers do).
* **Slow Performance**:
  + Close other tabs or apps to free up resources.
  + Use a smaller audio file or a device with better processing power.
* **Error Messages**:
  + If you see an alert (e.g., “Please select an audio file”), follow the prompt to upload a valid file.
  + For persistent issues, try a different browser or device.

**Enjoy Your Experience!**

The Amplitude Depth 3D Plot MP3 Player is a fun and educational tool for exploring audio frequencies. Whether you’re a music enthusiast, audio engineer, or just curious, we hope you enjoy visualizing and manipulating sound in 3D. If you have feedback or need help, feel free to experiment and discover the possibilities!

Happy listening and visualizing!

*This manual was created for the Amplitude Depth 3D Plot MP3 Player as of April 15, 2025.*