SOP: Frequency Management and Signal Processing Guidelines

Category: Audio Engineering / Technical Standards
Version: 1.0
Scope: Mixing, Mastering, and Sound Design Workflows

1. Frequency Spectrum Allocation

To ensure clarity and prevent "masking" in a mix, all engineers must adhere to the following frequency response standards.

Frequency Range	Character	Technical Action
20Hz – 60Hz	Sub-Bass	Use high-pass filters (HPF) on non-bass elements to clear headroom.
200Hz – 500Hz	Low-Mids / Mud	Attenuate narrow bands if the mix feels "cluttered" or "boxy."
2kHz – 4kHz	Presence / Attack	Critical range for percussion "snap" and vocal clarity. Use caution; excessive gain causes listener fatigue.
10kHz – 20kHz	Air / Brilliance	Subtle high-shelf boosts for "expensive" sounding textures.

2. Dynamic Processing Standards

Compression and transient shaping must be applied based on the "Envelope Profile" of the source material.

2.1 Transient Classification

- **Percussive Transients:** Short attack times (1ms–10ms) to tame peaks.
- **Sustained Textures:** Longer attack times to preserve the natural "hit" of the instrument while controlling the tail.

2.2 Signal Flow Protocol

For consistent results, follow this standard signal chain order:

1. **Corrective EQ:** Remove unwanted resonances.
2. **Dynamics:** Control peaks and RMS levels.
3. **Tonal EQ:** Shape the character of the sound.
4. **Temporal Effects:** Reverb and Delay (via Auxiliary Sends).

3. Mixing Best Practices (Internal)

- **A/B Comparison:** Use level-matched bypass to ensure processing is genuinely improving the signal.
- **Phase Correlation:** Check low-frequency elements (Kicks and Bass) in Mono to ensure no phase cancellation is occurring.
- **Headroom:** Maintain a minimum of -6dB peak on the Master Bus before entering the mastering stage.