Bass Guitar Effects Bank

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System Overview

- A modular audio effects bank for the Bass guitar
- Pre-amp stage and 5 audio effect modules:
Pre-amp

- No effect
- 2 stage JFET amplifier with variable gain
- flat frequency response
- Bring bass output up to signal levels (5 Vp-p)
- Stretch Goal: Add 3-5 band EQ
Phaser

- Subtle and otherworldly effect by shifting phase
- Stretch Goal: Add feedback, add LFO
Auto-Wah

- Classic disco and funk effect
- Voltage controlled filter
- Controlled by an envelope filter
- (bridge rectifier)
- Stretch Goal: finely adjustable resonance
Bitcrusher

- Why? -> It’s retro, arcade game music sounds cool
- Reduces “sample rate” and resolution
- Sample rate: requires adjustable clock, sample and hold circuit
- Resolution: 3-bit * flash ADC

*will add more comparators
Flanger

- Adds a “wooshing” effect to the Audio
- Original sound + time delayed
  And (varying) phase shifted sound
- Analog delay achieved by bucket Brigade circuit
Bucket brigade (BBD) = analog delay

Two clocks open and closes switches. The sampled audio is passed along, as if going through a chain of sample-hold blocks.
Overdrive

- When signal is over amplified it is clipped. Sine -> square.
- Adds sustain
- Adds both harmonic and inharmonic overtones
- Amplifier gain effect
Timeline

- By April 11: Ordered parts, designed schematic for preamp stage (Israel), schematic and working implementation of bitcrusher (Mark)
- By April 18: schematic of autowah done, working implementation of preamp stage (Israel), schematic of flanger (or am modulation) and working implementation (Mark)
- By April 25: schematic of phaser, working implementation of phaser (Israel), working implementation of overdrive (Mark)
- By May 2: fully integrate modules and circuit debugged (Israel/Mark)