Commitment:

- **Amplitude to LED Conversion** - Take a voltage from 0 -10v and incrementally turn on 8 LEDs proportionally to the voltage.
- **Bandpass Filter** - Take a signal from the mixer (fixed amplitude signal) and filter it through bandpass filters at specific frequencies with respective qualities (bandwidths)
- **Signal Mixer** - Given a square wave and a sine wave of ~260KHz this module produces an output sine wave that has a frequency equal to the difference of the inputs.
- **Frequency to DC Voltage Converter** - Converts a variable frequency sine wave to a variable DC voltage output.
- **Voltage Controlled Attenuator** - Attenuates an input sine wave signal based on a DC control voltage.
- **Tunable Fixed pitch oscillator** - A square wave oscillator that holds at one frequency but can be adjusted over a large range around 260KHz
- **Capacitance controlled oscillator** - A sine wave oscillator that can change frequency by ~3KHz with a changing capacitance for the pitch at ~260KHz and another sine wave oscillator that operates at around ~450KHz and can change frequency with changing capacitance.

Goal:

- **9 bandpass visualizers working together** - have 9 bandpass filters working in conjunction and a visualizer for each bandpass filter output
- **3 Frequencies to Audio** - Generate an audio, line-level signal that varies in frequency and volume based on three input frequencies.
- **Antenna controlled oscillators** - Capacitance controller oscillators from the commitment with the changing capacitance coming from hands around an antenna
- **Theremin** - Being able to produce an audible sound that changes in pitch and volume when hands move to and from a pitch and volume antenna. The volume should change between something loud and silence. The pitch should have a 20Hz - 3KHz range
**Stretch:**

- **PCB** - Design PCBs for some or all of the modules.
- **Visualize Line In Music** - Take a stereo input from a source (e.g. phone line-out), convert it to mono and feed it to the visualizer. Also have an audio output to feed an amplifier/speakers.
- **Audio Amplifier** - Construct an audio amplifier to directly drive a speaker.
- **Power supply** - Build an AC to DC power supply that can supply +/-12V.
- **Larger Frequency Range** - Having a range larger than 20Hz - 3KHz
- **Audio Effects** - Making the theremin sound like a real theremin instead of producing a pure sine tone.
- **More Responsive / Linear** - Having ~3 octaves with a linear enough pitch response to allow music to be played.