6.101 Project Checklist

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- Analog Synthesizer

1) Working keyboard controller

2) Controller circuit converts keyboard presses into control signals

3) voltage controlled oscillator creates output waveform with output waveform proportional to input voltage, specifically 1V per octave.

4) voltage controlled filter break frequency tracks input voltage, specifically 1V per octave.

5) voltage controlled amplifier control voltage modulates amplitude of input signal.

6 )envelope generator produces a ADSR waveform

- Power Supply

1) Ability to supply unregulated DC

2) Ability to supply regulated DC

3) Ability to supply +/- 15V @ no amps

4) Ability to supply +/-25V @ no amps

5) Ability to supply +/-25V at full amps, ~3A

6) Ability to supply +/-15V at full amps, ~3A

7) Ability to power Elaine's power amplifier

8) Ability to power Elliott's synthesizer

9) Ability to current limit the power supply

-Power Amplifier

1) Working differential amplifier input stage to include input signal and negative feedback

2) utilize Complementary feedback pairs in the differential amplifier stage to improve linearity.

3) utilize matched pair current mirror in the input stage.

4) Working Voltage Amplifying Stage using a pole compensating capacitor

5) Ability to amplify a 1khz sine wave, output of 20W.

6) Ability to amplify sine waves at full bandwidth range (20Hz-20kHz), and at maximum power of 50W.

7) ability to use Lauren's power rail

8) ability to switch off the upper power rail when the signal is low: working class G output stage

9)Stretch goals: lower distortion to roughly 0.2%.

Take higher frequency feedback from a previous stage in the circuit (not the final output) – this may help lower distortion.

1) Bandwidth of 20Hz – 20kHz

2) distortion of 0.2% (or lower)

3) working amplifier with gain of 4 (or slightly higher) – amplifies and transmits signal

4) working class g output stage