sdmay19-32: Sound Effect Devices for Musicians

Week 4 Report

September 27 – October 4

Team Members

Tim Day — *Analog Engineer*
Eric Fischer — *Test Engineer*
Francisco Alegria — *Chief/ Musical Engineer*
Blake Beyer — Digital Engineer
Travis Gillham — *Integration Engineer*

Summary of Progress this Report

This week we all worked on our designated tasks. We were able to produce a schematic for the white noise generator which was also tested in lab. We created filter designs for the low and high pass. The next step is to determine the value of the components and get a designated range for the movement of the filters cut off frequency. A schematic is in progress for the output amplifier. The oscillators are still being determined on if the device will be mono or poly phonic. Depending on which one is selected it will determine how many are need and may end up adjusting the design. We also decided on a new digital interphase the user will have that will be touch screen and will control all the modules. This will make our synthesizer stand out from others that are out in the market.

Pending Issues

- Need complete schematics from all of the modules.
- Need to start working on the design for the mixer and envelopes.
- Everyone needs to provide all the controls that are in their module. This will be used for the new digital and physical user interphase.

Plans for Upcoming Reporting Period

- Every module should have progress on the schematic to reach the deadline of the end of the month.
- If possible, the schematics should be tested in a simulation or at the lab to show proof of functionality.
- Update on the new digital interphase and have an outline for how it will look and what is needed from the hardware to work properly.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Tim Day	Research different types of noise: temperature, Johnson, and avalanche. Researched methods to amplify the noise from a BJT. Created a circuit that would be able to amplify the noise from the BJT. Test the circuit in the lab and made adjustments till it worked.	8	22.5
Eric Fischer	Researched filter designs and determined to go with 4^{th} order Butterworth filter with 12/24 V per octave. Still need to calculate what this is in dB per decade	2.5	12.5
Francisco Alegria	This week I have focused on the internal signal flow. Specifically, I have started designing the circuits that will interconnect all of the modules inside the synth system. I have also been researching and looking for the parts needed to implement all of the digital/analog UI features. The next step is to work with the team to implement the UI functionality in each module.	4	17.5
Blake Beyer	Research oscillators and low frequency oscillators.	<1	10
Travis Gillham	Researched designs for output amplifier to determine what op amp best suites our needs. Also researched materials that can be used for the case.	3	12.5