Multi-Effect Pedal Executive Summary

Team 28

The Multi-Effect Pedal was created in order to meet two critical needs, modularity and simplicity. Traditionally, guitarists would have to buy separate effect pedals and daisy chain them together in order to apply an effect to the audio. Our custom pedal allows a guitarist to have a single integrated system that is easy to use. Beyond the standard effects that can be applied, we decided to add some extra features. One of these is a display that allows users to view the current note they are playing. Another is a gain knob to adjust the degree to which the distortion effect is applied. The user interface was designed in such a way to retain the feeling of the old school pedals. Our system also saves you the space that would be required for three separate effects. The pedal is optimized for low interference within a guitar/amp arrangement. If the user would like, the pedal has a signal bypass mode that will allow the input signal from the guitar to be sent directly to the amp with minimal loss.

The development of our project was graced with two common cornerstones that many other great projects share: it was built in a garage and it had a continuously evolving vision. From the start of our project, we spent months brainstorming what the pedal should look like, do, and be used. We gathered our various designs and ideas into a shared Google Drive. With each revision, we would add to our compilation of what would become the Multi-Effect pedal. We tried to meet at least once a week face-to-face to discuss the project. During this time we would also create a Jira Board with two week sprints of what we would like to accomplish. As a team we would meet virtually when need be. We often set up meetings through Discord to do our weekly project update videos and to write our project partner updates. After the Fall term, where 3 months were spent designing the system, the next stage was to build. By the beginning of Winter term, we had all of the basic parts necessary to prototype the system. We used breadboards for all of the initial prototyping. Every effect in the pedal was prototyped using a breadboard. The tuner and display also used a breadboard at one point in order to amplify an input signal for testing. On this note, the equipment we used most frequently for testing were an oscilloscope and signal generator. Signal integrity and fidelity were critical for our project. Near the end of Winter term, we designed and ordered our PCB for the Multi-Effect pedal.

Some key learning outcomes from this project were hybrid work, project management, and electronic design. We learned new design tools such as Circuit Maker and project management software such as Jira. Project documentation has also been an important skill.

Project Timeline: