EXECUTIVE SUMMARY

When a guitarist is playing on-stage, the last thing they want to do is bend down and turn knobs every time they need to adjust the pedal effects (FX). The Blackbox allows guitar players to switch seamlessly between parameters mid-performance, using only their feet. While other products may have similar capabilities, they do not allow the user to be completely hands-free. As shown in Figure 1, this product allows the user to switch between three distinct FX of their choosing and offers a pedal for volume control, along with an LCD screen to display which FX the user is currently editing.

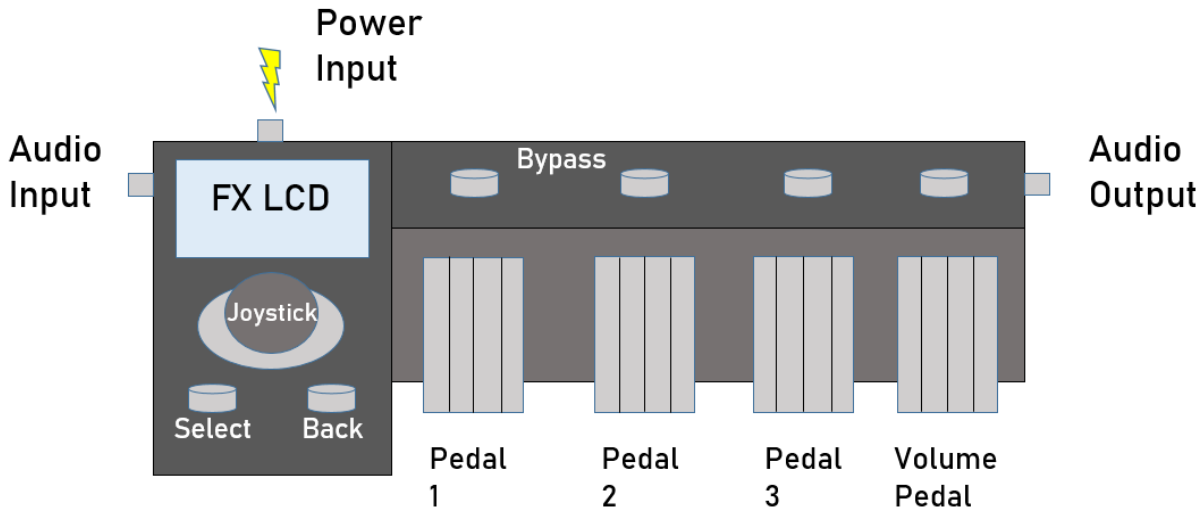

Figure 1: The Blackbox Enclosure Diagram

The Blackbox boasts a variety of features, designed to ensure maximum user satisfaction. The Blackbox meets IP-55 standards for dust and waterproofing, allowing the user to perform in varying circumstances and environments. Although it only offers three FX pedals, each pedal can be assigned to adjust any one parameter of any of the multiple FX possible in the chain. It has a fourth pedal for controlling volume and a directional pad that allows the user to switch between parameters with ease. It also has an adapter allowing it to plug into the wall, so the user doesn't have to worry about a battery dying on them.

The Blackbox uses three Spin FV-1 microprocessors to implement each FX separately. It utilizes an Arduino Mega microcontroller to send potentiometer inputs to each FV-1 and adjust parameters as needed by the user. The Arduino relays this information to a Liquid Crystal Display (LCD) screen every time an effect is adjusted and allows the user to navigate the UI options using foot switches arranged in a D-Pad. This LCD system prioritizes visual clarity so that a user may know what they are manipulating at any given time. Lastly, all power management occurs within the Arduino, with no power management needed from a user.

The Blackbox strives to streamline the process of switching FX mid-performance. The product will have a continuously upgraded enclosure, increasing its durability and resistance to the elements. Future development will involve the development of more FX, giving performers a more versatile range of tools to fine-tune their sound. It could even allow a user to import custom FX to the device for personal use. If this design is successful, it could change guitar performances and make life easier for the performer.