

Bluetooth-Connected Digital Multi-Effect Guitar Pedal

Background

Effect pedals are electronic devices that allow guitar players to add effects to the guitar's original sound while performing. Many guitar pedals are programmed for a singular effect. This means achieving a higher sound complexity and variety can only be done by connecting multiple pedals in series. This becomes costly, burdensome, and overwhelming for guitarists of all experience levels.

The Problem

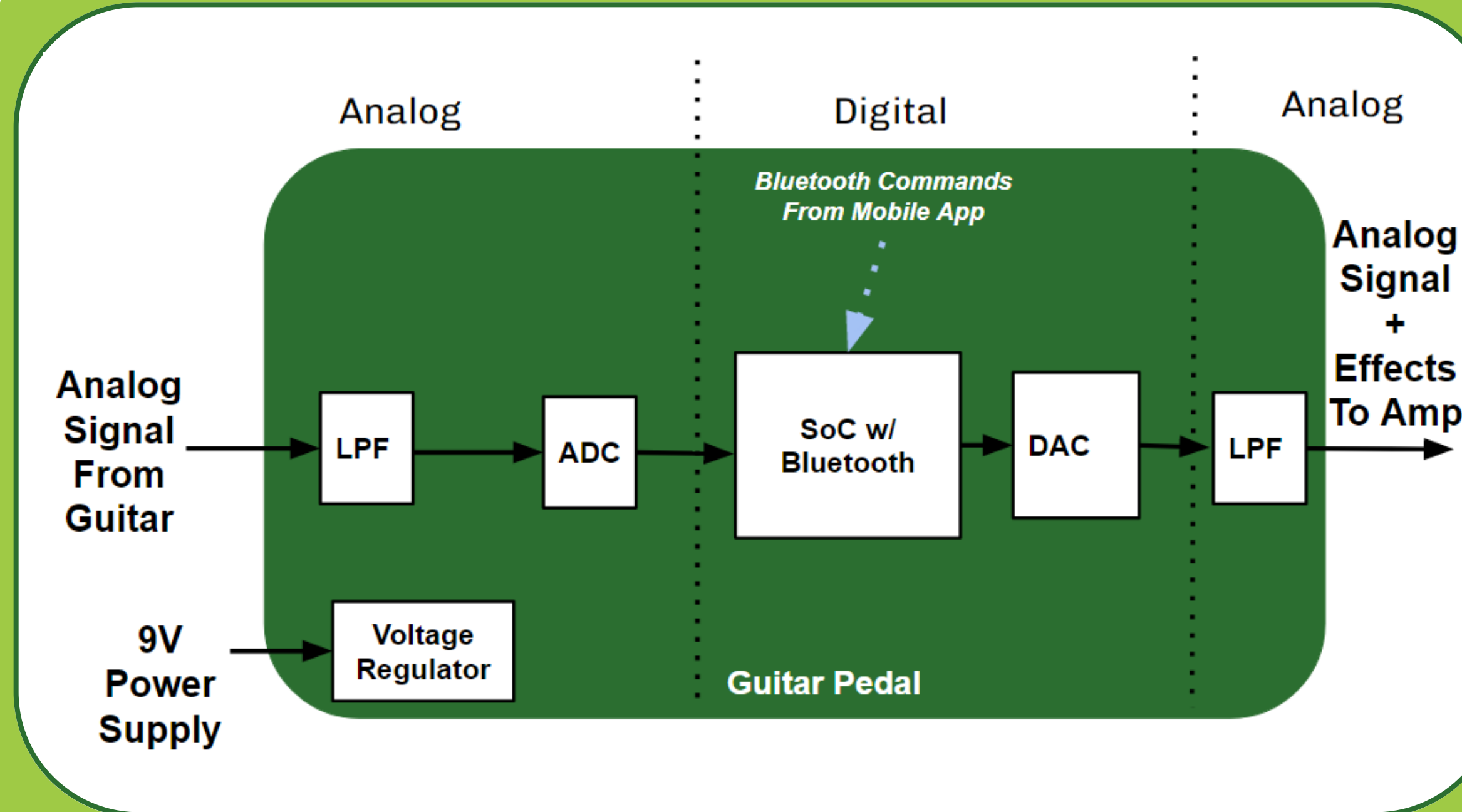
The few multi-effect pedals already found on the market lack functionality in that their effect chain cannot be configured by the artist. Other alternatives require additional purchase(s) of a separate pedal interface and virtual software suites.

Our Solution

A digital multi-effect pedal with integrated Bluetooth technology that offers multiple, customizable effects from a smartphone. Our pedal boasts cost-effectiveness and versatility, resulting in an accessible and easy-to-use product for guitarists of all levels.

Intended Customer

Amateur guitarists and musicians of all skill levels on a budget.



Our Design

Interface Design

- Sliders on mobile app allow user to tune effect to desired strength
- Buttons on app allow complete start/stop of the effect
- Sleek pedal shell connects directly from guitar -> pedal -> amplifier

Technology/Methods Used

- ADC, DAC, Bluetooth, nRF52 SoC
- Biquadratic filters for DSP

Final Specs

Firmware (Effects)

- Lowpass, highpass, peak and shelf biquad filters
- Clipping, foldback distortion

Hardware

- Prototype estimated cost = \$30
- 6.35mm jack for audio
- Bluetooth 5.2
- 9 V wall-adapter
- 720 mW Power Consumption

Next Steps

Create PCB, add more effects, app UI developed, customize pedal shell

App UI & Frequency Response

Screamin' Green Bypass

Effect 1 Item 1

Effect 2 Item 1

Effect 3 Item 1

UPDATE!

