

ECE 411 - HW#7

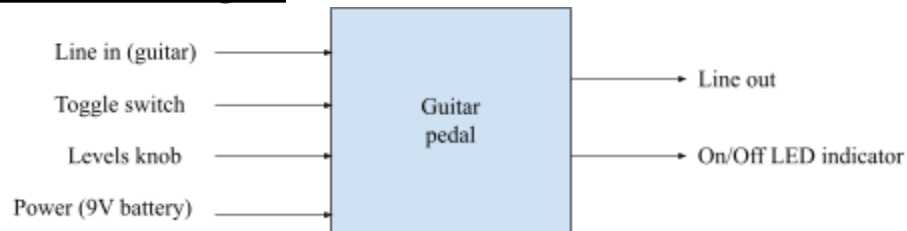
Group 12

Ali Mousawi, Daniel Trusty

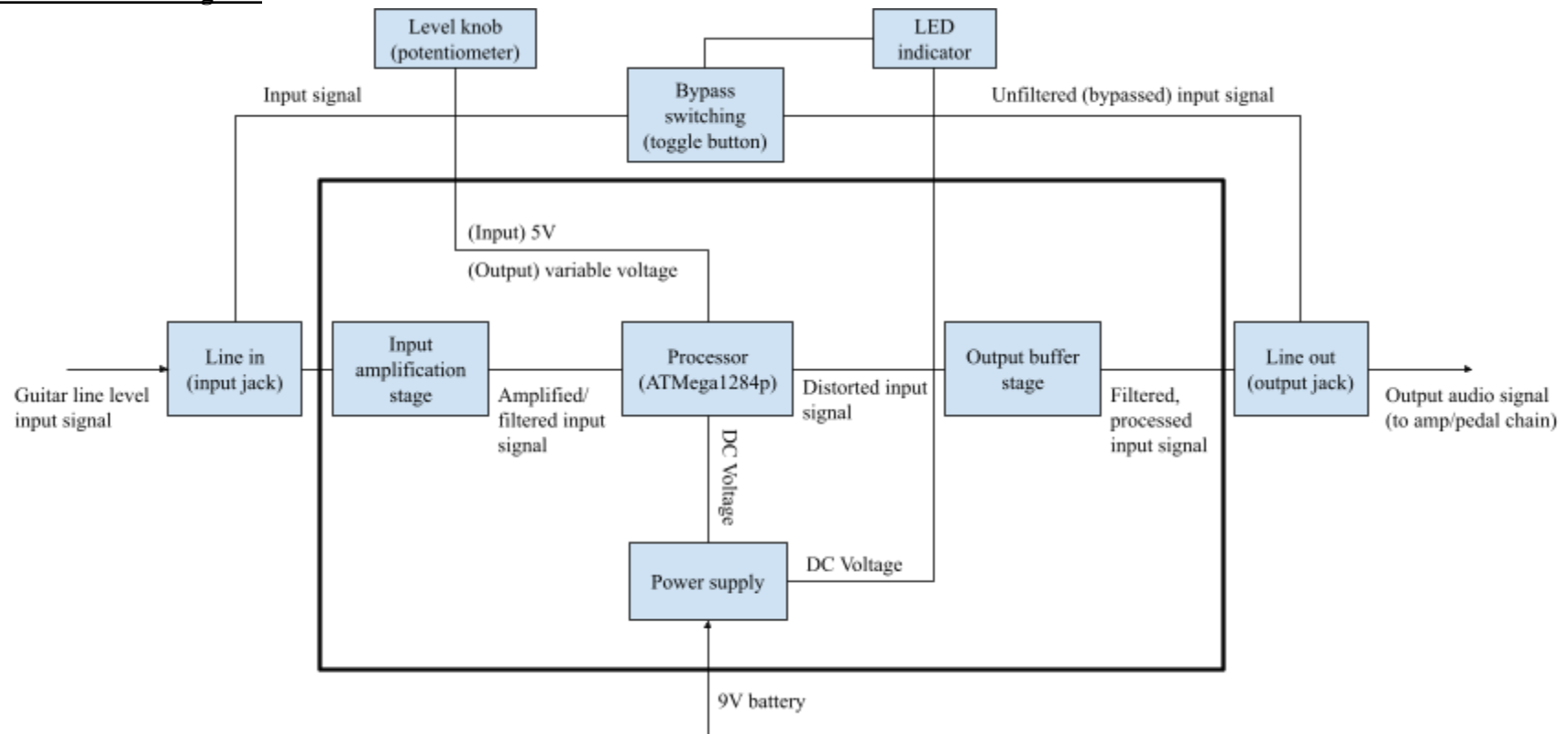
Lynn Nguyen, Roberto Torres

9 November 2023

Level 0 Block Diagram

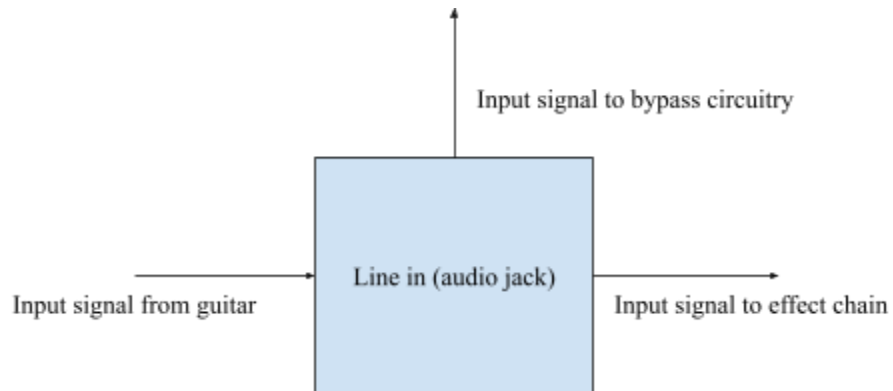


Level 1 Block Diagram



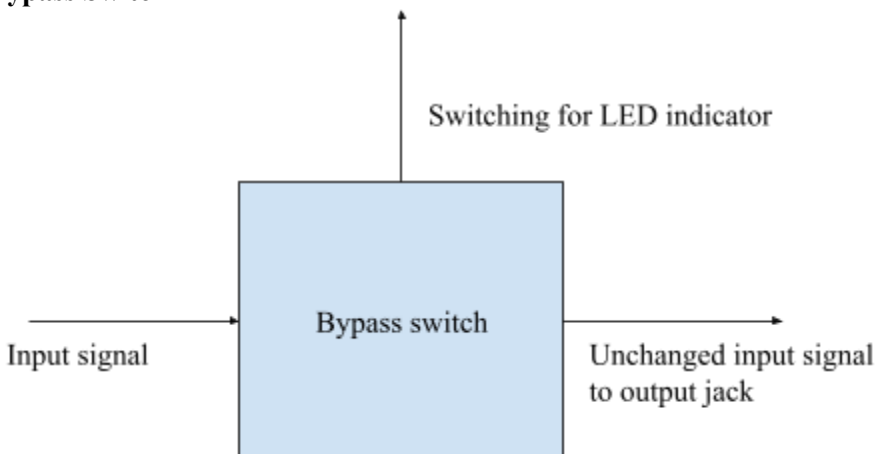
Submodules L1

Line In



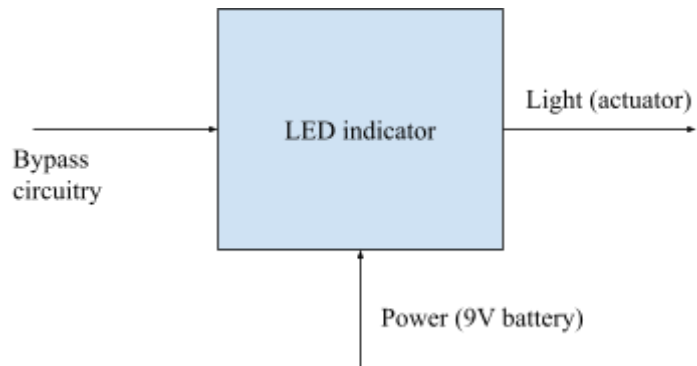
<i>Module</i>	Line in (audio jack)
<i>Inputs</i>	Audio signal from guitar (100 - 400 mV standard)
<i>Outputs</i>	Input signal to effect circuitry, input signal to bypass circuitry (100 - 400 mV)
<i>Functionality</i>	Accepts external audio source (from guitar)

Bypass Switch



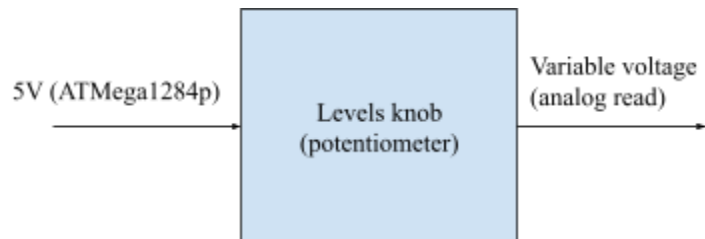
<i>Module</i>	Bypass circuitry
<i>Inputs</i>	Input signal from input jack
<i>Outputs</i>	Unprocessed input signal to output jack, switching circuitry for LED indicator
<i>Functionality</i>	Allows user the option of toggling the pedal effect, part of and controls user interface (LED)

LED indicator



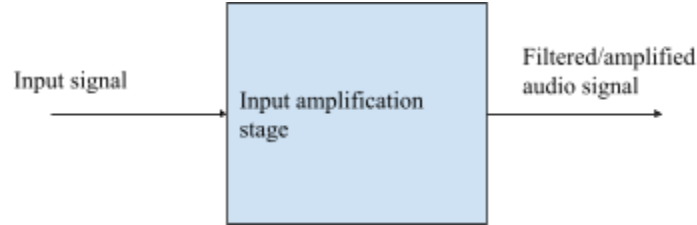
<i>Module</i>	LED indicator
<i>Inputs</i>	Bypass circuitry, power (9V battery)
<i>Outputs</i>	Light indication
<i>Functionality</i>	User interface, allows user to know if effect is on or off

Levels knob



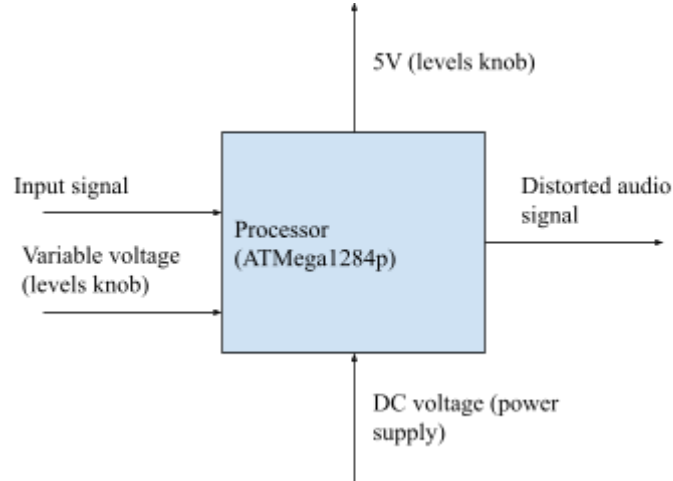
<i>Module</i>	Levels knob
<i>Inputs</i>	5V (ATMega1284p)
<i>Outputs</i>	Variable voltage to ATMega1284p analog read
<i>Functionality</i>	User interface, used as a voltage sensor translated to variable levels in effect

Input amplification stage



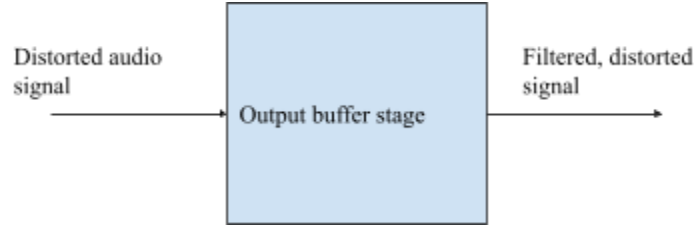
<i>Module</i>	Input amplification stage
<i>Inputs</i>	Input audio signal (100-400 mV)
<i>Outputs</i>	Filtered/amplified audio signal (5 V)
<i>Functionality</i>	Amplifies signal to ATmega1284p ADC pin levels, cuts unnecessary noise through filtering

Processor



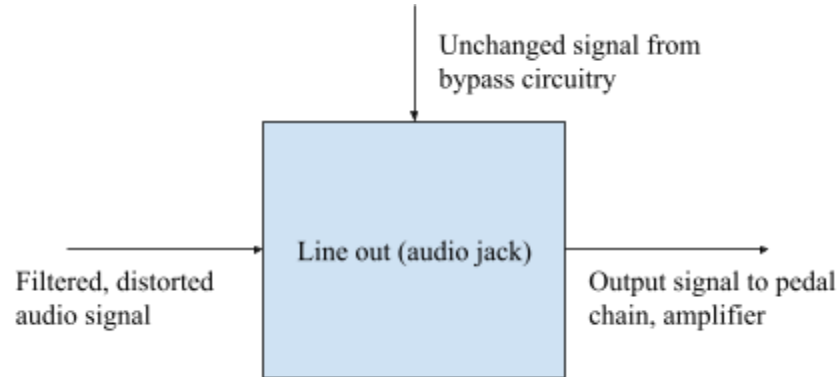
<i>Module</i>	Input amplification stage
<i>Inputs</i>	Input audio signal (5 V), variable voltage (from levels knob, analog read)
<i>Outputs</i>	Distorted audio signal, 5V for levels knob
<i>Functionality</i>	Performs digital processing on audio signal based on user inputs

Output buffer stage



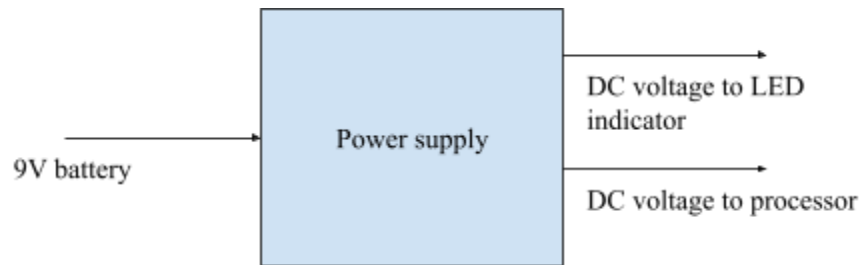
<i>Module</i>	Output buffer stage
<i>Inputs</i>	Distorted audio signal (5 V)
<i>Outputs</i>	Filtered, distorted signal
<i>Functionality</i>	Further filters distorted signal to prepare for output

Line out



<i>Module</i>	Line in (audio jack)
<i>Inputs</i>	(Only one transmitting at once) unchanged signal from bypass circuitry, filtered/distorted audio signal
<i>Outputs</i>	Output signal to pedal chain or amplifier
<i>Functionality</i>	Transmits audio to external actuator (amplifier, pedal chain)

Line out



<i>Module</i>	Power supply
<i>Inputs</i>	9V battery
<i>Outputs</i>	DC voltages
<i>Functionality</i>	Provides regulated power to all circuitry