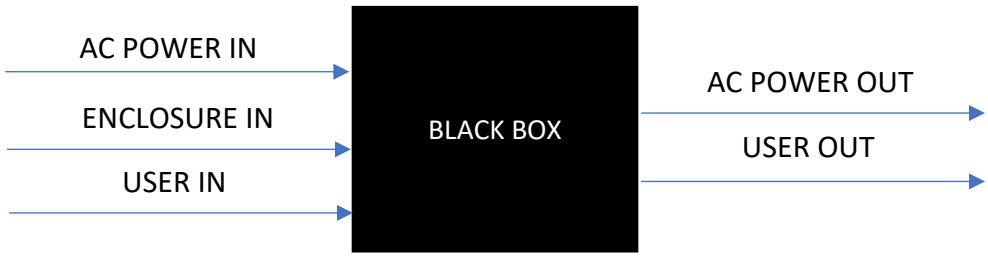
Block Diagram and Interfaces

Bluetooth Controlled AC Switch

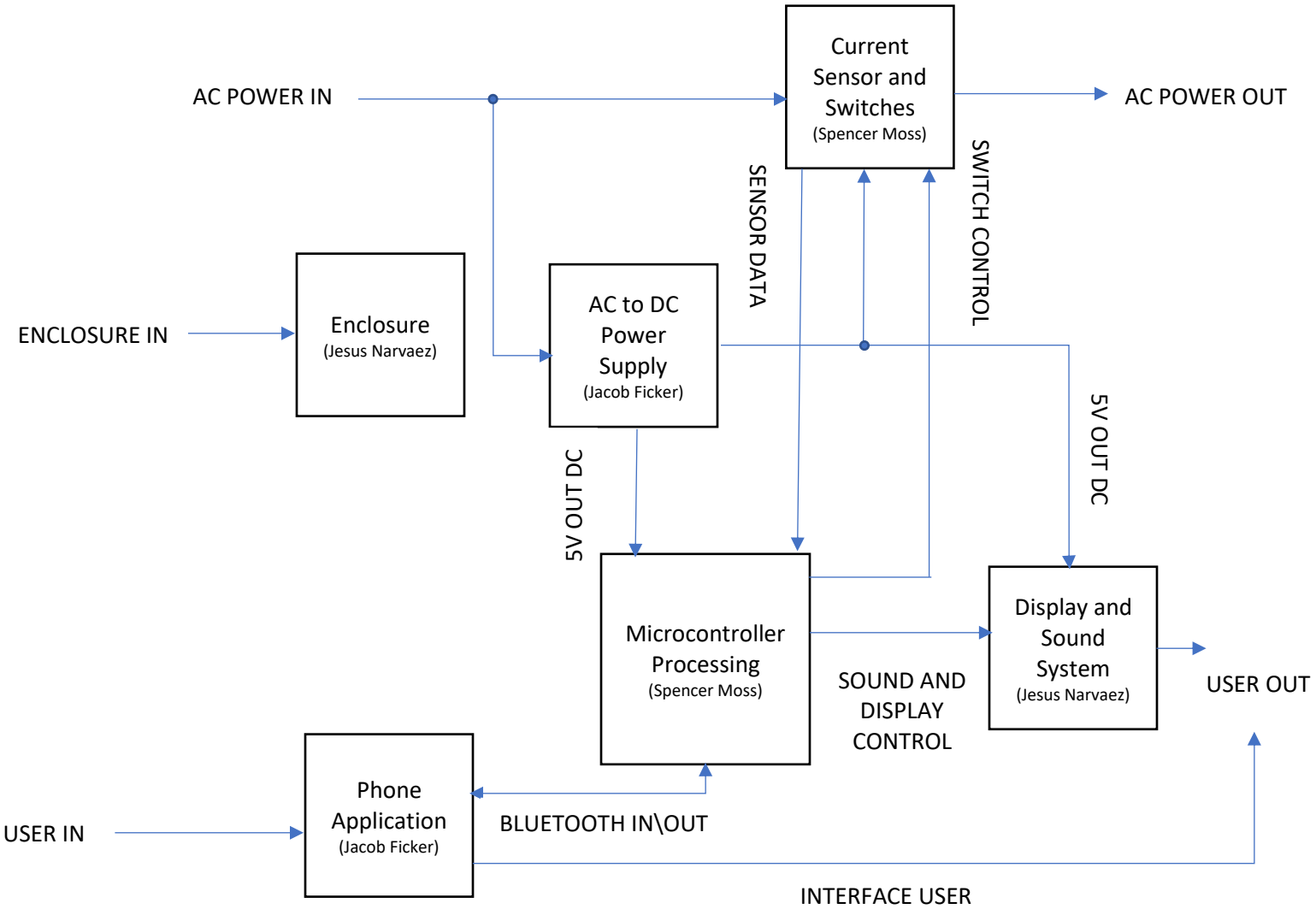
Group 5:

Jesus Narvaez, Spencer Moss and Jacob Ficker

Black Box System:



Complete Block Diagram:



Interface	Type	Specifics
AC In	AC Power	• Standard U.S. Power • 60 Hz • 120 VAC
AC Out, 2 channels	AC Power	• 60 Hz • 120 VAC • 5 A / 600 W limit on power draw
Enclosure Environment	Environment	• Must not allow any objects larger than 1mm in any dimension inside enclosure. • One master on/off switch
Bluetooth I/O	Digital Data / RF Communication	• Must communicate state of device/commands in less than 5 BTLE packets • Can transmit data further than 20ft
User In	App/Display	• Must be considered easily usable by 9/10 people • Successfully transmit data 90% of the time when within range of the device
5V DC Out	DC Power	• Must supply 5V +/- 0.4V DC • Up to 1A DC
Switch Control	Digital Signal	• On/Off 1-bit control signal • 1 signal per output channel (2 total)
Sensor Data	Analog Signal	• Analog 0-5V signal • 2 total signals, 1 per channel
Display + Sound Control	Mixed Signal	• 3 digital control signals using SPI • Small signal AC for audio output (0-5 V)
7-seg + Speaker	Display	• 7-segment displays are readable from 10ft away by a person with 20/20 vision • Must make audible sound that can be heard from at least 10 meters away.
User Interface	App Display	• Must display current power usage by each channel within 15% • Must update power usage data at least once per minute
User Output	Display	• Displays on/off state of each channel within 10 seconds of the state changing. • Displays time remaining on each timer in minutes. This feature must be accurate within five seconds of the actual time remaining.