

ESP32 Module:  
This microcontroller includes the bluetooth controller and antenna.

U1  
ESP32-S3-WROOM-1-N4

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+3.3V

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reset\_btn 3

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UART\_RX 36

UART\_TX 37

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TXD0

TP4 RX\_TP UART\_RX

TP5 RX\_TP UART\_TX

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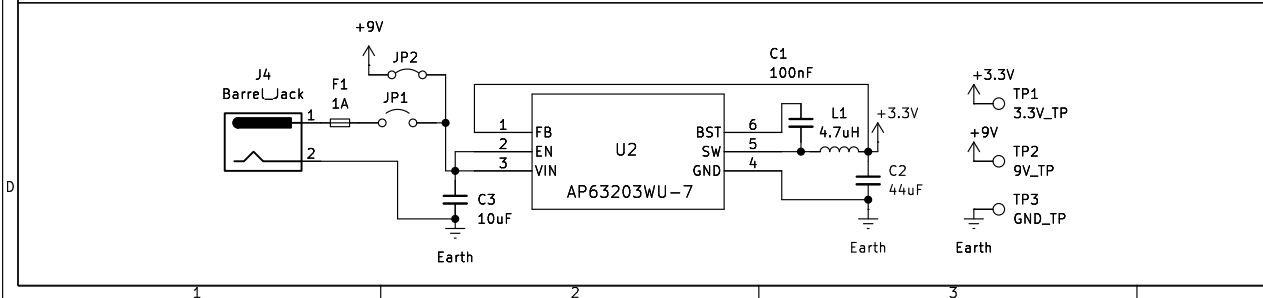
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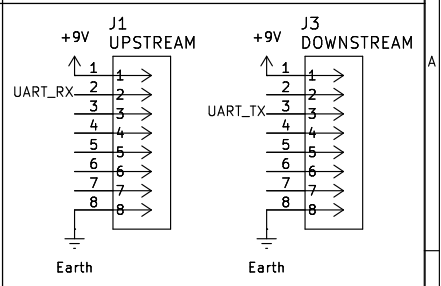
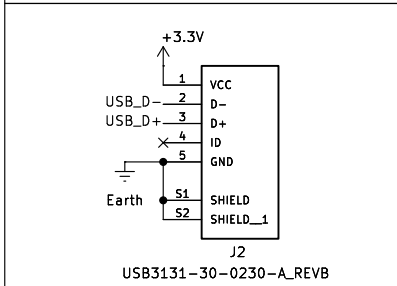
IO21 23

IO35 28

3.3V Power Regulator:  
9V input will be fed from the onboard battery pack, with an optional barrel jack for testing purposes.

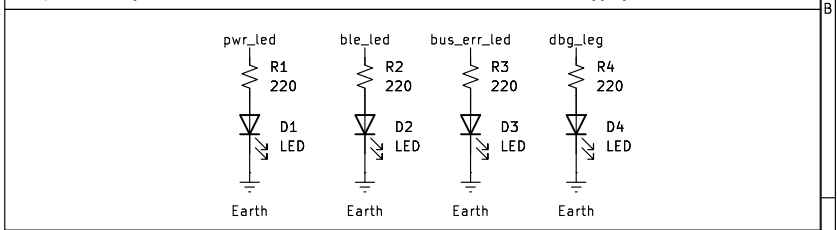


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<p><b>Micro-USB Connector:</b> This header can be used to communicate with an external device for programming. When jumper 1 is used to pull GPIO0 low, files can be written directly to flash or SRAM.</p>	<p><b>UART Bus Headers:</b> Unregulated power from the battery, common ground, and UART communication is relayed through these headers.</p>	

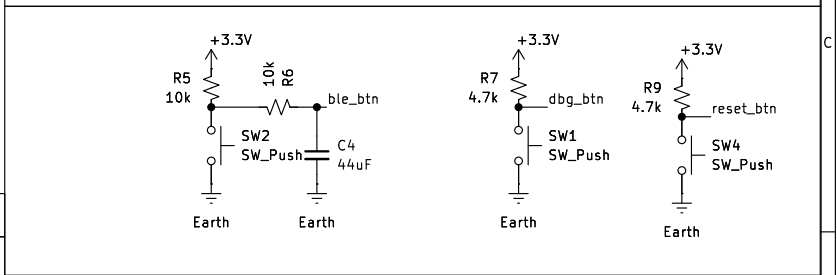


**Status Lights:**  
Four status lights are provided for easy operation. The green Power-On LED triggers when the ESP32 is successfully powered on and running. The blue Bluetooth Status LED will be solidly lit when a bluetooth connection with a remote is established, flashing when bluetooth is active but no remote paired, and off when bluetooth is not enabled. The red message packet LED will light up when the system receives a malformed message packet or does not receive any packets at all in a given time frame. This indicator allows simple identification of a faulty node in the bus network.

The yellow Debug LED's function can be defined in software to assist in debugging.



**Control Buttons:**  
Two buttons are provided for debugging purposes, being the reset and debug buttons. Pressing the reset button will pull the ESP32's ENABLE pin low, rebooting the microcontroller. The function of the debug button can be controlled in software.  
The BLE button is intended for use by an end-operator, and features an RC filter to avoid accidental triggering. This button allows a user to enable or disable the bluetooth radio to conserve power when it is not needed, while still keeping the system functional to relay messages over the UART bus.



Team 210

Sheet: /  
File: A3\_V1.kicad\_sch

**Title:** EGR314 Subsystem A3

Size: A4	Date: 2026-02-20	Rev: 1
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KiCad E.D.A. 9.0.2	Id: 1/1
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