| | |
|---|---|
| **Team Number:** | 306 |
| **Project Name:** | Sea Scout |
| **Team Member Names:** | Connor Bogenn, Harris Bokhari, Kai-ra de la Fuente, Skyler Riley |
| **Version:** | 3 |

**A. List ALL major components (active devices, integrated circuits, etc.) except for power sources, voltage regulators, resistors, capacitors, or passive elements**

| All Major Components | Component Name | Part Number | Supply Voltage Range | Number | Absolute Maximum Current | Total Current | Unit |
|---|---|---|---|---|---|---|---|
| | Microcontroller | PIC18F47K42T-I/PT | 2.3 - 5.5 V | 1 | 0.022 | 0.022 | mA |
| | Temperature Sensor | TC74A0-3.3VCTTR | 2.7 - 5.5 V | 1 | 0.35 | 0.35 | mA |
| | Humidity Sensor | HIH6030-021-001 | 2.3 - 5.5 V | 1 | 1000 | 1000 | mA |
| | Motor Transistor | 2N 3906331 | 3.3 - 12 V | 2 | 200 | 400 | mA |
| | Standard Motor | PPN7PA12C1 | 5 V | 2 | 270 | 540 | mA |
| | WiFi Board | ESP32-WOOM-32 | -0.3 - 3.6 V | 1 | 1100 | 1100 | mA |
| | | | | | | 3040.372 | mA |

**B. Assign each major component above to ONE power rail below. Try to minimize the number of different power rails in the design.**
**Add additional power rails or change the power rail voltages if needed.**

| (+)5V Power Rail (A) | Component Name | Part Number | Supply Voltage Range | Number | Absolute Maximum Current | Total Current | Unit |
|---|---|---|---|---|---|---|---|
| | Microcontroller | PIC18F47K42T-I/PT | 2.3 - 5.5 V | 1 | 0.022 | 0.022 | mA |
| | Motor Transistor | 2N 3906331 | 3.3 - 12 V | 2 | 200 | 400 | mA |
| | Standard Motor | PPN7PA12C1 | 5 V | 2 | 270 | 540 | mA |
| | WiFi Board | ESP32-WOOM-32 | -0.3 - 3.6 V | 1 | 1100 | 1100 | mA |
| | | | | | ***Subtotal*** | 2040.022 | mA |
| | | | | | ***Safety Margin*** | 25% | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | ***Total Current required on (+) 5V Rail*** | 2550.0275 | mA |
| | | | | | | | |
| **c1. Regulator or Source Channel** | Voltage Regulator | LM2596DSADJR4G | 0 - 12 V | 1 | 3000 | 449.9725 | mA |
| | | | | | **Total Remaining Current Available on (+) 5V Rail** | 449.9725 | mA |

| **(+)5V Power Rail (B)** | **Component Name** | **Part Number** | **Supply Voltage Range** | **Number** | **Absolute Maximum Current** | **Total Current** | **Unit** |
|---|---|---|---|---|---|---|---|
| | Temperature Sensor | TC74A0-3.3VCTTR | 2.7 - 5.5 V | 1 | 0.35 | 0.35 | mA |
| | Humidity Sensor | HIH6030-021-001 | 2.3 - 5.5 V | 1 | 1000 | 1000 | mA |
| | | | | | ***Subtotal*** | 1000.35 | mA |
| | | | | | ***Safety Margin*** | 25% | |
| | | | | | ***Total Current required on (+) 5V Rail*** | 1250.4375 | mA |
| | | | | | | | |
| **c1. Regulator or Source Channel** | Voltage Regulator | LM2596DSADJR4G | 0 - 12 V | 1 | 3000 | 1749.5625 | mA |
| | | | | | **Total Remaining Current Available on (+) 5V Rail** | 1749.5625 | mA |

| | **Component Name** | **Part Number** | **Supply Voltage Range** | **Capacity (mAh)** | **Required by Regulators** | **Battery Life (hr)** |
|---|---|---|---|---|---|---|
| | 7.4 V Battery | L74A26-2-1-2WX | 0 - 7.4 V | 26 | 0.06 | 433.3333333 |

***Notes***

External Supply Voltage should be determined by the dropout voltage for highest-voltage regulator (e.g., +14V for a +12V regulator).

If you have multiple units in your design (e.g., a base unit and remote unit) then you need a separate power budget for each unit