

## Power Budget-Bradley Pollock

|                                       |   |                    |                             |                       |                                      |   |             |
|---------------------------------------|---|--------------------|-----------------------------|-----------------------|--------------------------------------|---|-------------|
| <b>Student:</b>                       | Bradley Pollock   |                    |                             |                       |                                      |   |             |
| <b>Project Name:</b>                  | Interactive STEM Exhibit for Students-Stepper Motor Subsystem |                    |                             |                       |                                      |   |             |
| <b>Team:</b>                          | 201   |                    |                             |                       |                                      |   |             |
| <b>Version:</b>                       | 1   |                    |                             |                       |                                      |   |             |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>All Major Components</b>           | <b>Component Name</b>   | <b>Part Number</b> | <b>Supply Voltage Range</b> | <b>#</b>              | <b>Absolute Maximum Current (mA)</b> | <b>Total Current (mA)</b>   | <b>Unit</b> |
|                                       | PIC18 Microcontroller   | PIC18F27Q84        | 1.8V-5.5V                   | 1                     | 350                                  | 350   | mA          |
|                                       | Stepper motor   | MIKROE-1530 - 5V   | 5V                          | 1                     | 250                                  | 300   | mA          |
|                                       | Motor Driver  | BTM9011EP          | -0.3-40V                    | 2                     | 9200                                 | 18400   | mA          |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>" +5V Power Rail "</b>             | <b>Component Name</b>   | <b>Part Number</b> | <b>Supply Voltage Range</b> | <b>#</b>              | <b>Absolute Maximum Current (mA)</b> | <b>Total Current (mA)</b>   | <b>Unit</b> |
|                                       | Stepper motor   | MIKROE-1530 - 5V   | 5V                          | 1                     | 250                                  | 300   | mA          |
|                                       | 3.3V regulator  | M2575D2T-3P3R4G    | <45V                        | 1                     | 3000                                 | 3000  |             |
|                                       |   |                    |                             |                       |                                      |   |             |
|                                       |   |                    |                             |                       |                                      | <i>Subtotal</i>   | 3300 mA     |
|                                       |   |                    |                             |                       |                                      | <i>Safety Margin</i>  | 25%         |
|                                       |   |                    |                             |                       |                                      | <i>Total Current Required on +5V Rail</i>                           | 4125 mA     |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>c1. Regulator or Source Choice</b> | Pololu 5V Wall Supply   | 2183-1461-ND       | 5v                          | 1                     | 3000                                 | 3000  | mA          |
|                                       |   |                    |                             |                       |                                      | <i>Total Remaining Current Available on +12V Rail</i>               | -1125 mA    |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>" +3.3V Power Rail "</b>           | <b>Component Name</b>   | <b>Part Number</b> | <b>Supply Voltage Range</b> | <b>#</b>              | <b>Absolute Maximum Current (mA)</b> | <b>Total Current (mA)</b>   | <b>Unit</b> |
|                                       | PIC18 Microcontroller   | PIC18F27Q84        | 1.8V-5.5V                   | 1                     | 350                                  | 350   | mA          |
|                                       | Motor Driver  | BTM9011EP          | -0.3-40V                    | 2                     | 9200                                 | 18400   | mA          |
|                                       |   |                    |                             |                       |                                      |   |             |
|                                       |   |                    |                             |                       |                                      | <i>Subtotal</i>   | 18750 mA    |
|                                       |   |                    |                             |                       |                                      | <i>Safety Margin</i>  | 25%         |
|                                       |   |                    |                             |                       |                                      | <i>Total Current Required on +3.3V Rail</i>                         | 4687.5 mA   |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>c2. Regulator or Source Choice</b> | 3.3V regulator  | M2575D2T-3P3R4G    | 3.3V                        | 1                     | 3000                                 | 3000  | mA          |
|                                       |   |                    |                             |                       |                                      | <i>Total Remaining Current Available on +5V Rail</i>                | -1687.5 mA  |
|                                       |   |                    |                             |                       |                                      |   |             |
| <b>External Power Source 1</b>        | <b>Component Name</b>   | <b>Part Number</b> | <b>Supply Voltage Range</b> | <b>Output Voltage</b> | <b>Absolute Maximum Current (mA)</b> | <b>Total Current (mA)</b>   | <b>Unit</b> |
| <b>Power Source 1 Selection</b>       | Pololu 5V Wall Supply   | 2183-1461-ND       | 100-240VAC                  | 5V                    | 3000                                 | 3000  | mA          |
|                                       |   |                    |                             |                       |                                      |   |             |
|                                       | 3.3V regulator  | M2575D2T-3P3R4G    | <45V                        | 3.3V                  | 3000                                 | 3000  | mA          |
|                                       |   |                    |                             |                       |                                      | <i>Total Remaining Current Available on External Power Source 1</i> | 0 mA        |