

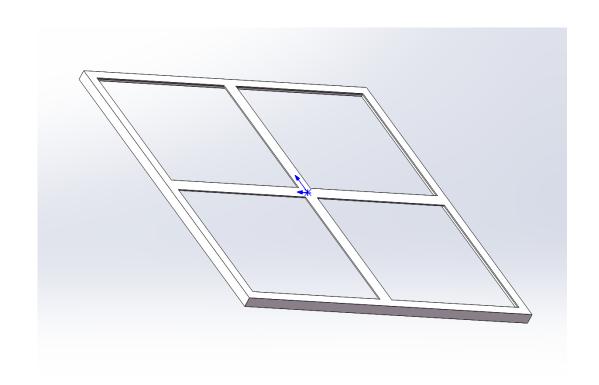
Renewable Energy Lab Weather Station

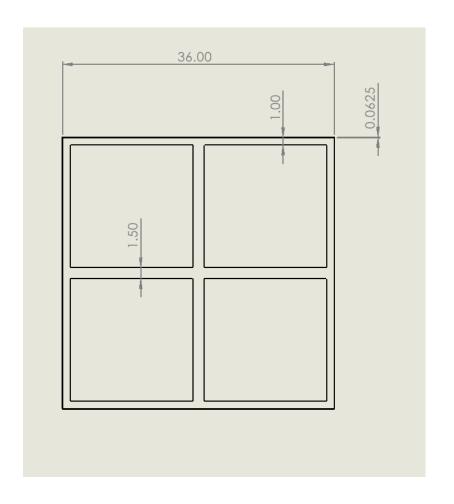
100% Build Update

By:

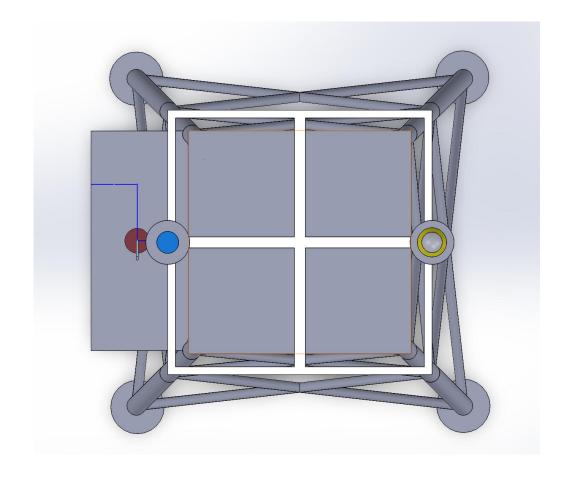
Chenxi Dong, Rowan McCullough, Ian Torp, and Shutong Wang

CAD – Aluminum Crossbar



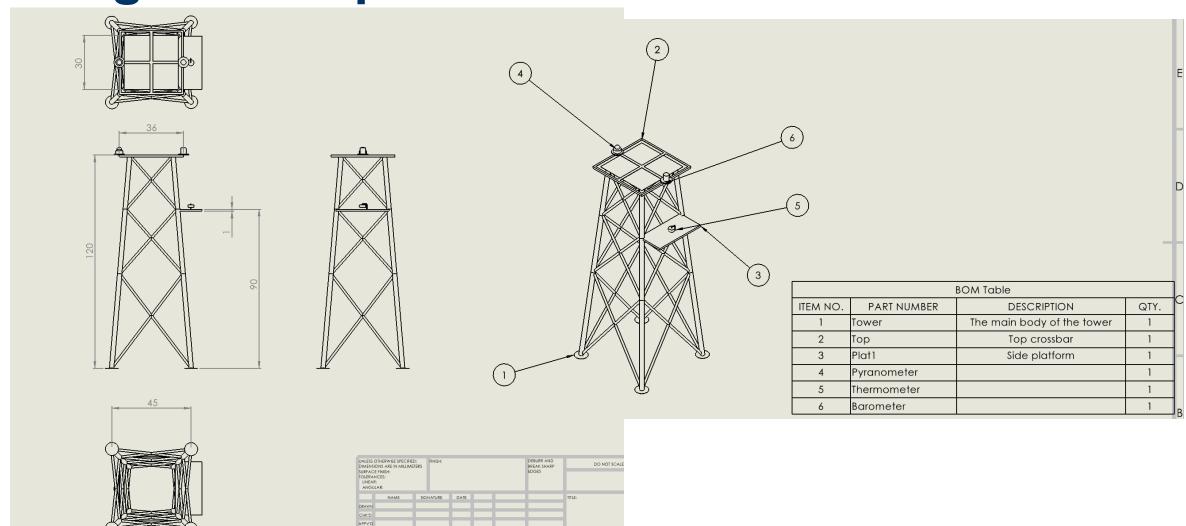


CAD – Weather Tower



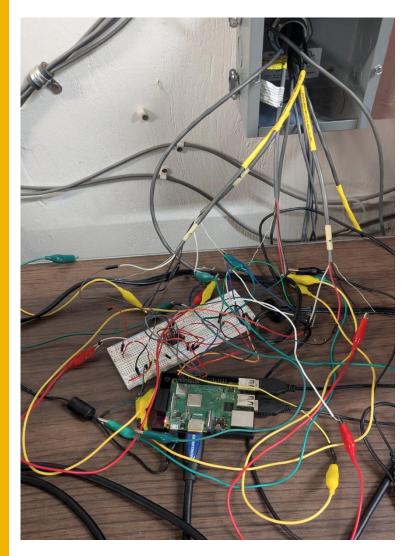


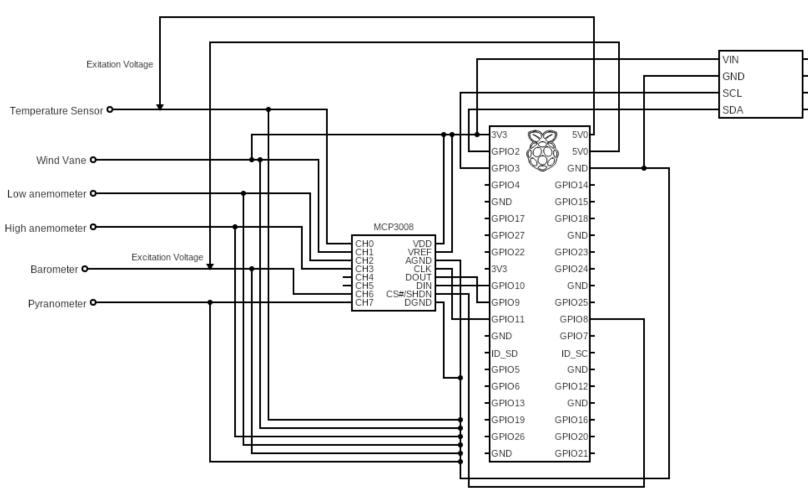
Design Description





Wiring





Budget

п

lan Torp
"Total Fundraising"
\$300

Split with

| (W) | Rowan McCullough | \$75.00 |
|-----|------------------|---------|
| 1 | | |

| IT | lan Torp | \$75.00 |
|----|----------|---------|
| | Paid | \$75.00 |

| CD | Chenxi Dong | \$75.00 |
|----|-------------|---------|

| sw | Shutong Wang | \$75.00 |
|----|--------------|---------|
| SW | Shutong Wang | \$75.00 |

\$250.41 Remaining

Client Funding Support: \$500

| Item | Total Cost: | Remaining Budget |
|--------------------------------|-------------------|------------------|
| Crossbar Aluminum | 67.38 | 432.62 |
| Hardware | 14.19 | 418.43 |
| Monitor | 37.42 | 381.01 |
| EKO Converter Cable | 104.2 | 276.81 |
| Replacement Raspberry PI | 85.42 | 191.39 |
| Home Depot Miscellaneous Items | 53.96 | 137.43 |
| Indoor Electrical Box | 40.02 | 97.41 |
| | Remaining Budget: | \$97.41 |

Total Spending Budget: \$800 Total Remaining: \$347.82

Bill Of Materials

| Material | Quantity | Cost | Part Status | Make/Buy | Primary vender | Manufacturer | Lead Time | Link to Product |
|-------------------------------------|-------------|---------|--------------|----------|----------------|--------------|-----------|-------------------|
| Onn MicroSD card 32gig | 1 | 6.96 | Arrived | Buy | Walmart | Onn | Same Day | https://www.wa |
| MCP3008 Analog to Digital Converter | 2 | 15.3 | Arrived | Buy | Amazon | Bridgold | Two Day | https://www.am |
| BME280 Sensor | 2 | 14.1 | Arrived | Buy | Amazon | Qoroos | Next Day | https://www.am |
| Model MS60 Pyranometer | 1 | | In house | Preowned | NRG | EKO | N/A | https://eko-instr |
| T60C Temperature NRG Sensor | 1 | (2) | In house | Preowned | NRG | NRG | N/A | https://www.nrg |
| Wind Vane NRG #200P | 1 | 3100 | In house | Preowned | NRG | NRG | N/A | https://www.car |
| NRG #40C Anemometer | 1 | 0 | In house | Preowned | NRG | NRG | N/A | https://www.nrg |
| NRG BP60 Barometric Pressure Sensor | 1 | | In house | Preowned | NRG | NRG | N/A | https://www.nrg |
| Raspberry Pi 3 model B+ | 1 | 35 | In house | Preowned | Mouser | Raspberry Pi | N/A | https://www.mo |
| Wire/cabling | 1 | 22c/ft | In house | Preowned | Home Depot | Syston | N/A | https://www.hor |
| 3/4 emc tubing | 18 | N/A | In house | Preowned | N/A | N/A | N/A | N/A |
| 36/1/(1/16) Angle Gage Aluminum | 4 | 34.32 | Arrived | Buy | Home Depot | Everbilt | Same Day | https://www.hor |
| 1.5/36/(1/8) Flat Bar Aluminum | 2 | 27.28 | Arrived | Buy | Home Depot | Everbilt | Same Day | https://www.hor |
| 2' Boom Mount | 2 | N/A | In house | Preowned | N/A | N/A | N/A | N/A |
| Voltage Amplifier (AD620) | 1 | 13.23 | Arrived | Buy | Amazon | Midzooparts | 6-10 Day | https://www.am |
| Mounting Hardware | 4 | 14.19 | Arrived | Buy | Home Depot | Everbilt | Same Day | https://www.hor |
| EKO Converter Cable | 1 | 104.2 | Arrived | Replace | EKO | EKO | 4-6 Day | https://eko-instr |
| Monitor | 1 | 37.42 | Arrived | Buy | NAU Surplus | Dell | Same Day | N/A |
| Backup Raspberry PI 4B | 1 | 85.42 | Arrived | Buy | ADA Fruit | Sony | 4-6 Day | https://www.ada |
| Steel Fish Tape | 1 | 29.97 | Arrived | Buy | Home Depot | Klein Tools | Same Day | https://www.hor |
| UV Resistant Zip Ties | 40 | 12.58 | Arrived | Buy | Home Depot | CE | Same Day | https://www.hor |
| Hose Clamps | 6 | 14.79 | Arrived | Buy | Home Depot | SS | Same Day | https://www.hor |
| 8x8x4 Electrical Enclosure Box | 1 | 40.02 | Arrived | Buy | Home Depot | Southwire | Same Day | Southwire 8 in. \ |
| | Total Cost: | 3487.42 | 100% ordered | | | | | |
| | | | 100% Arrived | | | | | |

Manufacturing Plan

- Permanent wiring attachments (soldering)
- Boom mounts moved to 30 ft
- Indoor electrical box housing for pi

| Manufacturing Items | Status | Completion Date |
|-------------------------------|-----------|-----------------|
| Crossbar Aluminum | Assembled | 7-0ct |
| Crossbar Hardware | Assembled | 12-0ct |
| Sensor Mounting | Assembled | 3-Nov |
| Long-Term Outdoor Wiring | Assembled | 3-Nov |
| EKO Converter Cable | Assembled | 4-Nov |
| Boom Mounts | Assembled | 3-Nov |
| Indoor Electrical Housing Box | Purchased | N/A |

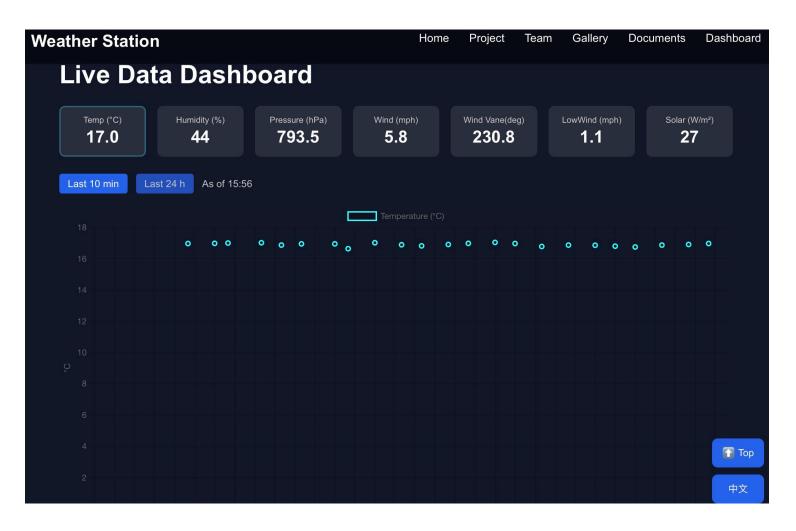






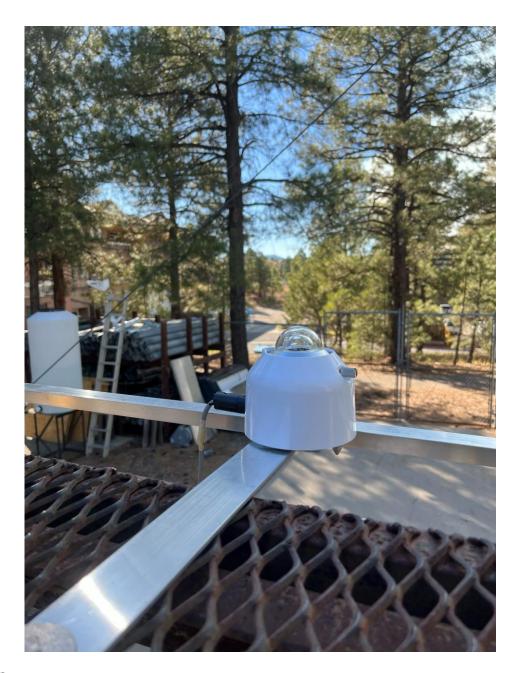
Website Dashboard

Weather Station



Pyranometer

- EKO MS-60
- Outputs to website



Thermometer

- Connected to the Raspberry Pi
- Outputs to website
- Weather Station



Post-Testing

- Anemometer and wind vane booms will be re-mounted at 30ft
- All wire connections will be soldered
- Electrical box will be mounted inside shack for Pi housing



Gantt Chart

Weather Station Tue, 8/26/2025 **NAU Capstone** Project Start: 11/4/2025 Today: Display Week: Aug 25, 2025 Sep 1, 2025 Sep 8, 2025 Sep 15, 2025 Sep 22, 2025 Sep 29, 2025 Oct 6, 2025 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 ASSIGNED **PROGRESS** START Hardware Status 100% 8/31/25 11/4/25 Sensor connection and code lan 100% 8/31/25 11/4/25 **Gantt Chart** 100% Shutong Material purchase, order and assembly lan&Rowan 8/31/25 11/4/25 99% Chenxi&Shutong 11/4/25 Website Updates 85% 8/31/25 Modification and improvement of CAD part Chenxi 90% 8/26/25 11/4/25 11/4/25 Testing (Anemometer) Rowan 0% 9/23/25 Testing (BME280) 0% 9/23/25 11/4/25 Rowan 11/4/25 Hardware Status 100% Everyone 100% 9/23/25 Programming (Wind Vane) lan 100% 9/23/25 11/4/25 Physical Connection (Wind Vane) 11/4/25 lan 100% 9/23/25 9/23/25 11/4/25 Programming (Pressure Sensor) Chenxi 100% Physical Connection (Pressure Sensor) Shutong 100% 9/23/25 11/16/25 Testing (Pyranometer) Rowan 0% 9/23/25 11/4/25 Testing (Wind Vane) Rowan 0% 9/23/25 11/6/25 Chenxi 100% 9/23/25 11/18/25 Website Check #1 Chenxi&Shutong 100% 9/23/25 10/7/25 Programming (Thermometer) Chenxi 100% 10/14/25 11/4/25 Connection (Thermometer) Shutong 100% 10/14/25 11/4/25 11/4/25 Programming (Pyranometer) 10/14/25 Connection (Pyranometer) 10/14/25 11/4/25 Mounting Rowan 10/14/25 11/4/25 Testing (Thermometer) 11/4/25 Rowan 10/14/25 Testing (Pressure Sensor) Rowan 10/14/25 11/4/25 Future 10/21/25 Efest Registration 100% 10/21/25 lan Finalized Testing plan Rowan 10/31/25 9/23/25 Final CAD 10/14/25 11/6/25 Chenxi Product Demo/Final Testing Rowan 11/6/25 11/18/25 Final Report 11/28/25 Everyone 11/6/25 Client Handoff 11/28/25 Everyone 11/20/25 Final Website check 11/20/25 11/28/25 Everyone Efest 12/5/25 Everyone 12/5/25

Thank You & Questions?