Team 312 Targets

Customer Needs:

| No. | Need/Statement |
| --- | --- |
| 1 | Durable |
| 2 | Provides power |
| 3 | Provides Wi-Fi |
| 4 | Able to be Movable |
| 5 | Easy to Maintain |
| 6 | Reliable |

Design Requirements:

| No. | Need | Requirements/Interpretations |
| --- | --- | --- |
| 1 | 2 | Will use solar energy to charge multiple small devices( ex. phone, computer) at the same time |
| 2 | 1,6 | Will withstand weather outcomes up to mild hurricane |
| 3 | 4 | Will not be permanently attached |
| 4 | 3 | Will provide Wi-Fi to for a small area |
| 5 | 5,6 | Components are accessible and replaceable |
| 6 | 2,6 | Will use a battery to store power |

Targets:

| No. | Need | Requirement | Metric | Imp | Units | Marginal Value | Ideal Value |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | Uses solar power to charge devices | Binary | 5 | Y/N | - | Y |
| 2 | 1,6 | Device will not break under a Cat 3 Hurricane | Wind Speed | 4 | km/h | >194 | 208 |
| 3 | 4 | Will not be permanently attached | Binary | 3 | Y/N | - | Y |
| 4 | 3 | Provides WiFi to a Small Area | Area | 3 | m2 | >600 | 800 |
| 5 | 5,6 | Components are accessible and replaceable | Binary | 2 | Y/N | - | Y |
| 6 | 2,6 | Will use a battery to store power | Hours | 5 | h | >10 | 14 |

We will need for measurement:

* A machine that can simulate the pressure of a hurricane to test resistance. The resistance will be measured by applying an amount of force to the device to a determined force and it passes by maintaining its structure.
* Mobile devices to test the reach of the WiFi repeater and a surveyor's tape.

The reach will be measured by using a surveyor’s tape to find different distances and at least 3 different mobile devices should connect to the network at any point at least 600m away.

* A stopwatch to measure the battery life and a multimeter.

The battery will be fully charged and attached to a multimeter to determine voltage. The voltage should be maintained at least for 10h.

Target Summary:

1. Uses solar energy to charge devices: Critical

This target is essential to the project. This is the primary purpose of building the device. Metric is binary as it only needs to use solar power per customer instructions.

1. Device will not break under a Cat 3 Hurricane:

This target is important for the safety and well-being of the people and the device. The metric was taken from the requirements of the Florida Building Code. The only limit to resistance would be the cost and not being able to be permanently fixed.

The device will be constructed with materials certified to be resistant and put under pressure simulating a Cat 3 Hurricane.

1. Will not be permanently attached:

This target aims to make the device movable to any place that is needed without it being destroyed. This is a goal but can be dismissed if incompatible with the previous target.

1. Provides WiFi to a Small Area:

This target is moderately important as it is a soft requirement and can be adjusted depending on price and power consumption. The ideal value comes from other market alternatives which makes this product on par with many other repeaters.

We will measure the broadcast of the network at different points more than 600m away from the device to see the reach.

1. Components are accessible and replaceable:

This target aims to facilitate the interchange of pieces and the replacement of faulty equipment in the device. It also helps the long-term goal of modularity in the device. All pieces that need to be replaced at some point should be easily accessible to a crew without complete disassembly.

1. Will use a battery to store power: Critical

This target’s goal is to make the device usable even without constant sun at any given time. The battery should last at least 10 hours. 14 hours is the lowest amount of time without sunlight in Tallahassee recorded between 2021-2022.

The battery will be timed from fully charged until total depletion and should be more than 10h.