**GNG1103 Project**

Group A12

Professor David Knox

Deliverable F

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Tarek Bedair

Benton Qiu

Mashiyat Islam

Joshua Lai

Ali Zaidi

**Prototype Testing Plan:**

**Battery charge and discharge test**

Why:

The purpose of this test is to ensure the battery we have selected will be sufficient for the purposes of our prototype.

How:

We will expose the system to our desired method of charging (in this case solar) and determine whether or not the battery can be charged within a reasonable time (5 hours) and that the battery onboard bowie can be charged sufficiently.

When: Once the battery is ready and the circuits are completed.

**Working Circuits**

Why:

The purpose of this test is to ensure that the circuits are providing electrical power to the house so that Bowie can be charged with our system.

How:

We are testing the voltage on the wireless battery when the battery is empty and checking the voltage on the battery after being charged by our system. This test will likely be done with the use of a multimeter.

When: Once the wirelessly charging battery pack is made.

**Durability of the house**

Why:

We have to ensure that Bowie has a place to stay in, which is safe, durable and weather resistant.

How:

We intend to expose the material we’re using for the body of the house to a variety of different theoretical environmental situations. The main things we would be testing would be resistance to heat and cold (AC Unit), water/snow resistance (exposing the material to water and snow) and UV resistance(either through use of a UV lamp or just leaving exposed to the sun). We would also test its durability by trying to cause physical damage to the individual pieces of the structure.We test its stress and strain compatibility by doing the bend test. We also apply known increasing force till it breaks, so we can know how much force it can withstand (N).

When: Once materials have finished 3D printing.

**Security of Locking Mechanism:**

Why:

In order for Bowie to be left overnight in a system like this, he would have to be securely stored. As such, it is important that the mechanism that secures Bowie in the house would be sufficient to safely store him.

How:

Attempt to break into the charging station ourselves, in whatever way possible. Test the lock, the hinges of the door and the surrounding walls for any weak points, and make sure to reinforce these areas as needed.

When: Once materials have shipped in and door has been built.

**Prototype:**

This prototype is a very basic concept, as our goal was to provide a rough idea of what the charging station would look like. This prototype is not to scale, and was more so made in hopes of providing us with some insight as to how we should assemble the completed project, and any potential issues with our design before we make the real thing. The area between the roof and panel beneath the roof was left open to show where we will be keeping the battery and any extra circuitry needed for our design.

A few things that we noted during the creation of our prototype:

* The roof of the station will have to be slanted in order to capture the most sunlight
* The inner workings of the station will have to be assembled before placing the roof of the station on
* Having a removable top might be handy for storage purposes
* Door will have to be hinged and have a way for a padlock to be put on in order to be secured
* The battery and any other circuitry will be kept underneath the roof on the panel above where Bowie will be stored

Prototype view 1 (Not to scale)



