# DASL UAV Antenna Gimbal

## Hardware Review 2

**Kalli Albright**
**Kaitlyn Barr**
**Dustin Branges**
**Daniel Johnson**

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Summary of Hardware Review 2:

Since Hardware Review 1, Team D1 has purchased a new motor, completed several part redesigns for their device, printed all necessary components, finished coding, assembled their system, and created a testing apparatus. In addition to this, the team has also completed several class related assignments, such as analytical analyses, a presentation, report, and update their website. The fully assembled and operational device is displayed in Figure 1, with the major components of the system labeled.


Figure 1: Final Assembly of Antenna Gimbal

Once mounted on the Unmanned Aerial Vehicle (UAV), provided by the Dynamic and Active Systems Lab (DASL), the antenna will remain in the horizontal position as seen in Figure 2. Once the user provides an input, commanding the gimbal to sweep the antenna or hold a specific angle, the device will lower it to the correct position as demonstrated in Figure 3.

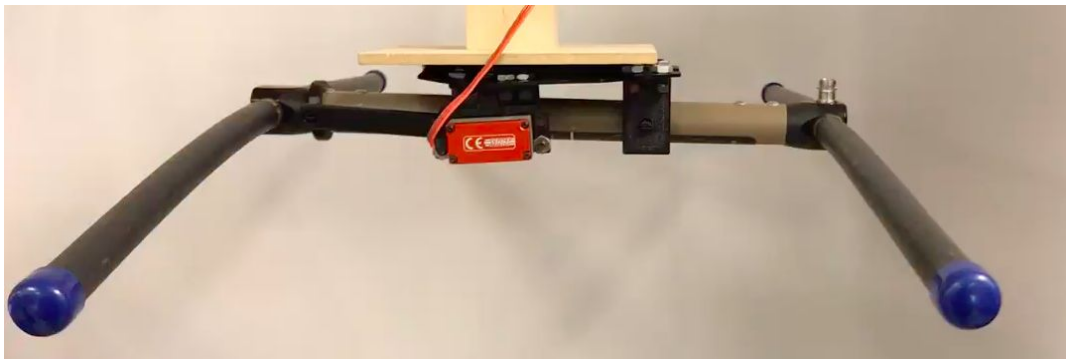

Figure 2: Antenna Gimbal in Horizontal Position

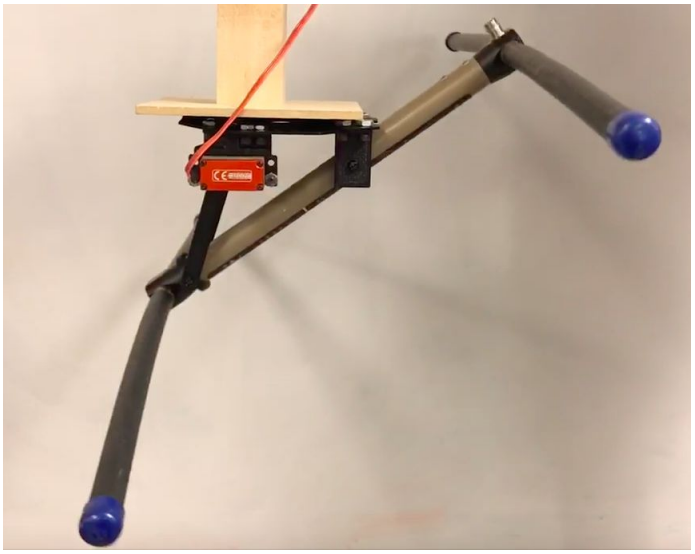

FIgure 3: Antenna Gimbal in Fixed Angle Position

Previous Action Items Completed:

The team is currently on track for their project. Table 2 shows the action items completed between Hardware Review 1 and Hardware Review 2, and which team member(s) completed them. Through these action items, the team was able to fully assemble and complete their device.

Table 2: Hardware Review 1 Action Items

| **Action Item** | **Completed By** |
|---|---|
| Fully program the arduino | Kaitlyn Barr |
| Create working arduino setup (hardware) | Kaitlyn Barr and Dustin Branges |
| Redesign shaft to fit newly selected motor | Daniel Johnson |
| Update all drawings for any modified parts | Daniel Johnson |
| Build test apparatus | Kailyn Barr and Kalli Albright |
| Design holster for antenna | Daniel Johnson and Kalli Albright |
| Print new/modified parts | Daniel Johnson and Dustin Branges |
| Assemble full system | All |
| Plan testing procedures | Kalli Albright and Kaitlyn Barr |
| Update website | Dustin Branges |
| Individual Analytical Analysis | All |

| | |
|---|---|
| Register for U-Grads | Kaitlyn Barr |
| Create Midpoint Presentation Outline | Kalli Albright |
| Finish Midpoint Presentation | Kalli Albright and Kaitlyn Barr |
| Rehearse Midpoint Presentation | All |
| Finish Midpoint Report | All |
| Mount Arduino | Kaitlyn Barr and Dustin Branges |
| Print Replacement Parts | Daniel Johnson and Dustin Branges |
| Calibrate Servo | Kaitlyn Barr |

Upcoming Action Items:

Since the team's device is fully complete, there are no further tasks to prepare for final product testing proof. Therefore, the only tasks to be completed for the testing are provided in Table 3, along with which team member(s) are incharge of each test.

Table 3: Testing Tasks

| **Test** | **Procedure** | **Requirement** | **Responsible Member** |
|---|---|---|---|
| Size | Measure surface area of system with ruler | ≤ 15 $in.^2$ | Daniel Johnson |
| Weight | Weigh all components of the system with scale | ≤ 0.5 lbs. | Dustin Branges |
| Angle | Measure maximum angle with protractor | ≥$45^0$ | Daniel Johnson |
| Modes | Note the number of user modes | ≥ 2 | Kaitlyn Barr |
| Communication | Note the rate of serial communication | = 9600 Baud | Kaitlyn Barr |
| Power Input | Measure power input with multimeter | ≤ 5 V | Dustin Branges |
| Cost | Calculate total cost | ≤ $500 | Kalli Albright |

| | | | |
|---|---|---|---|
| Linkages | Count number of linkages | ≤ 4 | Kalli Albright |
| Installation Time | Using stop watch, time how long it takes to fully assemble | ≤ 1 hour | All |