Drone Delivery Major Project

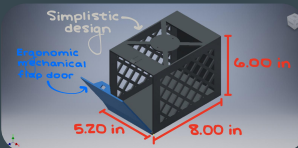## By Dylan Bok, Om Amin, Rahul Ayanampudi

Phase 1 — Phase 2 — Phase 3 — Phase 4 · · · Phase 5

Problem Statement

For decades, consumers have faced long delivery times and expensive shipping costs for small packages in urban or suburban areas.

Initial Development

In our initial development stages, we focused on creating the components of the modular drone delivery on Autodesk Inventor. We worked to maximize rigidity while minimizing mass to enable long flight times and ensure package safety. We adjusted the measurements as necessary to allow the components (modular crate, door, attachment, and quadcopter) to function properly together.
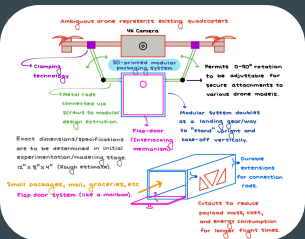

Flight Testing

We began flight testing the drone with and without the additional weight to better understand the flight capabilities. Incorporating the delivery system did not adversely affect flight.

Modular Drone Delivery System

This is our final working design. We made a few significant modifications to portions of the modular design to ensure that the assembly performance is optimal when fully integrated with the DJI Phantom drone. After testing, we determined that the drone is capable of transporting most small loads.

Future Plans

Going forward, we plan to create a navigation software that would allow users to input directions to the drone (given address will be converted to GPS coordinates) and to track its flight. We plan to create a autonomous drone that can deliver packages to a prespecified location.


Patents

This drone is Amazon's attempt at designing a drone to deliver packages.
Pros:
- Allows for the delivery of packages to areas inaccessible by delivery trucks.
- Allows for a modular design in which multiple drones can attach to each other, allowing for larger payload sizes.
- Has a variable landing gear which can allow it to land on uneven terrain.

Cons:
- Some models drop off packages through the use of parachutes which could cause damage to the packages.
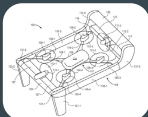
Deuce Drone uses octocopters to deliver retail/food and drink products.
Pros:
- Automated flight between multiple takeoff and landing areas.
- Landing zone identification and precision landing.
- Sensor object detection with drone flight control.
- Interactive customer app for retail item ordering and drone tracking.
- Payload of about 8-10 pounds.

Cons:
- Utilizes expensive octocopters to accomplish tasks.
- Requires users to lay out a QR code to be able to land the drone in a given location.