

2021-2022 NASA ARMD AERONAUTICS UNIVERSITY
DESIGN CHALLENGE:

EXTENDING AVIATION'S PUBLIC BENEFIT

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY



FIREFIGHTING GOBBLER

Modern Problems Require Modern Solutions



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Team Members:

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Abstract

Firefighting Gobbler, a team comprised of eight graduating seniors at Virginia Tech, is proud to present The Flock, an aerial firefighting system comprised of six eVSTOL RAM aircraft, known as Pelican, that best meets the NASA ARMD Aeronautics Design Challenge in an environmentally friendly and cost-efficient manner. The system is compliant with all FAA 14 CFR Part 23 standards, FAA 14 CFR Subchapter G Part 135, and ICAO Annex 16 Volume 1. The remotely piloted Pelican is capable of performing firefighting operations in remote and mountainous locations, such as the western United States.

The Flock can deploy 3,000 gallons of water in a single pass, 9,000 gallons of water before returning to the airport to swap batteries, and 72,000 gallons of water in 24 hours. Each Pelican is designed to perform VSTOL operations, capable of taking off and landing on small lakes in 360 ft and 440 ft respectively. Each Pelican is powered by Licerion batteries, making the system entirely electric, and thus environmentally friendly, cost-effective, and quiet.

In addition to performing firefighting operations, Pelican is designed to have variants for passenger travel and cargo transport. These variants are capable of being manufactured on the same assembly line as the firefighting version with minimal effort to transition between any manufacturing mode. The Flock is a low cost system, with a flyaway cost of \$14.76 million and an annual operational cost of \$5.4 million.

Requirements	Threshold	The Flock Compliance
Entry Into Service	2030	Dec. 2030
Service Ceiling	8,000 ft	12,000 ft
Water Delivery Per Pass	3,000 gal	3,000 gal
Remote Piloted or Single Pilot	~	Remotely Piloted
Drop Autocorrection	~	✓
Noise Abatement	~	✓
Comparable Aircraft Cost	~	✓
Firefighting Range	200 nmi	280 nmi
Takeoff Gross Weight	18,000 lb	15,200 lb
Very Short Takeoff	750 ft	360 ft
Very Short Landing	750 ft	440 ft

