

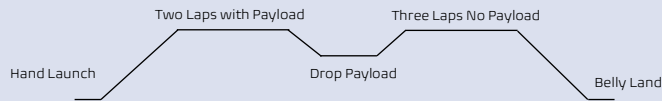
MISSION

The Bronze Propeller Competition 2019-2020

Develop a stowable "semi-autonomous emergency supply" vehicle that is capable of a hand launch, accurately and autonomously delivering its payload to a target area while completing five laps of the designated course.

Est. Mission Time: 90s

Est. Mission Score Per Run: 120



SIMETRA

Jonathan Edward Maye

Stability & Control

jonathan.e.maye@gmail.com

Tanat Tat Maichan

Structures

tatmaichan10@gmail.com

Lilia Noemi Marquez

Propulsion

marquezlilia1@gmail.com

Daniel Alvarez

Release Mechanism

dalvarez93551@yahoo.com

Dakota Jacob Harms

Aerodynamics

contact@djacobharms.info

STRATEGY

Have a high payload capacity to minimize overall power needed per payload mass.

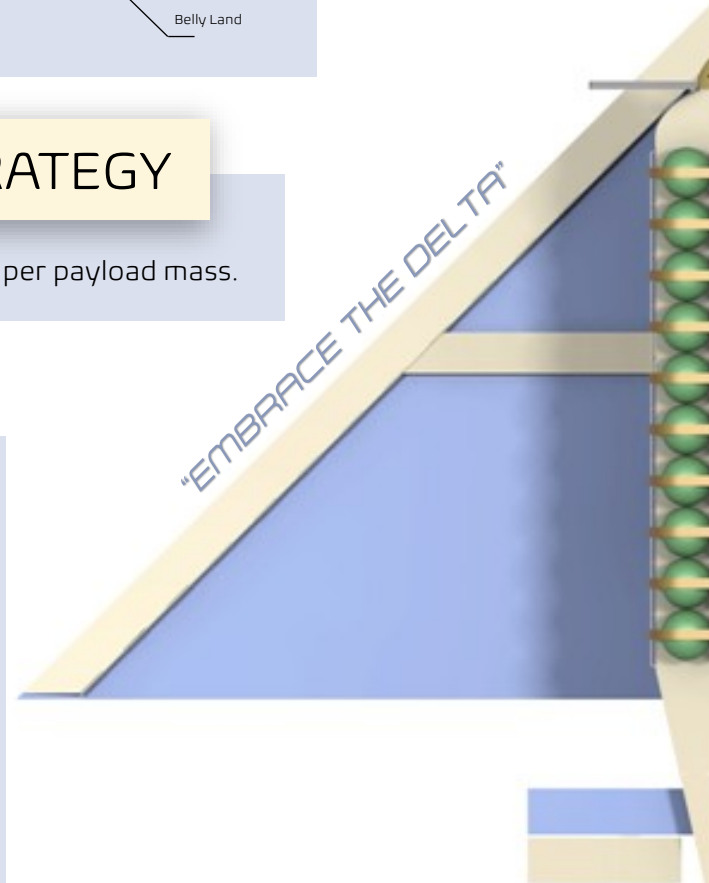
THE ARROW: VERSATILITY

Remarkable external payload bay allows for more supplies to be dropped per run and can easily be reconfigured to accept similarly sized cargo.

Large payload capacity is a result of the uniquely designed folding delta wing.

Propulsion package is fully customized for minimized power usage during turn maneuvers that supplies enough power to all phases of the mission.

A high precision GPS module with localized on-field waypoints and on-board live trajectory computation create a hands-free delivery method accurate to within 0.3 feet.



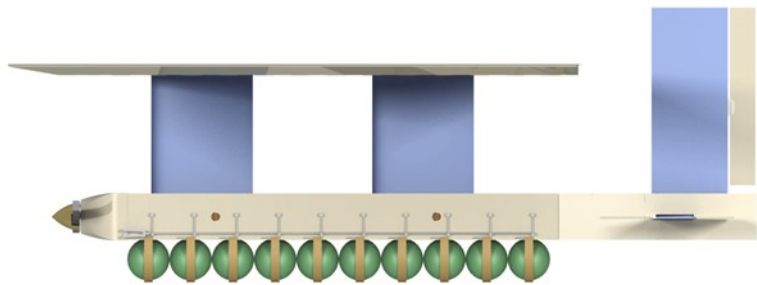
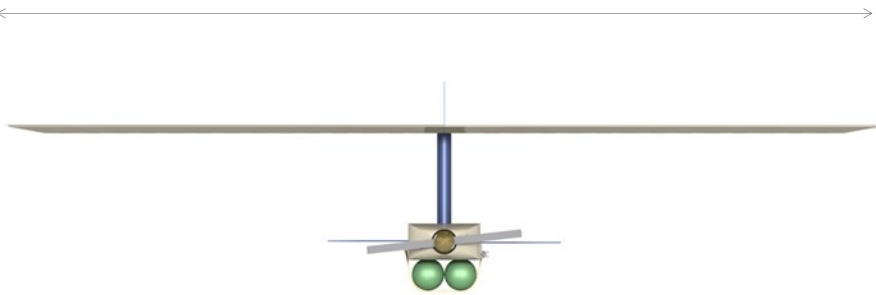
From The Team

The unique design of The Arrow is inspired by hang gliders and Francis Rogallo's concepts for landing the Gemini spacecraft. Simetra saw great potential in this design to increase our wing area over that of our competition and create a distinct aircraft. The team feels that there is great value in aiming high and reaching for unconventional solutions.

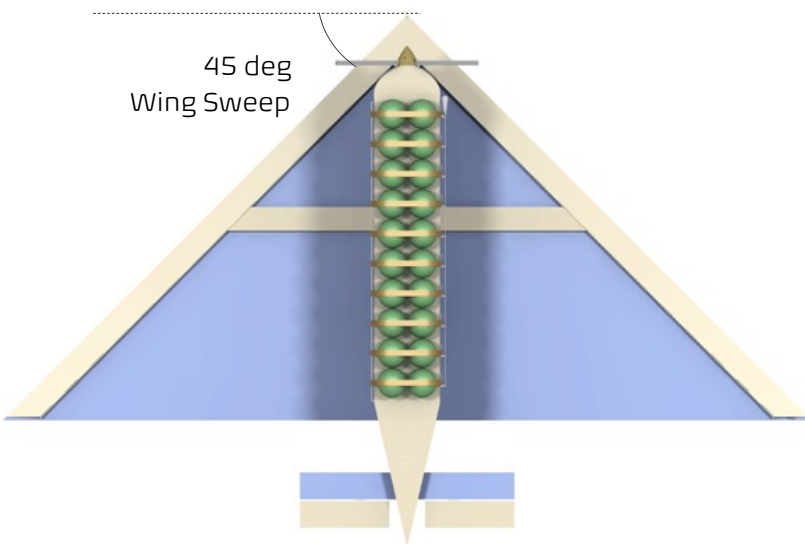




5.64 feet



3.5 feet



DIMENSIONS

Overall Vehicle Length:	3.50 ft / 42 in
Wingspan:	5.64 ft / 67.68 in
Wing Area:	7.96 ft ² / 1146.24 in ²
Propeller Diameter:	1 ft / 12 in

PERFORMANCE

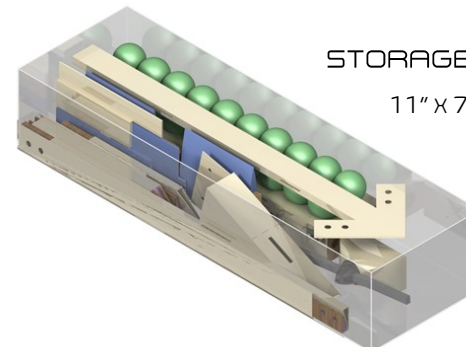
Endurance at Cruise:	732 sec / 0.2 hr
Efficient Speed:	75 fps / 51 mph
Max Level speed:	75 fps / 51 mph
Stall Speed:	32 fps / 21.8 mph
Motor:	Great Planes Rimfire .32 42-50-800 Outrunner Motor

AUTONOMOUS PAYLOAD RELEASE

On-board Computer:	Arduino Micro
Power Supply:	Onyx LiPo 3s 11.1v 1200mAh
Actuation Method:	Futaba BLS651

WEIGHTS

Empty Weight:	4 lbs
Max Takeoff Weight:	6.75 lbs
Max Payload Weight:	2.75 lbs



STORAGE CONTAINER

11" x 7" x 36"

