



Air Drop Mechanism — How Does It Work?

2026 update — summary of design changes since SUAS 2025

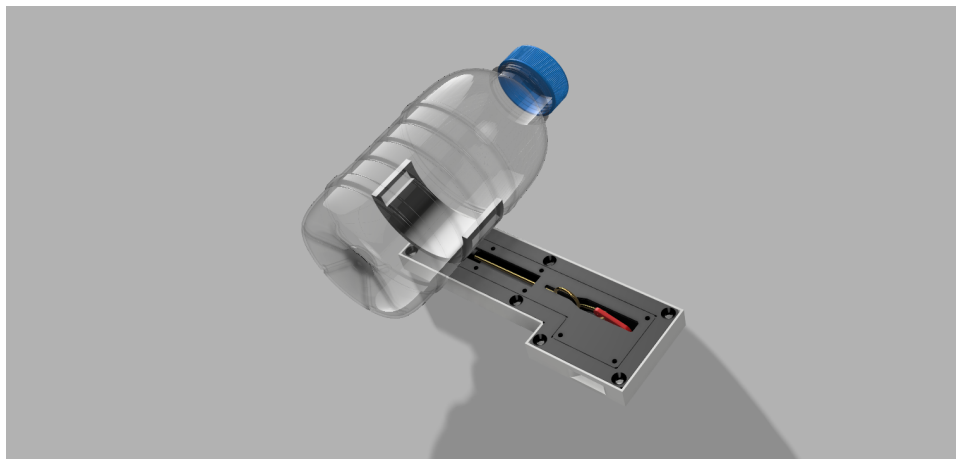
This is an update to last year's Air Drop Mechanism description. The release mechanism and payload attachment were revised for the 2026 season based on issues observed during SUAS 2025 testing, and a new fairing is planned; only these parts are covered below.

Release Mechanism

The release mechanism is still built around the KST X06 servo, which pulls a retaining pin out of the payload lock through the movement of its arm; once the pin is withdrawn, the payload is free to drop, and a spring inside the housing returns the pin to its starting position after each cycle.

For 2026, three parts of the mechanism were changed. The housing is now printed in ASA instead of the filament used previously. ASA has a higher heat-deflection temperature, which addresses a problem observed in 2025 where heat from the release servo softened the housing during sustained operation; ASA is also somewhat lighter than PLA, adding a small mass saving alongside the reliability fix. The retaining pin itself is now machined from brass, which is considerably stiffer and stronger than the material used before, so it resists bending under the payload's weight and is less likely to jam during release. The threaded fasteners that hold the housing together now use heat-set brass inserts rather than threads cut directly into the printed plastic — printed threads tend to strip after repeated opening, so the inserts let the module be serviced many times without wearing out.

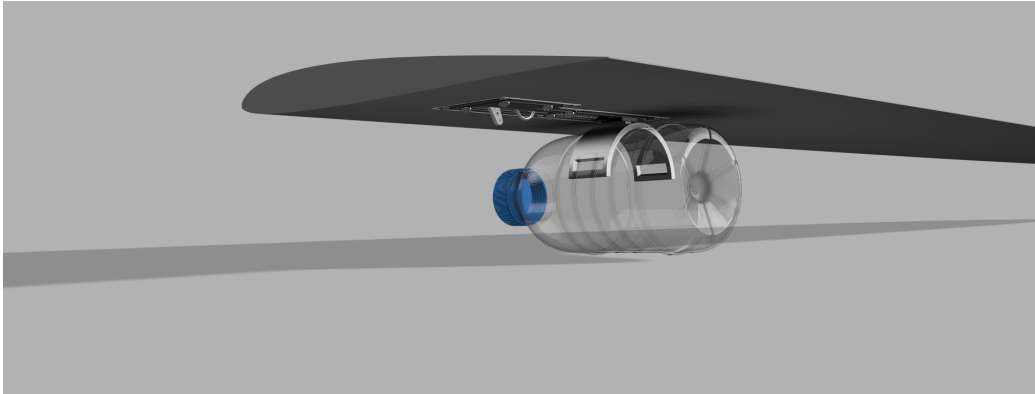
To keep the release action smooth and repeatable, the mechanism's moving parts are now lubricated with technical petroleum jelly, which reduces friction between them.



CAD render of the release mechanism baseplate with retaining pin, mounting inserts, and servo wiring (v20)

Payload Clamp

The payload for 2026 is a bottle-shaped object, which called for a different way of securing it to the release mechanism than the enclosure used previously. The team designed a new clamp printed in flexible TPU (96A); the flexibility of TPU lets the clamp conform closely to the curved shape of the bottle, and the bottle itself is held to the clamp with a hook-and-loop (velcro) strap, so it can be attached and removed quickly between test flights.



CAD render of the bottle payload clamp assembly mounted under the wing (v6)

Fairing

A new aerodynamic fairing is planned for 2026, to be reshaped around the profile of the bottle-shaped payload in place of the enclosure used previously. As of this writing, the fairing has not yet been designed.