

PRODUCT SPECIFICATION

NDAA UAV Development Platform

500 mm quadrotor airframe kit · ArduPilot / PX4 · GPS-denied capable

A complete NDAA-compliant powertrain and airframe. Ships with motors, a 4-in-1 ESC, propellers, telemetry and optical-flow sensing — sized for a 500 g class payload with 2.8:1 thrust margin. Flight controller, companion computer, mission sensors and battery are chosen by the integrator.

Capability Summary

Capability	Provision
GPS-denied flight	ARK Flow optical flow + rangefinder; no GNSS dependency. Supports indoor, under-canopy, and contested-navigation work.
Payload capacity	1185 g above a 410 g reference compute and sensing payload, to a 4000 g MTOW.
Companion compute	Mounting provision for Jetson Orin / Raspberry Pi class boards.
Telemetry	RFD 900x-US long-range modem — air + ground pair included. 902-928 MHz ISM, FCC-compliant.
Autopilot compatibility	Standard Pixhawk interfaces — Cube Orange+, Pixhawk 6C/6X, and similar. ArduPilot and PX4 both supported.
Safety	ESC interface supports RC or autopilot-level motor interlock, allowing an independent kill-switch channel alongside autonomous control.
Logging	Autopilot dataflash logging; no additional hardware required.
Supply chain	NDAA-compliant throughout.

Typical applications: university and research platforms, autonomy and computer-vision development, indoor inspection, GPS-denied navigation research, and engineering competitions where NDAA-compliant sourcing is required.

Pricing

Kit price: \$3,000

Covers the NDAA-compliant airframe and powertrain — the parts hardest to source compliantly. Flight controller, companion computer, battery, and payload are integrator-supplied (see below).

What's in the Kit

Item	Qty	Vendor
HPR Q500 NDAA Frame Kit	1	Hardpoint Robotics
Ewing EM3115 860 KV motor	4	Ewing Aerospace
ARK 4IN1 ESC	1	ARK Electronics
RFD 900x-US telemetry pair (air + ground)	1	RFDdesign
ARK Flow (optical flow + rangefinder)	1	ARK Electronics
Master Airscrew MR 10x4.5 propeller	4	Master Airscrew
Misc (hardware, wiring, standoffs, straps)	—	—

Not Included – Integrator-Supplied

Item	Est. cost	Notes
Autopilot – Cube Orange+ Standard Set	\$451	ADS-B carrier, Power Brick Mini, full cable set. Pixhawk 6C/6X also fit.
Companion computer	\$250+	Jetson Orin Nano class; mounting provided. Power is integrator-supplied.
6S 5000 mAh LiPo	\$150-250	XT90 connector. NDAA-sourced packs available; verify origin.
RC transmitter and receiver	\$200+	Manual control and motor-interlock / kill-switch channel.
Mission payload	varies	1185 g of headroom to MTOW for sensors, manipulators, accelerators.
Ground station	varies	Mission Planner or QGroundControl; ground-side RFD900x now included in the kit.

A complete flying system with autopilot, compute, depth camera, radio and battery typically lands near \$4,600. The kit covers the airframe and powertrain – the parts that are hardest to source compliantly and least interesting to integrate – leaving the integrator to choose the autonomy stack.

Powertrain Specification

Motor	Ewing EM3115 860 KV
Motor weight (ea)	113 g
Motor rating	40.3 A / 1000 W cont.
Peak	67.4 A / 1665 W
Magnets	N35SH
Stator	31 × 15 mm, 12N14P
Propeller	Master Airscrew MR 10x4.5
Propeller weight (ea)	12.8 g
Prop material	GFRC, US-made
Disk area (4)	0.203 m ²
ESC	ARK 4IN1 – 50 A cont / 75 A burst per motor (NDAA, Blue UAS)
Ewing recommendation	6S / 65 A
Battery (not included)	6S 5000 mAh LiPo
Hover throttle	~28%
Thrust ceiling	~2.0 kg/rotor → 8.0 kg MTOW at 2:1
MTOW	4000 g
Power path	XT90 to 4-in-1 ESC
Peak bus at 2:1	~93 A

Weight Budget

Frame (500 mm carbon)	920 g
Powertrain & avionics (motors, ESCs, props, radio, flow sensor)	630 g
Autopilot (Cube Orange+ class)	75 g
Base airframe subtotal	1625 g
Companion computer (Orin Nano class)	175 g
Stereo depth camera (ZED 2i class)	235 g
Mission payload	410 g
6S 5000 mAh LiPo	780 g
AUW, reference payload	2815 g

Performance

1 • Base weight – airframe and autopilot, no mission payload

Battery	Pack wt	Usable Wh	AUW	Bus	Margin	Endurance
6S 5000 LiPo	780 g	89	2405 g	16 A	3.33:1	15.0 min
6S 6000 LiPo	880 g	107	2505 g	17 A	3.19:1	17.0 min
6S 8000 LiPo	1150 g	142	2775 g	20 A	2.88:1	19.2 min

Base airframe 1625 g – a complete flyable aircraft with autopilot, telemetry and optical-flow sensing, before any mission payload. This is the configuration to tune and trim in first. Autopilot is integrator-supplied.

2 • Reference payload – companion computer and depth camera (410 g)

Battery	Pack wt	Usable Wh	AUW	Bus	Margin	Endurance
6S 5000 LiPo	780 g	89	2815 g	20 A	2.84:1	12.0 min
6S 6000 LiPo	880 g	107	2915 g	21 A	2.74:1	13.8 min
6S 8000 LiPo	1150 g	142	3185 g	24 A	2.51:1	16.0 min

Reference configuration for a typical autonomy build. The 6S 5000 is the recommended default – lowest AUW, best thrust margin, and least downwash for work near the ground or over loose objects. Step up a pack size where mission duration matters more than agility.

3 • At MTOW – 4000 g

Battery	Payload headroom	AUW at MTOW	Bus at MTOW	Endurance
6S 5000 LiPo	1185 g	4000 g	34 A	7.1 min
6S 6000 LiPo	1065 g	4000 g	34 A	8.5 min
6S 8000 LiPo	795 g	4000 g	34 A	11.3 min

Payload headroom is measured above the reference payload configuration. MTOW is set by propeller structural limits, so it does not vary with battery. Flying near MTOW costs endurance sharply – step up a pack size when running heavy.