

## UxV/35-Plane First Flight Brief

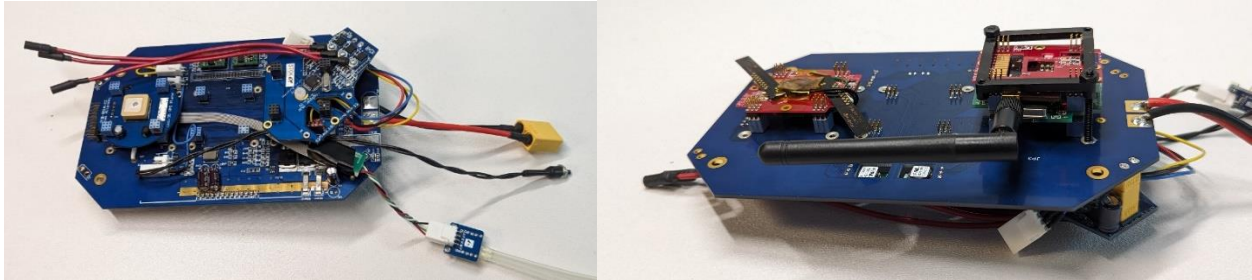


Successful UxV35-Plane Post Landing

### Summary of Flight

A successful first flight of a fixed wing aircraft, using UxV/35 components, was completed on 6/14/2024. All sensors performed as expected, allowing both assisted and autonomous behaviors to be demonstrated. Behaviors and performance metrics shown on previous generation Kairos fixed wing aircraft were matched by the UxV/35 Plane.

## UxV/35 Adaption for use in Plane Application



Photos above show the assembly of UxV/35 components used in the successful first flight.

- UxV/35 hardware was configured to the Plane application using an adapted quadcopter power distribution board.
- Except the airspeed sensor, all other components used in this aircraft are UxV/35 components that have already been rigorously tested in multirotor applications.
- After a change in flight controller firmware and parameters, the entirety of the UxV/35 components are prepared for use in the Plane application.



Successful UxV/35 Plane Post Landing



Image shows UxV/35 Components inside aircraft

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### UxV/35 Plane First Flight Brief

### Details of Successful Flight (UxV35 Plane #1):

1. 4,800mAh 4s LiPo is used (16.8V). Battery Weight = 0.98 lbs.
2. Passes thrust stand checkoff.
3. Launch is performed in the FBWA flight mode. Takeoff successful.
4. One circle (~300ft diameter) is manually performed overhead at an altitude of 120ft AGL in the FBWA flight mode.
5. Three circles (~300ft diameter) are performed autonomously overhead at an altitude of 120ft AGL in the LOITER flight mode.
6. Aircraft is switched to FBWA flight mode. A gradual decrease in altitude is commanded while the aircraft is turned to point back towards the operator and into the wind. A landing is performed manually in the FBWA flight mode. Successful. No damage to components.
7. Video recording can be found [here](#), showing the entirety of the flight described.
8. Battery level is measured at 16.0V after around 3.5 min. total flight time. A rough estimate gives a max flight time of approximately 30 min. with the reduced capacity battery.

#### Notes:

The thrust stand test procedure is outlined in a separate document. In short, control surface behavior, sensor readings, center of gravity and maximum thrust levels are verified before every flight.

Cycle time on performing thrust stand test and launching aircraft is currently around 5-10 min.

The assisted flight mode FBWA was used during takeoff, flight and landing.

The LOITER flight mode used during flight was chosen as one example of the aircraft's autonomous functionality.

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### UxV/35 Plane First Flight Brief

### UxV/35 Components

Part Number	Component Name	Quantity
KA1004-01	UxV/35 Multi-Const. GPS, Baro, Comp	1
KA1003-01	UxV/35 STM32F4 Mission Controller	1
KA1094-01	UxV/35 ESC Bridge	1
KA1079-01	UxV/35 915 Mhz Telemetry Radio	1
KA961-01	UxV/35 FRSKY Flight Radio	1
KA1043-01	UxV/35 Double Height	1
DJPCB-708H-02	Sturnus/FixedWing Base	1

### 3<sup>rd</sup> Party Components

Part Name	Additional Information	Quantity
Motor	C3542-920KV	1
Propellor	12x4.5 MRP - APC	1
Airspeed Sensor	MatekSys ASPD-4525	1
Frame/Servos	EPO foam airframe	1

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### UxV/35 Plane First Flight Brief

## Version History

Name	Date/Version	Description	Reason
Nicholas Ronnie	6/21/2024	Document Created	