FuryVision AAV Performance Test

ICFOSS, October 21, 2024

1. Frame & Build Integrity

1.1. **Frame Integrity:** Ensured no cracks, loose screws, or weak joints.

1.2. **Motors:** Verified all motors are securely attached and spin in the correct direction.

1.3. **Propellers:** Confirmed propellers are balanced, securely attached, and free of damage.

1.4. **Flight Controller (Pixhawk):** Ensured the flight controller is securely mounted, with all connections firm and correct.

1.5. **Antenna(s):** Confirmed the radio antennas are securely attached and positioned orthogonally to minimize interference.

1.6. **Battery Mount:** Checked that the battery mounting mechanism is secure (strap or case).

1.7. **Camera Mount:** Checked that the camera mounting mechanism is secure

2. Electronic & Wiring

2.1. **ESC Wiring:** Ensured ESC wiring is correct, solder joints are strong and provide stability.

2.2. **GPS/Compass Module:** Confirmed correct positioning and wiring, ensuring no electromagnetic interference.

2.3. **Raspberry Pi Wiring (if applicable):** Verified that all Raspberry Pi connections are properly wired and secure.

3. Calibration & Testing

3.1. **Accelerometer Calibration:** Verified that the accelerometer is calibrated and functioning properly.

3.2. **Compass Calibration:** Confirmed the compass is calibrated, with no significant interference.

3.3. **Radio Calibration:** Ensured that the radio system is properly calibrated.

3.4. **Motor Spinning Test:** Perform a motor spinning test to verify all motors start and stop correctly.

3.5. **Flight Test:** Conduct flight tests in the following modes, and note observations (attach flight log):

- Stabilize: For your reference, the flight log is attached in the folder **test_logs** under the folder name **stabilize**. The log files included are **stabilize.tlog** and **stabilize.rlog**.

- Altitude Hold: For your reference, the flight log is attached in the folder **test_logs** under the folder name **althold**. The log files included are **althold.tlog** and **althold.rlog**.
- Loiter: For your reference, the flight log is attached in the folder **test_logs** under the folder name **loiter**. The log files included are **loiter.tlog** and **loiter.rlog**.

4. Firmware & Tuning

4.1. Firmware Details: Upload the latest firmware and note the version details (e.g., ArduCopter)

Arducopter version: V4.5.6(7ce11b41)

4.2. Parameter Copy: Attach a copy of all tuned parameters after flight tuning for reference.

Note: For your reference, a copy of all tuned parameters is attached in the folder parameter with the file name **fury_drone1.param**.

5. Weight & Flight Time

5.1. All-Up Weight:

- Weight with battery: The all-up weight of 1161g includes the Fury frame, battery, 4 cameras and its mounting parts
- Weight without battery: The all-up weight of 923g includes the Fury frame, 4 cameras and its mounting parts

5.2. Observed Flight Time: Record the flight time during tests and mention the battery used (capacity, voltage).

Battery Voltage: 14.8V

Battery Capacity: 2200mAh

Test: Flight test to determine the flight time with an RTL voltage of 3.3V per cell. The all-up weight of 932g includes the Here GPS module, battery, and Fury frame.

Individual Cell	Before Flying	After Flying
Cell1	*4.13V*	*3.41V*
Cell2	*4.12V*	*3.37V*
Cell3	*4.14V*	*3.39V*
Cell4	*4.13V*	*3.42V*
Total Cell Voltage	*16.15V*	*13.5V*

Flight Time (up to landing): **8 minutes and 40 seconds**

Note: For your reference, the flight log is attached in the folder **test_logs** under the folder name **flighttime_test**. The log files included are **test.tlog** and **test.rlog**.

6. Performance & Observations

6.1. Motor Thrust Chart: Include the motor thrust chart, if possible.

6.2. Remote Controller Channel Mapping: Provide details of the remote controller channel mapping (throttle, pitch, roll, yaw).

		Channels	Switch
Flight Controls	Throttle	Channel 3	Joystick A
	Pitch	Channel 2	Joystick B
	Roll	Channel 1	Joystick B
	Yaw	Channel 4	Joystick A
Flight Modes	Stabilize	Channel 5	SWC1
	Loiter	Channel 5	SWC2
	Althold	Channel 5	SWC3
Arm / Disarm	Arm	Channel 6	SWA
	Disarm	Channel 6	SWA

6.3. Temperature After Hovering Test:

Test: Determine the temperature of the components (motors and ESC) before and after flying.

Items	Temperature Before Flying	Temperature After Flying
Motor1(M1)	*31.1° C*	*44.9° C*
Motor2(M2)	*31° C*	*43.5° C*
Motor3(M3)	*30.2° C*	*43.2° C*
Motor4(M4)	*31° C*	*44.5° C*
ESC	*29° C*	*43.2° C*

6.4. Temperature on Ground (after 5 minutes of powering):

Individual motor temperatures:

Motors	Temperature Before Powering	Temperature After 5 minutes of Powering
Motor1(M1)	*31° C*	*31.5° C*
Motor1(M2)	*32.2° C*	*31.7° C*
Motor1(M3)	*30.8° C*	*31.7° C*
Motor1(M4)	*30.7° C*	*317° C*
ESC	*29.6° C*	*35.5° C*