



## UM UAS Flight Review

Purpose: To certify safe operation of UM's UAS fleet in accordance with its 107 pilot certification and/or Certificate of Authorization. All UM faculty, staff, and students must complete this flight review who intend to act as pilot in command of a UM aircraft. This is an interactive process to provide the pilot with a periodic assessment of his or her flying skills and address areas that may adversely affect flight safety.

There are two portions of the review, an oral discussion and in flight practical. This is to ensure that the pilot and observer can comply with regulatory requirements and operate safely.

PIC must maintain their own individual logbook.

Areas to be covered:

Oral:

Types of airspace and compliance

Aircraft flight manual

Marking requirements

Alcohol or drugs

Flight planning

Portable electronic devices

Pre-flight

Right-of-way rules

Aircraft speed

Minimum safe altitudes

Basic VFR weather minimums

Emergency procedures

Maintenance Records

Aircraft Operations Manual

Preflight and Postflight Checklists

In Flight:

### **TAKEOFFS, LANDINGS**

Task: Normal Takeoff (not automated)

1. Maintain takeoff power and hovering within 2m horizontal until safe maneuvering altitude



2. Maintain directional control and wind-drift correction.

Task: Normal Landing (not automated)

1. Select a suitable touchdown point, considering ground/flight conditions.
2. Maintain a stabilized approach
3. Touch down at or within **13 feet of specified point**.
4. Maintain crosswind correction and directional control throughout the approach and landing.

### **GROUND REFERENCE MANEUVERS**

Perform the following tasks with the camera a) facing away towards a center point at all time and b) with the camera facing in the direction of flight.

Fade Out and Up, Fade In and Down (Introductory)

1. Select and object then fly equally back and increase altitude from the object.
2. Return to the object flying equally towards it with decreasing altitude to your starting point.

Task: Turns Around a Point (Intermediate)

1. Select a suitable ground reference point.
2. Plan to enter left or right at **25 - 50 feet agl**, at an appropriate distance from the reference point.
3. Apply wind-drift correction to track a constant radius turn around the reference point. Ensure the camera constantly faces toward the center of the circle.
4. Divide attention between UAS control and ground track while maintaining coordinated flight.
5. Maintain altitude, **±5 feet**; maintain airspeed, **±2 knots**.

Task: Rectangular Course (Advanced)

1. Select a suitable reference area.
2. Enter a left or right pattern, **25 - 50 feet agl** at an appropriate distance from the selected area, **45° to the downwind leg**.
3. Apply wind-drift correction to maintain a constant ground track.
4. Divide attention between UAS control and ground track while maintaining coordinated flight.



5. Maintain altitude, **±5 feet**; maintain airspeed, **±2 knots**.

## **PERFORMANCE MANEUVER**

Task: Steep Turns (Introductory)

1. Establish the recommended airspeed and heading.
2. Roll into a coordinated 360° turn; maintain Maximum Yaw (45° tilt) angular velocity of 200 Degrees per second. Note: Many UAVs will not allow this.
3. Perform the task in the opposite direction
4. Maintain the entry altitude, **±10 feet**, airspeed, **±2 knots**, bank, **±5°**; and roll out on the entry heading, **±10°** max.

## **EMERGENCY PROCEDURES**

Task: Loss of control or communications

1. Select an appropriate course of action.
2. HOME button setup? - Failsafe RTH will be automatically activated if the remote controller signal is lost for more than three seconds and Home Point was successfully recorded. Know the difference between DJI and other aircraft procedures. - demonstration
3. Vortex Ring State Recovery – move at a slope to come down to avoid - Oral
4. Stall recovery – reduce angle of attack then increase power. – Oral
5. Loss of Motor Power – See UM sUAS Aircraft Flight Manual - Oral
6. Loss of GPS Signal - See UM sUAS Aircraft Flight Manual - Oral
7. Loss of Control frequency - See UM sUAS Aircraft Flight Manual – Oral
8. Flyaway - See UM sUAS Aircraft Flight Manual – Oral
9. Aircraft Battery Failure - See UM sUAS Aircraft Flight Manual – Oral
10. Transmitter Battery Failure - - See UM sUAS Aircraft Flight Manual – Oral
11. Fire - See UM sUAS Aircraft Flight Manual – Oral
12. Structural Failure - See UM sUAS Aircraft Flight Manual – Oral
13. Pilot Incapacitation - See UM sUAS Aircraft Flight Manual – Oral
14. Controlled Flight into Terrain and Stalls – Oral

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Instructor

Date

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Pilot

Date



## UM Simulator Training

1. Map controls: Transmitter modes 1 and 2 (I prefer 2, mode one switches elevator and rudder)
2. Flight Modes: Top left switch, see question mark on screen for explanation for each aircraft. Some have GPS like our aircraft (return to launch) or IOC to have absolute directions regardless of aircraft orientation. Quadcopter X is like our Phantom, use "Stabilize" flight mode.
3. Take off and play with trim
4. Viewport under gadgets, then can have both camera view (nose) and see drone from the ground in a different window (chase or fixed).

To change the vantage point within the active viewport, press the `ESC` key on the keyboard. This toggles through the various camera modes, including chase view and a fixed viewpoint, or what you would see if you were standing at the side of the runway.

5. Use heads up display
6. Try flight review maneuvers
7. Change scenery and try complex terrain and a stall

Notes:

- a. Gimbal and FPV not on all aircraft. Rotating knob on upper right controls gimbal.
- b. Pause appears in challenges or if you get in a menu. Units are in meters.
- c. Use RC Desk Pilot for fixed wing aircraft.