

Test Methods for Evaluating Aerial Drones Safety | Capabilities | Proficiency RobotTestMethods.nist.gov



VERSION 2020K

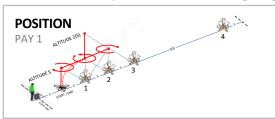


OPEN TEST LANE

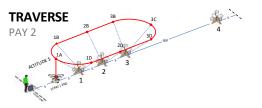
Payload Functionality Trials (PAY 1-5)

Perform 5 different flight paths around the omni bucket stands. Each flight path includes a sequence of alignments with one or more buckets. While aligned with each bucket, control camera zoom and exposure to capture a SINGLE IMAGE of the inscribed ring and IDENTIFY TARGETS inside each bucket.

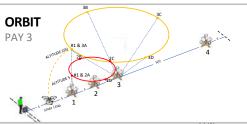
- Score ALIGNMENT POINTS during or after the trial from images with UNBROKEN RINGS (5 pts) or BROKEN RINGS (1 pt).
- Score ACUITY POINTS by identifying and calling out the 5 increasingly small VISUAL ACUITY TARGET GAPS (1 pt each).
- Land CENTERED (5 pts) with the aircraft center inside the designated 60 cm (24 inch) diameter circle, or OFFSET (1 pt) with at least one propeller motor inside the circle.
- Faults for extreme deviations from the intended flight path or contact with any object ends the trial to ensure safety.
- Timer starts at launch and ends after the last task is completed. Trial time limits are typically set to 5 minutes each (25 minutes to complete all 5 tests) although organizations may set their own trial time limits and passing scores.



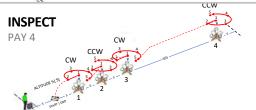
- Demonstrate basic flight maneuvers between designated hover positions, orientations, and altitudes along the lane centerline at altitudes S and 2(S).
- Climb, descend, yaw, pitch, and roll to simultaneously align with downward buckets to check position then forward buckets to check altitude.
- Complete 10 positions along the lane centerline with 18 alignments and 1 accurate landing (counts double) to score up to 100 points.



- Fly sideways parallel to objects while looking forward to identify features as if along a road, truck, bus, building, fence, tree line, etc.
- Maintain altitude S flying leftward and rightward around the first three bucket stands to align with all the designated buckets.
- Complete 1 lap leftward then 1 lap rightward with 18 alignments and 2 accurate landings to score up to 100 points.



- Fly circular orbits around designated bucket stands while looking inward to identify features on all four sides. Fly altitude 2(S) leftward and rightward around stand #3 (white), then altitude S leftward and rightward around stand #2 (black).
- Each orbit has 5 bucket alignments starting with 1 downward radius check then 4 altitude checks around the orbit looking inward at the angled buckets.
- Complete 4 orbits with 20 alignments to score up to 100 points.



- Fly in closer proximity around objects to inspect detailed features on top and all four sides of the bucket stands.
- Maintain altitude 1/2(S) starting on top of each bucket stand with alternating leftward and rightward rotations to inspect all four sides of each bucket stand.
- Complete all 4 stands with 20 alignments to score up to 100 points.



- Fly straight and level over the centerline to establish a stable hover over an object down range to perform reconnaissance tasks.
- Maintain altitude S to align with buckets and the landing at each end of the lane. Reconnaissance tasks are performed every 8(S) over a total distance of 80(S).
- Complete 5 laps (or 10 lane lengths) with 20 alignments to score up to 100 points.

