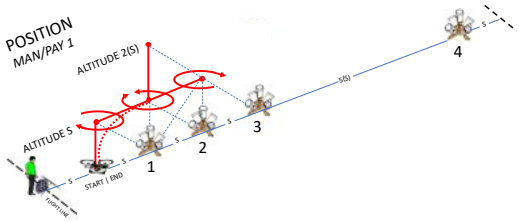
Open Test Lane and Related Scenarios

CHECKRIDE SCORESHEET

The aircraft performs a series of maneuvering paths around the omni bucket stands in the test lane or as embedded scoring tasks in the related scenarios. Each flight path includes alignments with one or more buckets to identify recessed targets inside. Successful alignment is achieved when the drone can maintain the designated position, orientation, and altitude long enough to verify an unobstructed view of the inscribed ring at the bottom of the bucket. A single alignment image is captured of each bucket to use for scoring after the trial. Additional targets inside each bucket evaluate camera pointing, zooming, and exposure control to measure visual and thermal acuity and identify color shifts, hazardous material labels, or other objects of interest. Faults for extreme deviations from the intended flight paths or contact with any of the test apparatuses ends the trial to ensure safety.

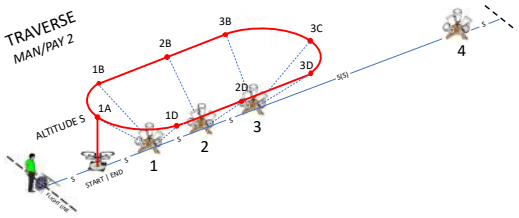
POSTION (MAN/PAY 1)

Evaluate basic flight maneuvers between designated hover positions, orientations, and altitudes along the lane centerline to demonstrate positive aircraft control at all times. The drone performs a series of maneuvers including climb, descend, yaw, pitch, and roll to simultaneously align with two buckets in each position, orientation, and altitude. The aircraft then lands centered on the platform with the chassis or any ground contact within a 30 cm (12 in) radius circle.



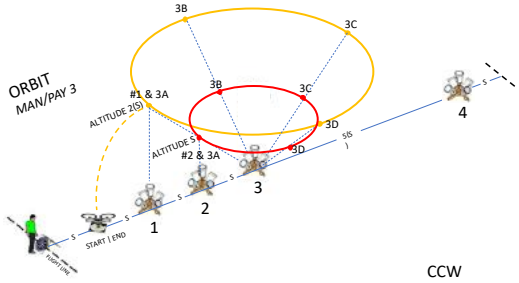
TRAVERSE (MAN/PAY 2)

Evaluate drones flying sideways parallel to objects while looking forward to identify features as if along a building, woods line, truck/bus, etc. The drone flies at altitude (S) to complete two laps in both directions around the omni bucket stands to align with the designated buckets. The drone also lands centered on the platform with the chassis or any ground contact within a 30 cm (12 in) radius circle.



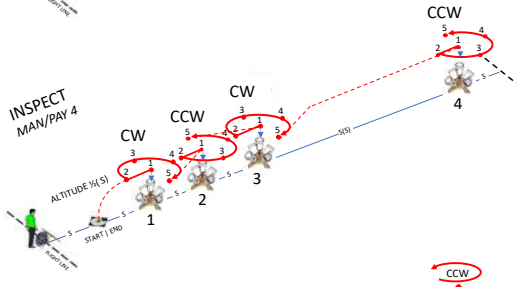
ORBIT (MAN/PAY 3)

Evaluate drones flying circular flight paths at different altitudes around objects while looking inward to identify features on all four sides. The drone orbits at altitude 2(S) in both directions then altitude (S) in both directions to align with the designated buckets. Each orbit starts with an initial downward bucket alignment to check the radius before proceeding leftward and rightward. Accurate landings are not included.



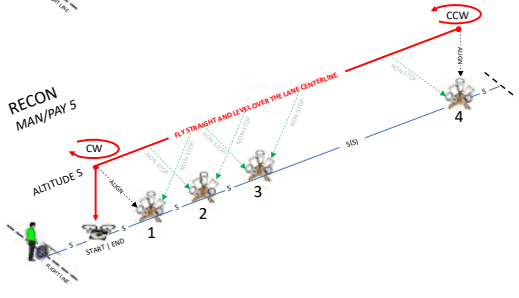
INSPECT (MAN/PAY 4)

Evaluate drones flying in closer proximity around objects to inspect detailed features on the top and all sides. The drone flies at altitude 1/2(S) all around each omni bucket stand to align with the designated buckets. Inspection tasks start on top then rotate around the objects in alternating clockwise and counter clockwise directions. Accurate landings are not included.



RECON (MAN/PAY 5)

Evaluate drones flying straight and level down range to establish stable hovers over objects in open space to perform reconnaissance tasks. The drone flies at altitude (S) at a sustainable speed directly over the lane centerline to align with designated buckets and the landing at each end of the lane. The down range reconnaissance tasks include looking straight down on the objects in different orientations and at an angle. A complete trial covers a total distance of 80(S) with moving (non-stop) alignments over the angled buckets along the centerline helping to identify deviations from the intended path and encourage consistency.



NIST National Institute of Standards and Technology U.S. Department of Commerce

Standard Test Methods for Small Unmanned Aircraft Systems

ASTM International Standards Committee on Homeland Security Applications; Response Robots (E54.09) | Website: RobotTestMethods.nist.gov

ASTM INTERNATIONAL

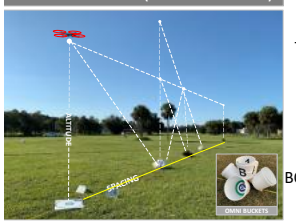
VERSION 2020E

PLEASE FILL IN ALL TRIAL INFORMATION

Open Test Lanes and Scenarios

CHECKRIDE SCORESHEET

SCALABLE TEST LANES (ALTITUDE = SPACING)



TOP (T)
TOP LEFT (TL)
(TR) TOP RIGHT
LEFT (L)
(R) RIGHT
BOTTOM LEFT (BL)
(BR) BOTTOM RIGHT
(B) BOTTOM

5 POINTS
1 POINT
1 POINT

Pilot Last Name: _____
Pilot First Name: _____
Drone Make: _____
Drone Model: _____
Facility: _____
YYYY-MM-DD: _____
Proctor Code: _____

LANE SPACING (S)	LIGHTING	WIND	PILOT VIEW	TIME LIMIT
10 FT 20 FT 30 FT _____ FT (CIRCLE ONE OR FILL IN)	DAYLIGHT 1000+ LUX; LIGHTED 300+ LUX; DARK < 1 LUX (CIRCLE ONE)	AVERAGE _____ MPH; GUSTS _____ MPH (FILL IN)	LINE OF SIGHT FACING LANE OPTIONAL V.O.; INTERFACE ONLY BACK TO LANE MANDATORY V.O. (CIRCLE ONE)	5 MIN; 10 MIN; _____ MIN (CIRCLE ONE OR FILL IN)

MANUEVERING SCORE: Circle the bucket number for full alignments (5 pts), or write a "1" over the bucket number for partial alignments (1 pt), or "X" through the bucket number for missed buckets (0 pts). **PAYLOAD SCOR**E: Circle correctly identified gap orientations using the answer key (1 pt each).

ANSWER KEY is relative to the target identifier letter or number on the sticker.

		POSITION (1)	TRAVERSE (2)	ORBIT (3)	INSPECT (4)	RECON (5)	SEARCH	VEHICLE
Trial Start Time (Clock)		HH : MM	HH : MM	HH : MM	HH : MM	HH : MM	HH : MM	HH : MM
	1	1 T BL R BR L (HOVER)	1A TR B TR L BR (LEFTWARD)	1 T BL R BR L (LEFTWARD)	1 T BL R BR L	4 TL B TR R BR	1 T BL R BR L	A1 T BL R BR L
	2	2A L BR T TL R	1B R TL T BL B	3A BR T TL R BL	1A TR B TR L BR	7 BR T BL L TL upside down	1A TR B TR L BR	A2 TR B TR L BR
	3	1 T BL R BR L (YAW LEFT)	2B TL R TR L BR	3B B TR R BL T	1B R TL T BL B	L B TR L BL T	1B R TL T BL B	A3 R TL T BL B
	4	2A L BR T TL R	3B B TR R BL T	3C BL R BL T BR	1C BR R TL L BR	1A TR B TR L BR	1C BR R TL L BR	A4 BR R TL L BR
	5	1 T BL R BR L (YAW RIGHT)	3C BL R BL T BR	3D L TL R BR T	1D B TL R BL T	4 TL B TR R BR (NEXT LAP)	1D B TL R BL T	A5 B TL R BL T
	6	2A L BR T TL R	3D L TL R BR T	1 T BL R BR L (RIGHTWARD)	2 BL T BR R TL (NEXT STAND)	7 BR T BL L TL upside down	2 BL T BR R TL	B1 BL T BR R TL
	7	1 T BL R BR L (CLIMB)	2D TR B TL B BL	3A BR T TL R BL	2A L BR T TL R	L B TR L BL T	2A L BR T TL R	B2 L BR T TL R
	8	3A BR T TL R BL	1D B TL R BL T	3D L TL R BR T	2D TR B TL B BL	1A TR B TR L BR	2D TR B TL B BL	B3 TL R TR L BR
	9	1 T BL R BR L (DESCEND)	1A TR B TR L BR	3C BL R BL T BR	2C T BL R TL B	4 TL B TR R BR (NEXT LAP)	2C T BL R TL B	B4 T BL R TL B
	10	2A L BR T TL R	P1 BL R TL L BL	3B B TR R BL T	2B TL R TR L BR	7 BR T BL L TL upside down	2B TL R TR L BR	B5 TR B TL B BL
	11	2 BL T BR R TL (FORWARD)	1A TR B TR L BR (RIGHTWARD)	2 BL T BR R TL (LEFTWARD)	3 R TL B BL R (NEXT STAND)	L B TR L BL T	3 R TL B BL R	C1 R TL B BL R
	12	3A BR T TL R BL	1D B TL R BL T	3A BR T TL R BL	3A BR T TL R BL	1A TR B TR L BR	3A BR T TL R BL	C2 BR T TL R BL
	13	1 T BL R BR L (BACKWARD)	2D TR B TL B BL	3B B TR R BL T	3B B TR R BL T	4 TL B TR R BR (NEXT LAP)	3B B TR R BL T	C3 B TR R BL T
	14	2A L BR T TL R	3D L TL R BR T	3C BL R BL T BR	3C BL R BL T BR	7 BR T BL L TL upside down	3C BL R BL T BR	C4 BL R BL T BR
	15	2 TR B TL L BR (FWD & YAW LEFT) upside down	3C BL R BL T BR	3D L TL R BR T	3D L TL R BR T	L B TR L BL T	3D L TL R BR T	C5 L TL R BR T
	16	1C BR R TL L BR	3B B TR R BL T	2 BL T BR R TL (RIGHTWARD)	4 TL B TR R BR (NEXT STAND)	1A TR B TR L BR	4 TL B TR R BR	D1 TL B TR R BR
	17	L B TR L BL T (FWD & YAW RIGHT)	2B TL R TR L BR	3A BR T TL R BL	4A T BL B TR L	4 TL B TR R BR (NEXT LAP)	4A T BL B TR L	D2 T BL B TR L
	18	1A TR B TR L BR	1B R TL T BL B	3D L TL R BR T	4D BR B TL B TR	7 BR T BL L TL upside down	4D BR B TL B TR	D3 TR L BL R TL
	19	P1 BL R TL L BL (LAND)	1A TR B TR L BR	3C BL R BL T BR	4C R BL T TR B	L B TR L BL T	4C R BL T TR B	D4 R BL T TR B
	20	P2 L BR T TL B	P2 L BR T TL B	3B B TR R BL T	4B TR L BL R TL	1A TR B TR L BR	4B TR L BL R TL	D5 BR B TL B TR
TOTAL		MAN /100	MAN /100	MAN /100	MAN /100	MAN /100	MAN /100	MAN /100
		PAY /100	PAY /100	PAY /100	PAY /100	PAY /100	PAY /100	PAY /100
Elapsed Time		MM : SS	MM : SS	MM : SS	MM : SS	MM : SS	MM : SS	MM : SS
		PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL

*If your training aircraft camera has a limited range of motion, align with as many buckets as possible. Pilot proficiency is only compared using similar systems.