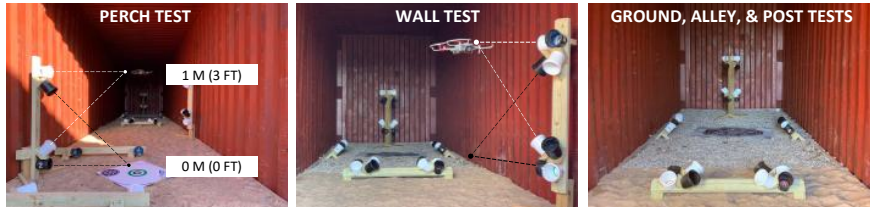


Confined Tests and Scorable Scenarios

Indoors/Outdoors, Lighted/Dark, GPS/No GPS



Pocket Guide for Aerial Drones



CONFINED Tests and Scenarios



Test Director

Adam Jacoff

Intelligent Systems Division

National Institute of Standards and Technology

U.S. Department of Commerce

Sponsor:

Systems Engineering & Standards Division

Science and Technology Directorate

U.S. Department of Homeland Security

Website

RobotTestMethods.nist.gov

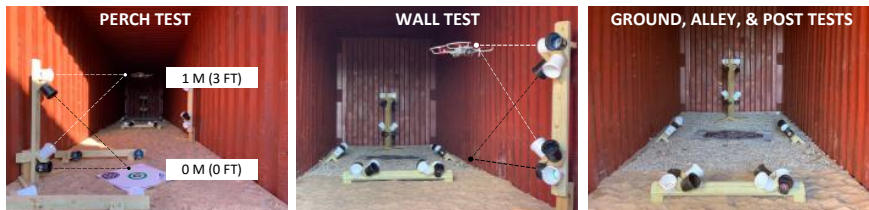


Email

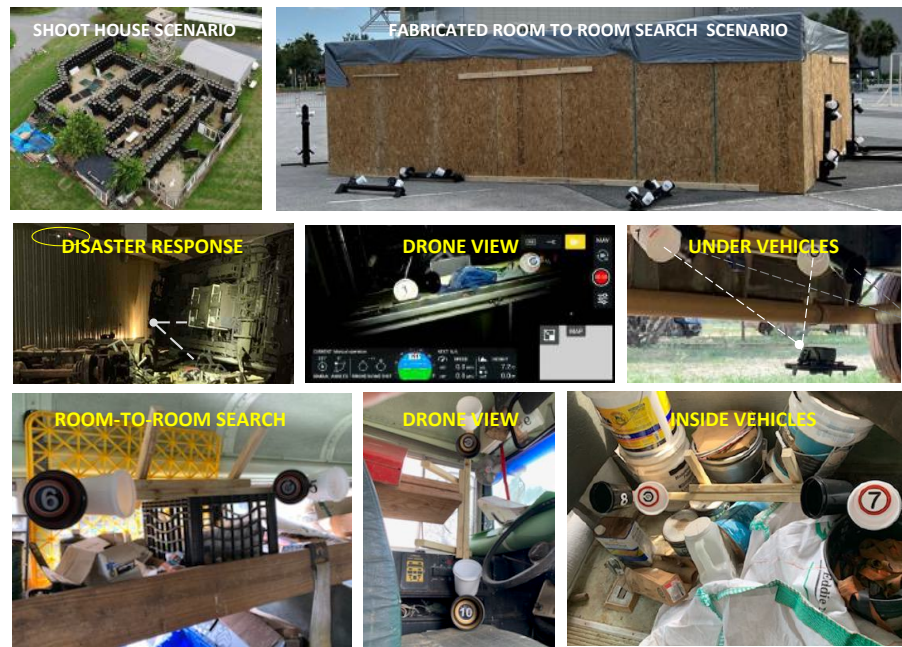
RobotTestMethods@nist.gov

Confined Tests and Scorable Scenarios

Evaluate safety, capabilities, and proficiency



The Confined tests and scorable scenarios enable remote pilots to perform safe and repeatable flight paths indoors room-to-room or in any confined space to inspect objects from very close proximity. There are 5 different tests that guide remote pilots through various standoff positions, orientations, and perches at about 1 m (3 ft) from objects. These tests can be performed indoors to control lighting, weather, and access to GPS or outdoors as appropriate.



CONFINED SEARCH		BUCKETS	ALIGNMENT	ACUITY				
START TIMER		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)				
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0					
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A	- -	TR	B	TR	L	BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0					
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L	BR	T	TL	R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0					
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR	T	TL	R	BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0					
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T	BL	B	TR	L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	5	5 1 0					
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	5A		BL	R	TL	L	BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	6	5 1 0					
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	6A		TR	B	TR	L	BR
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	7	5 1 0					
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	7A	- -	L	BR	T	TL	R
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	8	5 1 0					
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	8A		BR	T	TL	R	BL
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	9	5 1 0					
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	9A		T	BL	B	TR	L
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	10	5 1 0					
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	10A		BL	R	TL	L	BL
ELAPSED TIME: (MM:SS)		SCORES	/50		/50			

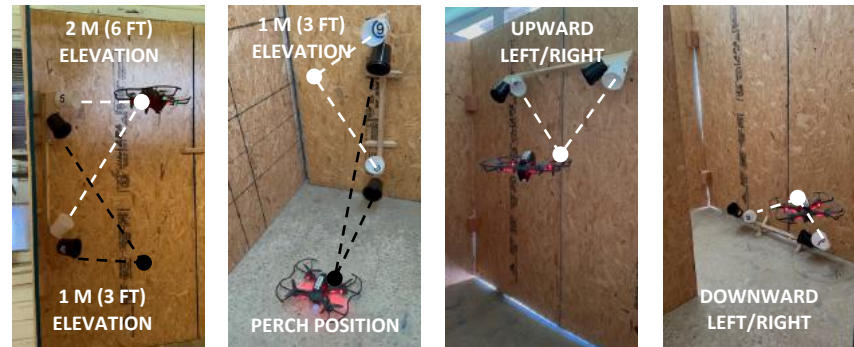
Confined Room-to-Room Labyrinth

Search tasks with 1 m (3ft) minimum clearances

USE SETS OF 5 “INLINE” DUAL BUCKET RAILS
HORIZONTALS FOR LEFTWARD/RIGHTWARD INSPECTIONS



VERTICALS FOR UPWARD/DOWNWARD INSPECTIONS

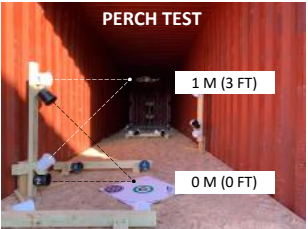
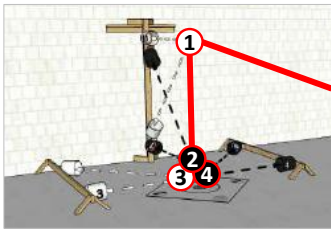


- Fabricated room-to-room search scenario with inspect tasks that can be replicated to track and compare scores.
- Self-standing plywood corner walls define 1.2m (4 ft) switchback hallways with a blackout tarp ceiling over top at 2.4m (8ft). Fits inside a 6m (20ft) shipping container.
- Square access “windows” measuring 1m (3ft) square provide entry/exit and interior high/low pass throughs.

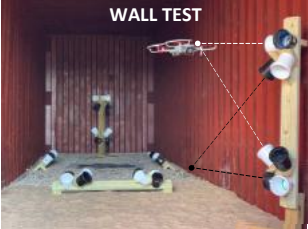
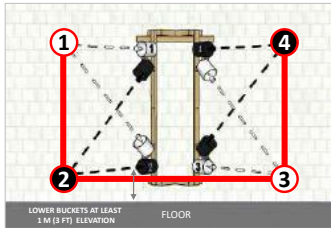
Bucket Alignments Define Flight Paths

Designated altitudes, positions, and orientations

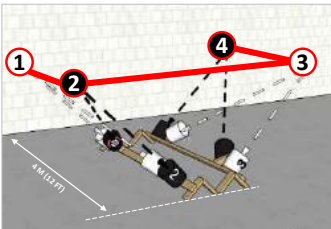
PERCH
PAY 6



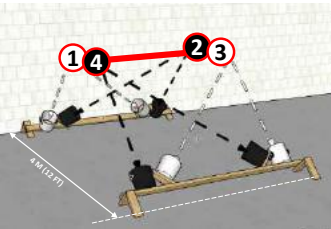
WALL
PAY 7



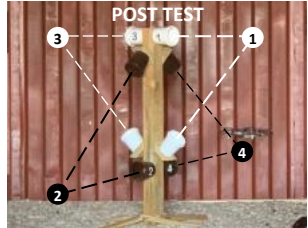
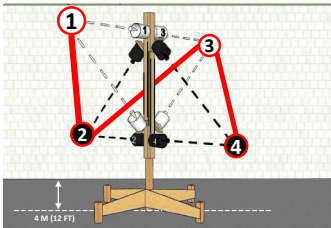
GROUND
PAY 8



ALLEY
PAY 9



POST
PAY 10



Metrics to Track Over Time

Measure System Capabilities and Pilot Proficiency

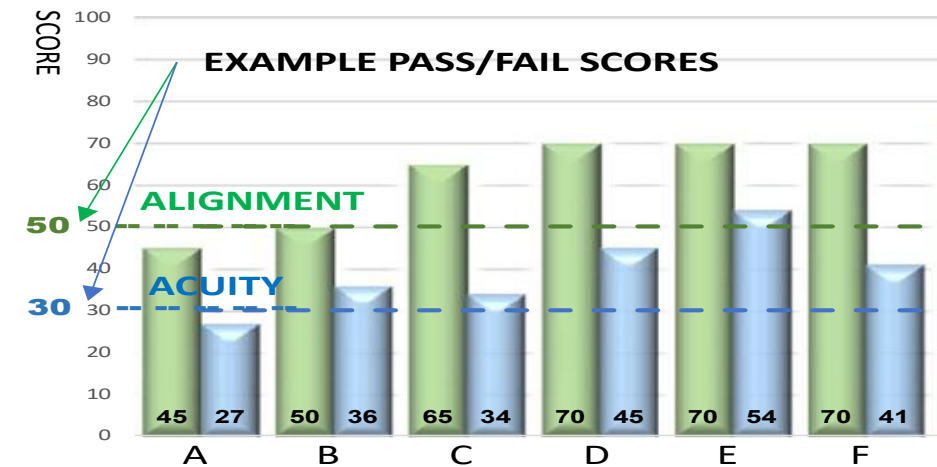
Completeness: Align with every bucket in the sequence and land accurately according to the procedure. The objective is scoring ALL points possible for your aircraft without making mistakes.

Score: For complete trials, track your scores over time. The average of your last five trials is an excellent measure of your proficiency on the aircraft and interface used.

Efficiency (Optional): For complete trials with maximum scores for a particular aircraft, the elapsed time can help identify the most efficient systems and techniques. Time limited trials can be used across multiple tests to maintain a schedule and similarly fatigue novices and experts.

Separate Scores: ALIGNMENT and ACUITY

Track and Compare Scores Using the Same Drone



CONFINED VEHICLE		BUCKETS	ALIGNMENT	ACUITY				
START TIMER		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)				
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0					
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A	- -	TR	B	TR	L	BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0					
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L	BR	T	TL	R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0					
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR	T	TL	R	BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0					
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T	BL	B	TR	L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	5	5 1 0					
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	5A		BL	R	TL	L	BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	6	5 1 0					
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	6A		TR	B	TR	L	BR
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	7	5 1 0					
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	7A	- -	L	BR	T	TL	R
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	8	5 1 0					
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	8A		BR	T	TL	R	BL
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	9	5 1 0					
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	9A		T	BL	B	TR	L
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	10	5 1 0					
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	10A		BL	R	TL	L	BL
ELAPSED TIME: (MM:SS)		SCORES	/50	/50				

Confined Vehicle Inspection Scenarios

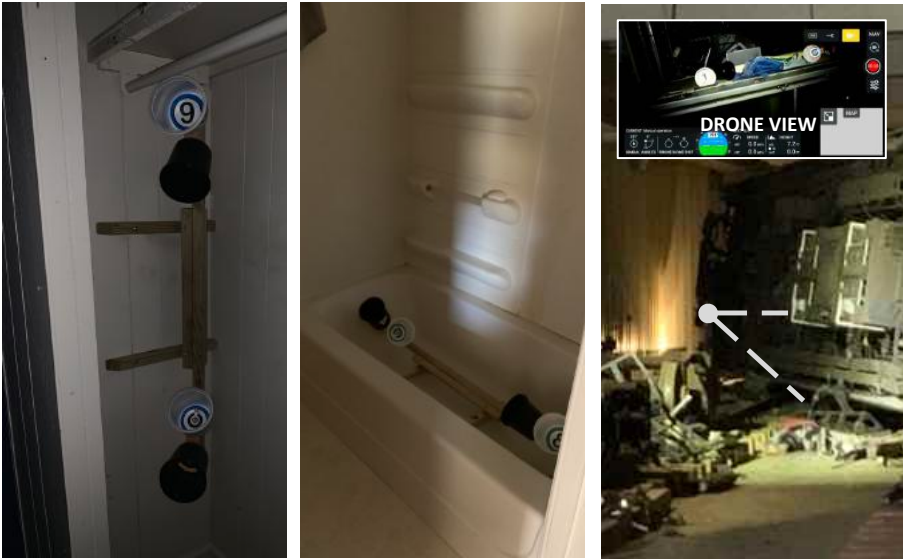
Day and Night Trials

USE SETS OF 5 “INLINE” DUAL BUCKET RAILS
DISTRIBUTED THROUGHOUT THE SCENARIO

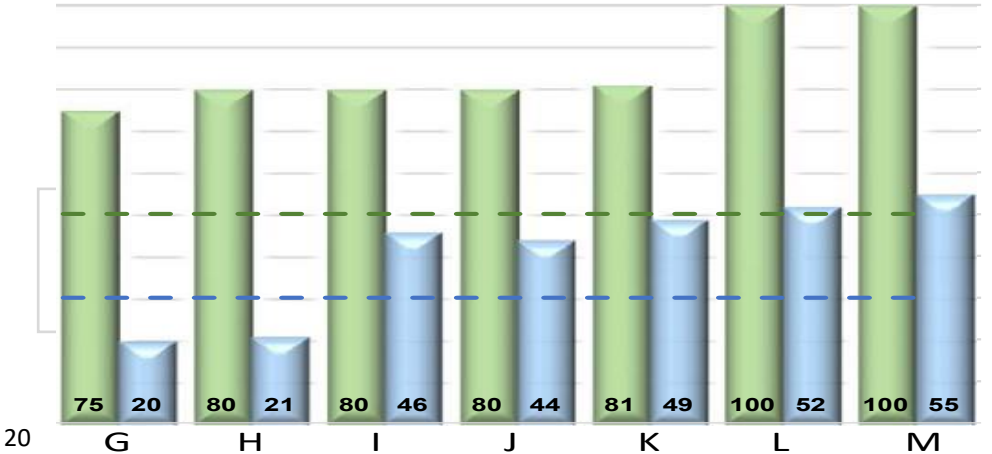


Indoor and Outdoor Scenarios

Evaluate using repeatable search/inspect tasks



The WALL and ALLEY test shown embedded in a room-to-room search scenario closet and bath tub. The pairs of of white and black buckets require exposure control to discern details. Also shown is a more complex overturned subway rail car disaster. All such scenarios get embedded with scoring tasks totaling 100 points.



Alignment Points

Scoring based on captured alignment images

ALIGN WITH BUCKETS TO CAPTURE IMAGES

10 ALIGNMENT RINGS TOTAL 50 POINTS

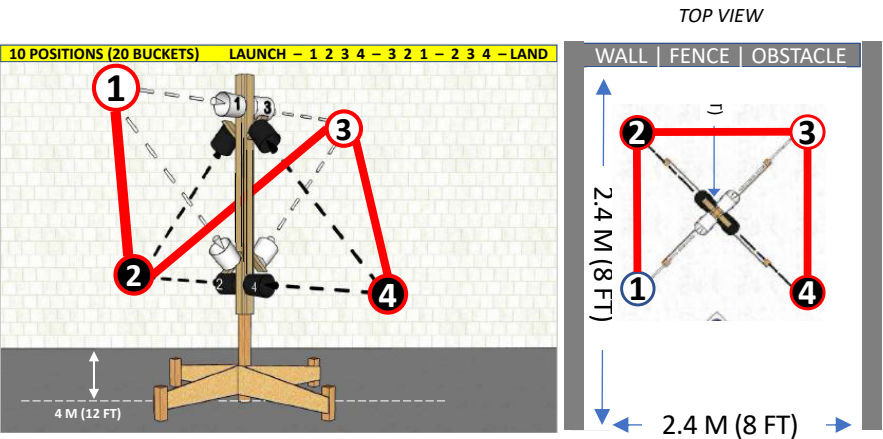


CAPTURE IMAGES OF THE INSCRIBED RINGS AND PERCH ACCURATELY.

- First align with each PERPENDICULAR BUCKET to capture a SINGLE ALIGNMENT IMAGE of the inscribed ring.
- Score captured images with
 - UNBROKEN RINGS (5 points)
 - BROKEN RINGS (1 point)
 - NO RINGS (0 points, strike through line)
- Accurate landings are not scored.
- Verification of captured alignment images can be during the trial when obvious or after the trial to eliminate discussions during the trial. Images can also be stored for documentation.

CONFINED POST		BUCKETS	ALIGNMENT	ACUITY
START TIMER :		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR T TL R BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR T TL R BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A	- - -	TR B TR L BR
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
ELAPSED TIME: (MM:SS)		SCORES	/50	/50

Post (PAY 10)
Confined Test Lane



- Center the Post apparatus in a 2.4m (8 ft) cubic space or shipping container with the vertical task elevations at 1m (3ft) and 2m (6 ft) above the ground.
- Fly within 1 m (3 ft) of the post to inspect vertical object features upward and downward.
- Pass between the post and walls throughout.

SCORING

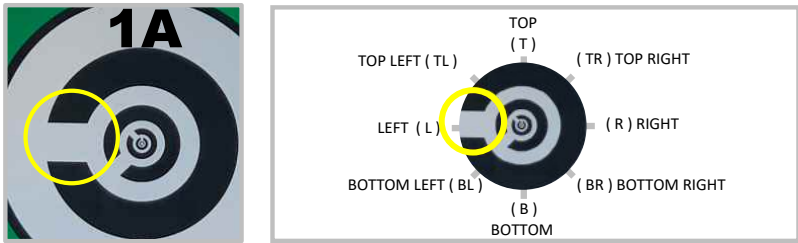
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

Acuity Points in Angled Buckets (50 Total):
Align with each angled bucket to IDENTIFY ACUITY GAPS through the pilot interface. Images are optional for documentation but use the answer key for scoring.

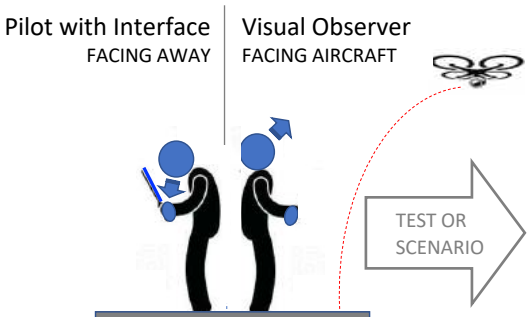
Acuity Points
Scoring based on identifying details

ALIGN THEN CONTROL ZOOM AND EXPOSURE

10 ACUITY TARGETS TOTAL 50 POINTS

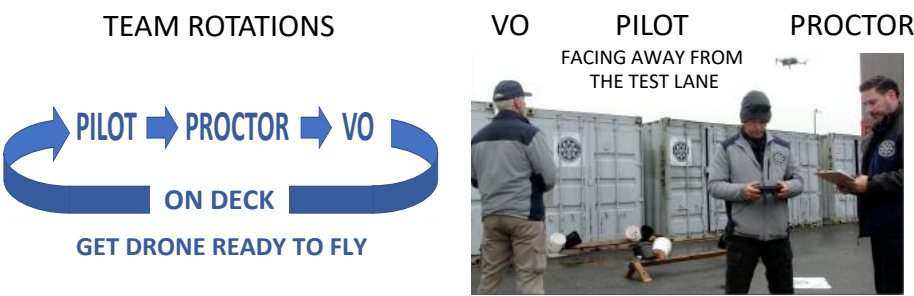


- Then align with each ANGLED BUCKET to IDENTIFY ACUITY TARGETS using camera zoom and exposure controls.
- Call out as many of the Concentric C gap directions as possible (1 pt each).
- Fly facing away from the test lane or scenario with a Visual Observer to evaluate flying interface only as if beyond visual line of sight.



Teams Rotate Through Each Role

Each Pilot flies a 5-minute trial with help from others.
A 3-4 person team completes all 5 tests in 2 hours.



Four person teams always have one person getting their aircraft ready to launch right after the previous lands.
Three person teams work too, but require some time between each rotation to prepare the next aircraft.

PILOT

- Maintain control of the aircraft.
- Call out each intention of movement before doing so.
- Call out each bucket alignment and acuity target gap.

PROCTOR

- Fill in the form header.
- Read the test procedures to the Pilot.
- Confirm, record, and attest to scoring after the trial.

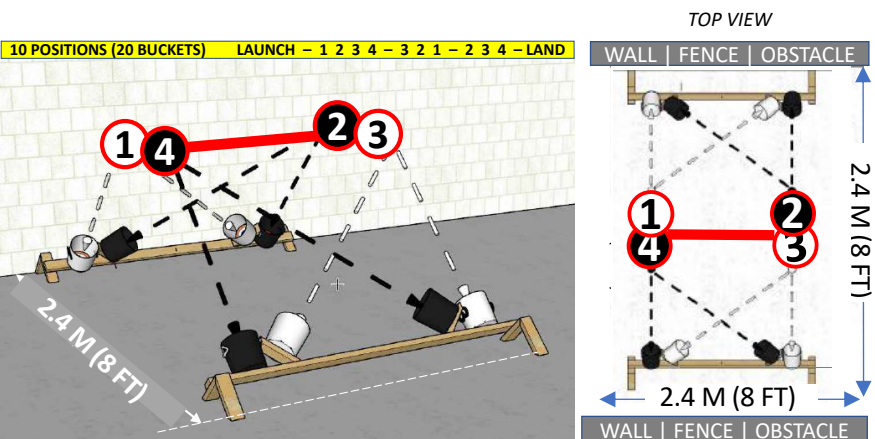
VISUAL OBSERVER (VO)

- Maintain sight with the aircraft and surroundings.
- Repeat the Pilot's intention of movement to confirm.
- Call out corrections and warnings as necessary.

CONFINED ALLEY		BUCKETS	ALIGNMENT	ACUITY
START TIMER		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR T TL R BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A	- - -	TR B TR L BR
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
ELAPSED TIME: (MM:SS)		SCORES	/50	/50

Alley (PAY 9)

Confined Test Lane



- Place the Alley apparatus in a 2.4m (8 ft) cubic space with ceiling (or shipping container) with the horizontal tasks centered along opposing side walls.
- Fly within 1 m (3 ft) to perform the alignments with the walls in front of the aircraft (0 degrees) and behind the aircraft (180 degrees).
- Inspect horizontal objects leftward and rightward.

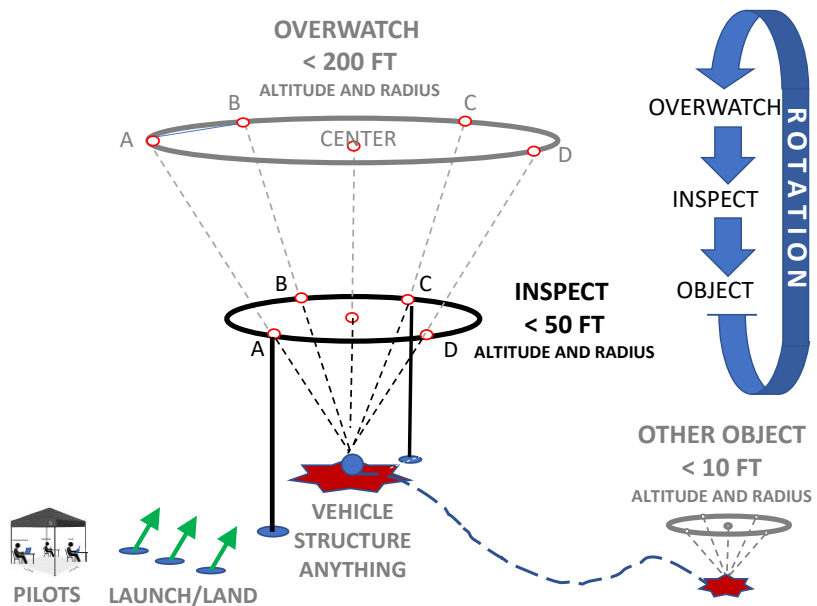
SCORING

Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

Acuity Points in Angled Buckets (50 Total):
Align with each angled bucket to IDENTIFY ACUITY GAPS through the pilot interface. Images are optional for documentation but use the answer key for scoring.

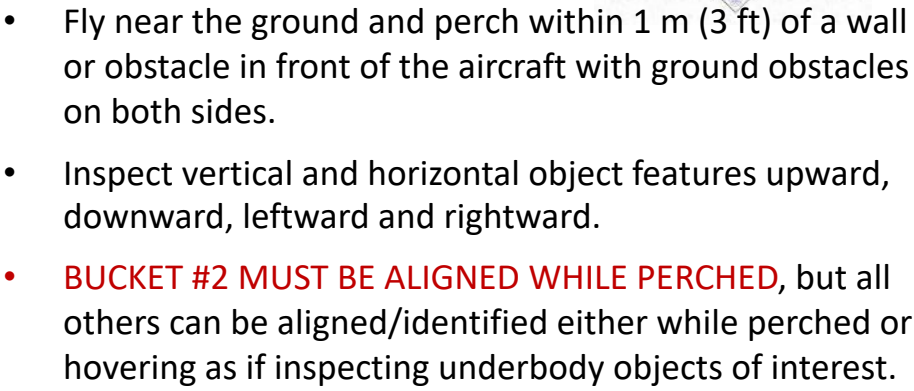
Teams Sequence Through Scenarios

Each Pilot flies a 15-minute scenario, sequencing through 3 objectives for 5 minutes each.



- This scenario mechanization enables embedded bucket scoring tasks to be performed similarly by all participating Pilots. So the results are comparable within the same scenario layout. Additional tactics can be overlaid onto these scenarios at your facility.
- Up to 3 teams concurrently fly different scenario objectives from safe distances and altitudes apart.
- Teams move as necessary to maintain sight lines with their aircraft and communications with other teams. The overwatch team leads communications.
- Scenarios restart every 20 minutes with a different rotation of Pilot, Proctor, and VO.

Obstructed Test Lane



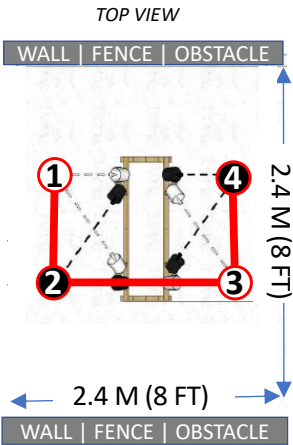
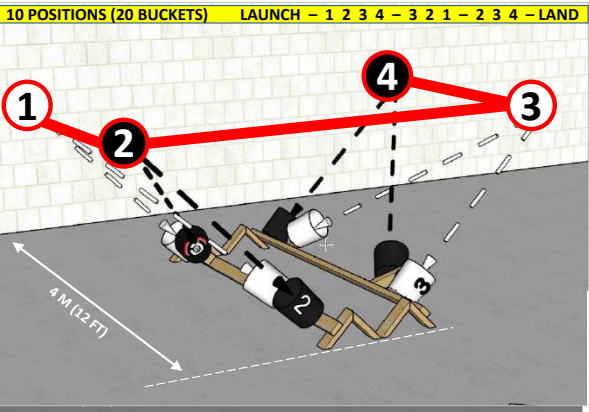
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

Align with each angled bucket to IDENTIFY ACUITY GAPS through the pilot interface. Images are optional for documentation but use the answer key for scoring..

10 15

Ground (PAY 8)

Confined Test Lane



- Place the Ground apparatus in a 2.4m (8 ft) cubic space with ceiling (or shipping container) with the horizontal tasks centered between the side walls.
- Fly within 1 m (3 ft) to perform the alignments with the walls at 90 degrees from forward of the aircraft.
- Inspect horizontal objects leftward and rightward.

SCORING

Alignment Points in Perpendicular Buckets (50 Total):

Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

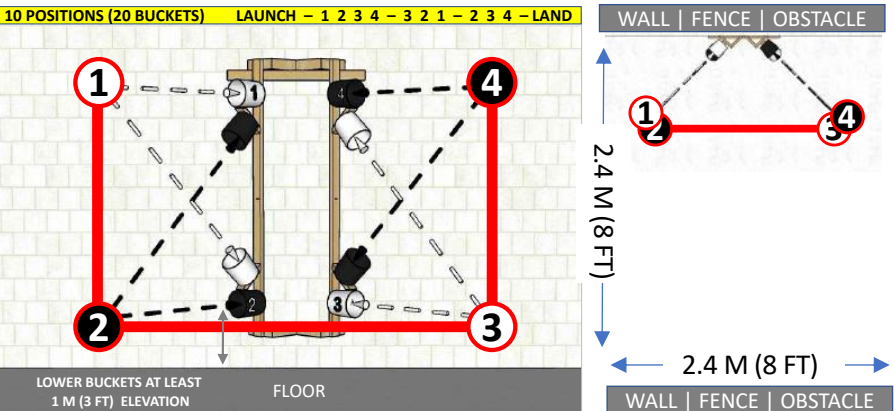
Acuity Points in Angled Buckets (50 Total):

Align with each angled bucket to IDENTIFY ACUITY GAPS through the pilot interface. Images are optional for documentation but use the answer key for scoring.

CONFINED PERCH		BUCKETS	ALIGNMENT	ACUITY
START TIMER		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	WHILE PERCHED
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	WHILE PERCHED
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A	- - -	TR B TR L BR
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	WHILE PERCHED
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
ELAPSED TIME: (MM:SS)		SCORES	/50	/50

Wall (PAY 7)

Confined Test Lane



- Place the Wall apparatus in a 2.4m (8 ft) cubic space with ceiling (or shipping container) with the vertical tasks at 1m (3ft) and 2m (6 ft) elevations.
- Fly within 1 m (3 ft) to perform the alignments with the wall at 45 degrees from forward of the aircraft.
- Inspect vertical objects upward and downward.

SCORING

Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

Acuity Points in Angled Buckets (50 Total):
Align with each angled bucket to IDENTIFY ACUITY GAPS through the pilot interface. Images are optional for documentation but use the answer key for scoring.

CONFINED WALL		BUCKETS	ALIGNMENT	ACUITY
START TIMER		NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
4	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
5	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
6	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR T TL R BL
7	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
8	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
9	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
10	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A	- - -	BR T TL R BL
11	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
12	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
13	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	1	5 1 0	
14	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
15	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	2	5 1 0	
16	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	2A		L BR T TL R
17	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	3	5 1 0	
18	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	3A		BR T TL R BL
19	PERPENDICULAR BUCKET: ALIGN AND CAPTURE IMAGE	4	5 1 0	
20	ANGLED BUCKET: CALL OUT ACUITY GAP DIRECTIONS	4A		T BL B TR L
ELAPSED TIME: (MM:SS)		SCORES	/50	/50