NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY U.S. DEPARTMENT OF COMMERCE

Science and Technology

Pocket Guide for Aerial Drones

CONFINED
Tests and Scenarios

Test Director

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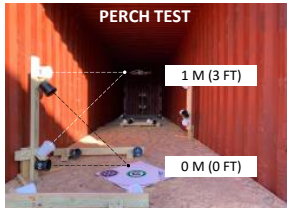
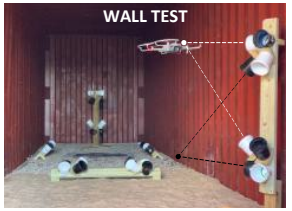
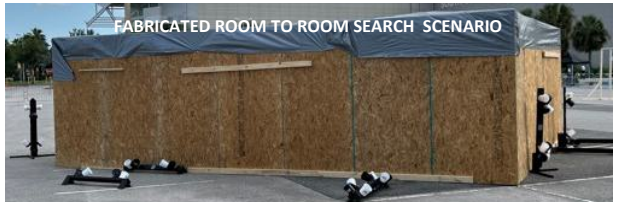
Version 2023D

Confined Tests and Scorable Scenarios

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

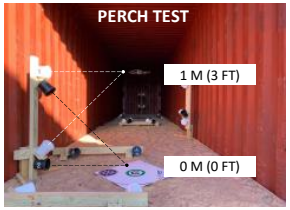


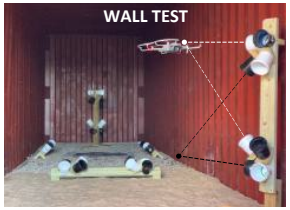




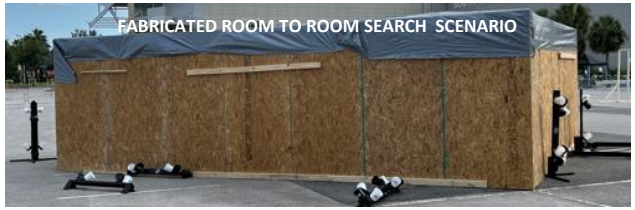
Confined Tests and Scorable Scenarios

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 within the drone's turbulent air. There are 5 different tests that guide remote pilots through various standoff positions, orientations, and perches. These tests can be performed indoors to control lighting, weather, and access to GPS or outdoors as appropriate.



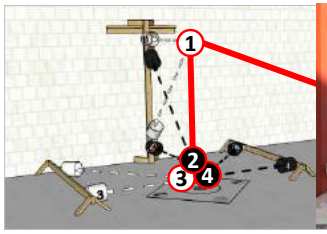
Bucket Alignments Define Flight Paths

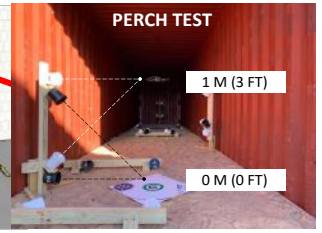
Designated altitudes, positions, and orientations

PERCH

PAY 6

ALL GROUND BUCKETS POINT TOWARD CENTER OF LANDING

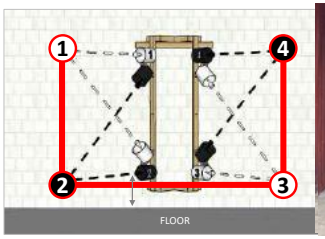


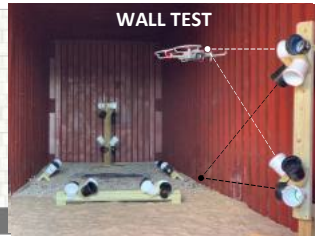


WALL

PAY 7

BOTTOM BUCKETS ARE CENTERED 60cm (24in) ABOVE GROUND

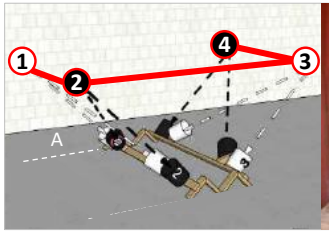




GROUND

PAY 8

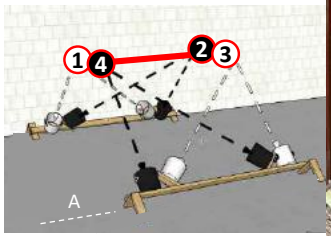
DISTANCE FROM WALL
A = 45cm (18in)



ALLEY

PAY 9

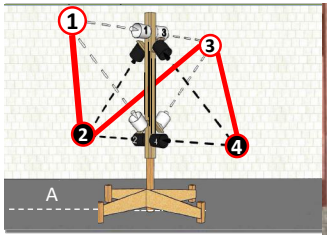
DISTANCE FROM WALL
A = 1m (3ft)

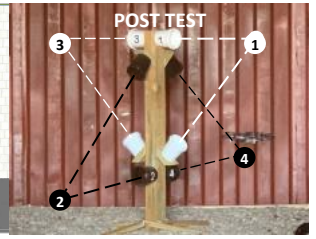


POST

PAY 10

DISTANCE FROM WALL
A = 1m (3ft)





Metrics to Track Over Time

Measure System Capabilities and Pilot Proficiency

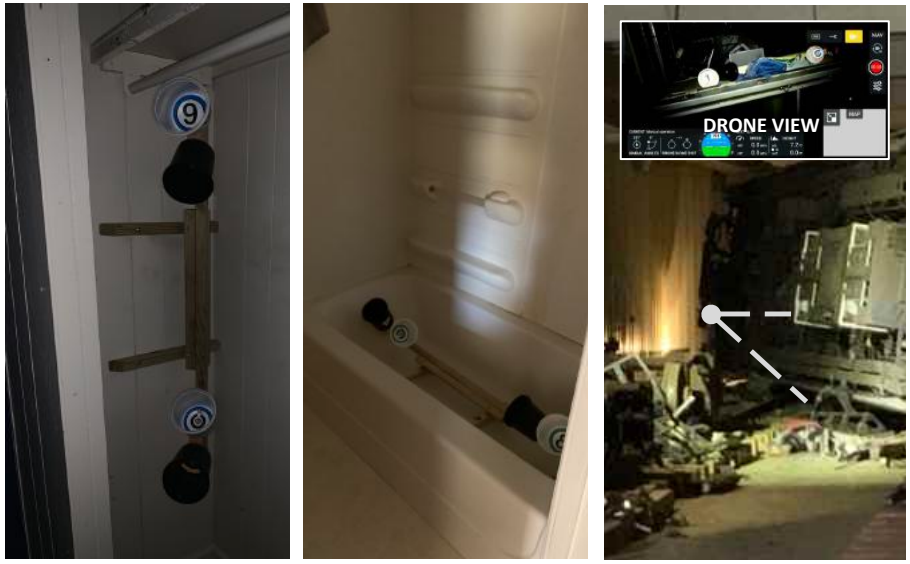
Completeness: Align with every bucket in the sequence and land accurately according to the procedure. The objective is scoring ALL points possible for your aircraft without making mistakes.

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.

Indoor and Outdoor Scenarios

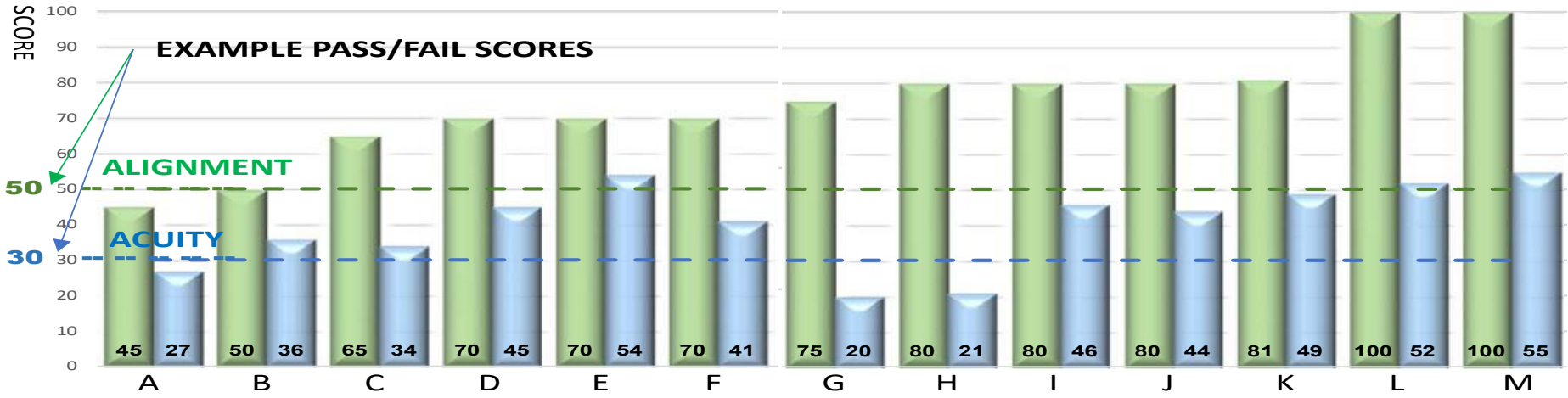
Evaluate using repeatable search/inspect tasks



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.

Separate Scores: ALIGNMENT and ACUITY

Track and Compare Scores Using the Same Drone



Scoring Alignment Points

Capture images of alignment rings to verify

ALIGN WITH BUCKETS TO CAPTURE IMAGES

10 ALIGNMENT RINGS TOTAL 50 POINTS

CAPTURE IMAGES OF THE INSCRIBED RINGS AND PERCH ACCURATELY.

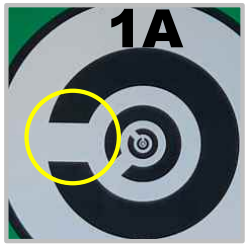
- First align with each PERPENDICULAR BUCKET to capture a SINGLE ALIGNMENT IMAGE of the inscribed ring.
- Score captured images with
  - UNBROKEN RINGS (5 points)
  - BROKEN RINGS (1 point)
  - NO RINGS (0 points, strike through line)
- Accurate landings are not scored.
- Verification of captured alignment 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.

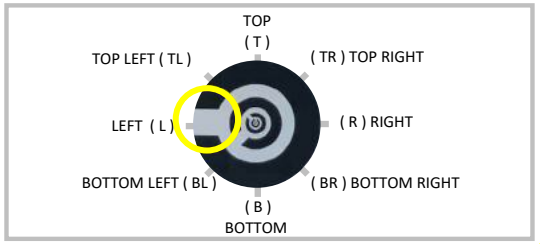
Scoring Acuity Points

Identify increasingly small visual acuity targets

ALIGN THEN CONTROL ZOOM AND EXPOSURE

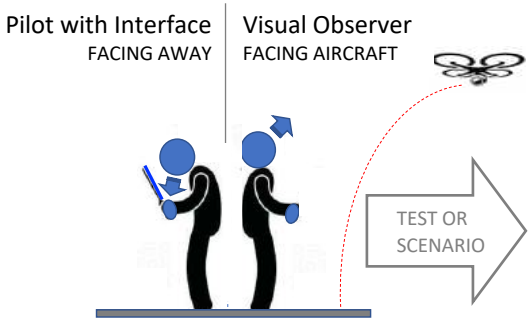
10 ACUITY TARGETS TOTAL 50 POINTS





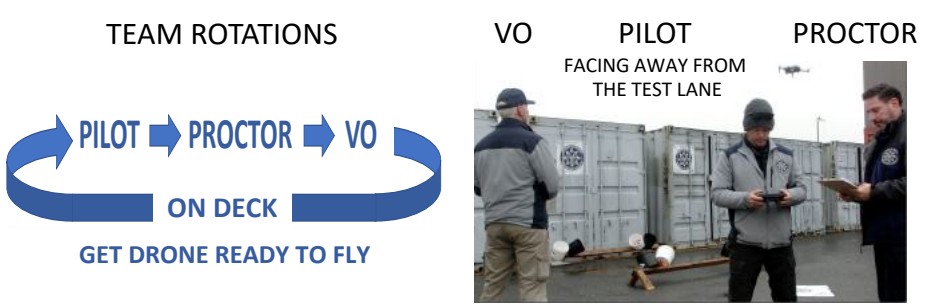
REPORT GAP DIRECTIONS RELATIVE TO THE BUCKET NUMBER (TOP)

- 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

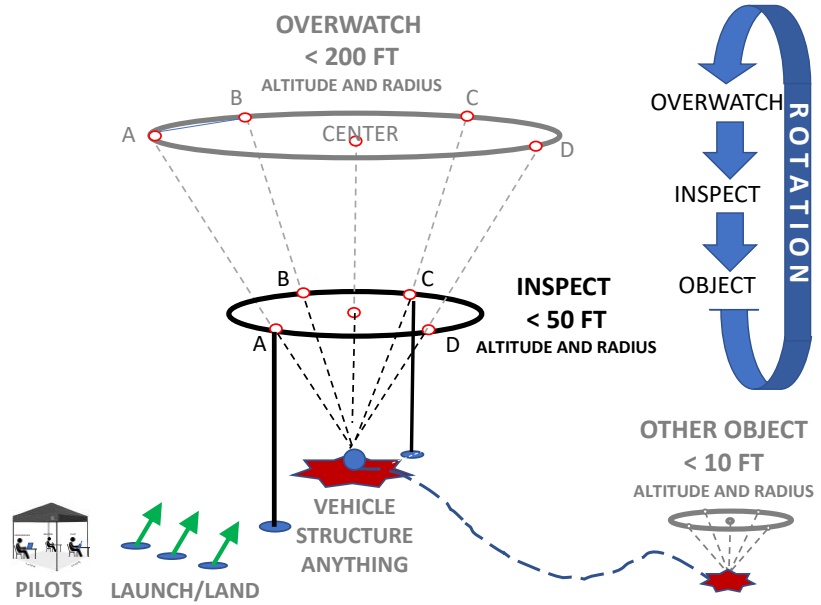
- Fill in the form header.
- Read the test procedures to the Pilot.
- Confirm, record, and attest to scoring after the trial.

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.

Teams Sequence Through Scenarios

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

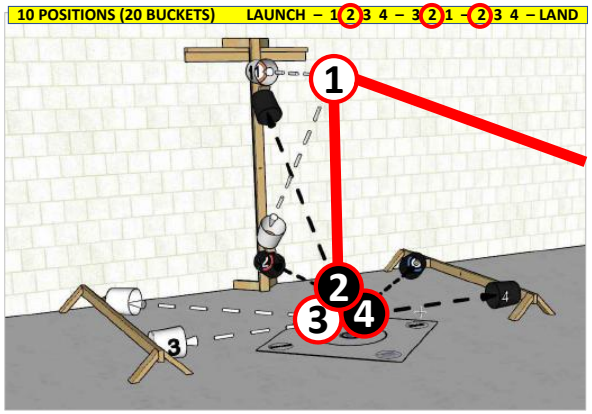


- This scenario mechanization enables embedded bucket scoring tasks to be performed similarly by all participating Pilots. So the results are comparable within the same scenario layout. Additional tactics can be overlayed onto these scenarios at your facility.
- Up to 3 teams concurrently fly different 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.

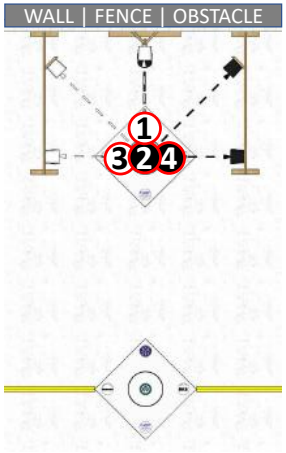
Perch (PAY 6)

Confined Test Lane

#2 ALIGNMENT WHILE PERCHED



TOP VIEW



- Fly and perch inside the 2m (6ft) wide alcove with with ground obstacles on both sides.
- Inspect vertical and horizontal object features upward, downward, leftward and rightward.
- BUCKET #2 MUST BE ALIGNED WHILE PERCHED, but all others can be aligned/identified either while perched or hovering as if inspecting underbody objects of interest.

SCORING

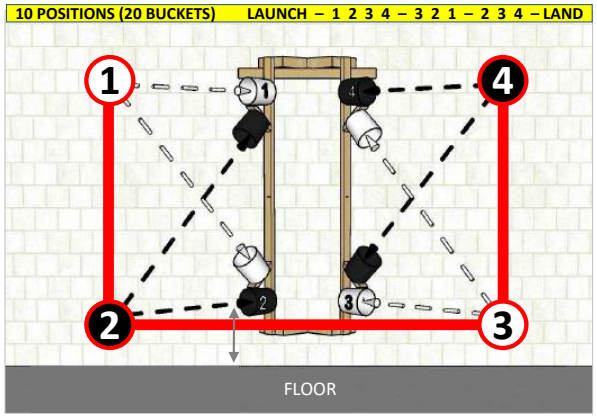
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

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..

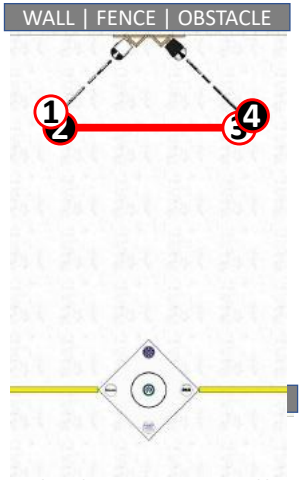
	CONFINED | PERCH	BUCKETS	ALIGNMENT	ACUITY
	START TIMER	NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	*PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	*ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	*PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	2	5 1 0	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
	ELASPED TIME: (MM:SS)	SCORES	/50	/50

Wall (PAY 7)

Confined Test Lane



TOP VIEW



- Fly inside the 2m (6ft) wide alcove with the main wall at 45 degrees from forward of the aircraft.
- Inspect vertical object features upward and downward.

SCORING

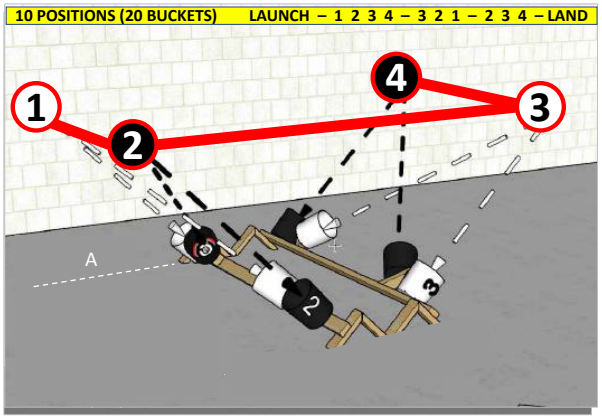
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

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.

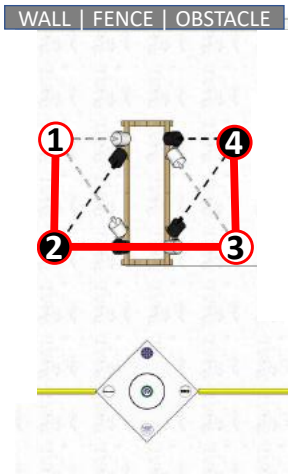
	CONFINED | WALL	BUCKETS	ALIGNMENT	ACUITY
	START TIMER	NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1	*PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2	*ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3	*PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	2	5 1 0	
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
	ELASPED TIME: (MM:SS)	SCORES	/50	/50

Ground (PAY 8)

Confined Test Lane



TOP VIEW



- Fly inside the 2m (6ft) wide alcove with the main wall at 90 degrees from forward of the aircraft.
- Inspect horizontal object features leftward and rightward.

SCORING

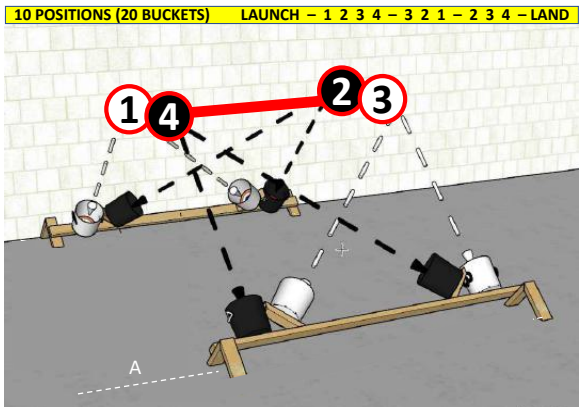
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

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.

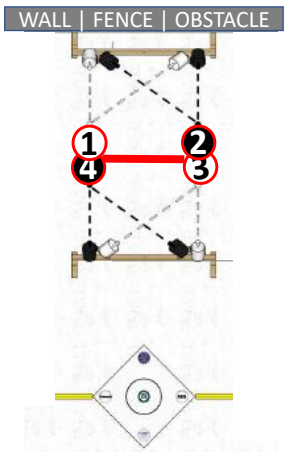
CONFINED | GROUND	BUCKETS	ALIGNMENT	ACUITY
START TIMER	NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS
2 *ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	1		— — — — —
3 *PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	1A	5 1 0	
4 *ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	2		— — — — —
5 *PERPENDICULAR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

Alley (PAY 9)

Confined Test Lane



TOP VIEW



- Fly inside the 2m (6ft) wide alcove with the main wall at in front of the aircraft (0 degrees) and behind the aircraft (180 degrees).
- Inspect horizontal object features leftward and rightward.

SCORING

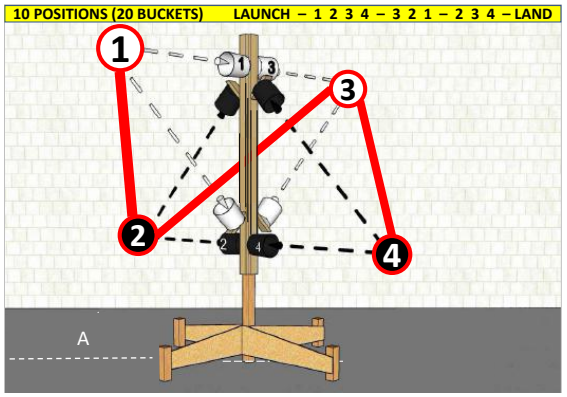
Alignment Points in Perpendicular Buckets (50 Total):
Align with each perpendicular bucket to CAPTURE A SINGLE IMAGE OF THE ALIGNMENT RING for scoring during or after the trial.

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.

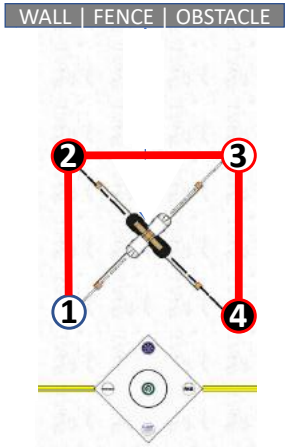
CONFINED | ALLEY	BUCKETS	ALIGNMENT	ACUITY
START TIMER	NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1 *PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2 *ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3 *PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	2	5 1 0	
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
ELASPED TIME: (MM:SS)	SCORES	/50	/50

Post (PAY 10)

Confined Test Lane



TOP VIEW



- Fly inside the 2m (6ft) wide alcove between the post and the main wall .
- Inspect vertical object features 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 | 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
ELASPED 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

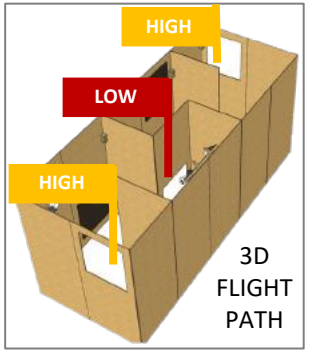
CONFINED | VEHICLE	BUCKETS	ALIGNMENT	ACUITY
START TIMER	NUMBER	IMAGE POINTS (5 OR 1 POINT)	CIRCLE GAPS (1 POINT EACH)
1 *PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	1	5 1 0	
2 *ANGLED BUCKET:* CALL OUT ACUITY GAP DIRECTIONS	1A		TR B TR L BR
3 *PERPENDICULAR BUCKET*: ALIGN AND CAPTURE IMAGE	2	5 1 0	
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
ELASPED TIME: (MM:SS)	SCORES	/50	/50

Confined Room-to-Room Labyrinth

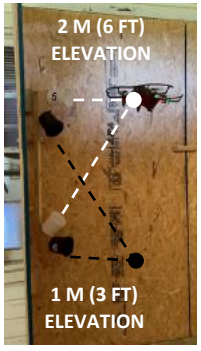
Search tasks with 1 m (3ft) minimum clearances

USE SETS OF 5 “INLINE” DUAL BUCKET RAILS

HORIZONTALS FOR LEFTWARD/RIGHTWARD INSPECTIONS



VERTICALS FOR UPWARD/DOWNWARD INSPECTIONS



- Plywood panels attached together form tall self standing “L” walls as test lane alcoves, switchback hallways, and rooms with tasks to identify. A blackout tarp over top makes a ceiling at 2.4m (8ft), or set it up inside a 6m (20ft) shipping container.
- Square access ”windows” measuring 1m (3ft) square provide entry/exit and interior high/low pass throughs.
- Split cylinder concrete forms evaluate 2D/3D maps.

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
ELASPED TIME: (MM:SS)	SCORES	/50	/50