



PSURT UAS RPIC Drills Handbook



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The vision of the participating departments and agencies is to create baselines for emerging technologies and standards for integrating them into existing emergency response, establish coordination between private and public, local and regional stakeholders to bridge the gaps in resource and capability sharing, and increase situational awareness and incident command decisions at emergency scenes.

This document includes training exercises for RPIC's and VO's.

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Using this Guide

The information in this guide is helpful to first time RPIC's as well as seasoned RPIC's who need a refresher or who are flying a new type of aircraft. Use the exercises to improve your hand-eye coordination and become more comfortable with flying your aircraft.

The exercises start with very basic maneuvers and get progressively harder. We recommend remaining on an exercise until you are comfortable with the maneuvers before proceeding to the next one.

Symbols

The aircraft in the illustrations show the direction your UAV should be facing when completing the exercise. The white arrow on the aircraft shows which way the front of the aircraft is facing.



Top view of aircraft facing right



Symbol for a cone



Side view of aircraft facing right



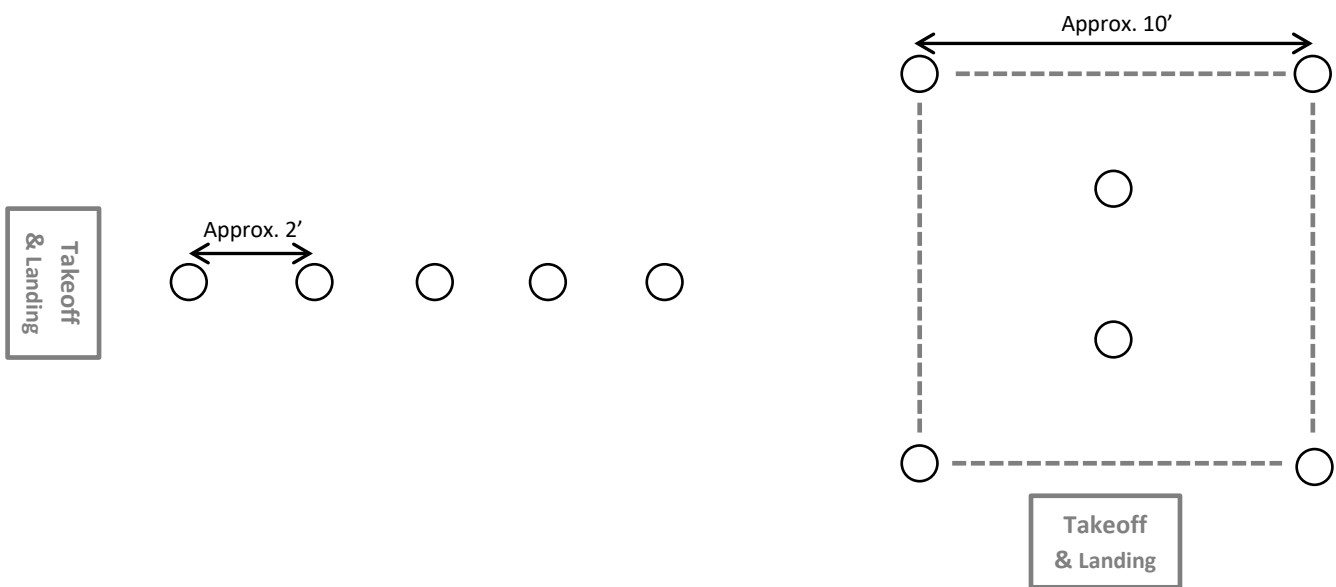
Shows you which direction to fly



Back view of aircraft

Equipment

There are two configurations that you will need for most exercises. The first is a set of 4-5 cones in a straight line, approximately two feet apart. The second is a square. Mark out a 10' x 10' square and place a cone at each corner. Place two cones inside the square, dividing the square into thirds.



If you don't have cones, many of the exercises can be completed using a single parking lot space as your flight area.

Make sure that you don't have any obstructions in the air above or too close to the perimeter of your flight area.

If your take off/landing area is on grass, it is highly recommended that you place a landing pad (hard piece of material, cardboard, plastic) on the ground as your landing pad. If your blades get caught in the grass when you take off or land, it can damage your engines.

Take Off and Landing Tips

Before you take off, complete a flight safety checklist. After taking off, ascend to approximately 5 feet and hover. Confirm that **Return to Home** has been set. Test all controls, maneuvering the aircraft 6-12 inches up, down, left, and right. This ensures that all controls are working before you start to fly. Complete one more quick check around you to make sure the air is clear and start your exercise.

If you experience an emergency as you are landing, a typical reaction is to push your sticks forward. For this reason, when your aircraft approaches the landing pad, rotate the aircraft and land with the aircraft facing away from you. That way, if something happens and you react, your aircraft will fly away from you and not towards you.

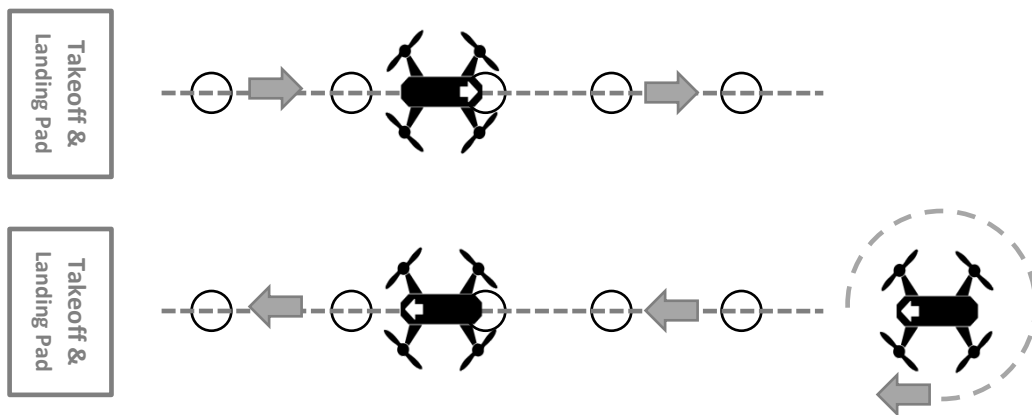
If it is very windy, try to take off and land into the wind to avoid the possibility of your aircraft tipping over.

Basic Exercises

Basic 1: Follow the Path

Fly across the cones, changing orientation at the end. Maintain altitude.

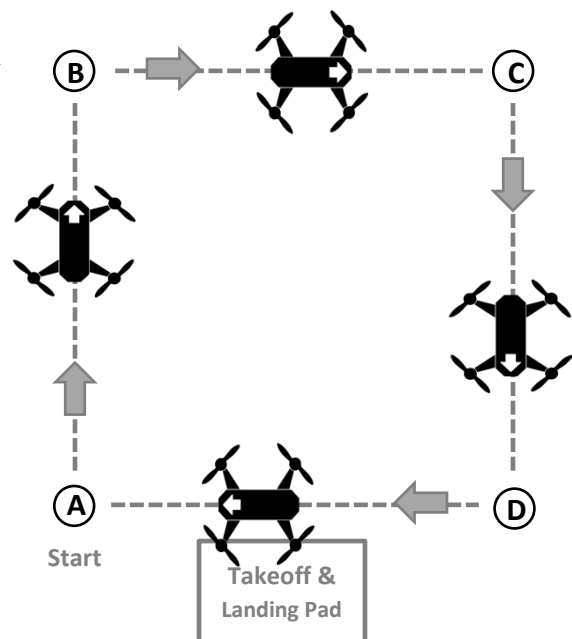
1. Take off from the pad.
2. Ascend to 5 feet and maintain this altitude throughout the exercise.
3. Fly from the pad, across the top of the cones.
4. After you have passed the last cone, turn the aircraft 180° so that it is facing towards the landing pad.
5. Fly back over the cones.
6. Repeat exercise several times and then land on pad.



Basic 2: Square, Change Orientation

Fly the square, changing orientation at each corner so that you are always flying forwards. Maintain altitude.

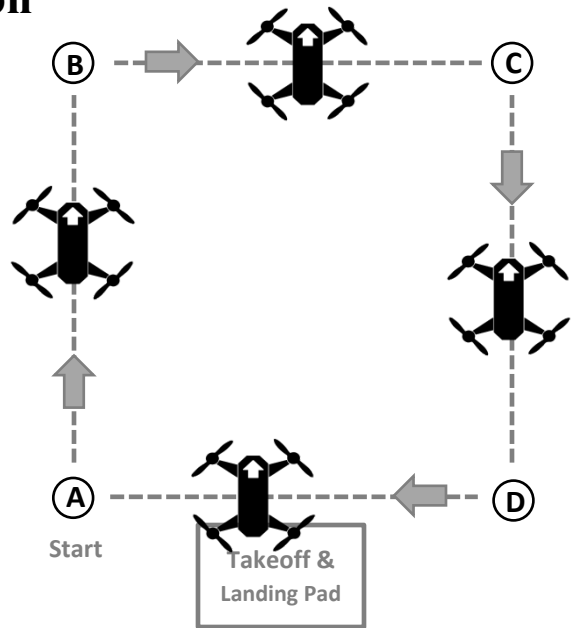
1. Take off from the pad.
2. Ascend to 5 feet and maintain this altitude throughout the exercise.
3. Fly to A.
4. Turn and face B and fly in a straight line to B.
5. Turn and face C and fly in a straight line to C.
6. Turn and face D and fly in a straight line to D.
7. Turn and face A and fly in a straight line to A.
8. Repeat exercise several times and land on pad.



Basic 3: Square; Maintain Orientation

Fly the square, maintaining orientation so that you fly forward » right » back » left. Maintain altitude.

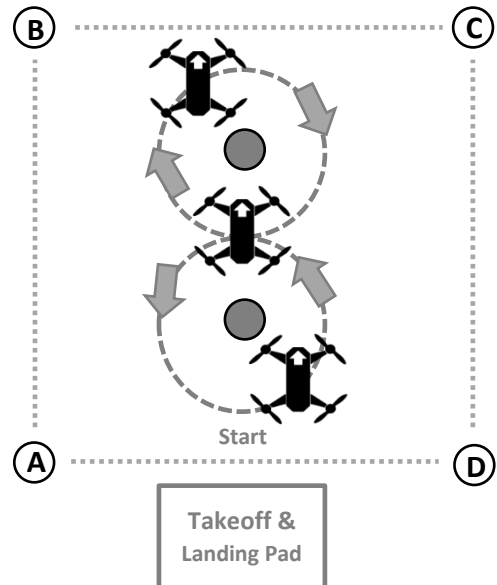
1. Take off from the pad.
2. Ascend to 5 feet and maintain this altitude throughout the exercise.
3. Fly to A.
4. Turn and face B and fly in a straight line to B.
5. Without turning, fly right in a straight line to C.
6. Without turning, fly backwards in a straight line to D.
7. Without turning, fly left in a straight line to A.
8. At A, rotate clockwise 90° and repeat the exercise, rotating clockwise 90° each time you start at A.
9. Land on the pad when you have completed four rotations (one facing each direction).



Basic 4: Figure 8; Maintain Orientation

Fly a figure 8, staying within the square, maintaining altitude and orientation.

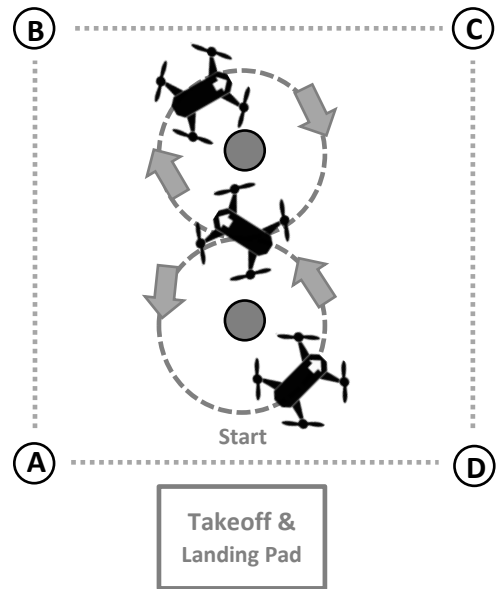
1. Place two cones inside the square, dividing the square into thirds.
2. Take off from the pad and ascend to 2 feet. Maintain this altitude for the entire exercise.
3. Fly a figure 8 clockwise around the cones, maintaining orientation so that you are sometimes flying forward, sometimes sideways, and sometimes backwards.
 - Stay within the square
 - Don't touch the cones
4. Repeat the exercise several times.
5. Change direction, flying your figure 8 in an anti-clockwise direction and repeat several times.
6. Return to the landing pad.



Basic 5: Figure 8; Change Orientation

Fly a figure 8, staying within the square, maintaining altitude, and changing orientation so that you are always flying forwards.

1. Place two cones inside the square, dividing the square into thirds.
2. Take off from the pad and ascend to 2 feet. Maintain this altitude for the entire exercise.
3. Fly a figure 8 clockwise around the cones, orienting your aircraft so that you are always flying forwards.
 - Stay within the square
 - Don't touch the cones
4. Repeat the exercise several times.
5. Change direction, flying your figure 8 in an anti-clockwise direction and repeat several times.
6. Return to the landing pad.

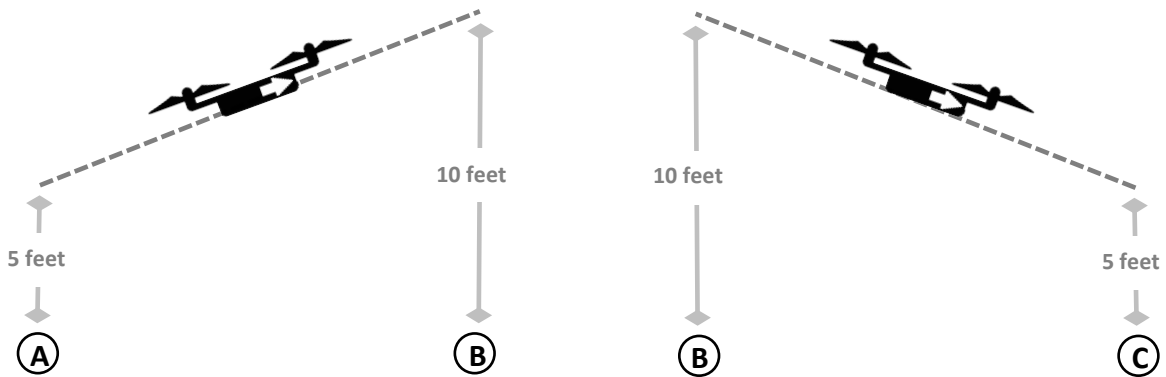
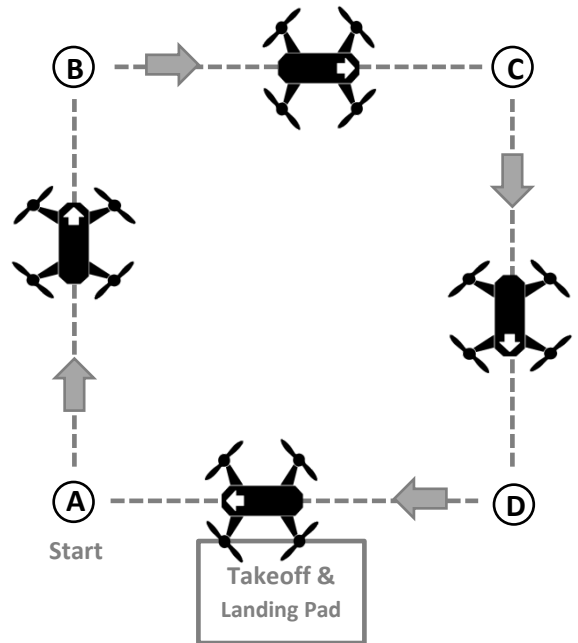


Intermediate Exercises

Intermediate 1: Square; Change Altitude and Orientation

Fly the square, changing orientation at each corner so that you are always flying forwards. Change altitude from 5 feet at A to 10 feet at B, to 5 feet at C, to 10 feet at D.

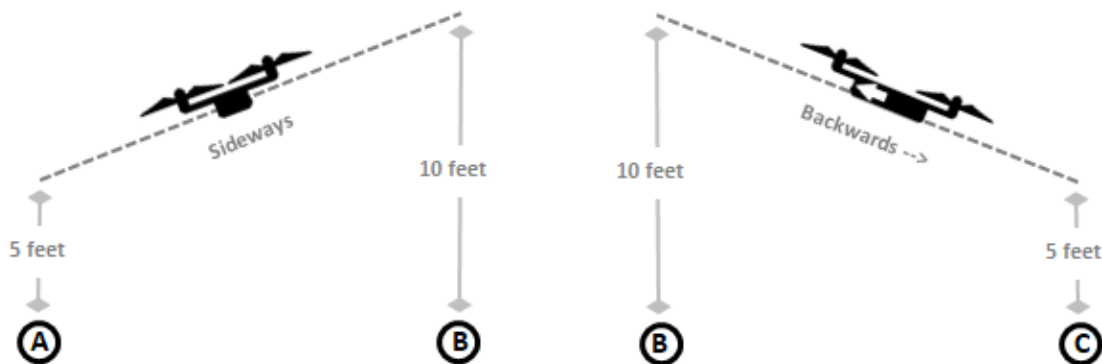
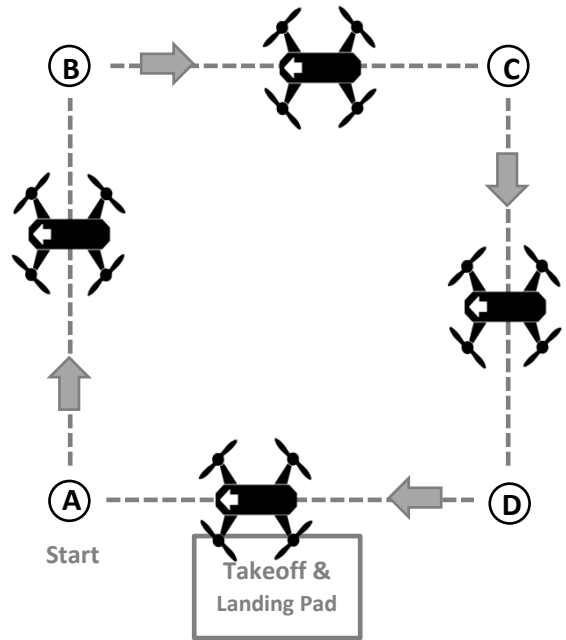
1. Take off from the pad.
2. Ascend to 5 feet and fly to A.
3. Turn and face B and fly to B while ascending to 10 feet.
4. Turn and face C and fly to C while descending to 5 feet.
5. Turn and face D and fly to D while ascending to 10 feet.
6. Turn and face A and fly to A while descending to 5 feet.
7. Repeat exercise several times and then land on pad.



Intermediate 2: Square; Change Altitude and Maintain Orientation

Fly the square, maintaining orientation. Change altitude from 5 feet at A to 10 feet at B, to 5 feet at C, to 10 feet at D.

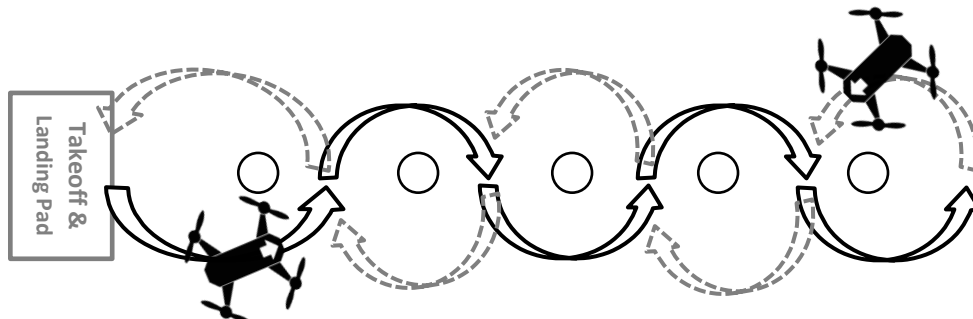
1. Take off from the pad.
2. Ascend to 5 feet and fly to A.
3. At A, rotate so that B is on your right. Maintain this orientation until you get back to A.
4. Fly right to B, ascending to 10 feet.
5. Without turning, fly backwards to C, descending to 5 feet.
6. Without turning, fly left to D, ascending to 10 feet.
7. Without turning, fly forwards to A, descending to 5 feet.
8. Repeat exercise, starting at A facing a different direction, and maintain that orientation until you get back to A.



Intermediate 3: Serpentine

Fly serpentine, maintaining altitude.

1. Take off from the pad.
2. Ascend to 2 feet and serpentine, maintaining altitude.
3. At the last cone, continue around, serpentine back and land on the pad.
4. Repeat exercise several times.



Intermediate 4: Diagonals; Maintain Orientation and Altitude

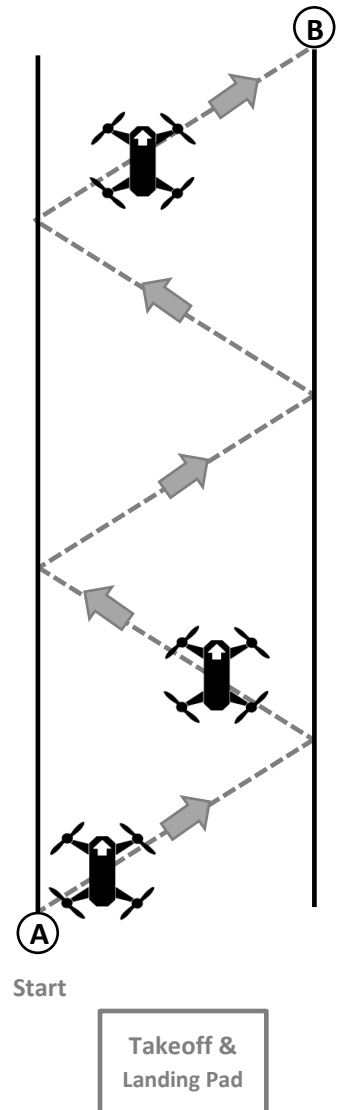
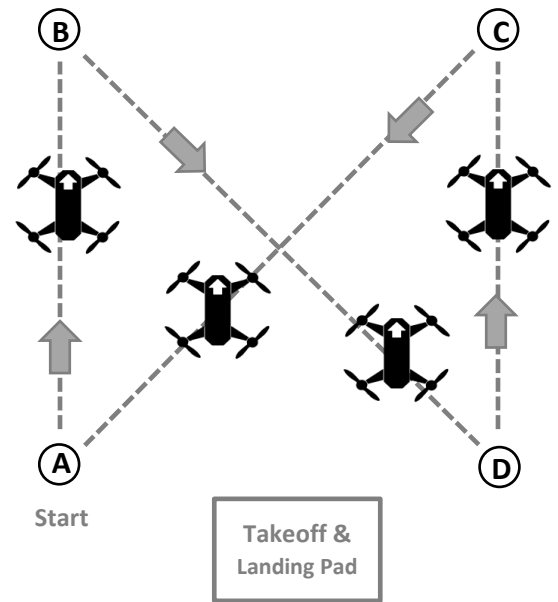
Fly A » B » D » C » A, and then A » C » D » B » A, maintaining orientation and altitude.

1. Take off from the pad, ascend to 5 feet, and maintain this altitude for the entire exercise.
2. Fly to A, turn and face B. Maintain this orientation for the entire exercise.
3. Fly to B.
4. Fly diagonally (flying at a 45° angle) to D.
5. Fly to C.
6. Fly diagonally to A.

Reverse the Pattern:

7. Fly diagonally back to C.
8. Fly backwards to D.
9. Fly diagonally to B.
10. Fly backwards to A.
11. Repeat exercise several times.

Optional: At A, rotate 90° left or right and fly the pattern again, maintaining orientation.



Intermediate 5: Diagonal Lines; Maintain Orientation and Altitude

Fly diagonal lines (zig-zag), maintaining altitude and orientation.

For this exercise, you need two lines, approximately 10 feet apart and 40 feet long.

1. Take off from the pad.
2. Ascend to 5 feet and maintain this altitude for the entire exercise.
3. Fly to A.
4. While maintaining orientation, fly diagonally to your right to the other line.
5. While maintaining orientation, fly diagonally to your left back to the first line.
6. Repeat, zig-zagging your way down to B.
7. At B, maintain orientation and zig-zag back to A (flying diagonally backwards)
8. At A, rotate 90° and repeat the exercise, rotating 90° every time you get back to A.

Advanced Exercises

Advanced 1: Diagonals; Maintain Orientation and Change Altitude

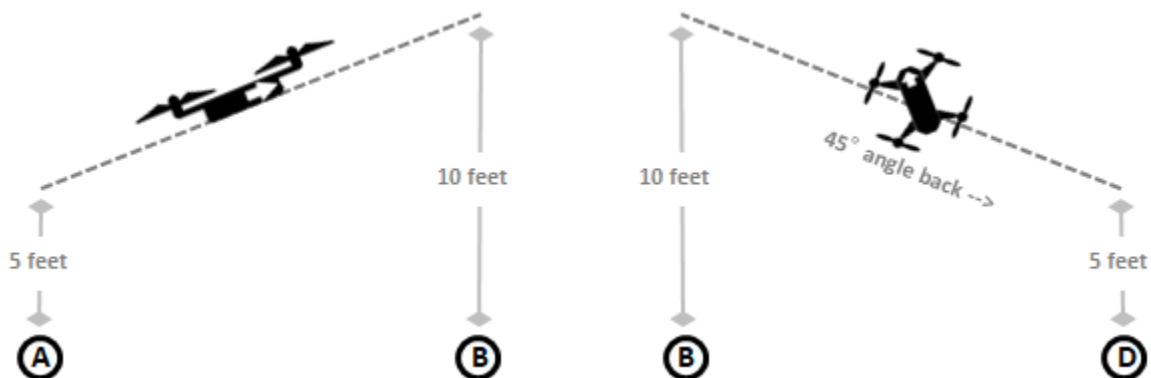
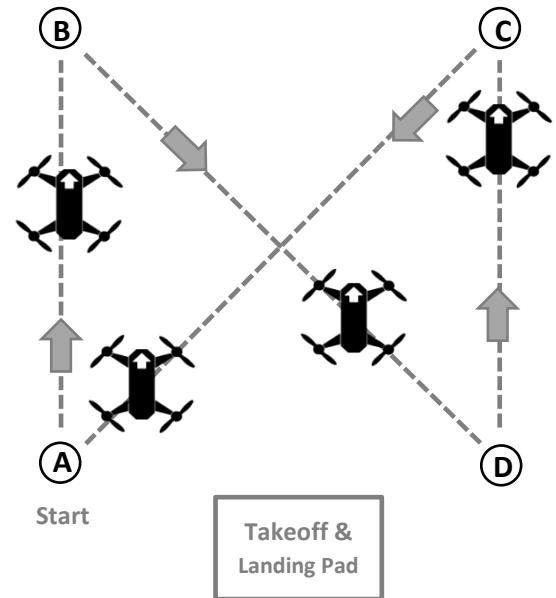
Fly A » B » D » C » A, then A » C » D » B » A, maintaining orientation and changing altitude.

1. Take off from the pad and ascent to 5 feet.
2. Fly to A, turn and face B. Maintain this orientation throughout the exercise.
3. Fly to B, ascending to 10 feet.
4. Fly diagonally (flying at a 45° angle) to D, descending to 5 feet.
5. Fly to C, ascending to 10 feet.
6. Fly diagonally to A, descending to 5 feet.

Reverse the pattern:

7. Fly diagonally back to C, ascending to 10 feet.
8. Fly backwards to D, descending to 5 feet.
9. Fly diagonally to B, ascending to 10 feet.
10. Fly backwards to A, descending to 5 feet.
11. Repeat exercise several times.

Optional: At A, rotate 90° left or right and fly the pattern again, maintaining orientation.

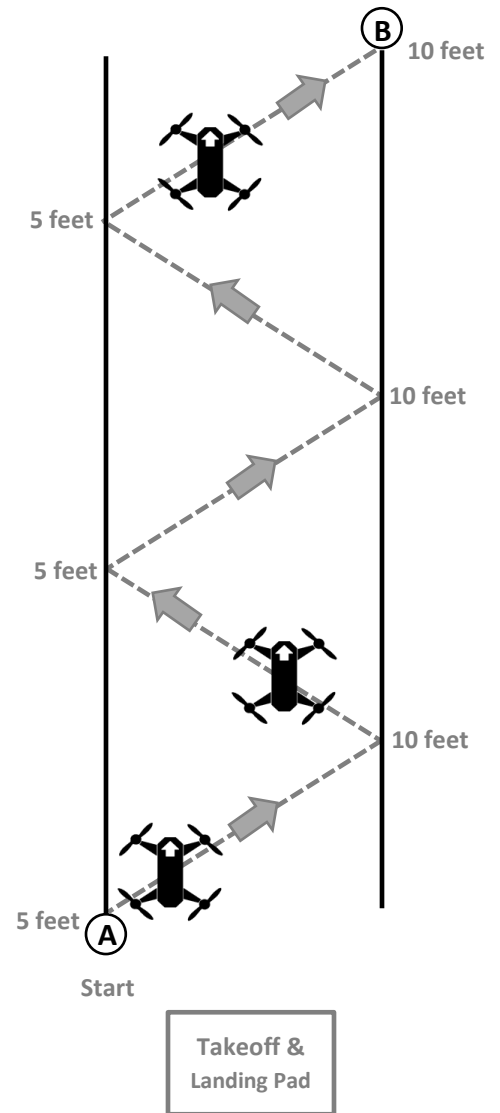


Advanced 2: Diagonal Lines; Maintain Orientation and Change Altitude

Fly diagonal lines (zig-zag), maintaining orientation and changing altitude.

For this exercise, you need two lines, approximately 10 feet apart and 40 feet in length.

1. Take off from the pad.
2. Ascend to 5 feet.
3. Fly to A.
4. While maintaining orientation, fly diagonally to your right to the other line while ascending to 10 feet.
5. While maintaining orientation, fly diagonally to your left back to the first line while descending to 5 feet.
6. Repeat, zig-zagging your way down to B.
7. At B, maintain orientation and zig-zag back to A (flying diagonally backwards)
8. At A, rotate 90° and repeat the exercise, rotating 90° every time you get back to A.

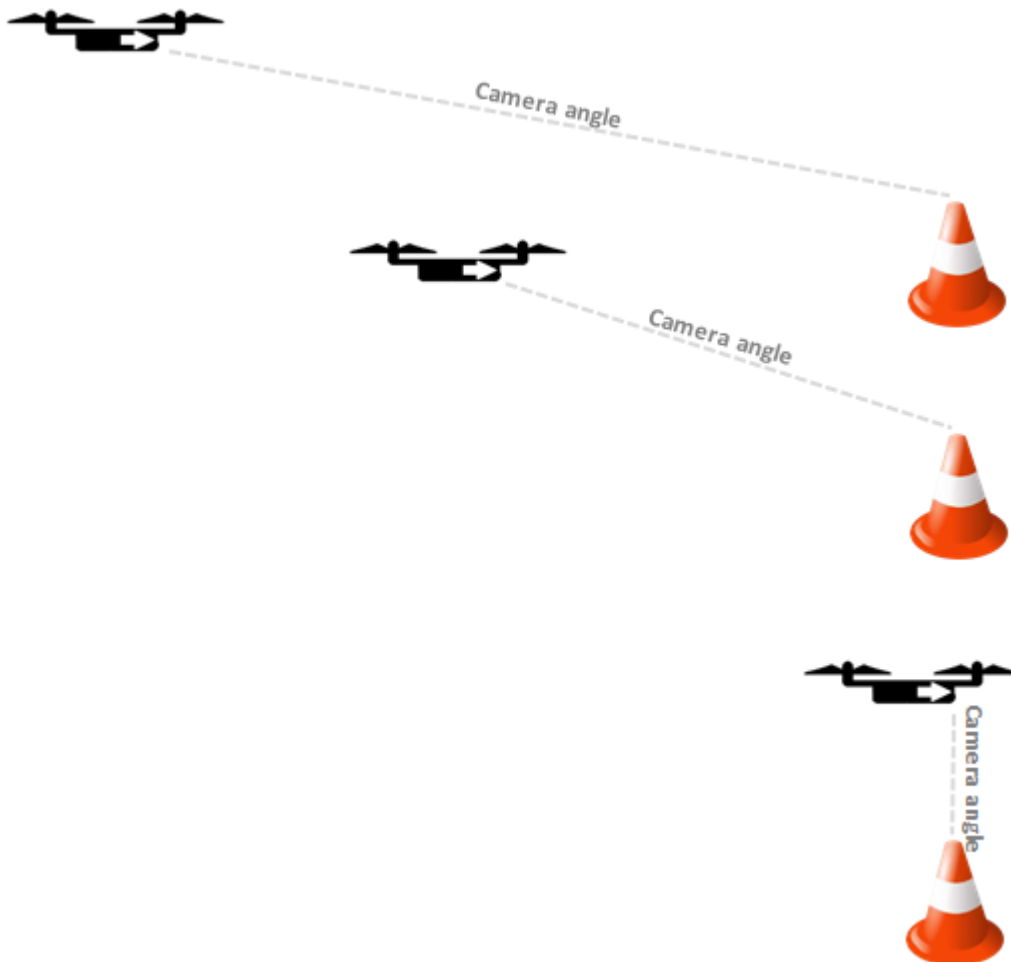


First Person View (FPV) Exercises

FPV 1: Camera on the Cone

Fly to the cone using FPV, keeping the cone in the center of your camera. Maintain altitude.

1. Position a cone approximately 20-30 feet away in a straight line from the pad.
2. Take off from the pad.
3. Ascend to 5 feet and maintain this altitude throughout the exercise.
4. With your aircraft facing the cone, and using FPV, position the cone in the center of your screen.
5. Fly towards the cone, adjusting your camera to keep the cone in the center of your screen until you are directly over the cone.
6. Land back on the pad.



FPV 2: Point of Interest (POI)

Fly 360° around an object, maintaining altitude.

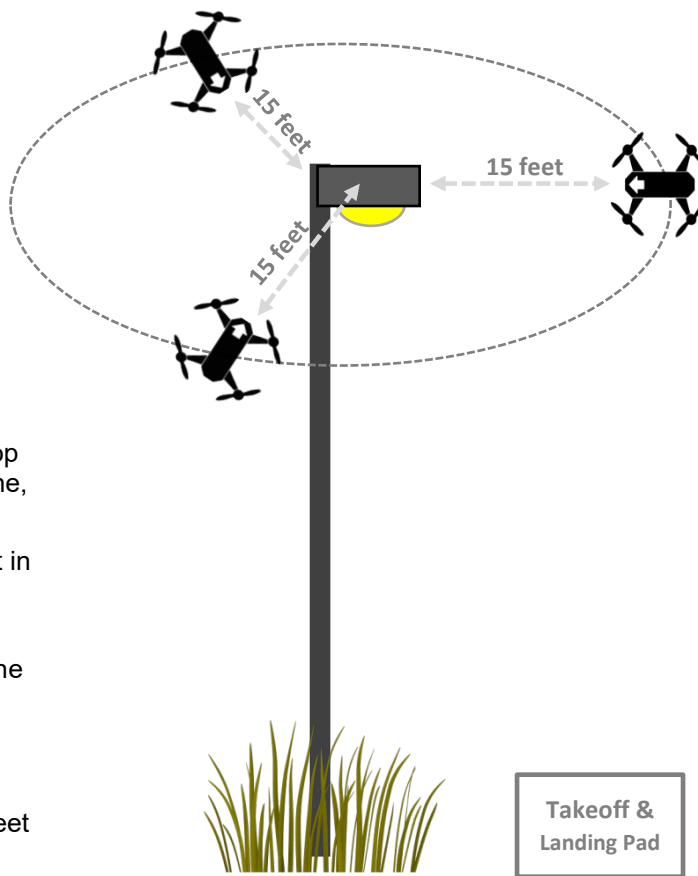
For this exercise, you need an object with approximately 25 feet of open space around it. A light pole works well for this exercise. Another option is a cone.

TIP: It is helpful to use your grid view (typically in camera settings). It is also helpful to have a VO the first few times you do this exercise to give you direction corrections.

1. Take off from the pad.
2. Ascend to an altitude that is in line with the top of the light pole or about 5 feet above the cone, and about 15 feet away.
3. Turn the aircraft to face the pole and center it in your camera screen.

If you are using a cone or an object on the ground, tilt your camera down until you see the object in the center of your screen.

4. While looking at your screen, maneuver the aircraft 360° around the pole/object.
5. Maintain altitude and remain within 12 – 15 feet of the pole/object.
6. When you can complete a reasonable circle, reverse direction.



Optional

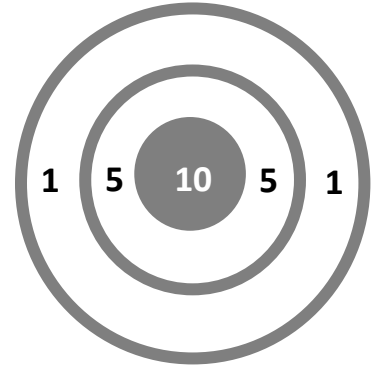
For an easier exercise, climb to a high (and safe) altitude, approximately 100 feet. Angle your camera down and position a building or vehicle in the center of your screen. Fly 360°, keeping the building/vehicle in the center of your screen.

Payload Exercises

Payload 1: Drop Accuracy

If your aircraft is capable of dropping payloads, you can set up an area to practice drop accuracy.

1. Set up a drop zone with the circular bands approximately 12 inches apart.
2. Set your landing pad up a distance away, approximately 6-12 feet.
3. Use something for your payload that is under the maximum safe lift load of your aircraft.
4. Launch your aircraft and ascend to 6 feet.
5. Fly over the drop zone, hover, announce your intent to drop, and drop your payload.
6. Land back on the landing pad.



Optional

- Repeat steps 4-6, changing altitude.
- Repeat steps 4-6, but instead of hovering, drop your payload as you fly over the drop zone.
- Add scoring to your drop zone. If any part of the payload is touching an outer circle, the lower score counts.

Visual Observer Exercises

Communications Training

Use the following exercises to improve direct, radio, and visual communication between the VO and RPIC. Ensure that you have a training location with plenty of space and that is free of obstacles.

- **Using FPV**

This simulates a mission where the UAS is out of sight of the RPIC but within sight of the VO. The RPIC is using FPV only to navigate.

1. Start with the basic RPIC exercises in this guide and progress to more difficult exercises as confidence and accuracy improves.
2. Have the RPIC face away from the exercise and only use FPV.
3. The VO shall watch the UAS throughout the exercise and communicate flight corrections to the RPIC. The VO shall also watch for obstacles in the air and on the ground.
4. Run exercises with both direct and radio communications so that both the RPIC and VO get used to the different ways to communicate.

- **Using VO view only**

This simulates a mission where the UAS is out of sight of the RPIC but within sight of the VO and the visual controls fail.

1. Start with the basic RPIC exercises in this guide and progress to more difficult exercises as confidence and accuracy improves.
2. Have the RPIC face away from the exercise and switch off or cover the visual controller (for example, iPad).
3. The VO shall guide the RPIC through the exercise by providing continuous instructions and corrections. The VO shall also watch for obstacles in the air and on the ground.
4. Run exercises with both direct and radio communications so that both the RPIC and VO get used to the different ways to communicate.

- **Visual Communication**

This simulates a mission where the VO is some distance away from the RPIC and radio communications fail.

1. The VO stands about 30-40 feet away from the RPIC.
2. Using the Flight Hand Signals in Appendix A, the VO instructs the RPIC when it is clear to takeoff.
3. After the UAS is airborne, the VO instructs the RPIC on basic flight maneuvers such as moving a few feet to the right or left, forward or backward, up or down.

Appendix A: Flight Hand Signals

Move Forward



Move Rearward



Move Left



Move Right



Stop



All Clear



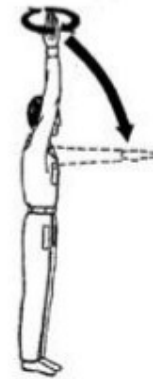
Move Upward



Move Downward



Clear to Take-off



(EdgeData, 2016)

Appendix B: RPIC / VO Skills Check

This appendix includes the following skills checks:

- Pilot Skill #1: Takeoff / Test / Land
- Pilot Skill #2: Preflight Inspection
- Pilot Skill #3: Preflight Operation
- Pilot Skill #4: Loading and Use of Software
- Pilot Skill #5: Post Flight Data Transfer
- Pilot Skill #6: Communications
- Pilot Skill #7: Basic Flight Maneuvers – Follow the Path
- Pilot Skill #8: Basic Flight Maneuvers – Figure of Eight
- Pilot Skill #9: Basic Flight Maneuvers – Serpentine
- Pilot Skill #10: Basic Flight Maneuvers – Four Corners
- Pilot Skill #11: Emergency Procedures – Lost Link
- Pilot Skill #12: Emergency Procedures –Mitigating Aircraft Incursion
- Pilot Skill #13: Compass Calibration
- Visual Observer Skill #1
- Pilot Skill Check Ride

PSURT Pilot Skill #1: Takeoff / Test / Land

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of deploying, testing, and landing a UAS. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall demonstrate the proper method of takeoff and landing of a UAS. The skill will begin when you state you are ready and, on my instruction, to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER'S NOTE	<ol style="list-style-type: none"> 1. The RPIC must establish a safe operating area prior to starting the skill. 2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest. 3. The RPIC will not be allowed to review the performance steps at the time of testing. 4. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none"> ▪ UAS ▪ Flight bag including landing pad ▪ Tablet/phone
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

RPIC Skill #1: Takeoff / Test / Land

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall:

(No partial points given)

Takeoff		
	a. Properly start the UAV, control station & pilot app	1.0
	b. Stand at a safe distance from the UAV and ensures LZ is clear of hazards	1.0
	c. Announce " <i>spinning up</i> " prior to starting the props	1.0
	d. Announce " <i>launching</i> " prior to takeoff	1.0
*	e. Safely takeoff and hover at 10 - 15 feet AGL	P / F
*	f. Perform the basic controls test	P / F
Landing		
	g. Ensures LZ is clear of hazards	1.0
	h. Ensures gimbal is facing up	1.0
	i. Announce " <i>landing</i> " prior to initiating landing	1.0
*	j. Safely land in the same location as takeoff	P / F
	k. Announce " <i>props stopped</i> " once the props have stopped moving	1.0
	l. Properly shutoff the UAV, control station & pilot app	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	9
Total points needed to pass	8
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill:

PASS: _____ **FAIL:** _____

Comments:

PSURT Pilot Skill #2: Preflight Inspection

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper steps for a preflight inspection of an UAS. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall demonstrate the proper preflight inspection procedures for a UAS. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

1. The RPIC must demonstrate confidence and familiarity with equipment.
2. The RPIC will not be allowed to review the performance steps at the time of testing.
3. Not a timed skill.

PREPARATION & EQUIPMENT

- UAS
- Flight bag
- Tablet/phone

CONDITIONS

The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE

RPIC Skill #2: Preflight Inspection

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

Flight Bag		
	a. Verify contents using the flight bag inventory list.	1.0
Aircraft		
	b. Inspect all aircraft components for visible damage	1.0
	c. Ensure props are tightened, spin freely and are free of damage	1.0
*	d. Verbalize any damage and takes appropriate actions	P / F
*	e. Check that battery is fully charged and properly fitted	P / F
*	f. Confirm that Micro-SD(s) card is properly seated	P / F
	g. Ensure camera is attached, gimbal is free to operate, and lens cap is removed	1.0
Control Station (CS)		
	h. Mount tablet/phone to CS (use tablet adapter if required)	1.0
	i. Connect CS to tablet/phone with cable	1.0
*	j. Verbalize battery percentage of both CS and tablet/phone	P / F
*	k. Verbalize mode of CS (ex. "P" or "Atti" mode)	P / F
	l. Position CS antennas for flight	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A** **Time:** _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #3: Preflight Operations

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of preflight operations prior to deploying the aircraft. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall demonstrate the proper method preflight operation before deploying the aircraft. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER'S NOTE	<ol style="list-style-type: none"> 1. The RPIC must establish a safe operating area prior to starting the skill. 2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest. 3. The RPIC will not be allowed to review the performance steps at the time of testing. 4. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none"> ▪ UAS ▪ Flight bag including landing pad ▪ Tablet/phone
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

RPIC Skill #3: Preflight Operations

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall:

(No partial points given)

	a. Turn on remote and launch appropriate pilot app	1.0
	b. Turn on aircraft	1.0
	c. Acknowledge aircraft status with LEDs	1.0
	d. Check for any warning indicators or updates and take appropriate actions	1.0
*	e. Calibrate compass (if required)	P / F
*	f. Calibrate IMU (if required)	P / F
*	g. Verbalize signal strength of the GPS, aircraft, & data telemetry	P / F
*	h. Verbalize battery percentage for the aircraft, tablet/phone, & control station	P / F
*	i. Perform risk assessment by checking for and acknowledging hazards and obstructions: wind, rain, trees, power lines, spectators and wildlife	P / F
	j. Cache maps if required	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	5
Total points needed to pass	4
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #4: Loading and Use of Software

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of loading and using the pilot software appropriate to the given mission. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall demonstrate the proper method of loading the appropriate software based on the scenario given by the instructor. You shall show competence and understanding of both the various features and capabilities within the chosen app. The skill will begin when you state you are ready and, on my instruction, to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

1. The RPIC must select the appropriate software application for the given scenario chosen by the instructor.
2. If the RPIC demonstrates a lack of knowledge or competence with the chosen software, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed skill.

PREPARATION & EQUIPMENT

- UAS
- Flight bag including tablet holder and lightning cable
- Tablet/phone loaded with testable apps

CONDITIONS**REFERENCE**

RPIC Skill #4: Loading and Use of Software

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Mounts tablet/phone to control station	1.0
	b. Turns on remote and connects to tablet/phone	1.0
	c. Turns on aircraft	1.0
	d. Chooses appropriate software based on mission requirements	1.0
*	e. Ensures only one app is running at a time	P / F
*	f. Demonstrate proficiency of app that includes but is not limited to: <ul style="list-style-type: none"> • Dashboard understating • Camera settings • Performance of a 360 • Changing settings • Toggle between camera and map • Toggle between still camera and video settings • Messaging between participants • Flight Planning • RTH setting 	P / F
*	g. Explain how to conduct operations without software	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	4
Total points needed to pass	3
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #5: Post Flight Data Transfer

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of post flight data transfer. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall demonstrate the proper method of transferring data from the UAS to a data storage device and complete the skill by returning the UAS to operational readiness. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

1. The RPIC must establish a safe operating area prior to starting the skill.
2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed skill.

PREPARATION & EQUIPMENT

- UAS
- Flight bag including data transfer device (desktop, laptop, portable drive, and so on)
- Micro SD card with transferrable data
- Tablet/phone

CONDITIONS

The RPIC properly transfers data without losing any content.

REFERENCE

RPIC Skill #5: Post Flight Data Transfer

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

*	a. Ensures UAS is completely powered off prior to removing Micro SD card	P / F
	b. Removes Micro SD card from aircraft and properly inserts it into data storage device (may require an adapter) or, connect aircraft to a data storage device (if required)	1.0
	c. Transfer data to a storage device	1.0
*	d. Transfers data to requestor per AFD Data Retention Policy	P / F
	e. Ensures Micro SD card is formatted	1.0
	f. Returns Micro SD card to aircraft and ensures proper seating or, removes cable connecting the aircraft with the data storage device (if required)	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A** **Time:** _____ **minutes** _____ **seconds**

Total points possible	4
Total points needed to pass	3
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #6: Communications

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of communicating via radio. The RPIC shall verbalize to the instructor each step identified in *italic print*. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall demonstrate the proper method of takeoff and landing of a UAS. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

1. The RPIC must establish a safe operating area prior to starting the skill.
2. The message should include who (call sign), what (actions taken), where (altitude and location of operating area. RPIC must clearly communicate UAS location in relation to other aircraft, manned or unmanned).
3. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
4. The RPIC will not be allowed to review the performance steps at the time of testing.
5. Not a timed skill.

PREPARATION & EQUIPMENT

- UAS
- Flight bag including landing pad, radio and compass
- Tablet/phone

CONDITIONS

The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE

RPIC Skill #6: Communications

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Turns on radio(s)	1.0
	b. Determine appropriate radio frequency: <ul style="list-style-type: none"> • Operational tactical channel • Air to air frequency (123.025) 	1.0
	c. Monitors radio(s) for pertinent traffic	1.0
	d. Communicates message: <ul style="list-style-type: none"> • Clearly • Concisely • With appropriate terminology 	P / F

** Denotes mandatory passage of this step*

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	4
Total points needed to pass	3
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #7: Basic Flight Maneuvers - Follow the Path

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of operating a UAS, performing the "Follow the Path" basic flight maneuver. The RPIC shall verbalize to the instructor each step identified in *italic print*. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall operate the aircraft in a safe and controlled manner while performing this basic flight maneuver. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

1. The RPIC must establish a safe operating area prior to starting the skill.
2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed skill.

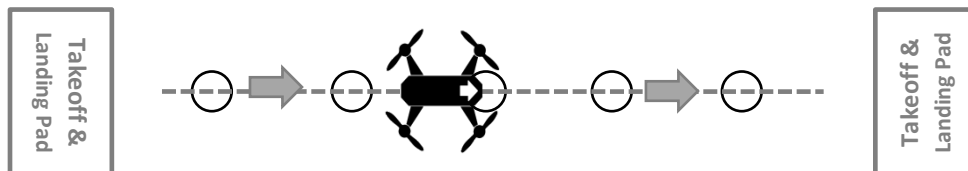
PREPARATION & EQUIPMENT

- UAS
- Flight bag including landing pad
- Tablet/phone
- 4 cones

CONDITIONS

The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE



RPIC Skill #7: Basic Flight Maneuvers - Follow the Path

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Place the aircraft at starting location (point 1) on designated takeoff/landing zone	1.0
	b. Launch the aircraft and fly over the cones in a straight line, then land the aircraft in the designated takeoff / landing zone (point 2) on the other end of the line. Return to starting location, repeating path of travel and maintaining aircraft orientation. (This should resemble a touch and go landing)	1.0
	c. The first direction of travel will be with the nose of the aircraft facing forward (0 degree orientation). Complete a flight lap, down and back.	1.0
	d. Maintain preferred flight elevation either above or below eye level.	1.0
	e. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (90 degree orientation).	1.0
	f. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (180 degree orientation).	1.0
	g. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (270 degree orientation).	1.0
*	h. Shall ensure all evolutions are performed safely while in control of the aircraft.	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #8: Basic Flight Maneuvers – Figure of Eight

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of operating a UAS, performing the “Figure of Eight” basic flight maneuver. The RPIC shall verbalize to the instructor each step identified in *italic print*. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall operate the aircraft in a safe and controlled manner while performing this basic flight maneuver. You shall complete five “figure of eight” evolutions in each of the (0, 90, 180, 270 degree) orientations. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER’S NOTE

1. The RPIC must establish a safe operating area prior to starting the skill.
2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed skill.

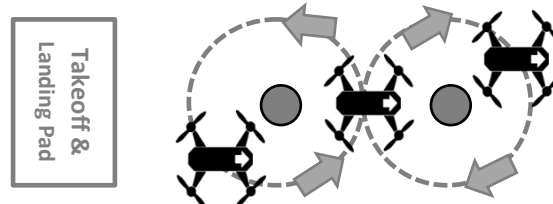
PREPARATION & EQUIPMENT

- UAS
- Flight bag including landing pad
- Tablet/phone
- 2 cones

CONDITIONS

The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE



RPIC Skill #8: Basic Flight Maneuvers – Figure of Eight

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Place the aircraft at starting location (point 1) on designated takeoff/landing zone	1.0
	b. Launch the aircraft from the designated area and travel in a clockwise/counterclockwise rotation (pilot's choice)	1.0
	c. Maintain preferred flight elevation either above or below eye level	1.0
	d. The aircraft must pass around each cone in a controlled manner, maintaining a tight pattern, following a figure of eight flight path. Completes 5 figure eights for each direction of travel (0 degree orientation).	1.0
	e. Upon completion of the first 5 laps, yaw aircraft 90 degrees to the right (90 degree orientation). Complete 5 figure eights.	1.0
	f. Upon returning to starting location, yaw aircraft 90 degrees to the right (180 degree orientation). Complete 5 figure eights.	1.0
	g. Upon returning to starting location, yaw aircraft 90 degrees to the right (270 degree orientation). Complete 5 figure eights.	1.0
*	h. Safely lands the aircraft on the designated takeoff/landing zone (point 1)	P / F
*	i. Shall ensure all evolutions are performed safely while in control of the aircraft.	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #9: Basic Flight Maneuvers – Serpentine

NFPA 2400

OBJECTIVE

The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of operating a UAS, performing the “Serpentine” basic flight maneuver. The RPIC shall verbalize to the instructor each step identified in *italic print*. This is not a timed skill.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC

You shall operate the aircraft in a safe and controlled manner while performing this basic flight maneuver. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER’S NOTE

1. The RPIC must establish a safe operating area prior to starting the skill.
2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed skill.

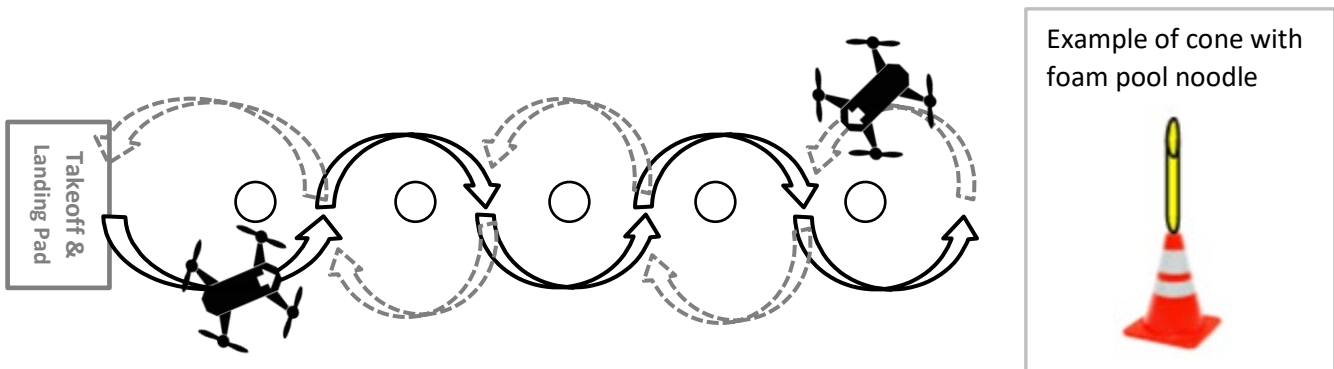
PREPARATION & EQUIPMENT

- UAS with prop guards
- Flight bag including landing pad
- Tablet/phone
- 5 cones
- 5 x 3/4” PVC pipe with foam pool noodles to create a vertical post

CONDITIONS

The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE



RPIC Skill #9: Basic Flight Maneuvers – Serpentine

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Place the aircraft at starting location (point 1) on designated takeoff/landing zone.	1.0
	b. Launch the aircraft from (point 1) and weave through the cones, down and back without making contact with foam vertical posts. The first lap through the course will be with the nose of the aircraft remaining forward facing (0 degree orientation).	1.0
	c. Maintain preferred flight elevation either above or below eye level.	1.0
	d. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (90 degree orientation) and complete serpentine course down and back.	1.0
	e. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (180 degree orientation) and complete serpentine course down and back.	1.0
	f. Upon returning to starting location (point 1), yaw aircraft 90 degrees to the right (270 degree orientation) and complete serpentine course down and back.	1.0
*	g. Safely lands the aircraft on the designated takeoff/landing zone (point 1).	P / F
*	h. Shall ensure all evolutions are performed safely while in control of the aircraft.	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	6
Total points needed to pass	5
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill:

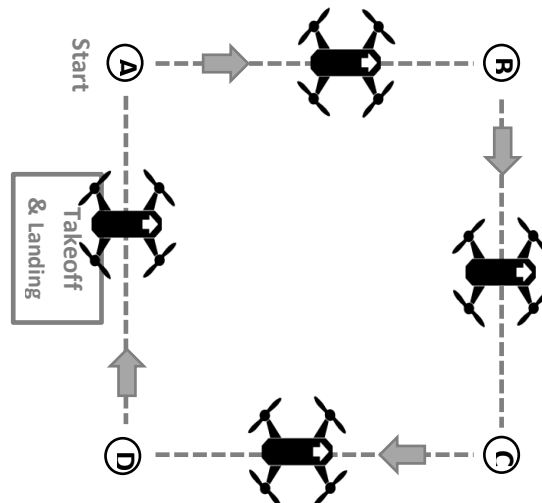
PASS: _____ **FAIL:** _____

Comments:

PSURT Pilot Skill #10: Basic Flight Maneuvers – Four Corners

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of operating a UAS, performing the “Four Corners” basic flight maneuver. The RPIC shall verbalize to the instructor each step identified in <i>italic print</i> . This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall operate the aircraft in a safe and controlled manner while performing this basic flight maneuver. You shall complete four “Four Corner” evolutions in each of the (0, 90, 180, 270 degree) orientations. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER’S NOTE	<ol style="list-style-type: none"> 1. The RPIC must establish a safe operating area prior to starting the skill. 2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest. 3. The RPIC will not be allowed to review the performance steps at the time of testing. 4. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none"> ▪ UAS ▪ Flight bag including landing pad ▪ Tablet/phone ▪ 4 cones
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	



RPIC Skill #10: Basic Flight Maneuvers – Four Corners

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Place the aircraft at starting location (point 1) on designated takeoff/landing zone	1.0
	b. Launch the aircraft from the designated area and travel in a clockwise/counterclockwise rotation (pilot's choice)	1.0
	c. Maintain preferred flight elevation either above or below eye level	1.0
	d. The aircraft must pass around each cone in a controlled manner, maintaining a tight pattern, following a flight path over four cones set in a square pattern. Completes a "four corner" flight path (0 degree orientation).	1.0
	e. Upon completion of the first 4 laps, yaw aircraft 90 degrees to the right (90 degree orientation). Complete 4 "four corner" evolutions	1.0
	f. Upon returning to starting location, yaw aircraft 90 degrees to the right (180 degree orientation). Complete 4 "four corner" evolutions.	1.0
	g. Upon returning to starting location, yaw aircraft 90 degrees to the right (270 degree orientation). Complete 4 "four corner" evolutions	1.0
*	h. Safely lands the aircraft on the designated takeoff/landing zone (point 1)	P / F
*	i. Shall ensure all evolutions are performed safely while in control of the aircraft.	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #11: Emergency Procedures – Lost Link

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the emergency procedure in response to a “lost link” event. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall simulate and verbalize the steps of the emergency procedure for a “lost link” event. The Instructor will notify the RPIC throughout the skill how the actions they take affect the simulated aircraft, when prompted. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER’S NOTE	<ol style="list-style-type: none"> 1. The RPIC must establish a safe operating area prior to starting the skill. 2. The aircraft will remain off for the duration of the skill to prevent controller inputs from creating an unsafe situation. 3. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest. 4. The RPIC will not be allowed to review the performance steps at the time of testing. 5. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none"> ▪ Control station for UAS ▪ Flight bag ▪ Tablet/phone with appropriate flight software installed
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

RPIC Skill #11: Emergency Procedures – Lost Link

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Change the aircraft Fight Mode to Attitude (ATTI) mode and try to regain control.	1.0
	Instructor: "Control is not restored."	
	b. If control is not restored, activate the aircraft's Return to Home (RTH). Check whether the mode is functional and/or if the control of the aircraft has been regained.	1.0
	Instructor: "Control is not restored."	
	c. Turn off and on the controller and try to recover control of the aircraft.	1.0
	Instructor: "Control is not restored."	
	d. If safe to do so, attempt to power off the motors.	1.0
	Instructor: "The aircraft is over a populated area."	
	e. If aircraft flyaway continues, note aircraft battery life, altitude, speed and heading.	1.0
	f. Inform local TRACON/ATC (if required). Verbalize contact number or where the RPIC would locate it.	1.0
	g. Maintain Visual Line of Sight (VLOS) with the aircraft for as long as possible.	1.0

** Denotes mandatory passage of this step*

Allotted time for this skill: N/A

Time: _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #12: Emergency Procedures – Mitigating Aircraft Incursions

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of mitigating aircraft incursion during UAS operations. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall explain the proper method of scanning for, identifying, and taking the appropriate actions during an airspace incursion involving both manned and unmanned aircraft. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER'S NOTE	<ol style="list-style-type: none"> 1. The RPIC must establish a safe operating area prior to starting the skill. 2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest. 3. The RPIC will not be allowed to review the performance steps at the time of testing. 4. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none"> ▪ UAS ▪ Flight bag including landing pad ▪ Standard Radio ▪ Air to Air Transceiver ▪ Tablet/phone
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

RPIC Skill #12: Emergency Procedures – Mitigating Aircraft Incursions

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

Manned Aircraft		
	a. While using effective scanning technique, identify aircraft as “factor” or “no factor”. <i>“I scan the airspace, dividing the sky into 10 degree increments, taking at least one second, per section.”</i>	1.0
*	b. If a factor, descend to safest, lowest altitude possible.	P / F
	c. When clear of incursive hazard and safe to do so, announce over assigned channel or air-to-air frequency: <ul style="list-style-type: none"> • Who (call sign) • Where (altitude and location of operating area) • What (actions taken) 	1.0
	d. If you establish contact, coordinate safe flight between aircraft.	1.0
*	e. If unable to establish contact, maintain a safe altitude and (using manual operation) return to landing zone.	P / F
Unmanned Aircraft		
	a. While using effective scanning technique, identify aircraft as “factor” or “no factor”. <i>“I scan the airspace, dividing the sky into 10 degree increments, taking at least one second, per section.”</i>	1.0
*	b. If a factor, ascend to safest, highest, altitude possible while maintaining visual on the unidentified UAS.	P / F
	c. Maintain physical separation of aircraft.	1.0
*	d. When safe to do so, either resume operations or return to landing zone.	P / F

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	9
Total points needed to pass	8
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
--

Comments:

PSURT Pilot Skill #13: Compass Calibration

NFPA 2400

OBJECTIVE	The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of compass calibration prior to deploying the aircraft. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall demonstrate the proper method of a compass calibration before deploying the aircraft. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER'S NOTE	<ol style="list-style-type: none">1. The RPIC must establish a safe operating area prior to starting the skill.2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.3. The RPIC will not be allowed to review the performance steps at the time of testing.4. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none">▪ Team member▪ UAS▪ Flight bag including landing pad▪ Tablet/phone
CONDITIONS	The RPIC shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

RPIC Skill #13: Compass Calibration

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Turn on remote and launch appropriate pilot app	1.0
	b. Turn on aircraft	1.0
	c. Acknowledge aircraft status with LEDs	1.0
	d. Check for any warning indicators or updates and take appropriate actions	1.0
*	e. Move aircraft to an appropriate area free of magnetic interference	P / F
*	f. Identify compass calibration feature in settings	P / F
*	g. Verbalize to calibration instructions with team member	P / F
	h. Confirm aircraft has accepted calibration	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	5
Total points needed to pass	4
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
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Comments:

PSURT Visual Observer Skill #1

NFPA 2400

OBJECTIVE	The Visual Observer (VO), given the necessary equipment, will demonstrate the proper method of assisting the Remote Pilot in Command (RPIC) in UAS operations. The VO shall verbalize to the instructor each step identified in italic print. This is not a timed skill.
INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC	You shall demonstrate the proper responsibilities of the Visual Observer role. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?
EXAMINER'S NOTE	<ol style="list-style-type: none">1. The VO must establish a safe work area for UAS operations.2. The VO must demonstrate clear communication skills3. If the VO fails to maintain a safe area of operation, the evaluator will stop the skill and inform the VO that they have failed the skill and will have to retest.4. The VO will not be allowed to review the performance steps at the time of testing.5. <u>Not</u> a timed skill.
PREPARATION & EQUIPMENT	<ul style="list-style-type: none">▪ RPIC▪ UAS▪ Flight bag including landing pad▪ Tablet/phone▪ Radio
CONDITIONS	The VO shall accomplish this skill having first established a safe and clear flight area.
REFERENCE	

Visual Observer Skill #1

Visual Observer:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

First Attempt Retest #: _____

The remote pilot being tested shall: **(No partial points given)**

	a. Acknowledge crew briefing	1.0
	b. Ensure correct radio channel(s)	1.0
*	c. Perform risk assessment by checking for and acknowledging hazards and obstructions: wind, rain, trees, power lines, spectators and wildlife	P / F
	d. Establish an appropriate LZ	1.0
	e. Assist PIC with aircraft start up and calibration	1.0
	f. Monitor radio channel(s) and communicates for PIC when necessary	1.0
*	g. Maintain safe launch and landing area and ensure PIC has sterile cockpit	P / F
*	h. Maintain airspace situational awareness to include location of all aircraft (manned and unmanned)	P / F
	i. Perform "hot" battery swap (if required)	1.0
	j. Turn off aircraft when instructed by PIC	1.0

* Denotes mandatory passage of this step

Allotted time for this skill: **N/A**

Time: _____ minutes _____ seconds

Total points possible	7
Total points needed to pass	6
Total points scored	

Performance rating of VO in accordance with the objectives and conditions of the skill: PASS: _____ FAIL: _____
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Comments:

PSURT Pilot Skill: Check Ride

NFPA 2400

OBJECTIVE The Remote Pilot in Command (RPIC), given the necessary equipment, will demonstrate the proper method of preflight operations prior to deploying the aircraft. The RPIC shall verbalize to the instructor each step identified in italic print. This is not a timed skill, However time will be recorded for purposes of data collection.

INSTRUCTIONS TO BE READ BY THE EVALUATOR TO THE RPIC You shall demonstrate the proper method preflight operation before deploying the aircraft. The skill will begin when you state you are ready and on my instruction to start. The skill will end when you state to me that you have completed all of the identified steps. Do you understand these instructions?

EXAMINER'S NOTE

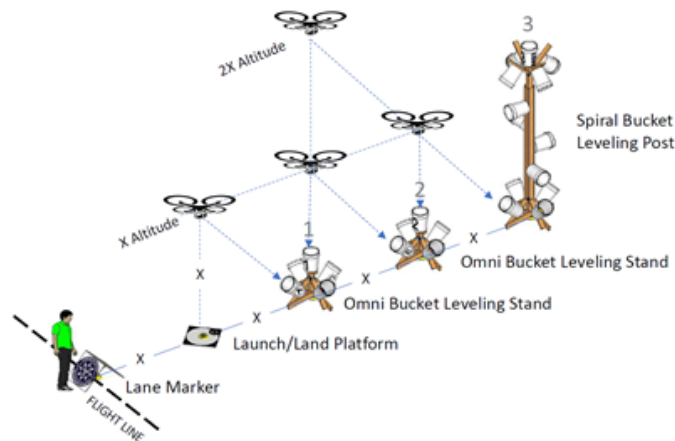
1. The RPIC must establish a safe operating area prior to starting the skill.
2. If the RPIC demonstrates unsafe or hazardous operations, the evaluator will stop the skill and inform the RPIC that they have failed the skill and will have to retest.
3. The RPIC will not be allowed to review the performance steps at the time of testing.
4. Not a timed pass or fail skill. Time will be recorded for purposes of data collection.

PREPARATION & EQUIPMENT

- UAS
- Flight bag including landing pad
- Tablet/phone
- NIST course

CONDITIONS The RPIC shall accomplish this skill having first established a safe and clear flight area.

REFERENCE The NIST course is used for part of the exercise



RPIC Skill: Check Ride

Pilot:	Date:
TxFir#:	Notes:
Evaluator:	
UAV Make/Model:	
Piloting App:	

Summary of Skills

Evolution	First Attempt or Retest #	Pass	Fail
Evolution 1: Maintain Position and Rotate			
Evolution 2: Point and Zoom			
Evolution 3: Straight and Level / Move and Rotate / Inspect Objects			
Evolution 4: Orbit			
Evolution 5: Slalom			

Comments:

EVOLUTION 1: Maintain Position and Rotate

The remote pilot being tested shall:

(No partial points given)

	a. Launch and fly aircraft to the top of tower, maintaining safe altitude (20') over highest upward facing bucket	1.0
	b. Orientate nose of aircraft towards cardinal direction and /or heading provided by instructor	1.0
*	c. Visualize target (bucket) located downward facing at a 45 degree angle and verbalize description of its contents and / or signage	P / F
	d. Yaw aircraft to next instructor designated cardinal direction and or / heading	1.0
*	e. Visualize target (bucket) located downward facing at a 45 degree angle and verbalize description of its contents and / or signage	P / F
	f. Yaw aircraft to next instructor designated cardinal direction and or / heading	1.0
*	g. Visualize target (bucket) located downward facing at a 45 degree angle and verbalize description of its contents and / or signage	P / F
	h. Yaw aircraft to next instructor designated cardinal direction and or / heading	1.0
*	i. Visualize target (bucket) located downward facing at a 45 degree angle and verbalize description of its contents and / or signage	P / F
	j. Yaw aircraft to next instructor designated cardinal direction and or / heading	1.0
*	k. Follow instructions and begin Evolution 2 (Point and Zoom)	P / F

* Denotes mandatory passage of this step

Total points possible	6
Total points needed to pass	4
Total points scored	

<p>Performance rating of RPIC in accordance with the objectives and conditions of the skill:</p> <p>PASS: _____ FAIL: _____</p>

EVOLUTION 2: Point and Zoom

The remote pilot being tested shall:

(No partial points given)

	a. Maintain aircraft's altitude and hold position over tower's highest upward facing bucket	1.0
	b. Orientate nose of aircraft towards cardinal direction and /or heading provided by instructor	1.0
*	c. Visualize downward facing target(s) located at an approximately 30 degree angle from tower. Verbalize description of signage ***** Use of camera zoom or screen capture with magnification of image will be required *****	P / F
	d. Yaw aircraft to next instructor designated cardinal direction and or / heading	1.0
*	e. Visualize downward facing target(s) located at an approximately 30 degree angle from tower. Verbalize description of signage ***** Use of camera zoom or screen capture with magnification of image will be required *****	P / F
	f. Follow instructions and fly aircraft to designated area to begin Evolution 3 (Straight and Level)	1.0

* Denotes mandatory passage of this step

Total points possible	4
Total points needed to pass	2
Total points scored	

<p>Performance rating of RPIC in accordance with the objectives and conditions of the skill:</p> <p>PASS: _____ FAIL: _____</p>

EVOLUTION 3: Straight and Level / Move and Rotate / Inspect Objects

The remote pilot being tested shall:

(No partial points given)

	a. Maintain position over designated area (bucket) with nose of aircraft pointed towards tower. Either climb or descend in altitude in order to visualize target (bucket) on the tower. Fly straight and level towards the target (bucket).	1.0
*	b. Visualize target (bucket) located forward facing of aircraft and verbalize description of its contents and / or signage	P / F
	c. Return along same flight path, flying straight and level in a reverse orientation, until you reach the designated bucket started from.	1.0
	d. Yaw aircraft 45 degrees and fly straight and level to the next bucket (constant heading and altitude).	1.0
	e. Maintain position over designated area (bucket) and yaw nose of aircraft towards tower. Either climb or descend in altitude in order to visualize target (bucket) on the tower. Fly straight and level towards the target (bucket).	1.0
*	f. Visualize target (bucket) located forward facing of aircraft and verbalize description of its contents and / or signage	P / F
	g. Return along same flight path, flying straight and level in a reverse orientation, until you reach the designated bucket started from.	1.0
	h. Yaw aircraft 45 degrees and fly straight and level to the next bucket (constant heading and altitude).	1.0
	i. Maintain position over designated area (bucket) and yaw nose of aircraft towards tower. Either climb or descend in altitude in order to visualize target (bucket) on the tower. . Fly straight and level towards the target (bucket).	1.0
*	j. Visualize target (bucket) located forward facing of aircraft and verbalize description of its contents and / or signage	P / F
	k. Return along same flight path, flying straight and level in a reverse orientation, until you reach the designated bucket started from.	1.0
	l. Yaw aircraft 45 degrees and fly straight and level to the next bucket (constant heading and altitude).	1.0
	m. Maintain position over designated area (bucket) and yaw nose of aircraft towards tower. Either climb or descend in altitude in order to visualize target (bucket) on the tower. . Fly straight and level towards the target (bucket).	1.0
*	n. Visualize target (bucket) located forward facing of aircraft and verbalize description of its contents and / or signage	P / F
	o. Return along same flight path, flying straight and level in a reverse orientation, until you reach the designated bucket started from.	1.0
*	Follow instructions and begin Evolution 4 (Orbit)	P / F

* Denotes mandatory passage of this step

Total points possible	11
Total points needed to pass	7
Total points scored	

Performance rating of RPIC in accordance with the objectives and conditions of the skill:

PASS: _____ **FAIL:** _____

EVOLUTION 4: Orbit

The remote pilot being tested shall:

(No partial points given)

	a. Climb aircraft to safe altitude (20') in order to begin 360 orbit with nose of aircraft pointing inward towards tower.	1.0
	b. Visualize target (bucket) on tower located downward facing from aircraft at approximately a 45 degree angle.	1.0
*	c. Verbalize contents and / or signage of each of the four targets (buckets)	P / F
	d. Aircraft must maintain a safe altitude (20') and safe working radius from tower (20') while completing 360 orbit	1.0
*	e. Upon completion, follow instructions and fly aircraft to designated landing area for battery swap. Begin Evolution 5 (Slalom)	P / F

* Denotes mandatory passage of this step

Total points possible	5
Total points needed to pass	4
Total points scored	

<p>Performance rating of RPIC in accordance with the objectives and conditions of the skill:</p> <p>PASS: _____ FAIL: _____</p>

EVOLUTION 5: Slalom

The remote pilot being tested shall:

(No partial points given)

	a. Launch and fly aircraft to the slalom UAS test method.	1.0
*	b. In a counter clockwise orientation, while flying nose forward, perform a “Figure of Eight” flight path around two vertical uprights for two repetitions. ***** Aircraft must be able maintain ability to fly *****	P / F
*	c. In an under over orientation, while flying nose forward, perform a “Figure of Eight” flight path around two horizontal standards for two repetitions. ***** Aircraft must be able maintain ability to fly *****	P / F
	d. Upon completion follow instructions and fly aircraft to designated landing area.	1.0

* Denotes mandatory passage of this step

Total points possible	2
Total points needed to pass	2
Total points scored	

<p>Performance rating of RPIC in accordance with the objectives and conditions of the skill:</p> <p>PASS: _____ FAIL: _____</p>

