

Coding with Parrot Mini Drones

Terminal Objective 2.2: Fly the mini drone in a square pattern using pitch and roll controls.

Performance Objective 2.2: Using an iPad or Android tablet with the free flight mini app, fly the mini drone in a square pattern using pitch and roll controls in clockwise and counterclockwise directions.

Enabling Objectives:

1. Identify pitch and roll as it relates to a quadcopter
2. Demonstrate how pitch controls forward and reverse and roll controls left and right
3. Demonstrate forward, reverse, left and right movements of the mini drone in safe manner

Materials and Supplies:

- iPad with iOS 8.0 or later or Android tablet with 4.0 or later
- Download and install free flight mini app on tablet (found in app store)
- Safety glasses for all participants
- Parrot Mini Drone: Cargo or Mamba
- USB charging device
- Flight Challenge 2.2 (for reference)
- Rope or other means of creating a square space
- *Performance Assessment 2.2: Square Challenge, Pitch and Roll* (copy for each student)

Learning Activities:

1. Video: ROAV mini 2.2 v1
2. Practice flying square pattern using pitch and roll controls

Formative Assessment:

1. Practice flying mini drone controlling pitch and roll
2. Safely perform square pattern maneuver in boundaries. (Refer to *Square challenge*)

Summative Assessment:

1. Evaluate students using *Performance Assessment 2.2: Square Challenge, Pitch and Roll*

Supplemental teacher resources:

- Flight controls for free flight 3 mini app
<https://community.parrot.com/t5/Mambo-Knowledge-Base/Using-the-Parrot-Mambo-wit-h-a-smartphone/ta-p/145927>

- Optional flypad accesory

<https://community.parrot.com/t5/Mambo-Knowledge-Base/Parrot-Flypad/ta-p/145932>

Square Challenge 2.2

To set up this challenge you will need rope or some way to establish a square. For this example we will use rope and barriers to create the square area.

Steps:

1. Establish designated fly and safe zones in an open area
2. Rope off a square area using barrier stands.(figure 1)
3. Have operating student place mini drone in the fly zone
4. Move to the safe zone
5. Have students practice flying in the square pattern using pitch and roll controls (figure 2)
6. Evaluate students using *Performance Assessment 2.2: Square Challenge, Pitch and Roll*

Figure 1

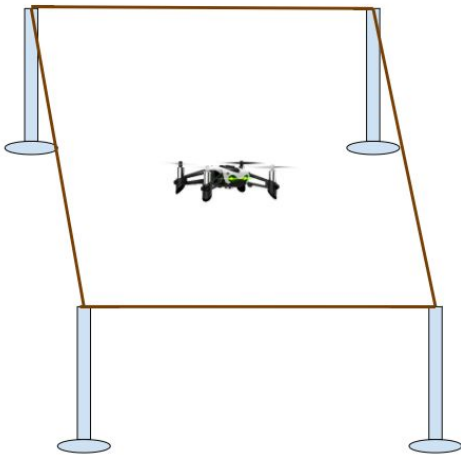
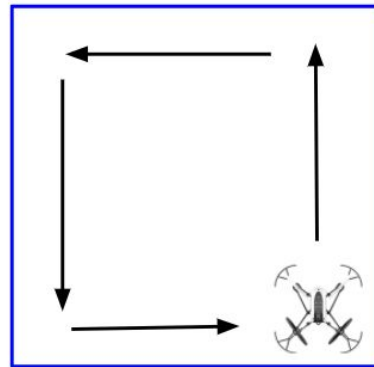


Figure 2



Performance Assessment 2.2: Square Challenge

Name: _____ Date _____

Terminal Objective 2.2: Fly the mini drone in a square pattern using pitch and roll controls

Performance Objective 2.2: Using an iPad or Android tablet with the free flight mini app, fly the mini drone in a square pattern using pitch and roll controls in clockwise and counterclockwise directions.

Assessment

Skill Check	Pass	Retry
Followed safe practices	<input type="radio"/>	<input type="radio"/>
Demonstrated proper power up and power down procedures	<input type="radio"/>	<input type="radio"/>
Flew the mini drone in a square pattern using pitch and roll controls, CW	<input type="radio"/>	<input type="radio"/>
Flew the mini drone in a square pattern using pitch and roll controls, CCW	<input type="radio"/>	<input type="radio"/>

Note: To pass this objective, all skill check items must receive a pass.

Assessed by: _____ Date: _____

Outline Video 2.2: Pitch and Roll

- I. Terms
 - A. Pitch
 - B. Roll

- II. Objectives
 - A. Using an iPad or Android tablet with the free flight mini app, fly the mini drone in a square pattern using pitch and roll controls in clockwise and counterclockwise directions.

- III. Pitch refers to the movement of the nose up or down
 - A. Controlling the pitch will move the mini drone forward or backward.

- IV. Roll refers to the movement the sides of the mini drone moving up or down
 - A. Controlling the roll will move the mini drone left and right.

- V. Square challenge (Animation)