

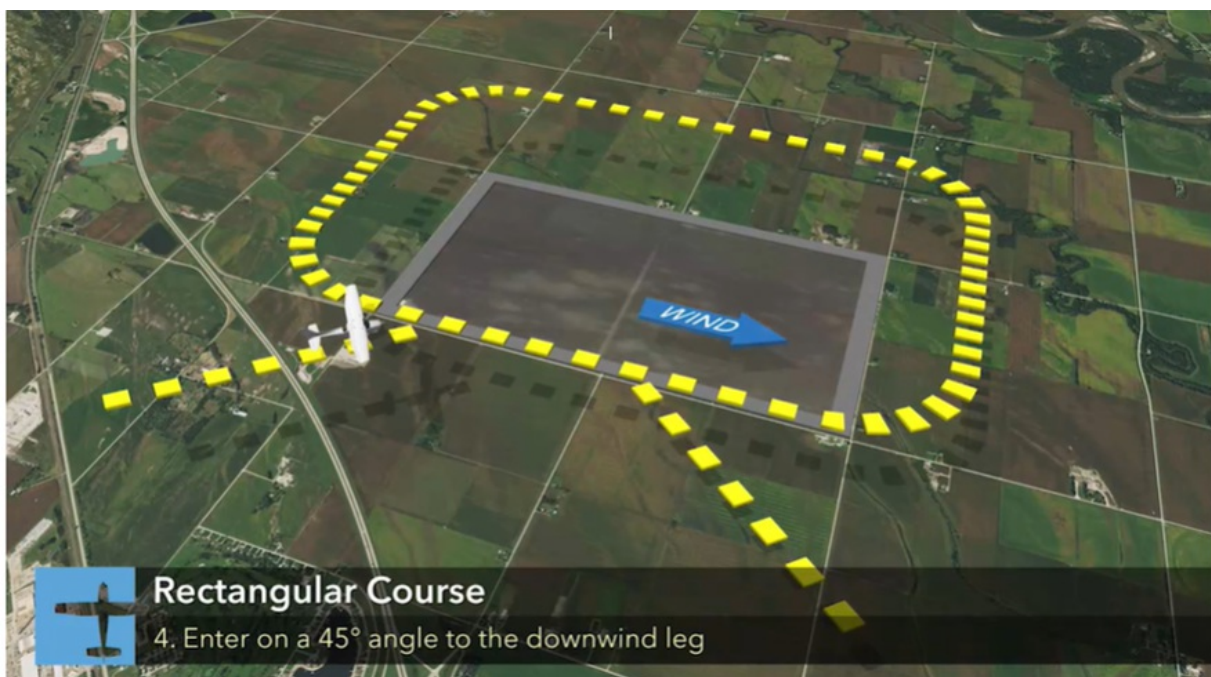
FLYING A CORRECT CIRCUIT PATTERN

During your training, you will be introduced to the rectangular course and other ground reference maneuvers. Ground reference maneuvers integrate the fundamentals of flight and demonstrate that you have competence in manipulating the flight controls and applying control pressures to maintain a pre-determined aircraft course relative to objects on the ground. Applying this skill to the rectangular course is the basis for airport traffic patterns.

To begin the rectangular course maneuver, we'll first select a prominent rectangular field bounded by four section lines whose sides are approximately equal to a typical traffic pattern. The field selected should be close to a suitable place to land in case of an emergency. We'll complete the Pre-Maneuver Checklist and ensure the area is clear of any traffic.

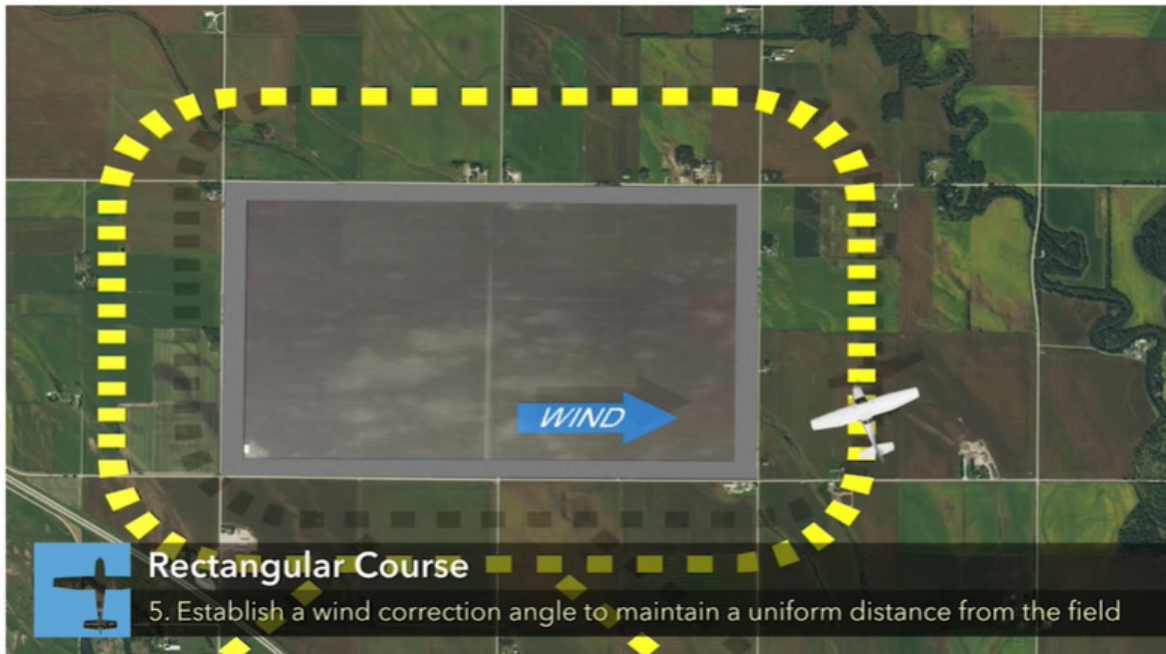
The airplane will be flown at 1,000' AGL parallel to and at an equal distance from the field boundaries – about $\frac{1}{2}$ – $\frac{3}{4}$ miles from the boundary as you would fly a traffic pattern. To maintain this equal distance on all legs of the maneuver, we will have to adjust bank angles during the turns and apply wind correction angles to prevent drifting toward or away from the field boundaries. The airspeed flown should be what's recommended by the manufacturer, but at an airspeed not to exceed maneuvering speed.

The entry into the maneuver should be accomplished downwind as you would enter the traffic pattern where groundspeed will be the greatest. On the downwind leg, there should be no wind correction angle if the wind is directly behind us, but with any type of quartering tailwind, some drift correction will be necessary. The turn from the downwind leg onto the base leg is entered with a relatively steep bank angle since the groundspeed is greatest. The steeper bank angle is necessary in order to maintain the equal distance from the boundaries.



Enter the rectangular course maneuvers on a 45 degree angle to the downwind leg.

As the airplane turns onto the following base leg, the tailwind will decrease and becomes a crosswind. The bank angle should be reduced gradually with coordinated aileron and rudder input. The pilot should be prepared for the necessary crosswind correction and compensate by turning more than 90° angling toward the inside of the rectangular course.



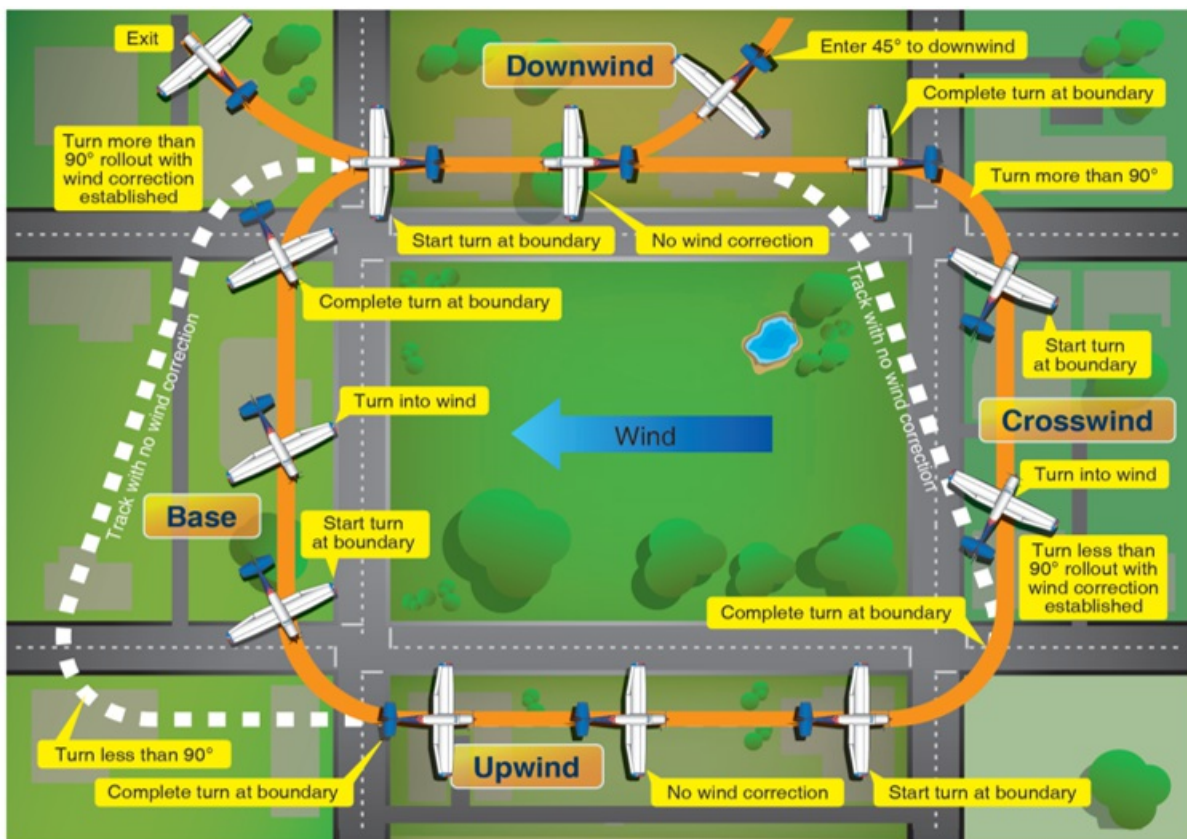
The turn from downwind leg to base leg will be more than 90 degrees to compensate for the increasing crosswind.

The next leg is where the airplane turns from a base leg position to the upwind leg. Ideally, on the upwind, the wind is directly on the nose of the airplane resulting in a direct headwind and decreased groundspeed; however, some drift correction will be necessary for any type of quartering headwind. The pilot should roll the airplane into a medium-banked turn with coordinated aileron and rudder input.

As the airplane turns onto the upwind leg, the crosswind lessens and becomes a headwind, and the bank angle is gradually reduced with coordinated aileron and rudder pressures. Because the pilot was angled into the wind on the base leg, the turn to the upwind leg is less than 90° .

The next leg is where the airplane turns from an upwind leg position to the crosswind leg. The pilot should slowly roll the airplane into a shallow-banked turn (the shallowest bank of the maneuvers since groundspeed is the slowest into the headwind). As the airplane turns onto the crosswind leg, the headwind lessens and becomes a crosswind. To compensate for the crosswind, the pilot maintains an angle into the wind, toward the outside of the rectangular course, which requires the turn to be less than 90° .

The final turn is back to the downwind leg, which requires a medium-banked angle and a turn greater than 90° since we were angled into the wind and away from the field boundary on the previous leg. The groundspeed will be increasing as the turn progresses and the bank should be held and then rolled out using coordinated aileron and rudder input.



Throughout the maneuver it's important to maintain positive, coordinated control at a constant airspeed, altitude and distance from the field boundary. It's also important to continue to be aware of your surroundings by scanning for other traffic or obstacles.

To summarize:

Standards:

Altitude: ± 100 feet

Airspeed: ± 10 knots

Bank: Avoids banking in excess of 45°

Procedures:

Select an altitude of 1000' AGL/or an appropriate traffic pattern altitude.

Select a prominent rectangular field bounded by four section lines whose sides are approximately equal to a typical traffic pattern. The major axis of the rectangle should be approximately parallel to wind direction at flight altitude. The field should also be close to a suitable place to land in case of an emergency.

Perform Pre-Maneuver Checklist and clear the area.

Establish the appropriate cruise airspeed (not to exceed maneuvering speed) and enter the maneuver at a 45° to the downwind. The first circuit should be to the left.

Establish the proper Wind Correction Angle to maintain a uniform distance from the field boundaries.

Commence and complete turns abeam the field boundaries.

Vary the bank angle (not to exceed 45°) to maintain a constant radius during the turns.

Common Errors:

Failure to adequately clear the area.

Poor reference selection.

Failure to establish proper altitude, prior to entry. (Typically entering the maneuver while descending).

Failure to establish appropriate wind correction angle resulting in drift.

Gaining or losing altitude.

Poor coordination. (Typically skidding in turns from a downwind heading and slipping in turns from an upwind heading).

Abrupt control usage.

Inability to adequately divide attention between airplane control and maintaining ground track.

Improper timing in beginning and recovering from turns.

Inadequate visual lookout for other aircraft.