

VIII.D. Circling Approach

References: 14 CFR part 91, Instrument Flying Handbook (FAA-H-8083-15), AIM, IAP

Objectives	The student should develop knowledge of the elements related to executing a circling approach.
Key Elements	<ol style="list-style-type: none">1. Use the Circling Minimums (not straight-in)2. Lose Visual, Go Missed3. Normal descent using normal maneuvers or Go Missed
Elements	<ol style="list-style-type: none">1. What is a Circling Approach?2. When Would I Circle?3. Approach Charts4. Protected Circling Area5. How to Circle6. Missed Approach from a Circle to Land7. ATC Compliance
Schedule	<ol style="list-style-type: none">1. Discuss Objectives2. Review material3. Development4. Conclusion
Equipment	<ol style="list-style-type: none">1. White board and markers2. References
IP's Actions	<ol style="list-style-type: none">1. Discuss lesson objectives2. Present Lecture3. Ask and Answer Questions4. Assign homework
SP's Actions	<ol style="list-style-type: none">1. Participate in discussion2. Take notes3. Ask and respond to questions
Completion Standards	The student understands and can perform a circling approach to landing or a missed approach.

Instructors Notes:

Introduction:

Attention

Interesting fact or attention-grabbing story

Overview

Review Objectives and Elements/Key ideas

What

Circling approaches are designed when the final approach course is not aligned with the landing runway or a steep descent gradient is required to reach the runway from the FAF. In this case you are expected to circle, or visually fly a traffic pattern to align yourself with the landing runway.

Why

Many airports have approaches that bring you to the airport rather than to a specific runway. Once you have visual contact with the airport it is your responsibility to realign with the landing runway per the tower instructions (or based on traffic at an uncontrolled field). Other situations which can result in a circling approach are low weather combined with the wind favoring a different runway (ILS to Runway 02, but the wind is out of the south. In this case, you have to fly the ILS to runway 02 and circle to land on runway 20 since it does not have an ILS), or steep descent gradients from the FAF (in which case a normal descent rate may not get you onto the runway, and you have to circle to make a normal landing).

How:

1. What is a Circling Approach?

- A. An approach without straight-in landing minimums
- B. Designed for the following reasons:
 - i. Final approach course alignment with the runway centerline exceeds 30°
 - ii. Descent gradient is greater than 400' per NM from the FAF to the threshold crossing height (TCH)
 - iii. Final approach course does not cross the extended runway centerline prior to the runway threshold
 - iv. A runway is not clearly defined on the airfield
- C. Identified by the type of approach followed by a letter
 - i. The 1st circling approach will be labeled 'A.' Lettering will continue in alphabetical order
- D. Most straight-in approaches also have circling minimums listed
 - i. Approach can be flown to the runway with the intent to circle to land on another runway
- E. Generally, tower will instruct the direction of your circle
 - i. For example, circle East of the field for a left downwind, runway 18
- F. Circling may require maneuvers at low altitude, at low airspeed, and in marginal weather conditions
 - i. Use sound judgment, have an in-depth knowledge of capabilities, and fully understand the aircraft performance to determine the exact circling maneuver since weather, unique airport design, and the aircraft position, altitude and airspeed must all be considered

2. When Would I Circle? Examples can include:

- A. Required by the procedure (i.e., circling approach is the only option)
- B. Terrain – Ex. Mountains surrounding airport - Winds favor landing east but can only approach from East
- C. Weather – Approaches don't serve the runway best suited for landing. Find an approach that does work and circle to land on the wind favored runway
- D. Construction – Approach to a closed runway; fly approach to the closed runway, circle to open runway

3. Approach Charts

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- A. Circling Minimums
 - i. NACO Charts
 - a. Circling minimums are shown in the Landing Minimums section and are can differ by category
 - b. Below the straight-in minimums (if there are any)
 - ii. Jeppesen Charts
 - a. Shown in the Minimums section and can differ by aircraft category
 - b. To the right of the straight-in minimums (if there are any)
- B. Notes – Often times there are Notes in the Briefing section of the approach that apply to circling
 - i. For example, circling to certain runways is NA at night, or circling south of the field is NA
- C. Selection of the Appropriate Circling Maneuver
 - i. If a circling approach has been assigned to you by ATC (i.e., VOR-A) use the corresponding chart
 - ii. If cleared for an approach to a runway followed by a circle to land on a different runway, use the approach chart you were cleared to fly
 - a. Use the circling minimums rather than the straight-in minimums
 - b. Once the airport complex is visible, circle to the appropriate runway for landing

4. Protected Circling Area

- A. Aircraft must remain in their respective category protected areas
 - i. Circling minimums provide at least 300’ of obstacle clearance within the protected area
- B. Standard Circling Minimums
 - i. Protected areas use the based on fixed radius distances, dependent on aircraft category
 - a. The faster the plane, the larger the protected area
 - b. Table on page B2 of the U.S. TPP
 - ii. Circling Radius:

Circling MDA in feet MSL	Approach Category and Circling Radius (NM)				
	CAT A	CAT B	CAT C	CAT D	CAT E
All Altitudes	1.3	1.5	1.7	2.3	4.5

- C. Enhanced Circling Minimums
 - i. Circling approach areas developed after late 2012 use enhanced circling minimums
 - a. Also shown on page B2 of the U.S. TPP
 - b. Identified by the “negative C” symbol on the circling minima (black box with a white C inside)
 - c. Dependent on aircraft category, but also take into account the altitude of the circling MDA
 - This accounts for increases in true airspeed with altitude
 - ii. Circling Radius:

Circling MDA in feet MSL	Approach Category and Circling Radius (NM)				
	CAT A	CAT B	CAT C	CAT D	CAT E
1000 or less	1.3	1.7	2.7	3.6	4.5
1001-3000	1.3	1.8	2.8	3.7	4.6
3001-5000	1.3	1.8	2.9	3.8	4.8
5001-7000	1.3	1.9	3.0	4.0	5.0
7001-9000	1.4	2.0	3.2	4.2	5.3
9001 and above	1.4	2.1	3.3	4.4	5.5

5. How to Circle

- A. Descend to the circling minimums
 - i. If visual prior to reaching circling minimums consider leveling off higher
 - a. More altitude is safer and provides a more normal approach to landing
 - ii. Descent is generally at a higher rate than a normal approach
 - a. The earlier you get down, the easier it is to circle (within reason)
 - b. Remember, never over 1,000 fpm descent

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- B. Once visual, inform tower and begin the circle based on tower's instructions
 - i. If no tower, broadcast intentions and begin the circle
 - C. Stay within the circling area
 - i. Maintain visual contact with the airport area, especially the runway of intended landing
 - D. Fly no lower than the circling minimums until you are in a position to make a final descent for a landing
 - i. Remain at or above until a normal rate of descent and normal maneuvers will allow for landing
 - ii. Minimums are the lowest you can fly. If you can, fly at an altitude close to a VFR pattern
 - E. If at any point visual contact is lost, go missed
 - F. Basic Rules (AIM 5-4-20):
 - i. Maneuver the shortest path to the base or downwind leg, weather permitting
 - a. No restriction to passing over the airport or other runways
 - ii. Circling maneuvers may be made while VFR or other traffic is flying. Standard left turns or specific instruction from the controller for maneuvering must be considered when circling
 - iii. Without a tower, it may be beneficial to overfly the airport to observe wind indicators / traffic
- 6. Missed Approach from a Circle to Land**
- A. During a circling approach, maintain visual contact with the runway of intended landing
 - B. If visual contact is lost, fly the missed approach for the instrument approach that you were cleared to fly
 - i. Begin a climbing turn toward the landing runway
 - ii. Continue the turn until established on the missed approach course
 - a. Procedures to intercept will vary based on the airport / specific missed approach course
 - iii. Once reestablished on course, fly the published missed approach procedure
 - C. Inform tower / ATC of the missed approach and coordinate for what you'd like to do next
- 7. ATC Compliance**
- A. Comply with the clearances, restrictions, etc. given by ATC
 - i. Circling instructions (approach, circling direction, pattern entry, etc.)
 - B. In the case that the clearance seems unsafe or is not understood, question ATC
 - i. Reply unable if necessary

Common Errors:

- Failure to have essential knowledge of the circling approach information on the approach chart
- Failure to adhere to the published MDA and visibility criteria during the circling approach maneuver
- Inappropriate pilot technique during the transition from the circling maneuver to the landing approach

Conclusion:

Brief review of the main points

PTS Requirements:

To determine that the applicant:

1. Exhibits instructional knowledge of the elements of a circling approach by describing-
 - A. selection of the appropriate circling approach maneuver considering the maneuvering capabilities of the aircraft.
 - B. circling approach minimums on the selected instrument approach chart.
 - C. compliance with advisories, clearance instructions, and/or restrictions.
 - D. importance of flying a circling approach pattern that does not exceed the published visibility criteria.
 - E. maintenance of an altitude no lower than the circling MDA until in a position from which a descent to a normal landing can be made.
2. Exhibits instructional knowledge of common errors related to a circling approach by describing-

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- A. failure to have essential knowledge of the circling approach information on the instrument approach chart.
 - B. failure to adhere to the published MDA and visibility criteria during the circling approach maneuver.
 - C. inappropriate pilot technique during transition from the circling maneuver to the landing approach.
3. Demonstrates and simultaneously explains a circling approach from an instructional standpoint.
 4. Analyzes and corrects simulated common errors related to a circling approach.

ACS Skills Standards

1. Select and comply with the circling approach procedure considering turbulence, wind shear, and the maneuvering capabilities of the aircraft.
2. Confirm the direction of traffic and adhere to all restrictions and instructions issued by ATC or the evaluator.
3. Maneuver the aircraft, at or above the MDA, 90° or more from the final approach course, on a flightpath permitting a normal landing on a suitable runway.
4. Avoid circling beyond visibility requirements and maintain the appropriate circling altitude until in a position from which a descent to a normal landing can be made.
5. Establish the approach and landing configuration for the situation and maintain altitude +100/-0 feet until a descent to a normal landing can be made.
6. Demonstrate SRM.