

The Circling Approach

1. Introduction

The circling approach used to be a frequent and normal part of standard airline operations. Today, it is not flown as frequently, and is no longer part of recurrent training for everyone. Yet, it remains a challenging maneuver.

2. What is a Circling Approach?

Airbus Definition:

When landing runway is different from instrument approach runway.

JAR Ops Definitions:

► Circling: the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.

► Visual approach: an approach when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain.

JAR-OPS 1 E 1.435 (1) and (8)

3. The Circling Approach Rules

From the beginning of the level flight phase, at or above the Mini-

mum Descent Altitude/Height (MDA/H), the instrument approach track determined by radio navigation aids should be maintained until:

► The pilot estimates that, in all probability, visual contact with the runway or runway environment will be maintained during the entire procedure;

► The pilot estimates that his aircraft is within the circling area before commencing circling; and

► The pilot is able to determine his aircraft's position in relation to the runway with the aid of the external references.

If the above conditions are not met by the Missed Approach Point (MAPt), a missed approach must be carried out in accordance with the instrument approach procedure.

If the instrument approach procedure is carried out with the aid of an ILS, the MAPt associated with an ILS procedure without glide path (GP out procedure) should be taken in account.

IEM to Appendix 1 to JAR-OPS 1.430, 4.2 and 3.2

The flight maneuvers should be conducted within the circling area, and in such a way that a visual contact with the runway, or the runway environment, is maintained at all times.

The same flight maneuvers should be carried out at an altitude/height which is not less than the circling MDA/H.

A descent below MDA/H should not be initiated until the threshold of the runway to be used has been identified and the aeroplane is in a position to continue with a normal rate of descent and land within the touchdown zone.

IEM to Appendix 1 to JAR-OPS 1.430, 4.4, 4.5 and 4.6

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4. What about the Missed Approach?

JAR Ops Definitions: Visual Maneuvering (circling)

If visual reference is lost while circling to land from an instrument approach, the missed approach specified for that particular instrument approach must be followed. It is expected that the pilot will make an initial climbing turn toward the landing runway and overhead the aerodrome where he will establish the aeroplane in a climb on the missed approach track. In as much as the circling maneuver may be accomplished in more than one direction, different patterns will be required to establish the aeroplane on the prescribed missed approach course depending on its position at the time visual reference is lost unless otherwise prescribed.

IEM to Appendix 1 to JAR-OPS 1.430, 3.1

5. Standard Circling Approach – Step by Step

5.1. Approach Preparation:

First of all, start with the chart, check the protected area and terrain and look for any special notes or restrictions. Check the MDA for circling (circling minima) for your category of aircraft and brief the approach configuration. Prepare the secondary flight plan (SEC F-PLN): copy active and change runway to actual landing runway. Ensure that the use of ND during the approach is fully briefed.

	Cat C		Cat D	
	ICAO	TERPS	ICAO	TERPS
Maneuvering Speed	180 kt	140 kt	205 kt	165 kt
R	4.20 nm	2.83 nm	5.28 nm	3.7 nm
Minimum Visibility	1 600 m	2 400 m	2 400 m	3 200 m
Minimum HAA	500 ft	450 ft	600 ft	550 ft





5.2. Instrument Approach:

Airbus SOP is that the initial part of the normal circling approach is flown with gear down and CONF 3. We recommend that, for an ILS, pilots should use the Flight Directors (FD) in HD/VS mode, whereas, for a non-precision approach, the FD mode should be TRK/FPA.



5.3. At MDA for Circling:

Level-off and fly not lower than MDA (Anticipate the level-off; this is a minimum descent altitude and the pilot must not descend below). Level-off using the VS knob (PUSH TO LEVEL OFF), or by pushing the ALT push-button, depending on your aircraft option and company SOP. If you are flying an ILS, select TRK/FPA and arm the 45 degree track turn, left or right, as appropriate.

► If visual reference is achieved (see diagram): commence the turn by pulling HDG knob for track.

► If not: Go Around.

Note: at this stage, the Go Around is still in the active F-PLN of the FMS, and may be flown automatically. The pilot is abble to determine his aircraft's position in relation to the runway with the aid of the external references.

IEM to Appendix 1 to JAR-OPS 1.430, 4.2 and 3.2



5.4. Timing for Circling:

The timing Airbus recommends is 30 seconds from wings level, adjusted for strong Head or Tail wind, by reference to the ND wind indicator.

However, this is a visual exercise: **Timings are approximate only**.



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5.5. Downwind:

Maintain visual reference with the runway environment. Monitor both lateral distance and track, with the aid of the ND, and adjust track for wind, as necessary. In particular if the aircraft is too close to the runway.

At an appropriate point, activate the SEC F-PLN (**Keep** the DIS-CONTINUITY). Disconnect the AP and remove FD, at the latest before commencing any further descent.



When the secondary F-PLN is activated, the valid missed approach procedure is no longer available.

5.6. Downwind ABM:

Start timing when abeam the threshold (3 sec per 100 ft is a guide).

But what about airspeed and tail wind? Remember: this is a visual exercise and timings are approximate only! The ND may be used as an aid to initiating and judging the base turn.



5.7. Visual Aid:

Once again, all timings are approximate, and use the ND as a guide ONLY, for:

- ► 2.5 Nm offset?
- ► Position downwind?
- ► Track downwind?
- ► Abeam threshold?
- ► Tailwind for timing?
- ► Crosswind?
- ► Terrain?

► 2.5 Nm offset? Remember the maximum for TERPS airfields and category C aircraft may be as little as 1.7 Nm. The small white marks of the range ring in this diagram represent 2.5 Nm. A normal circling approach at 150kts should result in a downwind offset of around 1.6 Nm and enable a rate 1 continuous base turn.

► **Position downwind?** The ND is a guide to the progress of the air-craft downwind but only a guide!

► Track downwind? The ND may be used as an immediate cross-check that the correct downwind track has been selected, and maintained.

► Abeam threshold? The threshold abeam point is best recognized visually but the ND may be used as a confirmation of the visual observation.

► Tailwind for timing? The ND wind arrow is a valuable and continuous measure of the wind situation during a circling approach. It enables the crew to observe, and react, to a changing wind situation including any...

► Crosswind?

Terrain? The ND is an excellent aid to situational awareness at all times.



5.8. Final Turn:

Initially, maintain a bank angle of 25° and maintain altitude until the runway threshold is identified. The definition of Visual Reference is given here below. Set the LDG configuration when appropriate, but ensure the aircraft is stable by 400ft aal.

5.9. JAR Ops Definitions: Visual Reference

A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

- Elements of the approach light system;
- II) The threshold;
- III) The threshold markings;
- IV) The threshold lights;
- v) The threshold identification lights;
- vi) The visual glide slope indicator;
- VII) The touchdown zone or touchdown zone markings;
- VIII) The touchdown zone lights;
- IX) Runway edge lights; or
- x) Other visual references accepted by the Authority.

Appendix 1 to JAR-OPS 1.430, (b) (3)

5.10. Go Around:

After the secondary flight plan has been activated, remember that the Go Around will have to be flown selected. Always fly the Go Around of the **initial** instrument approach, **unless otherwise instructed**. The pilot is expected to maneuver to enable this, but always remaining within the protected area.



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6. What about Engine Out?

In case of Engine Out, for all Airbus aircraft: Use the QRH, check the table for weight (A320/A330) and delay gear extension.



If the approach is flown at less than 750 ft RA, the "L/G NOT DOWN" warning will be triggered: This warning can be cancelled. The "TOO LOW GEAR" warning will be triggered

below 500 ft RA.



7. What about the Use of NAV?



A standard circle to land is a VISUAL approach. So, DO NOT USE:

- ► Pilot WPTs (PBDs), or
- ► NAV mode, or
- AP below circling minima



8. Conclusion:

Airbus recommends that all operators examine their operations and the associated training regarding the circling approach...

What about other types of approach? RNP APCH or RNP AR APCH may replace a circling approach and create a lower minima.



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