



VISUAL MANOEUVRING UNDER IFR

1. Introduction

Visual manoeuvring (or circling) is the term used to describe the phase of flight after an instrument approach which brings the aircraft into position for landing on a runway which is not suitably located for straight-in approach or where the criteria for alignment or descent gradient cannot be met.

Circling is not applicable for helicopters. The helicopter pilot has to conduct a visual manoeuvre in adequate meteorological conditions to see and avoid obstacles in the vicinity of the final approach and take-off area (FATO).

A circling approach is a visual flight manoeuvre. After a visual contact, the minimum requirement for circling is to maintain visual with the runway environment while established at minimum descent altitude/height (MDA/H).

Descent below the MDA/H should not be made until:

- Visual reference has been established and can be maintained
- The pilot has the landing threshold in sight
- The required obstacle clearance can be maintained
- The aircraft is in a position to carry out a landing

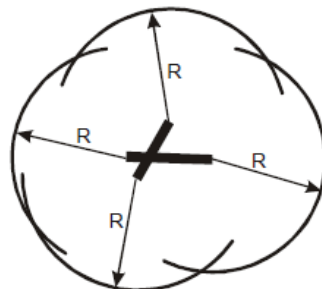
2. Visual manoeuvring or Circling

A circling approach can be started when entering the visual manoeuvring area

2.1. Visual manoeuvring area

The visual manoeuvring area for a circling approach is determined by drawing arcs centred on each runway threshold and joining those arcs with tangent lines.

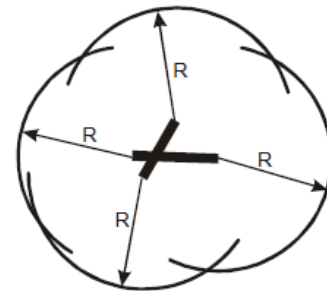
A visual manoeuvring (circling) approach can be commenced when entering the visual manoeuvring area.



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The radius (R) of the arc is related to:

- Category of aircraft
- Airspeed
- Wind speed 25kt
- Bank angle 20° average or 3° per second, whichever requires less bank



Category of aircraft	A	B	C	D	E
Maximum speed (kt)	100	135	180	205	240
Maximum true air speed with wind +25kt at 1000ft	131	168	215	242	279
Radius (r) of turn (NM)	0.69	1.13	1.85	2.34	3.12
Straight segment (NM)	0.30	0.40	0.50	0.60	0.70
Radius (R) from threshold (NM)	1.68	2.66	4.20	5.28	6.94

Extending downwind beyond visual manoeuvring area is not allowed in order to retain obstacle clearance.

2.2. Obstacle clearance

When the visual manoeuvring (circling) has been established, the obstacle clearance altitude/height (OCA/H) is determined for each category of aircraft.

Aircraft category	Obstacle clearance m (ft)	Lowest OCH above airfield elevation m (ft)	Minimum visibility km (NM)
A	90 (295)	120 (394)	1.9 (1.0)
B	90 (295)	150 (492)	2.8 (1.5)
C	120 (394)	180 (591)	3.7 (2.0)
D	120 (394)	210 (689)	4.6 (2.5)
E	150 (492)	240 (787)	6.5 (3.5)

A procedure can prohibit circling within an entire sector in which a prominent obstacle exists and may be ignored for OCA/H calculation as it is outside the final approach and missed approach areas.

2.3. Circling layout

Each circling situation is different because of:

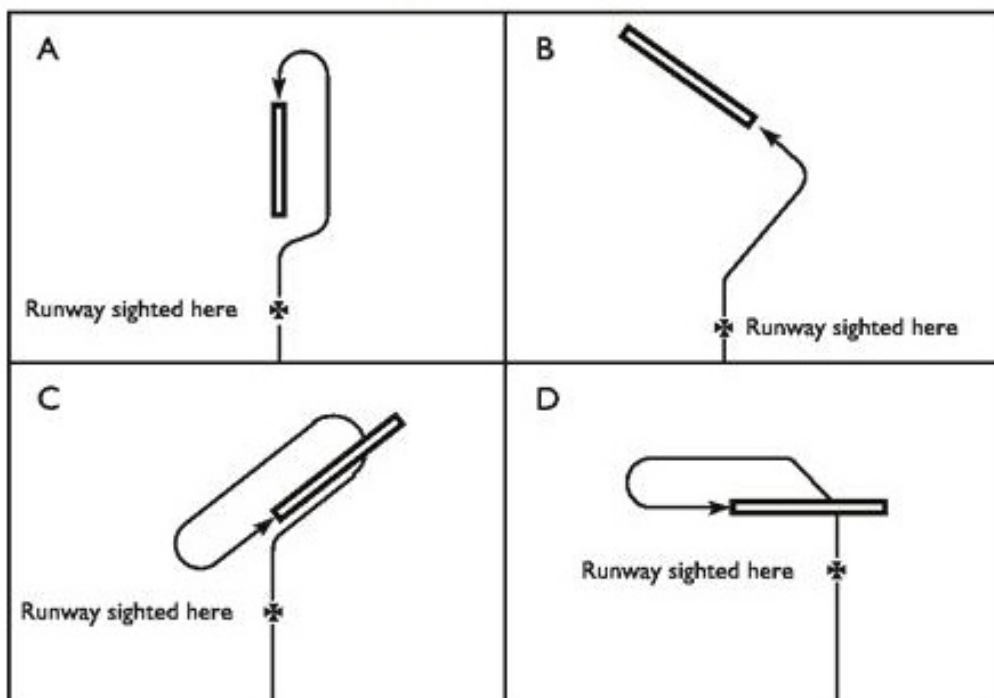
- Runway layout
- Final approach track
- Wind speed
- Meteorological conditions
- Landmarks and obstacles in environment

A typical circling track must contain:

- A track to join the downwind leg
- A downwind leg, except if the aircraft can join and is cleared to join a base leg directly
- A half turn in order to join the final leg, if a downwind leg has been performed

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Below we present several track configurations that can be used when performing visual manoeuvring:



2.4. Flown altitude

The visual manoeuvring shall be performed at the MDA altitude (or MDH height) at the minimum.

However, the pilot can choose a higher altitude if the weather conditions permit it. But, the visual manoeuvring and timing must be executed conform to the aircraft specification manual (FCOM) with the aircraft remaining within the visual manoeuvring area. The pilot can choose the normal altitude circuit to perform its visual approach.

2.5. Use of Autopilot

Maximum use of autopilot during circling can optimize monitoring of the approach.

Disengaging autopilot shall occur when starting descent below MDA at the latest.

2.6. Missed approach procedure

If there is a loss of visual reference (airfield) during the visual manoeuvring, a go around shall be initiated without delay.

The missed approach for the normal instrument procedure applies, but the visual manoeuvring allows for go around and to achieve a safe altitude/height thereafter – joining the downwind leg of the prescribed track procedure or the instrument missed approach trajectory.

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3. Visual manoeuvring using predefined prescribed tracks

In some airfields, a specified track may be prescribed for visual manoeuvring (VPT) in addition to the circling area. This procedure is based on the aircraft speed category. It is published on a special chart on which the visual features, track description and other characteristics are shown. The direction and the length of each segment are defined.

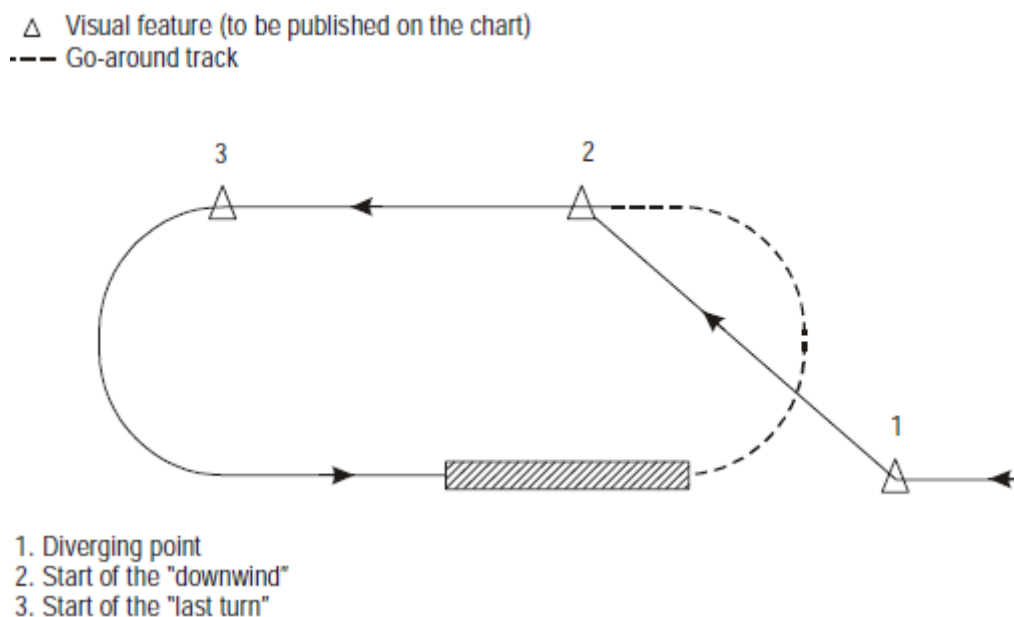
Navigation is primarily by visual reference and any radio navigation information presented is advisory only.

The missed approach for the normal instrument procedure applies, but the prescribed tracks provide for manoeuvring to allow for go around and to achieve a safe altitude/height thereafter – joining the downwind leg of the prescribed track procedure or the instrument missed approach trajectory.

If there is a loss of visual reference (airfield) during the visual manoeuvring, a go around shall be initiated without delay.

3.1. Standard track

The figure below shows one type of a standard track.



The length of the final segment is based on an allowance of 30s of flight before the threshold.

Some airports due to specific runway configuration or terrain layout can provide other configurations than the standard track.

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Example of one special visual manoeuvring using predefined prescribed tracks after an ILS approach:

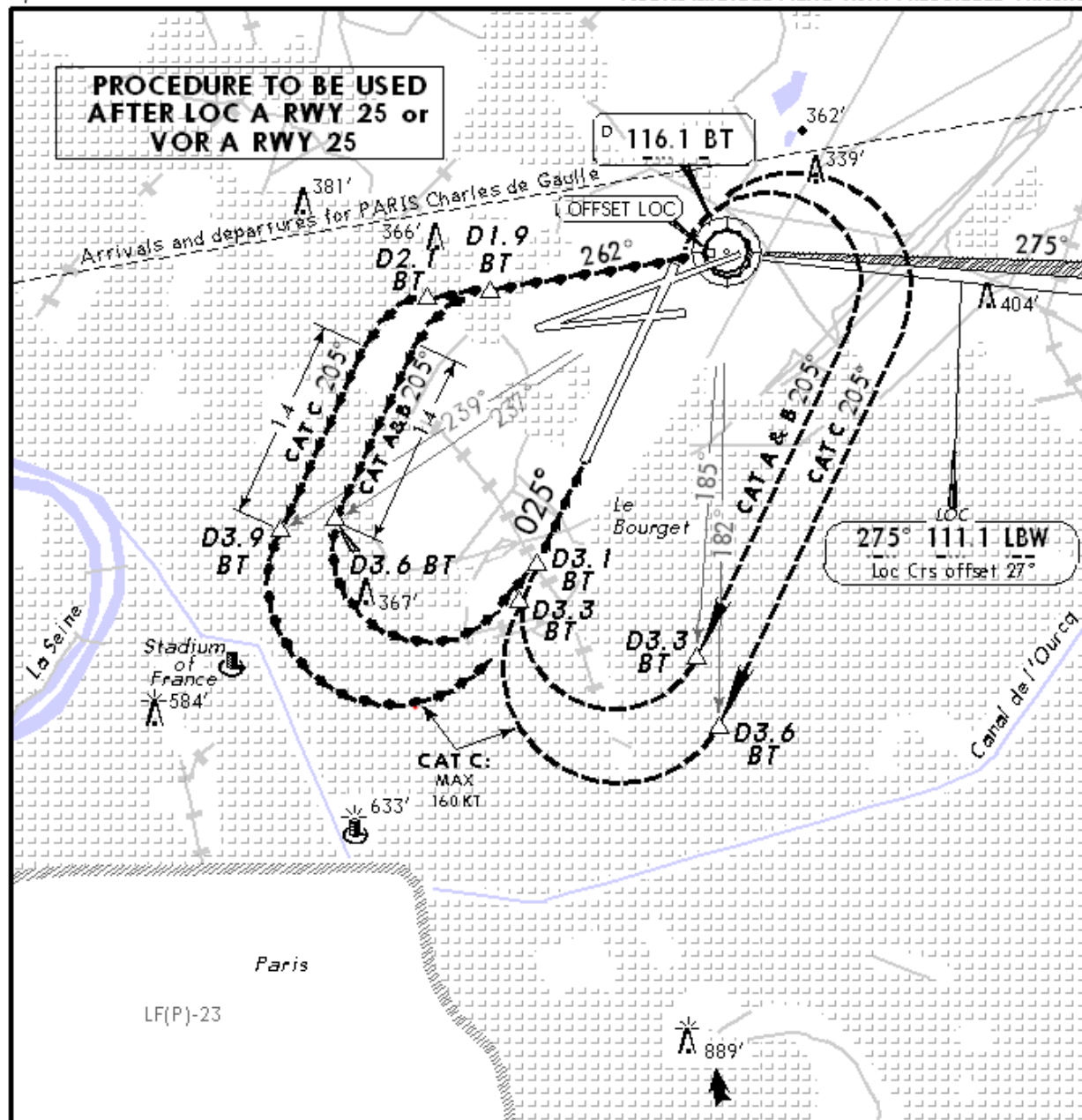
LFPB/LBG

JEPPESEN
3 JAN 14 (39-11) EII 9 Jan

PARIS, FRANCE
LE BOURGET
VPT B Rwy 03

Apt Elev 220'

CAT A, B & C
VISUAL MANOEUVRING WITH PRESCRIBED TRACKS



Descend from MDA(H) to CAT A & B: 670'(450'), CAT C: 770'(550') in down wind leg track 205°. Do not descend below CAT A & B: 670'(450'), CAT C: 770'(550') before the beginning of straight line segment.

PAPI Obstacle Clearance Surface limited to 7km/3.8NM

In case of missed landing turn RIGHT as soon as possible, climbing up to MAX 770' in order to avoid drifting onto approach path of LFPG Rwy 08R, then perform a RIGHT hand circuit for rwy 03.

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Example of one visual manoeuvring using predefined prescribed tracks directly after IAF:

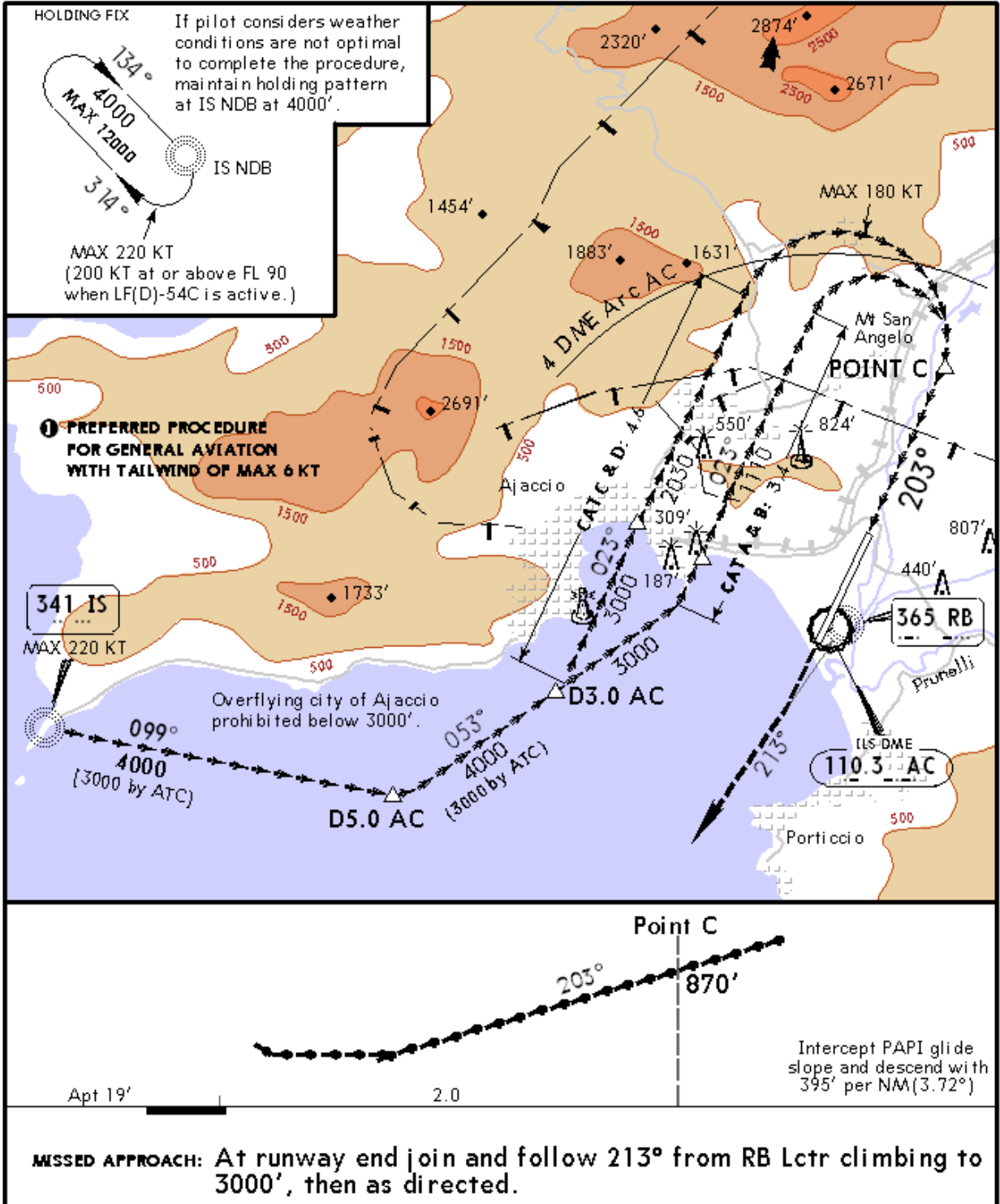
LFKJ/AJA

17 JUN 16
EII 23 Jun
JEPPESSEN
19-10

AJACCIO, FRANCE
NAPOLEON BONAPARTE
VPT A RWY 20

Apt Elev 19'

VISUAL MANOEUVRING WITH PRESCRIBED TRACKS



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3.2. Minimum obstacle clearance (MOC)

The OCA/H for visual manoeuvring on prescribed tracks provides the minimum obstacle clearance (MOC) over the highest obstacle within the prescribed track area.

It also conforms to the limit presented in the table in chapter 5 and is not less than the OCA/H calculated for the instrument procedure approach which leads the visual manoeuvre.

3.3. Missed approach procedure

If visual reference is lost while visual manoeuvring using predefined prescribed tracks from an instrument approach, the missed approach specified for that particular procedure shall be followed.

The transition from the visual manoeuvre to the missed approach should be initiated by a climbing turn, within the circling area, towards the landing runway, to return to the circling altitude or higher, immediately followed by interception and execution of the missed approach procedure.

The indicated airspeed during these manoeuvres shall not exceed the maximum indicated airspeed associated with visual manoeuvring.

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