

~~noted "Missed approach turn as soon as operationally practicable to \_\_\_\_\_ heading".~~

**NOTE:**

~~Flight personnel are expected to comply with such annotations on approach charts and execute the appropriate maneuvers without undue delay.~~

**3.6.4.5**

~~Parameters of construction of the turning missed approach area are based on the following assumed conditions:~~

- ~~a. **bank angle:** 15° average achieved;~~
- ~~b. **speed:** for each category of aircraft (see Tables III-1-1 and III-1-2);~~
- ~~c. **wind:** where statistical data are available, a maximum 95 per cent probability on omnidirectional basis is used. Where no data are available, omnidirectional wind of 56 km/h (30 kt) is used;~~
- ~~d. **pilot reaction time:** 0 to +3 s; and~~
- ~~e. **bank establishment time:** 0 to +3 s.~~

**3.6.4.6**

~~As with any turning maneuver, speed is a controlling factor in determining the aircraft track during the turn. The outer boundary of the turning area is based on the highest speed of the category for which the procedure is authorized. The inner boundary caters for the slowest aircraft, which is expected to have an IAS of at least 185 km/h (100 kt) prior to reaching the turning point.~~

**4 VISUAL MANOEUVRING (CIRCLING) IN THE VICINITY OF THE AERODROME**

**4.1 GENERAL**

Visual maneuvering (circling) is the term used to describe the visual phase of flight after completing an instrument approach, to bring an aircraft into position for landing on a runway which is not suitably located for straight-in approach.

**4.2 THE VISUAL MANEUVERING (CIRCLING) AREA**

**4.2.1**

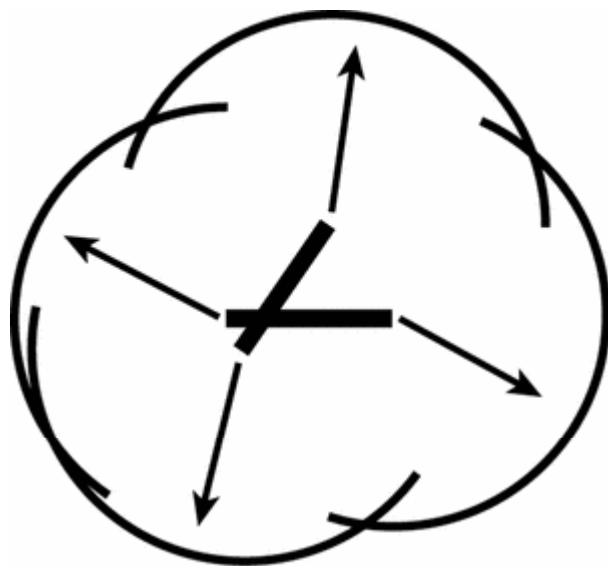
The visual maneuvering area for a circling approach is determined by drawing arcs centered on each runway threshold and joining those arcs with tangent lines (see Figure III-4-1). The radius of the arcs is related to:

- a. aircraft category;
- b. **speed:** speed for each category;
- c. **wind speed:** 46 km/h (25 kt) throughout the turn; and
- d. **bank angle:** 20° average or 3° per second, whichever requires less bank.

**NOTE:**

See Tables III-4-1 and III-4-2, and Figure III-4-1.

**Figure III-4-1. Visual Maneuvering (Circling Approach) Area**



Radius ( $\bar{R}$ ) varies with  
the aircraft category

**Table III-4-1. Example of determining radii for visual maneuvering (circling) area for aerodromes at 300m MSL (SI units)**

Category of Aircraft/IAS (km/h)	A/185	B/250	C/335	D/380	E/445
TAS at 300m MSL + 46 km/h wind factor	241	310	404	448	516
Radius (r) of turn (km)	1.28	2.08	3.46	4.34	5.76
Straight segment (km)	0.56	0.74	0.93	1.11	1.30
Radius ( $\bar{R}$ ) from threshold (km)	3.12	4.90	7.85	9.79	12.82

**Table III-4-2. Example of determining radii for visual maneuvering (circling) area for aerodromes at 1000 ft MSL (non-SI units)**

Category of Aircraft/IAS (kt)	A/100	B/135	C/180	D/205	E/240
TAS at 1000 ft MSL + 25 kt wind factor	131	168	215	242	279
Radius (r) of turn (NM)	0.69	1.13	1.85	2.34	3.12
Straight segment (NM) (this is a constant value)	0.30	0.40	0.50	0.60	0.70
Radius ( $\bar{R}$ ) from threshold (NM)	1.68	2.66	4.20	5.28	6.94

**NOTE:**

Radius ( $\bar{R}$ ) from threshold =  $2r + \text{straight segment}$ .

**Table III-4-3. OCA/H for visual maneuvering (circling) approach**

Aircraft Category	Obstacle Clearance m (ft)	Lowest OCH Above Aerodrome 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)

### 4.3 VISUAL MANEUVERING (CIRCLING) AREA NOT CONSIDERED FOR OBSTACLE CLEARANCE

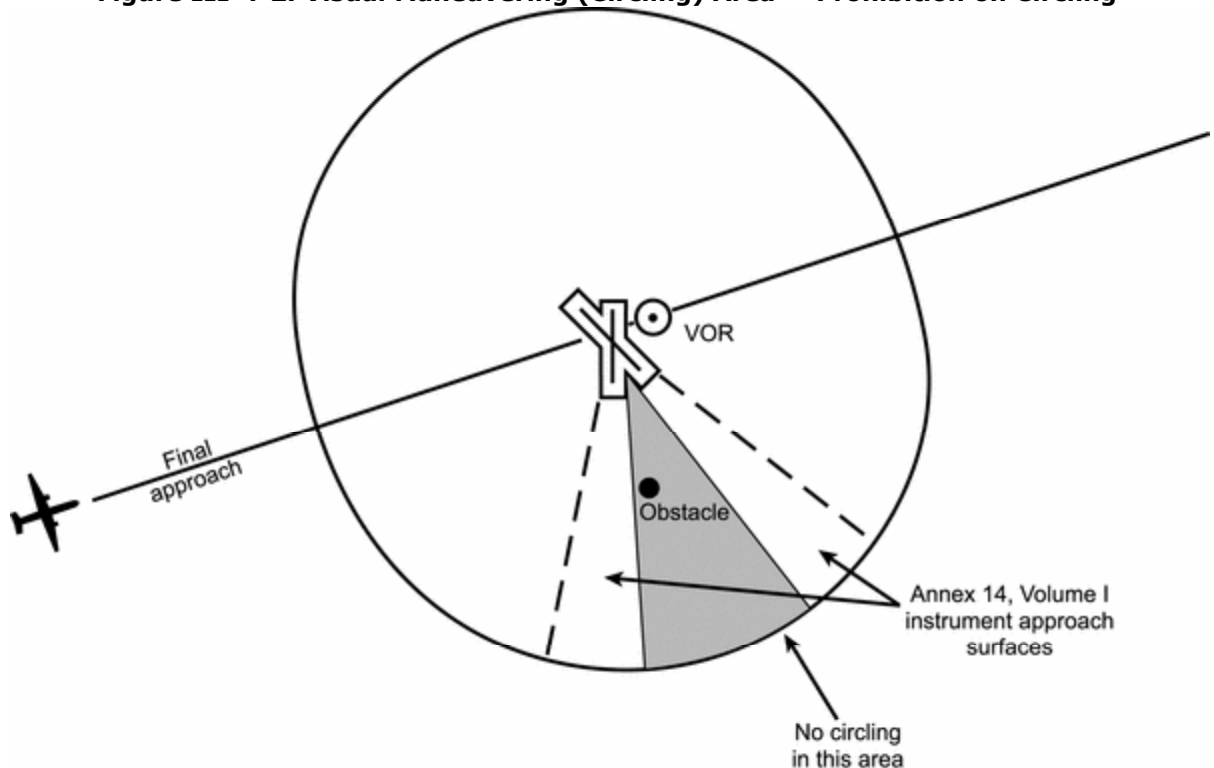
#### 4.3.1

It is permissible to eliminate from consideration a particular sector where a prominent obstacle exists in the visual maneuvering (circling) area outside the final approach and missed approach area.

#### 4.3.2

When this option is exercised, the published procedure prohibits circling within the total sector in which the obstacle exists (see Figure III-4-2).

**Figure III-4-2. Visual Maneuvering (Circling) Area — Prohibition on Circling**



### 4.4 OBSTACLE CLEARANCE

When the visual maneuvering (circling) area has been established, the obstacle clearance altitude / height (OCA/H) is determined for each category of aircraft (see Table III-4-3).

**NOTE:**

The information in Table III-4-3 should not be construed as operating minima.

**4.5 MINIMUM DESCENT ALTITUDE / HEIGHT (MDA/H)**

Descent below MDA(H) should not be made until:

- a. visual reference has been established and can be maintained;
- b. the pilot has the landing threshold in sight; and
- c. the required obstacle clearance can be maintained and the aircraft is in a position to carry out a landing.

**NOTE:**

The procedure does not provide protection from obstacles when the aircraft is below the OCA/H.

**4.6 VISUAL FLIGHT MANEUVER**

A circling approach is a visual flight maneuver. Each circling situation is different because of variables such as runway layout, final approach track, wind velocity and meteorological conditions. Therefore, there can be no single procedure designed that will cater for conducting a circling approach in every situation. After initial visual contact, the basic assumption is that the runway environment, (i.e., the runway threshold or approach lighting aids or other markings identifiable with the runway) should be kept in sight while at MDA/H for circling.

**4.7 MISSED APPROACH PROCEDURE WHILE CIRCLING**

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

**~~4.8 VISUAL MANEUVERING USING PRESCRIBED TRACK~~****~~4.8.1 General~~****~~4.8.1.1~~**

~~In those locations where clearly defined visual features permit, and if it is operationally desirable, a specific track for visual maneuvering may be prescribed (in addition to the circling area) by a State.~~

**~~4.8.1.2~~**

~~This procedure is described, for each aircraft category or group of categories (i.e., A and B) on a special chart on which the visual features used to define the track or other characteristic features near the track are shown. Note that:~~

- ~~— navigation is primarily by visual reference and any radio navigational information presented is advisory only;~~
- ~~— the missed approach for the normal instrument procedure applies, but the prescribed tracks provide for maneuvering to allow for a 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).~~

**~~4.8.1.3~~**

~~Since visual maneuvering with a prescribed track is intended for use where specific terrain features warrant such a procedure, it is necessary for the flight crew to be familiar with the terrain and visual cues to be used in weather conditions above the aerodrome operating minima prescribed for this procedure.~~

**~~4.8.2 Standard Track (General Case)~~**

~~(see Figure III-4-3)~~