



General criteria review

1 REVIEW

1.1 CONVERSION FACTORS

- 1 NM = 1 852 m
- 1 ft = 0.3048 m
- 1 m = 3.2808 ft
- 1 kt = 1 NM /h (1 852/3 600 m/s)
- 2π = 360°

1.2 TRUE AIR SPEED (TAS)

- TAS = k IAS

1.3 TURN RADIUS CALCULATION

1.3.1 Turn rate (R)

SI units :

Non SI units (ICAO) :

$$R = \frac{3431 \cdot \tan(i)}{\pi \cdot \text{TAS}} \quad \text{where:}$$

- i : Bank angle in °
- TAS : True air speed in Kt
- R : Rate of turn in °/s **up to a maximum of 3°/s (if greater, use 3°/s).**

Or

$$R = \frac{6\,355 \cdot \tan(i)}{\pi \cdot \text{TAS}}$$

where:

- R: rate of turn in °/s (**3° max**)
- TAS in km/h
- α : Bank angle in °

1.3.2 Turn radius

$$r = \frac{\text{TAS}}{20\pi R} \quad \text{where:}$$

- r : Turn radius in km or NM
- TAS : True air speed in kt

1.4 WIND

$V_w = 2h + 47$ where :

- h is the altitude in thousands of feet,
- V_w the wind in kt

1.5 WIND EFFECT

$E_w = T_v \times V_w$ T_v is the flight time

$T_v = \phi r / TAS$ ϕ in radians

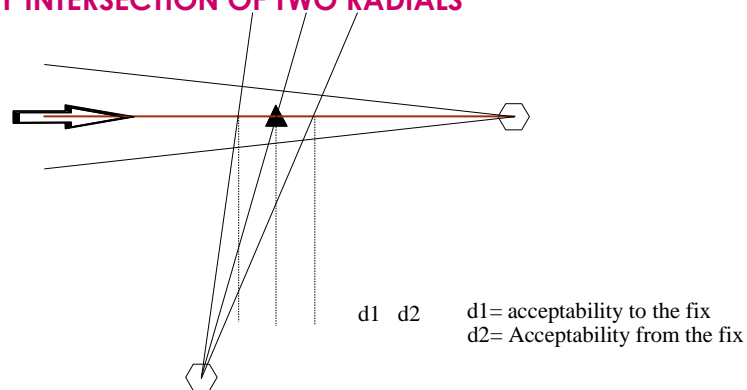
ICAO doc.8168 give a formula to compute wind effect using non-SI units. Wind effect is calculate for a 90°turn :

$E_{w90} = \frac{V_w}{40R}$ where:

- E_{w90} in NM,
- V_w : Wind speed in kt
- R : Rate in °/s

2 FIX TOLERANCES AREA

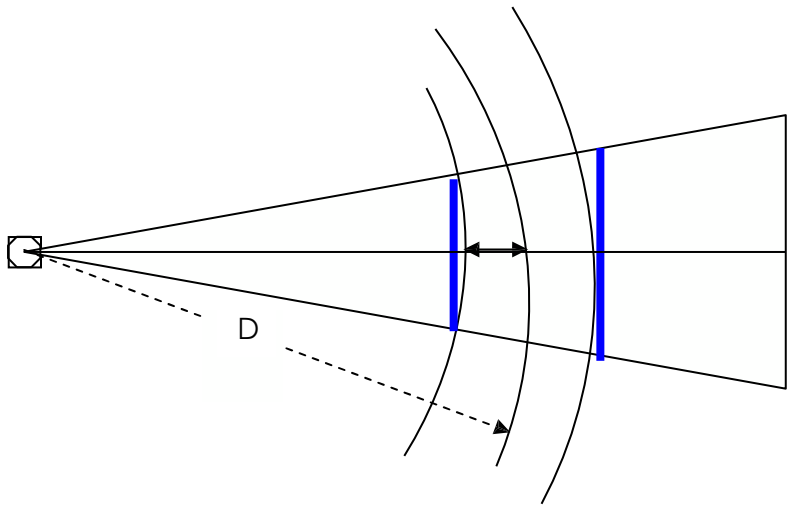
2.1 FIX DEFINED BY INTERSECTION OF TWO RADIALS



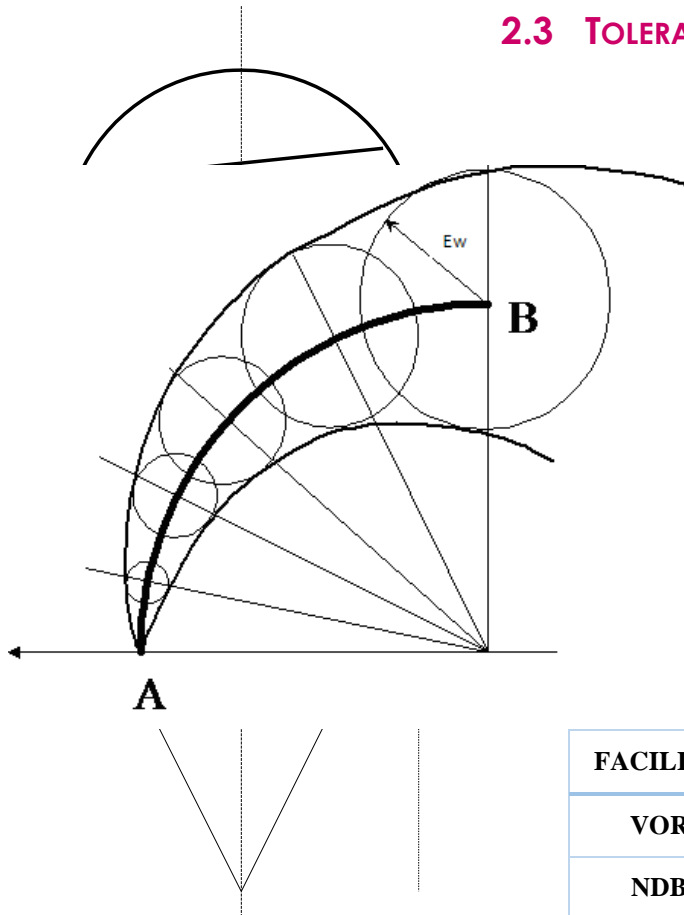
FACILITY	TRACKING (°)	INTERSECTING (°)
VOR	5.2	4.5
NDB	6.9	6.2
ILS	2.4	1.4

2.2 FIX DEFINED BY INTERSECTION A RADIAL AND A DISTANCE

$d = 0.25 + 1.25 \% D$ where D is the slant distance in NM



2.3 TOLERANCE OVERHEAD A FACILITY



3 EXERCISES

3.1 RADIUS AND RATES OF TURNS

Compute the rate of turn and the radius of turn for :

- IAS : 250 kt;
- Altitude : 5 000 ft ;
- Temperature : ISA+15°;
- Bank angle : 25°.

3.2 WIND

3.2.1 Compute the wind effect at 90° for :

- IAS : 250 kt
- Altitude : 5 000 ft
- Temperature : ISA+15°
- Bank angle : 25°
- Wind : ICAO
- Rate of turn : result of the preceding calculation

