

VFR Weather Minima (Below 10,000 ft)

Airspace	Visibility	Distance from Cloud
Class C, E	5,000 m	1,000 ft vertical · 1,500 m horizontal
Class D	5,000 m	1,000 ft above · 500 ft below · 600 m horizontal
Class G (Above 3,000 ft)	5,000 m	1,000 ft vertical · 1,500 m horizontal
Class G (Below 3,000 ft)	5,000 m	Clear of cloud* · In sight of ground

* Only applies if aircraft is equipped with a VHF radio.

Navigation Rules

- **Hemispherical Cruising Levels:** Applies at or above 3,000 ft AMSL (and $\geq 1,500$ ft AGL) in uncontrolled airspace, based on magnetic track.
- **Track 000°-179°:** Odd thousands plus 500 ft.
- **Track 180°-359°:** Even thousands plus 500 ft.
- **Magnetic Variation:** Convert True Heading (TH) to Magnetic Heading (MH). "Variation East, Magnetic Least; Variation West, Magnetic Best."

$$MH = TH - \text{East Var} \quad (\text{or} + \text{West Var})$$

- **1 in 60 Rule (Track Error):**

$$TE = (\text{Distance Off Track} \div \text{Distance Flown}) \times 60$$

Loading Systems (Day VFR)

- **System Alpha:** Uses kg. Graphical trimsheet only — plot ZFW and TOW by dropping final lines. Do not calculate moments manually.
- **System Bravo:** Uses lbs & inches. Normal limit 2,200 lbs; Utility 1,850 lbs. Convert kg/litres first.

$$\text{Index} = \text{Weight} \times \text{Arm} \div 1000$$

- **System Charlie:** Uses kg & mm. Never plot raw index on CG envelope; convert back first.

$$\text{Index} = \text{Weight} \times \text{Arm} \div 100$$

$$CG = (\text{Total Index} \times 100) \div \text{Total Weight}$$

Threat & Error Management (TEM)

- **The Framework:** Manage Threats → prevent Errors → prevent Undesired Aircraft States (UAS).
- **Threats:** Anticipated (weather), Unanticipated (system failure), Latent (fatigue, optical illusions).
- **Errors:** Slips (wrong execution), Lapses (memory failure), Mistakes (flawed plan).
- **Error Frequencies:** Systematic (consistent stage), Random (mental overload), Sporadic (occasional).
- **Undesired Aircraft States:** Last stage before incident. Categories: Configuration, Handling, Ground Navigation.

Aircraft Technical Knowledge

- **Carburettor Icing:** Most likely to form between -7°C and 21°C in areas of high humidity or visible moisture.
- **Detonation:** Spontaneous combustion of the end-gas. Caused by sub-spec fuel grade or excessive engine temperatures.
- **Pre-ignition:** Fuel/air mixture ignites before the spark plug fires, typically caused by a hot spot in the cylinder.

Fuel & Performance

- **Density Height:**
- $$DH = \text{Pressure Height} + (120 \times \text{ISA Deviation})$$
- **Fixed Reserve — Aeroplane:** 30 minutes at planned cruise consumption rate.
 - **Fixed Reserve — Helicopter:** 20 minutes at planned cruise consumption rate.