VICTORIA FLYING CLUB

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- Bookings, Questions

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Attitudes and Movements

- Definition and Motivation
- **Normal Aircraft Attitudes**
- **Rotational Movements**

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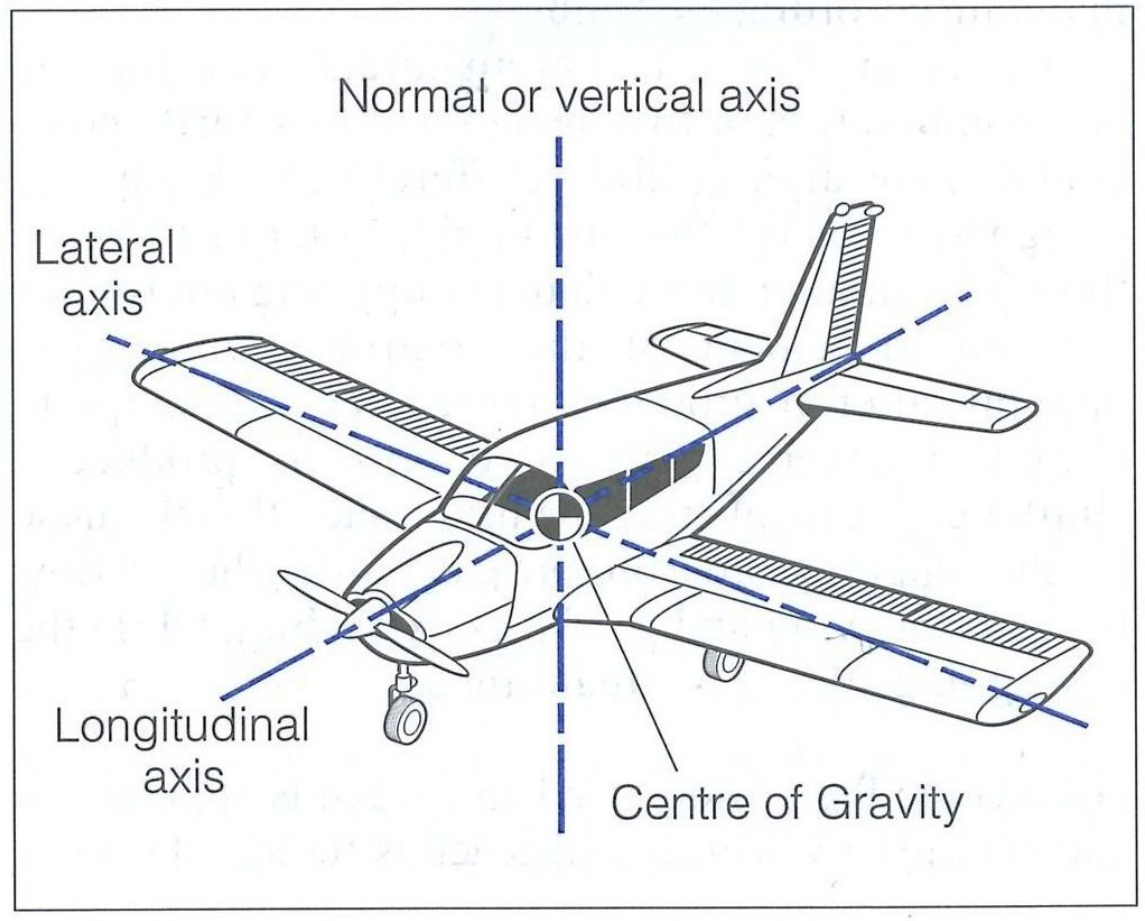
Attitudes and Movements



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Cruise Attitude

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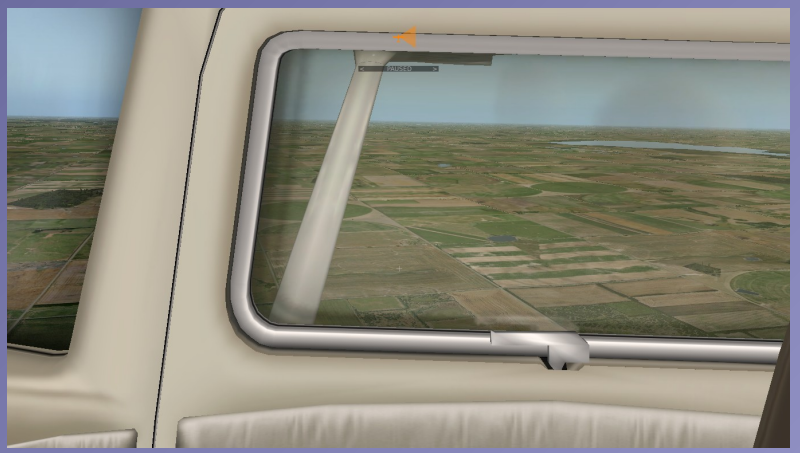
Cruise Attitude



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Pitch Attitudes: Nose-Up Attitude

- Normal Nose-Up Attitude Range to ***+15°***

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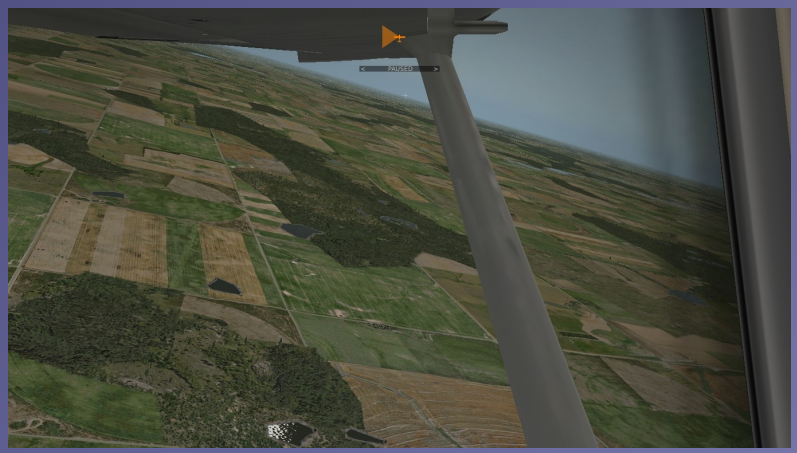
Pitch Attitudes: Nose-Up Attitude



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Pitch Attitudes: Nose-Down Attitude

- Normal Nose-Down Attitude Range to ***-10°***

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Pitch Attitudes: Nose-Down Attitude

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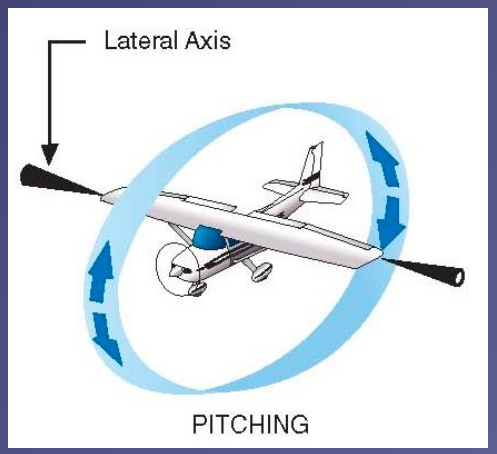
Pitching – Establishing and Recovering a Pitch Attitude



Push / Pull, Adjust Pressure

- Very *small* **movements** required (millimeters)
- Control **pressures** change *gradually* after establishing and holding new pitch attitude
- **Trim** may help to relieve control pressures

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Bank Attitudes: Left-Banked Attitude

- Normal Left-Banked Attitude Range to ***-30°***

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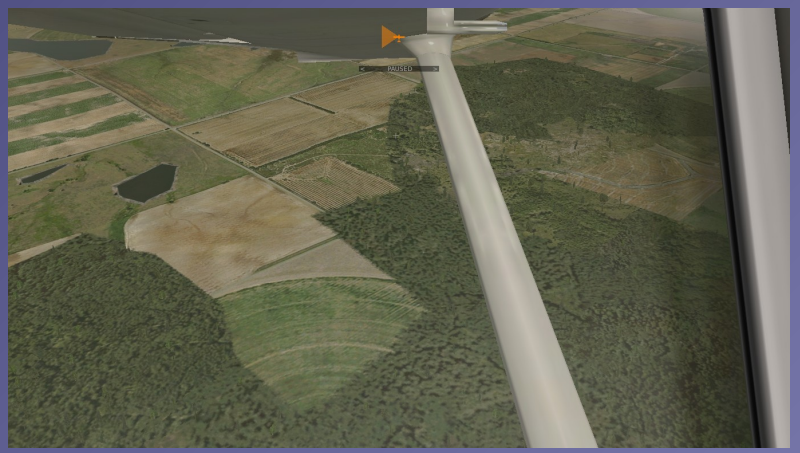
Bank Attitudes: Left-Banked Attitude



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Bank Attitudes: Right-Banked Attitude

- Normal Right-Banked Attitude Range to **+30°**

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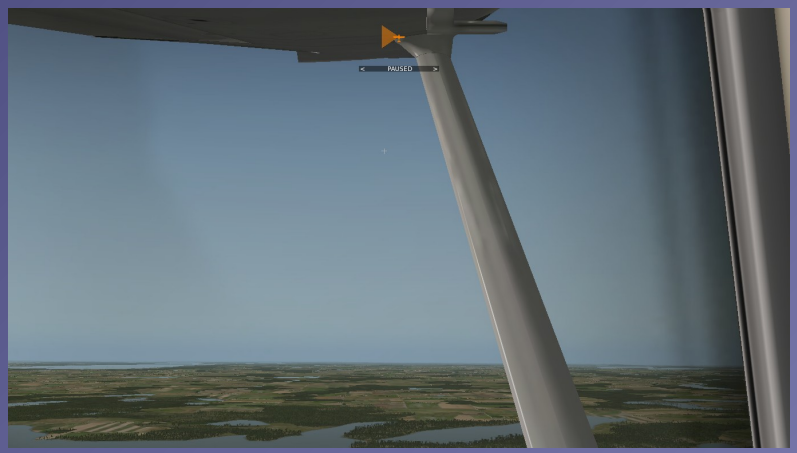
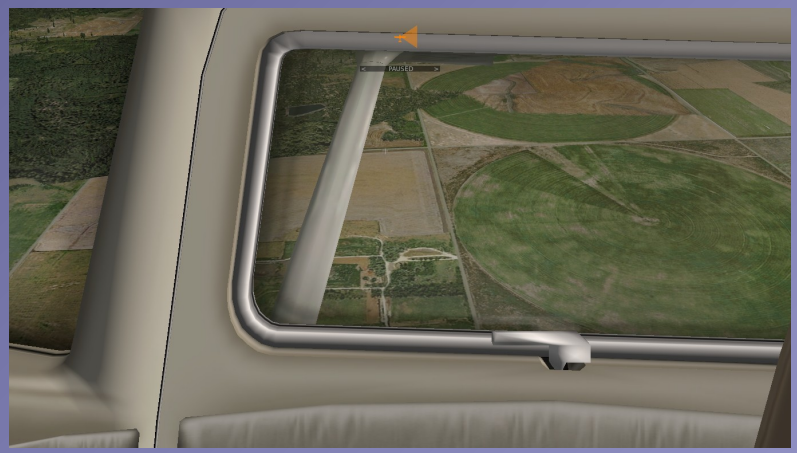
Bank Attitudes: Right-Banked Attitude





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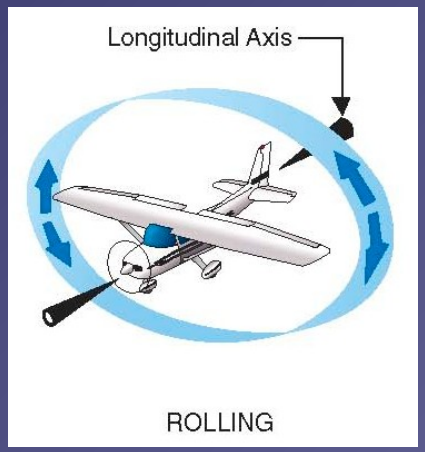
Rolling – Establishing and Recovering a Banked Attitude



Select

Neutralize

- Rotation **angle** controls *rate* of roll
- **Select** rotation angle *until* banked attitude is established
- **Neutralize** yoke to *maintain* banked attitude
- **Select** opposite rotation angle *until* cruise attitude is established
- **Neutralize** yoke to *maintain* cruise attitude

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Combined Attitudes

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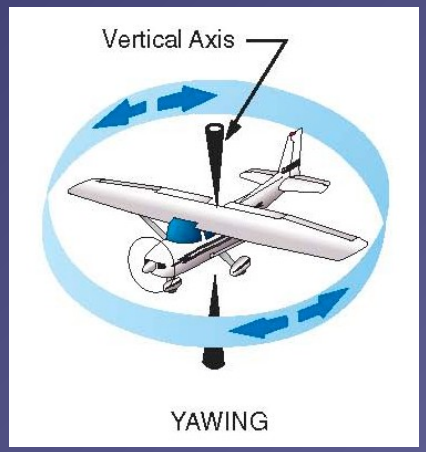
Yawing – Controlling Yaw and Coordination



- **Yawing** is a rotational movement about the **vertical** (normal) axis
- Yawing changes the **heading** of the aircraft (left, right)
- Yawing is primarily controlled with the **rudder** pedals
- *Coordinated flight* is desired in most situations (**kick and center the ball**)
- Real and indicated heading change (**heading indicator**, **turn coordinator**)

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Straight-and-Level Flight

- Definition and Motivation
- **Straight Flight**
- **Level Flight**

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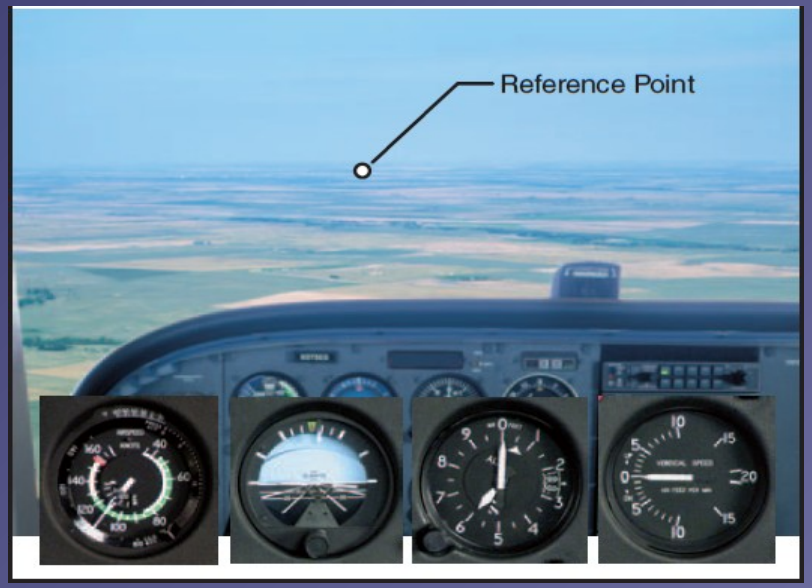
Straight Flight



- Maintain *constant* **heading** (horizon and reference point)
- Control **roll** and **yaw** to keep **wings level** in *coordinated flight*
- Check **attitude indicator** (bank attitude), **heading indicator** and **turn coordinator**
- Straight flight is *not* necessarily level flight (**variable altitude**)

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Level Flight

- Maintain *constant* **altitude** (attitude and power)
- Control **pitch** and **power** to maintain **altitude** in *coordinated flight*
- Check **attitude indicator** (pitch attitude), **RPM** (power setting), **altitude indicator** and **vertical speed indicator**
- Level flight is *not* necessarily straight flight (**variable heading**)

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Level Flight – Attitude and Power

- *Attitude plus power equals performance*
- **Less power** requires **more nose-up** (less nose-down) attitude (and vice versa) to *maintain* altitude at **lower constant airspeed**
- **More power** requires **less nose-up** (more nose-down) attitude (and vice versa) to *maintain* altitude at **higher constant airspeed**
- **Trim** is used to compensate control forces at different settings

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Straight-and-Level Flight

- Maintain **heading** and **altitude** in close tolerances
- *Restrained* use of all three flight controls
- Control **roll** and **yaw** to maintain **heading**
- Control **pitch** and **power** to maintain **altitude**
- Maintain *coordinated flight*
- Level flight at different power settings (airspeeds) is required for **separation** with other traffic
- Pitch and power affect the aerodynamic and economic **performance** of the aircraft (range and endurance)

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Gentle, Medium and Steep Turns

- Motivation and Definition
- Initiating, Maintaining and Recovering Coordinated **Gentle**, **Medium Level** and **Steep Turns**

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Gentle, Medium and Steep Level Turns

- **Gentle** level turns – up to ***15°*** bank angle
- **Medium** level turns – ***15°*** up to ***30°*** bank angle
- **Steep** level turns – beyond 30° bank angle (***45°***)
- **Heading** changes maintaining a **constant altitude**

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Initiating a Coordinated Level Turn

- Perform **lookout** in **cruise attitude** before initiating a turn
- Establish a **banked attitude** using the **yoke**
- Apply **rudder** *as required* to remain **coordinated**
- Center **yoke** after **banked attitude** is established

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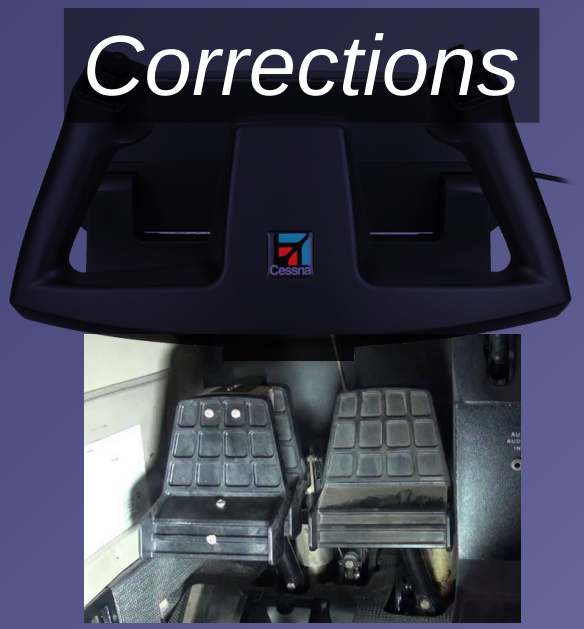
Maintaining a Coordinated Level Turn



- Apply **back-pressure** *as required* to maintain **pitch attitude**
- Apply **corrections** *as required* to maintain **bank attitude**
- Apply **rudder** *as required* to remain **coordinated**

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External References

- Continue to **lookout** and observe **references** during turn
- **Horizon** remains the primary attitude reference
- Nose moves steadily around the horizon neither rising or falling
- **Landmarks** can be used to establish headings

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Recovering a Coordinated Level Turn

- Continue to **lookout** observing **references** during recovery
- Turns need to be finished **anticipatory** – ***half the bank angle***
- Establish **cruise attitude** using the **yoke**
- Control **yaw** with **rudder** as required to remain **coordinated**
- Adjust **cruise attitude** and **trim**

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Steep Turns

45° Steep Turn

30° Medium Turn

- **Steep** turns – beyond ***30°*** bank angle
- **Evasive actions** and collision avoidance
- Control **coordination practice**
- Higher **load factor**, **stall speed** and **required power**

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Performing a Steep Level Turn

- **Lookout** all around before initiating a steep turn
- Initiate steep level turn like medium level turn
- **Add power** beyond ***30°*** bank angle to maintain **safe airspeed** above increased stall speed
- Correct as necessary to **maintain attitude**
- Remain **coordinated** and correct **overbanking**
- Left and right turns require *different* control inputs
- **Reduce power** accordingly during recovery
- Transition from left to right requires **smooth control** and **power adjustments**