EAGLE FLIGHT TRAINING LIMITED

Aerobatics Flight

The Stall Turn/ Hammerhead

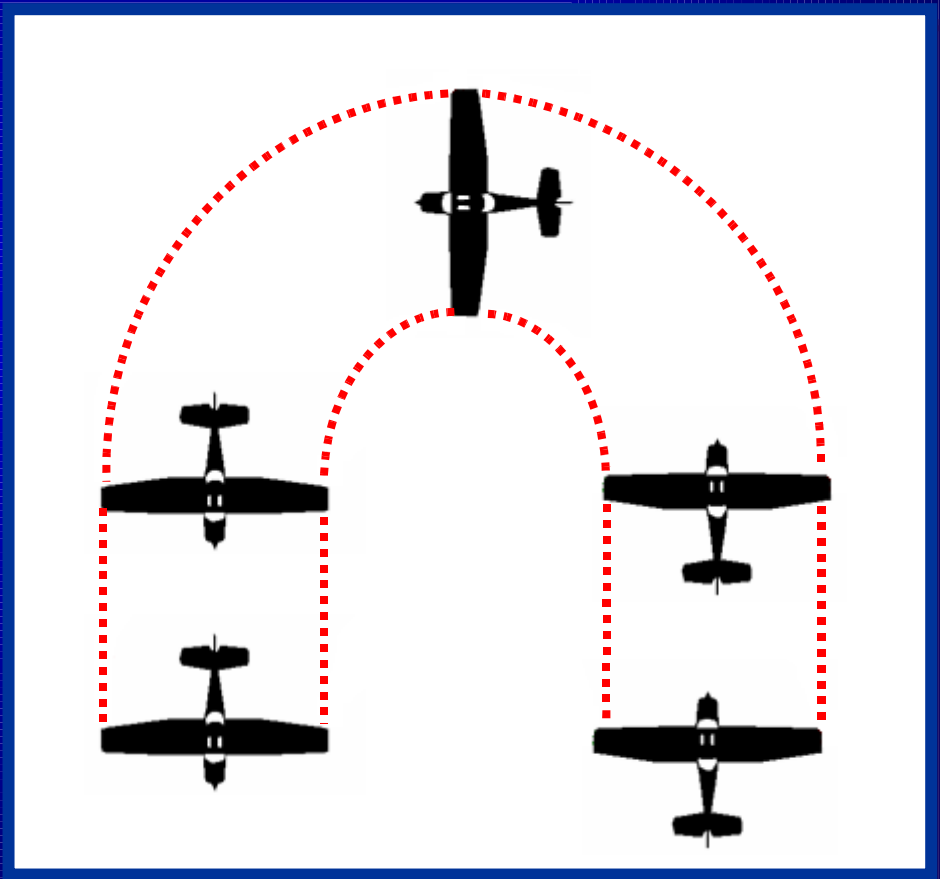
Revision 1 - 18 Nov 2004

Objective

- To fly the aircraft completely through 180° Yaw – The stall turn

The Manoeuvre

- During a stall turn the aircraft is climbed vertically, yawed through 180° about the normal axis, before diving vertically and recovering in the opposite direction to that of entry.



Considerations

Secondary Effect Of Yaw

- As soon as aircraft is yawed, the outer wing will speed up causing unwanted roll.
- In order to prevent this apply opposite aileron to direction of yaw as soon as rudder is applied.
- Rudder must be applied smoothly and progressively to full deflection.
- More aileron use required to the left than right
- Start to neutralize aileron passing horizontal

Considerations

Inertia

- When checking the aircraft attitude in the vertical, there is tendency for the aircraft to keep pitching due to inertia.

- Must be vertical or wing won't cut through reference point, can use elevator to make small corrections.

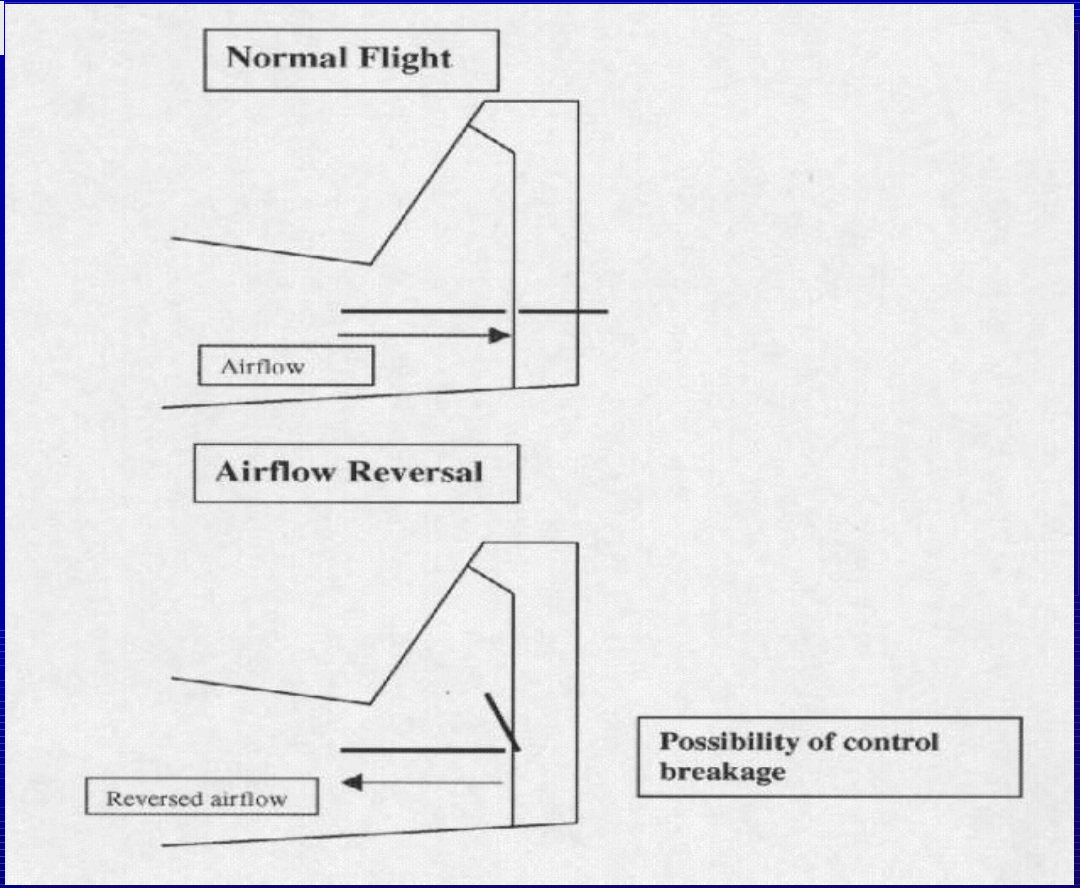
Considerations

Vertical Unusual Attitudes

- A/C can pitch over forwards or backwards
- Excess gyroscopic forces on engine / propeller if throttle not closed
- Danger of tail slide and damage to controls due to airflow reversal

Considerations

- Airflow Reversal and resultant damage to control



Considerations

Direction of Stall turn

- Left easier than right due to the slipstream tending to yaw the nose

Control Effectiveness during Stall Turn

- Rapidly changing IAS & effectiveness
  - Too slow = danger of tail slide
  - Too fast = resistance to the yaw

Engine Handling

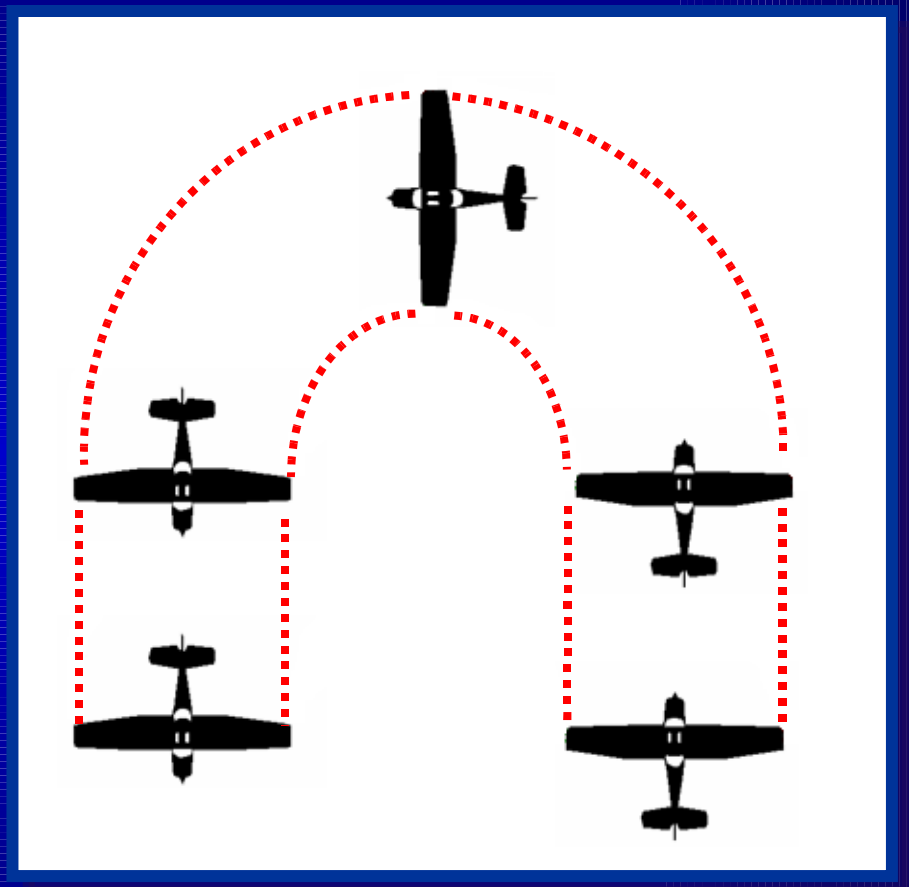
- Power (RPM) Smooth movements (red line)
- Mixture Full rich
- Carb heat Normal use
- T's & P's Monitor

Airmanship/ Human Factors

- IMSAFE – LOOKOUT– HASELL-HELL
- Use well defined ref points and features
- Flaps up
- Load factor, airspeed and power limits (AFM)

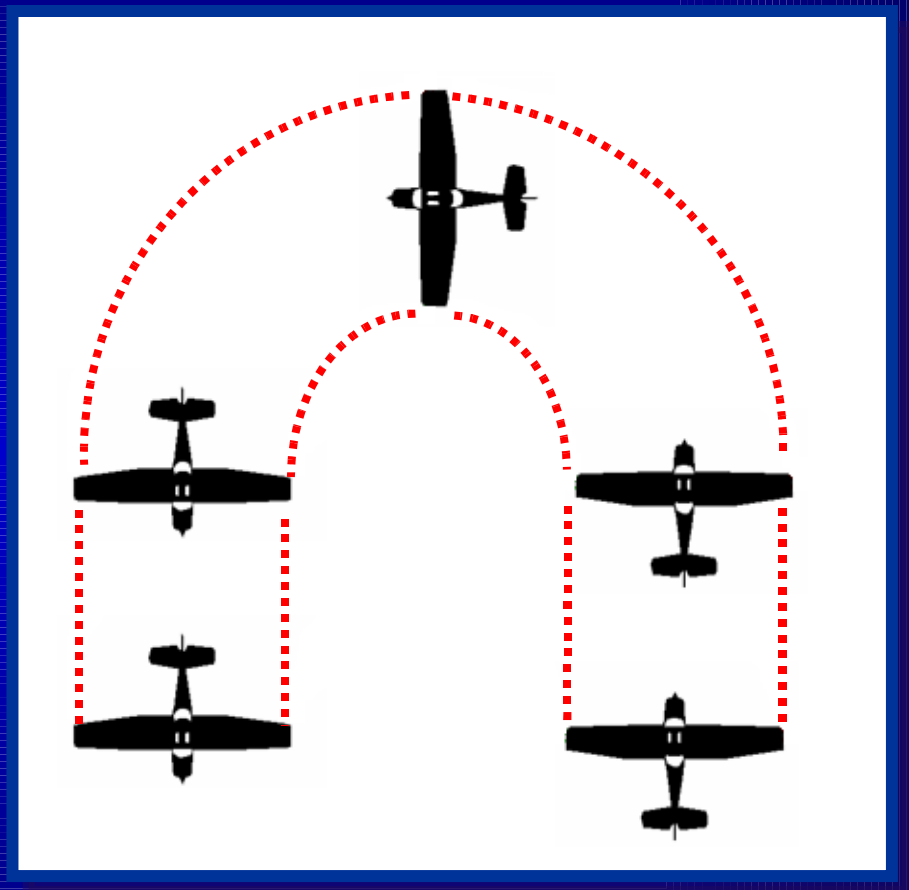
Air Exercise

- Select a line feature.
- Accelerate on the line feature in balance -Left rudder
- At entry IAS -Positive pitch up
- Check wings level as nose passes through horizon
- As feet pass through horizon apply full power
- Right rudder



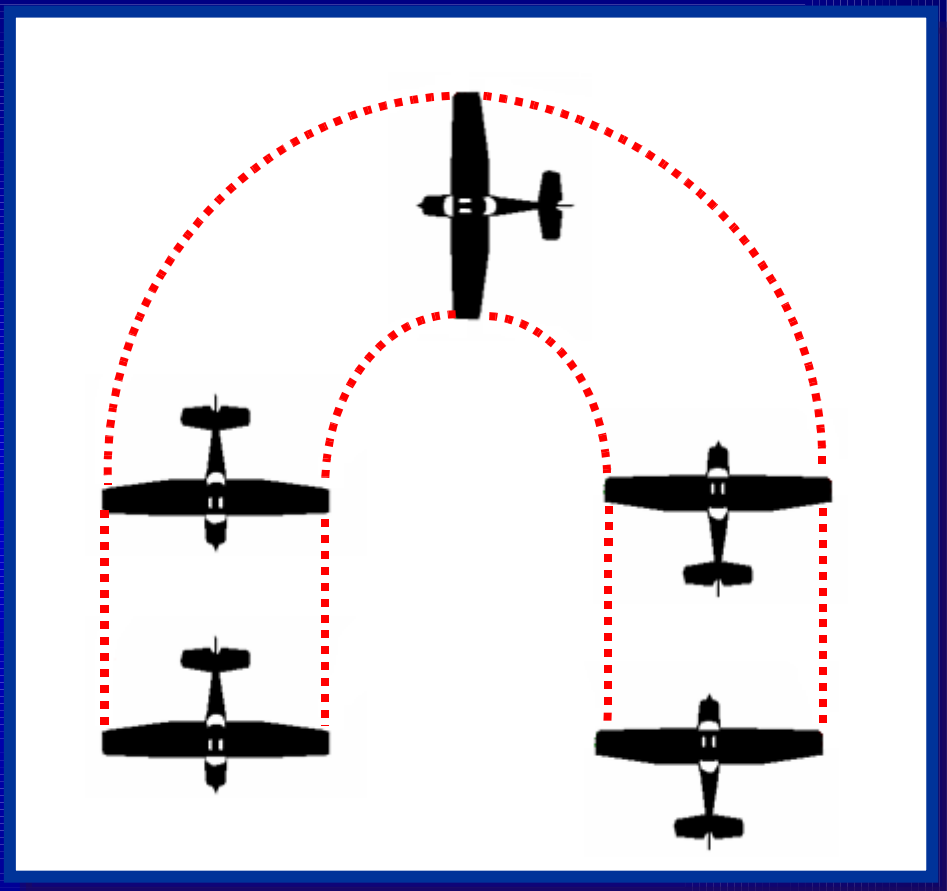
Air Exercise

- And look to wingtip in direction of turn
- Check pitch approaching the vertical and ease forward to maintain the vertical attitude
- Pause in vertical around 2 secs
- Left 55 Knots (approx)
- Right 60 Knots (approx)



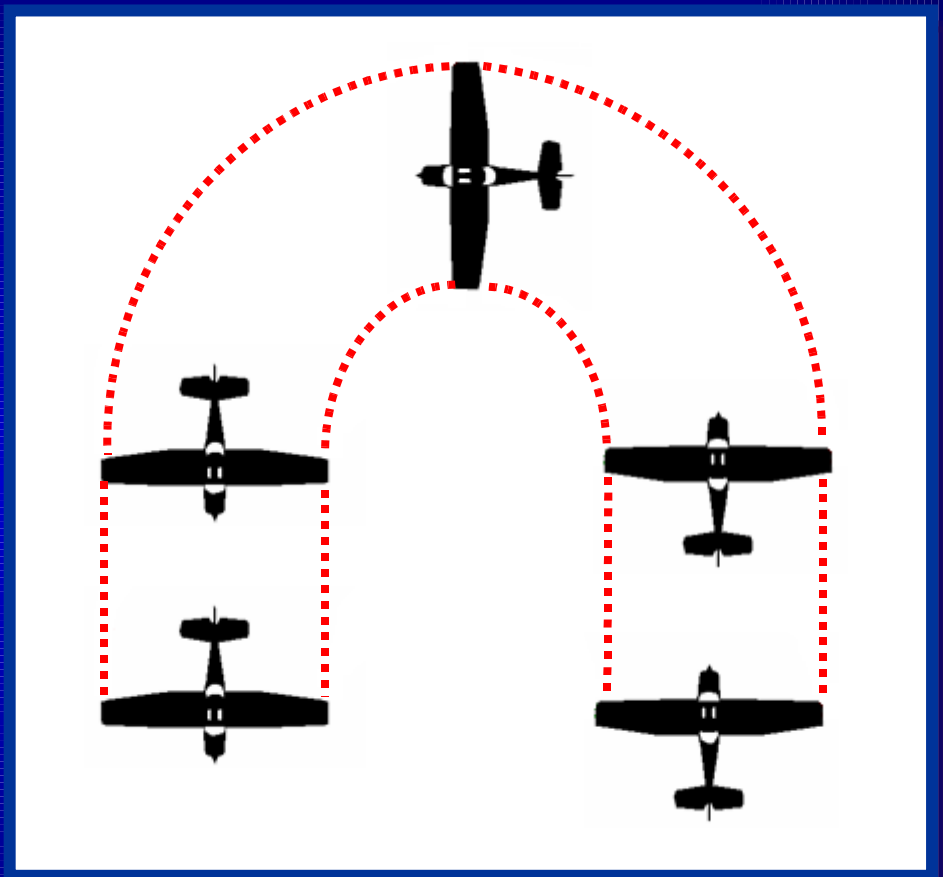
Air Exercise

- Smoothly and fully apply rudder in the desired direction of turn
- Apply opposite aileron if/ as required to prevent roll.
- Smoothly close the throttle as A/C nose passes through the horizon



Air Exercise

- Allow the nose to drop through to a vertical descent
- Look at the line feature, apply opposite rudder approaching the vertical to stop the aircraft vertically nose down

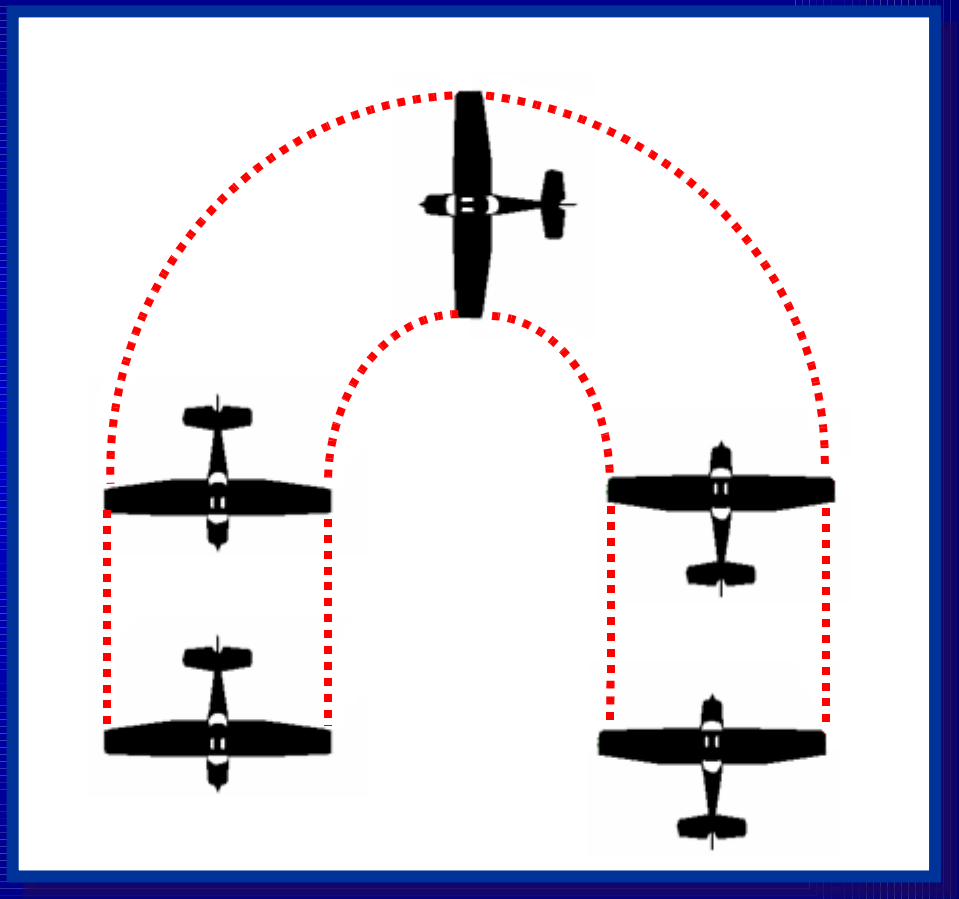


Air Exercise

- Centralise rudder
- Pause in vertical
- Ease out of dive (wings level)

  Pitch up to the climbing attitude

  Set climb power



Questions