Instrument flying introduction

Objectives

- To experience the sensory illusions that occur when deprived of visual references.
- To maintain straight and level flight by sole reference to the aeroplane's instruments.
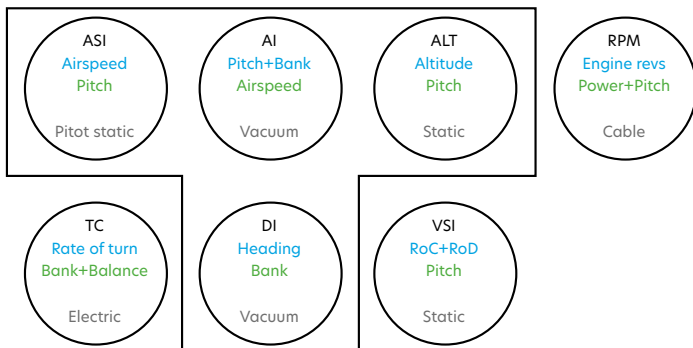
Considerations

- Power + Attitude = Performance

Control instruments

- Attitude indicator
- Tachometer

Performance instruments

- Airspeed indicator
- Altimeter
- Directional indicator
- Turn coordinator
- Balance indicator
- Vertical speed indicator

Instrument layout
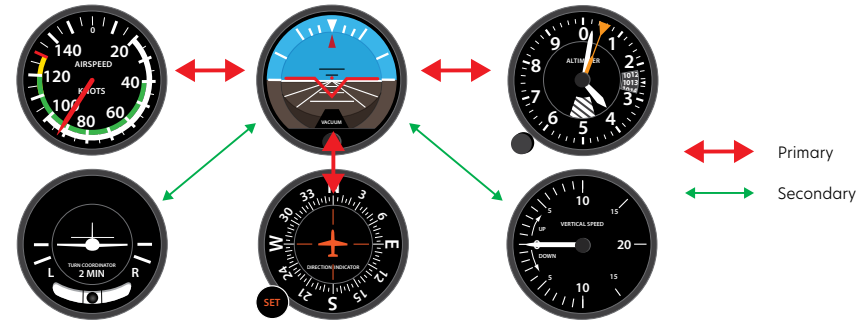
- Basic T plus TC, VSI and RPM

Instrument lag

- All instruments have lag (delay in indicating correct information)
- Only VSI lag is significant, must be checked against other information

Air exercise

- Demonstration of limitations of vestibular and muscular system

Selective radial scan

Primary

Secondary

Maintain straight and level

- Set attitude, check altitude, heading and airspeed being maintained
- Check in balance and VSI showing level

Attain straight and level from a climb or descent

- APT and PAT

Turns

- All turns at rate one

Airmanship

- Instrument check while taxiing
- Can't use peripheral vision
- Need to consciously counteract inertia
- Change – check – hold – adjust – trim
- Lookout "clear left"….

Aeroplane management

- Pitot static system operation
- Set AI symbol before flight, don't change

Human factors

Balance organs

- Sense angular acceleration and change of direction in 3 planes, and body tilt
- Can't detect change when it's very slow or constant

Muscular pressure sensors

- Affected by gravity
- Know if standing or sitting with eyes closed
- Can't distinguish between causes of increased G

Vision

- Most powerful system
- Usually resolves ambiguous information from other senses
- But in IF conditions visual references not available
- Leans
- Trust the instruments