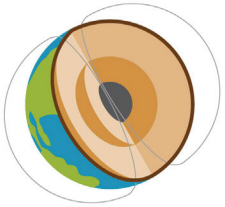
Compass Use

Objective

To turn accurately onto and maintain compass headings, compensating for known errors in the magnetic compass.

1. Considerations



Variation

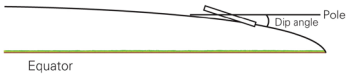
- Difference between true North and magnetic North
- Bar magnet will align itself with lines of flux

Deviation

- Aircraft magnet acted upon by things other than the lines of flux, ie, metal objects, aircraft, etc
- Compensated for by a compass swing – done by an engineer

Dip

- At magnetic equator flux lines are parallel with surface
- As they approach the poles they dip down towards the earth's surface
- A bar magnet tries to align with the lines of flux dip towards the earth's surface
- To compensate, the bar magnet is set on a pivot, but some residual dip remains
- The pivot arrangement is fairly unstable, so compass card and magnets are immersed in fluid that damps out oscillations – also providing lubrication



Acceleration Errors

SAND

- Apparent turn **S**outh when **A**ccelerating, apparent turn **N**orth when **D**ecelerating

Turning Errors

ONUS

- To compensate must **O**verturn on **N**orth and **U**nderturn on **S**outh
- Use Rate one turn, maximum error on N or S = 30°

2. Airmanship

- Compass checked during taxi for correct sense and runway heading
- Turn coordinator checked for serviceability
- Lookout

3. Aeroplane Management

- Compass system checked for serviceability before flight
- Deviation card is valid
- Keep metal items as far away from the compass as possible.
- Suction gauge should be checked during engine run-up (4.5–5.2")

4. Human Factors

- Helpful to have a 3-D picture of compass in your head
- In-flight mental calculations should be kept to a minimum
- Cover failed instruments to avoid confusion

5. Air Exercise

- Demonstration of acceleration and deceleration errors
- Demonstration of turning errors

Making a Turn

- Always turn in shortest direction
- Check present heading against desired heading – use shortest arc
- Decide on amount of overturn or underturn – ONUS
- Lookout and roll in using Rate 1 turn – balance
- Anticipate roll out
- Select reference point
- Level wings – hold for compass to settle
- Check heading and make correction if required