Flying the Magnetic Compass

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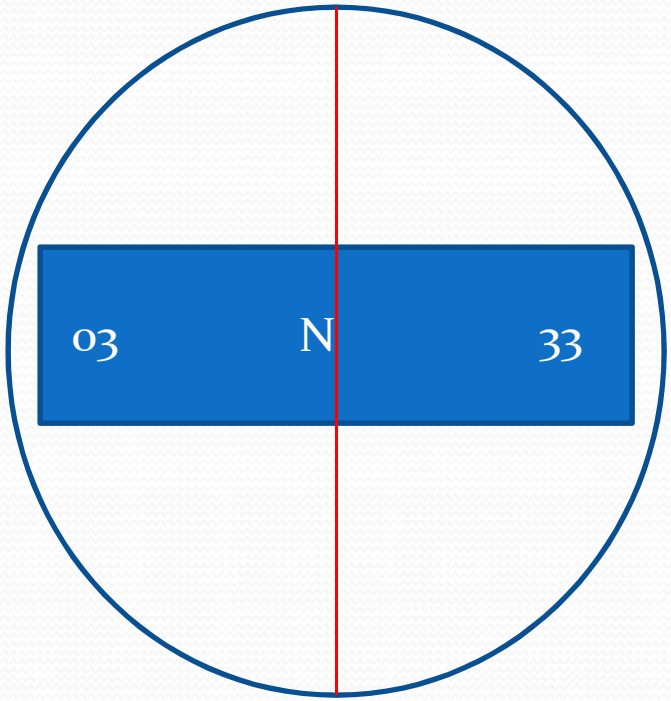
Sense of Direction

Sense of direction is reversed – read right to left



In this case the luber line is slightly West of North

Units

Each Major (Tall) Unit is 10 degrees
e.g. this is 20 degrees

Each Minor (short) Unit is 5 degrees
e.g. this is 345 degrees

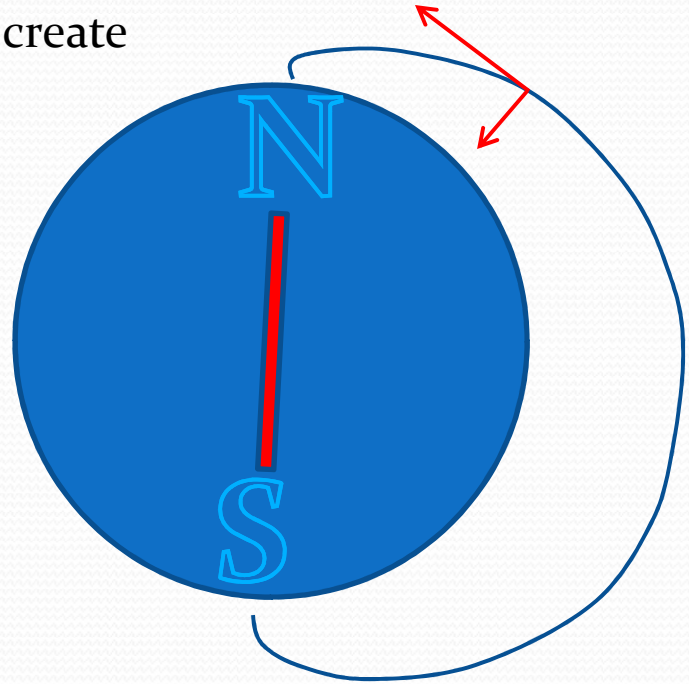
Tips to Interpret Magnetic Compass

- Find closest 30 degree Number to right of Luber Line, e.g. 30, 60, 90, etc.
- Add large units that are between this number and the Luber line as either 10 or 20 degrees (note there can be no more than 2 large units)
- Then add remaining small unit (5 deg), if there is one, between large unit and Luber line

Example: 030 is to the right of Luber and one large unit 30 + 10 = 40
There is one small unit between Luber and 1st large unit, so 40 + 5 = 45
Interpolate between Luber line and small unit, say 3 degrees, so 45 + 3 = 48

Downward Flux in Mid and Higher Latitudes

The downward vector of the Magnetic flux acts on the Internal components to create



Note at equator no vertical component

Turning Errors

- Turn from N heading to E results in *lag*
- Turn from N heading to W results in *lead*

(use styrene cup to explain)

- As turns approach E or W they become minimal
- SI/NO Rule
  - When turning to a Southerly heading, pass it (yes)
  - When turning to a Northerly heading, don't pass it (no)

Turning Errors (cont.)

- How Does One Apply the SI/NO rule?
  - Trial and Error (not efficient)
  - Approximate overshoots, undershoots
    - Use standard rate turns - determine bank angle (~12 deg)
    - **Add bank angle to ½ latitude (for here about 30 deg)**
- This 'guesstimate' is maximum when approaching N or S
- Don't use when approaching E or W
- Reduce guesstimate for intermediate headings

Turning Errors (cont.)

- Use timing and fly standard rate turns

Turn (deg)	30	45	60	90
Time (sec)	10	15	20	30

- Combination of SI/NO and timing may be best
- It may take 5 hours or more of instrument flying using magnetic compass alone to get proficient (efficient)

Acceleration Errors

- On East or West heading, acceleration causes turn to North
- Likewise, deceleration causes turn to South

(use styrene cup to explain)

- Remember ANDS (Accelerate N, Decelerate S)

Compass Deviation Card

FOR (MH)	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
STEER (CH)	359°	30°	60°	88°	120°	152°	183°	212°	240°	268°	300°	329°
RADIO ON ☑							RADIO OFF ☐					

Opinion: examine for each aircraft – if less than 2 degrees of deviation error it is likely not worth the effort to try to include since one's ability to interpolate compass readings to less than 2 degrees is problematic

Note: This likely has been developed for radio (electrical) equipment on (see card) – in case of electrical failure, compass errors may be larger than indicated

Finally

- Call ARTCC and request help for loss or suspected loss of any gyro of vacuum system
- ARTCC can provide ‘gyro-out’ vectors in case of loss of directional gyro
- In case of loss of AI or total vacuum loss (this in my opinion is an emergency so declare it) they can assist

Questions?