Ex. 23 - Diversion

What you will learn:

- ✓ How to plan and carry out diversion to a different destination in-flight.

Why learn this:

- ✓ You may need to divert because of:
  - weather deteriorating enroute
  - sick person on board
  - airplane problems
  - insufficient fuel (unexpected headwinds?)
  - just changing your mind?

Links:

- ✓ You have already learned about plotting your track and planning your trip
- ✓ You have practiced map reading and track corrections in-flight
- ✓ You learned the basic Aviate – Navigate – Communicate principle.

Let's see how much you already know:

- Q What are the VNC and the VTA, and what are the differences between the two?
- Q What do the following VNC symbols stand for?

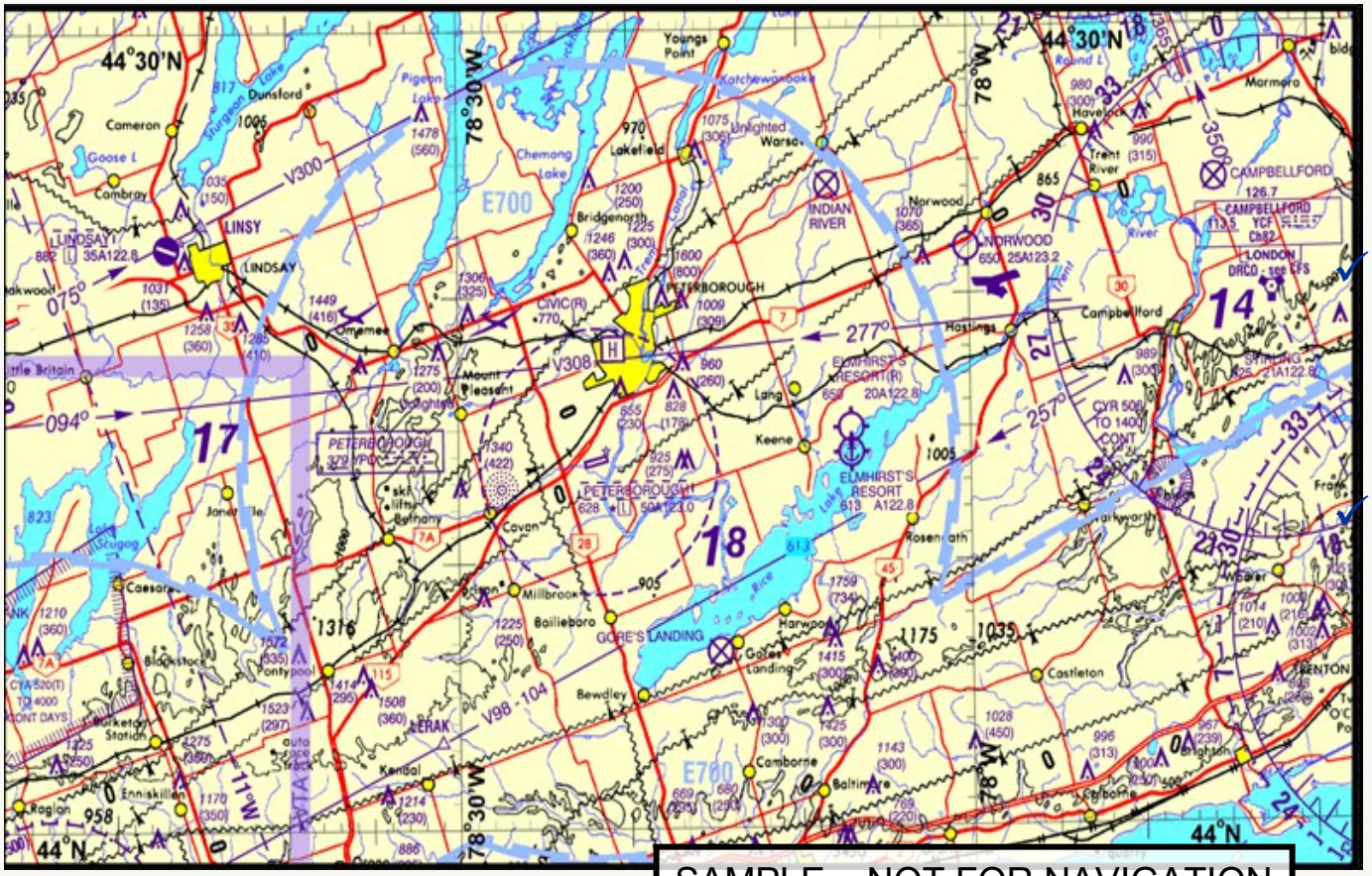
- Q What aerodrome information is available on a VNC?
- Q Where can you obtain additional aerodrome information?
- Q How do you estimate wind direction and speed in flight?
- Q How can you obtain weather updates in flight?
- Q What are weather minima for VFR flight in controlled and uncontrolled airspace?
- Q What are altitude restrictions for flight over built-up areas?

Theories and Definitions:

- ✓ Estimating
  - Distance
  - Time
  - Fuel
  - Track
  - Heading
- ✓ Communicating Your Diversion.

Estimating Distance

Can you point out latitude and longitude lines?



- 1 degree of latitude = 60 nautical miles
- 1 minute of latitude = 1 nautical mile
- Use your pencil and VNC minute notches.

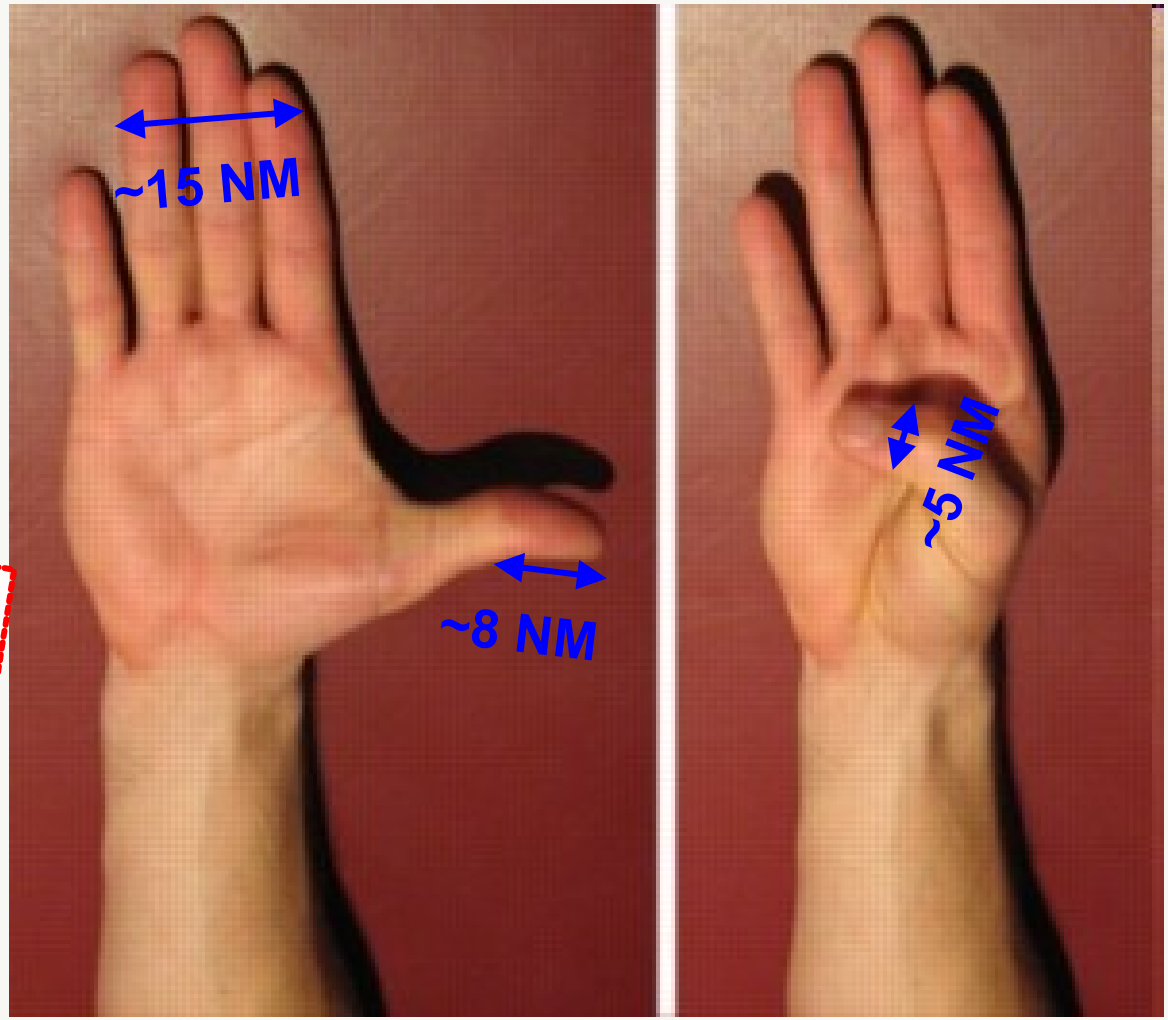
Which of the two lines are always a constant distance apart?

Estimating Distance

On a VNC:

DON'T USE THESE APPROXIMATIONS!

MEASURE YOUR OWN HAND!

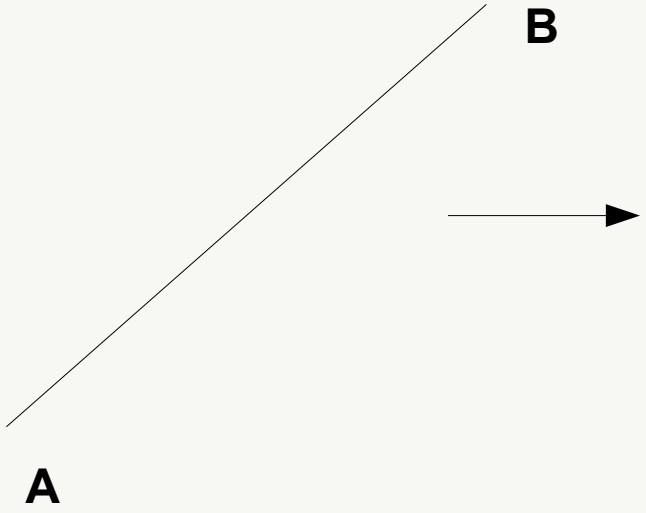


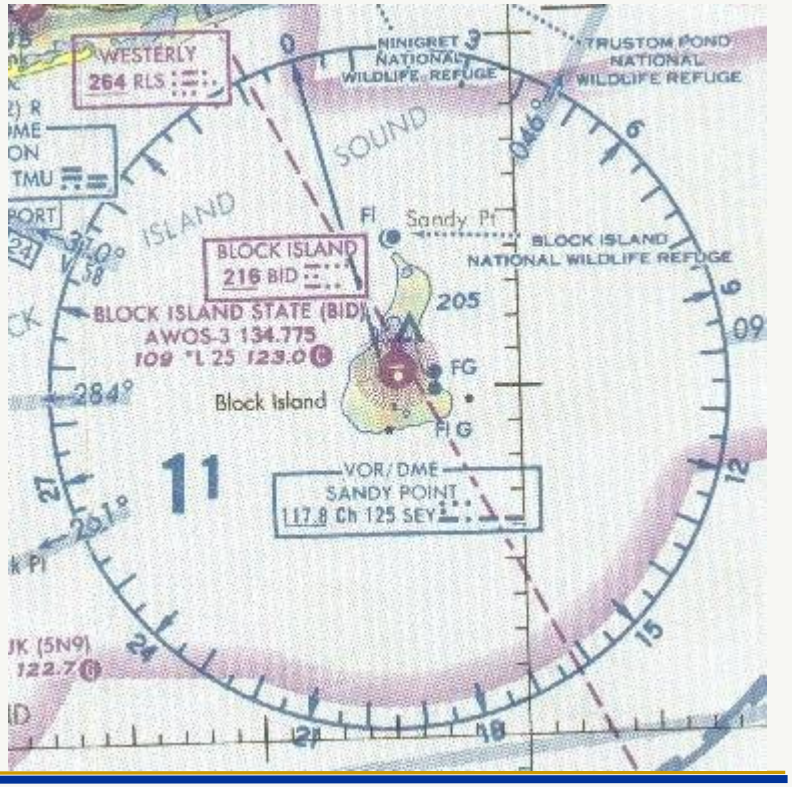
Estimating Time

- ✓ 60 kts = 1 nautical mile/minute
- ✓ 120 kts = 2 nautical mile/minute
- ✓ airspeed = 90 knots ~1.5 nm/min
- ✓ Thumb of 6 nm ~ 4 minute
- ✓ wind +/-30 seconds rough correction
- ✓ Fuel = Time * Fuel Flow

Estimating Track and Heading

- ✓ Get approximate track, use VOR compass rose for rough heading
- ✓ No VOR? lat-long lines + magnetic variation lines or Victor airways to estimate magnetic track
- ✓ Correct for crosswind





Communicating Your Diversion

- ✓ Let FSS/FIC know:
  - Who you are
  - Where you are
  - Last departed which aerodrome
  - What you were doing up to this point
  - What you intend to do now
  - Any issues-weather, mechanical
- ✓ Request information-weather reports?
- ✓ Enroute communications as appropriate -position reports, traffic updates, ATC

Procedures

- ✓ Diversion
  - Initial Planning
  - Departure and Further Planning
  - Enroute
  - Arrival.

Diversion: Initial Planning

- ✓ Slow cruise
- ✓ Head towards a prominent checkpoint a few minutes away or establish racetrack pattern around a checkpoint
- ✓ Circle checkpoint and new destination and connect them with a straight line
- ✓ Mark halfway point
- ✓ Estimate track and heading.

Diversion: Departure and More Planning

Time- over checkpoint – record
Turn - to estimated heading
Twist -heading indicator set
Throttle -set slow, mixture
Talk - inform ATC/FSS/FIC

ESTIMATE and record distance
ESTIMATE and record time & fuel

Diversion: Enroute

- ✓ Monitor your track
- ✓ Reset Heading Indicator every 15 minutes
- ✓ Record time at midpoint
- ✓ Provide revised ETA if necessary
- ✓ Adjust heading if necessary
- ✓ Radio calls as appropriate
- ✓ Look up aerodrome information in flight.

Diversion: Arrival

- ✓ Check time realistic-not lost
- ✓ Ensure landmarks on the ground match map - not lost
- ✓ Radio calls - ATC help?
- ✓ Normal or precautionary landing?

Considerations

- ✓ Navigation is easier at higher altitudes (but you may have to do a low-level diversion)
- ✓ If a road, railroad, river, power line goes to your destination – USE IT!
- ✓ Passengers (or the examiner) are a resource! They can help you fold charts, open CFS to a correct page, spot landmarks and traffic
- ✓ If lost, climb, confess, comply to get yourself “unlost”

SAFETY

- If a diversion is necessary for safety reasons – do not hesitate to divert. Do not continue to original destination if:
  - the weather enroute is deteriorating to below legal and personal minima
  - you are not sure if you have enough fuel to make it
  - you are suspicious of your plane's mechanical condition
  - your passenger is potentially seriously unwell…
- With a low-level diversion, beware of obstacles-use chart
- Beware of illusions created by drift
- Let FSS/FIC know of your diversion.

Conclusion

- ✓ Now you are able to accurately plan a diversion while in the air
- ✓ This makes you better prepared for enroute emergencies as well as fun detours
- ✓ Read for next lesson: Ex. 24, Intro, Aircraft Instruments, Fundamental Skills, Straight-and-Level Flight.

QUESTIONS?