Unit 11 Cross-Country Flight Planning

11.1 VFR Flight Plan

- ICAO int'l flt plan is used for domestic and int'l ops under VFR and IFR. If the flight is partially VFR and IFR, a separate plan must be filed for each phase.
    - AIM para 5-1-9 for filling out the flight plan
    - 15. Level: put initial requested altitude only
    - 16. Destination: 4-letter ICAO code or the place of your last landing. Stopovers over 1 hour should have two flight plans; less than 1 hour - mention in the remaining section
    - 19. Endurance: the amount of usable fuel in the a/p at time of dept, in hours of flying time
    - Except for military ops, the use of the int'l flight plan is mandatory and required for all VFR and IFR flight plans in the National Airspace System
- Close your flight plan online as appropriate or with FSS. If FSS is not available, contact ATC to relay your cancellation to the FSS
    - Control towers or ground control don't automatically close VFR or DVFR flight plans b/c they don't know if a particular VFR a/c is on a flight plan
    - Close flight plan after landing by contacting FSS via a remote communications outlet, or by calling 1-800-WX-BRIEF

11.2 Preflight Inspection

- The PIC is responsible for determining that the a/p is safe for flight
- owner/operator is responsible for maintaining the a/p in airworthy condition
- For the first flight of the day, the preflight should be accomplished by a thorough and systematic means recommended by the manufacturer.

11.3 Miscellaneous Airspeed Questions

- When turbulence is encountered, reduce speed to V_A (design maneuvering speed)
    - Attempt to maintain a level flight attitude.
    - Constant altitude and constant airspeed are usually impossible and result in additional control pressure, which adds stress to the airplane.
- If engine failure after airborne, establish and maintain the best glide speed. Do not prioritize altitude or a stall/spin will result.
    - Max gliding distance is obtained when the total drag is minimized. Occurs at a point where all of the sources of drag add up to a minimum total drag; any airspeed above or below this point results in an increase in drag.
    - Constant glide speed should be maintained b/c variations in glide speed will nullify your ability to determine gliding distance and choose a landing spot.
- Approaches and landings at night should be the same as in daylight (airspeed and altitude).

11.4 Taxiing Technique

- Quartering headwinds - ailerons up on the side from which the wind is blowing.

    - Elevator neutral for tricycle gear
    - Elevator up for tailwheel
- Quartering tailwinds - aileron should be down on the side from which the wind is blowing.
    - Elevator down for both types of a/c
- Quartering tailwind is most critical wind condition for high wing tricycle gear a/c.

11.5 Magnetic Course

- TC - true course, with respect to true north. MC - magnetic course, with respect to magnetic north
    - Use the following formula: $MC = TC \pm VAR$
- To determine magnetic course from one airport to the other, correct true course only for magnetic variation.
    - Place the straightedge of a plotter along the route with the hole on the intersection of the route and a line of longitude. TC is measured by the numbers on the protractor at the meridian.
    - Or, use a line of latitude if on a N/S course.
    - Determine MC by adjusting for variation (given on sectionals by number of degrees east or west)
    - If var is east, subtract; if west, add; "east is least, west is best" [from TC to MC]
- For VORs, using the compass rose on the sectional, no adjustment is needed to find the magnetic course.

11.6 Magnetic Heading

- To convert to magnetic heading from MC, adjust with the wind correction angle (WCA): $MH = MC \begin{smallmatrix} +R \\ -L \end{smallmatrix} WCA$
    - First convert wind direction from true to magnetic (add or subtract the variation)
    - Using the E6B, align the magnetic wind direction on the inner scale under the true index.
    - Mark a wind speed dot up from the grommet (from a known point). Then, rotate the scale to the magnetic course. Slide the card until the dot is over the TAS arc. Location of the grommet indicates groundspeed, and the pencil mark indicates WCA.
- OR, find MH by using true wind and true course, with the same method as above. Convert to true heading by adding or subtracting the WCA from the TC (+R, -L); then convert to MH by adding or subtracting variation.

11.7 Compass Heading

- Compass heading is given by $CH = MH \pm DEV$
- Deviation is indicated by a compass card in the aircraft.
- If you want to go 30 degrees, find the number 30 in the "FOR" row. Then, the number in the box below is what the compass reads when your heading is the upper value. The difference is the amount by which you need to adjust.

11.8 Time En Route

- Remember to use the sectional scale on a plotter. Also remember that sectionals on the test are not to scale.
- To determine TER, compute you groundspeed based on how much you have already traveled in the given time (distance over time); measure additional distance needed, then compute the time required to travel to that point. Measure in NM.
- To determine the speed, align the number of minutes it took to fly on the inner scale of the slide rule with the distance flown on the outer scale. The triangular arrow shows the rate. Add a 0 for numbers less than 10.
- Time required to the next point: start with the speed on the outer scale adjacent to the 60 mark. Then, find the NM to go on the outer scale. The adjacent number on the inner scale in the minutes to go.
- Groundspeed appears under the grommet when you slide the grid on the wind side; you can use this to compute TER.
- Wind triangle:
    - Point A to B: true heading and airspeed line
    - C to A: wind direction and velocity line
    - C to B: true course and groundspeed line

11.9 Time Zone Corrections

- Add 4 hours to EDT and 5 hours to EST to find UTC. Each timezone is 1 hour difference.

11.10 Fundamentals of Flight

- Four fundamentals in maneuvering an a/c: straight-and-level; turns; climbs and descents

11.11 Rectangular Course

- Determining factor in deciding the distance from the field boundary at which an a/c should be flown is the steepness of the bank desired in the turns.
- Same techniques of a rectangular course apply in a traffic pattern.
    - Downwind to base turn: steep to medium bank
    - Base to final: medium to shallow bank
    - Upwind to crosswind, shallow to medium
    - Crosswind to downwind, medium to steep bank
- Corners that require less than 90 degree turn are turn to final and turn to crosswind
- Corners that require more than 90 degree turn are turn to downwind and turn to base
- To properly compensate for crosswind during straight and level cruising flight, the pilot should establish a proper heading into the wind by coordinated use of the controls.

11.12 S-Turns across a Road

- Groundspeed is equal when headwind or tailwind components are the same (direct crosswind, downwind just out of crosswind and just into crosswind; same for upwind)
- Angle of bank is steepest when flying in a tailwind
- Must be crabbed into the wind the most when you have a full crosswind component.

- A consistently smaller half-circle is made on the upwind side of the road if the bank is increased too rapidly during the early part of the turn

11.13 Landings

- A proper crosswind landing requires that at the moment of touchdown, the direction of motion of the aircraft and its longitudinal axis be parallel to the runway (no crab during touchdown).
- If landing downwind or with tailwind, expect overshooting the intended landing spot and a faster groundspeed at touchdown.

Unit 11 Quiz 62/70
Missed Questions 8
26. Remember that the VOR radial is always FROM the VOR. When flying to, take the reciprocal
27. Used wrong plotter setting
40. Marked wind dot wrong
56. The line from point A to B is the true heading and airspeed. Look at the direction the airplane is pointing in.
57. The line from C to B is groundspeed and true course. In the image, the aircraft starts at point C and moves towards point B.
66. In a rectangular course, corners 1 and 4 have less than 90 degree turn. Draw the way the airplane crabs into the wind in the diagram.
67. Steep to medium bank at corner 3. Pretend it is a traffic pattern. The tailwind on the downwind leg causes increased airspeed, leading to a steeper bank on the next turn. The bank angle decreases when the tailwind component decreases.
69. Land with the longitudinal axis of the a/c parallel to the direction of motion to prevent excess side loading.