Ground Lesson: Preflight to Run-up

Objectives:

1. To understand the importance for always preflighting an aircraft.
2. To understand how and what to check during a preflight.
3. To understand how to do an engine start properly.
4. To understand how to taxi and aircraft properly.
5. To understand how to do a run-up properly.

Justification:

1. Preflight is an integral part of pilot safety
2. Engine starts are necessary for each flight.
3. Taxiing is necessary for every flight the student will take, both during training and as a Private Pilot.
4. During the private Pilot check ride it will be necessary to show competent radio work.
5. Run-ups are necessary for each flight, and must be performed during the Private Pilot check ride.

Schedule:

Activity	Est. Time
Ground	2.0
Total	2.0

Recommended Readings:

PHAK	Ch 13: 13-1 to 13-6
	Ch 13: 13-11 to 13-12
AFH	Chapter 1 & 2
AIM	Ch. 4, Sec. 2

Elements Ground:

- Preflight
- Engine Start
- Taxi
- Run-up
- Radio Communication

Presentation Ground:

Preflight

1. *:The examination of the aircraft's external structure, control surfaces, lighting, landing gear, pitot-static ports, and power plant before flight for the purposes of determining the airworthiness of the aircraft*
2. Why do we preflight?
   (1) As PIC, we have a legal responsibility (FAR?) as well as a personal responsibility to make sure the plane is safe before flight.
3. Importance of using a checklist
   (1) This is not a crutch for a bad memory.
   (2) Used to make sure things are checked in a logical order, and nothing is missed.
4. Preflight Check List: (See Checklist)

Engine Start

1. It is important to be aware of where you start an engine.
   (1) Toward a hangar, group of people, or cars is discourteous and in violation of FAA regulations (FAR?)
   (2) For this, and safety reasons, it is always important to clear an area before starting the plane.
2. Importance of checklist
   (1) Same as above
3. Engine start checklist (See Checklist)

Taxi

1. *:The controlled movement of the airplane under its own power while on the ground.*
2. What is a "safe" taxi speed?
   (1) A good rule of thumb is no faster than a brisk walking pace.
   (2) A speed in which you can maintain safe positive control of the aircraft at all times.
3. Nose controlled by rudder pedals.
   (1) left foot turns the plane left
   (2) right foot turns the plane right
   (3) accomplished through a mechanical linkage between the pedals and the nose wheel.
   (4) when aircraft takes-off, the weight is removed from the nose wheel and it centers.
   (5) Each rudder pedal has a brake on he toe of it, corresponding to the wheel it brakes.
      i. braking is mainly used for stopping the aircraft, slowing it down, and aiding in a sharp controlled turn.
      ii. while taxiing, it is better to use minimal power to control taxi speed, rather than continuously holding brakes.
4. Taxiing in Windy Conditions
   (1) "Dive away, Turn into"
   (2) When in a crosswind, the upwind aileron should be up
      i. This reduces the effect of the wind striking that wing, thus reducing the lift it produces
      ii. This also causes the downwind wing to create more drag, and possibly more lift, helping to counteract the tendency for the upwind wing to rise.
   (3) When in a quartering tailwind, the elevator should be down, and the upwind aileron should be down.

i.This reduces the tendency of the wind to get under the tail and the wind, and nose the plane over.

5. when stopping, it is good practice to straighten the nose wheel to minimize stress on the wheel assembly.

Run-Up (a.k.a. “pre-takeoff checklist)

1. *: A systematic procedure for checking the engine, controls, systems, instruments, and radios prior to flight.*

2. Before starting, make sure the nose wheel is aligned straight ahead to minimize stress on it during the high power run-up.

3. During the run-up it is important to divide attention between the inside and outside of the aircraft.

(1) If the brakes slip, you could move forward unnoticed

4. run-up checklist (see checklist)

Radio Communication

1. Radios are used to communicate with controllers and other aircraft

(1) This assists us in traffic separation and aircraft sequencing

2. The radios we use are called Transceivers

(1) The combine a receiving radio and a transmitting radio, thus the name Transceiver

3. We use VHF frequencies (Very High Frequency)

(1) These are basic FM radio frequencies.

(2) The advantage of VHF is good clarity and dependability.

(3) The disadvantage is that it is line of sight.

i. Mountains or the curvature of the earth can disrupt reliability and clarity.

(4) (There is also UHF (ultra high frequencies) used by the military, and HF (high frequencies) that are made to transmit over long distances.

i. HF signals can bounce off the Ionosphere and overcome the problem of line-of-sight)

4. For aeronautical voice communication, the range 118.000 to 135.975 megahertz is reserved.

(1) Palo Alto ATIS - 135.275

i. ATIS - Automatic Terminal Information Service

(i) *: A continuous broadcast of prerecorded terminal area information of a non-control nature.*

(ii) ATIS provides arriving and departing pilots with essential but routine information (such as weather conditions, active runway, altimeter setting) without congesting controller frequencies.

(iii) ATIS usually has its own frequency, and is only available at certain airports.

(2) Palo Alto Ground - 125.00

i. The ground controller is in charge of all aircraft on the ground, except aircraft entering, leaving, and on the runway.

ii. This includes traffic avoidance and taxiway assignment.

(3) Palo Alto Tower - 118.60

i. The tower controller is in charge of all aircraft in the vicinity of the airport, and the runway.

ii. This includes traffic separation and sequencing.

5. Since every frequency has a number of users at any given instant, a shorthand English has been developed for certain key phrases and concepts, thus ensuring standard unambiguous, and brief communications.

6. Phonetic Alphabet

(1) radio communication can be less clear than regular communication. Not only because of atmospheric conditions, but also peoples different accents.

(2) for this reason, a phonetic alphabet has been agreed-upon by the aviation community to clearly transmit important information

(3) Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-Ray, Yankee, Zulu

7. Numbers

(1) Numbers are very critical to flying safety. They communicate, headings, altitudes, frequencies, etc.

(2) Some numbers sound like words so here are also specific pronunciations for certain numbers.

(3) 1-wun, 2-too, 3-tree, 4-fow-er,5-fife,6-six,7-seven,8-ait, 9-niner, 0-zeero

(4) Multi-digit numbers are given by saying each number individually.

i. “heading one eight zero”

(5) Frequencies are read with “point” or “decimal” in the appropriate place

i. “one one eight point six”

(6) Altitudes

i. Below 10,000 ft altitudes are read as thousands and hundreds.

(i) 700 = “seven hundred”

(ii) 6500 = “six thousand five hundred”

ii. Above 10,000 ft, the thousands digits are stated separately.

(i) 10000 = “one zero thousand”

(ii) 16500 = “one six thousand five hundred”

iii. Above 18,000 altitudes are stated as flight levels

(i) 24000 = “flight level two four zero”

(7) Call Signs

i. All Aircraft are registered with their respective governments

ii. In the US, each civil aircraft registration number begins with the pre-fix N - November. Each registration number is also five alphanumeric digits long.

iii. To keep track of the aircraft in a certain area, aircrafts are addressed as their type of aircraft and the registration number without the N prefix.

(i) “Cessna four three eight niner golf”

iv. After the initial call, the controller may address you with your type, and the last three numbers/letters of your registration number.

(i) AFTER a controller does this, the pilot can also use that call sign.

(ii) Sometimes full callsigns will still be necessary to avoid confusion

(iii) each time you change controllers, you must use the full callsign again.

8. Ground Facilities

(1) are addressed by where they are, and what type of facility they are

i. “Palo Alto Tower”

ii. “San Francisco Ground”

9. Clock Reference System
   (1) A conventional 12 hour clock superimposed over the airplane
      i.12 o’clock - straight ahead
      ii.3 o’clock - off the right wing
      iii.6 o’clock - straight behind
      iv.9 o’clock - off the left wing
   (2) Traffic Callout example
      i. “Cessna four six seven four uniform, you have traffic one to two o’clock, three miles, two thousand five hundred, southwest bound”
10. Standard Phraseology
   (1) State by name who you are calling and WHO you are (callsigns)
   (2) Depending on controller, wait for acknowledgment of the callsign.
   (3) give approximate location and altitude.
   (4) state intentions or requests (briefly)
   (5) finish with any other relevant information
      i. Receipt of ATIS, low fuel, etc.
   (6) Always begin OR end your transmission with your call sign.
11. Read backs
   (1) A read back is restating what a controller has instructed you to do, and adding your call sign to the end.
   (2) This is necessary of all instructional or clearance calls (cleared through airspace, etc.)
   (3) It is not as necessary for informational calls (traffic calls, etc.)
12. Standard phrases:
      • affirmative
      • confirm
      • correction
      • negative
      • roger
      • used for non-clearance, non essential
      • stand by
      • traffic
      • traffic in sight
      • contact
      • (draw airport overhead view)
      • hold position
      • hold short
      • position and hold
      • cleared for takeoff
      • (Label all legs of traffic pattern, departure, and entries)