# Things to Know Before Starting Ground School

## Pilot Certificates

- Various levels: Student Pilot, Private Pilot, Commercial Pilot, Air Transport Pilot
- Each level has different privileges and limitations
- Most student pilots are working toward their **Private Pilot** certificate

## Flight Rules – VFR vs. IFR

- There are two basic ways to fly, depending on whether you can see the ground.
- **Visual Flight Rules** (VFR) means pilots must be able to navigate safely using the ground as reference. Most initial pilots learn to fly VFR.
- **Instrument Flight Rules** (IFR) means flying by reference only to the instruments in the airplane and by talking with Air Traffic Control. IFR pilots can fly through clouds or snowstorms. This type of flying is significantly more difficult, requires additional training and instrumentation in the cockpit, and pilots must take an additional FAA checkride in order to get an Instrument Rating added to their pilot certificate.
- **You are training to be a VFR pilot and the class will cover Visual Flight Rules.**

## Zulu Time

- The world is divided into many different time zones (e.g., Pacific Daylight Time, Mountain Standard Time, Greenwich Mean Time)
- All of aviation uses a single global time called Coordinated Universal Time for all flight planning and weather coordination. Pilots refer to this time as "**Zulu time**."
- Zulu time uses a 24-clock, like the military. 1pm = 1300 and would be spoken as "thirteen hundred"
- Zulu time is 7 hours ahead of Pacific Daylight Time, and 8 hours ahead of Pacific Standard Time
- Examples: 11am (PDT) = 1800Z, 1:45pm (PST) = 2145Z

## How Pilots Say Directions

- Most people know four directions: north, south, east, west. Additional directions combine these into northeast, southeast, northwest, and southwest
- Even more specific: north northeast, east northeast, etc.
- Pilots use a 360 degree circle to refer to directions. North = 0°, east = 90°, south = 180°, west = 270°
- North is either 0° or 360°, but is usually referred to as 360°
- **Pilots use all three digits to speak headings**, so northeast (45°) is spoken as "zero four five"

 

## Magnetic North

- On maps, the top axis of the earth is called the North Pole, and pilots refer to this as "true north"
- However, magnetic compasses point their needles at a different place that's a few hundred miles from the true north pole. This is based on movement of the iron-based core of the earth changing the magnetic field of the earth, and therefore changing where our little compass needles point.
- Pilots, who mostly refer to magnetic compasses to navigate, tend to use "ma gnetic north"

## Talking on the Radio – Letters and Numbers

- Sometimes radios are very hard to hear, and pilot communications hard to understand. To help eliminate confusion, pilots speaking over a radio transmitter use very specific words to refer to letters and numbers.

| Letters | | | | |
|---|---|---|---|---|
| A | Alpha | | N | November |
| B | Bravo | | O | Oscar |
| C | Charlie | | P | Papa |
| D | Delta | | Q | Quebec |
| E | Echo | | R | Romeo |
| F | Foxtrot | | S | Sierra |
| G | Golf | | T | Tango |
| H | Hotel | | U | Uniform |
| I | India | | V | Victor |
| J | Juliet | | W | Whiskey |
| K | Kilo | | X | X-ray |
| L | Lima | | Y | Yankee |
| M | Mike | | Z | Zulu |
| | | | | |
| **Numbers** | | | | |
| 1 | One | | 6 | Six |
| 2 | Two | | 7 | Sev-en |
| 3 | Tree | | 8 | Eight |
| 4 | Fow-er | | 9 | Nin-er |
| 5 | Fife | | 0 | Zero |

### Things to Note

- Nothing is pronounced "oh"; it is either "zero" or "Oscar"
- "3" is intentionally mispronounced as "tree"
- "4" is stretched into the two-syllable "fow-er"
- "5" is intentionally mispronounced as "fife"
- "9" is converted into the two-syllable "nin-er"

## Nautical Miles & Knots

- On land, distance can be measured along the ground. Sailors have a tougher time measuring how far they have sailed, because both the ship and the water are moving, at varying speeds. Early sailors started measuring distances based on lines of latitude, which they could deduce from stars and landmarks. Pilots, who fly through air that is moving all the time, use this method too.
- 1 nautical mile = $1/60^{th}$ of the distance between 1° of latitude
- 1 nautical mile ≈ 1.15 statute mile (the land-based mile that we use in the US)
- 1 knot = 1 nautical mile per hour, thus 100 knots ≈ 115 miles per hour

## Pilot-in-Command

- ✈ The pilot-in-command (PIC) is the final authority in operating the aircraft in a safe manner
- ✈ If you fly alone, you are PIC. If more than one pilot is in the airplane, one is always designated as PIC so that everyone knows who makes the final decisions.
- ✈ This is a great privilege and responsibility.
- ✈ Your entire training should be devoted to developing competent flight skills and learning how to make safe, responsible decisions as pilot-in-command.

## Practice Test

1. What pilot certificate are you working to get?

   _____

2. Will you be a VFR pilot or an IFR pilot?

   _____

3. Your weather report indicates that rain began to fall at SFO at 2148Z. What time is that in Pacific Daylight Time?

   _____ _____

4. Your plane is flying directly southwest. How would you refer to the direction on the radio?

   _____

5. If you're hiking with a magnetic compass, to what does the needle point?

   _____

6. Your airplane tail number is N236SP. How would you say this over the radio?

   _____

7. Which is faster? 80 knots or 80 miles per hour?

   _____

8. Who has final authority about how to fly the plane?

   _____

 