Microsoft Flight Simulator

Learn To Fly

Intermediate Lesson 12

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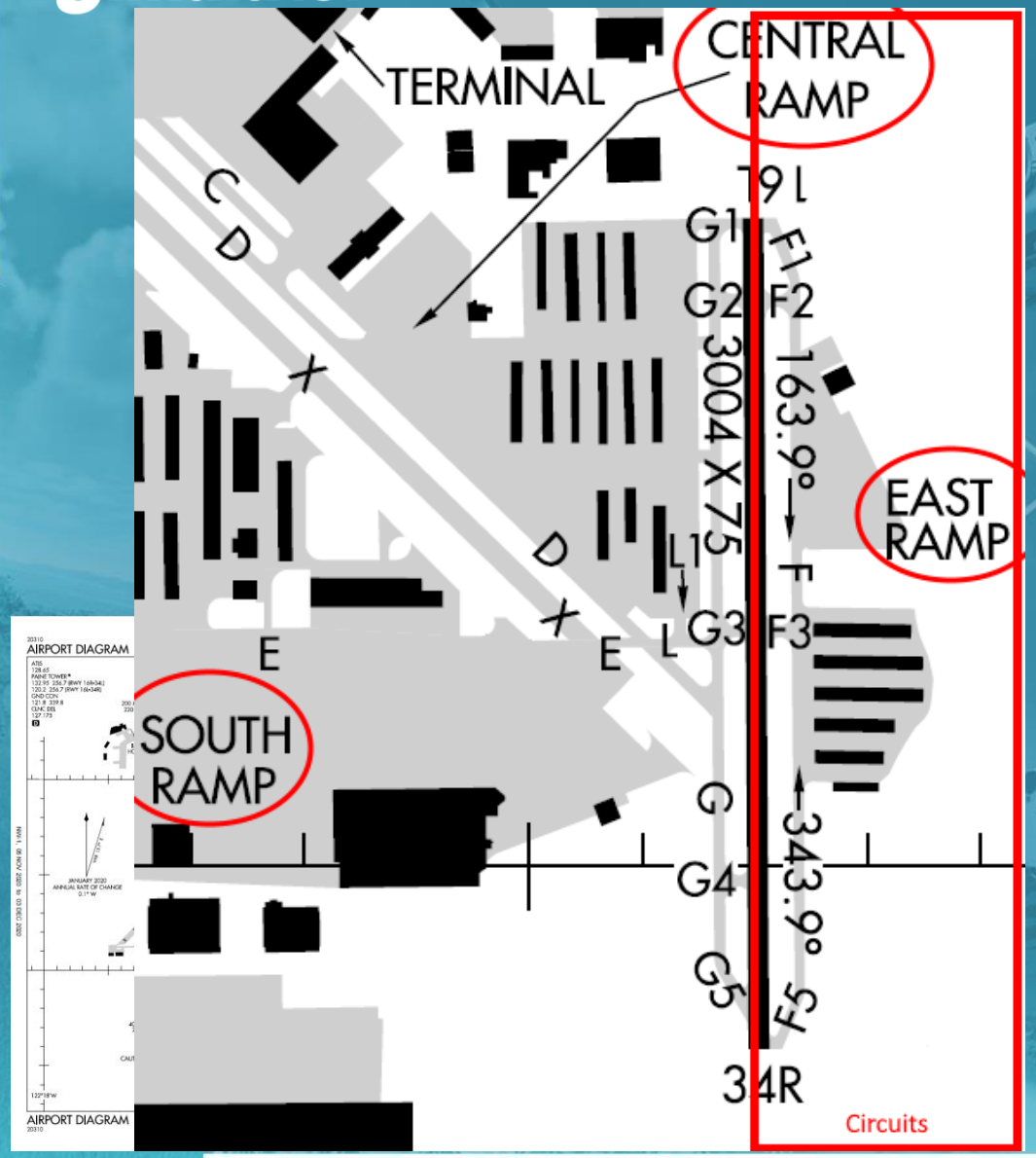
SOCIETY OF AVIATION AND FLIGHT EDUCATORS

Pilot IRL and Course Designer

Flight Lesson 12



Flight Preparation

Ensure you grab your student training materials kit with the links in chat. Includes your new checklists.

One link for a group of materials:

!studentkit2

!Checklist172

!material -URL for online material online

Previous Homework

1. Plot your own power curve with experimentation as we have done.
2. Learn to smoothly slow into slow flight and smoothly move out of slow flight.

How did it go?

Problems?

Suggestions?

Observations?

Today's Lesson:

You may download this lesson plan by typing: !Lesson12 (in chat)

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ForderLearnToFly.com Private Pilot Training (Flight Simulator)

C172 (G1000) LESSON PLANS

Lesson Plan #11 (Dual) Class Time .75 hours

SLOW FLIGHT

GENERAL

This lesson is a ground brief and air exercise for the experienced student. The student should be aware of the Pilot Operating Handbook, Aircraft documentation and flight authorization. The flight should be stimulating for the student without any abrupt maneuver.

MOTIVATION

To understand the lower end of the speed spectrum and how the plane behaves.

REFERENCE

(1) Aeroplane Flight Training Manual
(2) Pilot's Operating Handbook

TOPICS

(1) Slow Flight

ForderLearnToFly.com Private Pilot Training (Flight Simulator)

Lesson Plan #11 (Dual) Air Time .8 hours

AIR EXERCISE

(1) Student performs the external check, start check and after start check.
(2) Student taxis and departs to the practice area.
(3) Instructor assists student in speed experimentation and charting.
(4) Demonstration of entry, cruise and exit from slow flight.
(5) Student practices entry, cruise and exit from slow flight.
(6) During slow flight cruise, student practices turns and level flight.
(7) Student keeps altitude the whole time.
(8) Student returns to airport to land without assistance.

POST FLIGHT

(1) Review Lesson, re-brief as necessary.
(2) Assign reading for next lesson.

!IFRKit (in chat)

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This Lesson

Diversions and Precautionary Landings

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New Skills to learn:

1. Using slowflight to prepare for an alternate landing area.

2. Using pilotage and dead reckoning to get to the diversion airport or area.

Lesson Briefing

Diversion & Precautionary Landing:

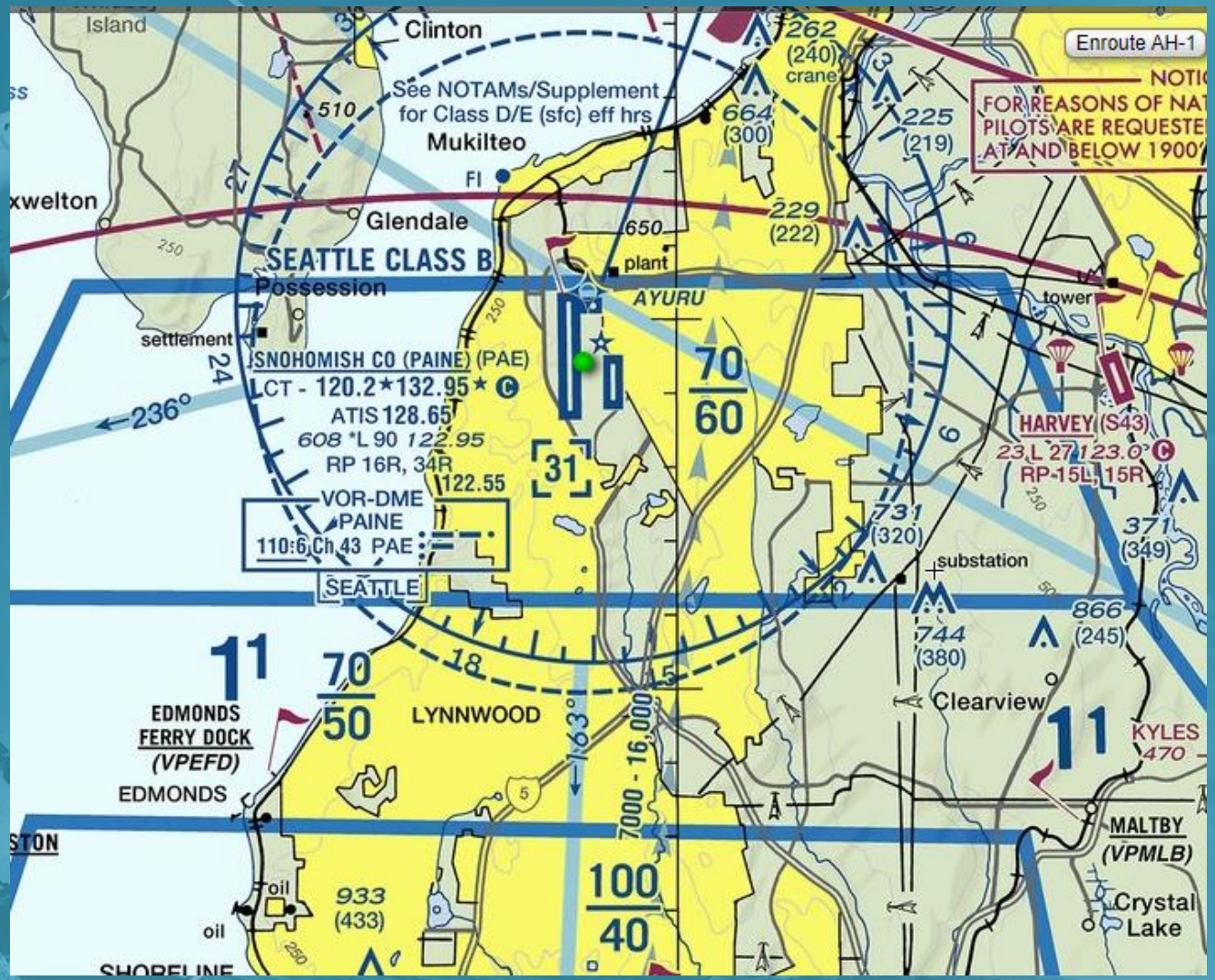
- We might have to divert to an alternate airport or an unknown area for many reasons.
- As we arrive, we may need to perform a precautionary landing, or inspection of the landing area before we execute a circuit.

A Diversion:

A flight diversion is simply your need as a pilot to divert to another airport or landing surface.

You need to know a direction, an elevation and how far it is for fuel and time estimates.

You do this while in-flight.



Reasons for a Diversion:

1. Low fuel
2. Bad weather
3. Pilot or passenger fatigue or illness.
4. Airplane system or equipment malfunction.
5. Any other reason that causes you to divert to another location/airport.

To Do This 3 Step Preparation:

You are going to be busy finding and calculating a lot of things with your head in the cockpit.

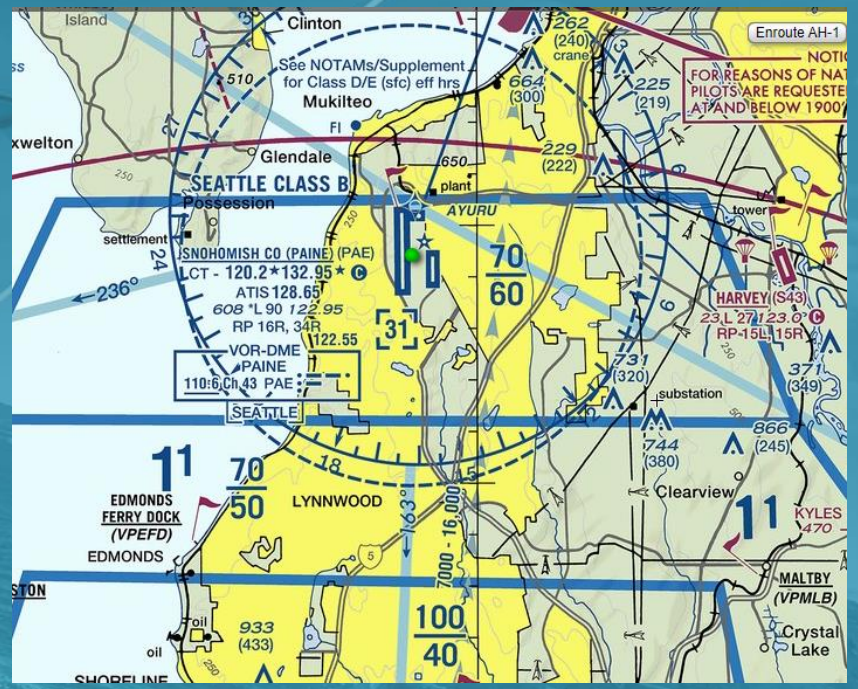
Find a road and enter slow flight to follow it.

Keep it on your left for easy visibility.

Once you have the 3 steps finished, turn back on the road to your set point, or turn to your new heading and configure your plane back to cruise.

Step 1: Where to Go?

1. Your step is to know your current location and are aware of alternate airports.
2. Next, how far to each of the airports?
3. Does each airport have better weather or fuel or facilities you are seeking?
4. Your destination might not even be an airport. (low fuel, deteriorating weather)



Step 2: Going There?

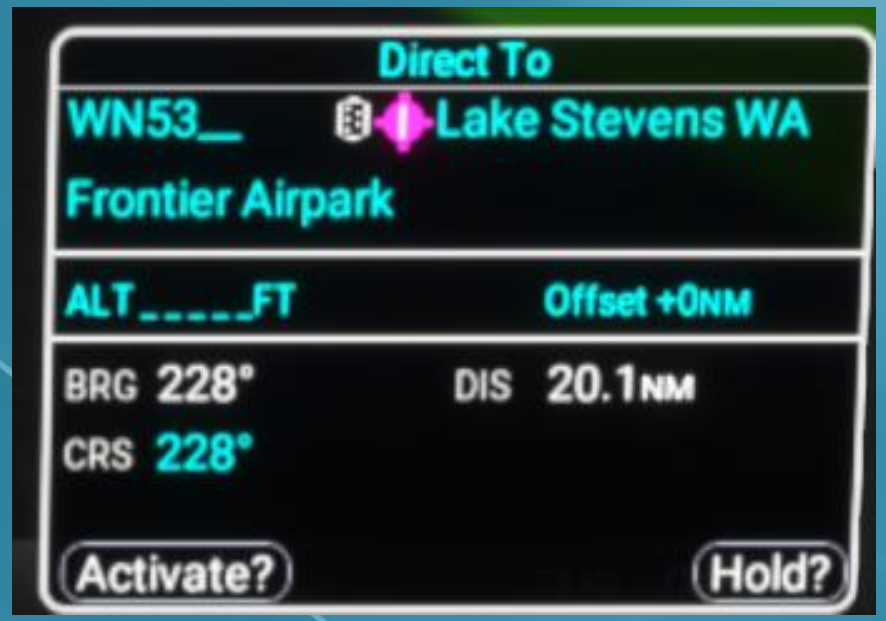
1. If you have “Direct To” functionality, or VORs with DME, the task gets easier.
2. Simply use your “Nearest” function, select from the list and use your “Direct To” function.

Step 2: Going There?

1. Without “Direct To” functionality, you need to consult a paper or electronic chart to determine the distance and the direction.
2. You can use a compass rose on a sectional and the distance scale on your plotter.
3. You can use a line of longitude. 1 minute of latitude, marked north or south on a line of longitude is equal to 1 nautical mile.

Step 3: Finalizations

Once established on your new course and altitude, use the known (or forecast) wind conditions to determine an estimated groundspeed, ETA and fuel consumption to your alternate.



Distance: 20 NM

Time to get there: (~100NM/hr) 12minutes

Fuel Needed: (at 8gph cruise) 1.6 gallons

Magnetic Course: 228

Our Example Diversion:

Distance: 20 NM

Time to get there: 12minutes

Fuel Needed: 1.6 gallons

Magnetic Course: 228

A Precautionary Landing:

A procedure a pilot executes to examine an unfamiliar airport or landing surface.

Similar to any uncontrolled airport arrival, but we fly a low circuit to examine the surface, then come around for a normal landing.

Reasons for a Precautionary Landing:

1. Low fuel
2. Bad weather
3. Pilot or passenger fatigue or illness.
4. Airplane system or equipment malfunction.
5. Aerodrome surface conditions, unfamiliar airport or landing area
6. Water landing for floatplanes
7. A diversion to an unfamiliar landing surface

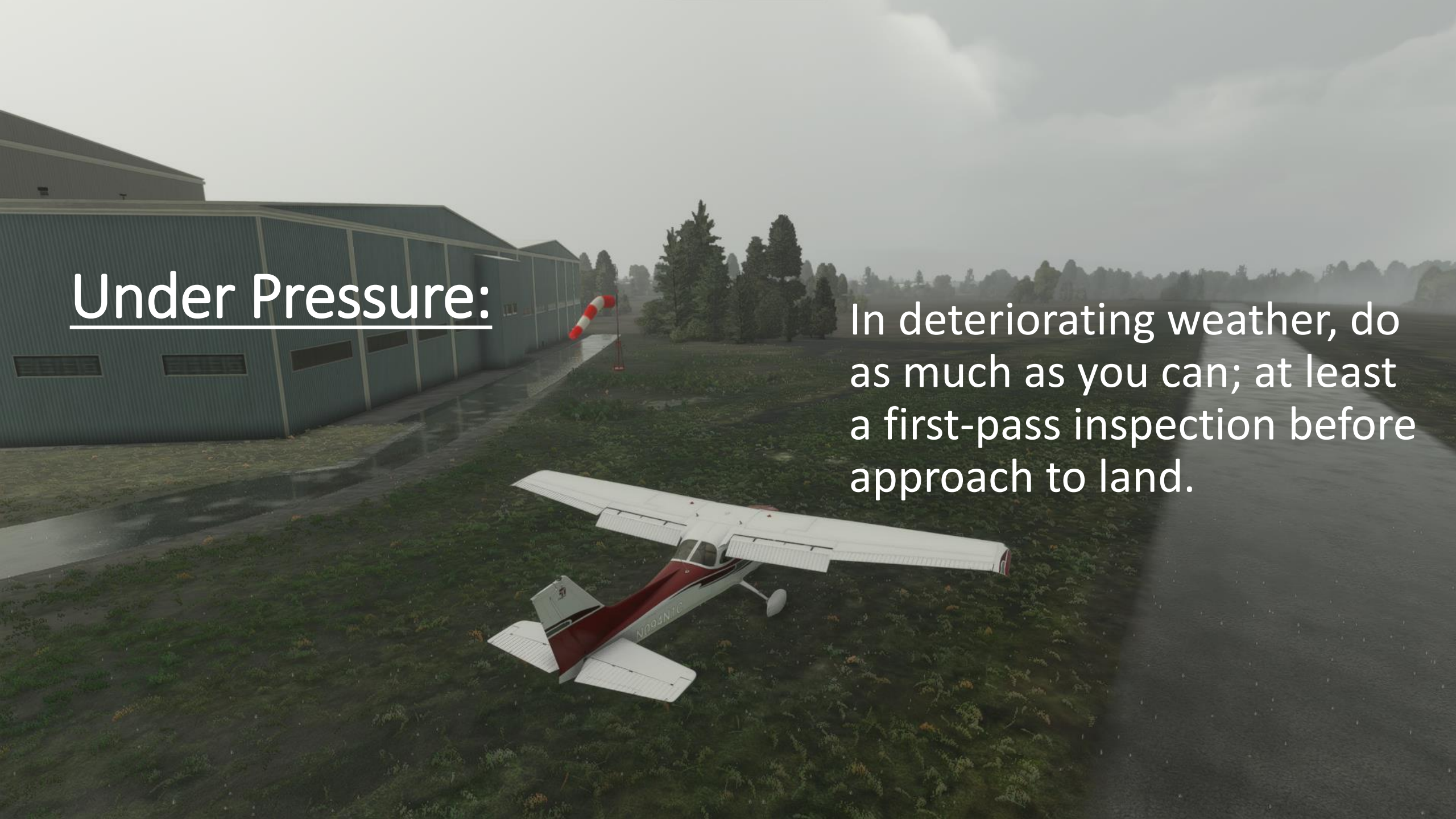
Precautionary Landing Procedure:

1. Determine wind direction and speed. Try to land into wind.
2. Descend to 500’ AGL on the upwind side and do a low speed, low inspection out your left window.
3. Detect obstacles such as potholes, trenches and objects on the ground.
4. Do a go-around to 1000’ and a normal circuit.
5. Communicate on downwind (3Ps)

Rules of Thumb:

- **C.O.W.L.S.**
  - **C**ivilization (nearby)
  - **O**bstacles
  - **W**ind
  - **L**ength
  - **S**urface (soft/short)

- 3Ps in downwind
  - PanPan call
  - PAX briefing
  - Pre-landing check



Under Pressure:

In deteriorating weather, do as much as you can; at least a first-pass inspection before approach to land.

PanPan Call & PAX Briefing:

You need to communicate to someone that you are landing here. This could be an emergency (mayday) or an urgency (PanPan) but certainly an unplanned landing.

You need to prepare your passengers for what you are about to do.

- CTAF
- 121.5
- Or both

The PanPan Call:

This radio call is similar in structure to the Mayday call.

It indicates an urgent situation such as a mechanical failure, medical problem or deteriorating weather that inhibits you from continuing on your flight plan.

- CTAF
- 121.5
- Or both

Pan pan, Pan pan, Pan pan,

- Your plane callsign and type.
- Your location.
- How many people.
- Your intentions
- Callsign

Pan pan, Pan pan, Pan pan

The PAX Briefing:

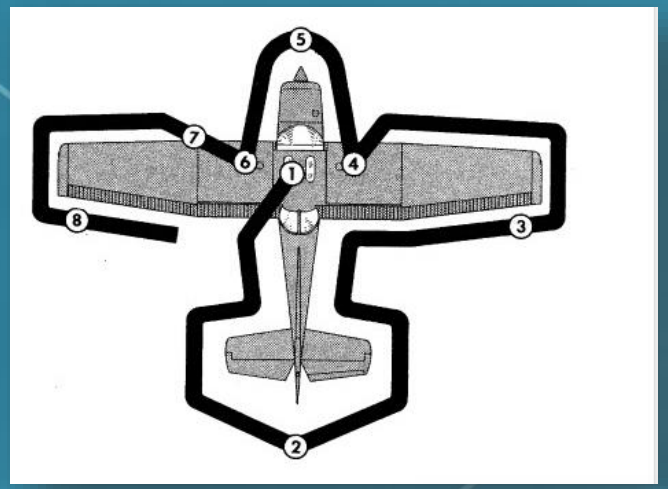
The purpose is to prepare passengers in the airplane for what is about to happen and a reminder where everything is located in the aircraft.

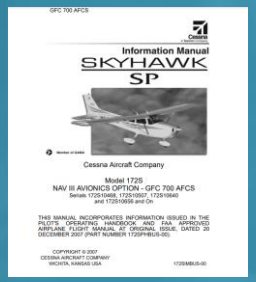
You can use the mnemonic: SAFETY but modify it for emergencies.

- Where you intend to land.
- Exits
- Fire extinguisher location
- First aid kit location
- ELT and manual activation
- Sharp objects stowed
- Coat on lap for cushion
- Crack doors just before landing
- Questions?

Questions Before Departure?

The Walkaround (pre-flight inspection)





Jayne has done the runup too to save us some time in the stream.

CTION 4 CESS
RMAL PROCEDURES MODEL 172S NAV
GFC 700 AF

FORE TAKEOFF (Continued)

5. A/P TRIM DISC Button - PRESS (if installed)
   (verify autopilot disengages and aural alert is heard)
6. Flight Director - OFF (if installed)
   (push FD button on either PFD or MFD bezel)
7. Elevator Trim Control - SET FOR TAKEOFF
8. Throttle Control - 1800 RPM
   a. MAGNETOS Switch - CHECK (RPM drop should exceed 150 RPM on either magneto or 50 RPM differen between magnetos)
   b. VAC Indicator - CHECK
   c. Engine Indicators - CHECK
   d. Ammeters and Voltmeters - CHECK
9. Annunciators - CHECK (verify no annunciators are shown)
20. Throttle Control - CHECK IDLE
21. Throttle Control - 1000 RPM or LESS
22. Throttle Control Friction Lock - ADJUST
23. COM Frequency(s) - SET
24. NAV Frequency(s) - SET
25. FMS/GPS Flight Plan - AS DESIRED

NOTE

Check GPS availability on AUX-GPS STATUS page. No annunciation is provided for loss of GPS2.

26. XPDR - SET

See lesson 1 for full runup.

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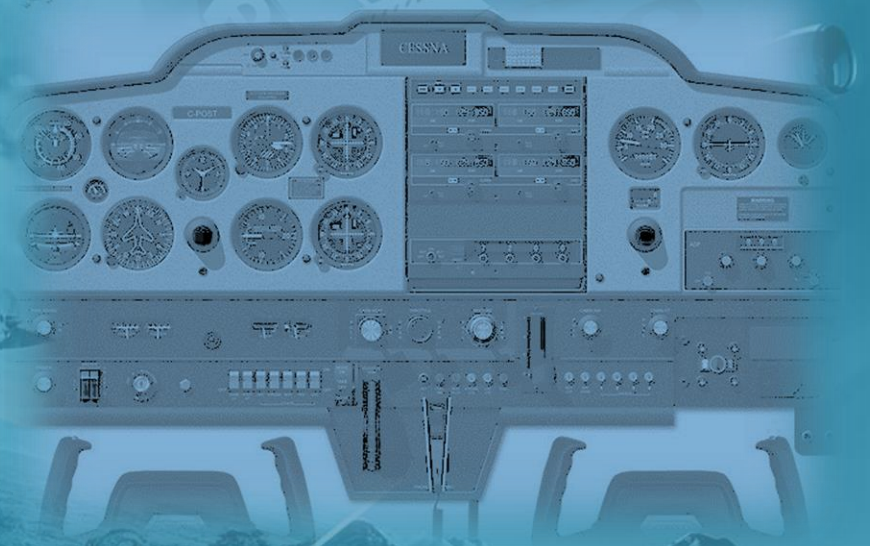
YOUR CONTROL



Gone Flying!

A 3rd party free download to pass control of the airplane back and forth.

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Diversions and Precautionary Landings

POST FLIGHT

(1) Review Lesson, re-brief as necessary.
(2) Assign reading for next lesson

Review Lesson

- Diversions
- Precautionary Landings

!Manual (FAA online docs)

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Summary Questions

1. What use is the slow flight range?

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Review Lesson

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Summary Questions

2. Why couldn’t we just fly to our flight-plan alternate airport?

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Review Lesson

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Summary Questions

3. What are the risks in diverting to an unknown airport or landing surface?

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Summary Questions

4. Why a PanPan call?

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Summary Questions

5. Is this different for a conventional dials plane or even one that is carbureted (not fuel injected)?

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Summary Questions

6. Why is this PAX briefing different than the standard SAFETY briefing before flight?

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Summary Questions

7. What if you don't have a "Direct To" function in your aircraft and need to divert?

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Homework

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Assignment

1. In our simulator, do many diversion calculations while you are flying, even if you don't go there, just for practice.

2. Practice both the diversion procedures and precautionary landings to get proficient at them.

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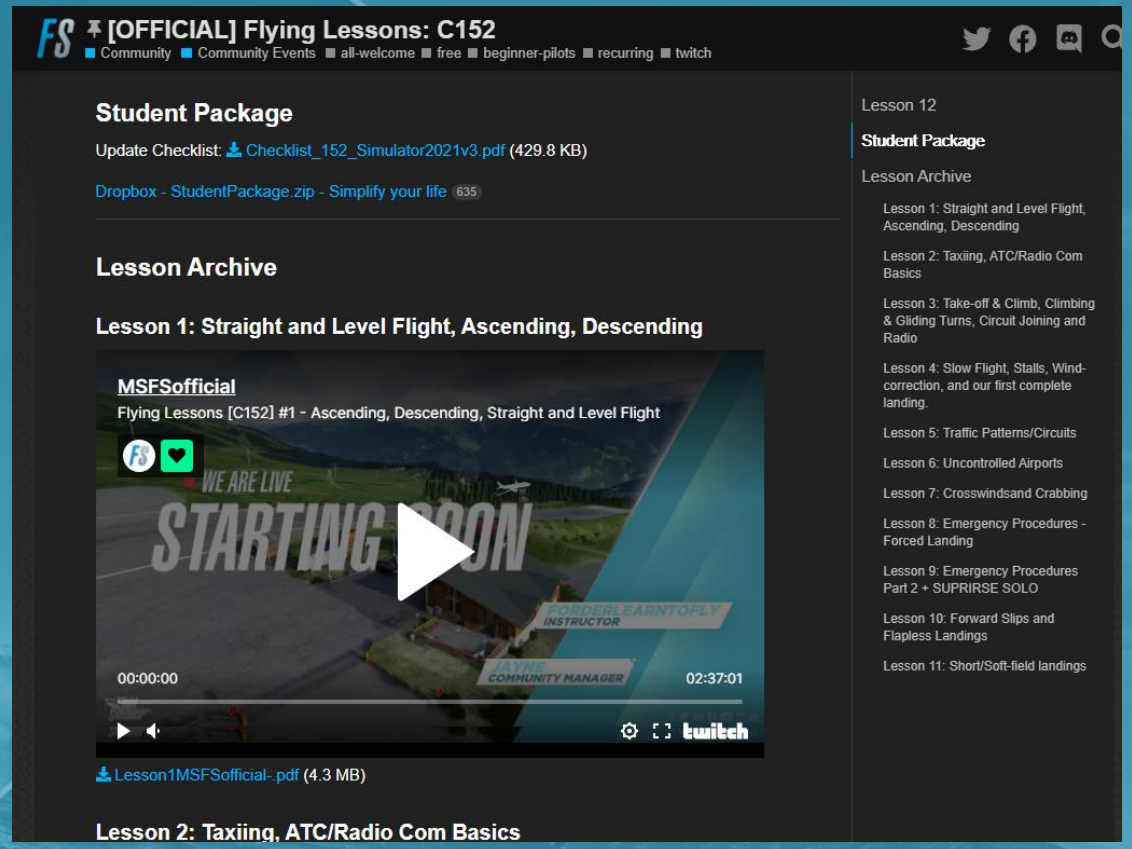
The Student HUB

ForderLearnToFly.com

Come join the discussions and continue the conversation on the student hub for this lesson series with Jayne and Forder.

Add your thoughts, your knowledge and your enthusiasm for learning a deeper understanding of flight using Microsoft Flight Simulator.

New Xbox Flyers welcome.



We welcome CFIs, real-life student pilots, flight enthusiasts and those new to flight simulation.

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