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# Learn To Fly

Intermediate Lesson 11

NO94N1







Pilot IRL and Course Designer

TUDENT JAYNE

### Flight Lesson 11



# Flight ForderLearn ToFly.com 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. Do stalls and spins in the simulator often so you will naturally recognize and recover.
- 2. Try a spiral in the simulator where there is no risk of danger.

### How did it go?

**Problems?** 

**Suggestions?** 

**Observations?** 

#### **Today's Lesson:**

#### You may download this lesson plan by typing: !Lesson11 (in chat)



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

Review Lesson, re-brief as necessary.
 Assign reading for next lesson.



# Intermediate Lesson 11 This Lesson Slow Flight

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# For Endurance or Sightseeing.

### New Skills to learn:

1. How to setup an airplane in the slow flight range without initiating a stall.

# 2. How to use this range for endurance or for sightseeing.

### Microsoft Flight Sinuator

### Lesson Briefing

### 11

### **Slow Flight:**

"Slow flight is an airspeed that any increase in angle-of-attack, increase in load-factor, or reduction in power will result in an immediate stall"

Maneuvering at minimum controllable airspeed.

### The Slow Flight Range

This chart shows us the power required to maintain altitude while slowing down or speeding up.

We have witnessed a poweron stall with full power. So we need to find the sweet spot of slow flight without risk of stalling. Power Power Required Curve Power reauired Airspeed (L/D) max Stall Speed **Minimum Power Required** (Max Endurance)

### The Slow Flight Range

The FAA says, "the objective is not to get the airplane as slow as possible, but instead to fly at a relatively slow speed while avoiding the envelope's edge."

"Recognize that unstable condition and avoid it"

Power Power Required Curve Power reauired Airspeed (L/D) max Stall Speed **Minimum Power Required** (Max Endurance)

### **Reduce Power and Speed?**

Your POH section 5 has charts to help:

Cruise Performance
 Range Profile
 Endurance Profile

Reducing power saves gas consumption but also slows you down. The object is to stay at altitude.

#### 45 MINUTES RESERVE 53 GALLONS USABLE FUEL



#### 45 MINUTES RESERVE 53 GALLONS USABLE FUEL

CONDITIONS: 2550 Pounds Recommended Lean Mixture for Cruise at all altitudes

Standard Temperature Zero Wind



#### CONDITIONS: 2550 Pounds Recommended Lean Mixture

Pressure Altitude	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
Feet		%			%			%		
		MCP	KTAS	GPH	MCP	KTAS	GPH	MCP	KTAS	GPH
8000	2700	83	125	11.1	77	124	10.4	71	123	9.7
	2650	78	122	10.5	72	122	9.9	67	120	9.3
	2600	74	120	10.0	68	119	9.4	64	117	8.9
	2500	65	114	9.1	61	112	8.6	57	111	8.1
	2400	58	108	8.2	54	106	7.8	51	104	7.4
	2300	52	101	7.5	48	99	7.1	46	97	6.8
	2200	46	94	6.8	43	92	6.5	41	90	6.2
10,000	2700	78	124	10.5	72	123	9.8	67	122	9.3
	2650	73	122	10.0	68	120	9.4	63	119	8.9
	2600	69	119	9.5	64	117	9.0	60	115	8.5
	2500	62	113	8.7	57	111	8.2	54	109	7.8
	2400	55	106	7.9	51	104	7.5	49	102	7.1
	2300	49	100	7.2	46	97	6.8	44	95	6.5
12,000	2650	69	121	9.5	64	119	8.9	60	117	8.5
	2600	65	118	9.1	61	116	8.5	57	114	8.1
	2500	58	111	8.3	54	109	7.8	51	107	7.4
	2400	52	105	7.5	49	102	7.1	46	100	6.8
	2300	47	98	6.9	44	95	6.6	41	92	6.3
NOTE										

### The Back Side of the Speed Curve

- This is the slow flight range.
- The minimum power airspeed is your endurance speed from the charts.
- The stall speed is shown on your airspeed indicator.
- Flaps give us a lower stall speed for safety.
- We can find a safe slow flight range with experimentation.



### Slow-Flight Entry:

1. HASEL at altitude.

- 2. Power to 1500 flaps 10° (below 107 kts.)
- 3. Increase pitch to maintain altitude as airspeed decreases TRIM
- 4. Extend full flaps (in white arc)
- 5. Upon reaching 50 kts increase power to maintain level flight (~ 2000 rpm)



6. Maintain coordinated flight (increased right rudder at low speed and high power setting)
7. Perform straight and level, and gentle turns
8. Use power to maintain altitude - pitch to maintain airspeed (just like landing)





### **Slow Flight Maneuvers:**

Maintain straight and level
Make gentle turns (<20°)</li>
Keep your speed safely above stall with pitch.
Keep your altitude with power.







### Slow Flight Example:



A closer view of the vitals.
This is with full flaps now.
57knots, 2600 feet at 2000 rpm



### **Slow-Flight Recovery:**

1. Apply full power, flaps 20°, reduce pitch to maintain altitude - TRIM

2. Retract flaps to 10° accelerating through 55 kts - TRIM

3. Retract flaps to 0° accelerating through
60 kts - TRIM

4. Accelerate to normal cruise or as specified and reduce power as necessary.

### Enter In and Out of Slow Flight

For air exercise practice:Know your slow flight range.

 Know how to get into it and out of it without losing altitude.

### **Questions Before Departure?**



### The Walkaround (pre-flight inspection)

Microsof

ForderLearnToFly.com



 
 Model 1735

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

See lesson 1 for full runup.

CTION 4 RMAL PROCEDURES

CESS MODEL 172S NAV GEC 700 AF

#### FORE TAKEOFF (Continued)

- 5. A/P TRIM DISC Button PRESS (if installed)
- (verify autopilot disengages and aural alert is heard)
- 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
- 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)
- 0. Throttle Control CHECK IDLE
- 1. Throttle Control 1000 RPM or LESS
- 2. Throttle Control Friction Lock ADJUST
- COM Frequency(s) SET
- 4. NAV Frequency(s) SET
- 5. FMS/GPS Flight Plan AS DESIRED

#### NOTE

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

6. XPDR - SET





Flying!

Gone

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

**UR CONTR** 

O. Tone



### Intermediate Lesson 11



### Stalls and Spins Training



Review

Slow Flight

#### IManual (FAA online docs)

POST FLIGHT

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



1.What use is the slow flight range?







# Summary Questions

2. Why do we have to add power at the slowest range?

Review Lesson



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# Summary Questions

3. What is the best memory aid for entry and exit from slow flight?

Review Lesson



# Summary Questions

4. Why do we need flaps if we are not landing?



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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

Review Lesson

### 6. What is a HASEL check?





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# Summary Questions

7. Is there any other practical use of slow flight other than understanding when you are in it and it's precautions?

# Intermediate Lesson 11 Homework



## Assignment

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.

# Intermediate Lesson 11 The Student HUB

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.

S ♣ [OFFICIAL] Flying Lessons: C152 Community ■ Community Events ■ all-welcome ■ free ■ beginner-pilots ■ recurring ■ twitch

#### Student Package

Update Checklist: La Checklist\_152\_Simulator2021v3.pdf (429.8 KB)

Dropbox - StudentPackage.zip - Simplify your life 635

#### **Lesson Archive**

Lesson 1: Straight and Level Flight, Ascending, Descending



Lesson 2: Taxiing, ATC/Radio Com Basics

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Lesson 12

#### Student Package

Lesson Archive

Lesson 1: Straight and Level Flight Ascending, Descending

Lesson 2: Taxiing, ATC/Radio Com Basics

Lesson 3: Take-off & Climb, Climbing & Gliding Turns, Circuit Joining and Radio

Lesson 4: Slow Flight, Stalls, Windcorrection, and our first complete landing.

Lesson 5: Traffic Patterns/Circuits

Lesson 6: Uncontrolled Airports

Lesson 7: Crosswindsand Crabbing

Lesson 8: Emergency Procedures -Forced Landing

Lesson 9: Emergency Procedures Part 2 + SUPRIRSE SOLO

Lesson 10: Forward Slips and Flapless Landings

Lesson 11: Short/Soft-field landings

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



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# Learn To Fly Intermediate Lesson 11

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Pilot IRL and Course Designer



On Voice Student Pilots

JAYNE