



## LANCAIR RECURRENT TRAINING Instructor Guide

This document is part of a syllabus for use by flight instructors and Lancair Pilots to conduct recurrent pilot training in the Lancair series aircraft. The course material is not complete without:

- LOBO Lancair Recurrent Training Instructor Guide (this document)
- LOBO Lancair Recurrent Training Student Guide
- LOBO Lancair Training Manual (model specific)
- LOBO Master Training Record

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# Introduction

This Lancair recurrent flight and ground training syllabus is based on modern FAA Industry/Training Standards (FITS) that train to proficiency utilizing scenario-based training modules combined with classic maneuver-based training. Instructors and Lancair Pilots will emphasize sound Aeronautical Decision Making (ADM), Single-pilot Resource Management (SRM) and Risk Management (RM) throughout a curriculum composed of Normal and Emergency procedures required to safely operate Lancair aircraft in a variety of scenarios. This program does not teach basic flying skills. Rather, it provides a proficient, certificated pilot a means to practice procedures and maneuvers in the Lancair series aircraft not practiced on normal operational flights.

This course is designed to be completed in two days. Completion is dependent on pilot proficiency and prior experience in flying complex, high-performance aircraft, the application of sound ADM and completion of prerequisite training material. The course schedule includes one ground lesson comprising approximately eight hours, and approximately five flight hours divided between two flights. All training times are estimated as the factors determining the total required training time (pilot knowledge, skill and preparation) cannot be determined prior to the start of training.

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**NOTE:** *This syllabus does not teach VFR only pilots the instrument flying skills necessary to safely fly in Instrument Meteorological Conditions (IMC). VFR-only pilots should be encouraged to seek appropriate instruction to earn an instrument rating.*

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## **Training Prerequisites**

The Lancair Pilot must hold at least a private pilot airplane single engine land certificate and have a current valid airman's medical certificate. The Lancair pilot must complete all prerequisite course material before beginning the flight and ground training syllabus below. The Lancair pilot will be the Pilot in Command per 14 CFR 91.3 for all flights, if qualified.

## **Syllabus**

**Lesson RG1:** this ground lesson covers scenario based training, aeronautical decision making, risk management, normal and emergency procedures in Lancair aircraft and aircraft systems, Lancair experimental amateur built status implications and aircraft limitations and performance issues.

**Lesson RF1:** this flight lesson is a review of the aircraft flight characteristics on a short cross country. The lesson also concentrates on the Lancair in the takeoff and landing pattern with an emphasis on emergency procedures and sound aeronautical decision making.

**Lesson RFI2:** this flight lesson comprises a three-leg cross high altitude country utilizing EFIS/GPS (if equipped) with an instrument approach at the three destinations for instrument rated pilots.

**Lesson RFV2:** this flight lesson comprises a three-leg high altitude cross country utilizing EFIS/GPS (if equipped) with a visual approach at the three destinations for non-instrument rated pilots.



## ***FITS Terminology***

In an effort to develop a common training vocabulary, below you will find several terms describing known, but perhaps not previously defined, training concepts.

**Aircraft Automation Management** – The demonstrated ability to control and navigate an aircraft by means of on-board automated systems.

**Automated Navigation Leg** – A flight of 30 minutes or more conducted between two airports in which the aircraft is controlled primarily by the autopilot and the on-board navigation systems.

**Automation Competence** – The demonstrated ability to understand and operate the automated systems installed in the aircraft.

**Automation Surprise** – An automated system’s ability to provide different cues to pilots when compared to the analog systems they replace, especially in time-critical situations.

**Automation Bias** – The relative willingness of the pilot to trust and utilize automated systems.

**Candidate Assessment** – A system of critical thinking and skill evaluations designed to assess a PT’s readiness to begin training at the appropriate level.

**Critical Safety Tasks/Events** – Those mission-related tasks/events that if not accomplished quickly and accurately, may result in aircraft damage, injury, or loss of life.

**Data Link Situational Awareness (SA) Systems** – Systems that provide real-time weather, traffic, terrain, and/or flight planning information to the cockpit. This information may be displayed on the Primary Flight Display (PFD), Multi-Function Display (MFD), or other related cockpit displays.

**Emergency Escape Maneuver** – A maneuver (or series of maneuvers) performed manually or with the aid of the aircraft’s automated systems that allows a pilot to successfully escape from an unanticipated flight into Instrument Meteorological Conditions (IMC) or other life-threatening situations.

**FAA-Industry Training Standards (FITS)** – A non-regulatory system of training jointly developed by the FAA and training experts in the general aviation industry. Instead of training pilots to pass a practical test, FITS trains pilots to manage real-world challenges with scenario-based training. The primary goals of FITS-based training scenarios is to enhance GA pilots’ aeronautical decision making, risk management, and single pilot resource management skills without compromising basic stick and rudder skills.

**Generic FITS** – These standards cover broad categories of training functions, such as flight reviews, complex/high-performance training, tail wheel training, and instructional exercises. Individual training entities (e.g. flight instructors, pilot schools) may adapt them for a particular aircraft or other scenarios.

**Mission Related Tasks** – Those tasks required for the safe and effective accomplishment of the flight.

**Multi-Function Display (MFD)** – A device that combines primarily navigation, systems, and situational awareness (SA) information onto a single electronic display.

**Primary Flight Display (PFD)** – A device that combines the primary six flight instruments plus other related navigation and situational awareness (SA) information into a single electronic display.

**Proficiency Based Qualification** – A qualification based on demonstrated performance rather than other flight time or experience.

**Pilot in Training (PT)** – The qualified pilot receiving training in a specified training program. Also referred to as “learner”.

**Scenario-based Training (SBT)** – Training programs built around highly structured scripts of “real-world” experiences to address flight-training objectives in an operational environment. Such training can include initial training, transition training, upgrade training, recurrent training, and special training. The appropriate term should appear with the term “Scenario-based,” e.g., “Scenario-based Transition Training,” to reflect the specific application.

**Simulation** – The use of animation and/or actual representations of aircraft systems to faithfully replicate the flight environment.

**Single-pilot Resource Management (SRM)** – The “art and science” of managing all available resources to ensure the successful outcome of the flight.

**Specific FITS** – A FITS program tailored for a specific aircraft or technology.

**Technically Advanced Aircraft (TAA)** – A general aviation aircraft that contains a GPS navigator with a moving map display, plus any additional systems. Traditional systems, such as autopilots, are included when combined with GPS navigators. Aircraft used in both VFR and IFR operations, with systems certified for either VFR or IFR flight, are also included.

**Training-Only Tasks** – Training maneuvers that while valuable to the pilot’s ability to understand and perform a mission related task, are not required when demonstrating proficiency. Flight instructors are required to be proficient in Training-Only Tasks.

## ***Learner Centered Grading***

**Desired Pilot in Training (PT) Scenario Outcomes-** The object of scenario-based training is a change in the thought processes, habits, and behaviors of the PT during the planning and execution of each scenario. Since the training is learner centered, success is measured in the following desired PT outcomes:

### ***Maneuver, Skill or Task Grades***

- **Describe (D)** – At the completion of the scenario, the PT will be able to describe the physical characteristics and cognitive elements of the scenario activities. *Instructor assistance is required to successfully execute the maneuver.*
- **Explain (E)** – At the completion of the scenario the PT will be able to describe the scenario activity and understand the underlying concepts, principles, and procedures that comprise the activity. *Instructor assistance is required to successfully execute the maneuver.*
- **Practice (Pr)** – At the completion of the scenario the PT will be able to plan and execute the scenario. *Some coaching, instruction, and/or assistance from the instructor are required to correct deviations and errors.*
- **Perform (Pe)** – At the completion of the scenario, the PT will be able to perform the activity without assistance from the instructor. *Errors and deviations will be identified and corrected by the PT in an expeditious manner. At no time will the successful completion of the activity be in doubt. “Perform” will be used to signify that the PT is satisfactorily demonstrating proficiency in piloting and systems operation skills.*
- **Not Observed (No)** – Any event not accomplished or required.



### ***Single-pilot Resource Management (SRM) Grades***

- **Explain (E)** – The PT can verbally identify, describe, and understand the risks inherent in the flight scenario. *The PT will need to be prompted to identify risks and make decisions.*
- **Practice (Pr)** – The PT is able to identify, understand, and apply SRM principles to the actual flight situation. *Coaching, instruction, and/or assistance from the instructor will quickly correct minor deviations and errors identified by the instructor.* The PT will be an active decision maker.
- **Manage/Decide (MD)** – The PT can correctly gather the most important data available both within and outside the cockpit, identify possible courses of action, evaluate the risk inherent in each course of action, and make the appropriate decision. *Instructor intervention is not required for the safe completion of the flight.* “Manage/Decide” will be used to signify the PT is satisfactorily demonstrating acceptable SRM skills
- **Not Observed (No)** – Any event not accomplished or required.

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**NOTE:** *Both the Pilot in Training (PT) and the instructor must grade independently and compare during the post flight critique.*

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Learner-centered grading is a vital part of the FITS concept. Traditional syllabi and curriculum have depended on a grading scale designed to maximize PT management and ease of instructor use. Thus the traditional “**excellent, good, fair, poor**” or “**exceeds standards, meets standards, needs more training**” grading scale often meets the instructor’s needs, but not the PT’s. The learner-centered grading described above is a way for the instructor and PT to determine the PT’s level of knowledge and understanding. “**Perform (Pe)**” is used to describe proficiency in a skill item such as an approach or landing. “**Manage/Decide (MD)**” is used to describe proficiency in the SRM area such as Aeronautical Decision Making (ADM). Grading should be progressive. During each flight, the PT should achieve a new level of learning.



## Lesson RG1 – Ground (approximately 8.0 hours)

### Text Reference

- Lancair Training Manual
- Airplane Flight Manual
- FAR/AIM
- Airplane Flying Handbook (FAA-H-8083-3, as amended)
- Certification and Operation of Amateur-Built Aircraft AC 20-27E, as amended
- The Aviation Instructor’s Handbook (FAA-H-8083-9, as amended)
- Aerodynamics For Naval Aviators (NAVAIR 00-80T-80)

### Lesson Objectives

During this ground training session the PT and instructor will review sound aeronautical decision making, risk management and single pilot resource management. Further discussion will include emphasis on aircraft systems, weight & balance computation, situational awareness, performance issues, and the unique handling qualities of Lancair aircraft as they pertain to operations and limitations unique to experimental amateur built aircraft. All discussion topics will include implications for both normal and emergency operations.

### Training Elements

<i>Systems</i>	<i>Normal Procedures</i>	<i>Emer Procedures/ Flight Safety</i>	<i>High-Perf Systems</i>
<input type="checkbox"/> Airframe Description <input type="checkbox"/> Fuel <input type="checkbox"/> Electrical <input type="checkbox"/> Flight Controls <input type="checkbox"/> Landing Gear <input type="checkbox"/> Flaps <input type="checkbox"/> Speed Brakes <input type="checkbox"/> Hydraulic <input type="checkbox"/> Wheel & Brakes <input type="checkbox"/> Avionics <input type="checkbox"/> Pitot Static <input type="checkbox"/> Propeller <input type="checkbox"/> Engine	<input type="checkbox"/> Checklist Use <input type="checkbox"/> Preflight <input type="checkbox"/> Taxi <input type="checkbox"/> Before Takeoff <input type="checkbox"/> Takeoff <input type="checkbox"/> Climb <input type="checkbox"/> Cruise <input type="checkbox"/> Descent <input type="checkbox"/> Before Landing <input type="checkbox"/> After Landing <input type="checkbox"/> Chocks	<input type="checkbox"/> Engine Failure/ Forced Landings <input type="checkbox"/> Fires <input type="checkbox"/> Icing <input type="checkbox"/> T/O & Landing EP’s <input type="checkbox"/> Brake Failure <input type="checkbox"/> Electrical <input type="checkbox"/> Single-pilot Resource Management <input type="checkbox"/> Aeronautical Decision Making <input type="checkbox"/> Risk Management	<input type="checkbox"/> Turbo-Engine Operation <input type="checkbox"/> Autopilot Operation <input type="checkbox"/> Pressurization & Air- Conditioning

<i>Experimental Aircraft</i>	<i>Performance</i>	<i>Weather</i>	<i>GPS</i>
<input type="checkbox"/> Condition Inspection <input type="checkbox"/> Repairman Certificate <input type="checkbox"/> Maintenance Issues <input type="checkbox"/> Flight Tests	<input type="checkbox"/> Weight and Balance <input type="checkbox"/> Performance Factors <input type="checkbox"/> Performance Charts <input type="checkbox"/> Aircraft Limitations <input type="checkbox"/> V <sub>n</sub> Diagram	<input type="checkbox"/> Icing <input type="checkbox"/> Thunderstorms <input type="checkbox"/> Data Link Weather	<input type="checkbox"/> RAIM, RNP, WAAS Approaches



### Completion Standards

The PT will demonstrate a fundamental understanding of aircraft operation, systems, description and operation of the constant-speed propeller, engine cooling, weight & balance and aircraft limitations and performance. Additionally, the PT will demonstrate understanding of experimental amateur built aircraft issues.

**NOTE:** The asterisk (\*) indicates the desired pilot performance level.

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>D</b>	<b>E*</b>	<b>D</b>	<b>E*</b>
Training Program				
Aircraft Systems				
Normal Procedures				
Emergency Procedures				
Weather				
GPS				
Performance				
Experimental Amateur-Built Aircraft				
High Performance Systems				

### Single Pilot Resource Management

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>E*</b>	<b>Pr</b>	<b>E*</b>	<b>Pr</b>
Automation/Avionics Management				
Radio Communication				
Hazard & Risk Analysis				
Situational Awareness				
Task Management				
ADM				
Checklist Use				
Performance & Limitations				

## Lesson RF1 – Flight (approximately 2.0- 2.5 hours)

### **Text Reference**

- Lancair Training Manual
- Airplane Flight Manual
- Airplane Flying Handbook (FAA-H-8083-3, as amended)

### **Lesson Objectives**

During the lesson the PT will enhance their understanding of the Lancair through review of the power, attitude, and configuration (PAC) required to perform the listed maneuvers and procedures. The mission will originate at a local field and proceed via day VMC cross-country flight to a nearby airport (approximately 50 nm away). The PT will complete all start, taxi, takeoff and departure, cruise, arrival and landing checklists as well as utilize advanced GPS navigation skills. EFIS and autopilot operation will be reviewed (if equipped). The PT will make a full-stop landing at the first destination. The second leg will mirror the flight profile of the first leg with the PT accomplishing any maneuvers requiring further practice. Additionally, the instructor will introduce a simulated emergency situation requiring a diversion. The PT will review and accomplish emergency landing procedures at one or more of the destination airports during the mission. The instructor will use the return flight to the point of origin to further practice maneuvers or procedures requiring additional training.

### **Training Elements**

<ul style="list-style-type: none"> <li><input type="checkbox"/> Operation of airplane systems</li> <li><input type="checkbox"/> Determining Performance and Limitations</li> <li><input type="checkbox"/> Performance Maneuvers</li> <li><input type="checkbox"/> Ground Operations</li> <li><input type="checkbox"/> Engine Start &amp; Warm-up</li> <li><input type="checkbox"/> Taxiing: Normal &amp; Crosswind</li> <li><input type="checkbox"/> Takeoff</li> <li><input type="checkbox"/> Climb – <math>V_x</math>, <math>V_y</math></li> <li><input type="checkbox"/> Engine Operations/Monitoring/Cooling</li> <li><input type="checkbox"/> Cruise Climb</li> <li><input type="checkbox"/> Straight &amp; Level Turns</li> <li><input type="checkbox"/> Steep Turns</li> <li><input type="checkbox"/> Slow Flight</li> <li><input type="checkbox"/> Straight &amp; Turning Stall Recognition/Recovery</li> <li><input type="checkbox"/> Descents &amp; Descent Planning</li> <li><input type="checkbox"/> After Landing Procedures</li> <li><input type="checkbox"/> Normal Landings</li> <li><input type="checkbox"/> Emergency Landing</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Abnormal and Emergency Procedure Demo &amp; practice (selected)</li> <li><input type="checkbox"/> Full/Partial In-Flight Engine Failure</li> <li><input type="checkbox"/> Loss of Cabin Pressure</li> <li><input type="checkbox"/> Engine Failure After Takeoff</li> <li><input type="checkbox"/> Recovery from unusual attitudes</li> <li><input type="checkbox"/> Cabin/Wing Fires</li> <li><input type="checkbox"/> Engine Fire</li> <li><input type="checkbox"/> Landing Gear Malfunction/Emergency Gear Extension</li> <li><input type="checkbox"/> Oil Pressure/Temp Out of Limits</li> <li><input type="checkbox"/> Propeller Governor Malfunction</li> <li><input type="checkbox"/> Engine-Out Landing Procedures</li> <li><input type="checkbox"/> Alternator Failure</li> <li><input type="checkbox"/> Total Electrical Failure</li> <li><input type="checkbox"/> Vacuum Failure</li> <li><input type="checkbox"/> Autopilot Malfunctions</li> <li><input type="checkbox"/> No-Flap Take Off</li> <li><input type="checkbox"/> Flight at Slow Airspeeds (high AOA)</li> <li><input type="checkbox"/> Go Around/Rejected landing</li> <li><input type="checkbox"/> Rejected Takeoff</li> <li><input type="checkbox"/> Emergency 180° Turn</li> </ul>
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### **Training Scenario**

You have a friend who is also a pilot. He is considering the purchase of an airplane. The friend has less flight experience than you, so he asks you to conduct an airplane performance flight and give him a recommendation. In order to help your friend make the best decision you will really have to put the airplane through its paces – exploring some specific areas of flight performance in particular. The areas you have special interest in are: slow flight characteristics, stall recognition, and takeoff and landing performance. You get started when the current owner of the airplane allows you to take the airplane for a “test drive.”

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***NOTE: Due to the experimental, amateur-built nature of the Lancair, stall characteristics – and more importantly stall recovery techniques – have not been determined for each and every Lancair. Therefore, at no time will the instructor or PT intentionally stall the aircraft!***

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### **Instructor Notes**

Lesson RF1 is planned as a three-leg cross-country flight incorporating traditional maneuver-based training demonstrating and practicing PTS maneuvers including slow flight, steep turns, stall recognition and takeoffs and landings. The Lancair pilot should be given a thorough review of the aircraft takeoff and landing characteristics.

### Completion Standards

The PT shall demonstrate knowledge and skill commensurate with the certificate(s) held, and sound judgment in operation of the aircraft. At a minimum, the PT should maintain heading within 5 degrees, altitude to within 100 feet, and airspeed to within 5 knots. The PT will perform all Emergency procedures such that the successful outcome is never seriously in doubt. The PT must use checklists at all times. The PT must demonstrate proficiency in single-pilot operation of the aircraft and installed systems.

**NOTE:** The asterisk (\*) indicates the desired pilot performance level.

#### Single Pilot Resource Management

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr*</b>	<b>MD</b>	<b>Pr*</b>	<b>MD</b>
Automation/Avionics Management				
Radio Communication				
Hazard & Risk Analysis				
Situational Awareness				
Task Management				
ADM				
Checklist Use				
Performance & Limitations				

#### Pre-Takeoff

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Preflight				
Engine Start				
Before Taxi				
Taxi				
Before Takeoff				
Checklist Use				

#### Takeoff & Climb

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Normal/Crosswind Takeoff				
Climb				
Checklist Use				



Cruise

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Initial Cruise				
En Route Cruise				
Checklist Use				
Slow Flight Maneuvers				
Stall Recognition & Recovery				
Autopilot Stall Recognition & Recovery				
Steep Turns				

Descent & Landing

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Descent & Arrival Procedures				
Traffic Pattern				
Normal/Crosswind Landing				
Zero-Flap Landing				
Power-Off Landing				
Go Around				

Post Flight

<b>ELEMENTS</b>	<b>Completed</b>	
	<b>Pilot</b>	<b>Instructor</b>
Post Flight Critique & Discussion		

# **Lesson RF12 – Flight (approximately 2.0- 2.5 hours)**

## **Text Reference**

- Lancair Training Manual
- Airplane Flight Manual
- Airplane Flying Handbook (FAA-H-8083-3, as amended)
- Instrument Flying Handbook (FAA-H-8083-15, as amended)
- Instrument Procedures Handbook (FAA-H-8261-1, as amended)

## **Lesson Objective**

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*NOTE: This training flight is aimed specifically at the instrument-rated PT. VFR-only pilots will complete lesson RFV2 (described in the next section).*

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The PT will review and practice the principles of attitude instrument flying and the correlation of flight instruments to maintaining precise aircraft control during a three-leg cross country flight. The PT will review and practice use of advanced avionics within the airspace/ATC environment. The PT will review and practice ILS, GPS and VOR instrument approaches, holds and demonstrate radial tracking. The flight will originate at a local field and proceed via day or night IFR cross-country flight to a nearby airport (approximately 50-80 nm away). The PT will complete all start, taxi, takeoff and departure, cruise, arrival and landing checklists, as well as utilize advanced GPS navigation skills. EFIS and autopilot operation will be reviewed (if installed). The PT will accomplish a full-stop landing at the first destination. The second and third legs will mirror the flight profile of the first leg with the PT accomplishing any maneuvers requiring further practice.

## **Lesson Content**

<ul style="list-style-type: none"><li><input type="checkbox"/> Instrument Preflight</li><li><input type="checkbox"/> Normal Takeoff into IMC</li><li><input type="checkbox"/> Climbs</li><li><input type="checkbox"/> Straight &amp; Level</li><li><input type="checkbox"/> Turns (Level)</li><li><input type="checkbox"/> Descents &amp; Descent planning</li><li><input type="checkbox"/> Steep Turns</li><li><input type="checkbox"/> Standard Rate Turns</li><li><input type="checkbox"/> Partial Panel</li><li><input type="checkbox"/> Holding</li><li><input type="checkbox"/> IMC Emergency Landing</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Constant Airspeed Descents</li><li><input type="checkbox"/> Constant Rate Descents</li><li><input type="checkbox"/> Constant Airspeed Climbs</li><li><input type="checkbox"/> Constant Rate Climbs</li><li><input type="checkbox"/> Precision Approach</li><li><input type="checkbox"/> Non-Precision Approach</li><li><input type="checkbox"/> GPS Approaches</li><li><input type="checkbox"/> Missed Approach</li><li><input type="checkbox"/> Circling Approach</li><li><input type="checkbox"/> Advanced Avionics</li></ul>
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## **Training Scenario**

It is homecoming weekend at Tippacanoe U., your alma mater. You and two fraternity buddies are going to the big game. Kick off is at 1 pm so don't be late. Even though the forecast calls for rain you are still a go since you have that coveted instrument rating. If you can't get a hotel room you three are planning on returning after dinner at the old frat house.



### Instructor Notes

Lesson RFI2 is a scenario-based, three-leg short cross-country flown under simulated IMC conditions. The PT will program a GPS course to another airport allowing 20 to 30 minutes enroute. Following a normal takeoff and departure the PT should navigate to the destination at a median altitude. If installed, the PT should program and use the autopilot and GPS for all phases of flight including the climb and level off, autopilot/GPS-coupled navigation and a GPS approach at the destination. The PT will execute a missed approach to a hold to prepare for another instrument approach of the instructor’s choosing. The second approach should terminate with a full-stop landing. The second leg will mirror the flight profile of the first with the instructor adding a simulated TAWS warning on approach requiring the PT to perform an appropriate escape maneuver. The third leg (a return to the originating airport) will mirror the first two legs with the instructor adding an AHARS failure (if installed).

### Completion Standards

The PT will demonstrate an understanding of PAC flight management and aircraft control by reference to the flight and power instruments. The PT should maintain altitude within 100 feet, airspeed within 10 knots, and heading within 5 degrees. The PT will perform all Emergency Procedures such that the successful outcome is never seriously in doubt. The PT must use checklists at all times. The PT must demonstrate proficiency in single-pilot IFR operation of the aircraft and installed systems.

#### Single Pilot Resource Management

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr*</b>	<b>MD</b>	<b>Pr*</b>	<b>MD</b>
Automation/Avionics Management				
Radio Communication				
Hazard & Risk Analysis				
Situational Awareness				
Task Management				
ADM				
Checklist Use				
Performance & Limitations				
Terrain/CFIT Awareness				

#### Pre-Takeoff

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Preflight				
Start				
Before Taxi				
Taxi				
Before Takeoff				
Checklist Use				



Takeoff & Climb

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr*</i>	<i>Pe</i>	<i>Pr*</i>	<i>Pe</i>
Normal/Crosswind Takeoff				
Climb				
Checklist Use				

Cruise

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr*</i>	<i>Pe</i>	<i>Pr*</i>	<i>Pe</i>
Initial Cruise				
En Route Cruise				
Checklist Use				
GPS Navigation				
EFIS/Autopilot Operation				
EFIS/PFD/AHARS Malfunction				
Partial Panel				
Unusual Attitude Recovery				

Descent & Landing

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr*</i>	<i>Pe</i>	<i>Pr*</i>	<i>Pe</i>
Descent & Arrival Procedures				
Holding				
Approach				
Traffic Pattern				
Normal/Crosswind Landing				
TAWS Escape Maneuver				
Go Around				
After Landing				
Shutdown				
Checklist Use				

Post Flight

<i>ELEMENTS</i>	<i>Completed</i>	
	<i>Pilot</i>	<i>Instructor</i>
Post Flight Critique & Discussion		



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# **Lesson RFV2 – Flight (approximately 2.0- 2.5 hours)**

## **Text Reference**

- Lancair Training Manual
- Aircraft Flight Manual
- Airplane Flying Handbook (FAA-H-8083-3, as amended)
- Instrument Flying Handbook (FAA-H-8083-15, as amended)
- Instrument Procedures Handbook (FAA-H-8261-1, as amended)

## **Lesson Objective**

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*NOTE: This training flight is aimed specifically at the VFR PT.*

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The PT will review and practice the principles of VFR cross country flying and the correlation of flight instruments to maintaining precise aircraft control during a three-leg cross country flight. The PT will review and practice use of advanced avionics within the airspace/ATC environment utilizing ATC flight following where available. The PT will review and practice visual, GPS and VOR navigation and demonstrate radial tracking. The flight will originate at a local field and proceed via day or night VFR cross-country flight to a nearby airport (approximately 50-80 nm away). The PT will complete all start, taxi, takeoff and departure, cruise, arrival and landing checklists, as well as utilize advanced GPS navigation skills. EFIS and autopilot operation will be performed (if installed). The PT will accomplish a full-stop landing at the first destination. The second and third legs will mirror the flight profile of the first leg with the PT accomplishing any maneuvers requiring further practice.

## **Lesson Content**

<input type="checkbox"/> Preflight	<input type="checkbox"/> Constant Airspeed Descents
<input type="checkbox"/> Normal Takeoff	<input type="checkbox"/> Constant Rate Descents
<input type="checkbox"/> Climbs	<input type="checkbox"/> Constant Airspeed Climbs
<input type="checkbox"/> Straight & Level	<input type="checkbox"/> Constant Rate Climbs
<input type="checkbox"/> Turns (Level)	<input type="checkbox"/> Advanced Avionics
<input type="checkbox"/> Descents & Descent planning	<input type="checkbox"/> VOR Navigation
<input type="checkbox"/> Steep Turns	<input type="checkbox"/> GPS Navigation
<input type="checkbox"/> Emergency Landing	

## **Training Scenario**

It is homecoming weekend at Tippacanoë U., your alma mater. You and two fraternity buddies are going to the big game. Kick off is at 1 pm so don't be late. Even though the forecast calls for rain, the weather is VFR, so you are still a go. If you can't get a hotel room you three are planning on returning after dinner at the old frat house.



### Instructor Notes

Lesson RFV2 is a scenario-based, three-leg short cross-country flown under VMC conditions. The PT will program a GPS course to another airport allowing 20 to 30 minutes enroute. Following a normal takeoff and departure the PT should navigate to the destination at a median altitude. If installed, the PT shall program and use the autopilot and GPS for all phases of flight after takeoff including the climb and level off, autopilot/GPS-coupled navigation and a VFR pattern entry at the destination. Abnormal and emergency procedures will be practiced including an electrical system malfunction. The second leg will mirror the flight profile of the first with the instructor adding a simulated TAWS warning on approach requiring the PT to perform an appropriate escape maneuver. The third leg (a return to the originating airport) will mirror the first two legs with the instructor adding an AHARS failure (if installed).

### Completion Standards

The PT will demonstrate an understanding of PAC flight management and aircraft control by reference to the flight and power instruments. The PT should maintain altitude within 100 feet, airspeed within 10 knots, and heading within 5 degrees. The PT will perform all Emergency Procedures such that the successful outcome is never seriously in doubt. The PT must use checklists at all times. The PT must demonstrate proficiency in single-pilot operation of the aircraft and installed systems.

#### Single Pilot Resource Management

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>MD*</b>	<b>Pr</b>	<b>MD*</b>
Automation/Avionics Management				
Radio Communication				
Hazard & Risk Analysis				
Situational Awareness				
Task Management				
ADM				
Checklist Use				
Performance & Limitations				
Terrain/CFIT Awareness				

#### Pre-Takeoff

<b>ELEMENTS</b>	<b>Grade</b>			
	<b>Pilot</b>		<b>Instructor</b>	
	<b>Pr</b>	<b>Pe*</b>	<b>Pr</b>	<b>Pe*</b>
Preflight				
Start				
Before Taxi				
Taxi				
Before Takeoff				
Checklist Use				

Takeoff & Climb

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr</i>	<i>Pe*</i>	<i>Pr</i>	<i>Pe*</i>
Normal/Crosswind Takeoff				
Climb				
Checklist Use				

Cruise

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr</i>	<i>Pe*</i>	<i>Pr</i>	<i>Pe*</i>
Initial Cruise				
En Route Cruise				
Checklist Use				
GPS Navigation				
VOR Navigation				
EFIS/PFD/AHARS Malfunction				
Unusual Attitude Recovery				
EFIS/Autopilot Operation				

Descent & Landing

<i>ELEMENTS</i>	<i>Grade</i>			
	<i>Pilot</i>		<i>Instructor</i>	
	<i>Pr</i>	<i>Pe*</i>	<i>Pr</i>	<i>Pe*</i>
Descent & Arrival Procedures				
Emergency Descent				
Selected Emergency				
Traffic Pattern				
Normal/Crosswind Landing				
TAWS Escape Maneuver				
Go Around				
After Landing				
Shutdown				
Checklist Use				

Post Flight

<i>ELEMENTS</i>	<i>Completed</i>	
	<i>Pilot</i>	<i>Instructor</i>
Post Flight Critique & Discussion		



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## Personal Minimums

14 CFR 61 comprise FAA regulations concerning airmen training, certification, and currency. Part 91 concerns general flight operation rules. While these rules comprise the core of today's aeronautical standards, they are the absolute floor in many situations regarding safety of flight.

A review of accident statistics shows the majority of serious and fatal accidents occur while a pilot new to Lancair aircraft accumulates their first 100 hours in type. Prudence dictates limiting exposure to high-risk operations during this time.

LOBO offers the following matrix to help the PT develop appropriate personal minimums. Pilots with more flight time and/or professional experience may wish to use this matrix as a starting point to develop their own for use while flying Lancair aircraft. Pilots with less overall experience and/or no professional flying experience should adhere to the personal minimums recommended here, or adopt more conservative ones.

**NOTE: Night and IFR flight *not recommended* for pilots with less than 100 hours time in type.**

QUALIFICATION	DAY		NIGHT	
	TIME IN TYPE (hours)			
	Less than 100	More than 100	Less than 100	More than 100
<b>VMC</b>				
<b>VFR-ONLY</b> (Not-IFR Rated) or <b>IFR RATED -- not proficient</b>	Minimum 3000' Ceiling & 5 SM Visibility		Not Recommended	Minimum 5000' Ceiling & 10 SM Visibility
<b>IMC</b>				
<b>IFR RATED &amp; PROFICIENT</b>	Not Recommended	Minimum 500' Ceiling & 1 SM Visibility	Not Recommended	Minimum 600' Ceiling & 1 SM Visibility
<b>IFR RATED &amp; PROFICIENT CAT 1 MINS</b> (within 60 days)	Not Recommended	Minimum 200' Ceiling & ½ SM Visibility	Not Recommended	Minimum 400' Ceiling & ¾ SM Visibility
<b>NOTE: FILE IFR ANYTIME WEATHER IS BELOW 3000'/5 SM</b>				
<b>TIME IN TYPE</b> (hours)	<b>MAXIMUM WIND</b>			
Less than 25	20 KNOTS SUSTAINED AND/OR 10 KNOT CROSSWIND		20 KNOTS TOTAL SUSTAINED AND/OR 10 KNOT CROSSWIND	
From 25 – 100	25 KNOTS SUSTAINED AND/OR 15 KNOT CROSSWIND		25 KNOTS SUSTAINED AND/OR 15 KNOT CROSSWIND	
More than 100	35 KNOTS SUSTAINED AND/OR 20 KNOT CROSSWIND OR MAX DEMONSTRATED WHICHEVER IS LESS		35 KNOTS SUSTAINED AND/OR 20 KNOT CROSSWIND OR MAX DEMONSTRATED WHICHEVER IS LESS	
<b>FLIGHT INTO KNOWN ICING PROHIBITED</b>				



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