Cirrus Perspective Differences Training

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Cirrus Perspective Avionics

Version 1.0.0
Presentation Updated 6/15/2009

Course Introduction

- Goals of Course
  - Familiarize *current and proficient* Cirrus pilots with operating the aircraft and avionics in VFR conditions
  - Highlight differences in operating procedures between avionics packages
  - Teach normal and abnormal situations

Agenda

- Introductions and Background
- Cirrus Training Philosophy
- Course Overview
- Review and clarification of pre-training material
- Procedures Trainer

Introductions

- Lets learn a little more about each other
  - Where do you live?
  - What is your occupation/hobbies?
  - Flying Background (VFR, IFR, Total Time, Cirrus Time)
  - How do you plan to use the aircraft?
  - What do you hope to accomplish from this training?
  - Are there any special requirements for your training?

Course Overview

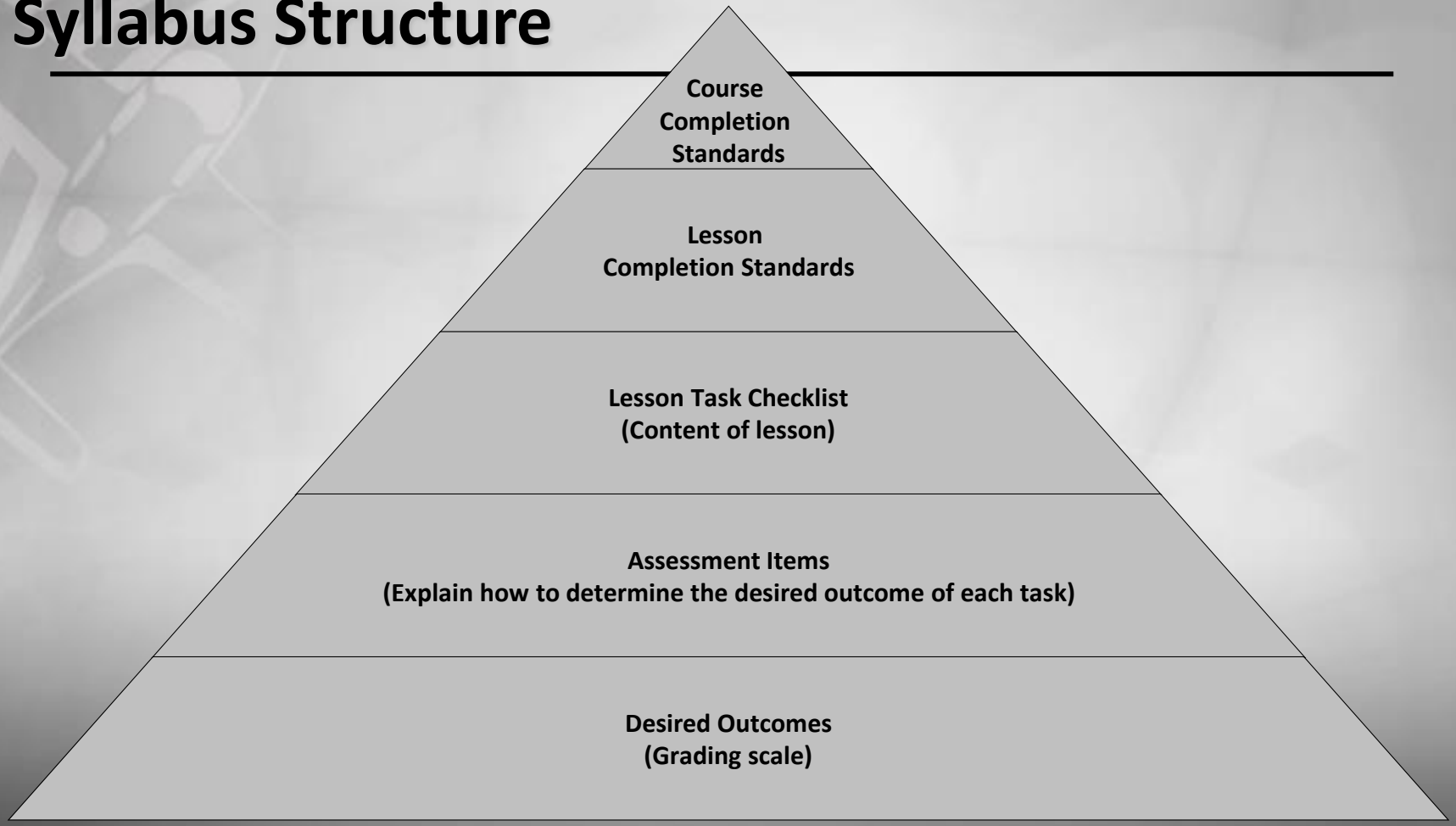
- Syllabus
  - 3 Lessons
  - 1 Day
  - Optional Flight Review (May add tasks and time)

- Emphasis Areas
  - Normal Procedures
  - Abnormal / Emergency Procedures
  - Standard Operating Procedures
  - Aeronautical Decision Making
  - Risk Management

Introduction to the Syllabus

How to Use This Course

Syllabus Structure



see next slides for further explanation

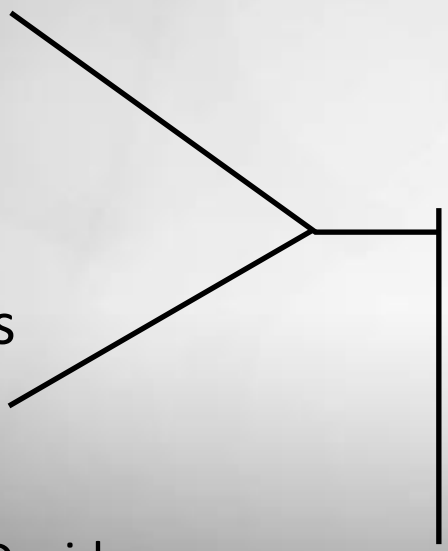
Desired Outcomes

- Maneuver Grades
  - **Describe**
  - Explain
  - Practice
  - Perform
- SRM Grades
  - Explain
  - Practice
  - Manage/Decide

Cirrus Pilot can describe the physical characteristics and cognitive elements of the activity

Desired Outcomes

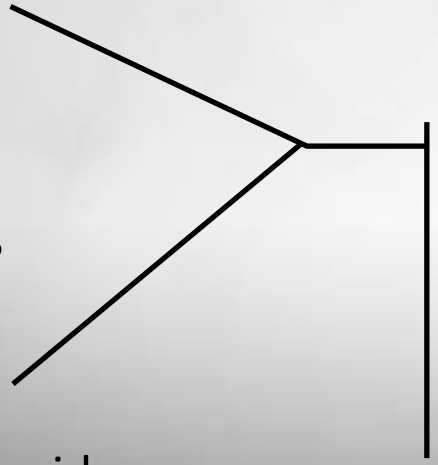
- Maneuver Grades
  - Describe
  - **Explain**
  - Practice
  - Perform
- SRM Grades
  - **Explain**
  - Practice
  - Manage/Decide



Cirrus Pilot can understand the underlying concepts, principles, and procedures that comprise the activity

Desired Outcomes

- Maneuver Grades
  - Describe
  - Explain
  - **Practice**
  - Perform
- SRM Grades
  - Explain
  - **Practice**
  - Manage/Decide



Cirrus Pilot can plan and execute the activity with coaching and assistance from the instructor

Desired Outcomes

- Maneuver Grades
  - Describe
  - Explain
  - Practice
  - **Perform**

- SRM Grades
  - Explain
  - Practice
  - Manage/Decide

Cirrus Pilot can perform the activity without assistance from the instructor

Desired Outcomes

- Maneuver Grades
  - Describe
  - Explain
  - Practice
  - Perform
- SRM Grades
  - Explain
  - Practice
  - **Manage/Decide**

Cirrus Pilot can gather the most important data available both within and outside the cockpit, identify possible courses of action, evaluate the risk of those actions, and make the appropriate decision without assistance or coaching from the instructor

Assessment Items

- Explanation of what needs to be observed by the instructor for the Cirrus pilot to meet the desired outcome for each task
- Presented in a manner that promotes pilot-led critique

Climb

- Cirrus pilot used the autopilot to assist in climb-out if appropriate.
- Cirrus pilot retracted the flaps at the appropriate time.
- Cirrus pilot selected the appropriate altitude to turn onto course.
- Cirrus pilot used the traffic system to aid in visually acquiring other aircraft while using proper scanning techniques for collision avoidance.
- Cirrus pilot completed the climb checklist.
- Cirrus pilot established the proper power and mixture settings on climb out.
- Cirrus pilot transitioned to an en-route climb and utilized engine monitoring to maintain proper engine cooling.
- Cirrus pilot used the oxygen system if applicable and donned the mask/cannula prior to reaching an altitude where oxygen is required.

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Task Checklist

- Tool for tracking course progress and desired outcomes of required tasks
- Gray shaded boxes indicate required performance of required tasks
- Each *task* has associated *Assessment Items*

Descent and Landing

Task	Desired Outcome	
	Practice	Perform
Descent and Arrival Procedures	❑	❑
Traffic pattern	❑	❑
Normal/Crosswind Landing	❑	❑
Short-field Landing	❑	❑
Soft-field Landing	❑	❑
50% Flap Landing	❑	❑
Zero Flap Landing	❑	❑
Power-off Landing	❑	❑
Go-around	❑	❑
After Landing	❑	❑
Shutdown	❑	❑

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Lesson Completion Standards

- Each lesson will be complete when the Cirrus pilot can satisfactorily:
  - Demonstrate ADM and SRM
  - Demonstrate critical thinking skills
  - Complete the required tasks using the assessment criteria within the course

Course Completion Standards

Certificate of Completion awarded when:

- All lessons satisfactorily complete
- All desired outcomes met for required tasks
- Demonstrate judgment, ADM abilities, SRM and RM skills

All maneuvers and procedures will be performed at the standards defined in the FAA Practical Test Standards (or international equivalent) for the pilot certificate held.

CERTIFICATE OF COMPLETION

This document certifies that

Cirrus Pilot

has completed the course requirements for

Transition Training

March 31, 2009

COMPLETION DATE

AUTHORIZED CIRRUS AIRCRAFT INSTRUCTOR

CIRRUS AIRCRAFT 4515 TAYLOR CIRCLE DULUTH MN 55811 218.788.3600

Lesson Content

Layout of Typical Flight Lesson

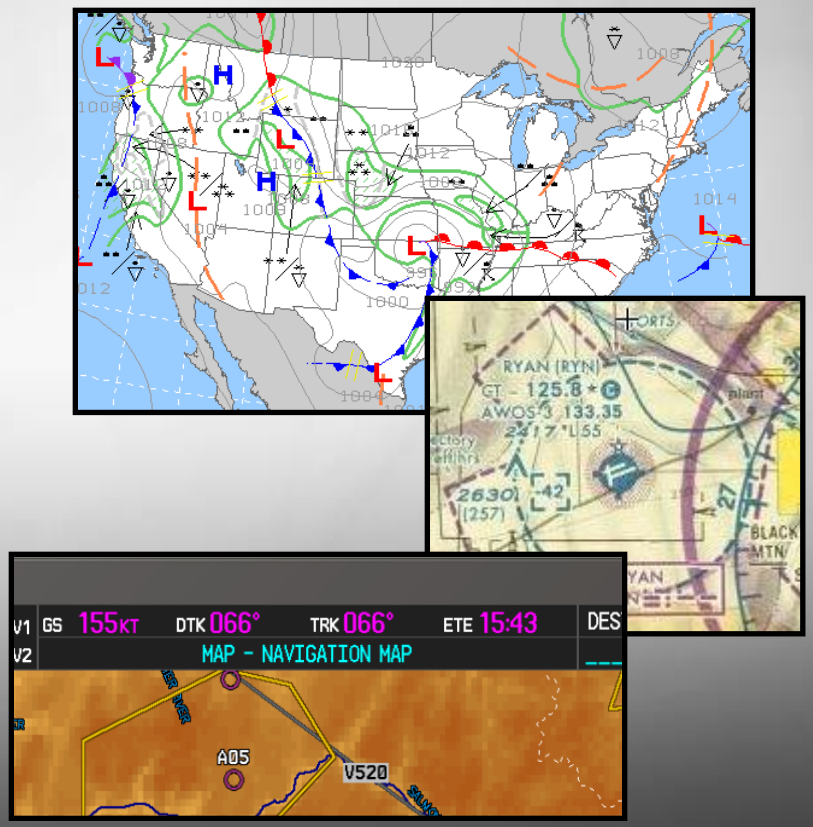
- Preflight Brief
  - Lesson Preview and Discussion
  - Flight Planning
  - Weather Analysis
- Flight Lesson
- Post flight Critique
  - Self-critique
  - Instructor Critique
  - Study Assignments and Next Lesson Preview

Preflight Brief

Discuss lesson content and scenarios on the ground prior to flight.

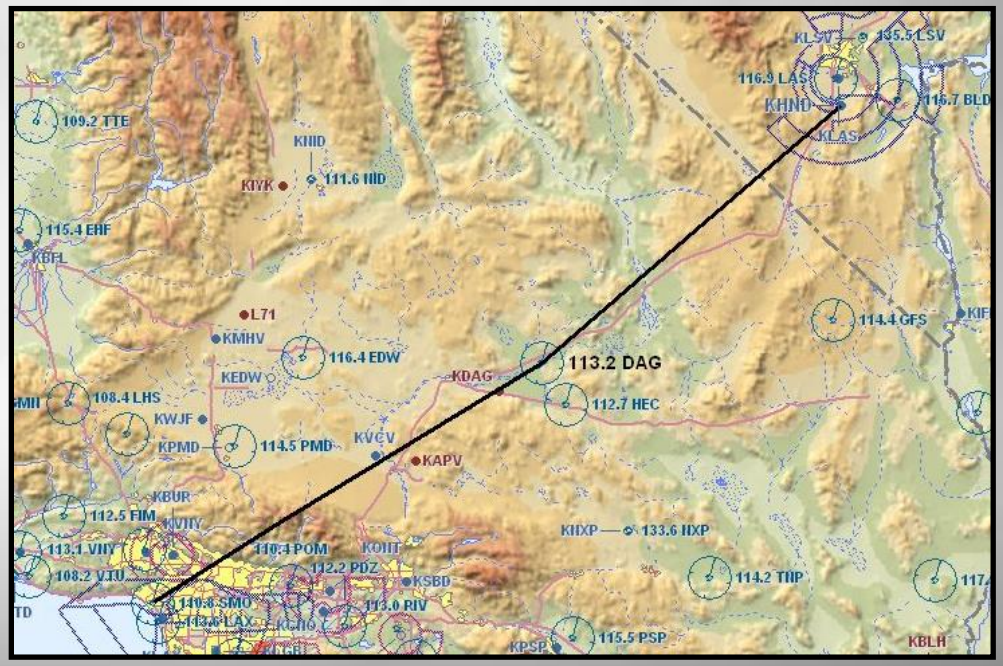
Make a plan for the flight taking into account:

- Weather requirements (Avionics failures and IMC)
- Airport requirements (Instrument approaches, ATC)
- Time requirements (Short legs create busy cockpit)



Flight Lesson

- **Ultimate goal of most lessons is to get from departure to destination.**
  - **Issues may come up along the way that challenge that goal**
  - **There are consequences for not reaching your destination**



Post Flight Critique

At the end of each lesson, the Cirrus pilot should self-critique his or her performance

The instructor will also critique the Cirrus pilot's performance

From this, a discussion will follow to determine whether the tasks for the lesson were completed satisfactorily

Areas of improvement also discussed

Safety Culture

- What is a “Safe” flight?
- How do you make the “Go/No-Go” determination for a given flight?
- What things do you consider?
  - What is your thought process?

Envelope of Safety

QUALIFICATION	DAY		NIGHT			MAX WIND: T-0 & LND
ALL VFR FLIGHTS NON-INSTRUMENT RATED -OR- INSTRUMENT RATED [NON-PROFICIENT]	Operate at or Above 3000' Ceilings 5 SM Visibility		Operate at or Above 5000' Ceilings 10 SM Visibility		DAY	25 KNOTS TOTAL SUSTAINED 15 KNOT CROSSWIND
					NIGHT	25 KNOTS TOTAL SUSTAINED 10 KNOT CROSSWIND
INSTRUMENT RATED [PROFICIENT]	Less than 100 hours in Type	Greater than 100 hours in Type	Less than 100 hours in Type	Greater than 100 hours in Type	DAY	30 KNOTS TOTAL SUSTAINED 15 KNOT CROSSWIND
Note: File IFR anytime the weather is below 3000'/ 5 SM	Operate at or Above 1000' Ceilings 3 SM Visibility	Operate at or Above 500' Ceilings 1 SM Visibility	Operate at or Above 1000' Ceilings 3 SM Visibility	Operate at or Above 600' Ceilings 2 SM Visibility	NIGHT	25 KNOTS TOTAL SUSTAINED 15 KNOT CROSSWIND
INSTRUMENT RATED [PROFICIENT WITH DEMONSTRATED ABILITY TO CAT 1 MINIMUMS WITHIN 60 DAYS]	Less than 100 hours in Type	Greater than 100 hours in Type	Less than 100 hours in Type	Greater than 100 hours in Type	DAY	35 KNOTS TOTAL SUSTAINED 20 KNOT CROSSWIND OR MAX DEMONSTRATED
Note: File IFR anytime the weather is below 3000'/ 5 SM	Operate at or Above 500' Ceilings 1 SM Visibility	Operate at or Above 200' Ceilings 1/2 SM Visibility	Operate at or Above 500' Ceilings 1 SM Visibility	Operate at or Above 200' Ceilings 1/2 SM Visibility	NIGHT	35 KNOTS TOTAL SUSTAINED 20 KNOT CROSSWIND OR MAX DEMONSTRATED

ICING CONDITIONS:

FLIGHT INTO ICING CONDITIONS IS HAZARDOUS

Refer to Approved Airplane Flight Manual Limitations

Minimum runway is 2.5 times the expected T-O or LND distance

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Risk Management

5P Checklist

- Use at the following intervals:
  - Flight planning
  - Before takeoff
  - En-route
  - Top of descent

The 5P Checklist	
Plan	➢ Weather ➢ Route ➢ Publications ➢ ATC Delays ➢ Fuel Remaining
Plane	➢ Mechanical Status ➢ Automation Status ➢ Database Currency ➢ Circuit Breakers ➢ Backup Systems
Pilot	➢ "I"llness ➢ "M"edication ➢ "S"tress ➢ "A"lcohol ➢ "F"atigue ➢ "E"motion
Passengers	➢ Pilots or non-pilots ➢ Nervous or quiet ➢ Experienced or new ➢ Helpful or a handful ➢ Urgent or optional ➢ Business or pleasure
Programming	*Preprogram the:* ➢ Autopilot ➢ GPS ➢ MFD/PFD *Anticipate:* ➢ Likely reroutes and clearances ➢ Crunch points ➢ Manual backup ➢ High terrain encounters

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Lesson Summaries

Lesson 1 – Ground (Course Intro and CPT)

Lesson Objectives

- Review course content, objectives, and completion standards.
- Review pre-training material.
- Avionics proficiency using a cockpit procedures trainer or an aircraft on ground power.

Lesson 2 – Flight (Practice Avionics Usage)

Lesson Objectives

- Normal operations for VFR cross country flight while using automation
- Practice functions of the avionics:
  - Tuning frequencies
  - Creating and modifying flight plans
  - Scanning and interpreting the PFD and the MFD
  - Using the autopilot
- Manage any malfunctions of the avionics or the electrical system

- Normal Procedures
  - FMS Operation
  - Autopilot Operation
  - Checklist Usage
  - Avionics Interpretation
- PFD Failure
- Air Data Failure
- Alternator Failure
- Autopilot Failure

Lesson 3 – Flight (Evaluation)

Lesson Objectives

- Demonstrate the judgment, aeronautical decision making, and single pilot resource management skills necessary to effectively, efficiently, and safely operate the Cirrus aircraft.

- Avionics Malfunction
- Autopilot Malfunction
- Weather Diversion

Flight Review – Optional

Lesson Objectives

- Complete items required by FAR 61.56 to satisfy requirements of a Biennial Flight Review
- An additional half-day of training may be required to cover information required by the Federal Aviation Regulations.

Pre-Training Material

- Successful on-schedule completion of training is greatly dependent on devoting the proper amount of time to reviewing and studying the pre-training material.
- Lets talk about your pre-training material
- Answer and clarify any questions

Procedures Trainer / CAPS Simulator

- CAPS Simulator (if available)
  - Demonstrate the proper procedure on how to deploy the CAPS system.
- Procedures Trainer (or aircraft on ground power)
  - Explore functions of the avionics
  - Form foundation to build upon once we start flying

Pre-Flight Briefings

Cirrus Perspective Avionics

Navigation Menu

Lesson 2

Lesson 3

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Lesson 2 – Practice Avionics Usage

Lesson Objectives

- Normal operations for VFR cross country flight while using automation
- Practice functions of the avionics:
  - Tuning frequencies
  - Creating and modifying flight plans
  - Scanning and interpreting the PFD and the MFD
  - Using the autopilot
- Manage any malfunctions of the avionics or the electrical system

Lesson Content

- *Leg 1 – Autopilot*
  - Basic functions of FMS/GPS
  - Basic functions of autopilot
- *Leg 2 – Autopilot*
  - Advanced functions of FMS/GPS
  - Advanced functions of autopilot
  - Electrical Malfunction
  - Air Data Failure
- *Leg 3 – Autopilot*
  - All functions of FMS/GPS
  - All functions of autopilot
  - PFD Failure
- Leg 4 – Hand Fly
  - Autopilot Failure

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Lesson 2

While en-route, half-way between Portland and Bozeman, the PFD does this…

What will you do now?

In what ways are you now impaired?

What factors will influence or change your process?

Lesson 2

One hour into your two hour flight from Nashville to Chicago you see this:

What will you do now?

What factors will influence your decisions?

In what ways are we impaired?

Lesson 2

While taxiing out for a 3 hour flight from Albuquerque to Dallas, you notice the AFCS **annunciation on your PFD.**

What has happened?

Forecast weather along your route of flight is slightly better than your personal minimums.

What will you do?

Lesson 2

While en-route on a 2 hour flight from Albuquerque to Denver your annunciator panel shows this:

What does this mean?

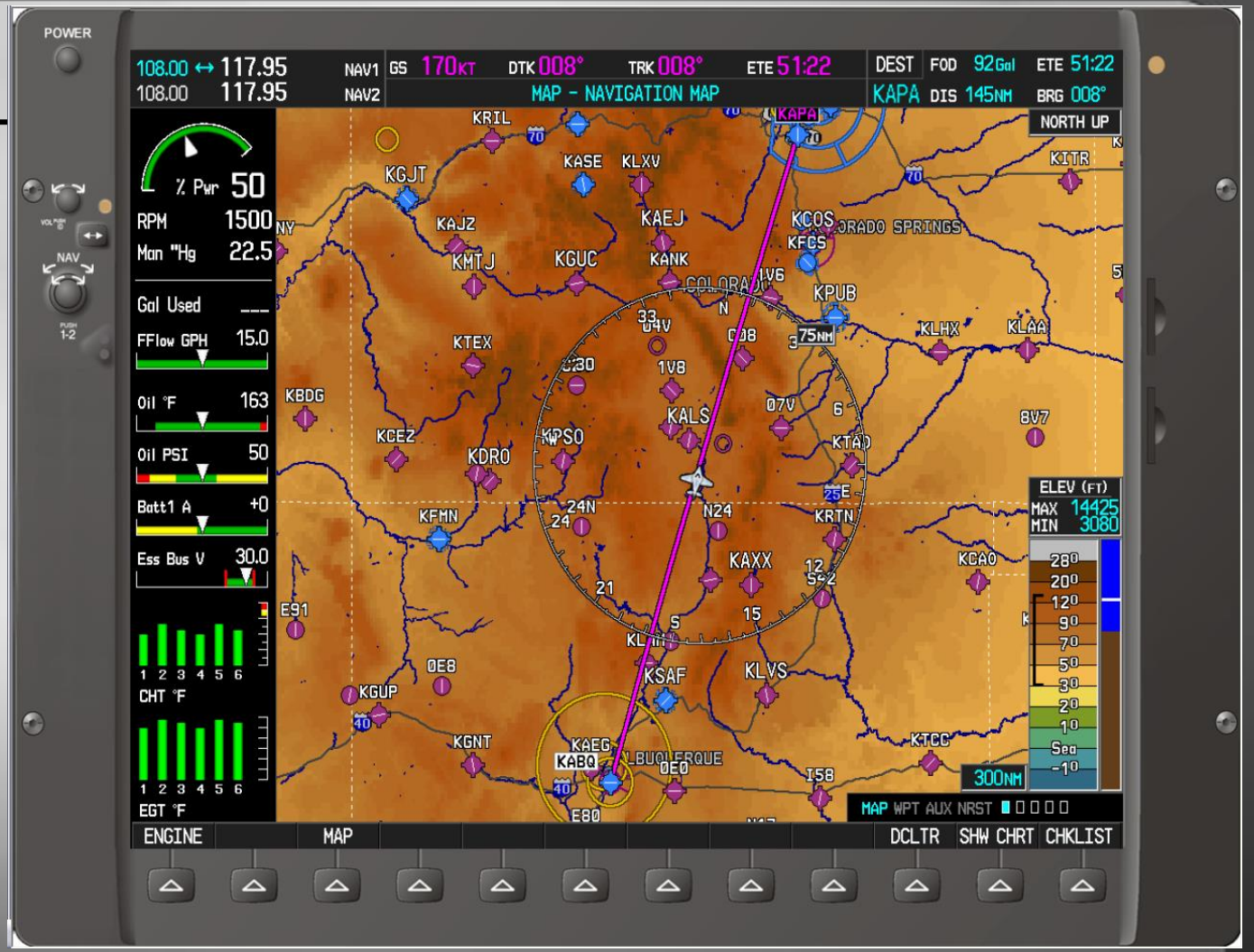
Lesson 2

Here is a quick look at the MFD.

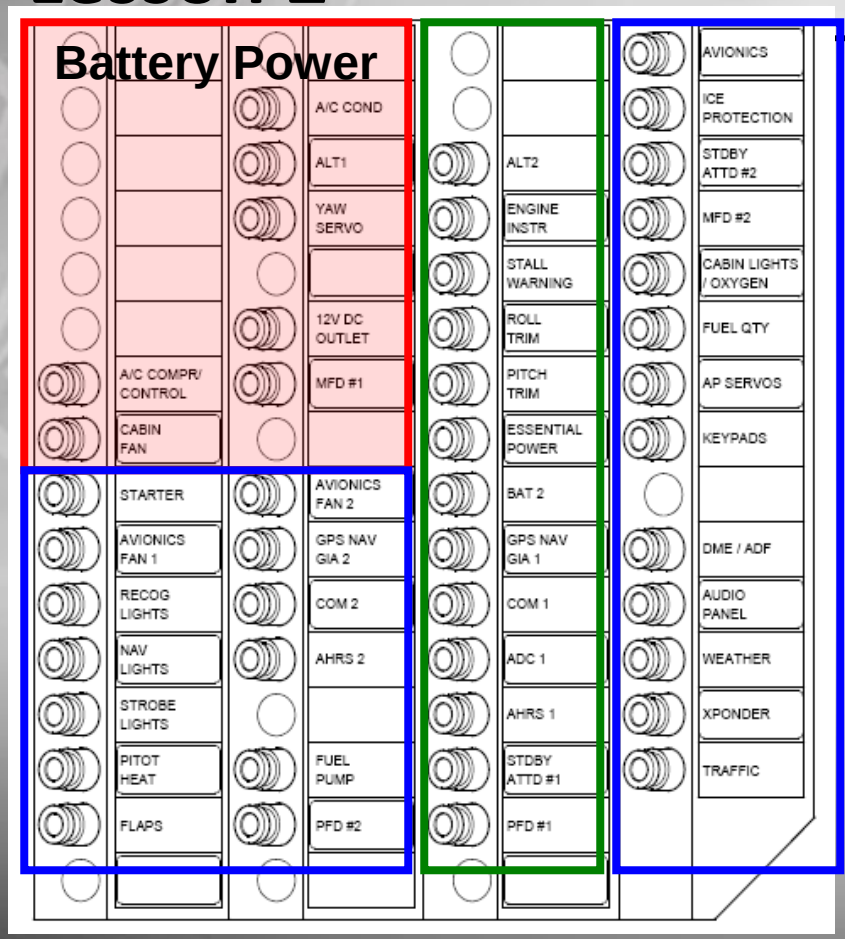
What will you do now?

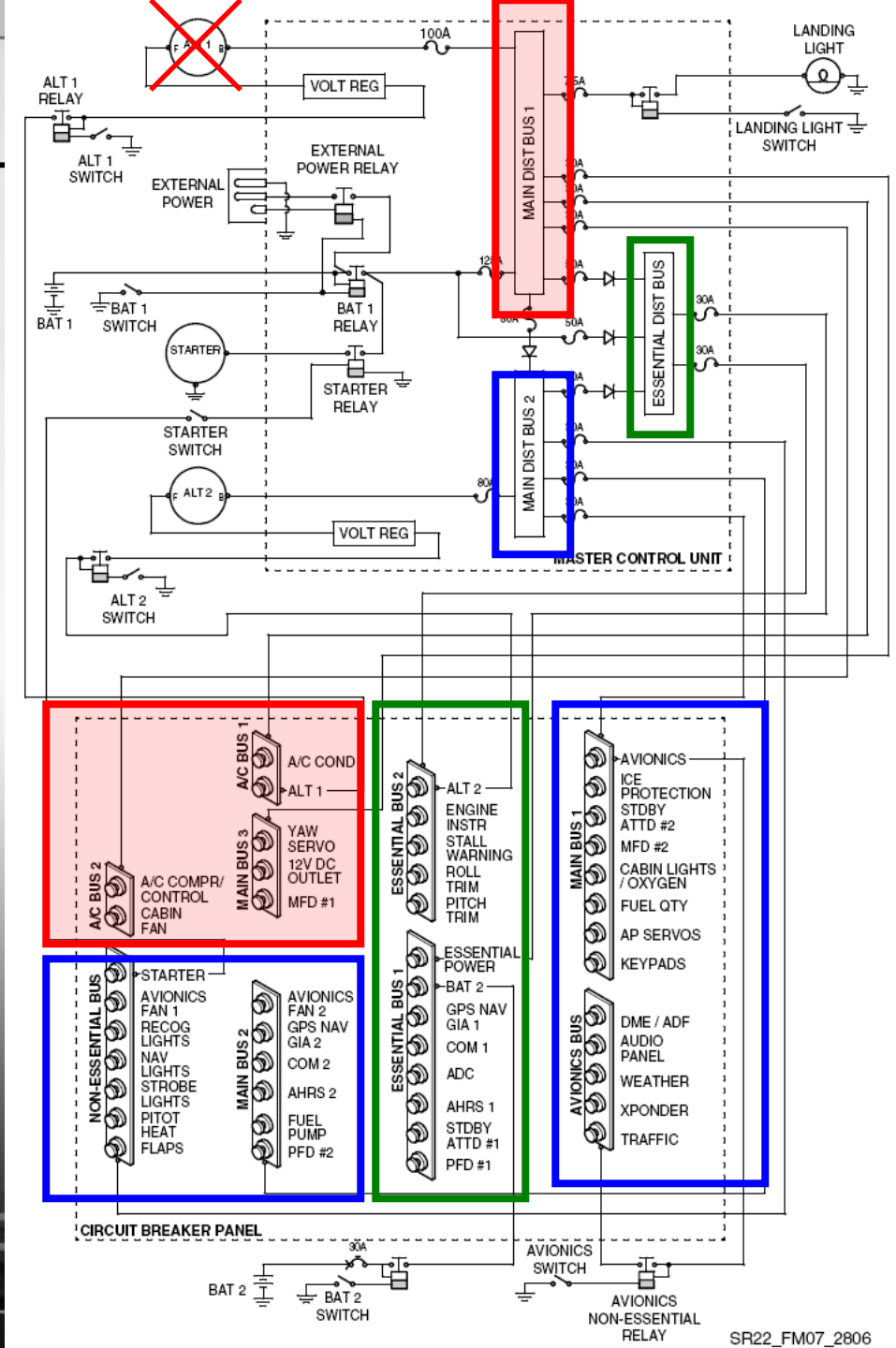
How will you load shed?

Which equipment is affected?



Lesson 2


Battery Power
A/C COND
ALT1
YAW SERVO
12V DC OUTLET
MFD #1
A/C COMPR/ CONTROL
CABIN FAN
STARTER
AVIONICS FAN 1
RECOG LIGHTS
NAV LIGHTS
STROBE LIGHTS
PITOT HEAT
FLAPS
AVIONICS FAN 2
GPS NAV GIA 2
COM 2
AHRS 2
FUEL PUMP
PFD #2
ALT2
ENGINE INSTR
STALL WARNING
ROLL TRIM
PITCH TRIM
ESSENTIAL POWER
BAT 2
GPS NAV GIA 1
COM 1
ADC 1
AHRS 1
STDBY ATTD #1
PFD #1
AVIONICS
ICE PROTECTION
STDBY ATTD #2
MFD #2
CABIN LIGHTS / OXYGEN
FUEL QTY
AP SERVOS
KEYPADS
DME / ADF
AUDIO PANEL
WEATHER
XPONDER
TRAFFIC

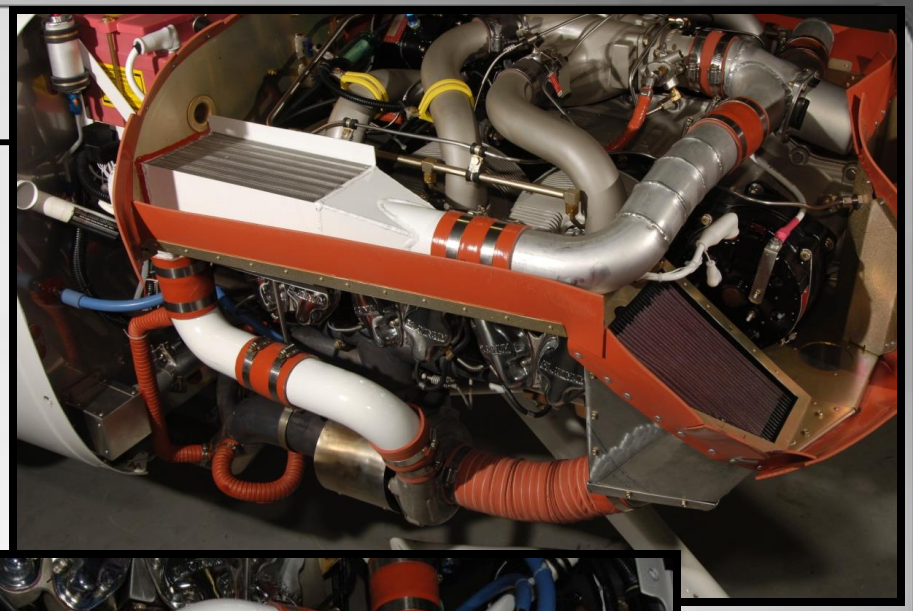

100A
LANDING LIGHT
ALT 1 RELAY
VOLT REG
LANDING LIGHT SWITCH
ALT 1 SWITCH
EXTERNAL POWER RELAY
EXTERNAL POWER
MAIN DIST BUS 1
BAT 1
BAT 1 SWITCH
BAT 1 RELAY
ESSENTIAL DIST BUS
STARTER
STARTER RELAY
STARTER SWITCH
MAIN DIST BUS 2
ALT 2
VOLT REG
MASTER CONTROL UNIT
ALT 2 SWITCH
A/C BUS 1
A/C COND
ALT 1
A/C BUS 2
A/C COMPR/ CONTROL CABIN FAN
MAIN BUS 3
YAW SERVO
12V DC OUTLET
MFD #1
ESSENTIAL BUS 2
ALT 2
ENGINE INSTR
STALL WARNING
ROLL TRIM
PITCH TRIM
MAIN BUS 1
AVIONICS
ICE PROTECTION
STDBY ATTD #2
MFD #2
CABIN LIGHTS / OXYGEN
FUEL QTY
AP SERVOS
KEYPADS
NON-ESSENTIAL BUS
STARTER
AVIONICS FAN 1
RECOG LIGHTS
NAV LIGHTS
STROBE LIGHTS
PITOT HEAT
FLAPS
MAIN BUS 2
AVIONICS FAN 2
GPS NAV GIA 2
COM 2
AHRS 2
FUEL PUMP
PFD #2
ESSENTIAL BUS 1
ESSENTIAL POWER
BAT 2
GPS NAV GIA 1
COM 1
ADC
AHRS 1
STDBY ATTD #1
PFD #1
AVIONICS BUS
DME / ADF
AUDIO PANEL
WEATHER
XPONDER
TRAFFIC
CIRCUIT BREAKER PANEL
BAT 2
BAT 2 SWITCH
AVIONICS SWITCH
AVIONICS NON-ESSENTIAL RELAY
SR22_FM07_2806

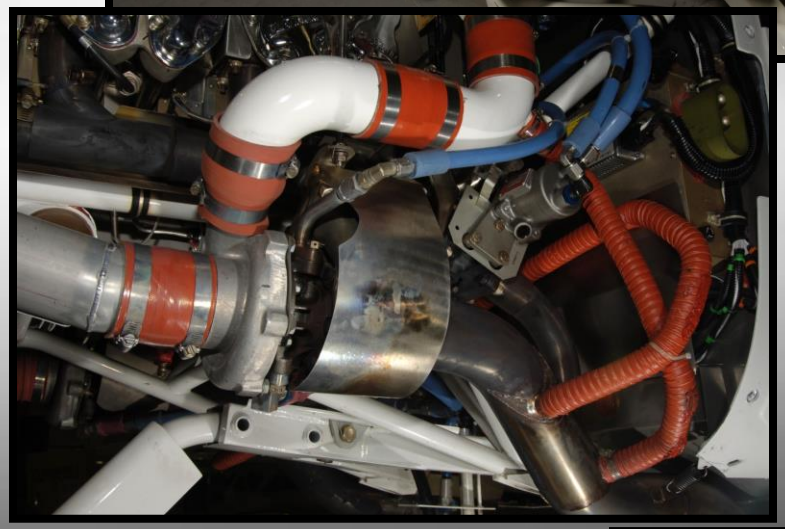
Lesson 2 (Turbo)

While in level flight at 17,500 you notice a sudden loss of manifold pressure.

What has happened?

What action are you going to take?





Lesson 2

While setting up the avionics for the descent to your destination airport you see this:

What happened?

What will you do now?

What factors will affect your decisions?

Lesson 2

While preparing for takeoff on an overcast night, you adjust the altitude pre-select to 2,100 ft (1,300 ft AGL) to remain below the clouds.

A few minutes after turning on course, you hear, *Obstacle Ahead*.

What does this mean?

What is the projected time to impact?

What should you do now?

Lesson 2

Now the TAWS system is saying, *Pull Up*.

Now what is the projected time to impact?

What will you do if you enter the clouds during recovery?

Lesson 2

While on a three hour flight the PFD screen does this:

What has happened?

What do you do?

Lesson 2

On initial climb out to your cruise altitude of 13,000 ft, your autopilot is engaged as shown on the PFD.

You now hear the stall warning horn.

What is happening?

What should you do?

How can you prevent this from occurring again?

Lesson 3 – Evaluation

Lesson Objectives

- Demonstrate a manage/decide level of competency for the entire flight.
- Demonstrate judgment, aeronautical decision making, and single pilot resource management skills necessary to effectively, efficiently, and safely operate the Cirrus aircraft.

Scenario Summary

- *Leg 1 – Autopilot Usage*
  - Avionics Malfunction
  - Weather Diversion (one leg only)
- *Leg 2 – Hand Fly*
  - Autopilot Failure
  - Weather Diversion (one leg only)