Confidential Information

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  | Appendix A | Personal Minimums Work Sheet |
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  | Appendix C | Risk Assessment Chart |

Cirrus Publications:

  Aircraft Checklist (For Reference Only)
  Aircraft POH (For Reference Only)
<table>
<thead>
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<th>Nature of Change</th>
<th>Initial</th>
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<tr>
<td>Original</td>
<td>July '04</td>
<td></td>
<td></td>
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<tr>
<td>Pg 28</td>
<td>Oct '04</td>
<td>W&amp;B table Corrected</td>
<td>JW</td>
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<tr>
<td>Pg 59</td>
<td>Oct '04</td>
<td>Precautionary note added</td>
<td>JW</td>
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<td>Pg 64</td>
<td>Oct '04</td>
<td>Precautionary note added</td>
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Introduction

How to use this manual

This training manual is designed to serve as a companion to the Pilots Operating Handbook for your new SR22. It will be used before and during your new-owner transition training. It is a workbook designed to help you get the most from your training. Each section in the training manual corresponds to its section in the POH that is included at the end of this manual. In each section you will find: quiz questions, supplemental information, and operating tips.

This manual is designed to be a reference only, it does not constitute limitations. The official FAA approved POH for your aircraft is the only source for official aircraft information.

This manual is divided into 12 sections; the first 10 sections correspond to the same section that is in the provided POH. In every section you will find questions related to that section. The answers to the questions will be found in the provided generic POH. (unless otherwise noted) These questions are required to be completed prior to the beginning of your training. If you have problems with the workbook or would like clarification on a question within it you may use the forum “Q & A Forum” at the following address: www.aero.und.edu/cirrus. Follow these links: “Training” – “Resources” – “Transition Training”.
Schedule of Training

The estimated/recommended training times listed on page 4 reflects the average time for a proficient and current pilot who comes prepared for training. We strongly encourage you to schedule as many days as recommended. You will only be charged for the time you spend with your instructor. The advanced avionics in the Cirrus SR22 are one of the largest challenges for transitioning owners. If you have little or no experience with the Garmin GNS430 you will want to schedule additional training. Weather and maintenance can play a key role in the training schedule. Please build some flexibility into your personal schedule for any such delays. In the event of unforeseen delays such as weather or maintenance occur you will still be billed for any time you spend with the instructor.

The amount of training needed is dependent on the experience level of the pilot. Please use the guidelines below to determine the amount of training you should schedule. Many factors, including weather, maintenance, insurance requirements and customer proficiency may extend the training schedule. You can reduce the training time by coming prepared. Additional training resources are available on line at www.aero.und.edu/cirrus Follow these links: “Training” – “Resources” – “Transition Training”

Please note that the average pilot that comes for transition training spends more than three days to complete the transition training program, and each additional pilot that is being trained will take additional time to train as outlined in the table below. On the next page you will find a brief description of the transition training course.

<table>
<thead>
<tr>
<th>If your flying experience includes:</th>
<th>Plan for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000+ hours total time (with at least 100 hours in last 12 months) 50+ high performance Experience with advanced avionics and GPS Instrument rated, instrument current and proficient</td>
<td>2 Days</td>
</tr>
<tr>
<td>1000-500 hours total time 25-50 high performance Instrument rated current and proficient</td>
<td>OR</td>
</tr>
<tr>
<td>1000-500 hours total time 25-50 high performance Experience with advanced avionics and GPS</td>
<td>3 Days</td>
</tr>
<tr>
<td>Less than 500 hours total time Less than 25 hours high performance No instrument rating or No experience with advanced avionics and GPS</td>
<td>4 Days</td>
</tr>
</tbody>
</table>
Transition Training Course

The Cirrus Transition Training Course is accepted by the FAA/Industry Training Standards. The course is comprised of 7 lessons and an optional biennial flight review and/or instrument proficiency check lesson after the transition training has been completed.

The amount of time it takes to complete the course is dependent on several factors:
- Experience level of the pilot.
- Overall knowledge of the aircraft and avionics
- Insurance requirements

The course is a basic VFR course. Minimal instrument procedures are covered within these 7 lessons. If more emphasis on instrument operations is requested, more time will need to be scheduled.

Lesson 1: This lesson will cover the course briefing, detailing what will be covered during the next few days of training. During this lesson the operator must either correctly answer 70% of the training guide questions or complete a written quiz covering materials from the POH achieving at least a 70% score.

If operator has satisfactory completed the training guide or quiz they may continue with the flight training. If not, extra time will be spent going over the deficient areas.

This is also the lesson where you may ask questions specific to avionics or systems of the Cirrus aircraft.

Lesson 2: This lesson will be the first introduction to SR22 covering normal operating procedures, introduction to avionics and basic flight maneuvers.
Lesson 3: The operator will be asked to identify and correct systems and system malfunctions in a scenario based format. These scenarios will be based on the certificate and ratings held by the pilot. This lesson will also look at ways to reduce risk and accident prevention associated with single pilot operations.

Lesson 4: The operator will review items learned in lesson 2 and develop increased proficiency in airport operations. Takeoffs, landings, go around and stabilized approach procedures will be the major emphasis.

Lesson 5: The pilot will be introduced to abnormal and emergency procedures in flight. He will also demonstrate automation competency in a Cirrus aircraft while conducting a cross country scenario. Automation and avionics interface will be the major emphasis.

Lesson 6: Pilot will review abnormal and emergency procedures and demonstrate an increased proficiency in conducting a cross country based scenario.

Lesson 7: This lesson is the final evaluation flight that will take into account previously learned material. Conducted on a planned cross country scenario, the pilot must be able to perform at a level where they can identify possible courses of action, evaluate risk inherent in each course of action, and make the appropriate decision.
Note: Optional biennial flight review and/or instrument proficiency check training can only be conducted after satisfactorily completing the transition training course.

Lesson 8 Optional biennial flight review in which an additional half day of training will be required to cover the required ground material.

Lesson 9 Optional instrument proficiency check in which an additional day of training will be needed to cover the required ground and flight lessons.
**Additional Services & Fees**

In addition to regular transition training, UND Aerospace Foundation offers the following additional services and training to Cirrus customers. Please contact us at (218)-788-3217 to schedule all your training needs or view our web site for more information.  
[www.aero.und.edu/cirrus](http://www.aero.und.edu/cirrus)

- Acceptance of your aircraft on your behalf  
  *(Power of Attorney)*
- Delivery of your aircraft to your home airport
- Flight home accompaniment
- Biennial Flight Review (BFR)  
  Extra ½ day required
- Instrument Proficiency Check (IPC)  
  Extra full day required
- Recurrent Training  
  One day structured course
- Accelerated Instrument Course
- Custom Training  
  Training to fit your needs and requirements
- Companion Course

**Note:**
It is highly recommended that you come to Duluth to take delivery of your aircraft and complete the transition program. If you decide to take advantage of our additional services, you are responsible for fees associated with training outside of the factory which may include but is not limited to lodging, meals, airfare, transportation, aircraft fuel, charts, and unforeseen delays do to weather and/or mechanical issues.
Internet Hyperlinks

Pilot operating handbooks and supplements can be downloaded from the following web pages listed below.

http://www.cirrusdesign.com/serviceandupgrades/pilotoperators/

www.aero.und.edu/cirrus
www.cirrusdesign.com
www.cirruspilots.org
www.avidyne.com
www.tcmlink.com
www.garmin.com
www.as.l-3com.com
www.s-tec.com
www.sandel.com
www.flightice.com/tks.html
www.aopa.org
www.faa.gov

UND Aerospace
Cirrus Factory Training Provider
Cirrus Design Corporation
COPA
Avidyne Avionics
Teledyne Continental Motors
Garmin Avionics
L-3 Avionics Systems
S-Tec/Meggit
Sandel
TKS
AOPA
Federal Aviation Administration
Intentionally Left Blank
Section 1 General

This section will cover Section 1 (General) of the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. What is the wing span of the Cirrus SR22? **Tip:** Consider this when hangering your aircraft.

2. What is the certified max gross weight of the aircraft?

3. In what ways does the weight of the aircraft effect the aircraft?

4. How much clearance is between the tip of the propeller and the ground?

5. What is your engine model?

6. What is the definition of reference datum?
Section 2 Limitations

This section will cover Section 2 (Limitations) of the Cirrus SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. Fill in the speeds and definitions of the following:
   - Vne _____ KIAS _______________
   - Vno _____ KIAS _______________
   - Vo _____ KIAS _______________ 3400lbs.
   - Vfe _____ KIAS _______________ 50% Flaps
   - Vfe _____ KIAS _______________ 100% Flaps
   - Vpd _____ KIAS _______________
   - Vso _____ KIAS _______________
   - Vs _____ KIAS _______________

2. What is the significance of \( V_{no} \) and how does it differ from \( V_{ne} \)?

3. What is the significance of \( V_{o} \)?

4. What is the significance of the green arc?

5. What two speeds define the green arc?

6. During the engine break-in period what type of oil should be used?

7. What is the max takeoff altitude for the aircraft?
8. What is the max operating altitude of the aircraft?

9. Can you operate the aircraft at that altitude without oxygen? (FAR 91.211)

10. Can you paint your airplane Navy Blue? Why?

11. Can you operate this aircraft out of un-paved runway surfaces?

12. Is the MFD approved as a primary navigation instrument?

13. Can you fly VFR with ALT 2 INOP?

14. Can you fly IFR with ALT 2 INOP?

15. Can you fly VFR with one of the strobe lights out?

16. What is the significance of $V_{pd}$ and why do you not see this in other Aircraft?

17. Can you fly IFR with the NAV lights inoperative?
18. Can you fly with any of the engine instruments inoperative?

19. Is the aircraft approved for acrobatics/spins?

20. Can you operate your aircraft without removing the CAPS safety pin? (FAR 91.9)

21. Indicate the following Fuel Limits

   Approved Fuel  ______________gals
   Total Fuel Capacity  ______________gals
   Total Fuel Each Tank  ______________gals
   Total Usable Fuel  ______________gals
   Unusable Fuel  ______________gals
   Maximum Allowable Fuel Imbalance  ______________gals

22. When does the BOOST pump need to be in operation?

23. What three caution lights are required to be operational for flight?
   **Tip:** It is important to remember to check the caution lights panel each time. This item is not included in any other operational checklist.
Intentionally Left Blank
Section 3 Emergency Procedures

This section will cover Section 3 (Emergency Procedures) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. Fill in the speeds and definitions of the following: (best glide)
   \[ V_g \] KIAS \[ \] \[ 3400 \text{ lbs.} \]
   \[ V_g \] KIAS \[ \] \[ 2900 \text{ lbs.} \]

2. Emergency Landing Speeds:
   - Flaps Up \[ \] KIAS
   - 50% Flaps \[ \] KIAS
   - 100% Flaps \[ \] KIAS

3. In any emergency situation, what is the most important thing to remember and perform?

4. What is the procedure for a fire on engine start?

5. How many circuit breakers would you pull with runaway trim? What are these circuit breakers labeled?

6. What indicates the failure of an alternator?

7. Would you lose any equipment if you lost ALT1? (Electrical Distribution Diagram in Section 3) If yes, what?
8. If taxiing at 1000RPMs, why is your ALT2 caution light on?

9. Would you lose any equipment if you lost ALT2? (Electrical Distribution Diagram in Section 3) If yes, what?

10. What is your aircraft glide ratio?

11. What is your best glide distance if you were at 6,000' AGL?

12. A propeller governor failure can be the cause of what two situations?

13. Is it advisable to unlatch the cabin doors with smoke or fumes in the cabin?

14. What is the procedure for an emergency descent? What situation would you use an emergency descent?

15. What is the procedure if you have an engine failure in flight?

16. Is flight into known icing conditions prohibited? What is the procedure for an inadvertent icing encounter?
17. In an engine failure situation with the prop wind milling, how can you gain additional glide distance?

18. What is the only approved and demonstrated method for spin recovery?

19. If only the airspeed indicator is giving erroneous information, what kind of malfunction can you expect?

20. Will the auxiliary fuel pump provide enough fuel to power the engine in the event of an engine driven fuel pump failure?

21. What two situations can you probably expect with a low oil pressure reading and a rise in temperature?

22. What is the procedure for a propeller overspeed?

23. What would your procedure be if you had a cabin fire in flight?

24. What procedure would you use to try and get ALT 1 back online in the case of an ALT1 failure? What would your next step be if you could not get the alternator back online?
25. The expected impact from a parachute drop is approximately?

26. If activation of the CAPS system is necessary, what kind of motion do you want to use when pulling the handle?

27. With an engine out will full flaps increase or decrease your glide distance?

28. If landing without elevator control, what speed do you want to trim the aircraft for?

29. True or False? If you lose the audio panel you have lost all communications with ATC?

30. Your ALT1 light illuminates 30 minutes from your destination while in non-icing/IMC conditions at night. Would you want to reduce the loads on ALT1? What items would you pull the circuit breakers on?

31. What is the procedure for single and dual brake failure?
Section 4 Normal Procedures

This section will cover Section 4 (Normal Procedures) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. Fill in the speeds and definitions of the following:
   - Vr _____ KIAS _______________ Normal
   - Vy _____ KIAS _______________ S.L.
   - Vy _____ KIAS _______________ 10,000’
   - Vx _____ KIAS _______________ S.L.
   - Vx _____ KIAS _______________ 10,000’
   - Vo _____ KIAS _______________ 3400 lbs.
   - Vo _____ KIAS _______________ 2900 lbs.

   Final Approach Flaps Up _____ KIAS
   Final Approach 50% Flaps _____ KIAS
   Final Approach 100% Flaps _____ KIAS
   Vref Short Field 100% Flaps _____ KIAS
   Max Demonstrated X-Wind _____ Knots

2. During the cabin preflight, what should be the normal voltage indication on the SR22?

3. How many points are you able to drain fuel from?

4. What items would you brief your passengers on during a passenger briefing?

5. True or False? You will start the engine with both Batteries and both Alternators on?
6. After start up, how soon should you see a change in oil pressure?

7. What are the max cranking intervals for the starter?

8. During taxi, the taxi checklist has you check three pieces of equipment. What are these three pieces of equipment and what are you checking for?

9. Before doing your run-up you want the oil temperature to reach what temperature?

10. Within what RPM range should the ALT2 caution light turn off?

11. What is the procedure to lean for maximum power fuel flow

12. No drop in RPM is noted on the magneto check, what is the probable cause?

13. Normal takeoffs can be performed with what flap setting(s)? Short and Soft field takeoffs?

14. Flaps retraction from 50% to 0% is done at or above what minimum speed?
15. Climb checklist should be completed no lower than what altitude? (Section 11, Standardization)

16. True or False? The fuel BOOST must be used when switching tanks?

17. The descent checklist should be completed by what point? (Section 11, Standardization)

18. True or False? Normal landings are not allowed with 0% flaps?

19. On a crosswind landing at what point will you keep the aircraft crabbed to?

20. Power goes to what setting on a balked landing/go-around?

21. When do you perform the after landing checklist? (Section 11, Standardization)

22. Why is the use of a paper checklist for shutdown necessary?
23. At what point should you hear the stall warning horn when practicing maneuvers at or close to those speeds?

24. When priming the aircraft for start what are the differences between; normal, cold, and hot starts?

25. Below what temperature should external preheat or external power be used for start?

26. On start up the engine has intermittent firing and a small puffs of black smoke rise from under the aircraft. What is the probable cause and corrective action?

27. You have misjudged your approach to landing due to winds, and it appears you will land longer than you anticipated. What is your best course of action?
Section 5 Performance

This section will cover Section 5 (Performance) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

Use the following information to answer the questions, for a flight from Duluth MN to Rapid City SD. Assume Max gross weight on takeoff, full fuel and 75% “best power” setting for cruise.

Distance 487 NM
Magnetic Course 254 degrees

Weather Conditions
KDLH 101250Z 33020KT 10SM SCT010 15/10 A2982
KRAP 101250Z 22026KTG35 10SM FEW010 SCT020 20/17 A2975

Winds aloft

<table>
<thead>
<tr>
<th>Winds aloft</th>
<th>FD</th>
<th>3000</th>
<th>6000</th>
<th>9000</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLH</td>
<td>2925</td>
<td>253415</td>
<td>253704</td>
<td></td>
</tr>
<tr>
<td>GFK</td>
<td>302610</td>
<td>263309</td>
<td>253708</td>
<td></td>
</tr>
<tr>
<td>FSD</td>
<td>2923</td>
<td>263214</td>
<td>272907</td>
<td></td>
</tr>
<tr>
<td>RAP</td>
<td>283417</td>
<td>303309</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Airport Information
KDLH Elevation 1420ft.
RWY 27/09 10152ft.
RWY 03/21 5699ft.

KRAP Elevation 3202ft.
RWY 23/05 3600ft.
RWY 32/14 8701ft.

1. What will be your takeoff distance departing KDLH?

2. What is your x-wind component for runway 27?
3. What will be your average climb rate out of KDLH to your selected cruise altitude?

4. What altitude will you use and why?

5. Why is it recommended to fly at or below 8000ft on a new engine?

6. What will be your endurance for today’s flight?

7. What will be your calculated KTAS and fuel flow for cruise flight?

8. How much fuel will you have once you reach your destination?

9. Will you be able to make your destination non-stop? SAFELY? (Difference between FARs vs. personal minimums)

10. What will be your landing distance at KRAP?

11. What will your ground roll be upon arrival at KRAP?

12. What is the KCAS at 100KIAS with 100% flaps?
13. What will your KIAS stall speed be on departure with 50% flaps and an AFT C.G.?

14. What is the difference between takeoff rate of climb vs. enroute rate of climb?
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Section 6 Weight and Balance

This section will cover Section 6 (Weight and Balance) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

Aircraft:
BEW 2340lbs.  Moment 326.563
Hours on New Engine  15.2 hrs
Payload
   Pilot  160 lbs.
   Front Pax  160 lbs.
   Rear Pax  200 lbs.
   Baggage  130 lbs.
   Fuel  486 lbs.

Note  You can not leave anyone or baggage behind.
Use any of the following methods of calculation in the POH to come up with the appropriate answers.

1. What is your ramp weight?

2. What is your aircraft’s zero fuel weight?

3. What will be your aircraft’s gross takeoff weight?

4. How much fuel will you have on board before takeoff?
   
   GALS.  LBS.

5. Is unusable fuel and oil included in basic empty weight?
6. Will your aircraft be within CG limitations?

7. Where is the aircraft Datum?

You may use the following table to aid in calculations.
For Moment/1000, refer to loading table.

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight</th>
<th>Moment/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Empty Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes unusable fuel &amp; full oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Front Seats Occupants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot and Passenger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Rear Seats Occupants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Baggage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 Lb maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Zero Fuel Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub total items 1 thru 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Fuel Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>81 Gallon @6.0 lb/gal. maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Ramp Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub total items 5 and 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Fuel for Start, taxi, and runup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally 9 lb at average Moment of /1394</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Takeoff Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtract Item 8 for item 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 7 Systems

This section will cover Section 7 (Systems) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. What are the three flap settings?
   __________% __________º
   __________% __________º
   __________% __________º

2. True or False? The horizontal stabilizer is a two piece unit attached at empennage.

3. The rudder-aileron interconnect does what to the aileron when full right rudder is inputted?

4. True or False? It is possible to have a asymmetrical flap deployment in a Cirrus aircraft?
   Hint: take a look at the Flap control diagram.

5. Why is the Cirrus not equipped with gust locks?

6. True or False? The autopilot also uses the electric roll trim?

7. The landing gear struts are made of what?
8. How many master brake cylinders are there?

9. Below what temperature does the oil bypass the oil cooler?

10. What is the recommended extended flight oil level for the engine?

11. Where is the alternate air control knob?

12. What will cause the OIL warning light to illuminate?

13. Describe when oil is metered into and out of the prop hub.

14. What pulls the fuel from the collector tanks?

15. How much fuel is held in each collector tank? (power point slides on Training CD)

16. What is the FUEL caution light illuminated by?
17. When will the FUEL caution light illuminate?

18. True or False? If one tank is at 10 gallons, and the other tank is at 17 gallons the FUEL caution light will illuminate?

19. Alternator #1 is rated for how many amps? How many volts?

20. Alternator #2 is rated for how many amps? How many volts?

21. Battery #1 is rated for how many amps? How many volts?

22. Battery #2 is rated for how many amps? How many volts?

23. Output from alternator #1 is connected to which bus?

24. Output from alternator #2 is connected to which bus?

25. How is the main distribution bus and essential distribution bus connected?
26. What does the diode between the two distribution buses do?

27. You are on the ground with BAT #2 on. What indication do you get if the isolation diode has failed?

28. When battery #1 is turned on, which buses are energized?

29. When battery #2 is turned on which buses are energized?

30. A steady ALT 1/AILT2 light denotes?

31. A flashing alternator ALT 1/ALT2 light denotes?

32. The back seat passengers are cold, how do you go about setting the heat and ventilation knobs to direct the maximum amount of warm air to your passengers? **Hint**: Look at the heating & ventilation diagram.

33. What kind of stall warning system is installed on the Cirrus?
34. When practicing power off stalls with full flaps, at what IAS would you expect to hear the stall horn?

35. When would you see the “Pitot Heat” light on the annunciator panel? Is this a normal or abnormal condition?

36. How many square feet is the parachute?

37. What kind of pull on the handle works best when activating the CAPS system.

38. What kind of descent rate can you expect with a parachute deployment?
Section 8 Service and Handling

This section will cover Section 8 (Service and Handling) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

1. What are the five documents required by the FAA to be onboard the aircraft at all times?

2. What are the two recommended procedures for you to verify if your airplane is compliant with all Airworthiness Directives?  
   **Hint:** It is also possible to get this information from www.faa.gov on the web.

3. If an annual inspection was done on your aircraft November 19, 2003 the next inspection will be due?

4. After completing any of the work described as preventative maintenance in the POH, what are the required logbook entries you must make?

5. Should you use external power to start the airplane if it has a “dead” battery?  
   **Tip:** In most cases you can’t even connect external power to the airplane unless there’s enough volts and amps remaining in battery 1 to energize the relay in the MCU.
6. While taxiing, steering is accomplished through?

**Tip:** In the event of a brake failure it is possible to use rudder for directional control, however, this procedure will only work if you are carrying enough power on the engine to produce enough induced airflow over the rudder. This procedure should only be used in an emergency! When applying power you may gain directional control but you will also gain a considerable amount of groundspeed.

7. When moving your Cirrus around on the ground you should ALWAYS use a ____________.

**Tip:** When flying into an unfamiliar FBO that wants to move your aircraft with a mechanical tow bars be sure to check if the tow hook fits your aircraft. Some tow bars appear to fit but once any pressure is applied they will slip on the inside and all pressure is now being applied to the nose wheel fairing causing damage to the fairing.

Mechanical dollies that lift the nose wheel off the ground should, also, be avoided due to the clearance of the nose wheel fairing. Also, the strap used to secure the aircraft on these types of systems wraps around the nose wheel strut fairing and will crack or possibly destroy the fairing.

8. Where is the hydraulic brake fluid reservoir located?

9. What is the proper tire pressure?

Nose Gear –

Main Gear -
10. After the engine break in period, what is the recommended time between oil changes?

11. The fuel filtration screen in the gascolator must be cleaned every ________-hours of operation.

**Tip:** In order to get the most accurate fuel readings, when flying a Cirrus with engine monitoring, make sure that the fuel tanks are “topped off”. Many times FBO’s will leave fuel levels an inch or two from the top and in the Cirrus that could equate to several gallons that may be used for reserve purposes.

12. True of False? A fuel sample is not required to be taken prior to each flight.

13. True or False? Battery 1 is located aft of the baggage compartment.

14. What should you use when washing the exterior of the aircraft?

15. When cleaning any of the windows, what do you not want to use?
Section 9 Supplements/Avionics

This section will cover Section 9 (Supplements) from the SR22 Pilots Operating Handbook, unless otherwise noted.

We recommend that you download the specific information manual for each piece of equipment because of the diversity and complexity of the various avionics utilized in Cirrus aircraft.

Additional training information on specific avionics can be found on our web page at: www.aero.und.edu/cirrus.

Internet Hyperlinks

Pilot operating handbooks and supplements can be downloaded from the following web pages located on Page 7 of this guide.

NOTE: Only answer the questions for the avionics that are in your aircraft.
Garmin GMA 340 Audio System

Before conducting your training you will need to know how to accomplish the following basic functions.

- Volume and squelch adjustments
- Com/Nav selectivity transmit and receive functions
- Crew isolation features
- Operation of Marker Beacon Annunciator

1. What will happen if the audio panel fails?
Garmin GTX 327 Transponder

Before conducting your training you will need to know how to accomplish the following basic functions.

- Entering squawk codes
- Power on, off, and mode C operations
- Ident function
- Sub functions: Pressure Alt, flight time, count up timer, count down timer, contrast

1. At what groundspeed does the transponder automatically cycle into “ALT” mode?

2. At what point will the transponder cycle out of “ALT” mode and into “STBY”?

3. Define the following squawk codes
   a. 1200
   b. 7500
   c. 7600
   d. 7700
Garmin GNS 430 Global Positioning System (GPS)

Before conducting your training you will need to know how to accomplish the following basic functions. Please note this is the most difficult piece of avionics to operate please take the time to learn the basic functions listed below. We recommend purchasing a tutorial to aid in learning this system, such as V-flight, a free demo disk will be sent to you upon request.

www.vflite.com

- Turn ON and OFF the Garmin unit.
- Tune in communications frequencies (manually with knob and frequency standby switch button) and adjust the volume.
- Direct-To Function (D → button) and input the airport name and/or identifier.
- Select nearest airport and navigate GPS direct-to the desired airport.
- Emergency frequency 121.5 MHz (communications standby switch held).
- Clear (CLR) Button – Default to Nav 1 page.
- Should know how to create, save and activate a flight plan. (not required)

Recommended for Instrument Rated Pilots (Required for IPC)

- VOR/Localizer frequencies and how to identify them (manually with knob and the standby frequency switch) and adjust the volume.
- How to load and activate an approach
- How to create and edit a flight plan
- Understand when and where to use the cursor and enter buttons.
- Change the CDI between GPS and V/LOC mode and understand when it is appropriate to do so.
- Understand and know what the function of the OBS button.
1. True or False? The GNS 430 Pilot’s Guide and Reference can be stored outside the reach of the pilot during flight?
S-Tec System 55X Autopilot

Before conducting your training you will need to know how to accomplish the following basic functions.

- Knowledge of aircraft response after engaging; HDG, NAV, APR, ALT, and VS functions.
- How to engage GPSS (GPS Steer mode)
- How to disengage autopilot.
- Limitations to the autopilot system.
- Knowledge of annunciator indications and appropriate corrective action.
- Knowledge of altitude pre-select and how to set for climbs and decent.

1. Name limitations for the S-Tec 55x.
Approved Oxygen Systems

Training on Oxygen systems is not covered in the standard training. Questions regarding Oxygen systems should be directed to Cirrus design or the supplier indicated in the Pilots Operating Handbook.

Note: You will need to add this to your pre-flight briefing for your passengers.
BF Goodrich Aerospace
WX500 Stormscope Sensor

Before conducting training you will need to be familiar with the following:

- How and where information is displayed for the stormscope
- Limitations of the system

1. To what range does the WX500 detect the electrical and magnetic fields/discharges?
Goodrich SkyWatch SKY497
Traffic Advisory System

Before conducting training you will need to be familiar with the following:

- How and where information is displayed for the SkyWatch system
- Limitations of the system

1. True or False? If advised to disable your transponder by ATC, you need to turn off your Sky Watch System?
Avidyne FlightMax Ex-Series
Multifunction Flight Display

Before conducting training you will need to be familiar with the following:

- Limitations of the system

1. Name the limitations of the MFD.
Avidyne FlightMax Ex-Series
Primary Flight Display

Before conducting training you will need to be familiar with the following:

- Limitations of the system

1. True or False? Back course approaches are prohibited with use of the PFD?

2. Name the limitations of the primary flight display.
Ice Protection System

Before conducting training you will need to be familiar with the following:

- Limitations of the system

1. Is flight into known icing approved for the Cirrus?

2. What does the NTSB define as “known icing”?

NOTE: This answer is not in the POH. If you don't know your best guess is appreciated. There are plenty of news articles out there on this subject.
Section 10
Safety Information

This section will cover Section 10 (Safety Information) from the SR22 Pilots Operating Handbook. Answers to all questions will be found in the appropriate section of the POH, unless otherwise noted.

The following section covers the intricacies of the (CAPS) Cirrus Airframe Parachute System.

1. What is the significance of the Vpd or max parachute deployment speed and what is the numerical value?

2. What factors do you need to take into account if the parachute is to be deployed?

3. List scenarios when activation of the CAPS might be appropriate?

**Tip:** There is no minimum deployment altitude. This is because the actual altitude loss during a particular deployment depends upon the airplane’s speed, altitude and attitude at deployment as well as other environmental factors. As a guideline, the demonstrated altitude loss from entry into a one-turn spin until under a stabilized parachute is 920ft. Altitude loss from level flight deployments has been demonstrated at less than 400ft. The recommended cut-off decision altitude is 2,000’ AGL.
Section 11
Standard Operating Procedures

Introduction

This section describes the Standard Operating Procedures (SOP’s) recommended when operating the Cirrus SR22. These procedures serve as a framework for aircraft management and pilot decision making. The utilization of a standard set of procedures works to enhance the situational awareness of the flight crew, in both single pilot and crew situations. Adhering to these procedures allows the pilot to take full advantage of all of the aircraft’s capabilities while maintaining a high level of safety.

Note: These operating procedures are advisory only and do not supersede the procedures in the basic POH. In the event of conflict the POH shall take precedence.

Checklists

SOP’s are heavily dependent on the effective use of checklists. When used properly, checklists serve several functions. Checklists enhance safety of flight by confirming the aircraft is appropriately configured for the flight condition. At the same time checklists expedite the completion of procedures that are necessary to transition to subsequent phases of flight.

Classification of Checklists

All checklist procedures can be assigned one of three classifications:

Normal Procedures: These procedures used during normal flight operations.

Abnormal Procedures: Procedures used in response to system failures and malfunctions that while not immediately threatening may effect safety of flight if not addressed.
Emergency Procedures: Procedures used in response to system failures and malfunctions that are an immediate threat to safety of flight. Emergencies require immediate action by the flight crew to ensure a safe outcome.
Checklist Completion

Normal Procedures

Normal procedure checklists can be appropriately completed by using one of the following two methods. The appropriate method of checklist completion for each normal procedure is indicated in this section.

Do-List: A do-list is a checklist which is executed in a conventional manner of reading the checklist item and selecting the appropriate condition of the item. Do-lists are used when procedure sequence and/or item condition is critical to completion of the procedure.

Flow Pattern: Flow patterns take a do and verify approach to checklist completion. The term “flow pattern” refers to the path through the cockpit the pilot moves along during the execution of the checklist. The items and their condition are memorized and executed without reference to the written checklist. Following completion of the flow pattern the checklist is immediately referenced to ensure procedure completion. **UNDER NO CIRCUMSTANCE SHOULD A NORMAL PROCEDURE BE COMPLETED SOLELY FROM MEMORY!!!** When used properly, flow patterns allow timely configuration of the aircraft for the appropriate flight condition. Flow patterns are used when procedure sequence and condition is not critical and there is an operational advantage to executing the checklist items and verifying with the written checklist when cockpit workload permits.
Abnormal Procedures

Checklists which do not contain memory items are abnormal procedures. Completion of abnormal procedures should be done using the do-list method. The checklist should be directly referred to and each item should be completed in the order prescribed.

Emergency Procedures

Checklists which contain memory items are emergency procedures. Execution of these procedures are considered time critical and are done without reference to a checklist. The checklist should only be referenced during an emergency if time permits.

Single Pilot Operations

Single Pilot Resource Management (SRM) - The art and science of managing all the resources (both on-board the aircraft and from outside sources) available to a single-pilot (prior and during flight) to ensure that the successful outcome of the flight is never in doubt.

The majority of Cirrus aircraft operations are conducted single pilot. The workload associated with configuring and monitoring avionics, communicating with air traffic control, and decision making can be overwhelming at times. The following procedures have been adapted from cockpit procedures common to dual pilot transport category aircraft for use when operating as the sole crew member.

As a Part 91 operator a great deal of latitude exists for how you manage your cockpit and operate your aircraft. To ensure the highest levels of safety it is strongly recommended that these single pilot operating procedures be incorporated into how you operate your aircraft.

Cockpit Organization

The task of cockpit organization is a task which is constantly recurring in all phases of flight, from the preflight to the postflight. The following are guidelines to create an organized and efficient cockpit.
Aeronautical Charts

The appropriate flight data should be organized in a way that will allow immediate access to the chart pertaining to the current flight condition, and also to any charts that may be needed should the need arise to proceed via alternate routing or to an alternate destination.

Users of electronic flight data systems should ensure that the chart data is current for the flight to be conducted and that the appropriate charts can be called from the database. Users of such systems should ensure that power will be available to the device for the duration of the flight. Battery power should only be used in the event of an onboard system malfunction.

Radio Tuning and Communication

To avoid confusion in flight with regard to radio frequencies the following frequency configuration is recommended:

**Nav/Comm 1:**
Comm Airborne air traffic control frequencies
(Tower, Approach/Departure, Center)
Nav Select appropriate VLOC or GPS course verify – CDI Indications

**Nav/Comm 2:**
Comm Ground air traffic control frequencies and supplemental communications (Clearance Delivery, Ground, Flight Service, CTAF/UNICOM)
Nav Select appropriate VLOC or GPS course verify – CDI Indications
Autopilot

The use of any automatic flight control system should not be substituted for pilot proficiency and currency. It is, however, a tool available to manage the workload associated with normal flight operations. When using the autopilot it is important to monitor the aircraft for any abnormal conditions which may develop and to ensure that the limitations associated with the operation of the automatic flight control system are observed.

Stabilized Approach Criteria

A stabilized approach is critical to a safe successful landing. If a stabilized approach is not attained by 200 ft. AGL a go-around must be conducted.

The criteria for a stabilized approach include:
- Proper airspeed
- Correct flight path
- Correct landing configuration
- Power setting appropriate for aircraft configuration
- Sink rate is not abnormal
- All checklists are complete

In-Flight Briefings

In-flight briefings are a conscious situational review of the operation which is about to be conducted and are also a planning tool for abnormalities and emergencies which may occur during high workload and time critical periods in the cockpit.
Flight Profile

Before Start Do List

Engine Start Do List

Select the starting procedure appropriate to the current conditions (normal, hot, flooded)

Before Taxi Flow Pattern

Before Taxi Checklist complete
Obtain appropriate ATC clearance
Airport diagram visible

Taxi Flow Pattern

Instrument check
Taxi checklist complete

NOTE:
Because Cirrus aircraft rely on differential braking for directional control while taxiing, proper braking practices are more critical.

BRAKE FAILURE WILL RESULT IN LOSS OF DIRECTIONAL CONTROL AND POSSIBLE AIRCRAFT DAMAGE OR PERSONAL INJURY.

The most common cause of brake failure is the creation of excessive heat through improper braking practices. Riding brakes while taxiing caused continuous build up of energy that would otherwise be moving the airplane. Excessive heat causes warped brake rotors, damaged or glazed linings, damaged o-rings, and vaporized brake fluid. To avoid brake failure, please observe the following operating and maintenance practices:

- Use only as much power (throttle) as is necessary to achieve forward movement.
- Avoid unnecessary high speed taxiing. High speed taxiing will result in excessive demands on the brakes, increased brake wear and the possibility of brake failure.
• Use the minimum necessary brake application to achieve directional control.
• The rudder is effective for steering on the ground and should be used.
• Do not ride the brakes. Pilots should consciously remove pressure from the brakes while taxiing. Failure to do so results in excessive heat, premature brake wear, and increased possibility of brake failure.
• Refer to the maintenance manual or chapter 8 for recommended maintenance and inspection intervals for brakes.
• Refer to chapter 4 for preflight inspection of wheels and brakes.

Before Takeoff

**Flow Pattern**

Before Takeoff Checklist complete (activation of Transponder and Landing Light should be delayed until cleared for takeoff. Strobe Light activation should also be delayed until cleared for takeoff if operating at night.)

Takeoff Briefing: The takeoff briefing should include some of the following elements:

- Runway length
- Runway conditions
- Takeoff distance
- Initial heading
- Initial altitude
- Departure procedures
  - Instrument DP's
  - Noise Abatement
- Emergency procedures
Sample Takeoff Briefing: “We’re holding short of runway ___ for takeoff. The available takeoff distance for this runway is _____ and we have a takeoff distance of _____. Initial heading and altitude as assigned by ATC. In the event of a loss of directional control, annunciator illumination, engine failure or system malfunction prior to $V_R$ I will abort the takeoff. If an engine failure occurs after $V_R$ we will land the airplane straight ahead, maneuvering around obstacles as necessary. Any other malfunction after $V_R$ we will plan to return to runway ___ for a visual / instrument approach.”

The potential for an aborted takeoff should be considered before every takeoff, and the actions taken decided prior to beginning the takeoff roll.

**Climb Flow Pattern**

-1000 ft agl – Complete Climb checklist
-Transition to cruise

**Cruise Flow Pattern**

-Top of climb – Complete cruise checklist
Descent Flow Pattern

Descent Planning: Planning for the descent should be completed prior to the top of descent.

- Approach Briefing: The approach briefing should include some of the following elements:
  - Standard Terminal Arrival Procedure (STAR)
  - Approach procedure
    - Type of procedure
    - Transition to final course (IAF or vectors)
    - Inbound course
    - Target airspeed
    - Flap setting
    - Stepdown fixes
    - Final approach fix
    - Missed approach point
    - DH/MDA Altitude
    - Missed approach procedure
  - Configuration of avionics
    - Nav source (ILS/VOR/GPS)
    - Display configuration
    - Autopilot usage during procedure

- Top of descent – Complete descent checklist
- Airspeed: as appropriate
- Power: Adjust MP as necessary to maintain appropriate airspeed.

Before Landing Flow Pattern

This checklist should be completed prior to entering the traffic pattern. If on an instrument approach this checklist should be completed prior to the final approach fix or prior to beginning a decent on final.

After Landing Flow Pattern

Clear of active runway – After Landing Checklist complete (no items on the after landing checklist should be attempted until the aircraft is clear of the runway)
Shutdown

Do List

Be sure to remove keys from the ignition.

Post-flight

Do List

- Verify that Magnetos are off and keys have been removed.
- Conduct post flight inspection
- Secure the aircraft with tie downs and chocks as necessary
Maneuver Profiles –

Takeoff, Landings and Go-Arounds

Normal/Crosswind Takeoff
- Rotate at Vr (70-73 KIAS with 50% Flaps)
  (Recommended Vr 0% Flaps is 80 KIAS)
- Retract flaps to 0%
  Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.
- Pitch for Vy (101 KIAS) or a cruise climb speed of 120 KIAS
- Above 1000’ AGL complete Climb Checklist

Short Field Takeoff
- Set flaps to 50%
- Rotate at Vr (70 KIAS)
- Pitch for Vx (78 KIAS) until over obstacle
- Reduce pitch to regain airspeed
- Retract flaps to 0%
  Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.
- Pitch for Vy (101 KIAS) or a cruise climb speed of 120 KIAS
- Above 1000’ AGL complete Climb Checklist

Soft Field Takeoff
- Set flaps to 50%
- Maintain ground effect until Vx (78 KIAS) or Vy (101 KIAS)
- Climb out at Vx or Vy
- Reduce pitch to regain airspeed if climb out is at Vx
- Retract flaps to 0%
  Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.
- Pitch for Vy (101 KIAS) or a cruise climb speed of 120 KIAS
- Above 1000’ AGL complete Climb Checklist
Traffic Patterns
-Entry
  110 KIAS
  Power 18” MP (approximately)
  Before Landing Checklist Complete

-Downwind
  100 KIAS
  Power: 15” MP (approximately)

-Abeam Touchdown Zone
  100 KIAS
  Power: 11’ MP (approximately)
  Flaps: 50%

-Base
  90 KIAS
  Power: 11” MP (approximately)
  Flaps: 100%

-Final
  Airspeed: 80 knots
  Power: 11” MP (approximately)

Note: Aircraft configuration may be adjusted for abnormal patterns or straight in approach to landing. Aircraft should be configured for landing no lower than 200ft AGL.
  - See stabilized approach criteria on page 58.

Normal/Crosswind Landing
-Final Speed
  100% Flaps 80 KIAS
  50% Flaps 85 KIAS
  0% Flaps 90 KIAS
- Crab into the wind until in ground effect and avoid prolonged slips. Take out any crab angle with rudder once in ground effect.

Short Field Landing
- Final Speed
  100% Flaps 77 KIAS

Soft Field Landing
- Follow normal/crosswind landing. Hold nose off to reduce pressure on the nose gear.
Go-Around/Balked Landing
- At any point during the approach a go around/balked landing may be executed
- Smoothly apply maximum power, level the wings and transition to a pitch attitude that will slow or stop the descent.
- After the descent has stopped reduce flaps 50%
- Pitch forVy
- Retract flaps to 0%
  Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.

Precision Instrument Approach

Initial Approach Fix/Final Vector (3 Minutes Prior)
- Descent Checklist Complete
- Airspeed: 120 KIAS (max)
- Flaps 0%
- Power: 17”-19” MP (approximately)

Intermediate Section (IAF to Glide Slope interception)
- Begin slowing for 100 KIAS
- Flaps 0%
- Power: 15” MP (approximately)

One Dot Below Glideslope
- Airspeed: 100 KIAS (max)
- Flaps: 50%

Glideslope Intercept
- Before Landing Checklist Complete
- Airspeed: 100 KIAS (max)
- Flaps: 50%
- Power: 10-12” MP (approximately)

Decision Height
  Visual contact is established, continue for landing
  - Autopilot: Disconnect
  - Flaps: As desired
  - Slow to appropriate final speed
  Visual contact not established
  - Execute Missed Approach Procedure
Non-precision Instrument Approach

Initial Approach Fix/Final Vector (3 Minutes Prior)
- Descent Checklist Complete
- Airspeed: 120 KIAS (max)
- Flaps 0%
- Power: 17”-19” MP (approximately)

Intermediate Section (IAF to FAF)
- Begin slowing for 100 KIAS
- Flaps 0%
- Power: 15” MP (approximately)

Final Approach Fix
- Before Landing Checklist Complete
- Airspeed: 100 KIAS (max)
- Flaps: 50%
- Power: 10-12” MP (approximately)

Missed Approach Point
  Visual contact is established, continue for landing
  - Autopilot: Disconnect
  - Flaps: As Necessary
  - Slow to appropriate final speed
  Visual contact not established
  - Execute Missed Approach Procedure
Circling Approach (Not recommended at night)

From Missed Approach Point
   Visual contact is established, continue for landing
      -Autopilot: Disconnect
      -Airspeed: As Necessary
      -Flaps: As Desired
   Visual contact not established
      -Execute Missed Approach Procedure

Final descent to landing
   -Airspeed: As Necessary
   -Flaps: As Desired

Missed Approach
   -Autopilot: Disconnect
   -Power: Full power
   -Pitch forVy
   -Retract flaps to 0%
   Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.

Holding

3 Minutes prior to holding fix
   -120 KIAS (max)
   -Power: 17”-19” (approximately)
Maneuver Profiles – Certification Maneuvers

Power On Stalls

*Minimum Recovery Altitude: 1,500 AGL*

**Execution**
- Execute clearing turns
- Power 11” MP
- Flaps: 0% or 50%, as necessary
- Airspeed: Slow to $V_R$
- Bank Angle: 20° maximum, as desired
- Apply Full Power
- Increase pitch angle to induce stall (approximate 25° pitch attitude)

**Recovery**
- Reduce angle of attack
- Verify full power
- Accelerate to $V_y$
- Retract flaps to 0%

*Note*: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.

Power Off Stalls

*Minimum Recovery Altitude: 1,500 AGL*

**Execution**
- Execute clearing turns
- Power: 11” MP
- Flaps: As necessary
- Establish glide or gliding turn not to exceed 20° of bank
  (Glide should be a descent at about 500 fpm)
- Reduce throttle to idle and increase pitch to induce a stall
Recovery
- Reduce angle of attack
- Apply full power
- Flaps 50%
- Accelerate to Vy
- Retract flaps to 0%

Note: Ensure you have a positive rate of climb, are at a safe altitude above all obstacles and above 80 KIAS prior to retraction.

Maneuvering During Slow Flight

Minimum Recovery Altitude: 1,500 AGL

Execution
- Execute clearing turns
- Flaps: As necessary
- Airspeed: An airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in an immediate stall.

Steep Turns

Minimum Altitude: 1,500 AGL

Execution
- Execute clearing turns
- Airspeed: 120 KIAS
- Power: 17"-19" MP (approximately)
- Bank Angle: 45° (Private) or 50° (Commercial)
Intentionally Left Blank
Section 12
Operational Guidelines for
Personal and Weather Risk Assessment

12.1 Introduction

As a general aviation (GA) pilot you are the head of your flight department, and as such have multiple roles. You are the organizational management selecting the proper airplane for the mission, ensuring adequate pilot training, and establishing personal weather minimums for the pilot (and if you are also the airplane owner, you are responsible for maintenance). You are the dispatcher: gathering weather and other flight information, planning the flight, and ensuring adequate fuel for the mission (and perhaps actually fueling the airplane). You are the pilot in command: responsible for the safety of the flight, including making in-flight weather decisions. In commercial air carrier operations and corporate flight departments, these responsibilities are assigned to different persons. Air carriers are required to have standardized procedures to aid the responsible persons in accomplishing their role, and corporate flight departments typically do the same. Adopting similar safety procedures for non-corporate GA operations could lead to similar safety results.

This Personal and Weather Risk Assessment Guide will assist you in developing your own standardized procedures for accomplishing the dispatch and pilot in command responsibilities of your flight department (you) and making sound preflight and in-flight weather decisions.

Section 12.2, Establishing Personal Minimums, provides guidance on establishing the pilot’s personal weather minimums. It should be completed first, and then reviewed and possibly revised whenever there is a significant change in the pilot’s certification, training, or experience, but at least once a year. It contains a form for compiling the pilot’s certifications, training, and experience, which is assessed to determining appropriate personal weather minimums. The completed personal minimums form should be attached to the pilot’s logbook for quick reference.
Section 12.3, Preflight Risk Assessment, provides guidance on assessing the risk of a particular flight and planning a safe flight given the weather conditions, and should be referenced before each flight. This section contains two established risk assessment tools which require the assessment of the pilot, the aircraft and the environment for the mission. The first tool, PAVE (Pilot-Aircraft-enVironment-External pressures), results in a detailed, but qualitative, analysis. The second tool, flight risk assessment form, applies a numeric factor to each relevant risk element, and produces a number that is used to make the decision to either: 1) go, 2) consult with a flight instructor or mentor, or 3) wait until later or cancel the flight. These different tools are presented because of the variety of pilots and their varied decision making. You should determine which best suits your decision making style and then incorporate it into your preflight planning process.

Section 12.4, Best Practices Weather Flight Planning, contains a Best Practices Weather Planning guide. This guide explains how to obtain a weather briefing and develop a plan to complete the flight safely given the weather conditions. This guide stresses the need to have a back up plan, “plan B,” before embarking on a flight.

The appendix contains a scenario flight for the pilot with a set of all of the above elements filled out to provide a model of how to use this guide. This information is also available on-line under the training section at www.aero.und.edu/cirrus.
12.2 Establishing Personal Minimums

Each pilot should establish personal weather minimums, which may be, and often are, above FAA legal minimums for a VFR or IFR flight. Airlines and corporate flight departments have personal minimums above FAA weather minimums where pilot experience is limited, and have operations minimums that apply when the aircraft has less than full operation of all systems necessary for dealing with weather. Pilot personal minimums are based on an assessment of pilot certification, training, and experience. When you obtain new ratings or upgrade your certificate, or when your current experience level changes, you should review and, if appropriate, revise your personal minimums at least annually. The following forms may be used to assess your certification, training, and experience level, and to record your personal minimums. They should be cut, folded, and placed in the pilot’s logbook for ready reference.

- Assessment of personal minimums should include but is not limited to:
- Pilot Certification (e.g., commercial, instrument rating)
- Training (e.g., flight review - wings or annual training, IPC, time since initial training, variation in equipment, and familiarity with that equipment)
- Experience (total years flying, total flight time, time in type, number of landings in the last year, night time and night landings, experience with high density airports, experience with mountain flying, IFR hours last year, approaches - actual or simulated - last year)

Appendix A contains a Personal Minimums Worksheet that an individual is able to record and reference personal minimums.

This part contains recommended minimum flight conditions and conditional considerations for Cirrus operators. These numbers are derived from the policies and procedures used by both Cirrus Flight Operations and UND Aerospace – Duluth Factory Training Center. These guidelines are advisory only; pilot in command is the final authority to the operation of the aircraft.
Pilot Minimums

Level 1 – Category A Conditions
- Professional pilot, commercial with instrument or ATP
- More than 100 hours in make and model
- Minimum 20 hours actual instrument experience and current

Level 2 – Category B Conditions
- Professional pilot, commercial with instrument or ATP
- Less than 100 hours in make and model
- Private pilot, instrument rated, and current
- More than 100 hours in make and model
- Minimum 10 hours actual instrument experience

Level 3 – Category C Conditions
- Private pilot, instrument rated, and current
- Less than 100 hours in make and model

Level 4 – Category D Conditions
- Private Pilot
Operating Categories

Category A
- Ceilings: Published procedure minimums
- Visibility: Published procedure minimums
- Winds:
  - Maximum winds: 35 knots
  - Maximum crosswind: Maximum demonstrated crosswind component
- Runway Length: 2.5 times computed takeoff or landing distance

Category B
- Ceilings: No less than 500 feet or FAR minimums
- Visibility: No less than 1 mile
- Winds:
  - Maximum winds: 25 knots
  - Maximum crosswind: 75% of demonstrated crosswind component
- Runway Length: 2.5 times computed takeoff or landing distance

Category C
- Ceilings: No less than 1000 feet
- Visibility: No less than 3 miles
- Winds:
  - Maximum winds: 20 knots
  - Maximum crosswind: 50% of demonstrated crosswind component
- Runway Length: 2.5 times computed takeoff or landing distance

Category D
- Ceilings: Better than 3000 feet
- Visibility: Better than 5 miles
- Winds:
  - Maximum winds: 20 knots
  - Maximum crosswind: 50% of demonstrated crosswind component
- Runway Length: 2.5 times the computed takeoff or landing distance

See Appendix A for development of your own personal minimums.
12.3 Preflight Risk Assessment

PAVE (Pilot-Aircraft-enViroment-External)
The PAVE Checklist (Appendix B) works like any checklist that you would use in your aircraft; however, you should expand the use of the PAVE to your flight planning as well, and take special consideration to each line item before your final decision to fly. The PAVE checklist will give you a step by step approach to assessing your knowledge; but leaves the final go-no-go decision to the PIC.

Appendix B contains the FAA’s PAVE risk assessment form, which contains instructions for use. This form contains a larger number of risk factors. It can also be downloaded from the FAA’s web page.

Preflight Risk Assessment
The flight assessment form (Appendix C) assigns a number to various risk factors regarding the pilot, aircraft, and environment. Each element is scored for the flight and the grand total is determined. Then the pilot is advised on the appropriate course of action depending on the grand total and whether the flight is VFR or IFR. These actions are: go for lowest grand total, consider alternate actions, consult experienced CFI or mentor, and do not go for the highest grand total.

Appendix C contains the preflight assessment form.
### 12.4: Best Practices Weather Flight Planning

**A. Sources of Information for Flight Planning**

There are many sources of weather information for flight planning.
- Telephone: FAA, FSS, 1-800-WX-BRIEF
- DUATS
- Association weather pages (e.g., AOPA, EAA)
- National Weather Service (NWS)
- Aviation Digital Data Service (ADDS)
- Private weather services
- Airline Dispatchers Federation
- Internet
- Television: weather channel, news

**B. Review the information and your readiness for the flight.** The quantity and quality of your weather information will have a direct affect on your weather planning. The factors that affect the adequacy of the quantity and quality of weather information for your decisions include:

The severity of the consequences of being wrong. For example, what will happen if you inadvertently encounter:
- IMC conditions?
- Icing conditions?
- Embedded thunderstorms?
- Other significant weather hazards?

Your degree of certainty about information may be affected by:
- FAA approved source (e.g., DUATS, FSS, NWS)
- The duration of your flight
- The distance between reporting points
- The proximity of the weather conditions to your personal minimums
- Your degree of confidence that you understand the weather situation
C. Prepare Your Weather Map
You should develop a weather picture over your intended route of flight.

- Using the information you obtained, state or visualize a picture, both in plan view (from above) and in cross section view (from the side, including terrain) of all the relevant weather on your flight/route, with other information, all of which are related to time. The information may include:
  - Terrain (topography that includes natural and man-made obstructions)
  - Cloud bases and tops
  - Icing levels
  - Winds aloft
  - Areas of IMC
  - Thunderstorm movement

- Visualize your flight by drawing a “weather picture” of your flight.
  - Draw a straight line between your two points.
  - Draw an ellipse (actually a rough boundary line of either side of the straight line, the resulting lines will probably form a elliptical border around your intended route to show an area where you will need information about weather that may affect your route of flight)
  - Note the weather patterns with the elliptical area.
  - Apply the information to your weather decisions. Construct a route to avoid weather that is hazardous to you and your airplane (given the capabilities of you and your airplane).
D. Develop a primary flight plan (Plan A) to conduct your flight safely using your weather picture by considering:
   - What is the best plan to make the flight, within your personal minimums, considering:
     Your aircraft and its capabilities
     The environment, weather, and terrain
     External factors, such as security restrictions (e.g., Temporary Flight Restrictions (TFR’s) and Air Defense Identification Zones (ADIZs))
   - The plan is defined by:
     The route
     The altitudes en route and time of departure

E. Develop an alternate flight plan (Plan B) to be executed when the actual weather you find en-route is not what your weather picture was believed to be when you made Plan A. Determine under what conditions you abandon Plan A and execute Plan B, based on changing weather conditions en-route. Know your methods of execution from weather hazards when conditions deteriorate by activating Plan B in order to remain within your personal minimums. Plan B is defined by:
   - The new route,
   - Changes in altitude, or
   - The new destination.
Plan B: Proposed alternative action(s) to be taken

At Departure Airport

<table>
<thead>
<tr>
<th>Unplanned decision event</th>
<th>______________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action(s) to be taken</td>
<td>______________________</td>
</tr>
<tr>
<td></td>
<td>______________________</td>
</tr>
<tr>
<td>Expectation of Success</td>
<td>______________________</td>
</tr>
</tbody>
</table>

En Route

<table>
<thead>
<tr>
<th>Unplanned decision event</th>
<th>______________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action(s) to be taken</td>
<td>______________________</td>
</tr>
<tr>
<td></td>
<td>______________________</td>
</tr>
<tr>
<td>Expectation of Success</td>
<td>______________________</td>
</tr>
</tbody>
</table>

At Destination

<table>
<thead>
<tr>
<th>Unplanned decision event</th>
<th>______________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action(s) to be taken</td>
<td>______________________</td>
</tr>
<tr>
<td></td>
<td>______________________</td>
</tr>
<tr>
<td>Expectation of Success</td>
<td>______________________</td>
</tr>
</tbody>
</table>

A. Your decision whether to execute Plan A or to go to Plan B will be based on a risk assessment.
   - This is a continuous process of evaluating the actual weather against your picture and deciding if the actual weather still meets your personal minimums.
   - If you are within your personal minimums, you may stay with Plan A.
   - If you are not within your personal minimums, or it looks like it is not developing as you expected, you should immediately go to Plan B.
   - Timely decisions are of the utmost importance because a large number of accidents are caused by pilots waiting too long to execute plan B.
B. You must always have a safe “out.” If you are a relatively new VFR pilot and Plan A has failed and you have executed Plan B, and now it too is failing, you should realize that you may not have adequately assessed the weather conditions initially and that Plan C should be to land as soon as practical. You then can develop an entirely new set of plans in an environment where you have access to weather information from more detailed discussions with weather briefer on the phone and from computer graphics at the FBO. After plans A and B have not worked, you may not be able to construct a good plan C in the air and simultaneously cope with adverse weather conditions at the same time. In these circumstances, it is best to land and reassess the situation.

C. During preflight preparation, you should not be hesitant to involve outside evaluation of your risk assessment by using peer review by fellow pilots, or consulting with an instructor or mentor who is more experienced. Once you are en route, the only outside review is likely to be flight service or air traffic control personnel,
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Appendix A: Personal Minimums Worksheet

Using the above guidelines, the following worksheet should be used to formulate a comfortable set of personal minimums. These minimums should be numerical values that can be practically applied to flight operations.

<table>
<thead>
<tr>
<th></th>
<th>Day VFR</th>
<th>Night VFR</th>
<th>Day IFR</th>
<th>Night IFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Length/Width</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest Period (IM SAFE Checklist)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Reserves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (e.g., icing, thunder storms, mountain flying)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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Appendix B: Personal Minimums Checklist

Think...

PILOT

AIRCRAFT

ENVIRONMENT

EXTERNAL

PRESSURES

Pilot: ____________________________________________

Date Revised: ________________________________

Reviewed With: ________________________________

(if applicable)
Your Personal Minimums Checklist

- An easy-to-use, personal tool, tailored to your level of skill, knowledge, and ability
- Helps you control and manage risk by identifying even subtle risk factors
- Lets you fly with less stress and less risk

Practice “Conservatism without Guilt”
Each item provides you with either a space to complete a personal minimum or a checklist item to think about. Spend some quiet time completing each blank and consider other items that apply to your personal minimums. Give yourself permission to choose higher minimums than those specified in the regulations, aircraft flight manuals, or other rules.

How to Use Your Checklist
Use this checklist just as you would one for your aircraft. Carry the checklist in your flight kit. Use it at home as you start planning a flight, and again just before you make your final decision to fly. Be wary if you have an item that is marginal in any single risk factor category. But if you have items in more than one category, you may be headed for trouble. **IF YOU HAVE MARGINAL ITEMS IN TWO OR MORE RISK FACTORS/CATEGORIES, DON'T GO!**

Periodically review and revise your checklist as your personal circumstances change, such as your proficiency, recency, or training. You should never make your minimums less restrictive unless a significant positive event has occurred; however, it is okay to make your minimums more restrictive at any time. Never make your minimums less restrictive when you are planning a specific flight, or else external pressures will influence you.
# Experience/Recency

<table>
<thead>
<tr>
<th>Experience/Recency</th>
<th>Quantity in the Last</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takeoffs/Landings</td>
<td>_____</td>
<td>_____ days</td>
</tr>
<tr>
<td>Hours in make/model</td>
<td>_____</td>
<td>_____ days</td>
</tr>
<tr>
<td>Instrument approaches (simulated or actual)</td>
<td>_____</td>
<td>_____ days</td>
</tr>
<tr>
<td>Instrument flight hours (simulated or actual)</td>
<td>_____</td>
<td>_____ days</td>
</tr>
<tr>
<td>Terrain and airspace</td>
<td></td>
<td>familiar</td>
</tr>
</tbody>
</table>

## Physical Condition

<table>
<thead>
<tr>
<th>Physical Condition</th>
<th>Quantity in the Last</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep</td>
<td>_____</td>
<td>24 hours</td>
</tr>
<tr>
<td>Food and water</td>
<td>_____</td>
<td>_____ hours</td>
</tr>
<tr>
<td>Alcohol</td>
<td>_____</td>
<td>None in the last hours</td>
</tr>
<tr>
<td>Drugs or medication</td>
<td>_____</td>
<td>None in the last hours</td>
</tr>
<tr>
<td>Stressful events</td>
<td>_____</td>
<td>None in the last days</td>
</tr>
<tr>
<td>Illnesses</td>
<td>_____</td>
<td>None in the last days</td>
</tr>
</tbody>
</table>
AIRCRAFT

Fuel Reserves (Cross-Country)
- VFR Day: _____ hours
- VFR Night: _____ hours
- IFR Day: _____ hours
- IFR Night: _____ hours

Experience in Type
- Takeoffs/landings: _____ in the last ____ days in aircraft type

Aircraft Performance
Establish that you have additional performance available over that required. Consider the following:
- Gross weight
- Load distribution
- Density altitude
- Performance charts

Aircraft Equipment
Avionics: Familiar with equipment (including autopilot and GPS systems)
- COM/NAV: Equipment appropriate to flight, Charts current
- Clothing: Suitable for preflight and flight
- Survival gear: Appropriate for flight/terrain
## ENVIRONMENT

### Airport Conditions
- Crosswind: _____ % of max POH
- Runway length: _____ % more than POH

### Weather
- Reports and forecasts: not more than _____ hours old
- Icing conditions: within aircraft/pilot capabilities

### Weather for VFR
- Ceiling Day: _____ feet
- Ceiling Night: _____ feet
- Visibility Day: _____ miles
- Visibility Night: _____ miles

### Weather for IFR
#### Precision Approaches
- Ceiling: _____ feet above min.
- Visibility: _____ mile(s) above min.

#### Non-Precision Approaches
- Ceiling: _____ feet above min.
- Visibility: _____ mile(s) above min.

#### Missed Approaches
- No more than _____ before diverting

### Takeoff Minimums
- Ceiling: _____ feet
- Visibility: _____ mile(s)
EXTERNAL PRESSURES

Trip Planning
Allowance for delays _____ minutes

Diversion or Cancellation — Alternate Plans
- Notification of person(s) you are meeting
- Passengers briefed on diversion or cancellation plans and alternatives
- Modification or cancellation of car rental, restaurant, or hotel reservations
- Arrangement of alternative transportation (airline, car, etc.)

Personal Equipment
- Credit card and telephone numbers available for alternate plans
- Appropriate clothing or personal needs (eye wear, medication…) in the event of an unexpected stay

Importance of Trip
The more important the trip, the more tendency there is to compromise your personal minimums, and the more important it becomes to have alternate plans.
## Appendix C: Risk Assessment Chart

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight type</td>
<td>VFR</td>
<td>IFR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual/solo</td>
<td>Dual</td>
<td>Solo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day/night</td>
<td>Day</td>
<td>Night</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rating</td>
<td>CFI/ATP</td>
<td>Comm/Inst</td>
<td>PPL w/Inst</td>
<td>PPL</td>
<td>Student</td>
</tr>
<tr>
<td>Rest in last 24 hrs</td>
<td>&gt;8</td>
<td>6-7</td>
<td>3-5</td>
<td>&lt;3</td>
<td></td>
</tr>
<tr>
<td>Visibility</td>
<td>&gt;15</td>
<td>10-15</td>
<td>6-9</td>
<td>3-5</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Ceiling</td>
<td>10,000</td>
<td>5,000-9,000</td>
<td>3,000-4,000</td>
<td>1,000-2,000</td>
<td>&lt;1,000</td>
</tr>
<tr>
<td>Crosswind departure</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-20</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Crosswind destination</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-20</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Weather stability</td>
<td>Stable</td>
<td>Slow Deterioration</td>
<td>Rapid Deterioration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destination airport familiarity</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours in aircraft type</td>
<td>&gt;200</td>
<td>151-199</td>
<td>100-150</td>
<td>50-99</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Hours last 90 days</td>
<td>&gt;20</td>
<td>15-20</td>
<td>10-14</td>
<td>5-9</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Total hrs</td>
<td>&gt;2000</td>
<td>501-2000</td>
<td>251-500</td>
<td>100-250</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Risk Level</td>
<td>Description</td>
<td>Score Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No unusual hazards. Use normal flight planning and establish personal minimums and operating procedures</td>
<td>14-30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat riskier than usual. Conduct flight planning with extra care. Review personal minimums and operating procedures to insure that all standards are being met. Consider alternatives to reduce risk.</td>
<td>31-47 or a 5 in any row</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions present much higher than normal risk. Conduct flight planning with extra care and review all elements to identify those that could be modified to reduce risk. If available, consult with more experienced pilot or instructor for guidance before flight. Develop contingency plans before flight to deal with high risk items. Decide beforehand on alternates and brief passengers and other crewmembers on special precautions to be taken during the flight. Consider delaying flight until conditions improve and risk is reduced.</td>
<td>48-63 or a 5 in any 2 rows</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>