Single-Pilot Resource Management

A. Single-pilot Resource Management (SRM)

1. Define the term "single-pilot resource management." (FAA-H-8083-9)

SRM is the art and science of managing all the resources (both onboard the aircraft and from outside sources) available to a single pilot (prior to and during flight) to ensure that the successful outcome of the flight is never in doubt.

2. What are examples of the skills necessary for effective SRM? (FAA-H-8083-25)

SRM includes the concepts of aeronautical decision making, risk management, task management, automation management, controlled flight into terrain awareness, and situational awareness.

3. What practical application provides a pilot with an effective method to practice SRM? (FAA-H-8083-9)

The "Five P" checklist consists of the Plan, the Plane, the Pilot, the Passengers, and the Programming. It is based on the idea that the pilot has essentially five variables that impact his or her environment, which can cause the pilot to make a single critical decision or several less critical decisions, and when they are all added together, can create a critical outcome.

4. When is the use of the Five P checklist recommended? (FAA-H-8083-9)

The Five P (or 5P) concept relies on the pilot to adopt a scheduled review of the critical variables at points in the flight where decisions are most likely to be effective. These key decision points include preflight, pre-takeoff, hourly or at the midpoint of the flight, pre-descent, and just prior to the final approach fix or, for VFR operations, just prior to entering the traffic pattern. They also should be used anytime an emergency situation arises.

5. Explain the use of the Five P model and the risk associated with each of the five factors. (FAA-H-8083-9)

At each of the key decision points, application of the 5P checklist should be performed by reviewing each of the critical variables:
Plan—planning, weather, route, fuel, publications, ATC reroutes/delays.
Plane—mechanical status, database currency, automation status, backup systems.
Pilot—illness, medication, stress, alcohol, fatigue, eating (IMSAFE).
Passengers—pilot or non-pilot, experienced or inexperienced, nervous or calm, etc.
Programming—GPS, autopilot, PFD/MFD, possible reroutes requiring reprogramming.

B. Aeronautical Decision-Making (ADM)

1. Define the term "aeronautical decision-making." (FAA-H-8083-9)

ADM is a systematic approach to the mental process used by aircraft pilots to consistently determine the best course of action in response to a given set of circumstances.

2. What key principles are often collectively called ADM? (FAA-H-8083-9)

Risk management, situational awareness, and single-pilot resource management.

3. Explain the three basic steps in the decision-making process. (FAA-H-8083-9)

a. Define the problem.
b. Choose a course of action.
c. Implement the decision and evaluate the outcome.

4. What are the two models for practicing ADM? (FAA-H-8083-9)

The DECIDE model, and the Perceive-Process-Perform (3P) model.

5. List the elements involved in the DECIDE model of decision-making. (FAA-H-8083-9)

Detect a change needing attention.
Estimate the need to counter or react to a change.
Choose the most desirable outcome for the flight.
Identify actions to successfully control the change.
Do something to adapt to the change.
Evaluate the effect of the action countering the change.

6. Name five hazardous attitudes that can affect a pilot's ability to make sound decisions and exercise authority properly. (FAA-H-8083-9)

Attitude	Antidote
Anti-authority	Follow the rules, they are usually right.
Impulsivity	Think first – not so fast.
Invulnerability	It could happen to me.
Macho	Taking chances is foolish.
Resignation	I can make a difference, I am not helpless.

C. Risk Management (RM)

1. Define the term "risk management." (FAA-H-8083-9)

Risk management is a decision making process designed to identify hazards systematically, assess the degree of risk, and determine the best course of action. You weigh the potential costs of risks against the possible benefits of allowing those risks to stand uncontrolled.

2. How can you use the "PAVE" checklist to assess risk? (FAA-H-8083-9)

By using the PAVE checklist in all stages of flight planning, the pilot divides the risks of flight into four categories:
Pilot-In-Command—general health, physical/mental/emotional state: proficiency, currency.
Aircraft—airworthiness, equipment, performance capability.
en**V**ironment—weather hazards, terrain, airports/runways to be used, conditions.
External pressures—meetings, people waiting at destination, etc.

3. Explain the use of a personal minimums checklist and how it can help a pilot control risk. (FAA-H-8083-9)

One of the most important concepts that safe pilots understand is the difference between what is *legal* in terms of the regulations, and what is *smart* or *safe* in terms of pilot experience and proficiency. Pilots should set personal minimums for items in each risk category, to help control risk. These are limits unique to that individual pilot's current level of experience and proficiency.

4. How does the "3P model" in ADM help a pilot manage risk? (FAA-H-8083-9)

The 3P model offers a simple, practical and structured way for a pilot to manage risk. In using the 3P model, the pilot:
Perceives—the given set of circumstances for a flight; identify hazards in each risk category.
Processes—by evaluating the impact of those circumstances on flight safety; what can hurt you.
Performs—by implementing the best course of action; change the situation in your favor.

5. How will you recognize and mitigate risks throughout a flight? (FAA-H-8083-9)

Once a pilot has completed the 3P decision process and selected a course of action, the process begins again because the circumstances brought about by the course of action require analysis. The decision-making process is a continuous loop of perceiving, processing and performing.

6. Explain the use of a personal checklist such as IMSAFE to determine personal risks. (FAA-H-8083-9)

Illness—Do I have any symptoms?
Medication—Have I been taking prescription or over-the-counter drugs?
Stress—Am I under psychological pressure from the job? Do I have money, health, or family problems?
Alcohol—Have I been drinking within 8 hours? Within 24 hours?
Fatigue—Am I tired and not adequately rested?
Eating—Am I adequately nourished?

D. Task Management (TM)

1. Define the term "task management." (FAA-H-8083-9)

Task management is the process by which pilots manage the many concurrent tasks that must be performed to safely and efficiently fly a modern aircraft.

2. Describe the different tasks in this process which may occur at any given time. (FAA-H-8083-9)

a. *Initiation* of new tasks.
b. *Monitoring* of ongoing tasks to determine their status.
c. *Prioritization* of tasks based on importance, status, urgency, and other factors.
d. *Allocation* of human and machine resources to high-priority tasks.
e. *Interruption* and subsequent resumption of lower priority tasks.
f. *Termination* of tasks that are completed or no longer relevant.

3. What will happen when information flow exceeds a person's ability to mentally process and act on the information? (FAA-H-8083-25)

When a pilot becomes task-saturated, there is no awareness of input from various sources, so decisions might be made with incomplete information and the possibility of error increases.

4. What are several options that a pilot can employ to decrease workload and avoid becoming overloaded? (FAA-H-8083-25)

Stop, think, slow down, and prioritize. Tasks such as locating an item on a chart or setting a radio frequency may be delegated to another pilot or passenger. An autopilot, if available, may be used. ATC may be enlisted to provide assistance.

5. What is one method of prioritizing tasks so as to avoid an overload situation? (FAA-H-8083-25)

During any situation, and especially in an emergency, remember the phrase "aviate, navigate, and communicate."

6. How can tasks be completed in a timely manner without causing a distraction from flying? (FAA-H-8083-9)

By planning, prioritizing, and sequencing tasks, a potential work overload situation can be avoided. As experience is gained, a pilot learns to recognize future workload requirements and can prepare for high workload periods during times of low workload.

E. Situational Awareness (SA)

1. Define the term "situational awareness." (FAA-H-8083-25)

The accurate perception and understanding of all the factors and conditions within the four fundamental risk elements (pilot, aircraft, environment, external pressures) that affect safety before, during, and after the flight.

2. What are some of the elements inside and outside the aircraft that a pilot must consider to maintain situational awareness? (FAA-H-8083-9)

Inside the aircraft—the status of aircraft systems, pilot, and passengers.
Outside the aircraft—awareness of the environmental conditions of the flight, such as spatial orientation of the aircraft and its relationship to terrain, traffic, weather, and airspace.

3. What are several factors that reduce situational awareness? (FAA-H-8083-15)

Factors that reduce SA include fatigue, distractions, unusual or unexpected events, complacency, high workload, unfamiliar situations, and inoperative equipment.

4. When flying technically advanced aircraft, what are several procedures that help ensure situational awareness is *enhanced* by the automation, and not diminished? (FAA-H-8083-25)

Always double-check the system and verbal callouts. At a minimum, ensure the presentation makes sense. Was the correct destination fed into the navigation system? Callouts are an excellent way to maintain situational awareness and manage information, even for single-pilot operations.

5. What are additional procedures that may be used for maintaining situational awareness in technically advanced aircraft? (FAA-H-8083-25)

a. Perform a verification check of all programming—check all information while on the ground.
b. Check the flight routing—ensure all routing matches planned route of flight.
c. Verify waypoints.
d. Make use of all onboard navigation equipment—use VOR to back GPS and vice versa.
e. Match the use of the automated system with pilot proficiency—stay within personal limitations.
f. Plan a realistic flight route to maintain situational awareness.
g. Be ready to verify computer data entries—incorrect keystrokes can lead to loss of situational awareness.

F. CFIT Awareness

1. What is the definition of controlled flight into terrain? (AC 61-134)

It is a situation in which an airworthy aircraft is flown, under the control of a qualified pilot, into terrain with inadequate awareness on the part of the pilot of the impending collision.

2. A majority of CFIT accidents have been attributed to what factors? (AC 61-134)

a. Lack of pilot currency.
b. Loss of situational awareness.
c. Pilot distractions and breakdown of SRM.
d. Failure to comply with minimum safe altitudes.
e. Breakdown in effective aeronautical decision making.
f. Insufficient planning especially for the descent and arrival segments.

3. Prior to flight, a pilot can decrease exposure to a CFIT accident at the destination by identifying what risk factors? (FAA-H-8261-1)

Pilots should consider all factors, such as airport location, runway lighting, weather/daylight conditions, approach specifications, ATC capabilities and limitations, type of operation, departure procedures, controller/pilot phraseology, and crew configuration.

4. Describe several operational techniques that will help you avoid a CFIT accident. (AC 61-134)

a. Maintain situational awareness at all times.
b. Adhere to safe takeoff and departure procedures.
c. Familiarize yourself with surrounding terrain features and obstacles.
d. Adhere to published routes and minimum altitudes.
e. Fly a stabilized approach.
f. Understand ATC clearances and instructions.
g. Don’t become complacent.

G. Automation Management

1. What does the term “automation management” refer to? (FAA-H-8083-9)

Automation management is the demonstrated ability to control and navigate an aircraft by means of the automated systems installed in the aircraft.

2. What three areas must a pilot be proficient in when using advanced avionics or any automated system? (FAA-H-8083-25)

The pilot must know what to expect, how to monitor the system for proper operation, and promptly take appropriate action if the system does not perform as expected.

3. What is the most important aspect of managing an autopilot/FMS? (FAA-H-8083-9)

Knowing at all times which modes are engaged, which modes are armed to engage, and being capable of verifying that armed functions engage at the appropriate time (for example, navigation tracking or altitude capture).

4. At a minimum, the pilot flying with advanced avionics must know how to manage what three primary items? (FAA-H-8083-25)

The course deviation indicator (CDI), the navigation source, and the autopilot.

5. Automation management is a good place to practice the standard callout technique. What are standard callouts? (FAA-H-8261-1)

The non-flying pilot may call 2,000 and 1,000 feet prior to reaching an assigned altitude; the callout may be, “two to go” and “one to go.” Examples of standard callouts are:

- “Power Set”
- “Airspeed Alive”
- “Rotate”
- “Positive Rate – Gear Up”
- “Localizer Alive”
- “Glideslope Alive”
- “Nav Source Verified”
- “Approach Mode Armed”
- “Approach Mode Active”
- “Final Approach Fix”