



The Pilot's Manual

Access to Flight

Integrated Private and Instrument Curriculum



Foreword by Alan and Dale Klapmeier

The Pilot's Manual: Access to Flight

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Acknowledgments: The publishers would like to thank the Federal Aviation Administration (FAA), Cirrus Design, the National Weather Service (NWS), Jeppesen Sanderson, Inc. (Jeppesen charts have been reproduced with permission, and are copyrighted by Jeppesen Sanderson, Inc.), Bendix/King (a division of Allied Signal Aerospace), II Morrow, Inc., RYAN, Narco Avionics, Garmin Communication and Navigation, and our distinguished editorial board. Also, to the many students, instructors, and FAA personnel whose comments have helped in developing and refining the material in this manual.

Photographs: Cirrus Design, FM Photographics and Aviation Theory Centre

ASA-PM-AF-PD

PDF ISBN 978-1-56027-836-8

Contents

Foreword ix
 About the Editorial Team x
 Introduction xi

Personal Progress Table

The Pilot

1. Airmanship 3
 2. The Human in the Cockpit..... 19
 3. Aviation Regulations..... 59

Text	Review

Aerodynamics

4. Forces Acting on an Airplane..... 99
 5. Stability and Control 131
 6. Aerodynamics of Flight 151

Text	Review

The Airplane

7. Airframe..... 203
 8. Engine 211
 9. Systems..... 243
 10. Flight Instruments..... 259
 11. Weight and Balance..... 289

Text	Review

Navigation

12. Charts.....	315
13. Airports and Airport Operations.....	339
14. Visual Navigation Fundamentals.....	353
15. Global Positioning Systems (GPS).....	371
16. Radar & ADS-B.....	381
17. The VOR.....	407
18. Airspace.....	441
19. Flight Planning.....	449

Text	Review

Instrument Flight

20. Introduction to Instrument Flight.....	471
21. Instrument Departures.....	487
22. En Route.....	499
23. Instrument Approaches.....	515
24. Visual Maneuvering.....	541
25. The VOR Instrument Approach.....	553
26. GPS Approaches.....	563
27. Instrument Landing System (ILS).....	575
28. Holding Patterns, Procedure Turns, and DME Arcs.....	615
29. Normal Instrument Flight on a Partial Panel.....	637

Text	Review

Weather

30. Wind, Air Masses, and Fronts	659
31. Visibility	675
32. Clouds	683
33. Icing	697
34. Thunderstorms	703
35. High-Level Meteorology	717
36. Weather Reports and Forecasts	721

Text	Review

Appendices

Appendix 1 Abbreviations	759
Appendix 2 Answers to Review Questions	763
Index	797

The idea of Airmanship is complex. It encompasses all the facets that make up a competent and safe pilot. To have Airmanship is to be able to fly an airplane with skill and precision but the idea means more. To have Airmanship is to be a savvy decision maker and in the 21st century it means having the ability to acquire, prioritize, and utilize information during flight. Pilots with Airmanship can be trusted to make decisions that will insure the safety of flight with confidence.

Sometimes a pilot with Airmanship says no to a flight even when the decision is not popular with passengers and alternate plans would be inconvenient. Sometimes a pilot with Airmanship says yes to a flight and conducts that flight with the greatest level of safety in situations that might be dangerous for other pilots who do not have Airmanship. So the goal of every pilot is to work on obtaining and maintaining their Airmanship because by doing so they insure safety for all and guarantee the fun and excitement of flying.

Across the world pilots fly together in teams or crews, but pilots are initially trained to fly alone without the aid of a second pilot on board. This means that all the tasks required to make a flight safe must be accomplished by a single pilot.

The pilot is never really alone however. Today vast amounts of information is available in the airplane while in flight. There are many people on the ground who assist pilots while in flight. Assistance by the airplane's radio, air traffic controllers, weather observers and forecasters, and even airplane maintenance personnel can be considered the "crew" of a single pilot. How the pilot manages all these resources is called Single-Pilot Resource Management (SRM).

Airmanship is the sound acquaintance with the principles of flight, the ability to operate an airplane with competence and precision, and the exercise of sound judgment that results in optimal operational safety and efficiency.

Single Pilot Resource Management

Single Pilot Resource Management (SRM) is defined as 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. SRM includes the concepts of Aeronautical Decision Making (ADM), Risk Management (RM), Task Management (TM), Automation Management (AM), Controlled Flight Into Terrain (CFIT) Awareness, and Situational Awareness (SA). SRM training helps the pilot maintain situational awareness by managing the automation and associated aircraft control and navigation tasks. This enables the pilot to accurately assess and manage risks and make accurate and timely decisions.

The ability to identify problems, analyze the information, and make informed and timely decisions is one of the most difficult tasks for the pilot. If pilots can accomplish these tasks confidently and consistently then they are maintaining their Situational Awareness and SA leads to Airmanship.

Situational Awareness

We tend to think of piloting an airplane as a physical skill. However, there is more to it—much more. Aircraft control, the manipulation of controls to achieve a desired performance, is important, but it is only one element of the pilot’s total task. The pilot must assemble information, interpret the data, assess its importance, make decisions, act, communicate, correct and continuously reassess. We call this total process *piloting*. But let’s start with the control process so that, once the aircraft is under control, we can be sensitive to and more aware of the bigger picture.

Where am I, where am I going, when will I get there, with how much fuel, at what time, what will the weather be like, how well is the aircraft performing, how tired am I, how well are the passengers, how do I get to the town after I land, how to avoid weather, how to avoid airspace, what calls I have to make . . . this is situational awareness. It is a total appreciation of where you are, where you want to be and how best to get there safely and on time.

How You Process Information

The main feature of your brain, as a central decision-maker, is that it can only function as a *single-channel* computer, which means that you can consider only one problem at a time. Conscious decisions are therefore not made simultaneously, but sequentially. They are placed in a queue according to a priority—but not always logically.

How the brain processes information is fascinating. There are six fundamental stages:

- *stimulation* and *sensation* where sensors receive a signal;
- *perception* for recognition, classification and remembering;
- *analysis* to work out what to do (make a decision);
- *action* for doing something (or nothing);
- *feedback* to check results; and
- *correction* to achieve acceptable standards of accuracy.

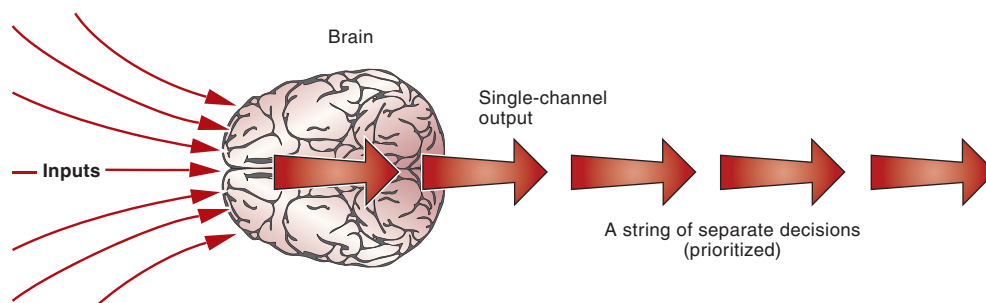


Figure 1-1 Single-channel processing.

Assembling the Big Picture

The pilot’s task involves two processes:

- being in *control* of the airplane; and
- being in *command* of the situation.

Situational awareness is the process whereby the pilot gathers data from his or her own senses via sight, hearing, smell, taste, touch, and feel. For a pilot, the eyes and ears are the primary sensors—although control feel and “seat-of-the-pants” are important

cues for aircraft control. In addition to direct sight and sound, the eyes and ears are used to gather information from the instruments, radios, and NAVAIDs so that the pilot can build and maintain an awareness of position, time, fuel, weather, traffic, and aircraft status. From these data, the pilot can prioritize the importance of the information, anticipate trends, assess the need for urgency, and make decisions. The primary task of being the pilot in command is decision making. The quality of the decision depends upon the quality, completeness, and timeliness of the data—and is affected by pilot aptitude, training, fatigue, stress, and personality.

The process of assembling data, making a decision, acting and correcting is called the pilot's *control loop*.

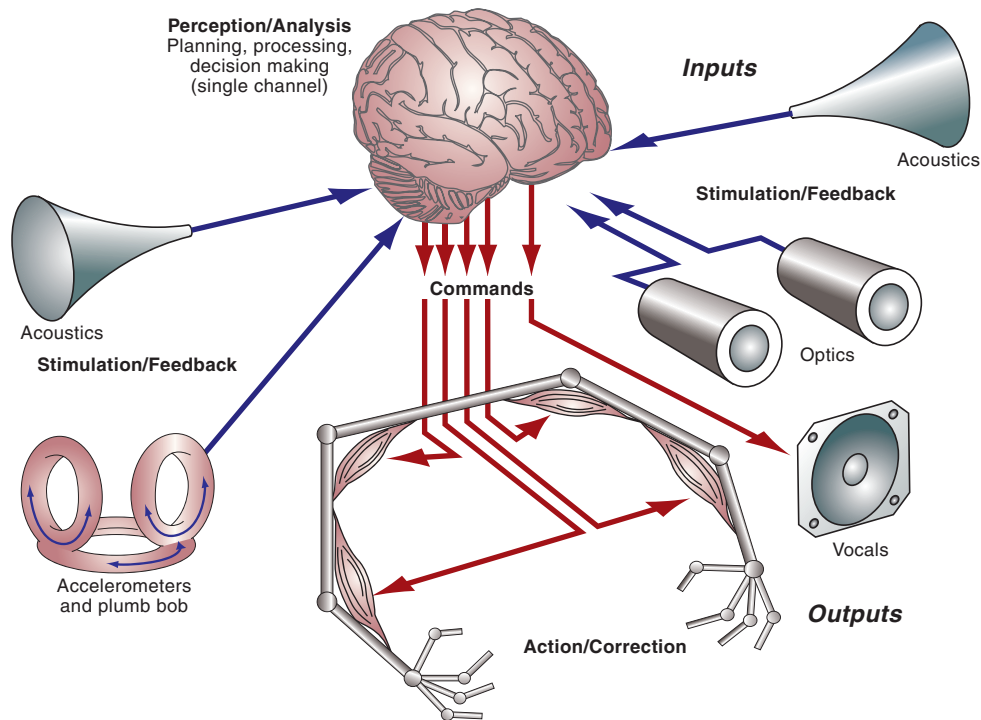


Figure 1-2 The pilot's central role in the control loop.

Flying as a Learned Set of Skills

While a student pilot is concentrating on learning to fly safely and accurately, the central decision-maker will be almost fully occupied. There will be very little spare capacity for other tasks such as navigation and radio calls—or even listening to the instructor. Once the student has learned the motor skills and practiced them until they are second nature, flying the airplane will occur with little conscious thought. In this case, a string of activities is run autonomously in the brain, leaving the central decision-maker available for higher-level decisions. Strings (or sets) of skills are often initiated by the central decision-maker. You might make a decision to get up and walk toward the door, but once this decision has been made, the central decision-maker can drop out of the picture temporarily and let the motor program run the activity. As well as initiating the activity, the central decision-maker will also



Figure 1-3
The primary pilot-airplane interface.

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Whether you fly for pleasure, business, or a career in aviation, the Private Pilot certificate with the Instrument Rating is your ticket into the full spectrum of the airspace system—it is the key to maximizing the utility of a general aviation aircraft. This book provides everything you need to know to safely fly a Technical Advanced Aircraft (TAA) in both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). The combined curriculum provides efficient training methodology that helps you graduate with a truly successful personal transportation solution.

The most comprehensive pilot textbook available, *Access to Flight* covers all of the aeronautical knowledge and skill needed to earn your license and rating using today's glass cockpit technologies: from aerodynamics to navigation and meteorology, to the actual maneuvers flown in the air—illustrated with over 800 full-color drawings and photographs.

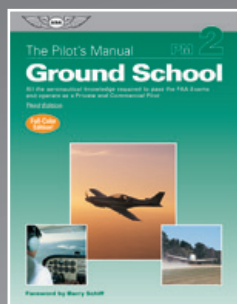
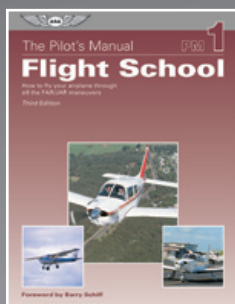
Get a solid foundation for your pilot certificate in real-world applications, with procedures and tips that can only be gleaned from experts! *Access to Flight* comes from the same team of aviation writers for The Pilot's Manual Series. Foreword by Cirrus Design co-founders Alan and Dale Klapmeier.

Also available in The Pilot's Manual Series:

Flight School: How to fly all the FAA/JAR maneuvers

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