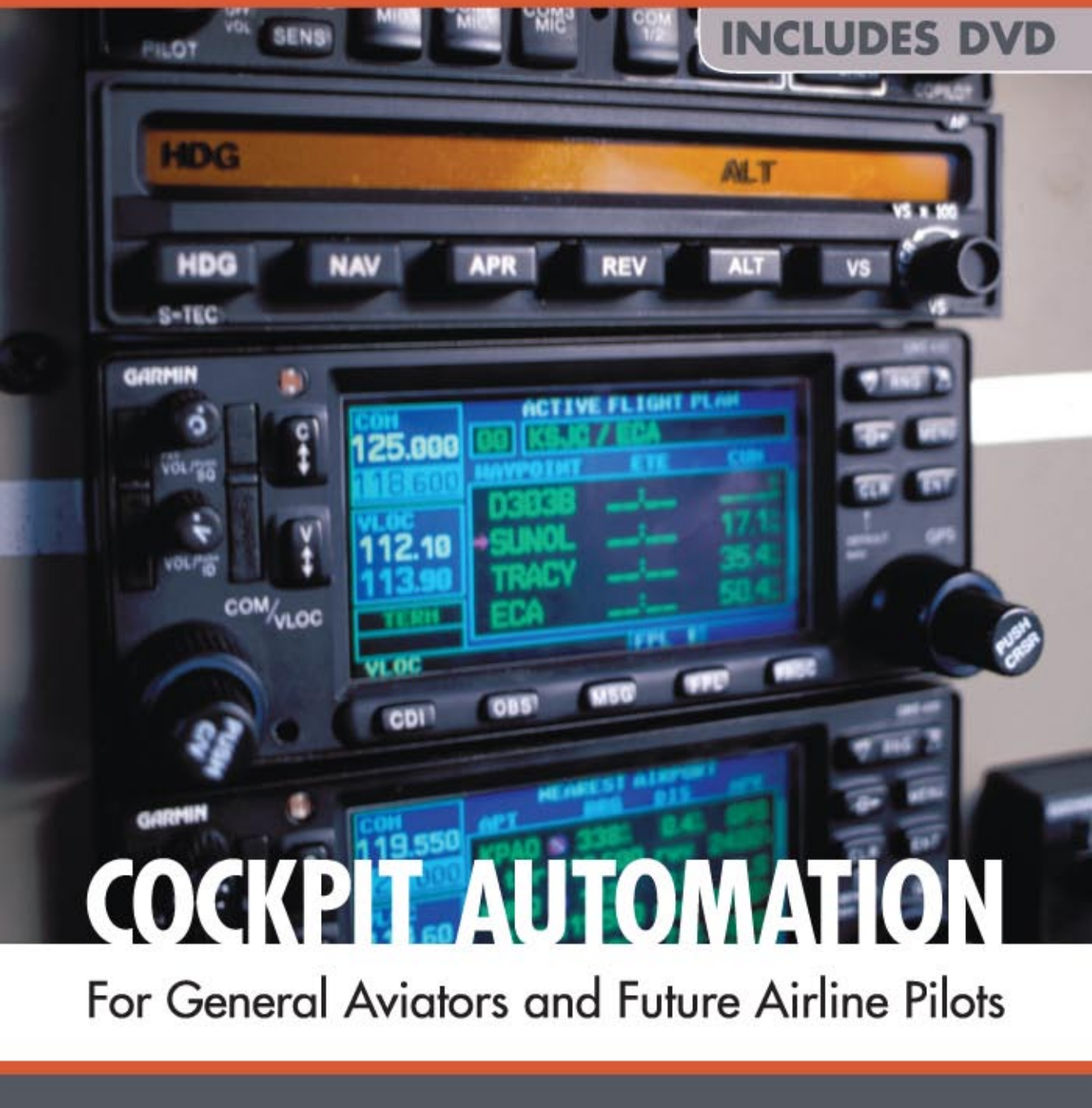

COCKPIT AUTOMATION

For General Aviators and Future Airline Pilots

Stephen M. Casner

Illustrated by Douglas A. Dupuie

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by Stephen M. Casner

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CHAPTER 1

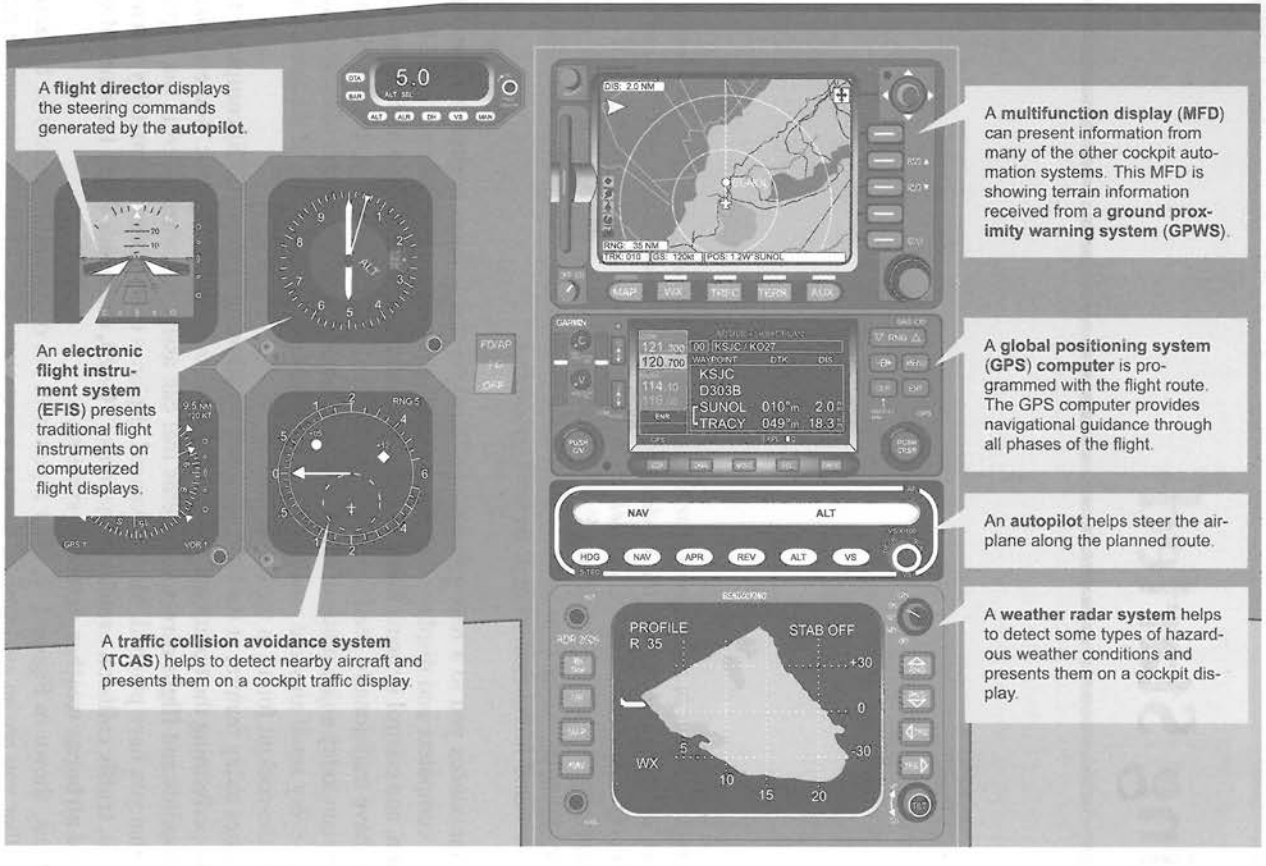
Getting Started

This chapter gets you started in the exciting world of cockpit automation: the high-tech computers and displays that are now common in the modern small airplane cockpit. You will find out why learning about cockpit automation is a good idea, both for the general aviation pilot as well as for the pilot with aspirations to fly for an airline. You will learn how to use this book, together with a collection of free computer-based simulators, to master the basic skills you will need to confidently act as pilot-in-command in the modern high-technology cockpit.

This book introduces you to a new generation of airplane that features **cockpit automation:** the collection of computers and displays that have taken the place of the traditional flight instruments, navigation, and control systems found in older-generation airplanes. These high-technology cockpit systems have traditionally been found only in the modern airline cockpit, but the pilots of smaller airplanes can today enjoy much of the excitement, benefits, and challenges offered by such systems. Almost every small airplane manufactured today features at least some of the same kinds of computers-in-the-cockpit found in the big airliners.

Small airplanes today feature, at the least, a **global positioning system (GPS) computer** that can assist you in performing the traditional tasks of flight planning and navigation. Some airplanes also feature **autopilots** and **flight director systems** that can assist you when steering the airplane along the route that you have planned. More advanced airplanes offer **ground proximity warning systems (GPWS), traffic collision avoidance systems (TCAS), electronic flight instrument systems (EFIS),** and **airborne weather detection systems.**

These systems, shown in Figure 1–1, offer a powerful set of cockpit resources to the small-plane pilot. Whether you are an avid general aviator, a corporate pilot, or an aspiring airline pilot, it is hoped that you will use this book to acquaint yourself with these systems and begin to experience the changing job of flying in the modern high-tech cockpit.



1.1. Cockpit automation systems found in the modern small-airplane cockpit.

WHY LEARN ABOUT COCKPIT AUTOMATION?

For the general aviation pilot, the most motivating reason to learn about cockpit automation is that practically every new airplane manufactured today contains some type of cockpit automation as standard equipment. Too often, pilots not familiar with these new technologies leave the equipment turned off in favor of more familiar equipment and methods. The problem with this scenario is that, aside from missing an exciting learning opportunity, the pilot has new cockpit automation technologies right at hand that can significantly enhance both safety and productivity.

For the career-minded pilot, taking advantage of the cockpit automation now found in small training airplanes represents a chance to get a head start on facing the inevitable challenge of walking into a modern airline cockpit. The airplanes now operated by regional airlines are fully equipped with the latest in cockpit automation technology. These systems represent a significant learning challenge for new-hire pilots, especially those coming directly from single-engine training airplanes with no cockpit automation experience.

ISN'T LEARNING ABOUT COCKPIT AUTOMATION MOSTLY ABOUT KNOWING WHAT BUTTONS TO PUSH?

The most interesting thing I discovered when developing and testing the materials presented in this book is that becoming a proficient cockpit automation user means more than learning how to push buttons and twist knobs. In fact, learning to operate the knobs, dials, and displays was the least difficult challenge for pilots new to the systems we studied. After working with scores of student pilots and shooting hundreds of GPS approaches, I found that most students learned the procedures quickly and recalled them easily when they were regularly used in practice.

What presented the biggest challenge to most students was understanding and maintaining an awareness of what the automation was currently configured to do, especially in challenging scenarios presented by air traffic control (ATC). Although students had little trouble understanding these new skills and concepts in the classroom, they proved difficult for students to incorporate into their existing habit patterns when flying the airplane. Students had to be constantly reminded that the automation had a plan of its own, and that this plan had to be continually monitored by the student. As one expert has pointed out, the most common three questions asked in the modern automated cockpit are as follows:

1. Why did it do that?
2. What's it doing now?
3. What's it going to do next?

You will likely find that developing the skills required to work as a team with cockpit automation will challenge you the most.

COCKPIT AUTOMATION

For General Aviators and Future Airline Pilots

Welcome to the world of cockpit automation for the general aviation airplane. Learn to use the GPS computers, autopilots, and colorful displays that are rapidly taking the place of conventional flight instruments and navigation systems found in older-generation airplanes.

Ideal for self-study or classroom use, this book provides step-by-step instruction that teaches you to use your panel-mounted IFR GPS computer, an autopilot, and other modern cockpit technologies. The fundamental skills you need are presented using simple language and familiar examples drawn from everyday flight situations. Each chapter ends with a practice session that can be accomplished using a simulator program you can download for free from the Internet, or using an airplane at your local flight school. The book also includes a DVD that demonstrates each of the skills covered in the book.

For the future airline pilot, this book is the ideal prerequisite to *The Pilot's Guide to the Modern Airline Cockpit.*

Cockpit Automation: For General Aviators and Future Airline Pilots provides hands-on experience with cockpit automation in the airplanes you are flying today.

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