
Before You Take Off

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What You Need to Use This Book

If you're like most pilots, you enjoy gadgets — they're one of aviation's main attractions — and when you get serious about using a PC-based simulation to complement flight training or the hobby of virtual flying, it's tempting to set up an elaborate home cockpit.

But aside from the desire to learn and a commitment to work through the lessons in this book in a logical sequence, here's all you need to use this book effectively:

- X-Plane version 9 or Microsoft Flight Simulator X (FSX)
- A suitable computer with a single display, a basic joystick, and a mouse (a keyboard usually isn't required after you start the simulation); even a laptop can suffice (see Figure 1-1)
- Web access to download the scenarios and background reading for the lessons
- A PDF reader, such as the free Adobe Reader, to read the FAA training handbooks, view charts, and use other resources that complement this book



Figure 1-1: The minimum required setup for X-Plane or FSX: a laptop, mouse, and joystick

CROSS-REFERENCE For more information about using PC-based simulations in training, see Chapter 8.

Supported Flight Simulations

Pilots and flight simulation enthusiasts engage in passionate debates about the relative merits of X-Plane (see Figure 1-2) versus FSX (see Figure 1-3) — you'll find a chapter devoted to the subject later in this book — but either product can be equally effective when used properly as a training tool.

The scenarios in this book are based on preset initial conditions — location, time of day, weather, and so forth — stored in files that you can open in either X-Plane or FSX. You can find separate sets of these scenarios for each simulation at this book's website at www.wiley.com/go/flightssimulatortraining.

These scenarios assume a standard installation of either X-Plane or FSX, and they are based in the Pacific Northwest, a region presented well in both simulations. Enhanced scenery and features such as advanced navigation displays are not required.

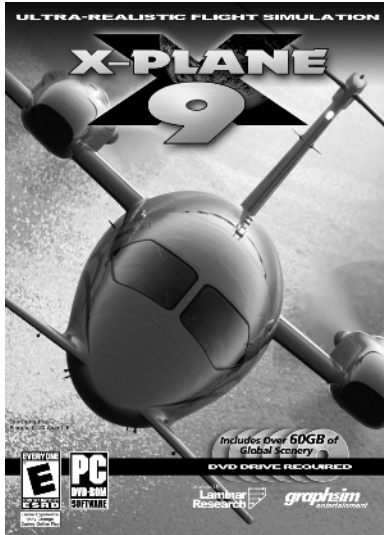


Figure 1-2: X-Plane 9 package

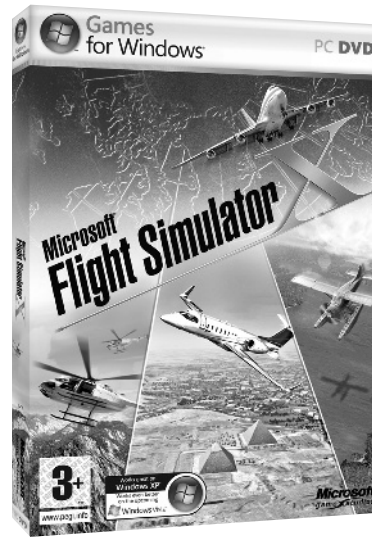


Figure 1-3: FSX package

Both X-Plane and FSX include sets of supplied aircraft, and except for some advanced lessons, the scenarios in this book use the Cessna 172 Skyhawk (see Figure 1-4), which has long been the most popular training and personal aircraft in the world.



Photo courtesy of Cessna Aircraft Company

Figure 1-4: Cessna 172 Skyhawk

CROSS-REFERENCE For more information about selecting the best simulation for your circumstances, see Chapter 5.

X-Plane

If you use X-Plane, the lessons in this book require X-Plane Situations (.sit files) created in X-Plane 9, the latest version available when this book was in production.

The Situations have not been tested in earlier versions of X-Plane or in X-Plane 10, which is scheduled for release in late 2011.

You can learn about and order X-Plane at the product's website, at www.x-plane.com. Links are also available at this book's website.

Microsoft Flight Simulator X (FSX)

If you use Microsoft Flight Simulator, the lessons in this book are based on Flights (.flt, .wx, and .fssave files) created in FSX.

Microsoft changed the format of the .flt and .wx files after Flight Simulator 2004, so the Flights provided on this book's website will not work with versions earlier than FSX.

You can learn about and order FSX at the product's website at www.microsoft.com/games/flightsimulatorx/. Links are also available at this book's website.

Microsoft Flight

Microsoft announced the successor to FSX, "Microsoft Flight" ("simulator" is not part of the new title) on August 31, 2010. According to the company's announcement, Microsoft Flight is "inspired by the best-selling Flight Simulator," but few details about the scope and features of Microsoft Flight were available as this book was being finalized in the summer of 2011.

It may be possible to use the FSX Flights (the .flt, .wx, and .fssave files available at this book's website) with Microsoft Flight, but you may find that the scenery, database of navigation aids, cockpit instrumentation, and other details in the new game do not support all of the goals of the scenarios.

For the latest official information about Microsoft Flight, visit the product's website. A link is available at this book's website at www.wiley.com/go/flightsimulatortraining.

Computer and Accessories

One of the most common questions about using PC-based simulations is "What kind of computer do I need?"

The short answers are as follows:

- For X-Plane, a suitable computer running Windows, or a Mac (OS X version 10.4 or later); X-Plane also runs under Linux
- For FSX, a suitable computer running Windows (XP SP1 through Windows 7)

You can find the latest minimum system specifications at the websites for each product.

Of course, the minimum processor and system memory requirements listed by the manufacturers are just that — minimums. More speed and memory are always preferable. For example, in 2006, Microsoft recommended the following specifications for a good experience with FSX, shown in Table 1-1.

Table 1-1: FSX Recommended System

COMPONENT	SPECIFICATION
CPU	3.6 GHz+
Memory (RAM)	2 GB+
Video card	512 MB+

FSInsider.com: Optimizing Visuals and Performance

Those specifications also exceed the minimum requirements for X-Plane and should deliver good performance with that simulation.

Because the scenarios in this book don't require add-ons or depend on high-definition scenery, you can probably get by with a recent mid-range system. Most computers made in the last three years or so are sufficiently powerful, provided, most crucially, that they include a separate graphics processor (video card) that supports DirectX 9 or later (if you run Windows). Many new high-performance laptops intended for playing games and enjoying multimedia are also suitable for running PC-based flight simulations.

If you're shopping for a new computer, look for a model that is designed for games, entertainment, or graphics-intensive applications such as video editing. Bargain-priced computers often don't include dedicated video cards, and they may skimp on system memory (RAM).

Because development of new computers and components such as video cards continues apace, it's impossible for a book to offer definitive, up-to-the-moment advice about the latest hardware. To get help equipping and tweaking your computer for optimum performance, visit the enthusiast websites, forums, and other online resources for each simulation noted at this book's website.

Joysticks and Flight Yokes

The focus of the scenarios in this book isn't developing "stick and rudder" skills that prepare you adequately to take the controls of a real airplane. As explained in Chapter 3, developing and honing the muscle memories required to fly an airplane precisely and smoothly requires practice in a real airplane under the guidance of a qualified instructor. Simply put, PC-based simulations can't provide all of the visual and motion (kinesthetic) cues and control responses necessary to develop a pilot's feel for flying, especially as you begin flight training.

Nevertheless, all that's required for the purposes of this book is a joystick (see Figure 1-5) or a yoke (see Figure 1-6) that provides an intuitive, fundamentally correct way to control the virtual airplane — its pitch and roll (and optionally, yaw). It's also helpful to have a lever for the throttle, and switches and knobs to operate elevator trim, flaps, and other secondary aircraft controls and systems.



Figure 1-5: Logitech Extreme 3D Pro Joystick

Fortunately, most joysticks and flight yokes available today offer those features, and current models connect to your computer via a standard USB port. The choice of which joystick or yoke to use is entirely up to you. Many models are available from such manufacturers as CH Products, Saitek, Logitech, and Thrustmaster. You can find links to the manufacturers at this book's website.

Some virtual pilots insist on using a flight yoke, not a joystick, because most civilian training and personal aircraft made since the 1950s feature primary controls that resemble the steering wheels in cars. But many new airplanes, such as the Cirrus SR models and the Cessna Corvalis and Skycatcher series, are equipped with side-stick or hybrid controls that are neither pure yokes nor joysticks (see Figure 1-7).



Figure 1-6: CH Products Eclipse Yoke



Figure 1-7: Side-stick control in a Cirrus SR22.

Pilots, even those with many years of experience with conventional flight yokes, quickly adapt to the new controls, and soon the mechanism used to bank the wings and raise or lower the nose becomes irrelevant. That experience also applies to joysticks and yokes used with PC-based simulations.

I suggest you try various joysticks and yokes and then choose the model that you find the most comfortable and the easiest to use — and the best fit for your budget. It's also important to consider how you use your computer. A joystick, small and easy to put aside, may be the best option if you have limited space and often switch from flying to email and other tasks. If you dedicate a computer to virtual flying, attaching a yoke to your computer desk may be the better setup.

Rudder Pedals and Radio Stacks

Virtual pilots often want to equip their home cockpits with rudder pedals and separate consoles to simulate radios and other systems. Those components are important if you want to earn FAA approval for a flight training device (FTD), but they aren't necessary for using the scenarios effectively.

However, if you can't suspend your disbelief and enjoy virtual flying without those accessories, you can find links to manufacturers at this book's website.

Mouse with Scroll Wheel

A mouse is essential, regardless of whether you use a joystick or a yoke bristling with buttons and levers. You can use a mouse like your hand to operate naturally and realistically many on-screen cockpit controls — including heading and course selectors; radio-tuning knobs; and the throttle, flap, and trim controls. Any standard mouse equipped with two buttons and a wheel will suffice.

CROSS-REFERENCE For more information about using a mouse, see Chapters 6 and 7.

Multiple Displays

The view from your virtual cockpit may sometimes seem crowded or limited. Computer displays have become less cumbersome (and cheaper) and many recent video cards support multiple monitors. If you find it helpful to expand your virtual field of view by adding a second (or even three or four displays) to your system, you can configure X-Plane or FSX to display inside and outside views and other features, such as radios and accessories, on different monitors.

However, multiple displays aren't necessary to use the scenarios effectively; and like rudder pedals and separate consoles for radios and other controls, multiple monitors add to the complexity, cost, and everyday utility of your virtual cockpit.

CROSS-REFERENCE For more information about using multiple displays, see Chapters 6 and 7.

Additional Software and Web Access

X-Plane and Microsoft Flight Simulator have inspired developers all over the world to enhance the basic simulations. You can download thousands of aircraft; enhanced scenery; interactive air traffic control; and specialized avionics that emulate specific models of GPS navigators, autopilots, and the like. Other products support virtual flying with others online or enhance the use of PC-based simulations as training tools. Some add-ons are free; others are sold as supplemental products.

As noted earlier, no add-ons are required to fly the scenarios in the private pilot and instrument rating courses in this book. You're free, of course, to enhance your virtual flying with as many options as you like. You can find links to information about add-ons at the website for this book.

CROSS-REFERENCE For more information about the resources that complement this book, see Chapter 2.

Glass Cockpits and Flying RNAV (GPS) Procedures

New and recently updated aircraft are typically equipped with electronic flight displays — so-called *glass cockpits* (see Figure 1-8). Older aircraft are often updated with a GPS receiver and moving map, because GPS has become increasingly important in real-world instrument flying for all phases of flight.

You can find glass cockpit and GPS add-ons for both X-Plane and FSX that can help you learn about this new technology, but those supplements aren't necessary for the scenarios in this book, which focuses on fundamental knowledge and skills that apply regardless of whether you fly an aircraft with conventional instruments or the latest touch-screen, flat-panel displays.



Photo courtesy of Cessna Aircraft Company

Figure 1-8: Garmin G1000 system in a late-model Cessna 172 Skyhawk

In addition, the cockpits in the basic versions of X-Plane and FSX rely on conventional instruments — “steam gauges,” as they’re known to pilots (see Figures 1-9 and 1-10). Accurately rendering the latest flat-panel cockpit displays and emulating all of their functions usually requires multiple computers and several large displays, a setup that defeats one of the primary purposes of this book.



Figure 1-9: Default Cessna 172 Skyhawk instrument panel in X-Plane 9



Figure 1-10: Default Cessna 172 Skyhawk instrument panel in FSX

For similar reasons, details about using specific IFR-approved, GPS-based navigation systems, especially when flying the latest RNAV (GPS) approaches, are beyond the scope of this book.

The GPS in the consumer version of X-Plane 9 supports only basic GPS functions. The emulation of the Garmin GNS500 series navigation system in FSX is more detailed, but it does not include a current database of procedures, and you can't use it to practice the latest instrument approaches, which are based on the Wide Area Augmentation System (WAAS).

To fly the latest GPS (RNAV) procedures, you need one or more add-ons for X-Plane or FSX. Options include the RealityXP GNS430W/GNS530W accessories (for either X-Plane or FSX) and the G1000 and Avidyne add-ons from Flight1Aviation Technologies that work with FSX.

For more information about add-ons for X-Plane and FSX, see the links on the book's website.

Virtual Flying with Others

Finally, you may want to share your virtual cockpit with fellow aviators or mentors. Both X-Plane and FSX enable you to connect with others over the Internet or a local network, but this capability isn't required to fly the scenarios described in this book.

You can find links to information about sharing your cockpit at each simulation's website. To learn more about interactive ATC services such as VATSIM and PilotEdge, see the links at the website for this book at www.wiley.com/go/flightsimulatortraining.

