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- Topics are organized into logical chapters for easy comprehension. Although this is a typical feature of books, too many materials offered free on the Internet are not organized logically.

- Every chapter is numbered and titled. Again, a lot of Internet materials are not conveniently chaptered and referenced.

- The chapter page and title are shown on the top of every page for easy reference.

- The book title is at the bottom of every page for easy reference. This is handy when you're reading several books and lose track of which book you're reading at the moment.

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Jet Simming

flight simming in business jets and airliners

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Chapter 1

Advantages and Challenges of Flying Jets

Why Fly Jets?

Just about every flight simmer wants to fly jets. We simply cannot deny ourselves the machismo feed that results from flying the biggest and fastest aircraft. And flight simming provides our machismo no greater feed than the exhilaration of advancing the throttles of two, three or four powerful engines, rolling down a runway at full power with all its noise and g-forces, lifting off in a huge aircraft presumably full of people and/or cargo, and climbing up to altitude in this massive and powerful machine. Wow, this is real mens' stuff, isn't it?

Of course, jet flight offers many more advantages than simply feeding our sense of manhood. It offers quicker travel, farther distances and several other advantages over light general-aviation aircraft.

Quicker Travel. We can reach nearly any destination sooner by jet. Often, jet flights are 50 percent shorter than prop flights of the same routes. For long routes, several hours can be trimmed from the flights. In flight simming, jet flight enables us to travel to more distant places in the same amount of simming time as we could in prop planes. Hour for hour, we can cover about four times as much distance in a typical business jet versus a typical prop plane.

Chapter 2

What Jet Pilots Do

With very few exceptions, jet pilots are paid to fly. They're employees of an airline company, a charter company, or a private corporation. A few are private contractors. The number of jet pilots who fly jets for fun is minuscule – restricted to a few very rich people with money to burn and time to waste. So when you simulate jet flight, you will be simulating yourself as "on the job."

What You Will Do as a Business-Jet Simmer

Pilots of business jets operate powerful and sophisticated machines that carry important people and/or cargo in most weather conditions. Generally speaking, they are better trained and more experienced than most general-aviation pilots, and most of them earn more than typical college graduates, but they are not paid as well as jetliner pilots.

In addition to all the other things pilots usually do, pilots of business jets routinely do and are responsible for many other things during their day's work. The following paragraphs summarize the job of a typical business-jet pilot.

Chapter 3

Requirements for Flying Jets

A few requirements are fundamental and common to flying business jets and jet airliners. Simulating jet flight realistically requires knowing what they are and adhering to them as much as we can within flight-sim limits. Of course, we simmers have the freedom to do whatever we want, but that wouldn't be realistic. To simulate jet flight realistically, we should try to abide by and meet as many requirements as we can.

Legal Authorizations

Pilots flying jets must have proper permissions from governing authorities. These permissions are called "certificates," "ratings" and "authorizations." People without these permissions cannot fly these aircraft.

Pilot Certificates. Pilots flying business jets and commercial jet airliners must have special certificates beyond those required for general-aviation: instrument and commercial. These certificates are as follows.

Chapter 4

Jet Fundamentals

Jet fundamentals are those aspects of jet simming that apply to all jets, whether business, jetliner or supersonic. They're explained in this chapter to minimize duplication of information in the chapter about each jet type.

Elementary Characteristics

Workhorses. Jets are workhorses, especially jetliners. Large jetliners fly long-range routes, so they take off heavy with passengers, cargo and fuel. Smaller jetliners such as 757s and 737s take off and land many times daily. Many of them stay at gates less than an hour before they push off, taxi and take off again. These numerous daily operations as well as pressurization and depressurization for every flight make small jetliners more vulnerable to wear, and it's one reason that airliners so frequently check their mechanical and physical conditions. For us flight simmers, this means that flying lots of short hops is as realistic as flying long range over oceans.

Fewer Airports. The larger the jet, generally speaking, the fewer airports it can use. This axiom results from the fact that larger jets generally require longer runways, and only some airports have runways long enough. Obviously, a Boeing 777 cannot land at a municipal airport with 5,000-foot runways, and it cannot land at small

Chapter 5

Jet Performance Speeds

Jet performance speeds are standards regarding performance abilities or characteristics of a given jet aircraft type. They are abbreviated with a capital letter V and other designations such as Vlo and Vfe, so they are commonly called V speeds.

There are minimums, maximums and optimums. Pilots should not allow their aircraft to fly slower than minimums or push their aircraft above maximums. Optimums are best speeds, so aircraft can go somewhat slower or faster than them.

These speeds differ for every aircraft type and the conditions of those aircraft. We can go on and on about the differences, but the following three examples should make the point.

- V speeds for a Learjet 45 differ from a Boeing 737, which differ from a Boeing 777, which differ from a Concorde.

- V speeds for a Learjet 45 differ from a Learjet 31 and a Learjet 60.

- V speeds for a Learjet 45 full of fuel, passengers and cargo differ from a Learjet 45 half full of fuel, passengers and cargo.

Chapter 6

Jet Panels and Instruments

While jet panel layouts and instrument displays are generally similar to those found in other aircraft, enough differences exist to make knowledge of jet panels and instruments absolutely requisite to simming in business jets and jetliners.

NOTE: Numerous variations of instrument panels and gauges are available in real-world flying and flight simming. For simplicity, we explain default panels and instruments in Microsoft's Flight Simulator. Once you understand how to use a given instrument, you can easily adapt to variations in panels and instruments.

Jet Panels

Instrument panels in today's jet aircraft are fundamentally similar to those used in most aircraft for decades, yet they are different in specific ways. Just like other aircraft panels, jet panels have flight, navigation, aircraft, engine, and miscellaneous instruments. However, modern jet panels are made differently, work differently and are laid out differently.

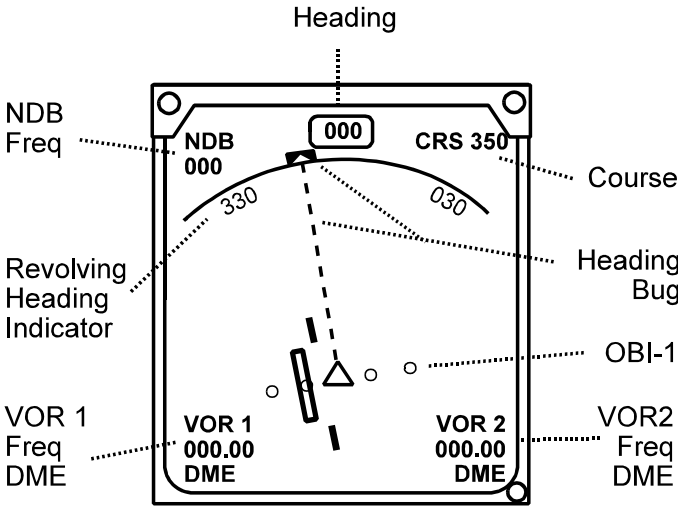

Figure 6-K: Boeing 747 Navigation Display

☞ All graphical aids in our books are uncomplicated, easy to understand, and referenced with numbers and captions.

☞ Useful information is provided in easy-to-read tables.

Chapter 7

Planing and Preparing Your Jet Flights

Flying jets is much more complicated and demanding than flying general-aviation aircraft, so business-jet and jetliner pilots can easily spend 30 minutes or more preparing for each flight. For us flight simmers, the process is a lot simpler and will take only a few minutes. Forego this short planning and preparation, and you will forego your realistic jet simming.

Choose Your Aircraft, Flight Purpose and Route

Jet simmers have the luxury of determining what type of aircraft to fly, what purposes their flights will have and where they will fly from/to. Each of these decisions affects the other considerations. For example, if you choose to simulate flight in a large jetliner, you will restrict the number of airports you can use. If you choose to simulate business-jet flight, you would likely use municipal airports instead of commercial airports.

The exact order for making these decisions depends on the simming desires. If we decide to fly a 777 today, we would then choose airports, runways and routes appropriate for that aircraft. If we decide to fly from New York to Boston or London

Chapter 8

Flying Propjets

All About Propjets

What is a propjet? Who owns and flies them? How are they flown? This chapter answers all those and more questions about these popular flight-simulation aircraft.

What Is a Propjet?

A *propjet* is an airplane with an external propeller that is driven by a turbojet engine such as those that drive jet aircraft. Primary thrust is provided by the propeller instead of by the jet exhaust. Another common name is *turboprop*.

Propjets generally range in size from the single-engine Cessna Caravan that seat six to eight passengers to large four-engine aircraft that seat 70 or more passengers. Propjets such as the Beechcraft King Air are typically used by general aviation, and propjets such as the DeHaviland Dash 8 are typically used by airlines. The King Air 350 is a suitable aircraft for simulating commuter airline flights if add-on commuter airliners are not available.

Chapter 9

Flying Business Jets

What Is a Business Jet?

We find no official definition of business jet, but defining one is easy. A typical *business jet* is a small civil jet owned by nonairline companies and used for flying business executives to and from business engagements. Most business jets hold 10 to 20 passengers and have two engines, although a few have three engines. Examples of business jets are the Learjet 45, the Cessna Citation Jet and the Hawker 800XP business jet.

We realize that not all business jets fit this definition or these examples. Some companies use business jets to haul cargo instead of people. Some very wealthy people and companies use small airliners such as DC-9s as business jets. Boeing has been marketing its 737 to corporations as a business jet for a few years. Nonetheless, DC9s and 737s are still considered airliners because of their size and original purpose. They are simply airliners being used for business-jet purposes. When we say "business jet," we mean small jets that typically carry a few business people to and from their business activities.

Much of the flight methods explained in this chapter can be applied to the larger jets.

Business Jet Exercises

These exercises will help you apply the jet-simming techniques explained in this chapter. We are not going to lead you through every small step of these exercises, because we assume you are an experienced flight-sim pilot and we want you to use the appropriate checklists. Refer to applicable pages of this chapter for assistance whenever necessary. Remember that you may pause any time you need to compensate for lack of a copilot. Charts will not be needed for these basic exercises, but you might find them more enjoyable by using charts.

The origin and destination airports were chosen because they are in a well-known area of the world – the northeastern United States. You are welcome to practice appropriately modified exercises at airports of your choice.

☞ Exercises at the end of appropriate chapters give you an opportunity to practice the flight techniques explained in that chapter.

Chapter 10

Flying Jetliners

Taking Off. Numerous steps in correct sequence are necessary taking off safely and efficiently in jetliner. The Microsoft 737 and 777 have an automatic take-off feature that controls throttles during take-offs. You still need to steer the aircraft and retract gear and flaps when appropriate.

For details, consult the corresponding section of chapter 8, "Flying Business Jets."

Synchronize Your Engines. For best takeoff results, be sure your engines are both running at equal power.

Begin Rolling. When you are ready to take off, advance your throttle steadily to take-off power and begin your take-off roll down the runway. Adjust your throttle to keep your N1 and N2 gauges in the green zone and out of the red zone.

Check Your Decision Speed. If necessary, you can abort your take-off up to reaching your take-off decision speed (V1). After that, it is too late. Remember that take-off decision speeds vary with weight and other factors. Fully fueled jetliners take longer to reach their decisions speeds than jetliners with lighter fuel loads.

Rotate and Lift Off. When your airspeed reaches rotation speed (VR), you should be able to pull the nose up and lift off.

✔ Use our handy take-off checklist in appendix A.

Jet Airliner Exercises

These six exercises will help you apply the jetliner techniques explained in this chapter. Because we assume that you are an experienced flight-sim pilot, we will not lead you through these exercises as we would a novice. Refer to applicable pages of this chapter and chapter 8 for assistance and use the appropriate checklists. Pause any time needed to compensate for lack of a copilot in these self-training exercises.

For simplicity, we have intentionally omitted some navigation steps, all standard departure and arrival procedures and all ATC interactions. We are assuming that all our procedures have been filed and cleared for these training exercises. Charts will not be needed, but you might find these basic exercises more enjoyable by using charts.

The origin and destination airports were chosen for these exercises because they are in a well-known area of the world – the northeastern United States. You are welcome to practice similar exercises at airports of your choice (appropriately modified, of course).

Chapter 11

Flying on Autopilot

Using the Autopilot

Using a flight-simulation autopilot is a simple matter of setting the desired parameters and turning on the device when needed. Flight simmers then sit back and watch. If you will fly long distances, you can literally leave your simulator on autopilot and return later, doing other things in the interim. This wonderful luxury is not realistic, however.

Be sure to use your autopilot realistically. Autopilots are legitimate flight-management tools that real pilots use routinely, so using them in flight simming is not a crutch. However, relying on them from the early days of our flight-simulation experiences deprives us of the hands-on experiences we need for learning how to fly. We suggest practicing flight maneuvers such as climbs, level flight, turns, descents, and landing approaches without relying on the autopilot until you learn how to perform those maneuvers easily. Thereafter, we recommend using the autopilot during portions of a flight when a jet or propjet pilot would normally use it.

Under basic operations, desired flight conditions are manually selected by the pilot or automatically selected by a flight-management computer. No hard rules apply to the use of autopilots, so we provide a few simple guidelines for simulating autopilot flight.

Appendix A

Checklists for Jet Simming

These checklists are intended to help you simulate jet flight as realistically as you can. We found that using paper checklists is easier and more realistic than using the checklists included with the flight-sim games. Additionally, our checklists provide more steps and information. They are suitable for business jets as well as subsonic and supersonic airliners.

NOTE: These checklists are for flight-simulation only, not for use in real-world aviation.

Appendix B

Sources of Aviation Charts

Because we receive more requests for charts and lists of navigation aids than any other item, we provide this list of reputable and reliable charts suppliers to help you find the charts you need. Only suppliers that we consider reputable are recommended. This list is a service to our readers. No supplier paid us to be listed.

No chart supplier can afford to keep inventory of every chart for every airspace in the world, so you might need to contact several suppliers before you find the charts you need.

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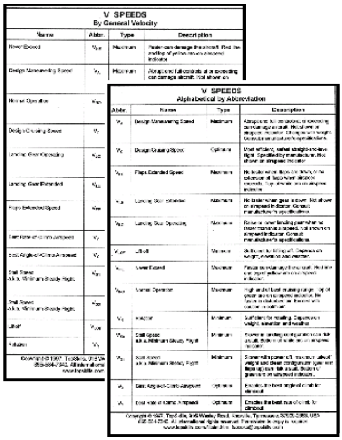
If you can show that this book is not as described on our web site (www.topskills.com/flitsim.htm), we will refund your purchase price.

Nothing can be safer or more fair than this.



Get a *Free* V-Speed Card

V-speeds are a series of velocities designated by aviation authorities. Some are minimums, some are maximums, and some are optimums.

For example, "Vne" means the designated velocity should never be exceeded (it differs for each aircraft).

Your V-speed card lists the most common general-aviation V-speeds in two easy-to-find ways – alphabetically on one side and by velocity on the other side. Each V-speed is identified by name and abbreviation and explained in clear language. These cards are a handy size for using at your flight simulator.

You will get a V-speed card free with every order of flight-sim books from TopSkills! This is author Bill Stack's way of saying "Thank You."

QUALITY FLIGHT-SIM BOOKS FROM TopSkills

Flight-Sim Maneuvers

Master the correct ways to take off, climb, fly straight and level, turn, climb while turning, descend, turn while descending, fly airport traffic patterns, approach to land and land. See how pilot judgment is affected by altitude, speed and other factors during these maneuvers. Learn what not to do in performing these maneuvers. Plenty of step-by-step explanations, graphical demonstrations and exercises.

Flight-Sim Navigation

Fly anywhere in your flight simulator with ease. Navigation concepts, methods and terms used by real-world pilots are applied to PC flight simulation to enable flight-sim pilots fly cross country precisely and on time. Plenty of step-by-step explanations, graphical demonstrations and exercises.

Flight-Sim Pilot's Information Manual

Fly your flight simulator in accordance with real aviation rules, regulations, requirements, restrictions and procedures. Learn about pilot ratings, airports, altitudes, airspaces, air traffic control, weather services, navigation aids and much more. Hundreds of aviation requirements are applied to PC noncombat flight simulation so flight-simulation pilots can make their simulation as realistic as feasible.

Flight Simulator Flight Plan Forms

Manage your flights as professional pilots do with formal plans. Lay out your routes and waypoints. Indicate your origin, en route and destination airports. Check VFR or IFR flight. Cite departure and arrival times. Record your estimated duration. And much more. Pads of 50 and 100 forms.

Instrument Flying for Flight-Simulation Pilots

Fly through any weather conditions anytime using instruments as real pilots do. Read cockpit instruments and know what they are telling you. Adhere to IFR requirements and restrictions. Execute instrument procedures properly and safely. Use instrument charts and flight plans for safe and timely flights. Detailed explanations, numerous graphical depictions and many practical exercises.

Top Performance

Get the most from your flight-sim aircraft using the same techniques and procedures real-world pilots use. Know your aircraft's abilities and limits, calculate weight and balance, determine fuel needs, learn to use real performance charts, plan your flights and much more. Detailed explanations, numerous graphical depictions and many practical exercises.

Concorde Simming

Learn to simulate flight in the world's only supersonic airliner. Taxi, take off, climb, cruise, descend, approach, and land subsonic. Climb, cruise, and descend supersonic. Balance fuel. Use Concorde V Speeds. Practical exercises.

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