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TOP PERFORMANCE

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# *Top Performance*

Getting the Most From  
Your Flight-Sim Aircraft

by *Bill Stack*

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Knoxville, Tennessee  
United States of America

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## Chapter 1

# Knowing Your Aircraft's Abilities, Limits and Restrictions

Getting the most from your aircraft requires knowing what our aircraft can, cannot and should not do. *Abilities* are things it can do. *Optimums* are levels and ranges in which the aircraft performs most efficiently and safely. *Limits* are minimum and maximum performance characteristics beyond which it cannot or should not be pushed. *Restrictions* are things pilots are legally prohibited from doing in their aircraft.

What our aircraft can, cannot and should not do varies with conditions. For example, it might be able to take off from a sea-level airport in calm air with a full passenger, luggage and fuel load, but it probably could not achieve this feat from an airport several thousand feet above sea level because of density altitude.

## Chapter 2

### Getting the Most From Your Instruments

*Instruments* are devices that provide us needed information about our aircraft. Some tell about our aircraft's general condition. Some tell about its position in space. Others tell us about the engine's performance. All this information is essential for smooth, safe, timely and efficient flight.

Pilots and flight-simmers have several reasons for using instruments during their flights. First, some possible misunderstandings about visual and instrument flight need clarification.

1. We can fly visually and use our instruments at the same time. Just because we might be flying visually does not mean we cannot use our instruments. In fact, we should always read our instruments whether we are flying VFR or IFR so we can know what our aircraft is doing and what is happening around us. An apparent misguided notion is that we can fly either visually or on instruments but not both.

## Chapter 3

# Adapting to Weather

### **What Should I Do About Flight-Sim Weather?**

*Weather* is the ever-changing condition of the atmosphere as it affects flight. We are all familiar with weather, because we experience it in its various forms daily. Aviation weather is more complicated than ordinary weather because of its effects on aircraft performance.

Flight-simulation weather is not as varied and dynamic as real weather, but it is getting better with every new release. Some flight-sim programs offer more weather features than others, and some add-on programs provide plenty of good weather variables for stimulating flight. In this book, we focus on weather as it affects aircraft performance. We plan to delve deeper into flight-simulation weather in general in a future book.

## Chapter 4

### Managing Fuel for Peak Advantage

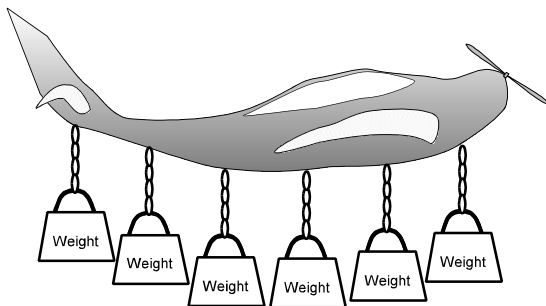
Peak advantage means getting the most benefits from our fuel. These benefits can be (1) reaching the farthest distance on a fuel load, (2) flying the longest duration on a fuel load, (3) or reaching our destination with the least amount of fuel needed. Managing fuel usage means planning and controlling that fuel usage to achieve our objectives.

Additionally, we have three specific objectives in managing our fuel. First, we want to reach our destinations safely, without running out of fuel. Second, we need to meet aviation regulations that stipulate how much fuel we carry. Third, we want to minimize our fuel costs and not waste fuel.

Recently, a general-aviation aircraft approaching our local airport dropped from the sky onto a residential neighborhood about five miles short of the runway. The pilot had radioed minutes earlier that his engine had stopped running. As local pilots expected, investigators found that the aircraft had simply run out of fuel. His fuel miscalculation ruined his aircraft and nearly cost him and his passengers their lives. It is a pilot error that happens too frequently according to Flying Magazine's monthly recaps of official general-aviation accident reports.

## Chapter 5

## Managing Weight and Balance



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**Figure 5-A:** Excessive Weight Diminishes Performance

- ✈ Graphical aids in our books are uncomplicated, easy to understand, and referenced with numbers and captions.

## Chapter 6

# Managing Flights for Peak Performance

Managing flights for peak performance means selecting performance objectives and laying out specific steps for accomplishing them. We do not simply take off and push our aircraft to its limits with no regard to the many factors that enable or inhibit peak performance.

The following procedures and techniques will enable us to achieve the results we seek within the abilities and limits of our aircraft. Much of what we explain in this chapter relates to, affects and/or depends on factors explained in other chapters. For example, aircraft abilities and limits are explained in chapter 1, “Knowing Your Aircraft’s Abilities and Limits.” Flying as fast as possible affects fuel efficiency, which is explained in chapter 4, “Managing Fuel for Peak Efficiency.” Flying as high as possible depends on density altitude, which is explained in chapter 3, “Adapting to Weather.”

## Chapter 7

### Managing In-Flight Performance Problems

Managing in-flight performance problems is one of the pilot's fundamental duties. In addition to planning and following the plans, pilots must solve problems that arise during their flights without warning or expectation. Prudent pilots prepare themselves for possible difficulties and/or failures with their aircraft, engines, avionics and navigation. Additionally, competent pilots are willing to admit mistakes and change what they are doing before their mistakes turn into failures.

Not facing life-threatening situations, we flight-simulation pilots simply create our own in-flight problems and emergencies. Two easy ways are available to us. We can either set our simulators for realism and reliability or literally cover instruments with papers as real flight instructors do. Then we can practice managing problems and avoiding catastrophes.

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

<b>What to Do When Avionics Appear Faulty</b> Quick Reference Guide		
Problem Device	Verify Against	If It Is Faulty *
Omni Bearing Indicator	automatic direction finder	plot position with ADF
Automatic Direction Finder	omni bearing indicator	plot position with OBI
Distance Measuring Equip		plot position with OBI, ADF
Communication radios	check frequencies check other stations	squawk 7600 continue on planned course land at planned destination
Navigation radios	check frequencies check other stations	use dead reckoning use pilotage
GPS Device	OBI, ADF, DME verify database	use conventional nav aids
		* without ATC assistance
This is a simple synopsis of what to do for easy reference. Refer to the text for details.		

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## 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.

### Jet Simming

Simulate flight in the large and powerful aircraft. Learn proper procedures and professional techniques for flying propjets, business jets, and jet airliners. Learn to read and use advanced instruments found in jet aircraft. Apply the skills with realistic 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. Apply the skills through practical exercises.