

FLIGHT PLAN

Steps to becoming a pilot

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RESOURCES: Internet

- ASA (AVIATION SUPPLIES & ACADEMICS, INC.)** www.asa2fly.com
- NAFI (NATIONAL ASSOC. OF FLIGHT INSTRUCTORS)** www.nafinet.org
- SAFE (SOCIETY OF AVIATION & FLIGHT EDUCATORS)** www.safepilots.org
- SPORT PILOT LINKS**
- Paul Hamilton — www.adventure-productions.com
 - www.sportpilottraining.info
 - EAA — www.sportpilot.org
 - U.S. Ultralight Association — www.usua.org
- EAA (EXPERIMENTAL AIRCRAFT ASSOC.)** www.eaa.org
- EAA Young Eagles — www.young eagles.org/
- AOPA (AIRCRAFT OWNERS AND PILOTS ASSOC.)** www.aopa.org
- AOPA Project Pilot — <http://projectpilot.aopa.org/projectpilot/>
 - AOPA Let's Go Flying! — www.aopa.org/lets go flying
 - AOPA Flight Training — <http://flighttraining.aopa.org/learntofly/>
- FAA KNOWLEDGE EXAM DESIGNATED TESTING SERVICES**
- Computer Assisted Testing Service (CATS) — www.catstest.com (800) 947-4228
 - LaserGrade Computer Testing — www.lasergrade.com (800) 211-2754
- OTHER HELPFUL LINKS**
- NWS Aviation Weather Center — <http://aviationweather.gov/>
 - Aviation Digital Data Service — <http://aviationweather.gov/adds>
 - Aviation Medical Examiners — www.faa.gov/pilots/amelocator/

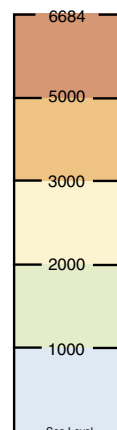


PLOTTING YOUR COURSE



How to become a pilot

Follow the path the airplane takes and learn how to start your own flying adventure!



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CHOOSING A FLIGHT SCHOOL AND INSTRUCTOR

There are many ways to go about finding a flight school and instructor. The National Association of Flight Instructors (NAFI) and Society of Aviation and Flight Educators (SAFE) are excellent resources. You can also look in your local telephone directory or conduct an internet search to find flight schools in your area. If you have a friend or acquaintance that's a pilot, give them a call. Pilots love to share their passion for aviation!

Then visit several schools and take a look around to get a feel for their operations in general. Some schools are large training organizations with huge aircraft fleets where everyone is dressed in pressed button-down shirts and epaulettes, while others are small operations with one or two aircraft that live next to a grass strip. The majority of schools fall somewhere in this spectrum. The important thing is that you find a training establishment that feels right for you.

As you narrow your search, take an introductory or "discovery" flight at each school. These are offered at reduced cost so prospective pilots can get an introduction to the world of flight to see if they want to pursue flight training. These flights will prove a tremendous experience for you but even more importantly, they'll give you an opportunity to spend time with an instructor, ask questions, and get an idea of how each school conducts business.

When you select a school, sit down with a few different instructors there and discuss how your training will proceed. It's important that you feel comfortable with your instructor. Each will have a different teaching style so don't be discouraged if you don't hit it off with a particular one immediately. You'll find that most instructors are professional, knowledgeable, and conscientious (the traits you should find in any good pilot). No matter where your training leads or how many flight hours you gain, your first flight instructor will probably remain the most significant influence throughout.

ASK QUESTIONS!

Many students are so afraid of asking a "dumb" question that they never truly get the benefit of having a trained, experienced, knowledgeable professional at their disposal during the entire course of their training. Flight instructors LOVE questions! Please ask!

HAVE FUN!

No doubt, flying is serious business but that doesn't mean it can't be fun. Few challenges in life will give you a bigger sense of enjoyment and accomplishment.

FIRST STEPS Learn to Fly Checklist

- ✓ Take an introductory flight! Almost every flight school and training establishment has what is called a discovery or introductory flight. These flights are relatively inexpensive and will give you a chance to experience flight firsthand. You'll even get to fly the plane yourself!
- ✓ Age: You must be at least 16 years of age to obtain a Student Pilot Certificate and/or fly solo. You must be at least 17 years of age to take the practical test (flight test or checkride).
- ✓ Language: You must be able to read, speak, write, and converse fluently in English.
- ✓ FAA Medical Certificate: Find a local Aviation Medical Examiner (AME) and obtain an FAA medical certificate. Sport Pilots can fly using a driver's license in place of a medical.
- ✓ Ground School: Here's where you'll begin studying in earnest for your FAA Knowledge Exam and flight training and preparing for the Knowledge Exam. You'll study basic aerodynamics, aircraft and engine systems, weather, regulations, weight and balance, navigation, flight planning, airspace, and more. ***
- ✓ FAA Knowledge Exam: Formerly called the "written" test, this exam is taken on a computer.
- ✓ Flight Training: Your flight training will consist of a minimum 40 hours. The actual number of hours is usually a little higher and varies among students. A minimum of 10 hours will be solo (flying by yourself).
- ✓ Practical (Flight) Test, also called a checkride: This is your "final exam." The practical test is actually two in one, consisting of exams conducted both orally and in flight.
- ✓ Cost? (see "Certificate and Ratings" table below)

***The ground school training portion of your training is up to you, but it's a good idea to start studying early and take the FAA Exam as soon as possible. There are flight training establishments that conduct their own ground schools, but many students simply take advantage of the numerous self-study options available (books, DVDs, software, internet, etc.). See the Resources sections of this guide for more information and suggestions.

CERTIFICATE AND RATINGS TABLE

Certificate or Rating	What do you want to do?	How much does it cost?	How long will it take?*
Sport	Day flights in light-sport aircraft.	~ \$3,000	3 months
Private	Fly personal or business, travel in clear weather.	~ \$7,000	4 months
Instrument	Fly personal or business, travel in clear or cloudy weather.	~ \$3,000	6 months
Multi-Engine	Fly higher, and faster in airplanes with two engines.	~ \$3,000	3 months
Commercial	Get paid to fly! Charter, cargo (135 ops).	~ \$20,000	8 months
Flight Instructor	Teach people to fly.	~ \$2,000	12 months
Airline Transport Pilot	Be an airline captain!	Might be \$0, if training is paid by airline	6 months to 4 years**

* Flying 2-3 times a week.
** Some airlines provide career-track flight training.

Steering an aircraft (on the ground) is done with your feet! Unlike a car, an aircraft's yoke or stick is NOT connected to its wheels for turning. Pilots taxi by pressing the left or right rudder pedals with their feet to go in the direction desired.

GENERAL FACTS AND QUESTIONS

VFR (Visual Flight Rules) The set of regulations applicable to visual flight...

IFR (Instrument Flight Rules) The set of regulations applicable to instrument flight... (See next FAQ)

CAN I FLY INTO THAT CLOUD? Well, NO (at least not at first). "Blind flight" as it was once referred to many years ago, simply means flight without visual references such as the horizon, sky, ground, etc. Without visual references a pilot must rely solely on instruments to safely maneuver and navigate the skies. Many atmospheric phenomena and obscurities can contribute to "instrument conditions" such as clouds, rain, fog, smog, haze, smoke, snow, and even volcanic ash. How does a pilot fly and find the airport without looking outside? **INSTRUMENTS!**

INSTRUMENT FLIGHT can only be conducted by pilots specifically trained and properly certified to do so. An instrument rating can be added to a private or commercial pilot certificate by taking additional training, passing the instrument knowledge test, and passing the instrument practical test. Due to the unique demands of flying on instruments pilots must stay instrument current to be legal to fly on an instrument flight plan. Also the aircraft itself must also be properly equipped for instrument flight. Only with these requirements met, and a proper clearance, can you "fly into that cloud."

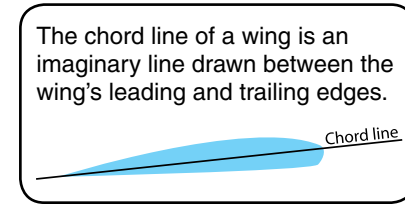
I'M NO MATH WHIZ! One of the biggest misconceptions about learning to fly is that you need to be some kind of math prodigy. Nothing could be further from the truth. Pilots find the most useful application of math concepts are rules of thumb, which are mostly calculated with basic multiplication, division, addition, and subtraction. The bottom line is you don't need to be an aeronautical engineer or rocket scientist to fly an airplane.

WHAT IS A STALL? When an airplane stalls, it does not just fall out of the sky. In most cases, simply letting go of the flight controls will correct the situation, returning the aircraft to normal flight. Don't think of "stall" here the same way you would think of an engine stalling—these are two completely different things. "Stall" here refers to a separation of airflow from the surface of a wing when the critical angle of attack (see next FAQ) has been exceeded.

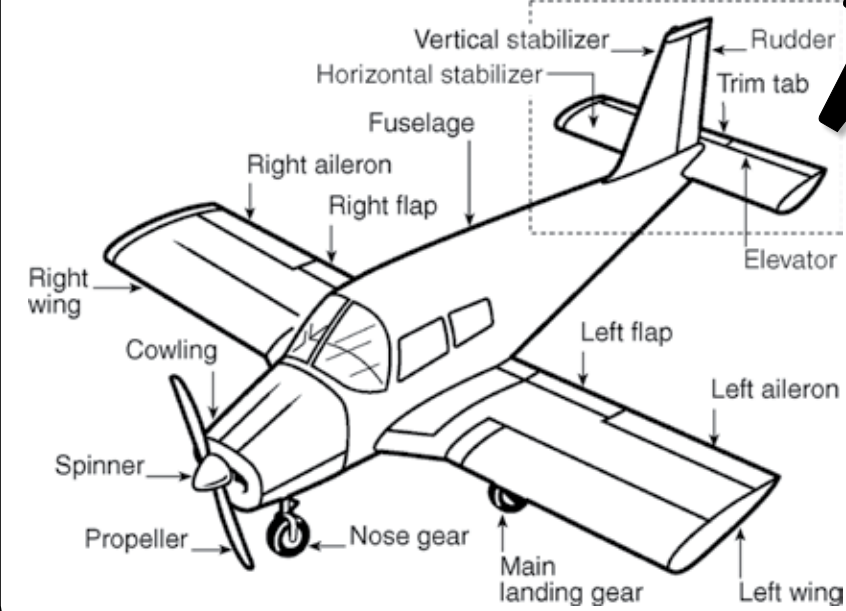
OK, NOW PLEASE TELL ME WHAT "CRITICAL ANGLE OF ATTACK" MEANS. Angle of attack is the angle formed between the wing's chord line and the relative wind. Relative wind is caused by the motion of the aircraft through the air. It's always parallel and opposite to the aircraft's flight path.

We're all familiar with relative wind although maybe don't realize it. Relative wind is what you feel when you stick your hand out of a car's window motoring down the highway. It may be a totally calm day with absolutely no wind to speak of, but if that car is traveling at 60 MPH your hand will feel a relative wind of the same speed.

The critical angle of attack is the angle beyond which airflow can no longer follow the wing's shape and therefore separates causing a loss of lift.



PARTS OF AN AIRPLANE



AIRCRAFT SYSTEMS

How the airplane's parts work together

ENGINE: The engine's primary purpose is to provide thrust. In propeller-driven aircraft the engine turns a propeller, which then provides thrust to move the aircraft forward. As a result of this forward motion, the wings create lift to keep the aircraft aloft. The engine also drives other systems (such as the electrical and vacuum) vital to the aircraft's safe and efficient operation.

IGNITION: The ignition system is an integrated part of the engine and is responsible for supplying the spark that ignites the engine's mixture of fuel and air. Unlike an automobile ignition system an aircraft's is self-contained. Once an aircraft engine has been started with the battery, the electrical system could fail entirely and the engine would happily continue to run. Additionally, aircraft engines actually have two separate ignition systems, which provide redundancy in case one system should become inoperative.

ELECTRICAL: The electrical system supplies power to the aircraft's radios and navigation equipment, applicable instruments, lights, fuel pumps, flap motors, landing gear motors, etc. Typically, aircraft are equipped with an alternator or generator that supplies power to the electrical system and keeps the battery charged.

INSTRUMENTS: Aircraft cockpits may seem as varied as the pilots who fly in them, but almost every aircraft cockpit from the smallest trainer to the largest cargo transport plane has six basic flight instruments. Known somewhat affectionately as the "six pack," these are the standard/basic flight instruments: airspeed indicator, attitude indicator, altimeter, turn coordinator, heading indicator, vertical speed indicator. Most aircraft also have a compass (often considered the seventh in the basic group). As a student pilot you'll learn about each individual instrument, what drives them, and how to read them.

FUEL: Fuel is the engine's sustenance. As a student you'll learn the grade of fuel appropriate to the aircraft you fly, its weight, and how many gallons per hour the engine burns in order to make sure before every flight that the aircraft is properly fueled.

DISPLAY: General aviation has gone through somewhat of a paradigm shift in recent years as the "glass cockpit" has proliferated in the market. Glass cockpits use electronic displays similar to the LCD monitors commonly used with personal computers. Once found only in transport category aircraft, these sophisticated systems have found their way into even some of the smallest training aircraft. These systems may appear intimidating at first, but it's important to realize they convey the same information as the conventional six pack—it's just a different presentation.



Aviation fuel for light aircraft is blue.

EVERY PLANE has a combination of numbers and letters painted on its side, like a license plate. The first letter or two refer to the aircraft's country of registration. "N" designates U.S. registered aircraft.



Why We Fly

The awe and wonder of flight is universal. You are about to embark on a wonderful journey, an endeavor that man has contemplated since first looking up into the sky. You start this journey with a beginner's mind, able to readily drink in the experience of flight and to feel the many sensations about to come, with the kind of excitement brought on by uncertainty, anticipation, and wonder.

Although flying is an art and science about man and machine, like most things in life, it is truly a human endeavor. The path to becoming a pilot is an exercise in self-discovery that will forever change who you are. As many pilots attest, there will be days when you return to terra firma after having been "up there" and almost not be able to convince yourself it wasn't a dream. You'll secure the plane, glance back as you walk away, and won't be able to comprehend that this machine, this instrument of the air, has taken you where relatively few have been.



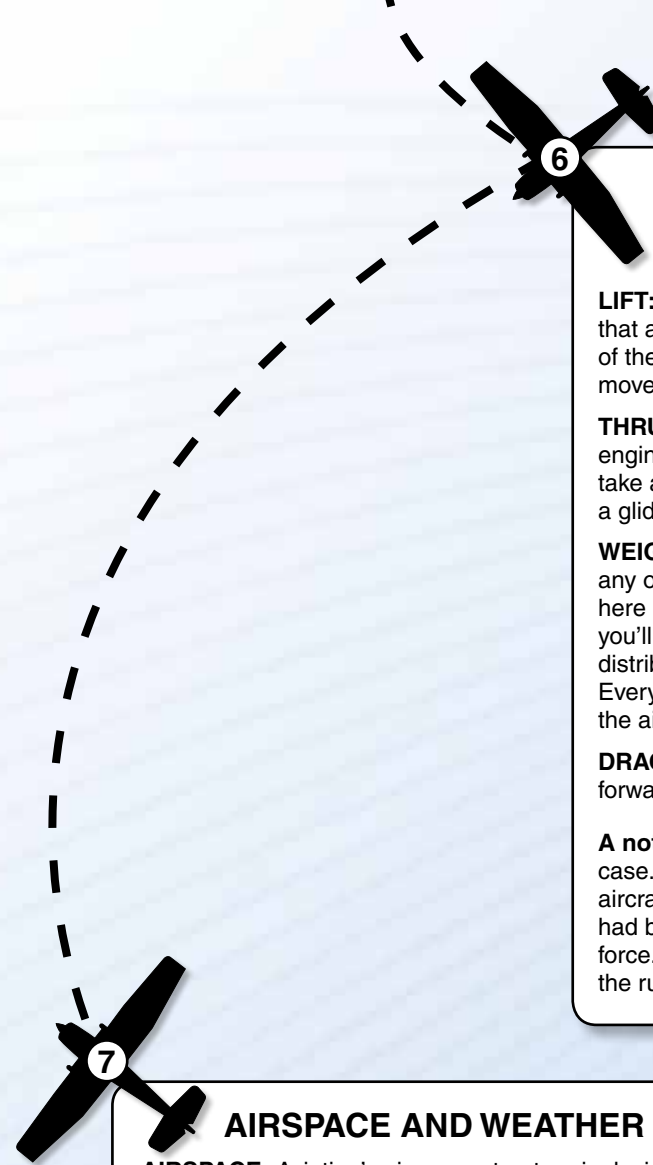
Throughout our childhoods, aviation was our hobby—not flying of course (that would come later), but just about everything short of it. Flying, it seemed, was a dream better left to the men and women who appeared as gods witnessed from afar. We were the kids that could be seen just about any time poking their noses through the airport fence from the outside, watching those wonderful vehicles of the air begin their magical journeys.

This guide is for all those "children," young and old, who have dreamed of taking to the sky. Like a compass, this guide is an introductory "navigation" tool to help answer many of the common questions you may have as you set a course for obtaining a pilot's license.

Why fly?...to learn about ourselves and become part, albeit only briefly, of that realm normally reserved only for bird and cloud.

So start your journey now and find your own piece of sky!

—ASA



FUNDAMENTALS OF FLIGHT

Like the rest of us you have probably looked up in the sky at an airplane flying overhead and wondered, how is that even possible? What principles are behind the magic that is flight? Let's begin with the four forces acting on an airplane.

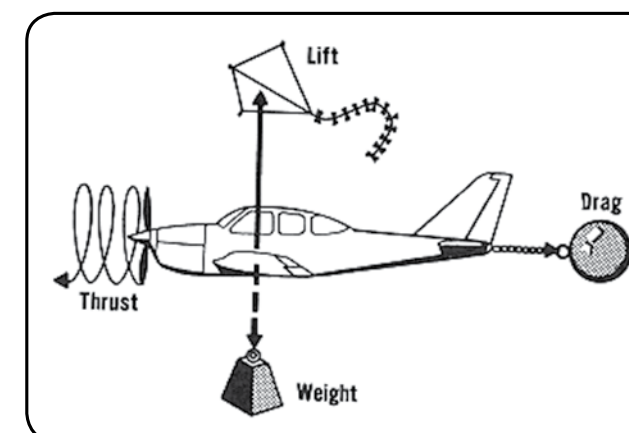
LIFT: An aircraft is kept aloft by what is called "lift." Lift is the force that acts in an upward direction (perpendicular to the top surface of the wing). An aircraft's wing produces lift by reacting to the air it moves through.

THRUST: Thrust is the propulsive force provided by the aircraft's engine(s). Gliders of course do not have engines and therefore must take advantage of gravity to convert altitude into airspeed. In addition, a glider pilot utilizes thermals (rising current of air) to stay aloft.

WEIGHT: Weight (gravity) acts opposite to lift. Just as you and I or any object have weight, so does an aircraft. Nothing really mysterious here except that there's more to it than just a number. As a pilot you'll learn the importance of "weight and balance," or, how weight distribution and limitations affect aircraft performance and stability. Every flight you take involves this factor as you consider the weight of the aircraft, fuel, passengers, and cargo.

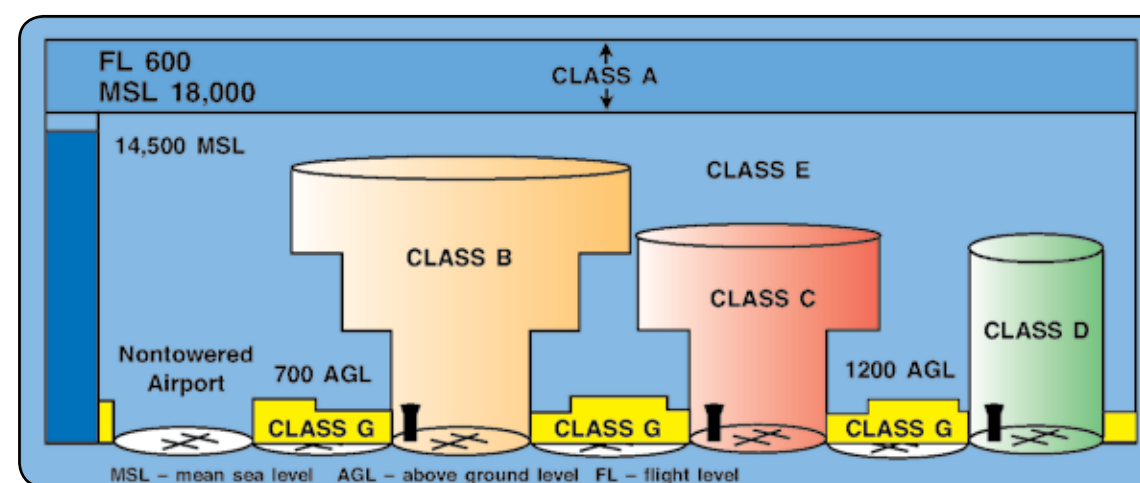
DRAG: Drag can be thought of as the force that resists the aircraft's forward movement.

A note about turning an airplane: A popular misconception is that an airplane (in the air) is turned by the rudder—this is not the case. An aircraft is turned by the banking of its wings and the re-direct of the lift produced by the wings. The wings still sustain the aircraft of course, but the bank produces two distinct "lift components." A vertical component acts opposite weight (gravity), just as it had before the aircraft was banked. A horizontal component acts sideways, 90° to the vertical component and opposite centrifugal force. It is this horizontal component of lift that turns the aircraft. There is, of course, more to it than meets the eye and that is where the rudder comes in... the rest you will learn as you start your adventure of flight!



AIRSPACE AND WEATHER

AIRSPACE: Aviation's airspace structure is designed in a logical manner to ensure the safe operation of aircraft in the National Airspace System, based on generally how much traffic is in a particular area and the type of operations conducted there. To determine under what conditions a pilot may fly in each area, specific rules are in place to keep aircraft separated from each other, as well as from terrain and man-made objects such as antennas. This diagram shows a cross-section of the major airspace classes. Needless to say, it is mandatory that pilots understand airspace nomenclature and become thoroughly familiar with the operational requirements of the various segments. You'll become an expert map reader, relying on the charts to help you determine what airspace you'll be operating in.



WEATHER:

It goes without saying that pilots have a keen interest in the weather. One of the great aspects of becoming a pilot is that you too will become familiar with this fascinating subject. As a pilot you'll find yourself monitoring the weather almost subconsciously. Suddenly all those lines, symbols, Highs and Lows on the six o'clock news weather map will start to make sense and the dynamics of temperature, pressure, and wind take on special significance—you'll begin to see the big picture as never before. You'll learn how clouds are formed and probably most importantly, what they mean for your next flight. It has been said that clouds are like "signposts in the sky" enabling pilots to get a feel for the state of the atmosphere just by glancing up.

This newly acquired knowledge will in no way affect the romance of the sky. In fact, the exact opposite is true. With knowledge comes greater understanding and appreciation, so don't worry; those beautiful red sunsets will still leave you speechless. But now you'll know what makes them that way.

RESOURCES: Training Materials and Pilot Supplies

THE AVIATOR'S LIBRARY

Inspiration, wisdom, and knowledge for the journey

Learn from those that have been there. Written by some of the most respected authors in aviation, the books in The Aviator's Library cover everything from piloting and flight skills to weather, hangar flying, aircraft ownership, and much more. It's a library comprising lifetimes of experience.



SELF STUDY/GROUND SCHOOL

The freedom of flight begins with solid footing on the ground

Preparation is an aviator's most valuable asset. Prepare for the FAA Knowledge Exam and the cockpit with ASA's line of comprehensive Test Prep products. You'll soar to untold heights with the confidence that comes from gaining real understanding of the concepts and a solid foundation of knowledge.



FLIGHT SCHOOL

No boundaries

It's all in the transformation. That place where ground school knowledge takes flight into the feelings, emotions, skills and experience of flying. Whether a university classroom or the picnic table behind a hangar at the local grass strip, flight school is the place where the laws of physics become more than just abstract words. ASA has a wide selection of kits, books, supplies, and multimedia products to help you soar through flight school, your checkride, and beyond.



FLIGHT BAG

The right gear makes all the difference

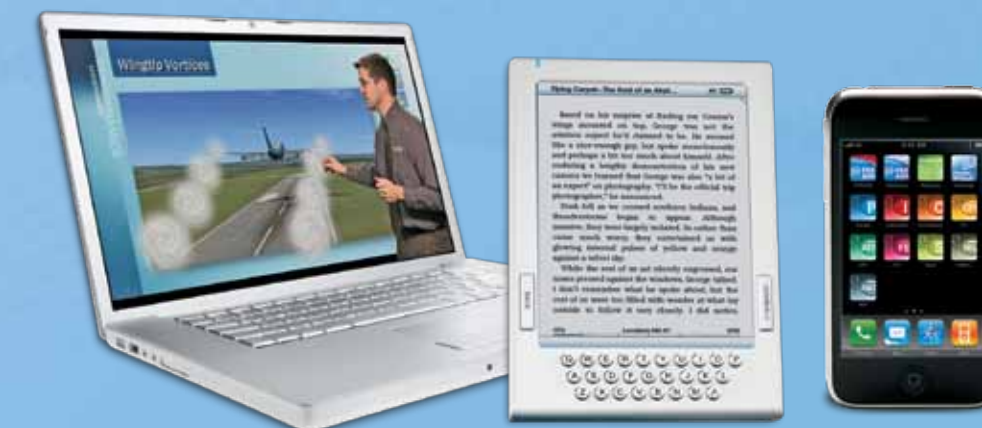
Equip yourself with quality flight gear for a trip around the pattern or a trek across the country. The right tools can increase efficiency, help reduce cockpit workload, make your flying experiences more enjoyable, and above all, safer. ASA pilot supplies are built with the integrity that has earned us the trust of pilots worldwide since 1947.



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