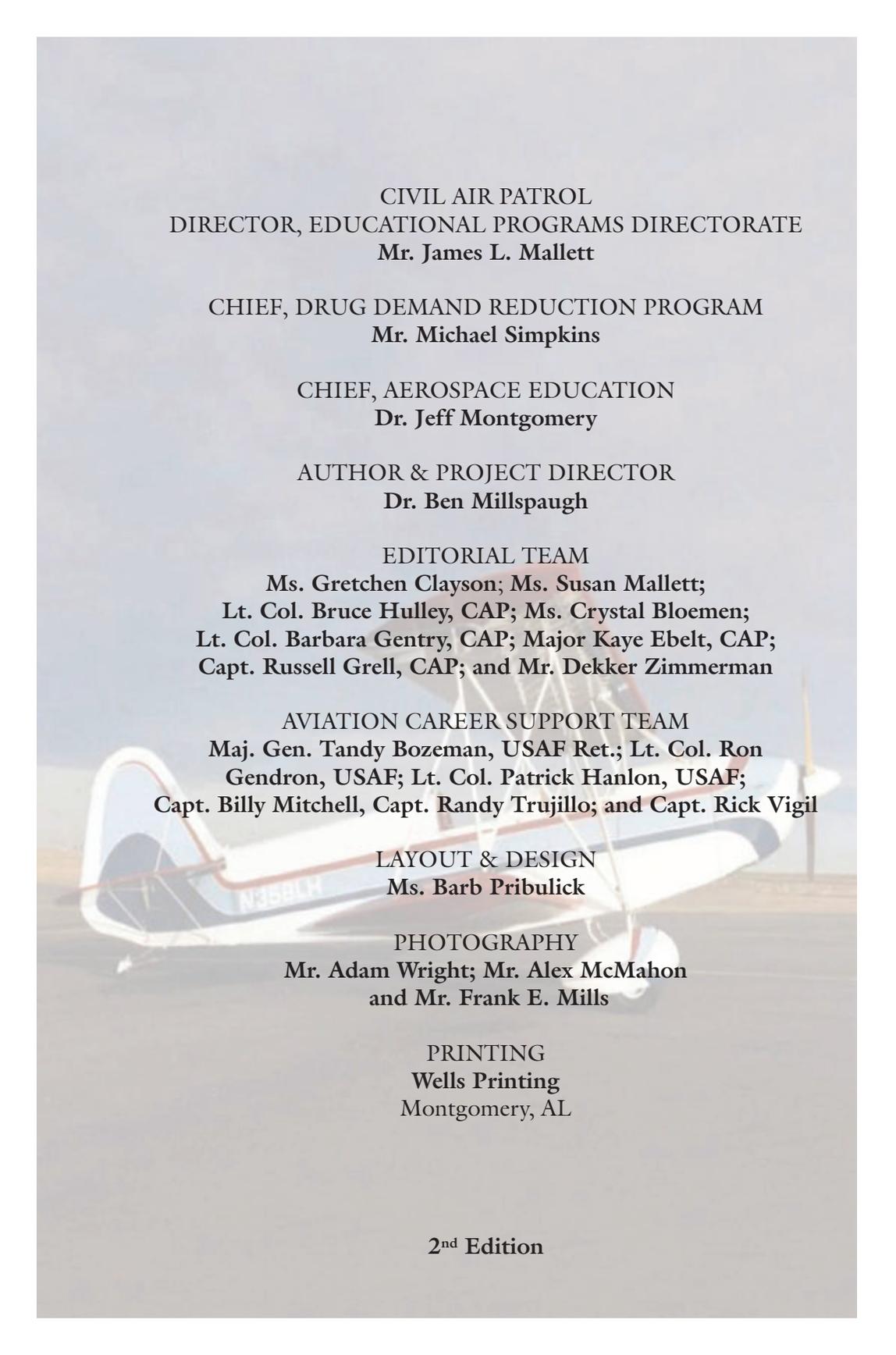


LET'S GO FLYING



A biplane with registration N3581H is parked on a runway. The aircraft is white with blue and red accents. The background is a clear sky.

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LET'S GO FLYING



Drug Demand Reduction Program Educational Programs Directorate

Civil Air Patrol National Headquarters
105 South Hansell Street
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Published 2009, 2010

The DDR Message

Throughout this book, the reader will see many references to drugs, alcohol, physical fitness, the aviation medical certificate and warnings about serious career issues. These passages are highlighted in yellow to raise the awareness of how the aviation industry has a zero tolerance for alcohol and drug abuse.

PART ONE

— Introduction to the world of aviation —
your first flight on
a commercial airliner



Photo by ADAM WRIGHT



1.1 Hey there it is! Your airplane is a Frontier A319 Air Bus.

You are planning a trip to visit relatives in a city over 800 miles from your home. You have saved up a certain amount of money for the trip, so you need to determine the most cost effective mode of travel. If you travel by automobile, it could take you two days. The cost for gas and a possible over-night lodging fee could cost quite a bit. If you include the hotel, that could be at least \$50 or more. So, when you put the math on paper, it may be best to save time and money by taking an airplane. And, it is quite an adventure to do so!

Check the internet to make sure you get a good deal on your ticket and you're set to go. Hold on! First things first! Your stay is going to be a week, so you have to make sure that you have enough socks, underwear, and clothes. Don't forget to check the weather so you can determine whether you need to take a coat or jacket. In your RON kit (which, in pilot lingo, means Remain Over Night), make sure you check the airlines for sizes of liquid containers you can take on board and what needs to be "checked" in the luggage area.

Here's something that you should also consider. Let's say that you have an allergy or a condition that requires prescription drugs. Do you carry them in your pocket, in your back-pack or in your luggage? If your luggage gets lost, what would you do? **You should call your family doctor and ask for some answers.** A physician will give you good advice on how you can carry prescription drugs on an airplane. Abusing prescription drugs is very dangerous and may cause serious bodily damage. Always take prescription drugs exactly as prescribed by your doctor or pharmacist. Of course, illegal drugs are out of the question. Airport security, known as the TSA, has strict regulations about drugs and, if you violate the rules, you could face some serious penalties. Just remember to follow your family doctor's recommendation and you should have no problems.

As you prepare for departure, give yourself plenty of time to get to the airport terminal for the recommended pre-boarding time, which is



*1.2 Denver International Airport –
One of the world's newest and most advanced airports.*

usually at least one hour. The terminal of an airport is where the passengers arrive and prepare for departure at their specific airline gate. Many large airports have terminal entrances for each airline. So, upon arrival at the airport, make sure you go to the right airport terminal. If someone is going to drop you off at the airport, you and that person need to also find where you need to be picked up upon your return. Knowing where you can be picked up, usually outside the baggage claim area, will enable you to plan the correct time for a quick pick-up when you come home. Airports have police who won't allow cars to sit and wait for very long. It's a national security issue and it also causes traffic congestion problems. Many airports provide "holding areas" where the person who will be picking up passengers can wait in case the planes happen to be late. Have your "ride" check to find out where this holding area is before leaving the airport. If your return trip arrival is behind schedule, your "ride" can wait without having to pay for parking or being told to move by the police.

1.3 Check in comes first in some cases. If you plan to check your luggage, you may be able to do so before you ever enter the building. If your baggage is all "carry-on," you're set. Say good-bye to the friends or family who gave you a ride and get ready for the adventure!





1.4 It seems like everyone has a suitcase with wheels. Flight crews call them “Rollaboards” which is made by a company called Travel Pro™. They designed the first, case-with-wheels, back in the 1980’s.

You’re about to enter the wonderful world of air travel

When you first enter a large airport, it can be overwhelming, especially big, international airports. An airport is “international” if there is a government customs office on the premises to check people going in or out of the country. Some airports have volunteers who can help guide you to the right places. Checking your luggage for the trip can be easy ... you can check it at the curb or go inside to your airline ticket counter.

The airport featured is Denver International and this world-class facility covers an astonishing 57 square miles! It was originally designed to be far away from downtown Denver. This kept the constant aircraft noise away from the city. However, as growth occurs, the expanding population is getting closer and closer to the airport. An airport is “international” if there is a government customs office on the premises.

Just inside the entrance to many terminals, you will find your airline counter or you will find computerized ticket machines. You only need your credit card or your airline confirmation number for the machine or the customer service agent at the ticket counter to immediately identify you and your reservation. If there is baggage to be “checked,” it can be done at the ticket counter. Large luggage is “checked” in with airplane to be stored in your airplane storage area to arrive at your destination. At this point you will receive your boarding



1.5 This is one of the many computerized kiosks. It gives you your boarding pass.

pass. If you look closely at **photo 1.5**, behind the machine and just below the Frontier sign, you will see a place where luggage can be checked. It's all very easy, although sometimes you might have to wait in line for a short while. If you only have a small piece of luggage and it can fit with you inside the plane, there is no need to "check" luggage. Either way, after you receive your boarding pass, you will be directed through "security" prior to entering the correct concourse for departure.

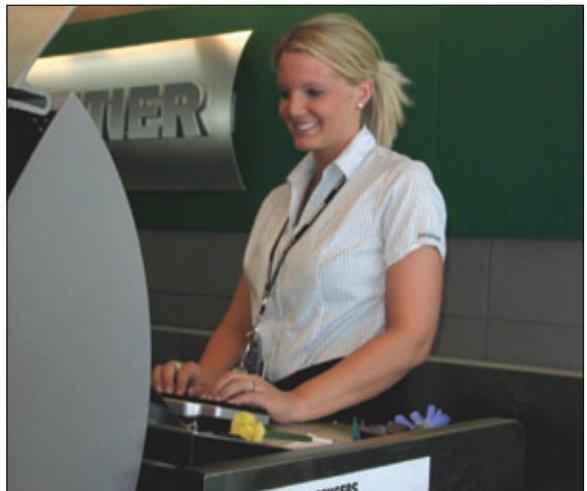
The place where the airplanes park and passengers get on and off the airplane is known as a "concourse" and at most airports there are several labeled by letters, such as *A, B and C*. These concourses have ample seating, are very comfortable and have large windows. The concourse areas also have shops, restaurants, shoe-shine stands and internet wi-fi stations.

As a first-time traveler, just remember to ASK for assistance. The airline staff are there for you and almost without exception, they will take the time to help you with anything you need. If you give them a smile and polite conversation you could receive even better help!

Say hello to customer service agents

Agents like Ms. Sanders, in the photo 1.6 will try to make everything go smoothly for all passengers. When you think of it, Ms. Sanders

1.6 If you prefer a real human, Ms. Sara Sanders, Customer Service Agent for Frontier Airlines, is also available to help you get your ticket, check your luggage and issue boarding passes. She has a wonderful smile, a very understanding attitude, and it's her duty to make passengers feel more comfortable about their flight!



may be **your first impression of an airline. She is, in essence, “Ms. Commercial Airlines.”** If she is helpful, friendly and caring, you will remember that when you fly again. If the experience is a good one, it is hoped that you will be a customer for life!

The TSA & national security

1.7 Passengers must get their boarding passes checked before entering Security.



Now, it's time to go through Security. The first step in the security process is to get your boarding pass checked by a representative of the TSA or Transportation Security Administration. You will have to take off your shoes, jacket, backpack, hats, watches, purses, and everything, except the essentials. You place these articles in small plastic bins so that your belongings can go through the X-ray machines. Airport Security is a serious business and after “9-11,” it's now a matter of life or death. **Remember what was mentioned earlier about drugs. If your doctor says it's okay to have your prescription bottle with you, then go ahead and carry it with you.**

The next issue is your attitude. The TSA agents are trying to do their job well and if you are cooperative and courteous, you will get the same treatment in return.

Don't be scared if you set off an alarm. A belt buckle, car keys or some other metal object can trigger the scanner to set off an alarm. Just politely remove all metallic objects and put them in the plastic bins, as you are requested to do. You will then proceed through a metal detector and, if needed, TSA agents can use a hand scanner to check you from head to toe! Be cool about it and you should have nothing to worry about.

1.8 All but the essentials are put in plastic bins for X-ray scanning. Notice the lady removing her shoes and the gentlemen in his stocking feet.



One thing to remember is that our country was attacked back in 2001 and the government is doing everything they possibly can to keep an attack from happening again. Terrorists used airliners to kill 3000 people on the morning of September 11th. With precautions, such as intense security screening, this type of thing might not happen again. The TSA has been given the task of checking everything and everyone who might be a possible threat. You need to do your part to make sure our national security process works.

Once past security, you're on your way to the departure gate at your concourse. Along the way, there will be temptations like "designer

1.9 Once everything passes through the scanner, you're on your way to the gates.



coffee” stands, yummy cinnamon rolls, upscale clothing shops, and, of course, everybody’s favorite, the newsstand, with many souvenirs and other goodies. That’s all part of what makes air travel fun!

1.10 This is the ever-popular food court, located in most airports.



1.11 They have all kinds of shops on the concourse including familiar fast food places.



1.12 Just about everyone’s favorite is the newsstand. They always have something fun to read or eat that you can take with you while you’re flying. There are also souvenirs of the state from which you are flying.





1.13 When you look out of one of the concourse windows, you'll see several aircraft with "jetways" attached. You will walk across one of these to board your airplane.

1.14 When you arrive at the concourse, look out the windows and watch the servicing of the airplanes.



It's always a good idea to check in with the customer service attendants when you arrive at your departure gate. Why do this if you have already done this in the terminal area? Sometimes an airline will switch gates before you arrive and if you happen to be sitting at one gate and your flight is being boarded at another one, you could possibly miss your flight.

Never assume anything

Sometimes, if you have a good attitude and a smile, the attendant may just say, "I have a better seat with more leg room if you're interested." Take it—especially if it gives you the opportunity to get a window seat just in front of or behind the wing.



1.15 This is called a concourse. The passengers check in, wait and eventually go down the jetway to the airplane. This location is Will Rogers World Airport, Oklahoma City, Oklahoma.



1.16 Sometimes airports will have historical displays on the history of aerospace. If time, take the opportunity to explore neat airport displays, such as this hot air balloon. This is a replica of the 1783 Montgolfier balloon, man's first powered ascent from Earth.

1.17 At this airport, they even had a Harley Davidson display!



1.18 It's boarding time! You get your boarding pass processed and then you go down the jetway to enter the aircraft.



Take a look around and see not only your plane but how others are being prepared for departure flights. The aircraft has to take on fuel, baggage, food items, and water. The ground crews also have to vacuum the floors and check all seats to make sure preceding passengers didn't leave valuables in the overhead bins or in the seat pockets. Safety & security is very important.

What about an aviation hobby – airline photography

If you really want to enjoy the wonderful world of airline adventure, take your camera and start a collection of some of the fantastic color schemes found on different aircraft.



1.19 Check this shot! This is an Alaska 737 going over the airport — very close. This image is courtesy of Adam Wright.

The color schemes on airplanes are known as “graphics,” or “liveries.” If you are in an airport like Los Angeles International, known as LAX, you can get a great lesson in “aero-geography” or just taking pictures. If you use a tripod and take your time, you can get some pictures that are good enough to be framed. You can also take some great shots out the window while you’re flying. In case a few come out blurry.

Here’s an example of a really great shot. How often can you see an airplane painted like this? The best time of day to get good pictures is usually in the early morning or in the late afternoon. The color saturation is excellent and the gray and blue background really makes the red, gold and white stand out!



*1.20 This is a Southwest Boeing 737 American Eagle.
This photo is courtesy of Ben Wang and Airliners.net.*

It’s always a good idea to make sure you have permission to take pictures. Also, make sure that you’re not in a restricted area. Taking pictures from your window seat is okay, but just make sure that your flash doesn’t go off inside. If you don’t have a way of shutting off the flash, put a piece of electrical tape over it. This keeps the light from bouncing off the inside of the window and back into the picture. As you will see in Part Six, Atlantic Southeast Airlines First Officer Adam Wright, has a hobby of aviation photography. He has given us permission to use many of his beautiful airplane photographs. Adam is a former CAP Cadet and Squadron Commander.

Something that will make the flight a lot more exciting when trying to view and shoot great aerial photos is getting a window seat. With computerized seat selection now available, **when buying your ticket**, try to get a seat where you can see the wing from the back or trailing

edge. This will be a wonderful learning experience. The next section will show you why!

Let's learn the language of an airliner

Image 1.21 is a picture of an Airbus during takeoff. Study it for a moment and see if you can identify the parts on the real airplane after you have had a chance to look at the NASA “Airplane Parts Definitions and Functions” **Illustration 1.0** on the next page.

- | | |
|--------------------------|-------------|
| a. Fuselage | b. Wing |
| c. Vertical Stabilizer | d. Rudder |
| e. Horizontal Stabilizer | f. Elevator |
| g. Jet Engines | h. Spoiler |
| i. Slats and flaps | j. Cockpit |

A closer look at the wing will reveal something. It has parts!!

As we concentrate on the wing, let's see where the wing parts fit. For example, you're looking out the window that is right on the wing's trailing edge. In the **Illustration 1.0**, look at the blue line pointing to the flaps. Note that it says “Change Lift and Drag.” In **Image 1.22**, you will see what a real wing looks like on the Frontier Airbus. Item



1.21 This shot of a Frontier Airbus was taken by Adam Wright in Las Vegas.

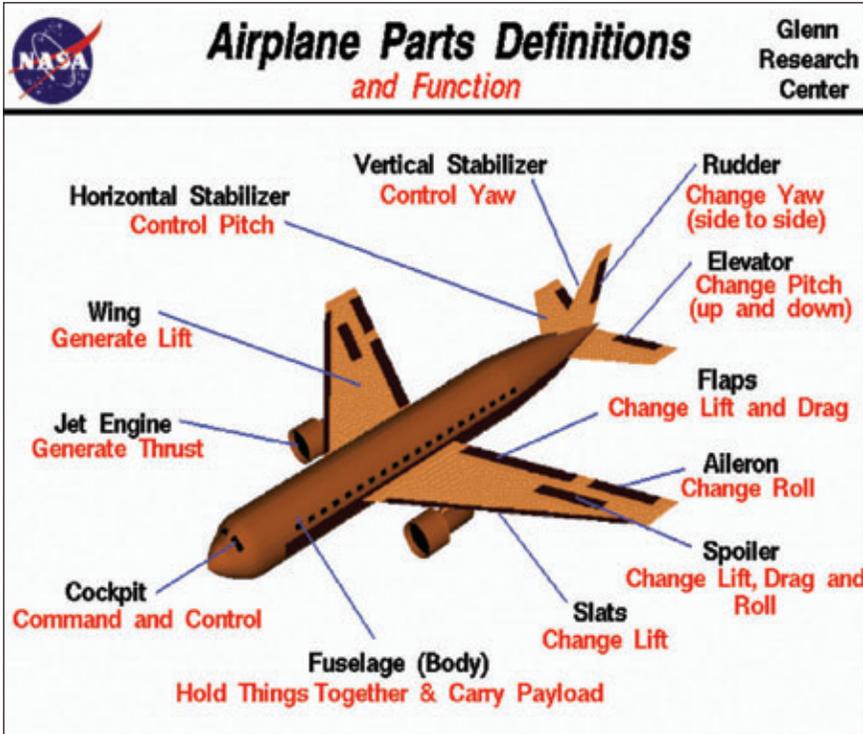


Illustration 1.0 This shows a simplified illustration of the parts of an airline.

“d” is the flap that you see in the simplified illustration. What the flaps do is change the camber, or curvature, of a wing. This creates a greater curvature of the wing and it also makes the wing slightly larger. When the airplane is flying at a high speed, it doesn’t need as much curvature and area as it does when flying at a low speed. If you will look at the first image of the flap, you’ll see it is down and extended from the wing. After takeoff, the flap moves forward and it also slides back into the wing. This makes the wing much thinner and better for flying at high speeds.

They movable parts of the wing are called **FLIGHT CONTROL SURFACES**. You will see these parts move before, during and after your flight. They allow the pilots to have precise control of the airplane on the ground, during low speed, high speed, take-off and landing.

Let’s identify the parts of the wing and see what moves when we fly:

- This is a “**winglet**.” It doesn’t move but helps to reduce drag.
- This isn’t a flap. It’s called an **aileron** and it helps to bank, or lean, the airplane.

- c. This is the wing. It is attached to the main body, or fuselage, of the airplane.
- d. This is an outboard **flap**. You will see the dark lines disappear later in flight.
- e. These panels are called **spoilers** or speed brakes.
- f. These are inboard ailerons.
- g. This is an inboard (closest to the fuselage) **spoiler** panel.



1.22 This is the wing on a Frontier Airbus. Item d points to one of the flaps.

1.23 This Airbus has just landed and you can see the leading edge slats. They extend from the wing's front (leading) edge to increase surface area and wing camber (curvature). These slats also help prevent a stall at low speed. On the back (trailing) edge of this wing you can also see the airbrake (spoiler panels). When these are in the full up position, they act as brakes and this helps slow the airplane to the point where the pilot can apply brakes and thrust reversers.



On the front of the wing — Ready for takeoff!

You can clearly see two cone-shaped parts sticking out from the back of the wing. These are “flap-track fairings” or they are sometimes called “canoe fairings.” The flaps move on a track and these fairings cover the system. Aircraft design engineers don’t want anything that is critical to flight, jammed by snow, ice or mud. Their cone shape allows air to flow smoothly around them.



1.24 The cone-shaped, pointed parts sticking out the backside of the wing are called Flap-track Fairings.

That’s the control tower in the background. The tower has cleared your flight for takeoff and, as the airplane passes by the tower, flaps are down. When the airplane passes over the edge of the city, you will see that the flaps have moved up into the wing. Notice the flap-track fairings. In the image above, they are pointed slightly downward. Now compare that to both the underside photo of the Airbus A319 in **Image 1.25** and the in-flight position. This will give you an idea of how they move with the flaps.

Several times throughout the flight, the pilot will want to turn the airplane toward the left or to the right. This will require the movement of one of the flight control surfaces. The small black line in **Image 1.26**, points toward the very small opening between the aileron and the wing. When this aileron moves upward, the wing goes down. At



1.25 In flight, the wing is “cleaned up,” as they say in “pilot-talk,” and the airplane is ready for high speed flight.



1.26 The black line points to a tiny opening between the aileron and the wing. It doesn't take much movement to initiate a turn when the airplane is going fast.

the same time, the aileron on the opposite side moves downward and the wing goes up. This causes the airplane to “roll.” At high speed, the ailerons don't have to move very far to make the airplane roll. If you look back at the **Illustration 1.0**, you will see two ailerons. Just remember that when one goes up the other goes down.

A roll can also be obtained by moving individual spoiler panels upward. These spoiler panels are controlled by a computer and will operate based on the airplane's speed and several other factors. When spoilers on both sides pop up together, they can be used as “brakes.” In this sense, they become very effective in slowing down a high speed aircraft, as shown in **Image 1.27**.

Spoilers do just what their name implies — they “spoil” lift. This means that when they are sticking up into the flow of air going over the wing, they disrupt part of the lift that is being created and will tend to make the airplane sink. In gliders, this is a very effective way of making the glider “stop flying.” It just so happens that when a glider gets close to the ground, it wants to keep on flying. If this isn't checked, the glider could over-shoot the runway. Spoilers can also help a big airliner stop sooner because it transfers the lifting energy of the wing to the actual wheel brakes.



1.27 The spoiler panel and inboard aileron are up. This means that they are spoiling lift and this wing will drop downward.

It's called a landing – on the ground again

When the airplane approaches its destination, the pilot has to slow the airplane down and this is done by using the flaps as brakes. In the next image you will see the flaps down to about 20 degrees and then as the plane lands you'll see the spoilers pop up to help slow the airplane as in **Image 1.28**.

When several spoilers pop up on both sides, they act as “speed brakes.” This means that they cause more drag and this slows the airplane. When the flaps, slats, and air brake spoiler panels are all deployed

at the same time, pilots refer to this as being aerodynamically “dirty.” This is the opposite of an airfoil that allows the air to flow smoothly over it, which is referred to as “clean.”



1.28 The airplane is coming in for an approach to land. The flaps help slow the airplane down and give it additional lift so that it can fly slower.



1.29 If you compare both images, you can see the flaps are much further down. In this position, which is about 30 degrees, the flaps help slow the airplane by acting as a very large air brake that will help it land.



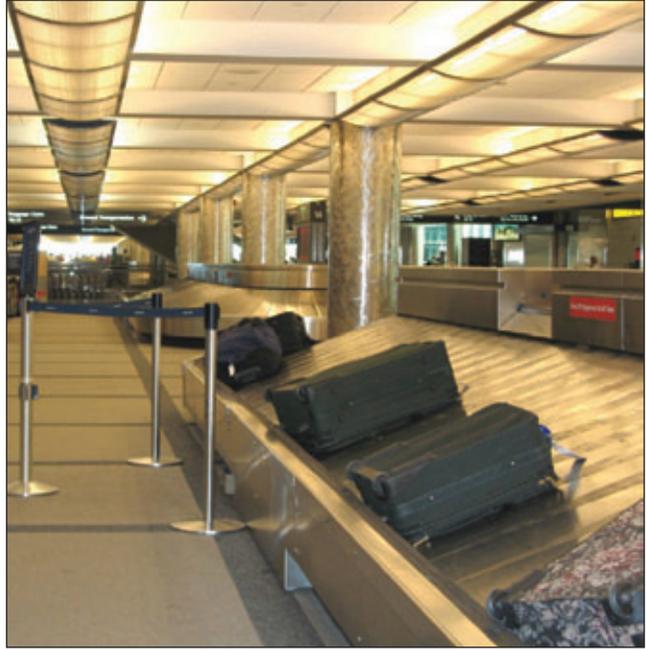
1.30 As the airplane touches down, the spoiler panels pop up. The word, “spoiler” means the panels are spoiling lift and they are also keeping the airplane from wanting to continue to fly! If you look at image 1.23, you’ll see the spoilers from the other (front) side.



1.31 We’re about to turn off the runway and the parts move back into their normal position. Because of this amazing wing, the airplane has gone from a low speed (at takeoff and touchdown) to lifting a very large amount of weight and supporting it at speeds above 600 miles per hour.

Just hope your luggage didn't go to Los Angeles!

1.32 The place where baggage is found is called Baggage Claim. The devices that carry your baggage for pickup are called Carousels.



1.33 Some people cannot find their Baggage. Airlines also have personnel who put lost baggage in a "holding area" where it can be claimed at a later time. This gentleman, an employee of American Airlines, is putting a claim tag on a piece of luggage so that it can be identified by the owner.



At the end of your flight, the attendant will announce where your baggage can be retrieved. Make sure that you note this. If you happen to miss the number, **ask!** It is not uncommon for luggage to get lost. Each airline will have an agent on duty somewhere near the baggage claim area who can assist you if your luggage does happen

to go somewhere else. Often this is one of the reasons why many people elect to travel with just carry-on luggage. But if you do decide to just carry on luggage, it is highly recommended that you contact the airline **in advance** to get the restrictions for size, weight and number of pieces that the airline allows per passenger.

Always be careful with your luggage. Don't go off and leave them even for a very short period of time. Thieves know that valuables, **PRESCRIPTION DRUGS** and other important items are carried in a person's luggage and it's possible for bags, lap-top computers and backpacks to be stolen if you are not watching your bags at all times. Never leave them unattended even for a moment.

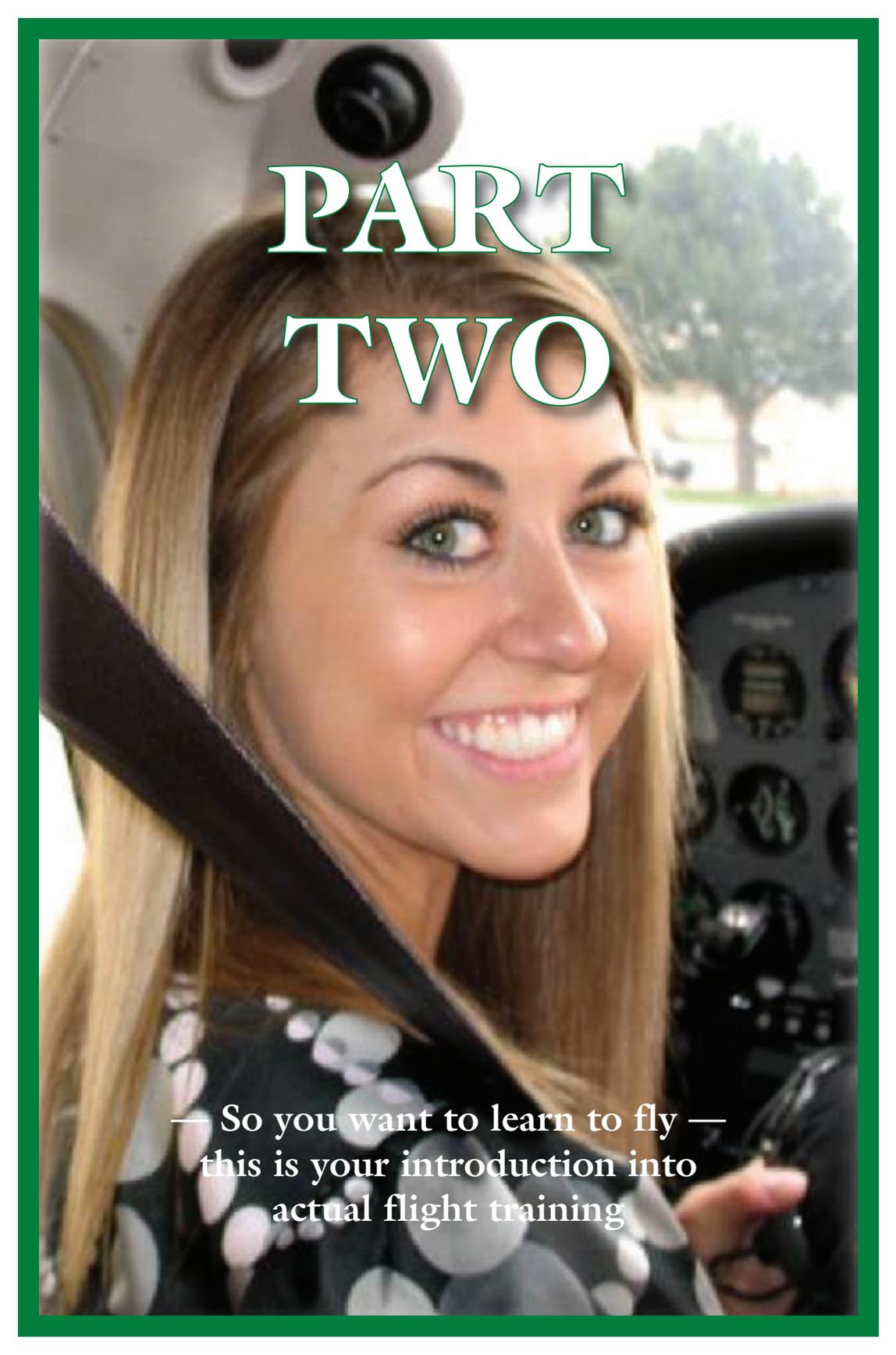
The cockpit – it's a pilot's “office”

When you land just remember....your friend or family member cannot meet you at the gate. Because of security restrictions, they will have to meet you in the Main Terminal. Typically, the best place to arrange to meet your ride is outside the baggage claim area. This is also the place with taxis and hotel shuttle buses, if this mode of transportation is needed. So, say farewell to your flight team and thank them for a safe flight. Then, go get your baggage or find your ride. You are now ready for the next adventure, your visit with your relatives! Hopefully, after your visit, your flight back home will be much easier, as you are now an experienced traveler!



1.34 This is the cockpit of the Airbus. The pilots who took you on your trip have this as their “OFFICE!” They flew you from point A to point B in safety, comfort and you had a great flight! Photo is courtesy of Adam Wright.

Look up. *It's a clear blue sky. Let's Go Flying*

A young woman with long blonde hair is smiling broadly while sitting in a flight simulator cockpit. She is wearing a black top with white polka dots. The cockpit features a steering yoke and various control panels. The background shows a blurred outdoor scene with trees and a building.

PART TWO

— So you want to learn to fly —
this is your introduction into
actual flight training

MAKING THE DREAM COME TRUE



2.1 *If you love airplanes, like Walter does, some day you'll probably want to learn to fly. Just remember you have to be in good physical condition and you can't do drugs if you want to accomplish this. You have to be willing to study hard. When you fly an airplane by yourself for the first time, you'll never be the same again. Welcome to the wonderful world of flight!*

Learning the language of aviation

If you've always dreamed of flying you were most likely one of those kids who looked up when an airplane went over the playground. When your dad drove you by the local airport, you were probably the one who said, "Let's stop!" If you attended an air show, you were most likely more interested in the airplanes than the food vendors. All of this makes you an "airplane nut!" It seems all airplane enthusiasts are just "plane crazy!"

If you've always wanted to learn more about airplanes, then there's a good possibility you will end up taking flying lessons. That's what this unit is all about. First things first! You have to learn the language! That's right — it's just like taking French or Spanish in school. Aviation has a **language** all by itself.

Take a look at the airplane parts in **Illustration 1**. Some parts look and sound familiar to you, but let's see how these parts work on an airplane. You don't find elevators on a car. Your grandfather's pickup truck doesn't have an aileron! Your uncle's boat does have a rudder. Maybe you have an antenna on your car, but that's about all of the similarities.

When you look at an airplane, think of it as a machine that uses the energy of the wind to fly. When you look at a shark, you will notice that it is all sleek and streamlined. It is designed to swim through water at very high speeds. An airplane is the same way, only it's designed to go through the air at very high speed. When the wind flows over and around the airplane, it is smooth; and when it passes over and under the wing, the airplane will rise above the Earth against the force of gravity.

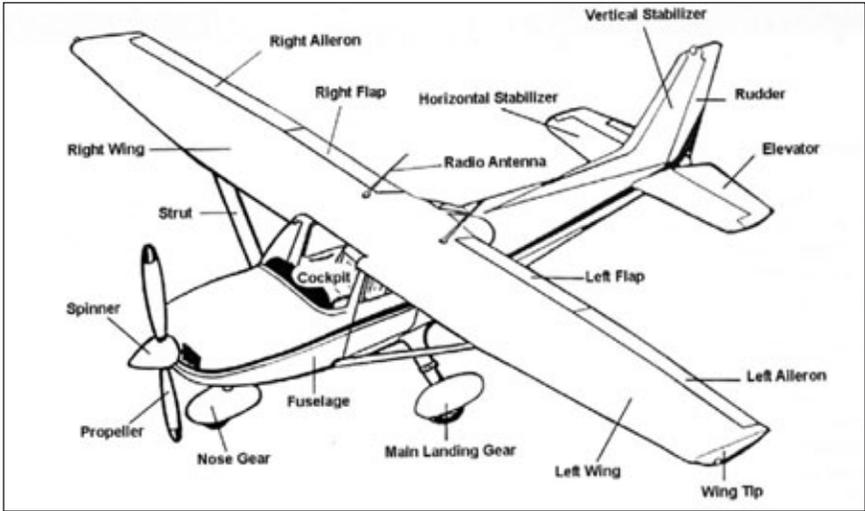


Illustration 1.0 - Can you identify the parts on the real one below?

*2.2 That amazing wing!
It harnesses the energy
of air to lift metal,
plastic, rubber, fabric,
steel and, of course,
humans, to heights
several thousand feet
above the surface of
the Earth. Picture is
courtesy of Cessna
Airplane Co., the
company that makes
most of CAP's planes.*



A little ground school

It typically follows that of those taking their first orientation flight, those who know a few of the basics of how an airplane flies and the operation of its controls, are less apprehensive about flying than those who didn't. It is also more fun for them.

Those who fly never cease to enjoy looking at airplanes. In a science where function determines form, an airplane is a work of technological art. From the little Cessna trainers to the enormous C5 Galaxy, they're all beautiful. From the side, an airplane has a streamlined tear-drop shape. From the top you see a form that captures the energy of the atmosphere and transforms it into lift. At the rear, you see smaller control surfaces that make the airplane perform in a three-dimensional world. If you find beauty in all airplanes, it's "love at first sight...every time!"

Let's learn more about airplanes

Part One of this book refers to the magnificent wing on an airliner and you were shown all of the parts. A training airplane isn't nearly that complicated and once you begin to "talk the talk," pilots will respect you more, simply because you've made an effort to understand what they're talking about.



2.3 This is the Cessna 172 Skyhawk. Image is courtesy of Adam Wright.

As you look back at **Illustration 1**, you will notice a few things right off. It has a big wing up front and there's a little wing in the back. The fuselage resembles a tear-drop shaped tube with wheels. In some aircraft, the wheels can be retracted into the wings or fuselage, thus eliminating unnecessary aerodynamic drag. These are called "retractable gear" aircraft.

The idea is to fly through the air with a minimum amount of resistance. Almost every component of an airplane is designed to have air flow around it smoothly. If the wheels remain outside, they will often have smooth covers called fairings, or "wheel pants." They help reduce drag and increase speed.

In the beginning—the Wright stuff

When you study the early history of the airplane, you’ll find that many pioneers actually succeeded, but only for “hops.” Sir George Cayley of Great Britain was one of the first to harness the energy of the wind and his little boat-shaped craft did come off the ground only to land, as his coachman put it, “rather abruptly!” You may then ask, “Why were the Wright Brothers so special? What did they do that made them so successful?”

The Wright Brothers systematically experimented with various designs, wing shapes and moveable control surfaces until they got a glider that was **controllable**. **THE SECRET OF THE WRIGHT BROTHERS’ SUCCESS was that they made the airplane CONTROLLABLE.** They were able to get a craft to glide through the air for quite a long period of time and they were able to control its direction, even in strong winds! When the scholars of history talk about the Wright Brothers’ success they use three words. On the 17th of December, 1903, their little “Flyer” took to the air for a distance of 120 feet, at an altitude of 12 feet and with a flight that lasted 12 seconds. They were successful because the airplane was **controllable**; their flight was **sustained**; and the airplane was **powered** by an engine that drove two propellers.



2.4 This is a picture of the first controlled, sustained and powered flight by the Wright Brothers, Dec. 17, 1903.

When you start taking flying lessons, you are going to have to learn **HOW TO CONTROL THE PLANE** — just like the Wright Brothers did. You must learn that either you control the airplane or the airplane controls you. An airplane is a machine and given enough



2.5 This is where it all began, at Kittyhawk, North Carolina. Near the top of the picture you will see a white line. This is where Orville Wright took the “Flyer” into the air. It flew a distance of 120 feet, climbed to an altitude of 12 feet and stayed aloft only 12 seconds.

speed, it will rise away from the Earth. You, the pilot, must learn how to make it do what you want it to do and go where you want it to go.

An airplane can only move in three directions — the three axes

An airplane can only move in three directions; one is called “Pitch” or nose up; nose down. The next is known as “Yaw,” or nose right, nose left. The third is called “Roll” a movement around a line that goes right down through the middle of the airplane and it is known as the longitudinal axis. **Illustrations 2** shows how the Cessna moves about these axes.

Movement around the lateral axis is known as “pitch.” When the nose goes up or down, it is said to pitch up, or pitch down. When the pilot moves a control device in the cockpit, in and out, it moves the elevator up and down (refer to **Illustration 3**). When you sit in the cockpit, there will be controls. Some will be shaped like a “U” while others will be a simple “stick.” The U shape or the stick will control the elevator.

On the instrument panel there will be knobs that are attached to rods and you will have to move these in or out at some time during the flight. It all seems complicated, but in time it will become easier and

Illustration 2.0 - There are three axes (this is the plural of axis) mentioned in the text. Where these axes come together is known as the center of gravity. If you attached a cable at this point and suspended the airplane from a point above it along the red line, it would hang perfectly straight and level.

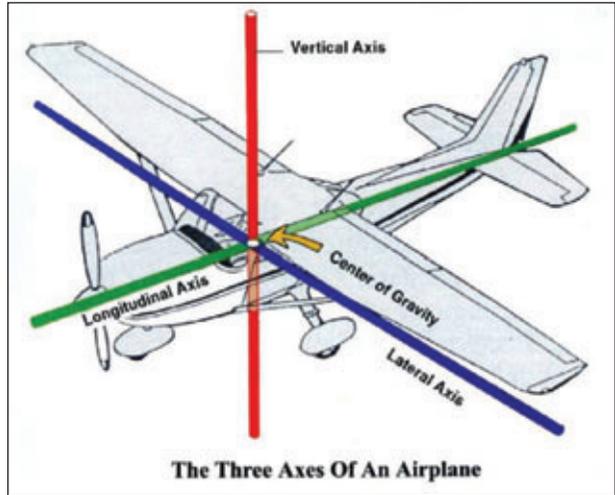
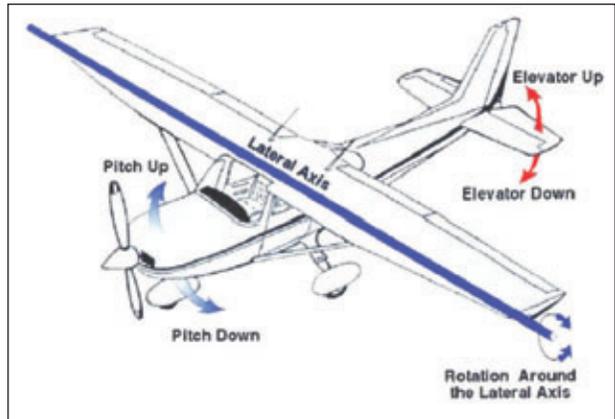


Illustration 3.0 - Here we have the lateral axis.



easier and it won't be much more difficult than driving a car or riding a bicycle. Like anything else, it just takes time and practice to get really good at controlling an airplane.

Let's take one axis at a time and see how aerodynamic control surfaces, make the airplane move. In illustration 2, the big red line that goes up and down is known as the vertical axis. Rotation about this axis is known as "Yaw." If you make the nose go right or left, the airplane will yaw. This is done by moving the rudder.

The rudder is located in the back of the tail section. The rudder is operated in the cockpit by moving the rudder pedals with your feet. (see **Image 2.7**)

As a pilot, you are going to have to learn how to make these control surfaces act in a smooth motion. The airplane requires speed to do this and after taking off, the instructor will show you how to operate the controls. Just remember, an airplane moves in three dimensions

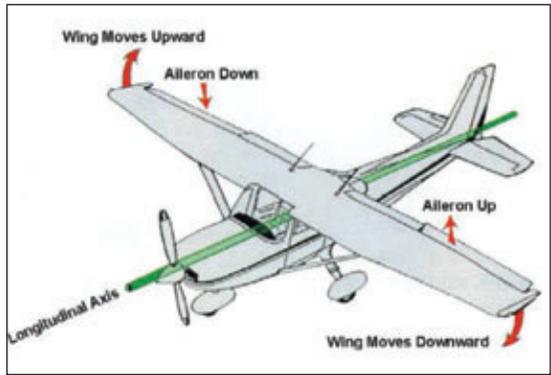
and that requires special skills. You will also see an Instrument panel showing the various gauges, dials, switches, and control devices. It all seems complicated, but don't let that scare you.

In **Image 2.6**, you will notice two shortened "steering wheels" that are attached to the panel. These are called control "yokes." on a Cessna training aircraft. In others, like the Cirrus shown in **Image 2.7**, you will see what is known as a "stick."

When the yoke is rotated from side to side this causes the airplane to lower one wingtip and raise the other. When the yoke is pushed in, or pulled out, the nose moves up or down, as noted in illustration 4. This causes the movement of "roll" on the green longitudinal axis.

So, to review the movement on the three axes: notice in **Illustration 3** a blue line called the **lateral** axis. When the yoke is pushed in,

Illustration 4.0 - The green tube is the longitudinal axis. Rotation about this axis is known as roll. To make the airplane roll, the pilot rotates the control yoke to the right or left. This makes the ailerons move. They move opposite one another; one goes up and the other goes down. As air flows over these control surfaces, it makes the wings move up or down.



2.6 This is the instrument panel of a Cessna 172 Skyhawk. The two white lines point to the left and right control "yokes." A yoke is a modified steering wheel and on your Discovery Flight, you will be sitting in front of the left yoke.

the elevator moves downward. This causes the airplane to rotate around the lateral axis and the nose also moves downward. The opposite occurs when the yoke is pulled toward you. The elevator moves upward and this causes the airplane to rotate again around the lateral axis. This movement is called “Pitch.”

When the yoke is rotated to the left, the right aileron moves downward and the airplane rotates about the **longitudinal** axis. This movement is called “Roll.”

On the floor are two pedals. These are called rudder pedals because they move the rudder. When one pedal is pushed inward, the other moves outward. When the right rudder pedal is pushed inward, it causes the rudder to move to the right and this rotates the airplane around the **vertical** axis. In turn, this causes the nose to move toward the right. The opposite holds true for the left rudder pedal. This movement is called “Yaw.”

On top of the rudder pedals, built in, are the brake pedals. You have to point your toes forward to get the brakes to work. The brakes can be worked separately or independently. The rudder pedals are also connected to the nose wheel. When the right rudder pedal is pushed to the right, the rudder moves in that direction and so does the nose wheel. If the engine is running, the blast of wind being propelled rearward, from the propeller, hits the rudder and this provides assistance in turning.



2.7 This image shows the left and right rudder pedals. The brakes are silver in color.

2.8 This is one of the Denver-based, Aspen Flying Club's, Cessna 172 Skyhawk aircraft. It has a registration number of "N772GK," or as we would say in pilot talk, "November, Seven, Seven, Two, Golf, Kilo." This photo is courtesy of Aspen Flight Club, Denver, Colorado.



International phonetic alphabet

Notice the three words used to designate the alpha-numeric registration number of the airplane in **Image 2.8**. In this case, it's "November," "Golf," and "Kilo." These words are part of the International Phonetic Alphabet and are used in place of letters to avoid confusion as some letter sound similar to each other. Just so you'll understand, here's the IPA for all letters:

A-Alpha	F- Foxtrot	K-Kilo	P- Papa	U-Uniform
B-Bravo	G-Golf	L-Lima	Q-Quebec	V-Victor
C-Charlie	H-Hotel	M-Mike	R- Romeo	W-Whiskey
D-Delta	I - India	N-November	S- Sierra	X- X-Ray
E-Echo	J-Juliet	O-Oscar	T-Tango	Y- Yankee
				Z-Zulu



2.9 The low wing Cirrus SR22.

High wing – low wing

Not all airplanes have their wings mounted on top of the fuselage. The Cirrus SR22 in **Image 2.9** has its wing mounted below the cockpit. This has some advantages especially when landing. Being closer to the ground, the wing moves into a cushion of air sooner and that makes the landing a little easier and sometimes smoother. The one disadvantage of a lower wing is that it blocks the view downward and the pilot is unable to see the airplane's wheels or other airplane traffic below. On the other hand, a low-mounted wing gives the pilot much greater visibility above and this is especially helpful during the takeoff and landing phase of flight. The Cessna 172 in **Image 2.8** has its wings mounted above the cockpit so a student pilot should be especially cognizant of this and take special precautions in areas when airplane traffic is greater, such as around airport. The advantage of a high wing airplane is that passengers and photographers have a great range of view below the airplane.

The real reason behind flight training

The purpose of flight training is to acquire and refine basic airmanship skills. The FAA defines “airmanship” with three statements:

- A sound acquaintance with the **principles of flight**.
- The ability to operate an airplane with competence and precision, both on the ground and in the air.
- Exercising sound judgment that results in optimal safety and efficiency in the operation of an aircraft.

Learning to fly an airplane has been likened to learning how to drive a car. This analogy is misleading. Since an airplane operates in a different environment; i.e., three dimensional and off-the-ground, it requires a type of motor skill development that is more demanding. The following are some examples of skills needed to be successful as a pilot.

- **Coordination** – The ability to use your hands and feet together subconsciously and in the proper relationship to produce the desired results in the airplane.
- **Timing** – The application of muscular coordination at the proper instant to make the flight and all maneuvers therein a smooth process.
- **Control touch** – The ability to sense the action of the airplane and its probable actions in the immediate future, with regard to attitude and speed variations, by sensing and evaluating the varying pressures and the resistance of the control surfaces transmitted through the cockpit flight controls.



2.10 The classic V-tail Beech Bonanza. Courtesy of Alex McMahon.

- Speed sense – The ability to sense react instantly to any reasonable variation of airspeed.
- Self confidence and self control – The ability to study and learn how to prepare for tasks and the ability to refrain from actions that would impair optimum physical and mental functionality, such as abstaining from alcohol or substance abuse.

The FAA *AIRPLANE FLYING HANDBOOK* has this to say about the skills required to fly an airplane and how to do so with safety and precision:

“An airman becomes one with the airplane rather than a machine operator. An accomplished airman demonstrates the ability to assess a situation quickly and accurately and to deduce the correct procedure to be followed under the circumstance; to analyze accurately the probable results of a given set of circumstances or of a proposed procedure; to exercise care and due regard for safety; to gauge accurately the performance of the airplane; and to recognize personal limitations of the airplane and to avoid approaching the critical points of each. The development of airmanship skills requires effort and dedication on the part of both the student pilot and the flight instructor, beginning with the very first training flight where proper habit formation begins with the student being introduced to good operating practices.”

Every airplane has its own flight characteristics. The purpose of primary and intermediate flight training, however, is not to learn how to fly a particular make and model airplane. **The underlying purpose of flight training is to develop skills and safe habits that are transferable to any airplane.** Basic airmanship skills serve as a foundation

for this. The pilot who has acquired the necessary airmanship skills during training and demonstrates these skills by flying training-type airplanes with precision and safe flying habits will be able to easily transition to more complex and high performance airplanes. It should also be remembered that the goal of flight training is to create a safe and competent pilot. Passing required tests for pilot certification is only incidental to this goal.

The role of the FAA

The Federal Aviation Administration is empowered by the U.S. Congress to promote aviation safety by prescribing safety standards for civil aviation. This is accomplished through the code of **Federal Aviation Regulations or FARs**. Title 14 of the Code of Federal Regulations Part 61 pertains to the certification of pilots as well as, flight and ground instructors. Title 14 CFR Part 61 prescribes the eligibility, aeronautical knowledge, flight proficiency, and training and testing requirements for each type of pilot certificate issued.

Title 14 CFR Part 67 prescribes the MEDICAL standards and certification procedures for issuing airman medical certificates and for remaining eligible for medical certificates.

In Part Five, called “*Getting Your Ticket & Passing Your Medical*,” there will be more detail on medical certification. **The medical certificate is very important because it literally controls the pilot’s certificate. If you can’t pass the medical exam, you won’t be allowed to exercise the privileges of the pilot certificate.**

Title 14 CFR Part 91 contains general operating and flight rules. This section is broad and provides guidance in the areas of general flight rules, visual flight rules (VFR), instrument flight rules (IFR), aircraft maintenance, and preventive maintenance and alterations.

The various kinds of pilot certificates

Although the name “license” is commonly used, an AIRMAN CERTIFICATE is the proper term. In the United States, the following certificates fall under Title 14 of the Code of Federal Regulations:

- 4.1 Student Pilot
- 4.2 Sport Pilot
- 4.3 Recreational Pilot
- 4.4 Private Pilot
- 4.5 Commercial Pilot
- 4.6 Airline Transport Pilot

You might ask, “What about balloons, helicopters, gliders, or powered-parachutes?” These come under different “Categories” and “Classes.” There is even one more step known as a “Type Rating.” Let’s say you are an “Airline Transport Pilot” and you are going to be flying a Boeing 737. You have to get special training for the 737. After extensive instruction and testing, you will be given a “Boeing 737” Type Rating. If the company you’re working for purchases a Boeing 757, you have to go back and start all over with this airplane to get that type rating.

In Part Five, called “*Getting Your Ticket & Passing Your Medical,*” the author will go into much more detail on medical certification. **The medical certificate is very important because it literally controls the pilot’s certificate. If you can’t pass the medical exam, you won’t be allowed to exercise the privileges of the pilot certificate.**



2.11 This Beech King Air, in the Aviation Program at Oklahoma University, costs nearly twice as much as a world renowned Ferrari Enzo!

What about ground school?

Ground school is a requirement in the Sport Pilot Certificate, the Private Pilot Certificate, the Commercial Pilot Certificate, the Instrument Pilot Rating, the Instructor Pilot Rating and the Airline Transport Pilot Certificate. There are several channels in which a pilot can prepare for these tests. Numerous classes are offered by flying clubs, fixed-base operators, community college night schools, regular high schools through college programs, organizations like the Civil Air Patrol, and online courses and “test prep” DVDs that can be ordered from various companies.

Formal courses teach basic aerodynamics, aircraft systems, weather, navigation, Federal Aviation Regulations, and, at the college



2.12 Ground instruction is a very important step in becoming a pilot.
 (Courtesy of Aims Community College Aviation Department, Greeley, Colorado.)

level, a vast array of classes related to the science and technology of aviation. There are ground school classes for everything from becoming an aviation mechanic to becoming an air traffic controller. Some highly specialized classes are offered to train candidates to be flight attendants, marketing agents, and airline customer service agents.

The Civil Air Patrol offers a grass-roots program for young adults age 12-20. CAP offers a variety of flight opportunities, aviation education, and special aviation career experiences. CAP emphasizes good character, leadership development, aerospace knowledge, and physical fitness, to include living a drug-free life style — all characteristics needed for good pilots.

The role of the flight instructor

The flight instructor is the cornerstone of aviation safety. The FAA has adopted an operational training concept that places the **full responsibility for student pilot training on the authorized flight instructor**. This training is the transfer of knowledge and wisdom needed to meet the requirements for a student to become a certified pilot. This knowledge includes airmanship skills, pilot judgment, decision-making aptitude and good operating practices.

An FAA certified flight instructor has to meet extensive flying experience requirements, pass rigid knowledge and practical tests, and demonstrate the ability to apply recommended teaching techniques in



2.13 The Flight Instructor is the cornerstone of aviation safety. Dr. Scott Hompland, noted Denver anesthesiologist (left), goes over a log book entry with Aspen Flying Club Certified Flight Instructor, Ted Matthews. A good flight instructor is the one person you will hold in high esteem throughout your life whether you just take a few flying lessons or go on to become an aviation professional.

the actual operation of an airplane. In addition, the flight instructor's certificate must be renewed every 24 months by showing continued success in: (1) training pilots; (2) completing a flight instructor's refresher course; and (3) passing a practical test designed to upgrade aeronautical knowledge, pilot proficiency and teaching techniques. A pilot training program is dependent on the quality of the ground and flight instruction the student pilot receives.

One of the first things you will notice is that your instructor will do everything with a little book or chart known as a Checklist. Nowhere is the old saying, "doing it by the book," more true than in the field of flight training. You, as a student pilot, will have many things to remember. It's a lot better, and logically safer, if you write down all of the "do's and don't" in the form of a Checklist. When you go out to fly an airplane, you can "check off" each little reminder so you don't forget the important things.



2.14 This beautiful Piper Warrior is part of the Training Program in the Aviation Department at the University of Oklahoma.

Let's take a look at the airport



2.15 This spectacular image is Daytona Airport with the world renowned Daytona Race Track close by. Photo by Adam Wright.

There are a few **terms** that you may hear when you and your instructor are together. Each time a pilot operates an airplane the flight begins and ends at an airport. An airport may be a small sod field or a large complex used by airlines. Some airport terms are:

- **Controlled** – A controlled airport has an operating control tower usually run by the FAA's Air Traffic Control division. It is responsible for providing the safe, orderly and expeditious flow of air traffic at airports where the volume of aircraft requires this service. Pilots operating from a controlled airport are required to maintain two-way radio communications with air traffic controllers and to acknowledge and comply with their instructions.
- **Uncontrolled Airports** – An uncontrolled airport does not have an operating control tower. Two-way radio communications are not required; however it is good operating practice for a pilot to transmit his/her intentions on a specified radio frequency for the benefit of other traffic in the area. (You might compare this to a turn signal on a car. It lets others know your intentions.)

- **Control Tower** – This is usually a tall structure that houses the Air Traffic Controllers.
- **FSS - Flight Service Station** – This is an FAA facility that provides pilots with weather briefing, flight planning and coordination of emergency services during search & rescue missions.
- **Noise Abatement** – This is a policy set forth by a governing body that controls the noise impact upon a community surrounding an airport.
- **Ramp** – This is an airplane's parking lot!
- **Runway** – This is a dedicated pathway for airplanes to take off or land.
- **Runway Heading** – This is a magnetic number that corresponds with the runway.
- **Taxi** – This is the ground movement of an airplane.
- **Taxiway** – This is a passageway between the parking area and the runways.
- **Tetrahedron** – This is a device that gives an indication of the organized landing direction at an airport.
- **Traffic** – This is the flow of aircraft movement around the airport.
- **Traffic Pattern** – This is a rectangular flight path around an airport that facilitates the flow of aircraft.
- **Windsock** – This is a fabric tube mounted on a pole and located where pilots can see it either on the ground or in the air. The windsock points in the direction where the wind is coming **from** because the wind blows through the sock from one end to the other.

A field trip is an excellent way to make all of your ground school come alive. Seeing the airport from a control tower is an exciting experience. Initially, the dialog between pilots and control tower operators seems almost im-

possible to understand. However, with just a little practice, you will begin to catch on to what they're saying. Experienced pilots have a way of "tuning-out" other conversations; however, when their number



2.16 The FAA has Flight Service Stations for flight planning, pilot briefings and other services.



2.17 This is an FAA-operated control tower.

is called. The response is extremely quick and the pilot will come back with something like, “Roger, 66 Bravo.” This tells the tower that the pilot understands what was said and will comply with the requested action.

Another way to learn the dialog is to get an aircraft scanner. Listening to a local control tower in operation is an excellent “learning tool” to begin understanding the pilot lingo.

The flight profile and air traffic

When an airplane flies from one point to another, it follows a “flight profile.” This means that it follows basically the same pattern every time. The first phase of a flight profile is a taxi. The word **taxi** simply means the aircraft movement on the ground. If it’s from a controlled field, the pilot requests permission from the **ground control operator** in the control tower. If it’s an uncontrolled airport, the pilot uses caution and moves along designated taxiways to the active runway. Before taking off, the pilot stops the aircraft and goes through what is known as a Pre-takeoff Checklist. When this procedure is complete,



2.18 Students from Aims Community College's Aviation Program Visit a Control Tower.

the pilot clears the area on and around the airport, then positions the airplane on the active runway. After one last clearing observation, the pilot brings the engine to full power and the takeoff roll starts. At a certain speed, the pilot will pull back on the control yoke, or stick, and this raises the nose slightly. This is known as “rotating” the airplane, or rotation. At this point the airplane should lift off the runway and start climbing. The pilot will set what is known as the “Best Rate of Climb” airspeed and at a point, usually around 400 feet above ground, the pilot will initiate a left turn. The airplane will roll left, putting the airplane into the “crosswind” direction. The crosswind pathway is 90 degrees to the original takeoff direction. At an altitude selected by the pilot, a turn to the right is made and this is recommended to be 45°. The airplane continues climbing and after the traffic area is cleared, the flight begins.

When the pilot levels the airplane at a desired altitude, the phase known as “cruise” begins. The power is pulled back and the nose is lowered to achieve the desired speed for the most efficient use of available fuel. At this point, the plane is on its way to its destination.

If the destination is a controlled airport; i.e., it has a control tower, a pilot will follow a recommended entry procedure by talking to their Air Traffic Control facilities with the onboard radio equipment. **If the destination is a non-controlled airport,** the pilot will first

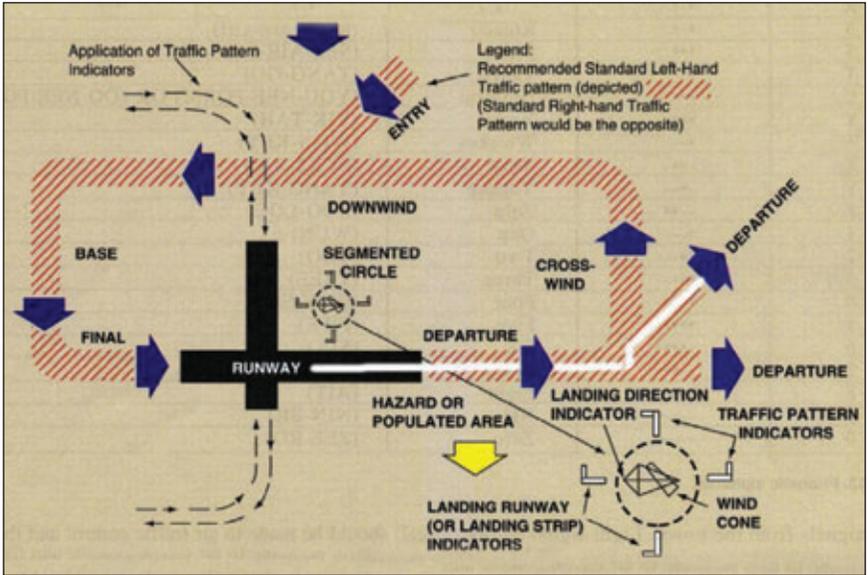


Illustration 5.0 - This is the airport traffic pattern. To begin, look at the word "RUNWAY" and follow the white line and turn left on to the "CROSSWIND" leg. Immediately, turn right 45° on to the "DEPARTURE" line.



2.19 A Cessna 172 is shown on Final Approach. This photo is courtesy of Alex McMahon.

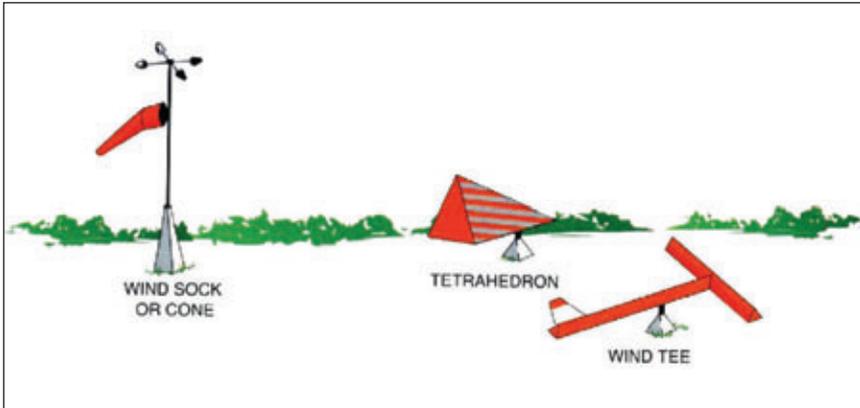


Illustration 6.0 - These are the wind indicators found in the segmented circle.



2.20 Based on the Airport Sign System on the next page, can you identify this one?

survey the local area and look for other airplanes using the airport for landing and takeoff.

There is an established procedure when entering the traffic pattern. At an altitude most commonly used, somewhere around 800-1000 feet above ground level, and, at an angle of 45° to a line which parallels the runway, the pilot will enter the traffic going the opposite direction of the landing. This is called, appropriately, the “entry” and is normally about 1/4 of a mile away from runway.

AIRPORT SIGN SYSTEMS	
TYPE OF SIGN AND ACTION OR PURPOSE	TYPE OF SIGN AND ACTION OR PURPOSE
4-22 Taxiway/Runway Hold Position: Hold short of runway on taxiway	 Runway Safety Area/Obstacle Free Zone Boundary: Exit boundary of runway protected areas
26-8 Runway/Runway Hold Position: Hold short of intersecting runway	 ILS Critical Area Boundary: Exit boundary of ILS critical area
8-APCH Runway Approach Hold Position: Hold short of aircraft on approach	 Taxiway Direction: Defines direction & designation of intersecting taxiway(s)
ILS ILS Critical Area Hold Position: Hold short of ILS approach critical area	 Runway Exit: Defines direction & designation of exit taxiway from runway
 No Entry: Identifies paved areas where aircraft entry is prohibited	 22 ↑ Outbound Destination: Defines directions to takeoff runways
 Taxiway Location: Identifies taxiway on which aircraft is located	 ↖ MIL Inbound Destination: Defines directions for arriving aircraft
 Runway Location: Identifies runway on which aircraft is located	 Taxiway Ending Marker Indicates taxiway does not continue
 Runway Distance Remaining Provides remaining runway length in 1,000 feet increments	 ↙ A G L → Direction Sign Array: Identifies location in conjunction with multiple intersecting taxiways

Illustration 7.0 - On the ramp, taxiways and close to the runways, you will see various signs like these.

Now the pilot has the airplane going parallel to the runway. This is called the “downwind” leg. The pilot flies this direction, allowing the airplane to slowly descend by reducing power until a point is reached that is approximately 45° from the edge of the runway. Now, depending upon wind and weather conditions, the pilot will bank the airplane into a left bank somewhere around 600 feet above the field elevation and start the “base” leg. This leg will be 90° to the pathway that will position the airplane pointed toward the runway. Somewhere around an altitude of 400 feet above the airport elevation, the pilot will again roll the airplane left and enter what is known as the “final approach” leg. If the pilot wants to slow the airplane, yet maintain a lift, the pilot will put down the flaps according to the manufacturer’s recommendations. At an airspeed that is approximately 1.4 times greater than the normal stall speed, the pilot will fly the aircraft down to a landing.

The discovery flight — let’s go flying

A Discovery Flight is set up to give the general public a “first try” at flying. These flights almost always allow the beginner an opportunity to sit in the pilot’s seat and actually operate the controls during a

flight. If the experience is a good one, there is a possibility that students will eventually take more lessons and maybe go on to an extensive training program to become a professional. Discovery Flights are good business and a great way to attract new people into aviation!

When you go on a Discovery Flight, you will get to do a thorough pre-flight inspection; a cockpit orientation; a ground operation (taxi); a radio procedure; and a pre-takeoff checklist. Then, while sitting in the left seat, where the pilot-in-command sits, you'll get to fly the airplane during part of the actual flight profile.

Meet Katy Czarnowsky — she is going on a discovery flight



2.21 Katy Czarnowsky jumped at the opportunity to take a Discovery Flight in a Cessna 172 with an instructor by the name of Billy Mitchell!

Numerous fixed-base operators (FBOs), flying clubs, private flying schools, summer camps and organizations, like the Civil Air Patrol, all have “introductory flights” or “orientation flights.”

If you are interested in seeing what a Discovery Flight is like, it is highly recommended that you contact a local flying club, flying school, Fixed Base Operator, or other operation that offers discovery flights. Ask the contact person (club owner, school director, etc.) to recommend a very patient, good-natured instructor. Request someone who will pick a good morning, or evening, to go fly with you. Generally, the earlier in the day you fly the better your flight will be.

Meet Katy Czarnowsky. She’s a junior in college majoring in Sports Medicine. Flying has always fascinated Katy so she has volunteered to go on a Discovery flight that will be documented in this book. Billy Mitchell, a flight instructor and test pilot, will be Katy’s pilot.



2.22 Meet Bill, or “Billy,” Mitchell, a 13,000 hour flight instructor & test pilot. He and Katy are starting the pre-flight inspection of their Cessna 172. Katy looks excited!

(Author’s note: For those who don’t know much about aviation history, Billy Mitchell was a famous Army Air Corps General who was a great proponent of airpower during the post World War I period. His theories about airpower proved to be very true in the Second World War. He even had a bomber named after him; the B-25. There is also an achievement award given in the Civil Air Patrol Cadet Program named after this famous aviator.)

Katy’s instructor, Billy, has over 13,000 hours of flight time in his logbook and is the CEO of Mitchell Aviation, located at Erie Municipal Airport just north of Denver, Colorado. His company has several divisions, but one of the most interesting involves testing experimental aircraft and helping the owner/builder prepare it for FAA certification.

Katy and Bill flew a Cessna 172 on Katy’s Discovery Flight. Before they flew, Bill had to ensure that he was “legal to fly.”

Let’s see what the FAA has to say about being legal to fly. The accomplishment of a safe flight begins with a careful visual inspection of the airplane. The purpose of the preflight inspection is

twofold: to determine that the airplane is legally airworthy, and is in good condition for a safe flight. The pilot must first make sure that the following documents are on the aircraft:

- Airworthiness Certificate
- A Registration Certificate
- An FCC radio station license (if required by the type of operation)
- Airplane operating limitations, which may be in the form of an FAA-Approved Airplane Flight Manual and/or Pilot's Operating Handbook, placards, instrument markings, or any combination thereof.

Airplane logbooks are not required to be kept in the airplane when it is operated; however, they should be inspected prior to flight to show that the airplane has had the required tests and inspections.

At a minimum, there should be an annual inspection within the preceding 12-calendar months. In addition, the airplane may also be required to have a 100 hour inspection.

The Emergency Locator Transmitter (ELT) should also be checked. The determination of whether the airplane is in condition for a safe flight is made by a thorough pre-flight inspection. The preflight inspection should be performed in accordance with a printed checklist provided by the airplane manufacturer for the specific make and model of the airplane.

A flight starts with an inspection of the interior of the aircraft, known as the cockpit. The pilot, after checking the windshield for any cracks or crazing, should check the seat, seat rails and seat belt attachment points for wear and serviceability. Next, the pilot checks that the battery and ignition switches are in the "off" position. The pilot can now turn on the battery power and push the flap switch down. The operation of the flaps can be checked from the cockpit to make sure they

2.23 Bill shows Katy where and how to check the rudder.



move easily and without any binding.

Next, the fuel selectors should be checked for proper operation in all positions including the OFF position. The primer should be exercised. The pilot should feel resistance when the primer is pulled out or pushed in. Then the primer should be securely locked. The engine controls should be manipulated by slowly moving each through its full range to check for binding or stiffness.

Mr. Mitchell gave Katy an orientation of the cockpit. He showed her: the clock, airspeed indicator, attitude indicator, altimeter, radio

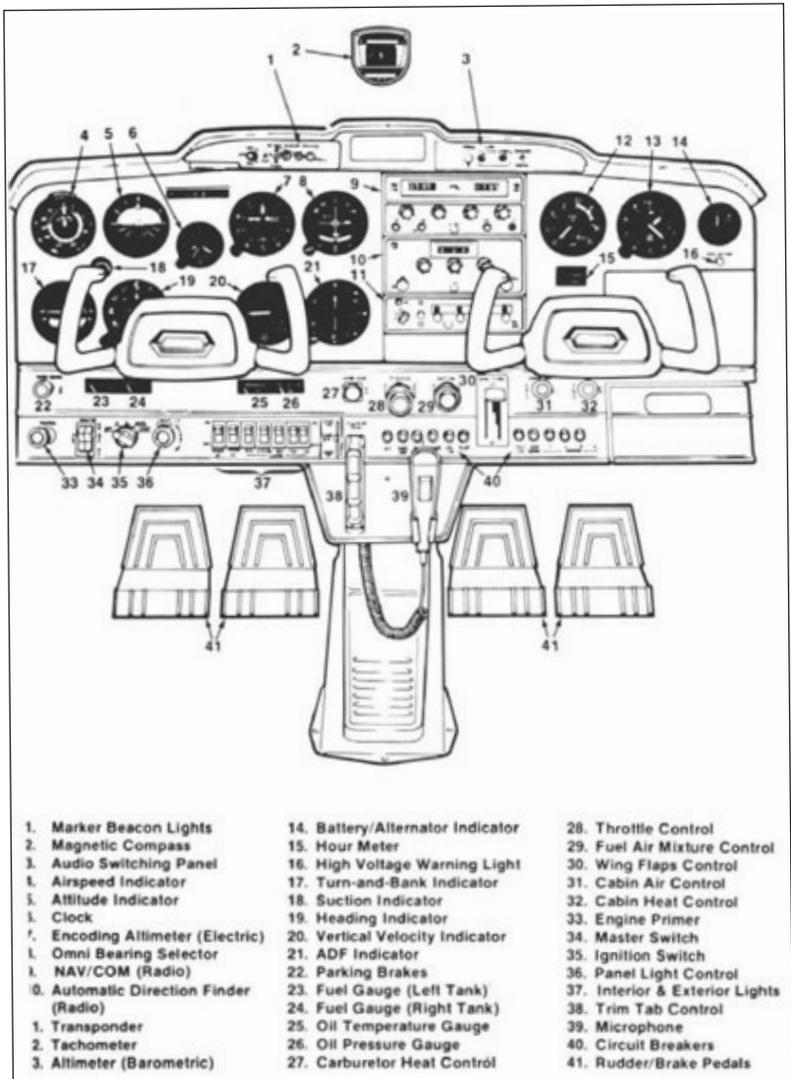


Illustration 8.0 - This is an illustration of what you see in the cockpit photo above.



2.24 This elevator has a trim tab that must be checked for free movement.

deck, engine instruments (oil temperature and oil pressure), fuel gauges, turn & bank indicator, heading indicator, vertical velocity indicator, flap position indicator, tachometer, the red master switch and a row of white circuit breakers. Just behind the yoke is a gray wing flap control. The rudder pedals are on the floor and there is a coiled cord that serves as the microphone connection. There are pockets in the door that contain the airplane documents.

Using a checklist, provided by the aircraft manufacturer or one that is accepted by a formal training program, the pilot starts a series of “checks” to make sure that the airplane is safe to fly.

At this point, the pilot should turn on the battery master switch. He should note the fuel quantity gauges and keep the readings in mind when he/she later checks the fuel visually in the wing tanks.

The airspeed indicator should be properly marked and the needle should read zero. The vertical speed indicator (VSI) should be in the level position. The magnetic compass should be checked for mounting and it should have a correction card in place. The gyro-driven instruments should be checked before being powered up.

The altimeter should be checked against the ramp or field elevation after setting in the current barometric pressure. The standard barometric pressure is 29.92 inches. When a pilot gets a weather briefing or contacts ground control (in the control tower if they have one at the airport), the **current barometric pressure** will be given. This number is set into the altimeter using a knob

found on the instrument panel.

Outside the airplane, the pilot should start the inspection for any outward signs of deterioration or distortion which may include any loose attachments.

The following is a typical external preflight inspection.

- (In the cockpit) The control lock is removed and stored in a compartment away from pilot & passengers.
- The Hobbs meter (measures the time the master switch has been “on”) is checked along with the reading on the tachometer (measures the rotation speed it has in a motor).
- **Walking toward the rear**, the horizontal stabilizer is first checked for damage, popped rivets or any skin damage.
- On the left elevator, the tips rechecked as well as, counterweights, attachment points and freedom of movement.
- Next, the rudder is checked, including the light, beacon, control cables, hinges and control stops.
- The right elevator attachment points and freedom of movement should be checked.
- At this point, the tail tie-down rope or chain should be disconnected.
- On the right elevator, the pilot should check its attachment points, hinges and trim tab.
- On the right side of the fuselage, the pilot should check for dents, popped rivets, or any signs of damage.



2.25 One of the most important checks of all is the fuel system.

- The flaps can be visually inspected at this point.
- Next is the right aileron. It should move easily and there should be no evidence of damage.
- At the right wingtip, the pilot can check the position lights and strobe lights, if they are connected.
- The leading, or front, edge of the right wing is now checked. There should be no damage.
- The right landing gear is checked. This includes the condition of the tires and the disc brakes.
- The door is checked for any evidence of damage.
- The pilot can now check the fuel tank for presence of water.
- The pilot can now check the fuel line below the engine for any possible water contamination.
- The pilot can open a small door on the cowl (engine covering) and carefully remove the oil dip stick. The oil should look normal with no signs of burning. The oil should register in the proper range between the two lines shown on the dip stick.
- The nose gear should be completely checked for any excessive wear or damage.
- The propeller should be thoroughly checked for any damage or pitting along its edge.
- A visual inspection should be made in the cowling intakes.
- On the left wing, the pilot should, once again, inspect the fuel as well as the stall warning intake opening.
- The pitot static tube (used on outside of airplane as speedometer) is now checked to make sure that it is not obstructed with something like a bug or other debris.
- Using a ladder or step stool, the pilot should check the fuel in each wing tank. If the airplane uses 100 Octane “low lead” fuel, the color should be blue.
- Next, the ailerons and wing flaps should be checked exactly as it was done on the left wing.

When air and fuel mix to burn providing power to an engine, the ratio is usually around 13 parts air to 1 part gasoline. As an airplane travels higher and higher from sea level, where the air is less dense, the amount of fuel required is less. The pilot can then vary the mixture control providing just the right amount of fuel when required. In most start-up checklists, the mixture is pushed all the way to the panel providing a condition called “Full Rich.” As the engine warms up, the mixture is pulled out to the point where the engine runs better.

2.26 *The oil level and condition are checked at this stage.*



2.27 *The condition of the propeller is critical to a safe flight.*



2.28 *Bill shows Katy the opening of the stall warning indicator.*



2.29 Katy points toward the disc brakes. This is an important item in the external pre-flight inspection.



2.30 The pilot looks around to make sure no one is close to the aircraft and then announces “Clear Prop” before starting the engine. The mixture control is pushed into the “full rich” position and the throttle is “cracked” open. A key is inserted and the ignition switch is activated, much like you would do in an automobile, and the engine is started.

The latitude of Erie Municipal, the airport where Katy is taking her Discovery Flight, is $40^{\circ} 00.57'$ north and the longitude is $105^{\circ} 02.84'$ west. The field elevation is 5130 feet above sea level and the airport's only runway has two numbers. One is "33." This is a magnetic heading of 330° . At the other end is the number "15." This means that it has a magnetic heading of 150° . If you would subtract 150 from 330, you get 180. This is a straight line, and, if a pilot, is coming in for a landing, the compass (located on top of the instrument panel) would show 33. If the pilot was coming in from the other direction, the compass would read 15. These are magnetic headings (minus a zero) based on magnetic north. In the Denver area, a compass is off by about 13° . This means that a magnetic field compass would not point toward true north; it would, however, say "North" and be pointing slightly east of

2.31 Katy and Bill will be using these 4 devices in the cockpit. The green line points to the microphone where Bill will notify airport traffic of his intentions on a frequency of 123.0. The white line points to the throttle. The red line points to the mixture control. The blue line points to the flap control.



2.32 Bill & Katy are on Runway 33 ready for takeoff and full power is applied.





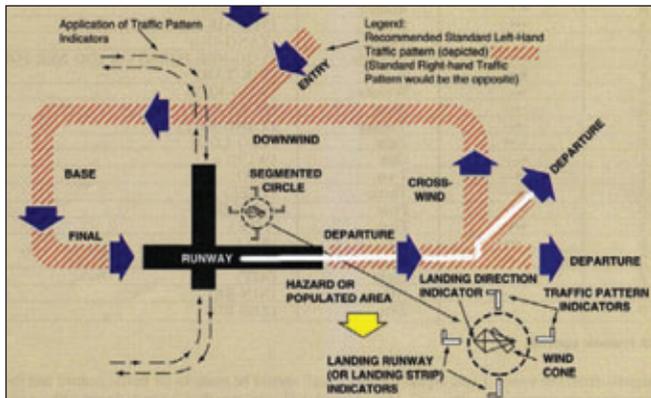
2.33 At about 60 miles per hour, Katy pulls back on the control yoke and the airplane lifts from the runway.

2.34 There is no set rule, but at an altitude of about 400 feet, Katy starts a left bank.

The airplane is rotating around the longitudinal axis and the motion is called "roll." Roll occurs when one aileron goes up and the other goes down. In this case, the left aileron went up and the right aileron went down. It only takes a very small movement of the control yoke to initiate a turn in a Cessna 172.



Illustration 9.0 - This illustration shows Katy's departure path if she had elected to leave the traffic pattern.



true north—by 13° . Pilots take this into consideration when navigating from point to point. It is called Magnetic Variation. Check **Illustration 9**.

At Erie Municipal Airport, the pilot comes into the “entry” portion of the pattern then rolls right onto the downwind leg. At a point approximately $\frac{1}{2}$ of a mile from the edge of the runway, the pilot banks (rolls) the airplane LEFT and turns on to the base leg. (An example of numbers used are 800-600-400) This meant that they flew downwind around 800 feet above field elevation, then turned base-leg at 600 feet, and rolled onto the final approach leg at 400 feet. Circumstances such as weather, traffic, and other airplanes taking off can change these numbers.

2.35 Katy and Bill make another left bank at about 800 feet above ground level (AGL) and the airplane is positioned on the downwind leg.



2.36 This is a field located just north of Denver near the small town of Erie, Colorado. It is called Erie Municipal Airport (commonly referred to as Tri-County) and has a three-letter identifier of “EIK.”

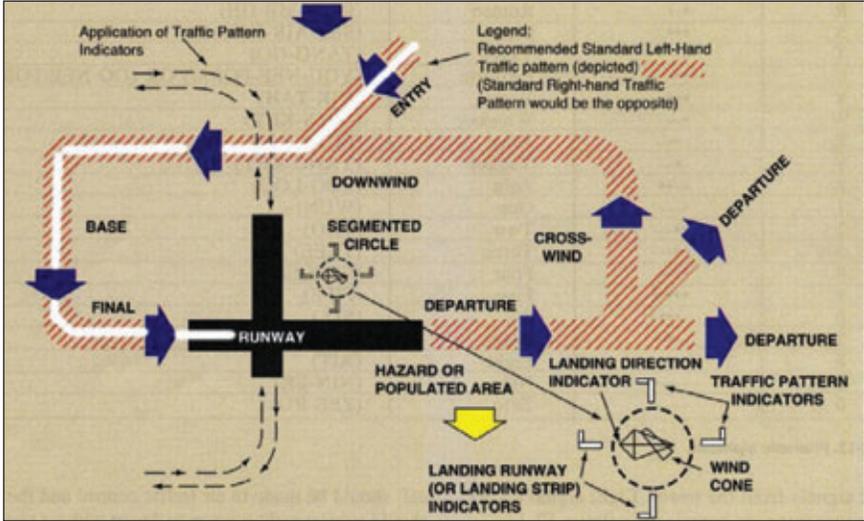


Illustration 10.0 This shows the proper method of flying the approach to the airport.

Billy asked Katy if she liked roller coasters. She nodded yes and he did a slight pitch-down-pitch-up motion with the nose. That brought a big smile from Katy. After some sight-seeing and instrument orientation, it was time to head home. Instructor Mitchell showed Katy the proper way to enter a traffic pattern at an altitude of 800 feet above the field elevation. This entry positioned the aircraft parallel to the runway going in the opposite direction of the landing.

Take a moment and refer back to **Illustration 9** of the traffic pattern. At an altitude around 400 feet above the ground, it is necessary to position the airplane on to the final approach leg. The object now is to get everything ready for landing. In most cases, the pilot will have the flaps down to slow the airplane and to provide additional lift at a

2.37 During her Discovery Flight, Katy was able to fly around for a little while and enjoy the view. Bill showed her about “roll,” “pitch,” and “yaw,” using the cockpit controls. He did not stall the aircraft but showed Katy “G” forces by making a steep bank as shown here. Note the white line and the line of trees outside the left window. This will show you the angle of bank they were doing in the turn!



decreased airspeed. Flaps function to increase lift and aerodynamically brake or slow the airplane. Katy's landing speed was 60 knots, or 69 miles per hour.

Pilots have to know the difference between miles per hour and knots. The word "knot" actually comes from the word "naut," or "nautical." A nautical mile is 6076 feet long while a statute (regular land) mile is 5280 feet. The conversion factor is 1.15.

2.38 Bill and Katy are now parallel to the runway on a heading of 150° magnetic. This is exactly 180° opposite the direction they will be landing. They will be on a magnetic heading of 330° when they enter the final approach leg. If you remove a zero from 330°, you get "33." That is the number they will see on the end of the runway.



2.39 From downwind, Katy and Bill rolled the airplane into the base leg. This shows the pilot all of the airport and possible traffic (other airplanes).



2.40 The airplane is being positioned on to the final approach leg. In the light reflection, you can see the runway and a parallel taxiway on the left side.



2.41 Bill has put the flaps down for landing using the flap control in the cockpit.

One person, one airplane, one life changed

Katy Czarnowsky's first-flight experience was documented by a post-flight interview.

1. Did it take courage to try a discovery flight? *Yes. I wasn't sure what I would be doing. However, after being told exactly what I was*



2.42 As Bill and Katy slow the airplane to about 60 knots, with a slight back pressure on the yoke, the airplane's nose comes up which is a maneuver called a "flare." Katy's airplane touches down for a great landing.

going to do and meeting the flight instructor for the first time, I felt completely comfortable about flying.

2. Did you ever fly on an airliner before this? *Yes and I had a chance once to look into the cockpit of an airliner, but that is the closest I've been to actually being in the cockpit. Actually sitting in the pilot's seat of our Cessna was a whole different experience. It was overwhelming at first, but that uncertain feeling turned to excitement once we started taxiing down the runway. The takeoff was amazing and when we lifted off the runway I was thrilled.*
3. If you were invited to speak to a class, about your flight experience what would you tell the students? *I would tell them that I got to fly*



2.43 Using a device that hooks to the nose gear, the airplane is carefully steered back into its position on the flight line.

2.44 Katy now has .6 of an hour of dual instruction in her new logbook.



out of Erie Municipal Airport and learn all about the plane that I would be flying. I would then share with them the thrill of “driving” down the taxiway and then moving onto the runway. I would explain how we had to gain enough speed to eventually take off. While describing this, I would emphasize the importance of being totally alert and focused on the task at hand. I would illustrate what it was like to be in the air and all of the responsibilities that come with being the pilot. Examples would be like watching out for other airplanes, hot air balloons, etc., and making sure that everything inside and outside the plane was set and operating correctly. Next I would share with them the excitement of landing the plane and the focus that it takes to make sure you touch down gently on the runway. After talking about the flying itself, I would then take a couple of minutes to emphasize the attention that flying an airplane takes and that in order to be completely alert, you can't be under the influence of any drugs or alcohol.

4. If you were sitting in the Student Center at your college, talking with a group of your peers, and the subject of “fun things I’ve done” came up, how would you tell a group of friends about your flight? I would tell them that in the beginning of the summer after my Junior year I got to fly an airplane for the first time. I would tell them that I flew with a very experienced flight instructor and he taught me all about the plane before I flew it. Then I would explain how he coached me before, during and after the flight and I felt quite comfortable about the entire experience. I would mention that he took the controls several times and let me look around and enjoy the scenery. Then I’d explain how he asked me questions like “do you like motorcycles?” or “do you like the rides at amusement parks?” He then showed me how you can create a similar experience—like leaning a motorcycle to make it turn or doing something like a roller coaster by moving the nose up and down. I would tell them about having to buy a log book and recording the time I flew in it. Throughout my explanation, I would do my best to describe how exciting each part of the flight was and how amazing it is to fly a plane.

5. If someone was talking about the issue of drugs. How would you tell students or your friends that alcohol, marijuana, cocaine and flying don't mix in flying ... and why? *I would tell them that trying to fly under the influence of any substance would significantly lower one's ability to perform. From the time you step into that plane and sit in the pilot's seat, you would not only be putting yourself in danger, but also your passengers and anyone else who might be in the sky, or on the ground. Flying a plane takes concentration and if someone was under the influence of drugs or alcohol, they would be more apt to forget an important step or lose focus on the task at hand.*
6. How would you explain the same issue to your second graders? *I would tell them that in order to become a pilot, or even to fly the airplane like I did, you must be completely drug free. I would tell them it takes a great deal of concentration and responsibility to fly an aircraft, none of which you would have if you were under the influence of any drug or had been drinking alcohol. After I emphasized this point, I would talk about how much fun it is to fly and that the "high" you get in flying is much greater than any thing you could ever experience on drugs.*



2.45 Every landing is a challenge.
This photo is courtesy of Alex McMahon.

7. Instructor Mitchell has offered you the opportunity to go flying in his AcroSport biplane. *Are you going to take him up on it? Yes! I think this would be a great opportunity for an awesome experience. I have a friend who got a chance to fly in a similar airplane and they did loops, rolls and other maneuvers. She always talks about how much fun it was and I would love to do something like she did. Then I could tell everyone about my flight.*
8. Did your Discovery Flight make you want to learn more about aviation and flying? *Yes! This experience really got me interested in aviation because I got to go see first-hand how much fun it is to fly an airplane. Now that I've done it once, I would love to continue learning more about the airplane itself and the skill of controlling it.*
9. Describe your Discovery Flight from the moment you climbed into the airplane until you finished up by getting your logbook signed. *Once we were all settled in the plane, Mr. Mitchell went through a checklist, started the engine and we moved down the taxiway. He told me that you steer with your feet and he made me take my hands off the yoke so I wouldn't be tempted to steer it like a car. When we came up to the runway, he stopped the airplane and made a pre-take-off -beck of the instruments and controls. He used the microphone and announced that we were about to takeoff. We waited for one airplane ahead of us to takeoff and then we taxied onto the runway. I had my hands on the yoke and he made me steer it as he applied the power. When we reached a certain speed he said to pull back on the yoke. I did and then he told me we were flying! The sound of these words gave me a great sense of excitement. We gradually increased our elevation and soon we were at the correct altitude to make a turn. While flying, Mr. Mitchell first showed me how to do a couple of gentle turns. We flew around for several minutes observing the surroundings and then he said we were going to make a "touch and go." We flew the airplane into our pattern approach and finally we were lined up for a landing on the runway. I pushed forward on the yoke and he pulled back on the power. As we came in for the landing I was told to pull back on the yoke and we settled on to the runway. Then he applied full power and I tried to keep the airplane going straight using my feet. I felt a big rush of relief as the airplane once again started to leave the runway. This time I felt much more confident with what I was doing and being told what to do. It was the second time around that Mr. Mitchell simulated the motion of a roller coaster and a motorcycle turning a sharp corner. We banked the airplane steeply and it was very exciting. We returned to the airport one last time and after making our landing, taxied back to our place on the ramp. We went through a post-flight checklist and once out of the airplane, he attached a steering handle and we pushed the airplane back into its tie-down spot. Once we had everything done, I was given a logbook and Mr. Mitchell signed it. This little book is a*

wonderful piece of memorabilia that I have, not only to remember this experience, but to use again if I get another chance to fly. This was a day I'll never forget.



2.46 Instructor Mitchell owns a biplane called the AcroSport II. This may be Katy's next adventure. Some people are just "plane lucky!"

Congratulations to Bill Mitchell, nationally-acclaimed test pilot

On the 31st of July, 2008, Bill Mitchell received the Experimental Aircraft Association (EAA) Spirit of Flight Award for his involvement in promoting air safety and testing homebuilt aircraft. Mitchell has spent over 13,000 hours in the air and has made the first flight of many homebuilt aircraft. Not only has Mitchell test-flown homebuilts, he also delivers airplanes, gives flight instruction, conducts Biennial Flight Reviews, presents safety topics to his EAA Chapter 43, flies countless numbers of Young Eagles (student) flights and always makes himself available to share his knowledge of aviation.

According to fellow EAA Chapter 43 member, Eugene A. Horsman, Mitchell is "Mr. Aviation" in the region and is one of the EAA's greatest assets. Mitchell has flown everything from Motor-Gliders to C-46s for Universal Air Freight.

Mr. Mitchell received his Spirit of Flight Award at the EAA's Air-Venture Homebuilder's Dinner in the Nature Center at Oshkosh,

Wisconsin. The Society of Experimental Test Pilots President, Ricardo Travern, presented him with the award. He said, “the Spirit of Flight Award, created in 1997, recognizes an EAA member who best exemplifies the spirit of research, development and flight testing. The award winners promote air safety by presenting pilots’ opinions, strengthening the influence of the test pilot on aeronautical progress, and continuously evaluating the adequacy of flight equipment.”

PART THREE

Special programs for your aviation interest





*This chapter is designed to give the young aviation enthusiast a look at **JUST A SMALL NUMBER OF THE AVAILABLE OPPORTUNITIES** for aviation enthusiasts. Several are featured here, but it's not the "whole picture." At the end of this unit, there will be a list of web sites that give the reader even more detailed descriptions of special opportunities. Some of these special programs may be close, while others may be far from your hometown. To participate, you and your family should consider all factors including cost, transportation, work schedules and medical issues that may limit your mobility.*

Because this book is sponsored by the Drug Demand Reduction program of the Civil Air Patrol, CAP will be the first featured organization. The whole world of aviation is a great adventure and it could easily start right here.

The Civil Air Patrol

Through Civil Air Patrol's Cadet Program, young adults can develop leadership skills, investigate the fundamentals of aerospace science and associated careers, acquire the habit of exercising regularly and living a drug-free lifestyle, and participate in exciting activities that prepare them to become responsible adult citizens.

The Civil Air Patrol is the official auxiliary of the United States Air force and a humanitarian organization that has three missions:

- Emergency Services – which focuses on search and rescue, disaster relief, and homeland security.
- The Cadet Program – which focuses on providing young people an opportunity to work with a group of young people in a positive youth development organization.
- Aerospace Education – which focuses on educating the public about the importance of aerospace to the future of our world.

The basic cadet achievement track publications are known as *Aerospace Dimensions* and they are presented in the form of "modules."



3.1 The Civil Air Patrol offers one of the finest selections of entry-level aviation and space training textbooks available.

These offer the young aviation enthusiast an excellent knowledge-base in the field of aerospace education. The main Aerospace Education textbook is known as *AEROSPACE, THE JOURNEY OF FLIGHT*. There are over 20 additional aviation education products provided by the Civil Air Patrol.

Young Americans between the ages of 12-18 may join the CAP Cadet program and remain in cadet status until they turn 20.

Leadership is learned in many ways. CAP ensures that cadets are learning leadership skills by making it mandatory to pass a 25 question multiple-choice test for every promotion. These are based on one of the cadet textbooks known as *Leadership 2000 and Beyond*. Additional training comes through classes taught by cadet officers.

The cadets advance through the program in a manner much like that of the U.S. Air Force. When cadets first join, they hold the grade of Cadet Airman Basic and if they have the will and commitment, they can rise to the rank of Cadet Colonel.

There are several requirements for promotion:

- Pass a 25 question multiple choice test on leadership



3.2 The Cadet Program has a strong emphasis on physical fitness. For promotion, cadets must pass a physical fitness test. Additional physical fitness comes through team sports and other physical exercise. The cadets are also given a strong message against the use of drugs. This is part of the program awareness provided by the Drug Demand Reduction division of Civil Air Patrol's National Headquarters.

- Pass a 25 question multiple choice test on Aerospace Education
- Pass a Cadet Physical Fitness Training test
- Attend 50% of all Moral Leadership programs
- Attend at least 70% of the meetings since last promotion

Civil Air Patrol promotes a strong interest in aviation

In the final chapter where several aviation professionals are interviewed, please note that retired Air Force Major General Tandy Bozeman and Atlantic Southeast Airlines First Officer Adam Wright both got their start in Civil Air Patrol.. Thousands of pilots, including Capt. Jason Dahl, a United Airlines Captain who lost his life in the 9/11 attack, started their careers with CAP.

The cadet is also taught the fundamentals of aviation, aircraft systems, airports, the airways, flight in the atmosphere and space technology. The Aerospace Education component of the Civil Air Patrol cadet program was mandated by Congress in 1946 and its mission is to keep America strong in airpower. CAP is making every effort to inspire young people toward aerospace related careers to help prepare the future workforce that will ultimately help America maintain aerospace supremacy and national security.

CAP cadets are eligible for 6 FREE flights in a Civil Air Patrol-owned Cessna Aircraft. These orientation flights, or “O-Flights,” are flown by experienced pilots whose job it is to give cadets a basic

3.3 This CAP cadet is “all smiles” about his upcoming orientation flight.



3.4 Civil Air Patrol Cadets can receive flight training in Summer Flight Encampments. This cadet is checking the spoilers on a glider prior to flight.



3.5 The CAP uses Cessna 172s for most of their Orientation Flights and flight training at Summer Encampment. Photo by Adam Wright.



knowledge of the safe operation and control of an aircraft.

These orientation flights are all part of a cadet’s achievement and leadership program. The flights give basic introduction to maneuvers, airport orientation, and flight operations into and out of both controlled and non-controlled airports. The flights also include important pre-flight planning and post-flight briefings.

Civil Air Patrol offers National and Regional Flight Academies. These summer programs are available for cadets to receive actual flight training in gliders or Cessna 172s. The program is generally two weeks long and the cadet has an intense regimen of ground school for half the day and flight the other half. All of this training is done with Certified Flight Instructors and the time will count toward the Student Pilot Certificate and also the Private Pilot's License. If the student meets the standards required by the instructors, he or she may be allowed to solo the aircraft (fly alone).

CAP Summer Encampments

An encampment is the CAP version of basic training. It is a week where cadets will be challenged to push his/her mental & physical skills and they learn leadership through teamwork. During encampments, cadets hone their marching skills, and practice military customs, courtesies, discipline and a DDR presentation. Throughout the week, cadets rise early and every waking moment is filled with exciting activities. Encampment is not all work—it's also about making new friends and building strong bonds with others who have common interests. Encampments are held all around the country to ensure all cadets have an opportunity to participate.

Flight encampments

The CAP offers yearly flight encampments. The National Flight Academies provide cadets approximately 10 hours of dual flight instruction in powered aircraft and approximately 10 training flights in gliders. The purpose of both is to expose the cadets to general aviation aircraft and to encourage them to pursue a private pilot certification.

During these flight-oriented activities, cadet student pilots undergo training that meets the basic requirements of the FAA. The Civil Air Patrol has one of the finest youth organizations in the world and their flight training program gives many young Americans the

3.6 Civil Air Patrol has an outstanding Emergency Services Program and cadets can be a part of the life-saving search & rescue efforts. Photo courtesy of Alex McMahon (professional airline pilot and CAP member).



3.7. *This is one of the world's finest homebuilt, experimental aircraft. It is called the Lancair and it is affectionately known as the "Ferrari of General Aviation."*
Image by Adam Wright.



3.8 *Now this is what sport flying is all about!*
Image by Alex McMahan.



opportunity to get started in aviation at a very reasonable cost. Cadets can enter the world of flight training and be on his or her way to becoming a certified FAA pilot.

For more information about CAP's exciting cadet programs, go to www.gocivilairpatrol.com!

Experimental Aircraft Association EAA air academy

Every year, thousands of aviation enthusiasts gather at the AirVenture Fly-In located in Oshkosh, Wisconsin. This great American airshow draws over 1,000,000 people over the period of a week. It is put on by the Experimental Aircraft Association (EAA) based on Whitman Field in Oshkosh, WI. The EAA is the premier organization for homebuilt and experimental aircraft. The EAA caters to those who want to acquire the skills necessary to custom-build an aircraft. The EAA also has a division that is solely for airplanes that have served America during war-time. These are called "Warbirds."

Not quite as well-known is the EAA's educational outreach. This organization offers many training programs for kids of all ages. Pilots from all walks of life use the EAA as a means of giving back what aviation has given them—by supporting the EAA aviation education

3.9 Now, this is a campsite! The EAA's beautiful lodge for campers and other visitors.



programs. Over the past decade, thousands of volunteers flew more than 1,000,000 young people in an outreach called “Young Eagles.” It brought the wonder of flight to these young Americans who would have never had the opportunity to fly had it not been for the EAA.

Summer camps and contacting the EAA

For kids between the ages of 12-18, the EAA has a unique summer camp program that takes interest in aviation to a new level. The large EAA facility is located on the grounds of Wittman Field in Oshkosh, Wisconsin. Top-notch aviation instructors help participants explore the world of flight through aviation studies, hands-on activities, flight simulation and many other exciting experiences. The highlight of the week is an orientation flight. These camps enhance a lifelong love of aviation and also the opportunity to create friendships with other aviation enthusiasts. For additional information, the toll-free number is 1.888.322.3229. The EAA web site is www.airacademy.org.

Air academy young eagles camp – ages 12 and 13

The EAA Young Eagles Camp is designed as an introduction to aviation for younger participants. This camp uses small group activities and close counselor relationships to give students the basics. Activities include:

Balloons:

- How balloons fly
- How to design, build and fly a plastic, hot-air balloon model

Aeromodeling:

- How to build and fly a balsa glider
- How to build and fly a rubber-band powered model airplane

Rocketry:

- How model rockets are flown and controlled
- How to build and fly a model rocket

- How to launch, record all parameter of flight
- How to recover rockets

Airplanes:

- The history of aviation
- Technology and science of flight
- EAA AirVenture museum tours
- EAA flight simulator flights
- Pioneer Airport visits
- Flight demonstration observations
- Orientation flights in both an airplane and a helicopter
- Model airplane wing rib building

Air Academy young eagles camp – ages 14-15

This camp is for the next age group and involves similar activities to the first one. Each hands-on activity is developed for the intermediate 14-15 age student. It has a specialized laboratory activities and

3.10 Who can forget those wonderful moments of “fireside” fellowship?



3.11 And when it comes time to get physical get physical! Go! Go! Go!



aviation-related classroom presentations. Activities include:

Balloons:

- Designing, building and flying a basic hot-air balloon model
- Observing a balloon flight demonstration
- Learning the science of balloon flight

Aeromodeling:

- Building and flying balsa gliders
- Building and flying rubber band-powered models

Rocketry:

- Learning the science of model rocketry
- Building and flying a model rocket
- Launching, recording data, and recovering a model rocket

Airplanes:

- Learning about the history of aviation and flight
- Touring the EAA AirVenture Museum
- Flying EAA's Flight Simulators
- Visiting the Pioneer Airport
- Building aircraft components
- **Experiencing a flight in an aircraft and a helicopter**

Air Academy Advanced Camp – ages 16-18

The Advanced Air Academy provides an atmosphere for mature students to become totally immersed in the world of flight. Ground instruction and introductory recreation flight experiences highlight the meaningful, action-packed camp. It combines many in-the-air and in class hands-on activities. The campers get to participate in forums, and all flight-line and other activities associated with the EAA AIR VENTURE, one of the world's largest airshows.

3.12 Students experience good old-fashioned "this-is-how-you-do-it" skills.



Flight training ground school

The Advanced Air Academy Camp curriculum consists of:

- Fundamentals of the science of flight
- Aircraft Systems
- Preflight instruction
- Flight controls and systems
- Weather
- Navigation
- Rules, regulations, and the airway system

Aircraft construction, restoration and maintenance ground school consists of :

This portion of the Advanced Air Academy Camp curriculum consists of:

- Welding
- Sheet metal work
- Fabric covering skills
- Composite fabrication
- Aeromodeling and woodworking

The greatest airshow on earth — AirVenture

- Learn about aviation history and flight
- Tour the EAA AirVenture Museum



3.13 How about a flight in THIS? Image by Alex McMahon

- Fly the EAA's advanced simulators
- Visit the Pioneer Airport
- Experience both aircraft and helicopter flight
- Study the history and technologies of aviation presented in the Buehler Leadership at the EAA Aviation Center
- Get workshop experiences, including an introduction into many of the skills required for the construction, restoration and maintenance of an aircraft. This is accomplished in workstations by working with aircraft parts, the construction of full-size aircraft components and aeromodeling projects
- Attend the EAA AirVenture which will provide an exciting element to the Academy program. The forums, workshops, exhibits, aircraft and air shows provide an aviation experience without equal

For more in-depth information, the reader should contact:

airacademy@ea.org

EAA Air Academy

P.O. Box 3086

Oshkosh, WI 54903-3086

An example of a day-camp for aviation enthusiasts from ages 4 through senior citizens!



That's right—there's a camp that includes grandfathers & grandmothers!

This unique program takes place at the University of Oklahoma. It is called the Sooner Flight Academy and offers:

- Adult Programs
- School programs, designed to complement public school math and science classes
- Youth summer programs for ages 4-18

In their description statement,

3.14 Grandmothers also make great flyers. Courtesy of the Sooner Flight Academy, University of Oklahoma.



3.15 The OU Flight Academy Instructors prepare the “rocketeers” for launch.

the program was described like this: “The OU Sooner Flight Academy facilitates the advancement and growth of aviation and technology to empower learners of all ages in science, math and technology through the exciting world of flight.”

ADULT PROGRAMS offer Teacher In-Service Training—“Incorporates the exciting world of aviation and aerospace in the classroom! Teachers learn to use hands-on activities to teach math and science and motivate students toward higher achievement. Teachers use the thrill of flying to recharge the classroom and provide students with a launching pad for new ideas. Participants receive a ‘flight bag’ of helpful materials such as curriculum, posters, templates, rocket launchers and maps for the classroom.”



3.16 This OU camper said, “it will fly!”
It almost went out of sight!

SENIOR PROGRAMS are also part of the Sooner Flight Academy and provide exciting aviation programs for senior adults. The outreach is known as Elderlearn. It is an exciting 3.5 day program providing adult learners with an overview of aviation, aerodynamics, rocketry and a very informative ground school. Grand Camp is an intergenerational summer camp which allows grandparents and/or parents to team up

with their grandchildren/child ages 9-12 for a week-long, high-flying time at flight camp.

Air Force Junior Reserve Officer Training Corps (AFJROTC)

The **mission** of the Air Force JROTC is to develop citizens of character dedicated to serving the nation and their community. The **goals** of the organization are service to our country, personal responsibility and a sense of accomplishment.

The AF Junior ROTC staff includes 28 headquarters personnel, eight regional administrators, and more than 1,800 retired Air Force military instructors. There are 869 Air Force JROTC units with 105,000 cadets in high schools across the United States and selected Department of Defense Dependent Schools in Europe and the Pacific. This also includes public schools in Puerto Rico and Guam.

The Air Force JROTC provides leadership training and an aerospace science program for high school students. Secondary school students who enroll in the program are offered a wide variety of curricular and extra-curricular activities. The program explores the historic and scientific aspects of aerospace technology and teaches high school students self-reliance, self-discipline and other characteristics found in good leaders. AFJROTC is open to 9th through 12th grade students who are physically fit and citizens of the United States. The program is not an official recruiting tool for the military services and those students who participate in AFJROTC do not incur any obligation to the Air Force.

Along with the aforementioned goals, the objectives of the



3.17 A line-up of trainers at Embry Riddle Aeronautical University.
Courtesy of Adam Wright.



3.18 Four F-16s of the Colorado Air National Guard over Iraq.
Image courtesy of CO ANG.

AFJROTC program are to educate and train high school cadets in life skills, promote community service, instill responsibility, and develop character and self-discipline through education and instruction in air and space fundamentals and the Air Force's core values. Those core values are *Integrity First*, *Service Before Self*, and *Excellence In All We Do*.

The AFJROTC curriculum

Aerospace Science comprises 40% of the curriculum, Leadership Education 40%, and **Physical Fitness for Life** 20%. All students who successfully complete AFJROTC classes are granted credit for graduation. Classroom study includes **heritage of flight, development of aerospace power, contemporary aviation, aerospace environment, human requirements in flight, aerospace vehicles, principles of aircraft flight, navigation, space programs, space technology, rocketry, propulsion and the aerospace industry.**

Students are also introduced to military customs and courtesies, flag etiquette, citizenship, survival training, first aid, **wellness, health and fitness**, basic drill and ceremonies, effective communication, basic management skills, human relations and life after high school. All uniforms and curriculum materials are provided by the Air Force. Supplemental materials are also provided to enhance the curriculum.

To reinforce what is learned in the classroom, cadets participate in many outside activities such as field trips to military bases and aerospace facilities and industries, museums, civilian airports and other areas

related to aerospace education.

Cadets participate in parades, summer leadership schools, drill team competitions, color guards, honor guards, honorary academic groups, and a magnificent military ball. Many AFJROTC units complement their curriculum through cooperation with NASA, the Civil Air Patrol and the National Endowment for Financial Education.

Instructors

All AFJROTC instructors are retired Air Force commissioned and noncommissioned officers. The instructors maintain Air Force standards and are trained through the Air Force JROTC Academic Instructor Course. They are full-time faculty members of participating high schools and are employed by local school boards. There are approximately 1,809 instructors serving in the 794 units around the world.

Community service

Community service is a major part of the cadet experience and it helps instill a sense of civic pride and citizenship. Projects range from working with national organizations, like the March of Dimes, Muscular Dystrophy, the National Red Ribbon Week Campaign and Special Olympics. AFJROTC cadets participate in local projects, such as cleaning and refurbishing parks, public facilities and Little League baseball teams.

Drug abuse prevention

Cadets are also very active in drug abuse prevention education. The Awareness Presentation Team is a program designed to



3.19 Cessna C172.

showcase cadets as positive role models for elementary and middle school students. Cadets visit the younger students and present talks and skits in an effort to deter drug use and abuse. They make presentations to thousands of students each year.

Scholarships and other benefits

AFJROTC cadets who choose to continue their education may receive special consideration for college AFROTC scholarships. Many of these scholarships will pay for two, three, or four years of tuition, books, and fees at numerous universities and colleges. They allow cadets to pursue studies in various technical and non-technical majors.

Cadets completing two years of AFJROTC and continue into college Air Force ROTC programs may waive one term of the college AFROTC program. Students completing 3 years in AFJROTC may receive credit for a full year of college level ROTC.

In addition, cadets electing to enter the military immediately after graduating from high school are eligible to enlist in the services at one to two pay grades higher than other enlistees. Students completing three years in AFJROTC are eligible to enter the Air Force two pay grades higher than other enlistees and are automatically enrolled in the Community College of the Air Force. This provides college credit towards their Associate Degree.



3.20 American Airpower--F-15, P-51, F-86, and F-16 in formation.
Image courtesy of Adam Wright.

AFJROTC contact information

If you wish to get more detailed information contact : Public Affairs, Headquarters Air University, 55 LeMay Plaza South, Maxwell AFB, AL 36112. Their phone number is 1.334.953.6371.



3.21 The magnet schools of today are producing the pilots and aircrew members of tomorrow. Their exciting future may be in this Joint Strike Fighter. Image courtesy of Lockheed Martin.

Aviation / aerospace magnet school list

Dr. Frank G. Mitchell, said that according to his research, the following programs were in operation as of the 2007-2008 school year. Programs, like aviation & aerospace magnets, often receive special funding. When this money is no longer available, the programs can get cancelled. Another factor is career changes in staff members. Former military pilots, airline pilots or other career professionals are often hired to run aviation courses. Other job opportunities or a full career retirement of the teacher can sometimes end a program.

If you are located in a city where one of these aviation specialty programs exists, you should call the school and ask if the aviation/aerospace program is operational. If the answer is affirmative, the next step



3.22 Many times, youth have the opportunity to take "airlift flights" on some military airplanes like the C-130 Hercules. Image courtesy California Air National Guard.

is to make contact with the person who is running it and set up a visit. If the facility looks exciting, you might want to consider it as a pre-career educational option. This list may open the door to a program that could be a “first step” for a career in aviation. A contact web site is www.faa.gov/education.

Aviation magnet schools appear to be quite popular choices for students interested in post-secondary aviation educations.

For information regarding magnet schools contact:

Dr. Frank G. Mitchell, Professor
 Department of Aviation
 College of Continuing Education
 Oklahoma University
 Westheimer Airport, 1700 Lexington
 Norman, Oklahoma 73069
 Email: fm20@cox.net

Aviation exploring-learning for life

Aviation Exploring is a career education program for young men and women who are at least 14 years old. The purpose is to provide experiences to help young people mature and to prepare them to become responsible and caring adults.

Aviation Career Exploring Posts can be sponsored by aircraft businesses of all types, airlines, FAA, EAA, soaring clubs, college aviation programs and other aviation organizations. There are well over 100 Explorer Posts and 2,200 youth members throughout the United States.

Explorers have opportunities for orientation flights in helicopters, gliders, single-engine general aviation aircraft and in some cases, military airlift . Air Force bases, aviation museums, air shows and FAA facilities such as control towers and ARTCC centers can be visited by the Explorers.

The program tries to match interests of young adults with available

3.23 Civil Air Patrol,
Always Vigilant!
 Image courtesy of
 Alex McMahan.



aviation resources. The goal is to build a well-balanced program around Aviation. Exploring has five areas that include: (1) career opportunities; (2) leadership experience; (3) life skills; (4) citizenship; (5) and character education.

For additional information please contact:

Learning For Life National HQ
1325 West Walnut Hill Lane,
P.O. Box 152079
Irving, TX 75015
www.aviationexploring.org. is their contact web site

4-H Youth Development

4-H Youth Development programs impact more than five million young people throughout the nation in a variety of educational efforts. In 1994, a strategic plan entitled “Partnerships for Aerospace Education and Workforce Preparation,” was developed. The plan led to a 4-H aerospace curriculum packaged as a set of printed materials as well as on a CD-ROM. An additional piece provided is a Helper’s Guide that includes group activities and guidelines for community organization. The following is a description of the 4-H Aerospace Adventures Curriculum showing how the fascination of flying an airplane, launching a rocket, exploring space and becoming an astronaut or pilot comes alive through youth activity guides:

- **Pre-Flight.** Kids learn how an airplane works and they have fun with many hands-on, age-appropriate, activities. (Grades K-2)
- **Lift-Off.** In this unit, students get to fly kites and build straw rockets. They also learn communication, decision-making, problem solving, teamwork and other life skills. (Grades 3-5)
- **Reaching New Heights.** At this level, the young members learn about flying an airplane, launching rockets, conquering space and pilot/astronaut training. Controlling aircraft flight direction and Space Shuttle technology add to this experiential curriculum. They also learn more advanced problem



3.24 4-H members prepare to fly an electric park flyer.

solving, team work and the wise use of available resources. (The age range is for grades 6-8)

- **Pilot In Command.** Students create their own altitude trackers, determine fuel efficiency for long range aircraft flights and other problem-solving skills. The program includes a study of pilot certification requirements, past and present navigation systems, the importance of an airport to their community, state and nation. Life skills include creative thinking, decision-making, and resource management. (Grades 9-12)

Go to National 4-H Curriculum (<http://www.4-hcurriculum.org/>) and search for aerospace.

Mission Mandates for 4-H include:

- Science, Engineering, & Technology
- Healthy Living
- Citizenship and Leadership

In addition to aerospace education, outstanding programs in these areas lead youth to a productive and positive experience in the workplace, their community, and their world. 4-H programs help assure good physical health, drug avoidance, the development of an excellent mental attitude, respect for others and an appreciation for our country.

For more about 4-H visit these national 4-H web sites or simply search for 4-H online:

National 4-H Headquarters: <http://www.national4-hheadquarters.gov/>

National 4-H Council: <http://www.fourhcouncil.edu/>

For additional information about aerospace education in 4-H please contact:

Dr. Tony Cook, Extension 4-H Specialist
 Science & Technology Literacy
 214 Duncan Hall (ACES)
 Auburn University, AL 36849-5620
 Phone: 334.844.2233
 E-mail: cookjal@auburn.edu

**Former CAP Spaatz cadet, Heather Cook,
 has created a book called the aviation
 scholarship directory 2009**

Ask any struggling flight student about the cost of flight training and the response will range from frustratingly high to impossible. With maintenance costs rising as airplanes age, and gas prices increasing

without any sign of relief, flight training is a good way to get poor fast. But the situation is not hopeless. On the contrary, there is an easy solution. The answers are in the *Aviation Scholarship Directory*. This publication tells how to find and win scholarships for all aviation goals. This comprehensive publication for aviation scholarships shows new and advanced flight students how to reduce the cost of their flight training by letting someone else pay. Flight training scholarships take an average of \$2,000 off the total expense, per scholarship, per rating. Plus

there is no limit to how many you can apply for or win! The *Aviation Scholarship Directory* will show you how to find and apply for several scholarships and increase your chances of winning every one. In fact this book will be your constant reference through every stage of the process. With detailed instructions, Heather Cook takes the mystery out of scholarships. You will learn how to select your personal best-chance scholarships, prepare your application, write the essay, get great letters of recommendation, prepare for an interview, and mail the completed package on time. Today there is a rise in flight training expense, and the possibility of more user fees just around corner. With tried-and-true techniques and the most complete, up-to-date and accurate resources for aviation scholarships, you can fly more often, easier, and for less money.



3.25 *The book everyone is talking about. Heather Cook's Aviation Scholarships 2009. The web site is phoenixflightpublications.com.*

Meet Heather Cook, CAP Spaatz Award recipient and author

The following web sites are recommended for the several reasons: (1) They have an extensive listing of schools; (2) One has listings by state so you can find schools close to home; (3) All have a good reputation in the aviation community.



*3.26 Former Civil Air Patrol Spatz Cadet,
Author Heather Cook standing by her Cessna 172.*

1. ***Best Aviation Directory*** — Showcases aviation schools across the nation. www.bestaviation.net/all_schools.asp
2. ***Aircraft Owners & Pilots Association*** — Excellent resource. www.apoa.org/learntofly/startfly/college_search.cfm
3. ***Avscholars*** offers an extensive listing of college programs. www.avscholars.com/Aviation_colleges/research_aviation_colleges

This is just a very small number of what's available. The student should start with one of the three recommended sites and then talk career plans over with parents, college counselors, and even a few pilots.

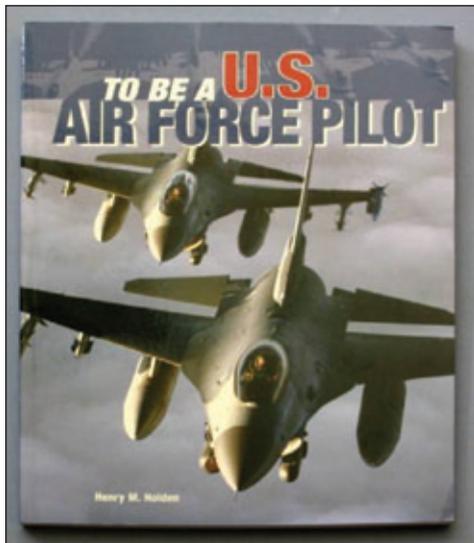
Becoming an air force pilot

Becoming an Air Force pilot involves college training and generally there are two avenues aspiring pilots take. First is the Air Force Reserved Officer's Training (AFROTC) program. The second is the U.S. Air Force Academy. High school students who are interested in either of these options are encouraged to research the following:

www.baseop.net/militarypilot/

<http://www.airforce.com/careers/officer/careers/php>

3.27 This excellent book, by Henry M. Holden, is available at the more popular bookstores or online at sites like Amazon.com. The ISBN number 0-7603-1791-7.



**Party-time or professional pilot—
make a commitment now**

One last thing, college is a place where you will be tempted to drink, experiment with drugs and spend a lot of time partying! Don't do it! Why take the risk? Your career can end with a drug or alcohol problem. You're going to be a pilot—make the commitment now! Stay clean, stay strong and stay focused to make it happen.



3.28 F-16 of the Mile High Militia, or CO Air National Guard, on tour in Iraq. Image courtesy of COANG.

PART FOUR

**Fun things you can do
with an interest in aviation**



This is a wonderful chapter about fun things you can do when you have an interest in airplanes and flying.

The hobby shop

If you have an interest in airplanes and you don't have the time or a way to get to the airport, why not try model airplanes?

Model building can be very rewarding and the selection is incredible. If you are totally immersed in other life pursuits and don't have much time for a hands-on hobby, you can find a great selection of pre-built, pre-painted die cast models.

If your interest is in model rocketry, and you are thinking of

4.1 This beautiful die-cast model is an F-16, already built, already painted and ready to sit on your desk!



4.2 This shows the real F-16 and you get an idea of how close the model's paint scheme and detailing is to the Falcon. Image Courtesy of Adam Wright.



4.3 This shows only about one-half of the plastic model airplanes in a big hobby center.

participating in Civil Air Patrol’s MODEL ROCKETRY Program where else but a hobby shop can you find a better selection? Not only do they have the models, but they also carry a big supply of building products, such as precision knives, paint, glue, masking tape, sanding supplies, and extra plastic to make custom parts, decals, balsa and foam plastic. They even have model “people,” such as pilots and air crew, to enhance your display. everything you need for model building and flying can be found at the hobby shop. It’s a great place to meet others with similar interests!

An interview with IPMS (International Plastic Model Society) national champion aircraft model builder Dekker Zimmerman

“I’m Dekker Zimmerman and I am a graphic designer. My father and I also own a hobby center specializing in trains. I have had an interest in model building since I was very young and my first project was a 1/48th scale Hawker Typhoon. I was six years old, but at the time I thought gold racing stripes made it look cool! Everyone said it looked great and in those early years, I found that model building was a great

way to get recognition. Looking back, it really helped me build self-esteem. I loved to read about airplanes and I read everything I could about flying and especially aviation history. This opened up the world to me and I became interested in other cultures through aviation.

My interest in model building continued to grow and by the time I reached high school, I was building some pretty good

aircrafts. Luckily, I had a teacher who had an aeronautics program and an afterschool aviation club. We built airplanes, took orientation rides in real airplanes and decorated the halls with the history of flight. There were eight students in the club, and this gave me a wonderful circle of friends. The aeronautics course really sparked my interest in science and technology. In college, I majored in industrial design and aviation was my minor.

Five of my models have won National Championships. The P-47D-30-RA, shown in image 4.6, won in the 2007 IMPS Nationals in Los Angeles. The paint scheme is the Escuadron Aereo de Pelea 201, Fuerza Aerea Expedicionaria Mexicana (FAEM). This was part of the 58th Fighter Group in the Philippines, circa 1945. The markings were all hand-painted since decals were not available. The Messerschmitt Bf-109G6 won first in the 2003 Nationals in Oklahoma City. It is done in Hungarian markings of the 101/2 Puma Squadron, circa 1944.

Regarding the drug issue, I do not, nor have I ever experimented with alcohol or drugs. Model building is the only “high” I need. I have also found that most modelers are very “anti-drug” minded. I know this because drugs, like marijuana, destroy ambition and diminish modeling skills. I know this for a fact because a good friend of mine used to build model trucks and he was one of the best in the country. During his teens, he became a frequent user of marijuana and then he got in with the “pot-heads” at school. From that time on, he gave up modeling, he was never able to keep a long-term job. I think people who stay with model-building as a hobby have a higher sense of self-worth. Drugs and alcohol ruin lives and destroy family bonds and friendships. My



4.4 Dekker Zimmerman (left) receiving one of his many regional and national awards in aviation modeling.

ambition and peer recognition mean far more to me than a temporary high.

The **International Plastic Model Society**, (IPMS) is a national organization that has chapters all over the world. The first chapter started in England in the late 50s and has been growing ever since. Their goal is to promote model building skills and to sponsor local, national and international competitions. Their web site is www.ipm-susa.org. The membership also works with groups like Cub Scouts and they even send model kits and supplies to our troops in Afghanistan and Iraq.

For ‘words of wisdom,’ I would recommend that kids try building a model. If they find it fascinating, then maybe join a local IPMS chapter—they’ll find friends with similar interests and they are a great support group. Modeling can lead to careers in engineering, design, aerospace technicians and of course, flight training.

Electric radio control

Today, we have radio controlled airplanes that are battery powered and this is great for several reasons. The main one being, they are quiet and can be flown in small parks, school yards, and even indoors. The airplanes are usually made of plastic, foam, or balsa and they can withstand several experimental crashes. It’s easy to go fly one of these electric airplanes.

One of the all-time great airplanes in



4.5 ... And his Spectacular National Champion P-47D Thunderbolt.



4.6 Dekker's 2003 champion Messerschmitt Bf-109 in Hungarian markings.

aviation history is a Piper Cub. To illustrate how you can combine learning about the rich heritage of aviation history with a hobby, this next section will focus on the Piper Cub — as both an actual plane and a model aircraft.

The incredible history of the piper cub

Gil Taylor and his brother established the Taylor Brothers Aviation Corporation in 1929. One of their famous designs was known as the Taylor Cub and it first flew in 1930. The company had a difficult time in the Great Depression; however, in 1937, a wealthy oilman by the name of William T. Piper took over the ownership and his financial strength kept the business alive. The Taylor Brothers Aviation Company thus became the Piper Aircraft Corporation.

Out of this new venture was born the Piper Cub, a 40 horsepower, high wing, monoplane powered by a Continental A40-4 engine, commonly known as the J3 Cub.

Just before entry into World War II, the United States government implemented what was known as the Civilian Pilot Training Program (CPTP) and the aircraft that was most commonly used was the Piper Cub. In 1940, 3,016 Cubs were built and, at the peak of wartime, a new Cub left the factory **every 20 minutes!** It was estimated that over 50,000 pilots began their flight training in Piper Cubs.

In 1941, the U.S. Army selected the Cub for artillery spotting. They soon learned that this versatile airplane had capabilities far beyond the Army's initial expectations. Modified for many tasks, the Army



4.7 One of the greatest airplanes in history was the Piper J3 “Cub.” Before and during World War II, it trained more than 50,000 pilots. This beautiful trainer was photographed within just a few feet of a runway by Adam Wright.



4.8 This Aeronca Champ was also a popular early training airplane. Image courtesy of Alex McMahon.

version was designated as the L-4 Grasshopper. The Navy had a number of these Piper-built airplanes and their designation was the NE-1.

Specifications for the 65 horsepower version gave it a maximum speed of 85 miles per hour and a service ceiling of 12,000 feet. The range was just under 200 miles and the gross weight was 1,220 pounds. The airplane had a wingspan of 35 feet, 2 inches and a length of 22 feet, 3 inches.

The Piper Cub also has a history with the Civil Air Patrol. During WWII, many civilian pilots contributed to the war effort by flying coastal patrol duty in their own private aircraft. Many of these “sorties” were flown in the bright yellow J3. When the Civil Air Patrol organization was formed, hundreds of pilots conducted exhaustive searches for German submarines, known as U-Boats. When a U-Boat was sighted off the coast of the United States, submarine crews would try to shoot the search planes down. As a result of the inability of the Army and Navy to react fast enough, the AAF (Army Air Forces) began arming the CAP airplanes with bombs. During the war, two U-Boats were sunk by CAP aircrews. Several CAP airplanes were shot down and many of their crews died in the cold Atlantic Ocean.

Because of the nature of the mission, early CAP aircrews became known as the “Flying Minutemen.” They would leave their homes in the morning, go fight in the war, and return home for dinner in the evening! This is similar to how the “minutemen” fought in the Revolutionary War. The term “minute” was based on the idea that it only took these citizens a “minute” to arm themselves and fight.

Having fun building and flying a beginner's electric J3 Cub

Now that you know a bit about the J3 Cub's history, you may want to try building an electric model flyer! So, go to your favorite hobby shop to pick out what will work for you. Or, if there is no shop near you, try the internet! Once you get the kit you want, try following guidelines prepared using a Cox Electra Cub kit:



4.9 An electric flyer with a Civil Air Patrol history, the J3 Cub.



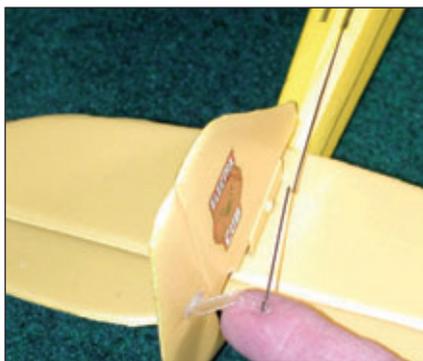
4.10 It's a good idea to identify all of the parts first.



4.11 Charge up the batteries with the enclosed charger.



4.12 The propeller is now fitted.



4.13 The rudder control horn is positioned.

- It's always a good idea to first lay out the parts of the kit. If something is missing, the hobby dealer, or store where it was purchased, should be notified immediately.
- Once the builder is sure that the Cub's parts are all included, it's time to get the flight battery charged. The charger comes with the kit and must be plugged into a wall outlet.
- The instructions have a warning that says, "Do not charge flight battery longer than 3.5 hours." There is also a warning about the wall charger that states, "Always unplug wall charger when not in use." Follow these instructions.
- The Cox Cub comes with two propellers. Installation is easy; simply press fit it to the electric motor shaft. It is recommended that the builder leave 1/16th of an inch gap between the nose and the back of the hub.
- The rudder control horn is now set. It is attached to the control pushrod in one of three positions. For the first flight, mount it into the outer hole.
- A small Phillip's screwdriver is used to secure the rudder to the fuselage. A bracket, mounted on the horizontal stabilizer, has a hole in it and the screw that comes with the kit is attached at this point.



4.14 The vertical stabilizer (fin) is now secured with mounting screws.



4.15 CAP Major Russ Grell is an avid electric model airplane builder. He prepares the J3 for a field test.



4.16 This shows the location of the battery in the model's fuselage.

- The battery is placed just aft of the windshield. The battery is connected and placed in this position for proper balance of the Cub.
- A rubber band adjustment, based on the power of the motor and estimated flying characteristics, may be in order prior to flying.

This Cub is made of a very strong, but sometimes brittle, plastic foam. If you're going to try this one, it's recommend that you try a flying area like a soccer field or some other wide open grassy area. The model can be hand launched. When it runs out of battery power, it simply glides in for a soft landing. When you launch & land a model like this on an asphalt or concrete area, there's a fair chance it will break. If you fly it in a park, or on grass, it will give you a better chance to learn about flight controls. So, after a bit of practice; when you think you have the skill to land it, THEN try the hard surfaces. This takes a while, but it's worth it in the long run.

If you are a "first-timer," electric models are the way to go. Just like this Cox Electra Cub, it's cheap, it's forgiving and it will take a lot of landings. Once you've caught on to the fun of electric radio control, it is highly recommended that you consider a radio-controlled (R/C) flight simulator. You can practice all you want on the simulator, learning the correct eye-hand coordination, and, then, when the time comes to go outside and fly, you can spend a little money and get an R/C trainer. From then on, the "sky's the limit!"



4.17 Major Grell makes some final adjustments to the rubber bands and wing mounts.



4.18 The control system (rudder and throttle) is now checked with the radio on.



4.19 The symmetry and dihedral is given a final check, and re-checked at about 50 feet away. (The dihedral is the angle between the wing center and wing tip.)



4.20 The fin requires a final adjustment before flight.



4.21 The airplane is given one final check for proper alignment. Russ also adjusts the landing gear position and dihedral



4.22 The moment of truth – will it flies under its own power?

A radio controlled flight simulator!

It's true! They have a flight simulator for radio control airplanes. It's the coolest thing ever. First there was the Microsoft Flight Simulators and now they have several on the market for R/C flight.

First, read the directions, load the software and install it according to the recommendations of the manufacturer. The radio is then hooked up.

On the back of the box of the "Real Flight Simulator" shown in **Image 4.23**, the company had this to say about their flight simulator: "True to the physics of flight, RealFlight's™ exclusive RealPhysics™

technology calculates hundreds of thousands of floating point operations per second and delivers sizzling real-time flight performance. ... Generation 2 makes it even easier to get into simulated R/C flying! You can superimpose your radio on-screen and see the actual stick movements as you perform them, and instantly see the effect they have on the model you're flying. The Windows-based pull-down menus let you make adjustments on the fly, without exiting the main screen."

This simulator system has a huge number of models to select from including helicopters, gliders, electric park flyers, combat fighter prop and jet aircraft, Cessna 182s, homebuilt custom airplanes, and even the Wright Flyer!

The programs have very realistic-looking airports. These sites have buildings, trees, pylons, mountains and lakes. Great Planes has this to say about the scenery: "Over 5000 square miles of flying fun! The largest flying regions of any R/C stimulatory...created from hundreds of MB of satellite imagery and digital elevation data. You run out of



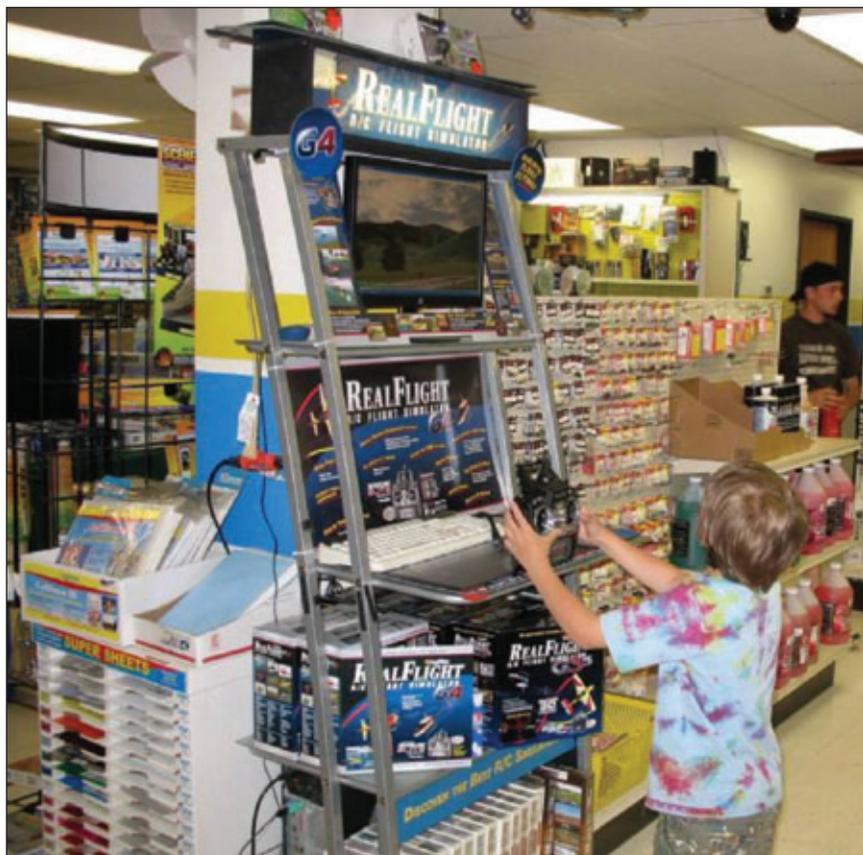
4.23 This is an R/C Flight Simulator made by the company, Great Planes. It is called "Real Flight Simulator" and comes with software and a real Futaba control box.

fuel before you run out of new scenery to explore.”

Regarding their incredible backgrounds, “Generation 3 goes far beyond the 2-dimensional billboard look of other simulators. It’s a living, breathing environment – fliers can immerse themselves in the realism. Trees sway in the background; clouds on the horizon follow the path of the prevailing winds; glare increases and subsides in relation to the position of the sun. Background objects even reflect off of the aircraft.”

There are many other quality R/C simulator products on the market. Find what you like and begin the adventure!

The eye-hand coordination is transferrable and you can become a “top gun” pilot in no time. Like anything else in aviation, it requires focus and concentration—drugs and alcohol can impair those skills!



4.24 This little guy is all of 6 years old and was enjoying himself with the Real Flight™ simulator. When it comes to flying, you can't start too soon!

Check out some of the virtual aircraft choices



4.25 The RICSim Piper J3 Cub will give you gas-powered characteristics and how they differ from the Cox Electra J3 Cub.



4.26 The magnificent P-51 Mustang!



4.27 A North American great is the F-86 Saber Jet. It's fast!!!



4.28 The Ryan STA is beautiful modified trainer made into an air racer. Great Planes also makes an ARF (Almost Ready to Fly) version of this aircraft for radio control flyers.



4.29 If you want low & slow, there is the option of this airship.



4.30 The Wright Flyer on December 17, 1903 it flew 120 feet, rose to an altitude of 12 feet and it all happened in 12 seconds!

A radio control model fly-in It's time to get real - the big warbirds



4.31 A WIDE RANGE OF INCREDIBLE RADIO CONTROL MODEL AIRCRAFT ARE AVAILABLE TO THE HOBBYIST. YOU CAN START AT AROUND \$60. Serious R/C builders can spend more than \$2500 on one model and this is just the start of a collection! But...it's cheaper than golf!

Every year, a group of extremely talented radio control flyers gets together at various venues around the country. Hundreds of model “warbirds” from all around the United States are brought together for display and daunting demonstrations. Almost without exception, the detail in each plane is incredibly accurate, and, aside from the sound in flight, they look REAL. So, what exactly is a warbird? The term was derived from the use of planes in combat. If you’re up for a little history



4.32 A National Championship Meet for radio control "war birds." It was not uncommon for these airplanes to cost well over \$5000.



4.33 A great combat fighter during WWI was this Sopwith. The British Commonwealth countries, the French and eventually, the Americans, all fought together against the Axis powers.

lesson to explain further, read on!

War is terrible, and millions of young men and women have lost their lives in the service of their country. One of the few benefits derived from war is the advancement in technology. From an aerospace standpoint, two World Wars and numerous other conflicts have brought about incredible advances in the technology of aerospace. Just look at the fighter planes currently protecting our country. But, back to history...

When the conflicting Allies and Axis powers entered World War I, the airplane was just an airborne scout looking at enemy activity in the skies over Europe. As the War progressed, however, the airplane became a killing machine. Back then, the media called them the “Knights of Air.” The pilot was the knight and the airplane was the “horse.” In the beginning, the pilots shot at each other using hand-held firearms. Later on, they attached guns to the fuselage or wing, and aimed the airplane at their target. The aircraft became what is now known as a “gun platform.”

After WWI, the airplane developed into a transport for hauling cargo and people. Also, during this period, pilots raced airplanes and all of this technology eventually ended up in war machines.

The term “Warbird” fits the combat aircraft because in the skies, there was the hunter and the hunted, just like birds of prey. If your airplane was faster, more maneuverable and better protected from damage, there was a good possibility that you could be a better hunter.

The “Buzzle.com” web site, defines a model warbird as, “... a model of any aircraft used for military purposes by any country at any time. It must be a scale or semi-scale rendering, recognizable as such, and marked accordingly. Any prototype offered to the military, but not accepted would also fall into the category of a ‘Warbird Aircraft. It cannot be a model of any aircraft made to look like a ‘Warbird Aircraft’ by

*4.34 Now this is detail ...
It's the cockpit of a P-47
Thunderbolt. Inside is
flying ace, Dave
Schilling, of the 56th
Fighter Group, 8th Air
Force, England WWII!
Look at the number of
Germans he shot down.
This is a classic
example of the term,
“WARBIRD.”*





4.35 It's called a "Fly-In." This is a time when R/C pilots get together to enjoy flying their aircraft, competing for awards and just enjoying friendships. This is not a place where you will see beer being consumed. It takes focus, concentration and good eye-hand coordination to fly radio-controlled airplanes. You have heard, "don't drink and drive." RIC flyer say, "don't drink and fly ... even model aircraft!" Can you imagine crashing a \$5000 model airplane because you've had a beer or two?

applying military markings to it." This quotation is directly from the WMWA (World Miniature Warbird Association) Constitution.

If you are interested in building scale wartime aircraft, first check out what they have at a local hobby shop. You can find electric model warbirds that are easy to fly and not too expensive in case you crash. From the electric flyers, you can move up to gas powered aircraft and off you go! Go to the Internet and check out the various web sites that specialize in this type of aircraft. There are fighters, bombers, transports, gliders and helicopters to choose from.

Your next move might be to join one of the warbird organizations in your area and go to one of their "Fly-Ins." These are get-togethers where people from all over come together to fly their airplanes and share fun and friendship. These R/C clubs can give you great advice on where to go and how to shop for the best deals on airplanes. Also, you get to meet people who share the same passion as you do—it's all about flying!



4.36 Check out the machine guns and rocket pods attached to the wing on this exact replica of a D-model Thunderbolt!



4.37 The jet fighters always make a hit at model air shows. Here, we have the T-38 Talon and the Navy's F4 "Blue Angels" Phantom. They are fast!



4.38 A pilot gives his P-51 a run-up by standing between the wings and the elevator.



4.39 Onto the runway, full power, and a little up, elevator!

It's air show time

If there is ever an opportunity to attend an airshow, do it! All kinds of airplanes, from warbirds, to sport planes, to experimental aircraft, to fighter jets convene at a big flying field and delight the audience with their feats in the skies! This is a great place to meet pilots and other aviation enthusiasts who can answer questions about aviation as a vocation (career) or avocation (hobby).



4.40 One of the great warbirds, the beautiful Avenger.
Photo Courtesy of Frank E. Mills, Sr.



4.41 Today's most advanced fighter, the F-22 Raptor. Image by Adam Wright.

4.42 A Fabulous shot of an F-86 doing a knife-edge pass. Where else but an airshow?
Image by Alex McMahon.



4.43 Cessna 185s, the Skylane, neat the thunderbirds to “wow” the crowd.



4.44 Where else could you get a fire-belching tractor and biplane screaming through the action....?



4.45 Adam Wright was at the right place and the right time to get this great shot of the F-117 Nighthawk Stealth Fighter!



*4.46 If you save your money and are willing to pay the price, you can actually go fly in some of America's all-time great warbirds like this B-17 of World War II.
Photo courtesy of Frank E. Mills Sr.*

Hot air balloons – if you haven't ridden in one, you should!

At many airshows, or even at their own “show,” hot air balloons are always a beautiful sight to see. Piloting them, flying in them, or watching them is an experience like no other.



4.47 They're the original “powered” aircraft. The Montgolfier Brothers created a hot air balloon and flew it in France in 1783.



4.48 If you get a chance, go fly in a hot air balloon. It's quiet—and you float on the wind! It's great. Images courtesy of Bernie & Mary Ann Gehan

Aviation & movies! Here's a new term — fly-flix!!!

If you like airplanes, then you have to really enjoy MOVIES about airplanes — “plane” & simple! Whether they are the old classics or the latest future technology, they are great to watch!

One of the most fun times is to get a bunch of “airplane buddies” around the TV and watch an aviation movie together. Then, while the movie is going on, laugh at Hollywood’s BIG MISTAKES like “... Ace, you’re cleared to land on Runway 88!” There’s no such thing as a runway 88! It’s all fun and some of the movies, like the *Battle of Britain*, are historically correct and have some incredibly realistic aerial combat scenes.



4.49 Just like the old time movies, here is an old time airplane, the Waco YMF.

With thanks to Major Bill Jackson, CAP Aerospace Education Officer the New Mexico Wing, here is a list of some of the all-time great airplane & space movies:

- | | | |
|----------------------|----|------|
| 1. Air Force | NR | 1943 |
| 2. 633 Squadron | NR | 1964 |
| 3. Apollo 13 | PG | 1999 |
| 4. Air Force One | R | 1998 |
| 5. Bat 21 | R | 1988 |
| 6. Battle of Britain | G | 1969 |
| 7. Blue Max | PG | 1966 |
| 8. Dawn Patrol | NR | 1930 |

9. Dish (The)	PG-13	2000
10. Flight of the Intruder	PG-13	1990
11. Flight of the Phoenix	NR	1965-2002
12. Fly Boys	PG-13	2006
13. Flying Tigers	NR	1942
14. Hanover Street	R	1979
15. High Road To china	PG	1983
16. Hindenburg (The)	PG	1975
17. Lafayette Escadrille	PG	1958
18. Magic of Flight	NR	1996
19. Magnificent Men in Their Flying Machines	G	1965
20. Memphis Belle	PG-13	1990
21. Midway	PG	1976
22. October Sky	PG	1999
23. Pancho Barnes	PG	1988
24. Pearl Harbor	R	2001
24. Piece of Cake (a British series)		1988
25. Right Stuff	R	1983
26. Rocketeer (the)	PG	1998
27. Rocket Men (documentary)	NR	1994
28. Spirit of St. Louis	G	1957
29. Strategic Air Command	G	1955
30. Stealth	R	2006
31. Test Pilot	NR	1938
32. Thirty Seconds Over Tokyo	NR	1944
33. Top Gun	PG	1986
34. Tora, Tora, Tora	G	1970
35. Tuskegee Airmen (The)	PG	1995
36. Twelve O’Clock High	NR	1949
37. Von Richthofen & Brown	PG-13	1971
38. Waldo Pepper (The Great)	PG	1978
39. Command Decision	NR	1949
40. The Aviator (Howard Hughes)	R	2006
41. Dog Fights, Season One A & E Documentary Series		2007

This is a good list, but it is not complete. It does not contain several space movies like “Space Cowboys” or “Amageddon.” It does cover the vast majority of airplane-related movies and if you want a hobby that will keep you entertained for years, go to Amazon.com or other movie-sellers and start a collection. “Popcorn, pop n’ planes! Bring on the show!”

Unfortunately when people gather for a good time there are sometimes alcoholic beverages present, and in some cases, illegal drugs. Remember that these things can seriously affect your chances of becoming a pilot & can have adverse affects on your overall health. Make the right choice — avoid drugs and alcohol!

You have a wonderful career ahead of you as a pilot and absolutely nothing is going to change your course.



*4.50 Adam Wright had some great experiences as a Civil Air Patrol cadet. He's now a first officer for Atlantic Southeast Airlines.
Image courtesy of Adam Wright.*

PART FIVE



Getting your “ticket”
& passing the medical



5.1 This is a two-place weight-shift control aircraft.
This image is by Adam Wright.

By the book

Nowhere is the old saying “You gotta do it by the book” more true than in aviation. The “book” is a set of rules, known as the **FARs, or Federal Aviation Regulations**. Everything regarding pilot certification and the operation of an aircraft is regulated by the Federal Aviation Administration, more commonly called the “FAA.” Because everything is regulated by law, you must learn right from the beginning how it works.

A classic example of incorrect use of the FARs is the use of the term “pilot’s license.” Everyone basically refers to getting their “pilot’s license,” but the FARs use the word **Certificate**. **FAR Part 61** covers pilot “**certification**” and that is where we will start.

The rules say you must have two things with you at all times: (1) your **Pilot Certificate** and (2) your **Medical Certificate**. The **pilot’s certificate** has a “slang” expression and it is called a “**Ticket**.” The medical certificate is, in pilot talk, just **the “Medical.”**

Being a pilot

Some people think they are not smart enough to become a pilot — this is unrealistic thinking. Anyone can become a pilot. In real life,

being a pilot requires:

- A dedication and a strong desire to succeed
- A clean, drug-free body that can pass an FAA Medical Examination
- Ability to pay for the use of an airplane and the services of a qualified, certificated instructor

Learning to fly an airplane is like learning how to play a sport. While in training, flying an airplane is not a “team sport.” Later on, when you enter the professional world where complex airplanes require two pilots, it becomes a team effort. Initially, however the responsibility of good performance rests squarely on your shoulders.

Somewhere in your training, you’ll be stopped on the ramp and the instructor is going to climb out of the cockpit and say, “You’re ready.” At that moment you are going to have to show the world that you can do it alone. This is called “going solo.” On your way home from the airport that day, your life will be changed. You will stand about ten feet taller than you did when you arrived at the airport. It may cost you quite a bit of money to reach that level, but it will be one of the best investments you ever made in self-esteem and preparation for your future.

To solo a fixed wing, powered airplane, you will have to be at least 16 years old, in good health, and able to read, write, speak and understand the English language.

The FAA requires that you pass a medical examination continuously THROUGHOUT your flying experience. You can wear glasses and you can have other medical problems but there will be a doctor called an Aviation Medical Examiner (AME) who will test and monitor your health during your flying career. If something becomes a problem, like hearing changes, or some other medical issue, the doctor may recommend that you continue flying with a waiver. This is done through the Aviation Medical Center in Oklahoma City, Oklahoma. It is the FAA who will decide if you can continue to fly. Thus, it is important that a pilot remain healthy and drug free to continue flying.

AUTHOR’S NOTE: The Federal Aviation Administration has very detailed laws covering certificates, qualifications and medical examinations and aircraft operations. It is not within the scope of this book to reprint FAA regulations. Please, don’t use this chapter as a study guide for any FAA examination or training. If you want to be a pilot, there will come a time when you have to learn the FAA rules. Part Five is just a short overview, nothing more.

CREDIT WHERE CREDIT IS DUE: *LET'S GO FLYING* is a public domain publication and it is for educational purposes only. Many references used in this part were taken from the Federal Aviation Regulations.

Pilot certificates

Pilots have different privilege levels and each requires certification. There are also several “categories” of aircraft that are operated by a certified pilot. The privilege level **certificates** are:

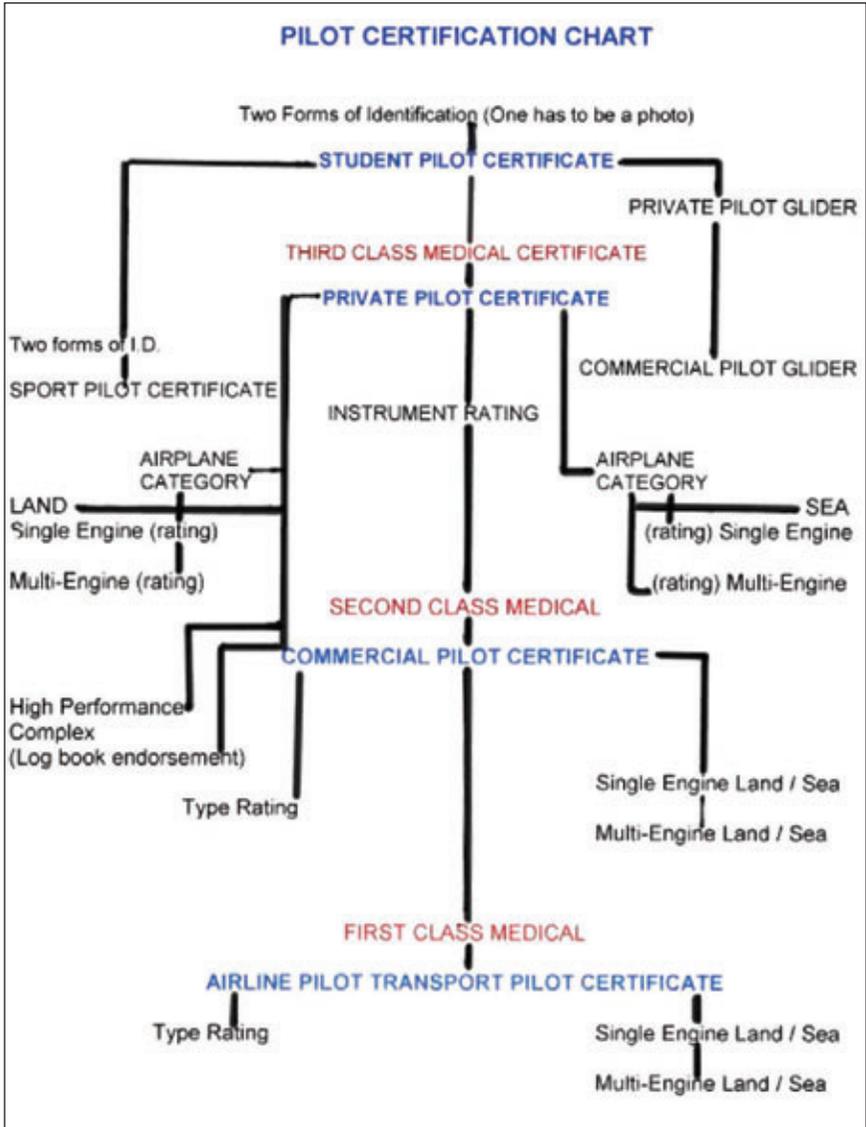
1. **Student Pilot** – This is for a pilot-in-training with an FAA certificated flight instructor. The student pilot certificate and medical examination certificate is issued by an FAA-designated AME, or Aviation Medical Examiner.
2. **Sport Pilot** – This is a relatively new pilot certificate and is used for operation of light, sport aircraft. These aircraft are more sophisticated, larger, and faster than ultralights. Sport pilots are allowed to carry a passenger.
3. **Recreational Pilot** – This is another new pilot certificate and is generally supplanted by the sport pilot certificate. The recreational pilot can fly aircraft with up to four seats.
4. **Private Pilot** – This is the most widely-used certificate and it is for the pilot who flies for pleasure or business. The certificate does not allow the pilot to receive payment from passengers except when sharing the costs of flying the aircraft. Private pilots can use the National Airspace System (NAS) to travel and the pilot may carry passengers.



5.2 An aerial view of a Civil Air Patrol Cessna 206.

5. **Commercial Pilot** – This certificate allows pilots to fly and, with some restrictions, get paid for doing so.
6. **Airline Transport Pilot** – This certificate is required for a pilot to be a “pilot-in-command” of a scheduled airline.

**Pilot certification chart –
A simplified flow chart**





5.3 Second only to the Piper Cub, this classic Cessna 150 has trained thousands of pilots. Starting in 1959, a total of 23,948 150s were built. Next, 7585 152s came out giving a total of 31,533. Most are still flying! The CATEGORY of this is "Airplane." Photo is courtesy of Alex McMahan.

An explanation of the flow chart — a simplified look at pilot certification

First, you would have to have two forms of identification to start flight training. It all begins when you show up at a local flying school and tell them you want to learn to fly. The flying school will assign you a **Certified Flight Instructor**. The instructor will most likely give you a list of Airman Medical Examiners (AME). These are doctors who have been given the authority to examine you for your medical certificate.

The instructor will then tell you that sometime between the start of your training and the time when you will be ready to solo the airplane, you're going to have to **get your Third Class Medical Certificate**. This will be issued by the doctor (AME) you choose. You will schedule your flying lessons with your instructor. **As a student in training, the qualifications and other requirements are:**

- **STUDENT**— Upon request, an FAA-authorized Aviation Medical Examiner will issue the trainee a combined medical certificate and a Student Pilot Certificate after completion of a physical examination. Applicants who fail to meet certain requirements or who have physical disabilities which might limit, but not prevent them acting as pilots, should contact the nearest FAA office. The student pilot certificate and medical expires two years from the date of issue. The trainee must carry the student pilot and medical certificate at all times when operating an airplane with or without an instructor. Once a student has sufficient training and experience, a Certified Flight Instructor (CFI) may allow the student to solo the aircraft. There are several operational requirements before the student is allowed to fly the airplane without an instructor.

The qualifications required for a student pilot are:

- Be at least 16 years old.

- Be able to read, write, speak and understand the English language
- Hold a **current** third class medical certificate, which included no “substance abuse” within the past two years.
- Demonstrate knowledge in:
 - Airspace rules and procedures concerning the airport where the solo flight takes place
 - Understanding of the operational limitations of the make and model of the airplane being flown in the solo phase
 - Pre-flight operations
 - Taxiing operations
 - Run-ups
 - Take off and landing operations (this must include normal and crosswind situations)
 - Straight and level flight, including turns
 - Airport traffic patterns; entry and departure procedures
 - Collision avoidance, wind shear and wake-turbulence avoidance
 - Descents, with and without turns, using high and low drag configurations
 - Flight at various airspeeds including cruise and slow flight
 - Stall entries from various flight attitudes and power combinations with recovery initiated at the first indication of a stall, and recovery from a full stall
 - Emergency procedures and equipment malfunctions.
 - Ground reference maneuvers
 - Approaches to a landing area with simulated engine malfunctions
 - Slips to a landing
 - Go-arounds

The next category of pilot certificates is the sport pilot certificate. Qualifications and requirements are as follows:

- **SPORT PILOT**-The Sport Pilot certificate became law in September of 2004. It was the result of an intense amount of research and hard work by the Experimental Aircraft Association. This new certificate made flying more accessible and less expensive. This new certification recognized a new category of aircraft which are smaller, lower-powered and less expensive than the traditional general aviation airplanes. Sport Pilots are only eligible to fly aircraft that are either certified to Light Sport Aircraft (LSA) regulations and are within the maximum weight and performance limitations of light-sport aircraft. The Sport Pilot Certificate does not require a medical certificate. Qualifications for the Sport Pilot Certificate are:

- Be 17 years old
- Be able to read, speak, write and understand English
- Must have logged at least 20 hours of flight time of which 15 must be dual instruction with a certificated flight instructor and at least 2 hours of cross-country dual instruction. The pilot must have logged at least 5 hours solo
- Must fly one solo cross-country flight over a distance (total) of 75 or more nautical miles to two different destinations to a full-stop landing. At least one leg of this trip must be over a total distance of 25 miles
- Must have received 3 hours of dual instruction within the preceding 60 days
- The applicant must pass a written examination
- Must pass a practical test
- Must have a valid United States driver's license and the individual can not have been rejected from a previous Airman Medical Certificate OR the applicant may have a Third or higher Airman Medical Certificate
- May carry no more than one passenger
- Restricted to daytime flights
- May not fly above 10,000 MSL (above Mean Sea Level)
- Not allowed to fly into airspace that requires radio communications (Classes A,B,C or D) without first obtaining additional instruction and instructor endorsement
- Not eligible for additional RATINGS, such as an Instrument rating.



*5.4 You can take your friends to fun places with your new private pilot's certificate.
Photo by Adam Wright.*

Private pilot

The Private Pilot Certificate allows the pilot to fly almost anywhere in visual flight conditions. The private pilot certificate is the basic pilot’s “license,” and may carry passengers in the National Airspace System (NAS). The passengers may help share the cost of flying but no payment may be made to the pilot for his or her services as pilot in command. The Private Pilot Certificate requirements are:

- Be at least 17 years old
- Be able to read, speak, understand and write the English language
- Must hold a current third class medical certificate obtained from a designated Aviation Medical Examiner
- Required to pass a written aeronautical knowledge test and a practical test

The pilot must accumulate at least 40 hours of pilot-in-command time. If the pilot is training under FAR Part 61, 20 hours of this flight time must be with a certificated instructor. There must also be 10 hours of cross-country flying time with an instructor and 10 hours of solo cross-country flying time. The solo requirements include 5 hours of solo cross-country time. One solo cross-country flight must be made at a minimum of 150 nautical miles total distance. The pilot must make a full-stop landing at a minimum of three points and with one segment of the flight consisting of 50 nautical miles between the takeoff location and the landing location. Three solo takeoffs and landings must be made at an airport with an operating control tower. Night requirements are that the pilot must have 3 hours of night flight training. The pilot must have one night cross-country flight of over 100 nautical miles total distance. The pilot must have ten takeoffs and ten landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport. The pilot must have three hours of flight training solely by reference to instruments.

The Private Pilot candidate must take an oral and flight test administered by an FAA designated examiner or an FAA inspector. This is for Part 61 FAR pilots.

Commercial pilot

With specified limitations, the commercial pilot may be paid for his/her services. This certificate requires that the pilot be able to have a better understanding of the aircraft and its systems, and, the pilot must perform operations with more skill and airmanship.

- The commercial pilot must be at least 18 years old



5.5 This is an example of another CATEGORY of aircraft. It's not an airplane, it's a Rotorcraft! The Image of this Schweizer 300C was made by Adam Wright.

- The commercial pilot must have a Private Pilot Certificate
- The commercial pilot must be able to read, speak, understand and write the English language
- To exercise the privileges of this Certificate, the Commercial Pilot must have a Second Class Medical
- The Commercial Pilot must accumulate and log a specified amount of flight training and experience. If the pilot is training under FAR Part 61, he/she must have at least 250 hours of piloting time including 20 hours of training with an instructor and 10 hours of solo flight and other requirements, including several cross-country flights. These flights must include more than 50 nautical miles from the departure airport and both solo and instructor-accompanied night flights. The Commercial Pilot must pass a 100-question aeronautical knowledge test. The Commercial Pilot must pass an oral and flight test administered by an FAA examiner or FAA designated examiner.

Airline transport pilot

The Airline Transport Pilot (ATP) certificate is required for a pilot to become a pilot-in-command of a scheduled airline operation. The minimum pilot experience is 1500 hours of flight time and 500 hours of cross-country flight time. The ATP must be at least 23 years old, hold an instrument rating and be able to read, speak, write and understand the English language, and, the pilot must be of good moral character.

5.6 Dr. Warren Silberman, D.O.,
 Manager, Medical Certification,
 Federal Aviation Administration,
 Center for Aerospace Medicine
 Institute,
 Oklahoma City,
 Oklahoma.



**An interview
 with the
 manager of
 aviation medical
 certification,
 Federal Aviation
 Administration,
 CAMI,
 Oklahoma City,
 Oklahoma**

There are over 600,000 pilots in the United States. There are three basic medical certificates and, when the time comes, every one of those 600,000 individuals must get a thorough physical examination from an Aviation Medical Examiner. The manager of the FAA Aviation Medical Certification, Dr. Warren Silberman, has consented to a brief interview. Dr. Warren Silberman comments will be noted as FAA “*Let’s Go Flying*” interviewer will be noted as LGF.

LGF: Dr. Silberman, would you please tell the readers about yourself?

FAA: I was born in Philadelphia and received my undergraduate degree at the Community College of Philadelphia Temple University. I went to medical school at the College of Osteopathic Medicine and Surgery in Des Moines, IA. After graduation, I was in the US Army Reserves and worked in the 403rd Combat Hospital, Phoenix, AZ, from 1983 to 1985. I went on active duty in the Army from 1985 and served until 1997. I became the manager of the Aerospace Medical Certification for the FAA on June 15, 1997 until the present. I am board certified in Internal Medicine and Preventive/Aerospace Medicine.

LGF: Doctor, if you had an opportunity to talk to a group of young adults about alcohol, drugs and their future, what “words of wisdom” would you give?

FAA: Obviously, some of us believe that genes play a role in drugs and alcohol abuse. But the thing is drugs and alcohol can affect your mind. Using these substances set you up to ruin your life. Yes, we do allow folks to get back to flying after they’ve gone through rehabilitation, but they have to go through all kinds of hoops. The key is not to do it in the first place. It causes more heartaches than you can imagine. The FAA closely monitors the First and Second Class medical examinations (and the third-class private pilots, as well) and if one gets caught lying about a drug or alcohol problem, a professional pilot can lose every certificate back to the Private Pilot. Pilots do get to keep their hours, but it’s just not worth it.



5.7 C-17 with everything hanging out! Image courtesy of Alex McMahon.

LGF: Could you tell us how many examination reviews the FAA does here in this Center?

FAA: The FAA processes 1600 to 1800 physical examinations per day! We also process waivers for pilots or special issuances, as we call them. Normally, an airman has to have a statement of demonstrated ability to receive a waiver. With a waiver, an airman has to have a medical flight test. We also give another waiver called the Authorization for Special Issuance. This is the one you would get for drugs. An Authorization for Special Issuance is also a waiver that we give for a condition that changes over time. The best example here would be someone with diabetes mellitus on treatment. The other type of waiver we issue is for medical conditions that are static, such as a one-eyed pilot. The name of this waiver is a Statement of Demonstrated Ability (or SODA). It usually requires a medical flight test given by an FAA Inspector.

LGF: How does the FAA handle DWI / DUI on an airman's record?

FAA: There are several ways to get caught with drugs and alcohol. One program is what they call the National Driver Registry. When an airman goes in for a Medical Certificate examination, he/she has to fill out a form which also includes their medical history. On this form there is a part called "Block 20" which gives the FAA permission to send the airman's name up to the National Driver Registry which is in Michigan. They run the airman's name against their record. If the pilot has been honest and has told us there was a problem, there won't be a serious problem unless it becomes a performance issue. There are two things the airman has to do if they've had a DUI. Within 60 days of a conviction, the airman must tell the AMC-700, which is our Security Division here in Oklahoma City. The airman has to admit to it

on their next medical examination. There is another way and that, of course, is the Anonymous Tip. They have a Drug Abatement Program which is run out of Washington, D.C. The D.A.P. inspectors are located throughout the US in nine regions. An inspector’s main job is to evaluate the drug testing programs of the airlines. This of course involves the First and Second Class Medicals. These inspectors evaluate the laboratories that take the drug testing specimens and the carriers that are tasked with drawing those specimens.

If a flight crew member tests positive to a random drug test, the inspectors have to make sure that tests were done properly. If so, what they do is kind of dastardly. The protocol is for the results to be forwarded to the Regional Counsel’s Office and they perform an Emergency Revocation. The legal folks in that region can take ALL OF THE PILOT’S CERTIFICATES AWAY and the only thing the pilot gets to keep are the hours of flight time that have been logged. This means that the pilot has to re-take all of the tests and related examinations over again.

LGF: How far back can the FAA go into an airman’s “history” when researching a case?

FAA: They take all of the certificates the airman has had back to the Private Pilot Certificate. As mentioned before, an airman can lose all of his/her Certificates and ratings. Alcohol is a major issue in our culture and it is a disease where “denial” is part of it until it is too late. We have two ways of dealing with alcohol problems: (1) Random testing and (2) Reasonable Suspicion. An example of this would be smelling alcohol on someone’s breath.

LGF: Is Drug Abatement essentially a watchdog program?

FAA: The FAA decided quite a while back they weren’t going to tolerate the drug and alcohol issue and they have become very proactive about it.

LGF: Does the Drug Abatement Program only deal with First and Second Class Medical issues?



5.8 Staying in good physical condition is going to be a part of being a professional pilot. Capt. Rick Vigil, Corporate pilot for Netjets, runs with his dog, Jaxson, three or more days a week. When he’s away from home, he runs out at the hotel exercise facilities during layovers.

FAA: Yes. The Third Class Medical alcohol & drug problems are handled mostly with the DUI Registry or if a person shows up with some sort of illness that is associated with alcoholism and we find that out.

LGF: Does the FAA offer general aviation seminars and training for physiological issues for substance abuse?

FAA: We do have training out of this institution. It is free, but pilots have to get here to get the training. We have seminars and workshops at airshows like the AirVenture Fly-In in Oshkosh, Wisconsin and Sum and Fun in Florida.

LGF: Doctor, how would you define “Medical Airworthiness?”

FAA: It's a matter of self-certification and whether the airman is fit to fly the aircraft. Pilots should run through their own “medical checklist” and be as thorough as the aircraft checklist. The airman is telling the rest of the world that, “I am as physically qualified as I was the day I took the examination for the Medical Certificate.”

LGF: We know that drugs and alcohol affect pilot performance. What do we know about smoking tobacco and flying a plane?

FAA: When you smoke, you are already at 4000 feet above the elevation of your departure airport. This means that if you climb to a cruise altitude of 8000 feet AGL (above ground level) your brain is operating at 12,000 feet. That is very close to the altitude where oxygen is required.

LGF: In the book LET'S GO FLYING, the readers have been told that a drug and alcohol record can follow them throughout their career. How would you respond to that statement?

FAA: Oh, it will! The medical examination form has a “history” section on it and it says, “Have you had, or have you ever ...?” Once an airman has had one of these problems they must respond “yes” to that question. These checks include mental disorders, substance dependence or failed a drug test The checks include alcohol abuse, drug abuse. As I said earlier, “Why start? It's not worth the risk.”



5.9 Simulator “time” can count toward a portion of the requirements for the instrument rating. A Metropolitan State College (Denver) student is flying the “Sim” as part of his Professional Pilot Program, a major course of study at the college.



5.10 This DeHavilland Beaver floatplane is an example of an “Aircraft Category” and a “Single-engine Sea” rating. Image courtesy of Adam Wright.

The third class medical

A Third Class Medical examination is somewhat similar to those required for high school athletic programs. The Third-Class Medical Certificate is required to exercise the privileges of a private pilot certificate, a recreational pilot certificate, a flight instructor certificate, and the student pilot certificate. “So”, you might ask, “What does it take to pass the beginner’s medical examination?” A 3rd Class Medical requires:

- Near Vision – 20/40 or better in each eye separately, without correction, as measured at a distance of 16 inches
- Far or Distant Vision – Must be 20/40 or better in each eye separately, with or without correction
- Hearing – The candidate must demonstrate the ability to hear an average conversational voice in a quiet room, using both ears, at a distance of six feet, with their back turned to the examiner, or pass an approved audiometric test
- Regarding the Ear, Nose & Throat – Exhibit no ear disease or condition manifested by, or that may reasonably be expected to be manifested by, vertigo or a disturbance of speed or equilibrium
- Blood Pressure Test – The candidate must have a blood pressure level under 155/95
- Mental Status – There will be no record or diagnosis of a psychosis, bipolar disorder, or any personality disorder



5.11 To fly for a charter operation, you must have a Commercial Pilot's Certificate including an Instrument and a multi-engine rating. The airplane is a beautiful Cessna C-340 image shot by Adam Wright.

- Substance Dependence – No dependence on alcohol, or any pharmacological substance in the previous two years.

For pilots under 40 years old, the Third Class Medical Certificate expires on the last day of the month they were issued in, five years from the date of issue. **For pilots over 40**, expiration occurs on the last day of the month they were issued, two years from the date of issue.

The second class medical

This medical examination is aimed at those pilots who will be exercising the privileges of the commercial pilot certificate. A second-class



5.12 To fly for hire, as an agricultural pilot, you must have at least a Commercial Pilot Certificate.

airman medical certificate is required for commercial non-airline duties such as agricultural pilots etc. It is a bit more stringent in the vision requirements than the Third Class Medical. To qualify in the Far or Distant Vision requirement, the pilot candidate must have 20/20 or better in each eye separately, with or without correction. In the near vision, the candidate must have 20/40 or better in each eye separately, with or without correction with a measurement limitation of 32 inches.

The Second Class Medical is good for twelve months from the date of issue. At the end of the 12 month period, this Medical becomes the same as a Third Class Medical Certificate.

The first class medical

This Medical Certificate is the one required when the pilot is in an air carrier operation requiring an Airline Transport Pilot (ATP) Certificate. To qualify, all of the parameters of the Third and Second Class Medicals apply but there is a requirement for an electrocardiogram once the pilot reaches age 35, and upon reaching age 40, the pilot must have the electrocardiogram annually. Officially, a first-class airman medical certificate is valid for 6 months plus the remainder of the days in the month of examination.

Because of insurance policies, the majority of corporate pilots and co-pilots, are required to have a first class medical certificate.



5.13 To be a captain on this airliner, you must have an Airline Transport Pilot Certificate and a Type Rating for the Boeing 757. Image Courtesy of Adam Wright.



5.14 With a Private Pilot's Certificate, you are eligible to fly search & rescue missions with Civil Air Patrol's Emergency Services program. Now you can help save lives with your new privilege. Image courtesy of Alex McMahon.

Going the professional route—commercial, multi-engine, flight instructor and instructors for higher ratings.

The private pilot can now decide if he or she wants to become a professional. As with medical doctors, attorneys, business executives, professors, and other higher-level professions, the cost can be substantial. In the cost sheet that was provided by Aims Community College it showed the following (as of September, 2007):

Private Pilot Certificate, which included the aircraft rental, medical examination, and pilot supplies\$8,886.00
The instrument rating was\$6,753.00
above and beyond the Private. The aircraft rental + instruction + pilot supplies for the Commercial Pilot Certificate was ...\$16,760.00.
This brought the total to\$32,399.00.
With the cost of fuel, the Aims Community College program is most likely going to rise another 20% and by the end of the year, the estimated could be close to \$40,000.00.

There is an excellent pre-career aviation program located in Greeley, Colorado. It is part of the offering of Aims Community College, 5401 W. 20th St., P.O. Box 69, Greeley, Colorado 80632. Their website is www.aims.edu/academics/aviation.



Electives

Students will take an additional three credits of aviation electives selected from the list below.

AVT 205	Mountain Flying Ground School	
AVT 207	Multi-Engine Ground School	
AVT 208	Multi-Engine Flight	
	Multi-Engine Rating	
	Aircraft rental and flight instruction	\$ 3,915.00
	Pilot supplies	25.00
	Flight examiner fee (approximately)	350.00
	Total Multi-Engine Instructor Rating	\$4,290.00
AVT 209	Multi-Engine Flight Trainer	
	Flight training device fee	\$ 275.00
AVT 210	Multi-Engine Cross-Country Flight	
	Aircraft rental (approximately)	\$ 2,790.00
AVT 211	Fundamentals of Instruction	
AVT 212	Flight Instructor Ground School	
AVT 213	Flight Instructor Flight	
	Flight Instructor Certificate	
	Aircraft rental and flight instruction	\$ 3,680.20
	Flight examiner fee (approximately)	\$ 700.00
	Total Flight Instructor Certificate	\$4,380.20
	Note: AVT-211 and AVT-212 are pre- and/or co-requisites for this course.	
AVT 222	Instrument Instructor Flight	
	Instrument Instructor Rating	
	Aircraft rental and flight instruction	\$ 991.00
	FAA written exam	20.00
	Flight examiner fee (approximately)	350.00
	Total Instrument Instructor Certificate	\$1,361.00
AVT 223	Multi-Engine Instructor Flight	
	Multi-Engine Instructor Rating	
	Aircraft rental and flight instruction	\$ 3,785.00
	Flight examiner fee (approximately)	350.00
	Total Multi-Engine Instructor Rating	\$4,135.00
AVT 226	Flight Deck Crew Management Transition Trainer	
	Flight training device fee	\$ 300.00
AVT 227	Transport Category Aircraft Systems	
AVT 228	Regional Transport Aircraft Transition	
	Flight training device fee	\$ 750.00
AVT 230	CL-65 Type Rating Prep Training	
AVT 231	Advanced Regional Transport Transition	
	Flight training device fee	\$ 750.00

The Aims Community College Program Costs from multi-engine to multi-engine Flight Instructor Certificate. At this level, the general aviation pilot is employable and capable of making a living as a flight instructor.



General Aviation Pilot
Estimated A.A.S. Degree Costs (60 degree credits)

Total costs include:

Degree Costs	<i>In-District</i>	<i>Out-of-District</i>	<i>Out-of-State</i>
College tuition and fees	\$ 5,727.00	\$ 8,749.00	\$ 26,680.00
Books and supplies			\$ 1,698.00
Miscellaneous Fees			
Flight exam fees (Stage checks and end-of-course checks)*			\$ 240.00
FAA computer exam fees			60.00
Flight training device fees			200.00
			<u>\$500.00</u>
Fixed-Wing Flight Training Costs**			
Required certificates and ratings			
Private Pilot Certificate			
Aircraft rental and flight instruction			\$ 8,471.00
Medical Certificate			120.00
Pilot supplies			295.00
Total Private Certificate			<u>\$8,886.00</u>
Instrument Rating			
Aircraft rental and flight instruction			\$ 6,728.00
Pilot supplies			25.00
Total Instrument Rating			<u>\$6,753.00</u>
Commercial Pilot Certificate			
Aircraft rental and flight instruction			\$ 16,685.00
Pilot supplies			75.00
Total Commercial Certificate			<u>\$16,760.00</u>
			<u>\$ 32,399.00</u>

The Aims Community College expenses from Private to Commercial Certificate.

Meet Dr. Scott Hompland, Anesthesiologist and Drug Rehabilitation Specialist



5.15 Instructor Ted Matthews and Dr. Scott Hompland (right) prepare for a "Discovery Flight" adventure.

Dr. Hompland talks about the joy of flying and the science of how drugs and alcohol can affect your flying performance.

My name is Scott Hompland and I am a practicing physician specializing in Anesthesiology and Drug Rehabilitation. I grew up in a small Iowa town which had a population of 1500 people and the economy was based primarily on agriculture. My father was a high school teacher/principal and my mother was a “stay-at-home mom.” She was also a very talented artist and made extra money for the family by retouching photographs in the days before color photography. In my formative years, my mother encouraged me to have a job and to participate in summer activities, like scouting. I had many small-town jobs, like mowing lawns and bailing hay. My parents were supportive in everything, especially school work and playing sports, like basketball.

I attended undergraduate college at Northwest Missouri State University and graduated in 1974. I was a Biology Major and, in my senior year, applied for, and was accepted, to medical school. At one point I actually considered AFROTC training directed toward a career as a military pilot. I was told that I couldn’t be accepted because I wore glasses.

After graduation from medical school, I did my internship in Garden City, Michigan, and then I went to work for the U.S. Public Health Service (USPHS) for 3 years. This program paid back the government for my medical school expenses. After finishing my obligation to the USPHS, I did an anesthesiology residency at the University of Chicago. The next step was fellowship training at the Rush-Presbyterian St. Luke’s Medical Center. There I did advanced studies in cardiac anesthesiology, critical care medicine and pain medicine. My wife and I eventually moved to Denver and I went to work for Kaiser Permanente. This organization was quite regimented and after four years with Kaiser, I decided to start my own practice. I joined the Rehabilitation Associates of Colorado and my current practice is limited to the care and treatment of patients with chronic intractable pain issues and the management of alcoholism and drug addiction.



5.16 Dr. Hompland works on instrument familiarization while instructor Matthews prepares the radio and other cockpit pre-flight tasks.

As a “kid,” I always enjoyed learning new things, especially anything related to science. I enjoyed sports and my supportive home and school environment helped me develop a strong sense of self-reliance. Sports helped me stay in shape and a strong work ethic has served me well my entire life. The most supportive person was my girl friend, Marvel, who is now my wife of 28 years. She always had confidence in my abilities, even during times of self-doubt.

As part of the LET'S GO FLYING project, I was given the opportunity to take a Discovery Flight and this gave me a chance to do something that I've wanted to do all my life—actually take the controls and fly an airplane. My preconceived idea of flying was that it would be easy. As it turned out, flying the airplane was easy, but all of the “multi-tasking” was much more challenging than expected. I found that monitoring the instruments, communicating with the control tower and watching out for other aircraft was very demanding. I also found that the “pilot speak” was similar to a foreign language and I wanted everything to “slow down” so I could understand more. It didn't happen so I focused on getting as much information as I could from my instructor and his tower communications.

The instructor, Ted Matthews, first took me through a weather briefing and then a “walk-around” pre-flight examination of the airplane. He gave me a complete inventory of the cockpit, controls and operating systems. Due to time constraints, he made every effort to expedite the pre-departure phase. Taxiing was strange at first because it was all footwork.



5.17 Dr. Hompland's words were, "I actually got to fly this 172. It was great!"

Takeoff was very exciting. I did not think I was going to be allowed to perform this maneuver, but to my pleasant surprise, my instructor told me to do it. With the roar of full-power and the immediate thrust, the airplane seemed to leap forward. At a speed of 60 knots, I was instructed to pull back on the control yoke and the aircraft took flight. It was incredible—I was actually flying!

Regarding the controls, I don’t know what I expected, but I discovered that once the plane was in the air, it took more than I anticipated making course corrections. It seemed like the airplane wanted to fly itself, and it took quite a bit of effort to make changes. It was great fun for me to make the constant adjustments to its flight. Ted did give me instructions regarding control changes, but I needed to learn these things by doing rather than by listening. I can see where hour after hour of practice would be a wonderful learning experience for me.

The Discovery Flight was a very exciting and rewarding experience. I got a chance to do something I’ve wanted to do all of my life; that is ,to take the controls of an airplane and actually fly it! If I were 30 years younger, I would seriously consider getting my pilot’s certificates and even incorporate it into my career.

My assessment of the Discovery Flight is that flying takes a “by the book” mentality. From the pre-flight examination, to the pre-takeoff checklist, to the in-flight settings, to the pre-landing checklist and the final post-flight details, it’s all done according to a series of steps. Just within the past few years, we’ve started doing this very same thing in surgery. Checklists are used between the surgeons, anesthesiologist and support staff. Details are checked before, during and after surgery. Just as pilots, physicians do not want any detail to go unchecked. In regard to the actual experience of flying, I am of the opinion that flight requires 100% (or more) of one’s skills as well as an ability to multi-task each of these skills in such a way as to optimize safety and performance. A medicated mind can impair the pilot’s senses giving a false sense of confidence. A medicated mind is an impaired mind and can lead to a compromise in the pilot’s performance, especially during times of stress or fatigue when performance may already be compromised.

Prescription medicines possess both the primary effect, as well as secondary side-effects. Illegal drugs are no different than the prescription medications except for the fact that the dosages are unknown and frequently other problematic additives are involved which make the drug unpredictable in its effect and duration. They both have detrimental effects on an individual’s physical capabilities, reaction time, and visual and auditory abilities and especially create an effect of altered perception of spatial relations and time.

The secondary side-effects can occur well after the primary effects of the medicine have dissipated and because they are not the primary

effect of the medicine, they can be easily overlooked. Medicines also possess what are referred to as idiosyncratic effects. These effects are unique to the individual and are not predictable based upon a review of the most relevant medical literature associated the medicines. I can now appreciate how even the most innocuous medicine, not to mention those with potential cognitive impairing abilities, can affect a pilot's performance without the individual even being aware of the effects until it may be too late.

WORDS OF WISDOM: The effects of medication or alcohol and drug abuse are always detrimental to one's ability to perform any action which requires hand-eye coordination, spatial consideration, judgment, and cognition. The long-term effects of these medicines/drugs are unpredictable in terms of who will suffer permanent long-term impairment in the brain and psychological status. It is known that sometimes even a single use of a specific illegal drug may result in permanent injury to the central nervous system from which no person could reasonably expect to recover and have normal mental and physical performance. Why take the chance? The risks are too high!



5.18 With new flying privileges, you may even want to build your own airplane. Over a period of two years, the author and a total of 8 advanced aeronautics' students, built this Fisher Classic Biplane. A supporter of this program, A. Scott Crossfield, named it, "A Class Act." While the students watched, an inspector of the Federal Aviation Administration gave the aircraft a six hour pre-flight evaluation. After it was approved and certificated, test pilot Bill Mitchell and the author flew it on the 2nd of March, 1992.

A photograph of a pilot in a cockpit, viewed from the front. The pilot is wearing a flight helmet with a visor and a flight suit. They are giving a thumbs-up gesture with their right hand. The cockpit is filled with various instruments and controls. The background shows the structure of the aircraft fuselage.

PART SIX

Interviews with
aviation professionals

Meet Lt. Col. Ron Gendron – C5 Galaxy pilot in the U.S. Air Force

I'm the youngest of eight children and grew up in San Jose, CA. I remember when I was 10 years old we went to an airshow at Moffitt Naval Air Station, CA. The Blue Angels performed at the end of the show. They were flying the McDonnell Douglas F-4 Phantom IIs. It was an incredibly inspiring (and loud) finale to a great airshow. After that, I noticed the P-3 Orions flying back to Moffitt after completing their missions over the Pacific. I continued to talk to my father and his WWII Navy comrades about what it was like to fly in the Navy. They told me all about "the good, the bad, and the ugly." I was "sold!"

During the early stages of my career decisions, my Mom and Dad supported my goals of flying in the military and attending the U.S. Air Force Academy (USAFA). Once the dream became a real possibility, my wife, Tracy, was my support. Although not an easy task, she helped me stay focused, and rested, throughout pilot training. She took care of our family and finances so that I could spend the time and energy I needed to study and prepare for the next day's flight schedule. Without her, I could not have made it through.

I knew from "Day One" at the Academy; that drugs or alcohol could end my career. In fact, I saw it happen to my roommate. There are no second chances with drug abuse. If an Air Force member tests positive for illicit drugs, it's over. Technology is so good, that there is no question, no excuses, no debates, The military simply cannot accept using drugs. Alcohol will make you do stupid things that you would not normally do. Think about this, if I used drugs or alcohol and you were getting on my aircraft as a passenger, how would that make you feel? I have to be ready to fly as if my own family was on board. That's the way we look at it.

I completed the Pilot Indoctrination Program (PIP) at USAFA in the Cessna T-41C (Cessna 172). From there I went to Undergraduate Pilot Training (UPT) at Vance AFB, OK. That training was 49 weeks of ground and flight training in the Cessna T-37 "Tweet" and the Northrop T-38 "Talon." We learned how to fly contact (transition) training including visual overhead patterns and aerobatics, as well as instrument, navigation, and formation flying. It was the hardest year of my life, yet it was also the most rewarding.

While still in high school, I was offered an AFROTC scholarship and an appointment to the U.S. Air Force Academy. Since the Academy expected all pilot-qualified candidates to attend pilot training, that is what I chose. Otherwise, I would have had to compete for a pilot training slot. The Academy is not for everyone. My class started with over 1400 cadets and graduated just over 900. The attrition rate was high. Staying focused

6.1 Lt. Colonel Ron Gendron, is a C-5 pilot for the USAF.



and disciplined was the key to making it through the rigorous program. If you are interested in any military academy it is important that you talk with your high school guidance counselor. They have catalogs and pamphlets that can get you pointed in the right direction.

Flying is a serious business no matter what branch, civilian or military. But, even after 23 years of flying in the Air Force, I still can't believe they actually pay me to do it. We do have some long, tedious missions, but when we arrive at our destination and unload helicopters, tanks, trucks, presidential limousines, or humanitarian supplies, it is all worth it!!! Knowing that we make a difference in the world means a lot. There is no amount of pay that can compare.

Physical fitness is very important. The Air Force has a physical fitness program designed to ensure that its members maintain good fitness. We are required to workout three times a week. This is just another benefit to being in the military. When you workout, you feel better, you are in better medical condition, and you perform your job better. I run 4 miles a day, 3-4 times a week. When I miss that goal, I feel it. Regardless of your career choice, I encourage you to adopt a workout schedule that works for you and stick with it.

A REAL LIFE STORY OF A CAREER RUINED — I flew with an exceptional pilot who was also selected for executive officer duties. He received top evaluations for flying and for staff duty. A few years after I left that assignment I found out that he was arrested for drug use. I couldn't believe it. This was one of the best pilots I had ever flown with. We called him "Golden Boy" because everything he touched turned to gold. He had a



6.2 Lt. Col. Gendron and his crew are “shooting touch & go’s” in an airplane that weighs 500,000 pounds.

great family and was a really nice guy. But after his conviction, he had to serve time in a military prison. Shortly after he got out, he relapsed into his old drug habits. Later on, they found him in his car pulled over on the side of a road, apparently dead from a drug overdose. Drugs and alcohol not only ruin careers, they ruin the lives of their loved ones. All I can say is, “Please make the decision right now to not allow this to happen to you or to your loved ones.”

Life is all about the decisions that you make. We all make mistakes, it is how we respond to those mistakes that makes the difference. I’m sure you’ve heard teachers and parents talk about the importance of staying in school and staying off drugs and alcohol. Guess what...they are right! These are decisions that YOU have to make. The sooner you make a commitment to yourself that you are going to stay focused, with your life goals in mind, the better off you are. Only you can make that decision. Military members are randomly tested for drugs to ensure that the zero tolerance policy is observed. We also receive a flight physical once a year to ensure we meet the physical qualifications to fly the required missions. As an officer in the USAF, I have taken an oath to support and defend the Constitution of the United States of America, against all enemies, foreign and domestic. I consider drug and alcohol abuse to be an enemy that we cannot allow in our lives. Be smart, and make good decisions...starting right now.

Meet Lt. Colonel Patrick Hanlon, F-16 pilot in the USAF

My name is Patrick Hanlon and I was born on September 21st, 1967 and was raised in Littleton, Colorado. I am the older of two kids; a boy and girl. My mother was an executive secretary and my father was a mechanical engineer. When I was a kid, I enjoyed fishing, soccer and baseball. My great

uncle had a Mexican restaurant in downtown Littleton, Colorado, and I worked there in the summers and during the school year. I always did well in school because I really enjoyed learning.

I don't remember when I first became interested in flying. My Dad tells the story of taking me to see the movie "Midway" when I was 9 years old. He said that I was glued to the screen and didn't even blink during the show. He remembers me saying, "I want to be a pilot when I grow up!" My first real memory of wanting to fly was seeing old pictures of my great uncle in WWII. He was a P-51 pilot in England. He never liked to talk about the war and it was tough to get him to talk about it. Conversing with him always added an element of mystery to the persona of being a "fighter pilot." I attended every air show that came to town and I remember spending hours in the Smithsonian's Air and Space Museum during a family vacation. By the time I was in junior high school, I was 100% hooked. All of my energy was devoted to excelling in school so I could follow my cousin, Andy Trujillo, to the Air Force Academy. I really wanted to fly the F-16. Coincidentally, my other cousin, Randy Trujillo, took a different route to an aviation career, as Randy dreamed of flying for the airlines. United Airlines hired Randy while I was still in school. This made me wonder, did I want to fly military or civilian? I decided I wanted to do both!! I knew I couldn't fly fighters the rest of my life so I set out on a track to fly military first and then transition to the civilian airline world later. I wasn't quite sure how to do it. All I knew was that I could do nothing else with my life except fly.

I find it difficult to pinpoint who supported me the most when I decided on aviation as a career. I think a lot of my family thought flying would be a passing fad. However, my father always subtly pushed me to do my very best at school as a foundation to achieving my goals, whatever they were. If I ever strayed from my stated goal of attending the USAFA, he would remind me that USAFA "wouldn't appreciate" a candidate like that. My mother eventually supported me wholeheartedly after she learned that I was secretly taking flying lessons. She was constantly worried about me flying and to this day, she still tells me to "be careful" when I fly. Until high school, USAFA was still a distant dream. I didn't need anyone to motivate me to do well in school and sports. I figured that out myself. However, all the motivation in the world does not necessarily translate into success.

(Author's note: I was Pat's teacher in a high school aviation/aero-space program during the mid-80s.) I would have to say that you, Ben, showed me a world where proper motivation and skill could be harnessed into a successful career. I hadn't really considered flying *before* I graduated high school; that is, until you took me up in a C-172 at Centennial Airport. Your influence as a teacher and mentor struck a chord in me that I ultimately attribute to my success. It's amazing what one person can do to affect an individual's life whether he knows it or not. I had the motivation and the fortitude to pursue an aviation career, but I needed someone to provide me with a realistic vector to my approach. I think you helped me

6.3 Lt.Col. Hanlon flies F-16s and is the Director of Operations for the 120th Fighter Squadron, Colorado Air National Guard, Buckley Air Force Base, Colorado.



realize that small steps matter more than giant leaps when chiseling out an aviation career. Once I was able to see a building-block approach to my passion, I began to see the light at the end of the tunnel. Of course, negative motivation helped me also. I can't remember the number of people who told me, "The Air Force Academy is too hard. You'll never get accepted." (One of those people was my high school guidance counselor. I guess the joke is now on him.)

I always had a "clean" image of a military pilot. No one had to tell me the Air Force wanted sober pilots. To me, Air Force pilots were treated with great respect and admiration. I say the same thing about professional airline pilots. A United Airlines captain once gave me a set of plastic wings when I got on board his aircraft. I was in awe. I still have those old, faded wings. I couldn't entertain the thought of tainting that image with drugs. I suppose I looked on drugs and alcohol as a competitive disadvantage and a sign of weakness. Knowing that drugs affected the brain made them a "no-starter" for me. I never even considered doing drugs. I was unaffected by peer pressure in junior high or high school. Luckily, my friends weren't into that stuff either. I was surrounded by family and friends who felt the same way as I did. Besides, you couldn't pick up an Air Force pamphlet or talk to anyone about the Air Force and not be bombarded with the "anti-drug" mentality. It worked!! For me, it was easy to disregard anything that would jeopardize a shot at my dream. Soon enough, the only "high" I needed was a takeoff and a landing.

While I was still in high school, I realized that I didn't have to wait until I graduated to learn to fly. I knew my mother would never let me do it, so I began a private pilot's license course without her knowledge when I was 17. I spent every dime I earned on flying lessons at Centennial Air-
port. I worked longer hours, weekends and holidays to finance my license.

Unfortunately, the day after I soloed, the loudspeaker at Littleton High School announced my accomplishment while my mother was in the building attending a meeting !!! My fledgling flying career almost ended that day. Once she got over the shock, she grudgingly accepted my career path. After that, it was smooth sailing. I received my private pilot's license from a flying club called "P.C. Flyers" in 1985. My instructor at the time is now a captain at Southwest Airlines.

After graduating from Littleton High School in 1986, I attended the Air Force Academy and graduated in 1990. During my time at the USAFA, I completed the Pilot Indoctrination Program in a T-41. Needless to say, military flying was a whole lot different than civilian flying. After the Academy, I attended Undergraduate Pilot Training (UPT) at Reese AFB in Lubbock, TX. That training was split evenly between the T-37 "Tweet" and the supersonic T-38 "Talon." All aspects of military flying were taught with an emphasis on procedures and standardization. Without a doubt, UPT was the most difficult, yet rewarding year of my life. With a deep-seated motivation to fly and with solid discipline instilled in my years at the Academy, I graduated at the top of my class and received my first choice of assignments. What else...F-16s!! Following UPT, I attended F-16 training at Luke AFB, AZ. Over the following 8 years, I flew all models of the F-16C at Kunsan AB, South Korea, Shaw AFB, South Carolina, and Hill AFB, Utah. After my commitment to the Air Force ended in 1999, I was hired by United Airlines to fly the 737. However, I couldn't give up flying the F-16. Luckily, I was hired by the 120th Fighter Squadron at Buckley AFB as a traditional (part-time) Guard pilot. I had the best of both worlds. I would fly the "bus" during the week and then go "turn and burn" during the weekends. Unfortunately, this situation didn't last and I was furloughed as well. "9-11" changed everything. I didn't have much time to whine though because the 120th was flying Air Sovereignty Alert (ASA) in the first hours following the terrorist attacks. That mission continues today 24/7. Our squadron was then mobilized to participate in Operation Iraqi Freedom (OIF) in 2003. Eventually, UAL called me back and I have been on a military leave of absence from UAL ever since. I recently made Lieutenant Colonel and I'm the Director of Operations for the 120th Fighter Squadron.

My office is in the air. I never had the desire for a "ground" job and flying for me is an escape. I would do it for FREE. In fact, I would pay them to do this "job." When I do sit in my office and look out over the flight line, I sometimes reflect on what it took to get to where I am now. Four years of grueling work at a service academy, one year of hardcore pilot training, and 8 months of challenging F-16 training only got me my wings. After all of that, I showed up in my first squadron as a basic wingman without any combat qualifications. The progression from wingman to 2-ship flight lead, 4-ship flight lead, mission commander, instructor pilot, and finally flight examiner, took 7 years to accomplish. All told, I spent the vast majority of my adult life training for my qualifications in the F-16. All of that culminated in my tour of duty in Iraq. I participated in the first missions of

that war. I quickly learned that getting shot at is not fun!! Just surviving a war gave me a huge sense of accomplishment. Our mission was to provide Close Air Support (CAS) for the ground troops during Iraqi Freedom. We saved countless lives of our Army brethren while pounding the enemy into submission. Hearing a ground controller scream, "Thank you!" in the radio after an intense firefight provides a real sense of purpose. I now have nearly 17 years in the F-16. I still get excited when I hear the jets fire up on the flight line. I cherish every sortie I get in the aircraft whether it's training or combat. Knowing that the Air Force and the United States depends on me to get the job done, without failure, is highly motivating.

We were taught the very first day of basic training at the USAFA that physical fitness is the key to physical and mental well-being. Whether I wanted to or not, I worked out every day at USAFA. That routine carried over to my post-USAFA life. You are expected to stay in top physical shape to fly fighter aircraft. The F-16 is an unforgiving machine in the hands of a pilot not physically ready to fly it. Every squadron I have been in has its own gym in the squadron building. The 120th is no exception. Every day, the pilots work out using their own routine or the routine provided by the "Squadron Fitness Officer." Yes, that's an official position in our squadron. He's essentially a personal trainer and pilot. Too many Viper pilots have died from G-LOC (G-induced loss of consciousness) due to poor physical fitness. We can't afford to lose pilots or iron to poor physical health. Most of the time, I don't even think about working out. It's just something we all do in the squadron. It's like a mandatory meeting that you must attend. As a side benefit, physical fitness provides for a great release of energy and serves to refocus one's thoughts after a tough day.



6.4 Lt. Col. Hanlon flying lead in a formation of F-16s. He is now Director of Operations for the 120th Fighter Squadron, Colorado Air National Guard.

It's no secret that pilots have been known to "tip a few" at the bar. The stress of war, family separation and combat all contribute to the downfall of some pilots. The key is knowing how to keep a "balance." A pilot must be able to separate bar time from flying time. No one whom I have known *intentionally* started abusing drugs. There was a guy I knew who suffered a back injury in the F-16. He was grounded for several months by the flight surgeon so his back could heal. Leaving the cockpit for that long was very difficult and he let the pain pills and boredom get to him. Within a year, he was a functioning alcoholic. He was a fixture at the bar every night. Trying to tell him otherwise always led to verbal confrontations. Even after repeated warnings, he ignored the Squadron Commander's orders to "knock it off." One day, he came in to fly with booze on his breath. That was the end of his career right then and there! He was removed from the squadron instantly and I never saw him again. Looking back, he let his judgment become impaired to the point that he couldn't see the difference between wrong and right. Sometimes only a fine line separates one from doing the right thing or following an incorrect path. The key is knowing when to admit a problem and seek help. Hopefully, you have the discipline to never let it get that far. No one is perfect.

People tell me all the time I have the best job in the world. Occasionally, I talk to someone who truly knows what it takes to reach this position. I now know what separates the "coulda, woulda, shoulda" crowd from the "I did it" crowd. The difference between these two groups is a matter of having a personal goal combined with the steadfast motivation, dedication and discipline to achieve it. I am no different than anyone else. However, I set a goal for myself at a very young age and I never wavered from it. My goals set the stage for my rabid motivation and lifelong passion for attaining them. Motivation is a powerful ally when properly harnessed. Focused motivation is a nearly unstoppable force. To all of you who really want to fly, remember—don't compromise your goals for the sake of simplicity or the lure of an easier path. Personal commitment to your goals will provide the motivation and discipline to carry you through the rough times when a goal seems too distant to achieve. Small, insignificant decisions can all build up to a huge accomplishment someday culminating in the realization of your dreams. First, however, you have to set boundaries and realistic conditions on yourself as you whittle away the path to your dreams. You must also realize that *nothing is free*. Whether money or "sweat equity" is needed, nothing worth achieving is easy. These are my recommendations for success:

My best advice: First of all, search yourself and find your dreams. It sounds easy, but it isn't. You must uncover the one thing that makes you tick and provides your motivation. Your goals will provide a subconscious guide to all of the little decisions you will make in your life that will ultimately affect its outcome. Stay clean! You cannot make sound decisions when artificial chemicals cloud your mind. Make a personal commitment to yourself to find your goals and pursue them with a clear head. What you can't allow to happen is negative peer pressure or lack of focus to start you down the

wrong path. You want to get high? Fulfill your dreams and you will feel a wonderful “high” every day of your life.

Stay focused! Pulling on different ends of the same rope gets you nowhere. Channel your energy and focus it on the steps required to achieve your goals. Focus creates discipline. Discipline will power you through the low points on your path.

Keep your mind and body sharp. A well thought-out physical fitness plan is both fun and motivating. Staying in shape will keep you motivated, competitive and focused. A person in top physical shape is less susceptible to making poor choices!

Look to someone who has already accomplished what you want to do. A mentor provides motivation and gives you a “human” side to your dreams. A mentor can provide a helping hand or crutch when dreams seem too far off to accomplish. Find someone who embodies all you stand for and emulate that person’s actions. Rest assured, he or she was in your shoes at one point. How did he/she do it? How did he/she deal with the difficulties? Just ask.

Let me give you something that is 100% quantifiable in the aviation industry: “Zero tolerance” is not only accepted, it’s encouraged. There is no room in this profession for substance abuse. Bust a drug test and you are *done!!* The only acceptable path is staying clean. All the skill and motivation in the world cannot overcome even a single lapse in judgment in this regard.

Meet Adam Wright, former Civil Air Patrol cadet and now a first officer for the Regional Atlantic Southeast Airlines

Author’s Note: Adam, we are very fortunate to have you “on board” and I know that thousands of Cadets, Seniors, AEMs, AEOs and classroom students want to thank you for your photographic contributions to LET’S GO FLYING!

My name is Adam Wright. I was born in Austin, TX and moved to Lynchburg, VA while still an infant. Growing up in Central Virginia, I attended public school through 8th grade and then attended the college preparatory high school, Virginia Episcopal School. Like most young boys, I participated in little league baseball and loved playing in the woods after school. I also took piano and violin lessons once a week in the evenings; this helped me develop an appreciation for all kinds of music.

My interest in flying was a pure fascination that developed without any exterior influences. Neither my father, neighbors, or any family friends in Lynchburg were pilots or had connections to the aviation industry. It was long summer evenings spent lying in the grass watching contrails streak through the sky heading for “exotic” destinations that sparked my 6-year-old imagination and ultimately got me hooked. When it became apparent to my parents that I had “caught the flying bug,” they nurtured it with aviation books, calendars, and toys.

I was about 12 when I knew I wanted to pursue a career in aviation. When

my uncle, a retired fighter pilot in the US Air Force, got wind of this news, he took me under his wing. He's a captain for Delta Air Lines on the Boeing 767 and would invite me down to Atlanta. We'd spend hours at the Delta training facilities running around the airport, taking turns flying the simulators, and talking planes. He was my role model through high school and college.

It was during high school that I realized that drugs and alcohol posed a great risk to my dream of flying. For the first time in my life, my peers were abusing alcohol and drugs. Some students took it to the extreme and I watched as their young lives took dramatic turns leading to horrible outcomes. Getting high for me was taking the Cessna 152 out on a solo flight after school and flying circles around the clouds. A freedom my friends could never hope to get with drugs or alcohol.

I took my lessons for the private license while in high school at Falwell Airport (W24) in Lynchburg, VA. The airport is a sleepy little country field with a single 3000' strip of pavement and roughly 20 daily operations. The flight school on the field was also small; probably only 6 training aircraft at the time. The flight instructors were all older retired men who instructed for the joy of it. I was an upcoming Junior at 16 years old when I took my first lesson on a humid June morning. The lessons progressed at a very casual pace and I didn't solo until 6 months later on December 27th, 2002. I



6.5 AUTHOR'S NOTE: Adam is not only an aviation professional, he is a very talented photographer. In Part One, I mentioned the possibility of having aviation photography as a hobby. Adam is one of the featured photographers on the world-renowned Airliners.com website. When I requested permission to use some of his work in a book being produced by the Civil Air Patrol, he kindly consented. He is a former CAP Cadet and a Cadet Squadron Commander. He felt that his photography was a way in which he could "give back" some of what Civil Air Patrol had given him.

got my Private Certificate almost 15 months after the first flight and one week before I left Virginia for college on August 21, 2003.

I started my track for a career in aviation when I joined the Civil Air Patrol at age 12. I first came in contact with CAP at a traveling aviation museum in Lynchburg, VA where cadets and seniors of the Lynchburg Composite Squadron were volunteering. During my 6 years as a cadet, I learned basics in fellowship, leadership, aerospace-related studies and integrity that prepared me for my young adult life. In addition to the activities at the local level, I got active on the regional and national level by attending the basic encampment at Ft. Bragg, NC and then two national glider academies in Tuskegee, AL and Ft. Collins, CO. To further my education after high school, I attended Embry Riddle Aeronautical University where I earned a bachelors of science in Aerospace Studies and completed the professional pilot minor. After graduation, I spent 6 months flight instructing in Ormond Beach, FL teaching international students the fundamentals of single and multi-engine flight. Then, I applied to Atlantic Southeast Airlines and was hired as a CRJ-700 First Officer at the age of 22.

Although my career in the airline industry is still in the infancy stage, the benefits of the job are evident. The biggest reward is that I enjoy going to work! I've attained my childhood dream to one day leave contrails high above the countryside. It's also satisfying to be a part of a multi-person crew, working to accomplish a single objective under varying weather/delay conditions. The challenges are different every time I go to work, but the exhilaration of flying never changes.

Physical activity became a cornerstone of my character when I was in high school. I joined the cross-country running team, not to be the fastest guy on the team, but to better my physical shape and mental toughness. Now, seven years later, I still run 12-15 miles a week. Even on my airline trips, I find myself lacing up the shoes and taking a 3 mile jog around the hotel complex and down sidewalks to get my "running fix." Not to neglect the upper portion of my body, I also lift weights regularly to keep my chest, arms and shoulders from getting lackadaisical. Working out is more mental toughness than physical toughness. Anyone can lift a weight or jog around a track, but to take the initiative and go to the gym or put on running shoes—that takes self discipline and mental strength.

From the first day of CAP to the first flight as an airline pilot, there were countless people who encouraged, supported, and challenged a person during his or her quest for an aviation career. But the most important force for any aspiring person is the inner desire and the will to succeed. I like to think of it as being slightly crazy about a certain profession. In my case, it was the desire to pursue a job at an airline. While training for my instrument rating, I fell into complete despair. I was truly overwhelmed by the training and it felt like it was the end. Friends and family encouraged me, but what it came down to was that I needed my inner strength to pick myself up, wipe my pants and charge forward. Find that inner passion and it will help you overcome the toughest of obstacles that lie ahead.



6.6 Adam Wright flies this Canadair CRJ-700 for Atlantic Southeast Airlines.

Meet 767 Captain Randy Trujillo, United Airlines

My name is Randy Trujillo and I grew up in Littleton, Colorado, a suburb of Denver. I have one brother, one sister and two wonderful, hard-working parents. We owned a motel on South Santa Fe Drive and I was blessed to have a huge “extended” family. I enjoyed mechanical things as a kid, and grew up with go-karts, mini-bikes and bicycles. It seemed like everyone in the family was into hot cars. I liked building models and I had a big collection of cars and aircraft.

I became interested in airplanes at an early age and was taken on a flight in a Cessna 172 when I was about seven years old. Dad was also fascinated by airplanes and often took us to the airport just to watch them come and go. There were many movies about airplanes back then and I watched them all. Maybe it’s just me, but it seemed like the country was more interested in aviation back then. I can remember it like it was yesterday when I attended my first air show at the old Lowry Air Force Base. The whole place shook when an F-100 made a supersonic pass as a finale to the event! It was a fun time to grow up.

This interest continued through high school. I heard about a class called “Aeronautics” and I enrolled in it during my Junior Year. It was basically a Private Pilot written exam course and I took the FAA test at the end. I went on a familiarization flight with the instructor and that really got me going. I was working for my Uncle, Joe Trujillo, at a family restaurant and used my income to take flying lessons at Columbine Airport, west of Littleton. I paid \$12.00 per hour in a Piper Cherokee 140 with instruction through Cole Aviation.

Regarding drugs, of course, there were other “temptations.” It was the Seventies, but my only addiction was airplanes and I was lucky enough to have a job to support my passion. Although they worried, Mom and Dad gave me their unconditional support.



6.7 Randy Trujillo is a 767 Captain for United Airlines.

I continued working on my Commercial and the Instrument tickets as time and money allowed. Eventually, I got a job as a CFI (certified flight instructor). It was a good time to be teaching people to fly—the Viet Nam War was winding down and the Veteran’s Administration was paying for flight instruction at the time. I was able to do a lot of instructing as I continued up the scale to finish my CIFI (Certified Instrument Flight Instructor) and the expensive Multi-Engine rating. During this time, I worked for Star Aviation and started my college program ending up with a Bachelor’s Degree at Metropolitan State College. My efforts in school were focused on Business as the airplane industry looked as if it would stagnate for quite some time. I eventually moved up to flying charters in Beech Barons, Piper Navajos and a Mitsubishi Mu2 for a coal and oil business. During this time, Star Aviation started a scheduled service to Gillette, Wyoming, using a Merlin Metroliner. It was a real break when I became a full-time pilot for this operation. Two years later, I got a job as a fixed-wing pilot in the Flight For Life program at St. Anthony’s Hospital. I flew Merlins in their Air Ambulance operation. I also flew, part-time, for Denver Beechcraft as a Demo Pilot for all Beech products.

In 1978, I was hired by United Airlines and was assigned as a Second Officer on their 737 fleet. In 1979, I was furloughed and went to work for Boettcher and Company flying a Citation and a King Air. In 1981, I was recalled by United and have been with them since.

Growing up in the environment I did, in hindsight, was very helpful in getting me where I am today. My adolescence was filled with hot rods, woodies, and I was exposed to many really fun things. The 60s and 70s were great times and although drugs were everywhere, I just had other more interesting things to do. My “addiction” to airplanes is just as strong

today as it was when I was young. I am still amazed by a sunset or moonrise that only a pilot can see. I still try to make my next landing the best one ever. It is also an honor to be able to work in the “Safety” side of my industry and I try to give back by working to make today safer than yesterday, in the world of commercial air travel.

I continue instructing by being a Check Airman who flies with 767 pilots who are just out of school on their first operational experience. It is just a small way to re-pay what I’ve learned over the years. Even with all of the turmoil in the Airline industry, once you make it to the cockpit, it’s the same as it’s always been—the best job in the world!

Since 9/11, the stress on the entire industry has increased dramatically. The same outside forces that affect every other industry has challenged the Airlines more than ever in history. It is also a lesson in keeping focused on Safety and what is really important. Stress on the industry has generated a marked increase in alcohol abuse and family issues. Most airlines now have what is called Employee’s Assistance Program that addresses these issues.

I have always enjoyed flying airplanes and this is still one of my main motivations for staying healthy and staying drug-free. Although the Airline business does not offer what it once did, it still has the sheer joy of just flying. I have been lucky in that I love what I do. Flying is such a rewarding career and drugs just can’t begin to compare with the pleasure I get from flying for a living.

If I were a guest speaker for a group of teens, I would tell them to keep their eye on a very rewarding future and to work hard to achieve their goals. Aviation now is for the purist. You have to fly to get the full satisfaction of being a pilot and don’t let anyone or anything stand in your way of making it happen.



6.8 Randy’s “office” is this beautiful Boeing 767. Photo courtesy of Adam Wright.

6.9 Capt. Rick Vigil, a corporate pilot for Netjets.



Meet Rick Vigil, Corporate Pilot

My name is Rick Vigil. I am from Denver, Colorado and grew up as the middle child and only boy in a family of 5 children. I attended Johnson Elementary, Kun-

smiller Junior High, Lincoln and East High Schools. I graduated from the University of Colorado, Boulder campus with a pre-medical distributed studies degree; majoring in Molecular Biology with minors in Math and Psychology. I was drawn to sports and played baseball (shortstop and pitcher) and football (quarterback and defensive safety) throughout my pre-college years.

I became interested in flying when I was in elementary school, gazing over pictures of jet cockpits during our library visits. I did not, however, take the first step toward flying until my junior year in college. On a whim, I signed up for a community free school class for a pilot ground training course taught by a local Boulder CFI. As it turned out, this whim reconnected me with my true passion for flying. Although I wasted little time in securing my private pilot rating, it was ten more years before I chose to seriously consider flying as a career.

My parents were more worried than thrilled by my aviation pursuits. As good fortune would have it, however, my uncle purchased a Piper Cherokee 235 and parked it at Boulder Municipal Airport. He encouraged my progression by offering his plane for only the price of operating fuel, claiming it “was beneficial for the airplane to be regularly operated.” Little did I know just how much this gesture would rapidly advance my career path. I am and will always be so very grateful to my late and dear “Uncle Joe.”

My first solo flight broad-sided me with the overwhelming sense of responsibility and awareness that my life and safety literally rested squarely upon my shoulders alone. This awareness provided me with an absolute commitment to remain clear of alcohol and drug abuse in my

pursuit to become the best and most emotionally and physically fit pilot possible.

I achieved my instrument, commercial, and multi-engine ratings at Wings of Denver, Centennial airport. With 250 hours total time and just 25 hours of multi-engine time, I moved to Miami, Florida and enrolled in DC-8 Flight Engineer training. Six months later I became an FE Check Airman and Simulator Instructor and began teaching Part 121 ground school for Fine Airlines. In just six months I was upgraded to First Officer (still with just 25 hours of multi-engine time). The route structure for this airline was primarily Central and South America. Five years later I was able to make the difficult decision to leave my role as a trainer in order to focus on advancing my own airman proficiency. I accepted a position with Rich International Airways flying charter DC-8s for the military between the US and Europe. When this airline ceased operation one year later, I accepted a position flying DC-8s in domestic operations for American International Airlines. Six months later I accepted my last DC-8 position with Emery Worldwide Airlines. Five years later, just prior to 9/11, after eleven years flying the DC-8, Emery ceased operations. Never before was I so fortunate to be available to be hired by my present, very amazing, and truly awesome employer, NETJETS, where I enjoy my role as a Check Airman on the Citation XLS.

I am very driven by my passion and goal to succeed in aviation. Failure, very simply, is not an option. The reward for persevering in this objective is that each time I receive a flight duty assignment; I perceive it as an amazement as I walk out the door and say to myself “today is another fabulous day, for today I actually *get* to go to work. “

I do have a physical workout schedule and whenever possible I take my dog out jogging. I also enjoy mountain biking, unicycling, and hiking. On



6.10 The Citation XL is the Netjet aircraft flown by Captain Rick Vigil.

hotel layovers I try to use the gym and opt for a room on the top floor so I can choose to take the stairs over the elevator.

Unfortunately, I have known several pilots who have fallen prey to the cycle of drug and alcohol abuse. There is just no allowance in this career field for mismanagement of these substances.

As I reflect upon this career choice, it is imperative to communicate with you the absolute personal commitment you must adopt as a pilot to insuring adequate margins of safety at all times. You absolutely must have a strong conviction to remain free from drugs and alcohol. This requires remaining focused on your goal and not giving in to the very real and very strong influence of your friends who might choose otherwise. When you are performing as a pilot, you alone hold virtually all of the responsibilities for safe flight. This is a skill practiced day in and day out through your choosing to make correct and sound decisions about your life and welfare. Your ability to make those decisions correctly is a direct result of what you feed your body and mind and how well you take care of both. The FAA requires a physical every 6 months to ensure this commitment to fitness is continuous. As well, they closely monitor any violations you may incur while driving a motor vehicle and you will likely face immediate suspension of flight privileges should any moving violation involve the use of drugs or alcohol.

I love my job almost more than words can express because I have pursued it as my passion, incorporated it as my lifestyle, and succeeded even against many odds because I allowed for no other option. I am a true believer in following your life's passions. If you are fortunate enough to have identified this to be flying, then by all means, pursue it with a zest and vigor like none you have known before. Your lifestyle will be determined by your passion to fly. Your success will depend upon it. Your reward will be the end result of it. And then perhaps you, too, will be able to walk out the door on your way to work one day and say, "today is another fabulous day, for today I actually *get* to go to work..."

Meet Major General Tandy Bozeman, USAF Retired

My name is Tandy Bozeman. If you had been around back when I was growing up, and someone asked you to point out the youngster in the neighborhood most likely NOT to grow up to be a jet pilot, you would have surely picked me.

Orphaned at age ten when my parents were killed in an accident, I went to live with my Victorian Grandmother in Montgomery, Alabama, a sleepy Southern river town with its roots in the American Civil War. My Grandmother was an elderly widow who lived quietly alone. The introduction of an active pre-teen boy into her life was a rude shock, but she willingly took on her new responsibilities as a single parent.

I settled into my new life in Montgomery and the loss of my parents faded with time. I did hold dear a particular memory of my father—a brief

6.11 Major General Tandy Bozeman is shown answering questions during an official interview.



experience together which was later to set my course in life. One summer morning when I was about five years old, my father hired a local pilot to take us up for a hop in a golden, yellow Piper Cub. We wedged ourselves into the narrow back seat with me perched on my dad's lap. The flight could not have

lasted more than thirty minutes, but that morning shared with my dad remains as my most vivid memory of my father, and was to become the spark that led me to the Civil Air Patrol cadet program.

Early in my first year in high school, I was humping my books between classes when I overheard a snatch of conversation between two classmates, something about an "Air Patrol." The word "air" caught my ear and I heard that they were discussing a meeting of Civil Air Patrol (CAP) cadets out at the local military airbase. The speaker said that sometimes cadets even got to fly along with the senior members in their personal planes. He explained that the Air Force leadership at Maxwell supported the CAP with the use of a building set into the perimeter fence so that you could enter the building from an off-base public street. This arrangement allowed one to get to CAP meetings without having to pass the military police at the gate. That was reassuring because I doubt that I would have had the nerve to attempt the main gate with its imposing armed guards. I wanted to learn more, but the bell rang and I ran late for class, receiving an icy glare from Miss Terry, the English teacher, as I tried unsuccessfully to slip unnoticed into my desk.

Maxwell AFB was a healthy hike from my home, but reassured that I would be a welcomed guest, I made plans to show up for the next cadet meeting. I was to find new friends, adult guidance I sorely needed, and the beginnings of the path to a flying career.

I was hooked at the first cadet meeting. A CAP senior member, outfitted in a sharp looking uniform, ran the session, showed World War II gun camera films for the first hour, and then the dozen or so cadets in the room took turns in a well worn yellow and blue "flying" box with tiny wings

called a link trainer. Even I got a turn in the trainer—my first experience trying to stay upright in three dimensions on instruments. My performance showed little promise of a career in aviation.

The CAP cadet program rapidly became an anchor and focus in my life. I joined the company of young friends, many of whom would later go on to careers in aviation. As I look back on the experience, I realize now that the Montgomery Civil Air Patrol cadet program was exceptionally well run, mentored by a small group of senior members who put thought and planning into their weekly cadet meetings. The highlight of the program came the next summer when the CAP Cadet Encampment was held at Maxwell. We moved into the military barracks for a week. The most exciting part of the program was a half an hour orientation flight in a T-33, the trainer version of a real jet fighter. The view through the bubble canopy was awesome, and I remember how I marveled at the sight of the earth falling away as we first broke ground on takeoff. I was to see the T-33 again.

My friends in high school and I were aware that some of our contemporaries were experimenting with drugs, but our shared interest in aviation and, in our novice eyes, its mystique of keenly honed pilot skills and clear judgment was enough to steer us away from any serious consideration of ingesting any substance that would muddle our mental abilities or threaten what we hoped was to be a flying future. Our senior CAP leaders did not harp on the subject, but they made it clear enough that drug use was a path to a quick exit from the cadet program. Also, our shared love of flying gave us each the self esteem to feel no need to be “cool.” I thought the few students I knew in high school that were gambling with drugs were just plain stupid. I got better kicks from trying not to crash the evil little link trainer.

I continued to be active in the Civil Air Patrol cadets, and now used some of the money I earned working as a copyboy at the local newspaper to buy flying lessons at Allenport, a grass strip on the south side on Montgomery where most of the CAP seniors hangared their personal planes. I rode my bicycle out to the airfield for lessons, and with something like five hours of dual instruction was launched solo around the pattern in an Aeronca Champ, while my instructor chewed his nails back on the ground. My grandmother was required to sign a permission form before I was allowed to make my first solo flight. She expressed grave reservations when I literally begged for her signature. She said her husband had once crashed with one of those Wright brothers. However, she signed and I got my way.

I logged a number of uneventful solo hours in the Champ and the Piper Cub, flying whenever I had a few dollars. I took immense pride because I was now an FAA licensed pilot, and I walked the flightline with a pronounced swagger that greatly amused the older and more experienced flyers. The nail-chewing concern over a student up on the first solo flight was also to be part of my future.

Even though aircraft rental rates were cheap compared to today's prices, my poor finances limited my time up in the Champ or the Piper Cub,

6.12 All professional pilots started in the same type of airplane as you, a student, will be flying.

Image courtesy of Alex McMahon.



the two rental offerings at Allenport. Even if my pockets were empty, I would still jump on my bike and pedal out to the airfield on

weekends and hang around listening to the hangar tales of the senior CAP members who passed their mornings leisurely polishing and tinkering on such exotic machines as Stinson, Taylorcraft, Aercoupes, Luscombes, and a shinny yellow and blue PT-17, a real military trainer. Many of the stories I eavesdropped on were thrilling tales of aerial combat over Europe in World War II. If it was my lucky day, one of the senior CAP member pilots would hoist himself out of his chair with a grunt, give me the squint eye, and offer, “Hey, kid, wanna come along for a hop?”.

I graduated from high school and went to work full-time at the newspaper, where as a staffer in the new photography department, I soon found myself in the middle of history in the making when a local black minister, Dr. Martin Luther King, rose to international fame leading what was to become the wider civil rights movement. The attention of the world was focused on Montgomery during this time and I had the opportunity to observe and learn from a number of famous photojournalists. From the experience I was to retain a life-long interest in photography.

For a year I thrived on the excitement of being a nascent photojournalist and gave little thought to plans for the future. Fortunately, Joe Holloway, chief photographer, my boss, friend and mentor, made a critical decision for me. One summer morning, to the amusement of the entire newsroom, he loudly announced to me and everyone within earshot, that I was “FIRED.” After a dramatic pause added, “You are going to college.” It was the right kick in the pants at the right time. A year working at the newspaper where almost everyone was college educated had given me a growing appreciation that a college degree was the entrance ticket to opportunity.

That fall I arrived on campus and enrolled in freshman Air Force Reserve Officer Training (AFROTC). My CAP cadet training was great preparation for AFROTC and I ended the first year selected as the outstanding



*6.13 Major General Bozeman flew many fire-fighting missions during in his career.
Image courtesy of the California Air National Guard.*

freshman cadet, and was to win outstanding cadet honors again for the next three years. In my senior year I was selected as the AFROTC Cadet Wing Commander. My cadet colonel uniform was a blinding delight to behold. This was years before AFROTC scholarships, so I worked part-time in the university photography department to help pay my tuition bills.

I graduated from the University of Alabama and the AFROTC program with a regular USAF commission as a second Lieutenant, selected to attend pilot training. Sporting gold bars, I headed west to Reese AFB in Lubbock Texas to begin Undergraduate Pilot Training (UPT) in Class 64A, a class comprised of Air Force Academy and Distinguished AFROTC graduates.

Once again, my CAP background helped me fit right into the military regimen of pilot training. However, I faced a bit of a problem when it came to signing up for one of the required physical fitness sports. I had never played organized sports, and to hide my lack of experience, I foolishly announced that I would play soccer, a sport offered mainly to accommodate the allied students in training. So, I passed my year in pilot training being run down, and over, by some excellent soccer players, who returned home to countries around the globe believing that Americans love American football because they are hopelessly incapable at soccer. I discovered that even though you run in the wrong direction, it's still good exercise.

Fortunately, I was more at home in the cockpit of the little T-37 jet trainer, and later in the venerable T-33. Learning to fly the T-33 was an interesting challenge. I was convinced the first T-33 cockpit originally contained one switch, and all the many others I was to face in training were added randomly without any thought for the poor pilot. To my constant dismay, tuning the Automatic Direction Finding (ADF) radio required that

you lean forward with your head between your legs and crank a small handle. When you finally got a radio station tuned and identified and returned upright, the aircraft was likely upside down. I quickly became accomplished at recovery from unusual attitudes.

My year in pilot training was a blast! After UPT graduation, I was assigned for further training as an Instructor Pilot and for the next five years served an IP at Laredo AFB in Texas and Craig AFB back in Alabama. After six years I left active duty for the Air National Guard and what was to be a short-lived airline job. My family and I moved to the Los Angeles area where I learned that the California Air Guard, just down the road in Van Nuys, was scheduled to transition into the C-130 Hercules. I drove down to the base and applied for a pilot slot in the unit. My timing was perfect, and I was soon shipped off back to Texas in the first class for C-130A conversion training. Within a few months after returning from training, I was upgraded to flight instructor/flight examiner, a qualification I was to hold for 20+ years. I was also privileged to serve as Wing Commander, Commander of the California Air National Guard, and Adjutant General of the California National Guard.

I have been privileged to enjoy more than 40 years in aviation—a lifetime of wonderful experiences, shared with like-minded folks in uniform whom I valued as my close friends. My years in the C-130, flying the world with Air Guard, were the best. To name just a few of the good times: I've landed a C-130 on a frozen lake north of the Arctic Circle, air dropped cattle fodder on the Navajo Reservation in Arizona, flown firebomber initial attack on wildfires in Italy, watched the sun rise out of the mist over the Amazon Basin, and been on combat maneuvers with the Ukrainian military. There is no more rewarding feeling than the one you experience at the very moment when the aircraft you are flying first breaks free of the earth, and you, in command of crew and machine, set off into the rising sun on an adventure to a new part of the world. And I got paid to do it.

Likely because I lacked the influence of a father, I have never been much involved in organized sports, but have always done something to keep in reasonable shape. As a youth I walked or rode a bicycle all over Montgomery. Later in college and in the military I took up jogging until an age at which my knees began to complain, and then I switched to a bicycle. I still hike in a nearby National Park, and keep a bike spin trainer in the house for use in the winter months. Physical exercise I considered to be good insurance so that I could keep passing the yearly flight physicals. Besides, exercise just makes you feel better and is a great stress reducer.

Sadly, almost every pilot has a dark story of a colleague whose life was destroyed by substance abuse. I was closely associated with a young pilot in my C-130 squadron who was a victim of a serious alcohol abuse problem. He was intelligent and a skilled flyer with a career of great promise ahead of him, but a descent into serious alcohol addiction was to prove his ruin. At the insistence of his commander, and with the encouragement of his friends in the squadron, he was persuaded to enter a medical treatment program.



6.14 This is General Bozeman and his son, Tandy, after an “orientation flight” in an F-16. Tandy Senior flew with an Instructor Pilot while his son flew wing. His son won the Distinguished Flying Cross in air combat over Yugoslavia.

He came out of treatment clean for while, but soon began to falter. His downhill slide was rapid—he was removed from flying status, saw his marriage dissolve, and finally, trapped in a whirlpool of alcohol addiction and depression, he ended his own life. His heartsore friends viewed his death as a tragic waste that we were powerless to prevent. It was a sobering lesson about the dangers of substance abuse, a memory which continues to sadden me many years later.

During my military career I’ve jumped at the any opportunity to talk to CAP cadet groups. In some small way I want to return some of the inspiration I received from the CAP cadet program. My message to the cadets is simple: “If I can do it, you can do it. All you need is a fire of determination in the belly.”

If you decide to make your life’s goal a career in aviation, the path to success is very straightforward. First and most important, you must stay in school and focus on completing your education. An education is your ticket to play. Getting that high school diploma or university degree is more a function of hard work than smarts— 80% perspiration and 20% talent. This means that the doorway to achievement and an education is open to anyone willing to turn in the effort. Follow these two rules: “Don’t put off to tomorrow what you can get done today”, and “Do it right the first time.”

To reach your goals, you have only to set your mind to the task at hand and believe in yourself. During my years as an instructor pilot I learned how vitally important it is to always maintain a positive belief in yourself and your

abilities. Pilot trainees that believed they could master the flying training program usually were successful. If you let doubt edge into your mind, it almost always will degrade your performance and cripple your ability to learn. I used to tell my students: “You are what you think.” You must understand that mistakes are part of any learning process, and, for that matter, part of living. Acknowledge and learn from your mistakes, that’s important, then put them behind you and move ahead with a positive attitude. In flight, like in life, you should learn from the past, but not dwell on it. Believe you can do it, and you can!

The only “equipment” you need to achieve your goals in life is a clear mind and a physical condition that maintains and enhances that clear mind. Physical activity and sports tune the body so that you both feel and think better, and, perhaps most important, feel good about yourself. The lure of drugs may seem to offer a quick route to “clearer vision” and other such myths, but in a long career I’ve never met a flyer who thought drugs would make them a better aviator.

Even as a teenage student pilot, my interest in aviation and pride that I could fly an airplane by myself gave me more than enough self confidence to say “no thanks” when invited to experiment with drugs. I felt no pressure to conform, be accepted, try something new—I was already into a heady experience—flying machines. Later, when I became a military aviator I was keenly aware that my “ticket” to the cockpit of those neat military planes was proactively maintaining a healthy body and mind. Every year I faced off with the Flight Surgeon during my annual flight physical, a rigorous examination that checked everything from your heart to your teeth. Each time I was handed the Air Force cleared-to-fly form signed by the Flight Surgeon, I felt that my personal exercise program had been once again validated as the best investment in my flying future. In my thinking, drug and alcohol abuse was a red-flag danger to my flying career, and to be avoided, period. Most pilots I knew all felt the same way. Why would you risk a career which, after your family, was the most important part of your life?

As for me, I’ve now hung up my Air force flight suit in retirement. But I still get into the air from time to time with friends who own airplanes. I find it’s like riding a bicycle, a couple of times around the pattern and I’m in the groove again. I’ve avoided the lure of owning my own plane, but lately have been eyeing an ultralight. Looks like a lot of fun. Occasionally, I still hang out on the flightline of my local country airfield, and if I notice a young person with that certain look of wonder in his or her eyes that I know so well, I stop to say hello.

I am most proud that my son has followed my lead, and is a career USAF active duty F-16 pilot. His Distinguished Flying Cross awarded for aerial combat over Yugoslavia hangs in a place of pride on my office wall.

Remember, the road to a career in aviation is wide open for you, and the way is well within your abilities. Just bravely keep to the straight path and you will be rewarded with a lifetime of doing what other folks only dream about.

THE ALL-STARS!



6.15 On July 16, 2008, Lt. Colonel Ron Gendron (seated center) was able to join the other professionals, featured in the LET'S GO FLYING book, at the Perfect Landing Restaurant, Centennial Airport near Denver, Colorado. Left to right, seated, we have Captain Rick Vigil, Lt. Col. Gendron, and Lt. Col. Pat Hanlon. Standing (left to right) we have Captain Randy Trujillo, Capt. Bill Mitchell, and your author, Dr. Ben Millspaugh. Unfortunately Major General Tandy Bozeman and First Officer Adam Wright were unable to join this luncheon. It was an amazing time to listen to all of these professionals talk about their careers. These pilots, including the author, have remained clean, focused and dedicated to being the best at what they do. They became successful by making good choices. They are drug free, alcohol free, and everyone of them said, "I have the best job life can offer." You can, too!



Educational Programs Directorate
&
Drug Demand Reduction Program

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