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# PRO PILOT USA™

## THE COMPLETE FLIGHT SIMULATOR

Windows® 95 & 98 Compatible

Dynamix
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# PRO-PILOT USA™

THE COMPLETE FLIGHT SIMULATOR

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# *Pilot Guide*

Dynamix®
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# Team Intro

If you're like most people, you've always dreamed of learning how to fly— now you can! Welcome to Sierra's *Pro Pilot USA*. Climb into one of six different civilian aircraft and travel to thousands of destinations all over the United States and Canada. Whether you're just starting out or already have a logbook the size of a telephone directory, *Pro Pilot USA* will have you adding up frequent flier miles in no time. If you think you've got the right stuff, get ready for some pure adrenaline entertainment.

This manual is designed to get you "in the air" as quickly and easily as possible. The first two chapters contain general information on installing the simulation and taking full advantage of its features. In particular, you'll want to check out the *Cool Things to Do and See* section in Chapter One and the first flight walk-through information found in Chapter Two. Chapter Three covers the fundamentals of flying an aircraft and includes a section on basic flight physics. If you're a novice pilot, this chapter will enhance your understanding of just how an aircraft is able to overcome gravity and stay airborne. Chapter Four challenges your flight proficiency by detailing some simple maneuvers that every pilot should be able to perform.

Appendix A contains detailed flight characteristics on each of the aircraft plus operational checklists that help you to fly them. The *Acronyms and Abbreviations* list in Appendix B will help you to make sense of the unique language pilots have created for themselves. Appendix C helps you to create a list of .wav files that allow you to insert your own voice into the simulation. Appendix D contains a compilation of solutions to problems that new users sometimes encounter. If you're still stuck, information on how to contact Sierra's Technical and Customer Support is also listed.

A brief word about some of *Pro Pilot USA*'s features is in order. Flight characteristics of the aircraft showcased in *Pro Pilot USA* have been carefully modeled to reflect real-world conditions. This attention to detail ensures a level of accuracy not commonly found in other simulations. *Pro Pilot USA* lets you visit hundreds of cities and towns spread out across the United States — meticulously recreated using the latest in digital technology. Of greatest importance to new pilots, is the collection of Ground School video clips. Finally, having the option of flying with a co-pilot takes much of the burden off your shoulders.

*Pro Pilot USA* is a valuable learning tool geared toward helping novice and experienced pilots alike. No matter what group you belong to, you can







practice your flight skills in the safety and security of your own home. With so many places to go and so many things to do, *Pro Pilot USA* will have you cris-crossing the country. The only question is: *Where do you want to fly today?*

Remember, your attitude will often determine your altitude. Have fun and thank you for purchasing Sierra's *Pro Pilot USA*.

— The *Pro Pilot USA* Development Team

# System Requirements

## *Minimum*

- A Pentium 90 PC with Windows® 95
- 4X CD-ROM Drive
- 16 Mb RAM
- 1 Mb Local Bus Video Card
- A hard disk with 30 Mb free (minimum installation)
- An SVGA graphics card
- SVGA (640 x 480 resolution) 256 color monitor
- DirectX 5.0 or later
- A mouse.

## *Preferred*

- Pentium 166 or better
- 8x CD-ROM Drive
- 32 Mb RAM
- A hard disk with 60 Mb free (typical installation)
- PCI Video Card

## *Additional Hardware Supports*

- 3DFX Voodoo Graphics Cards
- Win95 Compatible Joysticks

In order to connect with the Pro Pilot Web Site, a 9600-baud (or faster) modem with a Web browser and an Internet connection is required.

Check out *www.propilotusa.com* for the latest information.

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CHAPTER 1

# CHAPTER ONE: INTRODUCTION AND OVERVIEW

## 1. Installation and Set-Up

### *Installing* Pro Pilot USA

Insert the ***Pro Pilot USA*** **CD #1** into your CD-ROM drive.

After a few seconds, the *Pro Pilot USA* introductory video will play. After the video has finished playing, the Autoplay installation window appears. (You can skip the video by clicking your mouse anywhere on the screen while it is playing.) Click on the **Install** button then follow the on-screen instructions.

If the video and the Autoplay installation window do not appear, you must manually start the installation process by double-clicking on the ***setup.exe*** file.

Access the ***setup.exe*** file by using Windows Explorer to view the contents of the *Pro Pilot USA* CD.

The installation process makes certain system tests of your machine then gives you a choice of three different types of installations: **Typical**, **Custom**, and **Compact**. In most cases, you should select **Typical** installation. This places approximately 52 Mb of data files on your Hard Drive.

Once you have chosen a type of installation, you are prompted to name the location on your computer where the *Pro Pilot USA* files are to be placed. Use the default location indicated on-screen or press the **Browse** button to choose a new location.

Once the installation has been completed, be sure to register your copy of *Pro Pilot USA*.

If you choose ***Custom*** installation and are not able to select an install destination drive, choose a ***Compact*** installation instead. Once the ***Compact*** installation is complete, run *Pro Pilot USA* and click on the **Re-install** button on the Main Menu window. Now choose ***Custom*** installation and follow the remaining on-screen prompts.

## *Post Installation Notes*

When you install *Pro Pilot USA*, a **Sierra** Utilities icon appears at the top of your Windows 95™ **Start** menu. This utility allows you to easily register or uninstall any Sierra programs that are detected on your computer. You may also access the ***readme.txt*** file for any program that this utility detects. The Support option is an on-line Setup Help file that provides answers to hardware questions, troubleshooting issues, and explains how to create a Windows 95™ boot disk.

If, for any reason, you would like to remove this icon, go to the Start menu and select **Settings >Taskbar**. Select the **Start Menu Programs** tab and click the **Remove** button. Scroll to the bottom of the programs list where the **Sierra Utilities** icon is listed. Highlight it and click **Remove**.

In addition to the **Sierra** Utilities icon, a NetMarket icon is also placed on your desktop during the installation process. This is an Internet shortcut to the on-line shopping and travel service offered by **Cendant Software**, parent company of **Sierra On-line**. If you have an Internet browser and a connection, take a moment to browse the great buys, special offers, and entertaining games that this site provides. If you'd like to remove this icon, simply drag it into your Recycle bin.

## *Starting* Pro Pilot USA

Once the simulation has been installed on your computer, you're ready to go flying. Make sure that the *Pro Pilot USA* CD #1 is in your CD-ROM drive. You can start the simulation several different ways:

- by clicking on the *Pro Pilot USA* **desktop icon.** (This icon was created during the installation procedure. You are given the option of having this icon placed on your desktop at that time.)
- If you chose not to have a *Pro Pilot USA* icon placed on your desktop, you can start the simulation by clicking on the **Start** button on your Windows 95™ Task bar. Move your cursor to **Programs**, then select **Sierra>Pro Pilot USA** from the Start menu.

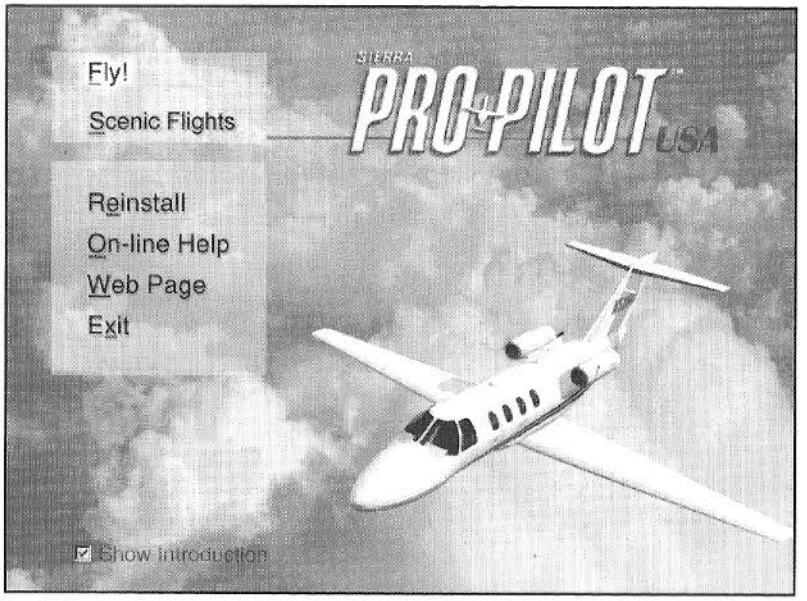
## *The* Pro Pilot USA *Start-Up Menu Window*

The *Pro Pilot USA* Start-Up Menu window contains the following options: **Fly!**, **Scenic Flights**, **Reinstall**, **On-line Help**, **Web Page**, and **Exit**. You may select an option either by double-clicking your mouse on the appropriate line or; by typing the **underlined letter** that represents the desired option and pressing the *ENTER key*.










- **Fly!**: Select this option to begin play. By default, you begin each flight in a stationary position located at the end of an active runway. Your engine, radios, and other instrumentation are initially turned off.
- **Scenic Flights**: Select this option if you are interested in flying one of ten pre-made scenic flights over some of America's most beautiful scenery and interesting landmarks. Check the *Cool Things to Do and See* section for more information.
- **Reinstall**: Select this option to reinstall *Pro Pilot USA*. For example, you would use this option if you later decide to change from a **Typical** to a **Custom** installation.
- **On-line Help**: Select this option to access the On-line Manual.
- **Web Page**: Select this option to access the *Pro Pilot USA* Web site on the Internet.
- **Exit**: Change your mind? Select this option to exit the simulation.

Additionally, if this is your initial flight, you are provided with the option to view an AVI (movie) on cockpit familiarization. This may be followed by a video of a complete rotation (take-off and landing), all with a flight instructor onboard. You can watch this video uninterrupted or you can jump in at any time and take control of the aircraft.

## *Calibrating Your Joystick/Yoke*

*Pro Pilot USA* supports many different joysticks and game controllers. Before playing the simulation, you must first enable and calibrate your particular controller from the Windows 95™ Control Panel. Some joysticks require adjustments before they *center* properly.

To calibrate your joystick, click on the **Start** button on the Windows 95™ task bar. Move your cursor to the **Settings** option and select **Control Panel**. One of the choices in the **Control Panel** window is **Joystick**. Double-click on the **Joystick** icon. Make sure that *your* joystick is showing in the Current Joystick window, and click **Calibrate.**

Follow the calibration procedure. Once you have completed the calibration, click **Test**. Check that the cross-hair is in the center of the square. Check that it moves left and right when you move the control, and that it moves up and down when you press forward and pull back on a joystick or yoke. Click on **OK** to return to the Control Panel.

Your joystick manufacturer may have updated drivers available for use with Windows 95™. If you have difficulties with your joystick, contact the manufacturer for possible updates.

## *Activating Your Joystick/Yoke*

Once the simulation is running, you can activate your joystick by pressing the *Alt-J* key combination. Press *Alt-K* key combination to re-activate your keyboard.

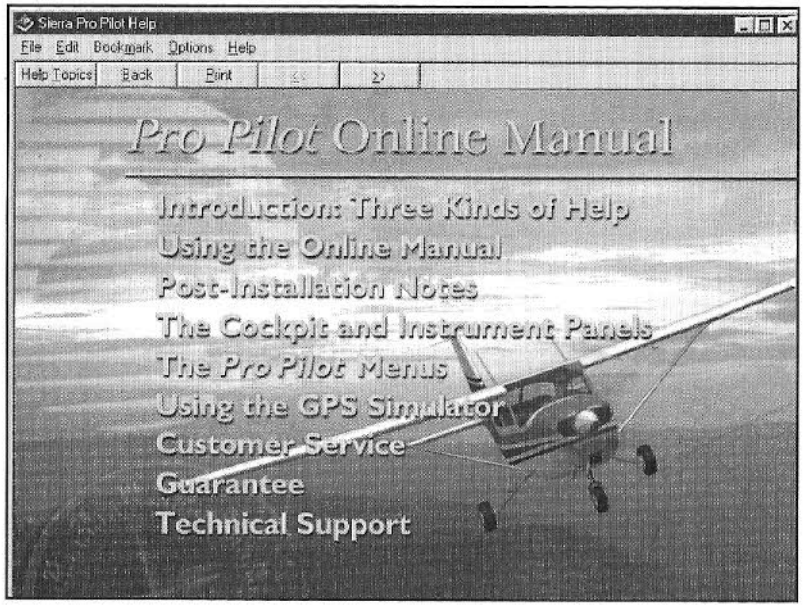
You can also activate your joystick/ yoke from the simulation by selecting **Options> Flight Controls** off the hidden menu strip at the top of your screen. Click on the **Joystick/Yoke On** checkbox to set a joystick/ yoke as your flight controller. This screen also allows you to set the sensitivity of your ailerons, elevators, rudders, and dead space controls.

Joystick schematics can be found on the *Pro Pilot USA* ***Controls Quick Reference*** card.










# 2. Getting the Most from *Pro Pilot USA*

## *The* Pro Pilot USA *On-line Manual*

Flying an aircraft is a difficult, demanding job even when winds are light and visibility is good. *Pro Pilot USA* comes with a comprehensive On-line Manual that makes learning to fly much easier. Here you'll find detailed information regarding your cockpit instrumentation as well as tips on navigating through *Pro Pilot USA's* many menu and dialogue box options. This handy reference is like having a co-pilot/ instructor along for the ride. It allows you to call a "time-out" at any time during your flight.

To access the On-line Manual, move your mouse to the top of the *Pro Pilot USA* window as shown in the figure above. This activates an on-screen hotspot causing a hidden Menu strip to appear. Select the **Help** menu option from the menu strip.


The **Help** menu option is subdivided into five sections: **Contents**, **Search**, **Selections**, **How To Use Help**, and **About Pro Pilot USA**.

- **Contents**: This option displays the On-line Manual's table of contents. Each Table of Content entry is a link to that particular section of the manual.
- **Search**: This option displays a Search index. You may search for help on a particular topic by scrolling through the index or typing a keyword or phrase.
- **Sections**: This option opens a pop-up menu that lists the major sections of the On-line Manual. Use this option, if necessary, to help you refine your search.
- **How to Use Help**: This option displays a brief explanation of the On-line Manual Help system. It will help you navigate within the On-line Manual more easily.
- **About Pro Pilot**: This option displays a list of the persons responsible for bringing you **Sierra's** *Pro Pilot* and *Pro Pilot USA*.

## *Ground School and Co-Pilot Assistance*

One of the things that makes *Pro Pilot USA* such a valuable learning tool are the Ground School AVIs (short video movies) and Co-Pilot Assistance features.







1. **Ground School**: The Ground School component of *Pro Pilot USA* consists of a dozen or so AVIs covering a variety of topics. These videos are a great way to learn how to fly because they give you a visual reference to accompany the audio and text instruction. To access these Ground School videos, simply access the **Mode** option off the menu strip located along the top of the window. Select **Ground Lesson** off the Mode pull-down menu.

   You'll be asked to insert Disk #2 into your CD ROM drive. (The video files are stored on this second disk.) Once the disk has been inserted, you are given a choice of videos to view. Use the slider bar to scroll the entire list, then double click on your selection.

2. **Co-Pilot Assistance**: In the real world, when first starting out as a pilot, the FAA requires that you have a certified instructor aboard the aircraft. Only after you prove to your instructor's satisfaction that you won't hurt the aircraft or yourself, are you allowed to fly solo. In *Pro Pilot USA* you have the option of taking a Co-Pilot/ Instructor along. You are not forced to take one with you but it's a good idea. Your Co-Pilot takes much of the workload off your shoulders so you can concentrate on flying.

   If you want to have a Co-Pilot accompany you, use your mouse to access the menu strip located at the top of your screen. Select **Mode** and check the **Dual Flight** option on the pull-down menu. Checking **Dual Flight** brings up the Dual Flight dialogue box. The Dual Flight dialogue box contains a check box labeled **Co-pilot Onboard**. Use your mouse to place a check in this box if you wish to have a Co-Pilot go with you in the aircraft. Other check boxes determine the level of Co-Pilot Assistance offered. For example, checking the box labeled **Handles NAV Radios** causes the Co-Pilot to automatically tune your NAV Radios to the appropriate frequency.

## *Cool Things to Do and See*

Learning how to fly is not an end unto itself. The whole point of flying is to gain the freedom to travel and see the country from the air. This unique vantage point gives you a better appreciation of just how beautiful the United States really is. Beyond looking at scenery however, consider the many exciting maneuvers you'll be able to perform as your skills as a pilot improve. This section outlines just a few of the cool things you can do and see with *Pro Pilot USA*. With a little time and imagination, you'll be thinking up plenty of things to add to the following list and maybe even come up with a new maneuver or two of your own.

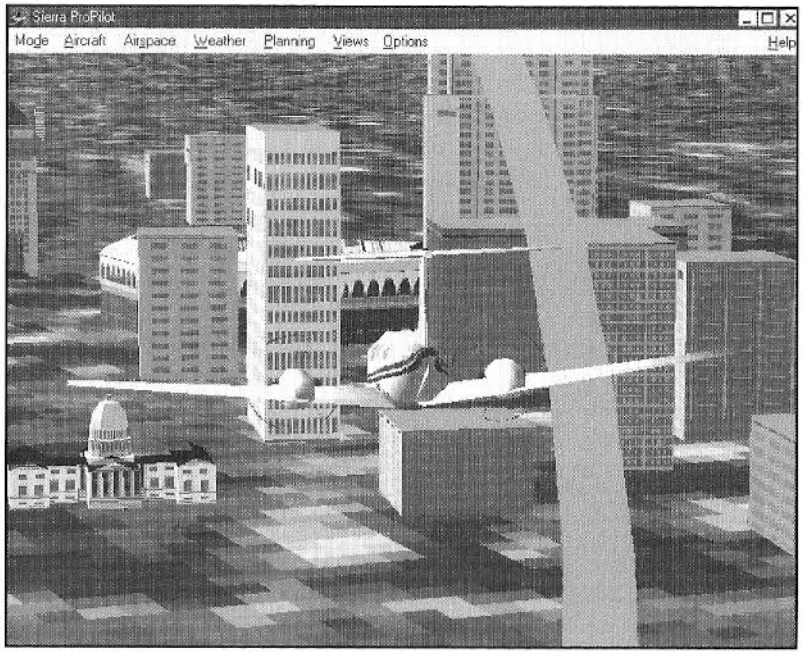

- **Scenic Flights:** *Pro Pilot USA* comes with ten pre-set scenic flights over some of the country's most interesting landscapes. Click the **Scenic Flights** button on the Start-Up Menu window or press the *n key* to access this option. You are taken immediately to a new window listing the ten selections. Choose a flight by clicking on the desired button. You'll be joining the flight already in progress. The pre-selected aircraft begins in straight and level flight so you have time to take control.

- The **Scenic Flights** include such natural wonders as the **Grand Canyon** National Park in Arizona and the **Rocky Mountains**. You can also fly over such man-made landmarks as the capitol and other government buildings in **Washington, DC**, the **Space Needle** in Seattle, **Statue of Liberty** in New York Harbor, **Cape Canaveral** in Florida, the magnificent **St. Louis Arch**, as well as the **Golden Gate Bridge** in San Francisco. For a truly fun vacation, how about taking a flight to the famous hotels and casinos of **Las Vegas**.










- **Be Your Own Daredevil:** None of the aircraft in *Pro Pilot USA* are certified to conduct "stunts" in the real world, but this shouldn't keep you from trying them out anyway. Better that you learn what you can do and what you can't do here, in a simulator— where the only thing you can hurt are your feelings. More importantly, you can do things in a simulation— you know, fun things— that would get you arrested in real life. The designers of *Pro Pilot USA* want to stress the importance of safety and are certainly not advocating that you engage in these activities— but we all know you're going to anyway.

Flying under bridges has always been a favorite way for pilots to prove how brave (or how crazy) they are. Actually, it takes significant skill to pilot an aircraft so precisely. One of the most famous bridges in *Pro Pilot USA* is the Golden Gate Bridge in San Francisco. You'll have to do a little wave hopping but if you pass under it from west to east you'll be pulling out of the maneuver over Alcatraz. For some real precision flying, however, try squeezing between tall buildings in a major city. You can almost hear some of the skyscrapers in New York City begging you to give it a try. You'll never get an opportunity to do this in real life but in *Pro Pilot USA*, it's just one more cool thing to do. Get it out of your system now.

- **"Who's the Best Pilot" Challenge Flights:** The save flight feature allows you to save your favorite mission and fly it over and over again. There's no reason why you can't use this feature to create a particularly difficult situation then test your ability to make a safe landing. Moreover, there's nothing stopping you from exchanging savegame *.flt* files with a friend who also happens to have a copy of *Pro Pilot USA*.

  Creating flights with poor visibility or high winds are just a couple examples of the kinds of challenge flights you can devise. How about creating a flight in which the reliability settings of your aircraft are lowered or one that starts out extremely low on fuel? You could, for example, challenge a friend to see which of you has the best flight time from Eugene, Oregon to San Francisco — or which of you can find your way home using only dead reckoning. In short, there are a variety of cool pilot challenges you can create. Let your imagination run wild, then swap files with your friend.

- **Changing Your Default Start-Up Flight:** *Pro Pilot USA* comes with so many different airports you are bound to find one near you. You can change the simulation's default start-up flight to your favorite airfield (and aircraft) by saving the flight under the file name ***startup.flt***. Place this file in the **ProPilot\Flight\Flights** directory. This flight will now replace the existing file and become your new default start-up flight.

  For example, if you are partial to flying in the Baltimore-Washington area, start a flight that has you taking off from a nearby airport such as Dulles or BWI. Save this flight and rename it ***startup.flt***. There's no reason why your start-up default flight has to begin on the ground, either. You can save a flight at any point (even in mid-air). Simply rename the file ***startup.flt*** and replace the existing file.







# CHAPTER TWO: YOUR FIRST FLIGHT

The most important things you do to ensure a safe flight occur on the ground so don't be in a hurry to get airborne. Always conduct a thorough inspection of your aircraft before you begin moving. Remember the old pilot's maxim: *It's better to be on the ground wishing you were in the air than in the air wishing you were on the ground.* As a private pilot, you have the luxury of taking as much time as you need. This section takes you step-by-step through an entire flight, from creating a simple fight plan to using Air Traffic Control (ATC) communications.

## 1. Setting Up the Simulator

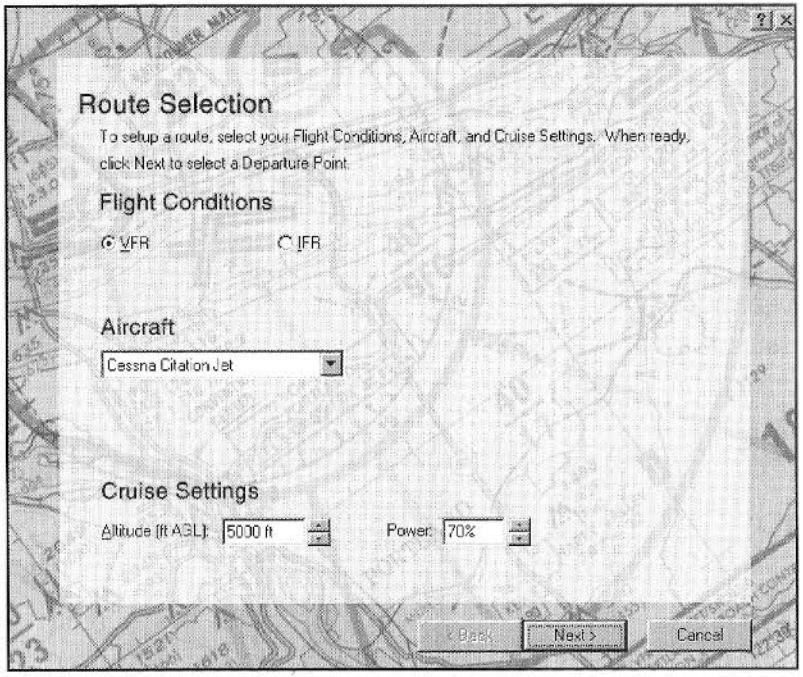
1. Use your mouse to activate the menu strip running along the top of your screen. Select the **Mode>Dual Flight** option from the pull-down menu. Make sure all seven of the boxes are checked.
2. Now select the **Airspace>ATC Communication** option (*Shift + F4 key*) from the pull-down menu. Make sure that the **Auto-Tune COM1 Radio, Auto Taxi to Runway,** and **Listen to Pilot's Readback** boxes are all checked.

Eventually, after you get a feel for what Air Traffic Control (ATC) expects from you and what you should expect to get back in return. You can turn off some of these communication options according to your ATC experience. Please note that the bottom three Instruction check boxes are only available when you're flying the Cessna 172P.

## 2. Creating a Simple Flight Plan

Smart pilots don't leave the ground without first creating a flight plan. The following instructions will help you create a basic VFR (Visual Flight Rules) flight plan taking you (in a Cessna 172P) from San Diego International to Gillespie Field using a NDB (Non Directional Beacon).

1. Use your mouse to activate the menu strip running along the top of your screen. Select the **Planning>Create Flight Plan** option from the pull-down menu.
2. On the **Route Selection** screen, check **VFR** flight conditions. Select **Cessna 172P**. Set **Cruise Settings** to **3500 feet** at **70% Power**. Click **Next** to advance to the Departure Point screen.




3. On the **Departure Point** screen, type in the letters **SAN**. Select **SAN — San Diego Intl — San Diego, CA** from the list. Click **Next** to advance to the Destination Point screen.
4. On the **Destination Point** screen, type in the letters **SEE**. Select **SEE — Gillespie Field — San Diego, CA** from the list. Click **Next** to advance to the Flight Plan map.
5. When the flight plan map appears, click on the **Show NDBs** button. There is one NDB on the route called **DEORO**. Click on the **Add Fix** button (it has a little flag on it), and then click on the **DEORO NDB** symbol on the map. The map will show our adjusted route to SEE via the DEORO NDB. Click **Next** to advance to the Weather Briefing page.
6. On the **Weather Briefing** screen click **Next** to advance to the Flight Log page.
7. On the **Flight Log** screen, click **Finish**.

When you click on **Finish** in the Flight Log, you have activated your flight plan. You can also activate a flight plan by selecting **Load Flight Plan** from the **Planning** option. Once the flight plan is activated, you will be placed at the departure airport at a 90° angle from the departure runway. In this instance, the departure runway is located at San Diego International.







# 3. Starting Your Aircraft

You begin this flight with your Cessna 172P's engine and avionics turned off. Because starting up an aircraft is a little more complicated than starting the family car, pay close attention to the following instructions.

For purposes of this tutorial section, the procedures listed here refer only to the Cessna 172P. Starting procedures for all of Pro Pilot USA's aircraft can be found in Appendix A.

1. Write down the numbers shown on the bottom of the RPM gauge. This is the Hobbs meter and it records the number of hours the engine has been running. You will use this number to record your flight time in your logbook once the flight is complete.
2. Set the fuel mixture to rich. (Press the */ key* on your keypad to enrich the mixture or use your mouse to push in the mixture knob. Press the knob in as far as it can go. You'll be able to see the mixture knob move.)
3. Set the battery/alternator switch to **On**. (Use the *Z key* on your keyboard to toggle the battery/alternator **On/Off** or click your mouse on the battery/alternator switch.)
4. Set the fuel selector valve to **B**. This allows the engine to draw fuel from both fuel tanks. (Use the *F key* on your keyboard or use your mouse to cycle the fuel selector value between **Off/Left/Both/Right**.)
5. Make sure that your parking brakes are **On**. (Use the *Alt + P key* on your keyboard to toggle your brakes **On/Off**.)
6. Open the **throttle**. (Use the *= key* on your keyboard or use your mouse to push in the throttle lever slightly. (In reality, you would push the knob in approximately 1/8th of an inch.)
7. Start the engines by turning the **ignition switch** to the **S** position. (Use the *S key* on your keyboard or by clicking your mouse on the **S** position of your ignition switch located in the lower left corner of the screen). When the engine has started, the switch will automatically move to the **B** position. Wait a few seconds, then check your oil pressure. The needle should be located in the green region of the guage.
8. Turn **On** your beacon and navigation lights. (Use the *3 key* on your keyboard to toggle the beacon light **On/Off**. Use the *4 key* on your keyboard to toggle the Navigation lights **On/Off**. You may also use your mouse to click on the beacon/navigation light switches.)
9. Turn **On** the power to your avionics. (Use the *x key* on your keyboard to toggle the avionics **On/Off**. You may also use your mouse to click on the avionics switch.)

# 4. Air Traffic Control Procedures

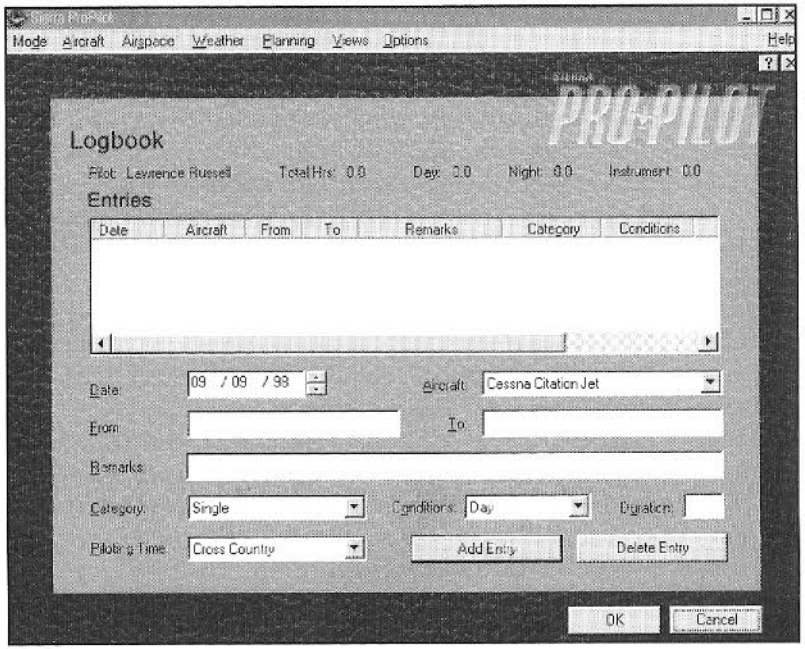
This section details the procedure for communicating with Air Traffic Controllers during your flight. Keep in mind that if you think you have missed a message, press the *ctrl-R key*. This will repeat the last instruction given to you. If you need further assistance with the ATC procedures in *Pro Pilot USA*, there is a file named *ATC.txt* in the **Propilot** directory.

1. Once power to the avionics is turned **On**, ATIS (Automatic Terminal Information Service) will begin playing. It will tuned into the COM1 radio. When the ATIS recording calls out the altimeter setting, make sure that you adjust your altimeter accordingly.
2. After ATIS finishes playing your copilot will tune in the next available facility, which in this case is **ground**. The copilot will request clearance to your destination airport: **SEE — Gillespie Field — San Diego, CA**. The facility will clear you to **SEE** via the NDB listed in your flight plan, **DEORO**.
3. Your co-pilot will then request permission to **taxi** to the active runway. Ground will give you that permission. Since the flight plan already starts you out at the active runway, you won't need to do anything.
4. Ground will now instruct you to contact tower. Your copilot will tune in the tower frequency on COM1 and check in with the tower. If no other planes are landing, the tower will instruct you to **taxi into position and hold.**
5. If other aircraft are landing, the tower will tell you to **hold for arriving aircraft**. You can look out your left side window with *shift + left arrow key* and see them fly down the runway.
6. You must hold here until tower gives you permission to taxi into position. Because you have **Auto Taxi to Runway** option selected, you will be placed on the runway when the tower instructs you to **taxi into position and hold.**
7. The tower will now give you clearance to takeoff. Apply full power by pressing the *backspace key* or using your mouse to push the throttle all the way forward. Once the throttle is at full power, release the parking brakes by pressing the *alt + p key*.
8. After lifting off from the runway, continue flying the runway heading. If you get instructions from the tower to fly a different heading, turn to this heading immediately.
9. Within a few moments, the tower will instruct you to contact **departure**. Your copilot will tune and contact departure. Departure will instruct you to **proceed direct to DEORO**. Congratulations. You're on your way!





10. **Departure** will instruct you to climb to your cruise altitude. "Real world" flight rules are applied whether you are flying VFR or IFR (Instrument Flight Rules) so Departure may not give you the altitude you've requested.
11. If you would like to request a different altitude, you can do that in the ATC Communication dialog under the **Airspace** menu, using **Request New Altitude**, but the same rules still apply. The altitude granted may be 500 to 1000 feet higher or lower than that you've requested.
12. As you fly toward DEORO, you will enter the airspace controlled by SEE (our destination airport). At this point DEORO has done its job and you will be turned over to **SEE approach.**
13. Your copilot will tune in the ATIS broadcast for SEE. After listening to the recorded message, your copilot will next tune in and contact SEE approach. Approach will instruct you as to which runway you will be landing on, then give you the **squawk code.**
14. Your copilot will tune the squawk code into the transponder. (If you are unsure what a squawk code is you may select **Ground Lesson** and view the video titled **Communication**.)
15. Continue to fly the heading given to you by SEE approach. Approach will fly you around the outside of the airport until you can be fit into the traffic pattern. At this point you will be instructed to contact tower. Your copilot will tune and contact tower on the new frequency.
16. The tower will now direct you into the traffic pattern, which may have other traffic. It is very important to fly the headings given to you in order for ATC to sequence you for landing amongst the other traffic.
17. The tower will instruct you to **turn left base.** Start your descent for landing. If you don't, your copilot will kindly remind you. At the proper time you will be given one last 90° turn towards the runway. When the runway comes into view, line yourself up. Your copilot will give you additional help if you have problems coming in. The tower will say **clear to land.**
18. Upon landing you will be instructed to contact **SEE ground**. After your copilot contacts ground, you will be instructed to **taxi to the ramp**. ATC communication is concluded at this point.




# 5. Shutdown and Paperwork

The fun part of your flight is concluded once you've landed but your job as a pilot is far from over. Before you head for the lounge and start telling "war stories," you must shut down the aircraft as follows:

1. Retract your flaps to the UP position. (Use the + *key* on your keypad or click your mouse on the flaps lever.)
2. Turn off your landing light. (Use the *6 key* on your keyboard or click the landing light switch on your screen.)
3. Center your trim tabs. (Use the appropriate keys on your keypad or click your mouse on the trim tab wheels.)
4. Reduce the fuel mixture to lean. (Use the * *key* on your keypad or click your mouse on the mixture control knob. This will cut the engine.)
5. Turn **Off** the avionics power. (*x key*)
6. Turn **Off** the battery/alternator. (*z key*)
7. Write down the number on the Hobbs meter (located on the RPM gauge).
8. Go to **Planning>Flight Log** and close your flight plan.
9. Go to **Planning>Logbook** and record your data. **Piloting Time** should be entered as dual. Subtract the number recorded on the Hobbs meter at startup from the time you just recorded at shutdown. Record this value in the **Duration** field. Example: 0004.7-0003.0 = 1.7 hours, where 0004.7 was your shutdown time and 0003.0 was your startup time.

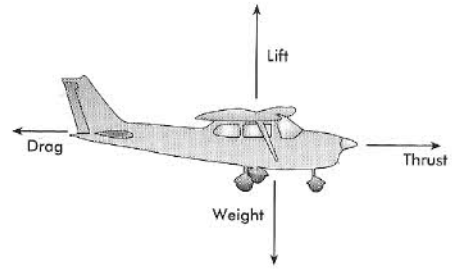






# CHAPTER THREE: HOW AIRCRAFT WORK

Most of us drive cars without knowing the ins and outs of how automobiles function. At best, the average person knows to step on the gas to go forward and to step on the brake to stop. Aside from checking the oil or refilling the wiper fluid, what goes on under the hood is black magic to most people. Unlike driving an automobile, a pilot must know what keeps his aircraft in the air. This section is intended as a very general overview of how aircraft work.




*Four forces that act on an airplane in flight: lift, weight, thrust, and drag.*

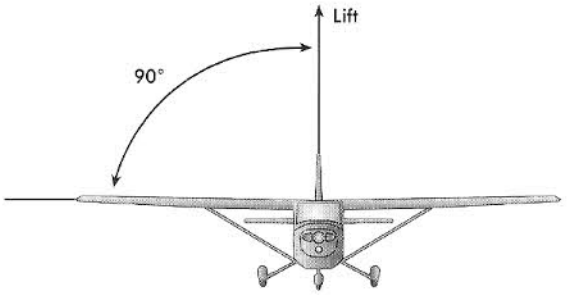
# 1. The Four Forces

Flying an aircraft requires a delicate balance of four physical forces: **Lift**, **Weight**, **Thrust**, and **Drag**. Each of these forces must be harnessed in order to control the aircraft while in flight. In this respect, a pilot must be a good manager— not of people necessarily, but of the environment surrounding his aircraft.

## *Lift*

Lift is a force that is created as air passes the aircraft's wings. Air must travel farther over the top of a wing than it does under the wing. In order to maintain equilibrium at the trailing edge, it must speed up. This faster moving air exerts less pressure on the top of the wing than the slower moving air underneath. Greater air pressure below the wing "lifts" it— or in other words creates lift.

Air density also affects lift. As the density of the surrounding air increases, there is more air for the aircraft's wing to "bite" into. But at higher elevations or on warmer days, air density decreases. You'll find that your aircraft generates noticeably less lift and requires a longer runway in order to take off.




*Lift acts perpendicular to the wingspan.*

The force of lift acts perpendicular to the chord of the wing— in direct opposition to the force of gravity. This is known in engineering circles as the "lift vector." In order for the aircraft to rise, the amount of lift being generated must be greater than the weight of the airplane. For example, in level (one G) flight, the wing is perpendicular to the ground and must generate at least one G worth of the lift to maintain altitude. (1 times weight of the airplane.) The lift vector, in this instance, is aimed directly upward.

When turning, however, the wing is banked and therefore, so is the lift. Because part of the lift is no longer aimed directly upward, the aircraft must increase its lift in a turn to maintain its altitude. Turning also increases the G forces acting on the aircraft (so long as you hold your altitude) so not only is lift diminished— the aircraft "weighs" more also.

## *Thrust*

Newton's law states that "*for every action, there is an equal and opposite reaction.*" Aircraft demonstrate this law at work. By using a propeller or jet engine to force air behind it, an aircraft causes *an equal and opposite reaction* to occur— forward motion. This forward motion is essential for generating lift, which in turn, is necessary for flight. Thrust is a function of the amount of horsepower being produced by the aircraft. By opening the throttle, you cause the engine to work harder and thus produce more thrust.







*Pro Pilot USA* features a variety of aircraft; everything from the single engine propeller-driven Cessna 172 to the twin jet engines of the CitationJet. As you become more familiar with each of these aircraft, you'll begin to appreciate the differences in available thrust that each is capable of producing.

The force of thrust pushes the aircraft forward in direct opposition to the force of drag. In order to go faster, an aircraft must increase the amount of thrust it is producing. However, as the aircraft begins to move faster, the amount of drag acting on the aircraft is exponentially increased. As drag increases, so too, is the amount of thrust needed to move the aircraft.

## *Drag*

Drag is the force exerted by an object to resist motion through a medium. In our case, that medium is air. Every object that moves through air, whether it's a football or a Boeing 747, produces drag. This force acts in opposition to thrust. The faster an aircraft travels through the air, the more drag it creates. The more drag that is created, the harder the engines must work to produce greater thrust. This is why it is more difficult for aircraft to achieve and maintain higher speeds.

There are actually two different types of drag acting on an aircraft. First, there is *induced drag*. Induced drag is drag that is created as a result of producing lift. It is inversely proportional to the square of the aircraft's speed. As the relative wind is deflected downward by the wing, the air moves over each wing tip toward the low pressure on the top of the wings and forms vortices. The strength of these vortices increases at higher angles of attack, so the slower the airplane flies, the greater the induced drag and vortices.

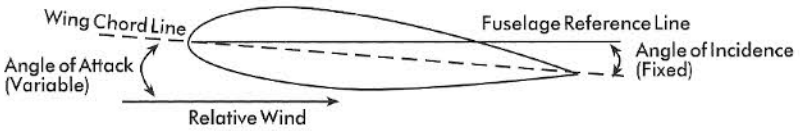
The second type of drag is known as *parasitic drag*. Parasite Drag is caused by friction between the aircraft and the surrounding air. Designers can reduce the amount of parasitic drag present, to a certain degree, by streamlining the aircraft's fuselage. A poorly designed aircraft does more than just look bad. There is a tangible penalty to be paid in the form of parasitic drag. Parasite drag increases as the square of the airspeed increases. If you double your airspeed, you increase your parasite drag four times. If you triple your airspeed, you increase your parasite drag a whopping nine times.

## *Gravity (Weight)*

The fourth force acting on an airplane is gravity. Gravity accelerates everything (be it animal, mineral, or vegetable) toward the center of the planet at a constant 32 feet per/second$^2$. It is measured in G forces; such that one G is equal to the force of gravity acting upon a stationary object at sea level.

Modern fighter aircraft are capable of producing more Gs than the human body can withstand. Even with G-suits designed to counteract the affects of high gravity on the human body, a pilot can typically withstand fewer than 10 Gs before blacking-out. Fortunately, in your career as a civilian pilot you will never be required to experience this much gravity. Still, you need to be aware that certain maneuvers, even in a Cessna 172, will place additional G stress on your aircraft.

Gravity acts in direct opposition to lift. As your aircraft struggles to generate lift in order to stay airborne, gravity is always present quietly doing its work, waiting for an opportunity to pull you back to Earth. As long as lift exceeds the force of gravity, your aircraft will rise. If the two forces are equally balanced, your aircraft will maintain a constant altitude. Once gravity gets the upper hand, however, your flight will soon come to a halt.




*The angle of attack, angle of incidence, chord line, and fuselage reference line.*

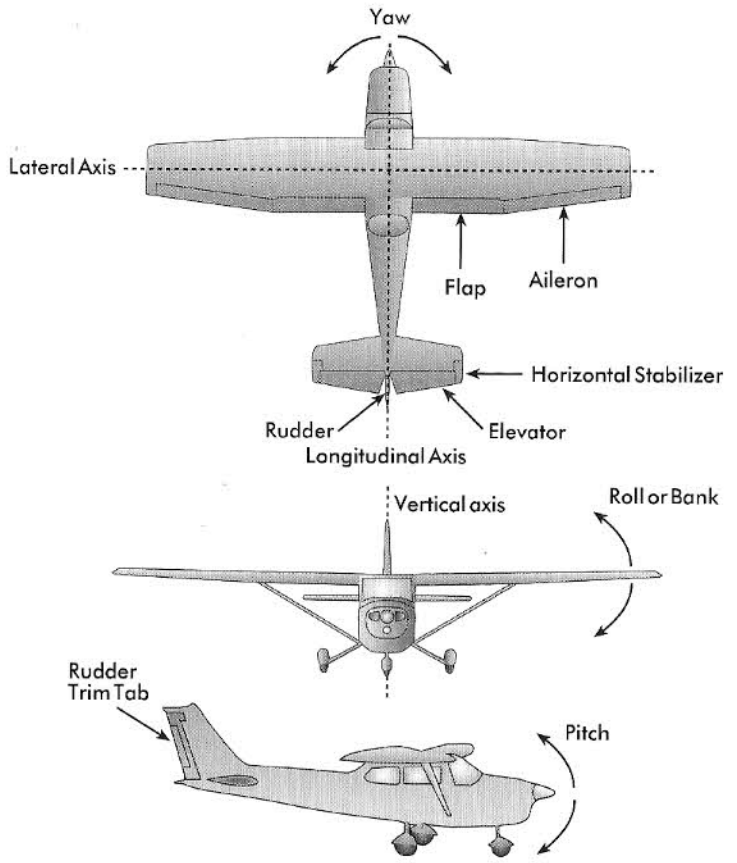
# 2. Your Primary Flight Controls

Unlike driving an automobile on the ground, flying an aircraft requires that you learn to move about in three dimensions, not just two. This extra dimension may give you additional freedom but it also creates more opportunities for things to go wrong. Fortunately, aircraft are equipped with a variety of control surfaces that enable them to move about their three axes: *lateral (pitch), longitudinal (roll),* and *vertical (yaw).* This section details the functions of your three primary control surfaces: **elevators, rudders,** and **ailerons.**







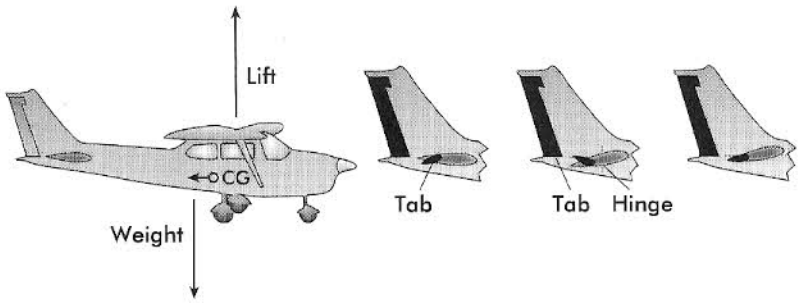



*The axes and controls of an aircraft.*

## Elevators

Elevators control the *pitching* motion of the aircraft about its lateral axis. They act as the airspeed control for a given throttle setting. Pulling back on the wheel moves the elevators up. Under normal conditions, this action forces the tail downward and the nose of the aircraft to rise. With sufficient power and airspeed, the aircraft climbs. Pushing forward on the control yoke (joystick) has the opposite affect. As the tail rises, the nose of the aircraft drops, causing the aircraft to descend.

*The elevator, elevator trim tab, and stabilator.*




At slower airspeeds, an elevator in the *up* position may in fact cause the aircraft to decrease airspeed rather than climb. This is called being behind the power curve. In order to climb, the aircraft must produce the necessary power to support the elevator control. Because most light aircraft don't have angle of attack indicators, you'll use the airspeed indicator to determine the aircraft's reactions to elevator control. This is why the elevators are considered to be the airspeed controller.

Elevator trim tabs are used to reduce elevator or stabilator pressure for the pilot. For instance, if an unusually heavy load is placed in the rear baggage compartment, the tail would be heavy and the nose would rise. You would have to hold forward pressure to maintain level flight. The trim tab can be set to hold the aircraft in a climb, glide, or straight and level flight with minimum control pressure.

## *Rudder*

The rudder controls the *yawing* motion of the airplane about its vertical axis. Push the left rudder pedal and the nose yaws to the left. Push the right rudder pedal and the nose yaws right. The primary purpose of the rudder is to overcome the adverse yaw of the aileron and counteract the "p" factor of the propeller. Most of the time aileron and rudder are used together. This is known as coordinated flight. When performing a *slip or crosswind landing*, they are used in opposition to each other.

Unlike the rudder on a boat, the rudder on an aircraft is not the primary control for turning. It is merely a back-up control for your ailerons. You can, however, turn the aircraft using only the rudder. This is a known as *skidding*; a situation in which too much rudder control is being input. If not enough rudder control is being input, the condition is known as *slipping*. Until you learn to coordinate the rudder with the ailerons, your



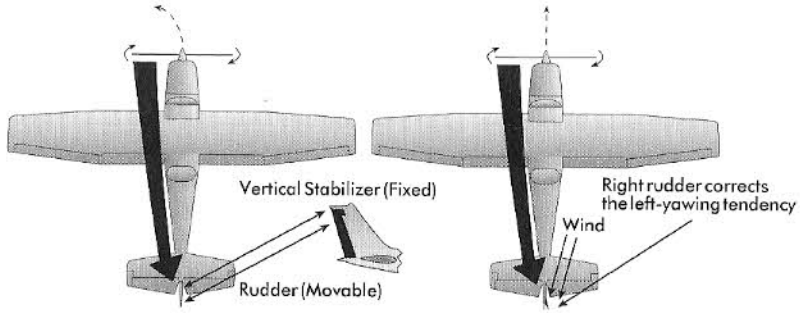




aircraft will either *slip* or *skid* its way through a turn, depending upon the amount of rudder control you input.

Fortunately, *Pro Pilot USA* comes with an auto-coordination feature that automatically inputs the proper amount of rudder whenever the ailerons are moved. To access this feature, simply select the **Aircraft** option from the menu strip located at the top of your flight window. **Select Auto-coordination** from the pull-down menu. If you want to input rudder control manually (i.e. independent of your ailerons), make sure that this option remains unchecked.

*The rudder and rudder trim tab.*




The rudder also comes with a trim tab (like the elevators) which can be used to input and maintain small corrections. You'll want to trim your rudder to offset the left yawing tendency in propeller driven aircraft. It can also be used to trim out the rudder forces needed in a prolonged descent. Use the trim tab to set and maintain a specific course throughout your flight rather than occasionally stepping on the rudders.

Note that the keys corresponding to the rudder pedals are reversed. Pressing on the < *key* causes the aircraft to yaw to the right. Pressing on the > *key* causes the aircraft to yaw to the left.

## *Ailerons*

Ailerons control the *roll* motion of the aircraft about its longitudinal axis. They are the primary means by which aircraft turn. As the control yoke (joystick) is moved to the left, the left aileron moves up and the right aileron moves down. The air flow moving over these surfaces causes the aircraft's left wing to dip and the right wing to rise. If the control yoke is

moved to the right, the ailerons move in the opposite direction— left aileron down, right aileron up. In this instance, the left wing rises while the right wing dips.

When the wings are no longer level, the aircraft is said to be *banked.* In order to turn, an aircraft must *bank* in the direction the pilot wants it to go. The severity of a bank is measured in degrees. A gentle turn requires just a few degrees of bank while a steep turn might require up to 45° of bank angle. Since the force of lift is directed perpendicular to the plane of the wing, banked wings cause the lift to turn the aircraft rather than oppose the affects of gravity. This loss of gravity fighting lift causes the aircraft to lose altitude during turns unless steps are taken to prevent this from happening.

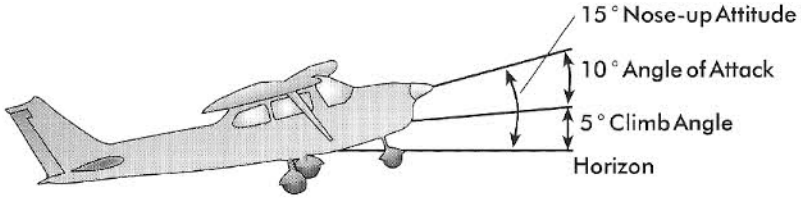
For additional information regarding all three of your primary flight controls, watch the Ground Lesson video entitled Primary Flight Controls. Other videos include information on performing turns, climbs, and other simple maneuvers using these controls. These videos are stored on CD #2 and can be accessed from the **Mode** option by selecting **Ground Lesson** off the pull-down menu.



# 3. Stalling the Aircraft

Angle of attack is the angle between the relative wind and the chord line of the wing. An aircraft in cruise flight, therefore, has a very low angle of attack. The angle of attack is altered by pitching the aircraft up or down in relation to the relative wind. Generally, the greater your angle of attack, the more lift your wings will produce. This is only true to a certain point however. Increasing your attack of attack too much can lead to a disruption in the flow of air over your wings. Once this happens, a stall occurs.

*The angle of attack, attitude, and climb angle.*




Contrary to popular belief, the term *stalling the aircraft* refers to a condition which affects the airflow over the wings of your aircraft— *not the engine.* A stall is a condition in which the *angle of attack* becomes so great that the flow of air over the wing separates from the wing surface. This causes the wing to cease producing lift, which in turn, causes the aircraft to begin losing altitude. Note that the engine may be humming right along, doing its thing, but a stall can still occur.

A stall is a serious condition that demands immediate attention. Left untreated, a stall can cause your aircraft to lose all of its altitude, i.e. crash into the ground. Since you only have so much altitude to play with, the lower you are to the ground when a stall occurs, the less time you have to react.

While stalls are serious, they are only as dangerous as you allow them to become. In fact, stalls are not inherently bad. A normal landing is nothing more than a stall. Air flow over the wing is diminished to the point at which it no longer produces lift. The trick is to have the aircraft arrive at this point just as its wheels are touching down.

In order for an aircraft to recover from a stall, it must begin producing sufficient lift to maintain its altitude. This can be accomplished in a number of ways. First, you can add power so that the wing is propelled through the air faster and generates greater lift. Using the throttle to power out of a stall takes time, however. At low altitudes, this may not be quick enough to prevent you from hitting the ground.

The preferred method of stall recovery is reducing the wing's angle of attack. By dropping the nose of your aircraft (thus reducing the angle of attack), air is once again able to flow evenly over the top of the wing's surface. This will allow the wing to resume producing lift.

You should practice stall recovery on every flight so you'll be ready to deal with a stall when one occurs unexpectedly. As a safety precaution, you should always practice stall recovery at least 3,000 feet above ground. The procedure for recovering from a stall (with your engine power **On**) is as follows:

1. Perform a quick visual inspection of the practice area. Make sure that no other traffic is nearby.
2. Turn your carburetor heat **On.** (Use the *h key* on your keyboard or your mouse to click on the carburetor heat switch.)
3. From a straight and level flight attitude, slowly pull back on control yoke, raising the nose of the aircraft above the horizon line.
4. Maintain this nose-up attitude with continued back pressure on the

control yoke. If you are simulating a landing, check your view out the left window while keeping the wings level and the correct nose-up position.

5. When the stall occurs, your nose will dip sharply indicating a loss in lift. When this occurs, apply full power. Do not immediately attempt to raise the nose. This may result in a secondary stall.
6. Turn carb heat **Off** at the same time you apply full-power.
7. Complete the recovery by resuming straight and level flight.

It is easy for beginners to create what's known as a secondary stall. This occurs when the back pressure is released to recover from the stall, then in an attempt to lose as little altitude as possible, the pilot re-applies back pressure too soon or is too heavy-handed. The aircraft simply stalls again and the process repeats itself. Always recover firmly, but don't overcontrol the aircraft.

## 4. Flaps

When an aircraft is flying at slow speeds, the volume of air passing its wings is small. As a result, the amount of lift being generated, at any given angle of attack, is also relatively small. The line between minimum controllable airspeed and stalling the aircraft becomes very fine. Typically, an aircraft flies slowly at two points during a flight; at take-off and at landing. Coincidentally, these are also the two worst possible times to enter a stall because of the aircraft's proximity to the ground.

Every aircraft is equipped with control surfaces known as *flaps*. Flaps allow the aircraft to operate safely at slow speeds by helping the wing produce additional lift. Naturally, extra lift helps get the aircraft into the air more quickly during take-offs. Flaps also allow the aircraft to land at a slower speed allowing the pilot to stop his airplane in as short a distance as possible. Another advantage is the additional drag flaps create. Extra drag allows the pilot to approach at a steeper than normal angle.

Your flaps have a variety of settings; from the UP position (indicating no flaps) to different increasing degrees of extension. The higher the setting, the more your flaps will assist in producing lift. As the flaps are extended into the air flow, aircraft drag is also increased. Your aircraft will begin to slow down yet remain at its present altitude because of the additional lift beginning created. Use your throttle to set a constant rate of climb or descent.

Each aircraft in *Pro Pilot USA* has its own unique flap settings. Consult the appropriate take-off and landing checklists in Appendix A of this manual.





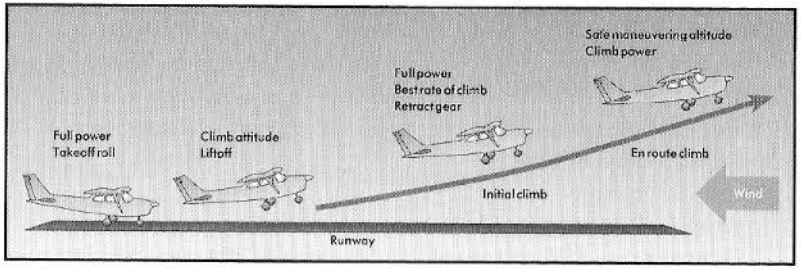


# CHAPTER FOUR: BASIC FLIGHT PROFICIENCY

Broken down to its bare essentials, flying an aircraft is nothing more than up, down, left and right. Nothing in life is ever this simple, however. This chapter contains some simple flight maneuvers that every pilot needs to be able to perform with confidence.

## 1. Taking-Off

Although the take-off and departure climb is one continuous maneuver, there are essentially three parts to it: the *take-off roll*, the *liftoff*, and the *initial climb*. Before taxiing onto the runway, the pilot should ensure that the engine is operating properly and that all controls, including flaps and




trim tabs, are set for takeoff.

*The normal take-off and climb.*

### *Take-off Roll Procedure*

Begin your *take-off roll* from a stationary position properly aligned with the runway centerline. (Your wheels should straddle the runway centerline.) Pick out a reference point at the opposite end of the runway and use it to maintain your orientation during the takeoff.

- Open the throttle slowly to get the aircraft rolling. Once the aircraft is in motion, smoothly apply full power by pressing the *backspace key*. Keep your fingers near the throttle keys or your mouse on the throttle lever. Check your engine instruments.
- As the aircraft continues its take-off roll, maintain your runway alignment by using the rudder keys as necessary. Pressure on your flight controls will increase as the aircraft picks up speed.

## *Liftoff Procedure (Rotation)*

Ideally, you will need to make only minor adjustments to your pitch angle once your aircraft leaves the runway. Consult the operating checklist in Appendix A for the best pitch angle and rate of climb for your respective aircraft.

- Gradually apply back pressure on the control yoke to raise the nosewheel slightly off the runway, thus establishing the take-off attitude. This procedure is often referred to as *rotating*. Note the position of the nose in relation to the horizon and apply elevator pressure as necessary to maintain this attitude.
- Apply aileron pressure to keep the wings level.
- In strong, gusty wind conditions, build up a faster takeoff speed before leaving the ground. Take-off at normal speeds in such conditions may result in a stall, if the aircraft encounters a sudden drop in wind speed.

## *Initial Climb Procedure*

Upon lifting-off from the runway, the aircraft should be brought to an attitude that will allow it to accelerate to its best rate-of-climb airspeed. Best rate of climb speed is that which the aircraft gains the most altitude in the shortest period of time.

- Apply back pressure on the control yoke to hold this attitude. After it is certain that the airplane will remain airborne and a definite climb is established, retract your flaps and landing gear.
- Maintain take-off power until you reach an altitude of at least 500 feet above the surrounding terrain and obstacles.
- Control the airspeed by using the elevators to make slight pitch adjustments. Watch the attitude of the airplane in relation to the horizon.
- Set your pitch trim to maintain your climb airspeed.
- Keep an eye on your airspeed. The aircraft will not immediately accelerate or decelerate following changes in pitch, so don't *chase the needle.*
- Continue making minor pitch adjustment until the desired climbing attitude is established.



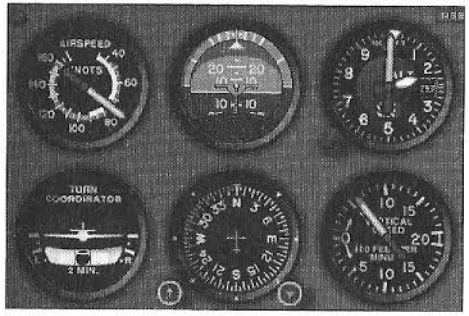




# 2. Gaining Altitude (Climbing)

Proper climbs are made through a combination of elevator and rudder position, as well as power. The rudder is used to offset the effects of torque from the engine and slipstream and the engine is used to generate power (thrust). You need to consider the recommended climb speed and power setting for your aircraft in order to attain a proper rate of climb (in feet per minute or fpm). This information can be found on the aircraft checklists in Appendix A. Normal climb speed is about 1.4 to 1.5 times the stall speed.

*The Normal Climb: the climb airspeed is steady; the attitude is nose up, wings level; the heading indicator shows a constant heading; the turn coordinator shows balanced, straight flight; and the altitude is increasing as shown by the altimeter and the vertical speed indicator.*




## *Normal Climb Procedures*

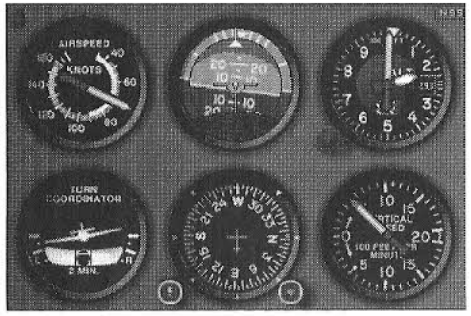
- After lifting off from the runway, place the nose in its climb pitch attitude.
- Set your power to the normal climb value as indicated on your checklist.
- As your air speed drops, apply right rudder to correct for the left yawing tendency.
- Don't let the nose of the aircraft drift during the climb.
- Set your pitch trim for the climb.

## *The Climbing Turn*

All climbing turns should begin from a normal straight climb. Make all climbing turns shallow, no more than 10 degrees angle of attack. Steeper turns during a climb result in a reduced rate of climb because more back pressure is required to keep the nose up (therefore, more drag is created).

- Begin a straight climb. Apply and maintain back pressure on the control yoke. Apply right rudder as your speed drops to correct for the effects of engine torque.
- Begin the climbing turn by using your ailerons to bank the aircraft in the desired direction. Keep both the bank angle and the climb angle shallow.
- Neutralize the ailerons and return to just enough right rudder to correct for P-factor. Once your reach your intended heading, roll out of the turn and resume the straight climb.
- As the wings become level, neutralize the ailerons and resume right rudder P-factor compensation.

*The Climbing Turn: the climb airspeed is steady; the attitude indicator shows 11° of bank, climb attitude; the heading indicator shows a left turn; the turn coordinator shows a standard-rate, balanced turn; altitude is increasing as shown by the altimeter and vertical speed indicator.*



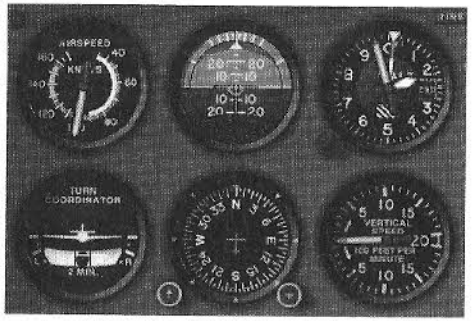

# 3. Straight and Level Flight

As easy as this sounds, even some experienced pilots have trouble keeping their aircraft flying straight and level. Viewing an airplane in straight and level flight is not the same as maintaining one in that position. A visual check for straight and level flying involves three things: the nose should be pointed in the desired direction (no yaw); the nose should be at the proper position with respect to the horizon (longitudinally level); and the wings should be at the same distance above (for the high-wing craft) or below (for a low-wing craft) the horizon (laterally level).





*Straight and Level Flight: the cruise airspeed is steady; the attitude indicator shows nose level, wings level flight; the heading indicator shows a constant heading; the turn coordinator shows straight and balanced flight; the altitude is constant as shown by the altimeter and the vertical speed indicator.*




The proper procedure for attaining straight and level flight begins as soon as you reach the assigned practice altitude. Place the nose at the correct attitude, leave the climb power on until the expected cruise airspeed is reached, set cruise power, then trim until the wheel force against your hand is zero.

# 4. Flying at Minimum Controllable Airspeed

It is important that pilots learn to recognize and avoid stalls when flying at slow speeds. Flying at the aircraft's minimum controllable airspeed is necessary, therefore, to build confidence and educate the pilot. By definition, flying at the aircraft's minimum controllable airspeed means operating at a speed at which any further increase in the angle of attack or reduction in power will cause an immediate stall. Here are the standard maneuvers you should perform while in this condition:

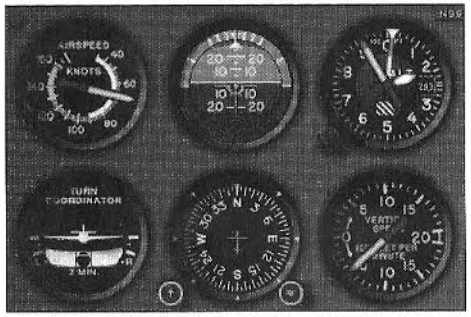
- Throttle back to a power setting less than that which is required to maintain level slow flight.
- Maintain a constant altitude as the aircraft slows by slowly raising its nose.
- Add full flaps when airspeed permits.
- Add power, if necessary, to maintain altitude but also maintain your airspeed through a coordinated use of throttle and elevators.
- Make a shallow turn in each direction while maintaining altitude.
- Level the wings and gradually decrease power to idle.
- Lower the nose to maintain a glide at the minimum controlled airspeed of 5-10 knots above the stall speed.
- Make 20-30° banked turns in each direction.




CHAPTER 4

# 5. Decreasing Altitude (Descending)

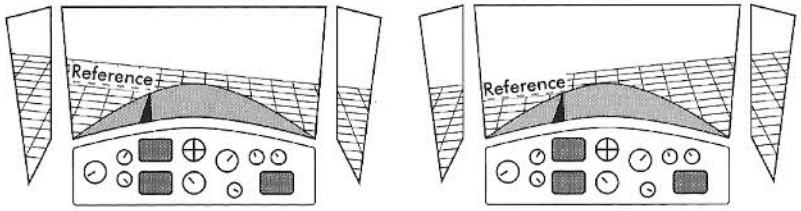
In a normal glide, the throttle is pulled back to idle and the ailerons are set for straight flight. Back pressure is maintained in order to avoid too steep a descent during the glide. With an engine in idle, the slipstream from the propeller becomes negligible. Airspeed decreases considerably because drag becomes greater than thrust. This means the relative wind speed also decreases. The plane noses down as a result. Normal glide attitude in most light aircraft is only slightly more nose-down than in straight and level flight.




*The Normal Glide: the glide airspeed is steady; the attitude is nose low, wings level; the heading indicator shows a constant heading; the turn coordinator shows straight, balanced flight; and the altitude is decreasing as indicated by the altimeter and vertical speed indicator.*

To establish a glide from straight and level flight:

- Pull the carburetor heat on (always recommended before closing the throttle in flight, unless the Pilot's Operating Manual indicates otherwise).
- Close the throttle (to idle) and apply back pressure to hold the nose in a level flight attitude.
- As your airspeed drops to normal glide speed, ease the nose down slightly to the normal glide position.
- You'll notice that quite a bit of back pressure is required to maintain your attitude. Use elevator trim to relieve this pressure.
- To return to straight and level flight, apply power smoothly as you simultaneously ease off the back pressure.
- Push carburetor heat off after cruising flight is established. Re-trim the elevators for straight and level flight




*Use a reference point on the cowling to avoid inadvertent altitude adjustments.*







# 6. Changing Course (Turning)

Life would be easy if all you had to do is turn the control yoke in order to make balanced turns. Things aren't that simple. (Unless you fly an Aerocoupe!) To properly turn an aircraft, a combination of aileron and rudder control is required. With a turn of the wheel to the right, for instance, the right aileron moves up and the left aileron moves down. This creates more drag over the left wing because of the down aileron. The aircraft rolls to the right but the nose yaws left. This creates a slipping turn to the right although a balanced turn will eventually result. The left yaw tendency is called adverse yaw. The rudder is used to correct for this.

As soon as the desired amount of bank is reached, neutralize the controls. This means smoothly returning the wheel to a neutral position and easing off on rudder pressure. The aircraft will remain in the turn even while the controls are neutralized. If you were to continue applying wheel and rudder pressure, the bank would become steeper until the aircraft eventually performed a roll.

- As the bank increases, start applying back pressure on the wheel. When the desired bank is reached, neutralize the rudder and ailerons. Maintain back pressure on the control yoke to keep the nose at the same pitch.
- If the rudder is used too little in a turn, *slipping* occurs. If it is used too much, *skidding* occurs. A *slip* feels like you're sliding toward the inside of the turn. A *skid* feels like you're sliding to the outside of the turn.

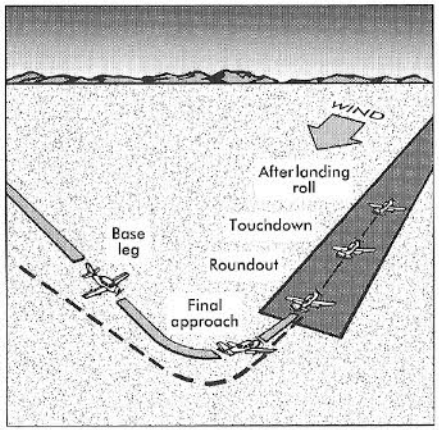
To improve your turning ability, think not in turns of control movement, but of control pressure. The smoother the pressure, the smoother the turn.


*The Turn: the airspeed is lower than normal cruise; the heading indicator shows a left turn, and the turn coordinator shows a balanced, standard-rate turn; altitude indicator is constant.*

# 7. Landing the Aircraft

Pilots are judged most critically on the way they perform landings. A pilot can make a sloppy turn and get away with it. If a pilot messes up a landing, everyone including passengers, will know. There's a saying, "Any landing you can walk away from is a *good* landing." That may be true but would you want to fly with a pilot who had such a cavalier attitude?

*Segments of the approach and landing.*




## *The Base Leg*

It is during the Base Leg of the traffic pattern that the pilot must begin to judge his landing attitude.

- The landing gear should be lowered (if necessary) upon reaching the base leg of the pattern. Start the descent at 1.4 times the aircraft's normal stalling speed with power off, landing gear and flaps down.
- Partially lower the landing flaps.
- Establish drift correction and follow a ground track that is perpendicular to the extended centerline of the runway. Since the final approach is usually made directly into the wind, the base leg will have a crosswind that will require establishing a crab angle toward the runway to maintain the proper ground track.
- Continue the base leg to the point where a medium to shallow-banked turn will align the airplane's path directly with the centerline of the runway. This turn should be high enough above the runway elevation to permit a final approach long enough for the pilot to estimate the touchdown point while maintaining the proper approach airspeed.

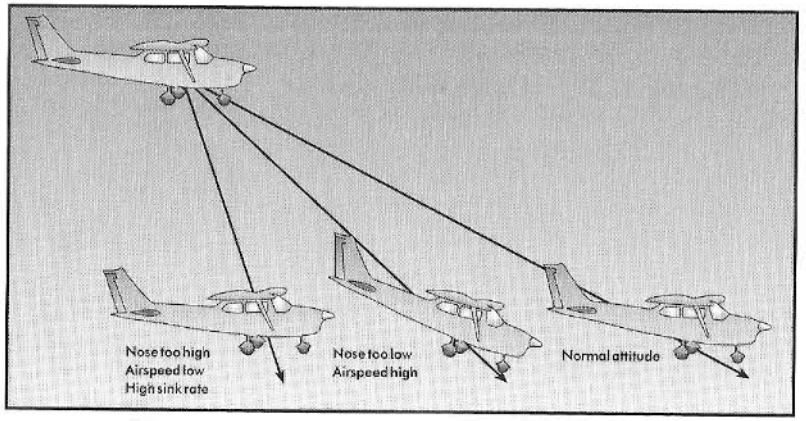




## *The Final Approach*

The last leg of the traffic pattern is known as the *final approach*. During this time, the aircraft is aligned with the runway centerline and a straight line descent is made to the point of touchdown.

- Set the flaps and adjust the pitch attitude for the desired rate of descent. Adjust pitch attitude and power to maintain the desired approach airspeed, approximately 1.3 times the power off stalling speed.
- With pitch attitude and airspeed stabilized, re-trim the airplane to relieve any control pressures.
- Control the descent angle so the aircraft will land in the center of the first third of the runway. A basic rule for the final approach is, "pitch for airspeed—power for altitude."
- Descend at an angle that will permit the aircraft to reach the desired touchdown point at an the correct airspeed.
- If the approach is too high, reduce power then lower the nose. If the approach is too low, add power and raise the nose. If the approach is extremely high or low, reject the landing and go around for another try.
- Flaps decrease airspeed (assuming no other adjustments are made). Use more flaps if it appears that the airplane will overshoot the desired touchdown point. However, never retract flaps to correct for undershooting as this will result in a sudden decrease in lift. Instead, increase pitch attitude and power to adjust the descent angle and airspeed.

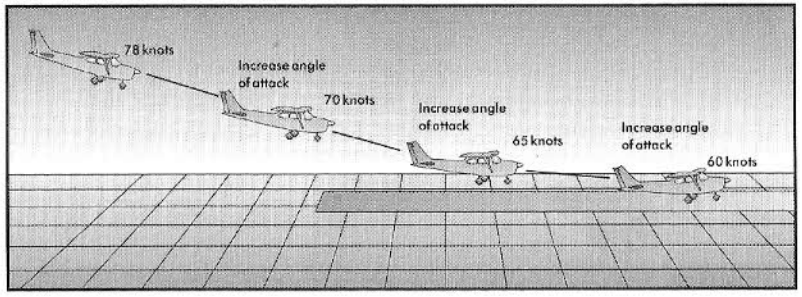



*The effect of pitch attitude on approach angle.*

## *The Roundout*

This part of the final approach is more commonly known as the *flare.* The flare is the point in the landing at which time the aircraft transitions from an approach attitude to the touchdown attitude. It begins when the aircraft is between 10 and 20 feet above the ground. By gradually applying back pressure to increase the angle of attack and pitch attitude, you cause the aircraft to settle onto the runway as its airspeed decreases.

When the angle of attack increases, lift is momentarily increased, thereby decreasing the rate of descent. Since power is normally reduced to idle during the roundout, the airspeed will also gradually decrease. The roundout should be executed so that the proper landing attitude and the proper touchdown airspeed are achieved just as the wheels contact the runway. Once the roundout is begun, elevator control should not be pushed forward. If too much back pressure has been exerted, then slightly relax or hold the pressure constant. It may be necessary to advance the throttle to prevent an excessive rate of sink. Therefore, it is recommended that you keep one hand on the throttle throughout the approach and landing.




*Changing the angle of attack during roundout.*

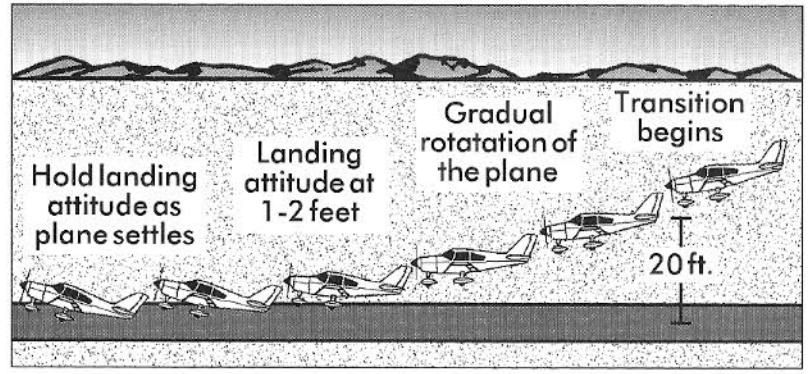






## *The Touchdown*

The point at which your wheels make contact with the landing surface is known as the *touchdown.* The full weight of the aircraft is now transferred from the wings to the wheels. The ideal landing is one in which the aircraft's wheels are held just a few inches above the ground as long as possible using elevators. Because the aircraft is already close to stalling and is already settling, the additional back pressure will slow the settling and result in a gentler landing.




*The proper tricycle-gear landing.*

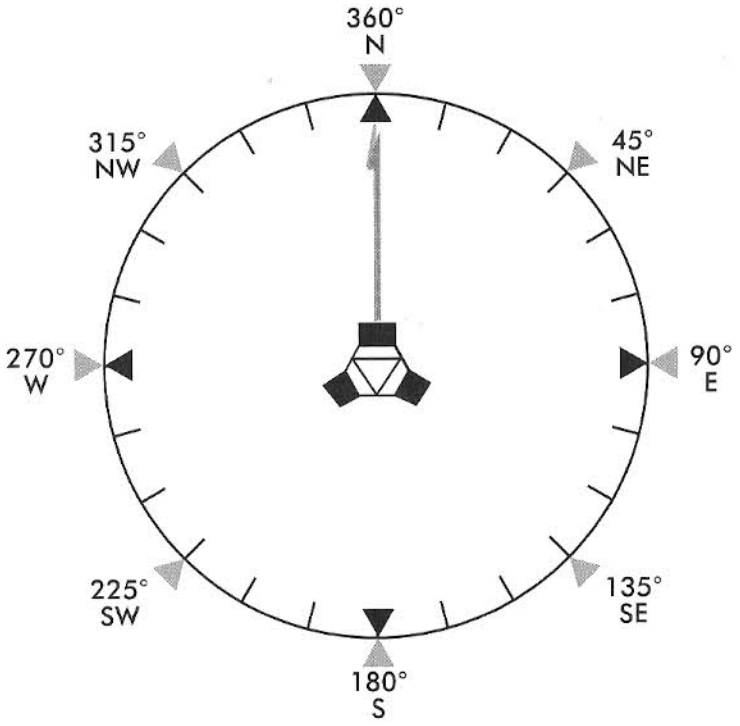
Tricycle-gear type aircraft should touchdown in a tail-low attitude with the main wheels touching down first, so that little or no weight is on the nosewheel. Hold back elevator pressure after touchdown to maintain a positive angle of attack for aerodynamic braking and to hold the nosewheel off the ground until the plane decelerates. Gradually decrease back pressure to allow the nosewheel to settle.

# 8. Navigation

Navigation is the art of getting where you want to go. Pilots must be skilled navigators because finding your way around in the air is a little more difficult in the air than it is on the ground. There aren't any street signs and you can't just pull over and ask for directions. Fortunately, your aircraft is equipped with a variety of navigation aids but it's up to you to learn how to use them properly.

## *The Compass Rose*

Because all forms of navigation involve references to direction and/ or degrees, it is important that you are familiar with a compass. As you can see by the diagram, there are 360° in the full circle represented by a compass rose. There are also eight cardinal directions: *north, south, east, west, northeast, southeast, northwest,* and *southwest.* North is located at 360°/ 0°, east is located at 90°, south is located at 180°, and west is 270°.




*The Compass Rose*

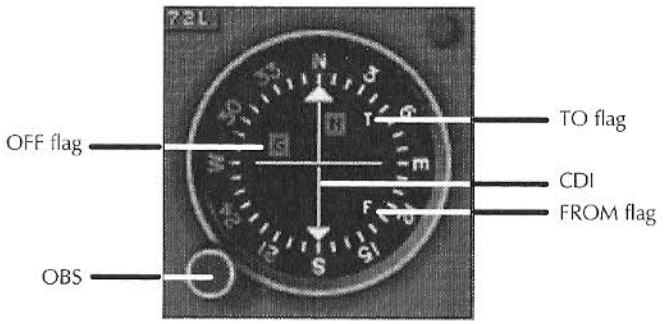






## *VOR Navigation (VHF Omni-bearing Range)*

The most commonly used navigation aid is the **VOR (VHF Omni-bearing Range)**. This system consists of thousands of VOR stations placed in known locations throughout the country. Each VOR station broadcasts a radio signal which pilots can receive and steer toward. The VOR receiver (NAV radio) is located in your radio stack. It converts incoming VHF radio waves to a mechanical device on your instrument panel called the VOR head. The VOR head has an Omni-Bearing Selector (OBS), and Course Deviation Indicator (CDI), a TO/ FROM indicator and a compass rose. Once you know which VOR you intend to fly toward, there are just a few simple steps to take to get you and your passengers there safely.




*The NAV display found on board* Pro Pilot *aircraft.*


## VOR Navigation Step-by-Step

Follow these steps and you'll be navigating by way of VOR in no time.

- Find the VOR you intend to fly toward on your map or GPS display. (Press the *F8 key* on your keyboard to see the GPS.)
- Locate the frequency of the VOR. (Zooming in on the GPS display allows the frequency to be displayed)

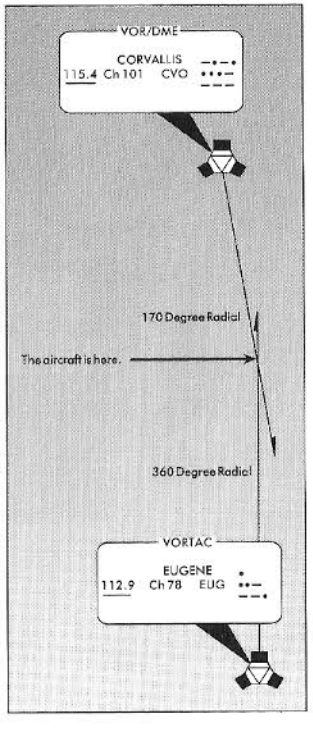
- Tune that frequency into your NAV 1 radio. Then press the double-ended arrow to load it into the active frequency.
- If you have the Morse code ID from your map, press the **NAV 1** button on your audio panel. Press the **IDT** button on your NAV radio. This allows you to hear the ID tone and compare it with what is on your map.
- Make sure your HI is set to your compass.
- Twist the OBS knob until the CDI needle is centered in the instrument and the TO indicator is showing.
- Read the course from the top of the VOR head, and simply turn the aircraft to that heading. You are now on your way to that VOR station.

Once you become proficient, you can expand your arsenal of navigational tools by learning to triangulate your current position by VORs or intercepting a specific course to a VOR.

## VOR Triangulation

By using two VORs, you can accurately determine your position.

- Tune in an area VOR into the NAV 1 radio.
- Verify it is usable by listening for the Morse code ID on the audio panel.
- Twist the OBS to center the CDI needle with a FROM indication shown.
- Find that VOR on your map and draw a line from that VOR in the direction given on the top of the VOR head.
- Do the same steps off of another VOR. Where those lines meet is your approximate position. (Keep in mind that you are moving during this process)





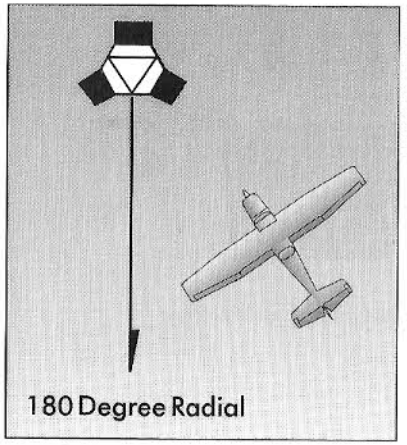


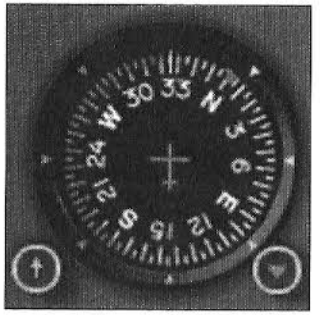


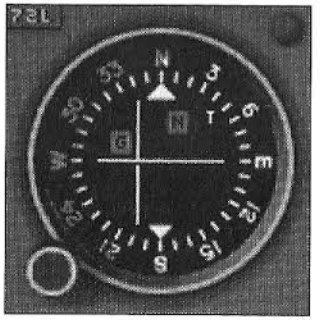

## Intercepting VOR Courses

Another advanced VOR concept is tuning and intercepting a specific course to the VOR. This can be used to bring your airplane into an airport complex lined up for a specific runway. It is also used in airway tracking for pilots flying under Instrument Flight Rules. This allows the government to layout routes or "highways" in the sky that pilots follow so as not to run into anything while flying in clouds.

- Tune in the desired VOR.
- Figure out which course you intend to fly to the VOR.
- If you are going to a VOR on the airport, choose a runway, then use its ID to input your course into the VOR. (Runway 35 is a 350° course)
- Twist the OBS knob until your desired course is at the top of the VOR head.
- Now parallel that course by flying the same heading as your tuned in course.
- The CDI needle now tells you where your course is. If it is to the right of center, you need to fly right to intercept that course.
- Choose a 30° turn left or right to intercept.
- Once the CDI needle is centered, turn back to your initial heading and you are on your way.





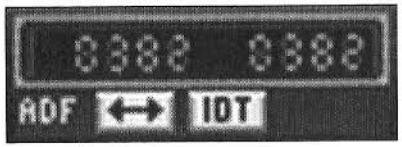
## *DME (Distance Measuring Equipment)*

There are several VOR stations with DME co-located with them. This allows you to determine, not only your course to the VOR but how far away the station is from your present position. The DME in *Pro Pilot USA* is slaved to the VOR so that when you tune in a VOR to your NAV 1 radio, the DME automatically gives you the distance to the station. You can verify the ID of the DME by pressing the **DME** button on your audio panel.

## *NDB Navigation (Non-Directional Beacon)*

The NDB is a simple yet effective navigational tool for today's pilot. Unlike the VOR, the NDB does not differentiate your course for you. The NDB is a radio transmitter that transmits LF (low-frequency) or MF (medium-frequency) signals. The ADF (Automatic Direction Finder) radio in your aircraft receives the signal and displays the stations position relative to you on the ADF indicator. Basically the only thing the ADF needle does is point to the NDB station. Since the frequency range of NDBs coincide with that of AM radio stations, tuning in an AM station will make the ADF needle point the broadcast antenna for that station.

Identify the station the same way you ID a VOR. Press the **ADF** button on your audio panel, press the **ID** button on your ADF radio and listen for the Morse code.




*The ADF receiver found on board the aircraft in* Pro Pilot.

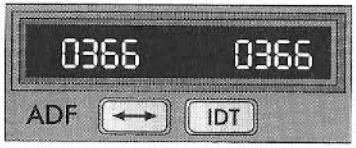


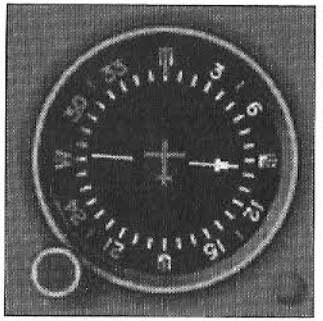




Navigating by NDB is pretty simple.

- Load in the NDB frequency into your ADF radio.
- Look where the needle points.
- If the needle points left, start a left turn. Roll out of the turn when the ADF indicator needle points to the top of the instrument.
- You are now flying directly to the NDB.



*With the PRAHL NDB frequency tuned in, the ADF needle points to the direction of the NDB station.*

# Cessna 172P® Checklist

| STARTING ENGINE | ACTION | HOTKEYS |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Mixture | RICH | Key * |
| 3. Carburetor Heat | COLD | H |
| 4. Battery / Alternator Switch | ON | Z |
| 5. Fuel Selector Valve | BOTH | F |
| 6. Throttle | OPEN 1/8 INCH | + |
| 7. Flashing Beacon and Navigation Lights | ON as required | 3 |
| 8. Ignition Switch | START | S |
| 9. Oil Pressure | CHECK | |
| 10. Avionics Power | ON | X |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Flight Instruments | SET | |
| 2. Mixture | RICH | Key * |
| 3. Elevator Trim | 0° | Key 1 or 7 |
| 4. Throttle (Runup) | 1700 RPM | + |
| 5. Magnetos | CHECK | W, Q, E |
| 6. Carburetor Heat | CHECK | H |
| 7. Engine Instruments | CHECK | |
| 8. Throttle | 1000 RPM or LESS | - |
| 9. Radios | SET FOR DEPARTURE | |
| 10. Autopilot | OFF | Shift + C (toggle) |
| 11. Strobe Lights | AS DESIRED | 2 |
| 12. Brakes | RELEASE | Alt + P |

| TAKEOFF - NORMAL TAKEOFF | | |
|---|---|---|
| 1. Wing Flaps | 0° | Key + |
| 2. Carburetor Heat | COLD (in) | H |
| 3. Throttle | FULL OPEN | \ |
| 4. Elevator Control | ROTATE (at 55 KIAS) | |
| 5. Climb Speed | 70-80 KIAS | |

| SHORT FIELD TAKEOFF | | |
|---|---|---|
| 1. Wing Flaps | 10° | Key + |
| 2. Carburetor Heat | COLD | H |
| 3. Brakes | HOLD | B |
| 4. Throttle | FULL OPEN | \ |
| 5. Mixture | RICH | Ins |
| 6. Brakes | RELEASE | B |
| 7. Elevator Control | SLIGHTLY TAIL LOW | |
| 8. Climb Speed | 56 KIAS (until all obstacles are cleared) | |
| 9. Flaps | RETRACT | Key - |

| ENROUTE CLIMB | | |
|---|---|---|
| Airspeed | 70-85 KIAS | |
| Throttle | FULL OPEN | + |
| Mixture | RICH | Key * |







| CRUISE | ACTION | HOTKEYS |
|---|---|---|
| 1. Power | 2100-2700 | + or - |
| 2. Elevator Trim | ADJUST | Key 1 or 7 |
| 3. Mixture | LEAN | Key / |

| DESCENT | | |
|---|---|---|
| 1. Fuel Selector Valve | BOTH | F |
| 2. Mixture | ADJUST | Key / |
| 3. Power | AS DESIRED | + or - |
| 4. Carburetor Heat | ON | H |

| BEFORE LANDING | | |
|---|---|---|
| 1. Fuel Selector Valve | BOTH | F |
| 2. Mixture | RICH | Key * |
| 3. Carburetor Heat | ON | H |
| 4. Autopilot | OFF | Shift + C |

| LANDING | | |
|---|---|---|
| 1. Airspeed | 65-75 KIAS | |
| 2. Wing Flaps | FULL DOWN (30°) | Key + |
| 3. Final Approach | 61 KIAS | |
| 4. Power | REDUCE | - |
| 5. Touchdown | MAIN WHEELS FIRST | |
| 6. Brakes | APPLY HEAVILY | B |
| 7. Wing Flaps | RETRACT | Key - |

| BALKED LANDING | | |
|---|---|---|
| 1. Throttle | FULL OPEN | \ |
| 2. Carburetor Heat | COLD | H |
| 3. Wing Flaps | 20° | Key - |
| 4. Climb Speed | 55 KIAS | |
| 5. Wing Flaps | 10° | Key - |

| AFTER LANDING | | |
|---|---|---|
| 1. Wing Flaps | UP | Key - |
| 2. Carburetor Heat | COLD | H |
| 3. Landing Light | OFF | 6 |

| SHUTDOWN | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. All Switches | OFF | 1 thru 9 |
| 3. Mixture | IDLE CUT-OFF | Key / |
| 4. Master Switch | OFF | Z |
| 5. Magnetos | OFF | O |

# Cessna 172R® Checklist

| STARTING ENGINE | ACTION | HOTKEYS |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Mixture | RICH | Key * |
| 3. Carburetor Heat | COLD | H |
| 4. Battery / Alternator Switch | ON | Z |
| 5. Fuel Selector Valve | BOTH | F |
| 6. Throttle | OPEN 1/8 INCH | + |
| 7. Flashing Beacon and Navigation Lights | ON as required | 3 |
| 8. Ignition Switch | START | S |
| 9. Oil Pressure | CHECK | |
| 10. Avionics Power | ON | X |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Flight Instruments | SET | |
| 2. Mixture | RICH | Key * |
| 3. Elevator Trim | 0° | Key 1 or 7 |
| 4. Throttle (Runup) | 1700 RPM | + |
| 5. Magnetos | CHECK | W, Q, E |
| 6. Carburetor Heat | CHECK | H |
| 7. Engine Instruments | CHECK | |
| 8. Throttle | 1000 RPM or LESS | - |
| 9. Radios | SET FOR DEPARTURE | |
| 10. Autopilot | OFF | Shift + C (toggle) |
| 11. Strobe Lights | AS DESIRED | 2 |
| 12. Brakes | RELEASE | Alt + P |

| TAKEOFF - NORMAL TAKEOFF | | |
|---|---|---|
| 1. Wing Flaps | 0° | Key + |
| 2. Carburetor Heat | COLD (in) | H |
| 3. Throttle | FULL OPEN | \ |
| 4. Elevator Control | ROTATE (at 55 KIAS) | |
| 5. Climb Speed | 70-80 KIAS | |

| SHORT FIELD TAKEOFF | | |
|---|---|---|
| 1. Wing Flaps | 10° | Key + |
| 2. Carburetor Heat | COLD | H |
| 3. Brakes | HOLD | B |
| 4. Throttle | FULL OPEN | \ |
| 5. Mixture | RICH | Ins |
| 6. Brakes | RELEASE | B |
| 7. Elevator Control | SLIGHTLY TAIL LOW | |
| 8. Climb Speed | 56 KIAS (until all obstacles are cleared) | |
| 9. Flaps | RETRACT | Key - |

| ENROUTE CLIMB | | |
|---|---|---|
| 1. Airspeed | 70-85 KIAS | |
| 2. Throttle | FULL OPEN | + |
| 3. Mixture | RICH | Key * |







| CRUISE | ACTION | HOTKEYS |
|---|---|---|
| 1. Power | 2100-2700 | + or - |
| 2. Elevator Trim | ADJUST | Key 1 or 7 |
| 3. Mixture | LEAN | Key / |

| DESCENT | | |
|---|---|---|
| 1. Fuel Selector Valve | BOTH | F |
| 2. Mixture | ADJUST | Key / |
| 3. Power | AS DESIRED | + or - |
| 4. Carburetor Heat | ON | H |

| BEFORE LANDING | | |
|---|---|---|
| 1. Fuel Selector Valve | BOTH | F |
| 2. Mixture | RICH | Key * |
| 3. Carburetor Heat | ON | H |
| 4. Autopilot | OFF | Shift + C |

| LANDING | | |
|---|---|---|
| 1. Airspeed | 65-75 KIAS | |
| 2. Wing Flaps | FULL DOWN (30°) | Key + |
| 3. Final Approach | 61 KIAS | |
| 4. Power | REDUCE | - |
| 5. Touchdown | MAIN WHEELS FIRST | |
| 6. Brakes | APPLY HEAVILY | B |
| 7. Wing Flaps | RETRACT | Key - |

| BALKED LANDING | | |
|---|---|---|
| 1. Throttle | FULL OPEN | \ |
| 2. Carburetor Heat | COLD | H |
| 3. Wing Flaps | 20° | Key - |
| 4. Climb Speed | 55 KIAS | |
| 5. Wing Flaps | 10° | Key - |

| AFTER LANDING | | |
|---|---|---|
| 1. Wing Flaps | UP | Key - |
| 2. Carburetor Heat | COLD | H |
| 3. Landing Light | OFF | 6 |

| SHUTDOWN | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. All Switches | OFF | 1 thru 9 |
| 3. Mixture | IDLE CUT-OFF | Key / |
| 4. Master Switch | OFF | Z |
| 5. Magnetos | OFF | O |

# Beech Bonanza V35® Checklist

| BEFORE STARTING | ACTION | HOTKEYS |
|---|---|---|
| 1. Rudder Pedals | ADJUSTED | |
| 2. Parking Brake | SET | ALT+P |
| 3. Avionics | CHECK OFF | X (toggle) |
| 4. Throttle | CLOSED | Zero |
| 5. Propeller | FORWARD | Insert |
| 6. Mixture | RICH | Key / |
| 7. Cowl Flaps | OPEN | C |
| 8. Autopilot | CHECK OFF | Shift + C |
| 9. Gear Handle | CHECK DOWN | |
| 10. Fuel Selector | FULLEST TANK | F |
| 11. Master Switch | ON | Z |
| 12. Fuel Quantities | CHECKED | |

| STARTING ENGINE | | |
|---|---|---|
| 1. Throttle | OPEN ¼ Inch | + |
| 2. Magnetos Switch | START | S |
| 3. Throttle | ADJUST TO 1000 RPM | + or - |
| 4. Oil Pressure | CHECKED | |

| AFTER STARTING | | |
|---|---|---|
| 1. Flaps | UP | Key - |
| 2. Ammeter | CHECKED | |
| 3. Engine Instruments | GREEN ARC | |
| 4. Lights | ON (as required) | 2 through 6 |
| 5. Avionics | ON | X (toggle) |
| 6. Parking Brake | RELEASE | Alt + P |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Avionics | SET FOR DEPARTURE | |
| 3. Engine Instruments | GREEN ARC | |
| 4. Flight Instruments | CHECKED and SET | |
| 5. Run-Up | | |
| 6. Throttle | 1700 RPM | + |
| 7. Propeller | CYCLE | Ins and Del |
| 8. Magnetos | CHECKED | W, Q, E |
| 9. Throttle | CLOSED | - |
| 10. Trim | SET 6° UP | Key 1 or 7 |
| 11. Flaps | APPR | Key + |
| 12. Fuel Selector | FULLEST TANK | F (toggle) |

| TAKEOFF | | |
|---|---|---|
| 1. Brakes | HOLD | B |
| 2. Throttle | FULL | Backspace |
| 3. Propeller | HIGH RPM | Ins |
| 4. Mixture | SET to BEST POWER | Key * |
| 5. Brakes | RELEASE | B |





Beech Bonanza V35 Checklist

| AFTER TAKEOFF | ACTION | HOTKEYS |
|---|---|---|
| 1. Climb Rate | POSITIVE | |
| 2. Gear | UP | G |
| 3. Flaps | RETRACT | Key - |
| 4. Airspeed | 95 KIAS | |
| 5. Power | SET | - |

| CRUISE | | |
|---|---|---|
| 1. Pitch Trim | SET | Key 1 or 7 |
| 2. Power | SET | |
| 3. Mixture | LEAN | Key / |
| 4. Cowl Flaps | CLOSED | C (toggle) |
| 5. Autopilot | ENGAGED | Shift C, Shift X |

| DESCENT | | |
|---|---|---|
| 1. Altimeter | SET | Shift , or . |
| 2. Mixture | RICH (as required) | Key * |
| 3. Cowl Flaps | CLOSED | C (toggle) |
| 4. Power | SET | |

| BEFORE LANDING | | |
|---|---|---|
| 1. Fuel Selector | FULLEST TANK | F |
| 2. Cowl Flaps | AS REQUIRED | C |
| 3. Mixture | RICH | Key / |
| 4. Landing Gear | DOWN, 3 GREEN | G |
| 5. Flaps | DOWN | Key + |
| 6. Airspeed | 85 KIAS | |
| 7. Propeller | FULL FORWARD | Ins |

| AFTER LANDING | | |
|---|---|---|
| 1. Cowl Flaps | OPEN | C |
| 2. Flaps | UP | Key - |
| 3. Lights | OFF | 2 through 6 |

| SHUTDOWN | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Avionics | OFF | X |
| 3. All Electrical | OFF | 1 through 9 |
| 4. Lights | OFF | |
| 5. Throttle | 1000 RPM | + or - |
| 6. Mixture | IDLE CUT-OFF | Key / |
| 7. Master Switch | OFF | Z |
| 8. Magnetos | OFF | O |

# Beech Baron 58® Checklist

| BEFORE STARTING | ACTION | HOTKEYS |
|---|---|---|
| 1. Parking Brake | SET | ALT+P |
| 2. Avionics | CHECK OFF | X (toggle) |
| 3. Gear Handle | CHECK DOWN | |
| 4. Cowl Flaps | OPEN | C |
| 5. Fuel Selector | ON (L or R) | F |
| 6. Master Switch | ON | Z |
| 7. Fuel Quantities | CHECKED | |
| 8. Boost Pumps | ON | 8 |

| STARTING ENGINES | | |
|---|---|---|
| 1. Engines | UNLINK | Alt + L |
| 2. Left Throttle | OPEN ¼ Inch | + |
| 3. Left Magnetos Switch | START | S |
| 4. Left Throttle | ADJUST TO 1000 RPM | + or - |
| 5. Left Oil Pressure | CHECKED | TAB |
| 6. Right Throttle | OPEN ¼ Inch | Alt + |
| 7. Right Magnetos Switch | START | Alt S |
| 8. Right Throttle | ADJUST TO 1000 RPM | Alt + or - |
| 9. Right Oil Pressure | CHECKED | |
| 10. Engines | RELINK | Alt + L |

| AFTER STARTING | | |
|---|---|---|
| 1. Ammeter | CHECKED | |
| 2. Engine Instruments | GREEN ARC | |
| 3. Avionics | ON | X (toggle) |
| 4. Lights | ON (as required) | 2 through 6 |
| 5. Boost Pumps | OFF | 8 |
| 6. Parking Brake | RELEASE | Alt + P |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Avionics | SET FOR DEPARTURE | |
| 3. Engine Instruments | GREEN ARC | |
| 4. Flight Instruments | CHECKED and SET | |
| 5. Run-Up | | |
| 6. Throttles | 2200 RPM | + |
| 7. Propellers | CYCLE | Ins and Del |
| 8. Magnetos | CHECKED | W, Q, E |
| 9. Throttles | CLOSED | - |
| 10. Trim | SET 6° UP | Key 1 or 7 |
| 11. Fuel Selector | FULLEST TANK | F (toggle) |

| TAKEOFF | | |
|---|---|---|
| 1. Boost Pumps | ON | 8 |
| 2. Brakes | HOLD | B |
| 3. Throttles | FULL | Backspace |
| 4. Propellers | HIGH RPM | Ins |
| 5. Mixtures | SET to BEST POWER | Key / |
| 6. Brakes | RELEASE | B |







| AFTER TAKEOFF | ACTION | HOTKEYS |
|---|---|---|
| 1. Climb Rate | POSITIVE | |
| 2. Gear | UP | G |
| 3. Airspeed | 105 KIAS | |
| 4. Power | SET | - |
| 5. Boost Pumps | OFF | 8 |

| CRUISE | | |
|---|---|---|
| 1. Pitch Trim | SET | Key 1 or 7 |
| 2. Power | SET | |
| 3. Mixtures | LEAN | Key / |
| 4. Cowl Flaps | CLOSED | C (toggle) |
| 5. Prop Synch | ON | 7 |
| 6. Autopilot | ENGAGED | Shift C, Shift X |

| DESCENT | | |
|---|---|---|
| 1. Altimeter | SET | Shift , or . |
| 2. Mixtures | RICH (as required) | Key / |
| 3. Cowl Flaps | CLOSED | C (toggle) |
| 4. Powers | SET | |

| BEFORE LANDING | | |
|---|---|---|
| 1. Fuel Selectors | FULLEST TANK | F |
| 2. Cowl Flaps | AS REQUIRED | C |
| 3. Mixtures | RICH | Key * |
| 4. Landing Gear | DOWN, 3 GREEN | G |
| 5. Flaps | DOWN | Key + |
| 6. Airspeed | 85 KIAS | |
| 7. Prop Synch | OFF | 7 |
| 8. Propellers | FULL FORWARD | Ins |

| AFTER LANDING | | |
|---|---|---|
| 1. Cowl Flaps | OPEN | C |
| 2. Flaps | UP | Key - |
| 3. Lights | AS REQUIRED | 2 through 6 |

| SHUTDOWN | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Avionics | OFF | X |
| 3. All Electrical | OFF | 1 through 9 |
| 4. Lights | OFF | |
| 5. Throttles | 1000 RPM | + or - |
| 6. Mixtures | IDLE CUT-OFF | Del |
| 7. Master Switch | OFF | Z |
| 8. Magnetos | OFF | O |

# Beech King Air 200® Checklist

| BEFORE STARTING | ACTION | HOTKEYS |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Landing Gear Control | DOWN | G |
| 3. All Other Switches | OFF | 2 thru 9 |
| 4. Power Levers | IDLE | Zero |
| 5. Propeller Levers | FULL FORWARD | Ins |
| 6. Condition Levers | FUEL CUT OFF | Key / |
| 7. Battery | ON | Z |
| 8. Standby Pumps | ON | 8 or 9 |
| 9. Fuel Quantity | BOTH | |
| 10. Beacon | ON | 3 |

| STARTING ENGINES | | |
|---|---|---|
| 1. Engines | UNLINK | Alt + L |
| 2. Right Fuel Selector | ON | Alt + F |
| 3. Right Condition Lever | HIGH IDLE | Alt + / |
| 4. Right Engine Start Switch | ON | Alt + S |
| 5. Right ITT and N1 | MONITOR | |
| 6. Right Oil Pressure | CHECK | |
| 7. Left Engine Start | REPEAT STEPS 2 thru 5 | (no Alt in command) |
| 8. Engines | LINK | Alt + L |

| BEFORE TAXIING | | |
|---|---|---|
| 1. Avionics Master | ON | X |
| 2. External Lights | AS REQUIRED | 2 thru 6 |
| 3. Brakes | RELEASED | Alt + P |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Avionics | SET FOR DEPARTURE | |
| 2. Elevator Trim | SET 0° | Key 1 or 7 |
| 3. Power Levers | IDLE | Zero |
| 4. Fuel Quantity | CHECK | |
| 5. Engine Instruments | CHECK | |
| 6. Flight Instruments | CHECK AND SET | |
| 7. Prop Levers | FULL FORWARD | Ins |
| 8. Flaps | APPR | Key – or + |
| 9. External Lights | AS REQUIRED | 2 thru 6 |

| TAKEOFF | | |
|---|---|---|
| 1. Landing Light and Strobes | ON | 2 and 6 |
| 2. Brakes | HOLD | B |
| 3. Power | FULL | \ |
| 4. Brakes | RELEASED | B |
| 5. Climb | POSITIVE RATE | |
| 6. Landing Gear | UP | G |
| 7. Flaps | UP | Key - |
| 8. Fuel Boost Pumps | OFF | 8 or 9 |





Beech King Air 200 Checklist

| CLIMB | ACTION | HOTKEYS |
|---|---|---|
| 1. Yaw Damp | ON | ; |
| 2. Climb Power | SET | + or - |
| 3. Propellers | 1900 RPM | Ins or Del |
| 4. Prop Sync | ON | 7 |
| 5. Engine Instruments | MONITOR | |
| 6. Landing Lights | OFF | 6 |

| CRUISE | |
|---|---|
| 1. Cruise Power | SET |
| 2. Engine Instruments | MONITOR |

| DESCENT | | |
|---|---|---|
| 1. Altimeter | SET | Shift +, or . |
| 2. Fuel Balance | CHECK | |
| 3. Power | AS REQUIRED | |

| BEFORE LANDING | | |
|---|---|---|
| 1. Approach Speed | 120 KIAS | |
| 2. Flaps | APPROACH | Key + or - |
| 3. Landing Gear | DOWN | G |
| 4. Lights | AS REQUIRED | 2 thru 6 |
| 5. Prop Sync | OFF | 7 |

| LANDING | | |
|---|---|---|
| 1. Flaps | DOWN | Key + |
| 2. Airspeed | 103 | |
| 3. Yaw Damp | OFF | ; |
| 4. Power Levers | IDLE | - |
| 5. Propeller Levers | FULL FORWARD | Ins |
| 6. After Touchdown: | | |
| 7. Propellers | REVERSE | \ |
| 8. Brakes | AS REQUIRED | B |
| 9. Propellers (Below 40 KIAS) | GROUND FINE | \ |

| AFTER LANDING | | |
|---|---|---|
| 1. Landing Lights | AS REQUIRED | 2 thru 6 |
| 2. Flaps | UP | Key - |

| SHUTDOWN | | |
|---|---|---|
| 1. Parking Brake | SET | Alt + P |
| 2. Standby Boost Pumps | OFF | 8 or 9 |
| 3. Avionics Master | OFF | X |
| 4. Lights | OFF | 2 thru 6 |
| 5. Condition Levers | FUEL CUT OFF | Key / |
| 6. Battery Switch | OFF | Z |

# Cessna Citation 525® Checklist

| STARTING ENGINE | ACTION | HOTKEYS |
|---|---|---|
| 1. Fuel Boost Pumps | ON | 8 |
| 2. Battery / Alternator Switch | ON | Z |
| 3. Fuel Selector | ON (left and right) | F |
| 4. Parking Brake | ON | Alt + P |
| 5. Thrust Levers | CHECK OFF | Zero |
| 6. Landing Gear Lever | CHECK DOWN | G (cycle) |
| 7. Fuel Quantity | CHECK | |
| 8. Beacon | ON | 3 |
| 9. Engines | UNLINK | Alt + L |
| 10. Left Start Button | PRESS | S |
| 11. Left TT | CHECK for Rise | |
| 12. LeftN1 Speed | CHECK for indication | |
| 13. Left Engine Instruments | CHECK NORMAL | |
| 14. Other Engine | Repeat steps 10 thru 13 | (Alt + command) |
| 15. Avionics Power | ON | X |
| 16. Engines | LINK | Alt + L |

| BEFORE TAKEOFF | | |
|---|---|---|
| 1. Avionics | CHECK | |
| 2. Engine Instruments | CHECK | |
| 3. Flight Instruments | CHECK AND SET | |
| 4. Fuel Quantity | CHECK | |
| 5. External Lights | AS REQUIRED | 2 thru 6 |
| 6. Pitot Heat | ON | 1 |
| 7. Trim | AS REQUIRED | Key 1 or 7 |
| 8. Flaps | SET FOR TAKE-OFF | Key + or - |

| TAKEOFF | | |
|---|---|---|
| 1. Brakes | ON | Alt + P |
| 2. Thrust | SET TAKE-OFF THRUST | Backspace |
| 3. Engine Instruments | CHECK | |
| 4. Brakes | RELEASED | Alt + P |
| 5. Climb | POSITIVE RATE | |
| 6. Landing Gear | RETRACT | G |
| 7. Flaps | UP | Key + or - |
| 8. Airspeed | ESTABLISHED | |

| CLIMB | | |
|---|---|---|
| 1. Climb Thrust | SET | + or - |
| 2. Engine Instruments | MONITOR | |
| 3. Lights | AS REQUIRED | 2 thru 6 |
| 4. Above FL180--Altimeter | SET to 29.92 | Shift + , or . |
| 5. Yaw Damper | ON | ; |
| 6. Fuel Boost Pumps | OFF | 8 and 9 |

| CRUISE | | |
|---|---|---|
| 1. Cruise Thrust | SET | |
| 2. Engine Instruments | MONITOR | |







| DESCENT | ACTION | HOTKEYS |
|---|---|---|
| 1. Altimeter | SET | |
| 2. Thrust | AS REQUIRED | |
| 3. Fuel Balance | CHECK | |
| 4. Speed Brakes | AS REQUIRED | 7 |

| BEFORE LANDING | | |
|---|---|---|
| 1. Approach Speed (Vref) | CONFIRM | |
| 2. Flaps | APPROACH | Key + or - |
| 3. Fuel | NORMAL | F |
| 4. Landing Gear | DOWN | G |
| 5. Lights | AS REQUIRED | 2 thru 6 |

| NORMAL LANDING | | |
|---|---|---|
| 1. Flaps | LAND | Key + or - |
| 2. Airspeed | Vref | |
| 3. Autopilot | OFF | Shift + C |
| 4. Yaw Damper | OFF | ; |
| 5. Speed Brakes | RETRACTED | 7 |

| BALKED LANDING | | |
|---|---|---|
| 1. Thrust | FULL THRUST | Backspace |
| 2. Airplane Pitch Attitude | POSITIVE | |
| 3. Rotation | T.O. + 10° | |
| 4. Flaps | T.O. & APPR. | Key + or - |
| 5. Landing Gear | UP | G |
| 6. Flaps | UP | Key - |
| 7. Thrust | SET FOR CLIMB | + or - |

| AFTER LANDING | | |
|---|---|---|
| 1. Flaps | UP | Key + or - |
| 2. Pitot Heat | OFF | 1 |
| 3. Landing and Taxi Lights | AS REQUIRED | 2 thru 6 |

| SHUTDOWN | | |
|---|---|---|
| 1. Brakes | ON | Alt + P |
| 2. Avionics | OFF | X |
| 3. Lights | OFF | 2 thru 6 |
| 4. Thrust Levers | IDLE | Zero |
| 5. Engine Start Switches | OFF | S |
| 6. Battery / Alternator Switch | OFF | Z |

# Appendix B: Acronyms and Abbreviations

## A

AD—Airworthiness Directive
ADF—Automatic Direction Finder
ADIZ—Air Defense Identification Zone
A/FD—Airport/Facility Directory
AFSS—Automated Flight Service Station
AGL—Above Ground Level
AI—Attitude Indicator
AIM—Aeronautical Information Manual
AIRMET—Airman's Meteorological Information
ALS—Approach Light System
ALT— Altitude; Altimeter
ARTCC—Air Route Traffic Control Center
ARTS—Automated Radar Terminal System
ASI—Airspeed Indicator
ASOS—Automated Surface Observing System
ATA—Airport Traffic Area
ATC—Air Traffic Control
ATCRBS—Air Traffic Control Radar Beacon System
ATCT—Air Traffic Control Tower
ATD—Actual Time of Departure
ATIS—Automatic Terminal Information Service
ATP—Airline Transport Pilot
AWOS—Automated Weather Observing System

## B

BRITE—Bright Radar Indicator Tower Equipment
BKN—Broken

## C

C—Centigrade (degrees) Celsius
CAS—Calibrated Airspeed
CAT—Clear Air Turbulence
CD—Clearance Delivery
CDI—Course Deviation Indicator
CFI—Certified Flight Instructor
CG—Center of Gravity
CH—Compass Heading
CRS—Course
CT—Control Tower
CTAF—Common Traffic Advisory Frequency

## D

DA—Density Altitude
DF—Direction Finder
DG—Directional Gyro
DME—Distance Measuring Equipment
DR—Dead Reckoning
DUAT—Direct User Access terminal

## E

EFAS—En Route Flight Advisory Service
EGT—Exhaust Gas Temperature
ELT—Emergency Locator Transmitter
ETA—Estimated Time of Arrival
ETD—Estimated Time of Departure
ETE—Estimated Time En Route

## F

F—Fahrenheit (degrees)
FAA—Federal Aviation Administration
FAR—Federal Aviation Regulation
FBO—Fixed Base Operator
FL—Flight Level
FPM—Feet Per Minute
FSS—Flight Service Station
ft—Feet

## G

GC—Ground Control
GOES—Geostationary Operational Environmental Satellite
GPS—Global Positioning System
GS—Groundspeed; Glide Slope

## H

HAA—Height Above Airport
HDG—Heading
HF—High Frequency
Hg— Inches of Mercury (barometric measure)
HI—Heading Indicator
HIRL—High Intensity Runway Lights
HSI—Horizontal Situation Indicator
Hz—Hertz (cycles per second)

## I

IAS—Indicated Airspeed
ICAO—International Civil Aviation Organization
IFR—Instrument Flight Rules
ILS—Instrument Landing System
IMC—Instrument Meteorological Conditions

## K

KCAS—Knots Calibrated Airspeed
kHz—Kilohertz
KIAS—Knots Indicated Air Speed
km—Kilometer
kt—Knots
KTAS—Knots True Airspeed

## L

LIRL—Low Intensity Runway Lights
LORAN—Long Range Navigation
LW—Landing Weight

## M

MALSR—Medium Intensity Approach Light System with Runway Alignment
MAYDAY—International Distress Radio Signal
MC—Magnetic Compass; Magnetic Course
MEF—Maximum Elevation Figures
METAR—Meteorological Reports–Aviation Routine
MH—Magnetic Heading
MHz—Megahertz
MIRL—Medium Intensity Runway Lights
MLS—Microwave Landing System
MOA—Military Operations Area
MSA—Minimum Safe Altitude
MSL—Mean Sea Level
MTR—Military Training RouteMulticom—self-announcing radio frequency
MVFR—Marginal Visual Flight Rules

## N

Navaid—Navigational Aid
NDB—Non-Directional Beacon
NM—Nautical Miles
NOS—National Ocean Service
NOTAM—Notice To Airmen
NTSB—National Transportation Safety Board
NWS—National Weather Service

## O

OAT—Outside Air Temperature
OBS—Omni Bearing Selector
OVC—Overcast

## P

PA—Pressure Altitude
PAPI—Precision Approach Path Indicator
PIREP—Pilot Report
PVASI—Pulsating Visual Approach Slope Indicator

## R

RAIL—Runway Alignment Indicator Lights
RBI—Runs Batted In (just seeing if you're paying attention); Relative Bearing Selector
RCLS—Runway Centerline Lighting System
RCO—Remote CommunicationsOutlet
REIL—Runway End Identifier Lights
RNAV—Area Navigation
RPM—Revolutions Per Minute
RVR—Runway Visual Range
RWY—Runway

## S

SCT—Scattered
SIGMET—Significant Meteorological Advisory Alert
SM—Statute Mile
SPECI—Special Surface Observation
Squawk—activate transponder code
SUA—Special Use Airspace
SVFR—Special Visual Flight Rules

## T

TAC—Terminal Area Chart
TACAN—Tactical Air Navigation
TAF—Terminal Aerodrome Forecast
TAS—True Airspeed
TC—True Course
TCA—Terminal Control Area
TDZL—Touchdown Zone Lights
TH—True Heading
TRACON—Terminal Radar Approach Control
TRSA—Terminal Radar Service Area
T-VASI—T-form Visual Approach Slope Indicator
TWEB—Transcribed Weather EnRoute Broadcast

## U

UHF—Ultra High Frequency
Unicom— Non-Government Communications facility
UTC—Universal Coordinated Time or Greenwich Mean Time

## V

VAR—Variation
VASI—Visual Approach Slope Indicator
VFR—Visual Flight Rules
VHF—Very High Frequency
VOR—VHF Omnidirectional Range
VOR/DME—VOR with Distance Measuring Equipment
VORTAC—VOR with TACAN
VSI—Vertical Speed Indicator

## W

WAC—World Aeronautical Charts
WCA—Wind Correction Angle
WSFO—Weather Service Forecast Office
WSO—Weather Service Office

## Z

Zulu—Greenwich Mean Time or Coordinated Universal Time (UTC)

# APPENDIX C: SETTING UP YOUR OWN PILOT VOICE

If you can record *.wav* files, *Pro Pilot USA* can be customized such that the pilot voice heard in the simulation is your own. Here's how it is done.

- Create the following directory(s) on your HD: ***Flight\Snd\Toweratc.*** (Depending on your install type, some or all of the directories may already exist.)
- Record the following phrases, and name the files as listed below. (You will need the .wav files to be in the following format: 11k, 8 bit, mono.)
- Place these *.wav* files into the **Toweratc** directory you created.

## Pilot Speech

| Filename | Phrase | Filename | Phrase |
|---|---|---|---|
| 5001.wav | clearance delivery | 5025.wav | enter straight in for |
| 5002.wav | ground | 5026.wav | continue left downwind for |
| 5003.wav | tower | 5027.wav | expect vectors for |
| 5004.wav | departure | 5028.wav | miles |
| 5005.wav | approach | 5029.wav | north |
| 5006.wav | center | 5030.wav | south |
| 5007.wav | this is | 5031.wav | east |
| 5008.wav | with information | 5032.wav | west |
| 5009.wav | request taxi for takeoff | 5033.wav | enter right base for |
| 5010.wav | taxi to | 5034.wav | continue right downwind for |
| 5011.wav | contact | | |
| 5012.wav | inbound for landing | 5035.wav | squawk |
| 5013.wav | holding short of | 5036.wav | my mistake, setting transponder to |
| 5014.wav | position and hold | | |
| 5015.wav | cleared for takeoff | 5037.wav | looks like I need a go around |
| 5016.wav | heading | | |
| 5017.wav | climbing through | 5038.wav | request closed traffic |
| 5018.wav | enter left downwind for | 5039.wav | Fly runway heading and climbing |
| 5019.wav | cleared left base for | | |
| 5020.wav | cleared to land, runway | 5040.wav | cleared for the touch and go |
| 5021.wav | enter right downwind for | | |
| 5022.wav | cleared right base for | 5041.wav | and hold short |
| 5023.wav | taxi to the ramp | 5042.wav | clearing the runway |
| 5024.wav | enter left base for | 5043.wav | request clearance to |

Note: Remember when recording numbers you should say each number individually. For example, the phrase [118.] should be recorded as **One One Eight Point** and not One Eighteen Point.





## Universal ATC Words & Phrases

| Filename | Phrase | Filename | Phrase |
|---|---|---|---|
| 6001.wav | one | 6043.wav | runway |
| 6002.wav | two | 6044.wav | Cessna niner 572 lima |
| 6003.wav | three | 6045.wav | Bonanza niner 621 sierra |
| 6004.wav | four | 6046.wav | Baron 6430 sierra |
| 6005.wav | five | 6047.wav | King Air 1416 sierra |
| 6006.wav | six | 6048.wav | Citation 525C juliet |
| 6007.wav | seven | 6049.wav | 72 lima |
| 6008.wav | eight | 6050.wav | 21 sierra |
| 6009.wav | niner | 6051.wav | 30 sierra |
| 6010.wav | zero | 6052.wav | 16 sierra |
| 6011.wav | alpha | 6053.wav | 5C juliet |
| 6012.wav | bravo | 6054.wav | g'day |
| 6013.wav | charlie | 6055.wav | on |
| 6014.wav | delta | 6056.wav | and |
| 6015.wav | echo | 6057.wav | (not used) |
| 6016.wav | foxtrot | 6058.wav | on 118 |
| 6017.wav | golf | 6059.wav | on 119. |
| 6018.wav | hotel | 6060.wav | on 120. |
| 6019.wav | india | 6061.wav | on 121. |
| 6020.wav | juliet | 6062.wav | on 122. |
| 6021.wav | kilo | 6063.wav | on 123. |
| 6022.wav | lima (lee-mah) | 6064.wav | on 124. |
| 6023.wav | mike | 6065.wav | on 125. |
| 6024.wav | november | 6066.wav | on 126. |
| 6025.wav | oscar | 6067.wav | on 127. |
| 6026.wav | papa | 6068.wav | on 128. |
| 6027.wav | quebec (kay-bek) | 6069.wav | on 129. |
| 6028.wav | romeo | 6070.wav | on 130. |
| 6029.wav | sierra | 6071.wav | on 131. |
| 6030.wav | tango | 6072.wav | on 132. |
| 6031.wav | uniform | 6073.wav | on 133. |
| 6032.wav | victor | 6074.wav | on 134. |
| 6033.wav | whiskey | 6075.wav | on 135. |
| 6034.wav | x-ray | 6076.wav | turn left heading |
| 6035.wav | yankee | 6077.wav | turn right heading |
| 6036.wav | zulu | 6078.wav | squawk |
| 6037.wav | point | 6079.wav | fly heading |
| 6038.wav | left | 6080.wav | roger |
| 6039.wav | right | 6081.wav | with |
| 6040.wav | center | 6082.wav | climb |
| 6041.wav | thousand | 6083.wav | descend |
| 6042.wav | hundred | 6084.wav | and maintain |

Make sure you check the **Listen to Pilot's Readback** box in the **Airspace/ATC Communication** menu. Also make sure the **Handles Radio Communication** check box under **Dual Flight** mode is *NOT* selected. If your pilot seems to skip a phrase, make sure that phrase is numbered correctly.

# APPENDIX D: TROUBLESHOOTING

This section contains solutions to problems sometimes experienced by new *Pro Pilot USA* users. Before contacting Sierra's Customer Service Department, check to see if your particular problem is addressed here.

**Problem: The aircraft engine won't start.**
**Solution:** To start your aircraft's engine, you must follow a specific sequence. First, turn **On** the battery/alternator switch (*z key*). Next, turn **On** your fuel pumps, making sure the fuel tank selector points to either or both of your fuel tanks (*f key*). Turn **On** your ignition switch (*s key*). After the aircraft engine has started, turn the power **On** to your avionics (*x key*). For more information, consult your aircraft's checklist in Appendix.

**Problem: The joystick does not work.**
**Solution:** You may still have your keyboard active instead of your joystick. In order to fly using your joystick, you must first activate it by pressing the *alt + j* keys. Make sure the proper drivers are loaded. Consult the manufacturer's documentation for more information.

**Problem: The rudder seems to be ineffective.**
**Solution:** *Pro Pilot USA* starts out having Auto-coordination turned on by default. To get rudder pedal control, use the < and > keys to disable the auto-coordination feature. This can also be done in the **Aircraft>Auto-Coordination** pull-down menu.

**Problem: The aircraft constantly yaws (pulls) in one direction.**
**Solution:** Consult the **Aircraft>Auto-Cordination** pull-down menu option, and see if Auto-coordination is enabled. If not, try using the *L key* to re-center your rudders. You might also try re-enabling Auto-coordination using < or > keys. Consult the **Weather** menu option and make sure your winds aren't set too high. Try adjusting your joystick's deadspace in the **Options** menu. If the problem persists, you may need to re-calibrate your joystick in Win95, or re-install your joystick's drivers.

**Problem: Win95 doesn't recognize your CH Products Virtual Pilot Pro with throttle and rudder pedals.**
**Solution:** Make sure you have them connected correctly— the yoke's output into the back of the throttle, the throttle's output into the female rudder pedal jack, the rudder pedal's output into your computer's game port. If the problem persists, you may need to down-load the latest device drivers from the CH Products website at *www.chproducts.com*.





**Problem: Program crashes to desktop.**
**Solution:** You may not have enough available swap space on your hard-drive, make sure you have 60 Mb of free hard-drive space.

**Problem: Low frame rate. Graphics seem to pause for a couple of seconds before updating (due to scenery being accessed from CD).**
**Solution:** *Pro Pilot USA* has many features which will allow you to improve your frame rate or reduce pausing in the simulation. If you have plenty of disk space, it is highly recommended you do a custom install and have the entire scenery database copied to your hard drive. This should eliminate any pausing that occurs when scenery is accessed off the CD. Also, there are several memory control lines you can add to the ***sierra\propilot\flight\flight.ini*** file to help fix the problem. There is a Disk Cache Size option under [MEMControl]. You can set this range from 5 to 300 Mb. This option will keep the most frequently used terrain bitmaps copied to your hard drive and is most beneficial for those who fly in only one section of the country. Add the following two lines in ***flight.ini***:

```
[MemControl]
DiskCacheSize=20
```

This will keep the most recently used 20 Mb of scenery data on your hard drive at all times. Selecting **Auto Complexity** under the **Options** menu will let the program set the correct level of graphics detail for the speed of your computer. You can also reduce the number of cloud **Layers**. Adding more than 1 layer of clouds will cause a decrease in frame rate. Consult the readme.txt file for their implementation. If disk space is at a premium, turn down your level of graphical detail.

**Problem: No buildings appear in large cities.**
**Solution:** Your graphical detail is too low. Consult the **Options** pull-down menu and increase the building density. Be aware, however, that this will lower your frame rate. You may need to adjust the balance between graphic detail and frame rate so that the simulation remains playable on your machine.

**Problem: The screen is blank or gray.**
**Solution:** First, check to make sure the Cloud layer is not set too low. You may be trying to take-off in a fog bank. If this is not the case, try pressing the *shift + keypad 8 keys* or the *F7 key* to access a different view.

**Problem: After you start a flight plan, you hear the same Air Traffic Control sequence repeated over and over, but you are never cleared for take-off.**
**Solution:** When flying a flight plan in **Pilot-in-Command** mode, you are required to listen to the ATC, which will instruct you as to the next frequency you need to tune in to. Make sure that you adjust the radio frequency you are receiving to the frequency for the next applicable ATC department. Try flying a few flight plans in **Dual Flight** mode. Your virtual co-pilot will handle the radio frequencies for you. By listening to the ATC dialog several times, you'll begin to understand which frequency to tune to, and when to do the tuning.

**Problem: The mouse seems jumpy in full screen mode.**
**Solution:** If you encounter jumpy mouse movement during full screen mode, *press alt + shift + enter key.*

**Problem: Sound Card not configured properly.**
**Solution:** To make sure that your sound card is configured correctly in Windows 95, check the **Audio** settings in the **Multimedia** section of Control Panel. The Audio setting defines what driver will be used to produce digitized sound (DAC). Speech and sound effects in *Pro Pilot USA* are usually DAC sounds.

**Problem: Choppy, bad, static sound or no sound at all.**
**Solution**: *Pro Pilot USA* uses Microsoft's Direct Sound. Some sound cards do not support this at this time. Others may require an update of the Sound Card Drivers to function properly. Verify that your sound card drivers are 100% certified for DirectX. To check for certification: Put the *Pro Pilot USA* CD in your CD-ROM drive. Click on the **Start** button, then select **Run**. In the Open box type **X:\DIRECTX\DXSETUP** and press the *enter key*. NOTE: The letter X represents the letter of your CD-ROM drive. There will be a list of the DirectX components. The word Certified will be next to any drivers that Microsoft considers compatible. If one of the components is not certified, *Pro Pilot USA* may not function properly. Check with your hardware manufacturer for DirectX certified Drivers.





# General Troubleshooting Steps

If you do not see your specific problem listed above, these standard troubleshooting procedures correct most problems running *Pro Pilot USA.*

- Step 1: Boot with a clean system disk before running Pro Pilot. A systems disk is a tool that can be used to resolve most conflicts. A system disk will free up more system resources and memory for your software. The systems disk also creates an environment that is *cleaner* or free of extra TSR and utilities that can sometimes cause conflicts.

- Step 2: Check for corrupted files. Click on the Win95 Start button. Select ***Programs>Accessories>System Tools>Scandisk*** off the menu. Run SCANDISK to detect and correct any hard drive errors and corrupted files. If you find any errors such as cross-linked or truncated files or lost allocation units, correct them, then uninstall *Pro Pilot USA*. Corrupted program files can cause lockups and other technical problems. No program will run correctly if the data or executable files are corrupted. This corruption will occur during the installation of *Pro Pilot USA* and are usually due to conflicts with TSRs or other utilities during the installation. Reinstalling *Pro Pilot USA* in the same environment will usually result in the same corrupted data. You should install *Pro Pilot USA* in a "clean" boot environment.

- Step 3: Create a clean Windows95 environment and reinstall *Pro Pilot.* Verify that you have sufficient hard drive space for reinstallation of the program. Remember to allocate twice the listed space on compressed drives! Make sure there are no other programs running in Windows95 before reinstalling. To do this:

  Hold down the *ctrl + alt* keys and press the *del key*. This will bring up a Close Program Box that shows your currently running programs. The only program we want listed in the task list is *Explorer*. If there are other programs in the task list, highlight one of them and click on the End Task button. Repeat this process until the only program listed in the Close Program Box is Explorer.

  NOTE: Some programs can not be shut down using these steps. You will need to shut down those programs according to the instructions specific to those programs. Once Explorer is the only program in the Close Program Box, reinstall the program.

- Step 4: Check your swapfile settings. Make sure there is at least 50 Mb of free space on your C: drive. Right-click on the **My Computer** icon and select **Properties**. Click on the **Performance** tab, then click on the **Virtual Memory** button. Make sure there is dot next to the **Let Windows manage my virtual memory** entry. Click **Okay**.

- Step 5: Check your drivers. Outdated or incompatible video or sound drivers can also cause lockups and errors in Windows. Sierra recommends you check with your sound and video card manufacturers to make sure you have the latest versions of these drivers. Some manufacturers update their drivers several times a year, so it's easy to get behind.







# INDEX

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