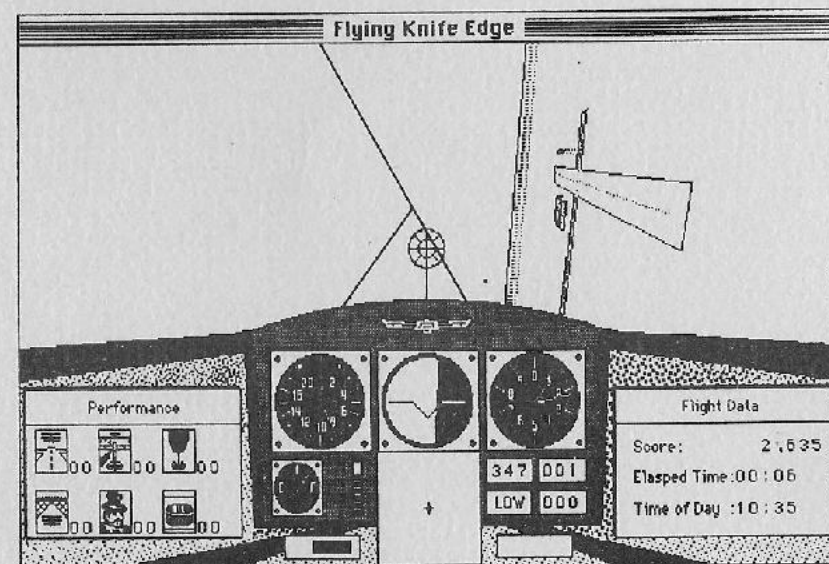


Bullseye Software
P.O. Drawer 7900
Incline Village, NV 89450

WWI

Fokker Triplane *Flight Simulator*

By Donald A. Hill, Jr.



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Program and Documentation by Donald A. Hill, Jr.

Cover Art by David M. Toy, Jr., Tahoe Communication Arts.

Getting Started

If you're anxious to get right to the program skip directly to "Quick Flying Instructions". This chapter tells you very briefly everything you need to know to run Fokker Triplane.

After you've played with the program awhile, I suggest you read the rest of the manual. The World describes the area you will be flying in. The Menus tells all about the menus. Ground School explains how planes fly. Flight School gives indepth instructions on flying and landing. Military Training will help you dogfight. Mission Briefings details 10 separate missions including a step by step study of aerobatics. History of Anthony Fokker looks back at the force behind Germany's WWI air power. And finally, About Fokker Triplane is a brief discussion of the programming and design philosophy.

Introduction

Welcome to the realm of Fokker Triplane.

Fokker Triplane is a look back into the times of Baron Manfred von Richthofen and Capt. Brown, of chivalry and honor, of blue skies and the tension of battle. It's you in your crate against him in his... the joy of flying and the threat of death.

You will be flying the most striking image of World War I aerial combat-the Fokker Triplane. This aircraft can climb 1750 feet per minute and turn on a dime. The Triplane was the symbol and vehicle of Baron von Richthofen, Germany's most famous ace.

You'll start out shaky, unsure of yourself (not unlike the pilots of the time) but soon you'll be doing loops, rolls and perhaps even a knife edge. Then you'll go cross country, testing your new found flying skills and becoming acquainted with your surroundings. A little cocky, you'll try a dogfight-one on one. You might get shot down the first few times (a luxury the pilots of the time did not enjoy) but before long you'll be master of the skies.

Suddenly you see trench lines below as you enter enemy airspace. Your mission... down observation balloons, destroy fuel depots, engage hostile aircraft and recover important spy papers.

This is Fokker Triplane.

So put on your goggles and silk scarf, climb into the cockpit, and let's go flying. The sky's the limit.

The World

The "world" is the database in which you fly. It encompasses over 20,000 square miles of land. There are seven airstrips—three enemy, four friendly. You start at the home base, the most detailed of all airstrips. It includes: two runways, a hangar, a tower, and a wind sock. The wind sock will point in the direction of the wind. The three other friendly bases have one runway and a hangar.

The three enemy bases have one airstrip and one fuel depot each.

Between friendly bases and enemy bases runs a double set of lines. These are the trench lines. You are in enemy airspace when you fly past the trenches.

The other solid lines you see are either roads or rivers. At one point you'll find the road crosses a river with a bridge.

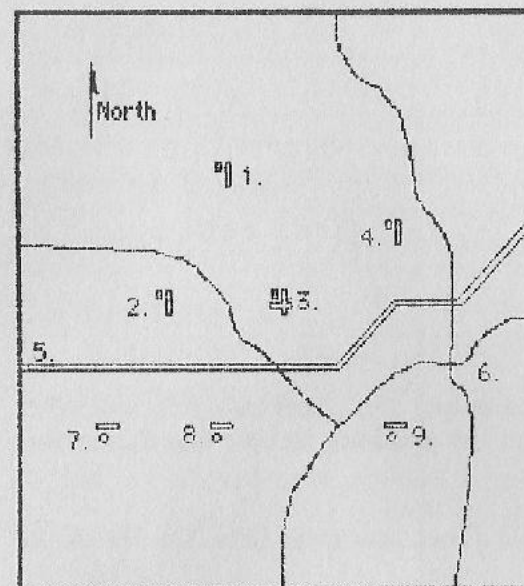
Always visible is a grid of lighter lines. These lines are to help the out-the-window perspective.

The enemy aircraft, a Sopwith Camel, will be flying around you from time to time. At a distance it's just a dot, but becomes more detailed as it gets closer.

Observation balloons will at times become visible. Shoot'em down, but don't fly into them.

You might see an arrow and a square deep in enemy territory. This is a signal from a spy placed behind lines.

The altitude of the ground is about 875 feet.



Map of World

1. North Base.
2. West Base.
3. Home Base.
4. East Base.
5. Trench Lines.
6. Bridge.
7. West Enemy Base.
8. South Enemy Base.
9. East Enemy Base.

The Menus



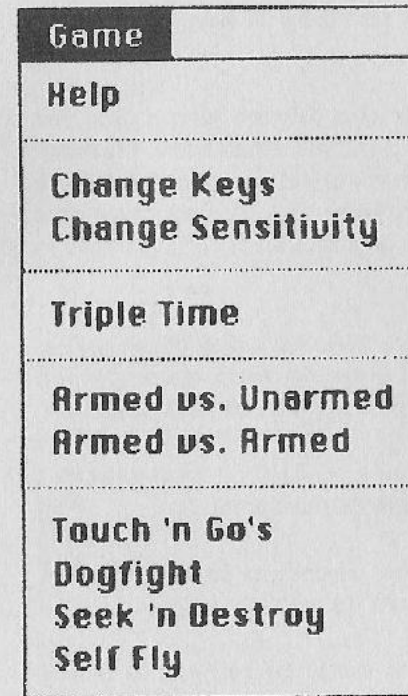
New-Restarts your position back to the home base. May also restart enemy and/or reinitialize seek 'n destroy mission. Also clears score, time, and performance.

Open-Allows you to load a previously saved game. You will lose the current game.

Save-Saves current game to the current title, overwriting the game already saved in that title.

Save as...-Asks for a title for the current game then saves it.

Quit-Exits Fokker Triplane.



Help-Displays the scrapbook where a partial copy of the manual is.

Change Keys-Allows you to reassign the keyboard. You can also see what each key does without changing any assignments. The original keyboard assignments are:



Change Sensitivity-Changes the sensitivity of elevator, ailerons, and rudder.

Triple Time/Normal Time-Toggles between normal time and triple time. If you're in normal time you'll see triple time in the menu. (In other words, what is visible when you select the option is what you get.) Triple time is used on cross country trips. It makes time pass about three times faster. The best time to switch to triple time is straight and level flight.

Armed vs. Unarmed-Allows you to experience dogfight or seek 'n destroy missions without being shot down. Be aware the enemy will sometimes ram you. Also, no bonus points or performance scores are awarded.

Armed vs. Armed-Allows the enemy to shoot back.

Touch 'n Go's-This makes the other aircraft do touch and go's at the home base. Try to follow him around the pattern.

Dogfight-As soon as you lift off, an enemy aircraft will be coming after you. Look alive.

Seek 'n Destroy-This will put balloons, spies, and enemy patrol planes in the world. Your mission is to seek 'n destroy.

Self Fly-This is a demonstration mode. The aircraft will repeatedly takeoff and land.

Wind

No Wind
5 MPH
10 MPH
Random Wind

North
NorthEast
East
SouthEast
South
SouthWest
West
NorthWest

No Wind, 5 mph, 10 mph-Creates the strength of the wind.

Random Wind-Selects both speed and direction randomly.

North...Northwest-This selects the direction of the wind. The checkmark here may not match the actual wind when 'random wind' is selected. The home base has a tower with a wind sock (triangle) on it. It always displays the direction of the wind.

Clouds

Cloud Ceiling 30,000

Cloud Ceiling 30,000-This sets the cloud ceiling. When you go into clouds, the view out the window becomes totally white.

ADF

Home Base
West Base
North Base
East Base
Bridge
West Enemy Base
South Enemy Base
East Enemy Base

ADF—stands for Automatic Direction Finder. Selecting one of these decides which VOR the Fokker's radio will home in on, giving a heading to the selected destination. (A VOR is a milk bottle shaped structure you might see out in a field. It broadcasts a radio signal that the radio in the aircraft picks up and uses for direction and distance.)

Famous Pilots

Show High Scores
Clear High Scores

Show High Scores—Will display the five most famous pilots and their scores.

Clear High Scores—Clears all names and sets scores to 1,000.

Quick Flying Instructions

*What follows is a brief description of flying the Fokker Triplane. For a complete description and step by step lessons be sure to read the Ground and Flight school chapters.

Fokker Triplane flight simulator has two modes—pause mode and flight mode. The pause mode, where the program begins, allows you to use the mouse in the typical Mac way. (Select pull down menus and use the desktop applications.) This mode is characterized by the standard arrow type pointer.

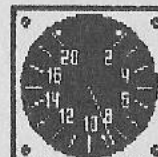
In the fly mode, the pointer changes to a circle with a cross in it and cannot be moved outside the stick box. In this mode you cannot access any of the menus. You must be in this mode to fly the aircraft. The button in this mode will center the pointer inside the stick box. You must "pause" to change options or to quit.

To enter the fly mode, click the mouse anywhere in the window. It's best to click inside the stick box exactly where you want the stick to be. Or you can double click the mouse which will select fly mode and center the stick. The switch between modes is instantaneous if you have a 512K Mac. On 128K Macs, the program will access the disk briefly between modes.

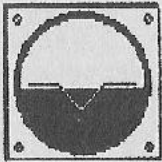
To exit the fly mode, press the Backspace key, (or alternately, a user defined key).

The Fokker will always start at the south end of the long runway at the home base. The Fokker Triplane is a tail dragger and you'll notice a slightly nose-up attitude out the window when it sits on the runway.

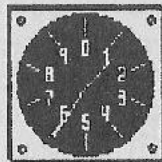
You'll notice that I've had to add several instruments in the cockpit that weren't invented until after WWI. This is because no one has yet built a "seat of the pants" interface for the Mac. By the "seat of the pants" is how these early aircraft were flown.



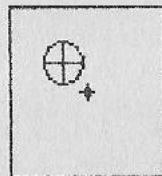
Airspeed Indicator tells velocity in miles per hour.



Artificial Horizon shows what the horizon looks like looking straight out the front of the airplane. White corresponds to sky, black to ground. There's also a "V" with wings on either side. The wings represent the half-way point. White above and black below means you are flying roughly straight and level. If the gauge is all black, pull up! The "V" is a good way to judge your climb angle. It's best not to let the white go below the bottom of the "V".



Altimeter displays your altitude in feet. The short arm is thousands of feet. The long arm is hundreds of feet. Once around for the long arm equals one thousand feet. Remember the ground is at about 875 feet.



This stick box corresponds to the range of movement the stick can make. The stick is just that... a stick connected by linkage to the elevator and ailerons. Moving the stick moves the elevator and ailerons. When flying, the mouse is shaped like a target. Moving the target down is the same as pulling back on the stick. Moving the stick back (down) makes the nose go up in relation to yourself (if you're inverted, moving the stick back makes the nose go toward the ground, but it still goes up in relation to you). Moving the stick forward (up) makes the nose go down. Side to side motion effects the aircraft's bank. (Bank refers to how far one wing tip goes down and the other goes up.) In Fokker Triplane, the aircraft will turn when it is banked. It is possible (quite easy in fact) to fly the aircraft without considering the rudder.



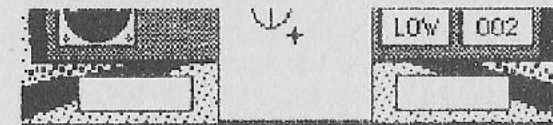
The fuel gauge acts just like in an automobile. When you get low on fuel taxi into the hangar (hangars are at all friendly bases) and come to a complete stop. Soon you will have a full tank of gas and a full load of ammo.



This is the Throttle slide. It shows where the current throttle is set. A black strip will show up for every throttle setting. All white is idle. There are eight settings.



The gauges above, left to right, top to bottom are: Current Heading Indicator (or compass), Heading to VOR (or ADF which stands for Automatic Direction Finder), Low Altitude Warning indicator and Distance from VOR Indicator (or DME which stands for Distance Measuring Equipment). The digital compass readout is in degrees. It tells where the nose of the aircraft is pointing. The ADF is also digital and is the heading necessary to fly to the VOR. Low Altitude Warning Indicator will flash when the aircraft is within 250 feet of the ground. It is normally white with black letters. The DME tells the number of miles to the selected VOR.



These two white boxes show where the rudder currently is. A black line will grow either on the left or right as rudder is added. Since rudder is not entirely necessary in this simulation, it is added mostly to allow certain aerobatic maneuvers. You can also use it as a "cheat" when you try to line up with a runway because it allows minor heading adjustments.

Performance		
 03	 01	 02
 04	 01	 01

Reading from left to right, top to bottom these icons correspond to: number of landings, number of enemy aircraft downed, number of balloons downed, number of times you've flown under the bridge, number of spy papers you've recovered, and number of depots destroyed.

If you climb over 1500 feet you're eligible for a landing bonus. You have to land (or crash) on a runway to get the bonus.

You only score on the others if the enemy is armed. (Except for the bridge.) Also, the enemy must be armed when you take off. If at any time during a flight you select unarmed, no more bonus points will be awarded.

Flight Data	
Score:	4,321
Elapsed Time:	01:43
Time of Day :	14:52

This is your score, Elapsed Time and Time of Day. Elapsed time is the total time since the last crash.

Taking off...

Click in the Fokker Window to enter fly mode.

Center the stick by putting the mouse pointer on the crosshairs in the middle of the stick box. Press "D" to make sure the rudder is centered.

Throttle up to full throttle. (Press "2" until the throttle slide is full.) Within the first few seconds the tail will come off the deck. Notice your airspeed rising. Also the artificial horizon will be half white/half black. Leave the stick centered until the airspeed is above 60 mph. Pull

back gently (move the pointer down a little) and the tail will drop, increasing your angle of attack. Very quickly you'll be in the air. The Low Altitude Warning Indicator will begin to flash and the altimeter will begin to move.

Taking off is pretty simple. The only danger is climbing with the nose at too steep a slope. Watch the artificial horizon to keep the climb safe. A safe climb is when the white in the gauge stays above the bottom of the "V". Keep your airspeed above 60 mph as a general rule.

Flying about...

To turn, first bank your aircraft by pushing the stick left or right. Return the stick to the center when you have about 30 degrees bank. The aircraft will start to turn. Pull back on the stick if the nose drops. You are flying level when the horizon line goes through the gun sight.

Rudder can also be used to turn or to make minor heading adjustments. Remember to center the rudder when you are finished turning.

Be careful of sustained dives. Your airframe will come apart at speeds above 190 mph.

Landing...

The hardest thing about landing is lining up with the runway. Here's what you do:

1. Takeoff and climb straight out to 1700 feet.
Throttle down one notch.
2. Turn left 90 degrees. Fly out 2 miles (use the distance indicator).
3. Turn left 90 degrees. Fly downwind until 2 miles out.
4. Turn left 90 degrees. Fly until heading to runway is 4 degrees.
5. Turn left 90 degrees. Throttle down another notch. Point nose at the near end of the runway. Get lined up. Note: the radio signal for the ADF Indicator comes from the tower. At other runways you can see the VOR. Once lined up (easier said than done) pull the nose up to the horizon. At this point you're home free. You can control altitude with the throttle. Throttle up and pull the nose up a little to gain altitude, (do this to avoid landing short of the runway) throttle

Ground School

down and leave the nose at the horizon to lose altitude. In fact, once you're within 100 feet or so of the runway you can throttle down to 4 notches and the Fokker will pretty much land itself.

Remember to keep the nose at or above the horizon (judge the nose by where the horizon line goes through the gun sight) and keep the wings level.

These five steps basically describe what the other aircraft does when you select "Touch 'n Go's" from the game menu. This maneuver is a classic rectangle pattern.

These are the keyboard assignments:

Keyboard Assignments (Enter one key per box)			
Left Rudder =	J	Toggle Cowl =	F
Right Rudder =	E	Fire Guns =	(space bar)
Center Rudder =	D	Throttle Up =	2
Look Forward =	W	Throttle Down =	1
Look Left =	A	Throttle Off =	0
Look Behind =	Z	Pause Flight =	
Look Right =	S	Sound Toggle =	H
OK		Cancel	

Be sure to read Flight school for an additional explanation of landing.

Caution:

All flight instructions that follow are necessarily brief and are sometimes incomplete. If you want to fly a real aircraft pick up a copy of "Pilots Handbook of Aeronautical Knowledge" or other similar text and seek flight training from a qualified instructor.

For many people an airplane zooming through the sky is a source of mystery. But like most mysterious things, once explained they are not only easy to understand but actually become logical.

All things with mass (weight) are subject to gravity. Drop a rock, a person, or a boat off a building and it falls to the earth. But airplanes don't fall to the earth, they are able to stay in the air. Therefore, they must, by some means, overcome gravity. And that's exactly what they do. They overcome or counter gravity by another force. This force is called lift. So for an airplane to fly straight and level (to stay in the air) it has to have exactly the same amount of force pulling it up (lift) as the force pulling it down (gravity). It follows then to climb (gain altitude), the aircraft needs to create more lift than gravity, and to dive (lose altitude) it needs less. Airplanes do sometimes fall out of the sky (crash) because they lose their ability to create lift.

Lift

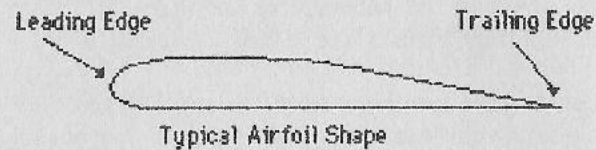
Lift is produced in two ways. From the angle of attack of the wing to the flight path, and from Bernoulli's principle.

Bernoulli was a Swiss scientist who lived from 1700 to 1782. His principle states, "As the velocity of the fluid increases, the pressure in the fluid decreases" and it also works conversely. You're asking yourself what this talk of fluids has to do with flying. Well Bernoulli stated the relationship between pressure and flow velocity. The relationship holds true for both liquids and gases. Air, of course, is a gas.

So if we can decrease the pressure on the top of an airplane, the pressure underneath the airplane will push it up. And that's exactly what the wing does. Wings have a special shape called an airfoil. The term airfoil refers to the shape of a cross section of the wing. In other

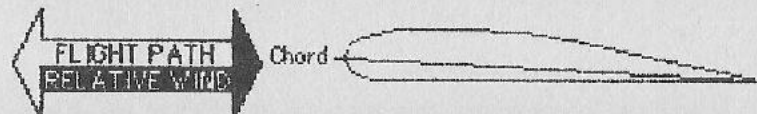
words, if you slice a wing parallel to the fuselage you can see the shape of the airfoil.

A typical airfoil looks like this:

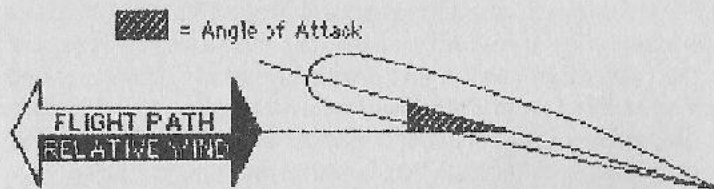


The airfoil forces air to move faster over the top edge than the bottom edge, thus producing less pressure (Bernoulli). This, in effect, sucks the wing upward.

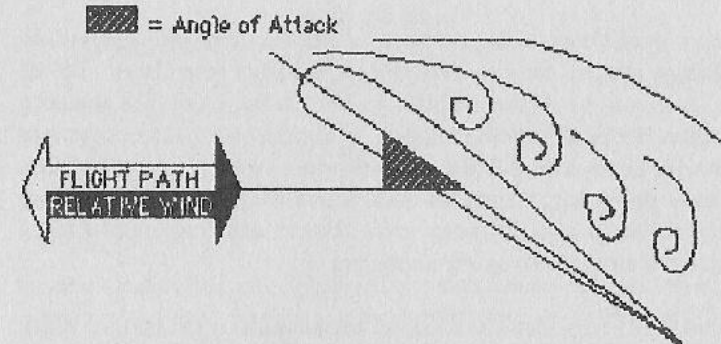
The airfoil, using Bernoulli's principle, produces most of the lift on an aircraft but not all of it. Some additional lift is produced from air pushing on the wing. The angle that the oncoming air strikes the wing is called the angle of attack. As the angle increases more lift is created. It's the same as putting your hand out the window of a moving car. If your hand is flat and pointing into the wind it moves smoothly. If you angle it to the wind you can feel it being pushed up (and backward).



Angle of attack is zero, no extra lift is produced.



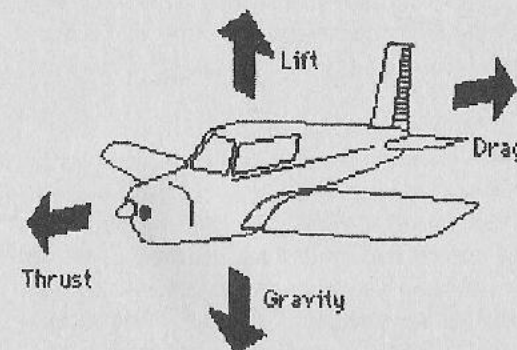
Wind now is hitting at more of an angle and is pushing the wing up. (It also slows the airplane down.) Angle of attack shown is 10 degrees.



At some point the angle of attack becomes too great and air stops flowing smoothly over the top of the wing. When this happens the wing stops producing lift. This is called a stall and makes the aircraft fall. Most aircraft are designed so that during a stall, the nose drops toward the ground. This automatically increases airspeed (the speed of air flowing across the wing) and gets the wings "flying" again.

Relative wind is the direction of on coming wind. Flight path is the direction of the aircraft. The flight path creates the relative wind so the relative wind and flight path are always parallel and go in opposite directions.

Two other forces that affect aircraft are thrust and drag. Thrust (produced from a propeller which is an airfoil) is the force pulling an aircraft forward. Drag is friction from the air which pulls against thrust.



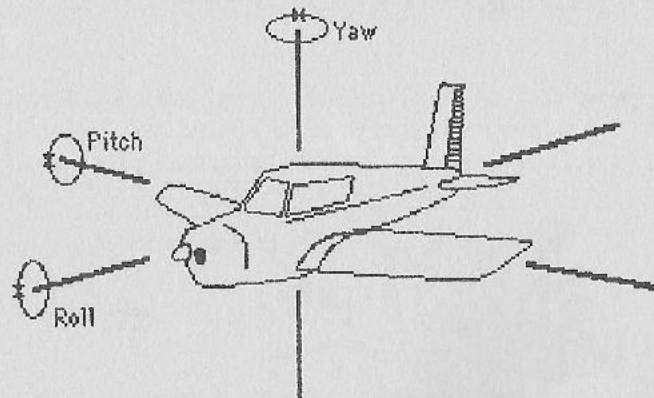
Basically, when flying straight and level at a constant speed, thrust and drag are equal. To go faster you must either decrease drag or

increase thrust. Most vintage aircraft, including the Fokker Triplane, can't change drag so the only alternative is to increase thrust. Thrust can be increased by adding throttle to the engine. (Just like pressing the accelerator in a car.) When thrust is increased it becomes greater than the force of drag and the aircraft goes faster. As the airplane goes faster more drag is created (as friction from the airplane moving through the wind) until, at some point, thrust and drag become equal again and the aircraft stops acceleration.

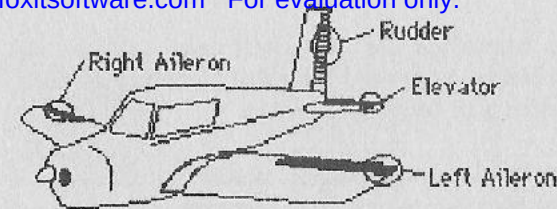
To summarize, airplanes fly because the airfoil can create lift which overcomes gravity. Lift is produced when air passes over the wing. The shape of the wing, the airfoil, makes air move faster over the top edge than the bottom edge which decreases the air pressure on the top of the wing, producing lift. Lift makes airplanes fly.

Controlling an Aircraft

Aircraft fly in 3 dimensions. That is: height, width, and depth. They can also twist in 3 dimensions. They are: pitch, roll, and yaw.



The three "twists" can be shown with your head: nodding "yes" is pitch, nodding "no" is yaw, and touching your ear to your shoulder is roll. Aircraft have surfaces that move the aircraft about these axes.



Control Surfaces or Fins

Elevator makes the aircraft pitch, rudder makes it yaw and ailerons produce roll. These surfaces or fins move into the airflow which alter the aircraft's attitude. If for example the elevator moves up, more air hits it on the top than on the bottom, and it forces the tail down bringing the nose up. And of course the opposite happens if the fin goes down. The rudder works the same as the elevator but changes yaw. (Just like a sailboat's rudder.) Ailerons are located on the trailing edge of the wing, one on each side, starting near the outer tip and moving inward. The two ailerons move in opposite directions. That is to say when one goes up the other goes down. This produces a roll effect because one wing tip is forced up, the other down.

These three surfaces along with throttle are the means to control an aircraft.

A pilot controls these surfaces with a stick, rudder pedals, and a throttle slide.

The pilot sits in the fuselage with his feet on the rudder pedals. Pushing forward on one rudder pedal makes the other pedal come backward and visa versa. This makes the rudder go left or right.

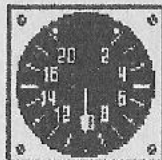
The control stick comes up from the floor between the pilots legs. The stick is connected to both the elevator and ailerons. When the stick is centered, straight up and down, both surfaces are centered. Moving the stick left makes the ailerons move, banking the aircraft to the left. Right stick banks the aircraft to the right. Pulling back on the stick brings the nose of the aircraft up, pushing forward makes the nose go down. Moving the stick left and back brings the nose up while banking left. Remember that these movements, left/right, up/down are in relation to the pilot, NOT in relation to the ground. If the aircraft is inverted, pulling back on the stick still makes the nose go up, in relation to the pilot, but the nose will be going down toward the ground!

The throttle slide is located on the instrument panel, sticking out toward the pilot. Pushing it in toward the panel increases throttle, pulling it back toward the pilot decreases throttle.

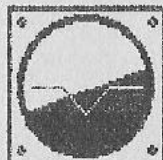
To summarize, an airplane has three axes of rotation: pitch, roll, and yaw. An airplane has three control surfaces, elevator, ailerons, and rudder which correspond to movement about each axis.

Instrumentation

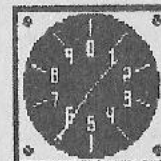
On the instrument panel are several gauges. The three main gauges are airspeed indicator, artificial horizon, and altitude indicator (or altimeter).



The airspeed indicator is like a speedometer in a car. The numbers on the face represent 10's of miles per hour. (So if the arm points to 10 it means the airspeed is 10x10 or 100 mph.) Airspeed means the speed of the airplane going through the air. It is not necessarily the same as the speed the airplane is flying over the ground (ground speed). If you are flying directly into a 10 mph wind and the airspeed indicator reads 100 mph your ground speed is 90 mph. The Fokker will stall around 38 mph so it's important to keep an eye on the airspeed indicator.



The artificial horizon is exactly that—an artificial representation of the actual earth's horizon. It displays where the horizon is when compared to the aircraft's attitude. The artificial horizon is very useful if you get mixed up about what the aircraft is doing. (This can happen quite easily if there are no out-the-window references.) The gauge displays white for sky and black for ground. Where the colors meet is where the horizon is. Sometimes the gauge displays all white or all black. This means the airplane is in an extreme up or down attitude.

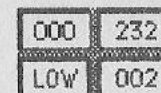


The altimeter displays the altitude of the airplane in feet. This is the altitude above sea level NOT over the ground. This is an important point. The ground you'll be flying over is 875 feet above sea level. You cannot fly below 875 feet. Notice what the gauge reads while on the ground. This is the ground altitude. The gauge has a long hand and a short hand just like a clock. The number the long hand points to is hundreds of feet, the short hand points to thousands of feet.

These three gauges are used to fly the aircraft safely.



The fuel gauge works exactly like in a car. Remember, you won't find gas stations on every cloud. Look at the gas gauge once in a while and act accordingly.



The gauges above, left to right, top to bottom are: Compass, ADF, Low Altitude Warning indicator, and DME. The compass tells you your current heading. The ADF (or Automatic Direction Finder) gauge tells the direction to the selected VOR (or Very high frequency Omnidirectional Range). If you guide the aircraft to this heading you will eventually fly to the VOR. The Low Altitude Warning indicator looks white with black letters (LOW) while on, or more than 250 feet above, the ground. When the aircraft is within 250 feet of the ground it flashes alternately white and black. The last item, the DME (Distance Measuring Equipment), shows, in miles, the distance from the selected VOR. (A VOR is a milk bottle shaped structure you might see out in a field. It broadcasts a radio signal that the radio in the aircraft picks up and uses for direction and distance.)

This completes ground school training. You are ready for flight school.

Flight School

Flight school consists of using the principles of flight (learned in ground school) to control a flying aircraft.

The first thing you'll learn is how to takeoff.

Boot Fokker Triplane and enter fly mode by clicking in the stick box.

Before you do anything else do a preflight check:

1. Center stick in stick box. (You can do this by clicking the mouse button.)
2. Make sure the rudder is centered. (To see what the screen looks like when the rudder isn't centered press "E" a couple of times. Then press "D" to center the rudder.) See page 5 or 14 for a complete list of keyboard assignments.
3. Check fuel gauge.
4. Make sure the front view is selected. (Press "W".)

Other things you might check are cloud ceiling, wind selection, and game options. But for now the list above is all you need worry about.

Your Fokker Triplane can lift off the runway at 60 mph. Read through the following eight steps and then try to takeoff.

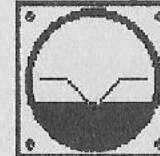
1. Throttle up to full throttle. (Press "2" on the keyboard 8 times.) After a couple of seconds the tail will come off the ground and you'll be rolling down the runway.
2. Alternately look straight ahead at the runway and down at the airspeed indicator. The Fokker begins in the middle of the runway-lined up with the stripes. If you had just landed or if the wind was blowing you might need to steer the airplane to keep it on the runway. Steer the Fokker on the ground using the rudder. The surfaces become very sluggish when the aircraft is moving slowly. It may take full rudder to get the plane to turn. As the airplane speeds up, more air flows over the fins and the surfaces work better. Remember to center the rudder when you're lined up.

3. When the airspeed reaches 60 mph gently pull back on the stick. (i.e. move the mouse pointer down in the stick box.)

4. The aircraft will rise into the air. You will know you're in the air because the altimeter will begin to move and the Low Altitude Warning indicator will begin to flash.

5. Once in the air move the stick back to the center.

6. Look at the artificial horizon to assure a safe climb angle. A safe climb angle is when the horizon is between the top and bottom of the "V" in the gauge.



7. Once a safe altitude is achieved, push forward on the stick (move the mouse pointer up) a little to bring the nose down level with the horizon. You know you're level when the horizon goes through the gun sight or when the horizon line on the artificial horizon is aligned with the wings on the gauge.

8. The last thing to do is throttle down two notches to conserve fuel.

Now practice climbing 500 feet, level off, then dive 500 feet. Pick the altitude you're going to climb to before you start the climb. Try to level off at exactly the correct altitude.

Turning the Fokker is generally easier than a real airplane. Real airplanes can slip or slide through the air during turns. If rudder and ailerons are not coordinated properly. In this simulation rudder and ailerons are automatically "coordinated" so turns can be performed effortlessly.

To turn the Fokker, bank the aircraft about 30 degrees by moving the stick left gently.

Move the stick near the center when the proper angle is achieved. The aircraft should now be in a gentle turn. You know it's turning when the

compass is continuously changing. If the airplane is banked but the compass isn't changing you're only flying crooked, not turning. If this happens, move the stick to the left again and bank the airplane a little more. You may sometimes need a little back stick to keep the nose on the horizon.

To stop turning, move the stick in the opposite direction that it was moved to enter the turn. If you entered the turn with left stick, use right stick to exit the turn. Use right stick until the wings are level.

You can gain, lose, or hold altitude while turning. To gain or lose altitude, put the aircraft in the proper attitude (nose up or down) before you enter the turn.

Holding altitude in a turn takes more effort. When an aircraft is banked its lift is no longer pulling straight up. Lift pulls perpendicular to the wings but gravity is still pulling straight down. So if you're holding altitude with the wings level you may lose altitude slowly with the wings banked. To hold altitude then, adjust the nose up or down slightly as needed.

Now practice turning to a heading. Look at the compass and pick a heading about 90 degrees away. (Add or subtract 90 from the current heading.) The trick is to exit the turn at the proper heading. If you start to level the wings at the heading you want, you'll be too late and go past the heading. Begin to level the wings several degrees before you reach your selected heading.

Climbing, diving, and holding altitude along with the ability to turn to a heading are the major components of landing. Master these skills and landing is a snap.

Landing is by far the most difficult task in civilian flying. The Fokker, in this simulation, is actually quite easy to land once lined up with the runway.

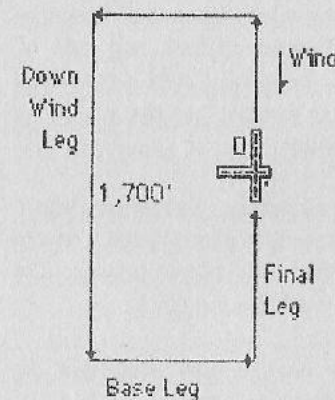
Landing the Fokker can be thought of as a two phase task. The first phase consists of lining up with the runway, phase two is the actual landing of the airplane.

The key word in lining up with the runway is patience. Lining up requires patience because it is easy to get impatient flying away from the airport, starting your approach too close to the runway. It's best

to start your approach about 3 miles away while learning. Later, when you can line up with less effort you can start much closer.

Also, as you get closer to the runway things seem to speed up. This is called panic. Things are not really moving faster, but since things are closer, they move more on the screen, which creates the effect of things moving faster. Don't expect to get lined up the first few times you try.

To begin an approach, fly to a point about 3 miles away from the runway and then turn toward the runway.



The best approach is to fly perpendicular to the runway you want to land on. Your altitude should be 1,700 feet. Use the file "Practice lining up" to start the Fokker 3 miles out, waiting to turn final. (To tell the distance to a runway be sure to select the correct VOR from the ADF menu.)

Runways always run north/south or east/west. Or in degrees, 000/180 or 090/270.

The following landing instructions will assume you have loaded "Practice lining up".

You are currently flying east at 1,700 feet, three miles out from the runway. When the ADF reads 002 degrees turn left at a heading of 000. You will pick up the airport visually. Being lined up means the airplane is lined up with the center of the runway and has a heading of 000. The rudder can be used to make minor heading adjustments.

If you get close to the runway and are not lined up, give up on landing on this approach and try again. (Pilots would say, "abort and go around".)

Phase two, landing the Fokker, is the easy part. You can load the file "Practice Landing", which will start you all lined up, to practice landing.

Once lined up make sure your wings are level. Point the nose at the near end of the runway until your altitude is about 1,100 feet. Then bring the nose up level with the horizon. At this point you are home free. You basically do not need to use the stick any more. Keep the nose at or a little above the horizon. Control altitude and rate of descent with throttle. Four notches down from full throttle creates a safe descent for landing. If your flight path is going to take you short of the runway increase throttle to hold altitude.

When you touch down you'll hear the tires squeak. Sometimes you'll bounce a little. You can't always see that you're bouncing but you can tell because you'll hear a second (or third... fourth...) squeak. The aircraft bounces when the rate of descent is a little too quick.

Be patient with yourself when trying to land. It may seem next to impossible at first, but soon it becomes second nature.

You now know the basic principles of flying, landing, and taking off. It may take several hours to master these skills, but stick to it. From these skills, basic control of the aircraft, comes more advanced skills... aerobatics and the ability to engage in combat with another aircraft.

The first three missions deal with taking off, flying, and landing. You might now fly these missions as further practice.

Military Training

Once you've learned to control your aircraft it's time to get radical. You won't last 5 minutes against an opponent if you do nice graceful turns. You've got to yank your crate around the sky. Don't be afraid to move the stick all the way to the edge of the stick box.

A classic military maneuver is Lufbery turns. Lufbery turns are ultra-steep maximum banked turns designed to position your aircraft on the tail of the enemy. This maneuver and others are detailed in mission 9.

At first, your aircraft turns much sharper than the enemy so you can get on his tail using Lufbery turns. Put your aircraft into a 75-85 degree bank and keep the nose on the horizon. Continue to turn for a while and you will see the enemy in front of you. Once you're on his tail, line him up in your gun sight and shoot him down.

Your aircraft will out climb the enemy's. A second technique is to climb about 1000 feet above the enemy, then dive on him and get the first shots in. Keep airspeed below 180 mph.

When you have the enemy in your sights, fire your guns as many times as possible.

Each time you shoot down the enemy he gets better flying characteristics until he's exactly your match mechanically. As he gets better, Lufbery turns may not do the job and you'll have to use different tactics. Also, the enemy will fly into you if he gets the chance, so use evasive maneuvers if he is coming right at you.

If he's on your tail, do a loop or barrel roll at low speed. This should put him in front of you temporarily. As soon as he's in front of you he'll probably turn left or right. The trick here is to see which way he turns. (or guess correctly) then you can pull right on his tail.

Other good maneuvers are the military wingover, the Immelmann turn, and the Split "S". Be sure to practice these and other maneuvers before putting your life on the line.

Sometimes it's a matter of doing several radical maneuvers one after the other. This may only get the enemy far enough away to plan how to

get on his tail. In any event, while you're maneuvering, the enemy will have a pretty hard time shooting you down.

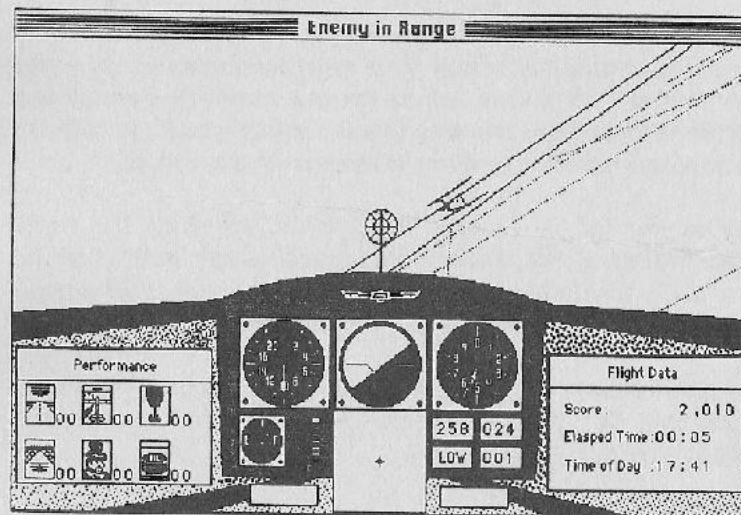
Two main points:

1. Pick up the enemy visually as soon as possible. The saying is, "keep your head on a swivel". When you fly a seek 'n destroy mission it's imperative to look around periodically. You never know when the enemy will appear on the horizon or dive on you from above. When you see the enemy at a distance you can plan the first exchange. Anytime you can decide how and when to attack you have a major advantage.

2. Don't fly straight and level if the enemy is on your tail. Practice the evasive maneuvers outlined in mission 9 and you'll find they become instinctive.

There are several aerobatic maneuvers you can use during a dogfight. Loop and barrel roll have already been mentioned. Other important maneuvers are Lufbery turns, military wingover, and Split "S". Adding these maneuvers to your repertoire makes surviving action a calculated risk rather than a foolhardy adventure.

These maneuvers and others are detailed in mission 9.



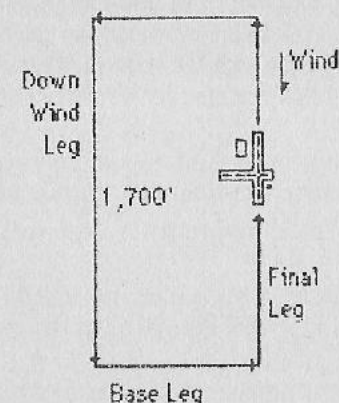
Mission Briefings

Mission 1-Takeoff and fly.

Follow takeoff instructions from flight school and climb to 6,000 feet. Practice gentle turns left and right. Try to turn to a specific heading. Dive and climb to specific altitudes. Your task is to get control of your aircraft.

Mission 2-Fly the pattern.

Make sure Touch 'n Go's is selected from the game menu. The standard pattern is a left hand rectangle:



Pattern altitude is 1700 feet.

The other aircraft flies this pattern when Touch 'n Go's is selected. When you get good at flying the pattern, form up with the other aircraft and fly in formation.

Mission 3-Go cross country and refuel.

There is a friendly base directly to the west of the home base. This mission takes you there and back. Select Touch 'n Go's from the game menu and West Base from the ADF menu.

Takeoff and climb to 6,000 feet. Using the ADF point the nose in the correct direction and throttle down two notches to conserve fuel. Now

is the time to use "Triple time". Triple time compresses time by a factor of 3 so you can go cross country quickly. Here's what you do: level your aircraft and check your heading (should be 6,000 feet and pointed toward the west base). Enter pause mode and select triple time from the game menu. Before entering fly mode, put the point on the crosshairs in the middle of the stick box. Enter fly mode and make any minor corrections to exactly center the stick. Or you can simply double click the mouse button which will automatically center the stick. In triple time your aircraft is three times more sensitive so it's best not to try to fly while in triple time. (Later, when you're a hot shot you'll find it fun to fly in triple time, but for now don't touch the stick in triple time.)

The west base is about 40 miles away. Pause and select normal time when the base looks close. The airstrip runs north and south (000 and 180 degrees). Pick a direction and land. Taxi into the hangar and come to a complete stop. (Be careful not to taxi through the walls.) After a second or two your fuel gauge will read full. (You also get a full load of ammo.)

To finish the mission, fly back to home base and land. Use the ADF to return to home base.

Mission 4-Dogfight.

Select dogfight from the game menu. You probably will want to start with armed vs. unarmed. Try this mission armed vs. armed when you feel you're ready.

Takeoff and make a climbing turn. It's important to see your enemy as soon as possible. He may come in high or low.

The trick is to get the enemy in your gun sights and shoot him down. Space bar fires your guns. The enemy must be about 1/4 inch wide or bigger for him to be in range. You can run out of ammo and you'll know you're out because the gun sight will disappear. Parking in the hangar will reload your guns.

See Military Training for help in a dogfight.

Mission 5-Balloon Busting.

Select Seek 'n Destroy from the game menu. Also Armed vs. Armed.

Takeoff and climb to 2,000 feet. Take a heading of 180 degrees. Fly until you're over trench lines. Turn 270 degrees which is directly parallel to the trench lines. Seek and destroy any balloons. Watch for enemy aircraft and engage if necessary. Cruising speed is one or two notches down from full throttle. Remember to throttle up to full during dogfights. When fuel is below half, return to closest friendly base and refuel.

Mission 6-Destroy enemy fuel depots.

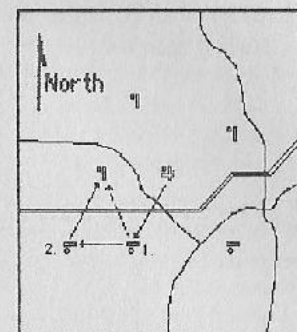
Select Armed vs. Armed and Seek 'n Destroy from the game menu.

Takeoff and climb to 6,000 feet. Select primary target from the ADF menu. Fly to and destroy depot. (See map below.)

After depot is destroyed, pilots choice:

1. If low on fuel return to friendly base and refuel. Then proceed to secondary target and destroy fuel depot. (See map below.)
2. If reasonable fuel, continue to secondary target (see map below) and destroy fuel depot.

Mission is then complete, return to friendly base.



1. Primary Target.
2. Secondary target.

Mission 7-Recover spy papers.

Select Armed vs. Armed and Seek 'n Destroy from game menu.

We don't know where the spy will be, we do know he'll be beyond the enemy airbases.

It's very important we recover the papers our agent has. Range will determine the success of this mission so do not engage balloons or enemy aircraft.

Fly 20 miles beyond enemy bases and cruise east/west.

If you find the spy, come to a complete stop in the square and the spy will have fuel for you. Good luck.

Mission 8-Seek 'n Destroy.

Select Armed vs. Armed and Seek 'n Destroy from game menu.

This is a general patrol assignment.

Use all resources available to destroy enemy aircraft, fuel depots, and balloons.

Mission 9-Practice flying skills and aerobotic maneuvers.

When flying precision maneuvers, pick out a visual reference on the ground. This will allow you to see just how precise your performance is. Also, remember to notice the altitude and heading when you enter a maneuver and check it against the altitude and heading upon completion of the maneuver.

1. Warm-ups

a. Discipline climbs and turns:

Climb to 5000 feet, 2 miles downwind of airport. Fly as precise as possible.

b. Coordination exercises:

Bring the nose to a heading 000.

Bank left to 45 degrees.

Immediately bank right to 45 degrees.

While banking back and forth, maintain heading and altitude.

Use opposite rudder (right rudder on a left bank) to keep the nose on heading.

c. Lufbery turns:

Bank the aircraft 75-85 degrees.

Pull up hard on elevator.

Keep the horizon in the middle of the gun sight.

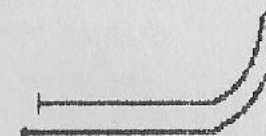
The following descriptions use the Aresti Key of graphically representing each maneuver.

	Normal Flight		Snap Roll
	Inverted Flight		4 Point Roll
	Slow Roll		Loop
	Barrel Roll		Hammer-head Turn

Aresti Key.

2. Military Wingover:

This is a vertical turning maneuver.



Enter a shallow dive, wings level, lined up on ground reference. Pull the nose straight up through the horizon to about 80 degrees up.

Use left or right aileron to turn the aircraft.

Use a little forward elevator to keep the nose from coming around.

The horizon should come across the nose vertically.

Begin pull out as nose drops toward ground.

3. Loop:



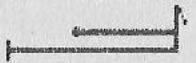
Enter a shallow dive, wings level, lined up on ground reference.
Pull the nose straight up through horizon, full throttle.
Continue back pressure on stick until inverted. Once inverted
relax back pressure momentarily to round out top of loop.
Ease off power as aircraft comes around. Be careful not to pull
too many G's.
Recover straight and level.

4. Snap Roll:



This is a popular airshow maneuver.
With full throttle enter a shallow climb, wings level, lined up on
ground reference or heading.
Pull full back on stick, blend in full right aileron and then, full
right rudder. This all happens fast, within one second.
From here on in, this maneuver is easy. The aircraft does all the
work. Hold full back, right aileron, and right rudder and enjoy
the view.
When the horizon comes around, center rudder and level wings.
Setting the stick to "Very Sensitive" makes the snap much
quicker.

5. Hammerhead Turn:



Another popular airshow maneuver.

Fly straight and level, lined up.
Pull nose straight up, full throttle.
As airspeed drops to just above stall speed, apply full left
rudder.
Use right aileron and elevator as necessary to control wing angle.
As nose cuts through horizon ease off power and use a little
forward elevator to keep nose where you want it.
When nose points down, pull up and apply power.

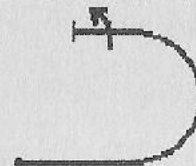
Look left to achieve a straight up attitude.
Look forward when the nose comes to the horizon.

6. Cuban 8:



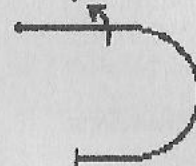
This is two loops side by side with a half roll at the intersections.
Enter shallow dive, wings level, lined up.
Pull up into a loop.
When nose is 20 degrees below horizon, about 3/4's into loop,
stop loop with forward pressure on stick.
Commence one-half roll with left aileron and left rudder.
Enter second loop. (Make sure you are still lined up.)
Again, perform half roll after about 3/4's loop is complete.
Recover to straight and level flight.

7. Immelmann Turn:



This maneuver, named after famed WWI ace Max Immelmann, is a
half loop with a half roll on top.
Enter a shallow dive, wings level, lined up.
Pull up just like a loop.
When nose is 10 degrees above horizon, push forward to stop
loop.
Roll upright using left aileron and left rudder.

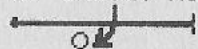
8. Split "S":



This is sort of the opposite of the Immelmann turn.
Enter straight and level, lined up.
Roll inverted using left aileron and right rudder.
Pull up completing a half loop.

Caution: check altitude before entering this maneuver. A
maneuver entered too low may be completed 6 feet under.

9. Barrel Roll:



Enter a climbing turn to the left.
Immediately use full back and right stick.
Recover straight and level.

10. Slow Roll:



Bring the nose 10 degrees above the horizon.
Use full left aileron, apply a little right rudder.
As the airplane goes inverted use forward elevator to hold the nose on horizon. Center rudder.
As the wings go vertical, use a little left rudder to hold nose on horizon.
Recover straight and level.

11. Knife Edge:



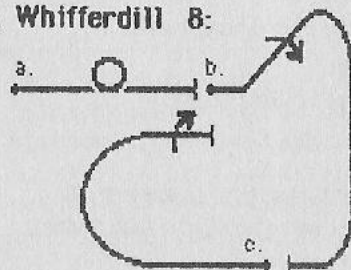
Airshow maneuver.

Fly straight and level, lined up.
Apply left aileron and right rudder.
Bank aircraft 90 degrees. Use two clicks of rudder.
Use considerable forward pressure on the stick to keep aircraft from turning.
Aircraft will be flying with wings vertical.

This maneuver must be mastered before you can do a 4 point hesitation roll.

The following maneuvers are combinations of previous maneuvers.

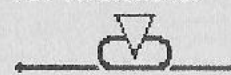
12. Whiffardill 8:



The whiffardill 8 consists of:

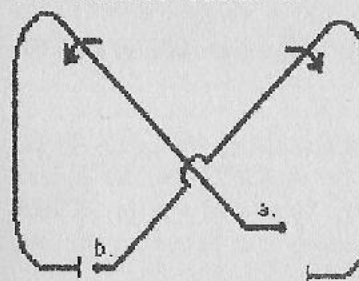
- simple loop.
- Split "S".
- Immelmann turn.

13. Avalanche:



Begin a loop.
At the top, perform a snap roll entered and exited from the inverted.
Finish normal loop.

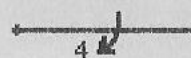
14. Reverse Cuban 8:



The reverse cuban 8 is:
a. Perform a climbing Split "S".
b. Perform a second climbing Split "S".

This will form an 8 on its side.

15. 4 Point Hesitation Roll:

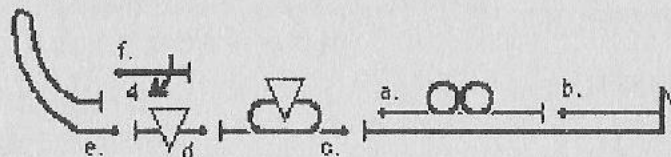


A popular airshow maneuver.

This is the same as a slow roll except that you must pause every 90 degrees around the roll. It consists of:

- Knife edge to left.
- Fly inverted.
- Knife edge to right.
- Recover straight and level.

When you can perform these maneuvers it's fun to combine them in your own order, designing an airshow routine. Here's a typical set of maneuvers:



- a. Cuban 8.
- b. Hammerhead turn.
- c. Avalanche.
- d. Snap Roll.
- e. Military wingover.
- f. 4 point hesitation roll.

Try to do these maneuvers just 50 feet off the deck, aligned with the long runway. Good Luck!

Note: Most roll maneuvers require cross controlling if entered upright. This means that if you roll right you use a little left rudder to hold heading and to keep the nose from falling. This takes practice. A book such as "Primary Aerobatic Flight Training" can help a bunch when trying to learn aerobatics.

Mission 10-Fly under bridge

Fly out to the bridge and line up a mile out. Point the gun sight just below the bottom of the bridge. Level off when the bottom of the bridge goes above the gun sight. Be careful not to fly into the ground. As soon as the bridge passes overhead, climb to a safe altitude. For a unique view, look backward as you pass under the bridge.

History of Anthony Fokker

The story of the Fokker Triplane begins with Anthony Fokker. Fokker was a selfmade man, a flamboyant man, a man who made things happen.

Fokker was born in 1891, on Kenbiri which is an island near the East Indies. His father, a Dutchman, was seeking his fortune as a coffee grower. The Fokkers stayed in Kenbiri until young Anthony was eight. While Anthony lived in Kenbiri he spent his days playing with the natives-shinning up trees as easily as running.

The Fokkers returned to Holland with a comfortable fortune. One reason for returning was concern that their children needed a structured upbringing. A structured upbringing is something Anthony Fokker was never to get used to.

In their new home in Holland, Fokker commandeered the attic for himself and made it his personal laboratory. In that attic he was to first build model airplanes, teaching himself the basics of aerodynamic design.

Fokker was an opinionated child and not above a prank or two. He once wired an electrical current to the attic doorknob to keep uninvited "guests" from just dropping by.

Fokker spent much of his school time not in school. By his own account, he expended three times as much effort designing methods of cheating in school as he would have spent studying his lessons.

Fokker finally dropped out of school to finish an invention he and a school chum were working on. The invention, an airless automobile tire, when finally finished was found to have been already patented by another inventor.

Next, Fokker's interest in aviation began to posses him. After a false start at a newfound aviation school, he built his first flying machine drawing heavily on his experience building models in his attic.

His first aircraft was a mono-wing design that used wing warping instead of ailerons. The Fokker design, using swept back wings with

generous dyhedral, was inherently stable. Fokker himself claimed this as a great achievement for the time.

Fokker flew this aircraft for the first time in 1910, almost exactly 7 years after the Wrights historic flight.

For several months, "flying" for Fokker meant brief hops into the air, always straight in a line. On May 5, 1911, Fokker decided to see if his aircraft could be turned. Nowadays, it's hard to imagine Fokker's fear about turning his aircraft. But in 1911, airplane design was mostly done by sight, sweat, and luck. Hard and fast rules had not been invented. Indeed, aerodynamics was not yet fully understood. Also, remember that Fokker had never flown before. Not only did he have to test the untested, but learn to fly at the same time.

On a calm May day, Fokker's craft not only turned, but turned with grace. In Fokker's words, "it answered like a trim yacht".

A few weeks later Fokker took his aerial examination. This examination was entirely based on flying skill. To pass the test he had to fly three figure eight patterns between two pylons 1,500 feet apart. Then land within 450 feet of a given point. Fokker's license was the 88th issued.

Fokker's fame grew as he flew in many exhibitions. Flying was entirely new at that time and flyers were sought out. In the press Fokker became known as the "Flying Dutchman".

Fokker's monoplane evolved into what he called "spin" or spider. He began to offer this airplane for sale in 1913. The spin had a wing span of 36 feet, 1 inch, length of 25 feet, 5 inches, weighed 882 pounds, and had a maximum speed 56 mph using a 50 hp Argus four cylinder, in-line engine.

Fokker moved his aircraft to Johannisthal in Germany. At that time, Johannisthal was attracting daring spirits, ne'er-do-wells, and adventurers from all over the world. It was a hot-bed of activity in aviation. These early aviators flew hard and lived fast. Many were to die there.

Fokker continued to fly and his fame continued to grow. He claims to

have been the first man to loop an aircraft in Germany. All along he was trying to sell his aircraft. He tried to sell to the Dutch, the Russians, the British, and to the Germans. Everyone was interested, no one would purchase. That changed with the start of World War I. Suddenly, the German services wanted to buy anything that resembled an airplane.

At first, airplanes were used for reconnaissance. Although pilots were armed with service revolvers, this weapon couldn't do any damage in the air.

It became apparent that the side with the best reconnaissance was winning the battles. Something had to be done to stop the enemy from gathering reconnaissance. The French had an aircraft with a pusher style engine. It was a two seater and they mounted a machine gun at the front seat. Guns began to be mounted on a variety of aircraft but pilots knew that bullets couldn't be fired through propellers. All they need do was make sure they were between the enemies' propeller and their gun. Then a French pilot mounted a gun that appeared to shoot "through" the propeller. This pilot began to add up the victories giving the French the advantage in the air.

Military secrets are most fleeting. Soon this French pilot was downed behind enemy lines, and the secret was out. The pilot proved to be one of France's greatest stunt pilots before the war, Roland Garros.

What Garros had done was attach a triangular steel wedge to the leading edge of each propeller blade, thus deflecting the bullets instead of shattering the propeller. Not an entirely safe situation since the recocheting bullets could go anywhere.

Fokker, being a leading supplier of airships, was asked to devise a similar method of firing a gun through a propeller.

Instead he did them one better. After working day and night for 3 days he created the interrupter gear. This gear was connected to the engine and would prohibit the machine gun from firing when a propeller blade was in front of the barrel. This was an incredible leap in technology for only 3 day's work. Surprisingly, the Army was slow to believe that a gun could be shot through the propeller. Even after several

successful demonstrations they weren't convinced. They even requested Fokker himself down one of the enemy aircraft to prove his new invention. Fokker claims that after several flights with no sightings he had an enemy in his sights but couldn't pull the trigger. (It's a sad commentary that an intelligent man can invent the instrument of death even when he himself cannot use it. Such is life.) Lieutenant Oswald Boelcke, later to become the first German ace, was assigned to test Fokker's invention in battle. On his third flight he brought down an enemy plane. Finally the German officials were convinced and ordered that as many planes as possible be outfitted with the new interrupter gear. Allied planes began to fall like flies. This began what was known as the Fokker Scourge.

Fokker's gear remained a secret for 5 months and it was more than a year before Allied airplanes were similarly equipped.

By this time Fokker had become a selfmade millionaire and had proved all of his father's worries unwarranted. (The elder Fokker had invested nearly 200,000 marks in his son over several years before a profit was first realized.)

But Fokker was an outsider, a foreigner in the eyes of Germans. Rival aircraft companies competed fiercely and perhaps not always in good faith. Fokker needed to design a new fighter to stay on top and what he needed most was the best engine available—the Mercedes water cooled 160 hp powerhouse. Unfortunately, one of his competitors, the Albatros factory, had secured the entire Mercedes output for their own aircraft.

Fokker couldn't build a faster fighter without the Mercedes engine, so he concentrated on things he could improve: rate of climb and maneuverability. The Fokker Triplane was the result. With its tripe bank of wings, its clean lines, and almost total absence of wires and struts, it seemed almost to float on the air. In Richthofen's own words, "(the triplane) climbed like a monkey and maneuvered like the devil". The triplane was so maneuverable that Allied pilots never learned how slow it was and how short its range.

Richthofen's entire outfit was given the triplane and they were very successful with it. They almost dared death by painting their triplanes in bright colors when most aircraft were painted in camouflage.

Richthofen's own triplane was painted blood red. Richthofen's squadron became known (and feared) as the Flying circus.

Fokker again found himself being squeezed out of business even though his aircraft were out-performing his competitors. Normal military selling channels were drying up. Eventually his factory got a massive order to build simple observation aircraft designed by a rival company. To Fokker, this was a slap in the face.

Since Fokker couldn't sell his latest designs to the top brass he had to try a different method of selling. Fokker reasoned that if the pilots could test each aircraft themselves they would surely pick his. And that's what he did, he organized a competition for Army contracts using front line pilots as judges.

When the competition began, Fokker had just finished a prototype of his latest fighter. The first few days were for the manufacturers to show off their planes, then all planes would be turned over to the pilots. Fokker was flying his new fighter for the first time and, although saying nothing, he noticed the plane was dangerously sensitive in turns. The night before the pilots were to get the aircraft, Fokker quietly brought in two of his best mechanics. Working all night they cut the fuselage apart between the tail and wings and added two feet to the fuselage reasoning that this would make the aircraft more controllable in turns. (Imagine an aircraft company today testing a new jet and just deciding to try the fuselage two feet longer. It's amazing Fokker survived testing all his aircraft.)

Fokker was correct and this aircraft became the famous Dr.7 biplane, one of the best (or the best) fighter of WWI. Not only was Fokker the main contractor again, two of his competitors were required to manufacture Fokker's aircraft, paying him a royalty. This was something like revenge in Fokker's mind.

Fokker felt the Dr.7 a great triumph for himself. But most things in life are short-lived. The war was soon to end limiting the need for aircraft. But that wasn't the worst part for Fokker. The Armistice terms called for all military airplanes and engines to be destroyed. What's more, one of Fokker's planes was mentioned specifically, "In erster Linie alle Apparate D.VII." Or, "especially, all machines of the D-7 type". A dubious distinction indeed. Fokker enjoyed the

"compliment". no other aircraft had been so mentioned, but the price was too high. He never was a man to sit back and let things happen. So the great smuggling plot was devised.

It consisted of 6 separate trains going out of Germany on separate days. Germany at the time was mostly lawless as rival factions competed for control. The allies would destroy Fokker's aircraft once found but Fokker had hid most of his inventory in the countryside. Eventually, the plot was carried out giving Fokker a good start back in Holland. In all, 350 carloads brought out over 400 engines, 120 Dr.7's, 60 two-seat observation planes, 12 Dr.8's and carloads of brass and steel fittings, rubber tubing, aluminum plates, screws, propellers, upholstery materials, and the thousand other little gadgets which are necessary in airplane construction. The smuggling was accomplished through massive organization and continuous bribes.

Fokker went on to be successful in the world aviation industry until his death in 1939.

Some famous post war flights in Fokker aircraft include:

- \$ First non-stop transcontinental flight from New York to San Diego-1923.
- \$ Commander Byrd flies over the North Pole-1926.
- \$ Commander Byrd flies across the Atlantic-1927.
- \$ Amelia Earhart, first woman to cross the Atlantic-1928.

Fokker Triplane Specifications:

Engine: 110 hp Oberusel Rotary
Span: 23' 7"
Length: 19'
Weight: 1289 lbs.
Speed: 115-122 mph*
Ceiling: 20,000-22,000 feet*
Rate of climb: 1,750 ft/min

* Specs vary from source to source.

About Fokker Triplane

Fokker Triplane represents about 1 year of work. The bulk of the program was written on a Sage II micro computer with the rest being written directly on the Mac.

The program is written entirely in 68000 assembly language. Consistent structure and ample registers make the 68000 a great chip for assembly language programming.

The 3D routines were written first, without much knowledge of the Mac. The rotation portion uses simple sine, cosine equations. The line drawers were also written without a Mac.

My main goal in Fokker Triplane was high frame rates. Frame rates refer to how many times a screen can be erased and redrawn per second. Fokker Triplane usually performs at about 7 frames per second but can dip to as low as 4 frames per second. The frame rate at any given time does not affect the real time action.

The pause mode of the program was written on the Mac using the Apple Assembler and the Inside Macintosh manuals. Inside Macintosh, while often only hinting at the true nature of things, is actually quite good, considering the complexity and volume of the Mac ROM.

Future versions of the program are tentatively planned, including different aircraft and other types of missions. High frame rates will continue to be a major goal. Detailed scenery can be achieved by sacrificing frame rates but lower frame rates reduce responsiveness so scenery will remain simple. There exists several high speed video chips (some handle polygon fills) at relatively low cost. The next generation of low cost flight simulators will certainly include one of these chips.

Fokker Triplane was a labor of love. I wrote it because I wanted to, not because of market consideration or because it was the "smart" thing to do. I hope it is received as it was intended—as entertainment. I don't intend to make a statement on war, or anything else. Fokker Triplane is a fantasy with as much realism as I could give it.

Yo.

dh

Your comments are appreciated...

All letters are read and considered. I would very much like to hear your comments about Fokker Triplane and/or your ideas for software you would like to see written for the Mac.

Thanks
Donald A. Hill, Jr.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

Name _____

Phone _____

☐ I give my permission for you to use any of my comments in your advertising.

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