SKYFIGHTERS 1918

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IMPORTANT: The first thing you must do before flying with a joystick is to calibrate the joystick. After moving past the "Pilot Sign-In" and initial "Select Mission" dialog boxes, look in the "Game" menu, then Configure Input->Joystick->Calibrate Joystick and follow instructions found there. A joystick is recommended with this program, but not necessary.

If you will be flying with the mouse, it is suggested that you go to the "Preferences" dialog box and select, "Mouse Position Feedback". This will show you where the mouse currently is located, which will show you where the aircrafts "stick" is positioned. The center of the screen means the stick is centered. This feedback makes flying with the mouse much easier. Also, when flying with the mouse, be sure to point the mouse cursor at the center of the screen each time before you unpause the game.

By default, the "Stall Limiter" option is turned on. The stall limiter makes flying these aircraft easier in that it tends to make stalling from violent input much less likely. As you become more accustomed to flying you might want to go to the "Preferences" dialog box and turn the stall limiter off.

Overview:

SkyFighters 1918 wMB is a WWI era flight sim for Mac computers running OSX. You can play **SkyFighters 1918 wMB** in either of two ways, fly a mission with specific victory conditions, or fly a "Dogfight Only" game where the only goal is to shoot down the enemy.

Here is a list of features:

- Training and combat missions to fly
- Fly Quick Dogfights or more complicated Missions
- Quality Aircraft AI
- Great Flight Model
- Watch Replay of recent action
- Network play with up to 8 players
- Mission Builder allows you to create missions that you can fly, and send to friends to fly
- Create Custom Paint Jobs for your aircraft
- Customize any program texture
- Customize program sounds

Introduction:

There are many ways to enjoy playing **SkyFighters 1918 wMB**, play each mission, flying each of the different aircraft types. Or, fly quick dogfights, where the focus is all combat, all the time. Create custom paint jobs for your aircraft. These paint jobs show up on your aircraft, while you are playing. Fly networked with up to a total of 8 players. Customize any texture in the program to create you own unique look. Change the sounds in the program. Create your own missions to play using the "Mission Builder" feature. The mission builder allows you to create your own missions including aircraft starting positions, ground targets, which world to use, and victory conditions. Create your own mission and then send it to friends to play, or, post it on your website. Even play the mission over the network with up to 8 people.

You can see there are a lot of things to learn and explore with the program. Keep things simple and just fly dogfights, or, spend more time and make your own missions, textures, and sounds.

And I am very much interested in hearing from you. Tell me what you like and what you don't like about this program. Send your comments to me, Donald A. Hill, Jr at info@donsgames.com

System Requirements:

This program is designed for OSX version 10.4 or later. 8 MB of VRAM is required. It looks better with more VRAM but will run with 8 megabytes at 1024x768 monitor resolution and thousands of colors. With more VRAM, some textures are used at a higher resolution, and so, look better.

You might find you get very slow frame rates with older Mac's, a 400 mhz G3 for example. You can try running the program in a smaller window, which will speed things up a bit. You can turn this on in the "Preferences" dialog box.

The requirements listed above are a bare minimum and provide marginal performance with the program. All current Mac's run the program with excellent performance. They usually have a minimum of 32 megabytes of VRAM and the program looks great on these machines. The program also runs natively on Intel based Macs.

Orientation:

The first thing you must do before flying with a joystick is to calibrate the joystick. To calibrate the joystick, go to the "Game" menu (after moving past the "Pilot Sign-In" and initial "Select Mission" dialog boxes), then Configure Input->Joystick->Calibrate Joystick, and follow the instructions in the dialog box.

If you are flying with the mouse, you'll probably want to go to the preferences and turn on "Mouse Position Feedback". This will shows where the mouse position in (and thus the aircraft elevator and ailerons) while flying. The feedback makes flying with the mouse much easier and enjoyable.

There is a complete list of the keyboard commands at the end of this document. Here is the short list:

Pause/Fly Game Toggle	p

CONTROL KEYS

Fire Guns	(space bar)
Un-Jam Guns	(control and) u
Throttle Up Incrementally	=
Throttle Down Incrementally	-
Move Rudder Left	q
Move Rudder Right	e
Center The Rudder	r
Brake On/Off Toggle	b
Drop Bomb	d

LOOKING AROUND KEYS

Look Forward Level	w
Look Incrementally Right	s

Look Incrementally Left	a
Look Incrementally Up	f
Look Incrementally Down	v
Look Up 45/90° Toggle	x
Look Forward	8 on keypad
Look 45° Left	7 on keypad
Look 90° Left	4 on keypad
Look 135° Left	1 on keypad
Look Rear Left	0 on keypad
Look 45° Right	9 on keypad
Look 90° Right	6 on keypad
Look 135° Right	3 on keypad
Look Rear Right	. on keypad

CAMERA POSITION KEYS

Camera Inside Pilot Head	(option and) 1
Camera View From North	(option and) 2
Camera View From South	(option and) 4
Camera View From East	(option and) 3
Camera View From West	(option and) 5
Camera View From Above	(option and) 6
Camera View From Left Wing	(option and) 7
Camera View From Right Wing	(option and) 9
Camera View From Nose	(option and) 8
Camera View From Tail	(option and) 0
Fly By Camera	(option and) y
Chase Camera	(option and) c
You And Nearest Enemy Aircraft	(option and) z
Camera In Nearest Tower	(option and) t
Camera On Bomb	(option and) b
Move Camera Closer	(up arrow)
Move Camera Farther Away	(down arrow)

Camera On Aircraft #1 (Your Aircraft)	(control and) 1
Camera On Aircraft #2	(control and) 2
Camera On Aircraft #3	(control and) 3
Camera On Aircraft #4	(control and) 4
Camera On Aircraft #5	(control and) 5
Camera On Aircraft #6	(control and) 6
Camera On Aircraft #7	(control and) 7
Camera On Aircraft #8	(control and) 8

Second Viewing Window	(option and) w

There are a ton of looking around keys, you will probably not use all of them, just pick ones you want/need and ignore the rest. Also, any of these commands can be defined on the joystick buttons, this greatly simplifies things. Some of your joystick buttons will probably already be defined, but you can easily change the buttons to whichever commands you want. Simply go to the "Define Joystick" dialog box.

And you can change any of the keyboard assignments by going to the "Define Keyoard" dialog box. In fact, if you are using a non U.S. keyboard layout you will most likely have to redefine some of the keyboard to more convenient keys.

Also included is an internal screen capture option. You can use the standard OSX screen capture methods, including command-shift-3 or command-shift-4, they should work fine. But you will probably get the dock and menu line in the screen capture, and probably get the "Paused" message also on your screen capture. If you use the internal screen capture option you will get a full screen capture without the dock or menu line. It is a very convenient option. It does, however, create a large file. Use the F2 key to make a screen capture. You will find the screen capture file on the desktop and it will be named "SF1918 Screen Shot 1". Subsequent screen captures will increment the trailing number.

First Flight:

The following will take you through your "First Flight" with **SkyFighters 1918 wMB**.

When you run the program you will be presented with the "Pilot Sign-In" dialog box. You can have up to 5 different "pilots" listed in this dialog box. Pilot stats are stored for each pilot. You might use the other pilots for other people in your family.

Pilots begin with 1 life. When you crash or are destroyed, you will lose your life and your service record is lost. However, the first time your pilot completes each mission, 1 life is added to your pilot. As long as your pilot has at least one life remaining, you keep building your service record. If you lose your last life, your service record is lost and you must begin building your record again from scratch.

Enter a short nick name and click on "Okay".

You will then see the "Select Mission" dialog box. Click on the pull down menu in the dialog box to see a list of the available missions. When you select a mission title the program will display a description of the mission and what you have to do to complete the mission.

There are up to 8 aircraft in each mission. Below the mission description area you'll see 8 pull down menus. They will display the aircraft types included with the selected mission. However, you can decide to use different aircraft types by selecting the type you want from each menu. You will always fly the #1 aircraft.

Below these menu items is the "Use Team ID Squares" option. When selected, this will put a colored box around each aircraft identifying which team the aircraft is on. The box will disappear when the aircraft gets very close. For a bit more difficulty, turn this option off. Or use the next item down, "Close Up ID Squares", which will only display the Team ID when you get close to an aircraft. This is good for making the transition from Team ID Squares to no ID squares at all.

At the lower left is the "Fly Mission" button which will begin the mission.

There is also another button to the far lower right titled, "Fly Quick Dogfight". This is a separate option that allows you to fly a mission that is only concerned with dogfighting. When you select "Fly Quick Dogfight" you will be presented with a different mission screen that allows you to set up particulars of your quick dogfight. You can set how many aircraft will be in the dogfight, and which teams they fly for and how many kills will complete the dogfight. This allows you to set up a 1vs1 fight, or a 3vs1 fight, any combination up to 8 total aircraft.

The "Fly Quick Dogfight" feature is great for practicing your dogfight skills, or for setting up a quick fight for an online game.

So select the first mission and click on "Fly Mission".

You begin inside the aircraft ready to fly. **Note:** while paused, after 10 seconds or so of inactivity, the "camera" will begin rotating outside the aircraft. If you move your joystick, mouse, or press a key, it will return to where it was.

You begin a mission "Paused". Any time the program is paused you will see "Paused" on the screen. To switch between being paused and flying, use the "p" key. Press the "p" key now and the "Paused" will disappear and you will be flying. Press "p" again to return to being "Paused".

Before switching to flying from being paused, you should jiggle the joystick, or, if you are using the mouse to fly, position the cursor in the center of the screen. This ensures that when you begin flying, your control surfaces will be centered.

For normal flying some of the gauges may not visible. When landing, it may be important to see more of the gauges. You can fly with your head tilted down a bit by pressing the 'v' key. This allows you to see both out the window and more of your cockpit gauges. To look forward again, use the 'w' key.

That is the quick instructions on your first flight. It is up to you to get familiar with how your aircraft flies and lands. You can always pause the program if you get into trouble and take stock of your situation. Use the exterior camera angles to see the state of your aircraft.

Try flying around, throttling down and setting up for landings.

Finally, anytime you are flying you can pause and watch a replay of the action. To enter the replay mode, pause the game, then press option-r (or select "Begin/End Replay" from the "Game" menu). This will go back about 20 seconds and reposition everything as it was at that time. Now, when you unpause the game, you'll be watching things as they just happened. You can change camera angles, view the action from any angle you choose. The entire replay buffer is about 60 seconds long. The buffer will automatically wrap and continue to loop through the last 60 seconds of action. Pressing the left or right arrow keys will change the speed of the replay. You can fast forward, or reverse the action. While in the replay mode you'll see an "R" at the upper left of the window. After the "R", you see the replay speed, this will be a number between -5 and 5, where -5 is five times normal speed in reverse, 5 is five times normal forward, 1 is normal playback, and 0 is freeze frame.

To exit the replay mode and return to normal play, first pause the game. Then press option-r again. Option-r will enter or end the replay mode.

The only time replay is not available is during a network game.

Flying using the Mouse:

If you do not have a joystick, then you will be using the mouse to control ailerons and elevator. It is slightly more difficult to control the aircraft using the mouse, instead of a joystick, so outlined here are some tips to make your flying experience more enjoyable:

First off, you'll need feedback about where the mouse is positioned. The position of the mouse corresponds to the position of the aircrafts control "stick". Go to the "Preferences" (found in the **SkyFighters 1918 wMB** menu) and check the "Mouse Position Feedback" option, this will turn mouse feedback on.

When feedback is on, you'll see a little black circle displayed whenever you are in the fly mode. This black circle will show you where the mouse is positioned. When the circle is in the center of your monitor (both up/down and left/right) then the control stick is centered and so the ailerons and elevator will be centered.

Always move the mouse to the center of the display before entering the fly mode.

Left/right movement of the mouse will apply left/right ailerons. The aircraft's ailerons are used to bank the aircraft, said another way, they make the aircraft roll. To turn the aircraft you must first bank the aircraft.

Up/down cursor movement corresponds to forward/back movement of the stick. Up (forward) movement makes the nose of the aircraft go down, down (back) movement makes the nose go up.

So, to turn the aircraft, first bank the aircraft about 45 degrees to the right or left (by moving the mouse to the right or left, and then returning it to the center of the monitor when the desired amount of bank is achieved), then ease back on the stick (move the cursor down a little bit), which will help hold the nose at the proper attitude, and make the aircraft turn.

The mouse is set up to be sensitive, so make small movements for best control. Large movements can quickly make the aircraft seem out of control. Also, remember to move the mouse back to the center of the monitor if you lose control of the aircraft. This should make the aircraft stop any wild movements and allow you to regain control.

Remember that with an aircraft you can't always point the nose in a particular direction. You need airspeed to control the aircraft. Anytime the nose is above the horizon, you are most likely losing speed, and eventually, will stall. Once the aircraft stalls, you will not have control until the aircraft picks up speed. You can help the aircraft pick up speed by pushing forward on the stick (move the mouse up) which should help the nose point downward.

Also, if you are new to a flight sim program, you will want to have the "Stall Limiter" feature turned on. (This setting is in the preferences dialog box, and the default setting is "on".) In many situations, you can stall the aircraft simply by applying too much up elevator. The Stall Limiter will make it much harder to stall the aircraft in this manner.

Frequently Asked Questions:

Q: Sometimes my guns stop working, what's up?

A: Guns sometimes jam. If you fire your guns for a long time without a pause, they are likely to over heat and jam up. If this happens, you can try to un-jam them by getting out your hammer and tapping on the gun. Use control-u to do this.

Q: Sometimes when I land the ground disappears and turns white, is this a bug?

A: Depending on the viewing position, the 'camera' can end up going below ground level. If this happens, you won't see the ground anymore and things look a bit weird. It isn't a bug. You'll most likely see this effect if you place the viewing position on the tail of the aircraft and land.

Q: When I un-pause to begin flying, the aircraft jerks to the side, why?

A: This usually happens when flying with the mouse. To make it not happen, always position the mouse pointer to the center of the screen before unpausing. When flying with a joystick, make sure the joystick is centered before unpausing.

Q: I can't see all my gauges, what do I do?

A: When looking forward out the cockpit, some of the gauges cannot be seen. To look down into the cockpit and make the gauges visible, use the 'v' key. To look forward again, press 'w'.

Q: How do I make the openning sequence sound silent?

A: Go the preferences and click on "Don't Play Opening Sound".

Network Play:

SkyFighters 1918 wMB allows network play (Internet or local area network) with up to 8 people. Network play can be very fun.

PLEASE NOTE: While this program works well with non-U.S. input in general, during network play you MUST set your keyboard to U.S. as the input mode. To do this go to the System Preferences, and select "International". Go to the "Keyboard Menu" and select U.S. as the input mode or keyboard. Also, you should be sure your pilot name is in the U.S. script, and that any automated messages are also in U.S. script. Any non-ASCII characters used during a network game will not show up on other player's computers.

With a network game, there is one "Host" and everyone else are "Joiners". The Host selects the mission to play (and if he chooses a "Dogfight Only" game, sets up the start conditions) and then waits for joiners to join the game. The host then accepts the joiners and network play happens.

To begin a network game, go to the "Game" menu and select, "Start Network Game". You can then choose either "Host" or "Join". There is an input box that will allow you to specify the port to use. For most situations you should leave this set to the default value. Everyone must use the same port number during a network game. More later on using the port number.

When hosting, the host can decide to begin either a private or public network game. To begin a public game, the host clicks on "List game publicly", and enters a brief description of the game he is hosting. You might include title of the mission that will be played, or, that it is a dogfight only kind of game. Anything you want can be included in the description area. Public network games will show up automatically in the dialog box joiners see. If the host doesn't click on the list games publicly option, then the game is considered private, and will not show up in the joiners dialog box. With this option, the host will need to find out his IP Address and give this number to joiners before attempting a network game. IP Addresses are explained below.

HOSTS: After clicking on "Host", the host is set up and ready to go. When a joiner "arrives", the host has the option to accept the joiner, or decline them. Press "control-a" to accept the joiner. After all joiners arrive it is suggested that the host restarts the mission. He can simply press "command-n".

JOINERS: After clicking on "Join", a joiner will see another dialog box allowing him to either enter the IP Address of the host, or to join a public network game.

The bottom of this dialog box shows a list of available public network games (if any). To join one of these games, you simply have to click on "Click to Join" on the line of the desired game.

If, instead, the joiner knows the IP address of a private game then the joiner enters the Host's IP Address (the IP Address is a number that will be look something like: 64.100.45.121) into the input box.

With either a private or public game, the joiner selects which team he wishes to join and what aircraft type he will fly.

For Dogfight Only games, the joiner will fly on the team he selects. For mission games, the joiner will get the next available "slot" in the mission, which determines which team he plays on.

For a private game, the joiner clicks "Join" and waits for the host to accept him. For a public game, the joiner clicks on "Click to Join" of the desired game, and waits for the host to accept him.

After being accepted the network game can begin. Joiners cannot restart missions, only the host can restart missions.

During a network game you can type messages to the other players. To begin a message press 'm'. After you press 'm', you'll be in a message typing mode. While in this mode, all key presses are interpreted as plain typing, not as commands to the program. So once you begin a message, you must finish it before you can enter commands to the program, like dropping a bomb, or changing the throttle setting. To end the message and send it, press 'return'. Your message will then be sent to all others in the game.

There is a second send message type, and that is the 'Team' message option. This kind of message will only go to members of your own team. To initiate this kind of message press 'o' instead of 'm'. When you press 'o' you see '*TEAM*' in the area where you type your message. This lets you know that you are sending a team member only message. The *TEAM* will disappear when you begin typing your message.

message.

Sometimes, after you begin typing a message, things have changed and you decide that you'd rather just cancel the message and not send it. You can do this by pressing the up arrow key.

Typing a message in the heat of battle can be difficult and distracting. To help this situation, the program allows you to enter 8 messages before hand that can be sent with a single key press. To send one of these messages, simply press one of the keys from 1 to 8.

To define these pre defined, or "auto" messages, go to the "Define Auto Messages" option in the "Game" menu.

When you are ready to end the network game, go to the "Game" menu and select, "End Network Game". This will end the network game.

Note: sometimes the Internet is not performing efficiently and when this happens you may notice poor network game performance. The only thing to do is try your network game at a later time.

There is also a chance that the server that keeps track of public network games will go down and if this happens, then no public games will be available or listed. This may also hamper the ability to join a private game because SkyFighters may get stuck (for a time) trying to find out about public games from the server. If this happens, or if you wish to simply join a private game and not check for public games, then make sure "Don't check for games" is selected. When selected, you will never see public network games. You can change this setting either from the Join dialog box, or in the preferences dialog box.

IP Addresses: Everyone connected to the internet has a unique "address" known as their IP Address. If you are using a modem to connect to the Internet you can probably see your IP Address by looking at the connection stats under the little telephone icon on the menu line. If you are connected using a router you can find your IP Address by looking at the router information.

If you have a local network then you most likely have 2 IP Addresses. One is the IP Address of your network on the Internet, and the other is the local IP Address of the individual machine on your network. If you are hosting a private game, be sure to give joiners your Internet address, not your local address.

If your connection to the network goes through a router then you may not initially be able to make a network game work. This is because routers usually, by default, block some incoming packets from getting to your machine. If this is the case you'll have to configure your router to allow these incoming packets. Usually, only the host will need to do this, but joiners may also have to do this with some setups.

Check your router manual for options on how to set up for network play. One method is to "forward" packets that arrive on the port you are using for the game to the correct "local" IP address of the host machine. For example, if you are using port number 12301 (the port number can be set after you select "Start Network Game"), you would forward packets on port number 12301 to ip address 192.168.1.50 (or whatever the local IP address of the host machine is.) Remember that if you do this then anyone sending packets to that port will be able to get past the router and to your machine. This may have security issues to consider.

Summary: Playing a network game can be simple and very fun. The easiest way to experience this kind of game is to go to the join dialog box and join a publicly listed network game. Give it a try, you might find that playing with other people is the most fun of all.

Mission Builder:

The "Mission Builder" is a really fun feature of **SkyFighters 1918 wMB**. Mission Builder, the "MB" in wMB, allows you to create your own, fully functioning missions. You decide where in the world to use, which ground objects to include, where the aircraft start, and what the victory conditions are. Once completed, you can trade your missions with other **SkyFighters 1918 wMB** users. MB is a very powerful feature that I hope will give you hours of enjoyment.

MB can be a bit daunting at first. There are a few things a bit hard to use, but, by the end of these instructions you should be able to build your mission. We'll go through it step by step, explaining all the features. This description may be enough for you to go on and start designing custom missions. However, the next secion is a detailed tutorial on the Mission Builder, which walks you through the creation of a fully functioning mission.

MB has its own menu titled, "Mission Builder". From this menu you can begin a new mission design from scratch, or, open an existing mission.

There are 6 steps you will work through when building a mission:

1. Select the World your mission will take place in
2. Add Buildings and Vehicles
3. Position Aircraft
4. Set Victory Conditions
5. Add the Mission Text
6. And a final "Misc" step

When you begin designing a mission (you select "Build Mission From Scratch") you will see these six steps along the top of the window, they are called, "tabs". You simply work from left to right, selecting each step in turn.

Step 1: Select World

After opening a MB window, the first step is to select the world. In fact, you are required to do this step first. Later, you can use the steps in any order, but this first step must be completed first.

You can view all the available worlds by selecting each one from the pull down menu. You'll see a brief description as you select them each of them. Finally, select the one you want your mission to take place in and then click "Add World".

It may take a few seconds, for the world to load. You'll see it displayed in the lower left 3d display portion of the window.

NOTE: While working in MB, most tools/items in the window have "Tool Tips".

This means that if you point the cursor at an item and then wait a little bit, you'll see information about the item you're pointing at. This is a very helpful way to be reminded how to use a particular tool.

After loading the world you can still decide that it is the wrong world and change to a different world. But once you move on to the next step you should NOT change the world. Once you decide on which world to use, you're locked into it.

You can navigate around the world in a couple ways. The first way is to point the cursor inside the 3d display portion of the window and drag the cursor. ("Drag" means moving the cursor while the mouse button is held down.) This will move the world around in the window.

Use the vertical slider to the right of the 3d display to raise and lower the viewing position.

You can also change the angle you are viewing, meaning you can look down if you wish. To change the viewing angle, hold down the "shift" key while dragging the mouse. You can change both looking up/down, and the left/right or "heading" angle that you are viewing the world at.

To the right of the 3d display is an area that shows where you are viewing the world from, including your current position and viewing angle. Below this is a little pull down menu that has some predefined locations in the world listed. You can move quickly to these locations by selecting them from the menu.

Step 2: Add Buildings & Vehicles

The next step is to add buildings and vehicles to your mission. Actually, you can do the next steps in any order you wish.

There is a pull down menu in the top middle of the window. This menu lists all the available items you can add to the world/mission. When you select an item you will see it displayed on the right third of the 3d display.

To add an item to your mission, first move the viewing position to look at the spot where you want the item to be. Make sure you are looking downward for an object you want to be placed on the ground. Looking downward (at least 40 degrees) tells MB to place the object at ground level. For objects that are placed in the air, like a cloud, look more level (less than 40 degrees). This tells MB to place the item in front of the camera, not necessarily on the ground.

So first move the cross hairs (by dragging the world) to the location where you want the item to be placed. Next, select the item you want from the menu.

Then, the final step is to click on "Add Item". This will place the item in the world.

Items in the world can be the current, "selected" item. You can tell the currently selected item by the "Unique ID:" item found to the upper left of the window. When an item is selected, you'll see a number after "ID:", when no item is selected, you'll see "ID: --".

Note: You might need to know an items Unique ID later when defining Victory Conditions. For an important item, if convenient, you might jot down an items Unique ID when you add it. Or, you can always come back later and find it and its Unique ID.

It is important to know when an item is selected. When selected, you can change particulars about the item, like its "Team". When an item is not selected, changing the particulars effect the next item that will be added.

If you point at an item in the world and drag the mouse, you will move the item within the world, instead of moving the world. Dragging an item will also select the item.

You can change the items heading orientation by shift dragging it.

The "Item Details" section of the window displays particulars about an item. The ID of an item might be used later in the victory conditions. There might be some special features associated with an item, you'll see them under the title, "Notes:". Some of the possible features are an item can be a tower camera location, it might be a refuel item, or it might shoot at aircraft.

Also in the details section is the items x, y, z position in the world, its heading, the team it belongs to, and the points awarded.

Use the x, y, z location input box to fine-tune an items location. If you enter 0 for the "y" location, the item will be placed on the ground, whatever the current ground elevation may be. Use the heading input box to fine-tune an items heading.

Of course, you may never need to do any fine-tuning at all. Don't be overwhelmed by all the options and features... you only need use features that allow you to create your desired mission. You can ignore unneeded options.

You might want some objects to start somewhat randomly near a position. For example, say you are setting up a bomber object that attacks a base to the east and your mission is that the player must find and shoot down the bomber. If this bomber always begins the mission in the exact same spot, then playing the mission more than a couple times might become boring. But if that bomber begins randomly, (but still within 10 miles of its start location), then that can add interest and added repeat playability. So, to make an object begin randomly near its start location, enter the number of feet it can be from its x, y, z start location in the "Random Start Distance" box. Note: during a network game, objects do not use the random start distance.

Sometimes, you have a group of objects that you want to start randomly, but keep the grouping you've set up intact. For example, you might have a flight of bombers all close together, but want this group to stay positioned the same in relation to each other, but positioned randomly as this group. You can do this, here's how: first, enter a "Random Start Distance" value normally for the first item in your group. Then, enter "1" as the "Random Start Distance" for each of the next items in the group. This will cause these items to begin randomly using the initial items start distance. Each subsequent item in the group must follow immediately in the list. Once an item is entered without a random start distance of "1", then the group is considered ended and later random start distance "1" instances will be part of a different group.

Which team the item belongs to is important for a couple reasons. The aircraft you fly in a mission is on a particular team, the enemy aircraft are on a different team. (The available teams are: "Red", "Blue", "Yellow", and "Black".) To get credit for destroying an ground target, it should be on a different team than the aircraft you fly is on. Also, a refuel item will only refuel aircraft on the same team.

And, finally, if an item shoots at aircraft, it will only shoot at enemy aircraft (aircraft on a different team). So when building your mission, be aware of friendly areas and enemy areas and assign teams accordingly.

A common mistake when building a mission is to have items assigned to the wrong team.

Some items can be programmed to move, either on the ground or in the air. When you select an item, check in the "Notes:", if it reads, "Can Follow Path", then the item can be told to move.

To make an item move, you first go to the "Misc" section and define a path using the Way Points. This is described in the "Misc" section.

After you set up the path you want the item to follow, note the starting way point number. Then enter this number in the "Item Path Start Number:" box. This will tell the selected item to follow the desired path.

If you enter a Item Path Start Number for an item that doesn't move, it will simply be ignored. For items that stay on the ground, a truck for example, then the "Y" component of the way point is ignored and the item will hug the ground. For items that can fly, the "Storch" for example, the "Y component will be followed, if it is above ground, otherwise the item will hug the ground.

Flying objects need more room to turn than ground items so take this in to account when creating your path. You'll want to put the way points farther away from each other for the flying items, like the "Storch".

Creating paths for objects, and getting them to follow the path and behave exactly as desired is more of an art than a science. The general rule is, most cases, the fewer the number of path points, the better.

There is also a certain number of "Points" associated with each item for scoring. This is the number of points awarded when you destroy the item. (Assuming it is on a different team than the aircraft you are flying.) All items have a default number of points awarded. You can, however, change the points awarded. Most of the time, the default number of points works fine. But, you might have a mission where 1 particular target is particularly difficult to destroy. In this case, you might want to award more points for that particular item.

Just to the left of "Unique ID:" is a little "stepper" object. It has an up and down arrow. This stepper allows you to step through each item you've added to the world. This is very helpful in finding and seeing everything you've added to the world.

"Selected Item Textures" displays the textures the item uses. This allows you to know the names of the texture files used for the item, by changing the textures design, you can change the look of an item. See the section titled, "Changing Program Textures" for more information on how to change program textures.

Step 3: Position Aircraft

There are up to 8 aircraft available in each mission. You will always fly the #1 aircraft and so you should design your mission from the #1 aircraft's perspective. (You might design a mission for online play, in that case there are some things you might do differently which will be discussed later.)

There are 8 "tabs" in the "Position Aircraft" step of MB. Each tab has the number of the aircraft, "Aircraft #1", "Aircraft #2", and so on. You click on the tab of the aircraft you wish to work on. The information particulars found under the tab is the same for each aircraft. This can appear confusing at first. There are quite a number of parameters available to define where an aircraft starts and how it acts. All of these parameters can be set for each aircraft. So, when you change tabs, it may at first appear that nothing has changed. You must make sure that the correct tab is selected for the aircraft you wish to work on.

All 8 aircraft begin already placed in the mission. When you click on a tab, your viewing position will move to the aircraft so that you will automatically be looking at that particular aircraft.

To position an aircraft you first click on the tab of the aircraft you want to position. Then you move the viewing position to the location you want the aircraft to be. The final step is to click on "Move Aircraft". This will move the aircraft in front of the viewing position.

Alternately, you can enter the x, y, z position of the aircraft directly.

All the aircraft particulars, location, heading, speed, bombs, and so on are mostly self explanatory. Here are some additional details about a few of them:

Remember to set the "Team" of the aircraft. Aircraft will only attack aircraft of different teams.

The "Start Modifier" effects how the aircraft is placed in the mission. You've entered a start location, but you can add a bit of randomness to your mission by having the program move the aircraft away from the absolute x, y, z position each time the mission begins. If you have "Random Near Location" selected, then you control how near by the value in "Max Random Distance".

There are a few tweaks you can do when using the Random Near Location selection. If you want to make the heading always be the same, even though the position is random, enter the heading you want but use a number greater than 359 degrees. So, use 360 to have the aircraft always face north after the random restart. Also, you can keep an multi-aircraft grouping while having the entire group position change randomly. To do this, use 1 in the Max Random Distance of the aircraft later in the group to want to keep together. For example, if you want aircraft #2, #3, and #4 to start randomly, but grouped together, you'd position them how you want them to start, then put the max random distance in the #2 aircraft, say 25,000 feet, then put 1 in both the #3, and #4 aircraft's max random distance.

"Fuel" is the amount of fuel on board when the mission begins. For a full tank, use 1.0. 0.5 means half full.

"Flap Position" and "Throttle" work the same way, use 1.0 for full flaps or full throttle.

The items down the right side set up the AI behavior of the aircraft.

For aircraft other than "Aircraft #1" there is an additional option titled, "Include This Aircraft: YES/NO" This option allows you to not include the aircraft in a mission. If you only want 4 aircraft in your mission then you would set the last 4 aircraft to "NO" on the "Include This Aircraft" option.

The right hand size has items concerning how the AI behaves. First is the "AI Type" list. There are 3 types here, "Dogfight", "Wingman", and "Patrol/Fly Path". You tell the aircraft how it will behave in your mission. "Dogfight" means the

aircraft attacks enemy aircraft relentlessly. That is all it will do, fly to the closest enemy and attack it.

You can tell an aircraft to fly as "Wingman" to another aircraft. This means that the aircraft will follow another aircraft during the mission. The aircraft will continue to follow the lead aircraft until the lead aircraft gets shot down or crashes.

The last choice is "Patrol/Fly Path". With this option you make the aircraft follow a pre-described path. Paths are defined in the "Misc" section, covered later.

"Patrol" can be set up so that an aircraft will fly in a particular area, staying there until an enemy aircraft comes too close. At that point, the patrol aircraft will switch to a dogfight mode. You set it up so that after the offending aircraft is dealt with, the patrol aircraft returns to its patrol area.

Also, the "Patrol/Fly Path" selection is used to tell an aircraft to attack ground targets. You can use this to create a mission where your job is to protect ground targets and enemy aircraft are attacking. Or, you can set it up to escort a friendly aircraft that is attacking enemy ground targets.

After selecting the "AI Type", you may then need to define some of the items to the right of the type list. For "Dogfight" only the last item, "AI Skill" need be selected. AI Skill controls how accomplished a dogfight pilot the AI will be.

If you choose "Wingman", then you will need to select which aircraft will be the lead aircraft. You do this by entering the number of the lead aircraft in the "Lead Aircraft #:" box. This should be a friendly aircraft, not an enemy aircraft. With "Wingman" you will also select an "AI Skill" item.

If you choose "Patrol/Fly Path" then there are several more items you will need to define. First is "Patrol Path Start #:". This is the first way point in a list of way points that the aircraft will fly to. Typically, you'll define the way points, in the Misc section, and then come back and fill in the first way point number in this "Patrol Path Start #:" box.

Next, you have the option to make an aircraft follow its path for a specific amount of time. To do this, you will enter the number of seconds to follow the pre-described path in the "Patrol for seconds before switch to Dogfight:" box. Enter "0" to not have a time limit.

Then you can set up a distance where a patrolling aircraft will give up its pre-described path and instead, engage in a dogfight. Enter the number of feet in the "Attack an enemy within this distance when on Patrol:" box. Enter "0" to never depart from a patrol path.

The next item dealing with a patrol is how far away the enemy must be for the aircraft to return to its patrol. This number, in feet, should be larger than the number you enter in "Attack an enemy within this distance when on Patrol:", or enter "0" to never return to a patrol.

The last item concerned with a patrol is the distance of an enemy target that will make the patrolling aircraft switch from patrol to attacking the target. This distance is in feet, set it to "0" to ignore all enemy targets (targets here refers to enemy items not including one of the 8 main aircraft), or to some positive distance. Beyond this distance, enemy targets are ignored and the patrolling aircraft will continue on its pre-determined path, when an enemy target gets within this distance, the aircraft will leave its patrol path and attack the enemy target. You might use this feature to have an aircraft patrol over its base, and then if enemy bombers get within 5 miles,

the aircraft will go attack the bombers.

Before your patrol will work properly you'll have to define the path or "way points" that will describe that path to be flown. This is described in the "Misc" section.

Finally, aircraft can either remain dead when destroyed, or they can come back to life, or "Restart". Each aircraft has "Start" and "Restart" tabs. "Start" is where they begin the mission, "Restart" is what happens after they are shot down.

Most of the items in the "Restart" tab are the same as in the "Start" tab, with a few additions. The first is the "Aircraft restarts after dead:" option. The default is "No" on all the aircraft. If this is set then you need not bother with any of the other data. The aircraft will stay dead when shot down.

If you'd rather have the aircraft come back then set this option to "Yes", and fill in the other data.

A couple things you can't set for a restarting aircraft are the "team", and aircraft "type". Both of these will remain the same as in the "Start" section.

A convenience option is "Load values from 'Start' tab". After setting up how an aircraft starts the mission, you may want the aircraft to restart with mostly the same values, so you can simply click on this button to fill in the values from the start tab. Then, change any items that need to be changed.

Step 4: Set Victory Conditions

This step allows you to very specifically set the conditions for a successfully completed mission. There are many options, and some are a bit complex. But in many cases you will only use 1 or a few of the items in a mission. Use only the conditions your mission requires, and leave the others alone. The victory conditions you set are cumulative. So you might say, Must be alive & must do 3 landings, & must have 3 kills... The more items you set in victory conditions the more difficult the mission might be, and the more complicated it will be when you explain what must be done to win the mission.

The first option is "You Must be alive to complete mission: Yes/No". You might be building a mission where your aircraft can be destroyed and come back to life. If so, set this to "No". Or, your mission might only required that an object is destroyed and you decide that crashing into the object is a valid way to win the mission, again, set this option to "No".

But, if your mission requires you to be alive to get credit for the mission, set this to "Yes". When set to "Yes", the mission will come to an end as soon as your aircraft is shot down or crashes.

"Required Landings" refers to the #1 aircraft only.

You can set both "Individual" kills, and "Team" kills. Individual kills refers to how many kills (aircraft shot down) that the #1 aircraft must get. Whereas, team kills refers to the number of kills needed by the team the #1 aircraft is on.

"Required Points" is the number of points required by destroying items. Points acquired by destroying aircraft are not considered for this item.

"Targets that should remain alive" is a list of up to 20 items. To include an item in this list, use the "Unique ID:" of the item. You can see this by going to the "Add

Buildings & Vehicles" tab and stepping through your items. When you find an item you want to put in the list, note its "Unique ID:", then add that number to the list.

You can list many items here (up to 20). You then specify how many of these items "MUST" be alive in the "Number of items in the list that MUST be alive:" field. So you might say, in effect, these 10 items should be protected, and any 5 of them MUST be alive to complete the mission. Once too many of these items are destroyed, the mission ends in failure.

Similarly, you can enter a list of items that should be destroyed, and the number of items that MUST be destroyed.

There are two items that deal with timing of the victory condition tests. First is "Check victory conditions after (seconds):", which allows you to have the game not check for a victory condition until after a certain number of seconds. You might use this if you require targets to be alive for say 5 minutes, simply enter 300 seconds and the game won't check for the alive targets until after 5 minutes. Enter 0 here to always check for victory conditions.

The second item is "Mission Time Limit in Minutes:", and it allows you to put an upper time limit on the mission. For example, let's say your victory conditions must be met within 8 minutes for the mission to be successful. You enter 8 (minutes) in this box and then, if victory conditions haven't been met in 8 minutes, the player will get a mission failure message. Enter 0 for unlimited time in the mission.

The last victory condition item is a 3 tab box, the tabs are titled Location #1, Location #2, and Location #3. This allows you to set a positional condition on aircraft #1. So you might say that aircraft #1 must be east of an X position. This would force the pilot to go into enemy territory, perhaps. Or, you might set it as a required "Near" location. This is how a fly through hangar condition is set up. You might use the "Speed in MPH" condition to require the #1 aircraft comes to a stop.

You can set up to 3 location requirements.

When setting up victory conditions you are thinking from the perspective of your aircraft, the #1 aircraft. For solo missions this is the correct way to do things. However, if you intend the mission to be played networked with others, you will have to take a different perspective into account when setting up the Victory Conditions. During a network game, your team is trying to win, the other team is trying to keep you from winning. So your Victory Conditions should reflect this. For a network game, "Team Kills" would probably be a better choice than "Individual Kills", depending on how your mission is structured, of course.

For example, you might think of the mission in terms of one team against the other, and think how you can set it up for a definite win/loss situation. You might have some items that you (your team) must destroy, AND some items that must remain alive. That would mean both teams have items to destroy.

Or, if you only have items that must be destroyed, you might put a time limit on the mission so the defending team has an end in sight... only a certain amount of time they must keep the attackers from succeeding.

Step 5: Mission Text

There are 4 text fields to define in this step.

First is the "Mission Title". This is the text that will show up in the "Select Mission" dialog box. This is also what is saved in the "Completed Missions" section of the pilots stats. This should be a concise or tantalizing title for your mission.

Next is the "Mission Description" text. You will see this text when you select the mission in the "Select Mission" dialog box.

The Mission Description should explain what is required to successfully complete the mission. You might also include how difficult you think the mission is, and perhaps some tips on how to go about completing the mission.

"Mission Victory Message" gets displayed when you successfully complete the mission.

"Mission Loss Message" is displayed when the mission can't be won. (Not all missions can display this message, it depends on how the victory conditions are set.)

Finally, you can define how many points are awarded for a mission success.

Step 6: Misc

The final step is a catch all for other miscellaneous items.

There are seven items here, "Time Of Day", "Visibility", "Ceiling", "Thickness", the "Permissions" setting, "Ground Cover" type, and the "Way Point locations for aircraft and/or objects" area.

"Time Of Day" allows you to set the time of day when the mission begins. You enter the hour you want, between 6 and 18, where 6 is 6 am, and 18 is 6 pm. Enter a fractional amount for parts of an hour, so to enter 10:30, you'd enter 10.5. You can also have the program pick a time randomly at the start of the mission. To do this, enter "0" as the time.

"Visibility" controls how hazy it is. A very small number makes the ground very sharp all the way to the horizon. A higher number makes the ground fade to white as it approaches the horizon. A larger number still and you'll see terrain quite close fading to white, giving more of a fog effect and reducing visibility. To create a random visibility at mission start, enter '0' for the visibility.

"Ceiling" allows you to set a cap level on ground fog. Below the ceiling and the sky is gray, fly above the ceiling and the sky turns blue, but now below you is all gray. By adjusting both the visibility and the ceiling you can create looks from a bright clear day to a socked in foggy day.

"Thickness" determines how thick the ceiling of clouds are. As you decent into a cloud ceiling, you will go through a transition area. Above the ceiling, the sky is blue, below the ceiling and transition area, the sky is gray. In the transition area, there will be times when you can see only gray outside the aircraft. (It is like flying inside a ping pong ball.) You can control to a degree, how thick this transition area is with the "Thickness" setting.

"Permissions" allows the designer of a mission to restrict access to the file making it only loadable into MB by himself. Only the designer would be able to view and

edit the file if so set.

Ground Cover type selects a family of trees that show up when you are near the ground.

The mission is still playable by anyone no matter how the permission is set.

"Way Point locations for aircraft and/or objects" allows you to create a pre-defined path for the aircraft AI or the objects to follow. You can have up to 200 way points. As you define a way point, it will be drawn in the world. When the "Misc" tab is selected, you can drag a way point to re-position it.

Each way point has several parameters: Location, Throttle, vfpm Target, Gear, Flaps, Brakes, Pri Tar#, Sec Tar#, Flags, and Next Point. These items control the 8 main aircraft following a path. When used to control the path of one of the other objects, only the Location, Primary and Secondary Targets, and Next Point are usually used. I'll describe what each one does:

Location is the xyz position of the way point. One of the easiest ways to figure out where you want a way point is to position the camera to look where you want the way point, then enter the xyz information displayed to the lower right. If you make the camera look straight down it will be easier to get the exact position you want. You can still go back later and fine tune a way point by dragging it. Remember to check the Y component and make sure it is above ground. Otherwise the aircraft will, when attempting to fly to the way point, may fly into the ground.

The aircraft will set its throttle to what you enter in the Throttle column. Use 1.0 for full throttle, 0.0 for engine off. Alternately, you can enter a target MPH here, and the aircraft will attempt to fly at that speed. Make sure to enter a reasonable speed, setting the target to 25 mph wouldn't make any sense here.

"vfpm Target" controls how quickly an aircraft will attempt to reach the next way point's altitude. vfpm stands for "Vertical Feet Per Minute". A value of 1000 or 1500 works well here.

Enter Up or Down in the Gear column.

Enter 0 to 40% in 10 degree increments in the Flaps column.

Enter "on" or "off" in the Brakes column.

"Pri Tar #" stands for "Primary Target Number". You can describe a path that takes an aircraft near a ground target, then, you make it attack the target by entering the "Unique ID" of the object in this column. The aircraft will attack the specified target before flying to the way point's location.

"Sec Tar #" stands for "Secondary Target Number". You might enter the "Unique ID" of a second object here, incase the primary target is already destroyed when the aircraft arrives.

The Flags column is used for additional settings. First, when you define a target for the aircraft to attack, it is assumed that the aircraft will be bombing the target. If the aircraft does not have any bombs, it will not attack the target, and instead resume flying to the next way point. If you want an aircraft to attack using guns, meaning to strafe the target, you will need to set this in the Flags column. Enter "S" for Strafe. Or, for a kamikaze run, use "K".

You can also use the "R" flag here. This tries to make a ground vehicle follow a road. To make this work, put the way points so that the path between them is approximately over the road. Place the ground vehicle on the road. Now, it should,

pretty much, follow the road while between the way points.

You can also make a switch from a "Patrol" AI Type to a "Dogfight" AI Type by entering "D" in the Flags column. This will make the aircraft switch to "Dogfight" and it will not return to flying way points after this change.

Another option is to switch to "Wingman" AI type after following a path. Do by entering "W" in the Flags column. This will make the aircraft switch to "Wingman" and it will not return to flying way points after this change.

The final column is titled "Next Point". While the way points are listed in order, 1, 2, 3, you can actually order them differently, meaning you have have way point #1 go to point #4, then to point #2... and so on. This is usually a BAD IDEA. It makes things very confusing to snake the way points together in this manner. However, there are a couple valid uses for the "Next Point" column. First, you might want a path to loop. This would allow you to set up say a box area for the aircraft to patrol, when the aircraft reaches the last way point, you would set the "Next Point" number to the first point in your patrol path.

The second use would be that you might have a patrol box set up, but several different initial paths different aircraft are flying to get there. At some point, you'd set the "Next Point" to the start of the patrol box.

So, the first 10 way points might describe a complete path for an aircraft. If you need another, different path, you'd begin with way point #11. As you describe your paths, jot down the path start number. Then you can go back to the "Position Aircraft" tab, select the aircraft that will use this path, and finally enter the path start number into the "Patrol Path Start #" box.

You can make items that are following a path pause before advancing to the next way point. It only works for items that move along the ground. The way you can make them pause is to put the number of seconds of the pause in the Secondary Target field of the way point. This only works when there is nothing in the Primary Target field. When an item gets to a way point set up with a pause, the item will pause before proceeding to the location of that way point. An example of what this could be used for is say you want a truck to drive up to a hangar, park there for 2 minutes, and then drive off. All you would have to do is put "120" in the secondary target field of the way point after the way point near the harger. That should do it.

Those are the 6 steps used to build a mission.

Saving User Missions:

A mission must be saved before it can be played. You can save a mission by clicking on the "Save" button, the "Save as" button, or by using the Save/Save As items in the "File" menu.

You must have your mission in the "Missions" folder inside the "Necessary Data" folder, next to the SkyFighters application. This may, but default, be set up when you first save a mission, but check to be sure. If your mission is not going to be saved in this location, make sure you navigate so that it will be saved there. This is where the program looks at start up for user missions. If you don't put the mission file here, the program will not load it.

Later, when you want to edit your mission select "Open Existing Mission" from

the "Mission Builder" menu. The program may directly you to the correct location by default, but if not, navigate to the "Missions" folder inside the "Necessary Data" folder, which is next to the SkyFighters application.

The program looks at start up in the Missions folder for user missions and loads all it finds. (Up to a max of 100 user missions.) If you create a new mission, or alter an existing mission, you'll have to tell the program about it in order to see the changes without first quitting and restarting the program. To do this select "Reload User Missions" in the "Game" menu. It will not select a particular mission, it will only reload the users missions. You may have to also select the mission you wish to fly from the "Select Mission" dialog box.

A max of 100 users mission can be available at one time. If you have more than 100 user missions it is suggested you split them into separate "Mission" folders. You might name them "Missions A", "Missions B", or something like that. Then, change the name of the group of missions you want available to "Missions".

You can email your missions to friends for them to try. Also, if you have a mission you are particularly proud of send a description of it to us at info@donsgames.com and we'll consider it for our website.

Finally, there is a source of confusion on the names of the mission files. There are actually, kind of, two names. There is the name of the file, this is the name you'd see if you were to look in the Missions folder from the finder, or in a open file panel. Then there is also the Mission Title. This is what you see from the "Select Mission" dialog box. This can be a bit confusing. You might want to work on your mission, "Fly through 5 hangars!", but when you try to open it in MB, you don't see any missions titled this. You used "Fly through 5 hangars!" as the mission title, but you saved the file as, "m3hangarwork". The solution is to name the file the same as the mission title, or at least use something similar.

To fly a user designed mission networked with others you must first send your mission to each participant. Each player must put the mission in their "Missions" folder before running the program.

NOTE: Do not edit a mission before trying to play it networked. After everyone has the mission, each copy must be exactly the same. The mission must remain unaltered. If you change the mission then the program will not see it as the same mission as selected by the host.

Mission Builder Tutorial:

Let's create a mission...

Launch SkyFighters and select "Build Mission From Scratch..." from the "Mission Builder" menu. You can click on the little green circle at the upper left of the window to make the window fill your screen. The first thing to do is decide where the mission will take place, Let's choose the Western Front. Select The Western Front from the "Select the World for your Mission:" pop up menu item. You'll see a description of the Western Front. To actually add this world to the mission click on the "Add World" button. It will take a few seconds for the world to be loaded.

You are now positing at the Western Front. The main 3d display area of the

window will display the Western Front from the current viewing location. We are going to make the base just to the north west of Ypres our home base for this mission. Select "Ypres" from the "Move to Location:" pop up menu to the lower right of the window. You can now see a green patch which is the base we're looking for..

By putting the mouse pointer in the 3d area of the window, and then holding the mouse button down and dragging the mouse, you can maneuver around the world. Try dragging the mouse pointer down with the button pressed to move closer to the base.

Next, hold the shift key down and drag the mouse pointer upward (while still in the 3d area of the window) to change the viewing angle. Make the viewing angle -90 degrees in the Pitch direction. You can confirm you have achieved this by looking to the lower right of the window where it reads "Pitch:", make it say, "Pitch: -90". You can then release the shift key and drag the mouse downward to create an overhead view of the base. You should now be looking straight down at the field, Pitch = -90 and Heading = 0. If the Heading isn't "0", hold the shift key down and drag the mouse left or right to achieve Heading = 0.

Drag the altitude slider downward (this is the vertical slider to the right of the 3d portion of the window) to get a bit lower over the field. Go down to around 2500 feet. (Again, you can check the viewing position by looking to the lower right of the window where it shows the x, y, and z positions. These are in feet, and show the exact location of the viewing position. The 'x' coordinate is the east/west location, the 'z' coordinate is the north/south location, and the 'y' coordinate is the altitude.)

Now let's add some buildings. Click on the "Add Buildings & Vehicles" tab at the top center of the window. The upper part of the window will change to show the particulars for editing buildings and vehicles. Note: This section, "Buildings and Vehicles", does not include the 8 main aircraft. Those are defined in a separate section. Move the viewing position (cross hairs) so that it is over the lower left of the base and let's put a hanger here. Find and select "Big Open Hangar" from the "Select, or New Item" pop up menu. You'll see a preview of the item to the right of the 3d area of the window. Use the cross hair target in the center of the 3d area to help position where the added object will be placed (in this case, the Big Open Hangar). It will go where the cross hairs are. Click the "Add Item" button. You should now have a hangar on the base.

It is smart to check the team of the object after you add it. When building missions you might find they don't behave exactly as expected, and it could be hard to figure out why. Many times the problem can be tracked down to objects being on the wrong team. For this mission, the team we will fly on will be the Red team. So objects at our base will also be on the Red team. Look above the 3d area of the window to where it says "Team" and make sure it says "Red" in the input field.

We can change the alignment of the hangar in either of 2 ways, one way, is to directly enter how the hangar (or any item) is rotated, here it is called, "Heading", and you'll see that parameter above the 3d part of the window. Try entering -40 into that field and pressing return. Notice that the hangar changed its orientation. If it isn't exactly how you want it, try entering other values until it is how you want it. (I ended up with 0 for the heading.) The second way to change an objects heading is to move the mouse pointer directly over the object and then hold down the shift key and the mouse button, and then drag. Try it now dragging left and right. Note:

Be sure the mouse is put directly over the object before trying to change its heading by shift dragging, if you miss the object, you'll instead change the viewing position's heading. It might look like you are rotating the object, but what you'll actually be doing is changing the rotation of the viewing position. If this happens, simply drag until you return the viewing heading to 0. Then move the mouse pointer over the object and try again.

You can fine tune the position of the hanger by either directly editing its x,y,z location (this is above the 3d part of the window), or by directly dragging it in the 3d window. To directly drag it position the mouse pointer directly over the hangar, and then hold down the mouse button and drag the pointer. You'll see the hangar move as you drag. Remember that moving the viewing position is pretty much the same activity as moving an object, namely, you position the mouse pointer in the 3d window and drag it. The difference between moving the viewing position and moving an object is the position of the mouse pointer when you press the mouse button and begin dragging. If the pointer is over an object when you begin dragging, you'll move the object, otherwise, you'll move the viewing position. The best way to change the viewing position is to position the mouse pointer to the right of the 3d window before dragging. This way there can be no confusion about whether you are moving the viewing position, or an object.

Try entering the position of the hangar directly into the "X,Y,Z Location" input box, enter this location: 2076000, 49, 2283700 and press return.

Next, let's add a wind sock just to the right of the hangar. Drag the viewing position so that the cross hairs are pointing at the position you want the wind sock to be added. (Remember, the way to change the viewing position is to move the mouse pointer to the right of the 3d window and then hold down the mouse button while dragging the mouse.) Select "Wind Sock" from the pop up menu and then click "Add Item". Check to make sure that this new item is on the Red team.

If you look to the upper left of the window you'll see an item labeled, "Notes:". Here is where we see anything specific to a particular object we've added. We've just added a wind sock object and you see in the notes for this object, "Camera Item". This means that when you are flying the mission and you select the "Tower View" camera position, the program will look for the closest "Camera Item" to the aircraft and use that item to position the camera on. It is good form to include some camera items near important areas of your mission, if possible.

We can look back through all objects we've added. (When talking about buildings and vehicles we can use the terms "item" and "object" interchangeable.) Simply click on the little stepper tool to the left of "Unique ID:" at the upper left of the window. Try it now. As you click the stepper tool (which will change which item you'll be viewing, the view position changes to show each item, as you click the tool) the "Selected, or New Item" menu will change to show the title of the item. When it reads, "Big Open Hangar" look at the "Notes:" for this item. It will read, "Camera Item, Refuel Item". This means this object can refuel any of the 8 main aircraft that are on the same team. It may be important to your mission to include a conveniently placed refuel object.

Let's add a truck. Position the cross hairs so that they are in front the hangar. (Remember how?) Select "Allied Truck" from the item menu and click "Add Item". You will now see a truck in front of the hangar.

Before we go on, let's save our mission. It is smart to save your mission fairly frequently, just to guard against the (unlikely) event of a power failure or other unforeseen event. To save the file click on the "Save As..." button to the lower right of the window. You'll be presented with a "Save As:" drop down panel which allows you to enter the file name of your mission. Use "My First Mission". Before clicking on "Save", you should make sure that the file will be saved in the correct location. It needs to be saved in the "Missions" folder, which is inside the "Necessary Data" folder, which is next to the SkyFighters application. If you put your mission file any place else, the program will not find it and you will not be able to play the mission. When ready, click "Save" to save the mission.

Each time I mention that we should save the mission we're working on, I have also saved, and included with the program, a file saved at the same point. You can, if you wish, load the file and see if it matches the work you've done, at that point. The file at this point is called, "Tutorial 1". You can load it by first closing your mission window (only one mission file can be open at a time) and then going to the "Open Existing Mission..." item in the "Mission Builder" menu. These tutorial files are saved in the "Tutorial files" folder, inside the Necessary Data folder. You can then return to the file you just saved, in the Missions folder, and titled, "My First Mission".

Let's make the truck drive around the runway. To do this, we'll have to define a path for the truck to follow. Paths are created in the "Misc" section of the Mission Builder. Click on the "Misc" tab. In the "Misc" section are many items that you can set, but for now, we're interesting only in the bottom section, which is the Way Point section. Notice the left hand column is labeled, "#", this column numbers the way points, there are a total of 200 way points. A path consists of one or more "Way Points". Each individual way point includes several pieces of information, primarily location (xyz) and the next way point. And secondarily, throttle, vfpm target, gear, flaps, brakes, Primary and Secondary Target, and Flags.

In many uses, all you'll need are the location, as it will be for our truck path. Let's make a rectangular path that goes left to right in front of the hangar. You can enter the xyz location of a way point directly by double clicking in the appropriate field and entering the information. But it is usually easier to simply look at where you want the point to go and tell Mission Builder to put a way point at that location. So let's do it. Using the altitude slider, move the viewing position up to about 2,500 feet. Move the cross hairs so that you are looking at a point a few feet in front of the hangar. Make sure the #1 way point line is highlighted (selected). When you have the viewing position where you want the way point to go, click on the "Enter location of cross hairs into selected line" button. You'll see a big red square on your screen. This is how the way point looks in the Mission Builder. Way points aren't seen when you are playing the mission. We want this way point to be on the ground, so we have to edit the "y" position and set it to 0. (It doesn't really matter the Y position of this way point. Ground vehicles ignore the Y location and only use the x and z positions to drive towards. But, we put the way point on the ground to make the way points easier to see and position for our ground path.) Double click on the xyz location of the #1 way point. This will highlight all three items, x,y,z. But we only want to change the Y item, which is the middle component, so now double click on the middle item to highlight only the Y component. Now type "0" and press return. This puts the way point on the ground. You'll see a line emanating out

of the way point. This line shows the connection between this way point and the next one.

Now, for the next way point, position the cross hairs off to the right a ways. Make sure the #2 way point line is highlighted, then click on "Enter location of cross hairs into selected line". You should now see the first way point with a line to the second one. Next, position the cross hairs straight up a bit. Remember to make sure the #3 line is selected before clicking on the Enter location button. And then move the cross hairs back to the left (completing the rectangle) and put that location into way point #4. The last step for this path is to change the "Next Point" column of way point #4 to be "1". To do this, double click on the "5" that is there now and enter "1" and press return. You will now see a neat little rectangle extending left to right in front off the hangar. The last step is to tell the truck to follow this path. Go back to the "Add Buildings" tab and make sure the truck is selected. (Use the up/down stepper to go through each object until you find the truck.) Now enter "1" in the "Item Path Start" input box and press return. That should do it.

Let's add a few more objects to our base before moving on to adding aircraft. Let's put in a couple wood buildings. Select "Wood Building" from the pop up menu, then position the cross hairs on the left side of the field and add a couple of these buildings. Then add a couple canvas hangars somewhere a bit away from the wood buildings. Lastly, lets add some base defenses. Select "AAA Gun" and add 1 of those items at the upper left edge of the base.

Click on the "Save" button at this point. If you wish to check your work, load the file titled, "Tutorial 2" and see if your work matches mine. You'll have to close the Mission Builder window before you can load a different file. The Mission Builder only allows one window to be open at a time. Remember to go back and load your mission titled, "My First Mission" before continuing.

We now move on to the "Position Aircraft" tab. Click on it. You'll notice that when you switch to this tab, there are now 8 aircraft tabs near the top of the window. Make sure "Aircraft #1" is selected. (Aircraft #1 is always the aircraft you fly.) With the cross hairs to the right side of the hangar, click on the "Move Aircraft" tab. There should now be an aircraft positioned in the cross hairs.

There are a large number of parameters we can set for each of the 8 aircraft. First, let's pick the type if aircraft this will be. Select "Sopwith Camel" from the "Aircraft Type" menu. Let's leave the aircraft facing north, which is "0" degrees in the Heading input box. The "Start Modifier" allows us to position the aircraft somewhat randomly, or not, for this aircraft, we want it in an exact location, so make sure the Start Modifier menu says, "Absolute Location". The "Max Random Distance" info is used for random aircraft positioning, since we are not using a random position, we can ignore this input box. Continuing on, "Fuel" of 0.5 is good, and "# of Bombs" 0 is good. We want the aircraft to begin stopped on the tarmac, so enter "0" in the "Speed" input box and press return. Enter 0 for the "Throttle" position.

One more thing we should do for an aircraft that is starting stopped on the ground. To make sure that the aircraft gets put exactly on the ground with the gear down we should set the altitude of the aircraft to -1. This ensures that no matter which aircraft we have selected, the program will correctly set the altitude to put the gear on the ground. If you set the altitude manually, and later change the

aircraft type, it might not set correctly on the ground. So do that now, edit the Y (the altitude) coordinate in the Location input box to "-1".

The right side of the aircraft parameters deal with what the aircraft will be doing. The parameters set up the aircraft "AI", or Artificial Intelligence (or lack there of). You won't usually need to worry about these items for the #1 aircraft since you'll be flying that aircraft, but you can, if you wish, set it up and then if you switch on the auto pilot, the aircraft will follow these instructions. But for now, we can leave those items alone.

Let's set up Aircraft #2 to fly through the hangar. Click on the Aircraft #2 tab. Drag the cross hairs to the south of the hangar some, say to about x = 2112200 and z = 2112000. Click on "Move Aircraft" to put the #2 aircraft here. Let's make this a Camel too. Since the viewing angle is straight down, the Mission Builder put the aircraft on the ground. We want the aircraft just above the ground, so edit the altitude of the aircraft to 65". Set the heading to 0. The default on the fuel and, bombs is good. The AI pilots don't like to be near the ground, unless they are landing. Next we need to create a path for the aircraft to follow, so it's back to the Misc section. Click on the "Misc" tab.

The aircraft can be told to fly to way points, thus, we can control where they fly in the world. We need a way point just on the other side of the hangar. Position the cross hairs just to the north of the hangar. Scroll down to way point #10 and click once on it to select it. (Make sure the way point you want to position is the one selected, it is very annoying to move a way point that you've already positioned.) Click the "Enter location of cross hairs into selected line" button. Edit the altitude of the way point to 53 feet. The position should be at 2076000, 53, 2284200. Next, put way point #11 farther to the north and make its altitude 300. Put #12 off to the left of #11 at 300 feet altitude. Let's continue the path down to the south and back through the hangar. Making the aircraft fly very exact paths can be difficult, and a bit fiddly. Aircraft can only turn so sharp, and can only change altitude so quickly. If you set up a path that the aircraft can't follow, they end up behaving somewhat oddly. If you see this, then you know that your way points are probably too close together and need to be repositioned.

Note: While working in the Mission Builder feel free to change the viewing position altitude frequently. If you are looking at the world from a point of view that is too low, move higher. Don't feel constrained by the viewing position, use it to your advantage.

Here are the way points for the hangar circuit:

#10: 2076000, 53, 2284200
#11: 2076000, 300, 2285135
#12: 2074350, 300, 2285135
#13: 2074350, 300, 2279435
#14: 2076000, 300, 2279575
#15: 2076000, 80, 2281100
#16: 2076000, 60, 2282300
#17: 2076000, 50, 2283160

Note: For most input boxes you'll need to press return after entering your data to make the program notice the change.

We want the path to be closed and loop, just like the truck path we set up earlier, so make the #17 way point have #10 as its "Next Point". Finally, just to clean up the look of the path make the #9 way point have #9 as its "Next Point".

Note: these kind of very critical, tightly control paths don't usually work the same for all the aircraft types. They will usually only work for the aircraft type they are set up for. Remember to set the aircraft type you want before tweaking the path. Also, on a tight loop path, you should test it through several loops, many times the path will be flown slightly differently each time through. In other missions you do, you'll only want an aircraft to fly to a particular area, so that path won't be terribly critical and a few way points will suffice, but when you are trying to make an aircraft fly through a hangar then things get very critical and it can be difficult to get things exactly right.

So that path we just set up is our first approximation of what we want. We're not sure yet that the aircraft will be able to fly that path, or not, so we need to test it. To do that, we must tell Aircraft #2's AI to fly this path. Click on the "Position Aircraft" tab, and then on Aircraft #2. Select "Patrol/Fly Path" from the "AI Type" pop up menu. Then we'll enter the first way point we want this aircraft to fly to, point #10, so put "10" in the "Patrol Path Start #" input box, and press return.

Let's give this mission a title so we can find it in the "Select Mission" dialog box. Click on the "Mission Text" tab. Enter "Tutorial Mission" in the "Mission Title" input box and press return. This is what will show up in that dialog box. For "Mission Description", enter "Learning how to use the Mission Builder to create a mission." We'll fill in the other items later.

Click on the "Save" button. Now click on the "Close" button. (I've saved a file named, "Tutorial 3" at this same spot so you can check to see if your mission looks about the same.) After you look at "Tutorial 3" (if you do) close the window.

The program loads all mission when it starts up. If you change a mission, you'll need to tell the program to reload the mission so that you'll see the change when you fly the mission. To do this, select "Reload User Missions" from the "Game" menu. Alternately, you can make sure the "Always reload user missions when the Mission Builder window closes" is check in the "Preferences dialog box.

Now let's test the path we create for the #2 aircraft. Go to the "Select Mission" dialog box and find the user mission titled "Tutorial Mission" and select it. (If you don't see it then the mission has gotten saved in the wrong spot. If this happens, quit SkyFighters, find the mission file (named My First Mission) and move it into the Missions folder inside the Necessary Data folder, which is next to the SkyFighters application. Then launch SkyFighters again and find the mission in the "Select Mission" dialog box.) You'll see the mission description we entered show up here too. Click on "Fly Mission". You should be sitting in your Camel looking out across the field. Use the option 2,3,4,5 keys to circle around your aircraft and see things. Next, use control 2 to switch to the #2 aircraft. We'll un-pause the game and watch what this aircraft does.

Okay, as I watch the #2 aircraft fly the path, it appears to be following our path pretty well. We lucked out on this one. Had we noticed the aircraft not able to turn to each way point we would go back and tweak the positions. But it isn't necessary

this time. **Note**: when testing paths it is sometimes useful to use the fast time option to speed things up. Use option f to toggle in and out of the fast time mode.

This path we just created gives an example of making an aircraft be at a particular heading, at a particular place. This can be a troublesome thing to achieve, but is absolutely required for the flying through the hangar task. The way I did it was the line of points before the hangar. This gives the aircraft a chance to settle in on a heading, along a particular position.

Now you can save your mission and close the Mission Builder window.

Let's make the #3 aircraft also follow this path. We can have any number of aircraft or objects following the same path, although sometimes we would want to make a separate path in a slightly different position. This would allow objects/aircraft of different speeds to fly the same path (nearly) without colliding. But since we will be setting the #3 aircraft to a Camel too, we can just use the exact same path. Load your mission back into the Mission Builder.

Note: For most input boxes you'll need to press return after entering your data to make the program notice the change.

Click on the "Position Aircraft" and "Aircraft #3" tabs. We want to add this aircraft already about half way through the path. Position the cross hairs at about: 2074360, 2500, 2283668. It should be roughly over the path line. Click on "Move Aircraft". Set the aircraft type to Camel. Set the altitude to 300 feet. Heading can be 180. Set the AI Type to "Patrol/Fly Path" and the "Patrol Path Start #" to 13. That should do it. You now have a second aircraft flying the through the hangar circuit.

For aircraft #4, let set it up to do touch and goes at our airport. This will be quite similar to the hangar circuit only we'll have the aircraft sit down briefly on the runway.

Click on "Aircraft #4". Make the aircraft type a Fokker DVII and place the aircraft on the field, around: 2076900, -1, 2283800. Be sure to set the altitude to "-1". Make the heading "0", speed "0", throttle "0". Set the AI Type to "Patrol/Fly Path", with the start path number "20". For this aircraft, we'll set a couple other parameters, make the "Attack an enemy within this distance when on Patrol" to "6000" feet, and "Return to Patrol if enemy beyond distance" to "10000" feet. Now we'll enter the way points. I'll list them here and you can enter them by going to the "Misc" tab.

```
#20: 2076900, 45, 2284050
#21: 2076900, 45, 2284800
#22: 2076900, 300, 2285370
#23: 2076900, 300, 2285960
#24: 2078500, 300, 2285960
#25: 2078500, 300, 2279700
#26: 2076920, 300, 2279815
#27: 2076900, 150, 2281165
#28: 2076900, 60, 2282410
#29: 2076900, 40, 2283600   --- make the throttle 0.1
```

Set the next point of #19 to "19" and of #29 to "20". That should do it. This aircraft will do touch and goes until, and unless, and enemy aircraft gets too close.

Now we are going to set up the conflict for this mission. We need conflict so we can have resolution. The conflict is going to be that we have incoming enemy aircraft, and these aircraft are intent on bombing our hangar. If they are successful, we lose the mission, if we stop them, then we win the mission. Simple as that. So the next step is to set up the incoming enemy aircraft.

Click on the "Position Aircraft" tab and then on "Aircraft #5". Make the aircraft type a Fokker DVII. We'll position the Fokker randomly to the north. We want this mission to be a fairly quick one so we won't put the Fokker too far away. Let's try to have it arrive at our base in under 5 minutes. So we should place it around 5 to 10 miles away. (100 mph / 60 is about 1.6 miles a minute, 5 minutes away would be about 8 miles.) Move the zoom in/out slider so that it is all the way to the top (zoom all the way out). You'll see a coastline towards the top and the trench lines running down the middle of the map. Move the cross hairs directly north about 8 miles, say to about Z = 2325000. Click on "Move Aircraft" to put the Fokker at this location. Make the Altitude be 1000'. Make sure the team of this aircraft is "Blue". We want to change the "Start Modifier" for this aircraft, change it to "Randomly Near Location". Next, set the "Max Random Distance" to 25000. This allows the program to move the aircraft up to 5 miles away from the spot we set as its start location. Note: Allowing a random position can sometimes complicate the creation of your mission, but if you can allow for random starts, it will make your mission more fun when played again and again. Each time it is played it will be a little bit different, which adds interest.

We want this aircraft to bomb the hangar, so give it 6 bombs. To add targeting information for the aircraft, we need to set up a way point. Click on "Misc" to return to the way point section of the Mission Builder.

Scroll to way point #40. We want the Fokker to fly to a point off to the east, and then do its bombing run. We don't want the point too close to the target, the AI needs some space to perform their bomb attack, so make the location of way point #40 be: 2087760, 500, 2283650. Set the "vfpm Target" to "3000". This allows the AI pilot to climb and dive more aggressively on the way to the way point. We'll use the next way point to set the target. The eighth column is titled, "Pri Tar #", this is where we can put the number of the object we want as the target. Oops, we don't know the number of our Hangar object, so go back to "Add Buildings" and use the stepper to scroll through all the objects until you find the hangar. Get the Unique ID number then click back on the "Misc" tab. Did you get it? It's 21. Put "21" in the "Pri Tar #" column at way point #41. The order of execution for a way point with a target is target first, then fly to way point location. So, when the Fokker's AI sees this way point, it will attack the listed target first, then after dropping its bombs, it will fly to the way point location. Set way point #41's location to the base to the east just past the trench lines.. (Remember how? Zoom all the way out, position the cross hairs over the base (it is located to the lower left of the city), make sure #41 is selected, then click on the "Enter location of cross hairs into selected line" button.) Make the next point be 41, so that if the Fokker gets to this way point, it will merely circle here.

Now back to "Position Aircraft". Set "AI Type" to Patrol/Fly Path" and the "Patrol Path Start #" to 40. We have set up this Fokker to be single minded, it will ignore

any attackers and simply fly to the hangar and drop its bombs. Now let's give this aircraft a wingman. Click on "View Aircraft" with "Aircraft #5" still selected. This will move our viewing position back to the Fokker we want to give a wingman. Now click on "Aircraft #6".

We want the wingman to begin behind the lead Fokker. Move the cross hairs to the north of the Fokker, say a few hundred feet. Click on "Move Aircraft". Make this new aircraft be a Fokker DVII and set its altitude to 1000 feet. Make sure it is on the Blue team. Set the AI type to "Wingman", and the "Lead Aircraft" to "5". This aircraft is now tied to the #5 aircraft. When an aircraft is set to Wingman, he will basically follow the lead aircraft unless and until an enemy aircraft is attacking it, or the lead aircraft is shot down. To make this aircraft also position randomly, but with the #5 aircraft, set the "Start Modifier" to "Randomly Near Location" and the "Max Random Distance" to "1". Setting the distance to "1" tells the Mission Builder that this aircraft keeps its relative distance to the previously randomly positioned aircraft. This allows you to have a group of aircraft be positioned randomly, but together in a group.

By making aircraft #6 a wingman to aircraft #5 we make this mission easier to complete because the #6 aircraft will not be terribly aggressive. To make it more aggressive, you could instead make it follow the same path as the bombing Zero, then set the "Attack an enemy within this distance when on Patrol" to some suitable distance, say 5000'. If set up this way, the aircraft would peal off of the path and attack an incoming enemy. Change the aircraft to behave this way, if you wish, or, change it later to see the difference in how the mission plays.

What to do with the last 2 aircraft? We could simply not include them in the mission. You'd do this by clicking on each of these aircraft and then setting "Include this aircraft" to "No". But, rather than do that, lets randomly place them in the world and let them be dogfight aircraft. This is a random complication that might be interesting. (If you find you don't like it, you can always turn the aircraft off later.) Let's position them now...

Zoom all the way out and move the cross hairs to the east somewhere past the base we just used for the way point. Click on "Aircraft #7". Make it a Fokker DVII. Click on "Move Aircraft". Set the altitude to 10000, make it a "Randomly Near Location" start, and set the Max Random Distance to 30000. This will make the aircraft some times too far away to be part of the mission, but sometimes, it might be right in the thick of it. Set up aircraft #8 the same.

By default, all the aircraft are set to stay dead when shot down. Alternately, you can have them come back to life after being shot down. To set that up we'd use the "Restart" tab. To turn on aircraft restarts set "Aircraft restarts after dead" to "Yes". All the same settings are pretty much available here as in the "Start" tab with the addition of "Number of restarts", which allows you to have an aircraft come back just once, or 10 times, or an unlimited number of times. But for this mission, we'll just leave them all staying dead after being shot down.

Now lets set the victory conditions, click on the "Set Victory Conditions" tab. There are all manner of things you can set here. Usually, you will not need more than a few to create the conditions needed. For this mission, we say that our hangar must not be destroyed. We can list up to 20 items that should remain alive, put "21" in the "Targets that should remain alive" input box. Then, in the "Number of items in the list that MUST be alive" put "1". This could alternately allow you to

have, say, 5 important objects to protect, but then say that if you keep 3 alive, you have succeeded in your mission. But here we are concerned with just one object. We also will required that the player shoot down 2 enemy aircraft. Change the "Required Individual Kills" input box to "2". To win the mission, the player must shoot down two enemy aircraft, and the hangar must not be destroyed. As soon as the hangar is destroyed, the player will lose the mission.

Click on the "Mission Text" tab. Having set up the victory conditions, we can now enter the Mission Description. It is important to give the person about to play the mission a clear picture of what they need to do to complete the mission. For this mission, we might say, "Incoming enemy aircraft have been spotted to the north. You must protect your air base. Get into the air as quickly as possible and down the aircraft. There are new aircraft engines in the hangar, this is most likely the target of the enemy attack." This tells the player everything they need to know. Well, almost. There will be, perhaps, 4 enemy aircraft in the air. The player is not told that only the #5 aircraft has the ability to destroy the hangar. You might choose to let the player figure this out for himself, or, alternately, you can give this as a hint in the "Mission Loss Message". It might read, "You must protect the hangar at all costs. Try to destroy the enemy aircraft that has bombs on board." Put whatever you wish in the Victory message, maybe "Well done". Go ahead and fill in these items now.

You can set the number of points awarded for a successful completion of the mission. 250 points is the default, you can raise or lower it if you wish.

Click on the "Misc" tab. Lets set the time of day to "0", this will make the mission have a different time of day each time it is started. We can also set the visibility to be different each time, put "0" here also. We don't want a ground layer, so leave that alone. The GC, or Ground Clutter, should be set to round trees.

Finally, there is a "Permissions" setting available. Usually you can simply leave this on "Anyone can view and save". You might set it to "Only creator can view and save" if you are using the mission for network play.

That's it. Congratulations, you've completed this tutorial. Save the mission, close the window, and give it a try. You might the return to the Mission Builder and add some clouds around, maybe put more objects on the ground. Even go back and tweak what is going on to make the mission more interesting. This tutorial only touched on a lot of the potential of the Mission Builder. For complete descriptions of each of the items, see the previous chapter, "Mission Builder".

As a final challenge, try changing this mission so that you are on the blue team. Position your aircraft where the number 5 aircraft is, and put the number 5 aircraft where the number 1 aircraft is. Remember to change the teams of these two aircraft. You'll also need to change the victory conditions so that the hangar now needs to be destroyed, not remain alive, and set Required Individual Kills to "0". Then you can see how the mission plays that way, with the players goal now to bomb the hangar.

I've saved this mission at several points of the tutorial so you can check your work, if you wish. You'll find the files in the Tutorial folder in the Necessary Data folder. They are titled "Tutorial n", with the "n" being numbers 1 through 4.

Flying & Dogfight Primer:

Flying...

Flying a flight sim program can be a bit difficult when first begining. It is a learning process. In this section I'll discuss a few items to be aware of that will make you a better flight sim pilot.

There are two areas of feedback that are vital when flying real aircraft and are impacted with a flight sim, 1) vision, and 2) seat of the pants.

Vision means that in a real aircraft, you not only get a wider field of view, but it is second nature to look in whichever direction is necessary. With a flight sim, your field of view is much narrower. This is obvious because when you are sitting at your computer, you can also see beyond both sides of the monitor. So the solution to this is to look left or right as necessary. With a real aircraft you'd simply turn your head. With a flight sim you must figure out how to tell the program to turn the pilots head. So, to enjoy flying this program you'll need to get comfortable telling the program where you want to look. Time spent getting comfortable using the joystick hat switch, or keypad numbers, or the other keys, to control where you are looking, is time well spent. It is also absolutely vital, when you get into dogfight, to be able to keep your eyes on the enemy aircraft.

Seat of the pants refers to the fact that in a real aircraft your entire body is constantly aware of how the aircraft is moving. If you are feeling very light in your seat, you know you are losing altitude. If your chin is being pushed into your chest, you know you are pulling a lot of Gs. With a real aircraft, you will not accidently pull all the way back on the elevator. You'll feel the Gs building, you'll feel the resistance on the joystick... your entire body will feel all the sensations and you'll know immediatly what is happening. With a flight sim you are limited to visually seeing what the aircraft is doing, and sometimes there will also be audio clues. The solution is to be aware of what you are asking the aircraft to do. With a flight sim, it is easy to pull quickly back on the elevator to full deflection. Is this something you'd want to do with a real aircraft? Rarely. Fly with smooth inputs. It doesn't take large deflections of the surfaces when at flying speeds. Listen for the stall warning, and if you hear it, push forward on the joystick. Remember that if the nose of your aircraft is above the horizon, you are probably losing airspeed, if it is below the horizon, you are probably gaining a lot of airspeed. The solution to the seat of the pants problem is to be aware of what your inputs are doing to the aircraft.

Dogfighting...

Successful dogfighting involves many skills, from situation awareness, to precise control of the aircraft, to aiming and shooting. This section is intended to give you some basic ideas and techniques to try while you pursue your fighter pilot career. The text that follows admittedly only scratches the surface. For a more complete discussion try "Fighter Combat, Tactics and Maneuvering", by Robert L. Shaw, or other resource.

The first thing that must happen before a dogfight begins is one pilot must see the other. You must therefore "keep your head on a swivel" as they say. The earlier you pick up the enemy the better it is for you.

After you have spotted an enemy and decided to engage, you should turn into

him. At great distances this is just a matter of pointing your nose at the enemy and flying toward him. But there are some other things to consider. Are you higher or can you out climb the enemy? If so, you will want to preserve your altitude advantage. Is there beneficial terrain or a teammate who can help you? If so, you will want to allow the enemy to fly to your position, or lead him to where your partner is flying. In general, being higher than the enemy gives you the advantage. Not only can you choose when to fight, but you have the option of swooping down on the enemy, taking a couple shots and zooming back to a higher altitude.

Many dogfights begin in earnest with a head-on pass. When the aircraft get fairly close together the theory is to turn into the enemy. The best technique uses what's called your lift vector. Picture the lift vector as a string coming out the top of the pilot's head and extending straight up out the top of the canopy. The technique is to roll your lift vector, in other words, the string coming out the top of your head, onto the enemy and pull back on the stick. For example: You spot the enemy flying past you, a little lower, and off your left wing. You would perform a maximum rate aileron roll to the left and look up through the top of the canopy to see the enemy. When you have placed your lift vector on the enemy, pull back hard on the stick being careful not to stall the wing.

Here is another way to think about it. Picture a vertical line that runs from the top of the screen to the bottom and goes through the gun sight. This is the direction of movement produced with the elevator. You want to put the enemy aircraft on this line so that you can "pull" onto him with the elevator.

As you pull elevator you will hopefully come around on the enemy, provided you can out turn him. Eventually, the enemy will appear in front of you. Now comes the most important final phase of a dogfight.

The final phase involves positioning the enemy in the proper spot for the kill. You will want to bring the enemy as close as possible, ideally about 200 yards. If you get too close there is the chance that you will overshoot the enemy, or fly into him. Be prepared to counter an overshoot maneuver by the enemy if your distance begins to decrease dramatically.

If you are shooting from close in, then it is merely a matter of putting the enemy aircraft in the cross hairs and blasting away. You will see little white flashes when your bullets hit home. When you're close in and the target is positioned correctly, start firing and keep firing for as long as it takes, or the target moves out of position.

It is possible to shoot the enemy at a much farther distance, but it is difficult because it usually involves a "deflection" shot. If both aircraft are turning, then you can't simply shoot directly at the enemy. You must lead the target. You must shoot to a point in space where the aircraft and the bullets will meet at a later time. A deflection shot success can be most rewarding. If you practice this you can get very good at judging the lead necessary.

There are two factors that contribute to the amount of lead you'll need, one is distance to the target, and the other is turn rate of your aircraft. The greater the distance, the larger the lead amount. And the faster the turn rate, again, the larger the lead amount. You can also judge your turn rate by the G's you're pulling, the greater the G force, the larger the lead amount needed.

The only way to get good at deflection shooting is to put in the hours practicing, and to notice when the lead angle is correct. The first thing to do is to pull your nose into a lead pursuit and send a quick burst of your guns. Watch the tracers form a line. Notice if the tracers are flying above, below, or right through the target. This is the first step. You must be able to make the line formed by the tracers appear to draw across the target.

Note: It is important that you can hold the relative positions so that you can make minor corrections each time you try a shot. If the enemy aircraft is constantly moving around the screen then you'll never hit him.

Make minor bank corrections to bring the tracers through the target. Alternately, you can use a bit of rudder to bring the tracers onto the target. Once you have the tracers going through the target, then you can begin to play with the lead amount. This is the second and final step. Eventually, your experience will help you judge what is close to the proper amount. Remember, if you are turning very hard, you need to lead more. And, as the distance decreases, use less lead. Once you are able to keep the tracer "line" drawing across the target, then it is a simple task to "walk" the tracers onto the aircraft. This means increasing or decreasing the lead amount until you achieve hits. Watch for the little white flashes and/or pieces flying off that tell you the bullets are hitting metal.

To repeat: If you are very close, simply put the target in the gun sight and blast away. When you are farther away, pull the nose into lead pursuit and aim your guns so that your tracers line up with the target. Next try a little more or less lead until you see the white flashes.

Keep in mind that in multiple aircraft fights, there may be a guy doing to you what you're trying to do to the guy in front of you. If you see tracers that are not your own, then hard as it may be, you must forget about the guy you're about to blast, and break off the attack to deal with the guy who is on your tail. Watch out if you hear yourself saying these famous last words, "Just one more second and I've got him...".

In multiple aircraft fights, situation awareness is very important. You may find yourself turning and twisting, rolling and snapping, all the while aircraft are flying in and out of view. Choosing which ones to pursue and which to skip is definitely a learned skill. Just try to take the easier shots and pounce on opportunities to latch on to an opponent's tail. But remember which team you are flying for and don't fire on friends!

Engage the enemy, but don't get shot down yourself. Downing one aircraft and losing your own is not a success.

One last thing, the aircraft can be damaged before being shot down. Each hit may cause specific damage. You might lose an aileron, or your elevator might get damaged. In either case, you'll notice that your aircraft is flying strangely, or just doesn't feel right. The pilot might also get hit, which can cause your head to begin to drop. Other things can also be damaged, the guns, the gauges, the throttle linkage, your engine. Anytime during a dogfight after you've taken hits, you might find things not quite right with your aircraft, this is because something has gotten damaged during the dogfight.

If you survive a dogfight, but find yourself damaged, or out of ammo, you must find a friendly hangar, or fuel tank, land close to it, come to a complete stop, and turn the engine off. Wait several seconds and you'll be repaired and rearmed.

Custom Paint Jobs:

"Custom Paint Jobs" refers to how your aircraft looks... the paint job it has. **SkyFighters 1918 wMB** allows you to create your own custom paint job for the aircraft you fly. It is fun to do and can give your aircraft a unique look. If you trade your custom paint job with people you fly against over a network, they will also see your custom paint job on your aircraft.

Custom paint jobs should be 1024x1024. The easiest way to get started making your own paint job is to look in the "Custom Paint Jobs" folder inside the "Necessary Data" folder. This is the place where you will put your paint jobs, and the paint jobs of people you fly with. In this folder you'll see the file, "cpjTemplate". Make a duplicate of this file and name it with the same name you use in the "Pilot Sign In" window. This is how you tell the program which paint job to use on your aircraft.

After you have made a duplicate of "cpjTemplate", use the new file as a guide for where to put each part of your paint job. Use a paint program, or similar, to load your paint job file and create your paint job design. You'll see where the left side of the fuselage goes, where the wing top goes, and so on. Make sure that you do not change the size of the texture, it must be 1024x1024.

Remember, the name of the custom paint job must match the name you use in the Pilot Sign-In dialog box for your paint job to be used.

Changing Program Textures:

You can change the look of any texture in the game. It is pretty easy to do and can dramatically change the look of the game.

There should be a folder next to the SkyFighters application titled, "Necessary Data". This is where you will store custom items you create. These will be both textures and missions. Inside the Necessary Data folder is another folder titled, "Textures". This folder is initially empty, but is where you will put game textures that you change.

There is an identically named folder, "Necessary Data", hidden inside the application bundle which also has a folder titled, "Textures". Inside this folder is where all the game textures are initially stored. What you will need to do is make a copy of this "Textures" folder (which includes all the textures inside), and put it in the "Necessary Data" folder that is next to the SkyFighters application.

Once you have this copy of game textures you can then change the look of these textures as you please. The only rules are 1) that you do not change the size of the textures, they must remain exactly the size you find them, and 2) you do not change the name of the textures.

Don't be confused by the fact that there are two "Necessary Data" folders. Think of them as the private and public versions. The private one resides hidden inside the application bundle, and should never be changed. The public one resides next to the SkyFighters application and is where you'll put your custom items.

Here is how to get the game textures out of the **SkyFighters 1918 wMB** bundle:

1. While the program is NOT running, point the cursor at the SkyFighters 1918 wMB icon (not the icon in the dock).
2. Hold down the "control" key.
3. Click on the application and you'll see a menu show up.
4. Select, "Show Package Contents" from the menu.
5. You will see a window with a folder titled, "Contents". Double click this folder to open it.
6. Find and open the folder titled, "Resources".
7. Find and open the folder titled, "Necessary Data".
8. You should be able to see the "Textures" folder now. Click on it once to select it, when selected it will be hilited. Then go to the "File" menu and select "Duplicate". This will make a duplicate copy of the "Textures folder (and all the textures inside) and it will be called, "Textures copy". Drag the "Textures copy" folder to your desktop.
9. Close all the folders you just opened.
10. Now, find and open the "Necessary Data" folder that is located next to the SkyFighters application.
11. Remove the existing (and empty) "Textures" folder and put it in the trash can.
12. Drag the "Textures Copy" folder you previously put on the desktop into the Necessary Data folder that you just removed the empty Texture folder from.
13. Finally, change the name from "Textures Copy" to "Textures".

You are now ready and able to change game textures that reside in this public "Textures" folder.

If/when you update **SkyFighters 1918 wMB** you will want to only replace the application, leaving your existing Necessary Data folder. This will allow you to keep all of your custom items and missions intact.

Changing Program Sounds:

The program sounds are available to you to change, if you wish. There is a folder inside the Necessary Data folder titled, "Sounds". Initially, it is empty. When it is empty, the program will use the included, default sounds. If you wish to change a sound, you will simply name your new sound correctly and place it in the Sounds folder.

All replacement sounds need to be in the same format, which is: they must be a .wav file, they must be mono, or single track, they must have a sample rate of 44,100 and they must be 16 bit integers. This is a common format. Also, sounds not in this format can be converted using widely available tools.

To find out what are the defaults sounds names, open the application bundle

and look in the Sounds folder there. To do this, hold down the control key and click once on the application. You'll see a menu, select "Show Package Contents". Then open the "Contents" folder, and then the "Resources" folder. You can then find the "Sounds" folder. Be very careful not to change, move, or delete any of the items inside the application bundle.

   Inside the Sounds folder are all the program's default sounds. The titles you see here are what you'll use for your replacement sounds. You won't put them in this folder, you are only getting the titles here. After jotting down the sound titles you can close the all the folders you just opened.

   To replace a sound, the "BombRelease" sound, for example, you would take the sound you want to replace it with, and name it "BombRelease.wav", and place it inside the "Sounds" folder, inside the "Necessary Data" folder, which is next to the application icon. As long as the file is named correctly, and is in the correct format, the new sound will be used the next time you run **SkyFighters 1918 wMB**.

   If you ever want to return to the default sounds, simply remove the replacement sound from the Sounds folder.

Complete Command List:

   Here is a list of the available commands:

Pause/Fly Game Toggle	p
Fire Guns	(space bar)
Un-Jam Guns	(control and) u
Throttle Up Incrementally	=
Throttle Down Incrementally	-
Switch Engine Off	(F5)
Engine Idle Throttle	(F6)
Engine Full Throttle	(F7)
Engine War Emergency Throttle	(F8)
Move Rudder Left	q
Move Rudder Right	e
Center The Rudder	r
Brake On/Off Toggle	b
Drop Bomb	d
Look Forward Level	w
Look Incrementally Right	s
Look Incrementally Left	a
Look Incrementally Up	f
Look Incrementally Down	v

Look Up 45/90° Toggle	x
Look Down/Level Toggle	c
Look Incrementally Right Small	.
Look Incrementally Left Small	,
Look Forward	8 on keypad
Look 45° Left	7 on keypad
Look 90° Left	4 on keypad
Look 135° Left	1 on keypad
Look Rear Left	0 on keypad
Look 45° Right	9 on keypad
Look 90° Right	6 on keypad
Look 135° Right	3 on keypad
Look Rear Right	. on keypad
Elevator Trim Up	i
Elevator Trim Down	k
Aileron Trim Left	j
Aileron Trim Right	l
Rudder Trim Left	u
Rudder Trim Right	o
Camera Inside Pilot Head	(option and) 1
Camera View From North	(option and) 2
Camera View From South	(option and) 4
Camera View From East	(option and) 3
Camera View From West	(option and) 5
Camera View From Above	(option and) 6
Camera View From Left Wing	(option and) 7
Camera View From Right Wing	(option and) 9
Camera View From Nose	(option and) 8
Camera View From Tail	(option and) 0
Fly By Camera	(option and) y
Chase Camera	(option and) c
You And Nearest Enemy Aircraft	(option and) z
Camera In Nearest Tower	(option and) t
Camera On Bomb	(option and) b
Move Camera Closer	(up arrow)
Move Camera Farther Away	(down arrow)
Camera On Aircraft #1 (Your Aircraft)	(control and) 1

Camera On Aircraft #2	(control and) 2
Camera On Aircraft #3	(control and) 3
Camera On Aircraft #4	(control and) 4
Camera On Aircraft #5	(control and) 5
Camera On Aircraft #6	(control and) 6
Camera On Aircraft #7	(control and) 7
Camera On Aircraft #8	(control and) 8
Send Message	m
Send Private Message	o
Send Canned Message 1	1
Send Canned Message 2	2
Send Canned Message 3	3
Send Canned Message 4	4
Send Canned Message 5	5
Send Canned Message 6	6
Send Canned Message 7	7
Send Canned Message 8	8
Host Declines Joiner	(control and) d
Host Accepts Joiner	(control and) a
Normal/Fast Time Toggle	(option and) f
3 Position Sound Toggle	(option and) h
Auto Pilot On/Off Toggle	(option and) a
Frame Rate Indicator On/Off Toggle	(option and) s
Begin/End Replay of Action	(option and) r
Reverse Replay	(left arrow)
Forward Replay	(right arrow)
Take Screen Shot	(F2)
Restart Current Mission	(control and) n
Second Viewing Window	(option and) w
Second Viewing Window uses	Closest Enemy (control and) e
Joystick Auto Trim	(control and) t