
Red Baron
3-D
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RED BARON 3-D

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Gameplay Table Of Contents

GETTING STARTED

INSTALLING THE GAME

Important: before installing Red Baron 3-D, *you should close all open applications.*

STARTING THE INSTALLATION PROGRAM

Before you can begin playing *Red Baron 3-D*, you must install it to your hard drive. Let's go ahead and do that now:

If you have AUTOPLAY enabled on your CD-ROM drive (the default setting) all you need to do is insert the *Red Baron 3-D* CD into the drive and close the drive door. After a few seconds, a window will appear on your desktop with a picture of a crewman grabbing the propeller of an airplane and a couple of buttons on the bottom.

If you do not have AUTOPLAY enabled, put the *Red Baron 3-D* CD into the CD-ROM drive and close the drive door. Click on the **My Computer** icon on your desktop and a window will open listing all the drives on your system. One of the drives will have an icon of an Iron Cross and will be labeled **Red Baron 3-D**. Right click the CD drive to bring up a menu of options. Left click the menu option labeled **Autoplay**. After a few seconds, a window will appear on your desktop with a picture of a crewman grabbing the propeller of an airplane and a couple of buttons on the bottom.

Click the **Install Red Baron 3-D** button to launch the installation program.

TESTING YOUR SYSTEM

The first thing the install program will do is test your system's audio playback capabilities. A small window will appear telling you that it is attempting to play a digital .WAV file. While that window is displayed, you should hear the sound of an aircraft engine starting up. After playing the sound the Setup program will display a small dialog box asking you if you heard the sound file.

If you heard the sound, click the **Yes** button when asked if you heard the sound.

If you did NOT hear the sound file, click the **No** button. A small window will then appear asking if you want more information on the problem. When you click the "Yes" button on this window, the Sierra On-Line Setup Help will be launched which will assist you in troubleshooting the source of the problem.

CHOOSING INSTALLATION SIZE

The next window to appear is the actual beginning of the installation process. This window tells you that you will need between 45 and 215 megabytes of available hard drive space for the game itself, plus an additional 80 megabytes of free space on the same drive the game is installed for use as a swap file.

Don't forget about this 80 megabyte requirement! If you ever have less than 80 megabytes free when *Red Baron 3-D* is launched, the game will warn you that it didn't find the required drive space.

In general, the larger the install size, the faster the game will respond. If you have the space for a full install, it is highly recommended, regardless of the speed of your system.

Click the **Next** button to get to the next screen which is where you are asked which size installation you want. Click either the **Large**, **Medium**, or **Small** install option, then click the **Next** button to proceed.

CHOOSING INSTALL LOCATION

Now the installation program wants to know on which drive you want *Red Baron 3-D* to be installed. The default location is on the C: drive in a directory called \Sierra\RedBaron3D.

If you want to install the game to a different location, click the **Browse** button, which will bring up the **Choose Folder** window. Select the drive you want the game installed to using the **Drives** list at the bottom of the window.

Important Note: *Red Baron 3-D* must be installed to a directory called \Sierra\RedBaron3D. For example, if you specify that you want to install the game to the \Games\RB2 folder, *Red Baron 3-D* will be installed to a directory called

\Games\RB2\Sierra\RedBaron3D.

When you are satisfied with the install location, click the **Next** button. The appropriate game files will then be copied to your computer's hard drive. This can take anywhere from two to twenty minutes, depending on the installation size you chose and the speed of your CD-ROM and hard drives.

After copying all the relevant files, you are informed that you should register the game and then that the install program created an icon on your desktop for a service called NetMarket. This icon is not needed by *Red Baron 3-D* and can be safely deleted at any time.

INSTALLING INDEO" AND DIRECTX" DRIVERS

Next, the installation program checks your system for the presence of the **Indeo™ Video Interactive** program which is necessary for the game's introduction and video sequences. If the installation program determines that you do not have the program already installed, you will be prompted with a series of windows to guide you through the installation process. Click the **Next** button to get to the license agreement, then click **Yes** to get to the system type selection window. Select the **Windows® 95/98** option, then click the **Next** button. You will then be given a list of the drivers to be installed. Click the **OK** button to complete the **Indeo™ Video Interactive** installation. When it is completed, you will be asked if you want to read the release notes. You can safely click the **No** button.

Now the installation program checks your system for the presence of **DirectX™** version 5.0 or later. If it is not installed, you will be asked if you wish to install it at this time. Click the **Yes** button and DirectX™ version 5.0 will be installed on your system without any further intervention on your part.

FINAL INSTALLATION STEPS

Next, the installation program asks if you want to install a *bookmark* to the official Red Baron web page for *Internet Explorer™*. Select either the **Internet Explorer™** or the **DO NOT Install Bookmarks** option and click the **Next** button. Next you may be asked if you want to connect to the internet and check for

Red Baron 3-D updates. For now, just click the **No** button if asked.

You will then be asked to register *Red Baron 3-D*. This can be easily accomplished by inputting your information into the forms provided. Alternately, you may register at a later time by clicking the **Register Later** button.

Finally, if either the *Indeo™* or *DirectX™* drivers were installed to your system, you will be told that your computer needs to be restarted before you can use *Red Baron 3-D*. Simply click the **Finish** button to restart your system. Otherwise, click the **Finish** button to end the install and return to your desktop.

Congratulations! You have successfully installed *Red Baron 3-D* to your system!

STARTING THE GAME

Once the game has been installed to your hard drive, you can choose one of two different ways of launching the game: autoplay or shortcut.

STARTING THE GAME WITH AUTOPLAY

If your system has autoplay enabled, starting *Red Baron 3-D* is as simple as putting the game CD in the CD-ROM drive and closing the drive door. After a few seconds, a window will appear on your desktop with a picture of a crewman grabbing the propeller of an airplane and a couple of buttons on the bottom. Click the button labeled **Play Red Baron 3-D** to start the game.

STARTING THE GAME WITH A SHORTCUT

When *Red Baron 3-D* was installed to your system, a set of program shortcuts was put into a folder in your **Start** menu. To start the game, first make sure the *Red Baron 3-D* CD is in the CD-ROM drive. Next, click the **Start** menu button in the lower left and click the **Programs** folder near the top of the menu.

Next, locate and click on a folder called **Sierra**, then another one called **Red Baron 3-D**. Inside this folder is a shortcut called **Red Baron 3-D**. Click this shortcut to start the game.

PUTTING A RED BARON SHORTCUT ON YOUR DESKTOP

Starting *Red Baron 3-D* from the Start menu shortcut is at least a five-click method. If you want to save time when starting the game, you can put a shortcut on your desktop, reducing program launch to a single click.

To put a shortcut on the desktop, we first have to get a copy of an existing shortcut. To do that, click the **Start** button at the bottom left of your screen and then click the **Programs** folder near the top. Locate and click on the folder called **Sierra**, then locate and click on the folder called **Red Baron 3-D**.

Inside this folder is a shortcut called **Red Baron 3-D**. Instead of clicking this icon with the left button, click on it with the RIGHT mouse button which will bring up a small action menu. Left-click the **Copy** entry.

Now, right-click anywhere on your desktop to get the same type of menu as in the last step. Left-click the **Paste** entry and the **Red Baron 3-D** shortcut will be copied onto your desktop, giving you single-click access to the game.

TUTORIALS

Note: These tutorials form a programmed instruction set designed to teach you the mechanics of the Red Baron 3-D *game as well as some of the basics of aerial combat. Each tutorial will rely on lessons learned in previous tutorials, so it is recommended that you perform each lesson in order.*

These tutorials assume the use of a Microsoft Sidewinder joystick, as depicted in the ***Joystick Controls*** *diagrams found on page* ***73*** *of this manual.*

If you are using joystick with fewer axis' or buttons, you will need to use the keyboard equivalents for any missing functions. Please refer to the ***Keyboard Controls*** *diagrams found on page* ***74*** *in this manual.*

If you have a control system with more functionality, you should refer to the controller manuals for instructions on configuring the controller to fit your needs.

TUTORIAL 1: FLY NOW

In this lesson, we will learn the following techniques:

1. *How to start a* ***Fly Now*** *game.*
2. *Using the fixed cockpit views.*
3. *Using the slewable cockpit views.*
4. *How to locate the enemy.*
5. *How to fly your aircraft using a joystick.*
6. *Fighting the enemy.*
7. *Exiting the cockpit.*

HOW TO START A FLY NOW GAME

Using one of the previously outlined methods, start *Red Baron 3-D*. After viewing the introduction, you will be left in the game's **Main Menu**. Click the **Fly Now** button at the top of the button row on the left.

Tip: You can skip the introduction by clicking the left mouse button or by pressing the ESC key on your keyboard.

After a short loading period, you will find yourself among the clouds in the cockpit of your *Nieuport 28* fighter aircraft. Before we do anything else, press the **pause** key on your keyboard.

Tip: The view controls all function while the game is paused. You can pause the game during combat to orient yourself or to identify and locate enemy aircraft. Don't rely on this too much, though, as the pause function is disabled in multiplayer games.

USING THE FIXED COCKPIT VIEWS

While the game is paused, let's learn the basics of the cockpit view system.

Red Baron 3-D features both a standard set of fixed views as well as a swiveling view that simulates the actions of a pilot's head as he looks around, known as the "slewable" cockpit view. Let's look at the fixed views first.

Note that when we start, we are looking straight ahead with the instrument panel dominating the lower part of the screen. Move

the *hat* on the joystick to the left and note that you are looking out the left side of the cockpit. Release the hat and note that the view returns to looking straight ahead, but that the instrument panel is mostly obscured and you have a better view over the upper wing. Whenever you release a view key or return to the cockpit from an external view, you will be returned to this forward view.

Now, push forward on the hat. Note that the forward view drops down a bit so that you can see the instrument panel. Move the hat around in a circle and note that the view pans to each of the eight basic viewing angles around the aircraft. Release the hat and the view returns to the standard forward view.

While holding down the CTRL key on your keyboard, push forward on the hat. Note that the view changes so that the only part of your aircraft that is visible is the top part of the prop circle. This view is known as the "45-degree forward" view and is one of the most useful combat views available. When you find yourself in a turning dogfight, this view allows you to glance at your enemy and see any maneuvers he might be making in an effort to shake you from his tail.

Similarly, holding down the CTRL key and looking back can give you a view of anyone that might be chasing you in a dogfight. With the CTRL key held down, all the standard hat views are changed to "45 degree up" views. Left becomes "45 degrees up and to the left", right becomes "45 degrees up and to the right", etc.

USING THE SLEWABLE COCKPIT VIEWS

Now let's have a look at the slewable cockpit views.

Press and hold down the **Camera Rotate** button (the large button next to the hat on the Sidewinder). Notice that the wings lose color and texture and the flying wires on the wing struts disappear.

Now, while holding down the **Camera Rotate** button, move the joystick forward and notice the view slides smoothly down to the instrument panel. Push the joystick to the left and note how the view smoothly slides around to the left until you are looking almost directly back at the tail. Push the joystick around to the right and notice how the view will not let you look directly back at the tail.

The slewable cockpit is meant to simulate the views available

to a pilot as well as the time it takes for him to swivel his head around to another viewing angle. Just as humans are incapable of turning their heads in a complete 360-degree circle, the slewable cockpit cannot be swiveled in a complete 360-degree circle.

When you release the **Camera Rotate** button the view snaps back to the standard forward view.

You can permanently enter the slewable cockpit view by pressing the **F2** key. **F1** will get you back to the standard fixed view system.

HOW TO LOCATE THE ENEMY

If you pressed the **pause** key as soon as the cockpit appears, you should see a small, dark dot in the center of your plane's windscreen. That dot is the enemy plane you are supposed to shoot down. All *Fly Now* games start with the enemy in front of you.

Now, press the **E** key on the keyboard. Notice how the view centers on the dot representing the enemy plane and that the view system has changed from a fixed view to a slewable view (evidenced by the lack of color and texture in the upper wing and the lack of flying wires on the wing struts). If the enemy was not visible, he should be now.

The **E** key activates the *Target Enemy* function. This causes the view to change so that the targeted enemy plane is in the center of the screen. As your plane's attitude changes, the view will adjust so that the enemy is always in the center of your screen.

If there were more than one enemy plane in the air, each press of the **E** key would cycle the target to the next enemy plane. This function serves as an effective identification system, allowing you to see if the specks in the distance are enemy or friendly, or to quickly find out if there are any enemy planes in the area.

Press the **pause** key on the keyboard to let play resume. Note That the view will slew to one side or another as the enemy aircraft leaves the center-line of your plane's flight path. Press the **pause** key again to halt the action while we discuss basic flight controls.

Tip: In Fly Now missions, you can identify the type of enemy aircraft by it's actions when you first see it. If the plane turns and comes directly toward you, it is a fighter. If the enemy plane gently turns to one side or the other and flies

away from you, it is a bomber or other plane with a tail gunner.

HOW TO FLY YOUR AIRCRAFT USING A JOYSTICK

The joystick style game controller is the most logical and intuitive input device you can use for a flight simulation because it duplicates the control stick in most aircraft in both form and function.

There are four basic flight controls in the game: throttle, ailerons, elevators, and rudder. Let's look at them one at a time:

The first control, and the most basic, is the **throttle**. As expected, the throttle controls the power produced by the engine just as the accelerator on your car increases engine power which allows you to go faster or climb steeper hills. You can control the throttle with either the keyboard or the joystick or both, depending on your needs at the time. If your joystick is equipped with a throttle wheel or slider, you can directly control the throttle setting by moving it up or down.

If you prefer, you can use the keyboard to set the throttle to a specific setting by pressing one of the number keys across the top row of your keyboard. The **1** key corresponds to an idle setting and the **0** key represents a 100% throttle setting, with all keys in between representing linear steps of increased throttle settings. Additionally, you can increase the throttle setting by one "notch" by pressing the **+/=** key and can decrease it one "notch" by pressing the **_/-** key.

The **ailerons** are used to control the *roll* of the aircraft along it's center line axis. Pushing left on the joystick will cause the plane to roll to the left and pushing the joystick to the right causes the aircraft to roll to the right. If you hold the joystick down, the aircraft will continue to roll in that direction. If you let up on the joystick, the roll will stop and the aircraft will remain in whatever attitude it was when the rolling stopped.

The **elevators** control the *pitch* of the aircraft along an axis parallel to the plane's wings. When you are flying right-side up with the wings parallel to the ground, pulling back on the stick will cause the plane's nose to pitch upward and pushing forward will cause the nose to pitch down.

The **rudder** controls the aircraft's *yaw* along an axis placed vertically through the plane. Applying left rudder causes the

planes nose to slide horizontally to the left until it starts to roll in that direction and applying right rudder causes the same reaction, but to the right. The rudder is used mainly to offset a natural yaw to one side or another caused by the engine's torque or by gravity when rolled to one side or another. Note that if you do not have a joystick rudder control, you can use the keyboard equivalents.

Although the rudder can slide the aircraft's nose to the left or right, that is not the way to turn your aircraft. Turning is a two step process. First, roll your aircraft in the direction you want to turn until the wings are banked at about a 45 degree angle to the ground. Next, pull back on the stick and the aircraft will turn in the desired direction. Pulling back slightly will cause you to conduct a shallow turn while pulling back hard will tighten the turn's radius. Similarly, rolling so that the wings are perpendicular to the ground will tighten the turning radius, however, with the wings vertical to the ground, there is no *lift* and your plane will rapidly lose altitude.

Now, let's put this all together and give it a try! Press the **pause** key to restart the action. Use the joystick to try to keep your nose pointed at the enemy aircraft. If you get disoriented with the slewable view, something that is easy to do when learning the system, switch to a fixed view by pressing forward on the hat. Concentrate on learning to control your aircraft and trying to follow the enemy plane, adjusting your throttle to keep from overshooting the target.

Tip: Make gentle movements with the joystick. It is very easy to overcompensate to the point where your plane is gyrating wildly around the sky. All of those sudden movements cause you to lose airspeed and can tear your wings off if they are poorly designed or weakened by combat damage.

FIGHTING THE ENEMY

Now that you are pointing your nose at the enemy plane, pull the trigger and watch where the bullets go. You've got unlimited ammunition and cannot jam your guns, so just hold the trigger down and adjust your aim until your bullets are hitting the enemy plane.

Practice keeping your bullet stream on the enemy plane while flying your aircraft. Try not to run into the enemy plane. It won't

hurt you for now because we've got collisions turned off, but you don't want to get in front of the target and get shot at yourself!

The purpose of the *Fly Now* missions is to give you a steady stream of enemy planes to fight. By default, a new plane is spawned every 5 minutes. When you shoot down the enemy plane, use the **E** key to check for the presence of other enemies. If there are none, start climbing!

> *Tip: Altitude is your best friend in combat. It gives you room to maneuver without fear of running into the ground and the freedom to dive your way out of a fight. You can trade altitude for airspeed when diving on an enemy and then trade the airspeed back into altitude.*

Practice shooting enemy planes. Watch out for the planes with tail gunners and try to approach them from behind and below or from an angle. Watch out for the ground, too! You can lose a lot of altitude in combat and wind up catching a wing on a tree if you're not careful.

EXITING THE COCKPIT

Press the **ESC** key and the *Exit Game* menu will appear giving you several options:

End Mission – ends the current mission right now.

Abort Mission – cancels the current mission, ending it without saving any results.

Restart Mission – restarts the current mission from the beginning.

Return To Sim – clears the menu and allows you to continue flying.

If you crashed during your flight, the same menu will appear, but without the "Return To Sim" option. Click the **End Mission** button to return to the Main Menu.

Each time you return from a mission, you will be given a mission debriefing that details what you accomplished during your flight. The first part of the debriefing is a map that shows your flight path and the events that occurred during the mission. Pressing the **Enter** key continues the display to the next event. Pressing

Esc ends the map portion of the debriefing and goes to the mission summary screen. Press **Esc** to continue.

The blackboard portion of the debriefing provides a summary of the entire flight, telling you how many planes you shot down as well as your own fate.

The **Replay** button restarts the debriefing by returning to the map display. Click the **Done** button to return to the *Main Menu*.

SUMMARY

In this lesson we learned how to start and end a *Fly Now* game, how to use both the fixed and slewable cockpit views, and how to use the **E** key to locate enemy aircraft. We also learned how to use the controls to fly the aircraft and how to use the aircraft as a weapon to down enemy planes. You should repeat this lesson until you are comfortable with each of these concepts and can control your aircraft with some degree of confidence.

For more detailed information about how to fly your aircraft, check out the *Flight Reference* and *Flight Maneuvers* sections in the *Historical Section* of this manual. The *Battle Tactics of the Great War* section contains a more comprehensive outline of good aerial combat tactics, including the famous *Boelcke's Dicta*, a set of rules for fighter pilots that is as relevant today as it was in 1916.

TUTORIAL 2: CHANGING PREFERENCES

In this lesson, we will learn the following:

1. *How to change the default settings for Fly Now missions.*
2. *Changing the game's difficulty with the Realism Settings.*
3. *Adjusting the game's sound levels before flight.*
4. *Optimizing game performance with the Graphics Settings before flight.*
5. *Adjusting sound and graphics settings in-flight.*

HOW TO CHANGE THE DEFAULT SETTINGS FOR FLY NOW MISSIONS

In the first tutorial, you flew a Nieuport 28 against a random variety of plane types, but one of the best features of *Red Baron 3-D* is that you can choose to fly over 20 different planes. Let's look at the *Fly Now* preferences and learn how you can change them.

From the *Main Menu*, click the **Preferences** button, which takes you to the *Preferences* menu. Click the button labeled **Fly Now Setting** to reveal a screen with seven different settings that control the composition of *Fly Now* missions.

Locate the box labeled **Player's Plane**. The top section of the box has the words *Nieuport 28*, indicating the current selection. Directly beneath the current selection is a list of the different plane types you can choose to fly. Clicking the up or down arrows to the left of the plane list causes the list to scroll up or down.

The plane list is sorted into *German* and *Allied* planes which are listed alphabetically. It also contains an entry labeled *Random*, which if selected, will randomly choose one of the plane types for you to fly whenever a *Fly Now* mission is generated.

Scroll the **Player's Plane** list until the **Fokker Dr.I** entry is visible. Click the **Fokker Dr.I** label and note that it changes from white to gold text. Click the **Select** button at the bottom of the box and the words *Nieuport 28* are replaced by the words *Fokker Dr.I* in the current selection box.

Immediately to the right of the *Player's Plane* box is a similar box labeled **Enemy's Plane** with the word *Random* in the current selection box. If you scroll through the list of planes in this box, you will notice that there are several plane types that are not in the *Player's Plane* list. These other plane types are bombers and reconnaissance aircraft, which you cannot fly.

Scroll the **Enemy's Plane** list until you locate the **Handley-Page 0/400** type, click it to highlight it, then click the **Select** button to make it the current selection.

The next box to the right is labeled **Weather,** which allows you to set the sky conditions for your *Fly Now* mission. With *Clear* skies, you can locate enemy planes at a greater distance while *Stormy* conditions severely reduce visibility. It should be set to **Clear** by default, which is the easiest to learn with, so let's leave it there for now.

Directly beneath the *Weather* box is the **Season** box. The selected season affects the color of the ground as seen from the air. This can have a significant effect on your ability to spot enemy planes. For example, most of the *Nieuport* models feature a white paint scheme, which is difficult to spot from a higher altitude during winter when the ground is covered in snow. However, in summer, the white plane stands out against the green trees and fields. In general, **Spring** or **Summer** gives the best visibility against the ground, so click the box next to the one you want to try.

The first box on the bottom row, labeled **Enemy AI Level**, allows you to control the quality of enemy pilots you come up against in *Fly Now* missions. Clicking the up or down arrows changes the current setting. You can set it so that all enemy pilots are **Novice**, **Junior**, **Veteran**, **Ace**, or **Elite** quality or you can set it to **Random** so that each enemy plane will be flown by a pilot of one of the above ability levels chosen at random. For now, leave it at **Random**.

The next box is labeled **New Enemy Activated** and is currently set to 5:00 minutes. This means that every 5 minutes of game time a new enemy plane is generated within visual range of your aircraft. You can change the interval to between 1 and 10 minutes or can set it to **No Enemies**, which allows you to fly around without fear of being shot down. Use the arrows to the left of the box to change the interval from 5:00 minutes to 2:00 minutes.

The last box is labeled **Time Of Day** and can be set to any hour of the day or night, from 00:00 to 23:00 hours. The time of day affects the lighting conditions as well as the placement of the sun in the game. With *Sun Glare* turned on, the placement of the sun in the sky can have extreme tactical significance. Use the up and down arrows in the box to set the time to **12:00**, which should place the sun directly overhead.

If you click the **Cancel** button, all changes are thrown away and you are returned to the *Preferences* menu.

Clicking the **Fly Now** button saves all changes and starts a *Fly Now* mission with the currently displayed settings.

For now, click the **OK** button to save all changes and return to the *Preferences* menu.

CHANGING THE GAME S DIFFICULTY WITH THE REALISM SETTINGS

No matter how much experience you have playing combat flight simulations, *Red Baron 3-D* is designed to be fun and challenging. By adjusting the *realism settings*, you can make the game easy enough so that you can be successful, but not so easy that it isn't fun.

Click the **Realism Setting** button. A box labeled **Realism Settings** appears in the center of the screen with a slider and three buttons.

The slider serves as both an indicator of overall game difficulty as well as a way of quickly increasing or decreasing the difficulty. The slider should be somewhere near the *low* setting.

To position the slider, simply point to where you want it and click. You can also drag the slider to the left or right by clicking the slider and holding the mouse button down while moving the mouse back and forth.

The **OK** button saves your changes and clears the box from the screen while the **Cancel** button clears the box without saving the changes. By the way, OK and Cancel work the same everywhere, so we can save time and space by not mentioning them again throughout the rest of the tutorial, unless you need to click one or the other for some reason.

The problem with using the slider to adjust the game's difficulty is that it doesn't give you any control over which settings get turned on or off, so it is really only useful if you want to move the difficulty to the either the minimum or maximum level.

Click the **Realism Options** button and the screen changes to show all of the individual options you can adjust. The **Score Modifier** in the 3rd row of options shows you a numerical evaluation of the overall game difficulty. In general, 100% is considered to be "realistic" with anything less than that being considered "easier" and anything over 100% being more difficult than "real".

Tip: Don't let yourself get intimidated by this number and think that you have to play the game at a certain level. The game is designed to be fun, so give yourself a challenge, but don't feel like you have to make it too hard just because of an arbitrary label.

There are 11 different realism categories you can control to adjust the game to your liking. Starting on the top row, the options are:

Vulnerability – when vulnerability is turned **on**, your plane can be damaged and you can be wounded by enemy fire. Turning it **off** means that your plane cannot be damaged and you cannot be wounded, even if you fly directly into the ground at full speed.

Ordnance – when set to **limited**, you only have 500 rounds of machine gun ammunition per gun, and a limited number of bombs or rockets, if the mission calls for them.

Fuel – when your fuel supply is **limited** you are subject to running out of fuel on particularly long missions or if your fuel tank is holed by enemy fire.

G-Force Effects – when turned **on**, your aircraft is subject to the effects of both positive and negative G-Forces. Negative G-Forces usually occur when, from level flight, you push forward on the control stick. This can cause your engine to cut momentarily which can have a significant effect in combat. Positive G-Forces usually occur when your airplane is diving and you pull back suddenly on the control stick in an effort to level it out. The forces generated in this maneuver can be enough to rip the wings off your plane, especially if they are poorly designed or have been weakened by combat damage.

Tip: Whenever you hear a "creaking" noise during maneuvering, you should know that you are inflicting permanent damage on your aircraft's structure which may result in a structural failure later in the flight. You should always try to avoid performing maneuvers which will damage your aircraft.

Collisions – when turned **on**, running into another aircraft will result in a crash and the probable destruction of both planes. Turning collisions **off**, allows you to fly through other aircraft without crashing.

Sun Glare – when turned **on**, the glare caused by looking directly at the sun reduces your visibility to the point where you may lose sight of enemy aircraft.

Gun Jams – World War I machine guns were temperamental and prone to jamming if they were fired while under excessive G-Forces or for prolonged periods of time. Turning Gun Jams **off**, allows you to shoot without fear of having your guns jam.

Tip: When firing your guns, squeeze off quick, short bursts. This not only helps prevent jamming, but also conserves your very limited supply of ammunition.

Flight Model – *Red Baron 3-D* allows you to choose among three different flight models, which provide increased levels of difficulty and realism.

The **Easy** flight model classifies all planes as one of three generic types: slow, medium, and fast. This is more of an "arcade" style of flight that is very forgiving and a good starting point for beginners.

The **Intermediate** flight model uses the individual performance variations for each aircraft type, but the planes have all been given additional engine power and they are more forgiving in that it is more difficult to get into a stall or spin.

The **Authentic** flight model is a much more realistic model and as such is very unforgiving. Accelerated stalls, spins, torque and gyroscopic effects all act on your plane during flight. Additionally, combat damage can severely affect the performance of your aircraft to the point where it is nearly impossible to maintain level flight. Becoming adept at controlling your aircraft with the authentic flight model requires many hours of practice.

Enemy Skill Factor – controlled by a slider, you can set the overall ability levels of all enemy pilots, regardless of their quality level (Novice, Ace, etc.). Setting the slider to **Min** makes all enemy pilots perform worse than normal, whereas setting the slider to **Max** makes enemy pilots perform better than normal.

Torque Effects – torque and gyroscopic effects are caused by the mass of the engine parts turning in one direction and tend to cause the aircraft to roll one way or another. Torque effects are most notable at low speed and high throttle settings, conditions that are prevalent at take-off and during stalls. This option is only available with the *Authentic* flight model enabled. Turning Torque Effects **off**, reduces your chances of getting into an unrecoverable spin.

Note: torque effects tend to resemble joystick calibration problems.

Instruments – the aircraft instruments available during World War I were very primitive when compared to the instruments available today. Using **Authentic** instruments limits you to those instruments which were available at the time while the **Balanced** set introduces the more common modern instruments such as an airspeed indicator and a fuel gauge.

When you are done setting the difficulty to your liking, click the **OK** button to save your changes and return to the *Preferences* menu.

ADJUSTING THE GAME S SOUND LEVELS BEFORE FLIGHT

Click the **Sound Setting** button and a box appears in the center of the screen with three vertical sliders labeled *Shell Music*, *Shell Sounds*, and *Sim Sounds*. Directly underneath each slider is a check box labeled *Mute*.

The sliders allow you to adjust the sound level while mute allows you to turn off all sounds of that type.

Shell Music is the music that plays when you are not actually in the sim.

Shell Sounds are the "clicks" you hear whenever you click a button.

Sim Sounds are the engine, machine gun, and other sounds that are heard when you are in the cockpit.

When you are done adjusting the sounds to your liking, click the **OK** button to return to the *Preferences* menu.

OPTIMIZING GAME PERFORMANCE WITH THE GRAPHICS SETTINGS BEFORE FLIGHT

Red Baron 3-D is designed to run with a smooth frame-rate on both older and slower computer systems as well as those that are on the bleeding edge of technology. By adjusting the level of graphical detail, you can control the frame-rate of the game so that it runs smoothly on your system.

Click the **Graphic Setting** button and a box similar to the *Realism Settings* box appears in the middle of the screen. As with the *Realism Settings*, you can quickly adjust the level of graphical detail by moving the slider to the left or right.

To get to the more detailed graphics settings, click the **Graphic Options** button at the bottom of the box, revealing a screen with 15 different options you can adjust or control. Starting in the upper left corner, the options are:

Object Detail – determines the distance at which ground objects are drawn in detail. When set to **Far**, ground objects will be rendered in full detail at the edge of your visibility range, which slows down the frame-rate, whereas if set to **Near**, objects are not fully detailed until you are quite close to them.

Aircraft Detail – determines the distance at which other aircraft are rendered in full detail. As with the *Object Detail* setting, the selected distance affects the game's frame-rate. However, the distance at which other planes are drawn also affects the distance at which you can identify them and gauge their heading and intent. In general, it is much better to reduce ground detail instead of reducing aircraft detail because the ground detail rarely affects combat.

Object Density – determines the number of ground objects that are drawn. A **High** number of ground objects looks more realistic but can severely decrease the game's frame-

rate.

Shadows – when turned **on**, all airplanes and buildings generate shadows based on the sun's position in the sky. Although the shadow serves as a useful tool in helping gauge your altitude above the ground, it severely impacts the game's frame-rate and should be one of the first details you turn off when trying to speed up game play.

Props – when turned **on**, your plane's propeller is drawn during flight, obscuring your view through the prop animation. Turning it **off**, increases the game's frame-rate.

Combat Detail – when set to **faster**, non-essential graphics, such as building textures and clouds, are removed whenever you are in combat. This helps offset the natural reduction in the game's frame-rate, which occurs when a large number of aircraft are being drawn.

Max Detail – all objects in the game, including buildings and aircraft, are rendered at two levels of detail. When this option is turned **on**, the higher detail level setting is used for all objects and when set to **off**, the less detailed objects are used, which can increase the frame-frate. Note that when max detail is on, aircraft control surfaces will move when viewed from outside the cockpit.

Pixel Size – determines which set of terrain "tiles" is used when rendering the terrain. The **Large** pixels option uses a fewer number of less detailed "tiles", which can give the ground a more "tiled" appearance, but improves the game's frame-rate. The **Small** option uses more "tiles" or greater detail, making the changes in terrain appear more smooth, at the expense of a slower frame-rate.

Terrain Range – determines the distance at which the terrain polygons are drawn, with anything beyond that distance being obscured by a "fog" effect.

Terrain Detail – determines the distance at which the terrain polygons are filled with the terrain textures. If you don't want to see polygon looking terrain, you should have this set as far or farther than you have the *Terrain Range* set.

Graphics – *Red Baron 3-D* is capable of being run with software or hardware rendering.

Setting the graphics to **Windowed** means that the game is software rendered within a window on your desktop. This is the slowest method and should only be

used on the fastest computer systems.

The **DirectDraw™** option is still software rendered, but is a bit faster because the game occupies the full screen.

The **Glide** option is only available if you have a 3dfx-based 3D accelerator with the Glide 2.43 (or higher) drivers installed. This full-screen option gives the fastest frame-rates available in the game. Note that Voodoo2™ cards require version 2.51 or higher.

Terrain Textures – determines how much processor time is put into smoothing out the edges of the terrain textures. The **Smooth** option causes the hardware to blur the edges between terrain textures. If you are using the *Glide* driver, this is the only option available.

The **Normal** option allows the terrain textures to be drawn without any modification, which tends to increase the frame-rate.

When you select **None**, terrain textures are not applied to the terrain surface, leaving the world with a flat-shaded, polygonal appearance. This will result in the fastest frame-rates of the three options.

Aircraft Textures – each squadron and Ace in the game has a unique paint scheme for their aircraft. However, all the additional paint schemes can take up valuable memory space and slow down the frame-rate. The **Default** option allows only a single paint scheme for each aircraft model whereas the **Custom** option allows for multiple paint schemes for each aircraft type.

Clouds – the presentation of clouds and "scud" layers significantly reduces the frame-rate on slower machines. As such, clouds can be turned **off** in order to improve the frame-rate. This feature has the largest effect on frame-rates.

Resolution – when the *Graphics* option is set to *Windowed*, this controls the size of the window, otherwise it controls the resolution used in the full-screen mode. In general, you will obtain faster frame-rates by using a lower resolution.

When you are finished adjusting the graphics options, click the **OK** button to save your changes and return to the *Preferences* menu.

ADJUSTING SOUND AND GRAPHICS SETTINGS IN-FLIGHT

Adjusting the graphics options before flight is useful, but it would be far too cumbersome to require you to return to the shell every time you wanted to make a change to the graphics settings, so these options are also available when you are in the cockpit.

Click the **Main Menu** button to return to the *Main Menu*, then click the **Fly Now** button to get back into the cockpit. As soon as you get into the game, press the **pause** key to halt the action.

Position the mouse cursor anywhere on screen and click the **right** mouse button. A gray menu with five buttons appears in the middle of the screen.

Click the **Sounds...** button to get to the *Sound Preferences* controls. You can adjust the sound volume or can mute the volume here. After you are happy with the sound level, click the **OK** button to return to the cockpit. Each time you clear one of the screens of the *In-Flight Preferences* menu, the entire menu is cleared and you will need to right-click again to bring it back up.

Right-click the screen, then click the **Terrain...** button. Note that you can set the *Terrain Range* and *Terrain Detail*, as described in the section above. Additionally, you can set the *Cloud Detail* to **Haze only** or can display the full **Top layer**. Click **OK** to clear the screen.

Right-click the screen, then click the **Object...** button. This screen allows you to set the *Object Detail*, *Aircraft Detail*, and *Object Density* levels, as described above. Additionally, you can enable or disable the *Max Detail*, *Prop Animations*, *Ground Shadows*, and *Combat Detail* settings, with the same effects as mentioned previously. Click the **OK** button to clear the screen.

Right-click the screen, then click the **Screen...** button. This control allows you to set the screen resolution as described above. Click **OK** to clear the screen.

Now that you are in the cockpit, go ahead and press the **pause** key again to resume the action. You should be in a Fokker Dr.I, the famous triplane flown by the Red Baron himself. You should be flying against a series of Handley-Page 0/400's, an early heavy bomber bristling with defensive guns. You have unlimited ammunition, so see how many you can shoot down before you crash or get shot down yourself.

When you are finished playing, exit the using the methods you learned in the first tutorial.

SUMMARY

In this lesson, we learned where all the preference controls are located, how to change them, and what each one does to the game. By experimenting with the controls, you should be able to set the game to a point where it runs smoothly and is fun and challenging to play.

TUTORIAL 3: FLYING SINGLE MISSIONS

In this lesson, we will learn the following techniques:

1. *How to select a Single Mission*
2. *How to delete a Single Mission*
3. *Viewing the pre-flight briefing*
4. *How to take-off from your aerodrome*
5. *Using the automatic pilot and time compression systems*
6. *Using the external view system*
7. *Navigating with the in-flight map*
8. *How to land at your aerodrome*

HOW TO SELECT A SINGLE MISSION

From the *Main Menu* click the **Single Mission** button. At the bottom of the *Single Mission* screen is a summary box which shows you the details of the currently selected mission. By default, it is the *Ace 1* mission where you have been challenged by Manfred von Richthofen.

Click the **Select Mission** button and a box will appear in the middle of the screen. At the top of the box is an area labeled *Mission Comments*, which displays the same mission summary that was at the bottom of the *Single Mission* screen. Directly underneath the *Mission Comments* is a list of the single missions which are available on your system.

A scroll-bar to the left of the missions list allows you to scroll through the pages of missions until you locate the one you want to fly. Each mission is identified by a *Filename*, a *Type*, and the *Squadron* you will be flying for in that mission.

Scroll through the list until you locate the mission called **TUTOR1**. Click the filename to highlight the mission and notice that the *Mission Comments* changes to reflect the contents of the highlighted mission. Click the **Select** button at the bottom of the list to select the Tutor1 mission.

HOW TO DELETE A SINGLE MISSION

Click the **Select Mission** button to get the missions list. Scroll through the list until you find the **DELETEME** mission. Click on the filename to highlight it.

Click the **Delete** button and a confirmation box appears which will ask you if you really want to delete the mission, in case you clicked the button by mistake. In this case, we do want to delete the mission, so click the **Yes** button.

Scroll through the missions list and note that the *DELETEME* mission is gone. Click the **Cancel** button to clear the missions list and return to the *Single Mission* screen.

VIEWING THE PRE-FLIGHT BRIEFING

Click the **View Briefing** button. The screen changes to show a chalk board with a series of map rings at the top. The chalk board will tell you that you are part of the 94th Aero Fighter Squadron and that the date is June 1, 1918.

Your mission is a Combat Air Patrol over the bridge which is about 4 kilometers from your airfield. You will take off at 10:04 and you will be flying a Nieuport 28.

Click the **Continue** button and the mission's *Navigation Chart* is shown on the right side of the chalk board while the left side lists the details of each of your waypoints. Your first waypoint is your airfield where you take off, so it isn't listed here.

The second waypoint is the target bridge. You are scheduled to arrive at the bridge at 10:06 at an altitude of 609 meters (about 2000 feet). The third waypoint is your home aerodrome again, which you should reach by 10:08, again at an altitude of 609 meters.

Click the **Continue** button and the page changes to show the formation you should use on the way to the target. Since you are the only plane in the flight, all the other planes in the standard *Echelon Right* formation have been X'd out. For more information on the various flight formations, check out the *Flight Formations* reference , pages **98** to **106** of the historical section of this book.

Click the **Continue** button and the page changes to show the formation you should use at the target. In most cases, the formations are the same for both the *Enroute* and *Target* formations, as they are here.

Click the **Continue** button and the page changes to show a reconnaissance photograph of the target bridge. Note the dip in the north side of the river, just to the west of the bridge. The recon photos will reflect the actual terrain characteristics found in the game.

Click the **Done** button to return to the *Single Mission* screen.

HOW TO TAKE-OFF FROM YOUR AERODROME

Click the **Fly Mission** button to start the mission and pretty soon you will find yourself in the cockpit with the engine off. At the top of the screen you should see the words "You may take off now". As the flight leader in the mission, not to mention the only plane, you are cleared for take-off as soon as you get into the cockpit. If you are part of a larger formation, you might have to wait for the planes in front of you to take-off before you will be given take-off clearance.

Before we take-off, let's get our bearings. Right now, all we have in front of us is blue sky. Use your fixed and slewable cockpit views to look around. You'll see that you are parked out on the runway of your aerodrome.

Once you're done looking around, go back to a forward view. The first thing we need to do is to start the engine. Position the throttle at about 10-20% of its movement, or press the **2** key to get the throttle set to just above idle. Now, press the **TAB** key on the keyboard to start the engine. If the engine sounds like it is trying to start but doesn't want to catch, give it a bit more throttle.

Once the engine is started, the plane will start to slowly roll forward. As it rolls forward over the slightly uneven ground, the plane will start to shake. You should also be able to hear the sound of the tail-skid scraping against the ground. Now, increase the throttle to 100% and the plane will start to move much faster.

The Nieuport 28 is a very stable aircraft and it will almost take-off by itself. Pretty soon, the nose of the plane should level out and you will hear the sound of the wheels start to cut out as your plane gets a little air. Gently pull back on the stick until the horizon is just above the bottom of the screen. This will put you in a very shallow, high-speed climb. Climb for about 15-20 seconds, then press the **pause** key to halt the action.

Tip: Some aircraft will not generate enough speed to level out the nose during the take-off run. To get enough speed to take off, you must carefully push the nose forward until the tail skid comes off the ground and your airspeed builds to the point you can lift off the ground.

Congratulations! You have successfully taken off from your aerodrome!

USING THE AUTOMATIC PILOT AND TIME COMPRESSION SYSTEMS

Red Baron 3-D provides three different automatic pilot systems to help you fly your aircraft.

The most comprehensive autopilot system is known as the *Full* autopilot and is activated by holding down the **CTRL** key and pressing the **A** key on the keyboard. The *Full* autopilot is capable of taking off, climbing to altitude, engaging in combat, and landing at your home aerodrome, all without any direction from you. In other words, the *Full* autopilot system is the same as assigning a computer pilot to fly your plane for you.

The next autopilot system is known as the *Navigation* autopilot and is activated by holding down the **ALT** key while pressing the **A** key on the keyboard. As the name implies, the *Navigation* autopilot will navigate your plane to each of the assigned waypoints, including changing to assigned altitudes. It will not engage in any combat, however.

The last autopilot system is known as the *Level* autopilot and all it does is keep your aircraft flying straight and level. Which can be useful when you find yourself far from your assigned flight path and need to fly a long way home. The *Level* autopilot system is engaged by holding down the **SHIFT** key while pressing the **A** key.

You can disengage any of the autopilot systems by pressing the **A** key, without any of the shifted states (CTRL, ALT, or SHIFT). You can switch to another autopilot system simply by selecting the new autopilot type, without the need to disable the existing autopilot system.

For now, let's just go with the *Full* autopilot system. Press the **pause** key to resume the action and then hold down the **CTRL** key and press **A**. At the top of the screen, you will see the words "Full autopilot enabled". Note that you cannot control the throttle or other aircraft controls as long as the autopilot is engaged.

There are two basic uses for the autopilot systems. Because so much energy and attention is put into simply keeping your aircraft flying straight and level, you don't have much time to put into scanning the skies for enemy aircraft. By engaging one of the autopilot systems, you don't need to worry about controlling the aircraft and can spend your time looking for the enemy.

The second reason for the autopilot system is to allow for a *time compression* system. Due to the long distances that can be

covered, it can take quite some time to get into some action, which is what the game is all about in the first place!

The time compression feature allows you to run at 2x, 4x, 8x, or 16x the normal speed. Pressing the] key will speed the game up one notch and pressing the [key will slow it down a notch. Pressing the \ key will instantly turn off time compression without having to step back down to normal time.

Tip: Never engage time compression without first engaging one of the autopilot systems. You will be unable to effectively control your aircraft and will end up crashing.

There are three events that will automatically disable time compression. The first is the presence of enemy planes. Whenever the game detects enemy planes /close to your aircraft, time compression is disabled. The second is when you disengage the autopilot system to resume manual flight. Time compression is automatically disabled to keep you from crashing. The third is when your aircraft is cleared to land.

Tip: You cannot engage time compression if there are enemy planes in the area, so you can use time compression as an early warning device.

Engage the *Level* autopilot by holding down the **SHIFT** key while pressing the **A** key so that we can play with time compression without ending the mission. Now, press the] key once to engage time compression. Note how a *2x* indicator appears in the upper right hand corner of the screen. This indicator will remain on-screen as long as you are in time compression.

Press] several more times and note how the time compression indicator doubles the speed of the game each time the] key is pressed. Now, try pressing the [key and note how the game slows down to half the speed it was previously. Now press the \ key and note how time compression is disabled.

USING THE EXTERNAL VIEW SYSTEM

If you are still flying, press **ESC** to get the exit menu and choose **Restart**. If you are already on the ground, the menu should already be displayed.

Once you get into the cockpit, take off, gain some altitude, then press **CTRL+A** to engage the *Full* autopilot. Let your plane gain altitude until it levels out, then engage the *Level* autopilot so that we can look at a the external view system without pausing the game.

Press the **F5** key on the keyboard and note that you are now looking directly at the tail of your plane. This is known as the *Chase Plane* view. Because the view is fixed to this external location, it is actually a good alternate view for controlling your aircraft.

Now, press **F4**. You probably won't see anything happen right away, but if you hold down the **Camera Rotate** button on the joystick and move the stick around, you will note that you can pan the camera to any position around your aircraft and can view in any direction. This is known as the *External Camera* view.

Tip: When patrolling the front looking for enemies, the External Camera view is probably the most useful view in the game. The **E** *key will still locate enemies for you and you can freely pan in any direction.*

The **F6** and **F7** keys provide some entertaining, but less useful views. **F6** is called the *Delayed Chase Plane* view. Try it out to see how it differs from the *Chase Plane* view. **F7** is called the *Fly-By* view and is more of a cinematic view than a combat one.

The last two views are enabled with the **F3** and **F8** keys. **F3** is known as the *External Slewable* view the same as using the **F4** view and selecting an enemy with the **E** key. **F8** is very similar except that it looks at *your* airplane from the perspective of the target. Appropriately enough, **F8** is known as the *Target* view.

NAVIGATING WITH THE IN-FLIGHT MAP

If you've been following the tutorial, you have probably passed the target bridge long ago and may even be out over the Channel. One way to find out where you are is to look at your in-flight map.

Make sure that the **Num Lock** light is on and press the **0** key on the numeric pad. Note that the view changes to show part of a flight map with your path drawn in yellow and red and that a small yellow airplane marks your actual location.

The in-flight map only covers a limited area so it is easy to fly off the edge of the map. If that is the case, you will see a small

white chevron at the edge of the map pointing to your location. The in-flight map is always oriented so that North is up.

The symbols on the map represent the major terrain features. The maps on page **119-123** of the historical section has a symbol legends to help you match what you see on the ground with what you see on the map.

To get back to the standard view, push forward on the hat or press the **0** key on the keypad again.

HOW TO LAND AT YOUR AERODROME

Ok, let's put it all together now and fly this mission for real. Restart the mission, start your engine, and take off.

Once you are airborne climb until you are at about 600 meters altitude. Check your compass and turn until you are headed north.

Use your external and internal views to locate the bridge. It is only about 2 kilometers away, so you should have no problem spotting it.

Fly your aircraft until you fly over the bridge. This will satisfy your mission requirements.

Now, turn your plane around and fly south toward your airfield. As you approach the airfield, engage the *Full* autopilot. One of the best ways to learn how to land is to actually see it done, so go ahead and let the autopilot land your plane. As it is landing you plane, note the approach angle and airspeed. Note how the autopilot uses the throttle to maintain speed.

After the plane stops, restart the mission, fly to the bridge and turn south towards your airfield. As you approach your field, chop your throttle to about 50-60% and lose altitude until you are at about 50 meters. Your airfield is oriented east to west, so circle around the west side of the field and then fly east, parallel to the field, about 100 meters south of the buildings.

After you pass the end of the field, bank to the left and slowly turn your aircraft so that it is headed west and lined up with the middle of the runway. If you aren't lined up, level out and continue to fly west until you pass the end of the field, then bank to the left and turn around for another try at it. Keep trying until you have it lined up.

Tip: Often times, your aircraft will obscure your vision, making it very difficult to see the runway on your approach.

*Pressing **ALT-T** (in Glide mode only) makes your aircraft translucent, allowing you to see the runway without having to change your plane's attitude.*

Now that you are lined up with the airfield and headed west, chop your throttle to about 30% and lose altitude until you drop down onto the end of the runway. When you touch down, chop the throttle to idle and then coast to a stop.

Most likely, your first few attempts at landing will end up with the ambulance rushing out onto the field to pick through the pieces of your crashed plane. Don't worry about it. With time and practice, you will get it down until becomes second nature!

*Tip: You do not have to land your aircraft to successfully complete your mission! When you get within sight of your airfield, press **ESC** to get the exit menu and choose **End Mission**. You will be returned to your squadron with no penalty of any kind!*

SUMMARY

In this lesson we learned how to select and fly a *Single Mission*. We also learned how to delete unwanted missions from the hard drive using the **Delete** button on the missions list. We learned about the pre-flight mission briefing and learned how to check out the flight path and reconnaissance photo.

Once in the cockpit, we learned how to start the engine and take off, as well as some of the restrictions that would be in place if you were part of a larger flight. We learned about the *Full*, *Navigation*, and *Level* autopilot systems and how to disengage the autopilot by pressing the **A** key.

We learned how to engage the time compression system and how to disengage it incrementally or all at one once. We discussed the external view system and checked out how the *External Camera* view allows you to view the entire sky around your aircraft by *flying* the camera around your plane.

We checked out the in-flight map and how to orient yourself with the flight path and aircraft symbol. We also discussed what to do if you find yourself off the edge of the map. Finally, we watched the autopilot land the plane and gave it a few tries. Most importantly, we learned that you don't have to land your aircraft to successfully complete missions!

TUTORIAL 4: THE CAMPAIGN GAME

In this lesson, we will learn the following techniques:

1. *How to create a new pilot*
2. *How to load and delete existing pilots*
3. *Reviewing campaign mission briefings*
4. *Viewing campaign reports*
5. *Transferring to another squadron*

HOW TO CREATE A NEW PILOT

One of the central features of *Red Baron 3-D* is the ability to assume the role of a pilot on the Western Front. Your pilot (you) will be assigned to fly for various squadrons alongside famous aces such as Werner Voss or Albert Ball. If you choose to fly the entire span of the war, you will see various new aircraft come into service and will experience first hand the frustration of having to fight in an inferior machine. At other times, you will feel the exhilaration of knowing that you hold a technical advantage over your hapless opponents.

From the *Main Menu* click the **Campaign** button and you will be presented with an empty pilot dossier. The first thing you need to do is to select a *service* to fly with. You may choose to create a British, German, French, or American pilot. Click the **Service** tab, then click the **U.S.** button. Notice that over on the right side of the dossier, the *Current Date*, *Service*, *Rank,* and *Date of Enlistment* fields have been filled in.

Since the Americans did not become officially involved in the war, the default start date for an American pilot is March 1, 1918. However, you may choose to start on an earlier date. Click the **Enlistment Date** tab on the left side of the dossier and you will be given a list of valid start dates. Note that the start dates are all the first day of every month between January 1, 1916 and November 1, 1918.

Locate and click the **January 1, 1917** date to start about a year earlier than normal. A box appears on screen telling you that Americans enlisting before February 16, 1918 will fly for the French air service in the *Lafayette Escadrille*. Click the **Continue** button to accept these terms. Note that the *Current Date*, *Service*, *Rank*, and *Date of Enlistment* fields change from their previous values and that the *Current Squadron*, *Aerodrome*, and *Region*

fields have been filled in.

Click the **Squadrons** tab. Note that as a French pilot, you have a variety of squadrons you can choose to fly with. However, we are creating an American pilot, so we'll stick with our current squadron. Click the **Cancel** button to return to the dossier without making any changes.

Now, click the **Rank** tab. You may choose to start the game at any of the available ranks in the service you have chosen to fly with. At the lowest ranks, you will always be at the tail end of your flight formations and will usually be assigned the older aircraft in service with your squadron. Along with your success in the air, you will be promoted in rank.

At the highest rank, you are considered the squadron commander and can make changes to flight and aircraft assignments, if you wish. Click the **Captaine** button to select the highest French rank and become the commander of the *Lafayette Escadrille*.

Move your mouse cursor over the right side of the dossier. Note that the cursor changes to a white outline when it is moved over the *Service*, *Rank*, *Date of Enlistment*, and *Current Squadron* fields. Clicking your mouse on these fields or pressing the **Enter** key will activate the selection menus the same as if you clicked the corresponding tab on the left side of the dossier.

Click in the field labeled *No Pilot Photo Available* and note that a photo appears in the box. Each click of the mouse on the photo will cycle the picture to the next one in the list. Click through the photos until you find one that you want to represent this pilot.

Now, click the *Last Name* field just underneath the photo and type in the last name of your pilot. Press the **Enter** key when done or click in the *First Name* field and type in your pilot's first name. Click the **Done** button and after a few seconds you will find yourself at the *Campaign* menu.

Congratulation! You have just started a career in the famed *Lafayette Escadrille*.

HOW TO LOAD AND DELETE EXISTING PILOTS

On the *Campaign* menu, click the **New Pilot** button. This gives you the same dossier as you saw in the previous step. Note that the empty dossier page is *Page 2* and that the *Previous* button is now enabled.

Click the **Previous** button and note that the page changes to *Page 1*, which is the one that contains your previously created pilot. Note that the *Next Page* button is now enabled and that *Previous* button is no longer available. If you have more than one pilot on your system, you can switch between them by using the *Previous* and *Next Page* buttons until the pilot's dossier is shown, then clicking the **Done** button.

Deleting an existing pilot is as simple as showing the pilot's dossier, then clicking the **Delete** button.

Select your previously created pilot and click the **Done** button to return to the *Campaign* menu.

REVIEWING CAMPAIGN MISSION BRIEFINGS

Click the **Next Mission** button. Soon you will find yourself looking at the familiar chalkboard describing your mission. Use the techniques learned in previous lessons to view the important data about your upcoming mission, then click the **Done** button to proceed to the *Next Mission* menu.

Click the **Repeat Briefing** button and note that it shows you the same briefing you just got done viewing. If you missed any portion of the briefing, you can review it prior to taking off. Click the **Done** button to return to the *Next Mission* menu.

Although the briefing contains a lot of good information about the upcoming mission, the real meat can be found elsewhere. Click the **View Flight Plan** button. You will see the chalkboard briefly and then a regional map will be displayed with your mission's flight path drawn in red.

Put the mouse cursor anywhere over the map and note that it changes to look like a magnifying class. Position the cursor over the area with your flight path and click the left mouse button once. Note that the map zooms in one level to show more detail. Click the left mouse button once more and note that the view zooms in one final level to show the maximum amount of map detail.

Placing the cursor on the edge will scroll the map in that direction. Click the right mouse button twice and note that the map zooms back out to its original size. Locate the legend in the lower left corner of the map. Note that the cursor changes to a "hand" as you move it over the labels for most of the symbols in the legend. Clicking the symbol or the check box to the left will remove all of those symbols from the map. Clicking it again will

re-enable the display of the selected object type.

You probably cannot help but notice the white mission summary box in the upper left corner of the map. The summary tells you the flight number, takeoff time, the type of mission, the mission's target and distance, how many aircraft are in the flight, and how many waypoints are on the flight path. Additionally, if the displayed flight is the one you are assigned to fly, the summary will show this as being the "Player's Flight".

Click the **Next** button in the bottom right corner of the mission summary. Note that the flight path and the mission details change, assuming your squadron is conducting multiple missions on this day. Each click of the **Next** button changes the summary to show the details for the next flight until it cycles back around to the first flight. The **Prev** button cycles backwards through the list of flights.

Get the summary back to where it shows your flight and then click the **Waypoints** button. The summary box changes to show a list of all the waypoints in your flight path. Note that on the map, one of the waypoints is flashing white and that in the summary, one of the waypoints is outlined in yellow. Click on one of the other waypoints in the list and note that the corresponding waypoint on the map starts to flash white.

Each waypoint in the list includes the major landmark type which corresponds to the selected waypoint, the action to take at the waypoint, the altitude (in meters), and the time of day you should be at the waypoint. To the right of the list are four arrow buttons. The double arrow buttons will take you to the beginning or end of the waypoints list and the single arrows scroll the list up or down one line at a time.

Click on the first waypoint, which should be labeled *Takeoff*. Click the **Add** button and note that a new waypoint was added between the first and second waypoints on the list. The new waypoint is placed on the nearest landmark to the previous waypoint.

Click the new waypoint to highlight it. Now click the **Edit** button and an edit screen appears. When editing waypoints you can change the altitude to fly at enroute to the waypoint, the action to take enroute, the action to take at the waypoint, the flight formation to use enroute, and the flight formation to use at the waypoint. We won't actually change anything at this point, so click the **Cancel** button to return to the waypoints list.

Zoom the map all the way in so that you can see the landmarks and waypoints clearly. Put your mouse cursor over the flashing waypoint mark and note that the cursor changes to a hand. Click and hold down the left mouse button and note that you can drag the waypoint to another landmark, which will be outlined in red. Let go of the mouse button and the waypoint changes to the new location.

In most cases, you will have no need to change waypoints and in this case, we really don't want the new waypoint added to our flight path. Highlight the new waypoint and click the **Delete** button. Note that the new waypoint and the corresponding flight path is removed from the map. Click the **Flights** button to return to the flight summary display.

With all the editing we did on our mission path, it is possible we messed up some of the timings. Click the **Restore Path** button, which is now displayed on the flight summary. This will revert back to the original flight plan.

Click the **Squadron** button and note that the flight summary changes to show a listing of all flights that will be flown by your squadron and that the map shows the flight paths for all flights. Click the **Done** button and the map is rolled back up and you are looking at a chalkboard display showing all of the missions assigned to your squadron, who is assigned to fly each one, and which plane type they will be flying. Note that one of the map rings at the top of the blackboard is colored red, indicating that it is the active map for your flight region. You can redisplay the map by clicking the map ring.

Because you are the squadron commander, you have the authority to change the details of any of the displayed missions. Position the mouse cursor over one of the pilot names assigned to one of the flights and note that a white box appears around the pilot name. Click and hold the left mouse button and drag the pilot's name over the top of another pilot's name in a different flight until a white box appears around the second pilot's name. Now, release the mouse button and note that the two pilots swap their flight assignments.

You can make a flight larger by moving a pilot into the blank spot at the end of each group of pilots. If you have extra pilots not already assigned to a flight, they will be listed at the bottom in the *Available* area.

You can do the same thing with planes. In some cases, your

squadron will be composed of a variety of planes, so you may want to assign a particular plane type to a particular pilot. To do so, simply drag the plane to the desired location and it will swap positions with the plane that is already there.

Click the **Flight** button and note that the chalkboard changes to show the names of the pilots in your flight as well as the ordnance loadout in use for each plane. As the squadron commander, you have the authority to change the ordnance loadout, too. You can enable or disable a particular ordnance type by clicking in the appropriate check box. A check in the box indicates that ordnance type is selected for that pilot's plane. Note that some ordnance types may not be available simply because your aircraft is incapable of using that ordnance.

When you are done reviewing your mission, click the **Done** button in the lower left to return to the *Next Mission* menu. To actually fly the mission, click the **Fly Mission** button. Alternatively, you can return to *Campaign* menu by clicking the **Campaign** button.

Go ahead and click **Fly Mission** to fly your first campaign mission.

VIEWING CAMPAIGN REPORTS

After completing your first mission and finishing the mission debriefing, you will be returned to the *Campaign* menu. Click the **Squadron Ops** button to get to the *Squadron Ops* menu.

Click the **Kill Board** button. The *Kill Board* shows how many enemy aircraft have been downed by members of your squadron, including your pilot. Click **Done** to continue.

Click the **Pilot Dossiers** button. A book opens up to display the squadron name and insignia on the left page and a list of all pilots in the squadron on the right page. Clicking the **Next Page** button turns the page to show the first pilot in the squadron, which should be your pilot. Alternatively, you can click the name of a pilot to go directly to that pilot's dossier. When you are done viewing the dossiers, click the **Done** button to return to the *Squadron Ops* menu.

Click the **Squadron Info** screen and another book opens up to show your squadron name, insignia, location, quality, and a list of historical aces on the left page. The right page lists all the aircraft types assigned to your squadron. Clicking an aircraft name will

take you directly to the page which shows statistics and a three-plane view of the aircraft. Click **Done** when you are finished looking at your squadron's details.

We'll look at the *Transfer* and *Paint Plane* functions later, so click the **Campaign** button to return to the *Campaign* menu.

Click the **Intelligence** button to get to the *Intelligence* menu. Click the **Top Aces** button to view a top 10 listing of the most successful pilots on the western front, sorted by the number of kills. Note that when you play *Red Baron 3-D*, you are changing history. It is entirely possible for an historical pilot to be killed in your campaign before he was killed in the real war. Alternatively, the pilot could live longer than he did in real life and end up with more kills than he really had. This is alternative history.

Click the **Done** button when you are finished looking at the list of top aces. Click the **Ace Dossiers** button to open a book which contains pilot profiles for the historical aces in the game. The right page of the book lists the currently active services. Click the **German** label or the **G** tab to get a listing of all the German aces. Click the name of one of the aces to view his profile. You can also page through the book using the **Next Page** and **Previous** buttons. When you are finished viewing the ace dossiers, click the **Done** button.

Click the **Local Squads** button. The by now familiar book appears listing the available services on the right page. Click the **German** button to get a listing of all the German squadrons operating in the same region of the front as your squadron operates. The book contains the same basic information as is contained in the *Squadron Info* book, but includes all enemy and friendly squadrons in the region. When you are done viewing the squadron details, click the **Done** button.

Click the **Intel Reports** button. You will be taken to the film room where you will be shown a short intelligence film detailing a particular enemy weapon system or other piece of intelligence information. When you are finished viewing the film, click the **Done** button.

Click the **Campaign** button to return to the *Campaign* menu, then click the **Pilot Log** button. This opens up a pilot dossier similar to the one you got when you clicked the *New Pilot* button. You can select an active pilot, create a new one, or delete an existing pilot, just as you can from the *New Pilot* screen. Click the **Done** button to return to the *Campaign* menu.

Click the **Personal Stats** button. This opens up a book that shows you details about your pilot only. Each plane you've shot down is described, along with the date you shot it down. When you are finished looking at your pilot's data, click the **Done** button.

Click the **Medals/Awards** button. The screen changes to show an animation of your medals case opening up to display any medals you may have been awarded. Most likely, it is empty right now, so you need to get busy! Click the **Done** button to return to the *Campaign* menu.

TRANSFERRING TO ANOTHER SQUADRON

If you get bored with a particular region or wish to see a little more of the western front, you can request transfer to another squadron.

From the main *Campaign* menu, click the **Squadron Ops** button and you will be shown a transfer request form. Locate and click on the button labeled **Select** in the bottom section of the form and you will get a list of available squadrons. Highlight the squadron you are interested in.

Click the **Info** button and you will be shown information about the selected squadron. Click the **Done** button when you are done looking at the squadron info.

Now, click the **Locate** button and you will be shown a map of the entire western front with a flashing red outline around the location of the squadron. If you don't see the flashing red right away, it may be obscured by the squadron selection box. You can click the left mouse button on the box and drag it out of the way, if you need to see behind it.

When you are done looking at the map, click either the **Select** or **Done** button to return to the transfer request form.

Finally, once you have decided which squadron you want to be a part of, highlight it in the list and click the **Done** button. The new squadron identification and location will be completed on the transfer request form. Click the **Done** button and your request will be submitted.

Now, fly the next mission. When you return from your mission, you may be informed that your transfer request has been approved. If you've changed your mind about the transfer, click the **Decline** button, otherwise click the **Accept** button and you will be transferred to the new squadron. You will find it easier to

transfer into poorer quality squadrons instead of the elite ones.

SUMMARY

In this lesson, we learned how to create new pilots as well as how to load and delete existing pilots. We learned about the different pre-mission briefing options available in the campaign game and we reviewed all the campaign reports and pilot dossiers, as well. We also learned how to request a transfer to another squadron and that you need to fly a mission while the transfer is being processed.

TUTORIAL 5: FLYING ONLINE

Once you've become familiar with flying single missions and campaigns, it is time to try your hand against the ultimate challenge – other people! In this lesson, we will learn the following:

1. *How to launch the Multiplayer version*
2. *Getting ready to fly online*
2. *How to find on-line games to join*
3. *Multiplayer game types*
4. *Navigating the lobby*
5. *Differences from flying single-player missions*

HOW TO LAUNCH THE MULTIPLAYER VERSION

As with the single player version of the game, there are a couple of different ways of launching the *Red Baron 3-D* multiplayer game.

When *Red Baron 3-D* was installed to your system, a set of program shortcuts was put into a folder in your **Start** menu. To start the game, first make sure the *Red Baron 3-D* CD is in the CD-ROM drive. Next, click the **Start** menu button in the lower left and click the **Programs** folder near the top of the menu.

Next, locate and click on a folder called **Sierra**, then another one called **Red Baron 3-D**. Inside this folder is a shortcut called **Red Baron 3-D Multiplayer**. Click this shortcut to start the multiplayer version of the game.

If you have AUTOPLAY enabled, putting the CD in the drive will display a window with picture of a crewman grabbing the propeller of an airplane and a couple of buttons on the bottom. Click the **Dogfight On WON.NET** button to start the multiplayer version of the game. Note that this option will take your through the WON.NET service, which serves as a substitute for the *Game Finder* described below. This software is being continually updated and is considered to be self-explanatory.

GETTING READY TO FLY ONLINE

*Note: The following instructions assume you are using the **Start** menu game finder and not the WON.NET finder, which is subject to continual improvement and is considered self-explanatory.*

When you first start the multiplayer version of *Red Baron 3-D*, you will be presented with an empty pilot roster and a series of action buttons. Because the demands on your system are different in multiplayer games than in single-player mode, there is a separate set of graphics preferences for multiplayer and single player modes.

Click the **Preferences** button and set the graphic preferences to approximately what you have set up for the single-player game. You can fine-tune the settings from the cockpit in the same way as described in the second tutorial.

> *Tip: You may find that you can play at a higher level of graphical detail in the multiplayer version of the game than you can in the single-player version, because the multiplayer version does not need to perform artificial intelligence calculations, which the single player version needs.*

When you are done setting your graphics preferences, click the **OK** button to return to the pilot roster screen. Before you can fly, you need to create a pilot name that people will know you by. You can have up to fifteen pilots in your roster but can only fly one of them at a time.

Click the **New Pilot** button, type in a name, and press the **Enter** key on the keyboard. Your new pilot should be shown in the pilot roster with zero missions and zero kills. Notice that your pilot name is highlighted in red and that all the buttons are available for selection.

Click somewhere below your pilot's name on the pilot roster and note that your pilot's name is changed to black and the *Connect*, *Solo*, and *Delete Pilot* buttons are no longer available. You must have a pilot selected before you will be allowed to fly, so click on your pilot name again. If you don't like your pilot name, you can delete the selected pilot by clicking the *Delete Pilot* button and confirming the deletion of the pilot.

Finally, clicking the *Solo* button will allow you to practice flying offline without any other aircraft in the sky.

HOW TO FIND ON-LINE GAMES TO JOIN

Now that you have your pilot ready to fly, let's find a game to play. First, you should get connected to the internet using your *Dial-Up Networking* or to by connecting to your local area network. Next, click the **Connect** button.

Once connected, you will find yourself looking at a screen with a list of *Available Games* at the top of the screen, some action buttons in the middle, and a set of connection and game type options listed at the bottom.

When you first get to this screen, your system will look on the network for game servers and will display a list of those servers in the *Available Games* window. Each line in the list of *Available Games* will show you the "name" of the server, it's *ping* time, how many players it currently has in the air versus the maximum number allowed, the game's difficulty level, and the type of game being played on that server.

Tip: If you see an available game that is displayed in gray text (instead of gold or yellow) it means that game is running a version of the software that is newer *than the version you have installed on your system. To play on those servers, you will need the latest update. Note that servers running* older *versions of the software will not be displayed. If you do not see any servers, make sure you are connected to the network.*

The server name is created by the host administrator (the person that runs the server) and is usually descriptive of the type of game being played on that server. The *ping* time is a measure of the quality of the connection between your machine and the server. As the search for available games is being done, your system sends several *pings* down the line to see how long it takes for information to travel to and from the remote server. In general, if you are getting ping times less than 200, you have an *great* connection between the two machines, whereas, if you are getting pings greater than 400, you have only a *fair* connection.

Note: Although you may have a low ping time, other problems, such as line noise or packet loss, can cause the game to be unplayable. If you see the NET indicator regularly while flying, you may want to find a different game with a more reliable connection.

A lock symbol to the left of the server name indicates that the game is password protected.

The *players* entry displays the number of players currently in the air to the left of the slash and the maximum number of players allowed in the game to the right. The maximum number of players allowed in the game is determined by the host administrator. Note that the display of current players in the game only counts those players that are in the air and not those players that are currently in the lobby.

There are three levels of difficulty in the multiplayer games: Novice, Veteran, and Ace. These labels not only help serve as a guide to the quality of opponents you will find in that game, but also determine the accuracy of ground gunners and the difficulty in damaging ground targets.

There are three types of multiplayer games supported in *Red Baron 3-D*: Melee, Team Melee, and Get The Baron. We will describe these in depth in the next section.

If the list of available games is particularly large, you can filter the list using the options at the bottom of the screen:

The *Protocol* option lets you choose whether you are looking for games over the internet or over an IPX or LAN based connection.

The *Quality* option allows you to filter out games that have poor ping times. If you select the *Fair* option, you will be able to see all connections that are considered at least *fair*, whereas choosing *Great* will only display the best connections.

The *Difficulty* option allows you to filter games by the level of difficulty and competition your would expect to find.

The *Description* option allows you to only display the types of games that you want to play.

Tip: You can refresh the games list by changing one or more of the options at the bottom of the screen.

MULTIPLAYER GAME TYPES

As stated earlier, *Red Baron 3-D* supports three different multiplayer game types:

Melee is your basic free-for-all contest. There are no teams and there are no friendlies. Everyone in the game is your target and everyone in the game is targeting you. Survival depends on picking your fights carefully and always ensuring you have an escape route available.

Team Melee is the most configurable of the three games and offers the widest variety of options. Players are divided into *Allied* and *German* teams and planes can be limited to those that were historically available on a particular date. Because you are flying as part of a team, you can be more effective by pre-planning and coordinating your missions with other pilots.

Get The Baron is basically a game of tag, with the *it* character referred to as *The Baron*. When the game starts, there is no *Baron* yet. The first player to shoot down another plane becomes *The Baron* and can start accumulating points by shooting down other planes. A player becomes *The Baron* and can start accumulating points by shooting down the existing *Baron*. The game can be configured to allow up to eight *Barons*, each distinguished by the use of a different, solid color instead of the plane's normal camouflage pattern.

Tip: Although you cannot get points for shooting down non-Baron planes, it may be to your advantage to take out a non-Baron plane.

The specific configuration options for each of the game types is contained in a file called *RB2SERVER.INI*, which can be found in the \SERVER directory on the CD.

NAVIGATING THE LOBBY

Locate a game you want to join and then click the **Join Now** button to get to that game's lobby. The left side of the lobby screen is dominated by the pilot list. If the game is a *Team Melee* type, there are two lists, one for Allied and one for German pilots, otherwise there is a single list of pilot names. If a pilot's name is prefaced by a dash ("-"), that pilot is currently in the lobby. Note that you can place your mouse cursor over a pilot's name and leave it there for a second or two, a picture of the plane type that pilot is

using is displayed.

To the upper right of the pilots list is a window showing the game's *Status*, displaying which of the various options have been enabled for this particular game. The *Region* refers to the map in use in the game and the *Arcade Mode* refers to whether the *Easy* flight model is being used or not. All the other status items are self-explanatory.

The bottom right quarter of the screen contains the *Chat* window. If you click in the blank area beneath the chat window, you can type a line of text to send to all other players in the game.

Across the bottom of the screen is a series of five buttons. If you are playing a *Team Melee* game, the *Change Teams* button allows you to switch between the two teams. If the game is not a team game, the button is unavailable.

The next button to the right is the *Change Aircraft* button. Clicking it will bring up a list of available aircraft to choose from. There are a few details here that are worth mentioning. First, due to texture space requirements, the game can only support a limited number of different aircraft types at one time, without adversely effecting the frame-rate of players using 3D cards equiped with less memory. This is defaulted to four but can be set higher or lower by the host administrator.

Secondly, the host administrator can configure the game to allow only particular aircraft types to be flown or can configure it to disallow certain types in the game. Because of this, the list of planes may be different from game to game.

Between the list of planes and the OK/Cancel button set, there is a small text area labeled *Squadron*. If you click in the blank area to the right of the *Squadron* label, you can type up to three numbers, which serve as a squadron identifier.

The squadron identifier serves three basic purposes in the multiplayer game:

1. One of the chat options is to communicate only with squadron members. Your squadron members are those players on your side (Allied or German) who have entered the same Squadron ID as you.
2. If you refer to the SQUADID.TXT file, found in the main SIERRA\REDBARON3D directory, you will see a list of historical squadrons and their accompanying squadron ID. By inputting one of these ID numbers, you can cause your

aircraft to use the historical camouflage pattern used by that particular squadron.

3. You can create a custom paint scheme, give it a Squadron ID number, and then use it in the game by referring to that ID number. For more information on how to use a custom paint scheme in the multiplayer game, refer to the *Painting Planes in Multiplayer* file, which can be found in the *Custom Paint* Schemes directory in the *Red Baron 3-D* folder of the Start menu.

The *Change Airfields* button changes the screen to show a picture of the map being used in the game. To change airfields, simply click on the *roundel* or *iron cross* icons on the map. The current airfield is identified with a red square. If playing a team game, use airfields matching your chosen team.

The *Show Scores* button changes the screen to show a window with current scores for your pilot in this particular on-line game. Whenever you shoot down a plane, or are shot down your yourself, the game calculates the value of the kill based on the number of kills you have registered, the number that have been registered by your opponent, the number of enemy and friendly planes in the game at the time, and the relative qualities of the two aircraft involved. This is then displayed as an *Adjusted Kill* or an *Adjusted Death*. Note that you can never adjust a kill above 1 and never below 0.01.

When you are ready to fly, click the **Fly Now** button or click the **Exit** button to return to the pilot selection screen.

DIFFERENCES BETWEEN SINGLE-PLAYER AND MULTIPLAYER

There are several differences between the single-player and multiplayer versions of *Red Baron 3-D*:

1. Occasionally you will see the word **NET** appear in the upper left corner of the screen. This means that your system has temporarily lost communications with the server. If this persists for more than 20 seconds, you should exit the game. When you see the **NET** indicator, be prepared for *warping* when communications are reestablished.
2. Holding down the **SHIFT** key and pressing the **N** key will cause the pilot name to be displayed above the plane for all aircraft within visual range.
3. The last person to put rounds into a target is credited with the kill regardless of how much damage was done to the target by each combatant. If a plane is shot down by flak, no pilot will get credit for that kill.
4. The **T** key targets the last person to shoot your plane, rather than the closest threat as is done in single-player.
5. The **D** key does not target the nearest dogfight. Instead, using **SHIFT-D** selects the closest plane in your cone of view as the default plane. Then, pressing the **D** key will cause the camera to refocus on that plane.
6. From within the cockpit (when not in the map view), you can activate the chat window by pressing the **BACK-SPACE** key. Pressing **ESC** or **ENTER** will clear the chat window if you have not typed in any text.
7. The in-flight chat supports four different targets:

   ALL Players selects all players in the game to receive your message.

   All Teammates causes your message to be sent to all players on your side in a team based game. Note that in the *Get The Baron* game, all *Barons* are considered to be on one team and all *non-Barons* are considered to be on the other.

   Visible Teammates sends your message only to those players on your side that are within visual range of your aircraft. If you can use the **F** or **E** key to target a plane, it is in visual range.

   Squadron Members allows your message to be read only by those players that are using the same Squadron ID as you.

   In addition to being able to select one of these chat options with the mouse, the left and right cursor keys can move the selection on the chat window.

8. You can land at a friendly airfield and get repaired, re-armed, and refueled without leaving the cockpit. Note that you must be on a friendly airfield, your engine must come to a complete stop, and you must have already flown to an

altitude of at least 100 feet before your plane can be refitted.

SUMMARY

In this lesson, we learned how to launch the multiplayer version of the game, either through the normal *Game Finder* or through WON.NET. We learned how to create and delete pilots for on-line play and how to find and select a game to play.

We learned about the different multiplayer game types you can play as well as the details of navigating the on-line lobby. Finally, we learned some detailed differences between the single-player and multiplayer versions of the game.

Note: For the most up to date information available about the multiplayer version of the game, please refer to the site at www.redbaronplayers.com.

TUTORIAL 6: ADVANCED CAMPAIGN TECHNIQUES

In this lesson, we will learn the following techniques:

1. *Working with the Paint Shop*
2. *Using custom pilot photos*
3. *Resurrecting dead pilots*
4. *Deleting unwanted missions*

Please note that the techniques you will learn in this lesson will require you to manipulate files at the DOS level. You should probably ensure that you are comfortable with the game before attempting to perform this lesson. Also, be warned that whenever you are manipulating files you greatly increase the chance of making a mistake that would require you to delete and then reinstall the game from scratch. Feel free to skip this lesson entirely.

WORKING WITH THE PAINT SHOP

As squadron commander, you have the opportunity to decide what paint scheme will be applied to the aircraft in your squadron as well as to select an alternate paint scheme for your own aircraft.

From the *Campaign* menu, click the **Squadron Ops** button, then click the **Paint Shop** button. The top of the *Paint Shop* display lists the various aircraft assigned to your squadron along the left side of the screen. To the right is a column labeled *Self Assignments* and another labeled *Squadron Assignments*. Beneath each of these labels is a button with the words *None Available*.

Click the **Paint Plane** button. The screen is divided into two sections. The left side of the screen has two pick lists labeled *Plane Part* and *Squadron Texture*. The right side of the screen contains a 3-D model of the plane being painted so that you can see what your paint scheme would look like in the game.

Despite what the name implies, you don't really "paint" your aircraft. Instead, you mix and match various pre-made textures to create a unique paint scheme for the finished plane. Most of the squadrons in the game have some unique paint scheme or identification badge for each of the aircraft that were historically assigned to that squadron. So, if you take a wing from squadron A and the fuselage from squadron B and the tail section from squadron C, you will have a unique paint scheme for your squadron, even though the individual parts were not unique. This is kind of hard

to describe in abstract terms, so let's just give it a try to see how it works.

If you are using the pilot you created for the *Lafayette Escadrille* the plane type assigned to your squadron is the Nieuport 17, which should be shown on the right side of the screen. Just underneath the Nieuport 17 model is a series of four arrow shaped buttons surrounding a button with a magnifying glass. These are the camera controls.

Put the cursor over the magnifying glass button and click and hold the left mouse button. Notice that the camera zooms in closer to the aircraft model. Now click and hold the right mouse button and note that the camera zooms out away from the plane. Now, click the button to the left of the magnifying glass button and note that the camera pans around the aircraft in a clockwise direction. Clicking the button to the right causes the camera to pan to the right. Similarly, clicking the button above the magnifying glass button pans the camera up and clicking the button at the bottom pans the camera down.

Click the **Plane List** button a list box appears with the Nieuport 17 as the only entry in the list. If your squadron had more than one aircraft type currently assigned, you could switch between aircraft types here without having to back out to the previous screen. Click the **Cancel** button to continue.

Click the **Load** button and a box will appear telling you that there are no saved configurations for this plane type on the hard drive. You cannot load the default squadron configurations and we haven't created any paint schemes yet, so the list of available schemes is empty. Click the **Continue** button to clear the box from the screen.

Now, let's change the look of one of the parts on our plane. The current plane part is the *Upper Wing Top* and the current scheme in use for that part is *Esc 124*, as identified by the *Plane Part* and *Squadron Texture* fields. Click the up and down arrows to the left of the *Plane Part* field until the current part is the *Fuselage*. Note that the fuselage for *Escadrille 124* contains the profile of a man's face just behind the cockpit.

Click the up and down arrows to the left of the *Squadron Texture* field until you locate the texture for *Esc 49*, which has a yellow flag in place of the profile. Click the **Apply** button and note that the aircraft model to the right changes to replace the "profile" fuselage with the "yellow flag" fuselage from *Escadrille*

49. Play around with the different parts and different squadron textures until you get comfortable with the concept.

Now, click the **Save** button and you will get a *Configurations* list box with the cursor in the type in field at the bottom. Type in an eight-character name for your configuration and click the **Save** button. Now, click the **Load** button and note that your scheme is now shown in the list. Click **Cancel** to clear the dialog box from the screen.

As you were scrolling through the various squadron textures, you probably noticed that most of them were exactly the same and that some of the more garish colors, such as solid red or solid blue parts, are not represented. You can use parts with alternate textures that are not already represented in the game, but you need to create them yourself.

Scroll the *Plane Part* field until it is showing the *Upper Wing Top*. Click the **Export** button to get a list box labeled *Export Texture*. The list is empty because this is the first texture we are exporting. In the edit field at the bottom of the box, type in an eight-character name that is descriptive of the plane part. For example, you might save this one as **N17UWT** for "Nieuport 17 Upper Wing Top".

Exit *Red Baron 3-D* and load up your favorite graphics editor, such as *Microsoft Paint*™, which comes as part of Windows 95®. Load the texture you just exported into the editor. If you installed *Red Baron 3-D* to the default location on your C: drive, the file will be found in the C:\SIERRA\REDBARON3D\PAINT subdirectory.

You can now edit the texture using the tools provided with your graphics editor program. You should avoid changing the shape of the texture as it may cause problems when it is applied to the aircraft in the game. One thing to keep in mind when editing is that the fuselage texture only covers the left side of the plane. For the right side, the fuselage texture is simply reversed, so if you have any text on the fuselage, it will be backwards on the right side of the plane.

When you are done editing your aircraft piece, save the file and exit your editor. Now, open an MS-DOS box and get to the *paint* directory where you saved your finished aircraft piece (usually by typing **cd\sierra\redbaron3D\paint**). Before we can use the piece, we have to make sure it uses only the same colors that the game uses in its *palette*. To this end, we've included a

small DOS program that will remap the palette to the appropriate group of colors.

The format of the command for redoing the palette is:

palmap infile.bmp –O outfile.bmp

where:

infile.bmp is the filename of the aircraft piece you edited

outfile.bmp is the filename you want for the new file

Note: the **–O outfile.bmp** *portion of the command is optional. If you leave it off, the output file will use the same name as the input file.*

Assuming you named your aircraft piece **N17UWT** as was suggested, type **PALMAP N17UWT.BMP** and press the enter key to convert the file to the proper palette.

Tip: Some of the more advanced graphics editors allow you to have multiple files open at the same time, which allows you to grab a particular color from one texture and use it in another. If you use one of these programs and are careful to use only those colors that are in exported aircraft pieces, you won't need to run the palette mapping tool on each piece before using it in the game.

Restart *Red Baron 3-D*, click the **Campaign** button, then **Squadron Ops**, followed by **Paint Shop** and finally the **Paint Plane** button. We should be back to viewing our Nieuport 17 model.

The first thing we need to do is to make sure that the active part shown in the *Plane Part* field is the same type as the one we edited. There is no way for the game to know that a particular bitmap file belongs to a particular part, so if you import the wing to the wheel, for example, you will have a VERY strange looking plane, indeed!

Now, click the **Import** button. You should see your modified part in the list of available textures. Click the filename to highlight it and then click the **Select** button to retrieve it. Now we can see that the new part is shown on the left but has not yet been applied

to the aircraft on the right. Click the **Apply** button and you will see your newly modified texture on the plane!

Click the **Save** button and give this new configuration with your custom painted parts a unique name. Now, click the **Exit** button to get back to the *Paint Shop* screen. Note that the buttons underneath the *Self Assignments* and *Squadron Assignments* headers have been changed from *None Available* to *Unassigned*, indicating that there are one or more custom paint schemes available for this plane type but that none have been selected yet.

Click the **Unassigned** button underneath the *Self Assignments* header. A box appears listing the available custom paint schemes. Note that, in addition to the schemes you have created and saved, there is one called *Unassign*. Selecting the *Unassign* scheme allows you to reselect the default scheme for the squadron.

Highlight one of the schemes you created and click the **Select** button. Note that the label on the button changes from *Unassigned* to display the name of the scheme you created. You can select separate schemes for your pilot and for your squadron, if you wish.

When you are done selecting schemes for your aircraft, click the **Squadron Ops** button to get back the *Squadron Ops* screen and then the **Campaign** button to get back to the *Campaign* menu. Go ahead and fly another mission to see how your new paint schemes look in the air!

USING CUSTOM PILOT PHOTOS

When you created your new pilots, you probably noticed that the number of available photos was rather limited. Fortunately, you can add photos of your own choosing to the game to make it more personal.

The first thing you need is a black and white or color photo to use. You will need to crop the photo so that it is exactly 95 pixels wide and 105 pixels tall.

Put the photo you want to use into the C:\SIERRA\REDBARON3D\DATA\SHELLPAT directory. Open up an MS-DOS box and change to the same directory.

Run the palette remapping tool on the photo you created, using the form:

palmap infile.bmp –O outfile.bmp –P photo.pal

where:

infile.bmp is the filename of the original photo
outfile.bmp is the output filename for the remapped photo

Note: the **–O outfile.bmp** *portion is optional. If you do not use it, the output file will be written over the original.*

Now that the file is converted, rename it to **usraceXX.bmp**, where XX is a two-digit number between 15 and 99 (files 00-14 are the ones that are already in the game). Now when you create a new pilot, your new photo will be among those that are available.

RESURRECTING DEAD PILOTS

Even though you can replay missions in which your pilot is killed, sometimes you will click the wrong button or hit ESC too many times and your pilot's death will be recorded into the pilot file. Fortunately, all is not lost, you can recover your pilot.

First, note which page of the pilot dossier is used to display for this pilot. For example, the first pilot in the game will be on page 1. Open up an MS-DOS window and change to the C:\SIERRA\REDBARON3D\CAMPAIGN directory. The data for your pilot is contained in a file called **campgnXX.dat**, where XX is the two-digit page number of your pilot minus one. For example, if the pilot is the first one, from page 1, the file is called **campgn00.dat**.

You will note that there is a corresponding file called **backup00.dat**. This is a backup of the campgn00.dat file made before the flight in which your pilot was killed. To restore your pilot back to where he was prior to that mission, simply copy the backup file over the current original. In the example, we've been using so far, you would simply type:

copy backup00.dat campgn00.dat

Reload the game and note that your pilot is alive and well and is ready to fly!

DELETING UNWANTED MISSIONS

Unlike most games, the missions in the *Red Baron 3-D* campaign game are generated, not pre-scripted. Because of this, it is very possible to get a mission that is so difficult that you cannot complete it without reducing the game's difficulty to nothing. Or you may find that you just hate a particular mission type and don't want to fly anymore of them.

Fortunately, you can delete an unwanted mission. To do this, open up an MS-DOS box and change to the C:\SIERRA\REDBARON3D\CAMPAIGN directory. The data for the mission is contained in a file called **campgnXX.mis**, where XX is the two-digit page number of your pilot, minus one.

To delete the mission, simply delete the **campgnXX.mis** file, in this example, you would delete **campgn00.mis**.

Now when you go back to the game and select the **Next Mission** button, you will get an entirely different mission generated for your pilot.

SUMMARY

In this lesson we learned how to mix different plane textures to create a unique plane configuration and we learned how to export textures, edit them, and import them back into the game for use in a custom paint scheme. We learned how to select a custom paint scheme for use by your pilot or squadron as well as how to revert back to the default paint schemes.

We also learned how to add custom pilot photos to the list of photos used in the pilot dossiers. Finally, we learned how to resurrect a dead pilot as well as how to delete an unwanted mission.

TUTORIAL 7: CREATING SINGLE MISSIONS

In this lesson, we will learn the following techniques:

1. *Locating aces and squadrons*
2. *Setting initial mission conditions*
3. *Creating a mission from scratch*
4. *Generating a large mission*

LOCATING ACES AND SQUADRONS

From the *Main Menu*, click the **Single Mission** button, then click the **New Mission** button to get to the *Mission Builder* chalkboard. In the lower right hand corner of the screen are two buttons which allow you to locate specific aces and squadrons. Click the **Locate Ace** button.

You will be shown a large scale map of the entire Western Front, with each of the four major regions outlined and identified. There is a window in the upper left corner, labeled *German Aces*, which can be moved around by clicking and holding the left mouse button on the border and dragging it to reveal that portion of the map.

You will notice that there are no German ace names highlighted in the list and that there is a flashign red square in the bottom left corner of the *Marne* region. Click on the entry labeled **Goering, H** and note that the flashing red square moves to the upper middle portion of the *Marne* region.

You can use the scroll bar to view the entire list of available German Aces. Clicking the down arrow to the left of the *Service* section will change the list of aces to show the various *French*, *British*, and *American* aces on the front. Note that the only *Richthofen* listed in the group of German aces is *Lothar*. So where is the famous Red Baron himself, *Manfred von Richthofen*?

Click the **Done** button to return to the chalkboard. Inside the boxed off section in the middle is the *Mission date*. Note that the date is currently set to *June 1, 1918*. This is the reason that *Manfred* is not listed among the German aces; by June 1, 1918, he is dead and no longer available for missions.

Click the left arrow underneath the *1918* date to change the date to **1917**. Now click the **Locate Ace** button, scroll down the list of German aces and note that both *Manfred* and *Lothar* are listed. The presence of an ace, and his location on the front, is

determined by his actual movement during the war.

Click the **Done** button to return to the *Mission Builder* chalkboard. Now click the **Locate Squad** button. Note that the display is identical to the *Locate Ace* display, except that it lists squadron names or designations rather than aces. Click **Done** to return to the chalkboard.

SETTING INITIAL MISSION CONDITIONS

We've already looked at one of the mission conditions, the mission date, and have seen its effect on the availability of aces and squadrons. Now let's look at some of the other conditions you have control over.

First, you have the opportunity to set the name of the pilot that you (the player) will be using in this mission. The default name is *Default Player*. To change the name, click on it, backspace to delete the existing name, then type in the new one.

To the right of the name is a section labeled *Region*, which is currently set to *Marne*. Click the left or right arrows under the region name to cycle through the four regions of the front. Beneath the region is a section labeled *Season*, which is currently set to *Spring*. As with the region, you can cycle through the four available seasons using the left and right arrows under the current season label.

Continuing to move to the right, there is a section labeled *Weather*, which is currently set to *Clear*. You can cycle between **Clear**, **High Clouds**, **Partly Cloudy**, **Cloudy**, and **Storm Pending** conditions to use in your mission. Finally, you can set the time of day that your mission is supposed to start, using a 24-hour military clock, which can be set to any time of day or night in 5 minute increments.

Just above the boxed off *Mission date* area is a check box labeled *Set Historical mode*, which is checked by default. Click in the box to turn off *Historical mode*, and note that the *Mission date* box is removed from the chalkboard and that the label at the top of the chalkboard changes from *Historical Squadron locations* to *All Squadrons available*. When you are creating a non-historical mission, you can use any squadron name or designation and equip their flights with any aircraft available to that service (you cannot equip German squadrons with Allied planes, and vice versa).

Click in the *Set Historical mode* box to re-enable historical

mode. Inside the *Mission date* box is a check box labeled *Generate flights for all active squadrons*. If this box is checked when the *Continue* button is clicked, the game will generate missions for all active squadrons in the selected region, which you can then edit. If you do not have this box checked, you will have to create flights for each squadron you wish to include in your mission. In general, if you are trying to recreate a specific engagement, you will want to create all the flights yourself, but in most cases, you will want to let the computer give you a head start and save yourself several hours of work.

CREATING A MISSION FROM SCRATCH

Change the mission date back to June 1, 1918, then click the *Set Historical mode* box to turn historical mode off for the mission we will be generating, then click the **Continue** button. A map of the selected region is displayed with a large, white *Create Flight* box dominating the center of the screen.

Use the up and down arrows to the right of the *Service* selection to make the flight an *American* one. Click inside the *Squadron* box to get a list of available American squadrons. Locate the *94th Aero Fighter Squadron*, click on it to highlight it, then click the **Done** button to continue.

Click in the *Aircraft* box to get a list of all available Allied aircraft. Locate the *Sopwith Camel*, highlight it, and click **Done** to make the selection. Now, click on the up arrow to the right of the *Number* label to change the number of aircraft in your flight from two to four.

Next, click to the right of the *Mission type* label to get a list of available mission types. Locate the *Combat Air Patrol* type, click it to highlight it, and click **Done** to select it. Note that a complete list of all mission types can be found on page **77**.

Change the start time to **10:00**, then click the **Continue** button. The large edit box disappears to reveal the map and the smaller *Create Flight* box in the upper left corner. The next step is to select the START point on the map. On other similar displays, you've been able to use the magnifying glass to zoom in on the map, but in this situation, the cursor is used for pointing instead of zooming. So, instead, you can use the + and – keys on the numeric pad to zoom in and out.

Zoom the map in one level so you can see the details and

locate the town of *Soissons*. Click on the roundel just below the town to set the home airfield for this flight. You are now prompted to select the PATROL region. Locate the blue infantry symbol (a square with an X in it) nearest your starting airfield and click it.

Tip: If you set your start location on a landmark other than an airfield, your mission will start in the air.

We now have a flight which takes off from the *Soissons* aerodrome and patrols over the nearest friendly infantry unit. Click the **Waypoints** button and note that there are only two waypoints. The first is the takeoff and the second is the patrol. Note that the patrol is set to occur at 8000 feet, or another excessive altitude. Let's drop that down to about 3000 feet.

Click on the *Patrol* waypoint, then click the **Edit** button. Click the down arrows next to the altitude until it is set to 3000 feet. From this edit screen, we can see that we are supposed to patrol in a *Diamond* formation for 17 minutes. Let's change that so that we are patrolling in **Fluid 4** formation for **20** minutes. Click the *Formation at* setting to activate the scroll arrows, then scroll through the list until you reach **Fluid 4**. Do the same with the *Minutes* setting and change it to **20**. Note that we will be flying *TO* the waypoint in a *Diamond* formation and then we will switch to a *Fluid 4* for the patrol itself. Click the **Done** button to accept our changes.

We still need to land our aircraft, so click the *Patrol* waypoint to highlight it, then click the **Add** button to add another waypoint after the patrol waypoint. Note that the waypoint is placed on a random landmark near the last one you entered. In this case, it is most likely NOT our home airfield, so click the third waypoint and drag it onto the home aerodrome.

The third waypoint is still listed as a *Navigation* type, so we need to change that to *Land*. Click on the third waypoint in the list to highlight it, then click the **Edit** button. Click the *Action at* entry and change it to **Land**. Obviously, we cannot land at 5000 feet, so click the *Altitude at waypoint* entry and start reducing the altitude. Note that it changes in 500 foot increments until it gets down to 1500 feet, then it changes in 100 foot increments and shows you the *AGL* (above ground level) altitude as well as the *MSL* (mean/average sea level) altitude.

When you reach 200 feet MSL, note that the AGL is at 86 feet,

indicating that out airfield is 114 feet above sea level. Click the down arrow once more and note that the altitude changes 114 MSL, 0 AGL, which is where we want it. Click the **Done** button to return to the waypoints list, then the **Flights** button to return to the flight details box. Click in the check box to the right of the *Player's Flight* label to make this the active player flight for this mission.

Now, let's create a flight to encounter on our mission. Click the **Create Flight** button to get the same *Create Flight* box as we had several paragraphs ago. Make this a *German* flight, from the *Jasta 2* squadron. Change the aircraft to the *Albatross D.III*, the number of planes in the flight to *4*, the mission type to *Offensive Patrol*, and the start time to *10:00*. Click the **Continue** button when done changing the details of the flight composition.

You are now being prompted to select the START point. Locate the German airfield that is closest to *Soissons* and click the iron cross symbol. You now need to select the PATROL point on the map, so click the same blue infantry symbol that you selected for the previous flight. This will ensure that the two flights will have someplace common to fight over.

Now, click the **Waypoints** button so we can give this flight a landing waypoint and can set it to patrol at the same altitude as the previous flight. First, click the second waypoint, labeled *Loiter* and then click the **Edit** button. Change the *Altitude at waypoint* to 3000 feet MSL and the *Minutes* to 20. Click the **Done** button to continue.

Now, create a third waypoint for this flight and set it to land at it's home airfield using the same methods as you used with the previous flight. When you are done, click the **Flights** button and then the **Done** button to get back to the chalkboard. The flights are now displayed on the chalkboard along with their ordnance options. For this mission, we'll just use standard ammunition, so click the **Save** button.

You will be prompted to give your mission a filename and description. For now, give this a filename of TEST and a description of "My first mission design." Click the **Save** button and you will be told that the mission is saved and will then be left back at the chalkboard. Click **Done** to return to the *Single Mission* screen, with your newly designed mission as the current selection.

Go ahead and click **Fly Mission** to see the results of your handiwork!

GENERATING A LARGE MISSION

When you are done flying the mission, return to the *Single Mission* menu and click the **New Mission** button. Set the initial mission conditions as desired. Before clicking the **Continue** button, ensure that you have the *Generate flights for all active squadrons* option checked.

Instead of getting the *Create Flight* box, you are shown the map with a series of green and blue flight paths criss-crossing the length of the front. Click the **Next** button to cycle through the various flights that have been created.

Locate a fighter flight that looks interesting and click the *Player's Flight* check box. You must have one of the flights selected as the player's flight in order to have a valid mission. After reviewing all the flights, click the **Done** button.

Note: As you can see from the complexity of the generated mission, creating a complete mission from scratch is not a trivial task! All the missions in the campaign game are generated in the same way and with the same degree of complexity, giving the campaign game infinite replayability.

Click **Done** to get back to the chalkboard, then save your newly generated mission.

SUMMARY

In this lesson we learned how to use the locator to find aces and squadrons in any particular historical period of the war. We learned about how to set the various mission conditions and how the historical option affects the availability of aces and aircraft.

We created a simple single mission and edited the waypoints to produce a complete mission. Finally, we looked at creating a mission by allowing the computer to generate flights for all the active squadrons in a region.

GAMEPLAY REFERENCES

KEYBOARD AND JOYSTICK CONTROLS

Because of the complexity of the game, *Red Baron 3-D* requires you to have both a keyboard and a joystick to play the game. This section describes all inputs that can be given to the game using the joystick and/or keyboard. Note that in the following text, an **F#** refers to the F1 through F12 function keys across the top of your keyboard and a **KP#** refers to a key on the numeric keypad on the right side of your keyboard. Also note that the **NumLock** light must be on for the numeric keypad inputs to function.

AIRCRAFT CONTROL SURFACES

The control surfaces include the elevator and ailerons:

Pushing forward on the joystick moves the elevators down which causes your plane to dive.

Pulling back on the joystick will move the elevators up which causes your plane to climb.

Pushing left on the joystick causes the ailerons to move in a way to cause your aircraft to roll to the left.

Pushing right on the joystick will make your aircraft roll to the right.

RUDDER CONTROL

The rudder can be controlled with either the keyboard or a joystick rudder control (either a set of rudder pedals or a rudder axis on a joystick).

For keyboard control, the rudder will move in the direction specified until you let up on the key, then it will remain in that position until you center it. The keyboard rudder inputs are:

, (comma)	Applies left rudder which causes your plane to yaw to the left.
. (period)	Centers the rudder.
/ (forward slash)	Applies right rudder which causes your plane to yaw to the right.

When using a joystick rudder control, you can apply exact amounts of rudder and hold the rudder in position as long as desired. When you let go of the rudder control, the rudder will center.

ENGINE CONTROLS

Although you can control the throttle setting with either the keyboard or a joystick throttle control, you must use the keyboard to turn the engine on and off:

TAB	Toggles engine on and off.
+/=	Increases the throttle setting.
_/-	Decreases the throttle setting.
1 through **0**	Sets the throttle to a specific position, where 1 is idle and 0 is full throttle.

For joystick throttle control, putting the throttle at the lowest position will set it to idle and putting it at its highest position will set the throttle to maximum.

WEAPON CONTROLS

Your plane can be equipped with up to three weapon types, machine guns, bombs, and rockets.

For keyboard control, the following keys are used:

SPACE BAR	Fire machine guns.
B	Drop bombs (if equipped).
R	Fire rockets (if equipped).
U	Unjam machine guns.

On the joystick, the following buttons are used to control the weapons (note that there is no joystick control for firing rockets):

Button 1	Fire machine guns.
Button 3	Drop bombs (if equipped).

COCKPIT VIEW CONTROLS

You can control the cockpit views with either the keyboard or a joystick "hat".

For the keyboard, the following keys are used:

F1	Enabled fixed views.
F2	Enable the slewable cockpit view.
KP8	Look down at control panel.
KP5	Look straight up.
KP2	Look straight back.
KP7	Look forward and left.
KP4	Look left.
KP1	Look back and left.
KP9	Look forward and right.
KP6	Look right.
KP3	Look back and right.
KP0	Toggle kneeboard map on and off.
KP/	Using the slash key on the keypad allows you to glance forward without disabling the slewable view.
CTRL	If CTRL is held down in conjunction with a fixed view key (KP1 through KP9), the view is pitched up 45 degrees. So, for example, CTRL+KP8 gives you a view straight ahead and 45 degrees above level.
ENTER	If the ENTER key is held down, moving the joystick will move the slewable view in the corresponding direction instead of moving the aircraft's control surfaces.
Page Up	Look forward and up.
Page Down	Look forward and down at the instrument panel

For the joystick, the following buttons are used:

HAT	The eight directions on the joystick "hat" correspond to the eight fixed views around the aircraft. You can use the **CTRL** key in conjunction with the "hat" to get the 45 degree up views.

Button 2	If button 2 is held down, moving the joystick will move the slewable view in the corresponding direction instead of moving the aircraft's control surfaces.

EXTERNAL VIEW CONTROLS

Almost all the external view controls are only available on the keyboard. These controls are:

F3	Enable the external slewable view. Note that you can move the camera, but that it will snap back to its object of focus when the camera controls are released.
F4	Enable the external camera view with the ability to move the camera.
F5	Enable the chase plane view (an external camera fixed directly behind the aircraft).
F6	Enable the delayed chase plane view. Similar to the chase plane view, but it starts with the camera at aircraft and lets the plane fly to the normal chase plane distance before entering chase plane mode.
F7	Enables the fly-by view. Puts the camera in your aircraft's flight path, then pans to follow as your plane flies past.
F8	Enables target view, which, if you have a target selected, causes the camera to look in the direction of your aircraft, but with your target in the foreground, which is very useful for target identification.
F9	Rotates the camera to the left.
F10	Rotates the camera up.
F11	Rotates the camera down.
F12	Rotates the camera to the right.
Z	Zooms the camera in.
X	Zooms the camera out.
ENTER	If the ENTER key is held down, moving the joystick will move the camera in the corresponding direction instead of moving the

aircraft's control surfaces.

The following is the only joystick control which affects the external views:

Button 2	If button 2 is held down, moving the joystick will move the camera in the corresponding direction instead of moving the aircraft's control surfaces.

TARGETING AND CAMERA FOCUS CONTROLS

Because there are no automated weapons systems, the terms "targeting" and "camera focus" have the same meaning in this context. Whenever you enter a slewable view, you have the option of fixing an external object as the focus of the camera, which will then slew to track the selected object. The following keys are used to set the target:

E	Targets the closest enemy plane. If an enemy plane is already the target, pressing **E** again will cycle to the next enemy plane in the list, if any.
F	Targets the closest friendly plane. If a friendly plane is already the target, pressing **F** again will cycle to the next friendly plane in the list, if any.
M	Targets the closest plane in your formation. If a plane in your formation is already the target, pressing **M** again will cycle to the next plane in your formation, if any.
N	Targets the closest plane of any type. If a plane is already the target, pressing **N** again will cycle to the next plane in the list, if any. Note that the **N** key can target planes at a greater distance than either the **E**, **F**, or **M** keys can, because it does not require aircraft identification to function.
D	Uses the game's AI to determine which enemy plane you should engage and then puts the camera's focus on that plane. This control functions differently in multiplayer games.
T	Uses the game's AI to determine which enemy plane is the greatest threat to you and puts the camera's focus on that aircraft. This control functions differently in multiplayer games.
L	Targets the nearest ground landmark. If a ground landmark is already targeted, pressing **L** again will cycle to the next ground landmark in the list, if any.
O	Targets the ground object in your cone of fire.

COMMUNICATIONS CONTROLS

The following keys allow you to communicate with other players in mutliplayer games:

BACKSPACE	Enables the in-flight chat window.
Left cursor	When the in-flight chat window is open, selects the previous recipient in the list.
Right cursor	When the in-flight chat window is open, selects the next recipient in the list.
Insert	Activates the **Insert** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.
Home	Activates the **Home** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.
PageUp	Activates the **PageUp** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.
Delete	Activates the **Delete** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.
End	Activates the **End** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.
PageDown	Activates the **PageDown** message macro, as defined in the [QuickKeys] section of the MPLAYER.INI file.

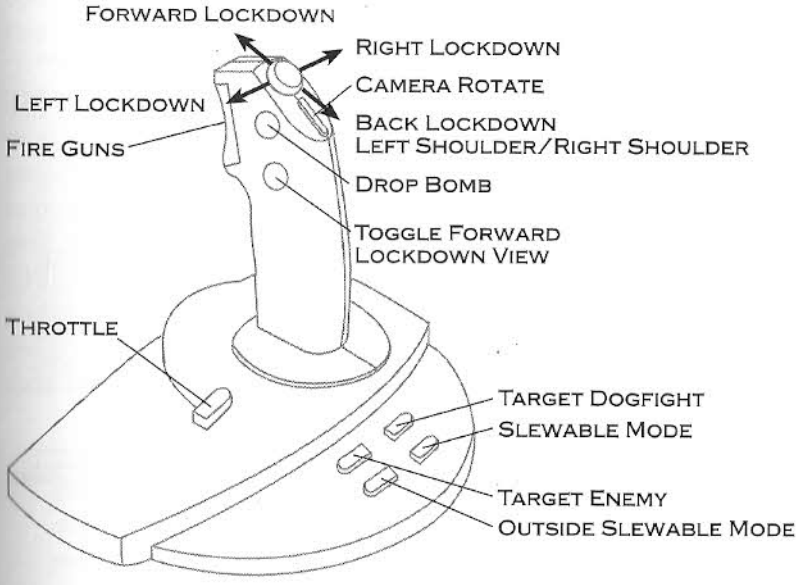
Note: the chat window must already be displayed for the chat macros to function.

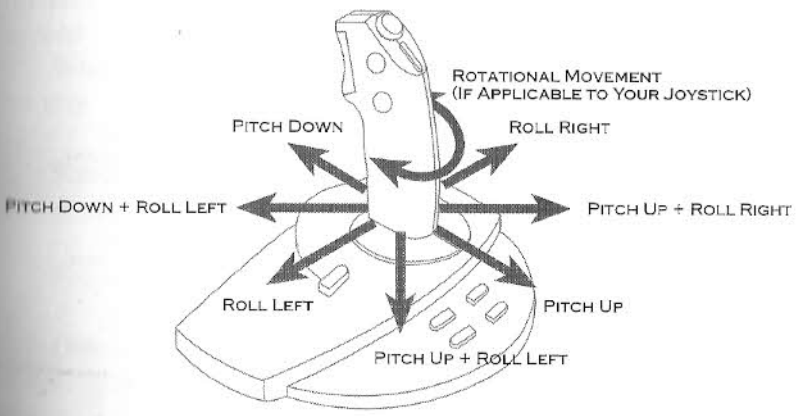
The rest of the keyboard controls are as follows:

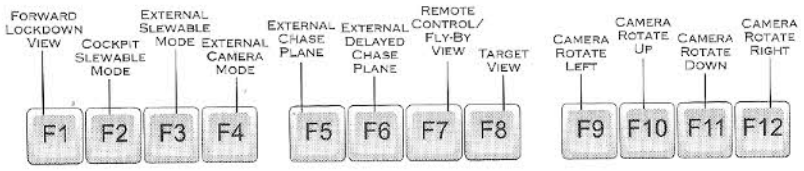
CTRL+A	Enables the Full Autopilot system, which allows the game's AI to fly your plane as if it were under computer control.
SHIFT+A	Enables the Level Autopilot system, which will keep your plane flying straight and level at about 70% throttle. (In Multiplayer, it will use 100% throttle.)
ALT+A	Enables the Navigation Autopilot system, which will fly your aircraft to each of the waypoints in your flight plan.
A	Disables any Autopilot system.
[	Decreases the time compression rate, halving it with every press of the key.
]	Increases the time compression rate, doubling it with every press of the key, to a maximum compression rate of 16x normal speed.
****	Disables time compression.
ALT+T	Toggles cockpit transparency.
ALT+F	Toggles the frame rate counter.
ALT+I	Toggles a wing angle indicator in the upper right corner of the screen. The first symbol, a straight line pivoted on the left, reflects the angle of attack to show whether you are climbing or diving and how much. The second symbol, a triangle pivoted in the center, indicates the amount of bank your plane is in.
P or **Pause**	Pause the game (not available in multiplayer).
J (3 times)	Pressing the **J** key three times in succession causes your pilot to bail out of your plane. Note that parachutes are not available to pilots in the *Red Baron 3-D*, so unless you are extremely lucky, bailing out is fatal.
ESC	Activates the "end flight" menu.
Right-click	Activates the in-flight preferences menu.

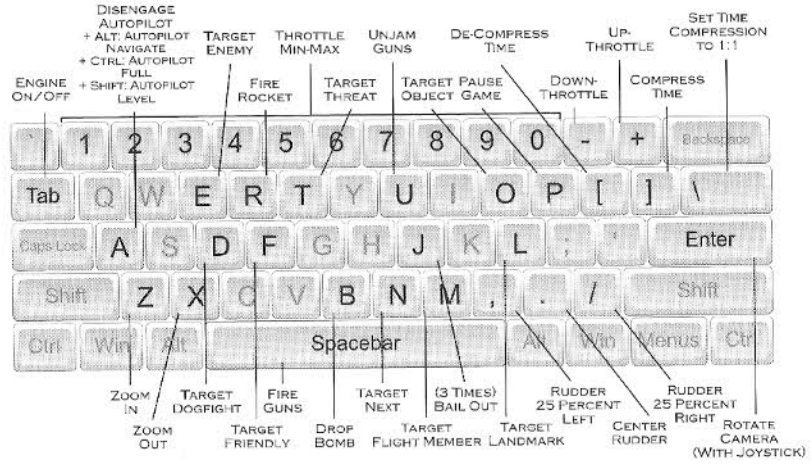
KEYBOARD AND JOYSTICK DIAGRAMS

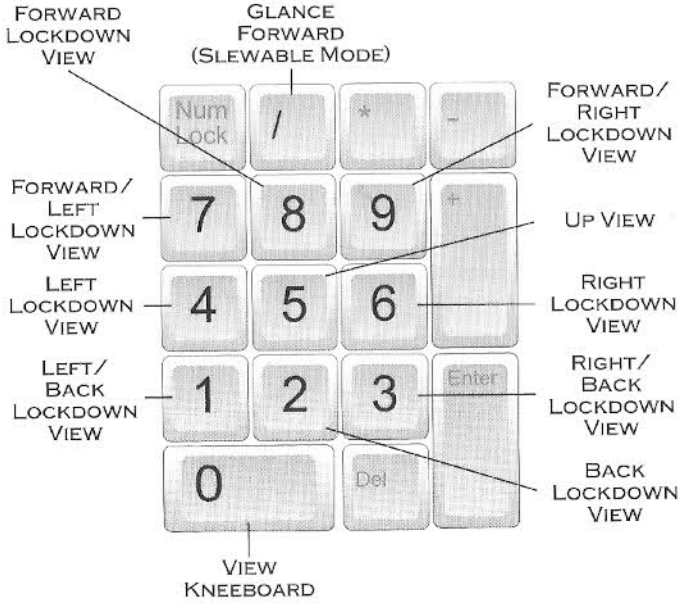
The following diagrams serve as a visual reference to the keyboard and joystick controls:











OPTIMIZING GAME PERFORMANCE

Red Baron 3-D is designed produce a smooth frame rate at maximum detail on the fastest machines available. If, like most of us, you don't have the fastest machine possible, you may need to optimize the game and your machine for a level of performance that fits your personal requirements.

As a basic approach, we have found that systems faster than 333 MHz can usually operate with full game detail (or with minimal modifications). Machines slower than 200 MHz usually should start with minimum detail settings, and then increase the important settings until a compromise between frame rate and graphical detail can be found. If your machine is between 200 and 333 MHz, you should be able to find a nice compromise that gives you most of the essential graphical details, while losing only the more trivial settings. Machines in this mid-range will gain the most from careful experimentation of the graphical detail settings.

Note: Because of the sheer number of textures used in the game, the amount of texture memory on the Voodoo or Voodoo2 based card will have a significant impact on the game's performance.

The first thing you should do is play the game and see how it performs. Use the frame rate counter (ALT+F) to help you get an idea of what is acceptable or not. In general, most people become dissatisfied when the frame rate drops to less than 10 frames per second.

When optimizing the graphics settings, you may want to remove or decrease detail in the following order:

Shadows – The only game function the shadows perform is to help you gauge your height above the ground, which you can do with the trees when playing in Glide mode.

Prop Animations – These look cool, but serve no useful purpose in the game.

Combat Detail – When set off, ground detail will be suppressed whenever you are actively in combat (triggered by firing your guns). When performing ground attack missions, this can be an important detail setting. When in an aerial dogfight, this setting has almost no impact on the

game.

Clouds – These look really cool and can affect your ability to identify enemy planes. Turning them off will have the effect of always flying in clear skies, both for you and for enemy aircraft.

Large Pixels – Changing from small to large pixels can improve performance on some systems. The graphical trade-off is minimal.

Max Detail – When objects are drawn in detail, they can have one of two levels of graphical detail. Turning *Max Detail* off allows gives you a lower level of detail, which can allow you to play with detail drawn at a greater distance.

Object Density – Reducing the number of ground objects that need to be drawn can have a significant effect on the game's performance.

Object Detail – Reducing the detail that is drawn on ground objects can also have a significant effect on the frame rate.

Resolution – Playing at lower resolutions greatly decreases the load on the system, allowing the game to run significantly faster. Higher resolutions, however, allow you to see more of the world, so this is a lower priority trade-off.

Terrain Range – This determines how far out the "fog" effect will be and how much of the world will be drawn between you and the "fog".

Terrain Detail – Determines how far out the ground detail is drawn. Any terrain visible between the detail range and the "fog" will have a polygonal appearance.

Aircraft Detail – Since the planes are the focus of the game, this is the last option your should try to reduce.

In addition to changing the game's internal graphics settings, there are some things you can do with your machine that will help game performance. First, try defragmenting the hard drive on which *Red Baron 3-D* is installed. If the game is installed to a drive other than the C: drive, defragmenting the C: drive will also improve performance since this is where your system's swap file resides.

There are also some performance issues directly related to the Voodoo™ based graphics accelerators. You should refer to your card's manufacturer as well as the newsgroups for assistance in optimizing your hardware.

FIGHTER AND BOMBER MISSION TYPES

Following is a description of each of the mission types that can be assigned to a fighter group:

Attack Balloon – The goal is simply to shoot down the enemy balloon. The task will be much easier if you use incendiary machine gun ammunition or the French "Le Prier" rockets. You should avoid flying directly under the balloon as you will run the risk of running into one of the tether cables.

Attack Target – The target of this mission is either an enemy aerodrome or infantry unit. The goal is to damage the target as much as possible. When attacking aerodromes, your priority is the destruction of aircraft and hangers. When attacking infantry, the artillery emplacements are the highest priority. To be successful you should destroy more than a quarter of the priority targets while losing less than one-third of your f ight's aircraft.

Balloon Defense – Prevent the friendly balloon from being destroyed by enemy planes.

Barrage Patrol – Patrol a section of the front and prevent enemy aircraft from penetrating your airspace.

Combat Air Patrol – Your job is to patrol the area above the friendly ground landmarks and destroy any aircraft that threaten those assets.

Escort – Fly along with friendly bombers or reconnaissance aircraft and prevent enemy planes from damaging your charges.

Lone Wolf – You job is simple – fly around looking for trouble and shoot down any enemies you encounter.

Offensive Patrol – Your job is to patrol the area above one or more enemy installations and destroy any enemy planes that rise to your challenge.

Support Attack – You are tasked with supporting an infantry advance across no-man's land. Take out any enemy aircraft that threaten the friendly infantry units and assist your infantry by taking out enemy artillery and machine gun emplacements.

Support Defense – Enemy infantry is advancing across no-man's land and your job is to support the defending

infantry forces. Prevent enemy aircraft from attacking the friendly infantry and gun emplacements and use your guns to attack the enemy infantry.

Following is a description of each of the mission types that can be assigned to a bomber or reconnaissance group:

Artillery Spotting – The aircraft acts as a forward observer for friendly artillery. The flight must get to the waypoint, stay long enough to get the required intelligence, and return safely to base.

Bomb Target – The aircraft is tasked with flying to the specified target and dropping bombs in an effort to destroy that target.

Landmark Reconnaissance – The aircraft is tasked with flying to an enemy landmark, usually at high altitude, taking photographs, and returning safely to base.

ADDITIONAL NOTES

Any information made available after this manual goes to press can be found either in a text or configuration file (.ini) in the SIERRA\REDBARON3D directory or can be gleaned from the www.redbaronplayers.com web site.

HISTORICAL OVERVIEW

Historical Overview Table of Contents

A GERMAN MACHINE GUN CREWIN ACTION DURING THE MARCH OFFENSIVE

APRIL 21, 1918: AMIENS FRONT

When the pilots of JG-1 crawled out of their bunks in the early morning hours of April 21, 1918, they found their aerodrome at Cappy shrouded in thick, gray fog. The blanket of mist clung to the ground, making any flying impossible. Delighted by the break, the pilots gathered near their planes to await the events of the day.

They needed the break. Since March 21st, the men had been in action nearly every day, fighting with a desperation born from the knowledge that this last, great German offensive would determine the course of the war. They knew that their nation had gambled everything—resources, men, equipment, aircraft, and money—on this final effort. At first, it had succeeded. Below the wings of JG-1s Fokker and Albatros fighters, the infantry had poured through a broken British line. German reinforcements flooded to the breakthroughs, pushing the Tommies back nearly 40 miles. In a war that measured success in yards, 40 miles seemed a ringing victory. But as JG-1 discovered, it proved to be a hollow success. Now, a month later, the British had turned to fight, stopping the advance cold before any real strategic success could be achieved.

All that was left to do was fight on with sheer momentum. Already, gossip around the mess tables at night told stories of friendly infantry units breaking and routing; of fighter squadrons running out of gas, rubber, and oil; of discontent in the ranks. In some cases, the red specter of Socialism seemed to play a part, boding ill for the future in light of Russia's Revolution the previous fall. Clearly, four years of stagnant, bloody, trench warfare had just plain worn out the German army, and now its men were being asked to do too much.

That was also true of the Air Service, and of JG-1 in particular. For the last month, they'd been flying four or five times a day. The men were exhausted, their lives measured in mere days as the inferno over the trenches claimed pilot after pilot.

For the ground crews, times were nearly as trying. They worked through the days and nights in a never ending battle to keep the planes airborne. With stocks of spare parts low, and replacement aircraft a wishful dream, the geschwader's fighting strength slowly drained away. Just to keep their remaining planes in fighting shape, parties of mechanics would scour the front for wrecks, from which they cannibalized all the rubber parts and brass fittings they could find.

THE ACES OF JG-1. KURT WUSTHOFF (27 KILLS), WILHELM REINHARD (20), MANFRED VON RICHTHOFEN (80), ERICH LOWENHARDT (54), AND LOTHAR VON RICHTHOFEN

Two things kept these men going: their love of Germany and their love for their leader, the legendary Manfred von Richthofen.

He was the type of man others instinctively followed. He led by example, by devotion to duty, and by sheer force of will. After four years of combat—first with the cavalry on the Eastern Front, then as a fighter pilot in the West—Richthofen was burned out. Nevertheless, he carried out his duty with grim determination that inspired all around him. His insistence to stay at the front endeared him to his men almost as much as it frustrated and worried the German high command. Richthofen, General Hindenburg once remarked, was worth at least one full division. He was the soul of the fighter force, the inspiration to all in the Air Service after three years of battling the British from the cockpit of Germany's best fighters. Alive, he was a great propaganda asset, a symbolism of everything the German fighting man stood for in this long and dreary war. To the core, he was a combat pilot, a hunter of the sky. And that is why he never let up.

Not even after he nearly died did he give much thought to taking some desk job far from the front, though his superiors urged him to do just that. Nearly a year before, in July 1917, he had been in a wild dogfight with Naval Ten Squadron and some FE2s from a local RFC unit. During the fight, one of the Fee gunners had shot Richthofen in the head. Nearly out of his mind with pain, and practically blinded by blood gushing over his eyes, Germany's ace of aces spiraled down to the trenches below and crash-landed within friendly lines. Some soldiers pulled him from the wreckage and carried him to a field hospital, where his wounds were dressed. After a spell at home where he was sent to recover, he returned to action once again that fall.

Despite his leave, he never really recovered from his wound. Now, months later, he looked gaunt and hollow. He suffered from terrible headaches that at times threatened to confine him to bed. Yet, he doggedly pressed on, shooting down an ever increasing number of Allied aircraft, until, by April 21st, his total stood at 80 kills.

As the sun rose over Cappy that spring morning, Richthofen appeared at the flight line to check on his pilots. He was in fine spirits, by all accounts, since the day before he had claimed his 80th victim. As he toured the scene, he tripped over a stretcher laid out on the ground. When he looked back to see what he'd fallen over, he saw Leutnant Wenzl, a young tiger who had just trans-

THE RED BARON S FUNERAL. THE AUSTRALIANS BURIED THE LEGENDARY ACE WITH FULL MILITARY HONORS.

ferred into geschwader from Jasta 31 at the end of March. Playfully, the Rittmeister tipped over the stretcher, spilling Wenzl into the mud.

Laughing at their leader's prank, the other pilots plotted revenge. Later that morning, they kidnapped the Rittmeister's dog, Moritz, and tied a wheel chock to his tail. Moritz had already seen much of the war, and, in fact, was missing part of an ear. Some months before, the big Great Dane was chasing Richthofen's Fokker Triplane as it began its takeoff roll. The dog got too close and collided with the propeller blades, which chopped off a good portion of his ear.

So it was on the morning of April 21st, Moritz, the half-eared dog came whining to his master, a wheel chock dragging at his hind legs. The Rittmeister took the gag in stride, laughing at the sight as he knelt down to free Moritz from the chock.

Little did anyone know that this would be the last time the Rittmeister's laughter would ring in their ears.

With late morning came a break in the weather. A strong wind scattered the fog, and as blue skies appeared over Cappy, the mood at the aerodrome became serious and businesslike. They'd be going into battle soon, and the men knew the odds, as usual, would

be heavily stacked against them.

The call came shortly after 10:30. A German observation point reported enemy aircraft heading for JG-1's patrol area. The news sent the pilots scurrying for their planes. In minutes, two ketten—flights—were airborne. Richthofen led them off in his blood-red Fokker Dr. I.

The men left behind at Cappy anxiously awaited the return of the geschwader's aircraft, going about their duty as they strained to hear the warm sounds of engines approaching the airfield.

Finally, in the early afternoon, they straggled in. The ground crews watched the Fokkers swing around the aerodrome, their quirky Oberursel engines coughing and burping as the pilots hit their "blip buttons" to slow their planes down to landing speed.

But one aircraft was missing. The blood-red Fokker that belonged to the Rittmeister was nowhere to be seen.

Through the afternoon they waited for news, despair threatening to overcome this once happy band of Germany's elite aviators. As the sun went down that afternoon, dread filled their hearts. He had fallen behind British lines, and now all they could do was hope he had been taken prisoner.

When word did come of their leader's fate, it was not what they had all feared. Their Rittmeister, the great Manfred von Richthofen, was dead.

British guns destroyed the heart and soul of the German fighter force that April day, and with it, so died Germany's last hopes of winning the air war.

And yet, something else happened that day, something that none of those present at Cappy Aerodrome could ever have imagined. With the death of Manfred von Richthofen, a legend was born—one that would endure long after they were but dust in a soldier's grave—the legend of the Red Baron.

Chapter One

Europe In Flames

One wrong turn changed the course of history. On June 28, 1914, Austrian Archduke Franz Ferdinand arrived in the Bosnian city of Sarajevo intent on attending army maneuvers in that recently annexed province of the Austro-Hungarian Empire. The results of that visit set in motion a chain of events that lead to the bloodiest war in world history. Long after all the players that day were dead and buried, the effects of their actions resounded for decades, affecting the course of both Europe and the United States for generations to come.

It began at the train station in Sarajevo, where the Archduke, his wife, and his entourage climbed into several open-topped touring cars to begin the short drive to City Hall, where they would meet Sarajevo's Mayor.

Unknown to them, assassins lurked along their planned route. As the Archduke's car trundled down the street, one of the killers jumped forward to throw a bomb. By chance, the bomb missed, bouncing off the car then landing in the street. It exploded next to the car directly behind the Archduke's, wounding several of his good friends and staff members. The injured men were rushed to the hospital while Ferdinand, furious at what had just happened, continued to City Hall.

Once he arrived there, he greeted the Mayor icily. "So, you welcome your guests here with bombs?" he asked angrily. The Mayor brushed aside the remark and welcomed his Austrian dignitary to his city, assuring the Archduke that the would-be assassin had been caught. The meeting ended with Ferdinand announcing he wished to visit his two wounded officers in the hospital. This required a change in plans which almost, but not quite, saved the Austrian's life.

That day, a number of pro-Serbian assassins had staked out the Archduke's route through the city. If the first assassin failed, there were backups to him—and backups to those backups. The Austrian's route through the city had been well known, and it was dotted with gun wielding, bomb toting fanatics. Trained by the Serbian terrorist organization known as the Black Hand, their goal was to secure Bosnian independence from Austria.

Now, though, circumstances foiled their plot. The Archduke

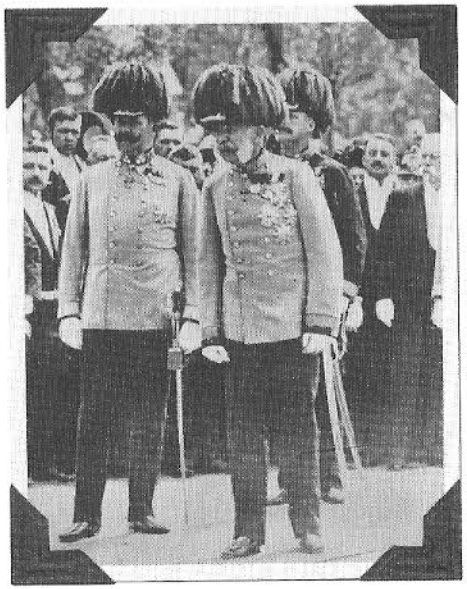
would not be traveling on his pre-selected route to the army maneuvers. Instead, he insisted on going to the hospital. He should have missed all the other assassins waiting for him.

Enter Franz Urban, the Archduke's personal chauffeur. Urban had never driven in Sarajevo before and did not know exactly how to get to the hospital. He tried his best, though, working through the maze of narrow streets, trying to follow his maps and instructions. In the end, he got lost.

Somewhere along the way, he made a right turn into a single-lane alley that was so narrow he could not turn the car around. He went only a few dozen yards down the alley before he realized his mistake. He slowed the car down, getting ready to turn it around. Then he saw he would have to back up to the main street he had left. He touched the brakes just as a shabbily dressed young man crossed in front of the car a dozen or so feet ahead. Franz watched the man—a boy really—look up and see the car.

The boy was a 19-year-old Bosnian Serb student named Gavrilo Princip. Trained by the Black Hand, he had been posted on the Archduke's original touring route. When the Austrian had not shown up, Princip got bored and decided to head for home. Running into the Archduke on this confined back alley was a complete accident.

Princip capitalized on the chance meeting. Quickly, he pulled his revolver and stepped toward the car. Shots rang out. The



THE DUAL MONARCHY S LEADER, EMPEROR FRANZ JOSEPH (AT RIGHT). HE HATED HIS NEPHEW, FRANZ FERDINAND, AND THOUGHT GOD HAD PUNISHED HIM THROUGH THE ASSASSINATION FOR HIS LIBERAL VIEWS.

THE KAISER S PERSONAL GUARD ON PARADE JUST PRIOR TO THE WAR S OUTBREAK IN AUGUST, 1914.

Archduke and Archduchess slumped forward, bleeding from their bullet wounds. Horrified, Franz Urban jammed the car into reverse and sped to the hospital. But by the time he arrived there, both Austrians had bled to death.

Princip did not enjoy his victory. Bosnian police arrested him immediately, and he spent the next four years languishing in prison before dying of pneumonia in 1918. He lived long enough to see the war—to see the millions killed or maimed—that had been touched off by his single act of madness.

And still, none of it would have happened if Franz Urban had not made that wrong turn. Urban's moment in history lasted but an instant. When it passed, he disappeared from view and lived out his life as anonymously as any other average person. Still, his single mistake triggered the events that consumed Europe in a four-year war that killed millions and destroyed an entire generation. Entire nations, including Urban's own, were erased from the map and new ones took their place. In the end, when the shooting finally ceased, nobody could remember what they had been fighting for in the first place.

In the wake of the assassination, the battle lines were quickly drawn. Soon, all of Europe seemed to be sucked into the crisis.

WHERE ALL TOO MANY OF EUROPES ENTHUSIASTIC VOLUNTEERS ENDED UP AFTER THE FIRST WEEKS OF THE WAR.

Austria blamed Serbia for the assassination and threatened war. Russia, always the "savior" of the Balkan Slavs, came to Serbia's defense. With Russia now involved, the Germans backed their ally, Austria-Hungary, to the hilt. With Germany now enmeshed in the crisis, France came to Russia's aid. As the diplomats fussed and fumed, the armies began to mobilize. Once that happened, war was inevitable.

Austria attacked Serbia, declaring war on July 28, 1914. On August 1, Germany declared war against Russia then invaded Luxembourg and Belgium in order to get to France. Two days later, Germany declared war on France. The next day, Britain went to war against Germany after learning of that country's invasion of Belgium. On the 6th, Austria-Hungary declared war on Russia. In the days that followed, the fighting spread from Belgium to the Balkans, from the Alsace to East Prussia.

And all because of a wrong turn in Sarajevo.

At first, the war delighted Europe. There were mass rallies in support of the war, and all the old divisions within France and Germany disappeared in a ground swell of nationalism. Volunteers flocked to the colors, and millions went off to battle with songs on their lips. Universally, Europe thought the war would be quick, sharp and bloodless. A few weeks of fighting, and the war would all be over.

The armies clashed in early August. Wearing brilliant colored uniforms and fighting with leftover Napoleonic tactics, Europe's legions were in for a sudden shock. The stand-up, shoulder-to-shoulder fighting their great-grandfathers had done at Austerlitz and Waterloo a hundred years before may have worked fine in the age of the muzzle-loading musket, but in the age of rapid-fire artillery, machine guns and magazine rifles, they were an invitation to slaughter. And that's precisely what happened.

France first went after its "lost territories"—the Alsace and Lorraine which it had ceded to Germany after the 1871 war. In nine days of fighting, known as the Battle of the Frontiers, the French launched massive human-wave attacks into the teeth of machine gun and artillery fire. They were slaughtered by the thousands. By the time the commander of the French army, Marshall Joffre, abandoned the offensive, 300,000 of his men lay dead on the killing fields from Mulhouse in the south to Nancy in the north.

Modern technology, as all sides soon discovered, made obsolete their battle tactics.

With the French offensive in the east stopped cold, the German army swept down from Belgium, threatening Paris from the north. Just in time to help avert disaster, the British Expeditionary Force arrived, 100,000 strong. In its first three battles, the Germans nearly destroyed it.

By early September, the situation was desperate. The Germans were on the outskirts of Paris. The BEF had taken huge losses in the last few weeks, and the French had been bled white defending Nancy. It seemed as if nothing could stop the German army from taking Paris and fulfilling all the promises that this would be a short war.

But then, another anonymous figure stepped into the historical spotlight and changed the course of the war. For the first time ever, that anonymous figure would be an aviator. France would be saved by the aeroplane.

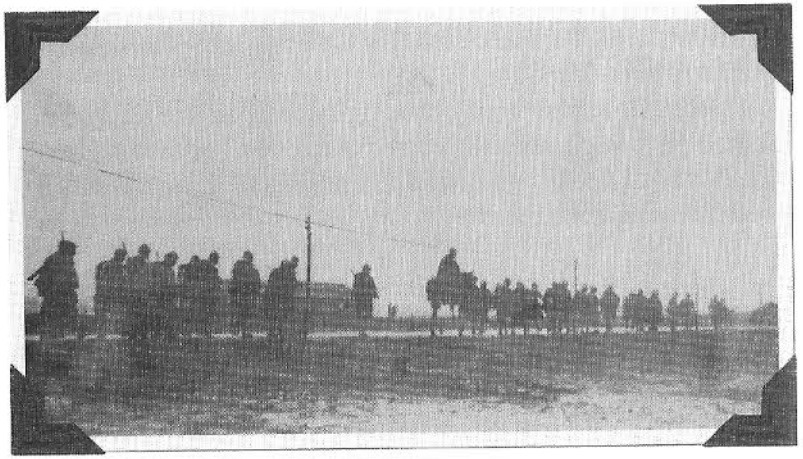
Chapter Two

The Rise of The Aeroplane

"...As experience has shown, a real combat in the air, such as journalists and romancers have described, should be considered a myth. The duty of the aviator is to see and not to fight." —German 1914 staff report.

The British knew exactly what the Germans were doing. When the BEF crossed the Channel into France in August, the troops took along 48 planes—the entire strength of the Royal Flying Corps. These primitive machines soon proved their worth as the "eyes" of the BEF. Each day, the pilots scouted out ahead of the ground troops, searching out German intentions as they lumbered overhead. At the end of August, with the situation on the ground growing increasingly desperate, the aviators brought home a bit of good news.

On the far right flank of the German thrust into France, General Alexander von Kluck's First Army suddenly shifted its line of advance. Instead of going around Paris to the west, von Kluck turned his corps southeastward, cutting inside of Paris and putting the fortified capital on his right flank. British pilots Lieutenant A.E. Borton, Captain D.LeG. Pitcher and Lieutenant C.G. Hosking all spotted the move, reporting back to HQ. Word of the change passed up the chain of command until it reached Marshall Joffre's



French Troops on the move.

Joffre of the Marne. The French commander-in-chief was given most of the creditfor the success at the battle of the Marne.

desk. After studying the situation, he decided the time was ripe for a counter-offensive against von Kluck's army.

As planning began for the great counter-attack, von Kluck made another mistake. As he moved south across the Marne River, a gap opened between his army and the Second Army on his left flank. The gap grew wider and wider as von Kluck's men marched south.

Again, the eagle-eyed pilots and observers of the RFC spotted the mistake. Again, word of the hole in the German lines sped up the chain of command.

On September 5, 1914, the Battle of the Marne began. The French, with the help of the multi-colored Parisian taxi cabs, moved into place an entire army on von Kluck's right flank. On the 5th, they went on the attack, surprising the Germans and nearly overwhelming them. General von Kluck, more concerned with his advance to the south than any "spoiling" attack the French could launch on his flank, ignored the brewing battle for two days. Finally, though, on September 7, von Kluck awoke to the danger and moved swiftly to crush the French attack. As he did, his forward units had to re-cross the Marne and swing back north and west to get into the battle.

The hole between von Kluck and the rest of the German army had just grown bigger. Into that gap flowed the resurgent British Expeditionary Force as well as the French Fifth Army. The Germans, nearly enveloped now on both flanks, knew the game was up. Reluctantly, von Kluck ordered a retreat which later forced the

rest of the German army to go on the defensive as well. The great push for Paris had collapsed in failure, as did any hopes that the war would be a short one.

The aeroplane had helped save France that September. Without the vital information the pilots brought back from their trips behind the lines, the Allied armies never would have been in a position to roll up von Kluck's army. Now, as the war settled into a long stalemate that would stretch from the North Sea to the Swiss border by Christmas, both sides wondered how else they could use this new weapon of war. Would the airplane just be used as the eyes of the armies, or could it be even more useful?

Chapter Three

The Birth of Air Fighting

Just an old-fashioned Avro with old-fashioned ways
And a kick that says 'back-fire' to you,
An old Mono engine that konks out and stays
When the toil of a long flight is through,
Tho' the pressure will drop, and it loses its prop,
And the pilot's inclined to resign,
I'll rejoice till the day—that I learnt how to fly,
In that old-fashioned Avro of mine!

—RFC Squadron Song

The Austrian Baron Rosenthal was the first to die in air-to-air combat. His victor, Russian Captain Nesteroff, was the second. On September 8, 1914, just as the Battle of the Marne reached its climax, Nesteroff encountered the Baron's fragile craft over the Eastern Front. Without thought to his own safety, Nesteroff dove after the Austrian plane and crashed his own into it. Locked together, the two wooden machines tumbled earthward, both crews dead.

In the early days of the war, Nesteroff's suicidal battle with the Baron Rosenthal was an aberration. In those first weeks of the war, pilots shared a sort of kinship that transcended national boundaries. German pilots who stumbled across French or British planes would often toss their enemies a jaunty wave—and nothing more. For the most part, the Allies did the same.

This sort of honeymoon didn't last much past the Battle of the Marne. When both sides realized the importance of air reconnaissance, air-to-air fighting became inevitable. Pilots and observers began carrying shotguns, revolvers, carbines and even bricks and bottles. Some of the more creative thinkers hauled aloft machine guns. RFC pilot Louis A. Strange convinced his observer to bring aboard a Lewis gun on one reconnaissance flight. Unfortunately, the weight of the gun kept the plane from climbing above 3,500 feet—well below the German planes Strange had been hunting. When his commanding officer learned of his idea, he ordered Strange to remove the gun and focus on his real job—scouting for the army.

Others continued to try. On October 5, 1914, French Sergeant-Pilot Frantz went aloft in a Voisin biplane with his mechanic,

Corporal Quenault. Over the lines that morning, Frantz spotted a German Aviatik at about 3,500 feet. He closed on the unsuspecting German until Quenault, armed with a light machine gun, found the range and opened fire. The Aviatik dove away, turning northward for its own lines. Frantz would not be deterred. He followed the German while Quenault snapped out short bursts from the gun. In his haste to catch the Aviatik, Frantz accidentally overshot it. As he passed on by, the German banked away from the Voisin and tried to run. Frantz reversed his turn, ending up behind the Aviatik. Quenault poured rounds into the ungainly German plane, even as the pilot tried to climb away from them. But Quenault's marksmanship was too good. The German plane, riddled with bullets, fell into a dive. The pilot fought the controls all the way down, pulling the nose up three times before losing it again. Finally, the Aviatik plunged into a small copse of trees, where it exploded.

Running to the scene of the crash, one observer recalled, "the motor was almost entirely buried in the ground, the fuselage was twisted, and the wings were broken into a thousand pieces. One of the aviators lay quite dead three yards away from the motor. The second, the observer, with beautiful hands exquisitely cared for and perhaps a great Prussian name, was caught under the red motor, now a wreck in flames. He seemed to us to attempt to pull himself out, but the movement was probably convulsive; he looked at us, clawed the earth with his hands, and died before our eyes."

The honeymoon was over. The air war was about to get dirty.

Chapter Four

Deflectors and Interrupters

"A sort of mystery surrounded the Fokker... rumour credited it with the most fantastic performance! It could outclimb, outpace and outmanoeuvre anything in the R.F.C. You were as good as dead if you as much as saw one...."

—Cecil Lewis, *Sagittarius Rising*

The land war on the Western Front remained a bloody standoff throughout 1915. Both the French and the British launched offensives of their own. Always, the attacks succeeded in gaining a little ground, but no attack made the "breakthrough" all involved sought.

Poison gas, a new and deadly weapon, was tried by the Germans for the first time ever during a local attack outside the city of Ypres in April, 1915. The gas caused panic among the British and French troops, sparking a stampede to the rear. A four-mile hole opened in the lines as men threw down their weapons while fleeing the terrible gas clouds. Seventy thousand Allied soldiers fell during the attack, but the Germans could not exploit their success. Not expecting such a reaction from the Allies, the German high command had not back-stopped the attack with enough reserves to achieve a decisive victory.

The Allies responded with gas attacks of their own, though none succeeded like the German one that April. By late 1915, the Allies had lost close to a half a million men for no gain at all in a series of vain offensives. The year ended with the lines drawn as they were the previous December.

While the ground war grew increasingly bloody and futile, the air war evolved through 1915 into a battle between technology and tactics. As each side developed new planes, new refinements, and new weapons, the other side scrambled to develop tactics to counter these new threats. It was a race begun by a young French daredevil named Roland Garros, and it would not end until the Armistice in November, 1918.

Before the war, Roland Garros was a well-known figure in aviation circles. As one of France's early air pioneers, he had entered nearly every contest and race in Europe, winning acclaim for his incredible feats. He was the first to fly across the Mediterra-

nean Sea, a risky proposition at best in that age of fussy engines and flawed designs. He later entered and won the Paris to Rome and Paris to Madrid races, and in 1911 he won the Grand Prix d'Anjou.

When the war broke out in 1914, Garros was in Germany. Worried that he might be arrested, he abandoned his belongings and took the first train to Switzerland. He returned to Paris as fast as he could, where he offered his services as an aviator. Along with many other pre-war daredevils, the French Air Service assigned him to M.S. 23, a squadron flying early Morane monoplanes.

During the first winter of the war, Garros began thinking up new ways to shoot down German observation planes. He concluded that the best way to do it would be to mount a machine gun on the nose of his plane so that he wouldn't have to carry an observer to shoot the gun. If the machine gun were fixed to fire forward, Garros could aim the gun by simply pointing his nose at his target. A great idea with one huge flaw: the propeller was in the way.

For several weeks, Garros and his mechanic tinkered with one of the Morane monoplanes, trying to come up with a way to protect the prop from the machine gun. As they experimented, they discovered that only about 10% of the bullets fired ever hit the prop blades. If they could just take care of that one in ten, their idea would work.

They settled on what they called a "deflector system." By mounting steel wedges onto the back of each propeller blade, any bullets that would normally damage it would just ricochet off. The wedges were angled so the bullets would not fly back and hit the pilot.

In the spring of 1915, after weeks of experimentation, Garros and his new weapon took to the air in search of a victim. Once aloft, he headed for his primary target, a railroad station outside of Ostend, which he would bomb. Along the way, though, he came across a lone Albatros two-seater, intent on spying behind Allied lines.

His original mission forgotten, Garros turned his Morane-Saulnier monoplane after the German. He crept up on the unsuspecting plane from behind, a tactic that confused the German observer. Then came the clatter of Garros' Hotchkiss machine gun. The observer fought back with a carbine, but it was really no contest. The Albatros burst into flames and crashed. Garros,

horrified by what had happened, later reported, "I gazed below me for a long time to convince myself that it was not a nightmare."

Garros' jury-rigged experiment had just given birth to the first true fighter plane in aviation history.

For eighteen days, Garros terrorized the local German units on the Belgian coast. German pilots, filled with rumors of new French superweapons, began avoiding all monoplanes to the outrage of their commanding officers, one of whom accused his aviators of having the "hallucinations of old women."

Garros' one man war ended almost as quickly as it had begun. After shooting down three planes, he himself fell victim to a German bullet on April 18, 1915. With his fuel line severed, he coasted down for a crash-landing behind German lines. Before he could burn his craft, German soldiers appeared and took him prisoner. His precious machine had fallen into enemy hands.

Garros remained a prisoner until January 1918, when he and another French pilot escaped from their captors and made their way to England. Upon returning to France, Garros rejoined the French Air Service, not realizing the tremendous changes that had taken place between his daring experiment and his return to combat. After flying only a few missions, the Germans shot him down again. A great pioneer of air combat technology had died at the hands of the weapons he helped invent.

Though Garros started the air combat revolution, it would be the Germans who refined his ideas, making them both practical and deadly. In April 1915, when Garros went down behind the lines, the Germans captured his Morane-Saulnier. After local officials examined it, they realized Garros' plane was an incredible intelligence coup. Quickly, they packed it up and sent it to young Tony Fokker, a Dutch aircraft designer working in Germany.

The German Air Service asked Fokker if he could duplicate Garros' invention. Fokker agreed to have a look, but instead of copying the deflector gear, he improved on it. Later, Fokker claimed that his novel idea came with a flash of inspiration. More likely, however, was the fact that the German Air Service provided Fokker with the details of a sychnronizing system patented in 1913 by LVG engineer Franz Schneider. In exchange for Fokker's time and effort, the Air Service apparently promised to protect him from lawsuits.

It took only a few days for Fokker to work through the kinks of the new system. Instead of protecting the propeller, Fokker built

a system of gears into the machine gun and engine that would ensure no bullets were fired when the propeller blade passed in front of the barrel. Fokker called his invention the "Interrupter Gear."

Earlier in 1915, his company had been hired to build a lightweight, single-seat aircraft whose chief attribute was speed. Fokker copied the Morane-Saulnier design and even used a license-built version of the French Gnome rotary engine—the Oberursel. Now, with his Eindecker aircraft just reaching production stages, Fokker married his interrupter gear to it and created the world's first true fighter plane.

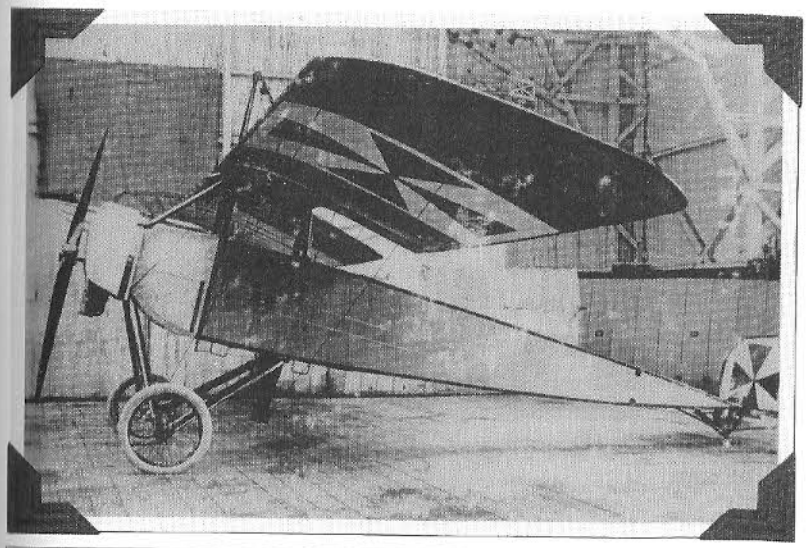
When the first Eindeckers arrived at the front in mid-May, 1915, they were allocated in penny-packets to the existing reconnaissance units. Initially, the German pilots balked at the Eindecker's capabilities. Having learned to fly on slow, awkward biplanes, or the Austrian Erich Taube, the speedy Fokker proved to be a difficult adjustment. Compared to the Aviatiks and the early Albatros two-seaters, the Fokker was far more maneuverable, unforgiving, and quirky. Fokker realized this problem early on and helped establish a training school to teach the proper techniques needed to fly his creation.

The transition period lasted until early August, and for some time the German Air Service doubted the effectiveness of Fokker's new airplane. In some cases, the interrupter gear malfunctioned, shooting off the propeller blades and killing the pilot in the ensuing crash. After three fatal crashes in July and August, the Air Service forbade its further use. It even disbanded Fokker's training school at Doberitz.

The Air Service very nearly killed the best weapon at its disposal by its overreaction. Two pilots, however, stepped in to save the day. They were Max Immelmann and Oswald Boelcke.

On August 1, 1915, a flight of nine British Be2 "Quirks" flew over the German airfield outside Douai. The Allied planes surprised the German pilots, who had been napping in their quarters nearby. Max Immelmann, a talented twenty-five year old pilot from Dresden, awoke to a "terrible row." When he reached his window, he spotted the British planes passing overhead, dropping bombs on the airfield. He telephoned for a car at once so he could get to his plane.

While waiting for his ride to the airfield, Oswald Boelcke, a smart Saxon with one kill already to his credit, buzzed by on his



WHILE FOKKER WORKED ON A COPY OF THE MORANE BULLET, PFALZ PRODUCED A COPY OF THE MORANE PARASOL CALLED THE A.I. IT SAW ONLY LIMITED USE.

motor bike, heading for the airfield and his awaiting Fokker Eindecker.

Boelcke and Immelmann were F.F.A. 62's two best pilots. When the squadron received a pair of Eindeckers earlier in July, their commanding officer assigned both of them to fly the new planes. Immelmann had only been flying the Eindecker for three days, but his raw talent as a flier would more than make up for his lack of experience on this day.

Immelmann reached the airfield ten minutes after Boelcke took off after the British Quirks. He fumed impatiently as he waited for the ground crew to roll his Fokker out of its shed, then climbed aboard once it was ready to go. Finally, well behind his comrade, Immelmann took to the skies, ready to test Fokker's fussy, but potentially deadly, interrupter gear.

Immelmann climbed to about 6,500 feet when he saw Boelcke abandon his attack on two Be2s. Boelcke dove away from the British planes and did not return to the action. Immelmann later discovered Boelcke's gun had jammed.

With the Quirks split up into at least three groups, Immelmann climbed after the two Boelcke had been stalking. Then he spotted another British plane slightly below him, dropping bombs on Vitry. He turned toward it and gave chase. Diving down, he

opened fire on the Be2, firing 60 rounds before his gun jammed. He broke off to clear it, noticing that the other two Quirks in the area were now closing on him. He freed up his machine gun and made for his original target. Two more times in the course of the fight his guns jammed. Yet, his marksmanship carried the day. In the end, the Quirk fell off into a long, shallow dive which Immelmann followed, firing his gun whenever he could get the jams cleared. Four hundred and fifty rounds later, the Quirk crash-landed in German territory.

Eager to meet his foe, Immelmann landed in the same field. Unarmed, he approached his two enemies cautiously, yelling, "Prisoniers!" in French at them. They offered no resistance, and the pilot held out his right hand to shake Immelmann's.

"Bonjour, monsieur," Immelmann said, but was surprised when the Allied pilot responded in English.

"Ah, you are an Englishman?" he asked.

"Yes," came the reply.

"You are my prisoner," Immelmann said.

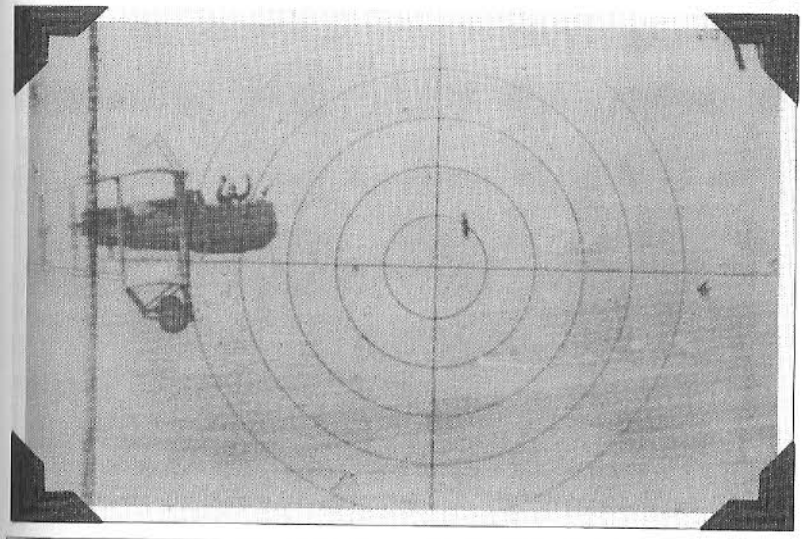
The Englishman, appearing unruffled, offered Immelmann congratulations, "My arm is broken. You shot very well."

As the German looked over his prisoner, he discovered that one of his bullets had smashed the Englishman's forearm. Indeed, he had shot very well.

The Fokker Scourge had begun.

Throughout that fall, Boelcke and Immelmann made life miserable for the British pilots in Flanders. Together or individually, they would roam the skies over the trenches, looking for Allied recon planes in their Fokker Eindeckers. On August 19, 1915, Boelcke scored his first kill in his monoplane fighter. Immelmann scored again on the 26th, and by the end of the year had seven victories. Boelcke finished the year with six. As their scores mounted, both men became heroes to the German people. Starved for good news in a war filled with seemingly purposeless slaughter on the ground, Germany embraced their young air heroes with pure adulation. When, in January 1916, the Air Service awarded both men the Pour Le Merite—the most prestigious Prussian award for bravery in battle—their rise to fame seemed complete.

Not only did they become national figures Immelmann and Boelcke set the tone for the next eight months in the skies over the Western Front. Following their example, other pilots began stalking Allied planes in their speedy Eindeckers. Soon, though there were



AN OBSERVER RQAISES HIS ARMS TO SURRENDER AS HE ENTERS SOME UNFRIENDLY SIGHTS.

fewer than sixty Fokkers at the front at any one time, the British and French Air Services fell into a panic over their losses. Other Eindecker pilots, including Ernst Udet and Kurt Wintgens, also began taking a toll on Allied planes. The French, who had been bombing Germany for months without serious losses, suddenly had nine planes shot down in one mission. Other attacks suffered the same fate, forcing them to abandon daylight bombing raids.

As the Fokkers made their presence known, Allied morale plummeted. Even the sight of a distant monoplane was enough to cause an Allied pilot to cut out for home. Missions were not being completed, and the myths surrounding the Fokker grew and grew until Allied aircrews were convinced it was an unbeatable super-weapon.

Allied leaders knew only two things could stop this German onslaught. First, new planes had to be deployed that could beat the Fokker. Second, tactics had to be developed to counter the Eindecker threat. In the meantime, the French and British pilots would have to take their losses, buying time with their lives until the next generation of aircraft arrived at the front. For nearly six months, the Allied pilots waited and bled, knowing that the Germans for the first time in the war had command of the air over the Western Front. As the war went on, the battle for that command would grow both furious and bloody.

Chapter Five

The Swing of the Pendulum

"You seem magnetically attracted to any German aeroplane you see, and never weigh the situation. I saw one of your machines take on one Fokker, then two Fokkers, then three Fokkers, before being shot down at Lille."

—Captured German pilot Lt. Baldamus to his British interrogators.

Major Lanoe Hawker was no stranger to air combat. In early 1915, he earned the Royal Flying Corps' second Victoria Cross, England's highest award for bravery. Hawker, a small, sensitive man prone to fits of depression, mounted a Lewis gun on the side of his Bristol Scout and went hunting for targets. He found two German planes, one of which he shot down and the other he forced to land behind German lines. He did it by aiming the gun off to the side, outside the propeller's arc.

That sort of ingenuity and aggressiveness convinced the RFC to give Hawker command of the world's first true fighter squadron. It almost proved his undoing. Hawker had been flying in combat since the war began with No. Six Squadron. When the RFC ordered him to England in the fall of 1915, Hawker was the last original member of his squadron. Everyone else had been killed or wounded.

Command in England did not go well at first. With all the fighting he'd seen, Hawker sometimes appeared on the verge of a total mental breakdown. The strain of his new position pushed him even closer to that edge. Nevertheless, this tough former engineer knew his duty, and carried out his responsibility well. By December 1915, No. 24 Squadron was ready to go to France.

Equipped with the new Airco DH-2, Hawker's men would be the spearhead of the RFC's response to the Fokker Scourge. Relatively fast for its time, the DH-2 carried a single machine gun fixed to fire forward. To solve the problem of firing through the propeller, British designers gave up on their own version of the interrupter gear and just moved the engine behind the pilot. This pusher design solved the problem admirably, but created others. As Hawker's men discovered, the DH-2 had some nasty habits. Its unreliable engine tended to catch fire, which usually meant the end for the unfortunate pilot. Worse, it spun easily, an especially bad

characteristic in an age where nobody knew how to recover from a spin. With their usual grim humor, the pilots nicknamed the DH-2 the "Spinning Incinerator."

Hawker's Squadron, as the outfit was nicknamed, went into action in early February 1916. He taught his men to be aggressive—"Attack everything," he once told them. After arriving in Flanders, the squadron's DH-2s sought out the dreaded Eindeckers and brought them into battle. Though the DH-2 had many problems, it was far superior to the Fokker monoplane. Soon, as other DH-2 squadrons arrived at the Front, the German Fokker menace gradually evaporated.

In early 1916, the French captured an intact Fokker Eindecker. After test flying it, they discovered the plane had only limited maneuverability, especially compared to the latest Allied types arriving at the front. When these facts filtered down to the squadrons, the Fokker at last ceased to be a psychological threat.

Instead, they were hunted until the Germans were nearly driven from the skies. Resurgent Allied air power had crushed the Fokker Scourge.

CHAPTER SIX

VERDUN

"Victory was to be bought so dear as to be almost indistinguishable from defeat."

—Winston Churchill

On February 20, 1916, a crushing bombardment—the biggest ever seen in human history—all but wiped out the forward French positions guarding the strategic city of Verdun. The next day, eight German divisions attacked on a narrow front, grinding their way through the remains of the French defense. By nightfall, good progress had been made on every sector.

The biggest and most important battle of the war had just begun.

As the battle raged below, a new struggle unfolded in the air. For their offensive, the Germans had amassed four observation squadrons, 14 balloons, and some 20 Fokker Eindeckers. The Eindeckers were charged with protecting the artillery-spotters as they went about their vital tasks.

When the battle began, the Eindeckers cleared the sky of all French machines. Outnumbered, and with their aerodromes under

THE LUNAR LANDSCAPE AROUND FORT DOUAUMONT.

heavy artillery fire, the French squadron fled Verdun for safer areas. However, that retreat did not last long. At the end of February, Colonel de Bares took command of the shattered units around Verdun. General Petain, head of the ground forces in the Verdun sector, ordered Bares to seize and hold air supremacy at all costs. The brutal artillery barrages had to be rendered ineffective, and the only way to do that was to shoot down the German spotter planes.

Colonel de Bares immediately called for reinforcements until he had almost 120 planes under his command. By early March, he had eight reconnaissance, two artillery, and six fighter escadrilles at his disposal. To lead the fighter squadrons, he chose Major Tricornot de Rose, a pre-war aviator who was France's first military pilot. An experienced leader, whose drooping mustache had made him a well-known figure in the Air Service, de Rose set to work reorganizing the fighter escadrilles to carry out their mission.

The first important change came on March 21. Prior to Verdun, aviation units had always been under the control of the local army commander. Now, the French tried a new system. After de Rose collected no fewer than fifteen fighter squadrons under his direct supervision, Marshall Joffre took his group out of the normal chain of command. Instead of reporting to the local ground commanders, de Rose reported directly to de Bares, who in turn answered only to Joffre himself. This way, the immediate needs of the army commanders would not interfere with the overall objective: air superiority over Verdun.

Major de Rose, with his chain of command secured, soon modified the very way his fighter squadrons did battle in the air. Until Verdun, Allied fighters had patrolled the front in small numbers, just as the Germans had done with their Eindeckers. Lanoe Hawker and No. 24 Squadron started to change that in Flanders when they flew missions as a squadron. At about the same time, Major de Rose ordered his squadrons to do the same thing.

No longer would there be single plane patrols over Verdun. Instead, de Rose taught his escadrilles to fly and fight in formation. He developed escort tactics and worked out effective ways to intercept incoming German aircraft. His experiments and their applications led to the first truly homogenous fighter squadron. It did not take long for his ideas to spread all through the French Air Service, as Hawker's did in the RFC.

The new tactics, combined with new aircraft like the Nieuport

11, went a long way toward saving France that grim spring. On the ground, the Germans slowly advanced toward Verdun, taking huge losses but grinding up the French army in the process. In the air, the Germans lost their brief control of the air over Verdun as their Eindeckers, scattered through the reconnaissance units, ran afoul of superior numbers and better French airplanes.

Once the Eindeckers had been vanquished, Major de Rose instituted a daily patrol system that he felt eliminated the need for escort missions altogether. Each day, his squadrons would patrol their assigned sector in groups of five or six. Sometimes, above these patrols would be the squadron's elite aces—men like Jean Navarre and Alfred Heurtaux. By using their comrades below as bait, they racked up high scores in the vicious fighting at Verdun.

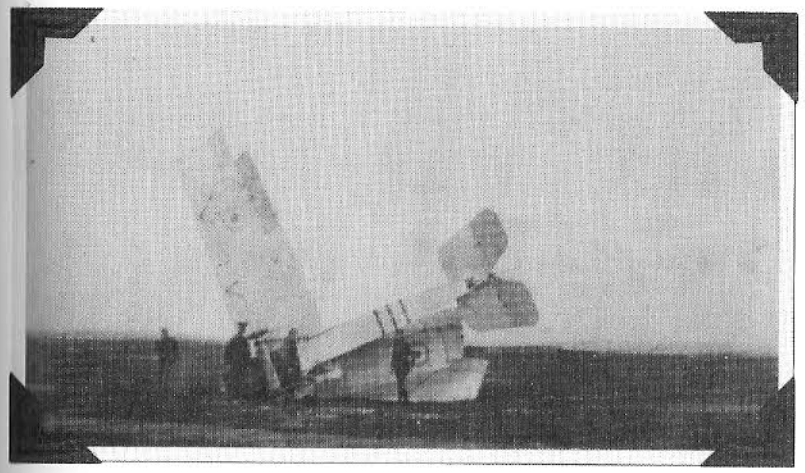
And it was vicious. The French showed no mercy to their outnumbered German enemies.

Twenty-six year-old Albert Deullin rose to ace-hood over the skies of Verdun, shooting down five planes between February and June 1916. On June 4, France awarded him the Legion of Honor, its highest award for bravery. On one of his most notable missions, Deullin was full of rage at the Germans after having lost his close friend, Lieutenant Peretti, in battle over Verdun. Thirsting for revenge, he caught an Eindecker from behind and closed to less than thirty feet before opening fire. Twenty-five rounds from his machine gun struck the cockpit and, as Deullin recalled, "The fellow was so riddled that vaporized blood sprayed on my hood, windshield, cap, and goggles. Naturally, the descent from 2,600 meters was delicious to contemplate."

It got even uglier. Bernard Lafont in his candid book, *Au Ciel de Verdun*, detailed the brutal side of the air war. One time, a Caudron bomber force-landed at his aerodrome. When he and his friends came out to see it, they discovered that the Caudron's gunner had been shot in the head. The pilot, Lafont noted, was unhurt but quite shaken as he was "covered with blood, {his} clothes and face, for in the wind of the motors, the blood that poured out of the passenger's wound lashed him."

Another time, Lafont's squadron commander assigned him to burial detail. He spent his days recovering the mutilated bodies of his comrades. Once, after a nighttime crash, Lafont arrived at the crash site the next morning and noted:

It is Senain. He received three bullets in the head, which exploded like rotten fruit; brains and blood trickle on the face and



THE FATE OF MANY AVIATORS WHO FOUGHT FOR THE SKY OVER VERDUN.

clothes. The helmet moves on a broken skull.

Both are horribly crushed. The stretcher-bearers who pick them up have only a bloody pulp in their hands.

Another time he recovered the body of a Farman crewman, who had fallen to his death from his airplane:

The second fell on the roof of the house. I clearly heard the dull sound of the body when it was crushed in a heap. Flouc!...The body was recovered from the roof, entirely broken, shattered and shapeless and without rigidity like a heap of ooze....

Clearly, the air war over Verdun was not for the faint of heart.

Chapter Seven

Germany Resurgent

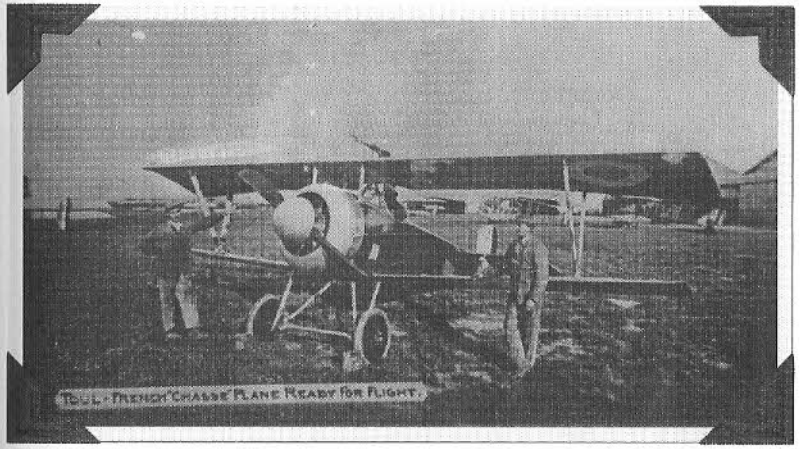
As a pilot in France I chanced over the lines
And there I met an Albatros Scout.
It seems that he saw me, or so I presumed,
His manoeuvres left small room for doubt.
He sat on my tail without further delay,
Of my subsequent actions I think I might say—

My turns approximated to the vertical,
I deemed it most judicious to recede.
I frequently gyrated on my axis
And obtained colossal atmospheric speed.
O descended with unparalleled momentum
My propeller's point of rupture I surpassed,
And performed the most astounding evolutions—
In other words—I SPLIT-ASSED!
—"In Other Words" RFC squadron song.

By early April, the air fighting over Verdun had all but driven the German Air Service from the skies. The Nieuport escadrilles had carried out Petain's desperate February order to win command of the air. Now, the German army below was blind, its reconnaissance and observation planes shot out of the sky. No longer would their artillery fire be nearly as effective as it was at the outset of the battle. As this happened, both sides realized the importance of the air fighting and renewed their efforts to take or maintain air superiority. The struggle took on a desperate intensity.

As their enemies concentrated their fighters into dedicated squadrons, the Germans began to react in the same way by the spring of 1916. Separate Fokker squadrons were established, sometimes called Fokker staffels or Single-Seat-Combat Flights (KEKs). These primitive fighter squadrons helped offset the Allied advantage in aircraft design until better German planes could make their debut over the front.

At first, the Germans tried to defend every piece of sky at once. They flew "barrage patrols" where each staffel was assigned a sector to scour. No Allied planes were supposed to cross the barrage patrol barrier. But to cover every inch of sky in a given



A Nieuport 17 at the front. The Nieuports 11 and 17 helped turn the tide against the Fokker Eindeckers.

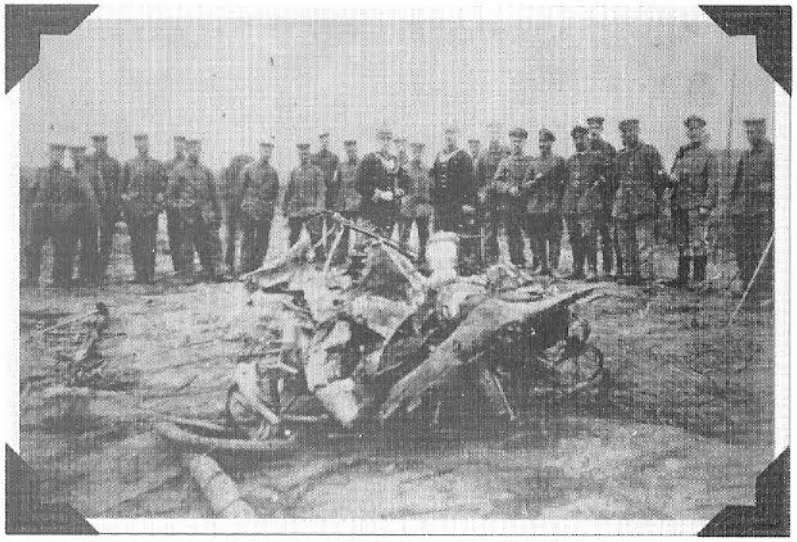
sector required the Fokker staffels to break down into flights of two or three each. Again, their tactics left them outnumbered and frequently overwhelmed by the larger formations of Allied planes.

Summer started poorly for the Germans and only got worse. In June, the great Max Immelmann, known to his countrymen as the "Eagle of Lille" died in combat with a British Fe2. Later investigation indicated that Immelmann's interrupter gear had failed and he had shot his propeller off. Tony Fokker, always worried about negative press, went to great lengths to deny this. In any case, the British were happy to take credit for Immelmann's death. He had been one of the top aces of the war at the time of his death, with 15 kills to his credit.

As the summer wore on, the German Air Service continued to be rolled back by the Allied change in tactics and aircraft. When the British launched their Somme Offensive in July, the air fighting heated up once again. Though the RFC squadrons took heavy losses, the Germans seemed on the ropes for sure. Given the disaster the ground offensive produced, the success in the air provided a glimmer of hope to the tiring Allied home fronts.

The German Air Service knew it had to do something soon to redress the balance in the air. To do it, they called on Oswald Boelcke, their leading ace and master tactician.

Clearly, the KEKs and Fokker staffels were a step in the right direction. Just as clearly, they had not gone far enough. Starting in late summer, the Germans began organizing dedicated fighter



THE WRECKAGE OF MAX IMMELMANN S FOKKER EINDECKER BEING INSPECTED BY GERMAN PERSONNEL.

squadrons of nine planes each. Boelcke was given a free hand to recruit for his squadron, which would be one of the first formed. Called Jagdstaffels—or hunting flights—these new units were sure to be an improvement over the earlier, ad-hoc collection of Eindeckers in the KEKs.

Jagdstaffel 2—or Jasta 2 as everyone soon called it—was given to Oswald Boelcke. He spent the end of the summer traveling all over Germany and the front lines selecting his pilots. In Russia, he found a former cavalry-officer-turned-reconnaissance-pilot named Manfred von Richthofen. Richthofen had proved time and again his aggressiveness in the air. The attribute appealed to Boelcke who invited him to join his new squadron. The young Prussian aristocrat quickly accepted.

In Werner Voss, Boelcke found another great fighter pilot. A shy, enigmatic nineteen year-old, Voss impressed Boelcke with his remarkable flying abilities. He would later become one of Germany's top aces.

By mid-September 1916, Jasta 2 was ready for combat. Assigned to the First Army, Boelcke's men would be going up against the best British squadrons in Flanders. In the weeks that followed, the squadron routinely ran up against Lanoe Hawker's No. 24 Squadron—and came out on top. After nearly six months of thrashings at the hands of the Allies, the German Air Service was

slowly climbing back on top.

Boelcke himself went on a scoring frenzy unmatched so far in the war. Between September 2 and October 27, 1916, Boelcke downed no fewer than twenty British planes. His men paced his achievements. Richthofen knocked down six in the same period while Boelcke's wingman, Erwin Boehme, claimed another five.

The string of victories continued through the fall, as Boelcke taught his elite group of pilots all that he had learned in his many prior combats. To help the entire Air Service, he set down on paper his famous "Dicta Boelcke" which spelled out the most important tenants of air combat. Those same basic principles apply today just as they did in the war-torn skies of France some eighty years ago.

But Boelcke was wearing himself out. Flying two or three missions a day throughout that fall had given him a haggard, gaunt visage. Despite his exhaustion, he continued to lead his men in battle. Nevertheless, the air fighting had long since become unforgiving, and the destruction in the skies that he helped develop and refine eventually claimed his life.

On October 28, 1916, Boelcke and his squadron were scrambled to intercept Lanoe Hawker's No. 24 Squadron. In his haste to get airborne, the great German tactician had forgotten to strap himself into the cockpit—a mistake born from exhaustion that would soon prove fatal.

With faithful Erwin Boehme on his wing, Boelcke led his Jasta up against Hawker's Squadron. Soon, a whirlwind dogfight raged, with planes zipping all over the sky. As usual, Boehme stayed close to his leader. Suddenly, though, Manfred von Richthofen cut in front of Boelcke, intent on killing a diving DH-2. Boelcke had to swerve to avoid colliding with the Prussian. As he did, his wing scuffed Boehme's Albatros D.II. It was barely a collision, Boehme recalled later, but it was enough to be Boelcke's undoing. His Albatros fell out of control toward the front lines below. The master tactician fought his plane all the way down and even managed to make a relatively soft crash landing. But since he was not strapped in, even the modest impact of the crash killed him.

Boehme, whose plane was also damaged, managed to make a successful landing and emerged from the tragedy physically unhurt. Emotionally, he was traumatized by the accident. For weeks, the brave native of Holzminden carried the guilt of Boelcke's death on his conscience. It did not help that his own

comrades also blamed him for their leader's death. Another man would have been broken by the accident, but not Boehme. He continued to fly and fight, winning back the respect of his fellow pilots with his impressive string of victories. He would continue to fly combat through 1917, despite two severe wounds including one terrible head injury that kept him out of combat for nearly five months.

Oswald Boelcke was gone, but his legacy lived in both the spirit and the organization of the German fighter force. He had taught them how to fight, and how to fight successfully despite being outnumbered. Now, though, his death created a leadership vacuum that would not be filled until early 1917.

The man who filled that vacuum was none other than Boelcke's former protégé, Manfred von Richthofen.

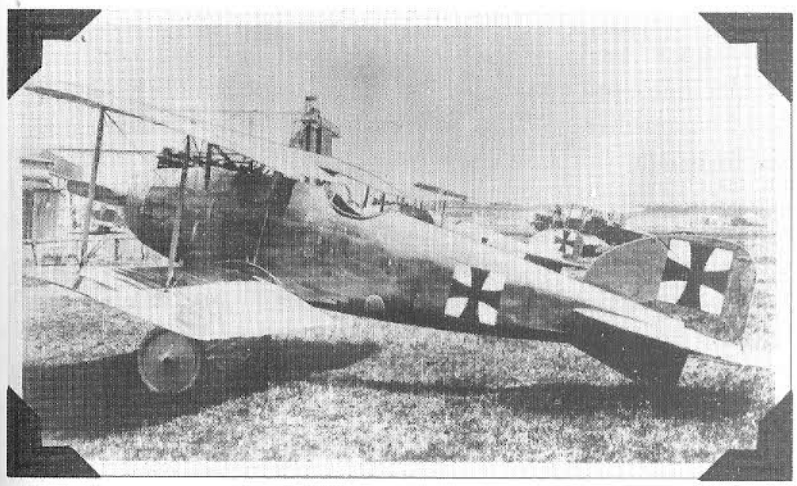
A cold, calculating pilot whose flying skills were not nearly as refined as some of his comrades, including Werner Voss, Richthofen nonetheless possessed all the ingredients for ace-hood. He had a thirst for hunting British planes, as well as a knack for picking the right fights and avoiding disadvantageous situations. He was a stalker, a plotter, a master of patience. All of these things paid off in spades as he continued to fly with Jasta 2.

His first big splash came on November 23, 1916, a day in which Jasta 2 met Hawker's Squadron twice. The first encounter came that morning over Le Sars. Though a whirling dogfight erupted between the two sides, no planes were shot down. After a sharp, intense action, both the British and Germans retreated to rearm and refuel.

Later that day, three DH-2s took off on another patrol. This flight, led by Major Hawker, included Captain J.O. Andrews and Lieutenant Robert Saundby, a future Air Marshal.

Over the lines, Hawker's patrol ran afoul of Jasta 2 again. This time, the British were outnumbered and were soon thrown on the defensive. Early in the dogfight, an Albatros D.II slid behind Hawker's DH-2, but before it could open fire, Andrews chased it off. He paid for saving his squadron commander moments later when another German hit his engine, forcing him to disengage and return to No. 24 Squadron's aerodrome at Bapaume.

Somehow in the fray, Hawker ended up one-on-one with an Albatros D.II. The German plane, flown by Manfred von Richthofen himself, was not as nimble as the DH-2, but was faster and could climb better.



JASTA 2 S PRIMARY WEAPON OF 1916: THE ALBATROS D.II

What developed was a battle of two masters. Hawker used his DH-2's maneuverability to avoid every attack Richthofen attempted. For his own part, the Prussian ace relied on his climb rate to get him above and behind Hawker's pusher. Round and round the fight went, all the while the wind blowing the two combatants deeper into German-held territory.

It was a standoff—neither pilot could get into position for the killing shot. But time and circumstance began to tell against Hawker. The farther the fight moved behind German lines, the more anxiously the British ace looked after his fuel gauge. Finally, with no other choice, the nine-kill Victoria Cross winner had to cut out for home. He chose to dive out of the fight, building airspeed as he sped back toward his own lines.

Richthofen gave chase, his Albatros tucked in right behind the DH-2. Hawker saw the danger and started to zig-zag, trying to throw off the German pilot's aim. At the same time, however, his sharp maneuvers killed off his airspeed, allowing Richthofen to close the range.

The Albatros' guns chattered briefly then stopped. Richthofen's guns had jammed! Hawker, now mere feet off the tree tops, was only a few hundred yards from his own lines. If he could just make that stretch, he would be okay.

Undeterred by his jammed guns, Richthofen continued the chase while banging away on his Spandaus with a tiny hammer. Working feverishly, he cleared one of the machine guns and

opened fire again. This time, his bullets did their grisly work. One round struck Hawker in the back of the head, killing him instantly. His DH-2 dropped into the shell-torn landscape right in front of a German grenadier unit. The great British leader and tactician had met his match.

Of the fight, Richthofen later wrote, "[it was] the most difficult battle... that I had experienced thus far." He had emerged unharmed, a hero to his squadron mates. Word quickly spread throughout the German Air Service that Richthofen had killed the "English Boelcke," Lanoe Hawker. And so began the rise to fame of this Prussian aristocrat. In time he would match, then eclipse the score and tactical genius of his mentor, Oswald Boelcke as he rose to become the war's most famous fighter ace.

Chapter Eight

April Massacre

When you soar in the air on a Sopwith Scout
And you're scrapping with a Hun and your gun cuts out
Well, you stuff down your nose 'til your plugs fall out
Cos you haven't got a hope in the morning.

For a batman woke me from my bed
I had a thick night and a very sore head
And I said to myself, to myself I said
'Oh! We haven't got a hope in the morning!

We were escorting Twenty-Two.
Hadn't a notion what to do,
So we shot down a Hun and an FE too!
Cos they hadn't got a hope in the morning.

We went to Cambrai all in vain
The FE's said, 'We must explain,
Our cameras broke; we must do it again,'
Oh! we haven't got a hope in the morning!

—"We Haven't Got a Hope in the Morning" 54 Squadron, RFC.

As the Jagdstaffeln made their presence felt all along the Western Front, Allied aviators found themselves again on the verge of losing control of the air. The German Air Service, now equipped with tough, nimble biplane fighters like the Albatros D.II and Fokker D.II, had come a long way since the bloodletting over Verdun and Flanders.

Now it was the Allies who were at a disadvantage. Their tactics and organization had been copied by their enemy, and now the German aircraft they met in the sky were at least as good as their own, and frequently better. While fighter development in France and Britain produced such excellent designs as the Spad 7, the Nieuports 11 and 17, and the Sopwith Pup in 1916, reconnaissance designs languished. The British were forced to keep using the hopelessly inadequate Be2 Quirk. German aces like Manfred von Richthofen feasted on these hapless planes, making a living by easily knocking them out of the sky. The Be2's replacement, the RE8—nicknamed the "Harry Tate" by its crews—turned out to be

a disaster. Ungainly in the air, and prone to all sorts of mechanical failures, the RE8 was, at best, a marginal improvement over the Quirk.

Then, in early 1917, the next generation of German fighters reached the front. Led by the agile and swift Albatros D.III, the new German designs caught the Allies totally unprepared. Their own replacements for the Nieuports and Spad 7s were just reaching squadron status and had not yet arrived in strength on the Western Front. These included the famed SE5 and the temperamental Sopwith Camel. While the front-line squadrons waited for these new planes, they did the best with what they had on hand, their morale soaring with the knowledge that the Germans seemed on the verge of defeat on the ground.

The year started on a high note for the French and British on the Western Front. The battle at Verdun had finally ended in December 1916, with the French pulling a victory out of what looked like certain defeat. On the Eastern Front, the Brusilov offensive had nearly crushed the Austrian army before petering out when the Germans arrived to bolster their sagging partners. By the end of the year, it looked like the Germans would be finished off in 1917. Allied fortunes were finally on the rise, and all looked forward to what they thought would be the final campaign season.

April 1917 shattered all their hopes. That month started and ended with disaster, both on the ground and in the air.

On the ground, the French launched a massive, go-for-broke offensive along the Chemin-des-Dames. Naturally, overhead, the air war heated up as the troops went over the top. The operations turned into disaster. In 48 hours, the French lost 120,000 men to the stiff German defenses. The medical corps had prepared only enough beds for 10,000 wounded, causing untold misery to the thousands of wounded who died while waiting to be examined by a doctor or an orderly. As the slaughter continued, the first cracks in the French army appeared. Some units refused to advance, others in the rear would not go back into the trenches, even when their officers threatened them at gunpoint. The rebellion spread like wildfire from the 6th Army (the one involved in the Chemin-des-Dames offensive) into the rest of the army. By the end of April, 68 of France's 110 infantry divisions were in open mutiny. It took until June to quell the unrest, but by then the damage had been done. Morale in the French army remained low, and for the rest of the war all it could manage were mainly defensive duties and

limited offensive operations.

The fighting in the air mirrored the fortunes below. With the new Albatros D.III in full service, the Jastas entered the month in better shape than ever. Tempered by the pitched air battles of the previous fall, the German pilots had both the tactics and the experience to deal the Allied air services a heavy blow. They took full advantage of it.

In Flanders, as Sir Douglas Haig's BEF flung itself at the German defenses around Arras, the Royal Flying Corps was called upon to give full support to the offensive. En masse, artillery spotting Quirks and Harry Tates crossed the lines to lend a hand in the fighting, only to be chopped out of the sky by prowling Albatros scouts. The fighter squadrons, now flying aging 1916 designs, could offer but little support. As the losses mounted, the replacement pilots entering the fray were so poorly trained they were hardly more than cannon fodder. Morale in the observation units plummeted as the death toll mounted.

The British started the battle of Arras with total superiority in aircraft. Three hundred and sixty-five RFC planes blanketed the skies over the battle, fully a third of them fighters. Against this force the Germans could muster only about a hundred fighters and a hundred other planes. By the end of the month, the British had lost 176 machines, while the Germans suffered losses of only 21 pilots and crew killed, and 15 wounded.

Nowhere was the carnage worse than around Douai, where two Nieuport squadrons, No. 60 and No. 29 were stationed. In one four-week period, both squadrons lost 100% of their pilot strength in action. Only the constant flow of inexperienced replacements kept the Nieuports manned for the daily dawn patrols over Douai. Morale sank as losses increased, but the two squadrons fought on in part because of rising stars like Billy Bishop and Albert Ball, as well as by the false assumption that the Germans were being hit as hard as they were. Day in and day out through April, they clashed with a deadly new threat, Jagdstaffel 11, now commanded by the legendary Manfred von Richthofen.

Richthofen took over Jasta 11 earlier in 1917 at a time when the outfit had done little in the air. It took only a short time for him to whip the squadron into fighting shape. By April, it had all the trappings of an elite formation—experience, dedication, high morale, and a tremendous commanding officer. When they went into action during the Battle of Arras, they soon proved their

DOUGLAS HAIG, COMMANDER OF THE BEF.

superiority over the best the British could field. Throughout the month, Richthofen set the pace for all his pilots by shooting down no fewer than 20 British planes, most of which were elderly Quirks and slow FE2s. Other pilots in the units chalked up amazing tallies as well. Lothar von Richthofen, Manfred's younger and more reckless brother, claimed fifteen kills that month, showing in the process that air combat ran in his family's blood. Another Jasta 11 pilot, Kurt Wulf, outshone his commander by knocking down no fewer than twenty-two RFC planes between April 6th and April 30th. Karl Allmenroder, a future 30-kill ace, got eight more that month.

By the end of the month, Jasta 11 and its cohorts killed or wounded 443 British aviators. Since the British insisted on offensive operations at all costs in the air, most of the wounded pilots and observers fell behind German lines and spent the rest of the war in POW camps.

The slaughter, known to the British as "Bloody April," had a profound effect on the air war. In the summer of 1916, the average life expectancy of an RFC pilot was 295 combat hours. After April 1917, the number fell to 92. The war would be fought from then on by a small core of hardened veterans surrounded by neophytes who were little more than victories-in-waiting for the likes of Manfred von Richthofen.

After April, the British and French spent the rest of that spring deploying their latest generation of fighters and bombers. The arrival of the Camels, SE5s, RE8s, Breugets, and SPAD 13s helped redress the imbalance in the air. For almost two years now, the air war had seesawed back and forth, with one side gaining the advantage and slaughtering the other until the technological balance swung to the other side. By the summer of 1917, the latest German and Allied planes were just about evenly matched. The

technological advantages enjoyed in the past—if but for fleeting moments—would never again be seen. For the rest of the war, the technological race would remain a near dead heat, a fact that forever changed the nature of the fighting over the Western Front.

Through the summer and into the fall, the air war settled down into a strangling struggle of attrition. No longer would individual feats of bravery affect the course of the fighting as it had back in 1915 when Boelcke and Immelmann struck terror into their British opponents. Two years removed from the Eagle of Lille's heyday, the air war became a simple battle of numbers. The Allies had them, the Germans did not. Compensating for their lack of numbers, the average German pilot was more experienced and better trained than his Allied counterpart. That fact alone helped even the odds as more and more Allied planes poured into German territory.

Losses were staggering. French and British units took 70% losses each month, but carried on anyway. Others suffered nearly 100% aircrew losses a month, and as the old veterans died, fewer and fewer of the new replacements lived long enough to be of use to their squadrons.

Despite the horrifying casualties, the Allies insisted on prosecuting an offensive air war. By maintaining the pressure on the Germans, they hoped to wear them down. As bloody as the strategy proved, the effect on the German Air Service slowly began to tell. By 1918, the strategy would finally bear fruit.

In the meantime, the killing continued.

One of the first great Allied pilots to die as the air war evolved into this battle of attrition was Albert Ball. Ball cut his teeth in combat in the early days of air combat where he learned to be a lone-wolf style hunter. He fought with reckless abandon, throwing himself into every fight no matter what the odds or risks may have been. He emerged undaunted after every fight, sometimes through sheer audacity. In the air, he was a one-man whirling dervish, but on the ground, he was a troubling character whose odd habits sometimes made his comrades nervous. He spent much of his off-duty hours tending to his gardens, but on occasion he would build a bonfire, then dance around the flames madly playing a violin. Needless to say it was a quirk that did not endear him to his squadron mates.

Though he preferred to stalk his aerial prey alone, by 1917, circumstances forced him to fly in with other pilots from 56

RICHTOFEN SPEAKING WITH JASTA 10 S COMMANDING OFFICER, LT. KLEIN, A 22 KILL ACE.

Squadron. He carried out his duties with the squadron, flying the SE5—a plane he detested—in formation like the others. After he completed these routine patrols, he would frequently exchange his SE5 for the more maneuverable Nieuport 17 and fly solo missions over the front. It was an increasingly dangerous pastime.

On May 7, 1917, Ball led a late afternoon patrol over German lines around Lens. The squadron ran right into Richthofen's Jasta 11, and a series of confused mini-battles raged all over the front. Toward the end of the fight, Albert Ball was seen to dive on an Albatros D.III, almost certainly flown by Lothar von Richthofen. He overshot the German fighter, which was then attacked by Ball's wingman, Lt. C.M. Crowe. As Lothar fended off this second attack, Ball continued down into a thick cloud layer just below the brewing fight. It was the last time anyone from his squadron saw him alive.

Witnesses later reported seeing Ball's SE5 plunge out of the cloud inverted with its propeller stopped. Too close to the ground to pull up, the SE5 smashed into the ground, killing Ball instantly.

Later research has shown that Ball probably became disoriented in the cloud and accidentally entered an inverted dive which choked the carburetor and killed the engine. The doctor examining Ball's corpse concluded he had suffered a broken back but no combat injuries. Later, the Germans tried to claim that Lothar von Richthofen shot Ball down. They even went so far as to fire a revolver into his SE5's wreckage then show the bullet holes as

evidence of Lothar's success.

Either way, Britain's first 40-kill ace was dead.

Four months later, Germany's greatest lone wolf ace, Werner Voss, met his end in one of the great air battles of the First World War.

Voss, like Ball, did not have many friends on the ground. He kept to himself, eschewing friendships with his fellow pilots in favor of spending time alone with his motorcycle. He spent hours tinkering with the cycle, working away on its tiny engine while dressed in an ancient green sweater much too big for his spindly frame. He loved machines and would spend much time talking with his mechanic about his airplanes and how they could improve on them.

While on the ground he was an awkward, retiring fellow, Voss was pure pilot in the air. A gifted flier with a phenomenal grasp of aerobatics, he could quickly maneuver for a killing shot in almost any situation. Combined with his incredible flying skill were his sharp-shooting abilities with his plane's machine guns. Voss was a deadeye shot who used his uncanny accuracy to spare the lives of his opponents. Having been a two-seater pilot once himself, he felt sympathy for his enemy to a degree few of his peers showed. Instead of shooting to kill, he would aim for the engine, hoping to knock it out, while leaving the crew unharmed. In Voss' mind, that at least gave his quarry a fair chance to make a crash landing—and

THE SPAD XIII, ONE OF THE BEST FIGHTERS OF THE WAR. THIS PARTICULAR SPAD SERVED IN THE USAS AS CAPTAIN JOHN MITCHELL S PERSONAL PLANE. MITCHELL WAS THE COMMANDER OF THE 95TH AERO SQUADRON.

he could claim a victory as well.

By early September 1917, Voss had risen to command of Jasta 10. His 48 victories made him the second leading ace in the German Air Service, a fact that earned him much publicity and praise. Just 20 years old, Voss hated his new responsibilities. Command did not suit him, and whenever he could, he'd fly his favored lone-wolf patrols.

On September 23, 1917, Voss flew his last patrol. The night before, the young squadron commander had attended a party for one of his pilots who had just earned the Pour Le Merite. He awoke the next morning groggy from a hangover. As a result, he was not at his best.

Alone, he set out over the front that afternoon in his Fokker Dr. I Triplane, a new type just entering use in the German Jagdstaffeln. Near Poelcapelle, he ran across B Flight, 56 Squadron. Led by no less a figure than ace Jimmy McCudden, B Flight represented one of the most experienced formations in the entire RFC. Six-to-one odds did nothing to deter Voss, who fought McCudden and his comrades to a standstill in an epic, 10-minute fight. He drove off one SE5, put holes in the other five until, at last, sheer numbers began to tell. Somewhere in the fight, Voss probably took a bullet that severely injured him. His flying became erratic, and when he went into a shaky, shallow dive, Arthur Rhys-Davids slipped onto the Fokker's tail and poured a long burst into the Triplane. The fusillade of bullets tore into the Dr.I, and Voss spun into the ground where his craft exploded in flames.

Perhaps the last, great lone-wolf hunter had met his end. With him, so ended the last vestiges of the earlier air war. From now on, the fight in the air would grow increasingly impersonal and bloody as the final climax of the war approached.

Chapter Nine

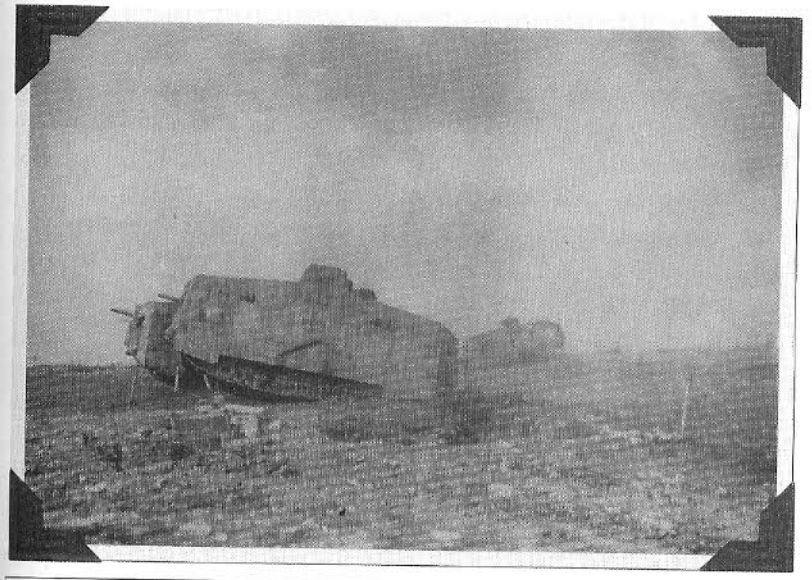
The Year of Exhaustion

"I can't write much these days. I'm too nervous. I can hardly hold a pen. I'm all right in the air, as calm as a cucumber, but on the ground I'm a wreck and I get panicky. Nobody in the squadron can get a glass to his mouth with one hand after of these decoy patrols except Cal, and he's got no nerve. But some nights we both have nightmares at the same time and Mac has to get up and find his teeth and quiet us. We don't sleep much at night."

—Elliot White Springs, Diary of an Unknown Aviator.

When the winter of 1917-18 hit the Western Front, the air fighting died down as the ground war lapsed into another weather-induced lull. As the rain and snow came down, the winter months became a time for renewal and preparation as both sides readied themselves for the coming spring.

With Russia knocked out of the war, the Allies knew they'd soon be hit by the full weight of the German army in one last, all-or-nothing effort to win the war. The spent the time building up reserves, sending additional squadrons to the front, and bickering



German tank in action during the last months of the war. The Germans built few tanks, relying instead on novel infantry tactics for their final offensives in the spring and summer of 1918.

over how best to employ the thousands of troops America was just beginning to send to Europe. Though the U.S. entered the war in April 1917, it had yet to make an impact on the Western Front.

The Germans did likewise. After the Russians surrendered that December, the Germans began transferring hundreds of thousands of troops west to France where they would undertake one last massive offensive designed to end the war before the Americans could get into it in any number. Called the Ludendorf Offensive, the initial plan was to drive a wedge between the French and British sectors of the front with specially trained assault troops equipped with light machine guns, mortars, and flame-throwers.

On March 21, 1918, the Germans opened the Ludendorf Offensive with stunning success. At first, the British seemed to crumple under the weight of the German attack. Ground that cost millions of casualties to gain was surrendered in the first few days of the battle. Along a 60-mile stretch of the front, the German shock troops overwhelmed and threw back the Allied defenders. As the crisis mounted, the British began retreating toward the channel ports, while the French focused on the protection of Paris. Into the growing gap between the Allied armies flowed division after division of German soldiers. For a time, it looked like the offensive would finally break the Allies, but Ferdinand Foch, the commander of all Allied forces in France, threw in his reserves. The German advance slowly lost steam as resistance stiffened and material shortages, including weapons and ammunition, began to plague the army. By April 5th, the offensive came to a halt after gaining some 40 miles of ground.

The second part of the offensive opened on April 9th. Again aimed mainly at the British, the attack succeeded for a time, but then ground to a halt as British reserves were flung into the battle. No breakthrough had been achieved, but the assault cost the British 100,000 men in less than a month's fighting.

The next phase of the German offensive came on May 27th against the French 6th Army along the Chemin-des-Dames. Initially, this attack proved even more successful than the other two combined as the dispirited and weakened 6th Army buckled, then collapsed. The Germans poured south toward the Marne in hot pursuit of the retreating French. Then, with their advance elements almost to the Paris suburbs, the German attack was stopped cold at a little town called Chateau-Thierry. Ominously, for the Germans, their opponent at Chateau-Thierry was the 6th U.S. Marine regiment.

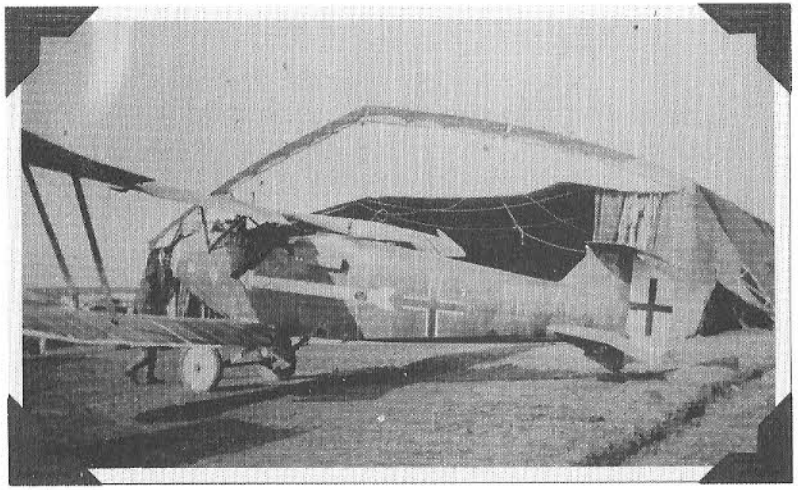
U.S. TROOPS IN ACTION, SUPPORTED BY A FRENCH TANK.

The Americans had arrived in force. Germany had lost the race against time.

When the German offensive opened in March, the air war exploded with renewed intensity. Losses over the two Flanders operations were staggering as both sides fought with a desperation unsurpassed in the war. Hundreds of Allied pilots died in the ensuing weeks attempting to slow the German advance with bombing and strafing attacks.

On the German side, the Air Service cooperated with the ground troops in new ways. Using "infantry battle planes" like the Hannover CL.III and Halberstadt C.L.II, the German Air Service swept ahead of the advancing infantry to bomb and strafe Allied strong points and troop concentrations. It was hazardous duty at best, flying down low amidst rifle and machine gun fire. Losses in the ground attack squadrons—known as Schlastas—approached critical levels during the spring offensives. Despite the casualties, their support proved a valuable component to the early successes in Flanders and along the Chemin-des-Dames.

Battle casualties and operational losses took a staggering toll on the German air units supporting the spring offensives. Between mid-March and mid-May, the squadrons in Flanders lost 479 planes, of which 135 were fighters. The rest were infantry support

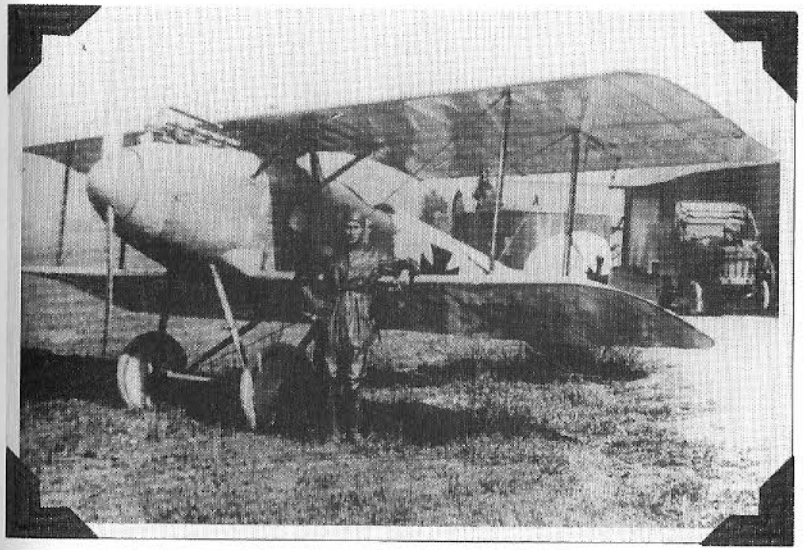


A HANNOVER C.L. III, CAPTURED BY THE 95TH AERO SQUADRON.

planes and reconnaissance aircraft. Later, historians calculated that the German Air Service lost at least one-seventh of its total strength each month during the spring of 1918—a figure their limited remaining resources just could not support.

Meanwhile, the Jastas continued to take a heavy toll of Allied aircraft. To compensate for the superior numbers they faced all along the front, the Germans began concentrating their Jagdstaffeln in critical areas in an effort to gain local air superiority. During the initial days of the March offensive, the Germans actually outnumbered the British on the sixty-mile stretch of front by almost 200 planes. Flying in geschwaders of up to four squadrons at a time, the Germans mowed down their opposition at an alarming rate. In one 10-day period alone, the Germans knocked down 478 British planes. By April 29th, the toll had risen to 1,302, the majority of which came from the reconnaissance and ground attack squadrons. Still, the British had the reserves and kept throwing raw replacements into the Western Front grinder, hoping that sheer volume would make up for experience and training.

To counter the new German tactics, the British and French began layering their patrols and overlapping their squadrons so as to provide each other with mutual support. At times, three or four squadrons would be stacked from 15,000 feet, down to three or four thousand, with different fighter types at different altitudes. Camels usually formed the low patrols, while SE5s and Spads covered their comrades below at increasingly high altitudes.



EVEN BY THE MIDDLE OF 1918, THE ALBATROSS D.V SERVED AS THE BACKBONE OF THE GERMAN FIGHTER CORPS.

With the German squadrons now concentrated into Jagdgeschwaders, the spring campaign gave rise to some of the largest air battles of the war. At times, over a hundred fighters could be involved in these tremendous dogfights that raged from just off the shell-torn landscape up to 20,000 feet and higher. It was the climax of the world's first air war that had begun just three years before with solo patrols in unwieldy Moranes and Eindeckers.

Though the Germans were giving more than they received, the steady drain of experienced pilots began to take its toll. By early summer, the units were growing exhausted. The tactic of concentrating large numbers of Jagdstaffeln on one critical front had not succeeded in winning local air superiority, for the Allies responded in kind and could absorb the tremendous losses the Germans inflicted on them.

On April 21, 1918, the German Air Service suffered its worst loss of the war. On that day, the legendary Red Baron—Rittmeister Manfred von Richthofen—took off from Cappy Aerodrome with nine other pilots from Jasta 11. The 10 planes broke up into two flights. The lead flight of four planes was led by Jasta 11's commanding officer, Leutnant Hans Weiss. Richthofen, in his scarlet Fokker Dr.I Triplane, took the rear flight of six and set off behind Weiss in search of Allied prey.

THE SPOILS OF WAR. THREE AUSTRALIAN SOLDIERS DISPLAY THE RED BARON S MACHINE GUNS TAKEN FROM THE WRECK OF HIS DR.I.

At 10:40 that morning, Weiss spotted a pair of RE8s from No. 35 Squadron. At 7,000 feet, the two planes were busy taking pictures when the sky around them suddenly erupted with German fighters. Miraculously, the RE8s held their own, fighting back with their rearward firing machine guns with fierce desperation. One of the RE8 gunners actually hit Weiss' fighter, severing his rudder controls. Crippled, Weiss limped back to Cappy.

Five minutes after the first flight attacked the RE8s, Sopwith Camels from No. 209 Squadron, led by Captain A.R. Brown, appeared on the scene at 12,000 feet. Brown saw Richthofen's men far below at 5,000 feet and dove to the attack. Soon, Richthofen's men were embroiled in a swirling dogfight with the aggressive Camel pilots.

Flying with 209 Squadron that day was a young neophyte pilot named Lieutenant W.R. May. His flight leader, Captain Brown, had given him explicit orders not to stay in a fight should one develop. Instead, he was to dive for home and avoid contact with any German planes.

When the fight started, May did exactly as he was told. He dove out of the growing dogfight, running westward toward the village of Vaux-sur-Somme. Above him, the Baron saw the lone

Camel disengage and must have figured the pilot would be easy meat. Down went his scarlet Fokker after May, the fight behind forgotten.

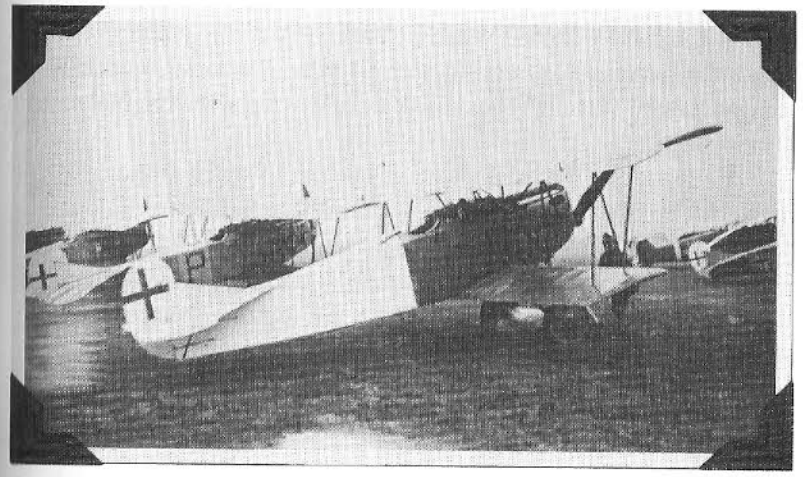
May saw the red Triplane and knew he was in trouble. He put his Camel right on the treetops and sped along the countryside for safety. Try as he might, May could not shake Richthofen. The Baron closed the distance quickly and began snapping out short bursts at May's Camel.

Overhead, Captain Brown saw May's trouble and dove down to help. Just east of Vaux-sur-Somme, he slipped behind the Fokker Dr.I. May led the two other planes right over the village and up over a ridge just as Brown got off a long machine gun burst at Richthofen's Fokker.

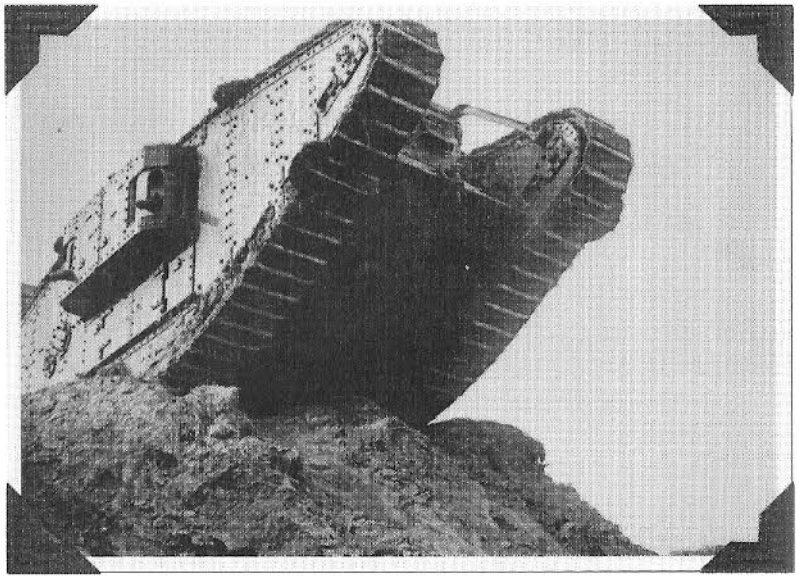
Suddenly, the Baron's plane lurched upward in a sharp right turn. Now going east, away from May, the Fokker swerved left then crashed into the ground next to the Bray-Corbie Road.

The great Red Baron was dead. He took no fewer than 80 Allied planes with him in the course of his spectacular three-year career.

The stunned German Air Service at first refused to believe the news. After so many battles and so many close shaves with death, it seemed inconceivable that Richthofen could have finally been killed. Throughout the day and into the next, they waited for news that their leader and inspiration was not dead, but rather a prisoner of the English. When word came through that Richthofen died in



THE FOKKER D.VII WAS THE BEST ALL-AROUND FIGHTER OF THE WAR. THESE EXAMPLES ARE FROM JASTA 18.



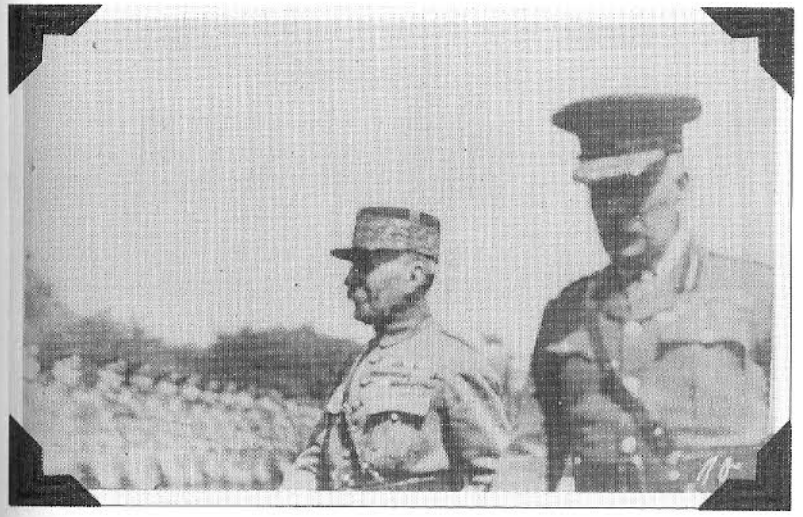
BY THE ALLIED SUMMER OFFENSIVE IN 1918, THE TANK HAD BECOME AN INTEGRAL PART OF THE ASSAULT FORCES.

the crash, all of Germany mourned his loss. As for the German fighter corps, it had suffered a brutal blow to its morale, one from which it would never quite recover.

After Richthofen, it seemed that one-by-one, the great German aces began to fall. That summer, Erich Lowenhardt was killed during a fight with 56 Squadron when he collided with a comrade's Fokker D.VII. When he died, he was the leading active ace in the German Air Service with 54 kills. The veterans that had so long helped stave off the Allied air offensive were beginning to disappear.

Even worse, material shortages began to strike at the Jagdstaffeln. Spare parts became increasingly harder to find, and rubber and brass fittings became almost unobtainable. Units were reduced to stripping wrecks in no-man's-land for strategic materials. By the end of the summer, though the fighter squadrons were still offering stiff resistance, the German Air Service began to run out of fuel.

At the same time, the ground war turned decisively against the German army. That summer, the British, Americans, and French launched a series of offensives that threw the Germans back all along the front. On August 8, 1918—the "Black Day" in the



MARSHAL FOCH AND GENERAL HAIG REVIEWING THE TROOPS IN 1918. IN 1918, FOCH BECAME COMMANDER-IN-CHIEF OF ALL ALLIED FORCES IN FRANCE. HE WAS THE LAST FRENCH COMMANDER-IN-CHIEF TO EVER WIN A WAR.

Germany army—the British came within a whisker of achieving a total breakthrough at Amiens. In just three days, they captured 11,000 Germans, 400 guns and 10 miles of ground.

The German gambit to end the war by the summer of 1918 had failed. With it went all hopes of winning the war. As fall approached, Germany teetered on the brink of a military collapse on the Western Front even as it faced revolution and civil war at home.

CHAPTER TEN

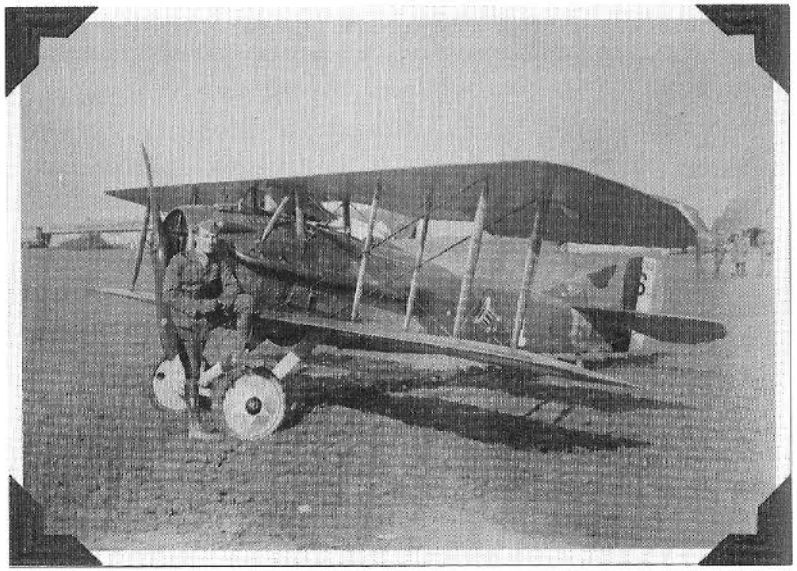
THE AMERICANS

"You cannot guess how I hate to put these new boys into the hardest kind of fighting, while they are still so totally inexperienced that they do not know how to properly protect themselves. One knows perfectly well when one sends them out that some of them are going to be killed... it is absolutely necessary to throw the green men in, and when they don't come back, one has to simply grin and bear it."

—Major Charles J. Biddle, USAS

The Americans stepped into the maelstrom of fighting in strength during the summer of 1918. After a year of organizing and sending troops across the Atlantic, the United States was at last ready for war.

During the spring, the first American fighter squadrons saw action. Most notable of these was the 94th Aero, a unit that would become the closest thing to an elite outfit in the U.S. Air Service. Flying outdated Nieuport 28s at first, the 94th Aero Squadron went through a tough baptism of fire, but in the process, discovered it had one of the best pilots of the war in its ranks—Eddie Rickenbacker.



CAPTAIN EDDIE.

THE 94TH AERO SQUADRON, AMERICA S MOST FAMOUS UNIT TO SEE ACTION IN WWI.

Captain Eddie, as Americans came to know him, was a pre-war daredevil auto racer whose love of all things mechanical naturally drew him toward aviation. Enlisting soon after the war broke out, Rickenbacker at first became the personal chauffeur to the commander of the American Expeditionary Force, General John J. "Blackjack" Pershing. Eventually, he managed to convince the general to release him for flight training, a move that proved wise indeed.

It did not take long for Eddie Rickenbacker to show his stuff in combat. On April 1, 1918, he downed a Pfalz D.III from Jasta 64 over Baussant. A month later, he claimed another Pfalz, this one flown by Lt. Sheerer of Jasta 64. By the end of May, his score rose to six, including two more fighters and a pair of Albatros two-seat recon planes.

Just as his star began to rise, fate stepped in. He came down with an inner ear infection that required hospitalization. As a result, he missed the bitter fighting of that summer. In September, during the worst month in the history of the USAS, Eddie returned to action. Flying Spad 13 fighters, he cut a swath through his opponents like no other American pilot. Between September 14th and October 30th, he scored 20 more kills in the vicious fighting over St. Mihiel and the Argonne Forest. When the war ended, his grateful nation later awarded him the Congressional Medal of Honor, one of only two given to fighter pilots for service in France. Rickenbacker later started an automobile company before becom-

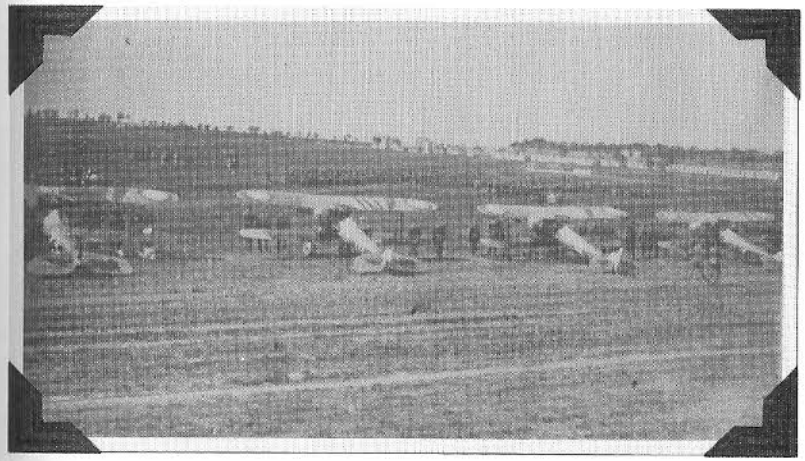
RICKENBACKER WITH MEMBERS OF THE 94TH AERO SQUADRON. NOTE THE CAPTURED HANNOVER C.L.III IN THE BACKGROUND.

ing president of Eastern Airlines. He lived a long, full life, dying at age 82 in Zurich, Switzerland on July 27, 1973.

While Rickenbacker was gaining fame as America's premier ace, the rest of the USAS was taking a pounding at the hands of veteran German Jastas. In the final months of the war, the fledgling American squadrons were pitted against the best formation of the entire war—JG 1. Now commanded by Hermann Göring, the "Richthofen" geschwader was transferred south to the fighting around the Meuse-Argonne to help beat back the latest Allied offensive.

That October saw the USAS take terrible losses as it supported the Allied drive in the Meuse-Argonne area. When the offensive started, the Americans had a total of 646 planes at the front. Throughout the last two months of the war, new replacements and fresh units joined the fighting, but the service suffered such high casualties that the number of planes available actually shrank by the time of the Armistice.

From the nearly 650 planes ready at the outset of the Meuse-Argonne offensive, the USAS had only 579 by October 15th. When the war ended, 479 were left in the front-line units. During that time, the three pursuit groups in action went from a total strength of 300 Spad 13s to less than 150.



THE NEW AMERICAN FIGHTER SQUADRONS FIRST USED THE NIEUPORT 28 IN COMBAT BEFORE SWITCHING TO THE SPAD XIII. THE NIEUPORTS SEEN HERE BELONG TO THE 95TH AERO SQUADRON.

In October alone, the Americans lost 537 planes in action and 583 aviators. Additionally, training claimed the lives of hundreds more pilots and aircrew. A 1920 evaluation of losses concluded that for every American killed in action over the front, three pilots died in training.

Yet, despite the losses, the Americans were the final element needed in the Allied equation to secure victory over the stubborn German defenders. Though losses ran high both on the ground and in the air, the influx of fresh American pilots and soldiers swelled the ranks of the advancing Allied armies and ensured the victories at St. Mihiel and the Argonne Forest. In the final days of the war, America lost nearly 100,000 men to achieve that victory.

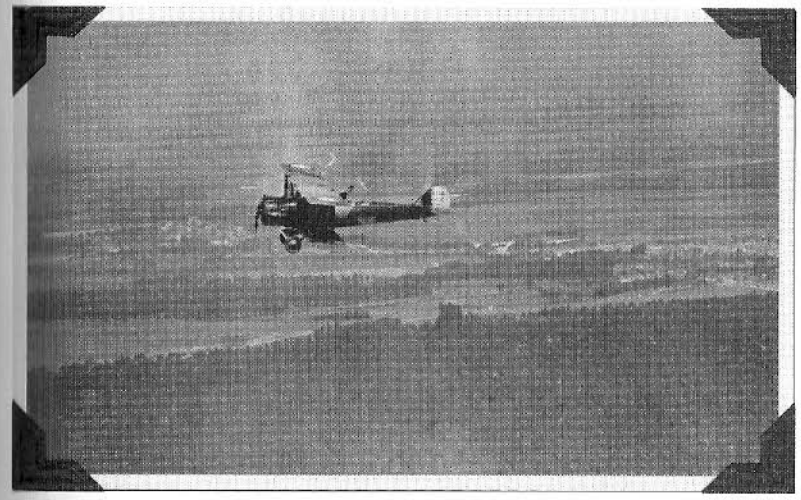
After four years of brutal, exhausting warfare, Germany had at last reached the end of its rope. At home, its citizens were war weary and threatened with full-scale starvation. Influenza outbreaks all over Germany had killed thousands and left the population weakened and dispirited. Finally, as the German army slowly collapsed on the Western Front, the navy mutinied at home, sparking a revolution and a rebellion that lasted until 1920.

Germany had no choice but to surrender. As the Kaiser fled to neutral Holland, Germany asked for an Armistice based on American President Wilson's famous Fourteen Points. On November 11, 1918, at 11:00 in the morning, the fighting ceased. The worst four years in European history finally had come to an end.

HERMAN G RING (LEF T). FIGHTER ACE, FUTURE MORPHINE ADDICT AND NAZI, G RING COMMIT TED SUICIDE AFTER BEING SENTENCED TO DEATH BY THE NUREBURG TRIBUNAL IN 1946.

The death toll was appalling. Ninety percent of all French males between the ages of 18 and 24 had been killed or wounded in action. Sixty percent of its army became casualties during the war. The British had 900,000 dead; the Germans, 1,800,000. Much of Europe lay in ruins or in hopeless poverty. Diseases ravaged the Central European nations as starvation continued to claim victims as well.

In the end, all the suffering, the misery, and death the war caused solved nothing. The peace treaty signed at Versailles in 1919 went a long way to ensuring that. Within that document lay the seeds for a second great war within a generation, a war that would surpass even the carnage of World War I. So the lull that fell across no-man's-land that November was but a stay of execution for much of Europe. For 20 years the uneasy peace lasted until Hitler's armored spearheads ground into Poland in September 1939. When the panzers rolled that autumn, the ghosts of the Great War rode with them. The great European calamity, sparked by that one wrong turn by Franz Urban in June of 1914, was at last complete.



AN AMERICAN 1ST AERO SQUADRON SALMSON TWO-SEATER IN FLIGHT.

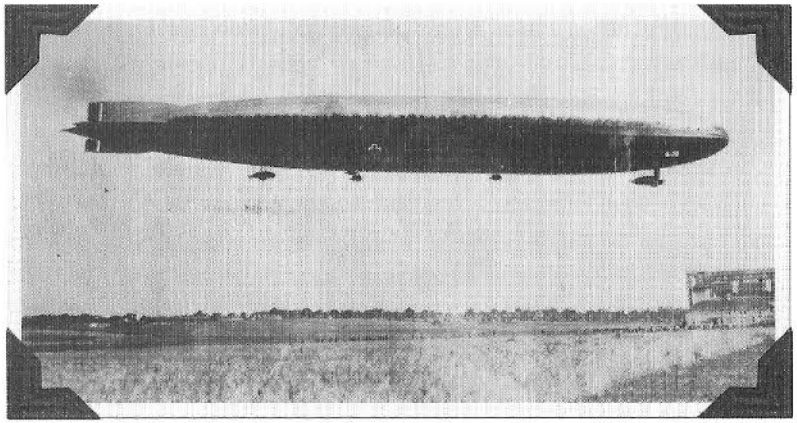
Epilogue

The Air War s Legacy

By the time the fighting finally ended in 1918, every major element of modern air warfare had been developed and employed in action by Germany or the Allied powers. From the early days of bottles and bricks being thrown at passing aircraft, air-to-air combat had been refined to a deadly science. Bombing raids, once ineffective and almost laughable, had also become more effective, with specific targets like railroad stations or vital bridges. In the infantry attack planes used to support the ground troops in 1918, one can see the inspiration of the Stukas and Sturmoviks of the Second World War. Even the A-10 Thunderbolt II has its roots in the armored aircraft used by the Schlastas at the end of the Great War.

The zeppelin raids of 1916-1917 on British industries represented the first strategic air campaign in history, where one side tried to destroy the other's means of waging war. The subsequent Gotha raids on London and its environs through the remainder of the war convinced the British that strategic bombing in the future could win wars by air power alone.

The strategic air war also had one other impact on the future. The Royal Flying Corps became an independent branch of the military in Great Britain on April 1, 1918, largely due to the constant air raids over London. Unchained from the army and navy, the new Royal Air Force set to work justifying its indepen-



Zeppelins terrorized Britain during the middle part of the war.

The last of a breed: a late-war jasta carries on to the end, flying a mix of Fokker D.VIIs, Albatros D.Vs and Fokker Dr.Is.

dence through the remainder of the war, and continued to do so in the 20s and 30s by focusing on strategic aviation. The two issues became hopelessly intertwined, leading the British to make some pretty serious doctrinal mistakes in the inter-war years. Incidentally, the same thing happened to the Americans.

Today, the First World War is but a dim memory in the United States. In Europe, its horrors have been overshadowed by the misery and carnage of World War II. Still, the Great War set the tone for the first half of the 20th Century, and from its mud-filled trenches and bullet-torn skies, the future could be gleaned. In the air, the Great War saw the fastest rate of technological advances ever made in aviation history. Today, the legacy of the air war still endures in the sleek modern fighters, bombers, and ground attack aircraft used the world over. On their steel wings fly the undiminished memories of the Great War's Camels, Fokkers and Spads.

Flight Reference

A BRIEF HISTORY OF FLIGHT

For centuries men dreamed of one day being able to fly through the sky like the birds. Many dreamers, such as Leonardo da Vinci, attempted to conquer the mysteries of flight. Da Vinci even went so far as to draw sketches of birds in flight and proposed flying machines based on these drawings. In 1783, two Frenchmen, the Montgolfier brothers, made a balloon that carried the first men in free flight. The success of the balloon led to continued development of the craft. During the American Civil War, balloons were used by the Union army for observing the battlefield.

Meanwhile, other inventors turned their attention to gliders. In 1804, an English inventor, Sir George Cayley, invented the first glider. During the 1890's, Otto Lilienthal of Germany continued to develop the glider.

During the late 1800's, various inventors attempted to invent powered aircraft. The most common approach involved the application of a steam engine. But steam engines were much too heavy. It wasn't until 1903 that the first powered flight occurred. Two American brothers, Orville and Wilbur Wright, had experimented with various glider designs. In 1903, they added a gasoline-powered engine to a bi-winged plane and flew 120 feet. Development continued throughout the first decade of this century. Alberto Santos-Dumont developed an aircraft patterned after a box kite and became the first person in Europe to fly. In 1907, Louis Bleriot developed one of the first successful monoplanes complete with a tail for balance at the rear.

THE PHYSICS OF FLIGHT

There are four basic forces acting upon an aircraft in flight: lift, thrust, gravity, and drag.

Lift is achieved through the design of the wing. As an aircraft moves, air flows over the surfaces of the wing. Wings have a special shape that forces the air to move faster over the top of the wing than on the bottom. This creates more pressure on the bottom than on the top. Known as the Bernoulli effect, this air pressure difference pushes up on the bottom of the wing, and lift is generated.

The angle at which the wing meets the airflow also affects the amount of lift generated. As this angle (known as the angle of attack) increases, more lift is created. However, if the angle of attack is too great, the air flowing above the wing will be disrupted, causing a sudden decrease in lift. This condition, a stall, occurs when the aircraft is either flying too slowly, or flying at too steep of an angle. When an aircraft stalls, the sudden loss of lift will force it into a dive. This is especially dangerous if the aircraft is at a low altitude. The aircraft will recover from a stall when it has regained sufficient airspeed.

Increasing airspeed increases lift. The more airspeed, the greater the difference between the air pressure above the wing and below, creating more lift.

Thrust is generated by the rotation of the propeller. Propeller blades are curved in the same way as wings. However, instead of lift being generated (ie., a movement upward), thrust (a movement forward) is created. To create more thrust, increase your throttle. Generally more throttle will increase your airspeed.

Drag is the friction caused by the aircraft's surfaces moving through the air. The more streamlined an aircraft, the less drag is produced.

When an aircraft is in level flight at a constant speed, all four forces (lift, thrust, gravity, and drag) are in balance.

The control surfaces of the aircraft are used for maneuvering it. With these control surfaces, the pilot can perform three basic movements: pitch, roll, and yaw.

Pitch is the rotation of the aircraft up or down. Roll is the motion of the aircraft banking left or right. Yaw is the motion of the aircraft rotating either left or right

The "elevators" are located on the tail assembly, and control

the aircraft's pitch. When the elevators move down, the nose will pitch down, and vice-versa.

The pilot controls the elevators with the stick. To nose the aircraft down, push forward on the stick. Pulling back on the stick will pull the nose of the aircraft up.

The rudder is located on the tail assembly. It controls the aircraft's yaw. When you move the rudder left or right, your aircraft's nose will yaw in the corresponding direction.

The ailerons, located on the wings, control the rolling motion of the aircraft. When the left aileron is raised or lowered, the right wing aileron moves in the opposite direction. This causes the aircraft to bank. The ailerons are controlled by the stick. To bank to the left, move the stick to the left; to bank to the right move the stick to the right.

The throttle controls the rotation speed of the propeller. By increasing the throttle, the pilot increases the speed of the propeller, thereby increasing the speed of the aircraft.

The aircraft of World War I did not have flaps or brakes. Keep this in mind when you land.

Many of the WWI aircraft were equipped with rotary engines. The entire engine would spin along with the propeller. This huge spinning mass of metal caused a powerful, gyroscopic effect. This meant that a rotary-equipped aircraft would try to nose down in a right-hand turn, and would attempt to nose up in a left-hand turn. Therefore left rudder had to be vigorously applied to keep the aircraft's nose level with the horizon. The Sopwith Camel had the most pronounced gyroscopic tendencies.

TURNING

Turning is *not* accomplished with the rudder, but with the ailerons. Bank your aircraft by using the ailerons. This will cause the aircraft's lift to move the plane in a horizontal direction rather than strictly vertically. You also need to increase the throttle, as the turn will bleed off speed. Increasing bank increases the turning rate. Gently pulling back on the stick while banked will result in an even tighter turn. More altitude is lost during a tighter turn, so keep your nose pointed above the horizon during the turn.

THE TAKEOFF

The takeoff procedure is performed a little differently for World War I aircraft than for modern aircraft. The aircraft of WWI

were tail draggers—they were equipped with a tail skid rather than a wheel.

First, apply full throttle. When the aircraft has picked up speed, push the stick forward. This will lift the tail off the ground. Be careful to avoid pushing too far forward on the stick or you may find your propeller plowing into the ground! Now that the tail is off the ground, the aircraft is more streamlined and will gain speed rapidly. When your aircraft gets up to about 40 mph, gently pull back on the stick to lift your aircraft into the air. You may damage your landing gear if you stay on the ground at too high of a speed (above 60 mph). Do not attempt to climb at too steep of an angle or your aircraft will go into a stall (with no room for recovery).

LANDING

When you begin the landing procedure, reduce the throttle. Approach the landing field with as little speed as possible (it is best to be slightly above stall speed, 40-50 mph). As you get close to the landing area, bring the nose of the aircraft up and reduce throttle some more. Keep the nose of your aircraft up to allow you to come in at a lower speed. Do not try to land with your nose below the horizon. When your wheels contact the ground, keep gentle pressure back on the stick so the nose of the aircraft doesn't pitch too far forward (caused by the increased drag of the wheels on the ground).

Takeoffs and landings are much easier at an aerodrome, because the area has been specifically prepared for aircraft. It is still possible to land on the open countryside, but the ground is rougher and the chance of losing control increases. Also, be sure to avoid landing or rolling onto forests or rivers—they'll spell the end of your aircraft!

Don't worry if you don't get the hang of takeoffs and landings at first. If you want to, you may activate the aircraft autopilot AI to takeoff or land for you. See **Autopilot** in the *Game Play* manual.

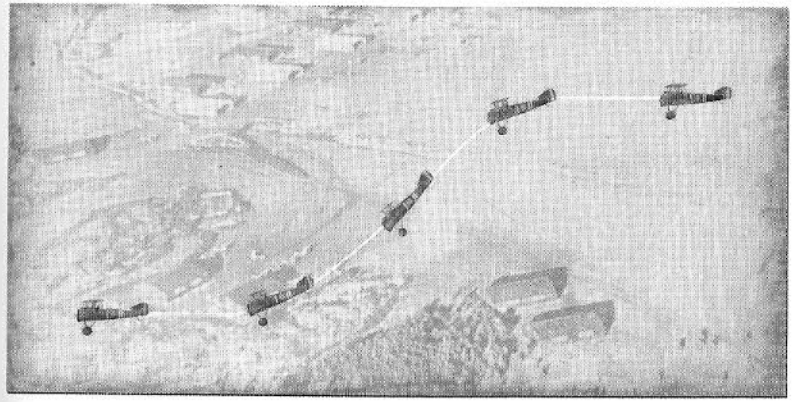
RECOVERY FROM A STALL

Allow your aircraft to nose down. Don't fight the stall by pulling back on the stick. When the aircraft picks up enough speed, it *will* recover from the stall. Pull back on the stick gently to level out.

Recovery from a Spin

A spin is a very nasty type of stall. Your aircraft will go into a spin when one wing stalls before the other. This immediately forces your aircraft to spin very rapidly. The natural instinct of a pilot is to fight the spin by applying opposite aileron. Unfortunately, this only makes the spin worse (many WWI aviators died this way). The safest way to recover is to let the stick return to the neutral position. Your aircraft will eventually stabilize itself. If you wish to come out of a spin more quickly, move the ailerons as if you were trying to roll the aircraft with the spin. But be careful—it's easy to get confused when you see the ground spinning around rapidly and, consequently, move the stick to the wrong side!

Flight Maneuvers

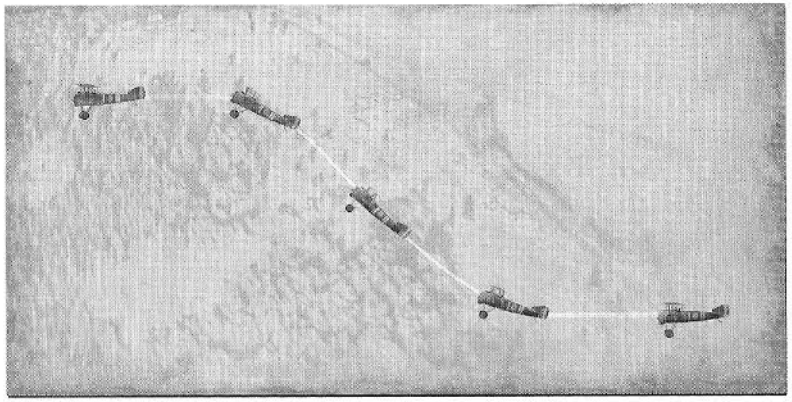


Dive

In World War I, even simple maneuvers such as steep dives and climbs were considered acrobatic - not surprising since aircraft were prone to stall and had many structural flaws.

A steep dive can be used to get out of combat quickly, especially when your aircraft can dive safely at a higher speed than your pursuer's. Keep an eye on your altimeter and, if an enemy follows you into the dive, jink your aircraft left and right with the rudder.

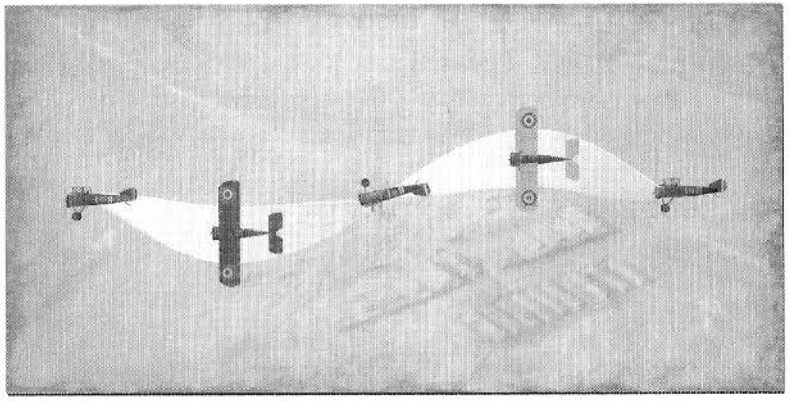
Diving is simple. Point the nose toward the ground and your crate will gain speed very quickly. Be careful because some aircraft have weak wings, and a high-speed dive may shear them off.



ZOOM OR ZOOM CLIMB

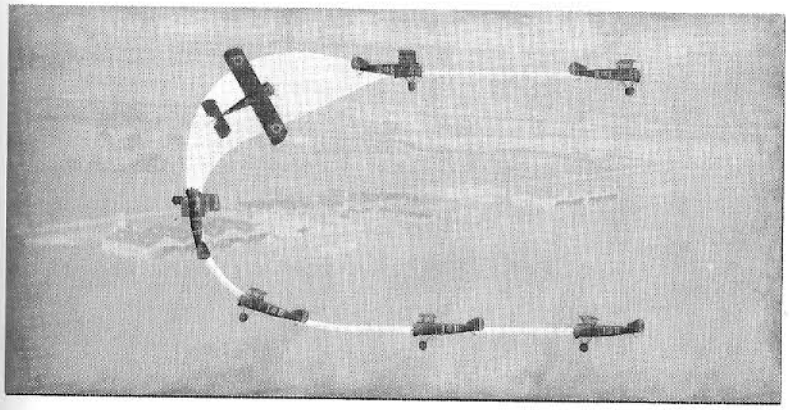
A very steep climb at high speed, the zoom-climb is usually performed after a dive. Sacrificing speed for higher altitude, it was used by the aviators of the Great War after they made a diving attack on an enemy aircraft to pull up beyond the reach of the enemy.

When zooming skyward, keep an eye on your airspeed. When it gets below 50 mph, level off before you stall your aircraft.



BARREL ROLL

The barrel roll is useful for confusing an attacker on your tail. To perform a barrel roll, bank hard while pulling back on the stick slightly. Your aircraft will take a corkscrew path through the sky. Be warned - you will lose altitude.

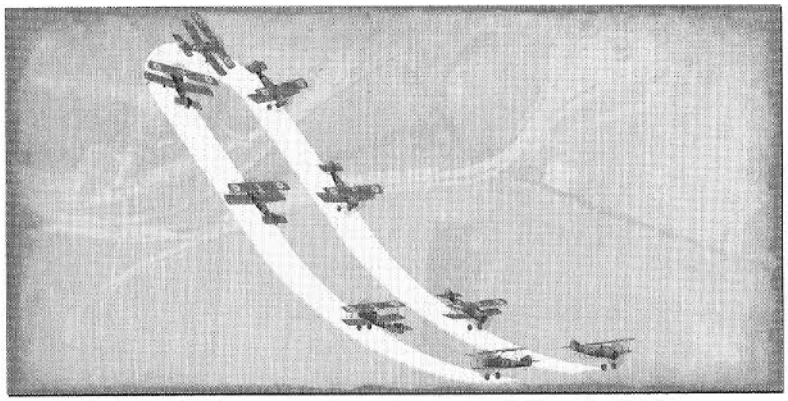


HALF LOOP

Today this maneuver is called an Immelmann turn. However, in World War I the Immelmann turn was an entirely different maneuver.

Perform a half-loop when you want to reverse direction and gain altitude. Use it when an enemy passes you going the other direction at a higher altitude.

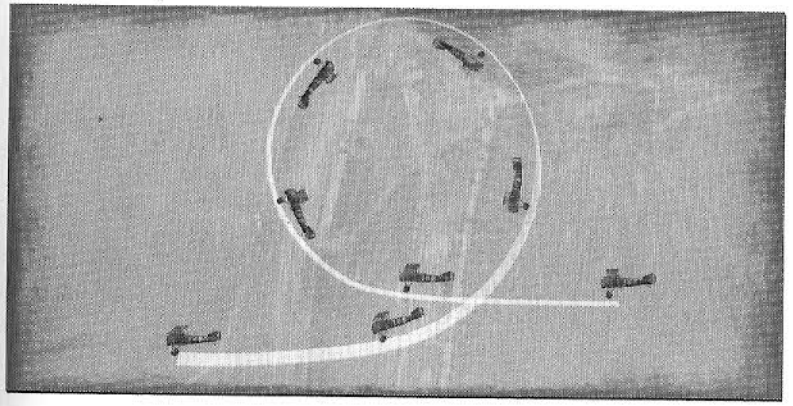
Before starting a half-Loop, make sure you have a lot of speed. Pull up as if you were going to loop, but begin rolling the aircraft before you reach the top of the loop. Level out when you reach the top.



IMMELMANN TURN

Also known as renversement by the French pilotes de chasse. The World War I Immelmann turn was used frequently by Max Immelmann. After making a diving pass on an enemy, Immelmann zoomed up past the enemy aircraft, and before stalling, used full rudder to bring his aircraft around. This put his aircraft facing down at the enemy aircraft, making another pass possible.

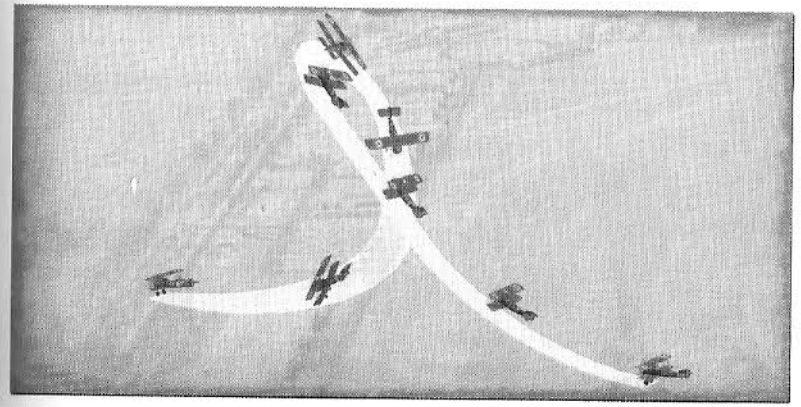
This is a difficult maneuver to perform properly. Pull up into a climb, apply full rudder as your speed drops, roll your aircraft, and pull back slightly on the stick. With good timing, you will be diving back down in the opposite direction.



LOOP

An impressive maneuver at an airshow, the loop is not very useful in combat. While looping, a pilot has no options until the loop is finished. In addition, you will lose a great deal of altitude.

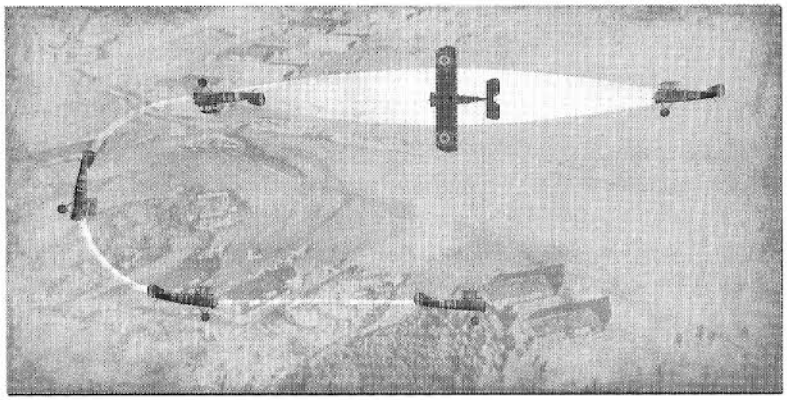
Before starting a loop, make sure you have a lot of airspeed (generally accomplished by diving first), otherwise you'll stall halfway through the loop.



RETOURNMENT

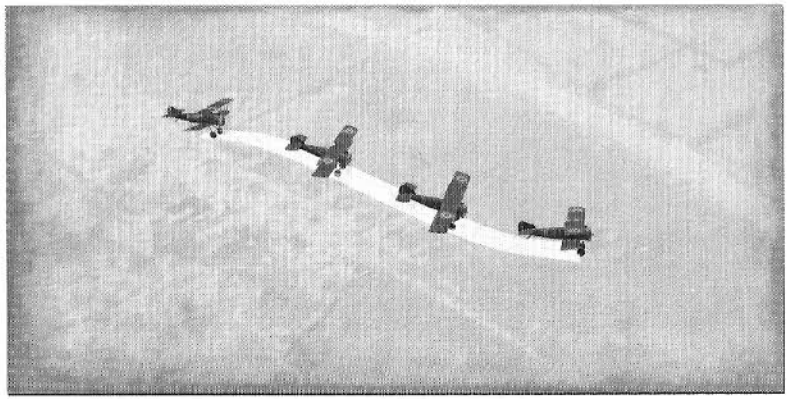
This offensive maneuver is similar to the Immelmann, Continue to apply the rudder and roll the aircraft after you have looped and come over the top. Instead of reversing direction, you'll be flying in the same direction you were going before you started climbing.

A retournment is used after a diving pass on an enemy. If the enemy continues in a straight path, not veering off to the side, a well-executed retournment will put you on the tail of the enemy.



SPLIT-S

The Split-S is an excellent way to escape an attacker on your tail. To perform a Split-S, roll your aircraft until it's inverted, then pull back on the stick to perform the last half of a loop. When you level off, you may repeat this maneuver. Be aware that altitude is rapidly lost in this maneuver.



SIDE-SLIP

A side-slip is used to lose altitude quickly without gaining speed. To side-slip, dip one wing down and apply enough reverse rudder to keep your aircraft from turning. You may need to push forward slightly on the stick to maintain your heading.

SLIP-TURN

The slip-turn is a flat turn performed exclusively with the rudder. Unlike a normal banked turn, the slip-turn uses no ailerons.

Most aircraft cannot perform an effective slip-turn. However, the Fokker Triplane did not have a vertical stabilizer, and could yaw very quickly with hard rudder applied. Although the Triplane would slip during the turn, losing a great deal of speed, it could reverse direction in about half the time of other fighters performing a normal turn. To execute an effective slip-turn, don't bank your aircraft's wings.

BATTLE TACTICS OF THE GREAT WAR

ACE VERSUS ACE

They were down to just four scouts. For weeks, Jasta 15 fought desperately against the rising tide of Allied airpower. One by one, the pilots went to their deaths, carried to the ground below in broken, flaming birds. By the summer of 1917, the squadron had just three sergeant pilots and rising ace Ernst Udet. The squadron commander, Henrich Gontermann, had seen enough of the war. One day, he took Udet aside and led him over to a metal table. Deftly, Gontermann bent over and scooped up some pebbles and a leaf. Putting the leaf on the table, he barraged it with pebbles until his hand was again empty. Each time a pebble struck the table, it sounded like a bullet striking home.

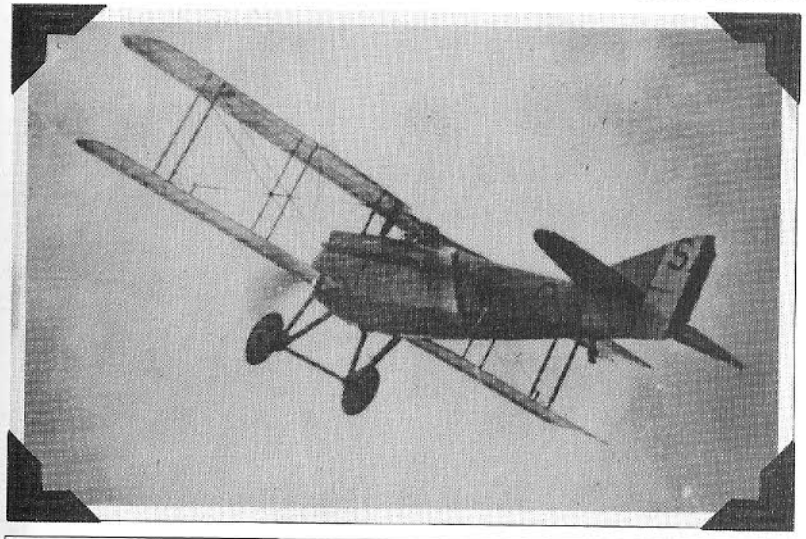
"You see, Udet," Gontermann lectured, "that's the way it is. The bullets fall from the hand of God. They come closer and closer. Sooner or later they will hit us. They will hit us for certain."

The long war of attrition was taking its toll. Even the most stout-hearted, such as Gontermann —wearer of the Blue Max and universally respected by his peers — could not take the daily losses forever. Sooner or later, a pilot's nerves would be shot.

Udet fought on, knowing his experience and expertise could keep him alive. Then one day in June 1917, at the height of his squadron's crisis, he ran into a tan SPAD VII with "Vieux Charles" spelled out in black letters on the fuselage.

It started at 15,000 feet over the little French town of Liearval. Flying alone, Udet had crossed the lines in search of an Allied observation balloon. Before he found it, though, a speck appeared off to the west. As it grew closer, he could see it was a Spad. He turned toward it, and the German's Albatros scout rushed headlong at the sturdy French biplane. They barreled past each other, mere feet apart. Both pilots now were too intent on the kill to be rattled by such a narrow evasion of death. Udet broke hard left, trying to come around behind the Spad. As he looked back at his enemy, he could see the Spad doing the same thing. Suddenly, they were locked in another head-on pass. Again, the two planes brushed by, escaping a collision by only the narrowest margin.

The battle continued as each pilot circled the other. Every few seconds, they leveled out of their tight turns to make a quick head-on attack before quickly banking hard to come around one more time. After one such run, Udet passed so close to the Spad that he



GUYNEMER S FAMOUS SPAD VII.

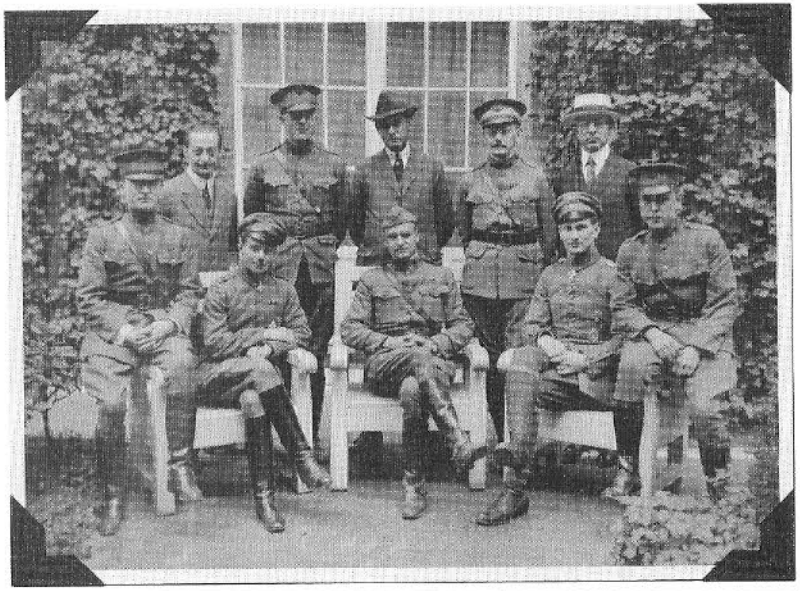
recognized the "narrow, pale face under the leather helmet." It was France's ace of aces, Charles Guynemer.

Convinced now he had his hands full, Udet resolved to stick it out, fighting this legendary French ace to the death. Swiftly, after another head-on attack, he pulled up into an Immelmann and tried to roll back down on the French ace. No good, Guynemer spotted the move and looped away. Udet broke into another hard turn, but as he emerged from it, Guynemer pounced. Guns rattled and Udet saw bullets tear across his wings and struts.

Desperate now, Udet threw his plane all over the sky. It did no good, for Guynemer matched every maneuver with one of his own. Always, the French ace seemed a bit faster, a bit better. Then, for an instant, the Spad appeared in his sights. It was Udet's one chance to take a shot, and he never hesitated. His finger crunched down on the gun tit on his control stick. Nothing. He pressed it again. Still nothing. His guns had jammed!

Now what would he do? Taking the stick in his left hand, Udet tried to clear the jam with his right hand. No good — he couldn't get the shell out. Briefly, he considered breaking away and diving for home, but he quickly squelched the thought. Guynemer would have jumped all over his tail in that sturdy Spad had he tried to get away. No, his only chance lay in evading Guynemer's attacks until the French ace tired of the game.

They went at it for eight more minutes, turning banking,



TAKEN AT KOBLENZ IN 1919, ERNST UDET AND BRUNO LOERZER CHAT WITH THEIR FORMER ENEMIES. UDET IS SEATED AT THE FAR LEFT, WHILE LOERZER IS SEATED AT THE FAR RIGHT.

arching up and down in half loops and split S's. By some miracle, Udet managed to keep Guynemer from getting all but the most fleeting of shots in at him. As the fight continued, Udet never gave up trying to clear his guns. Finally, out of sheer frustration, he began banging his fist against the guns. Just as he did, Guynemer soared over Udet's plane, inverted. As the Frenchman passed by, he saw Udet's gesture and realized the German's predicament.

Guynemer finished his pass then reversed his turn, coming back straight at Udet, almost inverted again. Udet was cold meat and he knew it. But instead of a torrent of bullets, all he received from Guynemer was a jaunty wave. And then he was gone, diving for home, his Spad disappearing rapidly into the gray summer's day.

Udet returned to Jasta 15 in a state of near-shock, his plane shot full of holes. Only through Guynemer's chivalry had he survived his brush with death.

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Udet's fight with Guynemer ranks as one of the all time one-on-one duels in aviation history. Two great masters fought it out, using every ounce of performance they could draw from their machines in concert with every maneuver and every tactic they had

ever learned. In this one fight, the essential elements of World War I air combat can all be distilled and examined.

ENGAGEMENT

When Udet first spotted Guynemer closing in on him, he reacted instinctively. While some inexperienced pilots would have attempted to dive away, or turn away from the French Spad, Udet knew he had to turn *toward* Guynemer. Had he turned away, the Spad would have been on his tail in a heartbeat. And with its superior diving abilities, the Spad would have caught even the best German plane in a long dive from 15,000 feet. Turning toward the enemy aircraft, however, as Udet did, denied Guynemer a tail-shot and initiated a head-on attack.

The manner in which pilots engaged their enemy often dictated just how the fight would turn out. Canny pilots would often stalk their prey for long periods, climbing above to get every possible advantage. The best possible position to engage an enemy was up sun, and above and behind. With the sun behind the attacker, the defending pilots would have been hard-pressed to see the attack coming. Meanwhile, diving down from above gave the attacking plane extra speed—energy—that could be used to maintain an advantageous position on the defender. And, best of all, attacking from the rear usually meant that no return fire could be expected (unless, of course, the defender happened to be a reconnaissance plane or a bomber).

BATTLE

Once the battle was joined, both Udet and Guynemer did their best to protect their vulnerable tails. To do that, they ended up in a turning contest, each one seeking the other's rear while striving to cover their own. As a result, the initial part of their contest developed into a series of turns punctuated with short, violent, head-on passes. Neither pilot could get directly behind the other though, through the course of the fight, Guynemer had several split-second opportunities to take a shot. He was an excellent marksman, so those fleeting chances were all he needed to stitch Udet's plane full of holes.

As the battle progressed, Udet could see that Guynemer was not only a better pilot, but his Spad was a better plane. If he had continued to turn-fight with the Spad, Guynemer would have eventually won the fight. So, Udet chose to take what had been a

horizontal fight into the vertical plane by executing an Immelmann. Against a normal opponent, Udet's move probably would have cleared his tail and given him an opportunity for a killing shot on the Spad. Not true with Guynemer. The French ace instinctively understood what Udet was attempting to do, so he followed with vertical maneuvers of his own.

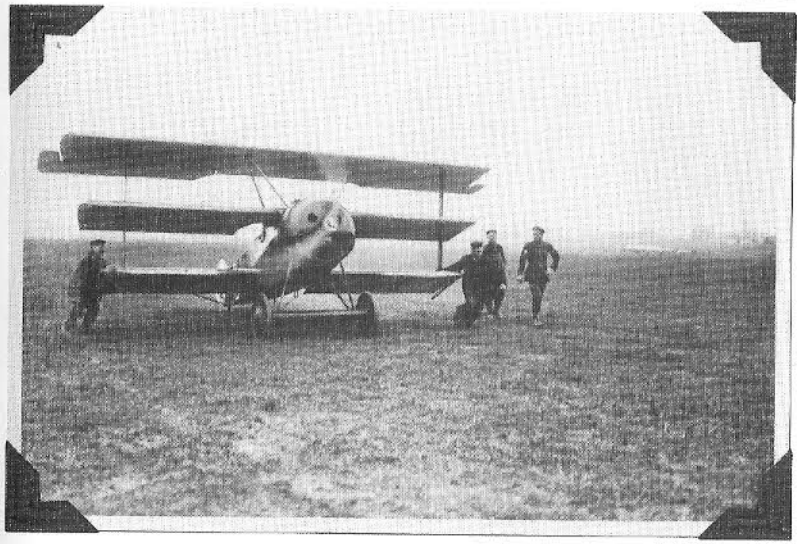
TURNING VERSUS HIT-AND-RUN

In the battle phase of a World War One dogfight, there were two main sets of tactics that could be employed. Turn fighting — as Udet and Guynemer did at the outset of their duel — was probably the most common until late in the war. Here, adversaries would swirl around, using their aircraft's turning agility in an effort to get on each other's tails for a killing shot. This is the type of dogfight usually portrayed in World War One aviation films.

The other type of fighting, more commonly used by the Germans toward the end of the war, was the hit-and-run method that today's fighter pilots sometimes call energy fighting. Here, a pilot in a plane with superior speed attributes picked a target below that he could make a diving attack upon. Having selected the target, he would swoop down, making a firing pass as he went, then climb back above his quarry. By trading altitude for speed and energy, he could always maintain the advantage over his slower — and lower — target. By racing back up above the target craft, the attacker would deny him any chance of a counter shot.

Toward the end of the war, especially in the summer of 1918, the German Air Service found itself so outnumbered in the skies over France that its pilots were forced to resort to hit-and-run attacks. Usually, the Jagdstaffeln would patrol the front, picking out Allied aircraft below them to attack. They'd dive down, make a pass, maybe two, then run for home. It was all they could do in the face of overwhelming odds.

To counter these types of attacks, the British began stacking flights of fighters at different altitudes. In the final months of World War One, the RAF would sometimes patrol the front with three of four squadrons covering each other for mutual protection. Usually, the Camels would cruise at medium to low altitude, while the SE5s provided high cover. Such an innovation forced the Germans to react as well. They started flying higher patrols, trying to maintain an altitude advantage even against the SE5 squadrons. In the latter stages of the war, the BMW-engined Fokker D.VIIs



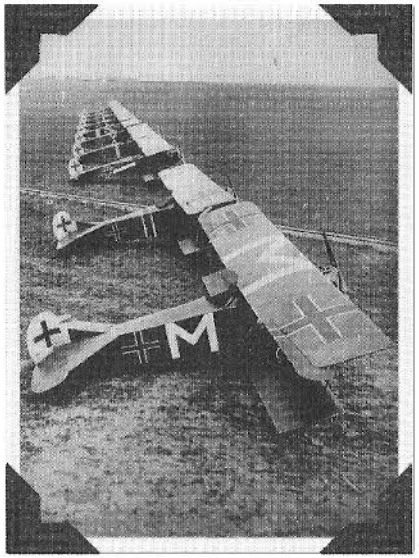
THE FOKKER DR.I WAS ONE OF THE BEST PURE TURN FIGHTERS OF THE WAR. HOWEVER, IT WAS ILL-SUITED FOR THE HIT-AND-RUN GERMAN PILOTS WERE FORCED TO USE BY 1918.

proved to be the best high-altitude fighter of the war. Some of the D.VII pilots could actually claw their way up to 20,000 feet or more. At such amazing heights, the SE5s were nearly helpless.

MAKE THE TACTICS SUIT THE AIRCRAFT

Throughout World War One, and indeed throughout aviation history, the battle tactics were usually dictated by either circumstance (such as the Germans being outnumbered at the end of the war) or by the aircraft types employed. Some airplanes are better than others at turn-fighting, while others excel at hit-and-run attacks. For example, the best two pure turn-fighters of the Great War were the Sopwith Camel and the Fokker Triplane. Neither possessed great speed or diving ability, but both could maneuver and turn better than any other plane deployed during the war.

The problem with these two fighters — especially with the Fokker Triplane — was that they were unable to disengage from a fight if the pilot felt the odds were against him. They couldn't run away, for the Fokker and Sopwith lacked the speed to do so. Nor could the Dr.I dive away from most Allied types, including the SE5 and Spad XIII. So, these two great turn-fighters could sometimes trap their pilots in bad situations from which other plane types



THE BEST HIGH ALTITUDE FIGHTER OF THE WAR: THE FOKKER D.VII. THESE EXAMPLES ARE FROM JASTA 72. THE FOKKER IN THE FOREGROUND BELONGED TO THE LEUTNANT KARL MENCKHOFF.

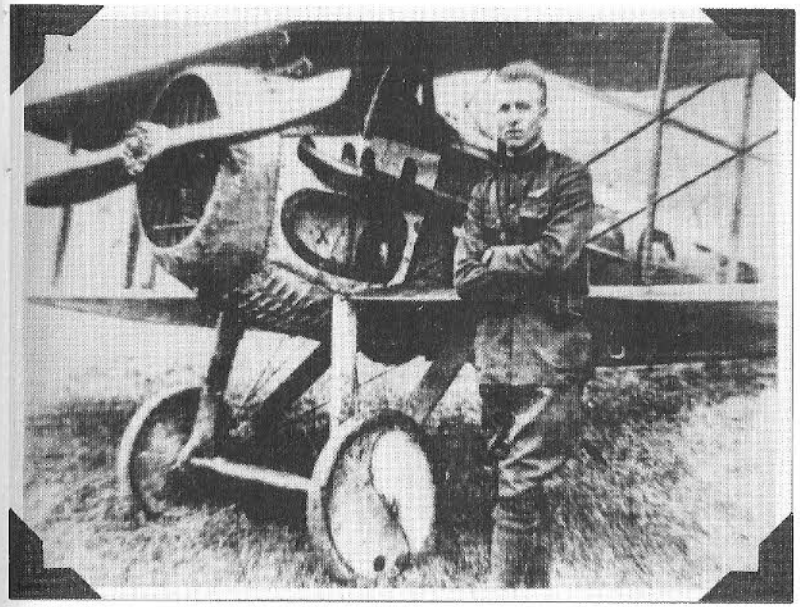
might have been able to escape. Werner Voss' last fight against 56 Squadron was a clear example of this flaw in the Triplane. Voss fought six SE5s to a draw for 10 minutes in a classic turn-fight. But, the minute he tried to disengage, he was caught from behind and shot down. No Fokker Dr.I could out-dive an SE5.

The best hit-and-run fighters included the Spad XIII, the SE5, and the Fokker D.VII. The Spad was probably the most sturdy and dependable fighter of the war in steep dives. While other fighters lost wings in fast dives, the Spad XIII hung together thanks to its solid construction. Though it could not turn as well as the late generation German fighters, it could hit and run with the best of them. A Spad in capable hands was more than a match for any German fighter.

The SE5's best attribute was pure speed. In fact, it was the fastest fighter of the war with a top speed close to 140 mph. Solid in a dive, and capable of limited high altitude flight, it was the Allies' best answer to the Fokker D.VII.

The D.VII was not as fast as the SE5, but the BMW-powered versions could fly higher and maintain better performance. Moreover, the D.VII was evenly balanced. Capable in a turn-fight, it could also be used as an energy fighter for hit-and-run attacks. Overall, the D.VII offered the greatest tactical flexibility to its pilots, making it probably the best fighter of the First World War.

When playing *Red Baron 3-D*, be sure to learn what method of dogfighting best fits your aircraft. Then, when you engage an enemy



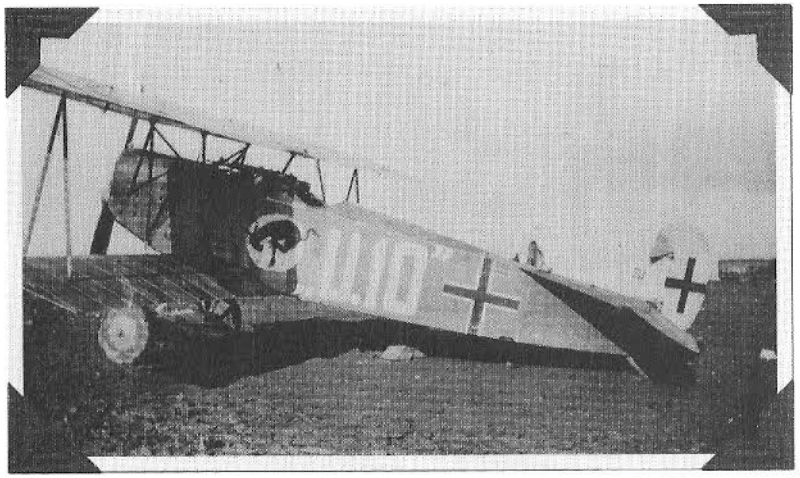
FRANK LUKE BESIDE HIS SPAD XIII. LUKE WAS NOT A TACTICAL GENIUS, BUT HIS ULTRA-AGGRESSIVENESS LED HIM TO RACK UP AN IMPRESSIVE SCORE BEFORE BEING SHOT DOWN IN SEPTEMBER 1918.

formation, use your aircraft's attributes to your advantage. Don't, for example, try to turn-fight with a Fokker Dr.I if you're in a Spad XIII. That will just send you to an early grave. Hit and run in that situation. A good part of the fun in *Red Baron 3-D* is learning about how the different planes fly, and how best to employ them.

Be sure your tactics also fit the strategic situation on your stretch of front. If you're hopelessly outnumbered by the enemy, getting into twisting, turn-fights might be a mistake. In such situations, you may want to get your hands on a hit-and-run fighter so that you and your men live to fight another day. Remember, in campaign games, it is important to keep your NPC pilots alive, so plan your engagements carefully and maximize your advantages.

DISENGAGEMENT

Sooner or later, every pilot had to head for home after a fight. Sometimes, fuel considerations forced a pilot to cut and run for his side of the lines. Other times, it was ammunition. On occasion, pilots disengaged because they were at a disadvantage in a fight. Most pilots felt that it was better to survive and fight again later, then stay in a battle with the deck stacked against them. Of course,



A FOKKER D.VII CAPTURED BY THE 95TH AERO SQUADRON ON THE VERDUN SECTOR.

there were exceptions to that rule, but most of the exceptions lie in soldiers' graves in France.

To disengage in the middle of a fight, every pilot had to know the capabilities of his own craft compared to those of his enemy. Some World War I aircraft could climb faster than others, so climbing out of a fight could be an effective way to disengage. Others, like the Spad XIII, could out dive anything on the Western Front. Spad pilots could usually get out of any fight they were in if they had altitude to dive away. Other planes had great level speed and in some cases could break out of a fight by just running away.

That latter tactic was always fraught with peril, however. In late 1916, Lanoe Hawker found this out when he tried to run away from Manfred von Richthofen. Down low and nearly out of gas, he had no choice but to just cut and run, jinking around as he went to throw off the Baron's aim. Of course, the DH-2 and the Albatros D.II were about equal in speed, with the D.II having a slight edge. Not surprisingly, Richthofen managed to catch Hawker from behind and shoot him down.

The fight between Guynemer and Udet demonstrated just how important disengagement options were to the pilots of the Great War. Very soon after entering the fight, Udet realized he was outmatched by his French enemy. Guynemer proved to be a superior pilot and the Spad XIII he was flying was a better overall aircraft to Udet's Albatros. Had Udet been able to run away, he probably would have taken the first opportunity to do so. However,

he realized that his plane could not dive away from Guynemer's Spad, and the chance for him to climb away was negligible as well. In the end, the circumstances of the engagement forced him to fight it out knowing the cards were against him.

In *Red Baron 3-D*, always try to have an escape route. If your fighter climbs well, be sure to keep your speed up in a fight so, if the need arises, you can head for the hills. Whenever possible, avoid fights that you won't be able to get out of after they start. It is not wise, for example, to go charging alone into a flight of SE5s while flying a Fokker Dr. I. You won't be able to get out of the fight unless you shoot all the SE5s down, or they decide to run away. Conversely, if you have an altitude advantage and want to attack a formation of Albatros D.Vs with your SE5, your superior performance and ability to disengage offsets, to an extent, their advantage of numbers. Basically, it comes down to this: try to dictate the terms of the dogfight to your enemy, while always keeping an escape route open. Disengaging is sometimes seen as inglorious, but it will keep you and your pilots alive.

GROUND ATTACKS

During the final months of the Great War, aircraft were used more and more for infantry support missions. Squadrons were sent out to strafe and bomb enemy infantry in front of friendly ground units. This required cooperation with the PBI (poor bloody infantry) so friendly troops were not strafed. Above all, the attacking pilot had to know, or at least have a reasonable idea of, where the friendlies were and where the enemy was in relation.

When strafing trenches or infantry in the open, World War I pilots tended to get right down on the deck. Sometimes, infantry officers reported being attacked by planes that were flying less than 25-50 feet off the ground!

In *Red Baron 3-D*, try hunting infantry from about 500 feet. Once you spot your quarry, make shallow, diving passes at them, guns blazing. If you have bombs, use them too, but try releasing them above a few hundred feet, as you might be hit by your own bomb blast, otherwise. Once you finish your pass, climb back up to 500 feet, circle around and go back in. While making these strafing runs, be certain to keep checking the sky around you. Many World War I pilots died when they became fixated on their targets and forgot to check their tails.

When attacking other targets, such as airfields, anti-aircraft

A German machine gun platoon moves forward along a French country lane. Such daylight marches became increasingly hazardous by war s end, as marauding Allied aircraft searched for just such targets.

fire can get quite intense. Many Great War pilots learned it was best to make only one pass on such targets, causing as much damage as possible before zooming out of range. The single pass will usually minimize the amount of AA fire you take as you strike your target. Another option would be to try and knock out the AA guns in your first pass, freeing you up to attack the target with impunity.

Boelcke s Dicta

1. Try to secure advantages before attacking. If possible, keep the sun behind you.
2. Always carry through an attack when you have started it.
3. Fire only at close range, and only when your opponent is properly in your sights.
4. Always keep your eye on your opponent, and never let yourself be deceived by ruses.
5. In any form of attack it is essential to assail your opponent from behind.
6. If your opponent dives on you, do not try to evade his onslaught, but fly to meet it.
7. When over the enemy s lines never forget your own line of retreat.
8. For the Staffel: Attack on principle in groups of four or six. When the fight breaks up into a series of single combats, take care that several do not go for one opponent.

The sky above the trenches was a deadly place to be. During Bloody April, some British squadrons suffered 60 percent losses. During the more routine months of the war the attrition rate was still very high. Most novice pilots never lived long enough to call themselves veterans. Those who did survive month after month rarely showed any inclination to coach the new replacements.

Oswald Boelcke was the exception. Boelcke possessed a rare combination of tactical brilliance and keen flying technique. Nothing escaped his eyes in the air, and as his experience grew, he began to teach his men how to survive in the air. Eventually, he put to paper his advice and circulated it among the Jagdstaffeln. His advice became known as *Boelcke's Dicta*. Its principles still form the foundation of fighter combat today.

1. Try to secure advantages before attacking. If possible, keep the sun behind you.

If you want to emulate the reckless fighting style of flamboyant pilots like Albert Ball or Lothar von Richthofen, attack before evaluating the situation. While you may score some spectacular victories, chances are you'll be flamed before the armistice. Exercising caution, however, will increase your odds for survival. Before you attack, try to secure as many advantages as possible. Attack out of the sun, for it is every pilot's blind spot. Try to attack from a higher altitude. This way, you'll have the initiative as well as superior speed and momentum. The pilot below can only react to your moves, so you've forced him to defend himself, and not go on the attack. Surprising your foe is the best way to minimize risks to yourself. Sneak up on your opponents by staying above them and in the sun. Be patient, and when a favorable moment arises, swoop down behind the target and attack before he can react. Unless you possess all three of these advantages (surprise, altitude and having the sun behind you), it is probably wise to avoid dogfighting against superior numbers.

2. Always carry through an attack when you have started it.

Often a green pilot, in his first engagement with an enemy aircraft, will start a firing pass on an enemy aircraft only to get cold feet and try to disengage. This presents his tail to the enemy, and, more often than not, the novice is shot down. The key is to be aggressive. When you are in the air, commit to a target. Don't break off the attack until you've completed the firing run. Your aggressiveness will often frighten your opponent into making a mistake. Many a novice pilot will freeze up when an enemy is on his tail.

3. Fire only at close range, and only when your opponent is properly in your sights.

Machine guns from the Great War were terribly inaccurate weapons on the ground, let alone in the air. Successful pilots closed to point-blank range before opening fire. When you find yourself in a dogfight, don't waste precious ammunition on long-range shots. Instead, choose your targets carefully then close the range until you're within about 30 yards of your opponent. When you open fire, don't hold the trigger down too long. Snap out short,

well-aimed bursts. Long bursts are likely to jam the machine guns and will waste ammunition.

4. Always keep your eye on your opponent, and never let yourself be deceived by ruses.

Occasionally, a pilot who is outmatched will feign death by going into a seemingly uncontrolled spin. At treetop level, the pilot will pull-up, level off, and head for home.

5. In any form of attack it is essential to assail your opponent from behind.

The art of deflection shooting was so difficult to master during the Great War that many pilots didn't even bother to try. A few of the great aces, most notably Mannock and Fonck, successfully made deflection shots in combat.

A deflection shot is made when the target aircraft is flying in a different direction than the attacker. To make a deflection shot, the attacker must lead the target since the target is not flying along the path of the bullets. For example, say you are traveling north and your target is in front of you heading west. This is a 90-degree deflection shot, since the target is perpendicular to you. This is the most difficult shot to make. Deflection requires leading the target; how much to lead depends on the speed of the target and the angle of the shot. A 90-degree deflection shot demands a great deal of leading.

If you do try a deflection shot, put the cross hairs well forward of the nose of the target plane. Squeeze off a short burst, and watch the tracers. Then adjust your aim accordingly. *If* you have time that is. Chances are, you'll have already passed the target. Rather than trying to adjust your aim for the speed of the enemy, the deflection angle of the shot, and the distance to the enemy, most pilots fired from a position where there was no deflection. This meant attacking head-on or from the rear. Attacking head-on has many disadvantages. First, because of the closure rate, you don't have much time to aim and shoot. Also, your target will probably be shooting at you too, while you're making your pass. Finally, you run the risk of a collision if one of you does not swerve.

Attacking from the rear is much better. Often your target won't see you. If you are stalking a single-seat scout, attacking from the rear denies him the ability to shoot at you. Furthermore,

there is no deflection angle from a stern shot, which greatly increases your chance of scoring a hit.

6. If your opponent dives on you, do not try to evade his onslaught, but fly to meet it.

Don't break away from an attack. If you do, you'll give your opponent a choice target and a chance to get on your tail. For example, if you spot a Fokker making a pass at you from behind and to the right, don't break left to avoid him. While the natural instinct is to turn away from him, this only exposes your tail. Instead, turn hard to your right. Even though you will cross his line of fire, it will only be for a brief moment. By turning toward him, you cut inside his turn and he won't be able to follow you. If a Fokker dives on you from the rear, don't try to dive straight down to get away. That gives him a clear stern shot. Instead, break left or right and turn toward him.

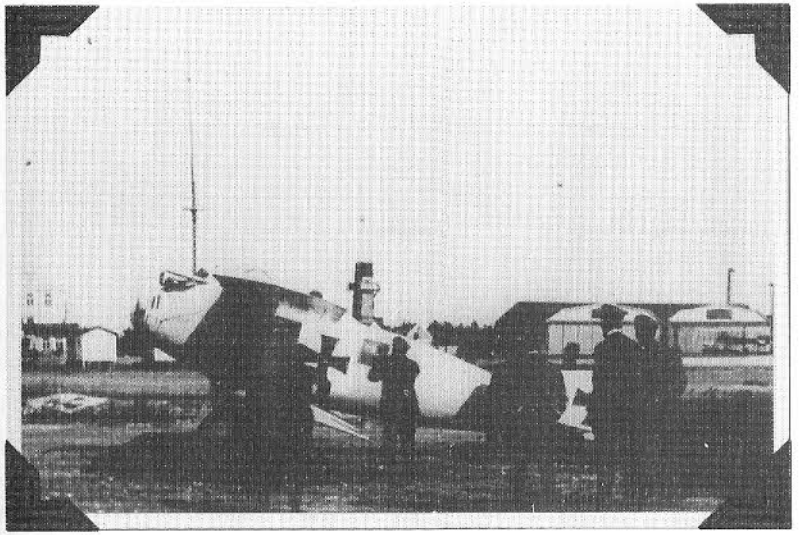
If your aircraft is sturdier than the enemy's you may try diving to get away. In other cases, however, it's best not to dive away as this only gives the enemy a clear stern shot.

7. When over the enemy's lines never forget your own line of retreat.

Always make sure you can run for home when you need to. Many pilots found themselves cut off from their lines with a damaged plane and had to land in enemy territory. Make sure you know where you are and where the front is.

8. For the Staffel: Attack on principle in groups of four or six. When the fight breaks up into a series of single combats, take care that several do not go for one opponent.

To retain the advantage in combat, it is essential to attack *every* enemy aircraft if the odds are even. If three Eindeckers bounce three Nieuports the odds are even, right? This is true *only* if each Eindecker engages a different Nieuport. This way, all three Nieuport pilots are forced to defend themselves with evasive flying. However, if all of the Eindeckers attack a single Nieuport, it leaves the other two Nieuports free to attack the Eindeckers.



A ROLAND C.II. WELL ARMED AND FAST, THESE WERE DANGEROUS TWO-SEATERS TO ATTACK. BALL FOUND THEIR WEAK SPOT BY ATTACKING THEM FROM BEHIND AND BELOW.

SPECIALIZED ATTACK TACTICS

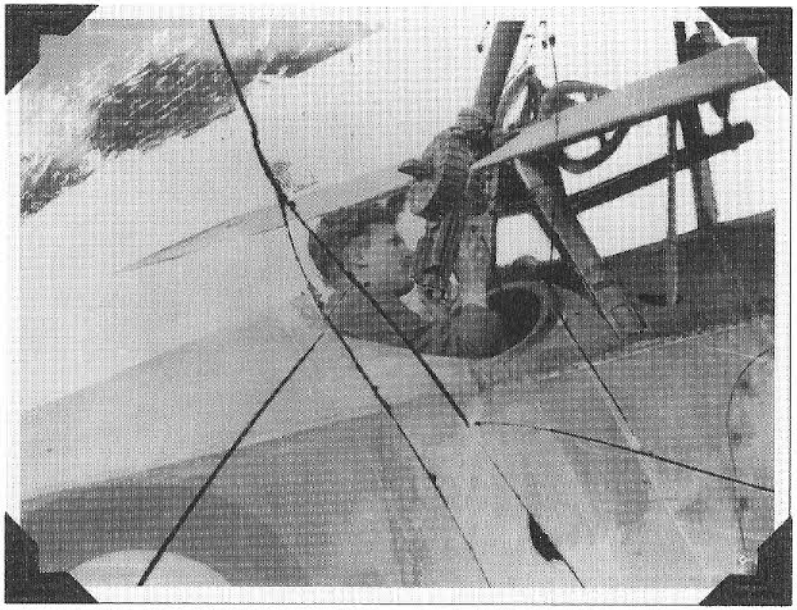
ATTACKING TWO-SEATERS

Albert Ball had to be the worst air combat tactician to make ace in World War I. He threw himself headlong into fights despite being outnumbered, cornered, or at any disadvantage. He didn't care, all he wanted to do was fight.

But, when it came to attacking two-seaters, even Ball approached them with care. He learned early in his career that to make a diving attack on a two-seater's tail simply courted disaster. The observer/gunner could easily draw a bead on him and plink his scout full of holes. That sort of risk even Ball refused to take. So, he looked for a blind spot that would let him get a shot in without worrying about any return fire.

One day in 1916, he discovered where that was. Patrolling the front alone, as usual, he ran across a couple of Roland C.II recon planes. The rear gunner on the C.II had an excellent field of fire due to the placement of the wings. Any attacking plane coming in from above, the sides, or dead behind were in his firing arc, and if Ball had chosen to make a head-on pass, he would have had a Spandau machine gun blazing away in his face.

Realizing this, Ball dove down behind and beneath the Whalefish and crept up on it from below. With his extra speed from



BILLY BISHOP DEMONSTRATES HOW TO USE THE LEWIS GUN MOUNTED ATOP HIS NIEUPORT S WING. BALL WOULD SLIDE THE LEWIS DOWN THE FOSTER MOUNT THEN AIM THE GUN UP AT HIS OPPONENTS BELLY.

the dive, he closed the distance to his target quickly. Once directly underneath, he pulled up and sprayed the Roland with long bursts from his wing-mounted Lewis machine gun. Stricken, the Roland fell off into a spiraling dive that ended only when it impacted with the ground below. Just like that, Ball had discovered the Roland's weak spot. Moreover, it was a weak spot shared by all two-seaters.

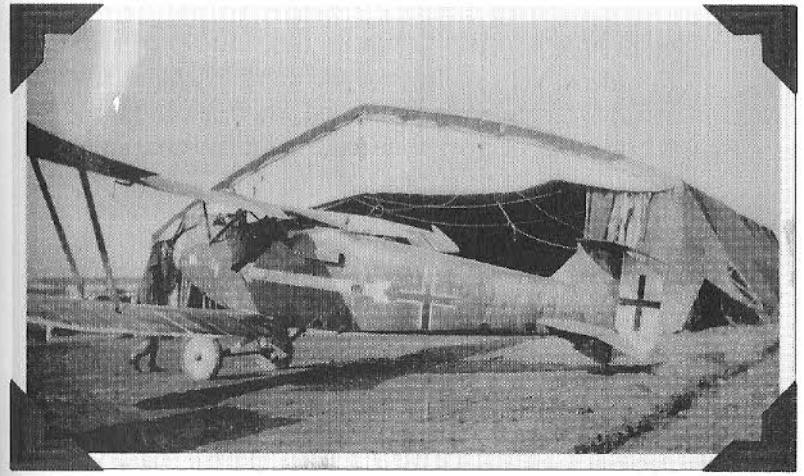
In *Red Baron 3-D*, two-seaters can be just as deadly as they were in the Great War. Taking on a Roland C.II or a Hannover C.III from above and behind is just going to get you killed. Copy Ball's method! Get above and behind your target — but well out of his gunner's range — then dive down below him and give him a squirt in the belly. The two-seater will probably jink and bank as he tries to give his gunner a shot, so be quick with the pass and break away if you start receiving return fire. You can always make another run.

Another, less favorable approach to attacking two-seaters was a head-on pass. Early in the war, many recon planes didn't have a forward firing machine gun. The Aviatik, the BE2, and the later RE8 all shared this blind spot. In certain cases, it may make more sense in *Red Baron 3-D* to make a level, head-on pass that ends with a downward break. Breaking underneath your two-seat target

will minimize the chances of any counter-fire from the rear gunner as you pass on by.

Two-seaters can be tough, but heavy bombers such as the Gotha and the Handley-Page can be downright dangerous. To protect its vulnerable belly, the Gotha came equipped with a ventral tunnel gun that surprised many a British pilot. Because of it, attacking from dead astern and underneath is not recommended. Basically, the Gotha has very few blind spots to exploit. The best you can do is give the gunners a poor shot at you. To that end, try making, what was called in WWII, a pursuit curve. Start above and behind the bomber, a little offset to one side. Then, as you draw up along side (remember to do this with the bomber below you and out of range), turn toward him and make a high deflection run. Best results were achieved when the attacking plane had about a 45-degree deflection shot. Such an attack forced the gunners to guess on lead, something that was quite difficult to do when the aircraft the gunners were shooting at were coming head-on and at a slight angle toward them.

Head-on attacks on Gothas and Handley-Pages can also be successful. To do them, you need to be a crack shot and have a great sense of timing. These sorts of runs, though, can disable the crew or knock an engine out, making the big bomber a cripple and thus easy meat for you.



ONE OF THE TOUGHEST TWO-SEATERS OF THE WAR WAS THE HANNOVER C.L.III INFANTRY ATTACK PLANE. THIS PARTICULAR PLANE WAS CAPTURED BY THE 94TH AERO SQUADRON RIGHT AT THE END OF THE WAR.

ATTACKING OBSERVATION BALLOONS

Well-protected with machine guns and flak, the lowly observation balloon ranked as the single-most difficult target to bring down in World War I. So important were these balloons to the artillery units on both sides that they were sometimes ringed by dozens of ground-based machine guns and cannon. Only a few fighter pilots dared such stiff defenses, others steered clear of them entirely. The few who tried generally got very good at making lightning-quick, diving attacks that would minimize their time under the balloon defense's guns. Ritter von Roth, Henrich Gontermann, and Frank Luke were probably the best balloon-busters of the war. They all took huge risks to shoot the great floating gasbags out of the sky, usually returning home with their planes full of bullet holes. It took nerves of steel to hit such dangerous targets, but the rewards were great as well. Knocking out two or three balloons on one sector could effectively blind the enemy's artillery units. Without spotters to watch and correct their fire, the big guns were almost useless, especially if the front lines were moving as a result of an offensive or minor breakthrough.

In *Red Baron 3-D*, balloons are extremely well defended. To attack one, first make sure you have part of your flight covering you as you make your run. The last thing you need as you're diving down on a balloon is to check your six and discover an enemy scout sitting right on your tail. So, leave a few planes up high to provide top cover while you make a diving pass at the balloon. If you fail to bring it down on the first pass, forget it. Keep running at high speed until you're out of range of the defensive guns. If you must make another pass, don't turn around while still in range of the AA guns below. Run clear, climb back up, then make another quick pass.

FINAL WORDS

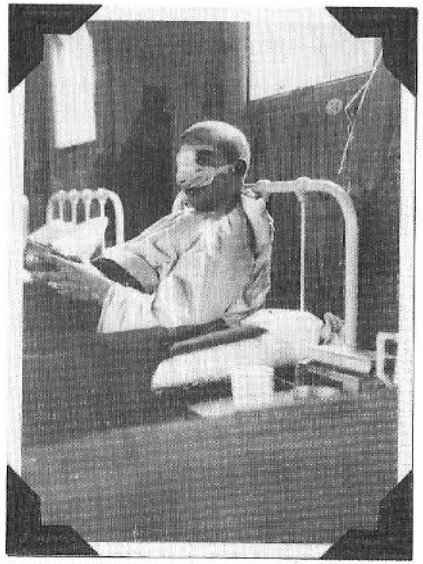
Red Baron 3-D's campaign system was constructed to mirror the historical realities on the Western Front as much as possible. While it may make headlines to be rash and daring, you'll soon discover such reckless behavior will not get you through the war. Remember that discretion is always the better part of valor, so it is better to run from a poor situation. Fighting it out every time will only get you killed. So be discreet, calculate the odds and only take risks if the rewards are worth it.

Plan your engagements carefully. If you spot a formation of

enemy planes above you, run away if you can. Then, if they aren't chasing, try turning around and stalking them. Climb above them and sneak behind them if you can. Use the sun to your advantage by keeping it at your back whenever possible. Whatever you do, don't engage every flight you see no matter what the tactical situation. You may get away with it for awhile, but sooner or later you'll go the way of the Albert Balls and Frank Lukes of the war.

Another key to *Red Baron 3-D's* campaign mode is keeping your pilots alive. Once you become the squadron commander, it is your duty to preserve your pilots and help them gain experience. Being reckless and rash with their lives will only engender resentment. Morale in your unit will plummet as the tables in the mess have more and more empty place settings. Don't sell your men cheaply, for replacements are hard to come by and are usually of low quality at first. Conversely, you don't want to burn your squadron out. If you insist on selecting the same few pilots for each mission, sooner or later they will come to their emotional limit. When that happens, their nerves are shot and they'll be worse than useless in the air. Beware of this and don't drive your men to the point where they all get the Twitch!

Calculated risks, crafty tactical planning, and good decision making are what make for successful careers in *Red Baron II*. Study your aircraft carefully, learn their good and bad qualities and use the former to your advantage while minimizing the latter when you engage the enemy. Above all, remember that the most successful pilots of the war — Fonck, Richthofen, and Rickenbacker —were all plotters. Far from rash or reckless, these men were stalkers who planned each engagement with care. Learn from them and apply what you've discovered to your career in *Red Baron 3-D*. You'll find that your success will mirror theirs.



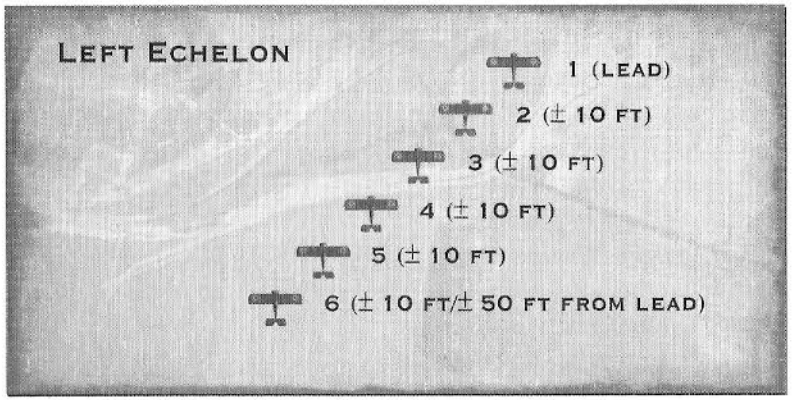
THE LAST STOP FOR MANY A RECKLESS AVIATOR.

FLIGHT FORMATIONS

Formations in Red Baron 2 3-D determine how planes are arranged in a flight. Any flight that has more than one plane in it (max 12 planes in any flight) will need some kind of formation. The number of planes in a flight will determine what formations are available, as some formations require an exact amount (like the diamond, which requires four planes). A flight can change formations several times throughout a mission, usually with a formation to takeoff, one to get to the target, a formation at the target, and one to land.

All formations are lead by they flight leader. He fills slot #1 (or lead) of the formation. All other planes fill descending slots (2, 3, 4, 5, etc). Each slot beyond the lead will read off of a slot positioned before him. In other words, slots #2 and #3 will usually read their position off of the lead, and further slots usually read off of the lead or slots 2 and 3. Read below for more info on this.

The following pages list the formations with comments:

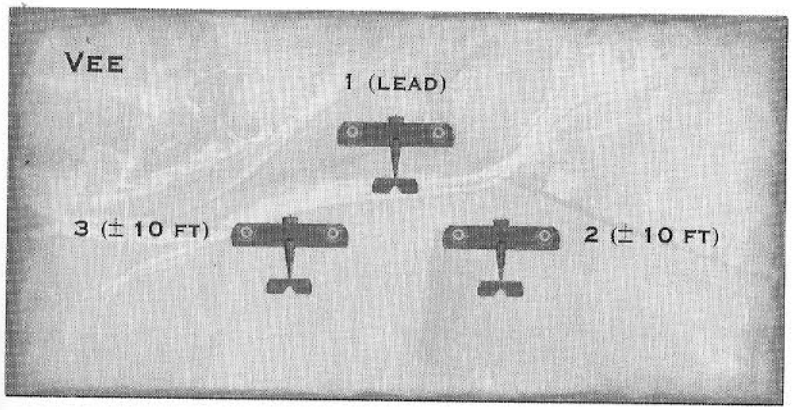


ECHELON (RIGHT AND LEFT)

This is the simplest of formations. It can hold from 2 to 12 planes. Basically, planes in the formation will line up off of the lead's right or left side at a 135-degree angle. Each plane forms off of its previous slot on the same side, at the same angle (2 forms off of 1, 3 forms off of 2, etc). Each plane will be 10ft above or below the plane it follows.

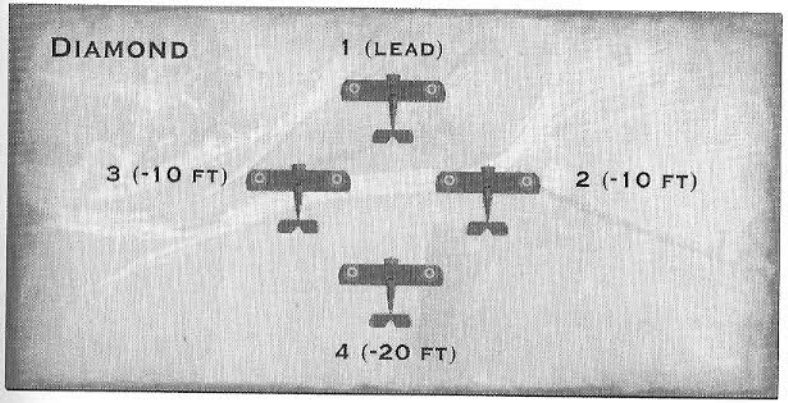
The Echelon forms the core of most other formations, and can be considered to be a generic or fallback formation. It can be used for takeoffs, landings, or patrolling the skies for enemies.

(...and so on - up to 12 slots)



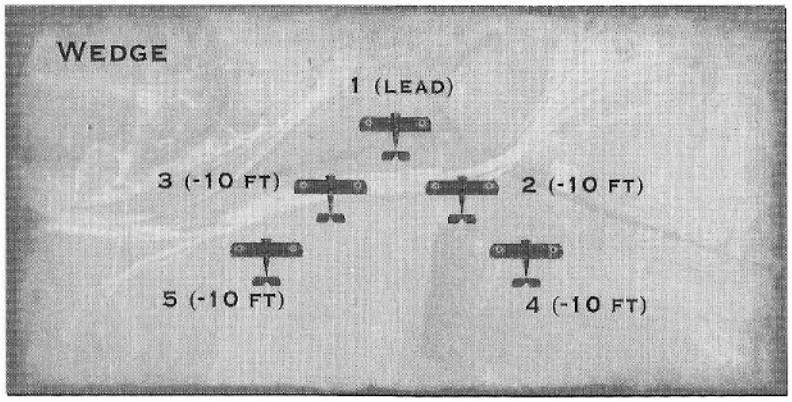
VEE

This formation requires exactly 3 planes. It has a lead, one plane in left echelon, and one in right echelon. Both stack 10 feet above or below the lead.



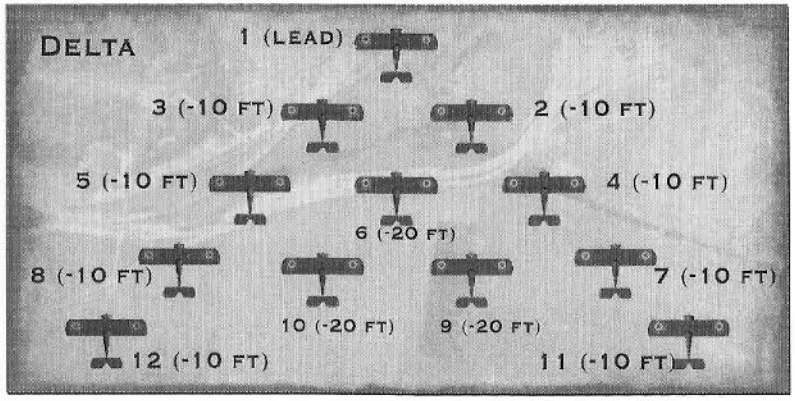
DIAMOND

The diamond adds a plane to the vee - it requires four planes. The fourth plane follows directly behind the lead and at a 135-degree angle from slots 2 and 3. From the lead, slots 2 and 3 are 10 feet below, and slot 4 is 20 feet below.



WEDGE

This formation adds two planes to the vee - it requires 5 planes. This formation puts two planes on either side of the lead in echelons. All planes form on the slot before them in the echelon (4 forms on 2, 2 forms on the lead). All planes stack 10 feet below the plane they follow.



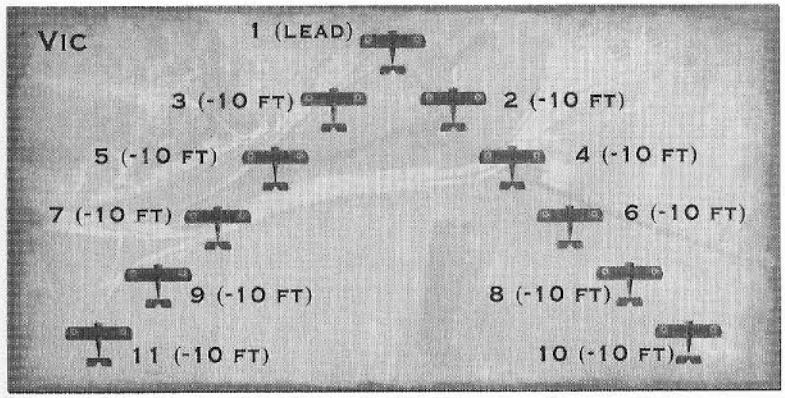
DELTA

The delta can handle anywhere from 6 to 12 planes. At its minimum number of planes, it looks like a combination of a diamond and a wedge.

Beyond the first 6 in the formation, additional planes line up in echelons, aside from slots 9 and 10, who form behind 2 and 3, respectively. Planes must be added in pairs (and in slot order - 7 and 8 must be filled before 9 and 10,etc), so this formation is only available to flights of 6, 8, 10, or 12 planes.

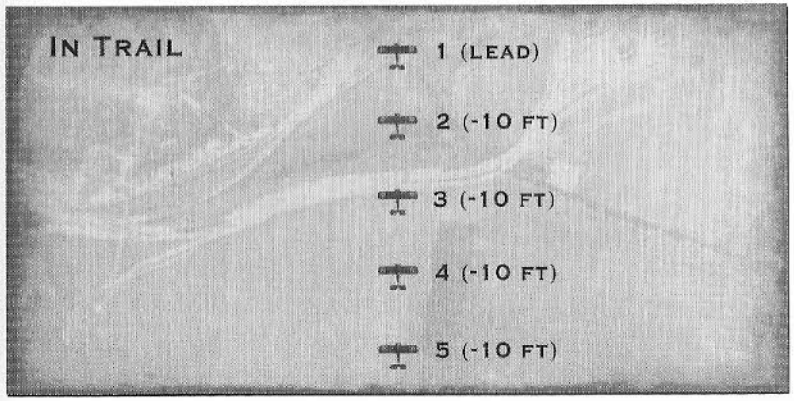
All planes in echelons are stacked 10 feet below the slot they

follow, and planes directly behind another plane (slots 6, 9, and 10) stack 20 feet below.



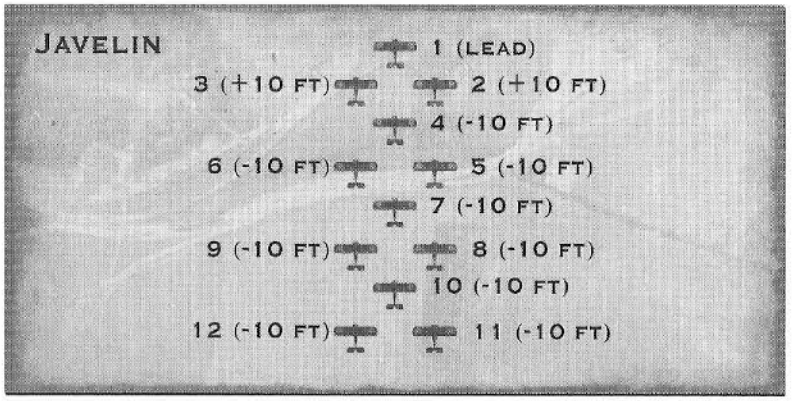
VIC

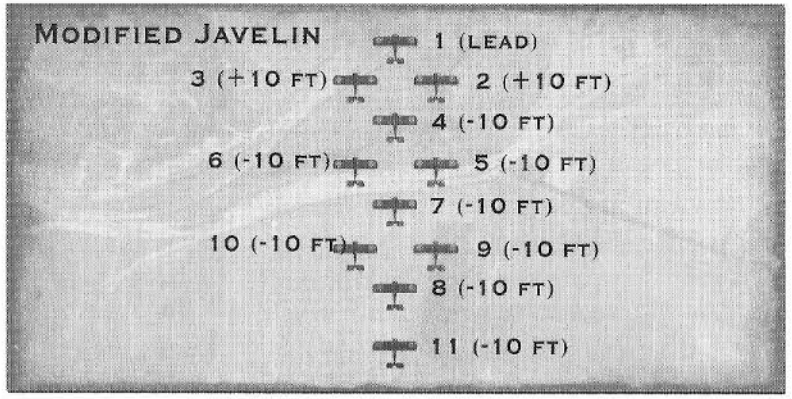
A vic formation is basically the same as a vee, except that you can keep adding pairs of planes until a maximum of 12 planes in the flight has been reached. The means that the vic can have 3, 5, 7, 9, or 11 planes in the formation. All planes are in right or left echelon from the lead, stacking 10 feet down per plane.



IN TRAIL (LINE ASTERN)

The In Trail formation is basically a row of planes, each lined up behind the plane it follows. This formation can have anywhere from 2 to 12 planes. This is a good takeoff formation. Its tactical use is limited, however. This formation can handle from 2 to 12 planes.





JAVELIN

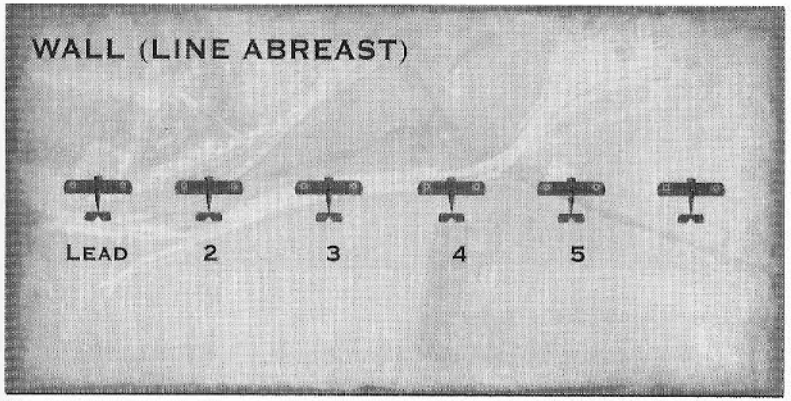
The javelin is mainly a bomber formation, and used only when there are more than 6 planes in the flight. While it looks complicated, it can be deadly when used by bombers, because each plane provides cover fire to the rear of other planes in the formation.

There are two variations of the Javelin, which are used for different number of planes in the formation. Basically, the formation used will be the regular javelin unless the number of planes give the formation an asymmetrical look.

For instance, if there's 6 or 7 planes in the formation, a regular javelin will be used. An eighth plane would unbalance the formation (as there'd be an extra plane on the right), so the formation would use the modified formation instead. Nine, ten, or twelve planes would use the regular javelin, but eleven would use the modified.

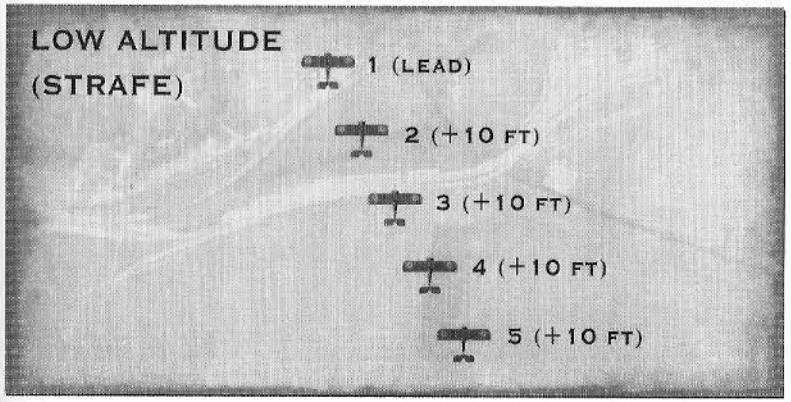
Slots 2 and 3 stack up 10ft from the lead, and every other plane stacks down 10ft from the plane it follows.

Don't worry if this seems a little confusing, since this is a bomber formation, you won't have to do anything but look at it in flight.



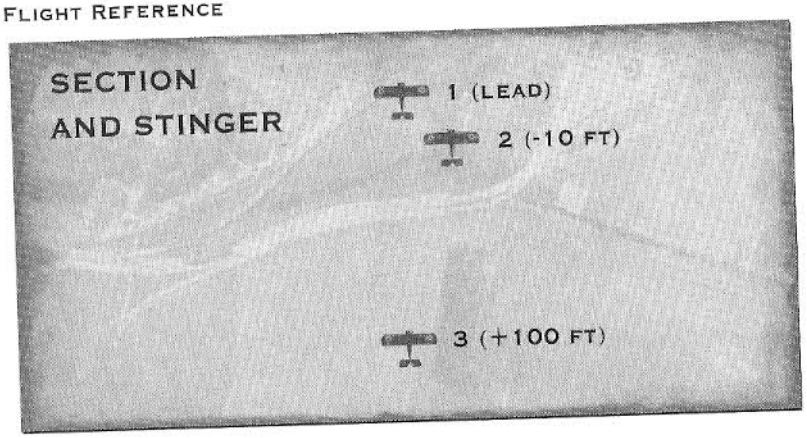
WALL (LINE ABREAST)

The wall is another good takeoff formation. The lead is at the far left, and each additional plane lines up to the right. This formation has a 0 stack, meaning that all the planes are at the same altitude. 2 to 12 planes are possible.



LOW ALTITUDE (STRAFE)

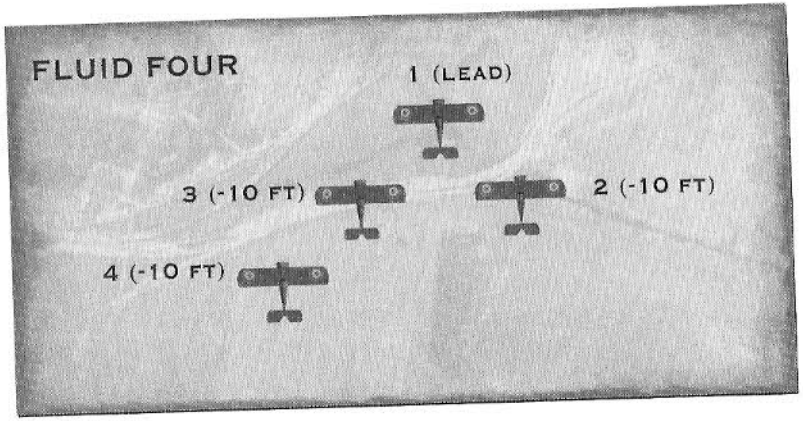
This four-plane formation is generally limited to ground attack. Planes line up in a right echelon from the lead, but their angle to the lead is much steeper (150deg, instead of the usual 135deg). Planes always stack up from the lead, so they don't crash into the ground during the attack.



SECTION AND STINGER

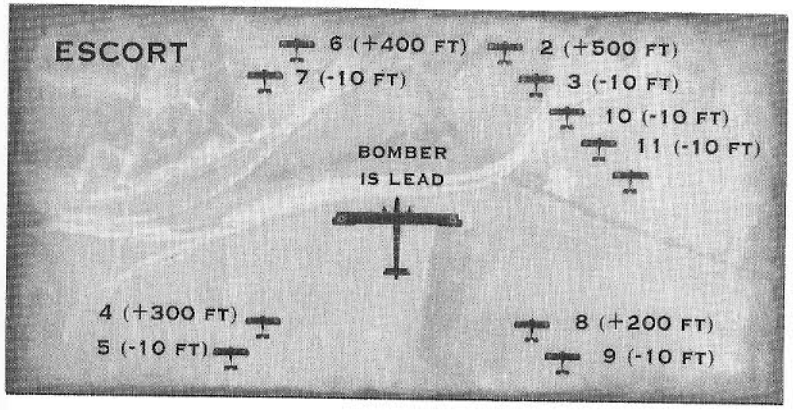
This is a formation designed to lure the enemy in to attack the two forward elements - while the third waits to drop down on the engaged enemy.

Slot 2 of the formation lines up on the lead in a normal right echelon, while slot 3 follow far behind and high above. If the first two slots are engaged, slot 3 is in a great position to finish off the enemy.



FLUID FOUR

This is a generic four plane formation, useful for patrols. Planes stack down.

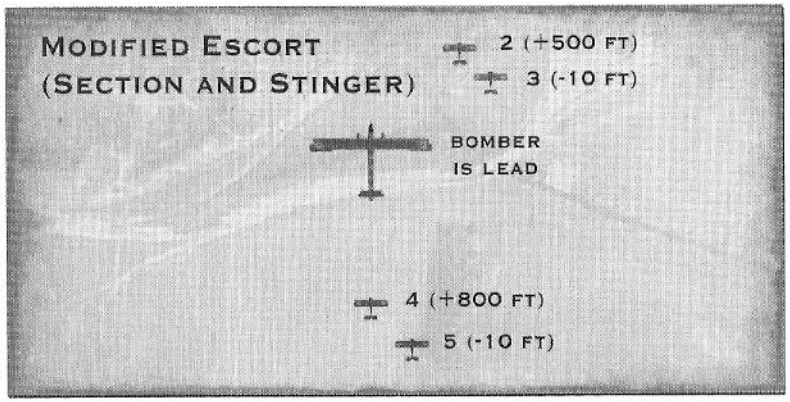


ESCORT

The escort formation is special in that the bomber being escorted becomes the formation lead. The flight lead before joining the bombers becomes the slot 2 plane, and so on. Basically, the escort fighters (from 2 to 12 of them) take up defensive positions around the bombers in simple echelons according to their relation to the bombers. Planes on the left side of the bombers will form a left echelon, and so on.

Slots 2, 4, 6, and 8 key off of the bomber lead (stacking high), while all other slots follow the plane before them, stacking down 10ft.

Note that a 12-plane escort can join with a 12-plane bomber formation (usually a javelin). This will result in quite a scary sight (even if rare) for your enemies!



MODIFIED ESCORT

The modified escort is a combination of a normal escort formation and a section and stinger formation. It can hold 3 to 4 planes. The first two slots (slot 2 and 3) are in a right echelon in front and to the right of the bombers. The last slots are behind and above the bombers, waiting for an enemy to engage them, so they can pounce.

MEDALS AND AWARDS

MEDALS AND AWARDS

Both the Central Powers and the Allies had their own awards structures that came into play during World War I and which were given for gallantry and military merit to natives and others deemed deserving. Among higher-ranking officers and royalty there was much exchange of awards as a customary military nicety. But the fighting man, both officer and man alike, was also recognized not only by his own country but if his bravery was sufficient, by the other nations allied with it in the war.

While many nations had highly developed and complex awards structures, especially those with long dynastic histories like the Romanovs in Russia and the Hohenzollerns in Prussia, none was quite as extensive as that which existed in Imperial Germany during World War I. The reason was that even though Prussia was the lead entity in the empire and its king was the emperor (Kaiser), the other states still retained certain military privileges. These included their own individual awards. Since Germany was still a collection of four kingdoms, numerous grand duchies, duchies, and principalities, the three free cities of the old Hanseatic League, and the Imperial Domain of Alsace-Lorraine (only the latter did not make awards), a fighter pilot of the prominence of Manfred von Richthofen could amass a truly staggering array of such awards.

One point regarding Imperial German awards needs to be made. There were no "German," or empire, awards for bravery and military merit in World War I. Each came from an individual state. Thus it is not correct to call the famous Orden Pour le Merite, the so-called "Blue Max," *Germany's* highest recognition for officers on the battlefield. It was *Prussia's*. However, because of its pre-eminent position within the empire, Prussia was called upon to make its awards throughout all contingents, not just its own. So, in effect, they became empire awards while still retaining their specific identity and origin.

BRITISH AWARDS

THE VICTORIA CROSS

Instituted by Queen Victoria in 1856, it takes precedence over every other honor in the British Empire including such illustrious orders of knighthood and chivalry as the Order of the Garter, Order of the Thistle, Order of St. Patrick, Etc. It was meant to recognize some signal act of valor or devotion to the country that was performed in the presence of the enemy.

THE DISTINGUISHED SERVICE ORDER

Established in 1886 to recognize distinguished or meritorious service in war, it was awarded to officers only. It generally went to more senior officers for superior work. It was also awarded as recognition for valor or merit of a superior kind which did not warrant the award of the Victoria Cross.

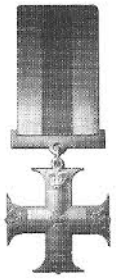
As with other British awards, bars were awarded to represent subsequent awards of the same decoration. Albert Ball is believed to be the first officer to receive the D.S.O. with 2 Bars.

THE DISTINGUISHED FLYING CROSS

When the Royal Flying Corps and the Royal Naval Air Service were combined to create the Royal Air Force with an effective date of April 1, 1918, it had been decided to found a new range of awards for the service which were meant to replace the Army and Navy awards previously bestowed.

The Distinguished Flying Cross was meant to reward officers and Warrant Officers of the R.A.F. for an act or acts of valor, courage or devotion to duty performed while flying in active operations against the enemy. It was meant to replace the M.C. There were 889 awards of the D.F.C. to pilots in the fledgling Royal Air Force.

THE MILITARY CROSS



This decoration was established on December 31, 1914 as an Army award to commissioned officers from the rank of Captain and below and to Warrant Officers. It was meant to recognize distinguished and meritorious service in time of war by men of these ranks. There were 1,077 awards of the M.C. for service by men in the R.F.C. / R.A.F.

FRENCH AWARDS

LEGION OF HONOR

Founded by Napoleon Bonaparte on May 19, 1802, it was France's highest honor. It came in five grades. The two lowest, the Officer's Cross and Knight's Cross, could go to the younger combat officers and the Knight's Cross could also go to exceptional non-commissioned officers and men.

It was also awarded to French citizens and foreigners for outstanding services of a civil or military nature. There was, however, no distinction on the insignia to differentiate between an award won, for example, on the battlefield versus one that might have been given for a distinguished career in civil life.

CROIX DE GUERRE

This decoration was established on April 8, 1915 as a means to mark individuals who had been mentioned in dispatches. It could go to both officer and man alike.

For a mention in an Army Dispatch (or the corresponding unit in the navy), a bronze laurel wreath, called a palm, was affixed to the ribbon of the cross. An Army Corps dispatch mention rated a gilt star. A Divisional dispatch mention was marked by a silver star and a Brigade, Regimental or Unit mention in a dispatch by a bronze star.

MILITARY MEDAL

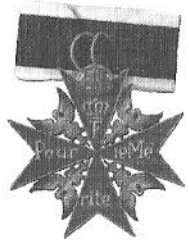
Established in 1852 during the reign of Napoleon III, the Medaille Militaire consisted of a gilded portrait of the French Emperor suspended by an eagle. It was awarded to both officers and NCOs alike for bravery in battle.

GERMAN AWARDS

ORDER FOR MERIT (ALSO KNOWN AS THE BLUE MAX)

Prussian name: Orden Pour le Merite

Founded in 1740 by Friedrich the Great of Prussia, he used French terminology for the words "for Merit" rather than the German because he was a great admirer of French court customs and insisted that language be used in his court. It was Prussia's highest recognition to officers for courage on the battlefield and for superior military performance in time of war. Thus it was rewarded in large numbers to senior military leaders and royalty as well as to officers for bravery in actual conflict with the enemy. In that respect it differed from the Victoria Cross and the U.S. Medal of Honor.



The order came in one class, that of knight, and was worn from the neck on a cravat. There was also a separate and higher award of the order, the Orden Pour le Merite mit Eichenlaub (the Order for Merit with Oak Leaf). The oak leaf did not indicate a second award of the same order as a bar or an oak leaf cluster would in the case of a British or U.S. award respectively.

No combat flier received the order with oak leaf during the war although von Richthofen was proposed for it (see the Red Eagle Order description).

There were 81 awards of the Orden Pour le Merite within the various air services in World War I. The Prussian awards system valued the consistent performer more so than a man who might perform a single act, however brave. It usually took repeated acts of bravery or continued good work over time to earn a high award like the Pour le Merite. For the combat airmen then, this got

translated into the number of victories for a fighter pilot or in the case of the men in the multi-place aircraft, many successful missions across enemy lines.

The first aviation awards of the Pour le Merite went to Oswald Boelcke and Max Immelmann on January 12, 1916, the day each scored his eighth confirmed victory. For the rest of that year, it took eight victories for the other fighter pilots who had been flying for some time before they received their awards. For the newer fighter pilots, a higher requirement was adopted in November 1916. The first to feel its effect was Manfred von Richthofen who was made to wait until he had 16 victories before his award was approved on January 12, 1917. Thereafter, it usually took at least 20 victories before the award would be approved but there were a few exceptions, Hermann Goering among them. In the last months of the war with scoring occurring at a rapid rate among the leading German aces and paperwork breaking down, the award sometimes did not reach a man until he had considerably more than 20 victories. The last two aviation recipients of the order, for example, had 30 victories when the award caught up with them.

ROYAL HOHENZOLLERN HOUSE ORDER WITH SWORDS

German name: Ritterkreuz des Koeniglichen Hausorden von Hohenzollern mit Schwerten

Founded on December 5, 1841 by King Friedrich Wilhelm IV of Prussia, it was the major award used by Prussia in World War I to recognize bravery and distinguished military service by officers after they had received the Iron Cross, 1st Class. It thus became the customary intermediate award between an Iron Cross, 1st Class and the Orden Pour le Merite. It is important to note that unlike Great Britain and the U.S., Imperial Germany did not engage in making multiple awards of the same order or decoration. To recognize a man for repeated acts of courage or superior performance it was necessary to go to a higher and separate award.

The order came in three classes with the lowest, that of Knight, being the one going to the young combat officers. Since the order could also be given in peacetime for service to the House of Hohenzollern, when awarded in wartime, a pair of crossed

swords was placed between the arms of the cross on the insignia. It was then said that the order had been given "with Swords."

The first airmen to receive the Knight's Cross with Swords of the order were, again, Boelcke and Immelmann. They received it in November 1915 after their sixth confirmed victories. Throughout 1916 it usually took fighter pilots six victories before they, too, received the award. In 1917 and thereafter it usually took at least 10 victories before a man would be favorably considered. In total, 8,291 Knight's Crosses with Swords were awarded for service in World War I.

THE RED EAGLE ORDER

German name: Roter Adler-Orden mit Schwerten

Prior to World War I, this order, founded in 1705, was used to reward junior officers for bravery in action and for meritorious service. Its usage in these ways was dropped in World War I and the Royal Hohenzollern House Order was employed instead.

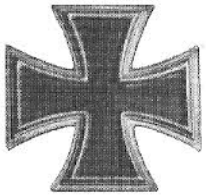
However, one combat airman received the order. He was Manfred von Richthofen who received the Red Eagle Order, 3rd Class with Crown and Swords on April 6, 1918 in recognition of his 70th victory and his nearly three years of service in the air. It was thus a unique award within the Imperial German Air Service in World War I.

Actually, von Richthofen had been proposed for the award of the Pour le Merite with Oakleaf instead. This was turned down on the basis of the archaic criteria for that award among which was that a recipient had to have forced the enemy to withdraw from a battlefield, i.e., to have won a battle. When General Ludendorff heard that von Richthofen had been denied the award because of this narrow interpretation, he is alleged to have snorted, "Richthofen has won many battles!"

IRON CROSS 1ST CLASS, IRON CROSS 2ND CLASS

German Name: Eisernes Kreuz I. Klasse and Eisernes Kreus II. Klasse

King Friedrich Wilhelm III of Prussia established the Iron Cross on March 10, 1813 as the main award to be used in the war then being fought against the French under Napoleon. There were



three classes, Grand Cross, 1st Class and 2nd Class. Originally, it was a very prestigious award and temporarily replaced many other Prussian bravery awards that might otherwise have been used.

After the Napoleonic Wars the Iron Cross was discontinued but renewed again on July 19, 1870 by King Wilhelm I of Prussia for the war that had again broken out with France. After the war, it again lapsed and was not renewed until August 5, 1914 when Emperor (Kaiser) Wilhelm II did so for World War I.

In the first years of the war, the award still retained much of its original prestige but large numbers awarded in the later years of the war, particularly in the 2nd Class, caused it to lose much of its meaning. It is estimated that for service in World War I, about 218,000 1st Class awards and over 5 million 2nd Class awards were made. No figures for aviation awards are known to exist although it can be said that any successful airman would undoubtedly have possessed both the 1st and the 2nd Class by the time the war ended.

UNITED STATES AWARDS

CONGRESSIONAL MEDAL OF HONOR

The Medal of Honor, given for service "above and beyond the call of duty," is the highest award for valor in action against an enemy force that can be bestowed upon an individual serving in the Armed Services of the United States. It is usually presented by the President of the United States in the name of Congress, and is therefore often called the Congressional Medal of Honor.

The Medal of Honor holds a special place as the first American decoration not patterned after English awards. It began as a Civil War decoration, approved by President Lincoln, intended for use by the Navy as a morale booster. It was to be awarded upon those servicemen "as shall most distinguish themselves by their gallantry in action." The Army soon adopted the award as well, and in 1904 added a wreath to the basic star-shaped medal for their own service. The Air Force

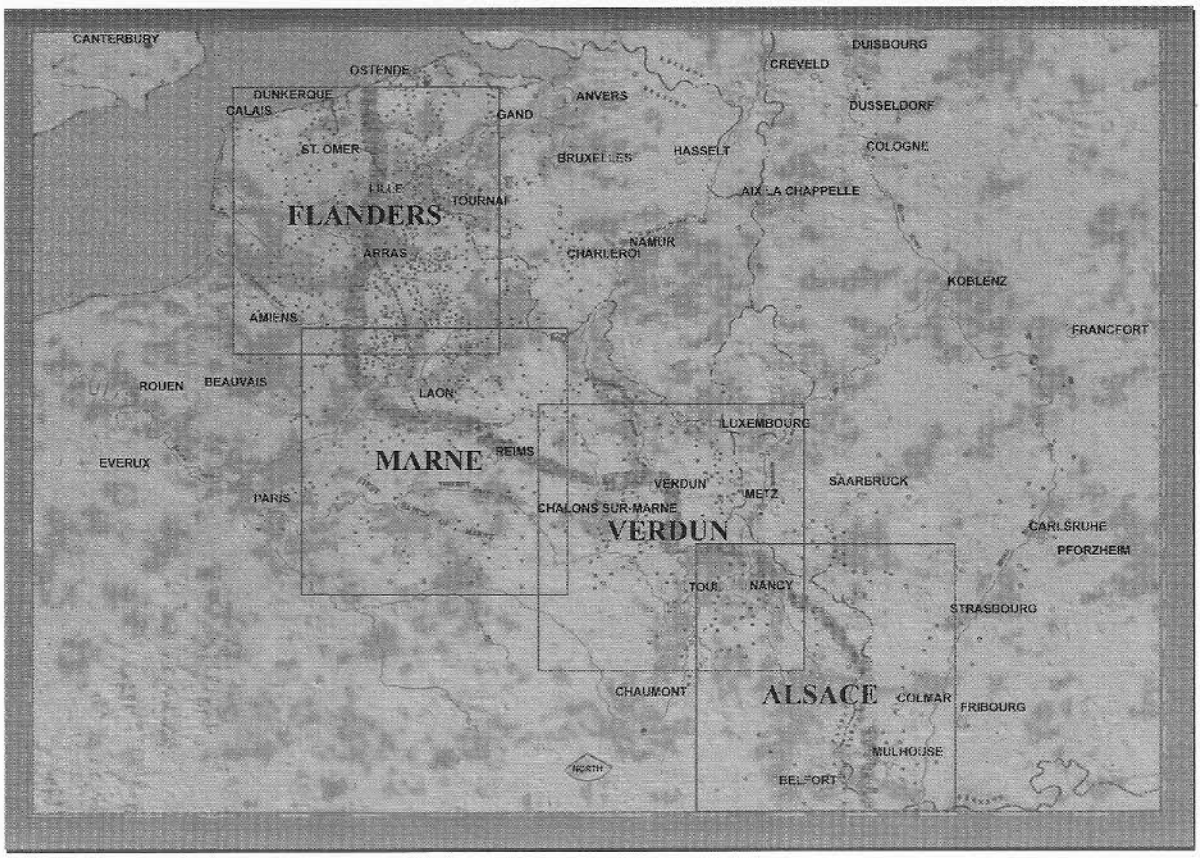
added a separate wreath design to create their unique version of the medal in 1965.

THE DISTINGUISHED SERVICE CROSS

The Distinguished Service Cross, established by an Act of Congress on July 9, 1918, could be awarded to any member of the US Army for "Extraordinary Heroism in Connection with Military Operations Against an Opposing Armed Force." This service could be in any capacity under the following circumstance: against an enemy of the United States; while engaged in military operations involving conflict with an opposing or foreign force; or while serving with friendly foreign forces engaged in an armed conflict against an opposing Armed Force in which the United States was not a belligerent party.

This medal was intended for presentation to servicemen whose actions were "so notable and have involved risk of life so extraordinary as to set the individual apart from his or her comrades," yet whose actions were not judged sufficient for the Medal of Honor. Although established in 1918, servicemen were eligible for this decoration for any action taking place after April 6, 1917.

Maps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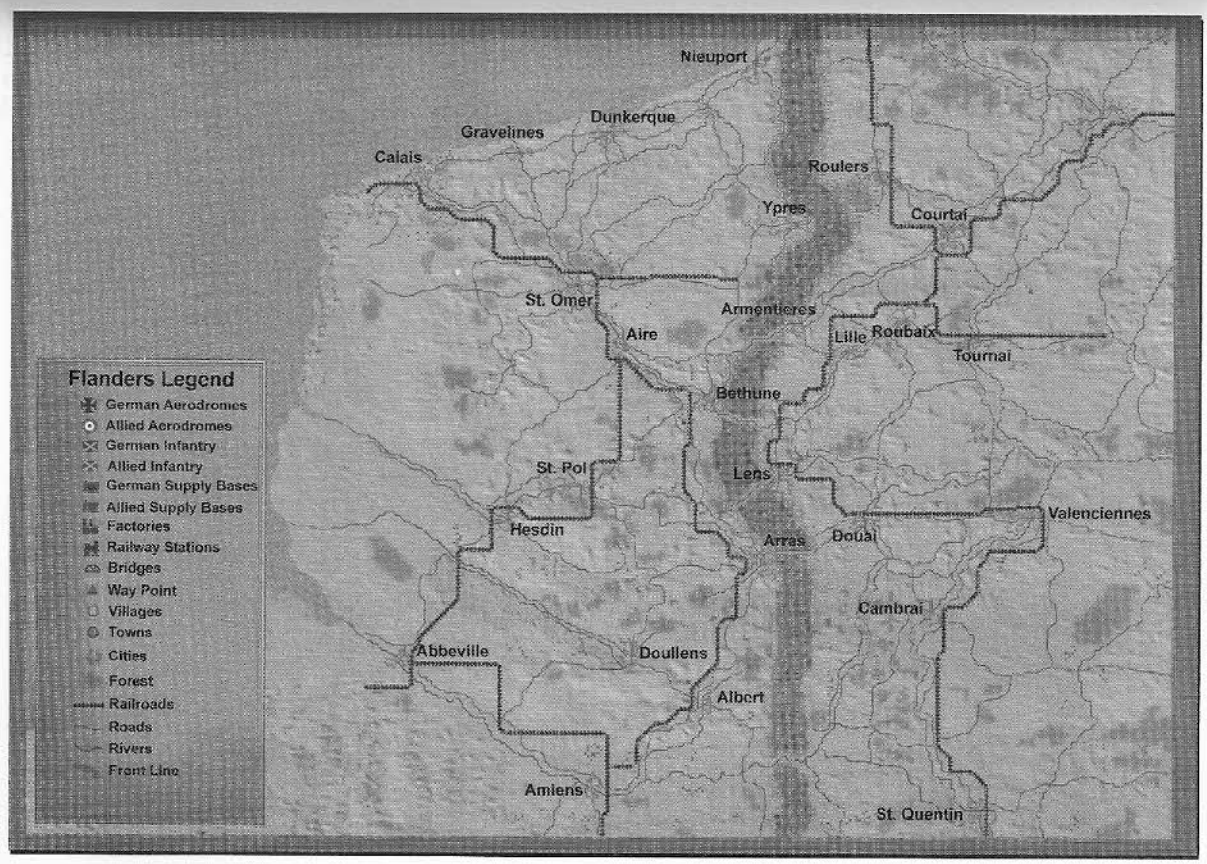
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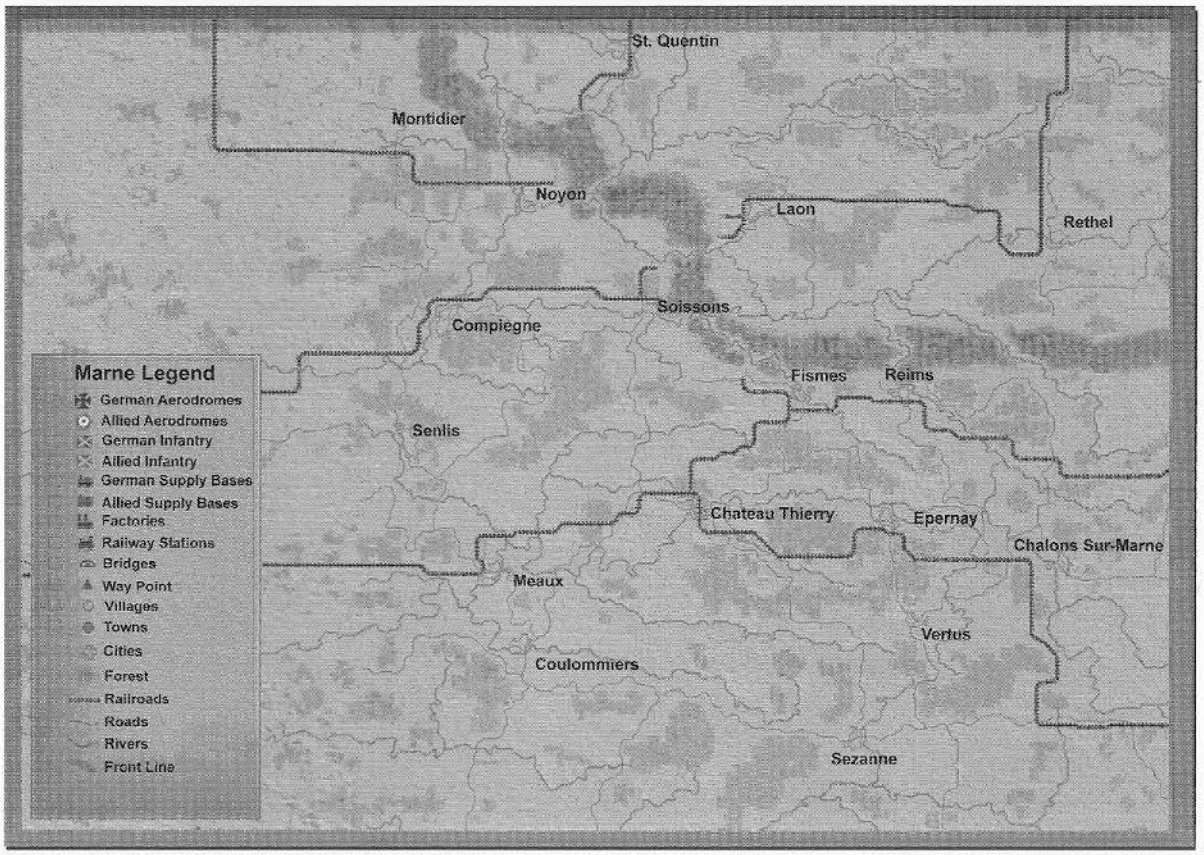
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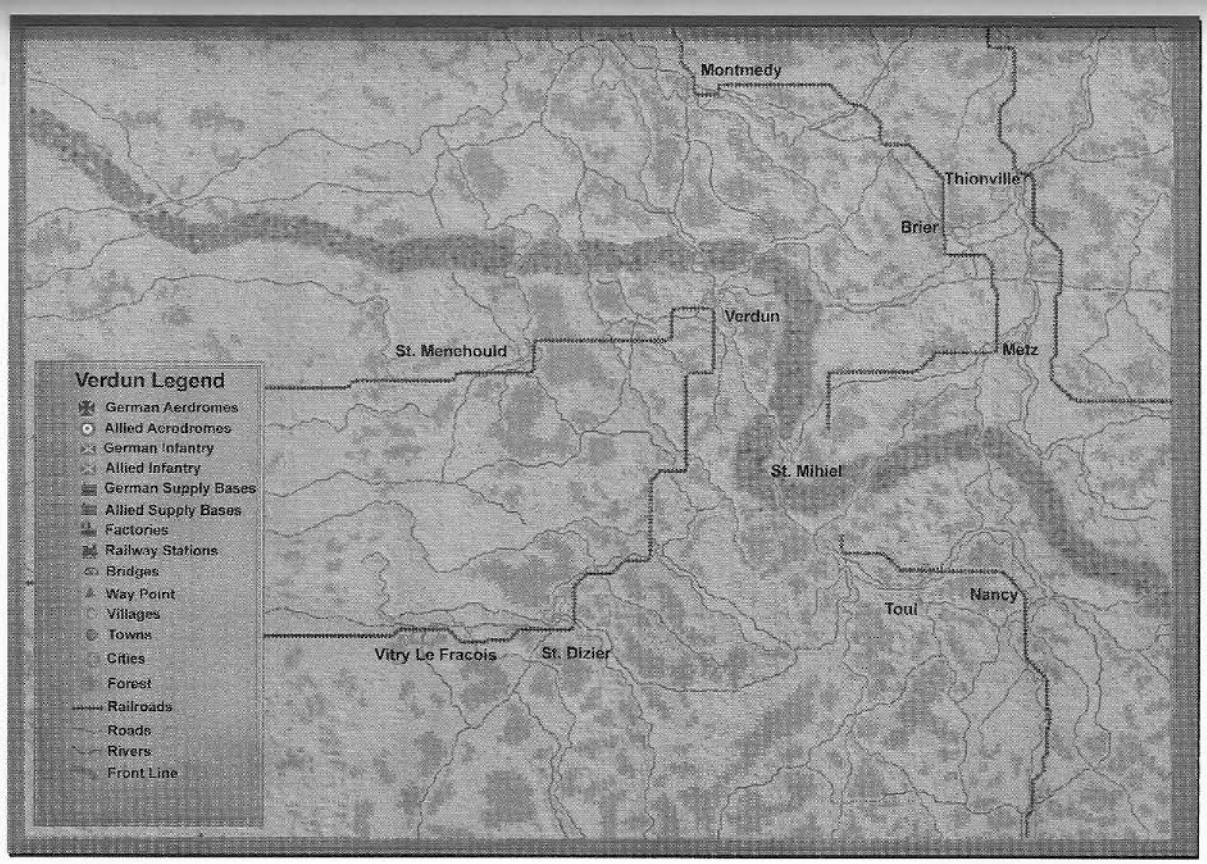
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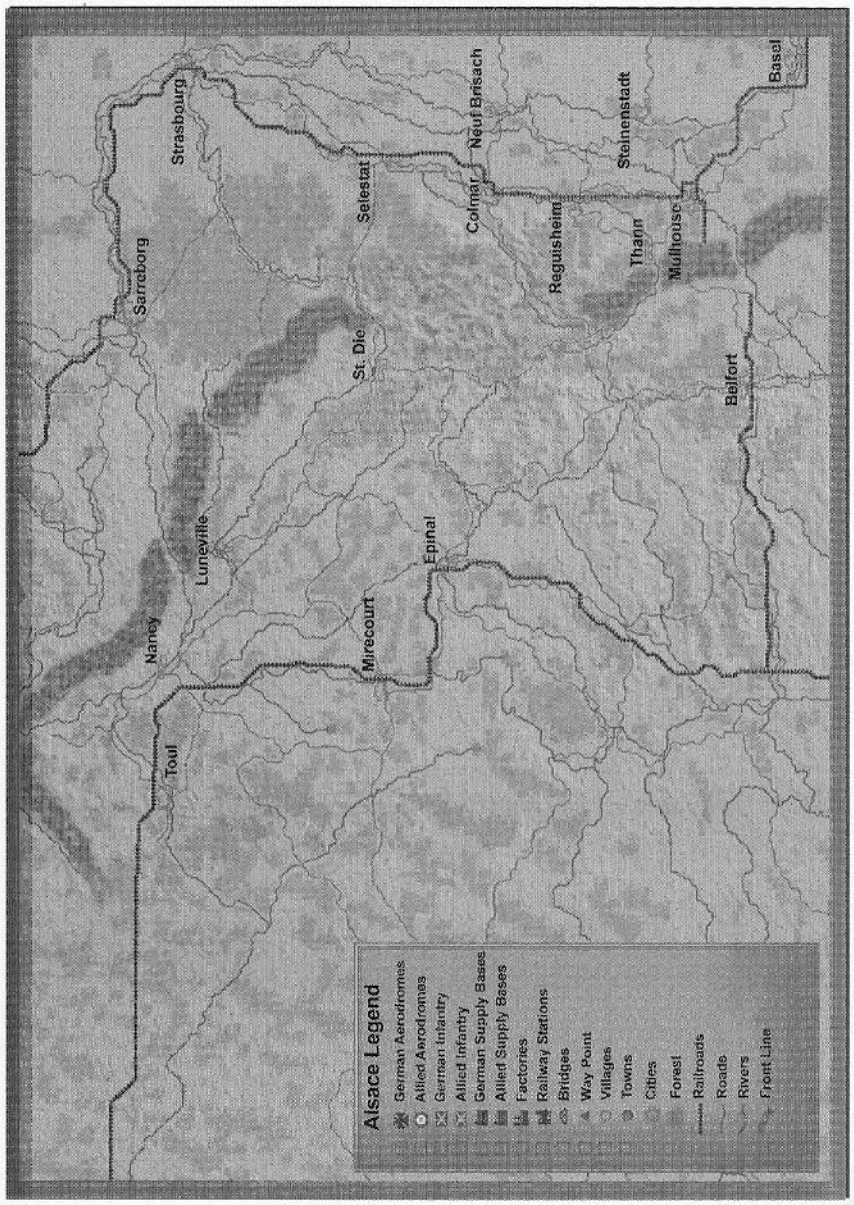
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APPENDIX

Glossary

Ace An aviator with at least five victories.
Aerodrome An airfield, generally makeshift or temporary.
Ailerons The movable surfaces on an aircraft's wings that control its roll.
Alley-man Derived from the French word for German, this was a British and American term for a German.
Allies The French, British, American, Russian and Italian coalition which was allied against the Central Powers.
Archie Pilot's slang for anti-aircraft fire.
As des As French term for the top ace. It literally means ace of aces.
Bloody April A name given to April of 1917 when the German Albatros D.III inflicted huge casualties on the Allied aircraft.
Blue Max Common English term for Germany's highest military honor, the Pour Le Merite award.
Bosche French slang for a German.
Bounce A slang term meaning to surprise an enemy aircraft.
Brisfit Nickname of the Bristol Fighter.
Central Powers The German and Austro-Hungarian Alliance that was allied against the Allies.
Crate Slang for aircraft.
Deflection angle The angle of a target in relation to the aircraft shooting at it.
Deflector gear Invented by Roland Garros as a means to allow a machine gun to fire through the arc of a propeller. A deflector gear was nothing more than a steel wedge mounted on the propeller blades to deflect any bullets that would have otherwise torn the blades off.
Dirigible A gas-filled airship with an internal framework or skeleton.
Dogfight Multiple aircraft involved in a melee. Sometimes more than 50 were involved in such battles.
Doppledecker German for biplane.
Dreidecker German for triplane, as in "Fokker Dreidecker I" or "Fokker Dr.I" for short.
Eagle of the Lille Nickname of Max Immelmann.
Egress Navigate away from the target.
Eindecker German for monoplane. It is used to describe the

Fokker E series.
Elevators The movable surfaces on an aircraft's tail assembly that control pitch.
Escadrille French term for squadron. Usually composed of 12 planes.
Fee Nickname for the F.E.2b. A British two-seat pusher biplane first used as a fighter, then later as night bomber.
Flak The German abbreviation for antiaircraft guns (Flieger Abwher Kannon).
Flamed A verb used to describe a downed plane.
Flying Circus Nickname applied to Richthofen's Jagdgeschwader because the unit lived out of tents, moved around a lot, and painted their planes in extravagant colors.
Fokker Scourge Took place between 1915-16 when the Fokker Eindeckers cleared the skies of Allied aircraft. Ended by summer of 1916.
Frog, Froggies British term for their French allies.
Geschwader Short for Jagdgeschwader.
Grid British expression for an aircraft.
Hate, Morning and Evening British expression for German artillery bombardments and anti-aircraft fire.
Hun Slang for a German.
Hunland German-held territory.
Ingress Navigate to the target.
Jagdgeschwader It literally means "hunting wing". It is a large German unit of about 50 scouts composed of 3 to 4 Jagdstaffeln.
Jagdstaffel Literally "hunting group", it is the German equivalent of the British Squadron. Each Jagdstaffel was equipped with a maximum of 12 scouts.
Jasta Short for Jagdstaffel.
J.G. Short for Jagdgeschwader.
Kill A downed aircraft credited to a pilot.
Lead Placing a machine gun's crosshairs in front of a target in order to compensate for the speed of the target and the angle it is at in relation to the gun.
Luftstreitkrafte Official German name for the German Imperial Air Service.
No-Man's Land The space between the German and Allied front line trenches. It was pocked and scarred and destroyed by the shelling.

Observer The gunner in all two-seaters.

Piste French for landing field, used by American pilots.

Pitch The up or down rotation of an aircraft controlled by the elevators.

Quirk Nickname of the B.E.2c British observation aircraft.

R.A.F. Abbreviation for the British Royal Air Force. Founded on April 1, 1918 from the combined R.F.C. and R.N.A.S.

Reconnaissance Scouting the enemy's strength, location and if possible, his intentions.

Red Baron Nickname of Manfred von Richthofen.

Red Devil/ Le Diable Rouge Allied nickname for Manfred von Richthofen.

Roll The rotation of an aircraft about the axis running from nose to tail. It is controlled by the ailerons.

R.F.C. Abbreviation for the British Royal Flying Corps. It later became the Royal Air Force.

R.N.A.S. Abbreviation for the British Royal Navy Air Service. It was incorporated into the R.A.F. on April 1, 1918.

Rudder The fin on the tail of an aircraft that controls its yaw.

Sardine Can Nickname of the Fokker Eindecker.

Schlastastaffel German ground attack squadron. It literally means "battle group."

Scout Usually a single-seat aircraft. Designed specifically to fight other aircraft. Called fighters or interceptors today.

Sortie A mission flown by an airplane.

Spad Acronym for the French Societe Pour l'Aviation et ses Derives. A French aviation company responsible for building the Spad VII and XIII among other aircraft.

Spinning Incinerator Slang for the Airco D.H.2. Named this since its engines were so unreliable as well as the plane's habit of falling into spins suddenly.

Squadron Standard British and American tactical aircraft unit, composed of between 12 and 18 planes.

Staffel Short for Jagdstaffel

Strafe To shoot at ground targets with airborne machine guns.

Stick The control column in an aircraft's cockpit used to operate the ailerons and elevators.

Stunt Merchant 60 Squadron's nickname for Billy Bishop

Synchronizer gear A timing device which allowed the machine-gun to fire between moving propeller blades without ever hitting them. Invented by Anthony Fokker, it revolutionized aerial warfare.

Tripehound Nickname for the Sopwith Triplane.

Triple Entente The French, British and Russian pre-war Alliance.

Two-Seater Generic term applied to aircraft with a crew of two, which were generally observation aircraft.

Victory The shooting down of an enemy aircraft.

Yaw The rotation of the aircraft in the horizontal plane controlled by the rudder.

CREDITS

EXECUTIVE DIRECTOR	Mike Jones
DIRECTOR	Tucker Hatfield
PRODUCER	Graeme Bayless
ASSISTANT PRODUCER	Scott Bandy
MULTIPLAYER DESIGN	Doug Johnson Brian Apgar Eric T Lanz
LEAD SOFTWEARE ENGINEER	Brian Apgar
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FLIGHT DATA GURU	Jerome Kluth
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ARTISTS	Craig Dorety Kelle DeForrest Ron Clayborn
QUALITY ASSURANCE	QA-Manager Lloyd Madden QA lead - Eric T lanz Colin Shannon Matt Wright Jeremy DeChaine Mike Inman Daryl Nichols Dave "Otter" Peterson Technician - Sue Garner Archivist - Aaron Anderson

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HISTORIC MANUAL EDITING	Kevin M. Lamb, Wordworks, Inc. Doug Johnson
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