DAWN PATROL

User Guide

empire INTERACTIVE

User Guide

Credits

Published by Empire Interactive Entertainment 1994

Produced by ROWAN SOFTWARE

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Introduction

The system used to create Dawn Patrol has taken quite a few man years to develop and involved many members of our team. We believe that we have brought you some of the best flight technology available.

But Dawn Patrol is more than simply a technological *tour de force*. It deals with one of the most exciting theatres in the whole of aviation history - the first use of aircraft in warfare. Our remit was to produce a simulator dealing with the First World War; to highlight the pilots and their aircraft as well as the rush to achieve air superiority. It soon became very clear to us that this was a very large story indeed. As the war progressed, so the fortunes of both sides in the air fluctuated. This was an intensely personal battle between individual flyers, sometimes employing quite unorthodox tactics in a wide range of aircraft. Many accounts of their experiences have been described in print.

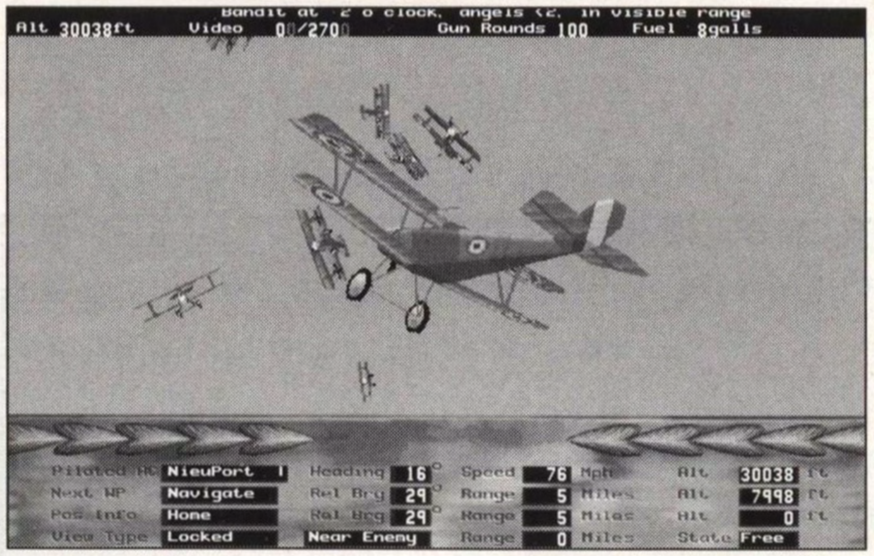
That's why we decided to base Dawn Patrol around an interactive 'book' of the air war. It means that we've been able to provide chapters on the history of the air war, the most famous aces and the aircraft they flew. That has allowed us to deal with many of the most interesting aspects of the conflict. Thanks to contemporary accounts, we can let you take part in recreated aerial battles and missions which are very close to those actually flown by the men on both sides of the conflict.

Our preoccupation with pre-jet flight simulators is based on the observation that early aerial battles were a lot more exciting than those employing modern technology. In the first air war there were no heat-guided missiles to aim in the general direction of the enemy. The aircraft approached each other at speeds that were slower than the fluttering of an eyelid. In the midst of battle it was possible to imagine that you could see the whites of your opponent's eyes. That's why we are sure you will enjoy Dawn Patrol.

Rowan Software

Section 1

About Dawn Patrol



Instructions to RFC crew, 1915

[1] The 'go-as-you-please' methods have been abandoned definitely, both by the French and ourselves, in favour of attacks carried out by swarms of aeroplanes. It is now an accepted principle that attacks on all important objectives should be carried out by as many aeroplanes as possible.

[2] All machines flying in line ahead at the same height is a formation above all to be avoided, as being the most vulnerable against attack by Anti-Aircraft guns.

[3] The French attack downwind. [. . . We have tried] a downwind attack only once - by the III Wing in the attack against Hervilly aerodrome on the 14th December. The majority of the bombs fell short.

[4] The growing importance of bombing operations cannot be too fully impressed upon pilots. There are still pilots who belittle the importance and utility of these operations. Skill in bomb-dropping can *only* be achieved by constant practice.

Notes On Bombing Attacks,
by Major Evelyn B. Gordon,
HQ, RFC, 21 December 1915

Dawn Patrol is really an interactive book devoted to flying in the First World War - the first ever air war. This book has over a hundred pages devoted to subjects like the first flying aces and the aircraft of the era. Like any good book, it's possible to read it sequentially or to dip into it at any point you like. Each page is devoted to a particular aspect of the aerial war, and includes an individually tailored aerial battle or mission. Normally, you will be allowed to alter the number of aircraft involved in the mission, and often you will be able to choose whether you wish to fly on the side of the "Allies" or on the side of the "Central Powers". Hence the game provides a great deal of variety and will, hopefully, give you hundreds of hours of enjoyable playing time.

An extra chapter lets you create your own personalised pilot record by undertaking all sorts of suggested missions under a persona of your own choosing. This is your chance to become a flying ace.

Finally, there is a "Video Editing Suite" where you can edit videos of your aerial adventures. During any mission you can start filming the action, and after the battle has finished you can sit back and replay the recorded action in the comfort of your armchair. The editing suite lets you manipulate the action with more flexibility than any real-life post-production unit. So, not only will you be able to show your friends how to win an aerial mission, but you'll be able to show off your talent as a film director.

About this User Guide

The Dawn Patrol User Guide deals with all of the major aspects of the game. To install the software on your machine, refer to the TECHNICAL REFERENCE SUPPLEMENT supplied separately from this guide. The supplement is tailored for your particular computer. Although this guide is intended for all Dawn Patrol users, it has been written from the perspective of an IBM PC compatible owner. If you use a different type of computer, and you are in doubt about any machine specific instructions such as key presses, then you should consult your technical supplement.

Your approach to this game will probably be to play it before reading any of the documentation. Inevitably, though, there will come a time when you'll need to uncover more information about Dawn Patrol. Hopefully it is all here in the User Guide. You can either read through the guide from the beginning, or look up the relevant topic in the Table of Contents at the start.

The next section, called First Mission, assumes that you are straining at the leash to get on your goggles and leather hat. It guides you from the first page of the Dawn Patrol book into the skies and on to the completion of your first aerial mission.

After First Mission, section 3 of the guide details all of the major chapters of the Dawn Patrol interactive book, from beginning to end. Section 4 goes through the basic controls of the in-flight section of the game. Section 5 describes some of the basic principles of flying, shooting, and tips for surviving the air war. Finally, section 6 describes all of the features of the video editing suite. Two appendices deal with keyboard commands and joystick controls.

Note:
Input Devices

The interactive book in Dawn Patrol can be controlled using your mouse and/or keyboard - the joystick is not available as an option. The flight simulation section of the game can be controlled by keyboard and/or joystick - the mouse is not available as an option. The specific keys to use on your keyboard are printed on the keyboard reference card provided with the package, and in appendix A of this guide. The specific control of the joystick is detailed in appendix B of the guide.

Selection

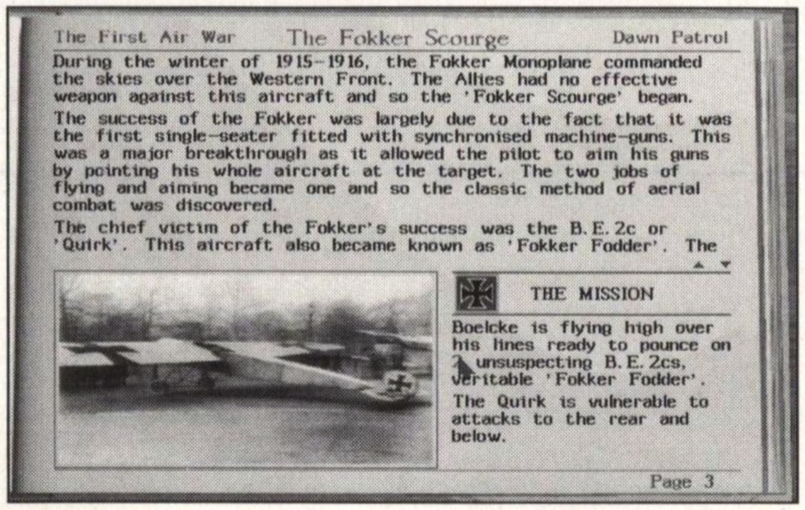
The generic term "select" is used when you are required to click on the left mouse or press **ENTER** on the keyboard. Items are selected in the interactive book by moving the on-screen pointer over a selectable item (which is normally displayed in red) and "selecting" it using either the mouse or keyboard. The on-screen pointer can be positioned by moving the mouse or pressing the **TAB** key on the keyboard (this will cycle the pointer around all of the "selectable" items on the screen).

Fighting it out: the RFC and RNAS

When, in 1912, the Royal Flying Corps was established, it consisted of a Military Wing, a Naval Wing, and a Central Flying School. But rivalry between the army and navy spilled over into the RFC. The Naval Wing eventually dubbed itself the Royal Naval Air Service, and the Military Wing continued to be known as the Royal Flying Corps. Each Wing had a different view of its own role and loyalties. The Military Wing saw itself as the reconnaissance eyes of ground troops; the Naval Wing emphasised the need for aerial home defence, and also looked ahead to anti-submarine patrols and strategic bombing missions. So, when war broke out, the RNAS and the RFC were already rivals: for the best aeroplanes, the best pilots, and the best flying records. As a result, it was sometimes unclear which flying service should defend Britain against air attacks, or which should bomb German Zeppelin and aeroplane factories. A wounded pilot, Pemberton Billing, won an independent seat in Parliament on the issue. Finally, it was recognised that the times demanded an air force which was independent of both the army and the navy. Marriage between the two air arms was attempted a second time, when, on 1 April 1918, the two branches were united in the Royal Air Force. Yet by 1924 the navy had its own air force again - the Fleet Air Arm .

Section 2

First Mission



'I know that I shall meet my fate Somewhere in the clouds above . . .'

- W. B. Yeats, 'An Irish Airman Foresees his Death'

A pilot's life expectancy was short. Superior enemy machines and pilots were a great threat. Unreliable aircraft, inadequate training and ground-fire shortened the odds further. Moreover, official policy - such as the RFC order banning fighter escorts for reconnaissance aircraft - could sometimes make the odds sacrificial. Among British pilots, life expectancy at the Front declined to eight days at one stage, and three weeks at another. In 'Bloody April', 1917, the RFC lost 316 airmen, while during the second half of 1917, between 153 and 214 RFC air crew were either killed or missing in action, each month. During the two-week Battle of Cambrai in November 1917, losses among those RFC pilots detailed to strafe troops and transport were 30%, *per day*. Ground-strafing was also used during the German offensive of March 1918: 'Bomb and shoot up everything. . . . All risks to be taken.' Of 1,300 British aircraft flying in support of their troops during the German offensive of March 1918, only 200 were left a few weeks later. Statistically, the survival rate was much higher in the trenches than among airmen. In the air, the chance of being killed was almost as great as the chance of being wounded, whereas on the ground, despite overwhelmingly high losses, troops were actually much more likely to be wounded than killed outright.

If you've hurriedly opened this package and now wish to get straight into a First World War dogfight, then these instructions will lead you through your first mission. A more detailed explanation of the game's features begins in section 3. If you have not already done so, read the instructions in the Technical Reference Supplement and follow the game installation and loading procedure.

Dawn Patrol starts on the first page of an interactive book. A list of contents details all of the chapters, whose opening pages are highlighted in red. We now wish to go to the first chapter, 'The First Air War', which starts on page two. Position the screen pointer over the First Air War page number (2), and select it. (If you have trouble selecting the page number then read the two paragraphs on 'input devices' in section 1 of this guide.) Page two lists the contents of the'First Air War' chapter, from which you should select page three, entitled The Fokker Scourge.

Page three is the first interactive page of Dawn Patrol, and it contains information about the early days of the air war, as well as providing a playable mission. The top half of the page displays text through which you can scroll downwards by selecting the red down arrow positioned half way down the screen on the right hand side. After selecting the down arrow twice the photograph of a Fokker Monoplane in the bottom left corner of the page will be replaced by an animation. This animation shows a British BE2c reconnaissance biplane in flight.

The page three mission is described in the bottom right corner. You take the role of Oswald Boelcke, an early German ace, flying a Fokker monoplane in an attack on two 'unsuspecting' BE2c's. If you are feeling very brave you can make the mission more difficult by altering the number of opponents highlighted in the mission profile. When you have read all of this page, select the Iron Cross to the left of the mission headline and your mission will have begun.

Your first flight in Dawn Patrol may take you by surprise. When you start you are already in the air, at the controls of a Fokker monoplane. There is no need to fire up your engines, take off and engage the enemy. Your opponents are probably not very far away! Since this is your first flight you might wish to press the pause button **P** at this point, and take a closer look at the screen. It shows an upper view of the cockpit with the double gunsights of your Fokker monoplane. Press the right square bracket key] for a lower cockpit view that includes your instrument panel. The dials display your rev count, compass bearing and speed. The number at the top left of the screen shows that you are at a height of a few thousand feet.

Now that you are in pause mode, you can take a little time to familiarise yourself with the game controls. You will find that many of the keys detailed by the 'in-flight keyboard' reference still work in pause mode, especially those which alter the views on the screen. Since Dawn Patrol provides immense flexibility of view types, it is worth getting a flavour of what is available. For instance, press the **5**, **6** and **8** keys to see, respectively, views of the rear, left and right of your aircraft.

Press the **F6** key and you will change to a 'track' view of your Fokker taken from a camera just behind the rear of the aircraft. You will notice that the bottom part of your screen changes to a panel once the view is from outside the cockpit. This panel contains information about your mission. For now, just note the top line that displays the name of your aircraft, as well as your bearing, speed and altitude. If you press the **SHIFT** and **F4** keys simultaneously then you will see a track view of your nearest enemy craft. Now you know what you're up against.

The message line at the top of the screen should shortly reveal the location of your enemy with a comment like "My opponent is moving at 4 o'clock". We can't tell you where YOUR opponent is, because each combat plays differently every time it is loaded. Think of a watch face aligned so that 12 o'clock is pointing straight ahead in the direction of your aircraft. If the enemy is at 4 o'clock, that means an enemy aircraft is in the direction of four o'clock on the clock face, in other words 120 degrees to the right. Unless the aircraft is in sight, though, you don't know whether it is above you or below you. You can get a good idea of your relative positions by pressing the **ENTER** key, which takes you into 'Outside Combat Lock' mode. This is just fancy jargon for a camera angle that maintains a lock on the nearest enemy from a position that also has your aircraft in the foreground. It may be that the enemy is obscured by the view of your aircraft, but it reveals your relative positions. For instance, if the enemy is above and in front of you, you'll get a view from beneath your aircraft, pointing forward and upwards towards the enemy aircraft. This is the direction you should be heading, so why not switch back to a cockpit view by pressing the right square bracket] key, and get flying.

Press the **P** key again to get out of pause mode, and start manoeuvring with the cursor keys or your joystick. If you find the controls too sensitive then press the 2 key a couple of times to decrease the flight sensitivity to the minimum level. Your aim should be to get behind the pair of BE2c's, because they will then be very easy to pick off. You can use the - key to reduce the engine revs and so match your speed more closely to your intended victims. When they get within range, press the space bar to fire your machine guns, and see what damage you can inflict. If you succeed in making hits you will see puffs of smoke. Fatal damage after a number of hits will be obvious, and you will then have taken your first step to becoming an ace in your own right. If you fail to get a good run on both aircraft, then you should try successive attacks.

The paint pot

In the first few weeks of the war, friendly fire caused the British and French to paint their national colours on their aircraft. Initially, the British used a rectangular Union Jack, but troops firing from below tended to confuse it with the German Iron Cross. So, at the end of 1914, Britain adopted the roundel, similar to that used by the French, but with the colours reversed. Other Allied air forces - Belgian, Italian and Russian - also used roundels in their national colours.

Other smoke exploding around the enemy will be flak from ground attacks - make sure you get in there before your artillery does the work for you! With a bit of skill on your part, the enemy should suffer a disastrous mission. You will then have four main options.

[1] If you have managed to complete your main mission objective, you can leave the scene of battle by pressing the **F10** key. This leads to a 'configuration' screen where you can select END MISSION, giving you a post mission summing up with details of your performance. Select the RESET PAGE option, and you will return to the third page of the book. Press the **cursor right** key to proceed to page four.

[2] If you have found the mission too hard for you at this stage then you should leave the flight simulator by pressing **F10**, and then alter some of the settings on the configuration screen. If you select 'vulnerability', 'arms', 'targets' and 'skill level' in turn, and set them to off, off, soft and low respectively, then you will now be invulnerable to damage, have an infinite amount of machine gun bullets, easier target volumes to hit and below average skill enemies. You can then repeat your flight by selecting END MISSION, followed by RESET PAGE and then re-entering from page three. Hopefully this time you will find it easier. When you have begun to master Dawn Patrol, remember to increase the difficulty of some of these settings if you want a greater challenge.

[3] If the mission was too easy for you then press **F10** to exit the flight and on the configuration screen set 'vulnerability', 'arms', 'targets' and 'skill level' to on, on, hard and high respectively. This should make things rather more challenging. Alternatively, you could progress to some further missions before making these changes!

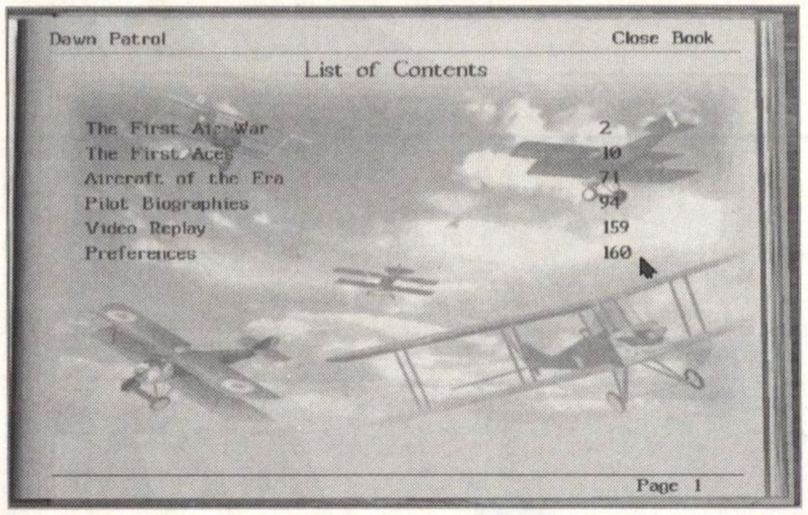
[4] If you have disposed of your enemy and are still waiting for more to do, then you could try and fly back to your 'home base', land there and fully complete your mission. On the third line of the control panel (the bottom portion of the screen on an external view), you will see the position information for your Home Base (if it is not being displayed, hit the keys **SHIFT** and ; simultaneously until it IS displayed). Set a heading back to base, and see if you can make a successful landing there. If the journey is more than a few miles then you can always speed up time when you have set an exact course by hitting the **TAB** key. Hit any key to get back to normal time progress. Once your home airfield is in sight, set a landing course, decrease your engine revs, and when you touch the ground put on the wheel brakes (press **W**) and turn off your engine (press the , key). Exit by pressing **F10** (or **ALT** and **X** together), bask in the approval of your post-mission summing up, and head off for a good shower, a mug of warm soup and an early night. There will be a lot of difficult missions out there tomorrow.

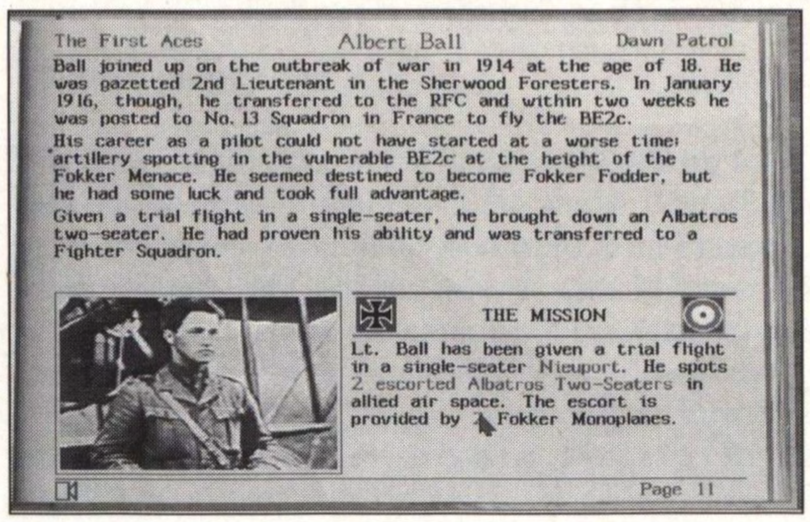
Pilots in peace-time

Two years before the war, France's enthusiasm for flying far outpaced that of the rest of the world. Out of 2,480 qualified pilots world-wide, 966 were from France. Great Britain and Germany trailed, with 382 and 345 respectively. Despite the exploits of the Wright brothers, air flight had failed to catch the imagination of the American public: the US possessed only 193 qualifed pilots. Italy followed close behind, with 186. Russia had162 pilots, and Austria 84.

Section 3

Dawn Patrol -The Book





List of Contents

Page one of the interactive Dawn Patrol book contains a list of six chapters, any one of which can be accessed directly.

The first three chapters, named The First Air War, The First Aces and Aircraft of the Era, deal with various aspects of the air war between 1915 and 1918. They contain ninety pages of information, and each one is linked to a specially tailored mission for you to fly. Chapter four, Pilot Biographies, allows you to assume the identity of a fictional flying character from one of the four major nations involved in the air war. You will be able to undertake special missions, from which a personal biography will be created. The fifth chapter, Video Replay, enables you to view and post-produce film of your experiences as an air ace. The last chapter provides a single page of your 'preferences' for the settings of the variable options relating to the game and its control.

Each item highlighted in red on the List of Contents page acts as a hotspot. If the screen pointer is selected while it is over a hotspot then an action will be taken. Selecting CLOSE BOOK on the top right corner of the screen is the method of quitting from Dawn Patrol back to the DOS prompt. Any chapter can be accessed by selecting the opening page number that is highlighted opposite the chapter name. In the bottom right corner of the page, the current page number is highlighted. If it is selected, then a small box is opened with an editing position represented by a vertical bar. This will accept any page number, to which the book turns when the box is selected again. If you wish to exit from the box without making a new page choice then press the **ESC** key.

If you are playing the CD-ROM version of Dawn Patrol you will note that some pages have a small loudspeaker symbol in the bottom left hand corner. If it is selected (or the V key is pressed) then you will hear a recorded commentary that deals with some relevant subject matter. There is a total of 36 pages with recorded information.

To turn forward through the book, select the right edge of the page. Select the left edge to turn backwards. Alternatively, press the **cursor right** or **cursor left** keys, respectively. These are two examples of hotkeys, which provide a shortcut for any commonly used action. Table 1 lists all of the standard hotkeys in the book section of Dawn Patrol.

TAB	Cycle round all screen hotspots
HOME	Move to List of Contents page
Cursor Up	Move up through chapters on List of Contents page
Cursor Dn	Move down through chapters on List of Contents page
END	Move to Preferences page
Cursor Left	Move to previous page
Cursor Right	Move to next page
PgUp)	
Cursor Up)	Scroll text upwards
PgDn)	
Cursor Dn)	Scroll text downwards
P or S	Open page number edit box
A	Fly on Allied side
C	Fly on Central Powers side
V	CD commentary (CD-ROM version only)
Alt X	Exit video screen
Ctrl Break	Fast quit game

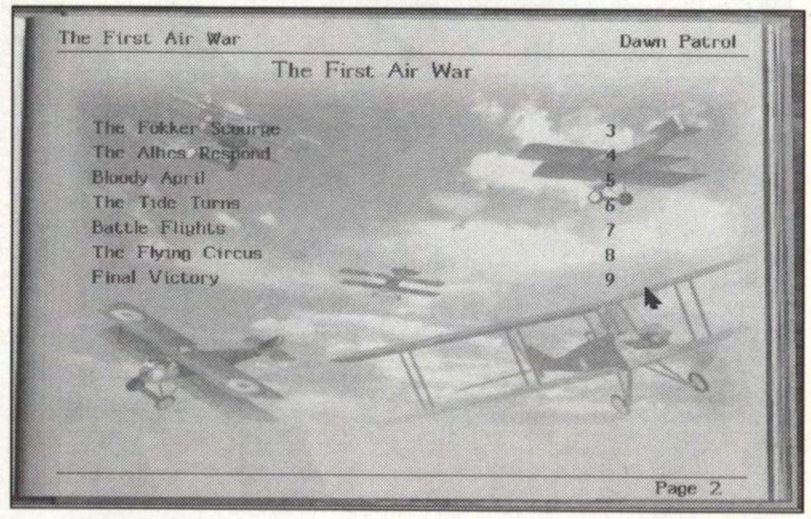
Table 1 - Dawn Patrol Book Hotkeys

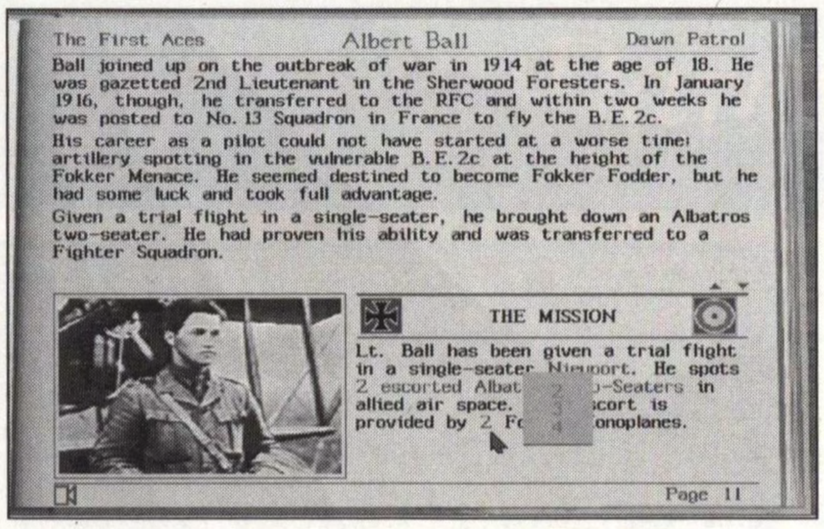
The First Air War

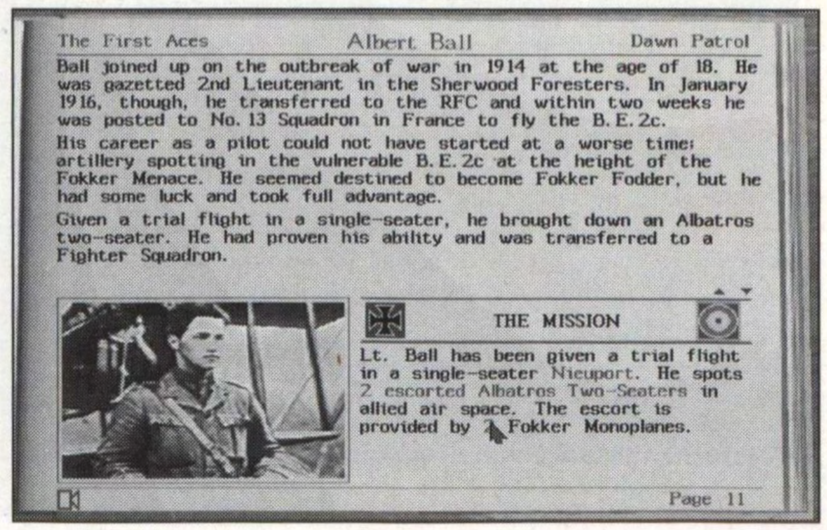
Page two lists the contents of the first chapter - The First Air War. This chapter deals with the most important aspects of the war in the air over Europe, from the winter of 1915 to April 1918.

Select a particular page and you will be at the heart of the interactive history of First World War aviation. The layout of these pages splits the screen into two distinct areas. The text at the top half of the page provides background information about the topic being covered. There is generally more text than can fit on this area, and it can be scrolled by using the highlighted arrows in the centre right side of the page. The text scrolls upwards by paragraphs each time the up arrow is selected. At the very top of the page the words The First Air War and Dawn Patrol are highlighted, and if selected will turn the book to pages two and one, respectively.

The lower half of the page displays information about an aerial mission related to the topic under discussion. The picture to the left encompasses some aspect of the mission-to-come. If an animation is displayed it may sometimes give clues to a potential strategy or manoeuvre that can be usefully employed in the mission.







The mission description briefly sets out the important details of the engagement, and will often allow you to specify some of the mission details. If any of the text is highlighted then it can be altered by you before you take part. For instance, in the screenshot opposite, the number of escorting Fokker monoplanes has been selected. A small text box gives the player a choice of 2, 3 or 4 escorting Fokkers. The desired option should be selected as appropriate.

When details have been altered to your satisfaction the mission can commence. If an RFC roundel is displayed to the right of the mission heading, then you can take part on the side of the Allies. If an Iron Cross is displayed on the left of the mission heading, then you can take part on the side of the Central Powers. Often, both the RFC and Iron Cross symbols will be displayed, and this means that you have a choice of sides. Whichever symbol is outlined in pink is the side for which the mission has been designed. If you choose this side, then you should try and achieve the mission objectives as outlined. If you choose the opposing side, then your mission will be essentially a spoiling one. Your aim should be to ensure that the mission objectives of the other side are not achieved. In general it is instructive and fun to play the game from both perspectives. However, the fundamental aim for the player should be to try and achieve all of the mission objectives detailed in each page of the book.

Selection of the mission will immediately put you at the controls of an aircraft in flight. The In-Flight Manual (section 4) of this guide provides all of the basic information about controlling your aircraft in Dawn Patrol. The next parts of this section provide information about the rest of the interactive book.

The First Aces

The second chapter of the book deals with fifteen of the most famous flying aces of the First World War. Many of their stories are astounding, some virtually unbelievable. There was Albert Ball, the British pilot who would issue challenges to the enemy by dropping messages over their bases. Or Oswald Boelcke, whose 'play chicken' strategy was to head straight for the enemy's aircraft. And Eddie Rickenbacker, the former Indianapolis driver, who would damage an opponent's aircraft and then let a novice colleague make the final kill.

This is your chance to take part in some of these pilot's most exciting missions. For instance, the screenshot shows a page detailing Albert Ball's trial flight as a pilot, where he is pitted against two escorted Albatros two-seaters. Quite a few parameters of this mission are highlighted, and can be tailored as you wish. You can choose to pilot one of six different aircraft. Or you could make the mission very hard indeed by putting Ball up against four Albatros reconnaissance aircraft escorted by four Fokker monoplanes. A victory at the hardest level would be a very impressive feat!

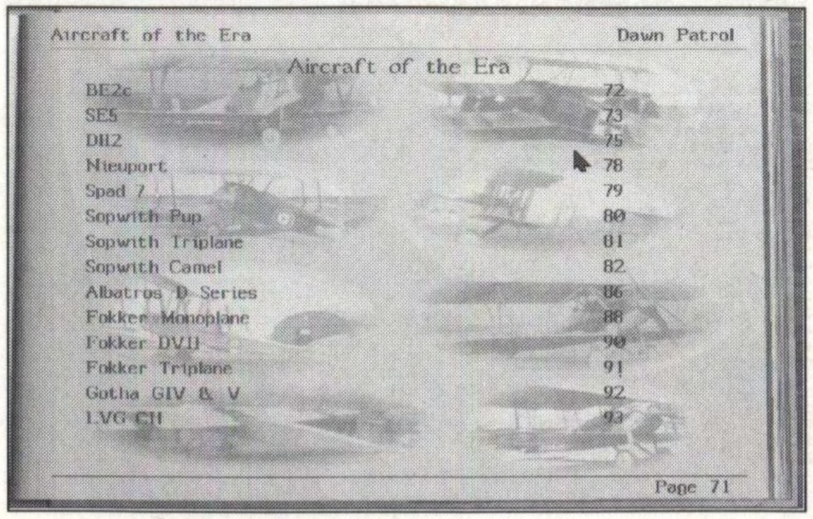
Aircraft of the Era

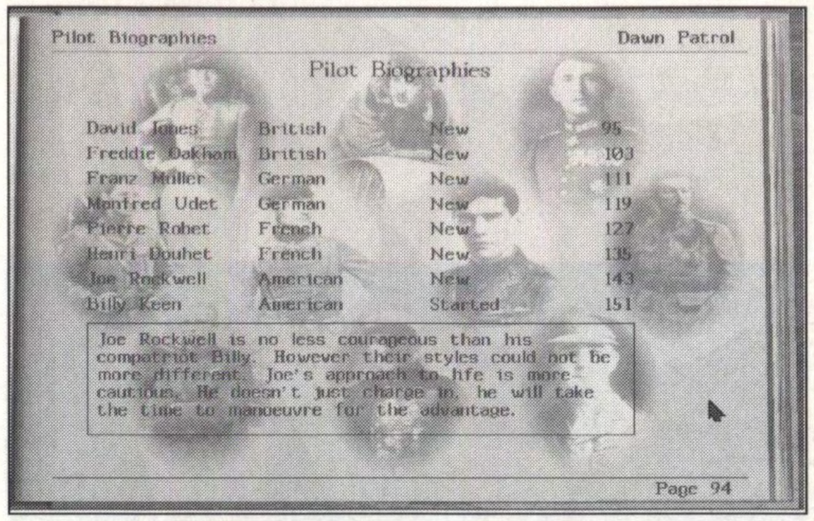
The third chapter concentrates on the machines used by the pilots during the war. It may only have been a decade or so after the Wright brothers, but there were scores of different types of aircraft in use throughout the war. Many tried out revolutionary ideas of design or armament. We highlight the role of fourteen aircraft types, and let you to take part in some of the missions they flew. We have worked hard to re-create accurate aerodynamic models of each aircraft. This means that you should end up with a very good idea about their relative strengths and weaknesses, as well as their individual characteristics. This chapter also introduces lesser known pilots involved in intriguing missions which did not fit into our First Aces chapter.

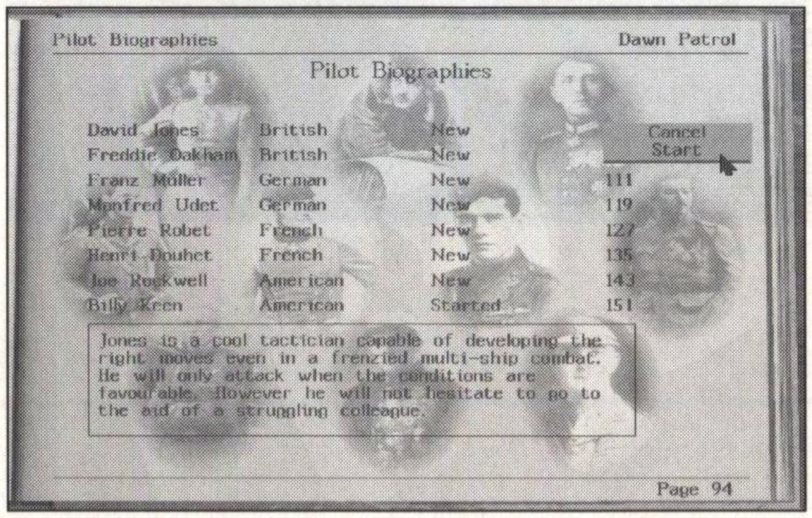
Pilot Biographies

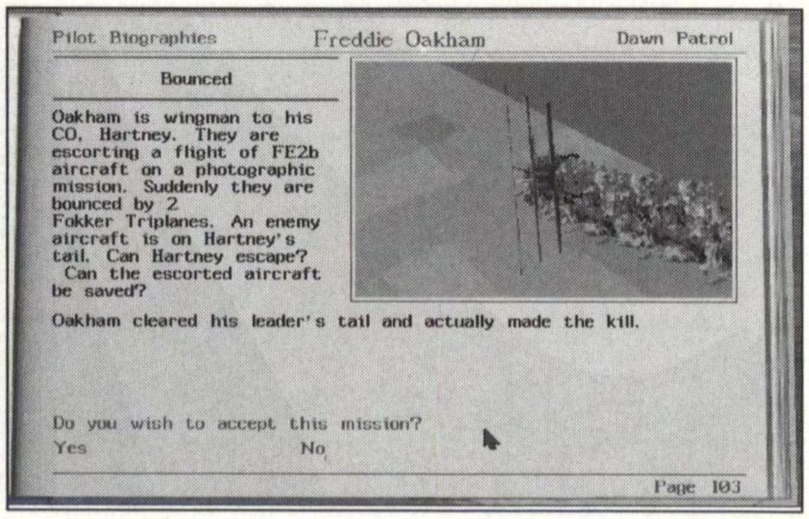
The Pilot Biographies chapter enables you to create your own war record as an air ace. There are eight fictional pilots whose role you can assume. Each pilot has a different perspective and personality - one might be a consummate tactician, another a bold cavalier. Place the screen pointer over the highlighted page number opposite each flyer, and a character summary of the flyer will be displayed at the bottom of the page. Your overall aim with each flyer should be to succeed while adopting his characteristics and attitude to aerial warfare. This part of the Dawn Patrol book leaves eight pages spare for each flyer, and at the start they are empty. As you play, you will have the opportunity to paste mission summaries into these blank pages.

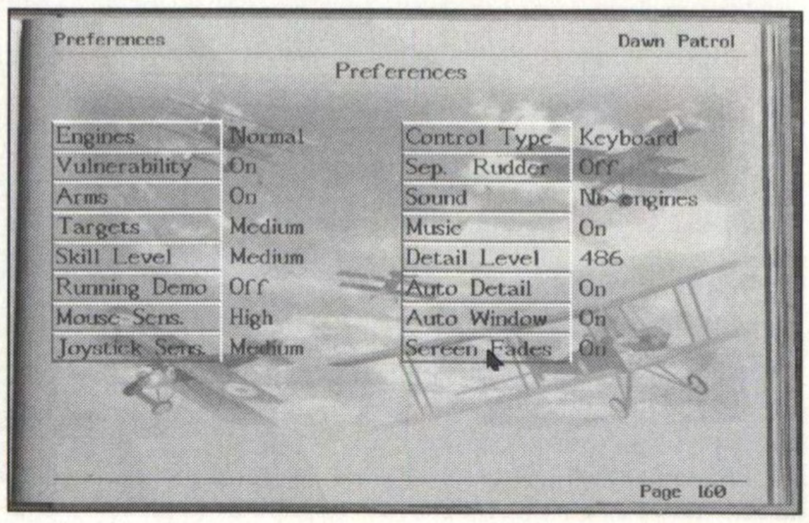
Select the highlighted page number of a pilot for the first time, and a small text window will offer an option to start a career as the named pilot. You will then be presented with a list of mission choices varying from flight testing, to trials, to missions impossible. In this illustrated example, Freddie Oakham is acting as the wingman to his CO. They are escorting a flight of FE2c aircraft, when he discovers a couple of Fokker triplanes on his tail. If you select this mission option, then a Roundel is displayed, and it should be selected to commence your flight.











Whatever the outcome of your flight, you should exit in the usual manner (by pressing **F10** or **ALT** and **X** simultaneously). The post-mission briefing will sum up your flight, and you will be asked whether or not you wish the mission to be accepted into your biographical history. If accepted, then the summary will be pasted into one of the pages left free for your pilot, and will remain as part of his biographical history. You will then be free to return to the main Pilot Biographies chapter page, and complete further missions under the guise of this pilot. The next time you choose the same pilot you will be asked whether you wish to re-start (clear the biography), view (look at the biography) or continue (complete further missions: a new set of missions will appear when you continue). If you accept a mission in which your pilot is killed, then his biography will be deemed complete. You have the opportunity, at any time, to re-start the pilot's career, and begin all over again. If only real life was so simple. You may take part in other pilot's biographies whenever you wish.

The pilot biography files are stored in the 'savegame' subdirectory. It is possible to delete all biographies by running the 'delete.bat' batch file in that directory.

Video Replay

Video replay is a separate feature of Dawn Patrol and can be accessed from the List of Contents page, where it is listed as a chapter heading at page 159 of the book. Alternatively you can access video replay from the post-mission briefing screen after a flight. Video replay provides access to a comprehensive video editing suite, and allows post-production of in-flight videos.

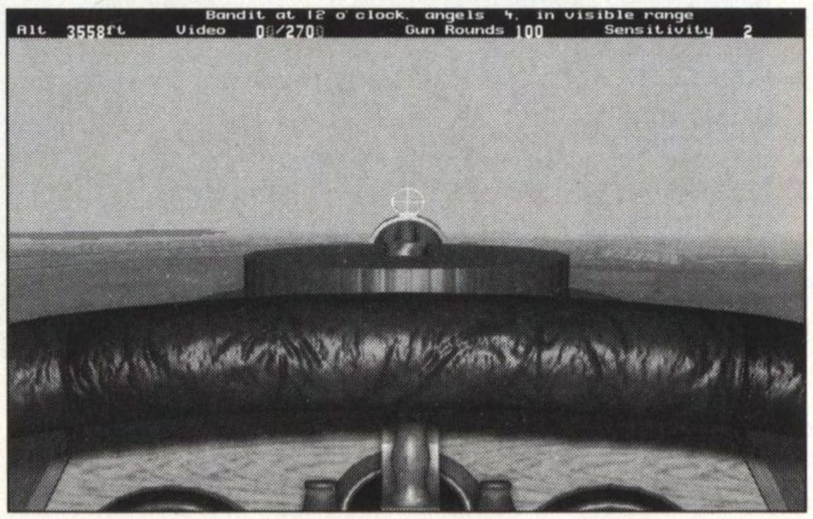
Of course, the facility is only of use if you have taken an in-flight video. To do this you must set the video camera rolling during a flight by pressing the **V** key. Since a mission needs to have been flown before video is available, we have left full discussion of the video editing suite until section 6 of the guide.

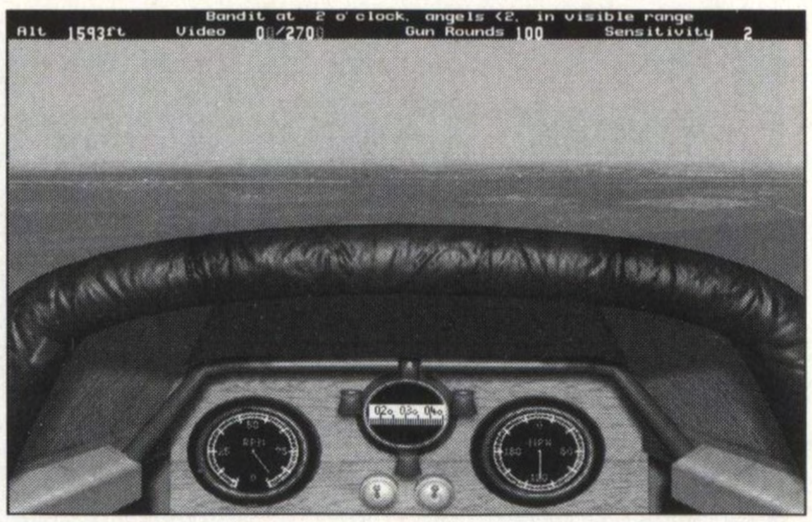
Preferences

The last page of the Dawn Patrol book (page 160) is a list of selectable 'preferences' that the player can alter during the game. These preferences relate to general aspects of the game such as skill levels, sound effects and joystick controls. A full discussion of preferences is given at the end of section 4.

Section 4

In-Flight Manual





This section of the User Guide deals with all of the features of the in-flight section of Dawn Patrol. A glance at the keyboard reference card will make it clear that you have a wide range of controls at your command.

After you have selected a mission you will find yourself in the cockpit of an aircraft. It will probably be flying at an altitude of a few thousand feet and charging forward at a hundred miles per hour! All of the Dawn Patrol missions have been designed so that they commence in the air at a stage close to the beginning of the engagement described in the mission profile. This enables us to set up the action in as realistic a manner as possible, and it saves you from undertaking a long journey before you get a crack at the enemy.

The four basic flight directions are controlled by your cursor keys or your joystick. Both emulate the characteristics of an aircraft's joystick.

Cockpit Layout

Your first view will be of the upper cockpit of your aircraft, looking forwards. If there are forward mounted guns you will see one or two gunsights in the foreground. This view lets you concentrate on centering an enemy aircraft in your sights, and affords a panorama of the aerial battlefield.

Press the right square bracket] key for a downward perspective of the cockpit. This view includes the instrument panel, which gives the most basic details about your aircraft's flight parameters. The on-board instrumentation comprises three dials.

On the left is a simplified rev counter, which displays the engine revs in revolutions per minute (RPM). The rev count corresponds closely to the thrust being delivered by the engine, which can be reduced or increased by pressing the - and + keys, respectively. The in-flight keyboard reference details other keys that can be used to vary the engine thrust. (Note that you cannot alter your basic engine or flight controls in pause mode.)

In the middle lies a compass, which gives the exact bearing of your aircraft. . The standard convention for a compass is observed: a bearing of 0 degrees points to magnetic north.

The rightmost instrument is the airspeed indicator. This displays your aircraft's airspeed in miles per hour. An observant pilot will keep a close eye on the airspeed, since an aircraft will often stall when this speed falls below a certain value.

Below the compass are two switches that indicate the status of the auto-pilot (left switch) and the auto-trigger (right switch). These two functions are controlled by the A and T keys, and when they are switched ON the switches point downwards. If you are having difficulty with strategy, then the auto-pilot should give you some ideas.

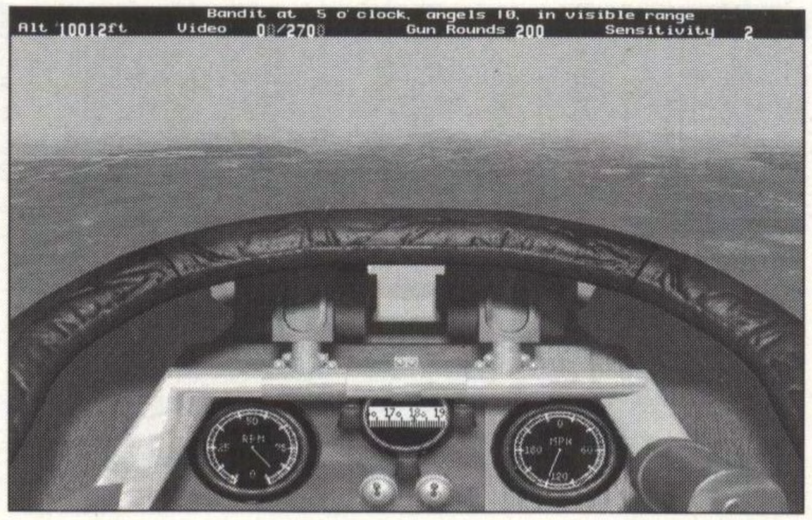
At the top of the screen, above the outline of the view outside the cockpit, there are two lines of information. These are present on all of the in-flight screens. At the very top is a message line, which lets you know of any significant information. In particular, you will be regularly informed of the position of the enemy, if they are within range. These messages will be similar to: "Enemy kite at 8 o'clock". Consider a clockface aligned so that 12 o'clock points in the direction you are travelling. 3 o'clock will be 90 degrees to the right and 6 o'clock will be directly behind you. An enemy at 8 o'clock will be 120 degrees to the left.

Below the message line, directly abutting the cockpit view, four parameters are permanently displayed.

* To the left, **ALT** is your altitude above the ground, measured in feet.
* **VIDEO** displays your current use of the in-flight video facility. The first number shows the quantity of video taken and the second shows the total amount of space available for video storage. You can start to operate the video camera by pressing the **V** key, and when you do so the first number should start increasing. The video is turned off by pressing the **V** key again. The amount of available video storage depends on the free expanded memory on your computer.
* **GUN ROUNDS** shows the number of bullets remaining in your firing drums. This number will not decrease if you have set the ARMS option on the preferences screen to OFF. In that case you have an infinite supply of bullets.
* **SENSITIVITY** shows the current responsiveness of your aircraft to the keyboard flight controls. Initially the sensitivity is set to a value of 2, out of a possible range of 0 through 3. Press the 1 key to increase the sensitivity, or the 2 key to decrease it.

Gun Sights

Press the left square bracket [key to return to the upper cockpit view. This will show the aircraft's gunsights, if the machine gun is mounted in front of the cockpit. Most aircraft in Dawn Patrol have this arrangement. The NieuPort is an exception, with a machine gun mounted above the pilot on the top wing.

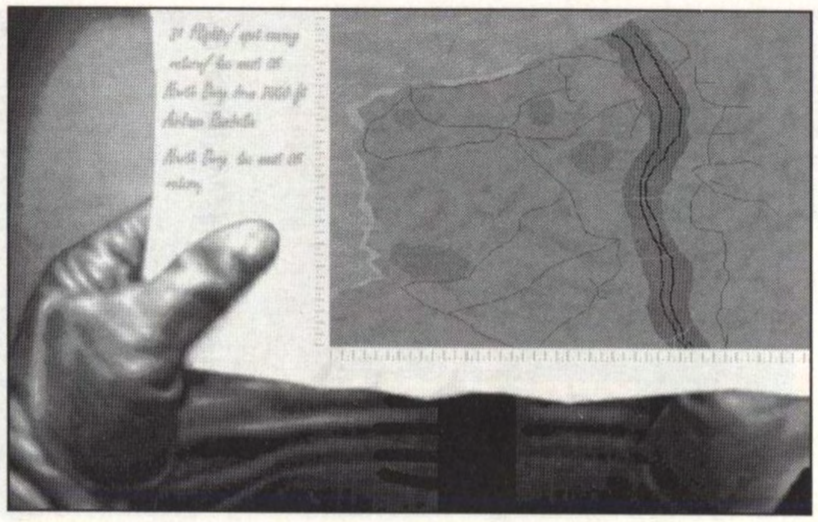


America arrives at the Front

'Lafayette, we are here.'

- Col. Charles Stanton, address on behalf of the American Expeditionary Force, at the tomb of the Marquis de Lafayette, 4 July 1917.

America renounced its neutrality in April 1917, and began to mobilise. It was the signal for the air arm to begin preparing in earnest. An Aviation Section (Signal Corps) of the US army had been founded in 1914, numbering 60 officers and 260 men. But the 1916 battle of Verdun - where the Escadrille Lafayette saw its baptism of fire - had alerted Congress to the growing importance of aircraft in wartime. It allocated $13,000,000 to the infant air service and to the air industry, a figure which was dwarfed by a further vote of $640,000,000 after the declaration of war. When America declared for the Allies, it still only had one combat squadron, 1,228 officers and men, and 250 uncompetitive aeroplanes. Its readiness compared unfavourably with that of France, Germany and Britain in 1914, three years and a whole era before. However, by the time of the Armistice a year and a half later, the US air arm had grown to 195,024 personnel, to Britain's 291,175 and France's 90,000. Beginning with the 1st Aero Squadron, which reached France in September 1917, forty-five American squadrons arrived to do battle all told. It was well short of the 263 due by mid-1918, but enough to make a difference. In the last two months of the war alone, 353 confirmed victories were attributed to American flyers.



You fire your machine gun by pressing the **space bar** (or joystick button). You will see your direction of fire from the tracer that is displayed. The gun operates in an authentic manner, since it will jam if you keep firing for too long a burst. To unjam the firing drums you must first level off the flight of your aircraft (to indicate that you are flying hands off, with your hands available to unjam the drums), and then press **U**. You will have to go through the same procedure when a drum has emptied and needs replacing. This happens whenever a multiple of hundreds of rounds is left, because each firing drum contains one hundred bullets.

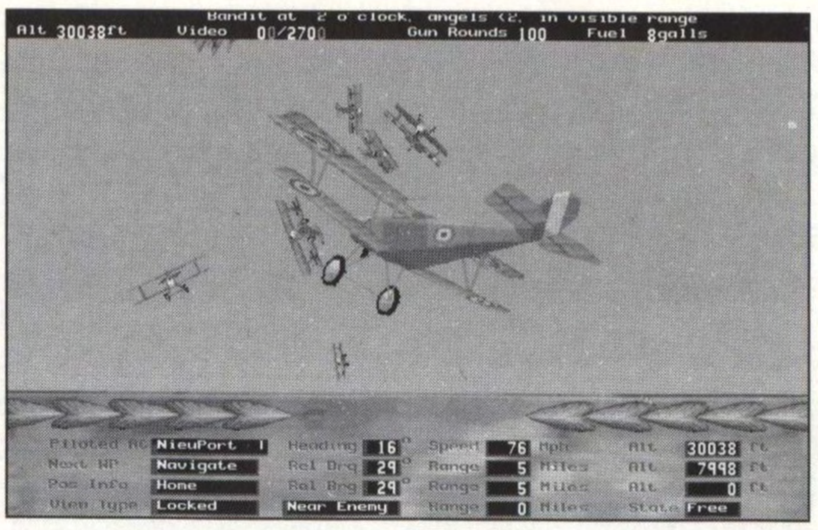
You are not restricted to firing from the gunsight view. The space bar operates your aircraft's machine gun irrespective of the on-screen view.

Map Screen

The map screen shows the area relevant to your mission, and covers a region of some hundred miles square. It can be called up in-flight by pressing the **M** key. The action in Dawn Patrol is centered on the battlefields of north-eastern France, an area which stretches from the Oise, south of Amiens, to Dunkerque and Oostende in the north. All of the major rivers, roads and forests are marked on the map.

The position of your aircraft is displayed by a flashing dot on the map. Light blue dots are Allied aircraft (from England, France or America), whereas pink dots refer to Central Powers aircraft (Germany and Austro Hungary). The position of ground vehicles is also displayed, with dark blue and red dots representing Allied and Central Powers vehicles respectively. Since the action of some aerial dogfights is at close range you may find that a number of coloured dots are displayed very close together.

External View



You needn't watch your mission just from the point of view of your aircraft's cockpit. An important feature of Dawn Patrol is the wide variety of external viewpoints from which the on-screen action can be displayed. If you press **ESC** followed by **F5**, then you will see a view of your aircraft from a camera locked just outside your aircraft. Like all external views, the bottom part of this screen displays an information panel. This panel contains a lot of information about your mission.

The top line of the panel has the words Piloted AC (piloted aircraft) to the left hand side, and it provides details about your aircraft. As well as the now familiar details of heading, speed and altitude, the leftmost of the top four boxes gives the name of your aircraft. In the example shown a NieuPort is being flown, and it is called NieuPort 1 because there is at least one other NieuPort in this mission.

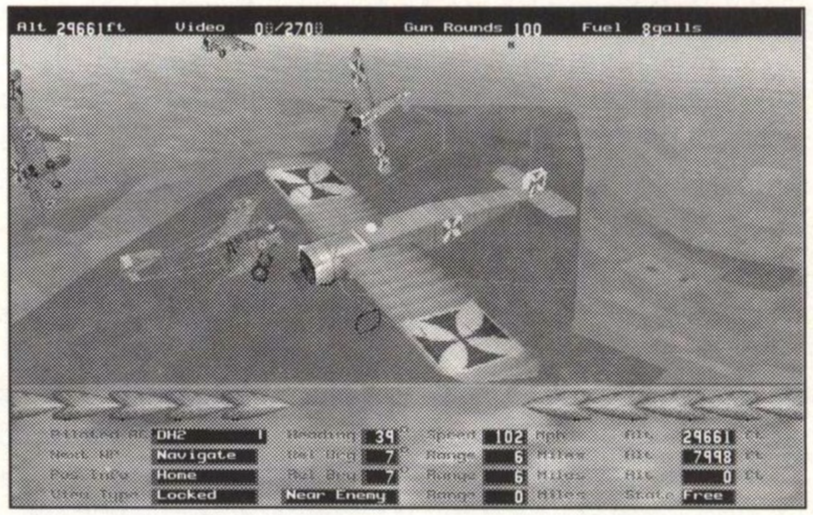
The second line is headlined Next WP, which stands for next waypoint. A waypoint is the location of a particular mission objective. In the example shown, the pilot is expected to NAVIGATE to the next waypoint, which is at the location specified by the three further boxes. These display the relative bearing, range and height of the waypoint, and to reach it the bearing should be set to 0 degrees, and the aircraft set to reach the desired altitude.

There may be more than one waypoint specified for the mission, and it's possible to step forward through them by pressing the ' key. (You can step back by pressing the ; key.) In Dawn Patrol it is not essential for you to achieve any of the waypoint objectives. At the start of the mission it is better to concentrate on the details of the pre-assigned mission objective, although the first waypoint sometimes gives information about the expected intercept of enemy aircraft. In missions where you are assigned to escort a group of bombers, further waypoints might relate to the planned bombing route. Such information could prove very useful if you become detached from your charges, and need to re-establish contact.

Once the mission objectives are achieved, a player of stamina can concentrate on further waypoint objectives. The waypoints are predetermined at the start of the mission, and are displayed purely for your information. It is not possible to change the mission profile by displaying a particular waypoint. Further waypoint types include 'attack', which locates a target to attack, and 'land' which displays the location of your homebase, where you can choose to land at the end of the mission.

The third line displays the position of a variety of predetermined aircraft or locations. They can be cycled by pressing the **SHIFT** and ; keys together. In this example the information relates to the location of the pilot's Home Base. Further information can be obtained on 'opposition' (the currently assigned enemy aircraft), 'escortee' (the bomber being escorted) and 'buddy' (the pilot's wingman), depending on the actual mission.

The bottom line gives details of the particular view being displayed on the main part of the screen. The first two boxes display the current view type and the current 'viewee'. The 'viewee' is the particular aircraft or object being viewed. In the example shown, the view is an 'outside locked' shot, and the 'viewee' is the nearest enemy. Dawn Patrol has a broad and flexible range of possible views of the action, and it is crucial to your success as a flyer that you can swiftly turn to the most suitable view at any given moment. The next sub-section, 'The View Matrix', is devoted to helping you master the on-screen view.



Flying for France: The American Squadron

After the outbreak of war, some adventurous Americans eschewed US neutrality, and went abroad to join the Allied forces. In all, about two hundred Americans flew for France, fifty or so being members of the Escadrille Lafayette. The Lafayette squadron grew from a group of American volunteers who'd enlisted in the French Foreign Legion, and were keen to fly. After intensive lobbying by the Legionnaires and by Americans in Paris, Escadrille N. 124 - soon re-titled the Escadrille *americaine* - was formed. After a formal protest from Germany, on the grounds that such a name gave the lie to America's neutrality, the squadron was re-named the Escadrille Lafayette. The name of the Marquis de Lafayette, a hero of both the American and the French revolutions, only intensified the aura of romantic, idealistic valour which surrounded the squadron.

The third box on the bottom line informs you that the object being viewed is at a range of 0 miles - within observation range, as can be seen! The final box details whether the view is 'fixed' or 'free'. In this case the view is 'fixed', which means that if another enemy craft came even closer than the one on display, the view would remain tracking the original aircraft. If the view had been altered to a 'free' view (by pressing the **Q** toggle key), then if the viewee was 'nearest enemy' it would change if another enemy aircraft came closer. It could be very disconcerting to have a view suddenly alter, especially in the middle of a dogfight. On the other hand, in 'fixed' mode an unseen aircraft could get very close to you without you knowledge. To some extent you can reduce the chance of this happening in fixed mode by occasionally pressing **CTRL** and **F** simultaneously. This resets the view to the current nearest enemy, even when you are in 'fixed' mode.

Mastering The View - The View Matrix

In Dawn Patrol it is possible to create virtually any view of the most important objects associated with your mission by pressing just two sets of keys:

[1] Press either a function key or a numeric key to alter the type of view.

[2] Press the shift key and a function key simultaneously to determine the aircraft or target being viewed - the 'viewee'.

Conceptually it is very simple, but there are so many combinations of key presses available that it takes a little practice to get the best out of it. The viewing system is called a viewing matrix because each pair of key presses leads to a separate view. All the possible combinations can be written out in the form a grid, rather like a matrix. The various key combinations can be inferred from the keyboard reference, and they are shown as a grid in table 2.

VIEW TYPE

VIEWEE		CHASE	OUTSIDE	TRACK	SATELLITE	OUTSIDE LOCK	INSIDE LOCK
		F4	F5	F6	F7	F8	F9
MISSILE	SHIFT F2						
NEAREST FRIEND	SHIFT F3						
NEAREST ENEMY	SHIFT F4					ENTER	BACKSPACE
CURRENT ENEMY	SHIFT F5						
MESSAGE ABOUT	SHIFT F7						
GROUND TARGET	SHIFT F8						
NEAREST TARGET	SHIFT F9						
PILOTED AIRCRAFT	SHIFT ESC					ILLEGAL	ILLEGAL

TABLE 2

From 'le chevalier seul' to 'these band of brothers'

By early 1917, the solitary pilot of the early war years was giving way to the formation. The lonely hunter of the skies became prey to the close-knit unit, thinking and acting in concert. In September 1917, when Jagdstaffel 10's Werner Voss ('the Flying Hussar') was caught hunting over the British lines by seven SE5s from No. 56 Squadron, led by James McCudden, their epic battle signalled the demise of the 'chevalier seul'. The new breed of aces - such as James McCudden and Edward 'Mick' Mannock - won renown as much for their leadership as their fighting prowess. Even the remote, solitary Manfred von Richthofen was a gifted team leader. Ironically, his nemesis came in April 1918, when he dived away from his 15-strong formation, in lone pursuit of a Camel heading for the British lines.

Along the top of table 2 are the six different 'view types':

* **CHASE**	Camera behind viewee, as if in a chasing aircraft
* **OUTSIDE**	Camera behind viewee, with absolute heading and pitch maintained
* **TRACK**	Camera behind viewee, following its pitch and heading
* **SATELLITE**	Camera above viewee, looking downwards
* **OUTSIDE LOCK**	Camera view across player's aircraft, maintaining viewee in centre of picture
* **INSIDE LOCK**	Camera inside player's cockpit, maintaining viewee in centre of picture

The eight 'viewees' down the first column of table 2 are:

* **MISSILE**	Current bullet, if one has been fired
* **NEAREST FRIEND**	Nearest friendly aircraft; normally a wingman or bomber
* **NEAREST ENEMY**	Nearest enemy aircraft, if within range (20 miles)
* **CURRENT ENEMY**	Enemy currently engaged against your aircraft
* **MESSAGE ABOUT**	Aircraft or vehicle referred to in last message
* **GROUND TARGET**	Ground target specified by mission
* **NEAREST TARGET**	Ground target nearest to player's aircraft
* **PILOTED AIRCRAFT**	Player's aircraft

To get any particular view type of any viewee press the relevant key from the view type row followed by the relevant key from the viewee column. The best way to feel comfortable with the viewing matrix is to get practical experience altering the viewing parameters. Select a mission such as page 29 of the interactive book, where there are a lot of combat aircraft in the sky. Once in the air, press the **P** pause button (so that you can inspect the view matrix at your leisure), and systematically feel your way about the grid of table 2.

Note that virtually any combination of view type and viewee is possible. For instance, if you want to see a satellite view of your nearest friend, then press **F7** followed by the **SHIFT** and **F3** keys together. Since the keypresses for view type and viewee are independent, the order in which you press the keys is not important.
Press **SHIFT** and **F4** together, followed by **F8**, to see a view of the nearest enemy aircraft from an 'outside lock' view. If you are taking part in the mission on page 29,

The air war between Italy and Austria-Hungary

Despite a pre-war alliance with the Central Powers, Italy remained neutral for the first ten months of the war, before declaring for the Allies. Italy's war was chiefly a territorial one, waged against Austria-Hungary. Much of the fighting took place in mountainous terrain, and so Italian and Austro-Hungarian pilots had to contend with the Alps. The Alps had first been crossed by air in 1910. Italy had been swift to recognise the potential of aircraft for waging war, dropping the first bombs of a military campaign as long ago as 1911. Since 1913 the designer Count Caproni had been developing long-range bombers, well-armed and with a heavy bomb-load. Caproni Bombers dominated the Italian Air Force. Using their seven-hour range, they bombed Austrian supply lines through the Alps, and hit Austrian cities and bases. They were a terrifying sight: one triplane version spanned 98 feet, approaching the size of a WWII British Lancaster bomber.

Aces of Britain and the Empire

Britain, pursuing the most active offensive air policy, and with an empire to draw on, produced 784 aces. Irishman Edward ('Mick') Mannock (73) led narrowly from Canada's William Bishop (72), who was followed by his compatriot Raymond Collishaw (60). England's James McCudden (57) was close behind. The South African, A. Beauchamp-Proctor (54), was the fifth-highest scoring ace.

this view should give you pause for thought - the screen is full of enemy aircraft, and they all appear to be chasing you! If you refer to the view matrix, you will see that the **ENTER** key has been marked at the intersection between nearest enemy and outside lock. This is a special hotkey we have created for the **SHIFT F4**, **F8** combination. In combat this view can be very helpful to you, and we call it the 'outside combat lock' view. Similarly, the matrix shows that the **BACKSPACE** key is a shortcut for **SHIFT F4**, **F9** - the inside lock view of the nearest enemy. This is the 'inside combat lock' view. Both combat lock views are discussed later in this section.

As you explore the view matrix you should keep an eye on the bottom line of the information panel. The leftmost box displays the view type, and the next one displays the current viewee. Hence these two boxes register your location within the viewing matrix. As you play the game you will sometimes find that some key combinations do not register. This will be because the requested viewee does not actually exist. A common instance is when you have no nearest enemy - either because all enemy aircraft have been shot down, or because the nearest enemy is more than 20 miles away. As noted in table 2, inside and outside lock views of your own aircraft are not valid.

Fine Tuning Your View

Once you have surveyed the view matrix a few times you will become more accustomed to the manipulation of the on-screen views. Although it is not essential to use extra features, the viewing system in Dawn Patrol has even more flexibility than so far discussed.

For instance, you can rotate the view of the viewee about horizontal and vertical axes by pressing the **F2** and **F3** keys. Note that this means the camera itself moves vertically and horizontally, respectively! (Rotation is not possible within a chase view.) The view can be zoomed in and out using the **F1** and **ALT F1** keys. If you rotate and zoom a view, then the camera will maintain its new relative position for all subsequent views of the same view type. The default zoom and viewing angles can be reset individually with the **CTRL F1**, **CTRL F2** and **CTRL F3** keys, or all together by pressing **CTRL R**.

The Third Battle of Ypres, 1917, and a new era

The battle of Messines - a curtain-raiser for Third Ypres (Passchendaele) - restored the RFC's confidence after 'Bloody April'. New aeroplanes had arrived in time for the June battle. As at the beginning of the year, the RFC outnumbered the enemy by two to one. But this time, the RFC had better aircraft, and won control of the air. However, much of the advantage was lost when the weather closed down early, at the end of July. British troops had secured Messines Ridge; now they pushed on, in torrential rain and mud, towards Passchendaele village. The RFC was virtually grounded by bad weather throughout August and again in October, unable to support British troops by artillery spotting, or reconnaisance, or strafing. By the time Canadian troops secured the village of Passchendaele, the five-mile advance had cost 250,000 British casualties (and a similar number of German), and had taken three months. The closing battle of the year - the two-week assault at Cambrai - saw a new stage in mechanised air and ground war. Britain launched 378 tanks at enemy positions, in the first massed tank attack of the war. Meanwhile, fourteen RFC squadrons were deployed, many of them strafing enemy troops and transport in low-level flying attacks. German pilots replied in kind. Despite the tanks' initial breakthrough, German forces counter-attacked and the two-week battle ended inconclusively, with losses of 45,000 on both sides.

The view matrix as described will only display the nearest enemy or friendly aircraft, but if there are other aircraft nearby it is possible to transfer the view to them as well. This is performed by using the **ALT F** key combination, which will transfer you to the next viewee nearest to the one you are currently looking at. This can only be done in 'fixed' mode, because 'free' mode will always choose the nearest viewee to your aircraft. If you are not in fixed mode then hit the Q toggle key. As an example, display an outside lock of the nearest friendly aircraft (**F8** and **SHIFT F3**), then keep pressing **ALT F** to cycle through the views of all friendly craft. Note that the description of the viewee on the information panel remains Near Friend throughout this cycle. The last viewee chosen in the cycle will remain the 'Near Friend' unless the viewee is reset to the nearest using the **CTRL F** keys.

After assembling all of this information, it is worth remembering what to do if you find yourself looking at an unfamiliar scene in the middle of a combat. Press **ESC** and the view will always return to your aircraft, press **ENTER** and you will always get an outside combat lock, and press the [and] keys to give gunsight and cockpit views of your own aircraft.

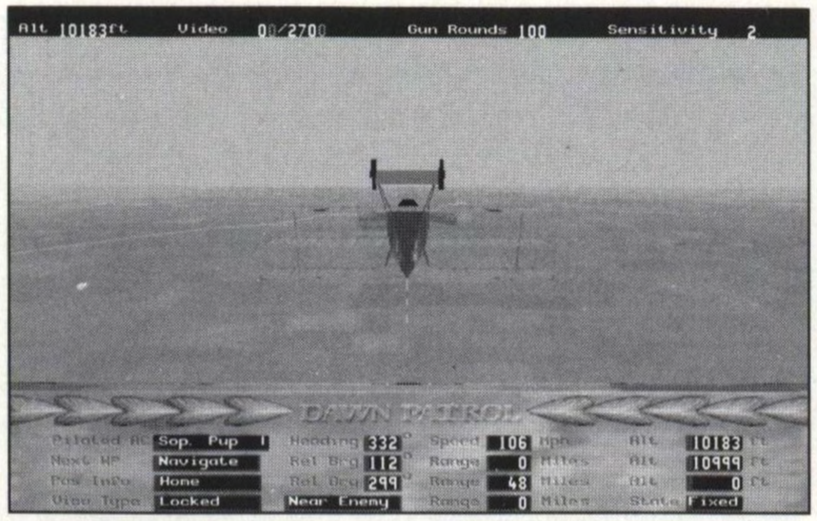
Combat Lock

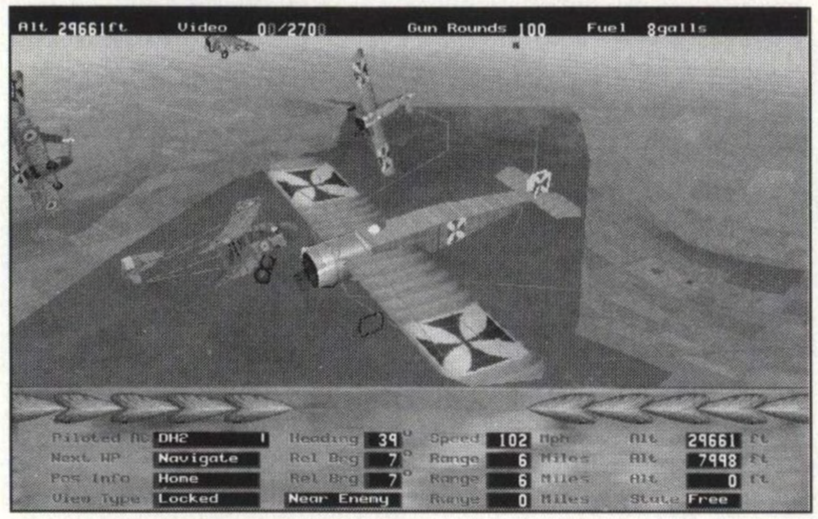
The combat lock views which were discussed earlier can be very useful in aerial combat, and can make the task of becoming an air ace a more feasible option. We have provided these views because any cockpit view from a flight simulator subtends a relatively small portion of the entire sky. The proper use of combat lock frees your vision so that you can concentrate on the nearest enemy aircraft, wherever it may be.

Outside Combat Lock

This view always has your own aircraft in the foreground of the camera, which points towards the nearest enemy aircraft. Since the camera tries to maintain the enemy in the centre of view (whether or not it is obscured by your craft), the position and orientation of your aircraft on the screen will alter in response to movement of the enemy, even if you are not adjusting your controls. Initially this can be disconcerting, especially when the enemy aircraft is very close, as the movements of camera angles can be quite large. You must also remember that if the combat lock places the camera in front of your aircraft looking behind you, then a rudder deflection to the left will turn the aircraft towards the right of the screen.

After a little practice you will find this view invaluable for determining the relative position of the enemy, and it is quite possible to make kills and fly an entire mission using the outside combat lock view .





From perambulation to dogfight

From late 1914 onwards, the air war became increasingly bloody. Polite, mostly unarmed reconnaissance was swiftly overtaken by two-seater armed reconnaissance. First, observers used a rifle; then, as aircraft gained in power and carrying capacity, they operated a light machine-gun. But these tended to be defensive and not offensive measures. The spiral of violence only increased dramatically with the development of the synchronised machine-gun. This enabled the pilot to fly and shoot at the same time, from more manoeuvrable single-seater fighters. The invention unleashed a desperate race for improved power, armament and manoeuverability.

Skill Level

There are three options; low, medium and high. The operational skill of an average enemy pilot is proportional to the skill level setting. An enemy novice will be less skilful than the average setting, while an enemy ace will be more skilful.

Running Demo

The two options are on and off. When turned on, the game will enter demonstration mode, which only applies if the book is being displayed. Pages will be turned every 10 seconds on still image pages, and at the end of the animation sequence on animated pages.

Mouse Sensitivity

There are two options; low and high. Under low sensitivity the mouse needs to be moved twice as far to effect the same on-screen pointer movement as under high sensitivity.

Joystick Sensitivity

The four options are low, medium, high and custom. The default setting is medium. If your joystick seems to suffer from poor calibration (see re-calibration option under control type), and you have no trim controls, or those that you have do not help, then you should choose low sensitivity. If you prefer to make your aircraft very sensitive then choose the high setting. The custom setting should only used if you have created a custom sensitivity using the information in appendix B.

Control Type

There are six options; keyboard, joystick, joy-throttle, flightstick pro, thrustmaster and recalibrate. The options refer to the control type for the in-flight section of the game.

Keyboard - Change flight control entirely to keyboard.

Joystick - This is the standard joystick option. Such a joystick has two movement axes and two fire buttons (A and B). If a second joystick is connected, the fire buttons on that stick can be used as buttons C and D.

Joy-Throttle - A joy-throttle has an additional independent throttle lever which can be used to control the aircraft's fuel intake and rev count. It may have up to four fire buttons. This option is compatible with the standard Flightstick and the Maxx Yoke.

FlightStick Pro - The FlightStick Pro has a throttle on the base of the joystick to control the rev count and a "coolie hat" on the top with four extra switches.

Thrustmaster - The Thrustmaster PFCS has a top "coolie hat" with four extra switches.

Re-calibrate - This option should be used if there is a tendency for your aircraft to yaw or pitch when the joystick is centred. Please see appendixB for details of how to proceed.

The Australian Flying Corps

Of the dominions who contributed airmen to the British war effort, only Australia set up an independent air arm, known as the Australian Flying Corps (AFC). One squadron served in Palestine from 1916, and three more served on the Western Front from late 1917. There were also three training squadrons in England. The AFC's leading ace was Arthur Cobby, whose score - achieved in a bare seven months - totalled 28 aeroplanes and 13 balloons. Australian pilots also served with the RFC: about two hundred transferred from the Australian army, while others entered the RFC either directly or from the British army.

Separate Rudder

The two options are on and off. If you have separate rudder pedals this option should be turned on.

Sound

There are three options; all off, no engine sounds or with engine sounds.. These settings relate to the in-flight section, and will output no sound; all sounds except the noise of the engine; or all available sounds. CD users will be able to select the speaker icon regardless of the setting of this option.

Music

The two options are off and on. When turned on, music will be played in the book section of the game.

Detail Level

There are four options; 386, 486, 486DX33, and fastest. This setting alters the amount of terrain and vehicle detail which the program attempts to display in-flight (the faster the setting the more the detail). Set the option to the specification closest to that of your particular PC. It is best to experiment, since the graphic speed of your machine will depend on factors other than the main processor, such as the type of video card. If the frame rate on your PC appears to be unacceptably slow, then turn to a slower option.

Auto Detail

The two options are on and off. When set to on, auto detail turns off any graphic detail that will greatly slow the displayed frame rate. It does this on a frame by frame basis.

Auto Window

There are two options; on and off. Auto window reduces the size of the display window if the frame rate begins to slow. It is an alternative method to 'auto detail' for dealing with frame rate reduction, although both features can be set on at the same time.

Screen Fades

The two options are off and on. This feature allows a smooth fade during the transition between two game screens. You should consider switching off screen fades on slower PC's.

Aces High

To become an ace, a pilot needed to be credited with destroying five or more enemy aircraft in combat. The system of 'scoring' victories is not a definitive way to compare talent between aces. Because of rapid technological advances, in both aircraft and armaments, top aces flying later in the war often had many more victories to their credit than aces who only flew in the early years. Length of active flying time, and length of time assigned to fighter craft, varied enormously between aces. Attribution was sometimes uncertain, especially during mass swarming attacks, or when intersecting with ground-fire. Some victories were never witnessed, and some were never claimed. Scores meant a great deal to some aces, and less to others. Germany's Werner Voss (48) set out like a sportsman each day, seeking to increase his tally. France's Charles Nungesser (45), failing to recover properly from multiple fractures, had himself carried to and from his aircraft so that he could continue to score victories. Von Richthofen (80) had a silver trophy engraved with each win. France's René Fonck (75) believed his personal score (incorporating victories not witnessed by Allied observers) was 127. Others, like Britain's top scorer, Mick Mannock (73), reportedly insisted that several victories be attributed to other pilots.

Section 5

Flying and Shooting

'Bloody April', 1917

At the beginning of 1917, the RFC outnumbered German airmen by almost two to one. But the German fighter aircraft were far superior. Their ability to outmanoeuvre British fighters left observer planes (like the BEs) exposed. During March and early April 1917, British observers were taking enormous risks to 'map' the terrain around Arras and Vimy Ridge. In static trench warfare, mobile aircraft were often the only way of discerning enemy positions, and, since the Somme debacle the previous winter, the British command was becoming more ruthless about exposing reconnaissance craft to ground-fire. Observers were literally sacrificed, but their efforts meant that the British and Canadian infantry began the April battles of Arras and Vimy Ridge with good maps and intelligence. Overall RFC losses were high before and during 'Bloody April', and at least one squadron needed replacing *twice over*. No. 60 Squadron was so desperate for pilots that new arrivals were sent up immediately in aircraft which they'd never seen before. During April itself, 316 RFC airmen were lost - double the monthly average for the rest of the year.

Basic Flying Skills

This section deals briefly with some of the fundamentals you will need to master in order to become a Dawn Patrol ace. All of the aircraft featured in the game have different flight characteristics. You will find that some will climb faster than others, some will turn more easily than others, and that the stalling speeds of each aircraft differ. World War One aces had to cope with this, too!

Climbing

An aircraft climbs when the lift provided by its wings is greater than its weight. Lift is proportional to the square of the velocity of the aircraft. Hence, if you want your aircraft to climb quickly and steeply, pull back on the joystick and increase the thrust of your engine, so that you gain airspeed. If you want to make a sustained altitude gain, then your angle of climb should be no more than 10 to 15 degrees. A steeper angle of climb will result in consistent loss of airspeed, leading to a loss of lift. Eventually your aircraft will start to fall and then there
is a risk of it stalling.

Reducing Altitude

Apart from pushing the joystick forward, there are two other factors which will reduce your aircraft's altitude. The aircraft will fall if you reduce the engine thrust, since the lift generated by the wings depends on the velocity. More surprisingly, altitude can be lost when the aircraft is turning. Since the lift points upwards in the direction of the tailplane, a turning aircraft loses some of the vertical component of its lift. If no rudder or elevator is applied the aircraft will lose altitude.

Turning your Aircraft

Your aircraft can be turned by moving your joystick left or right in the direction you wish to turn. If you turn acutely, then the aircraft will lose altitude. To prevent this from happening, you should pull up slightly on the joystick as you turn.

Stalling

An aircraft will stall when it loses all lift from its wings. This will tend to happen when you have climbed too steeply, or have let the airspeed fall below about 50 mph. At this point the nose of the aircraft will be pointing downwards, and it will not respond to flight controls. You can come out of a stall by letting go of the stick and increasing the thrust of your engines. As the airspeed builds up, gently pull back on the stick.

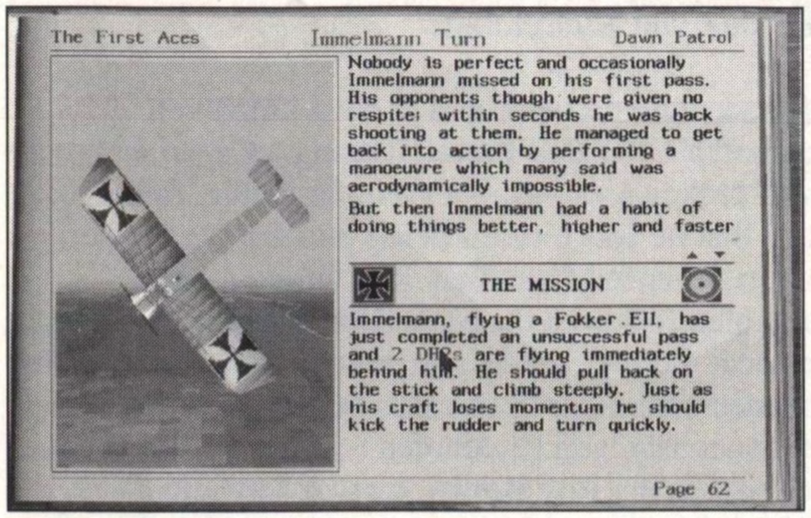
Immelmann Turn

This manoeuvre was first introduced by the German air ace Max Immelmann, who used it to devastating effect during World War One. Expert use of the turn allows you to reverse your direction in the minimum amount of time and space. An inexperienced attacker appearing on your tail can become cannon fodder before he's had time to line you up in his sights. An enemy who passes you after a head-on encounter can suddenly find you on his tail.

To perform your first Immelmann Turn, get a good external view of your aircraft. If you are performing head on approaches towards an enemy aircraft then you might wish to choose an outside combat lock view. If your airspeed is below about 120 mph you should increase it by putting yourself into a dive. Pull back on the stick so that you start climbing, and wait until you are nearly vertical and your airspeed is about 60 miles per hour. At this point apply full rudder, either to your left or right, by pressing the END or PG DN keys on your numeric keypad. Keep your hands on the rudder, and the aircraft will rotate about its tail, with its nose turning towards the ground. Come out of the turn at the appropriate point by letting go of the rudder, pulling back on the stick, and applying a little compensating rudder as needed. After a few practices the turn should become a normal part of your combat repertoire. Some aircraft will feel quite different when you perform this manoeuvre, so you will have to be ready to make small flight adjustments to maintain stability.

Page 62 of the Dawn Patrol book has a detailed animation of the Immelman Turn as it should be performed in combat. Study it closely, and see if you can emulate it. The mission associated with page 62 gives you the opportunity for a number of Immelman Turns as the enemy perform repeated head on passing manoeuvres.

These days the 'Immelmann Turn' is better known as the 'Hammerhead Turn'. Even so, it should not be confused with the more modern 'Immelmann' manoeuvre.



The flying wounded

Sheer grit ensured the survival of some aces, who landed their machines safely despite horrific wounds. In July 1917 von Richthofen was shot through the head while in mid-flight. He passed out, only regaining consciousness within 500 feet of impact. After landing safely, he fainted again. In an even more spectacular incident, in the dying days of the war, Canada's William Barker inadvertently found himself fighting up to sixty enemy aircraft, singlehanded. Already shot through the leg by a Fokker DVII, after dispatching an enemy two-seater, Barker found himself spinning into the midst of a formation of fifty or more Fokker scouts, ranged in descending levels. Some say that the ensuing battle lasted forty minutes. Facing four separate onslaughts of at least a dozen enemy craft, Barker managed to bring down at least three opponents. Somehow he continued fighting, even after his second thigh and his left elbow were smashed. In the course of the battle the wounded pilot fainted twice, to be revived by the rush of air as he plummeted towards ground zero. The remaining Fokkers called off, and Billy Barker - unable to operate the rudder - lowered his crippled Camel Snipe into a crash-landing. He survived, and, undeterred, went on to become a test pilot.

Some pilots continued fighting in the war, even after sustaining crippling wounds. Germany's Rudolf Berthold scored at least 16 of his 44 victories despite a shattered, septic right arm. France's Charles Nungesser set his teeth against multiple fractures sustained in early 1916, and had himself carried to and from the cockpit to achieve a total of 45.

Who shot von Richthofen?

Three separate parties claim to have killed von Richthofen. The Red Baron, hunting a Canadian novice who'd broken away from a group air battle, failed to notice that he was himself being pursued by another, more experienced Canadian, Roy Brown. Von Richthofen followed the novice towards the Australian lines near Corbie, virtually skimming the ground. What happened next is far from clear, but it seems that almost simultaneously, von Richthofen was fired on by at least three parties: by Roy Brown, by two Australian machine-gunners, and by two Australian anti-aircraft gunners. The fuselage of von Richthofen's triplane was riddled with bullets, but the pilot himself was reportedly killed by a single bullet through the chest. The angle of the shot is said to have accorded with Roy Brown's attack position, although doubt remains. Brown didn't actually claim the kill, but on reading his combat report the RAF - amid much controversy - credited him with it. Von Richthofen was given a full military funeral by No. 3 Squadron, Australian Flying Corps, and after the war, his body was returned to Germany.

Gunnery Tactics

Improving your Shooting

All of the aircraft in Dawn Patrol are equipped with one or two machine guns. Pressing the [key will give an upper cockpit view of the gun sights, so long as the guns are forward mounted. At all times, pressing the space bar will activate the machine gun. There is no need to fire just from the gun sight view, since it is possible to see the tracer from any view of your aircraft. The direction of the tracer tells you where the bullets are being delivered. A machine gun bullet has a range of about 200 yards, and its effect on the target will be determined by the distance to the target, where it hits, and the setting of the TARGETS option on the preferences screen.
If you are recording hits on the target, then you will hear the ricochet of the bullets, and you will see puffs of smoke from the enemy aircraft.

Ground Targets

Targets on the ground include buildings, airfields, trucks and barrage balloons. You will be able to see most nearby ground targets by pressing F6, then SHIFT F9 followed by repeatedly striking ALT F. These commands will cycle through the nearby ground targets depending on which side you choose for the mission. Opposition convoys are always displayed on the map screen, and you are at liberty to chase after them if you wish. The mission on page 74, 'Ground Attack', involves attacking enemy trucks. There are a potential fifteen further ground targets in this mission, and it is not recommended that you try and attack them all!

It is best to attack truck convoys by strafing the ground and 'walking' the bullets to the target. Start firing your guns, see where the bullets are hitting and adjust your line of flight so that the line of bullets coincide with the convoy. Don't keep firing too long or your guns will jam.

Flak

Many of the ground targets are artillery sites, and they can be a danger. In general you should try and avoid areas where there is heavy flak, because you run a high risk of being shot down.

Sites equipped with anti-aircraft artillery deliver white streams of tracer bullets. Larger bore sites deliver large plumes of exploding flak at higher altitudes. The flak from Allied artillery is white, while the flak from Central Powers artillery is black. At least you will know who is firing at you! If you are in the middle of a flak attack you might

consider making a positive movement of heading and altitude every 15 seconds, and clearing out as quickly as you can.

Aircraft

The firing arcs of a number of the aircraft featured in Dawn Patrol are show in Diagram 1. This diagram shows the relative strengths and weaknesses of each aircraft. For instance the Gotha bomber is very well protected at the rear, but it is extremely vulnerable to frontal attacks from below. In Dawn Patrol the Fe2b is treated as a fighter and so it is only capable of firing a forward fixed gun. A knowledge of the firing arcs of any aircraft can be very useful, whether or not you are attacking one, escorting one, or flying one yourself.

'Parachutes are bad for morale'

Scarcity of British aircraft led to a draconian measure. Airmen were not equipped with parachutes. Baling out was not an option. By forbidding the use of parachutes, the authorities could be sure that aeroplanes would not be abandoned (prematurely or otherwise). Possibly, concern for military property was not the only consideration. It was the first war in which civilians had been called upon to fight; the problem, as the authorities saw it, was to ensure that these civilian combatants did indeed fight to the last gasp. For the soldier, where conviction or courage failed, discipline (including the threat of execution) provided the goad. But enforcing battle readiness in the wide skies was another matter. And so pilots stayed with their aircraft, unable to use their judgement about when to escape a doomed craft. Pilots most dreaded fire, and some carried pistols with which to shoot themselves rather than endure death by burning. By contrast, observers in balloons - spotting for the artillery - were equipped with parachutes, so that they might escape when their gas-filled balloons were set on fire. Balloons were cheaper than aircraft.

Section 6

Video Editing Suite

The video editing suite is controlled from a single screen located at page 159 of the interactive book. It can be accessed through the List of Contents page or at the end of a mission from the post-mission briefing screen. In either case the facility can only be used if there is video to be edited. Video can be shot during a mission by pressing the V key. It will then be resident in memory, and can be edited on-line. Video footage is destroyed if you exit Dawn Patrol without having saved it onto your hard disk using the editing facility. Once written to your disk it can be edited and viewed whenever you wish. Therefore, if you have sufficient disk space it is advisable to save original video straight to disk after a mission.

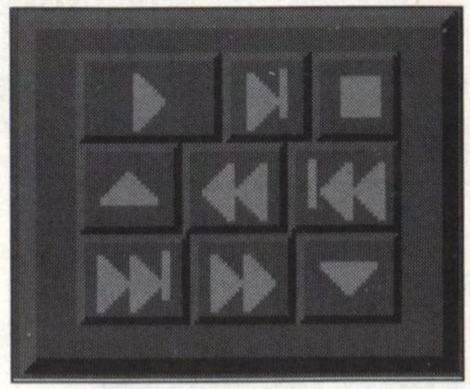
Unlike any real-life editing facility you are able to do much more than patch together different pieces of video. If you are unhappy with the camera angles and positions used to shoot the original, you can alter all the viewing characteristics with the same flexibility as the viewing matrix available in the game. The editing suite can be controlled by manoeuvring the on-screen pointer with the mouse and keyboard, but almost every facility is mapped to an individual hotkey for easy operation.

The major features of the editing facility are as follows:

Title Bar

This strip runs along the top of the screen. The filename is an eight character identifier of the current video footage. 'Last page' refers to the total memory size of the video footage. Expanded memory is divided into 'pages', each of which is 16 Kbytes long. Page count starts at zero, so a last page number of two takes up three pages, or 48 Kbytes. The number next to 'Position' is the location in memory of the current video frame. The first digit of the 'position' is the page number of the current frame.

Movement Block

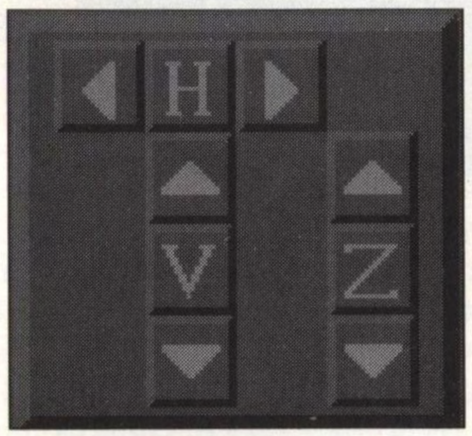


Basic video machine style controls are located in the middle on the left hand side of the screen. Moving across from left to right and then downwards the buttons are:

PLAY/PAUSE -	Toggle between play and pause
MOVE FORWARD ONE FRAME -	Move the video forward a single frame
STOP -	Stop the video
REWIND TO BEGINNING -	Rewind the video to the start
FAST REWIND -	Rewind the video at an accelerated pace
REWIND ONE SECTION -	Rewind the video one page backwards
FORWARD ONE SECTION -	Move one page forwards
FAST FORWARD -	Wind the video forward at an accelerated pace
FAST FORWARD TO END -	Wind the video to the end

This video movement grid is mapped directly to the numeric keypad of your machine.

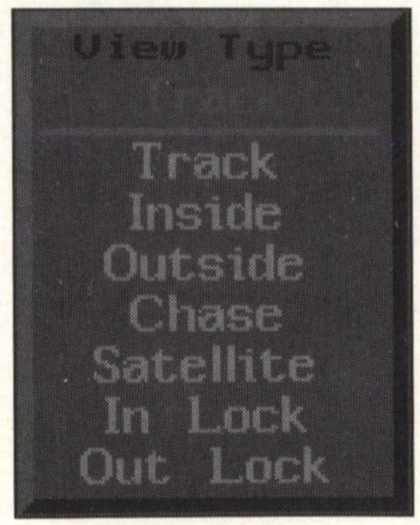
Zoom & Rotate Keys



These are similar to the zoom and rotate facilities of the flight simulator.

H = Horizontal. The left and right arrows allow you to rotate left and right about a vertical axis.
V = Vertical. The up and down arrows allow you to rotate up and down about a horizontal axis.
Z = Zoom. The up and down arrows allow you to zoom in and out.
Select the central H, V or Z letter to reset to the original display angle or zoom.
Note that a key or screen hotspot must be selected once to start the effect and once again to stop the effect.
Use the same hotkeys as those available in-flight. **F2** and **ALT F2** for vertical rotation; **F3** and **ALT F3** for horizontal rotation; **F1** and **ALT F1** for zoom.

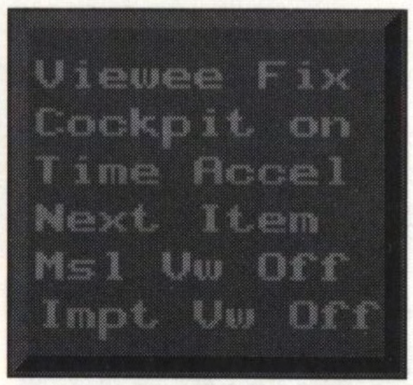
View Type Selector



The currently selected view type is displayed at the top of the box. These view types are the same as those available in-flight.

TRACK -	Track view of the viewee
INSIDE -	The view of the viewee from your cockpit. Enhanced by toggling cockpit on option.
OUTSIDE -	An outside view of the viewee
CHASE -	Chase view of viewee
SATELLITE -	Satellite view of viewee
IN LOCK -	Inside lock view of viewee
OUT LOCK -	Outside lock view of viewee

All of these viewing characteristics can be controlled by the familiar function keys.



Viewee Selector

The currently selected viewee is displayed at the top of this box.

PILOT AC: Viewee is your aircraft
NR GROUND: Viewee is the nearest ground target, if there is one
HOME BASE: Viewee is your home base
NR UNFRND: Viewee is the nearest enemy aircraft
NR FRIEND: Viewee is the nearest friendly aircraft
The viewee can also be selected using the familiar shift function keys.

Extra Flags

The following flags work in conjunction with the other options on the Video Editing Suite.They can all be accessed by pressing the first letter of the function.

VIEWEE FIX /FREE: Toggle between fixed and free viewpoints (hotkey **V** or **Q**)
COCKPIT OFF/ON: Toggles a view of cockpit on and off for relevant view types (hotkey **C**)
TIME NORM/ACCEL: Toggles between normal and accelerated time (hotkey **T**)
NEXT ITEM: If you have selected the VIEWEE FIX option then this moves to the next nearest viewee. Especially suitable for unfriendly aircraft (hotkey N or **ALT F**)
MSL VW OFF/ON: If toggled 'ON' it is possible to view the flight of bullets as they are fired (hotkey **M**)
IMPT VW OFF/ON: If toggled `On' then the view is transferred to targets just before they blow up (hotkey **I**).

Lower Editing Box

This facility is used for all the high level video production including editing, splicing, cutting as well as the manipulation of video files on your hard disk.
All grey symbols [e.g.: **1**, **2**, **3**,] at the bottom of the box are the relevant hotkeys.

Start Marker

START: Places the start marker at the beginning of the video: 'position' 0.
MARK: Places the start marker at the current video position.
GO: Move current video position to position of start marker.

Block Edit

Note: A `Block' is a section of video bracketed by `Start' and `End' markers.
DEL: Delete a video block (be careful - no confirmation asked!).
WRITE: Write a video block to disk.
READ: Read a video block into RAM. This allows you to splice different video segments into your footage.

File Edit

LOAD: Load a previously saved video file into the editor. This overwrites all video currently in memory.
SAVE: Save the current video block to memory. You should provide an eight character name, without a file extension.
DEL: Delete a video file from your hard disk.
Note: Videos are held in the VIDEOS subdirectory on your hard disk and can be directly manipulated from there.

End Marker

END: Place an end marker at the last frame of the current video.
MARK: Place an end marker at the current video position.
GO: Move the current video position to the end marker.

Le chevalier sans peur et sans reproche

'The pilots are the Knighthood of the Air, without fear and without reproach. Every aeroplane flight is a romance, every record an epic.'
- David Lloyd George, British Prime Minister, 1916-22

'Oh, if only I could have brought him down alive!'
- Lt. Rhys-Davids (No. 56 Squadron), after shooting down the German ace Werner Voss

'To be alone, to have your life in your own hands, to use your own skill, single-handed, against the enemy. It was like the lists of the Middle Ages, the only sphere in modern warfare where a man saw his adversary and faced him in mortal combat, the only sphere where there was still chivalry and honour. If you won, it was your own bravery and skill; if you lost, it was because you had met a better man.'
- Cecil Lewis, No. 56 Squadron

'To the memory of Captain Boelcke, our brave and chivalrous opponent.'
RFC tribute, dropped over German lines, October 1916.

There was much mutual respect - often expressed in acts of chivalry - between aces on both sides. When the German ace, Oswald Boelke, collided fatally with a comrade during a dogfight in 1916, the British dropped a wreath and a tribute over enemy lines. Sometimes a pilot would risk his own life to drop a message over an enemy aerodrome, relaying the death and burial of a brave opponent. When Britain's Albert Ball failed to return from a patrol in May 1917, the Germans dropped a message over his base, to say that he had been buried near Lille. When Manfred von Richthofen was shot down in April 1918, he was buried by the Australians, with full military honours, and a message was dropped at his aerodrome. Only six months earlier, when the Red Baron was at the height of his killing career, No. 56 Squadron mess had generously toasted his health as the greatest enemy pilot of all.

Appendix A

In-Flight Keyboard Controls

General advice for altering the in-flight view:

[a] Press the shift key and a function key simultaneously to determine the aircraft or target being viewed (the 'viewee').

[b] Press either a function key or a numeric key to alter the type of view.

KEYBOARD REFERENCE - NORMAL KEYS

ESC	Change viewee to your aircraft
F1	Zoom in (ALT F1 is zoom out)
F2	Rotate vertically around viewee
F3	Rotate horizontally around viewee
F4	External chase view
F5	Outside view - camera maintains absolute heading and pitch
F6	Track view - camera pitches and turns with the aircraft
F7	External satellite view
F8	View across your aircraft to the viewee (outside lock)
F9	View from your aircraft's cockpit of the viewee (inside lock)
F10	Configuration menus
1	Increase the keyboard flight control sensitivity
2	Decrease the keyboard flight control sensitivity
5	View the rear of your aircraft from the inside
6	View the left of your aircraft from the inside
7	View the front of your aircraft's cockpit from the inside
8	View the right of your aircraft from the inside
9	View the rear of your aircraft from the inside
0	Return to cockpit from an outside viewpoint
-	Decrease RPM continuously, in small steps
+	Increase RPM continuously, in small steps
BACKSPACE	Inside combat lock - lock onto nearest enemy (see manual)
TAB	Speed-up time (turns off when any key pressed or mission event occurs)
Q	Toggle between fixed and free viewpoints of viewee
W	Wheel brake
R	Decrease rate of rotation for **F2** and **F3** keys
T	Auto-gunfire (only if autopilot ON)
U	Unjam machine guns
P	Pause
[	Look up (see gun sights if looking forward)
]	Look down (see instrument panel if looking forward)
ENTER	Outside combat lock (lock onto enemy from outside view)

A	Autopilot (toggle - indication on instrument panel)
S	Sound toggle (off, no engine sounds or with engine sounds)
J	Increase rate of gunfire
K	Decrease rate of gunfire
;	Step back through waypoints
'	Step forward through waypoints
Z	Impact viewpoint - switch view to target when hit
X	Missile viewpoint - switch view to launched bullet
V	Video toggle
B	Air brake toggle
M	Map screen (ESC to return to flight)
,	Minimum power setting
.	Maximum power setting
SPACE	Fire

NUMERIC KEYPAD AND CURSOR CLUSTER

END (1)	Full rudder deflection, left
PAGE DOWN (3)	Full rudder deflection, right
INSERT (0)	Gradual rudder deflection, left
DELETE (.)	Gradual rudder deflection, right
(8 or cursor up)	Dive - pull forward on stick
(4 or cursor left)	Roll to the left
(6 or cursor right)	Roll to the right
(2 or cursor down)	Climb - pull back on stick
-	Decrease RPM by single, large steps
+	Increase RPM by single, large steps

KEYBOARD REFERENCE - 'ALT &' KEYS

ALT F1	Zoom out
ALT F2	Rotate vertically around viewee in opposite direction to **F2**
ALT F3	Rotate horizontally around viewee in opposite direction to **F3**
ALT F5	Outside view - looking out from viewee
ALT F6	Track view - looking out from viewee
ALT F7	View below viewee
ALT F8	View looking from in front of your aircraft to the viewee
ALT F9	View from in front of the viewee to your aircraft
ALT F10	Decrease time speed-up
ALT R	Increase rate of rotation for **F2** and **F3** keys
ALT D	Automatically select level of detail suitable for machine
ALT F	Select the next nearest viewee [fixed mode only]
ALT X	Exit flight

RNAS seaplanes

From 1913, the British Admiralty began planning for the use of seaplanes: for coastal defence, for scouting ahead of its ships, and - most boldly of all - as offensive aircraft launched from battleships. The aircraft carrier had its modest beginnings in the earliest days of powered flight. Only seven years after the Wright brothers' 1903 success at Kitty Hawk, another American airman, Eugene Ely, made the first successful flight from a sailing vessel A year later, in 1911, the exploit was matched in Britain. By 1913 the British Admiralty had a rudimentary aircraft carrier, HMS 'Hermes', with three seaplanes. By 1915, HMS 'Ark Royal' was in action, carrying ten seaplanes. The first carrier designed for launching and receiving land planes was HMS 'Furious'. She was equipped with six Sopwith Pups and four seaplanes.

KEYBOARD REFERENCE - 'CTRL &' KEYS

CTRL F1	Reset zoom
CTRL F2	Reset to default vertical view angle
CTRL F3	Reset to default horizontal view angle
CTRL F8	Lock view from behind the viewee to your aircraft
CTRL F10	Increase time speed-up
CTRL R	Reset rate of rotation for **F2** and **F3** keys and reset view and zoom parameters
CTRL D	Toggle 3D detail (auto detail must be turned off first)
CTRL F	Reset fixed viewpoint to current nearest viewee
CTRL V	Reset video to start and begin recording

KEYBOARD REFERENCE - 'SHIFT &' KEYS

SHIFT ESC	View of player's aircraft, maintaining last viewpoint
SHIFT F2	View of launched missile
SHIFT F3	View of nearest friendly aircraft
SHIFT F4	View of nearest enemy aircraft
SHIFT F5	View of object you have been assigned to attack, according to on-screen messages
SHIFT F7	View of object that last message refers to
SHIFT F8	View of currently assigned ground target
SHIFT F9	View of nearest possible ground target
SHIFT 9	View of your wingman
SHIFT -	Decrease RPM in large steps
SHIFT +	Increase RPM in large steps
SHIFT TAB	Uninterrupted time speed-up
SHIFT F	Toggle between fixed and free viewpoints of viewee
SHIFT ;	Cycle through position information

'SHIFT &' NUMERIC KEYPAD

SHIFT -	Decrease RPM by standard amount
SHIFT +	Increase RPM by standard amount
SHIFT 8, 4, 6 & 2	View directions

Pilots in training

When the RFC was formed in 1912, it numbered less than twelve qualified pilots. Midway through the war, 1,300 British pilots were being turned out each month. Training was less than stringent: 18 hours of flight, including a mere 60-mile flight across country, and only two night landings. Altogether, Britain trained about 22,000 pilots during the war. France, by comparison, trained about 16,500. However, the French casualty rate was much lower than Britain's: probably about 39%, compared with about 50% for British pilots.

Aviation casualties

On the face of it, German and British casualty figures would seem to be remarkably similar, with French figures lagging behind. But, as experts point out, the methods of compiling statistics varied from force to force (i.e. 'died' in one arm might mean only 'died of wounds'; in another, it might include 'died of sickness'). The French figures, in particular, are probably incomplete.

Keyboard Reference chart-Keys by Subject

VIEWPOINTS

ESC	Change viewee to your aircraft
SHIFT ESC	View of player's aircraft, maintaining last viewpoint
F1	Zoom in
ALT F1	Zoom out
CTRL F1	Reset zoom
F2	Rotate vertically around viewee
ALT F2	Rotate vertically around viewee in opposite direction to **F2**
CTRL F2	Reset to default vertical view angle
F3	Rotate horizontally around viewee
ALT F3	Rotate horizontally around viewee in opposite direction to **F3**
CTRL F3	Reset to default horizontal view angle
SHIFT F2	View of launched missile
SHIFT F3	View of nearest friendly aircraft
SHIFT F4	View of nearest enemy aircraft
SHIFT F5	View of object you have been assigned to attack, according to on-screen
SHIFT F7	View of object that last message refers to
SHIFT F8	View of currently assigned ground target
SHIFT F9	View of nearest possible ground target
SHIFT 9	View of your wingman
F4	External chase view
F5	Outside view: camera maintains absolute heading and pitch
ALT F5	Outside view - looking out from viewee messages
F6	Track view: camera pitches and turns with the aircraft
ALT F6	Track view - looking out from viewee
F7	External satellite view
ALT F7	View below viewee
F8	View across your aircraft to the viewee (outside lock)
ALT F8	View looking from in front of your aircraft to the viewee
CTRL F8	Lock view from behind the viewee to your aircraft
F9	View from your aircraft's cockpit of the viewee (inside lock)
ALT F9	View from in front of the viewee to your aircraft
5	View the rear of your aircraft from the inside
6	View the left of your aircraft from the inside
7	View the front of your aircraft's cockpit from the inside
8	View the right of your aircraft from the inside
9	View the rear of your aircraft from the inside
0	Return to cockpit from an outside viewpoint.
BACKSPACE	Inside combat lock - lock onto nearest enemy (see manual)
Q	Toggle between fixed and free viewpoints of viewee

R	Decrease rate of rotation for **F2** and **F3** keys
ALT R	Increase rate of rotation for **F2** and **F3** keys
CTRL R	Reset rate of rotation for **F2** and **F3** keys and reset view angle
[	Look up (see gun sights if looking forward)
]	Look down (see instrument panel if looking forward)
ENTER	Outside combat lock (lock onto nearest enemy from outside view)
ALT F	Select the next nearest viewee [fixed mode only]
CTRL F	Reset fixed viewpoint to current nearest viewee
SHIFT F	Toggle between fixed and free viewpoints of viewee
Z	Impact viewpoint - switch view to target when hit
X	Missile viewpoint - switch view to launched bullet
[NUM KEYPAD] SHIFT 8, 4, 6 & 2	View directions

ACCELERATION CONTROLS

TAB	Speed-up time (turns off when any key pressed or mission event occurs)
SHIFT TAB	Uninterrupted time speed-up
ALT F10	Decrease time speed-up
CTRL F10	Increase time speed-up

GEAR

W	Wheel brake

FLIGHT CONTROLS

A	Autopilot (toggle - indication on instrument panel)
1	Increase the keyboard flight control sensitivity
2	Decrease the keyboard flight control sensitivity
[NUM KEYPAD]END	Full rudder deflection, left
[NUM KEYPAD]PG DN	Full rudder deflection, right
[NUM KEYPAD]INS	Gradual rudder deflection, left
[NUM KEYPAD]DEL	Gradual rudder deflection, right
[NUM KEYPAD](8, 4, 6, 2)	Flight directions
CURSOR Right, Left, Up, Down	Flight directions
B	Air brake toggle

ENGINE CONTROLS

,	Minimum power setting
.	Maximum power setting
[NUM KEYPAD] -	Decrease RPM by single, large steps
[NUM KEYPAD] +	Increase RPM by single, large steps
SHIFT -	Decrease RPM in large steps
SHIFT +	Increase RPM in large steps
[NUM KEYPAD] SHIFT -	Decrease RPM by standard amount
[NUM KEYPAD] SHIFT +	Increase RPM by standard amount
-	Decrease RPM continuously, in small steps
+	Increase RPM continuously, in small steps

GENERAL CONTROLS

F10	Configuration menus
ALT X	Exit flight
P	Pause
S	Sound toggle (off, no engine sounds or with engine sounds)
V	Video toggle
CTRL V	Reset video to start and begin recording
ALT D	Automatically select level of detail suitable for machine
CTRL D	Toggle 3D detail (auto detail must be turned off first)

WEAPONS CONTROLS

SPACE	Fire
T	Auto-gunfire (only if autopilot ON)
U	Unjam machine gun
J	Increase rate of gunfire
K	Decrease rate of gunfire

MAPS AND WAYPOINTS

M	Map screen (ESC to return to flight)
;	Step back through waypoints
'	Step forward through waypoints
SHIFT ;	Cycle through position information

Joystick Controls

JOYSTICK CALIBRATION
After changing the joystick option and choosing 'accept' you will be asked to move your joystick controls in order to calibrate the game to your joystick. There are a number of factors which can effect the operation of the analogue joystick and it is necessary to go through this process in order to get the best from it.
First, ensure that any auto fire devices are turned off. These will not be useful in this simulation and will confuse the calibration process.

ALL JOYSTICKS
For all joysticks you will be asked to:
"Centre Stick & Press Fire Button"
Then you will be asked to:
"Move Stick thro' full movement"
"& Press Fire Button"

Make sure that you push the stick to its maximum deflection on each of the four sides. On some joysticks the maximum deflection is in the corners, on others it is in the middle of each edge, so to be certain of covering all the positions you should run along each edge and into each corner before pressing the joystick fire button.
If the joystick is not connected then after a few seconds the following message is displayed and the keyboard will be selected as the flight control device:

"CALIBRATION ERROR" "Press Enter"

You may also see a message like:
"Warning: Poor Calibration"
"Move trim to left and back"
This message indicates in which direction the trim controls should be moved to improve the calibration. It will only help if your joystick is fitted with trim controls.
You will then be asked to

"ACCEPT" or "RETRY"

You should "chop" the available trim range until the calibration screen accepts the value. For example, when you first calibrate with the trim centered you might get the message:

"Move trim to RIGHT"

Move the trim to the furthest right, and try again. Now, you may get the message:
"Move trim to LEFT"

The 'correct' place is clearly somewhere between the two trim settings. Move the trim half the distance back towards the left and retry the calibration. You will be told which direction to move the trim this time. Move it by only half the distance you moved it last time. Continue this process of halving the range until your joystick is accepted.

With certain joysticks there can be problems when initially moving the trim the furthest distance:
On some joysticks it may be necessary to move the trim in the opposite direction to that given in the messages. If you find that pushing the trim all the way in the requested direction has no effect on the warning message, then try pushing it in the opposite direction. If this does change the warning message then you have one of these non-standard joystick designs.

It can be possible to move the trim so far in one direction that the calibration code cannot produce any kind of calibration. In these cases a calibration error message will be displayed. Please try again, but do not push the trim control quite so far.

This is the end of the joystick configuration for normal joysticks.

FlightStick PRO AND THROTTLE CALIBRATION
For the FlightStick Pro and Throttle joysticks there are two extra request screens. These vary depending on whether or not you have also selected analogue rudder pedals.
If you have not selected rudder the first screen reads:
"Min Throttle" "& Press Fire Button"
You may arbitrarily decide to make your throttle work in either direction so you can choose either end as the minimum.

If you have also selected Rudder pedals then this request will read:

"Min Throttle" "Centre Pedals" "& Press Fire Button"

If the screen times out, or the throttle or pedals cannot be detected then the following message is displayed and the keyboard will be selected as the flight control device:
"CALIBRATION ERROR" "Press Enter"
If you have not selected rudder the second screen will show the following text:

"Max Throttle" "& Press Fire Button"
You should move the throttle control to the opposite extreme, then press the joystick fire key. If you have selected rudder the second screen will show the following text:
"Max Throttle"
"Move Pedals thro' full movement"
"& Press Fire Button"
As well as moving the throttle to the opposite extreme you should also press down each of the rudder pedals in turn before pressing the joystick fire key.

Aces of Belgium

Belgium, with two operational squadrons at the outbreak of war, was swiftly occupied by Germany at the outset. However, Belgian pilots went on to serve with distinction with the Allies. The leading Belgian aces were Willy Coppens (37), André de Meulemeester (11) and Edmond Thieffrey (10).

America's aces

In all, America produced 88 aces, counting those who flew in other Allied air arms besides the US force. America's aces were led by Edward Rickenbacker (26), Frank Luke Jr. (21) and Raoul Lufbery (17).

If the centering of the rudder pedals is poor then you may be warned:
"Warning: Poor Calibration"
"Move trim to left/right"
See the section above entitled 'ALL JOYSTICKS' for advice on dealing with this warning message.

THRUSTMASTER CALIBRATION
For the Thrustmaster PFCS coolie hat there are two additional request screens. These vary depending on whether you have also selected analogue rudder pedals.
If you have not selected rudder the first screen reads:
"Centre Coolie" "& Press Fire Button"
If you have rudder selected the screen will read:
"Centre Coolie" "Centre Pedals" "& Press Fire Button"

The coolie centre position is the position it returns to when released.
If the screen times out, or the coolie hat or pedals cannot be detected then the following message is displayed and the keyboard will be selected as the flight control device:
"CALIBRATION ERROR" "Press Enter"

NOTE: If you have also attached the WCS (Weapon Control System) you can either calibrate the PFCS as a standard joystick and use the keyboard mapping program to activate the coolie hat or you should set the switch to TEST and ANALOGUE on the WCS.

If you have not selected rudder the second screen will then show the following text:
"Move Coolie thro' full movement" "& Press Fire Button"
It is important that you push the coolie-hat into all four possible positions.
If you have selected rudder the second screen will then show the following text:
"Move Coolie thro' full movement"
"Move Pedals thro' full movement"
"& Press Fire Button"
It is important that you push the coolie-hat into all four possible positions, and press down each of the rudder pedals in turn before pressing the joystick fire key.
If the centring of the rudder pedals is poor then you may be warned:
"Warning: Poor Calibration"
"Move trim to left/right"
See the section above entitled 'ALL JOYSTICKS' for advice on dealing with this warning message.

If you have Thrustmaster's WCS Mk.II, which attaches to the keyboard port and can emulate the keyboard keys that controls the throttle, as well as any other functions, here are the keys that can be used for that unit:

.>	Max throttle
shift =+	Continuous large increases
pad +	Single large increase

Aces of France

The French produced 158 aces, of whom René Fonck (75), Georges Guynemer (54) and Charles Nungesser (45) were the top scorers.

Aces of Germany

Germany's aces numbered 363, led by Manfred von Richthofen (80), Ernst Udet (62) and Erich Loewenhardt (53). Werner Voss followed, with 48.

Aces of Italy

Italy's aces numbered 43. Francesco Baracca (34) had the highest score, followed by Silvio Scaroni (26) and Ruggiero Piccio (24).

=+	Continuous small increases
shift pad +	Single small increase
shift pad -	Single small decrease
_	Continuous small decreases
pad -	Single large decrease
shift _	Continuous large decreases
,<	Min throttle

RUDDER PEDALS

If you have selected Thrustmaster or FlightStick then you have already configured the rudder. If you selected joystick and rudder pedals then the following two additional screens will calibrate the rudder. Screen 1 requests:
"Centre Pedals" "& Press Fire Button"

If the screen times out, or the pedals cannot be detected then the following message is displayed and the keyboard will be selected as the flight control device:
"CALIBRATION ERROR" "Press Enter"
The second screen will then show the following text:
"Move Pedals thro' full movement"
"& Press Fire Button"

Press down each of the rudder pedals in turn before pressing the joystick fire key. If the centering of the rudder pedals is poor then you may be warned:
"Warning: Poor Calibration"
"Move trim to left/right"
See the section above entitled 'ALL JOYSTICKS' for advice on dealing with this warning message.

JOYSTICK CONTROLS

The basic joystick provides elevator (pitch) and aileron (roll) controls, and two fire buttons. Button "A" fires the guns. Button "B" switches between guns and other weapon types.

There are two additional buttons fitted to many extended joysticks:
Button "C" switches to track view
Button "D" steps though the available targets in "Nearest Friendly", "Nearest Unfriendly", and "Nearest ground target" views.

When available, the throttle controls the RPM of the aircraft.
When available, the four positions of the coolie hat are used to select additional views and aircraft controls:

front:	Selects max RPM
back:	Engages and disengages air-brakes
left:	Switches to an inside lock view of object currently being viewed
right:	Switches to an outside lock view of object currently being viewed

Armistice

'I cannot describe my feelings, right off the bat. But I can say I feel ninety-nine per cent better. There is a chance of living now and the gang is glad.'

- Eddie Rickenbacker, American ace, on the signing of the Armistice.

Confessions of leading aces

'When one has shot down one's first, second, or third opponent, then one begins to find out how the trick is done.'

- Manfred von Richthofen

'The most important thing in fighting was shooting; next, the various tactics in coming into a fight, and last of all flying ability itself.'

- Billy Bishop

'The smallest amount of vanity is fatal . . .. Self-distrust rather is the quality to which many a pilot owes his existence.

- Eddie Rickenbacker

The program is provided as a backstop for people who can't get a good calibration using the Dawn Patrol program. Here are some notes on JTEST:

1. The +/- keys can be used to change the range of the columns printed so that maximum does not go off the bottom of the screen.
3. The flicker or wobble of the columns represents noise. If the joystick wobbles a lot even when not touched then a lower sensitivity should be selected in the game. If the whole column is 'flickery' then you may have multiple joystick ports enabled on your machine. Most cards have jumpers to disable the joystick.
4. A 'gap' at the top of a column indicates a very old joystick card in a new fast machine. If you get calibration errors or other software doesn't like your joystick this may be why.
5. The JTEST can be used to trim the joystick. The +/- keys are useful here, as they allow the output to be limited to one column. This makes the job of finding the trimmed centre much easier. Simply note the position of maximum, minimum and center for different trim positions until you find a point where maximum and minimum are equidistant from center. When this is found Dawn Patrol should accept the joystick calibration.

Aviation casualties

On the face of it, German and British casualty figures would seem to be remarkably similar, with French figures lagging behind. But, as experts point out, the methods of compiling statistics varied from force to force (i.e. 'died' in one arm might mean only 'died of wounds'; in another, it might include 'died of sickness'). The French figures, in particular, are probably incomplete.

	British	German	French
Killed / died	6,166	5,953	2,872
Wounded/injured	7,245	7,350	2,922
Missing / interned	3,212	2,751	1,461
Total	16,623	16,054	7,255

British aviation casualties, by rank

Far more British officers became aviation casualties than did other ranks: altogether there were 12,787 officer casualties, compared with 3,836.

	Officers	Men
Killed:	4,579	1,587
Missing / POW:	2,839	373
Wounded:	5,369	1,876