

# OZISOFT

This card contains the following information:  
Detailed Mission Instructions (especially for your IBM or Tandy computer). These instructions tell you:

- how to load and play Their Finest Hour: The Battle of Britain from the enclosed floppy disks
- how to install the program on a hard disk drive, and start it up
- how to load the Mission Builder
- how to fly a mission right away (Quick Start)
- how to save your Combat Records on a floppy disk
- how the colors described in the manual will look if you're playing with a CGA monitor
- how to use the Frequency Cipher Wheel to tap your aircraft

Also, for general reference, there is a list of keyboard controls, and how to fly the three types of aircraft in Their Finest Hour.

But first, to see any important last minute updates about This Game, try the Mission Builder or the manual, look at the file called "READ.ME." To read this file, insert the 5 1/4" disk labeled "Disk 1" or the 3.5" disk labeled "Disk 1 and 2," then type: readme and press RETURN.

## LOADING INSTRUCTIONS

### Package Contents

Inside the package for Their Finest Hour, you should find the following items:

- a game manual
- two 5 1/4" floppy disks
- a 3.5" floppy disk
- a registration card
- a Frequency Cipher Wheel
- an order form for 3 disks
- a game cassette

If you're missing any of these items, please contact Lucadfilm Games Customer Support at 141-562-1902.

...from the floppy disks. To install Their Finest Hour, we recommend that you copy the game from a hard disk drive, if you have one. To install Their Finest Hour on a hard disk, see the Hard Disk Installation section below.

Before starting Their Finest Hour, remove all RAM resident programs, since they might conflict with the game.

Their Finest Hour is not copy-protected. Before you load it, we urge you to make a backup copy of the game disks by following the instructions in your DOS manual.

The program comes on four 5 1/4" floppy disks, labelled "Disk 1," "Disk 2," "Disk 3" and "Disk 4." It is also available on two 3.5" floppy disks, labelled "Disk 1 and 2" and "Disk 3 and 4." If you have a 3 1/2" drive and the program asks for a 5 1/4" disk, insert Disk 1 and type: a. If you have a 3 1/2" drive, insert Disk 1 and 2.

Start at the A> prompt, and insert the 5 1/4" disk labeled "Disk 1," or the 3.5" disk labeled "Disk 1 and 2," in drive A. Press drive type:

ask

then press RETURN.

### Hard Disk Installation

The program can be easily transferred from the floppy disks to your hard disk drive. First, boot your machine, then insert "Disk 1" or "Disk 1 and 2" in drive A, and type:

a:

Followed by RETURN. Your computer will respond with the prompt "A>". Now type the word:

install

Followed by a space, the letter of your hard disk, a colon, and RETURN. For example, if your hard disk is "C," type:

C: RETURN. This will automatically create a directory labelled "DOB1949" on drive C.

## Their Finest Hour

FOR AMIGA AND IBM

## Reference Card IBM/Tandy

This card contains start-up and additional Mission Instructions specifically for your IBM or Tandy computer. These instructions tell you:

- how to load and play *Their Finest Hour: The Battle of Britain* from the enclosed floppy disks
- how to install the program on a hard disk drive, and start it up
- how to load the Mission Builder
- how to fly a mission right away (Quick Start)
- how to save your Combat Records on a floppy disk
- how the colours described in the manual will look if you're playing with a CGA monitor
- how to use the Frequency Cipher Wheel to tune your aircraft radio

Also, for general reference, you'll find a list of keyboard controls, which allow you to fly the three types of aircraft in *Their Finest Hour*

But first, to see any important last minute updates about *Their Finest Hour* the Mission Builder or the manual, look at the file called "READ.ME." To read this file, insert the 5 1/4" disk labelled "Disk 1" or the 3.5" disk labelled "Disk 1 and 2," then type: **readme** and press **RETURN**.

### LOADING INSTRUCTIONS

#### Package Contents

Inside the package for *Their Finest Hour*, you should find the following items:

- a game manual
- four 5 1/4" floppy disks
- a reference card
- a registration card
- a Frequency Cipher Wheel
- an order form for 3 disks
- a game catalog

If you're missing any of these items, please contact Lucasfilm Games Customer Support at 1415562-1902.

### Starting Up from the Floppy Disks

NOTE: To greatly reduce loading and running times, we recommend that you play the game from a hard disk drive, if you have one. To install *Their Finest Hour* on a hard disk, see the Hard Disk Installation section below.

Before starting *Their Finest Hour* remove all RAM resident programs, since they might conflict with the game.

*Their Finest Hour* is not copy-protected. Before you load it, we urge you to make a backup copy of the game disks by following the instructions in your DOS manual.

The program comes on four 5 1/4" floppy disks, labelled "Disk 1," "Disk 2," "Disk 3," and "Disk 4." It is also available on two 3.5" floppy disks, labelled "Disk 1 and 2" and "Disk 3 and 4." If you have a 3 1/2" drive and the program asks for "Disk 1" or "Disk 2," insert "Disk 1 and 2." If the program asks for "Disk 3" or "Disk 4," insert "Disk 3 and 4."

Start at the A> prompt, and insert the 5 1/4" disk labelled "Disk 1," or the 3.5" disk labelled "Disk 1 and 2," in drive A. From there type:

**bob**

then press **RETURN**.

### Hard Disk Installation

The program can be easily transferred from the floppy disks to your hard disk drive. First, boot your machine, then insert "Disk 1" or "Disk 1 and 2" in drive A, and type:

**a:**

followed by **RETURN**. Your computer will respond with the prompt "A>". Now type the word:

**install**

followed by a space, the letter of your hard disk, a colon, and **RETURN**. For example, if your hard disk is "C," type:

**install c:**

and press **RETURN**. This will automatically create a directory labelled "BOB1940" on drive C.

### Starting Up from a Hard Disk

To play the game once it has been installed on your hard disk, first get to your hard disk prompt. If the disk is "C," type:

**c:**

and press **RETURN**. Then access the BOB1940 directory by typing:

**cd bob1940**

and press **RETURN**. From there type:

**bob**

and press **RETURN**.

### Starting Up Options

When the game starts up, you'll be asked to enter the graphics display you're using. You can skip this graphics display prompt by adding a space and the appropriate letter after you type "bob". For example, to start right up in EGA mode, type:

**bob e**

and press **RETURN**.

In addition, there are three settings you can use to change the amount of ground detail displayed in the game. If you're playing with a slower computer, such as a PC or XT the game will run slower if more ground detail is displayed. For faster machines, such as a newer-model AT or a 386, displaying a large amount of ground detail won't slow the game down at all.

To change the default settings for ground detail, start the game up by typing:

**bob**

followed by a space, then the letter of your graphics mode, another space, and one of these numbers:

**0** (minimal amount of ground detail)

**1** (moderate amount of ground detail)

**2** (maximum amount of ground detail)

You can also change these settings anytime during your mission by pressing **Alt-G**

### LOADING INSTRUCTIONS: MISSION BUILDER

Since the Mission Builder is a separate utility from the game program, you

use a different procedure to start it up.

If you've been playing Their Finest Hour from a hard disk drive, you'll need to get into the BOB1940 directory to use the Mission Builder by typing:

**cd bob1940**

From the directory, type:

**mb**

then press **RETURN**. You'll then be asked to indicate which graphics display you're using.

If you're playing the game from floppy disks, start at the A> prompt, insert "Disk 4" or "Disk 3 and 4" into drive A and type:

**mb**

then press **RETURN**. You'll also be asked to choose a graphics display from the list on the screen.

To continue, see Using the Mission Builder in the Appendix section of the manual.

### QUICK START

If you'd like to take Their Finest Hour for a test flight:

- First, load and start up the program by following the Loading Instructions above.

- When you finish you'll see a title screen, followed by the Main Menu featuring a list of choices surrounded by a painting of the Battle of Britain. Use your game controller to move the arrow on the screen to the menu choice FLY TRAINING FLIGHT. Then click your controller button.

- Next, you'll be at an Aircraft Selection menu. Move the arrow to SPITFIRE, and click your controller button.

- The menu you'll see now will have a list of Training Flights that you can choose from for Spitfire pilots. Move the arrow to the first one, labelled #1, and click your controller button.

- Now you'll be sent to Flight Briefing, which is a screen containing a large map of Southern England, the English Channel, and Continental Europe, along with a row of buttons. Move the arrow to the button at the bot-

tom of the screen labelled GO FLIGHT, and click your controller button.

- You'll immediately find yourself flying in a Spitfire over the chilly waters of the English Channel. Several Luftwaffe Bf 109 fighters are flying around, but won't fire back at you. Your fighter has unlimited fuel and ammunition, and can't crash. If you need to pause the flight, press:

**alt-p**

Your mission objective is to shoot down all the German fighters. Refer to the angle Seat Fighter Cockpit Controls section in the Mission Instructions: In-Flight chapter of the manual for more information about flying your fighter and using its machine guns.

- To end your mission, type:

**q**

at any time. This will first give you a post-flight evaluation, then return you to the Main Menu. You may also press:

**esc**

anytime during your mission to return to DOS.

- For more comprehensive instructions, turn to the Mission Instructions.. Pre-Flight chapter of the manual.

### SAVING COMBAT RECORDS ON A FLOPPY DISK

If you're running the program from the floppy disks and wish to save the Combat Records of the pilots and crews you create, you must format a floppy disk before you start playing the game. Then, at various times throughout the game, the program will ask you to insert this Combat Records disk

If you're playing the game from a hard disk, your Combat Records will automatically be saved on that disk in the BOB1940 directory.

### CGA COLOUR CHART

If you're using a CGA graphics display, the colours on your screen may look different from those described in

the manual. This is especially critical when you're flying in a medium bomber.

The colours of a medium bomber's gun indicator lights tell you where enemy planes are attacking from, and give you the status of your machine gun positions.




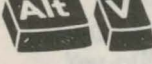



The chart at left can be used as a reference if you're playing the game in this mode.

Colour Described in the Manual	CGA Colour Displayed on Your Screen
Black	Black
Yellow	White
Blue	Blue and Black
Red	Magenta
Green	Light Blue

### KEYBOARD REFERENCE

The following keys are a summary of the controls used in Their Finest Hour. For a more detailed discussion of the cockpit controls for each of the three types of aircraft in the game (single-seat fighters, doubleseat fighters and dive bombers, and medium bombers), see the Mission Instructions: In-Flight chapter of the manual

### Game Controls

Key	Function
	Pauses game; press any key to continue
	Turns all game sounds off and on
	Turns engine sound off and on
	Gives version number of game
	Lets you adjust joystick
	Changes amount of ground detail to speed up game if it is running sluggishly
	Exits the game; returns you to your computer's operating system

## Weapons Controls

Key	Function
Left controller button or <b>SPACE BAR</b>	Fires forward machine guns or gunner position machine gun
Right controller button or period (.) key	Fires 20 mm cannon (Bf 109 and Bf 110 only)
Left AND right controller buttons or <b>RETURN</b>	Drops bombload (except fighters)



Lets you toggle between bombload settings (dive bombers and medium bombers only)



Fires gunner position machine guns automatically

## Cockpit Controls

Key	Function
+	Increases throttle 1• (shift key not needed)
-	Decreases throttle
L	Lowers and raises landing gear (except Ju 87 Stuka)
F	Lowers and raises flaps
D	Extends and retracts dive brakes (Ju 87 Stuka and Ju 88 only)
C	Turns replay camera on and off
R	Sends you to Review Combat Film to watch your replay camera movie
M	Sends you to In-Flight Map/Radio
A	Turns on the automatic pilot
J	Lets you and your crew, if any, jump from plane and parachute to safety
Q	Ends mission; sends you to post-flight evaluation

## View Controls

Key	Function
8	Forward view
6	View right
4	View left
3	View straight down
9	Scan view
2	Rear view (single-seat fighters), or moves you to rear gunner's seat (double-seat fighters and dive bombers)

## Switching to Different Positions

G	Moves you to gunner position (except fighters)
B	Moves you to bombardier position (medium bombers only)
P	Moves you to pilot position (except single-seat fighters)
7	Toggles you between pilot and gunner or bombardier positions (except single-seat fighters)

## Moving to Different Gun Positions (medium bombers only)

8	Nosegunner
6	Right fuselage gunner (except Ju 88)
4	Left fuselage gunner (except Ju 88)
5	Belly gunner (Lower fuselage, rear-facing)
2	Dorsal gunner (upper fuselage, rear-facing)

## TUNING YOUR RADIO WITH THE FREQUENCY CIPHER WHEEL

Inside the game box you'll find a wheel with various German unit insignias around its perimeter. This is the Frequency Cipher Wheel. You'll use it to tune the frequency of your plane's

radio so you can receive vital information about enemy aircraft sightings. These sightings will be shown on the In-Flight Map/Radio, and you'll also be given information about the number and type of enemy aircraft, their altitude, and their course. If you don't tune your radio properly, you won't be able to receive any enemy sighting reports, which will greatly hinder your chances for a successful mission.

When you first begin a mission you'll be in the cockpit of your chosen aircraft. You'll need to tune the frequency of the cockpit radio if the light next to it is not lit. You'll also receive on-screen reminders to tune your radio. To move to the In-Flight Map/Radio screen, where you can tune your radio, press **M**.

Once you're at the In-Flight Map/Radio, use your controller to move the arrow to a button labelled TUNE RADIO, located at the bottom of the screen. Then click your controller button. You'll then see a unit insignia, plus the name of an airfield, in a column at the right of the screen.

Now pull out your Frequency Cipher Wheel. Move the wheel around, and line up the notch to the unit insignia on the wheel's perimeter that matches the unit insignia on the screen. Next look on the inner wheel of the Frequency Cipher Wheel, and find the airfield name that matches the one on the screen. Next to the airfield name on the wheel, you'll see a window with three coloured numbers inside. These three numbers together make up your correct radio frequency. Use the controller to move the arrow to the up or down arrow icons in the lower right-hand corner of the screen. Click the controller button on these icons to select the correct number. Then, move the arrow to the colour display, and click the controller button to select the correct colour. Make sure that the three coloured numbers in the window match the ones you've just selected on the screen.

When your radio is tuned correctly, move the arrow to the box titled CONTINUE, and click your controller button to resume your flight.

For more information about the radio, turn to the InFlight Map/Radio section of the Mission Instructions: InFlight chapter of the manual.

## Reference Card Amiga

This card provides start-up instructions for playing Their Finest Hour. The Battle of Britain on an Amiga 500,1000, or 2000 computer. You'll also find additional Mission Instructions, including a list of keyboard controls for

flying all three types of aircraft in Their Finest Hour. The information on this card describes how to:

- load and play Their Finest Hour from floppy disks
- install the program on a hard disk drive
- save your Combat Records on floppy disk
- load the Mission Builder
- fly a quick training mission (Quick Start)
- use the Radio Frequency Cipher Wheel to tune your aircraft radio

Before proceeding with these instructions, you should examine the READ.ME text file on Disk 1 to learn of any last minute updates to the program, the Mission Builder, or the manual. To access this file:

1. Insert Disk 1 into any disk drive.
2. Type read me and press

## RETURN

## Game Controllers

You can use a mouse, a joystick, or the keyboard controls when playing Their Finest Hour.

## Memory Requirements

The more available free memory you have in your computer, the more game features you'll be able to use.

Examine the READ.ME file on Disk 1 for more details. You can play Their

Finest Hour on a 512K machine, but you'll hear no sound effects and certain graphic enhancements will be missing. Also, a 512K machine only allows you to run the program from floppy disks, and you'll be unable to use a hard drive. Sound effects, enhanced graphics, and the ability to run the game on a hard drive are features available only on machines with IMB of memory or more.

## LOADING INSTRUCTIONS

### Package Contents

The game package contains the following items:

- one Game Manual
- two 3.5inch disks, labelled "Disk 1" and "Disk 2"
- one Radio Frequency Cipher Wheel
- one Reference Card
- one Game Catalog

If you're missing any of these items, please contact Lucasfilm Games Customer Support at 1-415-662-1902.

### Running the Program from Floppy Disk

**NOTE:** Running Their Finest Hour from a hard drive will greatly reduce loading and running times. To install the program on a hard drive, please refer to the Hard Drive Installation section of this Reference Card.

Since Their Finest Hour is not copy-protected, we urge you to make backup copies of the two game disks by following the instructions in your Amiga manual. If you use the Duplicate function from the Workbench, you must change the name of Disk 1 to "bob1," and Disk 2 must be renamed "bob2."

### Cold Start

If your Amiga hasn't been started up yet:

1. Turn on the computer.
2. When you're asked for the Workbench disk, insert Disk 1 into drive df0.
3. Insert Disk 2 into any drive when prompted.

### Warm Start

If your Amiga is already up and running:

1. Take out the Workbench disk.
2. Insert Disk 1 into drive df0.
3. Press the Ctrl key and the two Amiga keys simultaneously.
4. Insert Disk 2 into any drive when prompted.

### HARD DRIVE INSTALLATION

To install Their Finest Hour on a hard drive:

1. Starting from the CLI, type **cd**, a space, the name of your hard drive, and a colon. For example, if you're starting from a hard drive named "dh0," you'd type **cd dh0:**.
2. Press **RETURN**.
3. Type **makedir bob1940** and press **RETURN**.
4. Insert Disk 1 into any drive.
5. Type copy **bob1: bob1940 ALL**

**QUIET** and press **RETURN**.

6. Insert Disk 2 into any drive.
  7. Type copy **bob2: bob1940 ALL**
- QUIET** and press **RETURN**.
8. Type **cd bob1940** and press **RETURN**.

9. Type **copy bob1940.info /** and press **RETURN**.

10. Type **delete bob1940.info** and press **RETURN**.

The program will now be installed on your hard drive.

### Starting Up from a Hard Drive

When playing from a hard drive, you can start up the program from either the Workbench or the CLI. From the Workbench:

1. Click on the hard drive icon containing the "bob1940" directory.
2. When the window opens, click on the drawer labelled "bob1940."
3. When the drawer opens, click on the icon labelled "bob." This will start up the program.

To start up the program from the CLI:

1. Get to the CLI prompt, and type

**cd**, followed by a space, the name of your hard drive, and a colon.

2. Press **RETURN**.

3. Type **cd bob1940** and press **RETURN**.

This will take you to the directory that contains the game.

4. Type **bob** and press **RETURN**. The program will now start up.

### SAVING COMBAT RECORDS ON A FLOPPY DISK

If you're running the program from floppy disks and wish to save pilot and crew records, Custom Missions, Campaign Missions, and combat film replays, you must format a floppy disk before you start the game. This disk must be titled "bobdata." At various times throughout the game, the program will ask you to insert this data disk.

If you're running the program from a hard drive, your Combat Records will automatically be saved in the "bob1940" directory.

To format a disk from the Workbench:

1. Insert a blank disk into any drive.
2. Select the disk icon.
3. Choose initialize from the disk menu.
4. Choose Rename from the Workbench menu after the disk has been initialized.
5. Use the Cursor key and the Delete key to erase the word "Empty"

6. Type **bobdata** and press **RETURN**. To format a disk from the CLI:

1. Insert a blank disk into any drive.
2. Type **format drive, the name of your drive, a colon, the word name, and then bobdata**. For example, if you're formatting a disk in drive df1, you'd type: **format drive df1: name bobdata**. Be sure to include the proper spaces when you're typing.
3. Press **RETURN**.

### LOADING INSTRUCTIONS: MISSION BUILDER

Since the Mission Builder is a sepa-

rate utility from the game program, you must use a special procedure to start it up.

If you've been running Their Finest Hour from a hard disk, you can access the Mission Builder from either the Workbench or the CLI.

To access the Mission Builder from the Workbench, simply click on the icon labelled "mb" that you'll find in the "bob1940" drawer.

To access the Mission Builder from the CLI, you'll need to get into the "bob1940" directory:

1. Type **cd bob1940** and press **RETURN**.

2. Type **mb** and press **RETURN**.

If you're running the game from floppy disks, follow the procedure described under "Cold Start" or "Warm Start," but insert Disk 2 when you're asked for the Workbench disk.

To continue, see Using the Mission Builder in the Appendix section of the manual.

### QUICK START

Follow these instructions if you'd like to take Their Finest Hour for a quick test flight.

1. Load and start up the program by following the Loading Instructions above. A title screen will appear followed by the Main Menu.

2. Select **FLY TRAINING FLIGHT** from the Main Menu by clicking on it. An Aircraft Selection menu will appear.

3. Click on **SPITFIRE**. A Spitfire Training Flights menu will appear.

4. Click on **SPITFIRE #2**. You'll then be sent to Flight Briefing, which contains a large map of Southern England, the English Channel, and Continental Europe, along with a row of buttons at the bottom of the screen.

5. Click on the **GO FLIGHT** button. You'll soon find yourself flying in a Spitfire over the chilly waters of the English Channel. Several Luftwaffe Bf 109 fighters are flying around, but won't fire back at you. Your fighter has unlim-

ited fuel and ammunition, and can't crash.

Your mission objective is to shoot down all the German fighters. Refer to the Single Seat Fighter Cockpit Controls section in the Mission Instructions.' In-Flight chapter of the manual for more information about flying your fighter and using its machine guns.






If you need to pause the flight, press Alt-P. To end your mission, type q at any time. This will first give you a post-flight evaluation, then return you to the Main Menu. You may also press esc at any time during your mission to leave the program.

For more comprehensive instructions, turn to the Mission Instructions.' Pre-Right chapter of the manual.

### KEYBOARD REFERENCE

The following keys are a summary of the controls used in Their Finest Hour. For a more detailed discussion of the cockpit controls for each of the three types of aircraft in the game (single-seat fighters, double-seat fighters and dive bombers, and medium bombers), see the Mission Instructions: In-Flight chapter of the manual.

### Game Controls

Key	Function
	Pauses game; press any key to continue
	Turns all game sounds off and on
	Turns engine sound off and on
	Gives version number of game
	Changes amount of ground detail to any of three settings to speed up game if it is running sluggishly



Exits the game. (If you're playing from a hard drive, you'll leave the program. If you're playing from floppy disks, you'll need to reboot the system.)

### Weapons Controls

Key	Function
Left mouse button or SPACE BAR	Fires forward machine guns (fighter), position machine gun (all other aircraft)
Right mouse button or period (.) key	Fires 20 mm cannon (Bf 109 and Bf 110 only)
RETURN	Drops bombload (except fighters)
Joystick button	Fires machine guns or cannon (see X below)



Lets you toggle joystick button between machine guns and cannon (Bf 109 and Bf 110 only)










Lets you toggle between bombload settings (dive bombers and medium bombers only)



Fires gunner position machine guns automatically

### Cockpit Controls

Key	Function
	Increases throttle (shift key not needed)
	Decreases throttle
	Lowers and raises landing gear (except Ju 88 Stuka)
	Lowers and raises flaps
	Extends and retracts dive brakes (Ju 87 Stuka and Ju 88 only)
	Turns replay camera on and off
	Sends you to Review Combat Film to watch your replay camera movie



Sends you to In-Flight Map/Radio Dorsal gunner



Turns on the automatic pilot



Toggles between normal and accelerated time



Gives you the location of your aircraft



Lets you and your crew, if any, jump from plane and parachute to safety



Ends mission; sends you to post-flight evaluation

### View Controls



Forward view



View Right



View left



View straight down



Scan view

### Switching to Different Positions



Moves you to gunner position (except fighters)



Moves you to bombardier position (medium bombers only)



Moves you to pilot position (except fighters)



Toggles you between pilot and gunner positions (except fighters)

Moving to Different Gun Positions (medium bombers only)



Nose gunner



Right fuselage gunner (except Ju 88)



Left fuselage gunner



Belly gunner (lower fuselage, rear-facing)



Dorsal gunner (upper fuselage, rear-facing)

### TUNING YOUR RADIO WITH THE RADIO FREQUENCY CIPHER WHEEL

Inside the game box you'll find a wheel with various German unit insignias around its perimeter. This is the Radio Frequency Cipher Wheel. You'll use it to tune the frequency of your plane's radio so you can receive vital information about enemy aircraft sightings. These sightings will be shown on the In-Flight Map/Radio, and you'll also be given information about the number and type of enemy aircraft, their altitude, and their course. If you don't tune your radio properly, you won't be able to receive any enemy sighting reports, which will greatly hinder your chances for a successful mission.

When you first begin a mission you'll be in the cock

pit of your chosen aircraft. You'll need to tune the frequency of the cockpit radio if the light next to it is not lit. You'll also receive on-screen reminders to tune your radio. To move to the In-Flight Map/Radio screen, where you can tune your radio, press M.

Once you're at the In-Flight Map/Radio:

1. Click on the TUNE RADIO button at the bottom of the screen. A unit insignia and the name of an airfield will appear in a column at the right of the screen.

2. Move the Radio Frequency Cipher Wheel around, until the notch lines up with the unit insignia on the wheel's perimeter that matches the insignia on the screen.

3. Look on the inner wheel of the Radio Frequency Cipher Wheel, and find the airfield name that matches the airfield name on the screen. Next to the airfield name on the wheel, you'll see a window with three coloured numbers inside. These three numbers together make up your correct radio frequency.

4. Click on the up and down arrow icons to select the correct numbers.

5. Click on the colour display on the

screen to select the correct colours for each number. Make sure that the three coloured numbers in the window match the ones you've just selected on the screen.

6. Click on the DONE button when you've finished setting the radio frequency. If your radio is tuned properly, the light at the top of the screen next to the frequency display will now be illuminated.

7. Click on the CONTINUE button to resume flight.

For more information about the radio, turn to the In-Flight Map/Radio section of the Mission Instructions.' Pre Flight chapter of the manual.

## LOADING INSTRUCTIONS

Remove the floppy disks marked Their Finest Hour: The Battle of Britain from the disk envelope inside the box, along with the Frequency Cipher Wheel. Then look at the Reference Card, also inside the box, to find the Loading Instructions. These instructions tell you how to start the game from the floppy disks, plus how to install and play it from a hard disk drive. When you've finished loading the game, see the Game Controllers section which follows.

## GAME CONTROLLERS (MOUSE/JOYSTICK/KEYBOARD)

In this manual, the word "controller" will be used to refer to your mouse, joystick, or keyboard cursor keys (arrow keys). "Controller buttons" will refer to the buttons on the mouse or joystick. If you're playing with a keyboard, there will be corresponding keyboard keys that will serve as controller buttons.

To find out which controllers the program supports on your computer please see your Reference Card.

If your computer doesn't support a mouse or a joystick, the keyboard will control all of the game functions, and the cursor keys used to pilot aircraft and move machine guns around. However, if your computer does support a joystick or mouse, we urge you to use it, as controlling the game is easier than with the cursor keys. The joystick gives the best true-to-life control, particularly for piloting the plane and performing aerial maneuvers. The mouse gives the best fine control, which is important for precision maneuvers such as aiming guns and moving a fighter into a favorable position from which to attack.

### Adjusting Your Joystick

If you are using a joystick when you first start up the game, the program will ask you if you want to use it. Press the Y key if you're using a joystick, and the N

key if you're using a different controller. If you press the Y key, the program will walk you through a three-step joystick adjustment process:

1. First, centre the joystick and click any joystick button.

2. Next, while holding the joystick in the top left corner, click any joystick button.

3. Finally, while holding the joystick in the lower right corner click any button.

You can adjust your joystick anytime during the game by pressing Alt-C.

### Using the Controller to Select from the Menus and Screens

After you've loaded Their Finest Hour you'll need to move through several menus that allow you to select missions, choose aircraft, keep track of Combat Records, and more. You'll also need to select icons on different screens throughout the program. Whenever you're at a menu or screen, you'll see a list of choices, or icons, along with a floating arrow. To make your selection, use your controller to move the arrow over the desired choice or icon, then click your controller button.

### Non-Standard Mouse or Joystick Buttons

If you're playing the game with a joystick or mouse that has an unusual button configuration, you may be confused when the game instructions call for pressing the "left" or "right" controller button. Here's an easy way to find out which of your buttons is considered left and which is considered right. First, read the following Main Menu section, then read the Training Flights section. Select a Bf 109 from the list of aircraft shown on the Training Flight screen. You'll soon find yourself in the cockpit of this fighter, where you'll see two numbers, showing the number of ammunition rounds you have in your machine guns and cannon. Pressing one of the buttons on your joystick or mouse will make the top number decrease. This

button is the one referred to as the "left" button. The other button will make the bottom number decrease. This button is the "right" button.

## MAIN MENU

When you get to the Main Menu, you'll see a box with a list of choices, surrounded by scenes from the Battle of Britain. On the left, Spitfires soar high above the English Channel, barrage balloons, radar installations, and the white cliffs of Dover. On the right, Stukas dive-bomb ships in the Channel while medium bombers roar off toward England.

Use the floating arrow to choose any of these Main Menu selections:

### FLY TRAINING FLIGHT

This lets you hone your flying, shooting, and bombing skills in a variety of practice situations. The results of these Training Flights will not count on your Combat Record.

### FLY COMBAT FLIGHT

This lets you fly an actual mission, the results of which will count on your Combat Record.

### FLY CUSTOM MISSION

This lets you fly in missions that you've created with the Mission Builder (see your Reference Card for more information on using the Mission Builder).

### PLAY CAMPAIGN

This lets you take part in various campaign missions, where you can change the historical outcome of the Battle of Britain if you're good enough.

### REVIEW COMBAT RECORDS

This lets you look over the records of the pilots and crews who have flown on your missions.

### REVIEW COMBAT FILM

This sends you to the Review Combat Film room, where you can watch the combat action you've recorded and saved from your various missions.

### EXIT FROM PROGRAM

This lets you leave the game and

return to your computers operating system.

## TRAINING FLIGHTS

To learn and practice the skills you'll need when flying a combat mission, we encourage you to fly as many Training Flights as you can. Since the results won't count on your Combat Record, you can experiment, take foolish chances, and make lots of mistakes. Training Flights are the best way to develop that "combat edge" you'll need in battle.

When you choose FLY TRAINING FLIGHT from the Main Menu, you'll be presented with an Aircraft Selection menu. There you'll see eight German and British aircraft you can choose from. Move the arrow to either the aircraft silhouette or the name next to it, then click the controller button to make your selection.

Next you'll be shown a Training Flight Selection menu. This has a list of four Training Flights specific to

that type of aircraft you've selected. For example, the training missions you can choose for a fighter include forward gunnery practice, intercepting bombers, and escorting bombers. The first mission on each of the lists is fairly easy, but subsequent ones become increasingly difficult. Once you've selected a Training Flight, you'll be sent to Flight Briefing before you begin your flight.

## COMBAT FLIGHTS

With these missions, you'll be reliving historically authentic flights that took place during different phases of the Battle of Britain (see the *Historical Overview* chapter for more information). When you're flying one of these Combat Flights, you'll select from a roster of pilots you've created for the side you're flying on. Their successes and failures will be kept track of in a Combat Record. Medals and promotions will be won by those who are skillful and courageous in

battle, but a far less glorious fate awaits those who are not.

To select a Combat Flight, move the arrow to FLY COMBAT FLIGHT on the Main Menu, and press the controller button. Next you'll be at an Aircraft Selection menu, where you'll see eight German or British aircraft silhouettes. Click on either the silhouette of the plane you want to fly or the name next to it. You'll then move to a Flight Selection menu, where you can choose from eight historically-based missions appropriate for the type of aircraft you've selected. These choices are ranked in order of difficulty, with the first choices being relatively easy, and the succeeding choices becoming increasingly difficult. You'll only see the first four mission choices when you come to the menu. To see the next four choices, press FORWARD. If you'd like to see the previous four choices again, press BACK. To make your selection, move the floating arrow to either the mission text or the number on the left side, and press your controller button. To leave the Flight Selection menu altogether press EXIT. When you have selected a mission, you'll move to Flight Briefing.

## CUSTOM MISSIONS

When you pick this selection from the Main Menu, you'll be shown a list of all the missions you've previously created with the Mission Builder (see your Reference Card for more information about building your own missions). If the list is a long one, move the floating arrow to the down arrow icon next to the list, and hold down your controller button to view all the missions on the list. Move the arrow to the up arrow icon and hold down your controller button to move back up the list. When you've found the mission you want to fly, click the arrow on it to select it. You'll then go to Flight Briefing.

## CAMPAIGN MISSIONS

When you play Campaign Missions, you get a chance to change the historical outcome of the Battle of Britain. You can choose to command either the British or the German side, and fly a number of consecutive missions on that side starting from July 10, 1940, the date generally recognized as the commencement of the Battle of Britain. Due to the changing weather conditions at that time of year, you'll only be flying a mission every two or three days. The success or failure of each of your individual missions is magnified, since each outcome reflects upon your entire side during the battle. Also, the effects of one mission are carried over to subsequent missions. For example, if you're playing on the German side, and you bomb certain installations, those installations will remain out of action for a given length of time.

Alter every mission, a scoring screen will let you know how close your side is to winning or losing the campaign. If you're directing the British side, you'll win the Battle of Britain by surviving until September 16. This was the date by which the Luftwaffe needed to gain air superiority so that Operation Sea Lion, the invasion of England, could be launched. You'll also win by shooting down enough Luftwaffe aircraft to deplete their air strength to the point where they can no longer continue their aerial assault. If you're directing the German side, you'll win by destroying enough Fighter Command aircraft, either in the air or on the ground, so that the Luftwaffe gains air superiority over England and the invasion can take place. No matter which side you choose, final victory may require that you direct from fifteen to twenty-five missions. (For more information about actual British and German campaign strategies you might want to experiment with, see the *Historical Overview* chapter.)



### Starting a Campaign

To begin a campaign, choose **PLAY CAMPAIGN** from the Main Menu. You'll then see another menu, with the following choices:

#### **START NEW CAMPAIGN DIRECTING THE RAF**

This creates a new British campaign, with the starting date set at July 10, 1940. At the text cursor, type in the name of your campaign, and press **RETURN**. You'll then go to the Campaign Map.

#### **START NEW CAMPAIGN DIRECTING THE LUFTWAFFE**

This creates a new German campaign, which will also start on July 10, 1940. Type in the name of your campaign, press **RETURN**, and you'll be sent to the Campaign Map.

#### **CONTINUE CAMPAIGN IN PROGRESS**

Choosing this displays the list of available campaigns that have already been created and saved on disk. If this list is a long one, move the floating arrow over the down arrow icon, and hold the controller button to look down the list. To look back up the list, hold the controller button after you move the floating arrow over the up arrow icon. At the bottom of the list, you'll also see two buttons, labelled **RETRY** and **CANCEL**. If you're saving your campaigns on floppy disks, and want the program to search a particular disk for your campaign, insert that disk and press **RETRY**. If you don't want to direct any of the campaigns listed, and want to direct a new one instead, press **CANCEL**. Once you've selected an available campaign, you'll move to the Campaign Map.

**EXIT** This sends you back to the Main Menu.

#### **Campaign Map**

After you've started a new campaign or chosen an existing one, you'll go to the Campaign Map. At the top of this map is the word "CAMPAIGN," along with the name of your campaign, plus its

historical date and time. From this map you'll send your forces into combat on the date shown above. You'll organize your aircraft into flight groups, give them orders, and begin that day's mission by taking the controls of one of the planes.

This Campaign Map resembles the Flight Briefing Map, with the English Channel, Southern England, and the north coast of France displayed (see the Flight Briefing section for comparison). The map will contain different information for each side. If you're playing an RAF campaign, you'll see icons on the map representing all the different British ground installations and ship convoys, with a special highlight on those that are about to be attacked. These targets include airfields, radar sites, and factories. You may also see icons that represent formations of incoming Luftwaffe aircraft. If you're playing a Luftwaffe campaign, you'll see icons representing all the possible targets you can attack, including ground installations and ship convoys. You'll then have to decide which ones to send your aircraft to assault.

To reveal information about the ground installations on your map, move the floating arrow over any installation icon. In the column in the lower right-hand corner of the screen, you'll see the name of the installation, along with its status (whether or not it has been previously damaged or destroyed in the campaign).

For both German and British campaigns, you'll see four buttons at the bottom of the screen:

#### **BRIEFING**

This gives you a description of the status of your campaign, and tells you how close each side is to victory or defeat.

#### **ROSTER**

This lets you create and select pilots and crews for that day's mission (see the flight Roster section for more information).

#### **CANCEL**

This sends you back to the Main Menu.

#### **GO FLIGHT**

This lets you begin your mission.

#### **Flight Groups**

Before you begin a Campaign Mission, you'll need to assign the aircraft under your command to various flight groups. A flight group is a given number of aircraft that fly together as a unit. You determine the number and type of aircraft in each flight group, and then assign it to a specific mission objective by creating a flight plan.

Next to the words "PLANES AVAILABLE" on the screen is a number indicating how many aircraft are available to be placed in your flight groups. Below these words are five buttons which you use to determine the composition of each group:

#### **FLIGHT GROUP**

Click your controller button to cycle through the flight groups you have on hand, plus those you have yet to create. To create a flight group, you must select a plane type (see below) and allocate at least one plane to that flight group from the pool of available planes.

#### **PLANE TYPE**

Click your controller button to cycle through the different types of aircraft you can allocate to a particular flight group. Each flight group must be made up of the same type of aircraft. For example, if you're flying an RAF campaign, you cannot have a flight group with both Spitfires and Hurricanes in it. However, you can create one flight group of Spitfires and a second of Hurricanes.

#### **NUMBER OF PLANES**

This lets you select the number of aircraft for the flight group you're creating. There must be at least one plane in a flight group before that group can fly your mission. Press the left controller button to increase the number, and the right controller button to decrease it.

#### **FORMATION**

Click your controller button to cycle through and set the flight formation for the current flight group you're creating.

#### **ORDERS**

Click your controller button to cycle through and set the mission orders for your current flight group. If you're directing the RAF, you can choose to have your fighters attack either enemy bombers or fighters. If you're directing the Luftwaffe, your choices vary, depending upon the type of aircraft. German fighters can fly in a bomber escort role, or a free-ranging role. *Jabo* fighter/bombers can either fly bomber escort, drop bombs, or strafe installations.

#### **Flight Plan**

After you've created a flight group, you must implement a flight plan for it. To do this you'll plot a course by placing a series of navigation points on the Campaign Map for the group to follow. A flight plan is composed of up to six of these points, including a starting point (**BEGIN**), four rendezvous points (**WAY POINTS 1-4**), and an airfield at a home-base point to return to (**LAND**). For fighter *Combat Air Patrol* (**CAP**) missions, the flight group will patrol an area by repeating the flight plan until it runs low on fuel. For fighter escort and bomber missions, the flight group follows the flight plan only once.

To create a flight plan, look below the flight group buttons. There, you'll see a chart which looks like this:

<b>FLIGHT PLAN</b>	<b>ALT</b>	<b>ATK</b>
<b>BEGIN</b>		
<b>WAY POINT 1</b>		
<b>WAY POINT 2</b>		
<b>WAY POINT 3</b>		
<b>WAY POINT 4</b>		
<b>LAND</b>	<b>DELETE</b>	

To choose where the flight group will begin its mission from, click on **BEGIN**. A star will appear to the left of the word. Move the floating arrow to the desired location on the Campaign Map, and click

the controller button. A starting point icon will appear on the map. If you change your mind, move the arrow to a new location, and click the button again. RAF flight groups can only begin their missions over England or the English Channel. Luftwaffe flight groups can only begin their missions over Continental Europe or the English Channel.

Now look on the screen for the word "ALT" next to the words "FLIGHT PLAN." This shows the current cruising altitude for this flight group, and is given in thousands of feet. (For example, if the number reads "11," the current cruising altitude is 11,000 feet.) Click the left controller button to increase the altitude at which the flight group begins its mission, and the right controller button to decrease the altitude.

You set the locations of the four Way Points the same way you set the BEGIN location. First, click on Way Point 1, move the arrow to the desired location on the map, and click your controller button. An icon will appear on the map to represent the location of that Way Point. Click on the number below ALT to adjust the altitude for your flight group flying toward Way Point 1. If you wish, repeat this procedure for Way Points 2, 3, and 4. You can plot a course with these different Way Points to confuse or divert the enemy.

If you're directing a Luftwaffe campaign, bomber or fighter/bomber flight groups will automatically bomb a target if it is located where you've placed a Way Point icon. If you don't want to attack this target, look for the word "ATK" (attack) next to ALT. The word YES will appear if an attack will occur. To call off the attack, click on YES and that word will go away.

To assign each flight group to a home-base landing area, click on LAND, move the arrow to the desired airfield on the map, then click the controller button.

After you've created a flight plan, you may want to modify it by removing one or more of the Way Points. To do so, click on the Way Point you'd like to remove, then click the DELETE button, which is located to the right of the LAND button. This will remove that Way Point icon from the map.

### Campaign Results

Although it may seem like you're fighting the Battle of Britain with just a handful of aircraft, the success of each of your missions represents the degree of success for your entire side. For example, if you successfully bomb radar installations on a Luftwaffe bombing mission, then the rest of the Luftwaffe will have been equally successful bombing similar targets elsewhere in Southern England.

On the Campaign Results screen at the end of your mission, you'll see a chart outlining how your mission results affected the status of each side. It also shows the total air strength remaining for both sides. The percentage of available RAF pilots, planes, and airfields will fluctuate, as will the number of available Luftwaffe planes and crews. These percentages determine how close each side is to winning or losing the Battle of Britain.

### REVIEW COMBAT RECORDS

When you choose REVIEW COMBAT RECORDS from the Main Menu, another menu will appear listing five categories of pilots and crew whose records you can review:

- RAF PILOTS
- Bf 109 PILOTS
- Bf 110 CREWS
- Ju 87 STUKA CREWS
- BOMBER CREWS

You can also choose EXIT, which will return you to the Main Menu.

Use the floating arrow to make your selection. The next menu you'll see will have two lists. The list on the left will

show all the current pilots or crews that exist in that category. If this is a long list, move to the down arrow icon next to the list, and press and hold your controller button to see all of the names on the list. Press and hold your controller button on the up arrow icon to move up the list. The list on the right will show the "Top 10" pilots or crews, with their names, the number of missions flown, and evaluation numbers rating their past combat experience. To look at the record of an individual pilot or crew, move the arrow to their name, and click the controller button. The next screen you'll see will give you detailed information, including rank, status, number of missions flown, number of air victories, number of bombloads dropped, targets destroyed, and number of planes lost.

Choosing REVIEW COMBAT RECORDS only lets you look at pilots' and crews' records. To create pilots and crews go to the Flight Roster screen, which you access from Flight Briefing (see the Flight Roster section for more information).

### REVIEW COMBAT FILM

Whenever you're flying a mission, you can record your combat action with the replay camera. Pressing the C key turns on the camera, which is located in the cockpit of your aircraft. A number next to the camera indicates the percentage of film you have left. You can turn off your camera by pressing C again, by waiting until the film runs out, or by pressing R, which sends you to the Review Combat Film screen. You can also get to this screen by selecting REVIEW COMBAT FILM on the Main Menu.

Once you've made your film and pressed R, you'll be at a screen with the words "REVIEW COMBAT FILM" in the upper part, along with the name of the plane you were flying in when you made your film. At the bottom \_ of the screen,

you'll see a floating cursor which you can move with your controller. You'll position this cursor over the desired red buttons on the bottom of the screen, and press your controller button to activate them.

### The View Window

The playback of your film will be shown in the view window in the centre of the screen. To the left and right of the view window, you'll see two numeric lists, one marked YOU, the other marked CAMERA. The YOU list shows flight statistics for the aircraft you were flying, while the CAMERA list shows flight statistics from the camera's vantage point, which you can change with the view mode and vantage point controls (see below). Both of these displays show the aircraft's IAS (Indicated Air Speed), the ALTITUDE, the RATE OF CLIMB (+ or - in feet per minute), the HEADING (in number of degrees), the PITCH (the angle of the nose of the aircraft in degrees above or below the horizon), and the amount of AMMUNITION left.

### Playback Controls

The playback controls in Review Combat Film are located directly below the view window. These controls are similar to those of a VCR. To start the playback of your film, press PLAY. To stop it at any time, press STOP. To fast-forward it at any time, press FWD. To rewind it, which you'll need to do when the end of the film has been reached, press REW. To leave Review Combat Film altogether, press EXIT. You'll be sent back to your aircraft if you were flying a mission; otherwise, you'll be sent back to the Main Menu.

Button	Function
REW	Rewinds film to start
STOP	Pauses the film
PLAY	Starts the film play back
FWD	Fast-forwards the film
EXIT	Exits you from Review Combat Film screen

### View Modes

Below the playback buttons at the bottom are three additional red buttons, which control different view modes. Whenever you have selected any of these modes, the word above the button will be highlighted. In the CHASE view mode, the camera looks forward from directly behind your aircraft. This is the view mode you always start in when you first come to the Review Combat Film screen. The next button, COCKPIT gives you the view from where the pilot is sitting. The final button, FREE, is a free floating eye-in-the-sky. You can pan this eye in-the-sky around by pressing U (up), D (down), L (left), or R (right). To move the camera forward in the FREE mode, press and hold the square button in the middle of U, D, L, and R. To move the camera straight up or down, press either the red up arrow or the red down arrow.

Button	Function
CHASE	Displays film from behind aircraft
COCKPIT	Displays film from cockpit of aircraft
FREE	Displays film from free-floating position in the sky
U, D, L, R	Pans camera position up, down, left, or right (FREE mode only)
Red square	Moves camera forward (FREE mode only)
Red up arrow	Moves camera view up (FREE mode only)
Red down arrow	Moves camera position down (FREE mode only)

### Switching Vantage Points

The buttons on the far right allow the camera to be switched to many vantage points, including different aircraft and objects. If you press the YOU button, the camera will be positioned on or near your aircraft, depending on your view mode. If you press the AIR button, the camera will be positioned from any object that was in the air when you

made your film, except for bombs. These objects can include other aircraft, barrage balloons, and even men in parachutes who have bailed out. Press the AIR button repeatedly to cycle through all the different airborne objects, and change the view mode for additional camera positions. If you press the GRND button, the camera will be positioned from targets on the ground. If any aircraft dropped bombs while you were filming, press BOMB to get a bomb's point of view. You can press YOU, AIR, GRND, or BOMB at anytime during your replay. The name of the object or aircraft that the camera is positioned on will always appear on the display at the top of the screen, next to the words "REVIEW COMBAT FILM."

Button	Function
YOU	Moves vantage point to your aircraft
AIR	Moves vantage point to objects in air
GRND	Moves vantage point to land and sea targets
BOMB	Moves vantage point to any bombs dropped during filming

### Saving Replays

If you'd like to save the movie of your combat action, look at the lower left-hand corner of the screen. There, you'll see a nameplate titled CURRENT CLIP with a display panel below it. Move the cursor to the display panel. Press your controller button, and the arrow will be replaced by a text cursor. Type in a name for your film clip, then press RETURN. This will restore the floating arrow. Click on the SAVE button to save your film under the name you just typed in. A directory of your film clips will be created, which you can only access by coming to the Review Combat Film screen from the Main Menu. As you accumulate replays, be sure not to give the same name to more than one film, or else you will erase the older version.

Button	Function
SAVE	Saves current replay clip to disk

### Loading Replays

To look at a film clip from any previous missions, press the LOAD button. A directory of the available film clips will then appear in the centre of the view window. To look down the list, move the floating arrow over the down arrow next to the list, and press and hold the controller button. To look back up the list, press and hold the controller button over the up arrow. To select one of these film clips, click the floating arrow on the one you'd like to watch.

Button	Function
LOAD	Loads films you have saved (will not function if you are in the middle of a mission)

### FLIGHT BRIEFING

After you've selected a Training Flight, Combat Flight, or Custom Mission, you'll go to Flight Briefing. This is where you'll learn about your mission in greater detail, choose the pilots or crew to fly it, and make any last-minute modifications. When you first enter Flight Briefing, you'll see a map of Southern England and the west coast of France. This Flight Briefing Map is similar to the In-Flight Map/Radio that you can access anytime during your mission. Above the map are the words "FLIGHT BRIEFING MAP." To the right will be the title of your mission, plus the name of the current pilot or crew who is assigned to your plane.

On the Flight Briefing Map, you'll find various coloured icons scattered around the two countries. These icons symbolise various land installations, such as RAF airfields, industrial targets, radar stations, and Luftwaffe bases. To learn more about these installations, move the floating arrow over any icon on the map. The information will then

appear in the column on the right side of the screen. You'll see the name of the installation, a description of it, and its status (whether it is operational, or if it has been damaged or destroyed by any previous action). Other icons will identify the location of aircraft and ship convoys in the battle area you are about to enter, along with the ground targets that are about to be attacked by Luftwaffe bombers.

On the bottom of the screen, you'll also find four buttons labelled:

#### BRIEFING

This brings up a detailed description of your mission, which will appear in place of the Flight Briefing Map.

#### ROSTER

This lets you assign pilots and crew to fly your mission (see the Flight Roster section which follows)

#### CANCEL

This aborts your mission and sends you back to the Main Menu, where you can choose a different mission if you wish

#### GO FLIGHT

This lets you begin your flight.

#### Modifying Your Mission

Before you begin your mission, you can modify many of the combat conditions of your flight by clicking on the Mission Setting buttons in the lower right-hand corner of the screen. However once you modify a Combat Flight, Custom Mission, or Campaign Mission, the results will not count in any Combat Record. Whenever you select a mission to fly, the Mission Settings you'll see will reflect the values for that particular mission.

The Mission Settings you can modify are:

#### SETUP

Use this to choose between a STANDARD or RANDOM disposition of forces. When you choose STANDARD, the aircraft on both sides will be in the same location every time you play. When you

choose **RANDOM**, they will be positioned differently every time you play.

#### **AMMO**

Use this to change between **STANDARD** or **UNLIMITED** amounts of ammunition. In the **STANDARD** mode, you'll carry the same number of gun or cannon rounds that aircraft in the **Battle of Britain** carried. In the **UNLIMITED** mode, you'll have an endless supply of ammunition.

#### **DAMAGE**

Use this to change between **STANDARD** or **UNLIMITED** amounts of battle damage your aircraft can sustain. In the **STANDARD** mode, your aircraft can be damaged and even shot down by enemy gunfire. In the **UNLIMITED** mode, you can't be damaged, shot down, or crash.

#### **FUEL**

Use this to change between **STANDARD** or **UNLIMITED** fuel capacity. In the **STANDARD** mode, you'll carry a finite supply of fuel, and use it up at the same rate as aircraft in 1940. In the **UNLIMITED** mode, you'll never run out of fuel.

#### **ENEMY**

Use this to select the skill level of the opposing pilots or crew members. These settings range from **NOVICE** to **TOP ACE**.

#### **START**

This lets you choose where to start your mission from. If you choose **ON GROUND**, you'll begin your mission on the runway of your home airfield, and will have to takeoff and fly to the enemy or the target. If you choose **IN AIR**, you'll begin your mission in mid-flight, and the enemy or target will be nearby.

#### **RESET**

This reverts the values for the mission back to the original default settings.

### **FLIGHT ROSTER**

The **ROSTER** button in **Flight Briefing** lets you create pilots and crews,

and choose the ones who will fly in the mission you've selected. You can fly your mission without selecting **ROSTER**, but then you'll fly with an unnamed pilot or crew, and the results of your mission won't count on any **Combat Records**. In addition to activating a pilot or crew for the plane you're about to fly, you can select the pilot or crew for any other plane on your side. At first, you won't have a roster of pilots or crews to choose from. But as you create more and more pilots and crews, and as they gain experience in combat, you'll be able to choose those best qualified to support you in your current mission — and return victorious more often as a result.

When you press the **ROSTER** button, you'll be sent to the **Flight Roster** screen. At the top of the screen, you'll see the words "**FLIGHT ROSTER**," plus a list of aircraft icons. These icons represent the different planes that are flying on your side in the particular mission you've chosen. Next to each aircraft icon will be the name of its assigned pilot or crew. The aircraft that you yourself are going to fly will be highlighted. The pilot and crew from your previous mission will be automatically reassigned to your aircraft if they survived. For example, let's say your last mission was in a **Spitfire** with a pilot named "Clive." If you are about to fly another one, you'll see the name "**Spitfire**" highlighted, along with a **Spitfire** icon, plus the name "Clive." This way, you won't have to create a new pilot every time you fly a new mission.

#### **Creating and Managing Pilots and Crews**

In the middle of the **Flight Roster** screen you'll see six buttons. The first five buttons are various pilot and crew categories for the different **RAF** and **Luftwaffe** aircraft. When you press one of these buttons, the roster of available pilots for that type of aircraft will appear at the bottom of the screen. A sixth button lets you create new pilots and crews to add to the roster of whichever type of aircraft you choose.

The five pilot and crew category buttons are:

#### **RAF**

Use this to list the available **Spitfire** and **Hurricane** pilots.

#### **Bf 109**

Use this to list the available **Bf 109** pilots.

#### **Bf 110**

Use this to list the available **Bf 110** pilots.

#### **STUKA**

Use this to list the available **Stuka** crews.

#### **BOMBERS**

Use this to list the available **He 111**, **Do 17z-2**, and **Ju 88** crews.

The last button on the list is **CREATE PILOTS/ CREW**. Use this to create pilots and crew, and to add them to the roster of each category. To do so, first select one of the pilot or crew categories by clicking on the appropriate button. Then, click on the **CREATE PILOTS/CREW** button. A text cursor will appear. Use your keyboard to type in the name of the pilot or crew, then press **RETURN**. The name of the new pilot or crew will now be added to the roster of available pilots and crews for that aircraft.

Here's an example. Let's say you want to create a new crew for a **Ju 88**. Click on the **BOMBERS** button, then click on the **CREATE PILOTS/CREW** button. Type in the crew name, which we'll call "**Blitzers**," with the keyboard, then press **RETURN**. You now have a **Ju 88** pilot and crew named "**Blitzers**."

#### **Looking Over the Roster**

If you've got a long list of pilots and crew on any roster, move the floating arrow to the down arrow icon on the left side of the screen, and press and hold the controller button to scroll down through all the names. Press and hold the up arrow icon to move back up through the names. To the right of each pilot or crew name, you'll see their rank, the number of missions they've flown,

and an evaluation number, which rates them based on their past successes and failures.

#### **Assigning Pilots and Crews**

To assign a pilot or crew to a particular plane, first select the category of aircraft you want them to fly. Then, use your arrow to select their name from the roster of available pilots or crews at the bottom of the screen. Finally, click on the aircraft icon at the top of the screen that you want to assign that pilot or crew to fly. The pilot's or crew's name will now appear next to that aircraft icon. Be sure to match the pilot or crew with a plane from the category of aircraft they're qualified to fly. For example, an **He 111** crew is qualified to fly the three kinds of German medium bombers, but they cannot fly any other **Luftwaffe** aircraft.

To deactivate a pilot or crew, click on their name when it appears next to any aircraft icon.

#### **Using the Roster for More Successful Missions**

Whenever you complete a mission, the **Combat Records** for all pilots and crews involved will be updated. The more experience each pilot or crew member gains, the better they'll perform in future missions. When you select these proven, experienced pilots or crews for your missions, they'll generally repeat their successes for you. For example, if you have a **Bf 109** pilot on your roster named "**Heinz**" who has flown many missions and is a crack shot, you might want to assign him as your wingman if you're flying a fighter intercept mission. Chances are he'll distinguish himself in that role, and help you accomplish the goals of your mission. However, as in real-life combat, there's always the possibility that he'll be shot down.

To exit the **Flight Roster** and return to the **Flight Briefing Map**, press the **EXIT** button.

To help you learn the flight controls and instruments of the twelve aircraft in *Their Finest Hour*, we've divided the planes into three categories, based on their design, their role in combat, and the number of persons onboard.

Single-Seat Fighters (Pilot only)	Double-Seat Fighters and Dive Bombers (Pilot and rear gunner)	Medium Bombers (Pilot, bombardier, and three to five gunners)
Spitfire MK 1	Bf 110C-4	He 111
Spitfire MK 11	Bf 110C-4/B	Do 17z-2
Hurricane MK 1	Ju 87B-1 Stuka	Ju 88A-1
Bf 109E-3	Ju 87B-2 Stuka	
Bf 109E-4/B		

Many of the control keys and the flight instruments are similar for all three categories. However we want to make sure that you have all the information you need right at your fingertips at all times. To do this, we deliberately repeat some of the information in each of the category discussions below, and you'll find that there is a separate flight controls section for each category as well.

Each flight controls section begins with a brief description of that category of aircraft, followed by some charts. The first chart shows you the controls you'll need to operate the aircraft's guns, while the second chart gives you a list of keys you'll use to fly and maneuver the aircraft itself. Another chart shows you how to look around outside your aircraft. If you're flying a medium bomber, there's also a discussion on how to move to the different gunner positions and man the guns, as well as how to move to the bombardier's position and drop bombs. Finally, a section on cockpit instruments describes all the different gauges and levers you'll see in the cockpit of your aircraft. One cockpit screen in each of the three plane categories is displayed, to help you master the instruments. To

see a cockpit screen of every aircraft, along with additional information, see the German and British Aircraft and Weapons chapter.

### FLIGHT CONTROLS








Your controller operates just like the control stick on a real plane. For more information, see the Flight Fundamentals and Tactics chapter.

#### Controller

Direction	Function
↑ Forward (away from you)	Moves the nose of the plane down
↓ Backward (toward you)	Moves the nose of the plane up
→ Right	Banks the plane to the right
← Left	Banks the plane to the left

### GAME CONTROLS

The following game controls can be used anytime during a mission, regardless of whether you're flying a fighter, dive bomber or medium bomber:

Keys	Function
	Pauses game; press any key to continue
	Turns all game sounds off and on
	Turns engine sound off and on
	gives version number of game
	Lets you adjust joystick
	Changes amount of detail to speed up game if it is running sluggishly
	Exits the game; returns you to your computer's operating system

### SINGLE-SEAT FIGHTER CONTROLS (SPITFIRE, HURRICANE, BF 109)










As a single-seat fighter pilot, you're basically a "flying gun," armed with forward-firing machine guns and, if you're flying a Bf 109, a formidable 20 mm cannon. Your fighter is faster and more maneuverable than a bomber but it is also less durable, and won't be able to sustain as much battle damage. Each of the fighters you can choose from has its own individual strengths and weaknesses, but they all excel at one task: bringing down enemy aircraft.

#### Single-Seat Fighter Weapons Controls

Controller Button	Function
Left controller button or SPACE BAR	Fires forward machine guns
Right controller button or period (.) key	Fires 20 mm cannon (Bf 109 only)
Left AND right controller buttons or	Drops bombload (BE 109 Jabo fighter/bomber only)







#### RETURN

#### Single-Seat Fighter Cockpit Controls

Key	Function
	Increases throttle (shift key not needed)
	Decreases throttle
	Lowers and raises landing gear
	Lowers and raises flaps
	Turns replay camera on and off
	Sends you to Review Combat Film (see the Mission Instructions. Pre-Flight chapter)
	Sends you to the In-Flight JR Map/Radio
	Lets you jump from your fighter JR and parachute to safety
	Ends mission; sends you to a post-JR flight evaluation

### Single-Seat Fighter View Controls

To look around your fighter in all directions, you can use either the number keys on the top of your keyboard or, if your keyboard has a keypad, use the keypad controls. On some computers, the keypad controls are labelled with arrows, and we recommend that you use them. For a further discussion of these controls, see cockpit instrument #10 in the Single-Seat Fighter Cockpit Instruments section below.

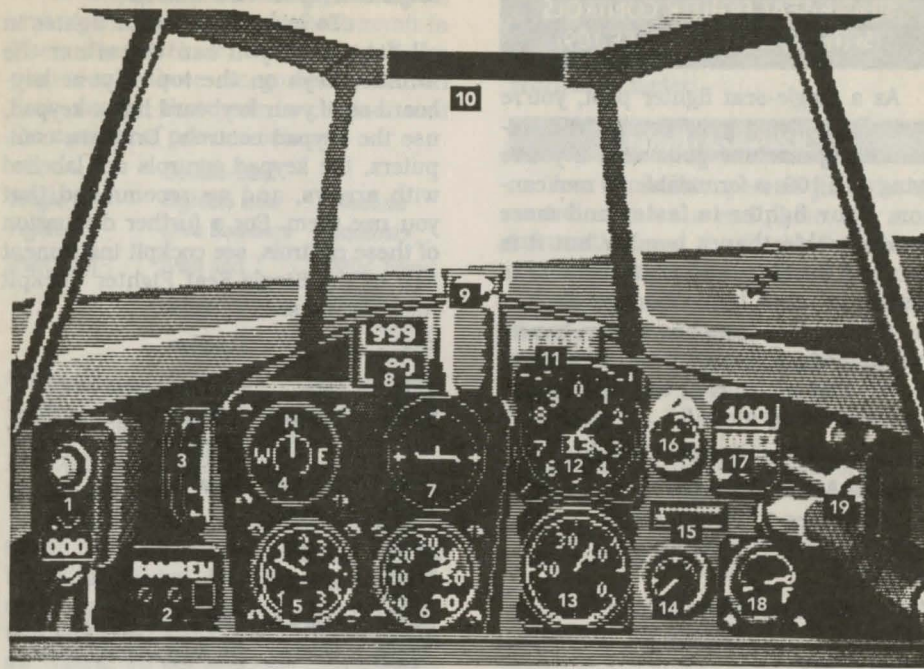
Key	Function
	(Up Arrow) Forward view (your mission starts in this direction)
	(Right arrow) View right
	(Left arrow) View left
	(Down arrow) Rearview mirror (to look behind you)
	(PgDn) View straight (regardless of your flight angle)
	(PgUp) Scan view (look complete around your fighter)

### Single-Seat Fighter Cockpit Instruments

When you're inside the cockpit of your chosen fighter these are the instruments you'll see in front of you:

**1. Radio** This receiver has two important components. The three-digit number shows what frequency your radio is tuned to, while the light next to it will be lit when you've tuned into the correct frequency, which allows you to receive important mission information. To tune or use your radio, press **M**, which moves you to the In-Flight Map/Radio.

**2. Bomb Release Light** (BE 109E-4/B *Jabo* fighter/bombers only) This will be lit if you have a bomb to drop. The number next to the light indicates if you



have one or zero bombs left.

**3. Flaps Lever** This gives you the position of your fighter's flaps. If it is in the up position, the flaps are up; if it is in the down position, the flaps are down. During normal flight your flaps should be up, but for takeoffs and landings, they should be down to increase lift and lower the stalling speed.

**4. Compass** This shows which direction your fighter is headed: north, south, east, or west.

**5. Climb/Dive Indicator** This gauge gives you the rate your fighter is climbing or diving, in thousands of feet per minute. The + area of the gauge indicates a climb, while the - indicates a descent.

**6. RPM Indicator** This gives you two readings. The dial shows the number of revolutions per minute (RPMs) your engine is delivering, in units of one hundred. The higher the RPMs, the farther to the right the dial will move. If the throttle setting is at "75" or higher, or if the dial

moves into the red area, you'll be using up fuel at a higher rate. The white number at the bottom of the gauge shows the throttle or power setting of the engine. For example, if it reads "85," your engine is set for 85 percent of the power it can produce.

**7. Banking Indicator** This shows the roll of your fighter (see the *flight Fundamentals and Tactics* chapter for more information). The large horizontal bar shows the position of your wings relative to the ground, while the small vertical bar shows the direction your tail is pointing. As you bank your fighter left or right, the horizontal bar will also bank to reflect your position.

**8. Ammunition Round Indicator** This shows how many gun rounds you have left in your forward-firing machine guns. If you're flying a Bf 109, you'll see two numbers. The top one indicates the number of machine gun rounds left, while the bottom number shows how many

rounds you have left in your more powerful 20 mm cannon.

**9. Gunsight** Use this to aim your forward-firing machine guns and cannon at enemy aircraft.

**10. View Indicator** This panel shows which direction you're looking out of from your fighter. In normal flight, the panel will be blank. When you press the 4 key, the view out of your cockpit window will be the left view, and the word "LEFT" will be displayed on the view indicator. If your computer has enough memory, the cockpit screen will be replaced by a picture of the view looking over the left wing of your aircraft. Pressing the 6 key gives you the right view in the cockpit window with the word "RIGHT" displayed, or the view looking over the right wing of your fighter. Pressing the 3 key gives you the view straight down, and the word "DOWN" will be displayed.

When you press the 9 key, you'll be in the scan mode. In this mode, you can look around your fighter in any direction by moving your controller, while your fighter remains on course. Two numbers will be displayed on the view indicator. The first number shows how many degrees up or down you're looking, starting at 0° (level flight), and ranging from -90° (straight down) to +90° (straight up). The second number shows how many degrees you're looking around, beginning with 0° (straight ahead, your flight path). If you're looking toward the right, the number ranges from 0° to +90° (directly right) to +180° (behind you). If you're looking left, the number ranges from 0° to -90° (directly left) to -179° (just about straight behind you).

**11. Nameplate** This gives the name and model number of your fighter.

**12. Altimeter** This gives your distance above sea level in feet. The digital number indicates thousands of feet, the big hand on the dial indicates hundreds of feet, and the little hand tens of feet. For example, if the digital display reads "21," the big hand is on the "4," and the

little hand on the "8," your altitude is 21,480 feet.

**13. Airspeed Indicator** This shows how fast your fighter is flying, in tens of miles per hour. For example, if the hand on the gauge is pointing to "30," you're flying at 300 miles per hour.

**14. Engine Damage Indicator** This dial shows the amount of damage done to your fighter's engine in combat. If the indicator moves into the red area, the power output of the engine will be severely reduced and your RPM indicator reading will drop. You may then have to abort the mission and return to your home base, or even bail out.

**15. Airframe Damage Indicator** This gauge shows the amount of structural damage sustained by your fighter in combat. When the indicator is in the red zone, your aircraft is severely damaged and may go out of control, forcing you to bail out.

**16. Pitch Indicator** This shows the position of the nose of your fighter relative to the horizon. + means your nose is pointing above the horizon, 0 is level with the horizon, and - indicates that your nose is pointing below the horizon.

**17. Replay Camera Indicator** This shows the percentage of film you have remaining in your replay camera when you are recording. The number on the indicator will decrease until you're out of film. When you press C to turn on your replay camera, a light above the indicator will go on, and stay on until you have turned your camera off, or used up all the film.

**18. Fuel Gauge** This shows how much fuel remains in your fighter's fuel tanks: E means empty, F means full.

**19. Landing Gear Lever** This shows the status of your landing gear. If the lever is forward or up, your landing gear is up; if the lever is back or down, your landing gear is down. Don't forget to lower your landing gear for a landing, or to raise it after takeoff. Lowering your landing gear has the effect of slowing

your air speed, which may be useful in certain situations.

## DOUBLE-SEAT FIGHTER AND DIVE BOMBER CONTROLS (Bf 110, JU 87 STUKA)















When you're flying a double-seat fighter or dive bomber, you're in a larger, less maneuverable aircraft than a single-seat fighter. However you're more heavily armed, with a rear-firing machine gun to help ward off enemy attacks. Like a single-seat fighter you're also armed with forward-firing machine guns, and, if you're flying a Bf 110, a 20 mm cannon. Your plane is slightly more durable than a fighter so it will take more enemy bullets to bring it down. The Stuka and the fighter/ bomber version of the Bf 110 carry bombs, and in the hands of a skilled pilot, they can be extremely accurate for low-altitude bombing (Bf 110C-4/B) and dive-bombing (Ju 87).

### Double-Seat Fighter and Dive Bomber Weapons Controls

Your forward-firing guns function exactly the same as in a single-seat fighter. But your plane is equipped with an extra weapon at your defence — a rear gunner. To activate your rear gunner and switch to the rear view, press the **G** key (the **2** key will also switch you to this mode). Your plane will fly on, with the controls left where you set them. If you press **A** before you switch to the rear gunner, you'd activate the automatic pilot. Then, to manually aim the machine gun, move your controller around. If you press **A** while you're manning the rear gun, you'll activate the automatic shooting mode, which aims and fires the machine gun for you. You cannot aim and fire the rear machine gun yourself while it is in this mode. If you want your rear gun to be firing away while you return to piloting the plane, you must activate this auto-shoot mode first.

Controller Button	Function
Left controller button or <b>SPACE BAR</b>	Fires forward machine gun or rear machine gun
Right controller button or period (.) key	Fires 20 mm cannon (Bf110 only)
Left AND right controller buttons or <b>RETURN</b>	Drops bombload (except Bf 110C-4)







### Double-Seat Fighter and Dive Bomber Cockpit Controls

Key	Function
	Increases throttle (shift key not needed)
	Decreases throttle
	Lowers and raises landing gear
	Lowers and raises flaps
	Extends and retracts dive brakes
	Turns replay camera on and off
	Sends you to Review Combat Film (see the <i>Pre-Flight</i> chapter)
	Moves you to pilot's position
	Moves you to rear gunner seat
	Turns on the automatic pilot, or automatic shoot mode if you're manning the rear gun position at the time
	Lets you toggle between bomber load settings
	Sends you to the In-Flight Map/Radio
	Lets you and crew member jump from plane & parachute to safety
	Ends mission; sends you to post flight evaluation

### Double-Seat Fighter and Dive

#### Bomber View Controls

To look around your double-seat fighter or dive bomber in all directions, you can use either the number keys on the top of your keyboard or, if your keyboard has a keypad, use the keypad controls. On some computers, the keypad controls are labelled with arrows, and we recommend that you use them. For a further discussion of these controls, see cockpit instrument #13 in the *DoubleSeat Fighter or Dive Bomber Cockpit Instruments* section below.

Key	Function
 (Up arrow)	Forward view (your mission starts in this direction)
 (Right arrow)	View right
 (Left arrow)	View left
 (Down arrow)	Switch to rear gunner
 (PgDn)	View straight down (regardless of your flight angle)
 (PgUp)	Scan view (look completely around your fighter or dive bomber)

### Double-Seat Fighter and Dive Bomber Cockpit Instruments

Once you're seated at the controls of a double-seat fighter or dive bomber, these are the instruments you'll be relying on in combat:

- Landing Gear Lever** (Bf110 only) This shows the status of your landing gear. If the lever is forward or up, your landing gear is up; if the lever is back or down, your landing gear is down. Don't forget to lower your landing gear for a landing, or to raise it after takeoff. Lowering your landing gear has the effect of slowing your airspeed, which

may be useful in certain situations.

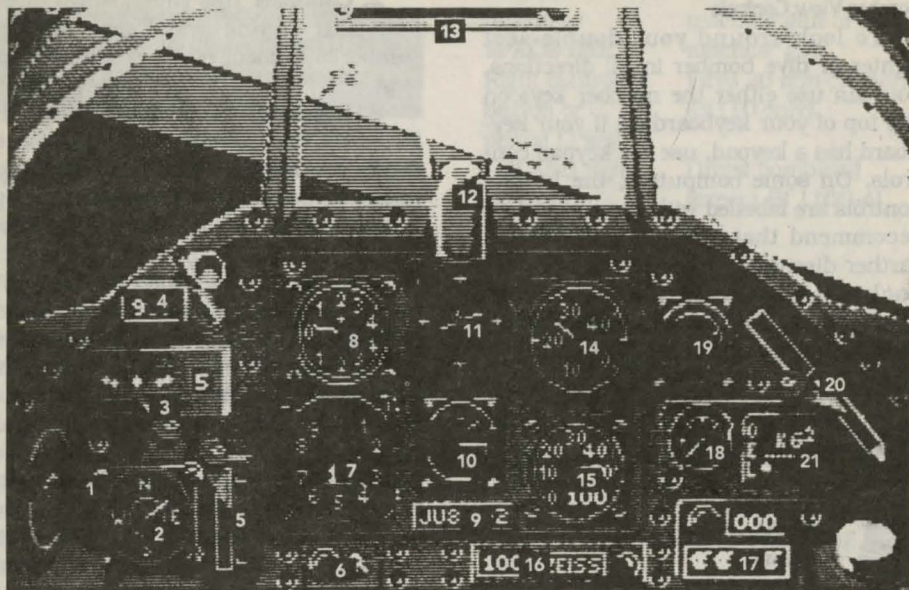
- Compass** This shows which direction your double-seat fighter or dive bomber is headed: north, south, east, or west.

- Bomb Indicator Panel** (except Bf 110C-4) The number on this panel shows you how many of your externally-mounted bombs you have left to drop. The lever lets you choose how to drop your bombload.

If you're flying a Ju 87 Stuka, you'll be carrying four small wing-mounted bombs and one large fuselage-mounted bomb. When you start your mission, the lever is in the far left position, and a light underneath the miniature aircraft on the panel indicates that only your fuselage-mounted bomb will be dropped when you press **RETURN**. Pressing **S** once moves the lever to the middle, and the lights on the miniature aircraft now indicate that only your four wing-mounted bombs will be dropped. Pressing **S** again moves the lever to the far right, with the lights showing that all of your bombs will be dropped. Pressing **S** a third time returns the lever to the original position.

If you're flying a Bf 110C-4/B, you'll be carrying two fuselage-mounted bombs. Your bomb indicator panel will be in the lower right-hand corner of the cockpit. Underneath the word **BOMBEN** on the panel, you'll see two lights. When the light on the left is lit, one bomb will drop every time you press **RETURN**. When the light on the right is lit, both of your bombs will drop at once if you press **RETURN**. Pressing **S** allows you to toggle between these two settings.

- Ammunition Round Indicator** This shows how many gun rounds you have left in your Forward-firing machine guns. If you're flying a Bf 110, you'll see two numbers. The top one indicates the number of machine gun rounds left, while the bottom number shows how many rounds you have left in your more powerful 20 mm cannon.



**5. Dive Brakes Lever (Ju 87 Stuka only)** This shows whether your dive brakes are up or down. Lowering the dive brakes is necessary to slow down a Ju 87 during a dive bombing run.

**6. Automatic Pilot Light** This tells you if you've turned on your automatic pilot, which you activate by pressing the A key. You'll want to turn on the automatic pilot before moving to the rear gunner position, other wise the double-seat fighter or dive bomber will fly with the controls set where you left them.

**7. Altimeter** This gives your distance above sea level in feet. The digital number indicates thousands of feet the big hand on the dial indicates hundreds of feet, and the little hand tens of feet. For example, if the digital display reads "13," the big hand is on the "J," and the little hand on the "2," your altitude is 13,720 feet.

**8. Climb/Dive Indicator** This gauge gives you the rate your double-seat fighter or dive bomber is climbing or diving, in thousands of feet per minute.

The + area of the gauge indicates a climb, while the - area indicates a descent.

**9. Nameplate** This gives the name and model number of your double-seat fighter or dive bomber.

**10. Pitch Indicator** This shows the position of the nose of your double-seat fighter or dive bomber relative to the horizon. + means your nose is pointing above the horizon, 0 is level with the horizon, and - indicates that your nose is pointing below the horizon.

**11. Banking Indicator** This shows the roll of your double-seat fighter or dive bomber (see the Flight Fundamentals and Tactics chapter for more information). The large horizontal bar shows the position of your wings relative to the ground, while the small vertical bar shows the direction your tail is pointing. As you bank your plane left or right, the horizontal line will also bank to reflect your position.

**12. Gunsight** Use this to aim your forward-firing machine guns and cannon

at enemy aircraft.

**13. View Indicator** This panel shows which direction you're looking out of from your double-seat fighter or dive bomber. In normal flight, the panel will be blank. When you press the 4 key, the view out of your cockpit window will be the left view, and the word "LEFT" will be displayed on the view indicator. If your computer has enough memory, the cockpit screen will be replaced by a picture of the view looking over the left wing of your aircraft. Pressing the 6 key gives you the right view from the cockpit window with the word "RIGHT" displayed, or the view looking over the right wing of your double-seat fighter or dive bomber. Pressing the 3 key gives you the view straight down, and the word "DOWN" will be displayed.

When you press the 9 key, you'll be in the scan mode. In this mode, you can look around your double seat fighter or dive bomber in any direction by moving your controller, while your plane remains on course. Two numbers will be displayed on the view indicator. The first number shows how many degrees up or down you're looking, starting at 0° (level flight), and ranging from -90° (straight down) to +90° (straight up). The second number shows how many degrees you're looking around, beginning with 0° (straight ahead, your flight path). If you're looking toward the right, the number ranges from 0° to +90° (directly right) to +180° (behind you). If you're looking left, the number ranges from 0° to -90° (directly left) to -179° (just about straight behind you).

**14. Airspeed Indicator** This shows how fast your double-seat fighter or dive bomber is flying, in tens of miles per hour. For example, if the hand on the gauge is pointing to halfway between "20" and "30," you're flying at 250 miles per hour.

**15. RPM Indicator** (One gauge for each engine — two on the Bf 110, one on the Ju 87 Stuka) Each indicator gives

you two readings. The dial shows the number of revolutions per minute (RPMs) the engine is delivering, in units of one hundred. The higher the RPMs, the farther to the right the dial will move. If the throttle setting is at "75" or higher, or if the dial moves into the red area, you'll be using up fuel at a higher rate. The white number at the bottom of the gauge shows the throttle or power setting of the engine. For example, if it reads "85," your engine is set for 85 percent of the power it can produce.

**16. Replay Camera Indicator** This shows the percentage of film you have remaining in your replay camera when you are recording. The number on the indicator will decrease until you're out of film. When you press C to turn on your replay camera, a light above the indicator will go on, and stay on until you have turned your camera off, or have used up all the film.

**17. Radio** This receiver has two important components. The three-digit number shows what frequency your radio is tuned to, while the light next to it will be lit when you've tuned into the correct frequency, which allows you to receive important mission information. To tune or use your radio, press M, which moves you to the In-Flight Map/Radio.

**18. Engine Damage Indicator** (One gauge per engine — two on the Bf 110, one on the Ju 87 Stuka) Each dial shows the amount of damage done to your double-seat fighter's or dive bomber's engine in combat. If the indicator moves into the red area, the power output of the engine will be severely reduced and your RPM indicator reading will drop. You may then have to abort the mission and return to your home base, or even bail out.

**19. Fuel Gauge** This shows how much fuel remains in your double-seat fighter's or dive bomber's fuel tanks: E means empty, F means full.

**20. Fuel Lever** This gives you the



position of your double-seat fighter's or dive bomber's flaps. If it is in the up position, the flaps are up; if it is in the down position, the flaps are down. During normal flight your flaps should be up, but for takeoffs and landings, they should be down to increase lift and lower the stalling speed.

### 21. Airframe Damage Indicator

This gauge shows the amount of structural damage sustained by your double-seat fighter or dive bomber in combat. When the indicator is in the red zone, your aircraft is severely damaged and may go out of control, forcing you to bail out.






### MEDIUM BOMBER CONTROLS (HE 111, DO 17Z-2, AND JU 88)

As the pilot of a medium bomber, you're flying a stable platform from which a large bombload can be dropped on enemy installations, usually from medium altitudes. However, your bomber is much slower and less maneuverable than the enemy fighters which will be defending these installations or intercepting you on your bombing mission. To partially compensate for this, your bomber is armed with machine guns, located at various positions throughout the fuselage (see the German and British Aircraft and Weapons chapter to find out where the machine guns are located on each bomber). The He 111 and the Do 17z both have five machine gun positions, while the Ju 88 has three. Your medium bomber is also very durable, and it can generally take a lot of battle damage before it is shot down.










#### Switching Positions in a Medium Bomber

In a medium bomber you can fly as a pilot, bombardier or gunner at a variety of gun positions. What's more, you can constantly switch between any or all of these positions in mid-flight. Use these keys to move around to all the positions. The pilot, gunner, and bombardier roles all have their own controls,



and will be discussed in turn in this section.

Key	Function
	Moves you to pilot position
	Moves you to gunner position
	Moves you to bombardier position Sends you to In-Flight
	Map/Radio
	Toggles you between pilot and gunner positions

#### Medium Bomber Cockpit Controls

	Increases throttle (shift key not needed)
	Decreases throttle
	Lowers and raises landing gear
	Lowers and raises flaps
	Lowers and raises dive brakes (Ju 88 only)
	Turns replay camera on and off
	Sends you to Review Combat Film (see the Pre-Flight chapter)
	Turns on the automatic pilot, or automatic shoot mode if you're manning a machine gun at the time
	Lets you toggle between bombload settings






#### RETURN Drops bombload

	Lets you and your crew jump from bomber and parachute to safety
	Ends mission; sends you to post flight evaluation

#### Medium Bomber View Controls

look around your bomber in all directions, you can use either the num-





ber keys on the top of your keyboard or if your keyboard has a keypad, use the keypad controls. On some computers, the keypad controls are labelled with arrows, and we recommend that you use them. For a further discussion of these controls, see cockpit instrument #10 in the Medium Bomber Cockpit Instruments section below.




Key	Function
	(Up arrow) Forward view (your mission starts in this direction)
	(Right arrow) View right
	(Left arrow) View left
	(PgDn) View straight down (regardless of your flight angle)
	(PgUp) Scan view (look completely around your bomber)

#### Medium Bomber Gunner Controls

From the pilot's position, you can move to the gunner position by pressing **G**, then pressing one of the keys in the chart below. The bomber will continue to fly with the controls set where you left them, unless you press **A** to turn on the autopilot before you leave the cockpit. If you go back to the pilot's position and press **G** again, you'll be sent to the last gunner position you manned.

To move around to all the gun positions, press any one of these keys:

Key	Function
	(Up arrow) Nose gunner
	(Left arrow) Left fuselage gunner (except Ju 88)
	(Right arrow) Right fuselage gunner (except Ju 88)
	(Middle) Lower fuselage

	(Down arrow) (Upper fuselage (rear) gunner)
	Lets you toggle between pilot and gunner positions
	Automatic shooting mode

Notice how the location of each gun corresponds with the numeric keypad key that sends you to that position. The location and key also correspond with the group of gun indicator lights in the cockpit that display the status of each gun (see the Medium Bomber Cockpit Instruments section for a description of these lights).

When you're in any of these gunner positions, use your controller to move the machine gun up, down, left, or right, and press your controller button to fire. The number displayed next to the machine gun indicates how many rounds of ammunition it has left. If you'd like for the machine gun to aim and shoot automatically, press **A**. A red light will come on to show that the gun is in the auto shoot mode. As long as it's in this mode, you won't be able to manually aim and shoot it. You'll also see gun indicator lights similar to those displayed in the cockpit, which indicate the status of all gunner positions. From any gun position, press **P** to return to the pilot's position, press **B** to move to the bombardier's position, or press **M** to get to the InFlight Map/Radio.

#### Medium Bomber Bombardier Controls

When you press **B**, you'll find yourself looking down from the bomber as a bombardier would. In this position, you actually fly the bomber, so you can maneuver it into the best position to drop its bombload. To do this, move the controller around just like you would when you're piloting the bomber from the pilot's position. All of the cockpit controls will function, although you won't be able to use the cockpit view unless you press **P** and move back to the

cockpit (see the Medium Bomber Cockpit Controls section for more information).

To help you maneuver your bomber into position you'll find four gauges: an altimeter, an airspeed indicator, a compass, and a banking indicator. You'll also find a bomb indicator panel, which shows you how many bombs are left, plus a switch which lets you choose how to drop your bombs. If the light on the left is lit, it indicates that only one bomb will drop every time you press **RETURN**. If the light on the right is lit, it indicates that all of your bombs will drop simultaneously when you press **RETURN**. To alternate between these two settings, press **S**. See the Medium Bomber Cockpit Instruments section for more information about these controls, and the flight Fundamentals and Tactics chapter to learn how to drop a bombload accurately.

#### Medium Bomber Cockpit Instruments

Most of the same instruments found in a fighter's or dive bomber's cockpit are also used by a medium bomber. These are the instruments you'll see in front of you:

**1. Altimeter** This gives your distance from the ground in feet. The digital number indicates thousands of feet, the big hand on the dial indicates hundreds of feet, and the little hand tens of feet. For example, if the digital display reads "09," the big hand is on the "6," and the little hand on the "1," your altitude is 9,610 feet.

**2. Climb/Dive Indicator** This gauge gives you the rate your bomber is climbing or diving, in thousands of feet per minute. The + area of the gauge indicates a climb, while the - area indicates a descent.

**3. Automatic Pilot Light** This tells you if you've turned on your automatic pilot, which you activate by pressing the **A** key. You'll want to turn on the automatic pilot before moving to the bombardier or gunner position, otherwise the bomber will fly with the controls set

where you left them.

**4. Banking Indicator** This shows the roll of your bomber (see the Flight Fundamentals and Tactics chapter for more information). The large horizontal bar shows the position of your wings relative to the ground, while the small vertical bar shows the direction your tail is pointing. As you bank your bomber left or right, the horizontal line will also bank to reflect your position.

**5. Pitch Indicator** This shows the position of the nose of your bomber relative to the horizon. + means your nose is pointing above the horizon, 0 is level with the horizon, and indicates that your nose is pointing below the horizon.

**6. Compass** This shows which direction your bomber is headed: north, south, east, or west.

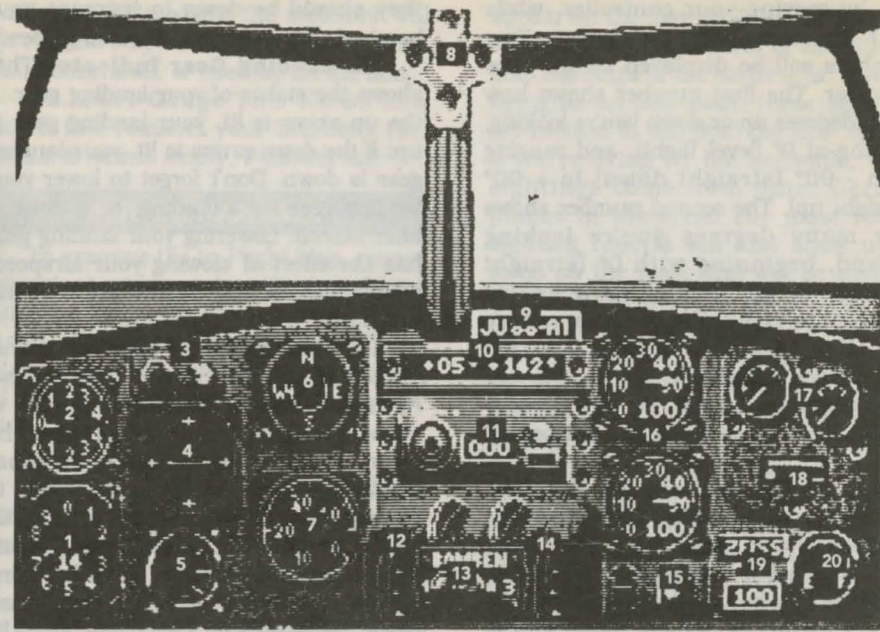
**7. Airspeed Indicator** This shows how fast your bomber is flying, in tens of miles per hour. For example, if the hand on the gauge is pointing to "20," you're flying at 200 miles per hour.

**8. Gun Indicator Lights** These lights show the status of each of your bomber's machine guns. The top light indicates the nose gun, the centre light indicates the upper fuselage (or dorsal) gun, the left and right lights indicate the left and right fuselage guns, and the bottom light indicates the lower fuselage (or belly) gun. The chart below tells you how to read these lights, which is crucial to defending your bomber.

#### Colour of

Light	Gun Status
Blue	Gun idle
Yellow	Enemy fighters approaching gun's field of fire; you could be attacked from that direction
Black	Gun out of ammunition or destroyed
Red	Gun switched on to automatic shoot mode
Green	Gun firing at enemy fighters in automatic shoot mode

In some graphics modes on some computers, the colours may be different.



Consult your Reference Card to see which colours are used by your computer.

When you begin your mission from the pilot's position, the guns will not be automatically shooting at enemy aircraft, and your bomber will be defenceless. To set your guns to fire automatically, press **G** to move into the gunner role (see the Medium Bomber Gunner Controls section to choose a particular gun position). Once you're in a position, press the **A** key. A red light on the machine gun barrel indicates that the gun is now in the autoshoot mode. Pressing **A** again turns off the autoshoot. If — you want, you can stay and watch the machine gun automatically aim and fire at enemy fighters, but you can't manually — move and shoot the gun when it's set on autoshoot. To activate this mode on all your guns, you must move into each individual gun position, and press **A**. Pressing **P** returns you to your pilot's seat. Your gun indicator lights will be red for every gun position in the

autoshoot mode. The lights will flash green when the guns are automatically firing at enemy fighters.

**9. Nameplate** This gives the name and model number of your bomber.

**10. View Indicator** This panel shows which direction you're looking out of from your bomber. In normal flight, the panel will be blank. When you press the **4** key, the view out of your cockpit window will be the left view, and the word "LEFT" will be displayed on the view indicator. If your computer has enough memory, the cockpit screen will be replaced by a picture of the view looking over the left wing of your aircraft. Pressing the **6** key gives you the right view from the cockpit window with the word "RIGHT" displayed, or the view looking over the right wing of your bomber. Pressing the **3** key gives you the view straight down, and the word "DOWN" will be displayed.

When you press the **9** key, you'll be in the scan mode. In this mode, you can look around your bomber in any direc-

tion by moving your controller, while your plane remains on course. Two numbers will be displayed on the view indicator. The first number shows how many degrees up or down you're looking, starting at 0° (level flight), and ranging from - 90° (straight down) to + 90° (straight up). The second number shows how many degrees you're looking around, beginning with 0° (straight ahead, your flight path). If you're looking toward the right, the number ranges from 0° to + 90° (directly right) to + 180° (behind you). If you're looking left, the number ranges from 0° to - 90° (directly left) to - 179° (just about straight behind you).

**11. Radio** This receiver has two important components. The three-digit number shows what frequency your radio is tuned to, while the light next to it will be lit when you've tuned into the correct frequency, which allows you to receive important mission information. To tune or use your radio, press **M**, which moves you to the In-Flight Map/Radio.

**12. Dive Brakes Lever** (Ju 88 only) This shows whether your dive brakes are up or down. Lowering the dive brakes is necessary to slow down a Ju 88 during a dive-bombing run.

**13. Bomb Indicator Panel** This give you information on the status of your bombload. The large number on the right indicates the number of bombs you have left. To the left, you'll see two lights, one marked "1," the other marked "A." If the light next to the "1" is on, one bomb will drop when you press **RETURN**. If the light next to the "A" is on, your entire bombload will drop consecutively when you press **RETURN**. To toggle between these two lights, press the **S** key.

**14. Flaps Lever** This gives you the position of your bomber's flaps. If it is in the up position, the flaps are up; if it is in the down position, the flaps are down. During normal flight your flaps should be up, but for takeoffs and landings,

they should be down to increase your bomber's lift and lower its stalling speed.

**15. Landing Gear Indicator** This shows the status of your landing gear. If the up arrow is lit, your landing gear is up; if the down arrow is lit, your landing gear is down. Don't forget to lower your landing gear for a landing, or to raise it after takeoff. Lowering your landing gear has the effect of slowing your airspeed, which may be useful in certain situations.

**16. RPM Indicators** (One per engine) These two identical gauges give you two readings. The dial shows the number of revolutions per minute (RPMs) the engine is delivering, in units of one hundred. The higher the RPMs, the farther to the right the dial will move. If the throttle setting is at "75" or higher, or if the dial moves into the red area, you'll be using up fuel at a higher rate. The white number at the bottom of the gauge shows the throttle or power setting of the engine. For example, if it reads "65," your engine is set for 65 percent of the power it can produce.

**17. Engine Damage Indicators** (One per engine) These two identical dials show the amount of damage sustained by your bomber's engines in combat. If the indicator moves into the red area, the power output of that engine will be severely reduced and your RPM indicator reading will drop. You may then have to abort the mission and return to your home base, or even bail out.

**18. Airframe Damage Indicator** This gauge shows the amount of structural damage done to your bomber in combat. When the indicator is in the red zone, your aircraft is severely damaged and may go out of control, forcing you to bail out.

**19. Replay Camera Indicator** This shows the percentage of film you have left in your replay camera when you are recording. The number on the indicator will decrease until you're out of film. When you press **C** to turn on your replay

camera, a light above the indicator will go on, and stay on until you have turned your camera off, or used up all the film.

**20. Fuel Gauge** This shows how much fuel remains your bomber's fuel tanks: **E** means empty, **F** means full.

## IN-FLIGHT MAP/RADIO

To examine the In-Flight Map, receive important mission information, and tune and use the radio of your plane, you'll need to move to the In-Flight Map/Radio. You can do this by pressing **M** from any crew position during a mission.

### In-Flight Map

Once you're at the In-Flight Map/Radio screen, you'll see a map of the English Channel, Southern England, and the west coast of France. In the upper part of the screen, the words "IN-FLIGHT MAP" will be displayed, along with the historical date and time of your mission.

On the map of Southern England and the west coast of France, you'll see small coloured icons scattered about. These icons represent various ground installations, including RAF airfields, factories, and radar sites, plus Luftwaffe airfields in France. To get more information about each of these installations, move the arrow over the icon. You'll then see the information listed in a column on the right, under the heading MAP ID. This information includes the name of the installation, a description of it, and its status (whether it is operational, or if it has been damaged or destroyed by any previous action). If your radio is tuned properly, you'll also be shown the distance this installation is from your plane, and the heading your plane needs to take to reach it.

### In-Flight Radio

Whenever you're flying a mission, the radio is a valuable source of information. You can use the radio to determine the position of your aircraft, and have it

appear on the map as an icon. The radio will also give you reports of aircraft and ship sightings in the battle area. If you're flying as an RAF pilot, these sightings are radioed to you from the RDF system; if you're flying for the Luftwaffe, these sightings come from other German planes in the area. The most recent sighting reports will also show up as icons on the map, and will be updated every five minutes. To get this information click on the AIR/SEA ID button at the bottom of the screen. Then click on the ship or plane icon on the map. Information about the sighting will be displayed in the column on the right of your screen. To cycle through all the available sightings, click on either the NFXT FWD or NEXT BACK button. To view the map containing information about ground installations again, click on the LAND ID button at the bottom of the screen.

### Tuning Your Radio

If the radio icon in the upper right-hand corner of the screen is lit, the radio is correctly tuned and you'll be able to receive information. If the icon is not lit, you'll need to tune your radio. To do this, pull out the Frequency Cipher Wheel, which you'll find inside the game box. Move the arrow to TUNE RADIO, located at the bottom of the screen, and click the button. Now you'll see a unit insignia, plus the name of an airfield, in the column at the right of the screen. Line up the notch on the Fre Cipher Wheel so that the unit insignia on the wheel matches the one on the screen. Next, look at the window on the Frequency Cipher Wheel that displays the same airfield name that is on the screen. Beside the airfield name on the Frequency Cipher Wheel, you'll find a window with three coloured numbers inside it. These three numbers together make up your correct radio frequency. Use the arrow to select the correct frequency and correct colour from the display on the screen.

To continue your flight, move the arrow to the box titled CONTINUE and click your controller button.

## ENDING YOUR FLIGHT

There are many ways that your mission can be ended:

**Crashing** If your plane smashes into the ground or water at a sharp angle before the pilot and crew has a chance to bail out, they are considered to be lost in action.

**Crash Landing** If your plane is forced down or lands poorly, and is a total wreck, the pilot and crew will survive. However, if this crash landing takes place on enemy soil, the pilot and crew will be captured, and will not be able to take part in any more missions.

**Ditching** If your plane splashes down in the English Channel, it cannot be recovered. The pilot and crew will survive, however, and will be rescued by a passing ship or a rescue seaplane from their side. They then will be able to participate in a new mission.

**Bailing Out Over Land** If your plane is plummeting down over land, and you press **J** before it crashes, the pilot and crew will parachute out of the plane. If the pilot and crew bail out over enemy territory, they will be captured, and cannot be used on any more missions. If they bail out over friendly territory, they will be transported back to their airfield for another mission.

**Bailing Out Over Water** If the pilot and crew parachute from their plane over the English Channel, they will be rescued and can fly again.

**Landing At Your Home Airfield** Your mission also ends when you fly back to your home airfield, land safely, and press **G**.

Pressing **G** in Mid-Flight If you don't want to make a landing, you may also press **a** at any time to end your mission. This will not affect the Combat Record score for your pilot and crew, unless

they are captured or the aircraft is lost, which can happen by:

- Pressing **G** while flying over enemy territory. If this happens, the pilot and crew will be captured and the aircraft lost.

- Pressing **G** while flying over the Channel. If this — happens, the plane will be lost, but the pilot and crew will be rescued.

To avoid losing your aircraft, or having your pilot or crew captured, press **a** when you're over England if you're a British pilot. If you're a Luftwaffe pilot, try to fly to the coast of Continental Europe before pressing **G**.

## MISSION RESULTS

When your mission has ended you'll see a Mission Evaluation screen. The chart in the centre of the screen will list the type of RAF or Luftwaffe aircraft that saw action in that mission, and how many were destroyed or damaged. The numbers in parentheses indicate the number of aircraft shot down or damaged by your own plane. At the bottom of the screen, you'll find a chart that shows which ground installations were destroyed or damaged, and which ship convoys were hit or sunk during your mission.

### Updating Combat Records

After a pilot or crew has completed the mission you assigned them to fly, their Combat Records will be updated to reflect their successes and failures. These Combat Records will be displayed after the Mission Evaluation screen. Any additional pilots or crews that you have selected from the Flight Roster to participate in a mission will also have their Combat Records updated. Each pilot or crew also has a cumulative score as part of their Record. This score is based on a ranking system, and allows you to compare pilots and crews to one another. It too will be updated after every mission.

Pilots and crews will achieve higher

missions are accomplished. If you're an RAF pilot, your main mission objective is to prevent ground installations, ship convoys, and other RAF fighters from being destroyed in Luftwaffe bombing attacks. If you're flying a Luftwaffe medium bomber or dive bomber, your main mission objective is to bomb the target accurately. Since knocking out a target is a group objective, if other bomber crews also score direct hits on a target, your individual score will improve. If you're flying a Luftwaffe fighter as an escort, your main mission objective is to protect the bombers from enemy fighter attack so they can drop their bombloads over the target. The more bombs that hit the target, and the more bombers that survive, the higher your score will be. If you're flying a Luftwaffe fighter in a free-ranging role, your main mission objective is to shoot down as many RAF fighters as you can. The greater the ratio of RAF fighter losses to Luftwaffe fighter losses, the higher your score will be.

No matter which mission you choose to fly, helping your fellow pilots and crews to survive and complete their missions will increase your score.

### Campaign Results

If you're flying a Campaign Mission, a chart will be displayed after the Combat Records screen. This chart will summarise the impact of your last mission on the Battle of Britain as a whole. It will also tell you how the Battle is shaping up, and which side is closer to victory.

## MEDALS AND PROMOTIONS

Whether you're an RAF pilot or a Luftwaffe pilot or crew member, medals and promotions in rank will be awarded if you and your fellow fliers repeatedly fulfil mission objectives and have outstanding flights. The following honors were bestowed upon those who distinguished themselves in battle in 1940.

**RAF Medals (Listed in order of rank)**

### Victoria Cross

The highest award in the Royal Army, Navy, and Air Force, the Victoria Cross was given to officers or enlisted men for "most conspicuous bravery or preeminent act of valour, self-sacrifice, or extreme devotion to duty in the presence of the enemy." Some 1,346 Victoria Crosses have been awarded since the decoration was originally established by Queen Victoria in 1856. Flight Commander James Nicolson was the one RAF Fighter Command pilot to receive this award for combat action during the Battle of Britain.

### George Cross

Established in 1940, this medal was awarded to men and women for deeds of bravery, either against an enemy, or in peacetime. It is the second-highest British decoration, ranking only below the Victoria Cross.

### Distinguished Service Order

Awarded for meritorious service while engaging an enemy, the Distinguished Service Order was established in 1886. It was given to officers and warrant officers of the Royal Army, Navy, Marines, or Air Force for numerous acts of bravery, rather than for a single individual act. If a recipient had already received a Distinguished Service Order, they were awarded bars, which were worn on the ribbon of the medal.

### Distinguished Flying Cross

This medal was awarded to Royal Air Force officers and warrant officers for courage and valor while flying against an enemy. Like the Distinguished Service Order, it was usually given for several acts of bravery. Bars were awarded if a person had already won this medal for previous actions.

### Battle of Britain Star

This was given to all Fighter Command aircrews who flew at least one sortie against the Luftwaffe between July 10 and October 31, 1940.

## Luftwaffe Medals

### Knight's Cross of the Iron Cross

This was the highest award in the German military, and was given for valor and heroism against an enemy. Luftwaffe fighter pilots could be awarded the Knight's Cross for shooting down a set number of enemy planes. Werner Molders was awarded the Knight's Cross for shooting down twenty aircraft, while Adolf Galland received his for downing seventeen. Molders and Galland were also the first fighter pilots to receive Oak Leaves, which were awarded if a pilot recorded forty aerial victories, and worn on the Knight's Cross. Swords were given when a pilot reached seventy victories (Galland was the first to do so), while Diamonds were awarded for one hundred victories (a mark Molders was first to reach). Both the awards of Swords and Diamonds were initiated specifically by Hitler to honor these extraordinary accomplishments of Luftwaffe fighter pilots.

### Iron Cross First Class

This medal was first instituted in 1813, and reinstated in 1870 and 1914. It was awarded for an outstanding feat of heroism, and usually given when the individual had already received the Iron Cross Second Class.

### Iron Cross Second Class

This award was commonly given for acts of bravery or distinguished service by the German military.

### Wound Badge

This medal was reinstated by Hitler in 1939, with three different classes. If an individual in the German military was wounded one or two times, he earned a black badge. If he was wounded three or four times, or lost an eye, a hand, a foot, or his hearing, he received a silver badge. If he was wounded five or more times, lost his eyesight, suffered brain damage, or was totally disabled, he was awarded a gold badge.

## Ranks and Promotions

For both the Luftwaffe and the RAF promotions in rank were awarded to those pilots who demonstrated success in battle and exhibited qualities of leadership. New Luftwaffe pilots began their careers with the rank of Lieutenant, while new RAF pilots started out with the rank of Pilot Officer.

### World War II Commissioned Officers' Ranks

Luftwaffe	RAF
Oberst	Group Captain
Oberstleutnant	Wing Commander
Major	Squadron Leader
Hauptmann	Flying Lieutenant
Oberleutnant	Flying Officer
Leutnant	Pilot Officer
<b>U.S. Army Air Force (for comparison)</b>	
Colonel	
Lieutenant Colonel	
Major	
Captain	
First Lieutenant	
Second Lieutenant	

### German and British Aircraft and Weapons

Three types of aircraft were used by the RAF and the Luftwaffe in the Battle of Britain: fighters, dive bombers, and medium bombers. World War I fighters were highly maneuverable biplanes, but the 1930s saw the evolution of the faster, though less maneuverable, monoplane fighter. There were those, especially on the British side, who believed that the biplane fighter's greater maneuverability would give it an advantage over the swifter monoplane fighter. However as subsequent World War II aerial battles proved, superior maneuverability was not nearly as important as superior speed.

The faster a fighter was, the quicker it could move into a favorable position from which to attack a slower, though perhaps more maneuverable, enemy. These new fighters also had metal wings

strong enough to hold as many as eight machine guns, while the biplanes could only carry two fuselage-mounted machine guns. Although the British had some biplane fighters in use during the latter part of 1940, they were eventually replaced altogether. In the Battle of Britain, the RAF mainly relied on two monoplane fighters, the single engine Supermarine Spitfire and the Hawker Hurricane. The Luftwaffe flew the single engine Messerschmitt Bf 109 and the twin-engine Messerschmitt Bf 110, both monoplane fighters.

Like the monoplane fighter, the dive bomber also evolved between the two world wars. The theory that called for using a plane to dive steeply on a target, drop its bombs from a relatively short distance, and pull out in time to escape the blast was first tested by the U.S. Navy. In 1933, German pilot Ernst Udet used a couple of obsolete American-made Curtiss Helldiver biplanes to demonstrate the accuracy of dive-bombing to the German Air Ministry. The demonstration was impressive, and eventually resulted in the development of the Junkers Ju 88 Stuka dive bomber. The single-engine Stuka was a formidable weapon in the conquest of Europe, when it attacked ground targets in coordination with German troops. It saw more action in the Battle of Britain than any other dive bomber, although the larger twin-engine Junkers Ju 88 was sometimes used in this role.

Though not as accurate as a dive bomber, the twin engine medium bomber could carry a greater bombload. On the German side, these aircraft were originally developed as Schnellbomber, or bombers that could fly faster than the fighters that were attacking them. During the Spanish Civil War, the Schnellbomber proved to be successful against the slower, obsolete opposition fighters. But in the Battle of

Britain, British Spitfire and Hurricane fighters were much faster than the Luftwaffe medium bombers, which resulted in heavy losses for the

German air force. Like the dive bomber, the medium bomber was designed to bomb targets in concert with an attacking army; Goering himself cancelled the development of a longer-range heavy bomber, since he did not see the need for one. This proved to be a mistake that would come back to haunt Germany, as many of Britain's factories and airfields could have been hit by heavy bombers but were out of range of the Luftwaffe medium bombers. During the Battle of Britain, the main German medium bombers were the Dornier Do 17, the Heinkel He 111, and the Ju 88.

### RAF AND LUFTWAFFE AIR UNIT DESIGNATIONS

In 1936 the RAF was reorganised and divided into "commands," each of which was a large operational unit consisting of aircraft with the same function and responsibility. The major commands were Bomber Command,

Fighter Command, Coastal Command, and Training Command. After war was declared in 1939, Fighter Command, the new fighter arm in charge of defending Britain from aerial attack, divided fighter coverage into four "groups," with each group responsible for covering a designated area of Britain. (See the Historical Overview chapter for a map of the area each group covered.) These groups were in turn divided into "sectors" with the most important airfield within a sector designated as the "sector station." At various airfields within each sector were "squadrons," each of which consisted of twelve aircraft. Each squadron was broken up into two "flights" of six aircraft, designated "A" and "B." In turn, each flight was broken up into two "sections" of three aircraft, and given the designation "red," "yellow,"

"blue," or "green." Two or more squadrons were sometimes joined together to form a "wing," and three to five squadrons formed a "big wing." (See the maps at the back of the manual for more information.)

Unlike the RAF, the Luftwaffe did not split up command of its aircraft according to function. Instead, it was divided into five self-contained air fleets, or "Luftflotten," each of which was responsible for air operations over a given section of Europe. (See the Historical Overview chapter for a map of the areas of Luftflotten coverage.) A Luftflotte was made up of approximately one thousand fighters, bombers, transports, and reconnaissance planes, and was in turn divided into two "Fliegerkorps," consisting of these four types of aircraft. As the war progressed, the Fliegerkorps, which had started out as units of mixed aircraft, became more specialized. Within each fliegerkorps were three to six "Geschwader" which were specialized units of around 80 to 120 aircraft. Each Geschwader was named for the type of aircraft in the unit. A "Jagdgeschwader" (JG) was a fighter unit, "Kampfgeschwader" (KG) a bomber unit, "Stukageschwader" (ST.G) a Stuka dive bomber unit, and "Zerstörergeschwader" (ZG) a Bf 110 Zerstörer unit. These Geschwader were divided into "Gruppen" of about thirty aircraft, which were usually based at the same airfield. Each Gruppe was divided into three "Staffeln,"

and each Staffel consisted of nine or ten of the same aircraft. (See the maps at the back of the manual for more information.)

## GERMAN AIRCRAFT: 1940

### Messerschmitt Bf 109E-3 Emil Fighter

One of the greatest fighter aircraft of the Second World War or of any war the Bf 109 was a mainstay of the Luftwaffe from the time of Spanish Civil War right up until the defeat of the Third Reich. Nearly thirty-five thousand Bf 109s were produced, more than any other fighter of that era. Bf 109s saw service in nearly every German offensive of World War II, and were the only German single-seat fighters used in the Battle of Britain. There the Bf 109s, with their small, stubby wings, were an even match for the Spitfire, and swifter and more maneuverable than any of the other British fighters.

The Bf 109E-3 was developed in 1939 as a faster, more heavily-armed improvement over the earlier models, the Bf 109B and C, which had been deadly in the Spanish Civil War. (Although designed by Willy Messerschmitt, the Bf 109 was named after his company at the time, Bayerische Flugzeugwerke.) The Emil featured a more powerful and reliable Daimler Benz 6601Aa engine, as well as 20 mm cannons in the wings in place of machine guns. The Bf 109E-3 saw service in the invasion of Denmark

and Norway, and in the campaigns against France, the Netherlands, Belgium, and Luxembourg, where it gained a fearsome reputation.

### Messerschmitt Bf 109E-4/B Jabo Fighter/Bomber

As the Bf 109E-3 was tested in battle, certain modifications were made based on its combat performance. This new version, the Bf 109E-4, had a redesigned and reinforced canopy for better visibility and durability, plus more powerful wing-mounted cannons. When it was later decided to use the Bf 109E-4 as a Jabo, or fighter/bomber, a bomb rack was mounted underneath the fuselage. This model, the Bf 109E-4/B, saw its first action in July 1940 against convoys in the English Channel, and was also used against coastal radar stations in the Battle of Britain.

The Bf 109E-3 and E-4/B were fast, agile fighters that could dive and climb quickly. These planes had a tighter turning radius than either the Spitfire or the Hurricane, though few pilots found this out because they were afraid that the stubby wings would break off. Like the Spitfire, the Bf 109 was a joy to fly at medium speeds, but tougher to handle at high speeds, and could easily tire its pilot in a dogfight. Takeoffs and landings were also tricky, because the Bf 109s had a tendency to swing right or left. During the Battle of Britain, their limited range became a factor, since they could only fly as far as London and back. As a result, the longer-range bombers they escorted would sometimes be left unprotected, and many Bf 109 pilots were forced to ditch in the Channel when they ran out of fuel.

### Bf 109E-3 Performance

Powerplant: one Daimler Benz DB 6601Aa 12 cylinder liquid cooled engine  
Horsepower: 1,100  
Top speed: 354 miles per hour  
Rate of climb: 3,280 feet per minute

## Bombload, Fighters

Spitfire  
No bombs

Hurricane  
No bombs

Bf 109  
550 lb

Bf 110  
1,100 lb



Ceiling: 34,450 feet  
Range: 410 miles  
Crew: one

### Dimensions

Wingspan: 32 feet 4 inches  
Wing area: 174 square feet  
Length: 28 feet 4 inches  
Height: 8 feet 2 inches

### Weights

Empty: 4,189 pounds  
Loaded: 5,520 pounds

### Armament

Guns: two 20 mm MG FF cannons with 60 rounds per gun, mounted in the wings. Two 7.92 mm Rheinmetall Borsig MG 17 machine guns with 1,000 rounds per gun, mounted in the fuselage.

### Bf 109E-4/B Performance

## Top Speed, Fighters

Spitfire  
370 MPH



Hurricane  
320 MPH

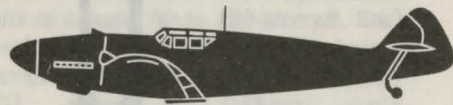
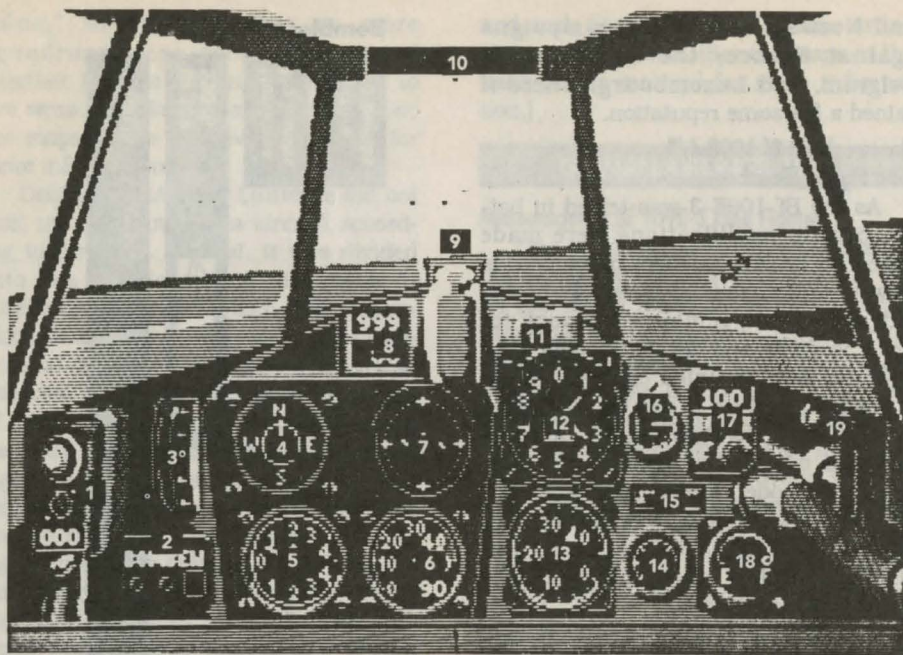


Bf 109  
354 MPH



Bf 110  
340 MPH





Powerplant: one Daimler Benz DB 601Aa 12 cylinder liquid cooled engine  
Horsepower: 1,100  
Top speed: 354 miles per hour  
Rate of climb: 3,280 feet per minute  
Ceiling: 34,450 feet  
Range: 410 miles  
Crew: one

#### Dimensions

Wingspan: 32 feet 4 inches  
Wing area: 174 square feet  
Length: 28 feet 4 inches  
Height: 8 feet 2 inches

#### Weights

Empty: 4, 189 pounds  
Loaded: 5,875 pounds

#### Armament

Guns: two 20 mm MG FF/M cannons with 60 rounds per gun, mounted in the wings. Two 7.92 mm Rheinmetall Borsig MG 17 machine guns with 1,000 rounds per gun, mounted in the fuselage.

Warhead load: one 110 pound bomb, or one 550 pound bomb, mounted beneath the fuselage.

1. Radio
2. Bomb Release Light (Bf 109E-4/B Jabo fighter/bombers only)
3. Flaps Lever
4. Compass
5. Climb/Dive Indicator
6. RPM Indicator
7. Banking Indicator
8. Ammunition Round Indicators
9. Gunsight
10. View Indicator
11. Nameplate
12. Altimeter

#### Durability, Fighters

Spitfire



Hurricane



Bf 109



Bf 110



13. Airspeed Indicator
14. Engine Damage Indicator
15. Airframe Damage Indicator
16. Pitch Indicator
17. Replay Camera Indicator
18. Fuel Gauge
19. Landing Gear Lever

#### Messerschmitt Bf 110C-4 Zerstorer Fighter

Noted for its sleek design and distinctive twin rudders and engines, the versatile Bf 110 served in a variety of roles during World War II. Heavily armed with two cannons and four machine guns in its nose, the Zerstorer or "destroyer," was originally designed as a fast, long-range fighter that could escort bombers deep into enemy territory, while blowing any opposition fighters out of the sky. During the invasion of Poland in 1939 Bf 110s proved successful in this role, and were also used to destroy Polish airfields and communications lines. As a fighter and a close support weapon for the German Army, the Bf 110 was highly effective in the invasion of Denmark, Norway, and the Low Countries, as well as in the Battle of France.

The Bf 110C series was the first Zerstorer to be widely produced. It featured the more powerful Daimler Benz 601A engines, which enabled it to fly faster and farther than earlier models, plus a shallower radiator which eliminated a turbulence problem. The Bf 110C-4

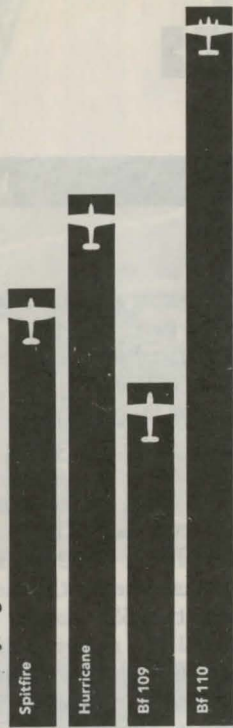
version had extra armour protection for its crew of two, the pilot and rear gunner. It arrived in France just in time for the Battle of Britain.

#### Messerschmitt Bf 110C-4/B Jabo Fighter/Bomber

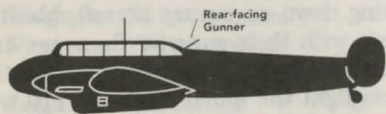
In the summer of 1940, a modified version of the Bf 110C-4 began arriving at the Luftwaffe bases in France. This new model, the Bf 110C-4/, had a pair of bomb racks beneath the fuselage and could carry two 551 pound bombs. It also featured the newer Daimler Benz 601N engines, which gave a slight boost in horsepower. A special Bf 110C-4/B unit, known as Experimental Group 210, was set up to develop fighter/bomber tactics, and in August this unit successfully attacked radar stations, airfields, and other targets in the south of Britain.

During the Battle of Britain the weaknesses of the Bf 110 began to outweigh its strengths. On the plus side it was almost as fast as the Spitfire, was formidably armed, a delight to fly, and extremely capable in the fighter/bomber role. When combating enemy fighters, Bf 110 pilots enjoyed the most success by diving down on enemy aircraft, blasting them with their superior firepower and then flying away from the action. But in a dogfight the much larger Bf 110 was no match for the more maneuverable Spitfires and Hurricanes, and a great number of 110s were lost in the summer's fighting. Many Bf 110s were forced to fly in defensive circles, to protect each

Durability, Fighters



other's more vulnerable rear. As fighter escort for Luftwaffe bombers, Bf 110s fared so poorly that they themselves had to be escorted by Bf 109s, and were eventually removed from that role. The versatility of the Bf 110 did prove to be a vital asset for the Luftwaffe in later action in North Africa and on the Russian Front, where the fighter opposition was less intense.



#### Bf 110C-4 Performance

Powerplant: two Daimler benz DB

601A 12 cylinder inline engines  
Horsepower: 1,100 per engine  
Top speed: 340 miles per hour  
Rate of Climb: 8.5 minutes to 18,000 feet  
Ceiling: 32,810 feet  
Range: 680 miles  
Crew: two—one pilot and one rear gunner

#### Dimensions

Wingspan: 53 feet 4 inches  
Wing area: 413 square feet  
Length: 40 feet 4 inches  
Height: 11 feet 6 inches

#### Weights

Empty: 9,920 pounds  
Loaded: 15,290 pounds

#### Armament

Guns: two 20mm MG FF cannons with 180 rounds per gun, mounted in the nose. One flexible 7.92mm MG 17 machine guns with 1,000 rounds per gun, also mounted in the nose. One flexible 7.92mm MG 15 machine gun, mounted in the rear of the canopy.

Bf 110C-4/B Performance  
Powerplant: two Daimler Benz DB 601N 12-cylinder liquid cooled engines  
Horsepower: 1,200 per engine  
Top speed: 349 miles per hour  
Rate of climb: 2,255 feet per minute  
Ceiling: 32,800 feet  
Range: 528 miles  
Crew: two—one pilot and one rear gunner

#### Dimensions

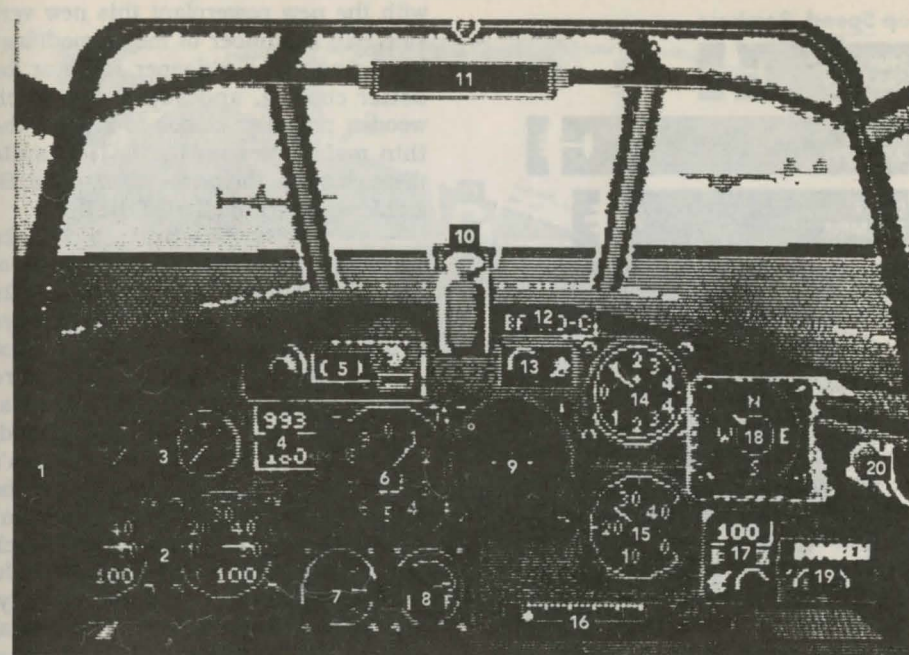
Wingspan: 53 feet 4 inches  
Wing area: 413 square feet  
Length: 40 feet 4 inches  
Height: 11 feet 6 inches

#### Weights

Empty: 9,920 pounds  
Loaded: 15,430 pounds

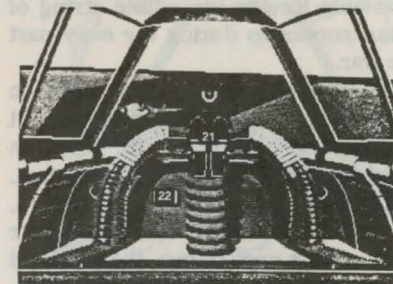
#### Armament

Guns: two 20mm MG FF cannons with 180 rounds per gun, mounted in the nose. Four 7.92mm MG 17 machine guns with 1,000 rounds per



gun, also mounted in the nose. One flexible 7.92mm MG 15 machine gun, mounted in the rear of the canopy.  
Warhead load: two 550 pound bombs, mounted beneath the fuselage

1. Flaps Lever
2. RPM Indicator
3. Engine Damage Indicators
4. Ammunition Round Indicators
5. Radio
6. Altimeter
7. Pitch Indicator
8. Fuel Gauge
9. Banking Indicator
10. Gunsight
11. View Indicator
12. Nameplate
13. Automatic Pilot Light
14. Climb/Dive Indicator
15. Airspeed Indicator



16. Airframe Damage Indicator
17. Replay Camera Indicator
18. Compass
19. Bomb Indicator Panel (Bf 110C-4/B Jabo fighter/bombers only)
20. Landing Gear Lever
21. Autoshoot Light
22. Ammunition Round Indicator

#### Junkers Ju 87B-1 Stuka Dive Bomber

At the start of World War 11 the Junkers Ju 87 was the most feared weapon in the arsenal of the Luftwaffe — and perhaps even of the entire Third



## Top Speed, Bombers

Stuka  
242 MPH



He 111  
273 MPH



Do 17  
265 MPH



Ju 88  
280 MPH



Reich. With its bent wings, fixed landing gear, and screaming sirens, the intimidating Stuka proved to be nearly unstoppable during the Spanish Civil War and the invasion of Poland. Since it could deliver bombs with great accuracy, it was unsurpassed as an army-support weapon, despite its lack of speed and maneuverability. Coordinated attacks with Stukas and German Army troops, part of the tactics of the Blitzkrieg, were responsible for the incredible string of German successes during the early part of the war.

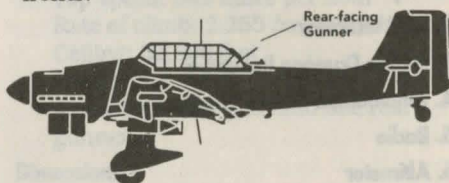
The Ju 87B-1 was the first model to be produced in great numbers, and it incorporated many of the lessons learned from Spanish Civil War combat. It featured a more powerful engine, redesigned landing struts, and better quarters for its crew of two, the pilot and the rear facing gunner/radio operator. The Ju 87B-1 even had lines etched into the port side of the canopy showing diving angles, and an automatic pilot which pulled the plane out of its dive if the pilot blacked out. This was the model that — gave the Stuka its notorious reputation, and it saw service in the campaigns against Poland, the Netherlands, Belgium, France, Greece, and Crete.

### Junkers Ju 87B-2 Stuka Dive Bomber

In late 1939, a slightly more powerful version of the Junkers Jumo 211 Da engine began to arrive at Ju 87 assembly lines. The Stukas fitted with this engine were designated as the Ju 87B-2. Along

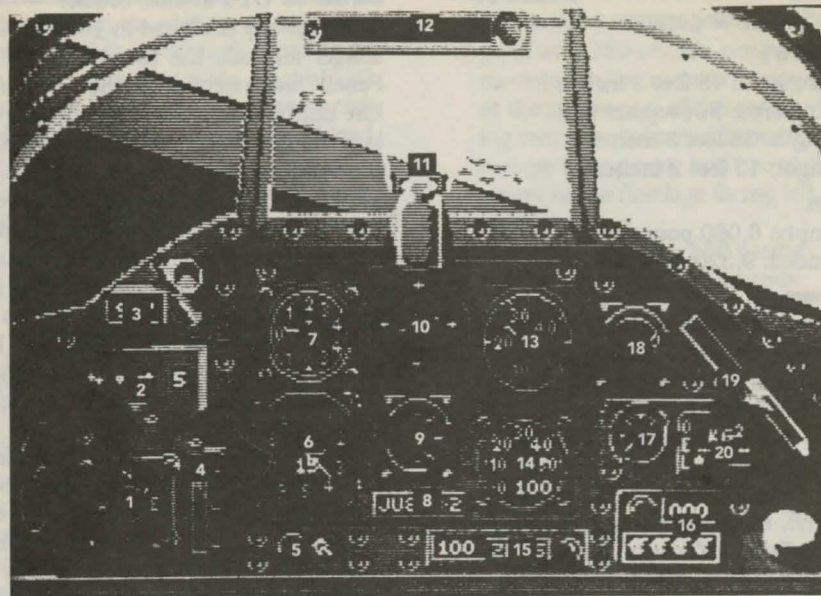
with the new powerplant this new version had a number of minor modifications, including a deeper radiator for better cooling, and adjustable-pitch wooden propeller blades to replace the thin metal ones on the B-1. Despite these changes, the performance of the B-2 differed little from that of the B-1.

The first Ju 87B-2s arrived in France just as the Battle of Britain began. At first B-1s and B-2s enjoyed success against British convoys in the English Channel. But after August 13, 1940, Eagle Day, Ju 87s were ordered to attack airfields and radar stations on the south coast of England, which were barely within the Stuka's range. For the first time in the war, the Ju 88 had to fly against significant enemy fighter opposition in an attack role for which it was ill-suited. The Ju 87's slow speed, lack of maneuverability, and poor crew protection proved fatal against RAF Spitfires and Hurricanes, especially when pulling out of a dive, and over forty were shot down in just six days. Ju 87 losses mounted, and after August 19 the Stuka, its invincible reputation shattered, would see no more action in the Battle of Britain, though it would continue to be successful on other fronts.



### Ju 87B-1 Performance

Powerplant: one Junkers Jumo 211  
Da 12 cylinder Vee liquid cooled engine  
Horsepower: 1,200  
Top speed: 242 miles per hour  
Rate of climb: 12 minutes to 12,140 feet  
Ceiling: 26,250 feet  
Range: 373 miles  
Crew: two — one pilot and one rear



gunner

### Dimensions

Wingspan: 45 feet 3 inches  
Wing area: 344 square feet Length:  
36 feet 5 inches Height: 12 feet 9  
inches

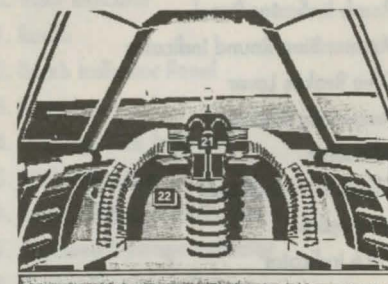
### Weights

Empty: 6,080 pounds  
Loaded: 9,371 pounds

### Armament

Guns: two 7.92 mm MG 17 machine  
guns with 1,000  
rounds per gun, mounted in the  
wings. One flexible 7.92 mm MG 15

The landing-gear  
mounted sirens,  
known as "trumpets  
of Jericho,"  
emitted a banshee-  
like wail that was  
designed to strike ter-  
ror into the hearts of  
those on the  
ground



machine gun with 900 rounds,  
mounted at the rear of the canopy.  
Warhead load: one 1,100 pound  
bomb, mounted beneath the fuselage.  
Four 110 pound bombs, mounted  
beneath the wings.

### Ju 87B-2 Performance

Powerplant: one Junkers Jumo 211  
Da 12-cylinder Vee liquid-cooled  
engine  
Horsepower: 1,200  
Top speed: 237 miles per hour  
Rate of climb: 12 minutes to 12,140  
feet  
Ceiling: 26,250 feet

Range: 373 miles Crew: two one pilot and one rear gunner

#### Dimensions

Wingspan: 45 feet 3 inches  
Wing area: 344 square feet  
Length: 36 feet 3 inches  
Height: 13 feet 2 inches

#### Weights

Empty: 6,060 pounds  
Loaded: 9,320 pounds

#### Armament

Guns: two 7.92 mm MG 17 machine guns, with 1,000 rounds per gun, mounted in the wings. One flexible 7.92 mm MG 15 machine gun with 900 rounds, mounted at the rear of the canopy.  
Warhead load: one 1,100 pound bomb, mounted beneath the fuselage. Four 110 pound bombs, mounted beneath the wings.

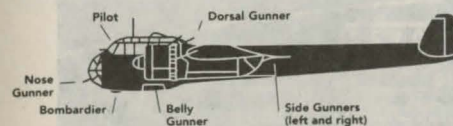
1. Compass
2. Bomb Indicator Panel
3. Ammunition Round Indicator
4. Dive Brakes Lever
5. Automatic Pilot Light
6. Altimeter
7. Climb/Dive Indicator
8. Nameplate
9. Pitch Indicator
10. Banking Indicator
11. Gunsight
12. View Indicator
13. Airspeed Indicator
14. RPM Indicator
15. Replay Camera Indicator
16. Radio
17. Engine Damage Indicator
18. Fuel Gauge
19. Flaps Lever
20. Airframe Damage Indicator
21. Autoshoot Light
22. Ammunition Round Indicator

#### Dornier Do 17z-2 Medium Bomber

Originally designed in 1934 as a passenger aircraft, the twin-engine "Flying Pencil" was rejected by the German airline Lufthansa because the slender fuselage did not leave enough room for its six passengers. The design attracted the attention of the Luftwaffe, however and prototypes were developed into bombers and reconnaissance planes that could fly faster than pursuing fighters. The feasibility of this Schnellbomber idea was tested at the Zurich Air Show in 1937, where a Do 17 prototype startled onlookers by finishing ahead of all the fighters in the competition.

The first Do 17s saw service in the Spanish Civil War as reconnaissance aircraft. The Do 17z-2, which had extra protective armour a redesigned nose, and a cockpit with more room and greater visibility, was delivered to the Luftwaffe in 1939. Unfortunately, the Messerschmitt factory had top priority and got to use the Daimler Benz engine for its Bf 109s, forcing the Do 17z-2 to use the less powerful BMW Bramo Fafnir engine, which greatly reduced its speed. During the Battle of Britain the Do 17z-2 was first used against Channel convoys, then on bombing missions against airfields and factories inland, where it did extensive damage despite suffering heavy losses. The Do 17 enjoyed success as a

low-altitude bomber, since it could dive on a target with its engines at full throttle and then pick up enough speed to get away after dropping its bombload. Although it had several drawbacks, including a relatively light warhead load, the ruggedness, maneuverability, and stability of the Flying Pencil made it popular with the men who flew it.



#### Do 17z-2 Performance

Powerplant: two BMW Bramo Fafnir 323P nine cylinder air-cooled radial engines  
Horsepower: 1,000 per engine  
Top speed: 265 miles per hour  
Rate of climb: 3.3 minutes to 3,280 feet  
Ceiling: 26,740 feet  
Range: 721 miles Crew: four one pilot, one radio operator, one flight engineer, and one aircraft commander/bombardier

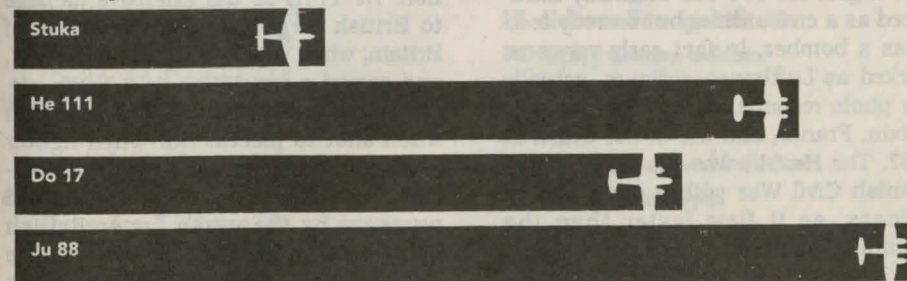
#### Dimensions

Wingspan: 59 feet 10 inches  
Wing area: 592 square feet  
Length: 51 feet 10 inches  
Height: 15 feet

#### Weights

Empty: 11,484 pounds  
Loaded: 18,913 pounds

#### Durability, Bombers

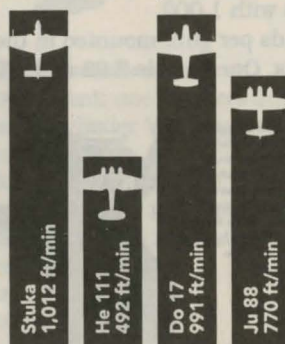


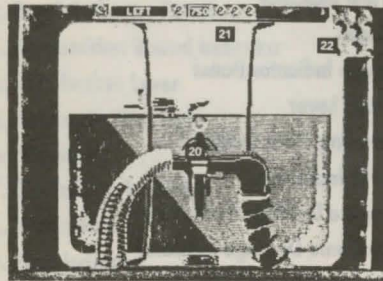
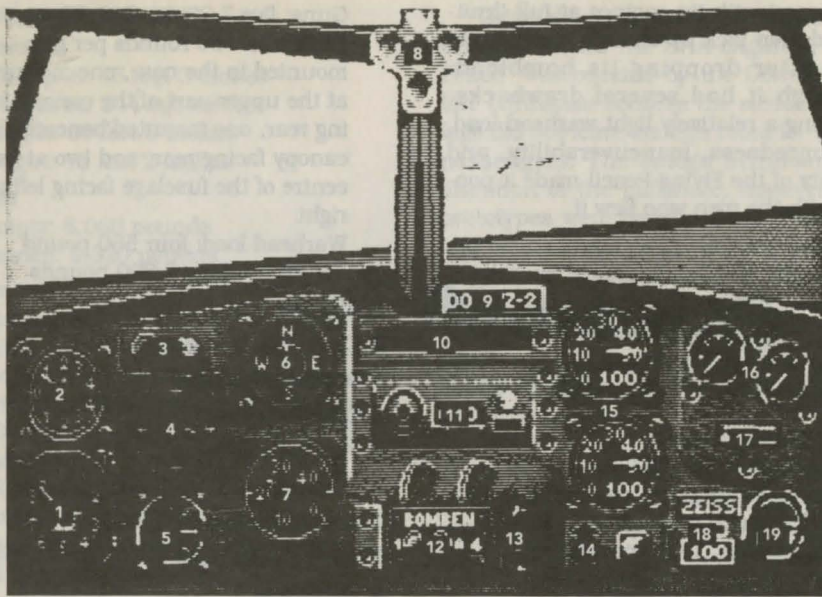
#### Armament

Guns: five 7.92 mm MG 15 machine guns with 750 rounds per gun — one mounted in the nose, one mounted at the upper part of the canopy facing rear, one mounted beneath the canopy facing rear, and two at the centre of the fuselage facing left and right  
Warhead load: four 550 pound bombs totalling 2,200 pounds

1. Altimeter
2. Climb/Dive Indicator
3. Automatic Pilot Light
4. Banking Indicator
5. Pitch Indicator
6. Compass
7. Airspeed Indicator
8. Gun Indicator Lights
9. Nameplate
10. View Indicator
11. Radio
12. Bomb Indicator Panel
13. Flaps Lever
14. Landing Gear Indicator
15. RPM Indicators
16. Engine Damage Indicators
17. Airframe Damage Indicator
18. Replay Camera Indicator
19. Fuel Gauge
20. Autoshoot Light
21. Ammunition Round Indicator

Rate of Climb, Bombers





## 22. Gun Indicator Lights

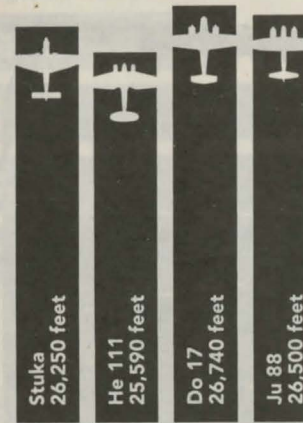
### Heinkel He 111 H-3 Medium Bomber

The bomber used most by the Luftwaffe in the Battle of Britain, the twin-engine He 111 was originally introduced as a civil airliner but secretly tested as a bomber. In fact early versions, marked as Lufthansa airliners, actually flew photo reconnaissance missions over Britain, France, and the Soviet Union in 1937. The He 111 was first used in the Spanish Civil War with a great deal of success, as it flew faster than the defending fighters. Then in 1939 it was mass produced as the main

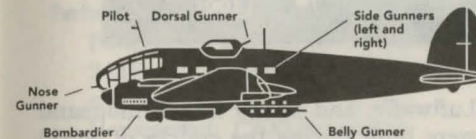
Luftwaffe bomber. Called "The Spade" by its crews because of its broad, rounded wings, the glass-nosed He 111 saw service in campaigns against Poland, Belgium, the Netherlands, and France.

The He 111 H-3 could carry twice the bombload of a Do 17, and over a thousand pounds more than the Ju 88. But since the Messerschmitt factory was using all available Daimler Benz engines, the He 111H-3, like the Do 17, was forced to use less powerful engines that reduced its airspeed. To compensate for its slowness, more machine guns were added, along with extra armour protection. He 111H-3s did extensive damage to British targets during the Battle of Britain, when protected by fighter escort, and gained a reputation as a tough aircraft capable of remaining airborne even when shot to pieces. But when fighter protection was unavailable, the lumbering "Spade" was shot down in great numbers by the much faster British fighters. After the Battle, however, He 111s were the main Luftwaffe bombers

## Ceiling, Bombers



used in the Blitz, and nearly levelled London.



## He 111H-3 Performance

Powerplant: two Junkers Jumo 211D-2 12-cylinder Vee liquid cooled engines  
 Horsepower: 1,200 per engine  
 Top speed: 273 miles per hour  
 Rate of climb: 30 minutes to 14,765 feet  
 Ceiling: 25,590 feet  
 Range: 745 miles  
 Crew: four or five

## Dimensions

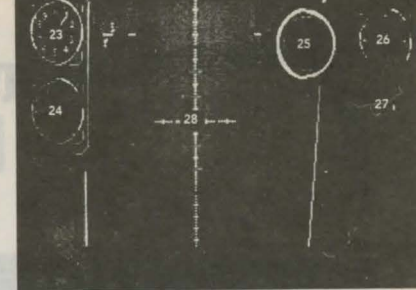
Wingspan: 74 feet 2 inches  
 Wing area: 943 square feet  
 Length: 53 feet 9 inches  
 Height: 13 feet 2 inches

## Weights

Empty: 15,873 pounds  
 Loaded: 28,924 pounds

## Armament

Guns: five 7.92 mm MG 15 machine guns with 750 rounds per gun — one



mounted in the nose, one mounted in the fuselage above the wings facing rear one mounted in the gondola beneath the fuselage facing rear, and two mounted at the waist within at the centre of the fuselage  
 Warhead load: eight 550 pound bombs or four 1,100 pound bombs, totalling 4,400 pounds

## 1. Altimeter

## 2. Climb/Dive Indicator

## 3. Automatic Pilot Light

## 4. Banking Indicator

## 5. Pitch Indicator

## 6. Compass

## 7. Airspeed Indicator

## 8. Gun Indicator Lights

## 9. Nameplate

## 10. View Indicator

## 11. Radio

## 12. Bomb Indicator Panel

## 13. Flaps Lever

## 14. Landing Gear Indicator

## 15. RPM Indicators

## 16. Engine Damage Indicators

## 17. Airframe Damage Indicator

## 18. Replay Camera Indicator

## 19. Fuel Gauge

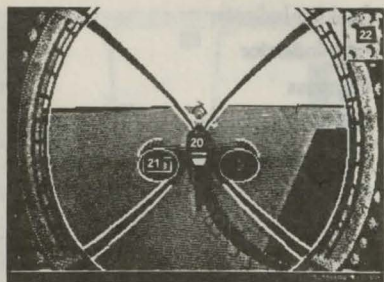
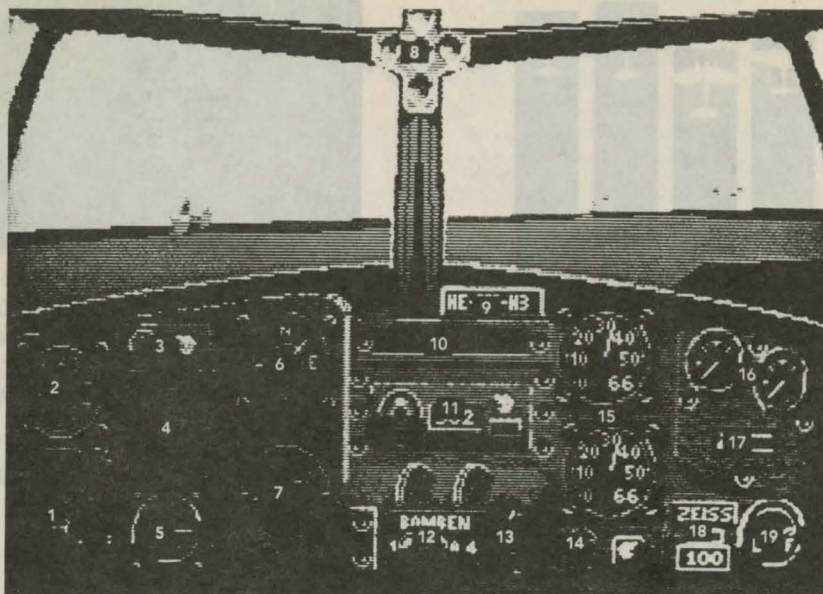
## 20. Autoshoot Light

## 21. Ammunition Round Indicator

## 22. Gun Indicator Lights

## 23. Altimeter

## 24. Airspeed Indicator



- 25. Compass
- 26. Banking Indicator
- 27. Bomb Indicator Panel
- 28. Bombsight

#### Junkers Ju 88A1 Medium Bomber/Dive Bomber

The newest and best of the German medium bombers in 1940, the twin-engine Junkers Ju 88 did not see as much action in the Battle of Britain as the He 111 or the Do 17 because fewer of them had been produced. Swift, reliable, and tough, the Ju 88 ended up as the primary all-purpose bomber of the

Luftwaffe, and nearly fifteen thousand were built during the course of World War II. Based on a 1935 design by a team led by two Americans, the first prototype flew in December 1936. Limited production began in 1939, too late for the testing grounds of the Spanish Civil War, and it saw little action in the conquest of Europe. The Ju 88 was used on a limited basis against British warships in the North Sea prior to the Battle of Britain.

The Ju 88A-1 was the first of these models to be widely produced, and featured underwing dive brakes that enabled it to be used as a dive bomber. It was faster, stronger, more maneuverable, and could fly farther than any other Luftwaffe medium bomber. In the Battle of Britain, the Ju 88A-1 initially enjoyed success attacking RAF airfields. But as the Battle progressed, the Ju 88A-1, like the other Luftwaffe bombers, proved vulnerable to the RAF fighters, though crews had a better chance of getting back to their bases in this excellent aircraft than in the others.

#### Range, Bombers

Stuka  
373 miles



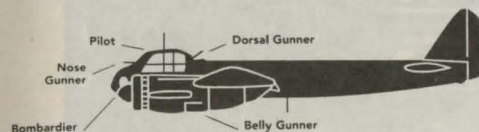
He 111  
745 miles



Do 17  
721 miles



Ju 88  
1,453 miles



#### Ju 88A-1

##### Performance

Powerplant: two Junkers Jumo 211B-112 cylinder Vee liquid-cooled engines  
Horsepower: 1,200 per engine  
Top speed: 280 miles per hour  
Rate of climb: 23 minutes to 17,715 feet  
Ceiling: 26,500 feet  
Range: 1,453 miles  
Crew: four — one pilot, one bombardier/nose gunner, one radio operator/rear gunner, and one gondola gunner

##### Dimensions

Wingspan: 59 feet 10 inches

#### Firepower, Bombers

Stuka



He 111



Do 17



Ju 88



Wing area: 540 square feet  
Length: 47 feet 1 inch  
Height: 15 feet 5 inches

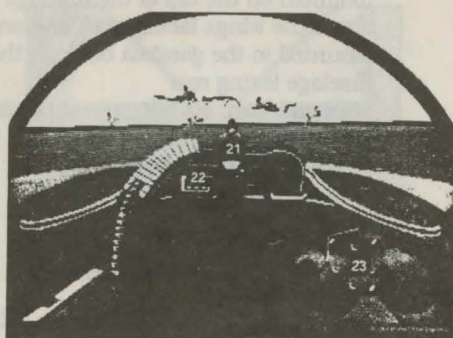
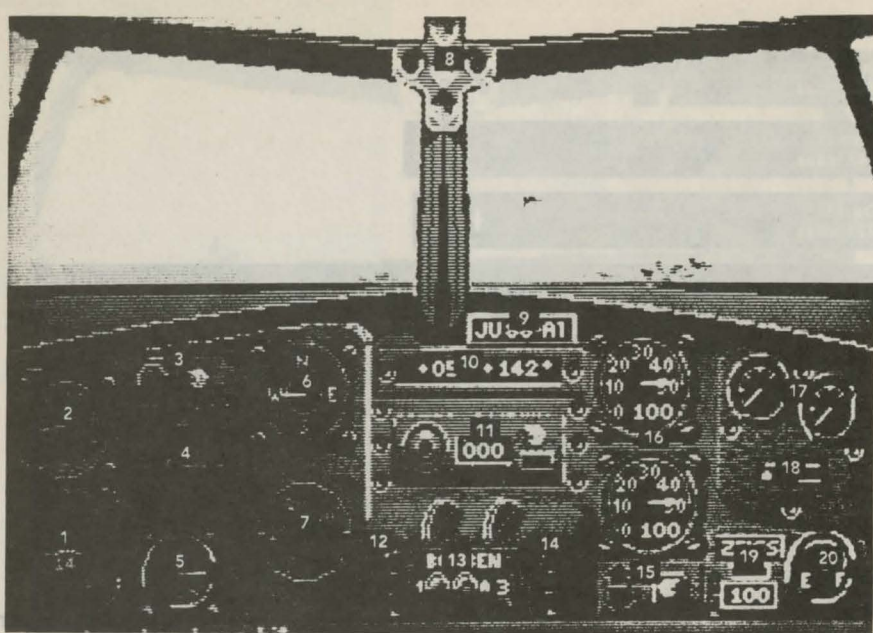
##### Weights

Empty: 21,738 pounds  
Loaded: 30,865 pounds

##### Armament

Guns: three 7.92 mm MG 15 machine guns with 750 rounds per gun — one mounted in the nose, one mounted on the top of the fuselage above the wings facing rear, and one mounted in the gondola beneath the fuselage facing rear  
Warhead load: six 550 pound bombs or three 1,100 pound bombs, totalling 3,300 pounds, mounted beneath the fuselage.

1. Altimeter
2. Climb/Dive Indicator
3. Automatic Pilot Light
4. Banking Indicator
5. Pitch Indicator



- 16. RPM Indicators
- 17. Engine Damage Indicators
- 18. Airframe Damage Indicator
- 19. Replay Camera Indicator
- 20. Fuel Gauge
- 21. Autoshoot Light
- 22. Ammunition Round Indicator
- 23. Gun Indicator Lights

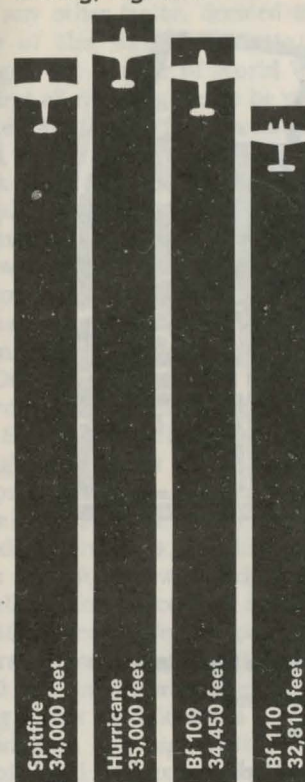
- 6. Compass
- 7. Airspeed Indicator
- 8. Gun Indicator Lights
- 9. Nameplate
- 10. View Indicator
- 11. Radio
- 12. Dive Brakes Lever
- 13. Bomb Indicator Panel
- 14. Flaps Lever
- is. Landing Gear Indicator

### BRITISH AIRCRAFT: 1940

#### Hawker Hurricane Mk I Fighter

The first monoplane fighter ever used by the RAF, the sturdy, reliable Hurricane was a workhorse during the early part of World War II when it outnumbered all other modern British fighters. Its fuselage was constructed of metal tubes surrounded by wood and fabric, which enabled it to sustain a good deal of damage in

### Ceiling, Fighters



battle and to be quickly repaired on the ground. Although not as fast or as maneuverable as the German Bf 109, the performance of the Hurricane was nevertheless close enough to hold its own in dogfights if its pilot was skilled enough. Also, since it had better range,

it had the advantage of staying in the air longer than the Bf 109. The rugged, heavily-armoured Hurricane proved to be devastating against the other German aircraft. Frequently British fighter tactics called for this fighter to attack the bombers, while the more maneuverable Spitfire would take on the 109s. The Hurricane proved more than capable, and 88 percent of the German aircraft lost in the battle of Britain were shot down by Hurricanes.

The Hurricane Mk I was the first production model to go into service. Later versions of this model featured an all-metal wing, replacing the earlier fabric-skinned wing, plus extra armour protection around the cockpit area. These were used in the defence of Singapore against the Japanese, and in the Battle of France and the Battle of Britain.



#### Hurricane Mk I Performance

- Powerplant: one Rolls Royce Merlin II or III 12-cylinder liquid-cooled engine
- Horsepower: 1,030
- Top speed: 320 miles per hour
- Rate of climb: 2,420 feet per minute
- Ceiling: 35,000 feet
- Range: 460 miles

Spitfire



Hurricane

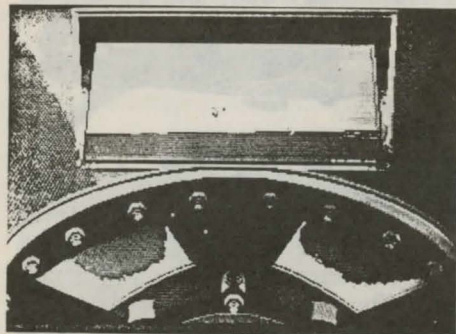
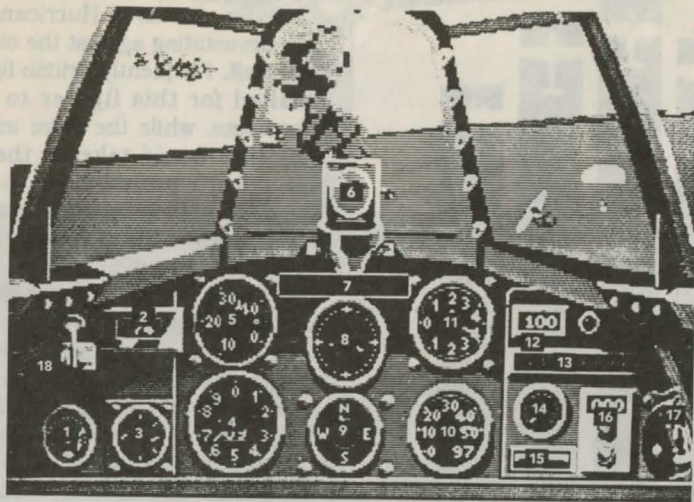


Bf 109



Bf 110





Crew: one

#### Dimensions

Wingspan: 40 feet  
Wing area: 257 square feet  
Length: 31 feet 5 inches  
Height: 13 feet 1 inch

#### Weights

Empty: 4,670 pounds  
Loaded: 6,600 pounds

#### Armament

Guns: eight Browning .303 calibre machine guns, four mounted in each wing, with 334 rounds per gun

#### 1. Fuel Gauge

2. Ammunition Round Indicator
3. Pitch Indicator
4. Altimeter
5. Airspeed Indicator
6. Gunsight
7. View Indicator
8. Banking Indicator
9. Compass
10. RPM Indicator
11. Climb/Dive Indicator
12. Replay Camera Indicator
13. Nameplate
14. Engine Damage Indicator
15. Airframe Damage Indicator
16. Radio
17. Landing Gear Lever
18. Flaps Lever

#### Supermarine Spitfire Mk I Fighter

Perhaps no other combat aircraft in history can match the reputation of the Spitfire. In the eyes of the British public,

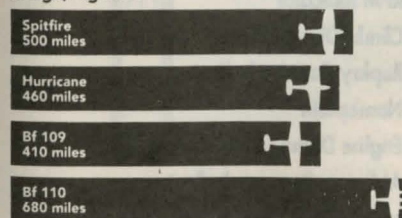
the performance of this aircraft, more than any other factor, decided the outcome of the Battle of Britain and changed the course of World War II. The first all-metal fighter to be produced for the RAF, the Spitfire was noted for its sleek design and unique thin, oval wings. While the Hurricane evolved from a biplane design, the Spitfire was designed as a monoplane from the start. And while the Hurricane outnumbered the Spitfire in 1940 and shot down more German aircraft, the Spitfire captured the imagination of the British people.

Originally based on a design for a record-breaking racing seaplane, the first Spitfire prototype flew in 1936. Though its complex design delayed initial production, — the first Spitfires, model Mk 1, were delivered to RAF squadrons in 1938. The first seventy-seven aircraft had twin-blade fixed pitch propellers, and succeeding aircraft were fit with three blade two position propellers, there by raising its ceiling by 7,000 feet and improving climbing and diving. Later modifications — included the addition of a high visibility bubble cockpit hood and extra armour protection. — The Spitfire Mk I first saw action in October 1938 at the Firth of Forth in Scotland, where two — RAF squadrons intercepted Ju 88 bombers and shot one down.

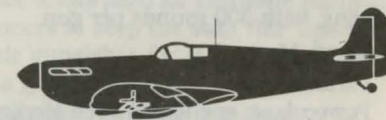
#### Supermarine Spitfire Mk 11 Fighter

When the more powerful Rolls Royce Merlin XII engine was developed in 1940, it was delivered to a new Spitfire plant

#### Range, Fighters

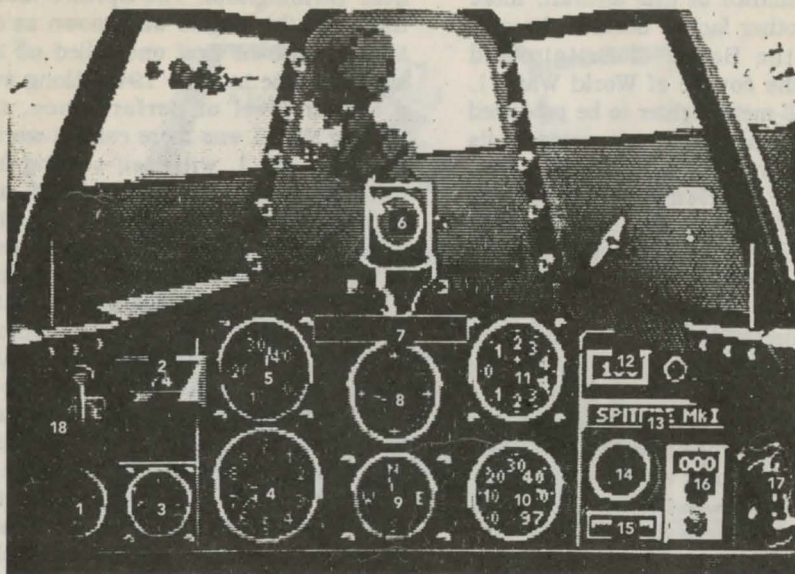


near Birmingham. The Spitfire model that used this engine was known as the Mk 11, and the first one rolled off the assembly line in June 1940. Along with a higher level of performance, the Spitfire Mk 11 was more combat-worthy than the Mk 1, with self-sealing fuel tanks, a bullet proof windshield, and extra armour protection for the pilot added during assembly. Certain versions of this model could also carry bombs and extra fuel tanks. During the Battle of Britain, the speed and maneuverability of the Spitfire made it an even match for its main German adversary, the Bf 109, and gave it a decisive advantage over other German aircraft. Although the Spitfire could not out climb the Bf 109, it could outrun it, unlike the Hurricane. The Spitfire's engine, however, would sometimes cut out in combat when the forces caused fuel to flood the carburettor. To prevent Bf 109 pilots from taking advantage of this, British pilots would execute a half roll and dive, which kept the Spitfire's engine running. The carburation flaw was later corrected, and the Spitfire would go down in history as perhaps the best defensive weapon of the war.



#### Spitfire Mk 1 Performance

Powerplant: one Rolls Royce Merlin II or III 12-cylinder liquid-cooled engine  
Horsepower: 1,030  
Top speed: 355 miles per hour  
Rate of climb: 2,530 feet per minute  
Ceiling: 34,000 feet  
Range: 395 miles  
Crew: one  
Dimensions  
Wingspan: 36 feet 10 inches  
Wing area: 242 square feet  
Length: 29 feet 11 inches  
Height: 11 feet 5 inches



#### Weights

Empty: 5,067 pounds

Loaded: 6,409 pounds

#### Armament

Guns: eight Browning .303 calibre machine guns, four mounted in each wing, with 300 rounds per gun

#### Spitfire Mk II

##### Performance

Powerplant: one Rolls Royce Merlin XII 12-cylinder liquid-cooled engine

Horsepower: 1,175

Top speed: 370 miles per hour

Rate of climb: 2,600 feet per minute

Ceiling: 34,000 feet

Range: 500 miles

Crew: one

##### Dimensions

Wingspan: 36 feet 10 inches

Wing area: 242 square feet

Length: 29 feet 11 inches

Height: 11 feet 5 inches

##### Weights

Empty: 5,142 pounds

Loaded: 6,484 pounds

#### Armament

Guns: eight Browning .303 calibre machine guns, four mounted in each wing, with 300 rounds per gun

1. Fuel Gauge
2. Ammunition Round Indicator
3. Pitch Indicator
4. Altimeter
5. Airspeed Indicator
6. Gunsight
7. View Indicator
8. Banking Indicator
9. Compass
10. RPM Indicator
11. Climb/Dive Indicator
12. Replay Camera Indicator
13. Nameplate
14. Engine Damage Indicator
15. Airframe Damage Indicator
16. Radio
17. Landing Gear Lever

## Bombload, Bombers

Stuka  
1,100 lb



He 111  
4,410 lb



Do 17  
2,205 lb



Ju 88  
3,307 lb



## GERMAN AIRBORNE WEAPONS

### 7.92 mm MG 15 and MG 17 Machine Guns

The MG 15 and MG 17 were the standard German airborne machine guns, used by both Luftwaffe fighters and bombers. The MG 15 was mounted on the wings, fuselage, and nose of the Bf 109, the Bf 110, and the Ju 87. The MG 17 was mounted inside the canopies and gondolas of the He 111, the Do 17, and the Ju 88. In performance, these weapons had a slightly slower rate of fire than the British .303 machine guns, although they fired slightly heavier bullets.

### 20 mm MG FF and MG FF/M Cannons

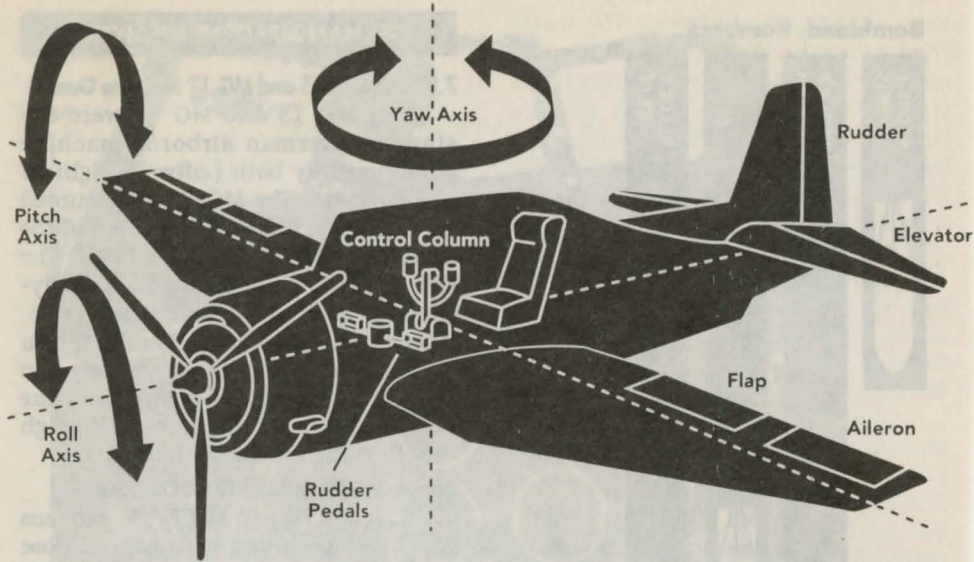
The MG FF and MG FF/M cannons could do a great deal of damage at close range, especially the MG FF/M, which had a higher firing rate. Mounted in the wings of the Bf 109 and in the nose of the Bf 110, they fired a thin shelled projectile that exploded on impact. These cannons, however had a limited magazine of sixty shells, which could be used up in just eight seconds! Worse yet, they had a low muzzle velocity, meaning that the shells were slow to reach the target. Since it was hard for Luftwaffe pilots and gunners to keep the swift RAF fighters in their gunsights for long, this proved to be a great drawback.

### 1,100/550/110 Pound (500/250/50 kg) Bombs

The 1,100, 550, and 110 pound bombs were general-purpose bombs, with bodies made of a solid piece of forged steel, then packed with explosives. From the He 111, the 550 pound version was dropped tail-first, which the British and other Allied enemies claimed reduced its accuracy.

### .303 Browning Machine Guns

With eight Browning machine guns mounted on the wings of the Spitfire and Hurricane, these fighters provided an even match for the firepower of the Bf 109, with its two cannons and two



machine guns. However, a lot of machine gun bullets were needed to bring down the more durable bombers. These machine guns had a somewhat greater muzzle velocity and rate of fire than their German counterparts, the MG 15 and MG 17.

## FLIGHT FUNDAMENTALS

This section covers the dynamics of flight, both in a real aircraft, and in the fighters and bombers you fly in *Their Finest Hour*. Those paragraphs that apply to flying in the game are in italics.

At the time of the Battle of Britain, aircraft had — become larger, heavier, and faster than ever before. Yet these 1940 fighters and bombers, like the supersonic military aircraft of today, utilised the same aerodynamic — principles that the Wright Brothers first

applied in 1903 at Kitty Hawk. And the most important of these principles of flight is known as **lift**.

Try this simple experiment. Hold a piece of paper by one of its edges and blow across the top of it. The paper will rise. Why? Because the air moving across the top of the paper creates a high pressure zone greater than the pressure zone below the paper, which in turn creates suction and pulls the paper up. This is known as lift.

Substitute an aircraft wing for the piece of paper, and you have some idea of how a plane becomes airborne. Of course, a wing has a more streamlined, aerodynamic shape than a piece of paper. This shape is designed specially to create high and low pressure zones, and to ensure a smooth flow of air around the wing. Without a streamlined shape, too much **drag**, or wind resistance, is produced, which reduces the amount of lift.

A continuous flow of air is needed over and under a wing to sustain lift. To do this, an engine is used to push the aircraft through the air by providing for-

ward **thrust**, or movement. The faster the forward thrust, the more lift is created. As a result, an aircraft can be large in size and weight as long as it is equipped with a powerful engine.

To increase your thrust, use the + key on your keyboard. To decrease it use the - key.

### Stalling

If the smooth flow of air around the wing is interrupted, a dangerous situation known as a **stall** can occur. An aircraft usually stalls when the wing is tilted upward at such a steep angle that it obstructs the airflow. A stall can also occur when the aircraft is moving too slowly. When an aircraft stalls, it can go out of control and crash.

Your aircraft may stall if you've pulled the nose up at too sharp an angle, or if you let your airspeed drop to 60-80 MPH in level flight (this is known as the **stalling speed** of your aircraft). If a stall occurs, push the nose of your aircraft down by moving the controller forward. When the message STALL RECOVERED appears on the screen, quickly pull back on the controller until your aircraft is in level flight again. Stalls frequently occur when you're trying to engage an aircraft that's at a much higher altitude. Learn to gain altitude gradually. Also, keep an eye on your airspeed indicator and learn to listen for the distinctive sound that your engine makes when the plane is about to stall.

### In-Flight Maneuvering

While an aircraft is in flight, it can maneuver three different ways. It can



Roll right:  
push control  
column right

pitch, or move up and down; it can yaw, or swivel left and right; and it can roll, or tilt left or right. To execute these maneuvers, the pilot moves a **control stick or column**, which controls pitch and roll.

Yaw is controlled by a combination of pitching — and rolling.

To make an aircraft dive, the pilot pushes on the control stick. This moves the trailing-edge (or rear) horizontal portions of the tail, called **elevators**, down. To climb, the pilot pulls back on the stick. This moves the **elevators** up. To turn, the pilot moves the control stick either left or right and **banks** the plane left or right. This moves the trailing edge vertical segment of the tail, called the **rudder**, along with the small, trailing-edge sections of the wing near the wing tips, called **ailerons**. As the aircraft banks, its wings will tilt more and more to one side or the other. The steeper the bank, the faster the turn, up to a full 90° with the wings pointing straight up and down.

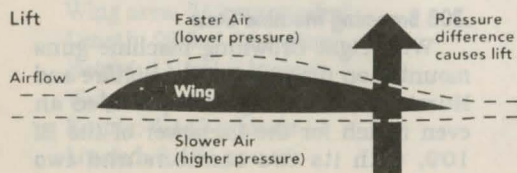
As you steepen a bank turn, and as your wings become closer and closer to perpendicular to the ground, your aircraft will lose lift and the nose will start to drop. To counter this, pull back on the controller slightly or increase your throttle setting when you bank. To come out of a banked turn, and return to level flight, move your controller in the opposite direction of your bank.

### Takeoffs and Landings

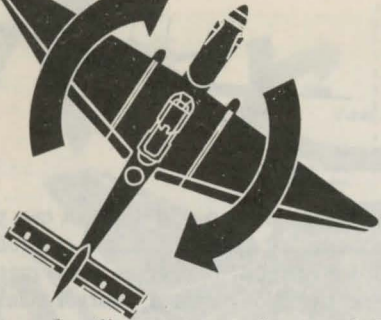
To help an aircraft gain lift for takeoffs, and allow it to slow it down for landings, **flaps** are used. These are the large trailing-edge sections of the wings that, when extended downward, increase lift. This added lift allows the plane to fly at a slower speed before stalling. Of



Pitch down:  
push control  
column forward







course, **landing gear** is also used for takeoffs and landings. It consists of the wheels of the aircraft and the supports for those wheels.

To takeoff from an airfield increase your planes throttle and taxi down the runway. When you reach the end of the runway, turn your plane around so that its pointing down the runway in the other direction. Then, lower your flaps and increase your throttle until the white digital number at the bottom of the RPM indicator reads "100%." "As your aircraft rushes down the runway wait until the air-speed reaches 125 MPH. Then, pull back on your controller to become airborne. Retract your landing gear (unless you are flying a Ju 87 Stuka with fixed landing-gear), then decrease the throttle setting with the - key to conserve fuel. When approaching an airfield to land, begin to slow your airspeed by decreasing the throttle setting. Gradually, flatten your descent, then line up your aircraft with the airstrip. As you continue to descend, lower your flaps and your landing gear and decrease the throttle setting until it is just above the stalling speed of your aircraft. When you touch down, decrease the throttle setting to O and let your aircraft taxi until it has come to a complete stop.

#### **Dive Bomber Maneuvering**

Speed brakes are special flaps found only on dive bombers. They open both up and down from the trailing-edge of the wing and are full of small holes to keep the aircraft from being buffeted when they are open.

If you're flying a Ju 87 Stuka or a Ju 88 use your speed brakes to slow your diving speed as you make your dive bombing run on a ship convoy or ground installation. This will make it easier to line up the target and drop your bombload more accurately.

### TACTICS

This section of the chapter describes tactics used by many RAF and Luftwaffe pilots during the Battle of Britain. Those paragraphs that will be helpful to you in the game situations of Their Finest Hour are in italics.

Also note that the replay camera is a useful tool for analysing your performance in combat and improving your aerial tactics. It lets you "film" your dog-fights, bombing runs, or other aerial maneuvers, and then view the "motion picture" from any angle. See the Review Combat Film section of the manual for more information.

#### **Fighter Tactics**

As the slower, more maneuverable biplane fighters of World War I evolved into the faster less maneuverable monoplane fighters of World War II, the tactics of aerial combat evolved as well. Yet one of the keys to aerial victory remained the same throughout both wars: surprise the enemy.

Gaining a height advantage was one way to achieve this element of surprise. The higher a fighter could get, the faster it could pounce upon the enemy aircraft below, hopefully without being detected until it was too late. Another way to surprise the enemy was to attack from the direction of the sun. Hidden in the sun's bright glare, a fighter pilot could strike before the enemy spotted him and retaliated. RAF pilots had an expression for guarding against this type of attack: "Beware of the Hun in the sun."

Attacking from the direction of the sun is a valuable tactic, since the enemy fighters or bombers you're attacking

can't see you. To attack from the angle of the sun, first use the scan view mode to locate the sun, then use it to locate the enemy fighters or bombers you want to attack. Next, adjust your flight path so that your fighter will eventually be positioned between the sun and the enemy. When you reach this point, turn your fighter around and head toward the enemy. Ideally the sun should be at your back, - if you can see the sun in your rear view mirror you're in a perfect position to attack. Since you can't be seen, the enemy fighters won't take any evasive action or fire at you until you fire at them. Likewise, the bomber gunners won't fire at you until you open fire first.

In all of your missions, keep in mind that enemy fighters may use these same tactics on you.

When attacking from the direction of the sun, pilots would usually rely on the **stern attack**. To execute this approach, which dates back to the First World War, the attacking pilot would dive on a target, pull out of his dive when he was on the tail of the target, then fire. If the target aircraft had a rear or tail gunner, the attacking pilots would usually pull out of their dive and fire at an angle slightly beneath the tail of the target to avoid gunfire. If you're flying a Spitfire or a Hurricane, and a Bf 109 is attacking you from behind never try to dive away from it since it can accelerate in a dive faster than you can. Instead, try to make a tight turn inside to shake it. A series of S-turns can also throw off its aim. But if you're flying a Bf 109 you can shake a pursuing RAF fighter by going into a dive. If you're flying a Bf 110 you won't be able to lose pursuing fighters with maneuvers, so use your rear gunner to ward off stern attacks, and try to bring your Zerstoror around so that you can use its forward firepower.

In the early part of the Battle of Britain, RAF pilots would sometimes fly straight at approaching enemy formations, and fire at them when they were

within range. This was known as the opposite attack, and it was phased out after a number of head on collisions.

With stern and opposite attack tactics, a fighter pilot could bring down an airplane by shooting straight ahead, since the target was right in front of him. But when approaching and attacking an enemy plane from an angle, pilots on both sides had to learn deflection shooting to score a kill. This meant that the pursuing pilot would shoot at a point ahead of the enemy plane's flight path, so that the bullets would reach that point at the same time as the enemy. Mastering deflection shooting was extremely difficult, as Spitfires and Bf 109s could reach speeds of nearly 400 MPH, leaving little time to judge distance.

Deflection shooting is a skill you must master to enjoy success as a fighter pilot. You'll need to compensate for the speed of your target the angle at which it crosses your line of sight, and its distance away from you, which you can judge by comparing the size of the enemy aircraft to your gunsight ring. If the enemy aircraft is faster flying a perpendicular flight path, or flying away from you, you'll have to lead your shots more. By taking all these factors into account and remembering to shoot ahead of your target you'll be able to score hits every time. You'll know your shots are hitting home when pieces of the enemy plane break off, or if smoke pours out of it.

To maximise a pilot's chances to score a kill, the eight machine guns on the Spitfire and the Hurricane were harmonised. This meant that the guns were adjusted so that when they were fired, the bullets would intersect at a certain point in the distance. This gave the pilots a large "area of lethal density" ahead of them. Unfortunately, this often penalised pilots who liked to shoot from close range, since their bullets did not intersect in the vicinity of the target.

These pilots counted by adjusting their own guns so that their intersection point was much closer, allowing them to pour on highly concentrated gunfire as they neared their target.

The machine guns of your RAF fighter are harmonised so that they will do more damage at close range than from long range. When you're approaching enemy fighters, there may be a few seconds when you'll be so close that you're able to make out the details of a particular aircraft. This is the time to open fire.

Since the machine guns on the Hurricane were more closely grouped together than those of the Spitfire, it had a denser bullet pattern. This made the Hurricane more suited for attacking bombers, since a bomber required more gunfire to bring it down than a fighter. Factored into this tactic was the knowledge that the Hurricane was not as maneuverable as the Bf 109, so while the Hurricanes took on the bombers, the more agile Spitfires attacked the German fighters.

A good rule to remember as a fighter pilot is that when you're in hostile skies, never fly in a straight or level path for more than thirty seconds.

### Fighter Formations

After the Luftwaffe fighters suffered heavy losses flying in tight three plane formations during the Spanish Civil War, German ace Werner Molders developed and tested a loose fighter formation. Known as the Schwarm, it consisted of four fighters flying in pairs, or Rotten. The leader of this formation was the best pilot and best shot, and always flew ahead of the other three fighters. The second aircraft was the leader's protective wingman, and his job was to never leave the leader's side. The wingman always flew on the side of the leader where the sun was, though at a lower altitude so that the other aircraft would not have to look into the sun to see him.

On the opposite side from the wingman was the leader of the second Rotte, and at his side, though at a higher altitude, was his wingman. The second wingman always had the job of scanning the sky around the sun, and watching for enemy attacks from that direction. Since the Schwarm was so spread out, it was harder for enemy fighters to spot it, and it had the added benefit of minimising the risk of collision within a formation. The result was a high rate of kills for the Luftwaffe fighters during the remainder of the Spanish Civil War and the early stages of the Battle of Britain.

During the time between the two world wars, the British, believing that their fighters would be attacking unescorted bombers, developed a tight formation known as the vic. Essentially the same formation the Luftwaffe abandoned in Spain, it consisted of three fighters flying at the same altitude, with the middle fighter slightly ahead of the other two. Flying wing tip-to-wing tip, the vic was a great formation for air shows, but with each pilot constantly worrying about collision, it left little time to look for the enemy. This made the RAF fighters easy targets for the looser-flying Luftwaffe fighters, who could also spot the tight British formation sooner. As the Battle of Britain progressed, RAF pilots, who lacked the vital experience the Luftwaffe had gained in the Spanish Civil War, gradually abandoned the vic, and adopted their own version of the Schwarm, which they called the finger four formation.

If you're flying as the leader of a Schwarm or a vic formation, you're responsible for leading the attack on the enemy. Its important that your wingmen remain at your side for protection, therefore don't fly so radically that you lose them. If you're flying as a wingman in either of these two formations, your primary responsibility is to cover your leader and to stay by his side.

A controversial fighter formation that

the British developed during the Battle of Britain was the **big wing**. It was made up of three to five squadrons, totalling some thirty-six to sixty aircraft. The advantage of a big wing was obvious — more guns were brought to bear on the enemy aircraft. Moreover, the sight of so many fighters proved to be a show of strength unnerving to the Luftwaffe. The disadvantage of the big wing was the amount of time it took all the aircraft to takeoff and assemble usually over half an hour. Also, the more RAF fighters in the air, the more that could be knocked out by the Luftwaffe, who saw aerial combat as the best way to finish off Fighter Command.

The debate over the feasibility of the big wing divided Fighter Command. Eleven Group felt that the big wing was impractical, since its besieged squadrons simply did not have enough time to assemble such a large formation. Twelve Group, which originated the big wing, was located further north than 11 Group, and this gave them more time to put a big wing together before the Luftwaffe arrived. Twelve Group's big wing proponents believed that it was better to hit the enemy hard after it had dropped its bombs on its targets and was returning to Continental Europe. But since many of these targets were 11 Group's fighter airfields, 11 Group vehemently disagreed with this philosophy, and usually tried to intercept the Luftwaffe beforehand, with single squadrons.

The formidable Bf 109 was often used in a **free-ranging** or **free chasing** role, in which formations of 109s would simply fly about looking for RAF fighters to attack. When the defensive-minded RAF avoided engaging these free-ranging Bf 109s, the Luftwaffe used the Ju 88 Stuka and other bombers as bait to lure the RAF fighters into combat.

Using fighters to accompany and protect bombers on their way to the target and back was known as **fighter**

**escort**. The Bf 110 was originally developed for this role, but during the early part of the Battle of Britain, it proved to be a failure against the more maneuverable Hurricane and Spitfire. The Bf 110 was successful only when it could dive down and blast the enemy with its two cannons and four machine guns, then get away. As Bf 110 losses mounted, they were given a protective escort of Bf 109s, and the 109 became the main escort fighter for the duration of the Battle.

If you're flying fighter escort, your main responsibility is to make sure the bombers reach their targets and escape enemy fighter attacks. Try to keep the bombers in sight at all times, and beware of enemy fighters pouncing on them from the direction of the sun, or from high above.

During the Kanalkampf providing fighter escort for Ju 87s proved to be next to impossible during a dive bombing run, since the Stukas were slowed by their dive brakes and bombload. Their escorts, the much faster Bf 109s, flew right past the Stukas during a dive, leaving them unescorted, and easy targets for Spitfires and Hurricanes. As Ju 87 losses increased, their crews began demanding more fighter escort, and the fighter-to-bomber ratio, which had been one to one, was increased to two to one.

When the Stukas were withdrawn from the Battle of Britain in mid-August, Luftwaffe bomber formations were escorted by formations of Bf 109s, flying several thousand feet higher to gain a height advantage over the attacking British fighters. But British fighters in turn took advantage of this height difference, and pulverised the bombers before the Bf 109s could dive down. Again, the increasing bomber losses forced the Luftwaffe to change its escort formations. Bf 109s were then ordered to fly alongside the bombers, at the same altitude. The fighters were forced to throttle way back to stay at the same speed as

the bombers, and often weaved in and out of the bomber formations. This cut down on bomber losses, but it also cut down on RAF losses, since the 109s were now in a defensive, rather than an offensive, role. The fighter-to-bomber ratio was increased to three to one, and formations of fighters flew ahead of, alongside, and above the bombers.

### Dive-Bombing Tactics

When the tactics of dive-bombing were being developed during the period between the wars, the RAF took little interest. But the Luftwaffe, seeing dive bombing as a way to soften up an enemy before ground troops moved in, embraced the concept, and developed the Ju 87 Stuka dive bomber in 1935. The Stuka became a formidable weapon in the conquest of Europe, although it had limited success against the convoys and coastal targets of the English Channel during the Battle of Britain.

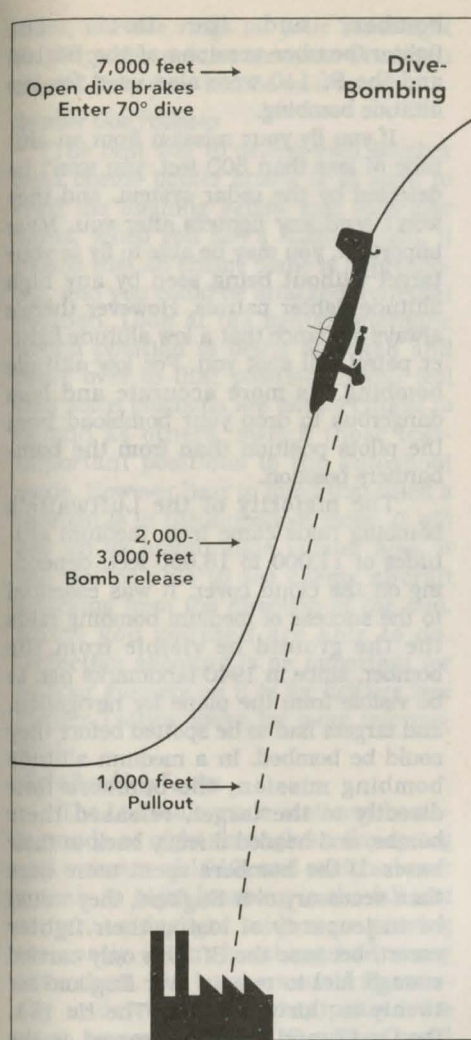
What made dive-bombing so appealing was its pin-point accuracy. Theoretically, if a plane could dive straight down on a target before releasing a bomb, there was no way it could miss. Though Stuka pilots rarely made vertical dives, 80° dives generally resulted in deadly hits.

Flying at an altitude between 10,000 and 15,000 feet, the Stuka pilot would spot his target, and begin to dive when he was nearly over it. Dive angle lines were even etched onto the glass canopy of the Ju 87, to give the pilot an idea of his angle of approach. As the Stuka picked up speed in its dive, the pilot would extend the dive brakes, which slowed the airspeed and enabled the pilot to make a more controlled dive. Along with the brakes, the drag on the fuselage caused by the externally-mounted bomb and the fixed landing gear slowed the Stuka's diving speed to around 350 MPH. With the landing gear-mounted sirens, called the "trumpets of Jericho," screaming in the wind, the pilot would release the Stuka's fuselage-

mounted bomb at an altitude of 3,000 feet. If the bomb was released any lower, the Stuka would be in danger of being destroyed by the resulting explosion, since it needed another 1,500 feet to pull out of its dive and level off. Once the pilot had released the bomb and pulled out of his dive, he would often make evasive turns to avoid any anti-aircraft fire or enemy fighters. And if he looked over his shoulder, he might get a glance at the damage inflicted by the bomb he just delivered.

If you're flying a Ju 87 dive-bombing mission with other Stukas, there will always be one or more Stukas flying ahead of you. When you're about five miles from the target, all the Stukas will assemble into a line astern formation, lined up one after another. If you've strayed away from the formation, you'll see a space where your Stuka should be. After you've returned to the formation, you'll be able to follow the Stuka ahead of you as it dives down to attack a ground installation or ship.

When you're piloting a solo Ju 87 Stuka or Ju 88 switch on the scan view mode to help you locate the target you want to dive-bomb (see the Double-Seat Fighter and Dive Bomber View Controls section for more information). In this view mode, you can fly the plane in one direction while searching in any direction. When you spot the target, make a note of its location in degrees, switch back to normal flight, and change the direction of your dive bomber so that will fly over the target. Switch back to the scan view mode if you have trouble locating the target in normal flight. As you get closer to the target, switch to the straight down view mode. If you have lined up your target correctly it will slowly begin to appear in the screen. This is the time to begin your dive. Ideally, you should be at an altitude of 7,000 feet or more when you start diving, if your starting altitude is below 5,000 feet, you may have trouble pulling out of your dive



in time.

To begin your dive, make sure you're in normal flight, and extend your speed brakes. You may want to turn on your replay camera to record your dive and see if your bombload hit home, and check your bomb indicator to determine which of your bombs will drop. If you're bombing a large target, such as a ship, you'll want to drop your entire bombload at once. If you're attacking scattered ground targets, such as airfield hangars,

you'll want to scatter your bombs on ferent targets. Then, when you're ready, push the controller forward until you're in a 70° to 80° dive. The Ju 87 has several diving angle lines etched in the left window. Four of these lines are labelled 50°, 60°, 70°, and 80°. Switch to the view left mode to line up any of these diving angle lines with the horizon. You can also use your pitch indicator to judge how steep your descent is. If its needle is pointing three-quarters of the way down the minus (-) part of the indicator you're in a 70° dive. Try to keep the target in your gunsight ring on your way down.

As you dive, you may find that your approach to the target is off and that its straying to one side or the other. Simply moving your controller to the side to correct this is dangerous, since it could cause your dive bomber to move sideways relative to the direction its headed (a condition known as **slipping** or **skidding**). To correct your approach, push the controller forward until your dive bomber is in a near-vertical dive, approaching 90°. Then, move your controller left or right until the target is lined up correctly and pull back on the controller to return to your desired diving angle.

If you're attacking a ship in a convoy a **longitudinal attack** along the line of the ships course, is best, since this gives you a longer area for your bombs to hit. Approaching the ship from the bow is more preferable than from the stern, as in a stern attack the ship will sail away from you and you'll have to flatten out your dive to catch it further along. Ho we don't waste valuable time making a perfect approach. With practice, you'll be able to score direct hits even with a perpendicular attack on a ship.

If you're attacking ground installations, they will be easier to hit than ships, because they aren't moving. But no matter which type of target you're attacking, ignore the bursts of flak or gunfire around you, and concentrate on

your mission objective, since it is vital.

When your altitude reaches 3,000 feet, you should get ready to release your bombload, and release it before your altitude reaches 2,000 feet. If you're in a 70° dive, your gunsight should be pointed just ahead of where you want your bomb or bombs to fall. This will compensate for gravity pulling your bombload out of the line of your dive. Once you've released your bombload pull back on the controller to pull out of your dive. In the Battle of Britain, this was the time when dive bombers, particularly the Ju 87 Stuka, were the most vulnerable to enemy fighter attack, since their air-speed was slowed and their fighter escort gone, unable to stay with the dive bombers in a dive. To avoid what the RAF fighter pilots called a 'stuka party', "make sure that your dive bomber is in level flight after you've pulled out of your dive, turn on the autopilot, then switch to the rear gunner. Use your forward guns if an unlucky fighter happens to wander in front of you. If you're flying a Ju 88 you may want to switch to the upper dorsal gun position to ward off fighter attacks. You can also weave your dive bomber around to make it a harder target for enemy fighters to hit.

#### **Low and Medium Altitude Bombing Tactics**

Low altitude bombing raids, from heights of several hundred feet or less, proved to be highly successful against airfields, radar stations, and other targets. At the low height these bombers flew, the RDF system couldn't detect them, and the Observer Corps on the ground had trouble spotting them.

Low altitude surprise attacks also gave anti-aircraft batteries little time to react, and thus gave the planes an excellent chance to get away after dropping their bombloads. Bombers also had a better chance of scoring more accurate hits from low levels. The main Luftwaffe bombers for low altitude bombing raids were the Ju 88, which was structurally reinforced to serve double-duty as a dive

bomber, and the Do17. The fighter/bomber versions of the Bf 109 and the Bf 110 were also used for low altitude bombing.

If you fly your mission from an altitude of less than 500 feet, you won't be detected by the radar system, and they won't send any fighters after you. More important, you may be able to fly to your target without being seen by any high altitude fighter patrols. However there's always a chance that a low altitude fighter patrol will spot you. For low altitude bombing, its more accurate and less dangerous to drop your bombload from the pilots position than from the bombardiers position.

The majority of the Luftwaffe's bombing raids came from medium altitudes of 11,000 to 18,000 feet, depending on the cloud cover. It was essential to the success of medium bombing raids the the ground be visible from the bomber, since in 1940 landmarks had to be visible from the plane for navigation, and targets had to be spotted before they could be bombed. In a medium altitude bombing mission, the bombers flew directly to the target, released their bombs, and headed directly back to their bases. If the bombers spent more time than necessary over England, they would be in jeopardy of losing their fighter escort, because the Bf 109s only carried enough fuel to remain over England for twenty to thirty minutes. The He 111, the Do 17, and the Ju 88 served as the main medium altitude bombers for the Luftwaffe.

If you're flying a bomber and are attacked by enemy fighters, maintain a tight formation. This allows the gunners on the other bombers to protect the formation.

It will take a lot of practice to learn how to drop a bombload accurately from a medium altitude. To give yourself some benchmarks, always drop your bombload from the same altitude and at the same speed on all your missions.

Then, use the rings on your bombsight to gauge the precise moment when you should drop your bombs on a target.

#### **Bomber Gun Positions**

The best way to defend your bomber from enemy fighter attack is to learn to read the flashing yellow gun indicator lights. When you see a flashing light, it means that an enemy plane is approaching, and you could be attacked from that position. Look at the lights, determine which position is being attacked and move over to that position. If you feel that some positions are not as critical to defend as others, switch those less-important positions to the autoshoot mode. However bear in mind that when a position is in the autoshoot mode, it will use up its ammunition cluster. Also, it will not be able to see enemy aircraft attacking from the direction of the sun, which you yourself are able to do. Deflection shooting is as important for bomber gunners as it is for fighters (see Fighter Tactics above for more information).

#### **Night Bombing Tactics**

The Luftwaffe made scattered bombing raids at night throughout the spring and summer of 1940, and switched over entirely to night bombing in the fall and winter, as daylight raids were proving too costly. Night bombing had many advantages. The bombers could fly virtually undetected after they passed the coast, since then the RDF system could no longer pick them up and the Observer Corps could not see them. British ground defenses had to rely on listening for the sounds of the bomber's engines to track them, and this difficult task was made virtually impossible by bad weather and the varying speeds of German aircraft. Since airborne radar had not yet been developed for RAF fighters, they were virtually useless in the dark, and only a few German bombers were brought down by fighters at night. Yet this same darkness that

hindered Fighter Command also prevented the Luftwaffe from finding and hitting blacked-out targets accurately.

However, the Luftwaffe did possess a navigational aid which could have made night bombing much more formidable. It was a radio beam known as Knickebein, or "crooked leg." The Knickebein signal radiated from Germany or France, and pointed toward a target in England. A bomber pilot, flying along this beam, which was a few hundred yards wide, heard a series of dot and dash codes if he strayed too far left or right. As the bomber approached the target, it would intersect with a second beam, which was transmitted from a different location on the Continent. This beam gave a different sound, and was the signal to prepare to drop the bombload. The bomber released its bombs a predetermined distance from where the second beacon was received.

But the British, who had known about Knickebein ever since early 1940, developed counter measures to hinder its effectiveness. Special detection equipment was installed on top of the 350-foot-high RDF masts along the British coast, and technicians precariously sat on the masts and listened for incoming beams. The Germans usually tested a beam the morning before a raid, and by plotting the direction of the beam, the British usually figured out which target was likely to be bombed that night. Then, the British overpowered the Knickebein beam by transmitting beams of their own, making it impossible for Luftwaffe bomber pilots to hear the correct beam. Often the British beam would be misinterpreted as the second German beam, and many German bombloads were dropped in the ocean or scattered throughout the countryside by crewmen who thought they had hit their target.

These British counter measures were not always successful, yet for the most part they blunted the weapon of night bombing. Although airfields, factories,

ports, and cities were hit at night throughout the close of 1940 and into the beginning of 1941, these raids, which might have brought Britain to its knees, did not.

## MISSION BUILDER

When you use the Mission Builder, you get a chance to become your own game designer. This utility lets you create missions, and then save them to disk for yourself and others to fly in Their Finest Hour. You actually construct a battle scenario by deciding the composition of forces for both the British side and the German side in the Battle of Britain. You decide the number of aircraft for each side, the types of aircraft to be used, the flight groups they'll fly in, and more. Once you finish designing a mission, you save it, and then select FLY CUSTOM MISSION from the Main Menu of Their Finest Hour to fly it. You can even go back and modify it later if you want. With the Mission Builder, there's no end to the variety of combat mission challenges you can create, both for yourself and for your friends.

**HINT:** Before you sit down in front of your computer to create a mission, plan it out on paper. Since there are so many choices you need to make, building a mission with the computer can be tricky without a plan to work from.

## LOADING THE MISSION BUILDER

To start up the Mission Builder on your computer, look at the Loading Instructions. Mission Builder section of your Reference Card. Then continue by following the instructions below.

## USING THE MISSION BUILDER

Once you've loaded the utility, you'll see a special map, which shows Southern England, the English Channel, and the west coast of France, with the words MISSION BUILDER at the top.

This map is nearly identical to the Campaign Map you access whenever you're playing Campaign Missions. If you've already fought a campaign battle, you'll notice that many of the controls used for playing a campaign are the same ones used for building a Custom Mission. You'll use this map and the buttons on it to determine the forces for both sides of your mission.

The markings on the map indicate different ground installations that can be attacked by the Luftwaffe or defended by the RAF. To learn the name of any of these ground installations, move the arrow over a ground installation icon. You'll see the information in the column in the lower right-hand corner of the screen.

At the bottom of the screen, you'll see five buttons:

**LOAD** This lets you load the missions you've already created, so you can make any modifications to them. When you choose this, you'll be shown a list of your missions. If the list is long, move the arrow to the down arrow icon, and hold down the controller button; to look up the list, move the arrow to the up arrow icon, and hold down the button. Click the arrow on the name of a mission to load it. The name of the mission you've selected will appear next to the word NAME at the top of the screen.

**SAVE** This lets you save a mission you've just created, so you can play it from the game program at a later time. Your mission will not be saved unless it has been given a name. To name your mission, click the controller on the white area labelled NAME at the top of the screen. A text cursor will appear. Use it to type the name of your mission, then press RETURN.

**NOTE:** If you build a mission with more than three different types of aircraft, you won't be able to save it, as it requires too much memory during gameplay.

**NEW** This cancels any mission-build-

ing choices you have made, so you can start building a mission all over again.

**SETTINGS** This lets you change the mission settings for the plane that you yourself will fly in your mission.

**EXIT** This returns you to your computer's operating system.

## Flight Groups

When you create a Custom Mission, you'll begin with up to sixteen aircraft, although you don't have to use all sixteen in every mission you create. To divide these available aircraft between the British and the German sides, you'll need to assign them to various flight groups for both sides. A flight group is a given number of aircraft flying together as a unit. By choosing the type of aircraft and the number of aircraft for each flight group, you allocate aircraft to either the RAF or the Luftwaffe in your mission.

Here's an example. Let's say you're creating three flight groups for a mission; the first with six He 111 bombers, the second with six Bf 109 fighters. The Luftwaffe now has twelve aircraft on its side in your mission. Now, the most aircraft the RAF can have on its side in the third flight group is four.

Of course, you can put all of your available aircraft on only one side, and create a mission with no enemy aerial opposition. But, as you'll find out, it won't be very challenging or interesting. Also, if you have a slow machine, you won't want to have the aircraft bunched together in the same location, since the mission will be more enjoyable when they're spread out.

**HINT:** Even though you have a limited number of aircraft, if you create a fighter flight group, and it is destroyed, a flight group of similar composition can be vectored to take its place. If you'd like to use this feature in your missions, see the WAVE button below.

## Building Your Opposing Forces

To determine the composition of

your forces, you'll use the seven Flight Group buttons on the right side of the screen:

**FLIGHT GROUP** Click your controller button to cycle through the flight groups that are available to be filled, and to look at the ones you've already created. To create a flight group, you must select a plane type (see below) and allocate at least one plane to that flight group.

You yourself will always fly in the first flight group, called FLIGHT GROUP 1. The default setting for this group will always have you flying a Spitfire. This can be changed by using the PLANE TYPE button below.

**PLANE TYPE** Click your controller button to cycle through the different types and models of aircraft that can make up a flight group. (For example, "SPITFIRE" is a type of aircraft, and "MK I" designates its model number.) Each flight group must consist of the same model of aircraft. For instance, you cannot create a — flight group with both Spitfire Mark Is and Spitfire Mark IIs. However, you can create one flight group of Mark Is and a second one of Mark IIs.

**# PLANES** This lets you change the number of aircraft in the flight group you're creating. You need to have at least one plane in the flight group before that group can fly in your mission. Pressing the left controller button increases the number, and pressing the right controller button decreases it.

The number of planes you have left to assign will be displayed in the upper right-hand corner of the screen, next to the words PLANES AVAILABLE.

The number of planes on your side, along with the number of planes on the opposition side, will be displayed below PLANES AVAILABLE.

The maximum number of planes you can have in flight group is six.

**FORMATION** Use this to cycle through the available flight formations your current flight group can fly in.

These formations are the "VIC" (a triangular three-plane formation), the "SCHWARM" (a spread out four plane formation), "ASTERN" (a single-file formation), and "ABREAST" (a side-by-side formation). For more information about the vic and the Schwarm, see the Flight Fundamental and Tactics chapter of the manual.

**EXPERIENCE** Use this to cycle through the amount of combat experience a flight group can possess.

**ORDERS** Click your controller button to cycle through the mission orders for the flight group you're creating. When you're composing the RAF forces, you can choose to have your fighters attack either enemy bombers or fighters, or to ignore or avoid an attack. If you're composing the Luftwaffe forces, the choices vary, depending upon the type of aircraft in your flight group. The He 111 and the Do 17z-2 can level-bomb, the Ju 87 Stuka can dive-bomb, and the Ju 88 can be used for both level bombing and dive bombing. The Bf 109 and 110 fighters can be used for bomber escort (protecting a bomber flight group), for free-ranging (hunting RAF fighters), or for strafing airfields. Bf 109 and 110 Jabo fighter/bombers can be used for either level bombing, or for bombing and strafing airfields. Both RAF and Luftwaffe forces can also be ordered to return to their home airfield.

**WAVES** Use this to choose the number of times the fighter Combat Air Patrol (CAP) aircraft in an enemy flight group will be reinforced. What this means is that if a wave of fighters is destroyed, another one will be vectored to the battle area to take its place. The number to the right of the WAVES button indicates the total number of waves that can appear in your mission. This number also includes the initial wave that you start with. For example, if you choose "4," your first wave of fighters will be reinforced up to three times. If the number to the right of the WAVES but-

ton is "1," the flight group will not be reinforced.

If you've chosen to have the flight group fly a fighter escort mission, this button will change to ESCORT. Then, you use this button to select which bomber flight group your fighters will escort.

#### **Flying Your Own Aircraft as Leader or Wingman**

At the top of the screen, in the upper right-hand corner, you'll see a button marked PLAYER. Pressing this button switches your plane between the LEADER, whose plane is leading the formation, or WINGMAN, whose plane has the responsibility of covering the leader. If you're flying a bomber, you cannot fly as the leader.

#### **Flight Rosters**

Like the other missions in Their Finest Hour you can select pilots and crews to fly the aircraft in your custom mission when you're at Flight Briefing in the program. However, if you create a mission with more than seven aircraft on your side, you'll only be able to assign pilots and crews from the ROSTER screen to the first seven planes.

#### **Creating a Flight Plan**

After you've created a flight group, you need to implement a flight plan for it to follow. You create a flight plan by placing a series of navigation markers on the Mission Builder map. A flight plan is composed of up to six of these navigation markers, including its starting point (BEGIN), four rendezvous points (WAY PT 1, WAY PT 2, WAY PT 3, and WAY PT 4) and an airfield to return to (LAND).

To create a flight plan, look below the Flight Group buttons. There, you'll see a chart that looks like this:

FLIGHT PLAN	ALT	ATK
BEGIN		
WAY PT 1		
WAY PT 2		
WAY PT 3		
WAY PT 4		

#### **LAND**

To choose where you want a flight group to start its mission, click on BEGIN. A star will appear next to the word BEGIN. Move the floating arrow to the location on the map where you want the flight group to begin its mission, then click the controller button. A starting point icon will now appear on the map. If you decide you want to relocate the starting point, move the arrow to the desired location, and click the button again. RAF flight groups can only begin their missions over England or the English Channel. Luftwaffe flight groups can only begin their missions over Continental Europe or the English Channel.

Now, look for the word ALT next to the words FLIGHT PLAN. This shows the current cruising altitude for this flight group, in thousands of feet. Clicking the left controller button increases the altitude at which that group begins your mission, and clicking the right controller button decreases it.

The locations of the four Way Points are set the same way you set the BEGIN location. First, click on WAY PT 1, move the arrow to the desired location on the map, and click your controller button. An icon will appear on the map to represent the location of WAY PT 1. To adjust the altitude for your flight group flying toward WAY PT 1, click on the number below ALT. Repeat this procedure for WAY PT 2, 3, and 4 if you want. With these different Way Points, you can plot a course for each side to follow in your mission.

During fighter Combat Air Patrol (CAP) missions, the flight group flies between the Way Points until it runs low on fuel. For bombing missions, the flight group only follows the flight plan once. For fighter escort missions, the flight group stays near the bomber flight group it is escorting, regardless of the flight plan created for it, unless the bombers have all been destroyed.

#### **DELETE**

Any bomber or fighter/bomber flight group will automatically bomb a target if it is located where you've placed a Way Point icon. If you don't want the flight group to attack this target, look for the word ATK (attack) next to ALT. A YES will appear if an attack will occur. Click on YES to erase this word, and call off the attack.

To assign each flight group to a landing area after you have assigned them to different Way Points, click on LAND, move the arrow to the desired airfield, then click the controller button.

After you've created a flight plan, you may want to remove one or more of the Way Points. To do this, click on the Way Point you'd like to remove, then click the DELETE button, which is located to the right of the LAND button. This removes the Way Point icon from the map.

As you create flight plans for all of the flight groups for both sides, their starting points will be marked by icons on the map.

#### **Convoys**

If you're looking for a suitable dive-bombing target for a Ju 87 Stuka or a Ju 88 flight group, you can include a ship convoy in your mission. To do this, look at the buttons in the lower right-hand corner of the screen. Click the controller on CONVOY to choose between a YES or a NO setting. If you choose YES, click the controller on # SHIPS to choose how many ships will be in the convoy. To determine the location where the convoy will start, click on START LOC. Now, every time you click the controller, a black convoy icon will move around to various locations in the English Channel. Keep clicking until the convoy icon is positioned in the desired location.

#### **Changing the Settings for Your Aircraft**

If you'd like to modify the features of your aircraft in your mission, press the SETTINGS button from the Flight Group buttons. You'll then see four new buttons:

**TIME** Use this to change the time of day you'll begin your mission, from 0 to 23:00 hours.

**AMMO** Use this to change between "STANDARD" or "UNLIMITED" amounts of ammunition you'll carry. In the "STANDARD" mode, you'll carry the same number of gun or cannon rounds as German and British aircraft in 1940. In the "UNLIMITED" mode, you'll never run out of ammunition.

**FUEL** Use this to change between "STANDARD" or "UNLIMITED" fuel capacity. In the "STANDARD" mode, you'll carry a finite supply of fuel, and use it up as you go along. In the "UNLIMITED" mode, you'll have an endless supply of fuel.

**DAMAGE** Use this to change between "STANDARD" or "UNLIMITED" amounts of battle damage that can be sustained by your aircraft. In the "STANDARD" mode, your plane can be damaged and shot down by enemy gunfire. In the "UNLIMITED" mode, your aircraft is invincible.

If you change the AMMO, FUEL, or DAMAGE settings to "UNLIMITED," the results of your mission will not count on your Combat Record.

### A SAMPLE MISSION: STEP BY STEP

Though the Mission Builder may seem complex at first glance, it is actually fairly easy to create a mission with it.

For example, let's say you want to create a mission where you defend the RAF airfield at Hawkinge with three Hurricanes against a level bombing attack by three He 111 bombers and three escorting Bf 109 fighters. First, set the composition of the RAF forces by clicking on FLIGHT GROUP. For FLIGHT GROUP 1, choose "HURR MKI" from the PLANE TYPE, and "3" from # PLANES. Choose "VIC" from FORMATION, "TOP ACE" from EXPERIENCE, "CAP PRIORITY BOMBERS" from ORDERS (ordering the Hurricanes to go after the bombers

instead of the fighters), and "1" from WAVES. Since the Luftwaffe will be attacking Hawkinge, create a flight plan where your fighter CAP covers this airfield from many directions. Finally, you might as well designate the aircraft you'll be flying to the leader position.

Now for the Luftwaffe. For FLIGHT GROUP 2, choose "He 111H-3," and for FLIGHT GROUP 3, choose "Bf 109E-3." For # PLANES, choose three for each flight group. Then, go down the flight group list to set the other variables for the two flight groups. Since Flight Group 3 will be escorting Flight Group 2, be sure to designate that with the ESCORT FG button. Then, create a flight plan for Flight Group 2 so that the bombers will fly straight in to Hawkinge, bomb it, and then head for home. Create a flight plan for Flight Group 3 in case you manage to shoot down all of the bombers in Flight Group 2.

The mission you're building is nearly completed. Now, click on the name bar, and type in a name for your mission. Click on SAVE to store it on disk. (If you're using a floppy disk to save the game, insert one at this time.) To fly the mission, exit the Mission Builder, and start up the game program. When you're at the Main Menu, select FLY CUSTOM MISSION, then select the name of your mission. Soon, you'll be flying a Hurricane over Hawkinge — against a larger Luftwaffe force. Good luck!

### SUGGESTED READING

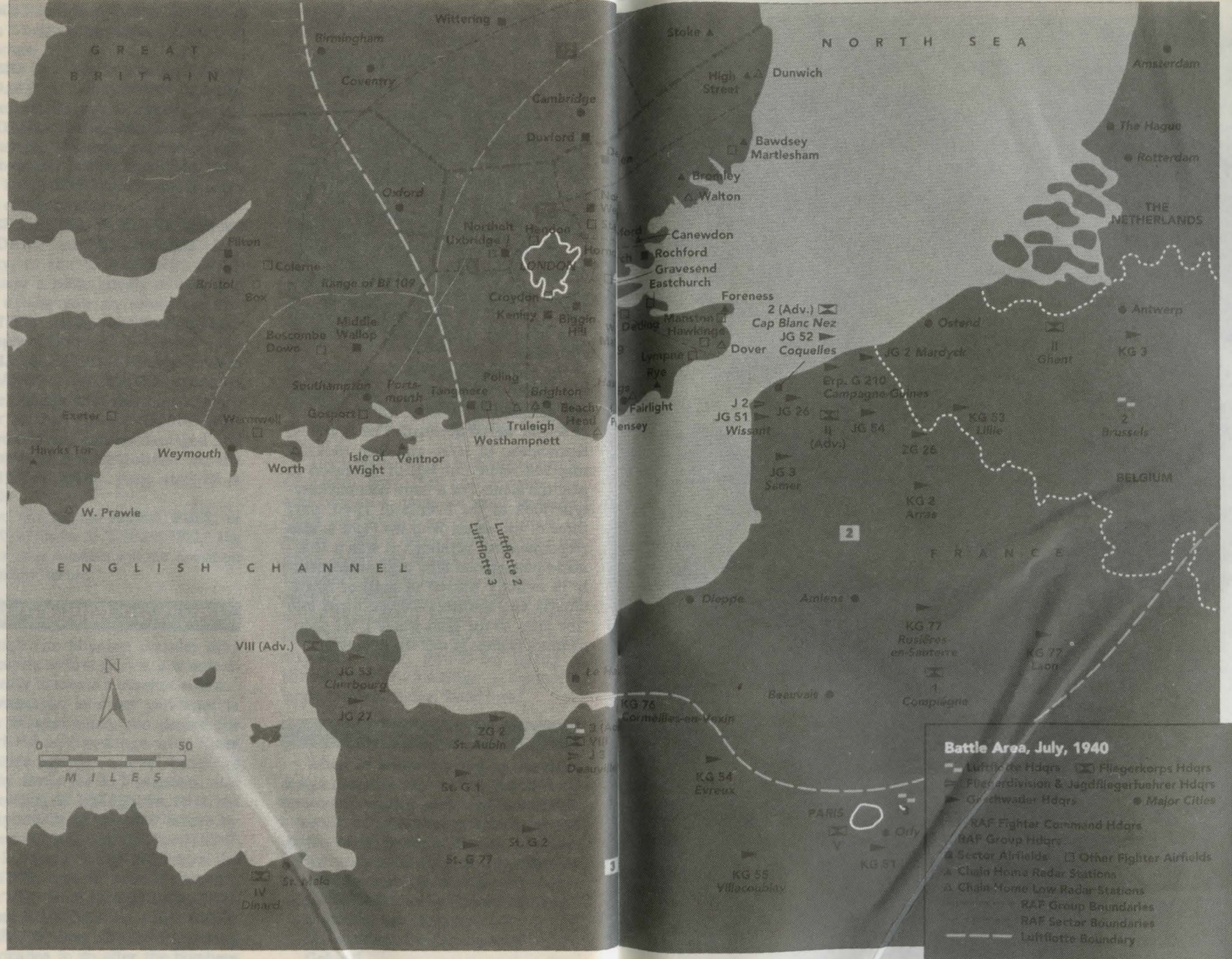
When we began working on the game design and manual for *Their Finest Hour* we were pleasantly surprised to find that a wealth of information exists on the subject of the Battle of Britain. To gain a better understanding of this epic air duel, we recommend the following books:

*Battle for Britain* by Ronald W. Clark  
*Fighter* by Len Deighton  
*The First and the Last* by Adolf Galland

*Summer 1940: The Battle of Britain* by Roger Parkinson  
*Duel of Eagles* by Peter Townshend  
*The Narrow Margin* by Derek Wood and Derek Dempster

A visit to the Smithsonian Air and Space Museum in Washington, D.C., is also highly recommended. Besides being one of the most interesting museums around, it's also one of the most fun. The Air and Space Museum features an actual Spitfire and Bf 109, plus many other famous World War 11 aircraft and memorabilia. It also has a research library, whose staff graciously — supplied us with many of the photographs used in this manual, and was of invaluable assistance.

In addition, we encourage you see the movie *The Battle of Britain*, which was released in 1969. It features plenty of terrific aerial acrobatics by Spitfires, Hurricanes, Bf 109s, and even He 111s that will really put you in the mood to play the game. For a more documentary-type look at the events of 1940, part three of the series *Why We Fight* is also recommended. Although it was a U.S.-made propaganda film, and consequently is heavily biased (a map of Scandinavia and Northern Europe turns into "the jaws of the Nazi whale"), its documentary footage is well worth seeing.



GREAT BRITAIN

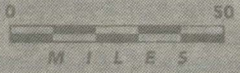
NORTH SEA

THE NETHERLANDS

ENGLISH CHANNEL

FRANCE

BELGIUM



LONDON

2

3

PARIS

**Battle Area, July, 1940**

- Luftflotte Hqrs
- Fliegerkorps Hqrs
- Fliegerdivision & Jagdfliegerführer Hqrs
- Geschwader Hqrs
- RAF Fighter Command Hqrs
- RAF Group Hqrs
- Sector Airfields
- Other Fighter Airfields
- Chain Home Radar Stations
- Chain Home Low Radar Stations
- RAF Group Boundaries
- RAF Sector Boundaries
- Luftflotte Boundary



