



TECHNICAL SUPPLEMENT

To play **1942 THE PACIFIC AIR WAR** your computer must have:

- a 386SX processor or better (For best play, we recommend at least a full 386 with a system speed of 33Mhz or more.);
- at least 594,000 bytes (580Kb) of free conventional memory;
- at least 1.6Mb of free EMS (expanded) memory;
- 14Mb of free space on the hard disk (Note that you can save some space by removing some unessential files: **open.flc** (the title animation) is 1,563,324 bytes, **mpslogo.flc** (the MPS animation) is 794,272 bytes, and **anim.cdf** (the newsreels) is 1,544,136 bytes.);
- VGA graphics or better;
- a joystick *or* a mouse.

For ease of play, convenience, and to take advantage of some of **1942 THE PACIFIC AIR WAR**'s advanced viewing features and flight film editing functions, we strongly recommend that your computer system include both a joystick and a mouse.

1942 THE PACIFIC AIR WAR supports most of the available flight add-on hardware. We have provided a configuration file for the WCS Mark II — **1942paw.adv**. Consult your Thrustmaster documentation for instructions on using this configuration file. If you have a problem using a particular device with the game, please contact MicroProse Customer Support for assistance.

HARDWARE & SYSTEM REQUIREMENTS

COMPATIBILITY ISSUES

Please note that this list includes only the *known* conflicts and incompatibilities. Since no test procedure can ever be totally comprehensive, you may run into undiscovered problems. Please consult with Customer Service if you do.

This game has not been tested under Microsoft Windows; therefore we suggest you do not use it with Windows. Chances are very good that the two will not work together.

We strongly recommend that you not have any Terminate-and-Stay-Resident programs (TSRs) loaded into memory when playing **1942 THE PACIFIC AIR WAR**. Not only will they decrease the amount of free memory available, thus slowing the game, but there may be unpredictable interactions.

If you experience keyboard response problems using a Tandy computer, the **Alt** status of the keyboard may be reversed. That is, pressing **A** results in the **Alt A** and vice-versa. To fix this problem, tap on the **Alt** key until the status returns to normal. We apologize for the inconvenience, but there seems to be something unique to the Tandy keyboard BIOS that causes this problem.

In some Packard Bell computers, there may be a conflict between the standard MicroProse boot disk application and some memory configurations. If you experience a lock up while using a boot disk made by the **1942** installation program, you'll need to change one line in the **config.sys** file on the boot disk, thus:

```
device=c:\dos\emm386.exe ramx=b0000-c400 /d=48 frame =e000 6800
```

should be:

```
device=c:\dos\emm386.exe 2048 ram
```

for DOS version 5.0, and

```
device=c:\dos\emm386.exe ram highscan
```

for any version higher than that.

If your hard drive is "doublespaced" and you experience problems using a boot disk, please add the following line to the end of the **config.sys** file on the boot disk:

```
devicehigh= c:\dos\dblspc.sys /move
```

Quick Cruise

When you're watching the mission progress from the **Pilot Map**, sometimes accelerating time is not enough. For those who want to cut right to the chase, the **Quick Cruise** feature has been added. Press to move immediately to the combat area. As soon as your planes reach cruising altitude, you will be translated to the target area. Note that time and fuel *will* be used, but you won't have to sit and watch it happen. (Of course, you can not use this feature if you're already in combat.)

Cycle Guns

Sometimes, in order to conserve ammunition, you may not want to fire all of your guns at once. Real fighter pilots had the freedom to fire whichever of their guns they thought would be the most effective against a particular target. **1942 THE PACIFIC AIR WAR** gives you the same option. Your gun setting at the beginning of a mission is **All**, so all of your guns will fire at once. Using the **Cycle** key , you can switch through the three possibilities — All, Primary only, and Secondary only. Note that each model of aircraft follows a different pattern (they all have different gun set-ups, after all).

Trimming

The automatic trim feature will cope with most (if not all) of the necessary trimming. However, there are always those who want to do more or who are not satisfied with the results of the automated process. For these folks, we have included a manual trim function. Set the controls in the positions you wish to trim them to and press the **Trim** key ().

Reality Options

In the **Carrier Battle**, two of these options — **Sightings** and **Battle Reports** — have been combined into the **Reports** option. The flight option **Enemy Skill** has been added.

A new option, **Flight Model**, has been added to both of the **Realism Options** menus. If you choose the **Realistic** flight model, you will have to contend with engines overheating, wings breaking off when you exceed the structural integrity envelope of the aircraft, nose trim, effects of engine torque, dive buffeting, and other annoying (but realistic) problems. Arrestor cables will only be strung on the rear third of the carrier deck, rather than all over it. If you prefer not to deal with this sort of thing, select the **Unrealistic** flight model.

Another new option, **Training Mode** has been added to the flight list. If **Training** is enabled, you will not get *any* points for your mission. You will, however, have a few advantages. The enemy planes will be unpiloted drones; they will fly poorly and will not fire on you. In addition, your aircraft will be supplied with unlimited bombs or torpedoes. You cannot use **Training Mode** during career missions.

The **Dud Torpedoes** option has been removed from the flight options.

Mission Builder Note

When creating a mission, it is important that you choose the **Home Base** and **Target** before you begin creating flights. If you change either of these selections after giving orders to any of the flights of planes you have created, those orders will be re-set. Remember, despite the implication in the manual that you should create flights first, we recommend that you choose the **Home Base** and **Target** first.

Air Search Note

During a **Carrier Battle**, if you decide to change the scope, range, or direction of an air search while the search is in progress, remember that the change will not take effect immediately. The aircraft involved must return to the carrier or base to receive their new orders.

Creating and Editing Flights

In the **Mission Builder**, the **Nationality** button has been removed from the **Flight Editing Box**. In its place, an **Delete Flight** button has been added. Use this button to remove the highlighted flight from the flight list. Note that, for convenience, flights of both nationalities are now listed together on the same list. (Note also that you can *not* change the nationality of a type of aircraft — no spies.)

The Cockpit Red-Light

Night missions without radar are extremely hazardous, and were therefore rare in the Pacific theater of this war. Nevertheless, you will occasionally begin or end a mission in darkness or near-dark conditions. Since the instruments in the cockpit tend to be difficult to read in the dark, the designers included a light in the cockpit. This light is red, on the theory that your night vision will be reduced less by a red light than a white one. To turn this light on and off, use the **Lights** key, **[L]**.

Auto-Scroll

Though it is often useful to have the **Cockpit Map** keep your aircraft on-screen, sometimes you might wish to override this behavior. You can use the **Auto-Scroll** buttons on the map key to choose which functionality you prefer. You can also use the keyboard shortcut, **[Alt][S]**, to toggle Auto-Scroll on and off.

Credit for Kills

When an aircraft is shot down and a kill is verified and recorded, only one pilot can get credit for the kill. Note that the pilot who got off the last shot does *not* automatically get the kill. Whoever did the most damage to the destroyed plane gets the credit, even though he may have left the job half done. (Who said life was fair?)

Hardware Calibration

As described in the manual, the calibration of your joystick(s) is automatic. This goes for all of the supported add-on hardware, too. At any time before you enter your aircraft, move each controller (pedals, throttle, etc.) to the limits of its movement to engage the automatic calibration. Note that for joysticks which include the "hat", you must calibrate the hat as well. A new feature, the **Calibrate** button, has been added to the **Controls Configuration**. This feature allows you to see the calibration routine working, in case you suspect that a particular controller is not being recognized or calibrated correctly.

Autopilot Note

The description in the manual of the way the autopilot controls your plane is valid only in **Training Mode**. When you are not in that mode, the autopilot will not engage in combat or land the plane. You will be notified when combat is joined, so that you can take control.

Ditching

To successfully ditch your plane in the ocean, you must hit the water at an extremely slow speed. The best bet is to stall below 50 feet. For career and scoring purposes, a ditch will be treated exactly as a bail-out. The chances of being rescued, captured, or killed are the same.

Cruising Altitudes

When a strike flies to a target, there is always a lead flight that everyone else follows. For mutual fire support reasons, the flights in a strike stay close to each other until they reach their target. Because of this, you may only adjust the cruising altitude of the lead flight. All other flights will automatically adjust their cruising altitudes to match.

The Padlock Feature

The “Padlock” view is only available when you’re in **Virtual Cockpit** mode. To activate the Padlock feature, you must first choose an enemy to “lock” (just as in reality). Swivel your head around until you can see the enemy. Pressing **[J]** will lock the **Padlock View** onto whatever aircraft is nearest the center of your view. Now, whenever you press **Button #2**, your virtual view will center on the locked plane. As long as you hold the button, the view will move to keep the locked plane centered. Press **[J]** again to unlock the target.

Carrier Battle 3-D Engagement

If you abort your piloting in an engagement that is part of a **Carrier Battle** game before the mission is completed, the computer will finish the attack as though you had selected to observe the engagement. Keep in mind that, due to limitations to the number of planes that can be represented in 3-D, damage from large strikes will be a combination of the damage done in 3-D and damage calculated statistically. Your performance in 3-D, however, will have a limited effect on the outcome of the statistical damage.

Japanese Radios

This is not a bug — the Japanese pilots do not receive radio messages, as the Americans do, because the Japanese planes of the time did not carry radios.

Scuttling Ships

In a **Carrier Battle**, when a severely damaged ship slows a Task Group down to a degree that is dangerous to the remaining ships, you should scuttle that ship. This was not an uncommon practice during the war, and was used primarily to prevent the enemy from capturing the ship. You can scuttle ships using the **Damaged Ships** option in the **Task Group** menu.

MODEM PLAY

What could be better than destroying enemy aircraft in a World War II flight simulation? How about destroying one of your friends in a World War II flight sim? The **Modem Play** update has been added to this version of **1942 The Pacific Air War** for those of you who want to fight your friends in the skies over the Pacific Ocean.

Using **Modem Play**, you can fight in any of the planes that you can pilot in the game. Note that, if you want to play in a mission that was created with the **Mission Builder**, it is necessary for that mission to have at least two flyable planes and no more than six planes all together.

SET-UP

In order for two computers to play **1942 The Pacific Air War**, it is necessary for them to be connected via modem or null modem cable. Prior to playing, one computer must be designated as the *Connect* computer. What this means is that that computer will be the one that makes all the final decisions on what type of game both computers are going to play.

To begin, click on the new **Modem Play** button on the **Main Menu**. The **Modem Play Menu** appears. At this menu, you must specify which is the *Connect* computer and which computer is going to *Wait on Connection*. Also, you must select a **Modem Rate** and specify which **Comm Port** your modem or null modem cable is connected to. (We strongly recommend that both computers use the same baud rate; in the case of a direct connection, this is mandatory.)

When you finish, the game will check the status of your system. If you are using a direct connection, ignore the "Modem not found" message; the game will connect automatically and proceed to the mission settings. If you are using a modem connection, the **Dial Menu** appears.

The Dial Menu

Once you have gone through setting up your modem for the game, you have to connect with the person you are going to be playing. At the **Modem Dial Menu**, which appears on the *Connect* computer, you can enter and use up to ten name and number combinations.

To use or change an existing combination, click on the listing. The name and number will be copied into boxes at the bottom of the menu. Click on the **Dial** button to dial the number in the **Phone** box, or click on either box to edit the info in that box.

The Mission Settings

Once the connection is successful, the person at the *Connect* computer decides which type of mission to play and who will fly for which nationality. Clicking on the **Head-To-Head** button makes the two of you opponents; clicking on **Cooperative** allows you to play on the same side.

In case you haven't agreed on settings ahead of time, at the bottom of the **Mission Settings** screen are the **Message** boxes. **Message In** shows incoming messages from the other computer, and **Message Out** is where you type any

message that you want to send to the other computer. To send a message, click on the **Message Out** box, type your message, then press **Enter** to send it.

The weather selection appears as soon as all of the mission decisions have been made. This is exactly the same as the usual weather selection. After you set the weather, you'll go into the pre-flight check just as in any other mission.

PLAY DIFFERENCES

There are a few **Modem Play** features that are not available in the standard game. One is the ability to exchange messages with the other player. To do this, press the **'** (single quote), then type the message. Press **Enter** to finish the message.

In the heat of battle, it is rather hard to type a full sentence without getting shot down. That is why there are pre-set messages, available at a keystroke. After you've pressed **'** to begin a message, use any of the function keys **F1** through **F10** to send a pre-set message to the other player. (Note that you can also create your own pre-set messages by editing the **messages.txt** file in the **1942** directory.) Be aware that there are different sets of messages for **Head-To-Head** and **Cooperative** play.

You can still pause the game at any time using **Alt P**. This will pause the game at both computers; play will only resume when the player who paused the game releases the pause.

Whenever you use **F9** to change the **Detail Levels**, the changes affect only your computer. While you are doing so, the game is paused for both players. The same is true for **F10**, the **Game Configuration**.

Unfortunately, you can not use the **Pilot Map** while you are in **Modem Play**. Also, the **Time Compression** utility is no longer available. In other words, nothing will happen if you press **M**, **R**, or **T** while in **Modem Play**.

1942

SIMULATION

THE PACIFIC AIR WAR



GAME PLAYER'S GUIDE



1942 THE PACIFIC AIR WAR
GAME PLAYER'S GUIDE

MicroProse

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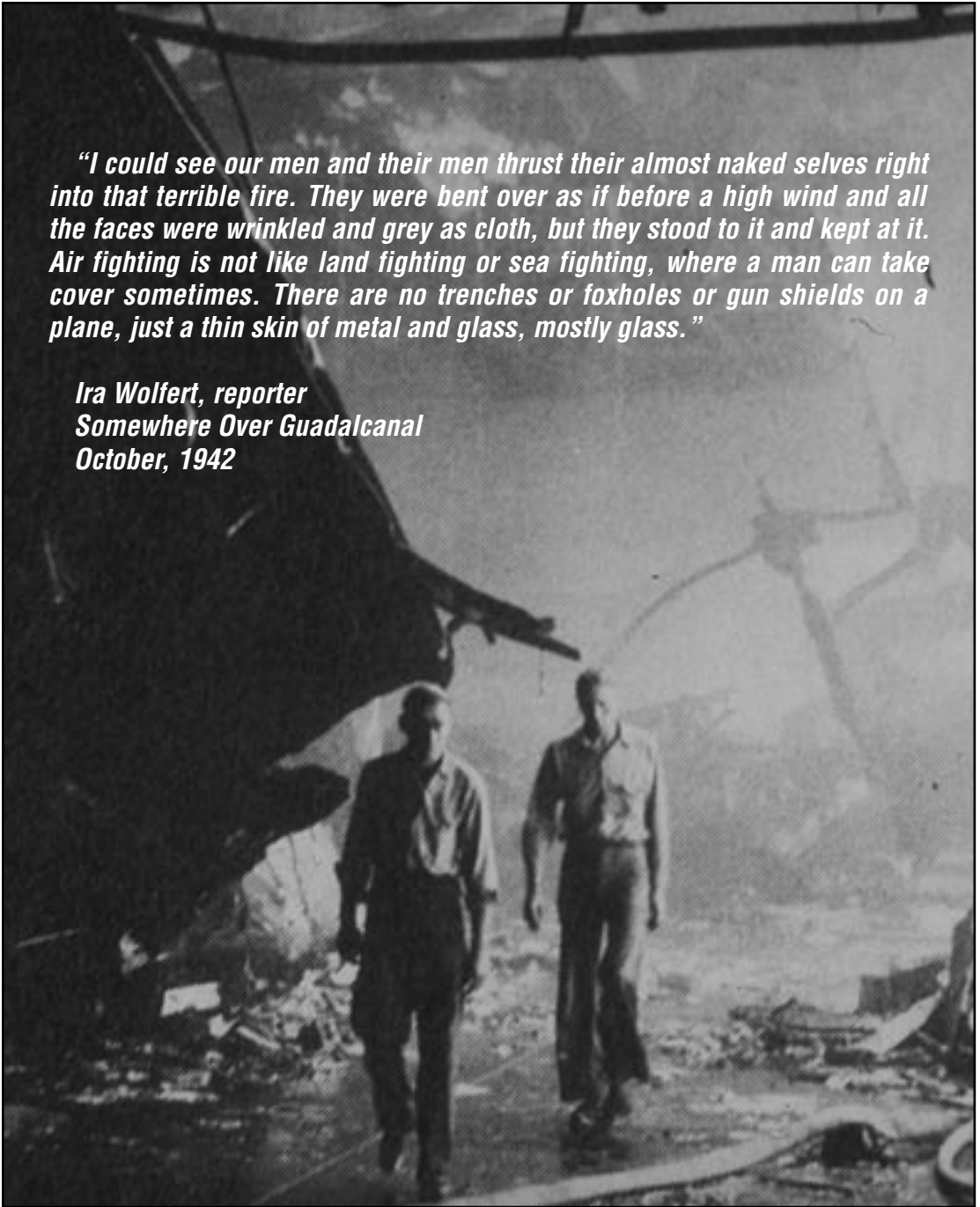
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Ira Wolfert quotes from his book *Battle for the Solomons*, copyright 1943,
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“I could see our men and their men thrust their almost naked selves right into that terrible fire. They were bent over as if before a high wind and all the faces were wrinkled and grey as cloth, but they stood to it and kept at it. Air fighting is not like land fighting or sea fighting, where a man can take cover sometimes. There are no trenches or foxholes or gun shields on a plane, just a thin skin of metal and glass, mostly glass.”

*Ira Wolfert, reporter
Somewhere Over Guadalcanal
October, 1942*





INTRODUCTION

From December of 1941 through the end of the World War, the combined forces of Japan fought the armed forces of the United States of America over a broad stretch of ocean peppered with islands. This was the Pacific campaign, one of the bloodiest, toughest-fought campaigns in all of recorded history. Though all of the forces involved were essential parts of the eventual outcome, naval aviation played a special part. The carrier forces of both sides proved their worth time and again.

There was nothing pretty and very little funny about the South Pacific campaign, despite what you may have learned from “McHale’s Navy”. Carrier forces didn’t have it any tougher than most, but they didn’t have it any easier, either. The naval aviators, especially, played a risky and daring game with their counterparts on the other side. The miniature wars that they fought out in the skies were a milieu in which they were not just faceless, identical soldiers – individual skill made a difference. Your success or failure were in your own hands.

Success, of course, is fleeting; failure was usually final. A flyboy’s “instant retirement” was never easy. To quote an eyewitness to one such event (Ira Wolfert of the North American News Alliance), “There must have been twenty acres of flame when we first passed over. In the center of the flames lay the frame [of the plane]. It was buckling before our eyes. There was nothing left of the plane but the frame, and the frame looked skinny and black like the bones of a skeleton disintegrating. Two small, black objects that could have been men or maybe just round bits of rubble or debris had been thrown clear of the plane and were on the edge of the oval of flames.”

The idea behind **1942 THE PACIFIC AIR WAR** is to re-create some of the adventure of that time and place and give you a chance to take part in it. To succeed, you have to avoid that oil- and blood-soaked, fire-on-water grave long enough to be of service to your country or your Emperor. As a commanding admiral of the navy, a crack fighter pilot, or just an anonymous Joe tail gunner, you are going to fight for recognition and just plain survival. The Japanese are moving south and east like a steamroller, trying to take control of the Pacific. The Americans are fighting back, desperately hoping to drain the strength from the Japanese juggernaut.

You decide for which nation you will fight. You decide how you will fight and in what capacity. After that, all you can do is give your all and hope that it's enough.

This book, the **Game Player's Guide**, contains complete instructions on installing, running, configuring, and playing **1942 THE PACIFIC AIR WAR**. The **Keycard** is a one-stop reference to all of the keyboard, mouse, joystick, and other controls. The **Technical Reference** includes the hardware requirements for running the game and all of the software compatibility issues discovered before release. Any changes to the game that were made after this manual was written are also described in the **Technical Reference**. As always, the **Readme** file was written last, so any notations in that file supersede all other information.



STARTUP

Now that you've bought **1942 THE PACIFIC AIR WAR**, you'll need to install it on your hard disk before you can play it. Those of you who have purchased and installed recent MicroProse games are already familiar with the installation process and can probably just skim this section. The rest of you will want to read carefully. You can avoid a lot of unnecessary complications (and Customer Service calls) that way.

The first step, as always, is to make sure you have enough space on your hard disk to install the game. Consult the **Technical Supplement** to find out approximately how much room **1942 THE PACIFIC AIR WAR** will fill. If you do not have space, you will have to clear some files (or find a larger hard disk).

Disk #1 of **1942 THE PACIFIC AIR WAR** includes the standard MicroProse installation program. To begin the installation process, insert this disk in your drive. Type in the letter of that drive (usually A or B), followed by a colon and the word **install**, then press . For example, the command:

b:install

would run the installation program from a disk in drive B.

NOTE: Do not attempt to run the installation program from within Microsoft Windows or when Windows is running. **Install** was not designed to interact with the Windows environment.

INSTALLING

When the install program starts up, it asks you to verify from which drive you are installing and to which drive and directory. By default, the game files are copied from the disk drive on which install is running (A: or B:) and to a directory on your C: disk called **\MPS\1942**. You can change either, but if you choose to install from a different drive, you'll have to put disk #1 in that drive. As the installation progresses, you will be prompted to insert the rest of the game disks. You can specify a new "from" drive for each disk, which is useful if you have more than one floppy drive.

After the game files have all been installed on your hard drive, **install** checks your system hardware and suggests a setup based on what it finds. This setup is normally sufficient, but you can modify it if it doesn't meet your specific requirements. Remember, however, that messing with your setup is probably the most common cause of unnecessary frustration and Customer Service calls.

NOTE: Some computer systems react badly to the hardware check. Usually, the problem is caused when **install** tries to identify your sound card. If you encounter a problem during this portion of the installation, restart **install** with the optional switch **-s**, thus:

install -s

(Note that there must be a space between the command and the switch.) This cancels the sound card check, which should solve the problem. You will need to select the correct sound card from the menu.

Finally, **install** checks your free memory. If you don't have enough, it tells you so. Assuming that your system has enough memory installed (see the **Technical Supplement** for the specific memory requirements), removing some Terminate-and-Stay-Resident programs (TSRs) or loading them into high memory should free up enough to run the game.

Note that you can easily update the installed setup if you change your hardware configuration. All you have to do is run the install program again – this time from the game directory, not the original disks. **Install** will not try to re-install the game, and the setup portion of the program will allow you to update your hardware setup.

STARTING THE GAME

If you've just finished installing **1942 THE PACIFIC AIR WAR**, then the game directory is your current directory. If not, make sure that the directory to which you installed the game is your current directory. Normally, this will be C:\MPS\1942.

Type **1942** and press **[Enter]** to start the game. No more than a few seconds should pass before the title screen appears.

1942 THE PACIFIC AIR WAR is an advanced, complex, historical military simulation. You can *not* play if you only use keyboard controls. Use of either a joystick or a mouse is absolutely necessary. In fact, we strongly recommend you use both. Otherwise, some of the **External Camera** functions and **Flight Film** editing features in particular will be difficult to use.

What follows is a brief introduction to the use of these standard controllers with this game. Experienced simulation players and those familiar with recent **MicroProse** products will probably want to skim this section. Beginning players will get the most benefit from reading it through.

1942 THE PACIFIC AIR WAR is designed to work with most of the available flight simulation add-on hardware systems. If you follow the installation instructions and the documentation that came with the add-on system you're using, you should not have any problems. Customer Service will likely be able to solve whatever problems you do encounter. However, please remember that there is no guarantee that any particular piece of non-standard hardware will function with this game.

CONFIGURATION

The **Controls Configuration** menu appears the first time you start up **1942 THE PACIFIC AIR WAR**. (You can also call it up as necessary; please refer to the **Keycard** for the exact method.) This menu is what you use to specify how you want to control the game.

The **Primary Flight Control** is what you'll use to control your aircraft. Which selection you settle on will also affect how you control your weapons. Note that your choices for the other options will change (and may be limited) depending on this selection.

The **External Camera** (which you'll learn about later) is moved around using the **Camera Control**. This can not be the same controller as the primary flight control.

Throttle Control is fairly self-explanatory. The only unusual aspect of this is the "Button 2" option. If you use this control method, pressing and holding the second button on the **Primary Flight Control** temporarily turns that controller into a throttle control. At that time, moving that control forward increases throttle, while moving it back decreases throttle.

The **Rudder Control** is used to move the rudder from side to side. As with the **Throttle Control**, there is a "Button 2" option. If you use this control method, pressing and holding the second button on the **Primary Flight Control** temporarily turns that controller into a rudder control. At that time, moving that control to the left is equivalent to a **Rudder Left**, while centering the control or moving it to the right cause the corresponding rudder movements.

You can also choose to turn the **Sound**, **Music**, and **Digitized Sound** on or off at this menu, depending on how you wish the game to sound.

KEYBOARD

The keyboard is the primary control device for your computer, but it is often a secondary controller while playing **1942 THE PACIFIC AIR WAR**. Keystroke commands are most commonly used to change the viewpoint while flying, to enter text in certain fields (naming pilots, for example), and to control things like the throttle, gear, and brakes.

Keyboard controls are represented in this manual enclosed in boxes. Thus, for example, Function Key #1 would appear as **F1**, just as it does on the keyboard itself. Key combinations that should be pressed at the same time are presented together, as in **Ctrl|Alt|Del**. All keys will be capitalized, but you do not need to enter capital letters. (A capital P, for example, would appear as **Shift|P**, while a lowercase p would be **P**.) We use the standard abbreviations for the special keys.

Note that if you wish to, you can use the keyboard in place of the mouse or joystick to select from menus and move on-screen boxes and menus around. Please refer to the **Keycard** for the exact method.

Though some of the keyboard commands are described in the relevant sections, please refer to the **Keycard** for the exact keystrokes used in controlling **1942 THE PACIFIC AIR WAR**. There are some keyboard command standards that are shared by virtually all MicroProse games; those are described here.

Pausing

At any time, you can press **Alt|P** to pause the game. Notification of the pause will appear, and nothing will happen (in the game) until you release the pause. The action in the game will stop until you restart it, but you still have control of the **External Camera** and the viewpoint controls. Note that none of the controls except those relevant to the Camera and viewpoints will have any function. To restart the action, press **Alt|P** again.

Quitting

The **Main Menu** includes an **Exit** option for leaving the game, but you will not always have the luxury of enough time to work your way back to this menu to quit. To quit **1942 THE PACIFIC AIR WAR** at any time, you can press **Alt|Q**. The game will prompt you to verify that you want to quit to DOS. If you verify, the game shuts down and returns you to a DOS prompt. If not, the game continues. Note that if you are in the midst of a career mission when you quit, you will begin again with that mission when you come back to the game.

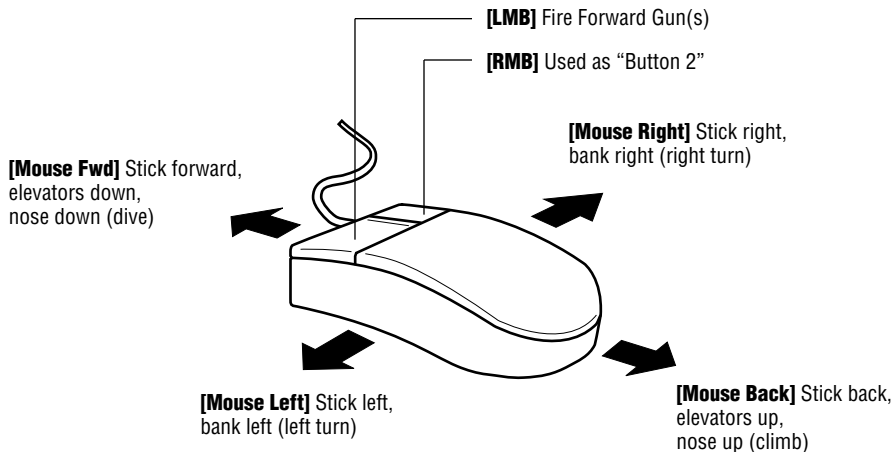
If you wish to end your current mission without the hassle of shutting down the whole game and restarting, press **Q**. You will be prompted to verify this command. If you were flying a career mission, the mission will be discarded unless you completed your objective before quitting.

MOUSE OR TRACKBALL

If you do not have a joystick attached to your system, the mouse or trackball is likely to be the primary controller for **1942 THE PACIFIC AIR WAR**. (Throughout this manual, the trackball and mouse are treated as being synonymous and referred to as the 'mouse'.) Though it is difficult at first, you can even fly the planes using the mouse. Even if you do have both a mouse and a joystick, the mouse is important. The mouse is most often used to select from menus and maps and to move around the briefing screens.

Mouse controls are represented in this manual in bold type and enclosed in brackets. Thus, for example, the Left Mouse Button would appear as **[LMB]**. Directional controls are represented by "mouse" commands – **[Mouse Left]**, for example.

The mouse controls for the **External Camera** are described in the relevant section. You can also use the **Keycard** as a quick reference. The mouse motions used to fly the plane are summarized here.



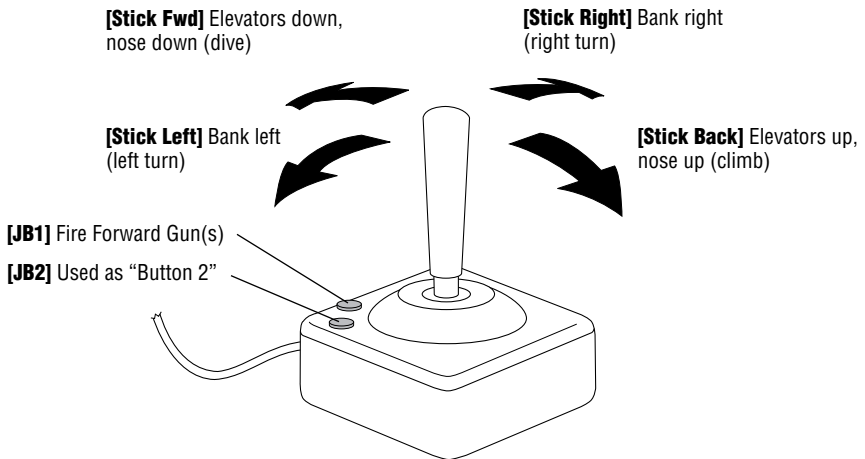
Note that you can use the mouse to "drag" or "carry" the on-screen menus and boxes around the screen. This can be helpful if one of them overlaps an area you'd like to see.

JOYSTICK

If you have no mouse, it's best to use the joystick as the primary control device for **1942 THE PACIFIC AIR WAR**. Even in tandem with a mouse, the joystick is essential. A joystick is the optimum controller for the plane in flight. Optionally, you also can use the stick in place of the mouse to select from menus and maps and move the mouse pointer around.

Joystick controls are represented in this manual in bold type and enclosed in brackets. Thus, for example, Joystick Button #1 would appear as **[JB1]**. Directional controls are represented by “stick” commands – **[Stick Left]**, for example.

Joystick controls other than those for flight are described in the relevant sections. You can also use the **Keycard** as a quick reference. The joystick controls used to fly the plane are standard and fairly obvious; those are summarized here.



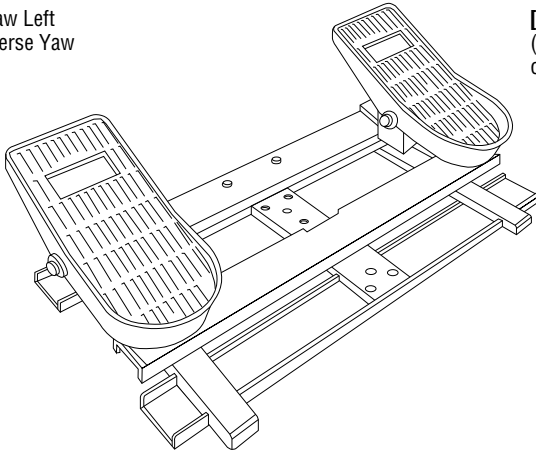
If you have no mouse attached to your system, the joystick (or keyboard, of course) substitutes for the mouse in selecting from menus and using on-screen buttons. **[JB1]** is the functional equivalent of the **[LMB]**, and **[JB2]** is used in place of the **[RMB]**. You can even use the joystick like a mouse to “drag” or “carry” the on-screen menus and boxes around the screen.

PEDALS

Foot pedals are optional hardware for controlling the rudder of the plane. If you do not have rudder pedals, don't worry; **1942 THE PACIFIC AIR WAR** allows you to control the rudder from the keyboard, a joystick, or a mouse. Using rudder control, several useful maneuvers are available to you that are not possible using the stick alone.

Rudder pedal controls (rudder controls in general, in fact) are represented in this manual in bold type and enclosed in brackets. Thus, for example, sliding the Left Pedal forward and the Right Pedal back would appear as **[Rudder Left]**. The direction of the control (i.e. 'left' or 'right') is based on the direction in which the control motion moves the rudder, as is standard in aviation.

[Rudder Left] Yaw Left
(Counteract Adverse Yaw
of Right Bank)



[Rudder Right] Yaw Right
(Counteract Adverse Yaw
of Left Bank)

The rudder is the pilot's only direct method of controlling the yaw of the plane. (Please refer to the **Glossary** for a brief definition of 'yaw'.) The primary uses of the rudder are to counteract the adverse yaw caused by banking with the ailerons and to steer the plane while on the runway. The rudder can also be helpful when you're making those little sideways adjustments as you approach the runway.

THE MAIN MENU

After the title screen and the opening animations have finished, the **1942 THE PACIFIC AIR WAR** Main Menu is displayed. This is the central control of the game, from which you choose the way you want to fight the Pacific air war. You can command the entirety of either carrier fleet, fly historical missions in a fighter or bomber, or live out a career as a pilot and potentially change the course of the war. **1942 THE PACIFIC AIR WAR**'s special features are also available from this menu, including the flight film viewer and the custom mission builder.



- | | |
|---------------------------|---|
| Carrier Battle | Command the American or Japanese Navy in the Pacific theater, circa 1942. You can also take over and fly individual missions. |
| Pilot Career | Start your career as a pilot for either side. |
| Fly Single Mission | Fly individual missions for either side. This is the best way to practice in preparation for a piloting career. |
| High Scores | View the scores of the best carrier group commanders and crack pilots. |
| Flight Films | View and edit films of your mission flights. You can save the original films and your edited versions for posterity. |
| Mission Builder | Design and fly “fantasy missions” in the context of the Pacific theater, circa 1942. You can save your missions for later play. |
| Configure Game | Set up the way you want to control the various aspects of the game. |
| Exit | Quit the game and return control to DOS. |

Veteran flight sim players will notice that the usual “Quick Start” option is missing from **1942 THE PACIFIC AIR WAR**. Since you can get airborne so quickly using the **Fly Single Mission** option, including “Quick Start” seemed redundant. For those of you who want to jump right into the cockpit and leave the details for later, here’s the shortest route:

- On the **Main Menu**, choose **Fly Single Mission**.
- Decide whether you want to fly the mission as an American or a Japanese pilot. You can select a nationality by clicking on the appropriate button or flag.
- Next, select the type of mission you want to fly using the buttons in the lower part of the menu. The different types are described under **Mission Type**, in the **Flying A Mission** section.
- Choose your mission from the displayed list in the upper part of the menu.
- Accept the default weather and time.
- Read or ignore the mission briefing. Click once anywhere on the screen to proceed.
- Choose your plane’s armament. Click on the **Accept** button to take the displayed load-out.
- Decide which of the **Realism Options** you want turned on. By default, all of these options are off, which is the easiest setting (Difficulty Level 0).
- Take off.

For details on the controls used for piloting your aircraft, please refer to the **Keyboard Reference Card** (the **Keycard**) and to the **Flying A Mission** section.



CARRIER BATTLE

Carrier Battle is the part of **1942 THE PACIFIC AIR WAR** dedicated to strategy and tactical play. Most of the other play options, including **Single Mission**, **Career Pilot**, and **Mission Builder**, are primarily flight-oriented. If you'd rather be an admiral than a combat pilot, **Carrier Battle** is the optimum first choice for you. Those of you who have played **Task Force 1942 Surface Naval Action in the South Pacific** will find portions of the command interface familiar, but the tactics quite different.

Resource management – making sure that your ships, aircraft, and pilots are put to best use and are available when and where you need them – is an important part of commanding carrier task groups. Again, **Task Force 1942** players will find they have experience with this, and it may count as an advantage.

Despite its focus on command and strategy, **Carrier Battle** does sometimes give you the opportunity to push one of the pilots out of the cockpit and fly. You can take over (in mid-flight!) and fly the “meat” of many of the air strikes you order.

STARTING

Once you've chosen **Carrier Battle** from the **Main Menu**, there are still a few decisions to make before the battle begins. The first two are fairly obvious – you have to decide what battle you want to fight and which side you wish to command. Lastly, the **Realism Options** allow you to make the battle more or less difficult to win, depending on your level of competence.

SELECT A BATTLE SCENARIO

The first and probably most important choice is in which of the five historical carrier battles you want to take part. Each is based on the actual events of 1942. Force concentrations and strengths differ, as well as which ships and Commanders are involved. You may be outnumbered and outgunned in one battle and command far superior forces in the next. A winning strategy for one scenario will almost undoubtedly not work in any of the others.

At this point, you could also re-load any of the battles-in-progress that you have saved in the past.

You will notice that these are not detailed descriptions of the historical progression of these battles. If you are regularly defeated by the game's "AI" Admirals, the historical details could be useful for developing winning strategies. A good history of the World War II Pacific Theater can be helpful; visit your local library.



Scenario Menu

Coral Sea

The Japanese Army is preparing to invade Port Moresby. Admiral Yamamoto has been forced to divert a light carrier, the *Shoho*, to support the invasion force. He has also sent two fleet carriers, the *Zuikaku* and *Shokaku*, escorted by two heavy cruisers and six destroyers (the First Air Fleet's Carrier Division Five) along with the force that is to contain the Americans in the Coral Sea, thus keeping them away from the main thrust of the invasion. If you command the IJN side, your job is to make sure the invasion proceeds as planned. Do not let the American forces escape from the Coral Sea.

Admiral Nimitz knows about the invasion of Port Moresby. He has sent Task Force 17, including the carriers *Yorktown* and *Lexington*, into the Coral Sea. If you choose to command the USN, you take the place of Rear Admiral Fletcher. Your goals are to do as much damage as you can to the Japanese forces, especially the carriers, and force them to call off the invasion if it is at all possible.

Midway

Yamamoto has a plan to force all of the American carrier forces into one big, decisive battle. His forces are split, so that two groups including carriers are approaching Midway Atoll from the northwest, while another is attempting to divert the Americans by attacking the Aleutian Islands. The First Carrier Strike Force includes the carriers *Akagi*, *Kaga*, *Soryu* and *Hiryu*, plus two battleships, a pair of heavy cruisers, one light cruiser, and twelve destroyers. The combined First and Second Fleets, hot on the heels of the carrier force, includes the super-battleship *Yamato* and two light carriers, the *Zuiho* and the *Hosho*. The carriers *Junyo* and *Ryujo* are assigned to the diversionary force.

Thanks to the codebreaking team, Nimitz knows that the main thrust of the Japanese attack is going to be Midway. Task Force 16, which includes the carriers *Enterprise* and *Hornet*, is waiting to the northeast. The unexpected Task Force 17, consisting primarily of the just-repaired *Yorktown*, is steaming in from Pearl Harbor.



USS Yorktown

Midway must be protected from invasion at any cost; losing it would mean giving the Japanese control of more than half of the Pacific Ocean.

Eastern Solomons

The Americans have taken the partially-built Japanese airfield on Guadalcanal and are rushing to finish it. Admiral Yamamoto has decided on a strategy to land a great number of reinforcements and at the same time draw the U.S. carriers to their doom. While the carrier *Ryojo* goes with the landing force, the Emperor's last two fleet carriers are tasked with the destruction of the American carriers. Meanwhile, the admiral himself will lead the main force, onboard the flagship *Yamato*.

Henderson Field is just on the edge of completion, and the Japanese are planning an all-out assault to take it back. Admiral Nimitz has ordered Fletcher to use everything he has to stop Yamamoto's Combined Fleet. Only the carrier *Hornet* is to be kept in reserve. The *Enterprise*, the *Wasp*, and the *Saratoga* are at his disposal. Protecting the Marines and crippling the IJN carriers are priorities one and two.

Santa Cruz

The Japanese forces on Guadalcanal are in need of reinforcements and supplies. The main body of the Combined Fleet is in the van, with the carriers providing support from behind this screen of destroyers and battleships. While the main force keeps the Americans occupied, a group of transports will have the opportunity to slip in and drop off sufficient forces. Success in this maneuver should guarantee a quick victory for the Emperor's troops on Guadalcanal.

Rear Admiral Kinkaid has replaced the injured Fletcher, and he is in command of Task Force 61 – the *Hornet* and the *Enterprise*. He knows that the Japanese have carriers in the area of Guadalcanal. These ships must be found and destroyed, in order to prevent Yamamoto's plan from taking shape. If no extra enemy forces reach Guadalcanal, the U.S. has a very good chance of taking the entire island before the end of the year.

Marianas

American submarines have been harassing the Japanese navy's fuel supply for months. Most of the IJN ships have to fall back on unrefined fuel all too often. Now, the U.S. has occupied Saipan. If they establish an airbase there, they will be able to launch regular attacks directly on the home islands. Admiral Toyoda has devised a desperate plan to thwart the Americans and deny them Saipan. All of Japan's remaining carriers, split into three carrier groups, are converging on the Marianas. After land-based strikes have weakened the American carrier forces, the Japanese carriers will launch an all-out attack that should cripple the U.S. fleet.

The massed power of the Fifth Fleet's Task Force 58 is lying in wait for the Japanese at Saipan. Seven heavy carriers and eight light carriers, plus a multitude of battleships, destroyers, cruisers, and other ships have prepared a hammering ambush. Admiral Kelly's Expeditionary Force includes twelve more escort carriers, just in case. The Americans' intention is clearly to annihilate the Japanese fleet and take away the enemy's ability to fight in the air.

Load Saved Game

Left-click on this button to take up where you left off in a saved battle. You will be presented with a list of those available from which to choose. Use the arrow keys or the mouse pointer to find and select the fight you want to rejoin. The battle restarts without further delay.

Once you have decided on a battle scenario, you must choose a side to command. The only options are the major combatants in the theater, the Americans and the Japanese.

Your nationality will determine the number and strength of your forces. Your carrier groups and bases will be organized and positioned as the originals were in 1942, and will begin following the historical course of events as soon as the curtain goes up. The commanders of your task groups will make decisions much like their historical archetypes, unless you override them with a strategy of your own.

Keep in mind that early in the war the Japanese fighters (Zekes, or "Zeros") are more agile and maneuverable than the American, but the American fighters are better armored. At the time of these battles, the Japanese torpedoes were far superior in accuracy and reliability to the Americans'.

NATIONALITY



REALISM OPTIONS AND THE DIFFICULTY LEVEL

At this point, you are presented with the **Difficulty Level Menu**. There are several **Realism Options** for battle, described below, each of which affects the way the game plays. All of these options default to the easier setting (Difficulty Level 0), and changing any of them raises the overall **Difficulty Level**. A higher Difficulty Level makes the game harder, but also increases your final score.

Sightings

The pilots of search planes are human, and humans sometimes make mistakes. If you were flying over an enemy task force with no bombs, trying really hard not to be spotted and shot down, you might make a few hasty identifications yourself. During the war, it was often the case that bad weather, low visibility, and exhausted spotters led to erroneous sighting reports (tankers reported as carriers, to use an historical example).



Identifying ships from a single sighting can be difficult.

If you decide that **Sightings** will always be accurate, you won't need to worry that the crews in your search planes might make a mistake. If you allow the occasional inaccurate sighting, you could be led astray by bad info.

Weather Effects

In the real world, weather does tend to affect the way things work outdoors. Baseball games are rained out, visibility is lowered, planes can't fly as far, landing on the carrier deck gets to be a little slippery. Ships, also, can't make quite the speed they might when fighting the high waves of a storm.

If you turn **Weather Effects** on, the weather will have several subtle effects on the things your forces are capable of and the outcomes of various actions. If not, everyone remembered their raincoat and rubbers and all-weather tires, and the weather will have no effect except for changing the view outside the cockpit.

Battle Reports

The admirals, vice-admirals, rear admirals, and other commanders in a carrier battle were very rarely involved directly in the minute-to-minute carnage of the air strikes they ordered. All their knowledge of what happened came from reports – reports from spotter planes, returning aircraft, and other sources. Not all of these reports were reliable. In fact, at the Battle of the Philippine Sea the commander of the Japanese forces was led to believe he was winning when almost every one of his planes had been destroyed.

If you set **Battle Reports** to be accurate, none of the information you receive as to damage done and losses will be incorrect. If you allow the reports to be inaccurate, you will sometimes get false news (about as often as the commanders of the time did).

Force Configuration

Those of you who have studied the historical context of these battles or played out each **Carrier Battle** scenario several times will find few surprises in the position, strength, and configuration of the forces on each side. It is conceivable that you might want to spice things up a little. The **Set-up** option lets you do just that. You can choose whether the force configurations are based on historical fact or are generated by the whim of the game.

Select **Historic Set-up** to have the two nations' forces closely match their historical configurations and starting positions. Use the **Random Set-up** to add a little uncertainty to the situation.

Skill Level

You rarely know, when you enter a sea battle, how cunning and experienced your opponent is. Much of the time, you don't even know the identity of the enemy commander. In **1942 THE PACIFIC AIR WAR**, you normally won't know who you're up against unless your spotters are pretty good, but you have a chance to decide just how skillful your opponents are going to be.

If you choose the easier **Skill Level**, the opposing admirals and other task force commanders will be less intelligent and crafty than their historical archetypes. If you challenge the more difficult level, prepare to have your butt kicked all over the Pacific.

Piloting Options

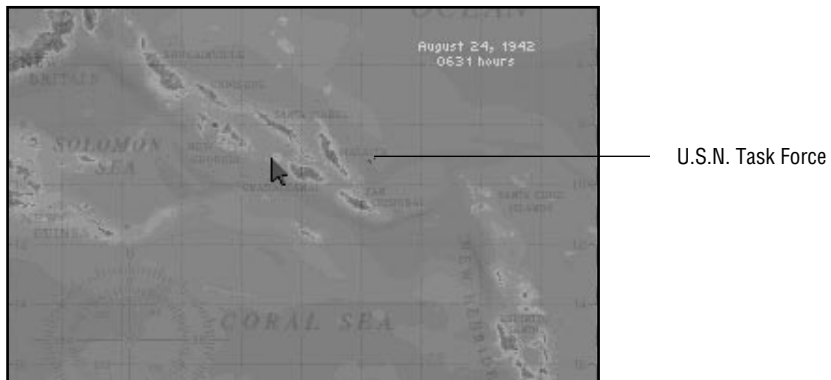
Several of the **Reality Options** only affect the way things work when you choose to enter the cockpit and fly the combat portion of a strike mission. These options are described briefly below. For more details, please refer to **Realism Options and the Difficulty Level**, in the **Flying A Mission** section.

Ammunition	Loads the plane with either realistic or unlimited ammunition.
The Sun	Turns the blinding aspect of facing the sun on and off.
Mid-air Collisions	Sets whether or not other aircraft are treated as solid objects.
Ships Evade	Determines whether ships will try to dodge bombs and torpedoes.
Blackouts	Real pilots black out at high g's; you have a choice.
Fatal Crashes	Makes collisions either harmless or plane-destroying.
Hit Detection	Scoring of hits with all types of weapons can be easy or realistic.
Engine Overheating	Engine will die out when overheated if this option is selected.
Engine Torque	With torque selected, the aircraft will naturally lean to the left.
Enemy Pilot Skilled	Enemy aircraft skill will be higher with this option selected.
Landings	Gives you the option to make landings easy or realistic.
Real Flight Model	Gives your flight more variants to deal with when selected.

THE MAP

Having accepted the **Realism Option** settings, you are thrown right into battle. The display from which you control your task groups is a map appropriate for the battle scenario you have chosen. Most of the larger land masses are labelled, as are the major bodies of water. Your forces should be at or near the center of the displayed portion of the map. They are already moving, and time is running.

The forces on the map, friendly and hostile, are represented by icons. These icons are necessarily small and don't look much like what they represent. In battle, representing the relative positions of forces with precision must take precedence over aesthetic concerns. Japanese forces are always red, while American forces are blue. The icons are pretty much self-explanatory, but you should know that friendly forces are represented by dots, while enemy forces are crosses (except for bases, which are always dots).



Some other useful information is always displayed, for reference. Near the upper right-hand corner of the screen, the current date and time are superimposed on the map, in military format. The outer edges of the map have degree hashmarks (tenths of degrees are marked off in smaller hashes) for latitude and longitude, and there is a compass rose in the southwestern corner of the map.

To see the parts of the map that don't fit on the map table (the screen), you'll need to slide the map. Move the mouse pointer beyond any edge of the map, and the view will slide in that direction. (This is as if the map were sliding off the table in the opposite direction.)

FORCE INFORMATION BOXES

Whenever the mouse pointer moves over a group of ships or a base, a **Force Information Box** opens. This box summarizes the most important facts known about that fighting force. For a friendly base, this information includes:

- Name of Base
- Location (Latitude and Longitude)
- Damage to the Airfield
- List of all Squadrons Currently Based Here

Base Information Box
(Friendly)



Base Info Box

If the pointer is over one of your task groups, the information in the box will include:

- Task Group (TG) Number
- Name of Commanding Officer
- Current Location (Latitude and Longitude)
- Heading
- Speed
- Composition
- Gun Range

Task Group Information Box
(Friendly)



Task Group Info Box

Note: For those of you who may be unfamiliar with the standard military vessel type abbreviations used in denoting the composition of a task group:

- | | |
|---------------------------|------------------------------|
| BB = Battleship | CA = Heavy Cruiser |
| CL = Light Cruiser | CV = Aircraft Carrier |
| DD = Destroyer | TR = Transport |

Whenever a **Force Information Box** is open on one of your task groups or bases, you can give orders to the forces listed in the box. Left-click to open the **Command Menu**. Note that time stops while you are giving orders to your forces.

Force Information Boxes for enemy forces will include only the information your reconnaissance planes were able to collect, plus whatever can be calculated from that data. The names of commanding officers, for example, will surely remain unknown. For an enemy base, you will normally get:

- Name of Base
- Location (Latitude and Longitude)
- List of those Squadrons Spotted by Reconnaissance

The standard reconnaissance report on an enemy task group includes:

- Time and Date of Sighting
- Location (Latitude and Longitude) at time of sighting
- Speed and Heading at time of sighting
- Composition at time of sighting

SCALE

There are three levels of scale on the map. When you begin the battle, the map is at that level which shows the greatest area and the least detail.

To zoom in (view a smaller area in more detail), press **[Z]**. Note that the action does pause while you are changing the scale. Use the mouse to move the magnification box to the area you want to scrutinize more closely, then left-click. Repeat this procedure to zoom to the smallest viewing area (and the highest level of detail).

To zoom out (view a larger area in less detail), press **[X]**.

ACCELERATING TIME

At certain junctions in a battle, you may want to allow things to progress on their own. Though time is already accelerated during the **Carrier Battle** (if it weren't, one battle could quite literally take weeks to play), sometimes strategy requires letting some pretty dull stretches go by. Rather than sitting idle for several minutes (or longer) just watching, some players may prefer to accelerate the passage of time even further. **1942 THE PACIFIC AIR WAR** makes this possible in both the **Carrier Battle** and the flight portions of the game.

To further accelerate time, press the **Accelerate Time** key. (Please check the **Keycard** for the exact keystroke.) The new time rate will be displayed on-screen. For even more acceleration, simply press the same key again to jump the time rate. You can continue to increase time up to the maximum rate.

Time will return to the original rate as soon as you click on a task group, opening the **Command Menu** (this will also stop time until you close the menu). If for some reason you would rather not do this, you can press the **Reset Time** key to immediately return to 1x time.

COMMANDING TASK GROUPS

Of the several options on the **Command Menu**, two are used to control the entire task group. If there are no carriers in the selected task group, only these options and **Exit** will be available. Neither of these options will ever be available for a base.



Command Menu

SET COURSE

For every task group under your command you have a **Command Compass**, which you use to order heading changes.

You can change course as often and as radically as you like. No matter what sort of deranged maneuvers you pull, your search and CAP planes will always be able to find their way back to their home carrier. If they have enough fuel, that is. Of course it's difficult, if not impossible, to land on the deck of a carrier that's in the midst of changing course, so you may want to leave the compass alone once in a while. One thing to note is that the pilots of planes out on a strike mission assume that the carrier will maintain a roughly steady course and speed while the strike is underway. These planes will not home in on the carrier. Please refer to **Launching a Strike** for more detail.

When you choose **Set Course**, your **Command Compass** is superimposed on the map. In the center of this compass is the task group to which you are giving orders. The compass needle, a thick white line, follows the mouse pointer around the screen. Move the pointer around until the needle points to the new course you plan for that group. Left-click to release the **Command Compass**, and the ships will begin turning to the new heading immediately.

SET SPEED

A beginning commander might think that all of his task groups should be at maximum speed at all times, to get where they're going sooner. In fact, sometimes this is the case. However, most advanced strategies depend more on timing than speed. Sometimes, having the enemy believe that a group of ships is slower or more heavily damaged than it really is can be the advantage that turns defeat into victory.

Then there are the practical considerations. Higher speed means higher fuel consumption. The speed of each carrier has an enormous effect on how difficult it is for your aircraft to safely land on the deck. Plus, if you're making tracks away from the direction in which you sent your planes, you could accidentally steam right out of their return range and lose them all! On the other hand, ships at a dead stop have a greatly diminished chance of evading bombs and torpedoes.



This carrier will not be travelling at high speed.

When you select **Set Speed**, the **Speed Box** opens. You can order any speed from a Full Stop (0 kts) to the maximum possible speed for that particular task group (the top speed of the slowest ship). Hold down the left mouse button and use the pointer to position the slider at the speed you want. All speeds are in knots (nautical miles per hour). As soon as you left-click on the corner box, the **Speed Box** closes and the group commander orders the change in speed.

Keep in mind that a task group that includes one or more damaged ships will not be able to achieve the same maximum speed as it did before the damage. Ships that have lost their engine rooms or are sinking are likely to be left behind, for the safety of the rest of the group.

FINDING THE ENEMY: RECON AND CAP

If you've selected a base or a task group that includes at least one carrier, the rest of the command options will be available to you. Of these, two are used primarily for information-gathering and defense purposes.

AIR SEARCH

One of the fastest, most reliable ways of reconnoitering a large area is to send out a spread of search planes. That's what the **Air Search** option is for. The enemy is certainly lurking around out there somewhere, and it's best if you find him before he finds you. Until you have a sighting, you have no way of targetting a strike.

First, select **Air Search**. If the force you're giving orders to includes more than one carrier, you will be prompted to choose from which carrier you would like to launch the search.

Next, you need to decide which squadron will supply the search planes. All of the available squadrons will be listed in a window according to the type of aircraft that makes up that squadron. There are no mixed squadrons in **1942 THE PACIFIC AIR WAR**. Left-click on a squadron to see how many planes are available.

Once you find the squadron you want for the search sweep, left-click on the up and down arrows next to the squadron information to set the number of planes involved in the search. Remember that these planes will be unavailable for other duties until the search is called off.

As you raise and lower the number of planes flying the search, the wedge showing the optimum search area is adjusted. You can use this wedge as a guide, to help you decide how many planes are necessary. Once you've settled on a good total, you'll need to assign a direction to the search. Left-click anywhere on the map in the direction you want the search to proceed, and the wedge will move. (It might take a little fine-tuning to send the search in the exact direction you want.)

When everything is satisfactory, left-click on the square in the upper left-hand corner of the window to launch the search. The search will continue until you return to this window and cancel it.



What some of the search planes at Midway saw.

Search Wedge

Search Orders Box



Air Search Wedge

COMBAT AIR PATROL

Combat Air Patrol (CAP) is the naval pilot's version of perimeter guard duty. As an early warning system, CAP is absolutely necessary for spotting and identifying enemy aircraft before they threaten the base or task group. In the case of an attack, your CAP also serves as a first line of defense. They may not always stop the enemy, but a good CAP might stall them long enough for the rest of your fighters to get into the air. Without CAP, you could easily be caught by surprise when the enemy comes after you.

First, select **Combat Air Patrol**. If the force you're giving orders to includes more than one carrier, you will be prompted to choose on which carrier you would like to base the patrol.



CAP Command

Next, you need to decide which squadron will supply planes for CAP. All of the available squadrons will be listed in a window according to the type of aircraft that makes up that squadron. Left-click on a squadron to see how many planes are available.

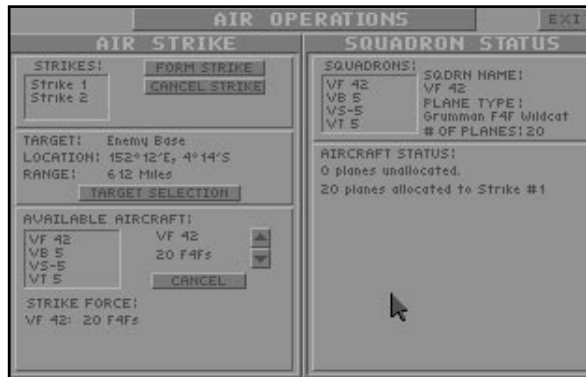
Once you find the squadron you want to fly CAP (preferably a group of fighters), left-click on the up and down arrows next to the squadron information to set the number of planes on CAP duty. Remember that these planes will be unavailable for other duties until the CAP is recalled.

When everything is the way you want it, left-click on the square in the upper left-hand corner of the window to order the patrol to begin. Your pilots will fly CAP continually until you return to this window and cancel CAP duty.

ATTACKING THE ENEMY: CARRIER AND BASE OPS

When you have located and identified the enemy surface forces, it remains to take the offensive to them. This is when resource management becomes essential. There will certainly be multiple enemy task groups, and your supply of planes is limited. You might be able to get by without any new search missions, but not maintaining a CAP once battle has begun is sure suicide.

The first step in sending an attack to the enemy is to select the task group or base from which to launch the strike. From the **Command Menu**, choose **Carrier Ops** (when commanding a task group) or **Base Ops** (when commanding a base). Game time is paused, and the **Air Operations** screen opens.



Air Ops

SQUADRON STATUS

The right-hand half of the **Air Operations** screen is dedicated to squadron status information. The list in the small box near the top contains all of the squadrons based on the selected carrier or base. Just to the right of this list is more specific information about whichever squadron you select. To view a squadron, left-click on its name in the list box. For that squadron, you'll see:

- the squadron name,
- the type of plane of which the squadron is composed, and
- the total number of planes in the squadron.

Below this, in the large box, the assignment and status of every plane in the squadron is listed. Once you know how many planes you have available for strikes, you can determine the optimum configuration for each strike force. You may find that you need to recall some of your search sweeps or CAP planes.

LAUNCHING A STRIKE

Use the left-hand side of the **Air Operations** screen for putting together strike forces and giving them their orders. The top box lists all of the strike forces presently formed. The first time you enter this screen for a particular carrier or base, this box will be empty. Next to this box are two mouse buttons. Left-clicking on the **Form Strike** button is the first step to launching a strike on the enemy. If you make a mistake or just want to disband a strike force, use the **Cancel Strike** button.



The captured and repaired base runway at Bougainville, November 1943

Obviously, an offensive strike intended to destroy a base or ship should include bombers. These bombers should be escorted by at least an equal number of fighters, preferably more. Many fighters have some limited bombing capability, but you cannot expect them to do any critical damage to surface targets. Sometimes it will require more than one strike to destroy a target.

It is often prudent to send out a preliminary strike consisting exclusively of fighters. This is called a “fighter sweep”. If they are successful, the fighters will “sweep the deck”, clearing much of the enemy’s air strength out of the way. When the slow, vulnerable bombers and their escort arrive at the target area, they’ll have a much easier time completing their mission.

Planes out on a strike are advised of their “return point”. This is the area where the carrier should be, calculated from its course and speed at the time the strike is launched. If you change the course or speed of the carrier while a strike is out, there is a very real risk that you will lose the entire strike. Returning planes rely on visual detection to find the task group and the carrier, so you have some leeway. Depending on the weather and visibility, a difference of less than forty nautical miles should not be a problem. Any more than that, though, and you’ll be writing letters to the families of quite a few lost pilots.

Having created a strike force, you have two more duties, which you can perform in any order. Let’s take them in the order they’re listed.



Strike aircraft on the deck of the Yorktown, May 1942

Select a Target

A newly created strike force has no target. Left-click on the **Select Target** button to assign one. The map is displayed for you to find and choose the target for this strike. Move the mouse pointer until it is over the enemy force you want attacked. When the info box for that force appears, left-click to make that force the strike target.

The target information area should now list the short description of the target, along with its last known location and its range. This is important information, but it is only as up-to-date as the last sighting of this enemy by a search plane. Keep in mind that some of your planes may have shorter ranges than those flying the search. Sending planes after an out-of-range target is a waste of time and fuel.

Assign Planes

Below the target selection area is the list of available aircraft. All of your squadrons appear in the box, but not all of them will have planes free. Left-click on a squadron with available planes to add those planes to the current strike force. The aircraft information will appear to the left of the squadron list and be added to the list in the **Strike Force** box. You can use the arrows to the left of the aircraft information to raise or lower the number of these planes assigned to this strike. The **Cancel** button deletes the current squadron's planes from the strike force.

When you assign planes to a strike force, always be aware of the type of target they'll be attacking. A strike force made up exclusively of fighters is not likely to be much good against any target, but will certainly deplete the air support around that target. Bombers flying without escort are sitting ducks for enemy CAP, and torpedoes are no good at all against bases.

To accept your strikes as listed and launch them, left-click on the **Exit** box in the top right-hand corner of the screen.

JUMPING INTO THE COCKPIT

Air strikes, once launched, will proceed to their target automatically, while you take care of other aspects of the battle. Whenever a strike force reaches its target, you will be given the option of taking over for the lead pilot and flying the attack mission yourself. Through the magic of computers, you can step into the cockpit just as the attack is beginning. Of course, if you'd rather not do this, you can choose to let your pilots fly the mission themselves.

For detailed instructions on flying an attack strike, please refer to **Encountering the Enemy**, in the **Flying A Mission** section.

Whenever you choose to leave the strike, you are returned to the map and to command mode. If your plane is still functional, the original pilot will take back the stick and finish the mission for you.

WIN, LOSE, OR DRAW

There is no time limit on **Carrier Battles**. Sooner or later, one side will either be completely decimated or will choose to withdraw. The battle ends when one force has retreated beyond the effective attack range of the other. (Sinking is one way to get out of range.) If neither you nor your enemy has completely destroyed the other, which is probable, there is no obvious winner. (Obviously, if one side has been annihilated, the other wins.)

In reality, judging which side won and which lost is a complex affair. Often, it's impossible to know until well after the entire war is over who gained what advantage during which battle. Since these battles are conducted in a vacuum, so to speak, it's much simpler to label one side "winner" and the other "loser".

1942 THE PACIFIC AIR WAR compares the damage done by each nation and computes the points gained and lost by both sides of the conflict. If either side completed its objective, that side gains some extra points. The side with the most points is the winner, but **1942 THE PACIFIC AIR WAR** knows the difference between a close contest and a blow-out. It is possible to fight to a draw.



Sometimes winning is a matter of taking your lumps and staying afloat, like the minesweeper Lindsey did at Okinawa.

Damaging and destroying enemy planes, ships, and bases adds to your chance of winning. Bases and ships will give you more points than planes, and destruction is more profitable than repairable damage. Larger ships are more valuable than smaller ones. Before you go on an all-out rampage, however, remember that losing your own planes, ships, and bases or allowing them to be damaged costs you in points (as well as long-term fighting ability).

If you were assigned an objective at the beginning of the battle, successfully fulfilling that goal is worth some points. Your score is also modified by the **Difficulty Level** you chose at the beginning of the battle. The greater the difficulty, the higher your score will be.

When the battle is finished, you will be notified of how well (or how poorly) you have commanded your nation's forces. If you do not feel that you did well enough, your only recourse is a rematch. Good commanders learn from their mistakes, and the best learn quickly.



FLYING A MISSION

Where **Carrier Battle** is the strategy- and command-oriented portion of **1942 THE PACIFIC AIR WAR**, most of the other play options are flight-oriented. **Single Mission** and **Career Pilot** both put you in the air, with none of the worries of command. All you have to worry about is your mission – and all those enemy pilots and gunners who want to shoot you down.

Testing yourself against the enemy in single missions is one the best ways to train yourself before embarking on a career as a pilot in the U.S.N. or the I.J.N. Flying the same mission over and over until you get it right is the bare essence of rote training. You could also train as a specialist, practicing on a specific type of mission or aircraft while varying the scenarios – the key to adaptability. Or, if you're ambitious enough to want to be an all-round pilot, you could attempt to master every type of mission.

Single missions are also a good option for those of you who don't want to spend the time to develop a pilot through a career, or just don't want to get involved in a campaign yet. It's the quickest way into the air.

NATIONALITY

Before you can choose your mission, you must decide for which side you wish to fly. The only options are the major combatants in the theater, the Americans and the Japanese.



Your nationality will limit the types of aircraft and armament available to you. Keep in mind that the Japanese fighters are more agile and maneuverable than the American early in the war, but the Americans gained the advantage with later aircraft designs. Also, the Japanese torpedo bombers are generally easier to handle than the American ones, and their torpedoes are far superior in accuracy and reliability.

Nationality will also be used to establish whether you are on the offensive or defensive during any particular mission.

MISSION TYPES

There are six basic mission types in **1942 THE PACIFIC AIR WAR**. The plane you pilot – fighter, dive bomber, or torpedo bomber – depends on the type of mission you choose, as follows:

Fighter	Dive Bomber	Torpedo Bomber
Fighter Sweep	Bomb Base	Torpedo Ship
CAP	Bomb Ship	Bomb Base
Bomber Escort		



Mission Selection

Several individual mission scenarios, all different, are included under each type. Select the type of mission you want to fly according to the descriptions below. Once you have selected, the list of individual mission scenarios is displayed.

FIGHTER SWEEP

The carrier group is launching an attack on an enemy base. In preparation, a force of fighters, including your plane, is sent out to minimize the air defenses over the target base. Your primary goal is to damage or destroy as many enemy aircraft as possible, whether you find them in the air or on the

ground. The fewer planes the enemy has in the air when the main force arrives, the better chance that the attack will be successful.

COMBAT AIR PATROL (CAP)

CAP is the only inherently defensive mission type. When flying CAP, your fighter or group of fighters is assigned to patrol a direction from which the enemy is expected to attack. Normally, you will fly out a specified distance from the carrier, then screen the assigned area for hostiles. If there is an encounter, it is most likely that the enemy is either the forefront of a greater force bent on attacking the carrier or a reconnaissance mission preparing for such an attack. In either case, destroying the enemy force swiftly and with minimal loss of friendlies is your primary goal.

BOMBER ESCORT

The carrier group has launched an attack on an enemy base or ship. The fighter sweep (if there was one) went out a few hours ago, and now the bombers are being launched. Your mission is to fly in formation with the bombers, protecting them from enemy aircraft on their way to the target. Remember, if the bombers are lost, the attack cannot proceed. Minimize your losses, but see that the bombers get through.

BOMB SHIP

You fly the lead dive bomber in an attack on an enemy ship. There may or may not be torpedo bombers backing you up. Whether it's a lone target or part of an enemy task force, the ship is sure to be heavily defended. The goal of this mission type is to get as many bombers through the enemy defenses as possible and do as much damage as you can to the designated target ship. Preferably, you'll sink her. Usually, you'll have a few fighters flying escort with you; they'll give you some shielding, but heads up flying is your best defense.

BOMB BASE

The carrier group is launching an attack on an enemy base. Your bomber is spearheading the backbone of that attack. The goal of this mission type is to get through the enemy defenses intact and do as much damage as you can to the enemy base. Under normal circumstances, you'll have a few fighters flying escort with you; use them to your best advantage. Hopefully, the fighter sweep that went out a few hours ago downed most of the enemy planes, but you can't depend on that.

TORPEDO SHIP

In this type of mission, your torpedo bomber is leading the attack on an enemy ship. Whether that ship is cruising alone or as part of a larger group, it will be well defended. There may be one or two dive bombers on your side, backing you up. The goal of this mission type is to get as many bombers through the enemy defenses as possible and do as much damage as you can to the designated target ship. Preferably, you'll sink her. Usually, you'll have a few fighters flying escort with you; they'll give you some shielding, but heads up flying is always your best defense.

SPECIFIC MISSION

Once you select a mission type, the list of available mission scenarios of that type is retrieved and displayed in the **Mission Listing Box**. All of these missions are derived from what really took place during the Pacific air war. The only significant difference is your involvement. These are pieces of the war that you can relive or rewrite, as you choose.

If you'd prefer not to fly an historical mission, you can invent your own missions using the **Mission Builder**. Please refer to the **Custom Missions** section for instructions.

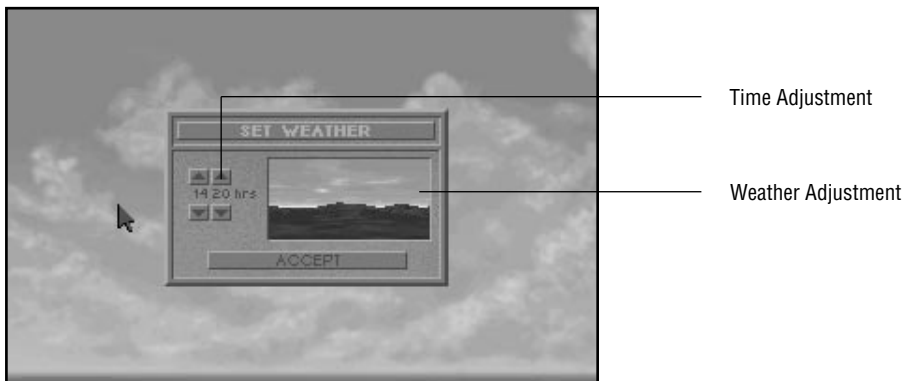
Use the arrow keys to highlight the mission you want to fly and press **Enter**, or simply click on that mission with the **[LMB]**.

Note that the **Mission Listing Box** can display no more than ten listings at one time, but there are more than ten individual missions to list. Use the scroll bar if you wish to bring the unseen mission listings into the box.

WEATHER AND TIME

At this point, you have the option of modifying the weather and the starting time of the mission you are about to fly. You can accept the default settings or customize the meteorological situation.

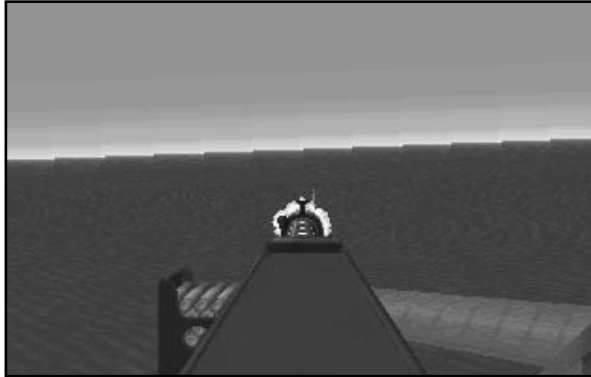
You control the weather by clicking the **[LMB]** on the landscape graphic in the **Meteorology Box**. Cycle through the various types of cloud cover until you find the one you wish to experience.



Changing the mission starting time only affects the sun. As your mission progresses, the sun may rise or set, depending on the time. Each part of the starting time has buttons above and below it. Left-click on the button above to move time forward, and use the button below to move time backward.

ARMING

The flight deck is where you decide what armament you'll be carrying on the mission. You only choose a load-out for your own flight; you have no control over what the other flights take. Left-click on the arrows to cycle through the armament options. Your options are limited to the type weapons typical of the model of plane you're flying.



Loading Out

If you are flying CAP or a fighter sweep, chances are good that your commanding officer will not allow you to carry bombs. The unnecessary extra weight would decrease your effective range. Extra fuel tanks also add weight, but the overall effect is an increase in range.



Ground Crews load your ammo and bombs, as demonstrated by these guys loading a Corsair in the early 1950s.

Left-click on the **Accept** button take the displayed load-out and start the mission.

At this point, you are presented with your pre-flight checklist, which is really the **Difficulty Level Menu**. There are several **Realism Options** for flight, described below, each of which affects the way the game plays. All of these options default to the easier setting, and changing any of them raises the overall **Difficulty Level**. A higher **Difficulty Level** makes the game harder, but also increases your final score.

When you are happy with the **Difficulty Level**, left-click on the total to signal “thumbs up” to the flight crew. When they pull the tarp, get ready to fly.

PRE-FLIGHT CHECKLIST: REALISM OPTIONS

THE SUN

Facing into or nearly into the sun causes serious visibility problems for pilots. Before the advent of radar, enemy pilots would often try to take advantage of this fact by setting the sun at their backs, thus avoiding visual detection. Since none of the aircraft in **1942 THE PACIFIC AIR WAR** is equipped with radar, this tactic is viable, useful, and dangerous.

If **Sun Blinding** is enabled, you and your opponents will be at a serious visibility disadvantage whenever facing into the sun. If not, the sun will be no more than a landmark in the sky.

BLACKOUTS

One of the limitations of the human body is that it tends to perform poorly at high accelerations. Tight turns at high speed, pulling out of dives, and other high-speed maneuvers can overcome the heart's ability to get blood to the brain, causing a pilot to lose consciousness. This is called a "blackout". A partial blackout is known as a "greyout".

Pushing the stick forward to dive can also be a problem. At a negative acceleration of about minus 2 g's, the blood pressure in a pilot's head becomes too great, and the capillaries in the eyes burst. Brain damage and death can also result. This is called a "redout".

If you have **Blackouts** enabled, you will be subject to these limitations, though redouts will not cause brain damage. If not, you will be able to perform incredible, high-acceleration maneuvers without losing vision or consciousness.

ENEMY SKILL

When you fly into combat, you never know whether you're squaring off against a rookie pilot or a seasoned veteran. In the seconds it takes you to find out, you could have already lost the fight. For the sake of those players whose combat flying is a little rusty, **1942 THE PACIFIC AIR WAR** includes a choice of enemy skill level.

If you select **Enemy Pilots are Skilled**, prepare to face experienced, well-trained pilots and vicious dogfighting tactics. If not, air-to-air combat against rookie pilots should be easier, but don't expect a turkey shoot.

DUD TORPEDOES

In 1942, torpedo failure was a big factor for the Americans. Failure to explode was only part of the problem; many torps just went wildly off-course, sometimes turning completely around. In air-launched torpedoes, this was usually attributed to the extreme sensitivity of the missile to the drop conditions. Overall, U.S. torpedoes had a failure rate of almost 50%. The Japanese torpedoes, though by no means perfect, had a much lower rate of failure.

If you choose **Torpedoes Can Be Duds**, any (or all!) of the torpedoes you fire could go astray or fail to explode, according to historical averages. If not, you can depend on a straight shot and a satisfying blast, but only if your aim is good.

MID-AIR COLLISIONS

Modern long-range weaponry assures that jet fighters rarely get close enough to each other to have to worry about the chance of collision. In 1942, however, this was not the case. Your only air-to-air weapons are your guns, and you have to get pretty close to use them. Mid-air collisions are a serious risk, especially when dogfighting.

If **Mid-air Collisions** are enabled, hitting another aircraft will damage your plane, probably fatally. If not, aircraft will pass through one another like ghosts.

HIT DETECTION

This option has to do with the way the game computes whether or not your bullets hit an enemy plane. Your target can be represented using a “bulk silhouette”, in which one big geometrical shape is used for the entire plane. This technique makes a lot of what would, in reality, be near-misses into hits. A “detail silhouette”, on the other hand, represents the target as an agglomeration of many smaller shapes. This more realistic option makes dogfighting just that much more difficult.

If **Hit Detection** is set to difficult, hits on enemy aircraft will be computed on the smaller, more realistic silhouette. If not, they will all be a little easier to hit.

SHIPS EVADE

Whenever you drop bombs toward a ship, there’s a good chance someone in the crew will notice. There’s a lesser chance that they’ll spot an incoming torpedo, but this chance grows the more torpedoes you fire. In either case, once a threat to the ship is detected, evasive maneuvers commence. An experienced Captain can minimize the damage and, in many cases, avoid being hit altogether.

If you choose to have **Ships Evade** enabled, surface targets may detect your attack and try to escape it. If not, the spotters are asleep, and the ship will steam blithely into the path of destruction.



This Japanese carrier unsuccessfully attempted to evade destruction.

AMMUNITION

Needless to say, in real life planes flew with a limited supply of ammunition. Whether it was a matter of weight or storage capacity, the crews could only pack so much destruction onto one aircraft. If the pilot was profligate with his guns, he'd soon find himself at a disadvantage in a dogfight – no bullets. Note also that the planes of the 1940s did not have automatic ammunition counters – pilots had to estimate how many seconds of fire they had left.

If you choose to carry **Limited Ammo**, you'll have to take care that your machine guns and cannon do not run out of bullets. If not, the only detriment to firing will be that you are announcing your position to those enemies who haven't spotted you yet.

FATAL CRASHES

Until you get some practice under your belt, it's surprisingly easy to crash into things (especially after you've been shot up a little). Generally speaking, your aircraft tends to break into little pieces when you do this, and no matter how spectacular the explosion is, none of those pieces really flies very far.

If you decide that **Crashes Are Fatal**, running into something solid (the ocean, for example) will be the end of your plane. If not, you will happily bounce off mountains, ships, the ground, et al. Of course, if your plane is damaged already, you might not bounce too high.

HALF A MISSION

Before you take off, there's something you should know. It is possible to "save" a mission in mid-flight and return to it later. This is not an historically accurate feature.

Sooner or later, a situation similar to this arises: you've been flying for 45 minutes (real time) and are in the middle of a great battle; you've broken out of the pack and are just coming around for another run into the thick of things; out of the blue, some sort of emergency rears its ugly head (outside of the game, that is) – something catches fire, somebody's choking to death, there's an earthquake, you run out of coffee, or whatever; you can't ignore it, but you really hate to lose all your progress on the mission. What can you do?

Well, obviously, you have to quit the mission. (Those of you who seriously considered ignoring the fire or the choking person might think about seeking professional help.) If you take advantage of the opportunity to save the **Flight Film** (please refer to **Unloading the Black Box: Flight Films** for instructions), you will be able to pick up later where you left off. It's a slightly cumbersome process, but it's effective.

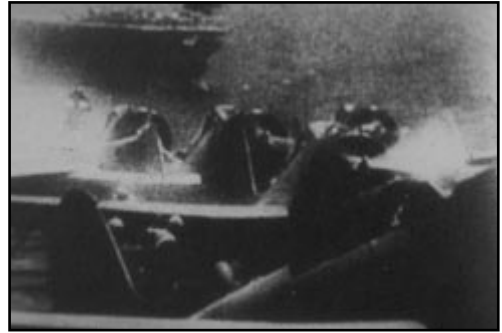
After you've dealt with the emergency and can return to the game, select **Flight Films** from the main menu. It will take some time, but you can run the film through to the end, then restart the action and finish the mission. (Please refer to the **Flight Films** section for more detailed instructions.)

Note that you can not do this with a career mission.

TAKE-OFF

Your mission might begin on a crowded carrier deck, in clear skies or overcast weather. Maybe your home field is a hidden runway, deep in the dense jungle surrounding a base on some small Pacific island. Regardless of your starting point, the first step in any mission is to successfully get off the surface.

Any experienced pilot will tell you that take-offs are one of the easier parts of flying. (Then again, they're experienced pilots – of course it seems easy to them.) With all of the aircraft included in this game, taking off is a simple, five-step process.



Ready For Take-Off

- 1(2).** Throttle up to at least 80% of engine capacity.
- 2(1).** Release the wheel brakes.
- 3.** Roll forward until you have enough speed to get airborne. The exact speed is different for each model of plane, but on average eighty or ninety knots will do.
- 4.** Pull back gently on the stick to lift off.
- 5.** As soon as you are clearly in the air, raise your landing gear to reduce drag. (Note that the Aichi D3A "Val" has fixed gear; you cannot raise it.)

Once you are airborne, climb to an altitude you feel comfortable with. On CAP and sweep missions, greater altitude means you can see farther. Bomber escort missions require that you stay within a reasonable distance of the bombers. The best altitude for any other type of mission depends on your style of approach.

GETTING THERE

The kind of mission your squadron is sent out on will determine your flight plan. Inexperienced, beginning pilots may want to avoid the lead position. Following the more experienced members of the flight is a good way to learn the ropes.

- CAP** Fly back and forth in the standard CAP pattern for as long as your fuel supply allows. Your only responsibility is to protect the carrier group from enemy incursions. Deflect incoming planes and destroy them whenever possible. If there are bombers in the enemy flight, they are your preferred target.
- Sweep** Fly to the assigned area and destroy as many enemy aircraft as possible. Your primary duty is to soften up the enemy for the upcoming attack. Expect heavy resistance, including plenty of anti-aircraft fire.
- Escort** Follow and protect the bombers. Escort fighters should fly roughly 1000 feet above the bombers and the same distance out. Position in relation to the bombers (front, rear, side, etc.) depends on from which direction the enemy is expected. Position in the formation depends on the rank and experience of the pilot.
- Bomber** Fly to the area where your target was reported to be, find it, and do as much damage as you can. You can depend on your fighter escort for a certain amount of protection, but be careful. Remember that your target is not defenseless; watch out for flak.



Getting there can take some time (we have included a function for accelerating the passage of time by several times – please refer to the **Keycard** for the method). This, the relatively peaceful part of the mission, is an opportunity to familiarize yourself with the basics of controlling your aircraft. This is also the best time to get in some practice with the various viewpoints and learn how to use the External Camera to your advantage.

VIEWPOINT AND THE CAMERA

When you've got the hang of flying, or at least are pretty sure you can keep from crashing for a few minutes, you can try looking around. (If you do have trouble controlling the aircraft while you're exploring the other viewpoints, set the autopilot and relax.) **1942 THE PACIFIC AIR WAR** provides almost every point of view available to pilots in actual planes, and quite a few that real combat pilots probably wish they could have.

Flying around on the way to your mission is a good time to familiarize yourself with the various point of view and camera controls. An instinctive command of these viewpoint controls – especially the **Virtual Cockpit Mode** – can be very helpful during a dogfight.

KEY VIEWS

The **Key Views** are a standard feature of many flight simulations. Pressing one of the numbered function keys changes your point of view, as follows:

- F1 Return to the standard cockpit view.
- F2 Look to the left, out over the wing.
- F3 Look to the right, out over the other wing.
- F4 Turn to look over your left shoulder.
- F5 Turn to look over your right shoulder.
- F6 Switch to the **External Camera**, in **Chase Mode**.
- F7 Switch to the **External Camera**, in **Tracking Mode**.
- F8 Change Planes. (This option is not always available; see below.)
- F9 Modify the Detail Levels of the game graphics.



Lap View

Airspeed Indicator —
Altimeter —



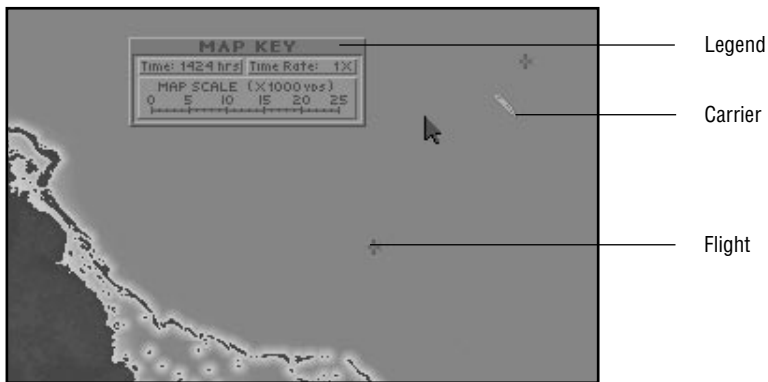
Standard View

There are a few other keys and controls that affect your point of view. Most of these are controls for the **External Camera**, and are explained in the **External Camera** subsection, below. The other important ones are listed here.

- I** **Heads Up** Look up from the instrument panel to the standard cockpit view.
- K** **Lap View** Look down at the instrument panel. (Note that **F1** will not return you from this view.)
- M** **Map** Unfold the cockpit map.
- Alt F1** **Virtual** Activate Virtual Cockpit Mode. (This option is only active in fighters.)
- Alt F1** **Station** Change station. (This option is only active in planes with multiple battle stations.)
- Alt F2** **Sight** Look through the bombsight. (This option is only active in bombers.)
- Alt F7** **Free** Switch to the **External Camera**, in **Free Mode**.

THE COCKPIT MAP

A map may not seem to be a viewpoint, but this is a special sort of map. Historical accuracy buffs will want to note that many of the functions of this cockpit map are not drawn from reality. You can unfold your map at any time, but note that your plane keeps flying. The autopilot takes control as soon as you open the map.



The Chart

Note: During the time that you have the map open, the “camera” that records your mission flight film is turned off. Nothing that happens at this time will be available for later replay.

When you pull out the map and unfold it on your lap, you'll see the area around your plane. An aircraft icon represents your flight and shows your direction and (roughly) speed. If you are finished taking off, the flight route you've been ordered to follow should also be pencilled onto the map. Ships and other planes – those you know the location of – are also represented as icons.

Don't worry about enemy planes sneaking up on you while you fuss with the map; if you encounter any opposition, your combat instincts will take over and return your attention to the cockpit. If you unfold the map during combat, the action will pause. This last isn't exactly realistic, but rather is a nod to ease of play. During battle, you will sometimes need to radio orders to other planes (see **Giving Orders**, below); without this automatic pause, you would often be shot down while trying to organize your attack.

Zooming

You can zoom this map out (unfold it further) by pressing [X]. The map will zoom out twice from its original range, showing more of the territory around you each time. Use [Z] to zoom in again; your plane will remain in the center of the map. Once you've unfolded the map a bit, you'll probably notice that land masses and bases are also represented on it.

Info Boxes

At this point, there hasn't been too much deviation from the function of the maps that were available in 1942 (excluding the autopilot, that is). If you move the mouse pointer over any of the icons, you will quickly depart from historical accuracy. This departure takes the form of a **Force Information Box**. These boxes list the same information as is listed in the **Force Information Boxes** described under **The Map**, in the **Carrier Battles** section. In addition, there are **Force Information Boxes** for flights of aircraft. These list:

- Flight Number
- Type and Number of Aircraft
- Speed and Altitude
- Distance to the Current Target

Note that the home base is counted as a "target" when flights are returning from a mission, but waypoints in the flight path are not considered "targets".

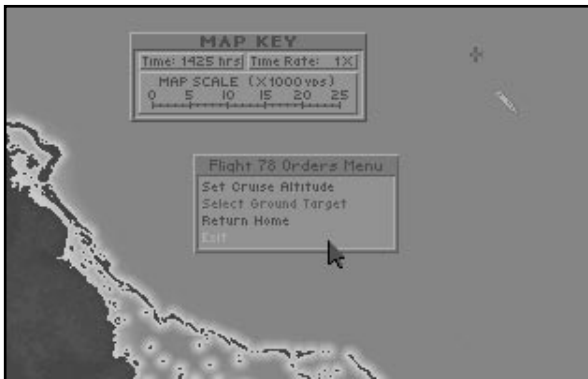
Giving Orders

Now historical accuracy goes completely out the window. (Well, maybe halfway out.) Instead of including a working radio in the cockpit, **1942 THE PACIFIC AIR WAR** allows you to give orders to other friendly aircraft using the map icons. (For those of you who do not have Galactic Starship Class sound cards, this should be welcome news.)

Left-click on any friendly aircraft icon to open the **Radio Orders** menu. There are three options:

- Set Cruise Altitude** Order the plane(s) to move to a new altitude.
- Select Target** Designate a specific enemy force as this flight's target.
- Return Home** Order the plane(s) to break off and head home.

Two of these are pretty straightforward. **Select Target** is only available when multiple enemy forces are nearby. Using this options, you can specify which flight or flights are to attack which targets. For example, you can order your bombers to ignore the approaching CAP fighters and the destroyer escort and go in for the kill on the enemy carrier. Once the attack on the designated target is finished, those planes are free to pick their own target – unless you pick another one for them.



Radio Orders

Note that you can also give orders to the autopilot in your own plane. In this way, those who disclaim the historically accurate (but often boring) long flight to the target area have another option for cutting out that portion of the mission. Rather than accelerating time, they can sit “upstairs” and order everybody around.

There are two drawbacks to this approach. One is that you will probably miss out on a few “targets of opportunity”. The other is that most of your mission will not be included on the flight film.

VIRTUAL COCKPIT MODE

Virtual Cockpit Mode is an advanced feature that allows you to swivel your view around as though you were actually in the fighter cockpit, turning your head. This gives you a smooth-scrolling range of vision that other games can only hint at. Once you get the hang of it, **Virtual Cockpit Mode** is extremely useful during a dogfight, when keeping track of the enemy is vital and difficult. Practice in this view will certainly be rewarded in combat. **Virtual Cockpit Mode** is available in any fighter aircraft.

Press **Alt F1** (at the pilot's station) to activate **Virtual Cockpit Mode**. Now the camera controls the pilot's "head". Press and hold Button 2 on the **Camera Control** to swivel your head and look around the cockpit. Move forward to tilt your view downward, back to tilt upward, left to pan left, and right to pan right. (Note: for those unfamiliar with the film terms 'tilt' and 'pan', please refer to the **Glossary** for brief definitions.) By combining these movements, you can scan the entire range of a real fighter pilot's view. All of the flight and other controls are still functional while you're in **Virtual Cockpit Mode**.

BOMBSIGHT VIEW

Navy bombers with only two stations required the pilot to do double duty as bombardier. With this in mind, the aircraft designers thoughtfully included a bombsight in the dive bombers. They located it (conveniently enough) in the cockpit. Once you've begun your bombing run, this sight is quite handy for aiming.

Press **Alt F2** (at the pilot's station) to peer through the bombsight. Note that you are still controlling the plane, unless you have activated the autopilot. As a piloting aid, your artificial horizon and airspeed indicator are reproduced to the side of the sight. Also to the side are the instruments necessary to help you get on target. The sight itself is fairly straightforward; whatever is in the center area is your current target. Please refer to the **Using the Bombsight** subsection for more detailed instructions.

CHANGING PLANES

Changing Planes is one of the options that increases the variety of flight experience in **1942 THE PACIFIC AIR WAR**. Using the **F8** key, you can jump from one plane into another. Whenever you jump into a plane, you become the pilot of that aircraft. This option is not available to career pilots; career pilots must be promoted to change their flight position.

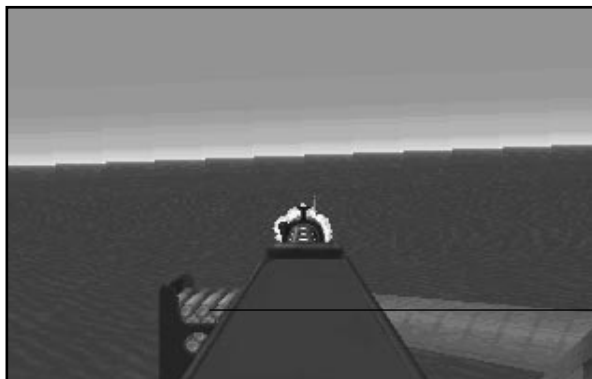
In **Single Mission** play, you will typically start a mission piloting the lead fighter or bomber (depending on the type of mission you chose). Repeatedly pressing **F8** will cycle you back through the other planes in your flight. You will not change into planes of the other flights. Thus, if you start in a fighter, all of the planes you jump into will be fighters, and the same goes for bombers. If you continue through the entire flight, you will return to your original aircraft and start the cycle over again.

If you jump into the cockpit during a **Carrier Battle**, you start the attack piloting the lead fighter of the lead flight. In this case, **F8** will cycle you back through the entire strike, starting with your flight. Once you've exhausted the possibilities of that flight, you will then move through the next. The process will continue until you either find a plane you like or run out of new planes to jump into. Finally, then, you will return to your original aircraft and start the cycle over again.

One final note: for the player who doesn't mind bending the rules a little, changing planes can be a big help when you've gotten yourself shot up and need to get out of a badly damaged aircraft. Of course, there's no guarantee the one you change into will be in any better shape.

BATTLE STATIONS

Changing Stations is another option intended to broaden the horizons of play. Real bombers of this era had entire crews, not just single pilots. In many cases, the bombers in **1942 THE PACIFIC AIR WAR** include a second active battle station – the dorsal gunner, sometimes called the 'tail gunner'.



Dorsal Battle Station

As pilot, you control the plane's motion, the forward-facing weapons, and the bombs. Press the **Station** key to move into the dorsal (tail) gunner's station. From here, you control only one thing – the dorsal-mounted machine gun(s). Your responsibility is to protect the "six", the vulnerable area behind the aircraft. The autopilot has taken over as pilot. Use the **Flight Control** to aim your machine gun and **Button 1** to fire. Press **F1** if you decide to jump back into the cockpit.

"The Gunners' Creed" (Unofficial)

*The pilot's job is just a chauffeur,
it's his job to fly the plane
But the gunner does the fighting,
though he doesn't get the fame.*

THE EXTERNAL CAMERA

The **External Camera** is your roving “eye in the sky”. Though it’s an unrealistic option (combat aircraft of the 1940s did not have remotely controlled, free-flying video probes), this camera provides an entertaining way to watch dogfights. It can also be exceedingly helpful when you’re having trouble finding nearby enemies (the technical, military aviation term for this is “cheating”). Simulation purists will not want to use the external camera during missions.

The camera works in three modes, which you can switch between indiscriminately. Note that if you choose to set up an unusual camera angle it can take some time. Rather than doing this while piloting and fighting, pause the action (press **Alt** **P**) so that you can relax a little. (Note: for those unfamiliar with the film terms used below: ‘track’, ‘tilt’, ‘roll’, and ‘pan’, please refer to the **Glossary** for brief definitions.)

Chase Mode

In **Chase Mode**, which you call by pressing **F6**, the camera flies along with the plane you’re piloting and keeps it in focus. All camera movements in this mode are relative to the aircraft. The active camera controls in **Chase Mode** are as follows (Note that buttons must be held down for the duration of the movement, as when “dragging” a mouse.):

Button 2 + [Fwd]	Zoom In (Get Closer)
Button 2 + [Back]	Zoom Out (Back Off)
Button 2 + [Left]	Rotate Left (Track Clockwise) around the plane
Button 1 + [Right]	Rotate Right (Track Counter-clockwise) around the plane
Button 1 + [Fwd]	Rotate Up (Track Over & Under) and around the plane
Button 1 + [Back]	Rotate Down (Track Under & Over) and around the plane

Free Mode

Once you press the **Free** key (**Alt** **F7**), the camera is in **Free Mode**, and it does not follow or track your plane. It moves only as you direct it. This is the mode you should use for setting up unusual angles for **Tracking Mode** or for close examination of ships, bases, and enemy planes. The camera controls in **Free Mode** are as follows (Note that buttons must be held down for the duration of the movement, as when “dragging” a mouse.):

Button 2 + [Fwd]	Move Forward (Zoom In or Track Forward)
Button 2 + [Back]	Move Backward (Zoom Out or Track Backward)
Button 1 + [Left]	Pan Left (Counter-clockwise)
Button 1 + [Right]	Pan Right (Clockwise)
Button 1 + [Fwd]	Tilt Down
Button 1 + [Back]	Tilt Up

Tracking Mode

In **Tracking Mode**, which you activate using **[F7]**, the camera is fixed in place, independent of your plane. There are no motion commands in **Tracking Mode**. The camera will automatically tilt, pan, and roll to keep your aircraft in the center of the frame. Use **Free Mode** to set the camera in the location you like (on the surface or floating in midair – it doesn't matter), then sit back and watch. **Tracking Mode** has many uses, one of the best of which is for setting up a "Reverse Tactical" view from any stationary target.

GRAPHICS DETAIL LEVELS

Pressing **[F9]** at any time during a mission calls up the **Detail Levels Control Screen**. (The action pauses as long as you are on this screen.) You can use the options on this screen to modify the level of detail in which many of the parts of **1942 THE PACIFIC AIR WAR** are displayed. All of these options default to their highest or "On" settings. The current settings are represented by example in the screen displayed to the right of the buttons. In brief, the options are:



Detail Levels Control Screen

- Planes** Aircraft detail can be switched from low to high detail. When in low detail, all aircraft will be in polygonal form.
- Clouds** Cloud graphics come in three varieties. At the lowest setting, there are no individual clouds, and an overcast cloud cover appears all white (from above or below). The medium setting has the same overcast, but also includes polygonal individual clouds. The highest setting includes a detailed cloud cover, polygonal cumulus puffs, and subtle cirrostratus wisps. Of course, whether or not any clouds are visible at all will depend on the weather.
- Ships** There are three levels of detail for displaying ships.

- Waves** Choose whether or not waves should be displayed on the surface of the water. No waves is the lower detail setting.
- Wakes** Choose whether or not the wakes of ships should be displayed. The length of a ship's wake is proportional to its speed. No wakes is the lower detail setting.
- Stars** During a mission that involves night flying, you can decide how the stars are displayed. No stars at all is the lowest detail level. The medium detail stars are the familiar twinkling points. High detail stars are the same as medium, except that they are subject to realistic blurring effects when you execute a maneuver.
- Land** The land, mostly islands, is displayed in one of three ways. The simplest level of detail is basic, polygonal land. Next come smoother, Gouraud-shaded land masses. Third and most detailed are the completely texture-mapped islands.
- Sprites** Set whether or not the sprite graphics are displayed. Sprite graphics include some of the not-quite-essential bits like explosions and splashes. No sprites is the lower detail setting.
- Visibility** You can adjust the current visibility to be as low as 18 and as high as 34 miles. At higher visibilities, you and the other pilots can see farther and, therefore, see more. At lower visibilities, the frame rate should increase.

Whenever you left-click on the button for one of these options, that option changes to its next setting. For those options which are not toggles, clicking on the highest setting will cycle back to the lowest. Every setting change is immediately reflected in the example screen, so that you know what you're getting when you return to the mission.

Keep in mind that the more detailed the graphics are when you play (i.e., the higher each of the settings), the slower your screen refresh rate (frame rate) will become. If your frame rate gets too low and the game becomes bogged down or "chunky", you might want to lower the detail levels until you get a more satisfactory, smoother display. When you are finished, left-click on the **Return to Mission** button to return to the view from which you pressed **F9**.

ENCOUNTERING THE ENEMY

All this sightseeing is wonderful, but completing your mission will undoubtedly involve some interaction with the enemy. Such is the nature of war. Your mission will determine exactly what type of interaction you have, but the basic idea is to lay them out for a dirt nap. Whether you fly and fight for the greater glory of the divine Emperor or for apple pie and the American way, your goal is to ruthlessly slaughter the enemy and destroy their machines. Surviving is also a good idea, preferably with your plane intact (or at least serviceable).

Remember, this is not the gentlemanly air combat of the First World War; this is a down-and-dirty street fight. Take every advantage you can get and give no quarter. Sympathy for the enemy means probable death for you (and a court martial).

IDENTIFICATION

Identifying any aircraft you encounter is the first order of business. Modern aircraft are equipped with radar and IFF (Identification Friend or Foe) systems. These long-distance detection systems are quite effective and useful. Unfortunately, you don't have them. Unless the position or actions of the aircraft make their identity obvious (shooting at you, for example, or flying CAP over an enemy task group), you must close to visual identification range.

If your mission calls for you to bomb or torpedo a ship, identification is a much easier and less hazardous process. You can safely assume that any ship or group of ships near the target coordinates is an enemy task group, and it is probably your target. (Note that, since enemy bases are never close enough to friendly bases for you to confuse the two, identifying base targets is not necessary.) When the target task group includes a carrier, the carrier must always be your primary target. Identifying the carrier is simple, since it's the largest ship in any task group. If there is no carrier among the target ships, your goal is to sink as many craft as possible.

Keep in mind that the enemy also do not have radar. Their information, like yours, is limited to what they can gain from visual inspection. If you are a skillful enough pilot, they may not know you are nearby until it's too late.

DOGFIGHTING

"Dogfight" is the term commonly applied to any close-quarters battle between combat aircraft. Your objectives, as should be obvious, are to shoot down the enemy planes and avoid being shot down. When you get into a situation that requires this sort of fighting, speed, maneuverability, and toughness are essential. Most important, however, is the skill of the pilot. No amount of training can truly get you ready for real combat, but the more you know in advance, the better prepared you'll be.

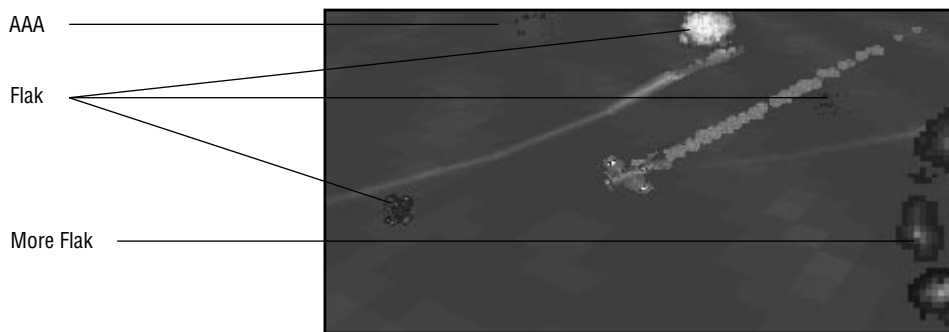
The type of aircraft involved also has a lot to do with the outcome of the dogfight. Bulky, unwieldy bombers simply can't compete against nimble fighters. On the other hand, bombers have an advantage when trying to escape; due to their excessive weight, they can gain speed quickly in a dive and leave any fighters with no options. Any fighter foolish enough to try to follow moves right into the tail gunner's line of fire. If your bomber is attacked by fighters, dive and run. If you stay to fight, you are almost guaranteed to be shot down.

When in a dogfight, keep in mind that the higher plane has an advantage. Also, a slower-moving plane is more maneuverable, but much easier to hit. In a battle between fighters, the aircraft that can get above and behind the other is in the catbird seat. Never let any enemy plane sit on your 'six' for long; if you do, you'll get a swimming lesson (or worse).

DIVE BOMBING

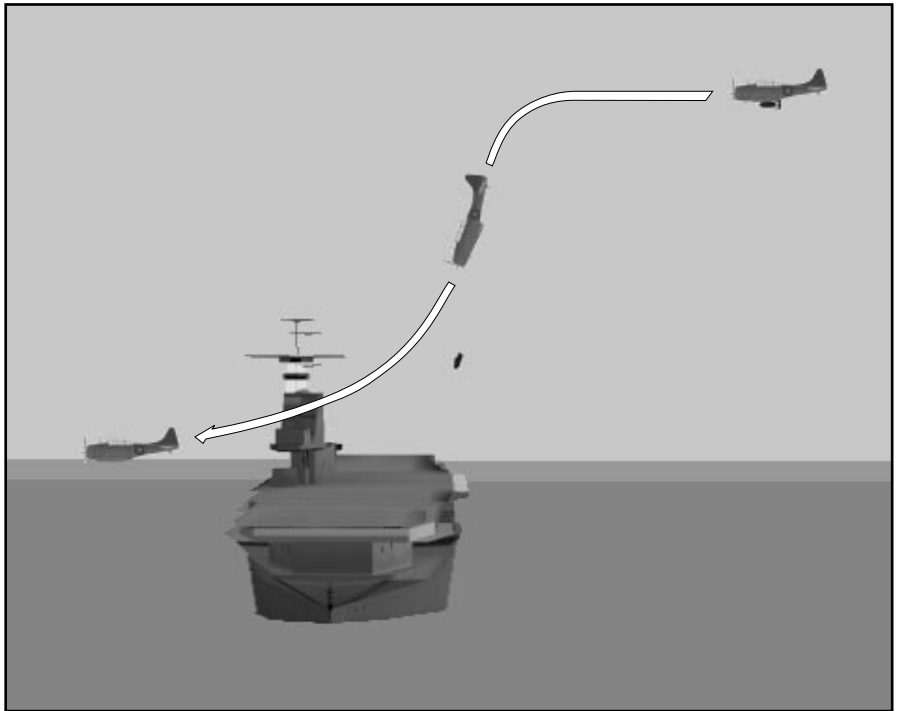
Any aircraft that is equipped with bombs and can sustain a dive can act as a dive bomber. (Note that most torpedo bombers are not built for steep dives.) Of course, the miniature bombs some fighters can carry won't cause nearly as much destruction as the whoppers on a bomber. Regardless of their size, none of the bombs in **1942 THE PACIFIC AIR WAR** are self-propelled, heat seeking, laser guided, or have any of the other modern conveniences. You have to fly right over the target, dive down at the steepest angle you can hold, and then release your payload. Hopefully, you'll have enough air under you to pull out of the dive. If not, you can console yourself with thoughts of the insurance money your family will get.

All this is assuming you even get anywhere near your target. Let's just say that the enemy fighters have been dealt with or are busy elsewhere. You see an opening and head for the main attraction, the ship or base you're supposed to destroy. As you get close, your gleeful gloating is interrupted by explosions all around your plane. What's going on? You're being subjected to flak – also know as anti-aircraft artillery, or AAA – from the surface. There's no way to stop it; you can only try to dodge and hope the gunners are having an off day.



Light Flak

The traditionally successful method of dive bombing a target starts with you approaching at an appreciable altitude (dodging flak). Remember, you have to dive long enough to aim, and the closer you are when you drop, the better. Coming up on a moving target from the side is usually a good idea, as it puts you in their optimum anti-aircraft range for a shorter time. When you're just about over the target, go into a full dive, as nearly vertical as your aircraft will allow. Experience will teach you just how steeply your plane can dive. Drop the bomb(s) when you are almost directly over your target. The bombs have the same forward momentum as your plane, so you must "lag" them a little. Make sure to take any motion of the target into account, as well.



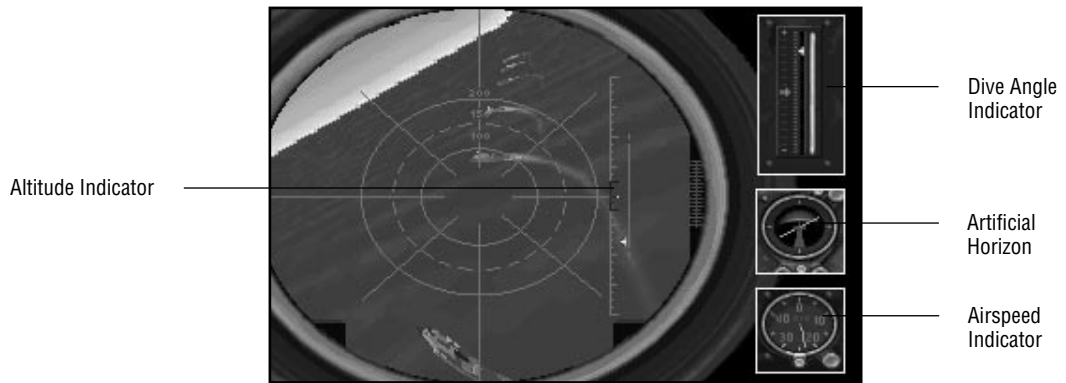
Standard Dive Approach

Using The Bombsight

As the pilot of a dive bomber (a Val, Helldiver, or Dauntless), you have the additional advantage of having a bombsight. Note that you can only use the bombsight and drop bombs if you are in the pilot's station. Once you're in your dive, you can switch to the **Bombsight View** (press **Alt** **F1**). Since you still have control of the plane, the airspeed indicator and artificial horizon are reproduced inside the bombsight. Use them to ensure that you maintain a steady approach.

There are three important things to watch in the bombsight, and all three are essential to a successful drop. The first is the **Dive Angle Indicator**, to the right of the bombsight viewer. As you pitch down, the needle will move toward the center, which is your best dive angle. The second, and probably the most important, is your target. You want to keep it centered in the crosshairs, and it will probably be doing some pretty drastic maneuvering to evade you. Last, but not least, is the altitude indicator superimposed on the bombsight viewer. As you approach the optimum altitude for release, the arrow will move to the center.

When the conditions are right for a good drop, both indicators will be in the "red zone". At this point, the vertical line on the right side of the **Dive Angle Indicator** will turn red. A red line is the cue that it's the right time to release your payload.



Bombsight View

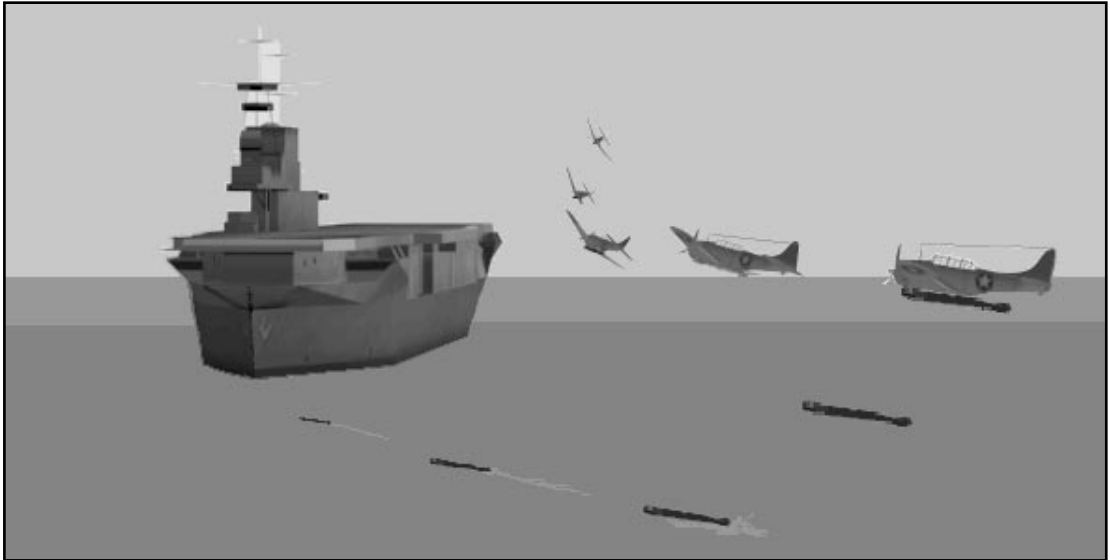
As soon as those babies are away, your job is done. Pull out of the dive and get the hell out of there. Once all of a bomber's eggs are laid, it goes home. The escort fighters will do the mopping up and gauge the damage you've done.

TORPEDO RUNS

Torpedo runs are easier in some ways than dive bombing. Of course, they're much harder in others. For one thing, only a torpedo bomber (a Kate, Devastator, or Avenger) can deliver torpedoes. Since torpedo technology was young and undeveloped, the mechanisms are not particularly forgiving. Once armed, each torpedo must be dropped from level flight – not too far above the surface, not with too much forward momentum, and aimed right at the target. Any deviation from the device's needs will cause a failure, and the target will not be damaged.

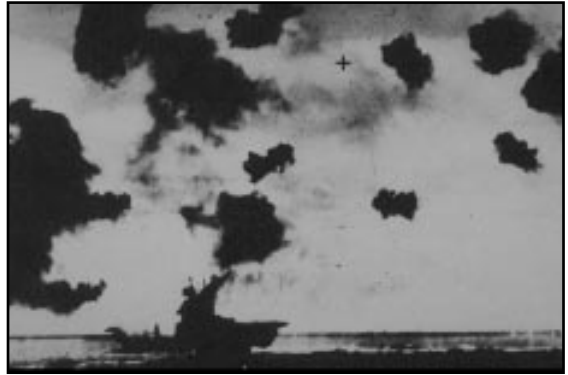
Surprise. Torpedo bombers also have to contend with flak. This is perhaps the most troublesome aspect of dropping torpedoes, since dodging flak will throw you off level. Never drop a torpedo when your aircraft is not perfectly level and stable (unless you have disabled torpedo failures). A bad drop usually results in a rogue torpedo, which probably won't hit anything.

The tried and true method of air-launching a torpedo starts with you approaching perpendicular to the path of the target ship (dodging flak). Note that you can only launch torpedoes if you are in the pilot's station. Once you've gotten down to torpedo altitude (300 to 400 ft. for Japanese torps, 200 to 300 ft. for American) and started your flat run, stay low, below the drop threshold of the torpedo. Make sure that you're flying below the safe launch speed of the torpedo (110 kts for American torps, 260 kts for Japanese). Keep on a good, flat trajectory. Launching from a tilted flight path is like throwing the torpedo away, and that's not what you're out here for.



Standard Torpedo Run

Take the time to calculate how much you need to lead the ship, and get as close as you dare (you must be inside the range of the torpedo, and the closer you are when you drop, the better). Now comes the hard part – waiting until you're in range. Each type of torpedo has a different range, but in general, the closer you are the better. American airborne torpedoes have ranges of approximately 6300 yds, while the Japanese airborne torps must be launched from within 2200 yds. Estimating the distance between you and your target is tricky, but there's no automation to help you. (Remember, radar has barely been invented.) Good luck, and try to learn from experience. When you're ready to drop, make absolutely certain that you're flying level. then fire away.



Mild AAA (Flak)

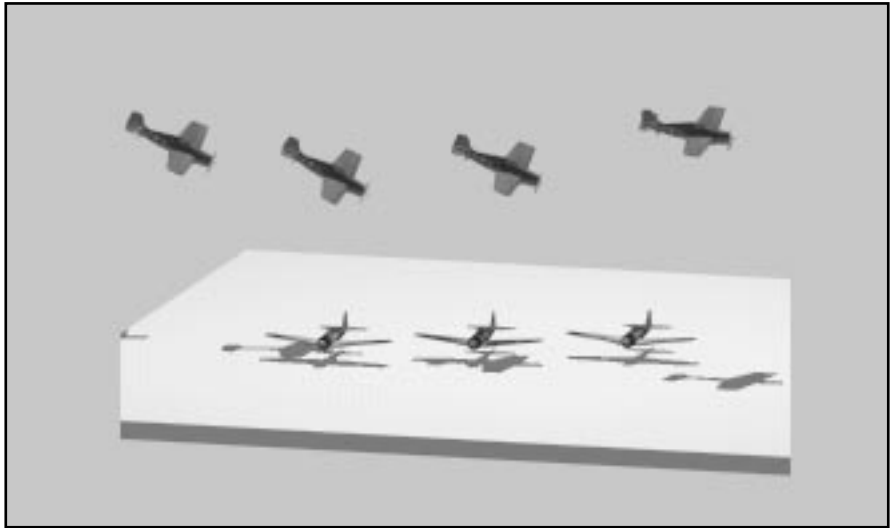
The planes you can pilot can only carry one torpedo. Once it's loosed, you can turn around and go home. The fighter pilots will stay as spotters to find out what kind of damage you did – if any.

"Torpedo runs have to be made at suicidally low speeds because aerial torpedoes are delicate instruments and flop over when dropped too fast or from too high an altitude. Lieutenant Jackson made his run at a hundred and twenty miles an hour about thirty feet over the water. He gave the enemy a square shake at a target for a very, very long time. Every gun in the force was fired at him. The big cannons were fired into the water to throw up splashes and wreck him. His intended victim kept making violent turns to evade him. But he continued steadily through the maelstrom, dropped his torpedo when about four hundred feet away from his target, saw the torpedo land with a soft squash in the black water and proceed correctly on its way, and, as he turned, heard the noise which told him his torpedo had arrived at its proper destination."

Ira Wolfert, 1942, Guadalcanal

STRAFING

Strafing is not always the most effective way to attack a ground target, but if you haven't any other options, it'll do. When strafing, you essentially treat the ground target as if it were an enemy plane; that is, you shoot bullets at it. You are rather vulnerable when strafing, so this is not normally a good idea if the target is able to shoot back.



Strafing Run

Approach your target low enough that you can hit it with bullets, but not so low that you chance hitting the deck. Keep in mind that you will probably lose some altitude during the run. You also want to be moving pretty fast, but not so fast that you can't aim well. Fire as you pass, then pull up. If you want to make another pass, perform a wing over and go for it.



The effects of a good strafe – note the damage to this hangar – are comparable to bomb damage.

RETURNING AND LANDING

Flying back to your home base is almost as easy as getting to the target was. Just as it was on the way out, though, the beginning and end are the most difficult parts.

Even in the unlikely case that your mission is a complete success, the enemy will almost always be able to scrape up something to shoot at you as you're leaving. Since you're facing away, trying to escape the battle area, you won't necessarily see it coming. This makes evading it rather difficult. Running fast and high is often your best bet.

The flight home is certainly a breeze – unless your plane is damaged. Even if you're unhurt, keep your eyes open. There's always the chance that a "target of opportunity" will present itself. (This is when identification gets to be vital – and tricky.) You can feel relieved when you sight the carrier, but don't relax. Landing, as anyone who's flown in a commercial airliner knows, is the most difficult and dangerous part of flying. There are uncounted thousands of things that could – and will – go wrong. Be prepared.

The first thing to do is one of the most important and most ignored necessities of landing – give yourself plenty of room. Optimally, you will line up with the runway at a distance of three miles. The best approach is to line up with one end of the runway, at a speed just barely above your plane's stalling speed. If you're lining up with a carrier, try to come in from behind the ship, using her movement to offset part of your forward velocity. Be careful not to go too slowly, as you can easily stall or lose control.

The next important steps are preparatory: lower your gear, extend your flaps, and, if you're landing on a carrier, put out your arrestor hook. All the best pilots go for a nose-high approach, without any kind of tilt or sideways movement. Try to set down on the runway with all your wheels at once. As soon as you touch down on something solid, cut the throttle and put on your wheel brakes. You can still steer (a little) in case you're heading for the edge of the runway.

Oh, yeah – there's one last thing. If you still have any bombs or torpedoes latched under your plane when you land, be extra careful. Leftover munitions had a bad habit of coming loose in the hurly-burly of the landing. They didn't always explode, of course. Sometimes they'd just roll around and scare the pants off of everybody. If something does fall off and go off, at least you'll get consolation prizes – a front-row seat for the fireworks and a posthumous Purple Heart.

"[We] sat down on the runway as softly as a falling petal – greasing it in, they call that – and Lieutenant Loberg put on the brakes.

Then we found out there were no brakes, and there we were, all the bomb-loaded tons of us, tearing along down that runway with nothing to stop us except what Fate might happen to think up....there wasn't any brake at all, and what finally stopped us was the wing of another plane, a parked one.

It came right up against our wing and both wings wrapped around each other like loving arms. But we weren't thinking of that at the time. There was a hundred-pound bomb on the other wing and our wing had snaked it out, pulled off its arming wire and moved its firing pin and sent it bumping along under us. When we saw that, we didn't think of anything at all, just held our ears and waited for the explosion.

The ordnance man from whom I tried to find out why the bomb didn't go off just said we were damn fools to hold our ears. 'If that bomb had gone off,' he said, 'you never would have heard anything.'"

Ira Wolfert, 1942, Guadalcanal

DEBRIEFING

Regardless of whether you survive your mission, you will stand for a debriefing. (The Navy has ways of commanding even dead pilots.) Your commanding officer will present you with the total numbers of planes and ships each side managed to damage or destroy during the fight. These statistics tell you exactly how you fared; no explanation is necessary. Your total score for the mission is based on the battle statistics and on your level of success in performing the mission objective. This score is modified by the **Difficulty Level** you set before take-off.



Near Miss on a Transport

UNLOADING THE BLACK BOX: FLIGHT FILMS

After the debriefing, you return to your bunk to find a pile of wet celluloid reels. Crews in many of the other planes, especially the bombers, carried hand-held cameras into the fight. This was a standard practice during the real Pacific air war, primarily for documenting kills and hits on enemy forces. In **1942 THE PACIFIC AIR WAR**, your entire mission is on film, not just the hits and kills.



Direct Hit on a Barge

The sopping mess dumped on your bunk is the films taken by crews in other planes. HQ has finished their review of the mission, and you have to decide what to do with the film. If the mission was nothing special, you'll likely just want to pitch the film in the ocean. Go right ahead. That's what the **Cancel** button is there for.

If, on the other hand, you think you might like to review the mission later, you'll have to save it. Left-click on the **Film Name Bar** (near the bottom of the box) to enter a name for the film to be saved under. Press **Enter** when you've finished typing in the name, then click on the **OK** button.

Note that if you change your mind about the name or for some other reason need to backtrack to the originally displayed default filename, you can do so. Left-click on the **Restore** button to start over.



CAREER PILOT

Flying single missions is good training. Sooner or later, though, you've got to join the war. As a career pilot on a tour of duty, you'll have a chance to do your part. You may not single-handedly win victory for your country (though anything is possible), but every contribution is an heroic act. There is honor and glory in the sky, for those who have the courage to earn it.

When you're convinced you're good enough, you can start a career as a combat pilot. In order to sign on as a pilot in either navy, you have only to apply. (The recruiting officers are a little desperate; volunteer pilots for Pacific duty are getting hard to find.)

WHOSE SIDE ARE YOU ON?

The first order of business is to pick your nationality. The only options are the major combatants in the theater, the Americans and the Japanese. Your nationality will determine your missions and the types of aircraft and armament available to you. Left-click on either the flag or the name of the nation for which you wish to fly.

WHAT'S YOUR NAME?

Next, left-click twice on any slot on the roster chalkboard. The name currently occupying that slot will be erased. Type in the name of your pilot and press **[Enter]**. You will, of course, begin your career at the bottom. If you do well, you can expect to be promoted.

CREATING A PILOT

WHAT DO YOU FLY?

Last but not least, you must choose a specialty in which to specialize for this tour of duty. Left-click on the type of aircraft you prefer to fly. The options are fighter, dive bomber, and torpedo bomber. Different planes require different battle skills, so choose carefully.

You are now ready to start your first tour of duty as a rookie pilot in your navy of choice. Left-click on the door to the **Briefing Room** to proceed to your first briefing.

THE BRIEFING ROOM

As a pilot, you have no say in the strategy and planning aspect of the war. Your commanding officer tells you what to do, and you do it to the best of your ability. The briefing room is where he outlines your duties for the next mission.

Loitering in the back of the **Briefing Room**, you have several choices. Move the mouse pointer around until you find them all.



USN Briefing Room

BRIEFING

Instead of staring at pin-ups all day, you could try paying attention to the briefing. This is the only way to find out what your mission is. Left-click on the mission map to view the briefing.

VIEW PILOT STATISTICS

Current Hit and Kill statistics are posted for every active pilot on the **Briefing Room Kill Sheet**. Left-click on the corkboard to view each pilot's stats. Use the arrow buttons at the bottom of the board to cycle through the various pilots. The **[Esc]** key returns you to the **Briefing Room**.

HALL OF FAME

Click on the **Hall of Fame** to see the best of the best – those career pilots who have gone over the top in successful missions. If you're incredible, you might even get your name on the list – someday.

RETURN TO PILOT CAREER ROSTER

At this point, you can still abort the mission without penalty (except perhaps embarrassment) and return to the pilot roster. Left-click on the blackboard to the right of the map.

FLIGHT DECK

The flight deck is where you instruct the loaders what armament load-out you want on your plane. When you're satisfied that you've memorized your mission objectives, this is your next step. In the American **Briefing Room**, left-click on the door to walk out to the flight deck. In the Japanese, click on the plane to the left of the blackboard.

For a detailed description of the flight deck and instructions for arming your aircraft, please refer to **Arming**, in the **Flying A Mission** section.

When you have accepted a load-out for your aircraft, you suit up and climb into the cockpit.

Before you take off, you must choose settings for the **Realism Options**, thus determining the **Difficulty Level** for the upcoming mission. Don't worry, you are not deciding on a **Difficulty Level** for your entire tour of duty (or career). You will have the chance to modify the **Realism Options** before every mission. For detailed descriptions of the various **Realism Options** and their possible settings, please refer to **Pre-Flight Checklist: Realism Options**, in the **Flying A Mission** section.

Once you finish the checklist and signal the thumbs up to the flight crew, the tarp is pulled off and you're ready to start the mission.

PRE-FLIGHT CHECK

PACIFIC CAMPAIGN MISSIONS

Your commanding officer will assign missions as necessary for carrying out the admiral's strategy. It is not in the best interest of the fleet that you or even your superior know the details of that strategy. If you should somehow fall into the hands of the enemy, the less you know, the better – for the fleet and for you. Trust that every mission is an important piece of that strategy.

One thing you can rely on is that no mission will be without resistance from the enemy. This is a war, not a mail run. Don't be lulled by the quiet sea and the seemingly empty sky in the minutes after take-off. Enjoy those few restful moments, because that's all the peace you'll get.

Missions will be of the same six basic types as those you flew in training. Please refer to **Mission Type**, in the **Flying A Mission** section, for details.

RECOGNITION FOR EXEMPLARY SERVICE

Those pilots and squadrons who distinguish themselves in the line of duty will be rewarded for their courage and skill. Only the best will be honored by having their contributions to their command, their division, and their country recognized.

It is possible that, due to an exemplary service record, one may rise in position. Of course, keep in mind that promotion to a high enough rank will remove you from piloting duties.



CUSTOM MISSIONS

Those of you who are not satisfied with the pre-designed missions included in **1942 THE PACIFIC AIR WAR** need not yank out your hair in frustration. You're not limited to the built-in situations. It doesn't matter whether you've defeated every mission time and again and, therefore, become bored or you just don't like the way the missions are set up. You can not only modify the pre-existing missions, but you can also design your own "fantasy" missions and re-create any of the thousands of historical missions that we couldn't include.

To begin designing your own missions, select the **Mission Builder** option from the **Main Menu**.

THE MISSION BUILDER

The **Mission Builder** is one of the tools the designers used to generate the numerous missions that come with the game. It's included in **1942 THE PACIFIC AIR WAR** so that you can expand the horizons of gameplay. You sit down in the designer's chair and make up your own scenarios.

The options on the main **Mission Builder Menu** are fairly straightforward; they are:

- | | |
|------------------------|--|
| Load Mission | Load an existing custom or pre-set mission into the Mission Builder. |
| Save Mission | Save (and name) the mission that is currently loaded in the Mission Builder. |
| Edit Mission | Modify the mission that is currently loaded in the Mission Builder. |
| New USN Mission | Create a new mission for United States Navy pilots. |
| New IJN Mission | Create a new mission for Imperial Japanese Navy pilots. |
| Cancel | Return to the Main Menu and discard any unsaved work. |



Mission Builder Menu

You can only work with one mission at a time. If you load a previously saved mission without saving the changes to the mission currently loaded in the Mission Builder, the unsaved work on the current mission will be lost.

SETTING THE SCENE

Select **New IJN Mission** or **New USN Mission** to start designing on a clean slate. Which you choose will, of course, determine which navy is the protagonist. When you fly the mission, you will fly for the protagonist nation.

The first thing you'll want to do (though you're not actually required to do things in any particular order, except for assigning a **Mission Type** and **Map Area**) is set the stage for the mission.

MISSION TYPE AND MAP AREA

Before you can begin designing, you must decide in what part of the Pacific theatre that mission will take place and what sort of mission you are working on.

Use the buttons in the **Mission Type Box** to implement your choice for the first of these two. Left-click on the button that matches the area in which you want to design. By selecting an area, you determine which of the mission maps will become your **Design Map**

You have a similar choice for the type of mission you wish to design. (Please refer to **Mission Type**, in the **Flying A Mission** section, for descriptions of the different **Mission Types**.)

Every type of mission has certain essential characteristics that rarely change. A **Bomb Ship** mission, for example, would have a certain hollow quality unless it included at least one enemy ship. The basic attributes that make the mission interesting are assumed by the Mission Builder and placed on the **Design Map** for you.



Mission Type Box

THE DESIGN MAP

The **Design Map** is going to be your primary work-space. The background is much like that of the cockpit map, including the latitude and longitude markings. You can also zoom this map, much like you can the one in the cockpit. The major difference is the big **Editing Box** in the corner.

Editing Box

This box is one of the main methods of configuring the custom mission. All of the option buttons are described later in this section. What you need to know now is that you can move it around just like any other window or box. It lists the current **Primary Flight**, **Home Base**, and **Target** for the mission.



Design Map

Also, if you left-click on the tiny square in the upper left-hand corner, you'll be returned to the main **Mission Builder Menu**.

Starting Time

The current date and starting time for the mission are always listed in the upper right-hand corner of the **Design Map**, directly underneath the name of the battle theater.

Forces

All bases and any forces that have already been inserted into the mission are represented on the map. Bases are small red (Axis) and blue (Allied) dots, and may be hard to find. (Luckily, they're always in the same places.) **Flight Groups** look like little planes, and **Task Forces** are represented by little boats. Note that any base or carrier group could have one or more flight groups ready to launch.

When the mouse pointer moves over any of these icons, an information box opens. This box lists all of the vital statistics for whatever force the pointer is covering.

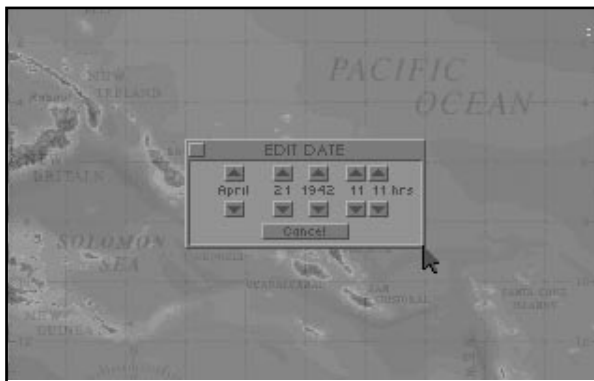
<i>For a:</i>	<i>the box lists:</i>
Base	Name and Location.
Task Group	Task Group Number, Commander, Location, Heading, Speed, Number of Ships.
Flight	Flight Number, Location, Altitude, Speed, Number and Type of Planes, Formation, Current Orders.

Instructions for setting the initial positions, attributes, and orders of these forces are later in this section.

DATE AND TIME

The time and date on which the mission begins are essential to the "atmosphere" of the flight. Historical completists will want to make certain that the date of their mission matches that of its historical counterpart. The time of day that the mission begins will affect the amount of light, since the sun is not always around (at 2300 hours, for example, it's pretty dark). Starting a mission near dawn or dusk will cause substantial visibility complications for the pilots.

Left-click on the **Edit Date** button to set a date and time for the mission to start. In the **Date Box**, each part of the date and time has buttons above and below it. Left-click on the button above to move time forward, and use the button below to move time backward. Any day and time from the beginning of 1942 through the end of the war (in 1945) is available.



Date Box

Now that you've established the proper setting and mood, you need to populate the world of the mission. The bases are immutable; those that, historically, were in existence at the date you set for the mission will be there, and you cannot change their positions or ownership. The ships and planes, however, are entirely under your control.

TASK GROUPS

For the purposes of the **Mission Builder**, a Task Group is a bunch of ships that start at their assigned position and move at a set heading and speed for the duration of the mission. Task groups can act as mobile bases (if there is a carrier in the group), mission targets, or as anti-aircraft obstacles.

When putting together the task groups for a mission, keep in mind that you can have up to a maximum of 96 ships on the map. That total includes the ships of both sides. Naturally, this also limits you to a total of no more than 96 task groups. Of course, there is no need to have any surface forces in a mission at all, if that's how you want it, but **Bomb Ship** and **Torpedo Ship** missions will seem rather pointless.

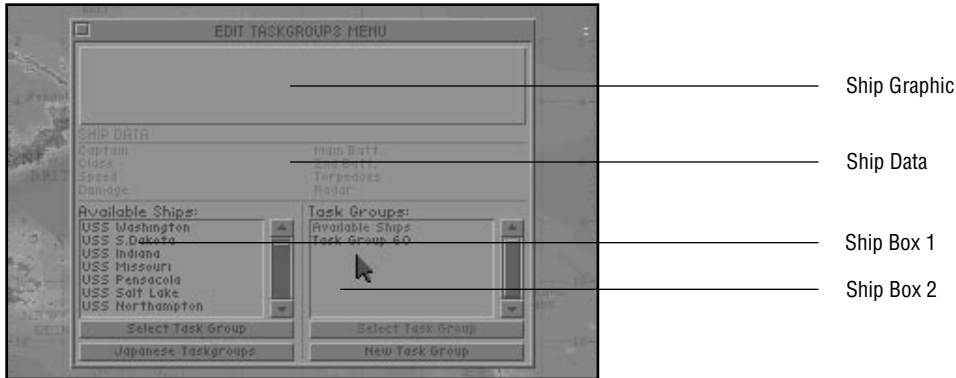
Composition

The surface forces for your mission are not pre-determined by history. (What would be the fun in that?) Left-click on the **Edit Task Groups** button in the **Edit Box** to begin forming the forces for your mission.

The **Task Group Editing Box** is divided into three sections. All your work is done in the bottom area, where the two **Ship Lists** sit side by side. At first, the left side lists all of the ships in the default task group, "Available Ships". The right side lists the existing task groups. Note that when you move the mouse pointer over the name of a ship, a graphic representation (picture) of that ship is displayed in the top area of the box. The vital statistics for the ship are listed in the center area, including the name of the Captain, the Class of the ship, the top Speed, any unrepaired Damage, the type of gun in the Main and 2nd gun Batteries, any Torpedoes on-board, and the type of Radar, if any is installed.

Use the **Nationality Button** to choose the navy with which you want to start. Note that the numbering of the task groups for the American side starts at #60, while the Japanese task forces are numbered from #10 up. If you left-click on the **Select Task Group** button under either list, that list will show all of the existing task groups for the current navy. You can left-click on the existing task group to edit it, or click on the **New Task Group** button to generate a new, empty task group.

Left-click on the new task group (or the default group that was already there) to have the ships in that group listed. There are none. In the other **Ship List**, left-click on “Available Ships” to have those ships displayed in that list. Now you can compose your new task group. When you left-click on any ship on either **Ship List**, that ship is moved to the other list. So, to place ships into a task group, you click them off of the “Available” list. In this way, you can populate as many task groups as you need.



Task Group Editing

There are some realistic restrictions on the make-up of task groups, but for the most part you have a free hand. When you finish with one navy, use the **Nationality Button** to switch to the other and complete the process of generating surface forces. When you are done, left-click on the little square in the upper left-hand corner of the **Task Group Editing Box**. All of your changes are saved automatically.

Positioning

Any task group that contains at least one ship is more than just an idea, it’s a force. As soon as they are created, each force is represented on the **Design Map** by the corresponding icon (the little boat). Japanese task groups appear as red boats, and U.S. task groups are blue boats.

Initially, newly created task groups are just plunked down anywhere on the map. It is your responsibility to position them in a meaningful manner. Note that under no circumstances will opposing task groups interact with each other in any way. This is a game of aerial combat; if you wish to pit groups of ships against each other, try **Task Force 1942** – it’s a great game.

To move a task force, place the mouse pointer over the corresponding icon. Press and hold the **[LMB]**, then carry the task force to its new position. When you release the mouse button, the ships will stay where the pointer was when you did so.

Initial Orders

Putting the ships where you want them to start is a good first step, but real task forces tended to move about (greatly complicating the war). Your forces can move as well. Place the mouse pointer over the group of ships you want to order around, then double-click the [LMB]. The **Orders Menu** appears, with these options:

- | | |
|-------------------------|--|
| Change Course | Assign a heading to the entire task group. |
| Change Speed | Assign a speed to the task group. |
| Edit Flights | Give orders to any flights stationed on the carrier(s) in the task group. |
| Delete Taskgroup | Remove the task group from the map and return all the ships to the list of those available for assignment. |
| Exit | Return to the map. |



Task Group Orders Menu

Changing the heading and speed of a task group is handled in exactly the same way as it is during a **Carrier Battle**. Please refer to that section if you need detailed instructions.

Editing the flights of planes that are stationed on the carrier(s) of a task group works just as it does when you click on one of the aircraft icons, except that first you must select which flight to order about. Please refer to **Initial Orders**, in the next subsection (**Combat Aircraft**), for details.

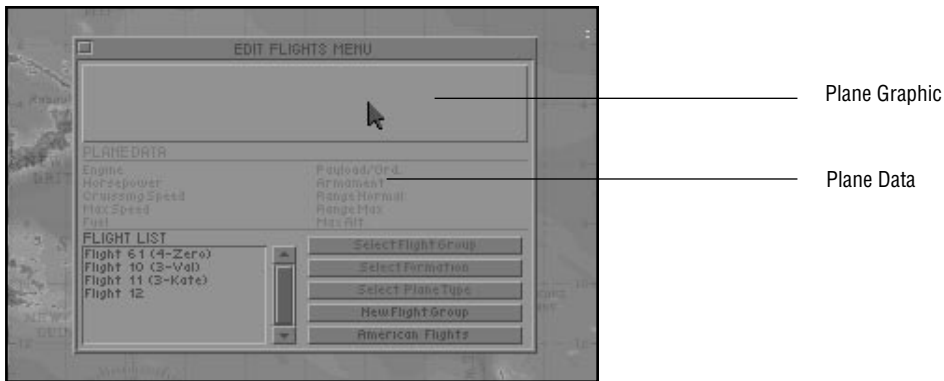
COMBAT AIRCRAFT

The aircraft are really the heart of any mission. When you play the mission, you'll be piloting a plane in one of the flights you generate. Your opponents will be the enemy flights that you place in the way of your objective. Thus, the choices you make here are important to how much fun (or how awesomely difficult) your mission will ultimately be.

When putting together flights of combat aircraft, remember that you can have a maximum of 16 planes involved in any single mission. That total includes friendly and hostile craft. Obviously, this means that you can create up to, but not more than, 16 different flights of planes. (If this seems like too few to make for really interesting missions, keep in mind that even the best pilots during the war would avoid an engagement – if they could – when faced with 4 to 1 odds.)

Forming Flights

Left-click on the **Edit Flights** button to start forming flights of aircraft for your mission. What you're left looking at is the **Flight Editing Box**. The top section of this box is reserved for graphic representations of selected plane types. The middle area is similarly reserved for vital statistics on the type of plane. The area in the lower left-hand corner is the **Flight List**.



Flight Editing

When you first open this box, the **Flight List** contains the default flight(s) for the type of mission you are creating. You have two basic options now: you can left-click on the **New Group** button to generate a new flight of aircraft, or you can left-click on one of the existing, default flights to edit that flight group. New flight groups are numbered automatically.

If you select an existing (or new) flight group to edit, the list of aircraft types shows up. Notice that the upper portions of the **Flight Editing Box** reflect the relevant information for whichever plane type you move the mouse pointer over. Left-click on the type of plane you want to assign to this flight group. The number of planes assigned to the group is listed in parentheses at the end of the plane type listing. Click on that type again to add another plane to the flight. Remember that navy regulations prohibit certain types of plane from flying in large groups; once you reach the maximum of that type of plane, the count will cycle back to one. (On the other hand, the composition of your flights is not limited by historical accuracy. Thus, for example, you could put Corsairs in a mission that takes place before they were actually built.)

When you are satisfied with the type and number of planes in the flight, left-click on the **Select Formation** button. The pilots in that flight group will be ordered to fly in whatever formation you choose. (Of course, you have no such control over the human player.) Note that if you wish, you can left-click on the **Select Type** button at this point to go back and re-edit the type and number of planes in the group.

Use the **Select Group** button to return to the list of flight groups. Create and edit whatever flights are necessary to your mission design. Make sure that you create flights containing at least the minimum number and type of aircraft to complete the mission. A **Torpedo Ship** mission, for example, would be impossible without at least one plane capable of carrying a torpedo.

Positioning

Every flight of aircraft that contains at least one plane is automatically placed on the **Design Map**. Each is represented by the proper icon (the little plane). American task groups appear as blue planes, and Japanese task groups are red planes.

Newly created flights are strewn about the map pretty much at random. Unless you position them somewhere that makes sense, most of them will simply run out of fuel and crash when you play the mission. If you expect to station a flight at a base or on a carrier, position that flight on top of its station. When you give the planes their initial orders, you can settle them on the ground if you wish.

To move a flight of planes, place the mouse pointer over the corresponding icon. Press and hold the **[LMB]**, then carry the aircraft to their new position. When you release the mouse button, the planes will drop into the position where the pointer was when you did so – in formation, no less.

Initial Orders

Stationing flights of bombers and fighters in their starting positions is only half the job. Without orders, those flyboys won't get too far. Place the mouse pointer over the group of planes you want to order around, then double-click the [LMB]. The **Orders Menu** appears, with these options:

Start at Home	Order the flight to start on the ground at the nearest base or carrier.
or	
Start in the Air	Order the flight to start the mission in the air over the base or carrier.
Fly Patrol	Order the flight to fly a patrol pattern you specify.
Fly CAP	Order the flight to fly CAP over the base or carrier at which it is stationed.
Cruising Altitude	Set the altitude at which the flight will fly until they reach a target or are disturbed by an enemy. Cruising altitude is 30,000 ft or below.
Delete Flight	Remove the flight from the map and disband the group.
Exit	Return to the map.



Flight Orders Menu

If you choose to have a flight **Fly Patrol**, you will have to designate the patrol route. You will notice that lines now emanate from the plane icon in two directions. These lines and their endpoints, which are called “waypoints”, make up the patrol pattern. If you leave these as they are, the flight will fly from its starting position to one end of the route, turn, fly to the other end, turn, and return to the start. The aircraft will repeat this pattern until they encounter an enemy or run out of fuel and fall. Unless this is what you want them to do, you will need to modify the patrol route.

The only way to change the starting point of the patrol route is to change the position of the flight group. To change the route, position the mouse pointer over one of the waypoints (you know the pointer is on the waypoint when a yellow square becomes visible around the waypoint). Click and hold the **[LMB]**, then carry the waypoint to its new position. Release the **[LMB]** to set the new waypoint. At times, you may need to create new waypoints between the existing ones. To do this, double-click on the waypoint before which you want to insert a new one. At the menu, select the **Insert** option. To remove a waypoint, double-click on it and select the other option. You can set a maximum of 8 waypoints on one route.

Note that planes will only **Fly CAP** (Combat Air Patrol) over the selected Mission Target and Mission Home Base. You must choose these sites (instructions for doing so are in the next subsection – **The Plot**) before you can order a flight group to fly CAP.

Now that the scene is set and the players have been cast, it's time to hand out scripts. You've got to choose the heroes and the villains and instruct them as to their plans and schemes.

If, as you go through the rest of this process, you find that the cast you have created doesn't quite fill your needs, don't fret. You can always go back and change things at any time, even after the mission is completed and saved to your hard disk.

THE PLOT

OUR PROTAGONISTS

The player who is going to fly this mission is only one individual, and no one can fly more than one of these aircraft at once. Therefore, you must decide which of the friendly flights you have created will be the primary flight for the mission. The player pilot will start the mission in the lead plane of this flight.

It may seem too obvious to state, but you should remember to assign the right type of plane as primary. For example, a flight of bombers should not be the primary on a bomber escort mission; that would be sort of pointless. Fighters cannot torpedo ships, and so forth. You get the idea.

Left-click on the **Select Primary Flight** button to select the flight of aircraft you wish the player of the mission to pilot. The **Editing Box** will disappear and the **Flight Selection Box** will open. Move the mouse pointer to the group of planes that you want as the primary flight and left-click on it. The selected flight will be listed in the **Editing Box** as the primary flight.

THEIR HOME BASE

Next, the primary flight needs a place to start out from and return to. Otherwise, the mission will quite literally never end (except in abject failure, of course), and no one will get any recognition for their valorous deeds. Only friendly bases and those friendly task groups which include at least one carrier can act as home base for a mission.

Left-click on the **Select Home Base** button to select a home base for the primary flight. The **Editing Box** will disappear and the **Base Selection Box** will open. Move the mouse pointer to the carrier or land base that will be the home base for the primary flight and left-click on it. The flight will start from that runway, and the home base will be listed as such in the **Edit Box**.

THE LOFTY GOAL

When designing an offensive type of mission (torpedo ship, for instance), you are required to assign a target for the primary flight to try to destroy. A good thing to keep in mind when selecting a target base or groups of ships is the effective range of the planes that make up the primary flight. While one-way missions are certainly possible (especially for the Japanese late in the war), they're not much fun to pilot. After all, you will be flying this mission, not some red-shirted Ensign Osborn.

Left-click on the **Select Mission Target** button to choose a main target for the primary flight. The **Editing Box** will disappear. Move the mouse pointer over the enemy base or task force that you want to designate as this target. Left-click again to select the target.

THEIR HEROIC PLAN

The **Mission Type** will have a lot to do with determining the plan of action for the primary flight group. One decision that does not depend on the type of mission is whether the pilots start the mission already in the air or on the runway. You have free reign in making this choice.

Any mission that is not CAP involves some sort of attack on the enemy. As soon as you have chosen the home base, target, and primary flight for an attack mission, the most direct flight route is computed for you. Your pilots, except for the human player, will be tied to this flight plan, except for times when they are defending themselves against enemies.

As with almost every other aspect of your mission design, you can customize the attackers' flight plan. This flight plan has waypoints at either end and at the target; of course, you cannot change these endpoints. (One of them is calculated to return the planes to their home base.) If you insert other waypoints in the route (refer back to **Initial Orders** in the **Combat Aircraft** subsection, for instructions), you can modify the flight plan. Make sure you don't overdo it and run your planes out of fuel.

If the **Mission Type** is **CAP**, you will not need to design any sort of plan. The aircraft involved are required to fly a standard CAP pattern.

THE NEFARIOUS ENEMIES

Every mission should include some enemy forces. If you have not already created them, then you should do so now. Otherwise, you're going to be pretty bored just flying around strafing the few palm trees left in the South Pacific.

Enemies should be assigned duties that complement the protagonists'. For example, if the goal of the mission is to torpedo a ship, that ship should be protected by CAP or a patrol flight (or both!). Placing task groups in the way of the attacking planes is also helpful, as flying through lots of flak is certain to make the mission more difficult. Defensive Mission Types, such as CAP, should be interrupted by at least one enemy attack. (If you really want to be hard on the protagonist pilots, have a friendly task group timed to steam through the target task group just as the primary flight arrives. Trying to identify which ships are which can be pretty tricky in the middle of a hot dogfight.)

Just remember, you can have 16 planes and 96 ships going all at once. Though larger numbers of aircraft and ships will almost certainly slow down the action, the confusion created by even a moderate number of extra vehicles may be worth the price.

Once you have gone through all the work of creating a customized mission, chances are you'll want to save that mission to fly (or edit) later. When you finish specifying all the parameters of a mission, you will be left looking at the main **Mission Builder Menu**. Select **Save Mission** to store your new mission on the hard disk.

All of the existing missions you have created are listed in the **Save Box** that appears next. You have several naming options for saving the new mission. You can:

- 1) Click on the name bar to type in the whole name manually;
- 2) Select and confirm an existing name to replace the existing mission with the new one (note that this will not work if you are modifying one of the pre-set missions); or
- 3) Select and edit an existing name to create a new name similar to the old one.

Of course, if you change your mind about saving, you can always click on the **Cancel** button. Note that if you leave the **Mission Builder** without saving the mission you have been working on, all of your work will be lost.

Once saved, the new mission is stored in a file in the missions subdirectory and will be listed with missions of the same type in the **Mission Listing Box**.

SAVING THE SCRIPT

ACTION

Starting any of the missions you have generated is no more difficult than choosing any other mission. When you choose the corresponding mission type in **Fly Single Mission**, your missions will be listed with all the others.

- On the **Main Menu**, choose **Fly Single Mission**.
- Decide whether you want to fly the mission from the American or Japanese side.
- Select the type of mission you want to fly.
- Choose your mission from the displayed list in the upper part of the menu.

Voila! Good hunting!

MAKING REVISIONS

If one of the missions you've created doesn't measure up to what you thought it would be, you have the ability to modify it. You can also copy and revise the pre-set missions that were included with **1942 THE PACIFIC AIR WAR**. The process is quite simple.

First, you need to load the mission into the **Mission Builder**. Choose **Load Mission** from the **Mission Builder Menu**. A box similar to the **Mission Listing Box** appears. Select the appropriate **Mission Type** and **Nationality**, and all of the appropriate missions will be listed, including your custom missions. Select and confirm the mission you want to modify, and it will be loaded.

Next, select **Edit Mission** from the menu. When the map is displayed, you're ready to go. Editing the mission is exactly like creating a new one, except that most (or all) of the mission is already in place. When you're finished, save this mission in the same way as you would any other.



FLIGHT FILMS

As you fly every mission, cameras record every move you and your opponents make. Much of the action during the real war was filmed in this way, for various reasons. The **Flight Films** in **1942 THE PACIFIC AIR WAR**, however, are just a little more versatile than their historical archetypes.

Using the **Flight Film Viewer**, you can watch the mission as it appeared to the player pilot. Beside the usual slow motion, rapid motion, and pause options, you also have the ability to “jump through the screen” and take over the mission in the middle (most likely changing the outcome).

The **Editing Board** features, in conjunction with all of the various camera functions and viewpoints that are available, let you build new (more exciting) films from the existing reels. You can save these for later viewing or further editing.

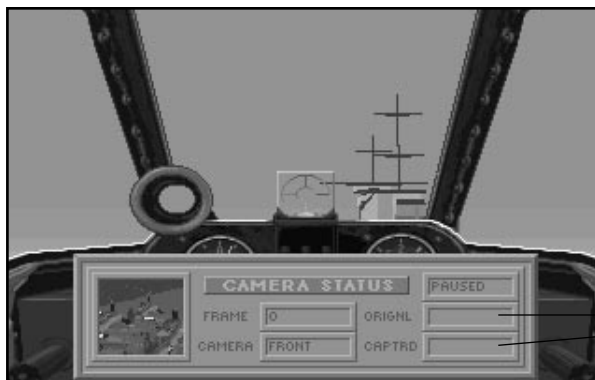
Select **Flight Films** from the **Main Menu** to begin viewing and editing the cinematic records of your missions. First off, you’ll have to choose the film on which you want to work. Left-click on the name of the film to select it, then on the **Load** button to load the film into the **Viewer**.

Note: Anyone unfamiliar with the film jargon used in this section will find brief definitions of most of the terms in the **Glossary**. If you need more detail, these days most good dictionaries include definitions for film terminology.

VIEWING

Having loaded a flight film, you'll be presented with the first frame – the beginning of the mission – and the **Camera Info Box**. This is probably the best time to decide how much detail you want displayed in the film. Press **(F9)** to modify the **Graphics Detail Levels**. The window that appears is exactly the same as the one used to modify the **Graphics Detail Levels** during a mission. (Please refer to **Graphics Detail Levels**, in the **Flying A Mission** section, for instructions.) When you've finished setting the detail options, you're ready to start watching the mission.

The **Camera Info Box** is included primarily to give editors information about what's going on with the camera. On the left, it shows a graphic of which aircraft the player pilot is currently controlling. In the center, little info boxes list what frame the Viewer is presently showing and which mode the camera is in for that frame. On the right, the status of the Viewer is displayed at the top. The **Original** and **Captured** boxes are most relevant when editing, and thus are described in the **Editing** subsection.



Camera View Boxes

Camera Info Box

To some of you, just sitting and watching a mission you have already flown may not seem particularly exciting or useful. Maybe you're right, but during the real Pacific war, pilots went over their **Flight Films** diligently. These films were the only impartial record of the enemy's strategies in the air; they also pointed up flaws in each pilot's tactics. If you didn't learn from your films, you could be sure that the enemy was learning from his. A mistake that neither of you noticed at the time could be fatal next time, because your opponent is waiting for it.

Those of you who are planning to edit your **Flight Films** will spend a lot of time viewing them. Professional film editors are constantly doing so. A good familiarity with the viewing functions is absolutely indispensable when editing a film. These functions are listed below. (Please note that the keystrokes listed on the **Keycard**, if different, supersede those listed here.)

- E** (Enter) Enter and play the mission at the displayed frame. This allows you to step into the frame and change what you did during the mission, thus creating a new flight film. Note that you can not return to the **Viewer** after entering a mission.
- Alt G** (Go) Instruct the **Viewer** to go to a specified frame without showing the intervening film. This feature allows you to seek to a particular frame without watching all the film in between. The **Viewer** will search from the first frame until it finds the one you specify, then pause and display that frame. Note that you can **Go** to earlier frames in the film (rewind), but the **Viewer** will always seek from the beginning. There are two special frame names you can use instead of numbers: **Last** is the end of the film and **First** is the beginning.
- M** (Modify) Activate the **Editing Board** and display it on the screen. Note that only the functions appropriate to the current editing status will be available.
- Alt M** (Move) Move the **Camera Info Box** to the next pre-set location. You cannot move the info box around with the mouse like any other box, and it may get in the way sometimes. **Move** will cycle the box through several pre-set locations.
- N** (Next) Step to the next frame; this function is only available when the **Viewer** is paused. The **Viewer** will remain paused, so that you can step through as many frames as you wish. This can be very helpful when editing, as you often need to search for an exact moment to get the right shot.
- O** (Observe) Instruct the **Viewer** to run the film to a specified frame, showing all of the action to that point. This feature allows you to seek to a particular frame while observing all that goes before. This is extremely useful when you are editing and want to put an exact limit on the length of a shot. The **Viewer** will start at the current frame and progress to the specified frame, then pause and display that frame. Note that you cannot **Observe** to an earlier frame.
- P** (Pause) Pause the **Viewer** at the current frame. The camera remains active and mobile. Press **P** again to release the pause and continue viewing.

- Q** (Quit) Quit the **Viewer** and return to the **Main Menu**. If you have made any changes at all to the loaded film, quitting will truncate the edited film at the current frame. This means that all action after that frame will be lost. If you do not wish to truncate the film, you must **Go** to the end (the last frame) before quitting.
- R** (Rapid Motion) Put the **Viewer** in **Rapid Motion Mode**. This is, in effect, the fast-forward feature. Press **R** again to return to normal speed viewing.
- S** (Slow Motion) Put the **Viewer** in **Slow Motion Mode**. This is quite handy when editing. Press **S** again to return to normal speed viewing.
- Y** (Clear Box) Clear the **Camera Info Box** from the screen. When moving the box around isn't enough, you can have it removed from view. Press **Y** again to return the info box to the display.

Note that all of these viewing commands are also functional while editing a flight film.

EDITING

Now that you're tired of watching the mission happen again from the same point of view, it's time to spice it up a little. The editing features let you change the way the film is shot, though you can't change what happens. It might be nice to copy a particular explosion and show it five times in extreme close-up, but this isn't video. These films are Navy property, and the sequence of events can not be tampered with (under penalty of court martial). You must limit your creative expression to the way the events are presented; your superiors will not let you monkey with the flow of time.

Once you put the **Viewer** into **Editing Mode**, you can change the way you watch any (or every) part of the mission. In fact, if you're familiar with controlling the **External Camera**, it is surprisingly simple to do so.

- Pause the film. Use the **Next** and **Go** functions to get to exactly the time in the mission when you want the shift in viewpoint to occur.
- Now move the camera. You can use any of the pre-set pilot views, the **Chase** or **Tracking Modes**, and the **Free Mode** to position the camera and determine how it will move during the shot. Note that you can position the camera anywhere on the mission map, but that the **F6** and **F7** modes will always center on the aircraft you were piloting. The original camera view for the segment of film is kept in memory and listed under **Original**, in the **Camera Info Box**.
- Release the pause and watch the shot progress. Note that the new viewpoint does not overwrite the original view for that segment of time until you save the film. If you go back and watch the segment again without saving, it will return to its original viewpoint.
- When you decide to change the viewpoint again for another shot, repeat this procedure.

After you've recorded and saved a shot (or several), it's a good idea to load the film again and see how the new shots fit in with the film that comes before and after. This can be time-consuming, but well worth it to avoid ugly scenes, empty frames, and other common goof-ups.

There are a few special features available to make editing a little more convenient. Each of these editing features works through a keyboard command or a button on the on-screen **Editing Board**. The major editing functions are detailed below.



Editing Board

- Capture** Capture a camera set-up. When you find a position and angle that really suits your needs, chances are you'll use it more than once. The **Capture** command lets you keep one particular such set-up in the **Viewer's** memory, which you can then call up and use at any time. The viewpoint of this camera set-up will be displayed under **Captured** in the **Camera Info Box**.
- Use View** Use the camera set-up you stored with the last **Capture** command. The camera will shift to that viewpoint immediately, without any change in the frame number.
- Write** Activate **Editing Mode**. You can not do any editing until the **Viewer** is put into **Editing Mode**. This means that you cannot deviate in any substantial way from the presentation of the flight film. You gain control of the camera position and angles only by entering this mode. To discontinue editing and return the **Viewer** to its default operation, press **Write** again.

You can re-edit (write over, essentially) any scene that you're not satisfied with as many times as necessary. None of the edits you make are actually final until you save the new film. Even so, it's always a good idea to keep the original reels (especially if you cut a lot off of the end), just in case you change your mind about some particular piece of footage.

SAVING

When you're finished with your edits or just want to save your progress, you need to exit **Flight Films** in order to save the modified film. First, you should always **Go** to the end of the film; otherwise, it will be truncated at the current frame, and you will lose the rest of the mission film. (Of course, if that's what you want to do, don't worry about seeking to the end.)

Press **Q** to **Quit the Viewer**. The same save box you used at the end of the mission itself appears. All of the functions are the same. Give your edited mission a name, then left-click on the **OK** button to save it.

You should always rename the first edited version of any flight film. Otherwise, you'll overwrite and permanently lose the original flight record. If, for some unforeseen reason, you would then find that you needed to refer back to find a lost bit or a shot you really liked, it would be too late.

FINISHING A MISSION

Some of you may be using the **Flight Films** option as a way of "restoring" an unfinished stand-alone mission that you "saved" as a film. Here's how you do it.

- After you select **Flight Films** from the **Main Menu**, select and load the film of the mission you "saved" and want to finish.
- Use the **Go** command (**Alt G**), and enter the word **Last** instead of a frame number.
- Wait for the Board to run the film through to the end. This may take some time, but it will certainly be a shorter wait than re-playing the entire mission.
- When the Board stops at the final frame, use the **Enter** command (**E**) to continue the mission from the point at which you originally stopped.

When you finish the mission, you will exit just as you would any other mission. You'll even have the option of saving the mission film, as usual. Once you use the **Enter** command, the Board is deactivated and the entire film manipulation setup is put away.



GLOSSARY OF TERMS AND ACRONYMS

- Absolute Altitude** - Height of the plane above the surface of the ground, as opposed to the height above sea level, which is 'True Altitude'.
- Acceleration** - Any change in velocity, whether positive or negative. Generally used to mean an increase in velocity, with the related negative 'Deceleration'.
- Aileron** - The aerodynamic control surfaces, usually located in the wing, that are used to produce roll.
- Air Strike** - An offensive maneuver consisting of aircraft flying to and attacking a target.
- Airfoil** - Any surface on an aircraft the major function of which is interaction with the air to produce a specific effect.
- Airspeed** - The plane's velocity with reference to the air through which it is moving, not the surface of the Earth.
- Airspeed Indicator** - Cockpit device designed to display the current airspeed of the plane.
- Altimeter** - A device that measures Altitude.
- Altitude** - Distance above the surface of the Earth. Altitude may be measured relative to the actual ground surface – 'Absolute Altitude' – or as a function of air pressure, relative to sea level – 'True Altitude'.
- Angle of Attack** - The difference, measured in degrees, between the pitch of the plane and level flight.

Arrestor Hook - A hook-like device attached to the rear of carrier-based aircraft and used to stop the plane on landing.

Artificial Horizon - A cockpit device much like a gyroscope that displays the deflection of the aircraft from level flight.

Attitude - The deflection of the aircraft from level flight.

Attitude Indicator - See Artificial Horizon.

Autopilot - A device for controlling the flight of an aircraft without input from the pilot.

Bank - Leaning, and therefore turning, of an aircraft to one side due to the position of the ailerons. The pilot causes this by pressing sideways on the stick.

BB - The standard naval abbreviation for “battleship”.

Bearing - Horizontal direction to or from any point, measured clockwise in degrees from North.

Bernoulli’s Equation - A mathematical description of the physical effect that causes lift to be generated by airfoils of a certain shapes. Roughly, the idea is that as air velocity increases, the pressure of that air decreases, and vice versa.

Black-out - Loss of consciousness due to a lack of oxygenating blood flow to the brain; in aircraft this is usually caused by excessive centripetal acceleration.

Brakes, Dive - Airfoils used in dive bombers to allow these planes to dive more steeply without gaining excessive airspeed.

Brakes, Wheel - Devices used to slow an aircraft on the ground by retarding the rotation of the wheels.

CA - The standard naval abbreviation for “heavy cruiser”.

Cannon - Weapons mounted on an aircraft that are too large in caliber or bore size to be considered machine guns.

CAP - The standard naval abbreviation for “combat air patrol”.

Carrier Group - Another name for any task force that includes at least one aircraft carrier.

Ceiling - The greatest altitude a certain aircraft can attain. The related term “Service Ceiling” is the greatest altitude at which a given aircraft will function controllably. Ceiling is primarily a function of available thrust and the lift potential of the major airfoil.

Centrifugal Force - A non-existent force, believed by some to be the name for the outward acceleration caused by inertia when turning.

Centripetal Acceleration - The real name for acceleration due to turning; this acceleration is directed inward, toward the center of the turn. Inertial effects cause the “G’s” experienced by pilots.

CH - The standard aviation abbreviation for “compass heading”.

CL - The standard naval abbreviation for “light cruiser”.

Climb - Aeronautic term for an increase in altitude – i.e. going up.

Cockpit - Where the pilot sits; this area includes all of the devices and instruments necessary for controlling the aircraft.

Combat Air Patrol - A defensive flight pattern intended to spot and deflect incoming aircraft.

Compass - A magnetic device that indicates the direction, measured as a function of magnetic North, of the aircraft’s flight.

Compass Heading - The magnetic heading, as different from the Bearing.

Compass Rose - An azimuth circle aligned with magnetic North, the primary use of which is calibrating the cockpit compass.

Compound Emergency - A situation in which a pilot faces more than one emergency condition.

Coordinated Turn - A turn (bank) during which the rudder is used with the ailerons to prevent adverse yaw.

Cowling - The structure that covers and streamlines the plane’s engine and channels cooling air across it.

CV - The standard naval abbreviation for “aircraft carrier”.

DD - The standard naval abbreviation for “destroyer”.

Deceleration - Negative change in velocity; slowing down.

Ditching - A forced landing in the water.

Dive - Any nose-down, substantial loss of altitude.

Dogfight - Combat between aircraft in the air.

Dorsal - Located on the “top” of the aircraft, but behind the pilot and cockpit.

Drag - The force that opposes the movement of the plane through the air, sometimes called air or wind resistance.

Drift - Deflection of the plane from its intended course due to the wind.

Dud - Any explosive device that does not explode when it is supposed to.

Engine, Radial - Any engine with the cylinders arranged in a circular fashion, usually around the lengthwise axis of the aircraft.

Engine, In-line - Any engine with the cylinders arranged in a straight-line or “V” fashion, as in most automobiles.

Engine Temperature Gauge - The cockpit instrument which displays the operating temperature of the aircraft’s engine.

Escort - A defensive flight pattern in which certain planes, normally fighters, fly ahead of (but near) another plane or group of planes in order to detect and defend from intercepting aircraft.

External Tank - A fuel tank carried on the outside of the aircraft, usually droppable in flight.

Final Approach - A flight path that is lined up with the runway, in preparation for landing.

Flak - Slang term for anti-aircraft fire (AAA) or other non-missile Surface-to-Air munitions.

Flight Crew - The personnel who prepare the aircraft for take-off; this includes fueling, the service check, and loading munitions.

Frame - One picture of a scene. Several frames, taken in order and at a certain speed, comprise a film or animation.

Fuel Gauge - The cockpit instrument that measures the amount of fuel remaining in the plane's tanks.

G Force - Acceleration due to gravity. In aeronautics, the term is also used for the forces on the bodies of the crew that are caused by the inertial effects of high-acceleration turns.

Glide - Flight without power or without thrust.

Go-around - An aborted landing attempt, wherein the pilot has to "go around" and begin a new approach.

Grayout - A partial black-out or semi-consciousness.

Ground Effect - An apparent gain in lift when the aircraft is flying at or below one wingspan's height above the surface. This is caused by the reduction in drag due to the diffusion of the plane's downwash against the surface.

Ground Speed - Velocity relative to the surface of the Earth; true airspeed corrected for wind effects.

Gunner, Rear - That crewman who mans the dorsal weapon(s).

Gunner, Ventral - That crewman who mans the ventral (belly) weapon(s).

Gunner, Dorsal - Same as the Rear Gunner.

Heading - Essentially the same thing as Bearing.

IAS - The standard aviation abbreviation for "indicated airspeed".

Identification Friend or Foe - A modern electronic system for determining the identity of an unidentified aircraft at long range, without the necessity for visual contact.

IFF - The standard aviation abbreviation for "identification friend or foe".

Immelmann - A maneuver for gaining altitude and changing direction.

Indicated Airspeed - The airspeed displayed by the Airspeed Indicator.

Instrumentation - All the stuff in the cockpit that tells the pilot what's going on in and around the aircraft; the gauges and dials.

Knot - One nautical mile per hour, abbreviated 'kt.'.

Land Flow Turbulence - A turbulent airflow caused at low altitudes by winds passing around obstacles (hills, buildings, coyotes, tanks, etc.).

Landing Signals Officer - The carrier crewman responsible for guiding aircraft on their final approaches.

Latitude - Distance north or south of the equator, measured in degrees, minutes, and seconds.

Load-out - The ordnance carried on an aircraft, not including ammunition for fixed guns.

Longitude - Distance east or west of the Greenwich Meridian, measured in degrees, minutes, and seconds.

LSO - The standard naval abbreviation for "landing signals officer".

Missed Approach - See Go-around.

Nacelle - Cowling for a wing-mounted engine.

Nautical Mile - Approximately one minute of latitude; this is equal to 1.15 statute miles.

Negative g's - G forces acting in the direction opposite that of gravity; these are the g's that make the pilot feel "lifted" and cause red-outs.

NM - The standard abbreviation for "nautical mile".

Oil Pressure Gauge - The cockpit instrument that displays the pressure of the oil running through the aircraft engine, a good indicator of the amount of damage the engine has taken.

ONC - The standard aviation abbreviation for "operational navigation chart".

Operational Navigation Chart - The cockpit map.

Ops - Standard military shorthand for "operations".

Pan - Motion of the camera from left to right or right to left around a center; roughly equivalent to the aircraft motion 'Yaw'.

Payload - Drop weapons carried on the aircraft; same as load-out.

Pilot - The person who is the primary controller of the aircraft.

Pitch - The angle of the aircraft's long axis in relation to level flight.

Positive g's - G forces acting in the direction of gravity; these are the g's that make the pilot feel "forced into the seat" and cause blackouts.

Propeller - The airfoil attached to the engine, used to generate thrust.

Radar - RAdio Detection And Ranging equipment; this is not standard equipment in the aircraft of 1942.

Radar Altimeter - A modern device used to gauge the Absolute Altitude of an aircraft using radar.

Red-out - Loss of vision and possibly consciousness due to bursting blood vessels in the corneas or other parts of the eyes. This is usually caused by excess negative g's.

Roll - (1) Motion of the aircraft around its long axis, as when one wing rises and the other falls; (2) Motion of the camera around its parallel horizontal axis, roughly equivalent to the aircraft motion of the same name.

Rudder - The control surface mounted on the tail of the aircraft and used to control the yaw of the plane.

Scissors - A two-plane maneuver in which opposing aircraft repeatedly attempt to out-turn one another in order to get the first shot.

Sea Level - Zero altitude; the altitude at the surface of the ocean.

Shot - General term for the combination of a camera set-up and scene; when either the scene shifts or the camera is 'cut' to a new set-up, a new shot begins.

Sink Rate - Vertical speed of descent.

Skid - Sideward motion of an aircraft in flight, generally caused by over-ruddering.

Slip - Motion of the aircraft that is not in line with the long axis, generally caused by intentionally under-ruddering; sideways flight.

Spin - Rotation of the plane around its center of gravity during a prolonged stall, usually coincident with a pronounced loss of altitude.

Split-S - A maneuver similar to an Immelman, but involving a loss of altitude rather than a gain.

Squadron - A group of military aircraft.

Stall - A condition in which the aircraft has lost all of its lift; this is caused by the plane's angle of attack exceeding that required for maximum lift and thus producing turbulent airflow around the wing.

Stick - The pilot's primary device for controlling the ailerons and elevators.

Tachometer - The cockpit instrument that displays the revolutions per minute of the engine crankshaft.

Task Force - A force of ships assigned a specific mission or function; normally, a Task Force is organized around a group of cruisers, carriers, or battleships.

Task Group - A smaller group of ships that is part of a Task Force; though the Task Groups that make up a Task Force share a common mission, each operates independently.

Thach Weave - A three-plane maneuver used by two cooperating planes to bring a third (enemy) plane that is behind the leader repeatedly through the line of fire of the wingman.

Throttle - The pilot's primary device for controlling the RPMs of the engine and, thus, the thrust.

Tilt - Motion of the camera up or down around a center; roughly equivalent to the aircraft motion 'Pitch'.

Torque - The twisting effect on the plane of the rotation of the engine crankshaft and propeller.

TR - The standard naval abbreviation for “transport”.

Track - Motion of the camera from one location to another, as distinct from the motion about a center described in Pan, Tilt, and Roll.

Transverse g’s - G forces acting in a direction perpendicular to that of gravity; these are the g’s that make the pilot feel “pushed to the side”. Transverse g’s are much more dangerous than either positive or negative g’s, since they rapidly cause organ damage.

Trim - Repositioning of the primary control surfaces to correct for tendencies of the aircraft.

True Altitude - Distance from sea level, usually calculated as a function of ambient air pressure.

Velocity - Distance travelled over a period of time. Speed.

Ventral - Located on the lower surface or “belly” of the aircraft, usually behind the wing.

Visibility - The distance the pilot can see from the cockpit; visual range.

Wave-off - A landing attempt that is aborted by the LSO.

Windmilling Propeller - A propeller that is in motion due to the effects of wind and airspeed, rather than impelled by the engine crankshaft. A windmilling propeller causes excess drag and increases fuel consumption.

Wing - The primary airfoil for generating lift.

Yaw - Movement of the aircraft about its vertical axis.

Zoom - Change in the focus of a camera. Zooming in causes the camera to focus on objects that are smaller or farther away, thus limiting the horizontal scope of the focus; zooming out causes the camera to focus on closer or larger objects, thus expanding the horizontal scope and bringing more of the scene into the view.



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1942

SIMULATION

THE PACIFIC AIR WAR



PILOT'S HANDBOOK



1942 THE PACIFIC AIR WAR
PILOT'S HANDBOOK

MicroProse

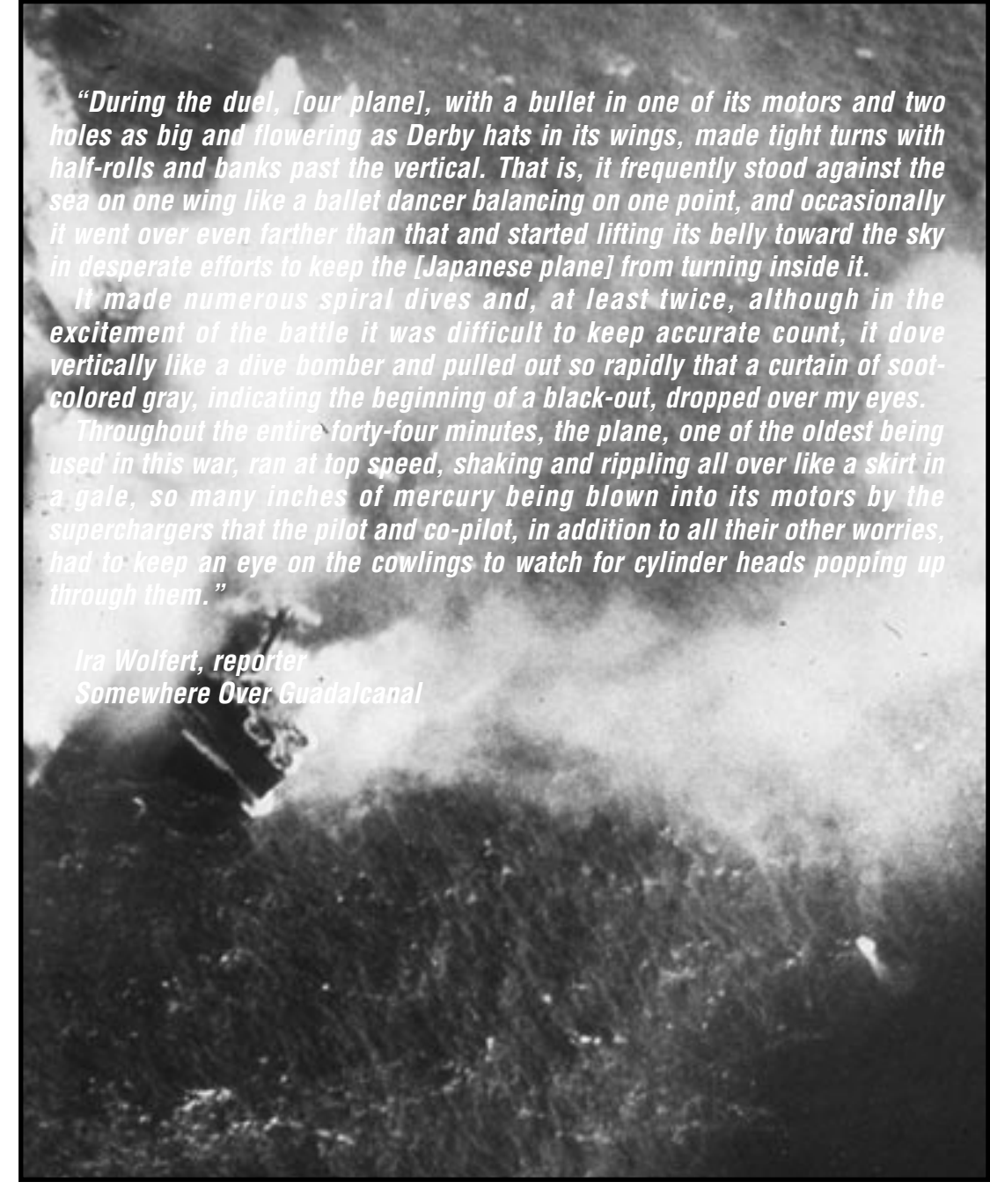
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“During the duel, [our plane], with a bullet in one of its motors and two holes as big and flowering as Derby hats in its wings, made tight turns with half-rolls and banks past the vertical. That is, it frequently stood against the sea on one wing like a ballet dancer balancing on one point, and occasionally it went over even farther than that and started lifting its belly toward the sky in desperate efforts to keep the [Japanese plane] from turning inside it.

It made numerous spiral dives and, at least twice, although in the excitement of the battle it was difficult to keep accurate count, it dove vertically like a dive bomber and pulled out so rapidly that a curtain of soot-colored gray, indicating the beginning of a black-out, dropped over my eyes.

Throughout the entire forty-four minutes, the plane, one of the oldest being used in this war, ran at top speed, shaking and rippling all over like a skirt in a gale, so many inches of mercury being blown into its motors by the superchargers that the pilot and co-pilot, in addition to all their other worries, had to keep an eye on the cowlings to watch for cylinder heads popping up through them.”

*Ira Wolfert, reporter
Somewhere Over Guadalcanal*



INTRODUCTION

Welcome to 1942, a great year to be a shark in the South Pacific. One of your primary goals in **1942 THE PACIFIC AIR WAR** is to avoid becoming shark food. The supplementary information in this book is intended to help you do just that – by staying airborne. Though skill and daring and marksmanship are extremely important factors in any aerial combat, it has been proven time and again that knowledge is the key to victory. When you know the enemy's strengths and weaknesses, you're ready to go into battle. When you know your own even better, you're ready to win.

This book, the **Pilot's Handbook**, contains a detailed flight tutorial, historical background for the campaigns and missions, statistics on all of the aircraft you can pilot in **1942 THE PACIFIC AIR WAR**, and a few basic combat strategies. Complete instructions on installing, running, configuring, and playing the game are in the **Game Player's Guide**. The **Keycard** is a one-stop reference to all of the keyboard, mouse, joystick, and other controls. The **Technical Reference** includes the hardware requirements for running the game and all of the software compatibility issues discovered before release. Any changes to the game that were made after this manual was written are also described in the **Technical Reference**. As always, the **Readme** file was written last, so any notations in that file supersede all other information.



FLIGHT SCHOOL

This section is your flight instructor. Any of you who have extensive experience with piloting, especially combat flying, can probably skip over this part; you've been through flight school once already. The rest of you rookies better read up, read close, and pay attention. You can be sure that the enemy already knows all of what's here – and a lot more.

Despite the differences in design between the several models of aircraft included in **1942 THE PACIFIC AIR WAR** (These differences are discussed in detail in the subsection entitled “**The Cockpits**”), there are some features of flight that remain consistent across the board. It is your responsibility as a pilot to familiarize yourself with the essential basics of flight before you even think of getting into one of your navy's expensive aircraft.

THE BASICS

Those of you who think you know something about flying might find some of these lessons overly simplified. Read them anyway. You won't have this book with you in combat (even if you do, wiseguy, you can't read and fly at the same time), and your life will depend on knowing more and being more skilled than your enemy. Besides, you might learn something.

ESSENTIAL AERODYNAMICS

This is the physics lecture, but don't nod off yet. You really need to know this stuff. Literally hundreds of green pilots have lost their lives because they thought they knew how their plane would react. The only way (let me stress that – the ONLY way) to really be in control of your aircraft is to understand the forces acting on it and the way the control surfaces manipulate those forces. You don't need to memorize Bernoulli's equation, but you'd better understand what it means for your wings. The pilot who has the aerodynamics ingrained in his head can overcome virtually any enemy, including the "ace-killer", an uncontrolled spin.

The Five Forces

There are five basic physical forces that you have to worry about when you're flying a propeller-driven aircraft. Most textbooks say four, but they're wrong. If you don't know about torque, you'll end up like the many inexperienced pilots whose careers (and, too often, their lives) were ended trying to land the Vought F4u Corsair – the legendary "Ensign Eliminator".

Gravity is easy to understand; you deal with it every day. Your plane and everything in it are attracted to the surface of the Earth. The more weight (technically, mass) is on your plane, the greater the attraction. If there were no other forces acting on your plane, gravity would pull it to the ground and keep it there.

Drag would limit how fast you would fall. In simple terms, drag is the resistance the air offers to anything trying to move through it. A moving aircraft with no force impelling it would quickly slow down and stop because of the drag of the air around it.

Thrust is how you force your plane through all that drag. The spinning propeller pushes air backward, which action results in Newton's equal and opposite reaction – a forward motion of the entire aircraft. Of course, this just makes you plummet faster.

Lift is what keeps you in the air. The aircraft's wings are designed to take advantage of a side effect of the law of conservation of energy. The curvature of the wing causes air to move faster going over the top of the wing than it does going under. The side effect is that this faster-moving air has a lower pressure than the slower air (the pressure is determined using Bernoulli's equation), and the difference in pressure between the bottom and top surfaces of the wing lifts it. When the lift on both wings is great enough, the plane is held aloft. With lift and thrust both working to counteract nature's attempts to keep your plane from moving, it flies.

Torque is twisting power. In an aircraft, the torque you need to worry about is caused by radial engines. These engines rotate in only one direction, and that direction coincides with the roll axis of the plane. Some of the torque generated by the engine's rotation is transferred to the body of the plane, which makes the plane try to rotate in the opposite direction as the engine (usually counterclockwise – to the pilot's left). If the pilot does not compensate for this (using the rudder), the torque will cause the plane to roll. This is especially dangerous at low airspeeds and when landing.

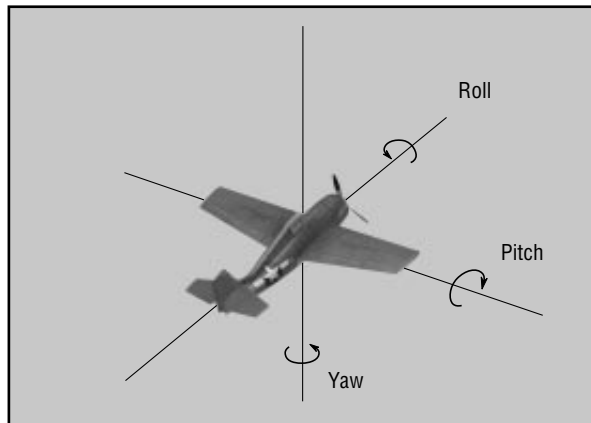
Note: Bernoulli's equation, as applied to the airflow around a wing (in case you really want to know) is:

$$P + 1/2\rho v^2 + \rho gy = K$$

That is, for any particular volume of air, the sum of its pressure (P), kinetic energy ($1/2\rho v^2$), and potential energy (ρgy) stays constant (= K). Meaning, roughly, that the faster a volume of air moves, the lower its pressure.

The Three Axes

An aircraft can move in an essentially unlimited number of directions. For simplicity, however, we use a system of reference based on three axes of motion. By design, these axes correspond to the three main types of aircraft motion that you can control.



Axes of Motion

Roll is rotation of the plane around its length, also called the parallel horizontal axis.

Pitch is rotation of the plane around its transverse horizontal axis. The line formed by the wings is a good approximation of this axis.

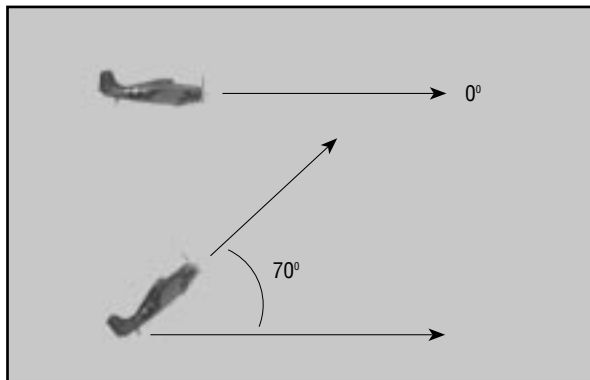
Yaw is rotation of the plane around its vertical axis. If you stuck a steel rod up through the belly of the plane and spun the plane around it, that would be yaw.

Control Surfaces

Manipulating these basic forces is how you control the movement of your plane. Your engine provides the thrust, thus you have control over thrust. Two of the forces – drag and lift – do not act on all parts of the plane equally. Aircraft designers have taken advantage of that fact to build in features that let you control the plane. These features are called the “control surfaces”. Note that you do not have any control over gravity.

The **Propeller** is the surface you use to manipulate thrust. By varying the throttle setting, you cause the propeller to spin at different speeds. The faster it spins, the more forward thrust you have available.

Elevators are vertically-tilting sections of the horizontal part of the tail. Through drag, they affect the pitch of the plane. You control them with the forward and back movements of the stick. When the elevators are down (stick forward), the imbalance in the drag on the plane makes the nose tilt down. This is called “lessening the angle of attack”, and it causes the plane to dive. Up elevators, conversely, tilt the nose up, and the plane climbs.



Angle of Attack

You can use the **Wings**, indirectly, as a control surface to manipulate lift. When you change the plane’s angle of attack (using the elevators), the airflow over the wing changes. A greater angle of attack creates more lift – to a point. If this angle gets too big, and the plane’s airspeed is not high enough to maintain a smooth flow, turbulence will take away all of the lift. Without lift, the plane will stall and drop like a rock. A lesser angle of attack creates less lift.

The **Ailerons** are the control surface you will likely pay the most attention to. They’re like the elevators, only they’re on the wings. When you move the stick to either side, one aileron goes up and the other one goes down. Suddenly, one wing gains some extra lift, and the other one gets stuck with more drag. The former wing rises, while the latter drops. This motion is called “roll”. Your aircraft turns (banks) in the direction of the roll – the direction you moved the stick.

Built into the wings are **Flaps**, which you can extend or retract as necessary. These are used most often during landing, but they do have the occasional other purpose. Extending the flaps (“flaps down”) has several results. First, lift is increased, so the plane rises; next, drag is also increased, so the plane slows. Overall (and this is most important), the flaps lower the speed at which the aircraft will stall. This means that, when landing, you can approach more slowly without stalling or, conversely, dive to a landing more steeply (because the flaps slow you), then “flare” – bring the nose up sharply just before touching down – and the flaps will kill most of your speed. Keep in mind that when you retract the flaps (“flaps up”), the plane will drop a bit. Some pilots use partial flaps for extra lift during take-off. If you are one of those, do not raise your flaps too soon after take-off, or you may find yourself at a negative altitude.

How much you use the **Rudder** depends on how soon you want to retire, and how violently. The rudder is a horizontally tilting section of the vertical part of the tail. Through drag, it affects the yaw of the plane, pointing the nose left or right. Not using the rudder enough will cause a rough ride and a very rough (if not violent) landing. Using the rudder too much or too often can quickly lead to your losing control of the plane. From there, it’s a short downhill ride home.

Brakes come in two types. Dive Brakes (sometimes called Air Brakes) are a control surface. Wheel Brakes are like the brakes on a car, and they only work when you’re on the runway. The dive brakes aren’t built for fine control; they’re either on or off. When on, they increase the drag on the aircraft, slowing the plane without causing any appreciable deflection from your course. When off, they have no effect at all.

Inertia

All good pilots are aware of the effects of inertia on their aircraft and on their bodies. Pilots who do not understand inertia crash a lot. One definition of inertia is “the tendency of any object to resist a change to its state of motion”. What that means is that if your body or your plane is sitting still, it wants to stay that way; if it is moving in a particular direction at a particular velocity, it wants to retain that speed and heading.

Inertia causes all sorts of trouble for pilots. Most importantly, it makes engines necessary. When starting your plane from a dead stop (at take-off, normally), you’ll need much more throttle to accelerate than you will during flight. The engine has to overcome the inertia of the aircraft, which is trying to keep it still. While in flight, inertia makes maneuvers more difficult at higher speeds. The faster your plane is moving, the more inertia it has in the direction of movement. Thus, the engine and control surfaces have to do more work to get the plane to change direction.

“We dove straight down so rapidly that my knees buckled under me... Nobody knows how many times the weight of gravity was multiplied by that dive, everybody being too busy to notice. But I could feel my cheeks pull far down below my eyes and could feel my eyes sticking out of my head and my cheeks resting on my shoulders, and everything that was inside of me pressed into a bundle and forced into my lap.”

Ira Wolfert, 1942, somewhere over the Solomons

The most noticeable problem inertia causes is g forces. The 'g' is a standard abbreviation for acceleration due to gravity; in this case it is used to denote any acceleration experienced by the plane and pilot. Whenever you change direction, you are subject to g's. If you turn to the side (as in yawing or banking), you're putting a centripetal acceleration on the plane and your body. Inertia (often mistakenly called "centrifugal force") tries to keep you moving in your original direction, causing "transverse g's". When you turn downward, "negative g's" make you feel lighter, as in a dropping elevator. If you turn upwards, as in pulling out of a dive, "positive g's" push you into your seat. Positive and negative g's have risks – blackouts, greyouts, and redouts – which are described in the **Blackouts** subsection in **Flying A Mission**.

LEVEL FLIGHT

Level flight is simply a matter of compensating for any predisposition the aircraft may have. For example, planes with radial engines tend to roll to one side, due to the excess torque inherent in the radial design. To fly straight and level, you need to counter the tendencies of your plane. A gentle hand on the stick and perhaps a little rudder is all it takes to maintain level flight. If you find it difficult to level your plane, the control surfaces (rudder, ailerons, and such) may have been damaged. Return to the carrier or base as soon as possible for repairs.

Pilots generally make level flight easier by setting the "trim" of the aircraft. Trimming is analogous to calibrating a joystick to center. You can "calibrate" the elevators to compensate for lift and the ailerons and rudder to compensate for roll. In **1942 THE PACIFIC AIR WAR**, all of this is done for you by the automatic trim feature. Though this may seem unrealistic, the theory behind it is simply that trimming comes effortlessly to a pilot as skilled as you, like breathing. You don't think about it, you just do it.

ACCELERATION AND DECELERATION

Acceleration and deceleration – speeding up and slowing down – are controlled by many factors, few of which are under your control. The throttle is the one factor over which you have the most control. More throttle means higher speed (and faster fuel use), and less means lower speed. Diving also adds to your airspeed. Climbing and turning both cause your plane to lose speed, as does flying with your gear down. You can also use the Dive Brakes if you want to cut your speed quickly.

RISING AND FALLING

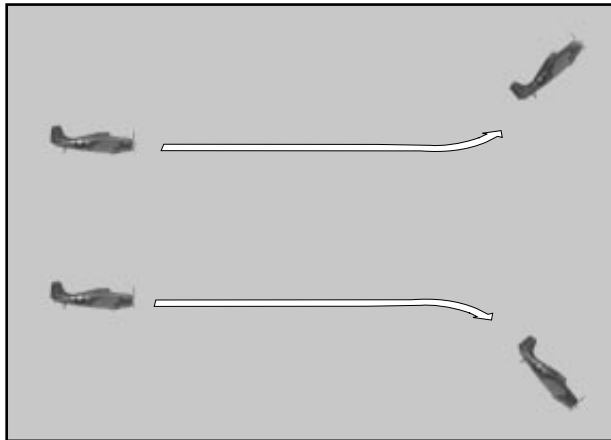
Rising and falling are two of the most often misunderstood and under-appreciated essentials of flying. If you want to gain altitude, the preferred method is not pulling back on the stick, as a rookie pilot might assume. That will cause you to rise, but it also pitches your nose up and slows your plane. Increasing throttle not only makes you gain altitude, it adds to your airspeed.

To lose altitude without gaining speed, cut back on the throttle. In this way, you avoid pushing the stick forward, which would lower your nose and add significantly to your airspeed. Pushing the stick is also a good way to cause a redout. If you must stick forward to fall, use your air brakes if you need to prevent the gain in airspeed.

Note that in **1942 THE PACIFIC AIR WAR**, these effects are almost entirely cancelled out by the automatic trim feature. The auto-trim works to keep the aircraft level and steady during normal flight. There are limits to what the auto-trim can compensate for, however. Rising and falling effects will be a factor at sufficiently high and low speeds.

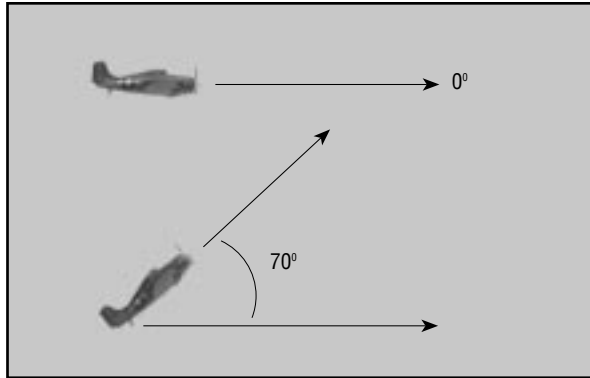
CLIMBS AND DIVES

Climbs and dives are more dramatic ways of gaining and losing altitude. To climb, pull back on the stick. The farther you pull, the steeper the climb will be. Keep in mind that the steepness of any climb is limited by your airspeed and the capabilities of the aircraft. To dive, push forward on the stick. The farther you push, the steeper the dive. Diving will cause your airspeed to creep up; use your air brakes to keep from gaining too much speed.



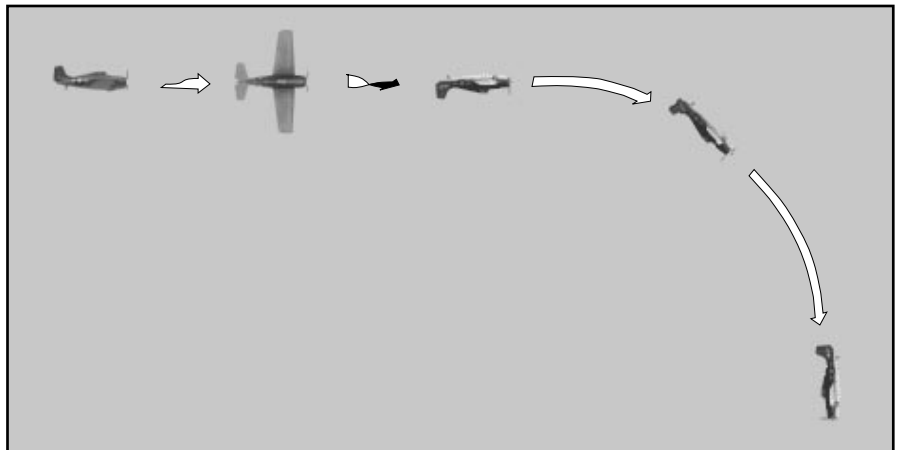
Climb and Dive

The reason this works is that tilting the plane changes the “angle of attack” of the wing surface. The angle at which air encounters the airfoil determines the amount of lift acting on the plane. A greater angle of attack means more lift, so your plane rises. A lesser angle of attack means less lift, causing your plane to fall.



Angle of Attack

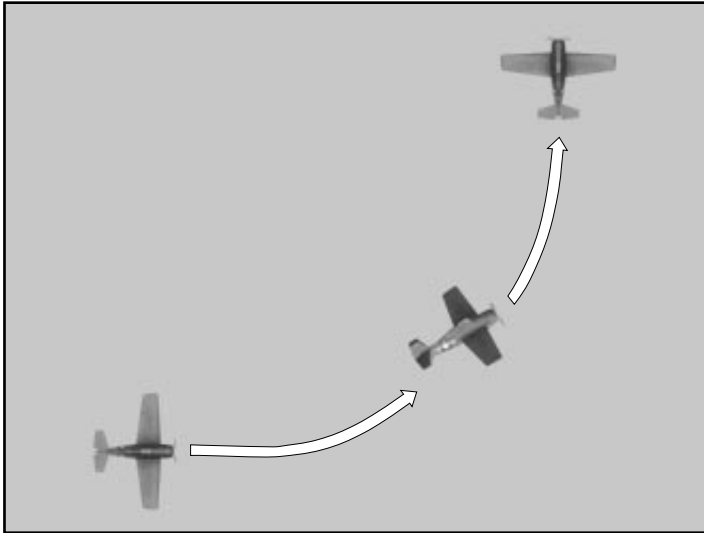
Remember also that quick, steep dives are the main cause of red-outs. Combat pilots who want to lose altitude quickly will not normally push the stick forward. Instead, they flip the plane over, then pull back on the stick to “climb” downward. Repeating the flip and climb straightens the plane out again, or you can continue the downward “climb” and end up pointing back the way you came (if you have room – otherwise, you end up getting your plane wet). Please refer to the **Split-S** maneuver in the **Advanced Flight** subsection for a detailed description and a diagram.



Steep Dive

SIMPLE TURNS

Simple turns are called “banks”. Push the stick to either side to tilt your plane to that side, thus turning in that direction. You can also push the rudder to that side to tighten the turn. You will notice that you lose speed as you turn, the nose starts to drift downward, and you begin to lose altitude. Add throttle to speed up, then pull back on the stick and ease the rudder in the opposite direction to counter this drop. For every aircraft there is an optimum airspeed for making nice, tight turns. If you are flying faster than this optimum, your turn will be more open than necessary; if you are below the optimum airspeed, you will lose altitude more quickly.



Simple Bank

AUTOPILOT

Autopilot is an option not everyone will want to use. Few of the aircraft you can pilot in **1942 THE PACIFIC AIR WAR** actually had an autopilot installed, and none had one as sophisticated as this. This feature is included strictly to ease gameplay in certain situations. For example, if you choose to accelerate time (please refer to the **Game Player's Guide** for instructions), the plane will become extremely hard for you to control; the autopilot has no such problems. The autopilot will take control of the plane and fly any portion of the mission for you, including combat. Your plane, in essence, becomes just another of the many computer-controlled aircraft. (Of course, if you have gotten your aircraft damaged beyond control, the autopilot can not help you. Bail out.) Turn the autopilot off again to regain control of your plane.

FINAL ADVICE

You can learn more advanced maneuvers from watching your fellow pilots, especially your lead. Analyzing the tactics of the enemy is another good way to learn. (According to Sun Tzu, your enemy is the most important teacher of all.) During dogfights, though, you're usually quite busy, and there's rarely time for analyzing every move. Later, in the security of your base of operations, you can review flight films at your leisure. Please refer to the **Flight Films** section of the **Game Player's Guide** for detailed instructions on viewing and saving these valuable references.

INSTRUMENTS

The instruments in the cockpit do not really vary from plane to plane. Every aircraft in the Pacific theater is outfitted with the same essential instruments, though they are certainly not in the same place in every cockpit. **1942 THE PACIFIC AIR WAR** reproduces the most important instruments, leaving out much of the complexity of the cockpit instrumentation to facilitate gameplay. This basic set of gauges and dials are summarized here.



Sample Cockpit: Std View

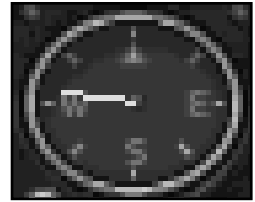


Sample Cockpit: Lap View

Remember that many (if not all) of the instruments in your cockpit will be located below the "dashboard" visible in the standard cockpit view. Tilt your view down and up or (in fighters) use the **Virtual Cockpit Mode** view to get a look at these gauges.

COMPASS

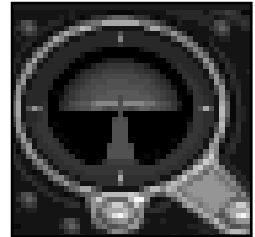
The compass is a simple, magnetic direction indicator. Whatever heading is at the top of the needle is the direction in which the nose of your aircraft is pointing. Headings are numbered from 000 (zero) to 360, starting and ending at due North and proceeding clockwise. Thus, due North is both heading 000 and 360, East is 090, South is 180, and West is 270.



Magnetic Compass

ARTIFICIAL HORIZON

The artificial horizon (also called the “Attitude Indicator”) is a floating ball that indicates your plane’s relation to the surface of the Earth, or attitude. This is extremely useful when visibility is poor or for some other reason you cannot see the natural horizon. If you are flying level, the artificial horizon will be centered and flat. If you are banking or rolling, it will be at an angle. When you climb, the light part (the “sky”) will cover more of the gauge; when you dive, the dark part (the “ground”) covers more. Keep in mind that the artificial horizon represents the actual, natural one. This is not radar! Irregularities in the surface of the Earth (mountains and such) are not reflected on this gauge.



Attitude Indicator

AIR SPEED INDICATOR

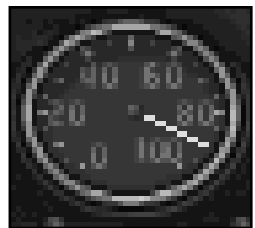
The air speed indicator is a dial that registers the speed of your aircraft in relation to the air around it. This airspeed is indicated in knots, which are nautical miles per hour. Remember that, since a nautical mile is longer than the statute mile used for land travel, your airspeed is a deceptively lower number than your speed with relation to the ground. Since the actual velocity is the same, mistaking knots for miles per hour can cause serious problems when landing. Also keep in mind that your airspeed must remain above a certain minimum (different for each model of aircraft) to stay aloft. Lower airspeed means greater control of the plane’s lateral (horizontal) movement, but less power for climbing.



Airspeed Indicator

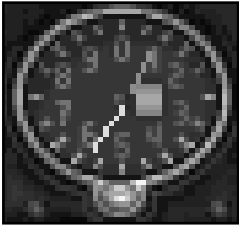
TACHOMETER

The tachometer dial measures the rpm (rotations per minute) of the aircraft’s engine. Under most circumstances, this is also the rpm of the propeller crankshaft. (Many planes had step-up gears and such, so this is not always true.) This indicator of engine power is relative to, but not directly determined by, the amount the throttle is open. Though the tachometer can serve as a rough guide to how much throttle you have on, especially during level flight, do not rely on rpm for an exact gauge. Knowing your engine’s rpm is primarily useful when you are planning a maneuver that requires a certain amount of engine power. Climbing, for example, or pulling out of a particularly steep dive.



RPMS

ALTIMETER



Altimeter

The altimeter tells you how far above sea level you are. The short needle indicates thousands of feet, the long needle indicates hundreds. So, for example, when the long is at “2” and the short is at “4”, you are 4200 feet above sea level. Since none of the aircraft in **1942 THE PACIFIC AIR WAR** is equipped with radar, radar altimeters are out of the question. Your altitude is measured as a function of the ambient air pressure, **not absolute altitude**. What this means to the pilot is that you can only trust your altimeter when flying over the ocean (which is pretty flat and always very close to sea level). Over land, you must stay alert for changes in the topography. If you are less than 100 feet above a 2000-foot mountain, your altimeter will still read 2100 feet. An inattentive pilot might feel safe making a dive and later (assuming he survives) wonder why he crashed.

OIL PRESSURE GAUGE



Oil Pressure

The oil pressure gauge, like the one in an automobile, keeps track of the pumping pressure of the oil that lubricates your aircraft’s engine. Since your flight crew are the best the navy has to offer, you can assume that there is nothing wrong with the engine when you take off. If you start to lose oil pressure, there can be only one explanation – your engine has been damaged by enemy fire.

The leak may not be a bad one, but you shouldn’t take chances. If you can, return to your take-off point right away. If you do not, the oil will eventually all run out, and the plane’s engine will seize (stop working suddenly). If you’re lucky, you might be able to glide to a safe landing, but it’s much more likely that you’ll end up a sitting duck for enemy pilots to shoot down. If you choose to stay in the fight and end up bailing out, fine. Living to fight another day is better than going down with your plane. However, unless you had a damn good reason for staying, expect a reprimand. Bringing your country’s plane home with you is more important and honorable than seeking personal victories and fame.

ENGINE TEMPERATURE GAUGE



Engine Temp.

The engine temperature gauge indicates the operating temperature of your aircraft’s engine. As you warm up prior to taking off, this gauge should rise from the bottom to hover approximately in the center of its range. Under normal conditions, engine temperature will not deviate substantially from this center. Note that combat flying at high RPMs is not considered normal conditions.

During combat maneuvers, running the engine without oil, carrying heavy loads, or when the engine has been damaged, the temperature may rise to dangerous levels. If the temperature nears the top of the indicator’s range, there is a good chance your engine will cease functioning. Avoid this if at all possible. Although you will hear stories of cooled-off engines that were restarted in flight after overheating, these are almost miraculous exceptions to the rule. Most pilots who overload their engines simply crash and die. Overheating causes permanent damage to the engine which must be repaired before the aircraft is airworthy.

FUEL GAUGE

The fuel gauge, like the one in a car, tells you how much fuel is left in the tanks. The level in your main tank is measured by the bright white “Main” needle of the gauge, while the level of fuel in any external tanks (normally, these will only be mounted for search flights and some fighter missions) is indicated on the dimmer “Reserve” needle. If the reserve tank runs out, the engine will begin drawing from the main tank automatically. Once the external tank is empty, you should consider jettisoning it. Without the excess weight of the empty tank, your plane will handle better and fly faster.



Fuel Gauge

MANIFOLD PRESSURE GAUGE

The gauge labeled “MP” is not the Military Police Indicator, it measures manifold pressure. This is an approximate measure of the air pressure inside the engine. Taken together with the Tachometer reading, this information gives you a very good idea of how much horsepower you have available. A lower manifold pressure means less available power, while a higher one (always assuming that the pressure is not great enough to destroy the engine) generally means you have more horses.

Note that the M.P. can also be a reliable indicator of engine damage. If your engine is punctured by one or more bullets or chunks of shrapnel (or a spear, for that matter), the manifold pressure will start to drop. If the pressure ever drops all the way to zero, one of two things is the case. Either you have turned the engine off or it has ceased functioning and become ballast.

Manifold pressure has a habit of becoming slightly lower as your altitude increases, reflecting the decrease in ambient air pressure. Thus, at higher altitudes (usually above a certain optimum operating altitude, which is different for each model of aircraft) you will tend to get a little less power from the same amount of throttle.



Manifold Pressure Gauge

RATE OF CLIMB INDICATOR

The R.O.C. Indicator lets you know how quickly your altitude is changing. Though you can get a rough approximation of this by watching the altimeter move, sometimes you need to know in a glance, and that’s where the R.O.C. comes in. If the needle is above the centerline, you’re climbing; if it’s below, you’re diving (or falling). Different planes have different scales (x10, x100, x1000, etc.), but the hash marks on the dial will always indicate a number of feet per minute.



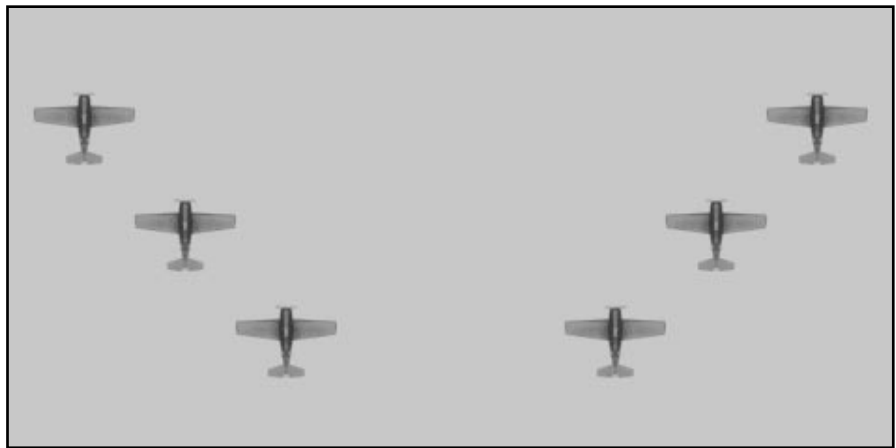
R.O.C.

FORMATIONS

If you've gone ahead against advice and flown a mission or two without reading this, you probably noticed that the aircraft in your flight are flying in formation. (Excepting you, of course, since you had no idea what was going on.) This is standard procedure, even if your flight is only yourself and one wingman. Your flight should stay in formation until the enemy engages you in combat or the mission ends. All of the normal formations you will encounter in **1942 THE PACIFIC AIR WAR** are variations on two basic themes.

ECHELON

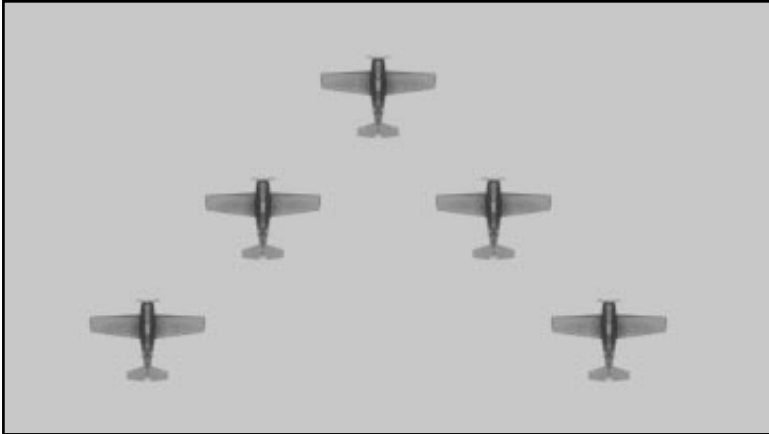
Echelon formations come in two flavors: echelon left and echelon right. The planes fly behind and to one side of each other, forming a diagonal or "stair-step" line. This type of formation can accommodate any number of aircraft, though it is not suggested for more than five. A two-plane echelon is the standard lead and wingman formation.



Echelons

V

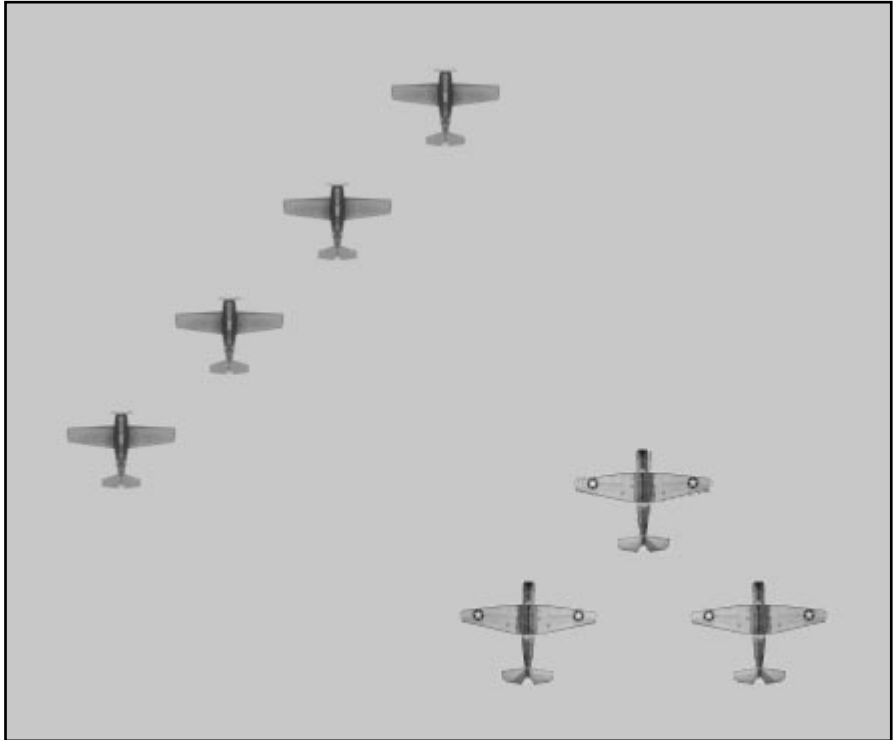
V Formations, or “Vees”, are the standard formation for flights of bombers (and geese). The front two following planes keep position behind and to each side of the lead aircraft, thus forming the ‘V’. Any further planes extend the legs of the formation; the standard V does not include any aircraft within the legs of the V. When there is an even number of aircraft in a V formation, the flight leader decides which leg will be extended. The two-plane V is essentially the same formation as the two-plane echelon.



V Formation

BOMBER ESCORTS

Bombers and their escorts fly near each other, but not in the same formation. As noted above, flights of bombers generally travel in a V formation. The escorting flight of fighters should keep 1000 feet above the bomber group and 1000 feet out in the direction from which the enemy is expected. Any formation is acceptable for the fighters, so long as it maximizes the protection of the bombers.



Bomber Escort

There are several easy maneuvers that are not only basic, but essential to combat flying. You may already be familiar with some of them. Regardless, you should practice every time you begin flying a new type of aircraft; every plane reacts differently, and you should always adapt to your aircraft – it will not adapt to you.

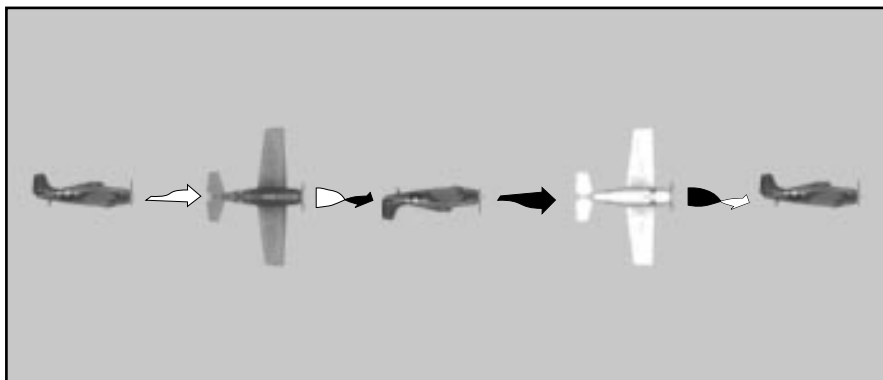
Aileron Roll

The aileron roll is not a maneuver that you are ever likely to use, unless you fly in an air show after the war. The utility of this simple roll is that it is a basic component of almost every other possible maneuver, trick, or trap you might use.

Push the stick all the way to either side, hold it there, and you will perform an aileron roll. Center the stick again once you return to an upright attitude. Now roll in the opposite direction. Notice how your plane acts during the rolls: which direction it “likes” to go in, how much speed and altitude you lose, etcetera. The little things get to be very big during a close-in dogfight.

Now roll into the inverted position and center the stick there. Spend a little time upside down and see what the plane tries to do. Roll back over whenever you’re ready (preferably before you hit the water). The half roll is the first step in many an important and useful maneuver.

SIMPLE MANEUVERS

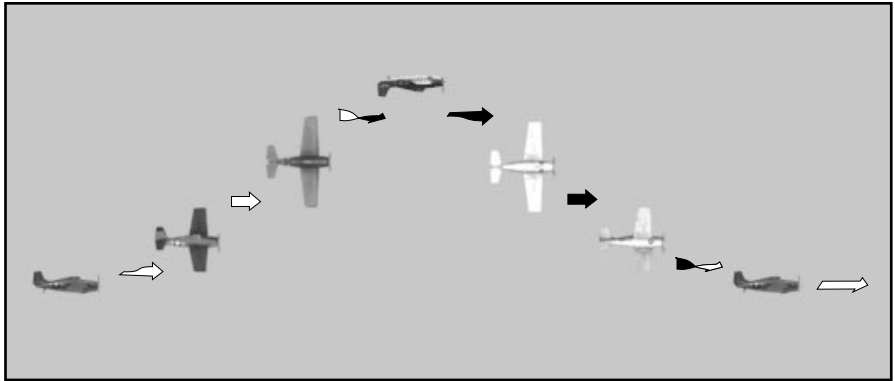


Aileron Roll

BARREL ROLL

A barrel roll can occasionally be useful in a dogfight, especially if your opponent is inexperienced or just plain stupid. It is similar to the aileron roll, but has a lateral component that turns it from a spin-in-place to more of a horizontal corkscrew motion. Unless your enemy is on your tail, performing the full roll may not be of any value. The barrel roll is similar to the aileron roll, however, in that a partial roll is often used as a part of another, more complex, maneuver.

To perform this roll, you push the stick to one side as in the aileron roll, but you also pull it back a bit. A perfect barrel roll brings you back to the same position and altitude, but lowers your airspeed. (Normal pilots will lose some altitude.) It is the lessening in your speed that will sometimes trick your opponent into overshooting. When you recover your position, you will likely be right in his six.



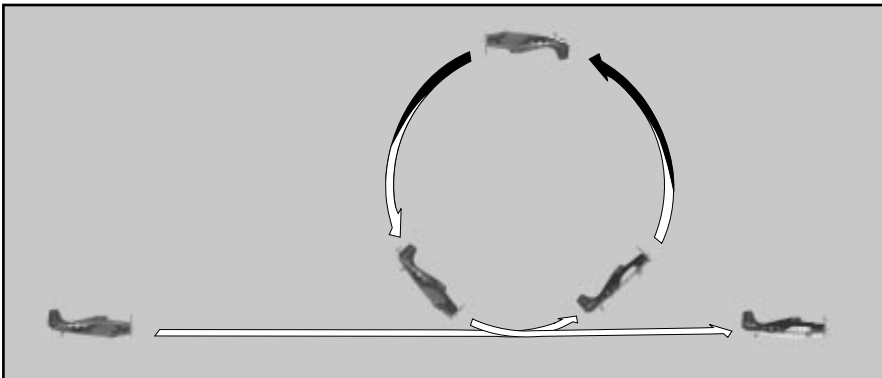
Barrel Roll

LOOP OVER

The loop over is what most people (including roller coaster designers) simply call a loop. A related maneuver, the loop under, is also covered here; thus the slight difference in the name. The loop is, essentially, a way to turn your plane over and end up back where you started. Sometimes it is useful in combat, but its primary importance (as with most basic maneuvers) is as a part of more complex maneuvers.

Make sure you have plenty of airspeed before you try a loop over. If you run out of steam partway through, you will stall and could end up in a spin (which is bad). Pull the stick all the way back and hold it there. If you do start to stall, give it more throttle. During the first half of a loop over, you will lose airspeed dramatically. This makes you an easy target for anyone who foresaw the maneuver. If you do notice someone shooting at you, however, you can easily roll out of the loop and enter a dive, using up some altitude to gain speed. Unfortunately, an enemy who saw the loop coming will probably be ready for the dive, too.

After you reach the top of the loop, you won't need the extra throttle any longer; you'll reclaim almost all of your lost airspeed from gravity during the second half. At the end of the loop, you should return to the same heading and speed you started with. Center (neutralize) the stick for level flight.



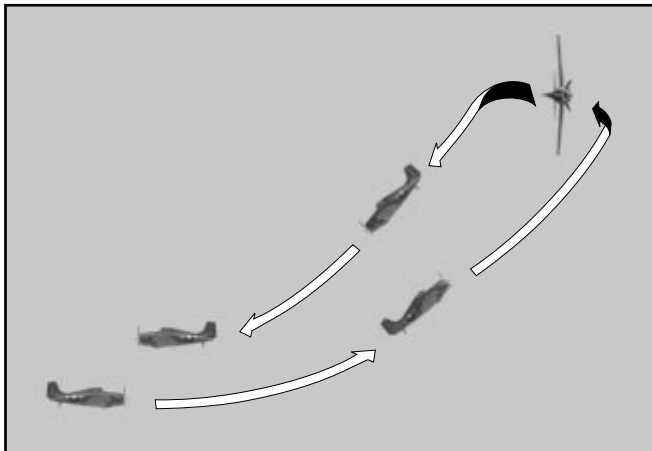
Loop Over

WING OVER

The “wing over” is what was originally called an “Immelmann”; however, there is another Immelmann maneuver now, so this turn has been renamed. A wing over is a handy way of turning around at the end of a strafing run, but is not much use in a dogfight. Since you begin the turn by climbing, thus losing speed, you’d be a sitting duck for any alert opponent. Note that you cannot perform this maneuver unless you use rudder pedals or some other (non-automatic) method of controlling the rudder.

As mentioned, you start a wing over by pulling back on the stick and climbing. The idea here is to gain a little altitude and lose some airspeed. Therefore, do not increase throttle to compensate for the plane slowing down. One of the consequences of the aerodynamics of flight is that rudders are most effective at low speeds.

When you have sufficient altitude to begin another run and your airspeed is in the good range for rudder control, it’s time to turn. Kick the rudder full to either side and neutralize the stick. Your aircraft should do a quick 180-degree turn, exactly like a car doing a J-turn. Push the stick forward and go into your strafing run.



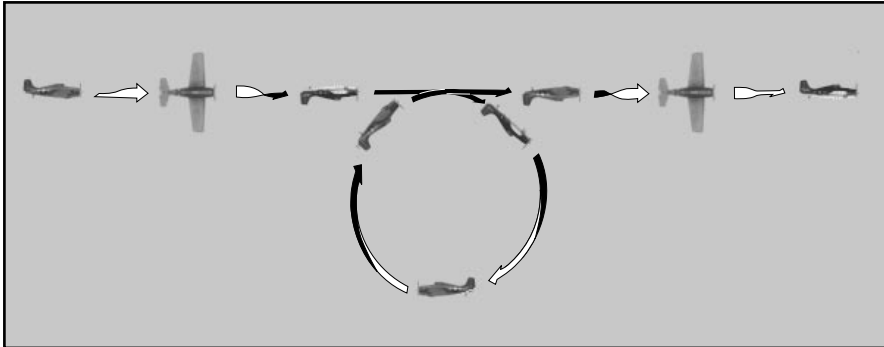
Wing Over

LOOP UNDER

The loop under is essentially a reversed loop over, except that it can be more dangerous. It is also more valuable in combat, since you gain speed quickly early in the loop. The loop under is also used as one step in some more complicated maneuvers.

You don't need to worry about airspeed when you start, but you do have to consider your altitude. If you have less than 5000 feet beneath you, don't bother (unless you want a swimming lesson). Perform half an aileron roll, so that you're inverted. Pull back on the stick and hold it there. During the first half of a loop under, you will gain airspeed quickly. This can be pretty handy when trying to elude an opponent. Do not do anything to slow yourself down, or you may not be able to complete the loop.

After you reach the bottom of the loop, you'll stop accelerating and begin to lose airspeed on the way back up. This is when you become vulnerable to any enemy who sees what you're doing. If it becomes necessary, you can increase throttle to finish faster or simply roll out of the loop. At the end of an uninterrupted loop, you should return to the same heading and speed you started with. Neutralize the stick to return to level flight.



Loop Under

EMERGENCY PROCEDURES

It would be nice to think you'll never need to know any of the emergency procedures outlined in this section, but let's be realistic. You're not flying a kiddie ride at Coney Island – this is a war. Since this information could (and probably will) save your life and our expensive aircraft, you will learn it. Trust me, it's for your own good.

RECOVERING FROM A STALL

A stall isn't really an emergency – unless you don't know how to deal with it. A wrong move during a stall could easily put you into a spin, and if you can't cope with a stall, you sure as hell won't be able to save yourself from a spin.

Your aircraft will stall when it does not have enough lift to balance out the force of gravity. There are lots of ways this can happen, but two are most common. The first is a simple lack of thrust. Since thrust is what keeps the air flowing around the wing, and the airflow generates lift, lack of thrust equals lack of lift. The second is more complex. Whenever your aircraft is climbing, the angle of attack is increased; if you do not have enough forward motion (thrust) to compensate for the loss of lift this causes, the plane could stall. This is the more dangerous type of stall, partly because of its complexity and partly because you were probably climbing for a reason.

If you go into the second type of stall too low, you'd better bail out. Without enough sky under you to safely recover and get out of the resulting dive, you haven't got a chance.

To recover control from the first type of stall, you don't really have to do anything. The nose of the plane will dip when you stall, and you will start to gain speed as you dive. The extra speed should cancel the stall, and you'll regain control of the aircraft. Alternately, you could increase throttle. This is probably the better option, since otherwise you'll just stall again.

The second type of stall is more troublesome. Since you were climbing, your nose is pointed up. The first tendency of the aircraft, then, is to go nose-down and act like a rock. Let it. Neutralize the stick, and you can control the direction in which the nose falls using the rudder. If you're not at too great an angle, you may even be able to get the nose to fall forward, into a standard dive.

Once you're diving, neutralize the rudder and use the stick to straighten out. Pull out of the dive as gently as your altitude and situation allow. Next time, be sure you have enough airspeed for the climb, or use more throttle to avoid stalling.

GETTING OUT OF A SPIN

Spins are potentially the most dangerous situation a pilot can get into. The pilot's handbook for almost every aircraft warns against entering a spin intentionally, since they can be so difficult to escape. Unlike some other ways of "sitting down on the water", a spin will almost never conclude with a survivable belly landing. To survive a spin, you must either get out of the spin or get out of the plane.

If you go into a spin at any altitude below 3000 feet, bail out immediately. You do not have enough maneuvering room to save your plane, so you may as well save your life.

If you feel you have enough room below you, your first action should be to jam the rudder hard (“with a positive motion,” the book says) in the direction opposite the spin. Hold it there. Half a spin later, push the stick full forward, jamming the elevators to full. Do not move the stick to the side under any circumstances; keep it centered. Neutral ailerons are essential to stopping the spin. Do not adjust the throttle at all.

If there is no change in the spin after five turns or so, try something else. Often, if you were going exceptionally fast when you entered the spin, you should allow more time for the recovery. Unless you feel you are getting control, you should bail out when you get too low.

If and when the spin eases and you feel control of the plane returning to you, you will find yourself in a dive. Ease out of it as gently as your altitude and situation allow, so as to avoid going into another spin.

DAMAGE

There is absolutely nothing you can do to repair damage to your aircraft while in flight. The instruments in the cockpit will be your warning when your plane takes damage. Sluggish controls or loss of control of the plane are also reliable signs of damage. Your only recourse is knowing how to cope and how to react.

Remember, once you’re airborne you are in command. If the damage to your aircraft is severe enough that you are having trouble controlling your flight, you have a command decision to make. Use your best judgment as to whether to continue on and attempt to complete your mission. Too much damage will make your mission impossible, and you may need to return prematurely. If the damage is too great, you may even have to bail out in order to save your life (and the lives of your crew). Although there is no loss of face in a necessary retreat, keep in mind that you will be held responsible if you overestimate the damage or react out of cowardice.



This B-17 made it home because the pilot knew what he was doing.

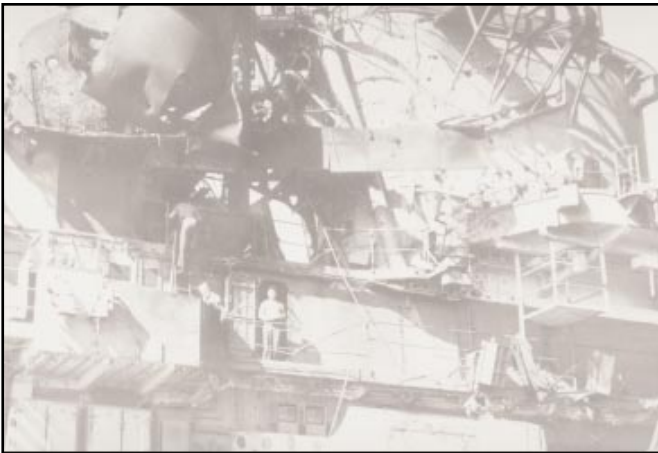
FIRE

If your aircraft is burning, what you do depends on where you are. Generally, the first warning sign of a fire will be the enormous, black billows of smoke coming out of the rear of your aircraft. This means that the aircraft's fire control system has not been sufficient to extinguish the fire. You have only three viable options, and none of them is particularly pleasant.



This is flak; It is very dangerous

If you do not wish to ditch the plane, but you are not in proximity to enemy forces, your best bet is simply to abandon the cockpit. Get your plane as close to level flight as you can manage, then bail out. Remember, you probably don't have too much time before the fire reaches the fuel tanks, so don't dilly-dally. With luck, you will be rescued before starvation, the sharks, the enemy, or a monsoon kills you.



Damage to the USS Ticonderoga, caused by well-aimed Japanese aircraft

You should ditch the plane if you feel there is any chance of you and maybe it being recovered and repaired by friendly forces. This is the correct action if you are near your home base or a friendly ship, but not if you are in the thick of battle over an enemy task force. Do not attempt to land a burning aircraft on a friendly runway. You will be held responsible for any and all damage caused by your foolishness. Note that safely ditching a burning plane is extraordinarily difficult; most pilots will not attempt such a maneuver unless they are suicidal.

The last and, admittedly, the most dangerous option is to use your flaming aircraft as an offensive projectile. If you find yourself aflame in the midst of enemy forces, your chances of survival are pretty slim, anyway. Put yourself into an uncontrolled nose dive, aimed directly at the nearest enemy vessel. When you feel that your aim is true and your aircraft cannot possibly miss the target, you have the option of bailing out. That is entirely up to you. If you do manage to bail out and survive, there is a tiny hope that you will be retrieved by friendly forces. If you are taken prisoner, do not worry. We're pretty sure all the propaganda about captured pilots being tortured to death is untrue.

BAILING OUT

Bailing out is a simple, last-ditch attempt to save your life after you've fouled up in combat. (This is giving you the benefit of the doubt by assuming that your plane was damaged in combat with the enemy, not by your carelessness.) What you do is abandon the aircraft and parachute to the surface.

If you land in the sea, your life raft will inflate automatically, and you will survive for quite some time on the rations and water included with the raft. If you land on an island, your best hope is that you might be spotted and rescued by a friendly ship passing nearby. Remember that any island may be occupied by friendly forces, the enemy, or vicious headhunting natives.

One last bit of advice. Headquarters wants to assure you that helpless, parachuting pilots are not considered viable targets. None of the reports of the enemy shooting down defenseless pilots and their parachutes has been confirmed. You know how these rumors spread.

If you understand everything in the **Simple Maneuvers** section, then you're well on your way to becoming a useful pilot. Useful to the Navy, that is. At this point, you could probably survive for a few seconds against an experienced opponent.

Now, you're going to learn a few things that will help you turn that survival time into a chance to perforate the enemy's plane. After all, that's really the whole idea here, isn't it? Note that the potential uses of the techniques described here are only suggestions; any maneuver is as versatile as the pilot who undertakes to learn it.

APPROACH

As soon as you identify an aircraft as belonging to the enemy, the conflict has begun. Even though neither of you can effectively fire on the other yet, one of the keys to aerial combat is the balance of advantage and disadvantage in approach positions.

The first and most important consideration is **Awareness**. Clearly, you are aware of the existence, the position, and the approximate speed of the other plane. Depending on the angle at which you are approaching, he may not know you are there. (The converse is also true; if you suddenly see tracers cross your line of flight from behind, someone has gained a serious awareness advantage over you.) You can usually tell by the other pilot's action – or inaction – whether or not he has spotted you.

The next thing to consider is **Altitude**. Whichever aircraft is flying at a greater altitude has a distinct tactical and energy advantage. However, approaching most bombers from above is a mistake, as their tail guns are designed to protect from exactly that type of threat.

Speed is another vital consideration. The faster plane, like the higher one, has an energy advantage. More speed means more climbing ability and outrunning potential. Remember, though, that the slower plane is better able to maneuver (to a point) when it comes to rudder effects and tight turns. The faster aircraft may also be lured into overshooting, thus becoming a rather easy target.

ADVANCED FLIGHT

The **Deflection** at which the attacking aircraft approaches is also critical. A pilot gets his best shot (most likely to do damage) when he fires along the flight path of the other plane. Otherwise, the uncertainty factor of leading the enemy comes into the picture. Deflection is measured by the angle the attacker's path makes with the path of the target. The greater the deflection, the less likely the shot will hit.

All told, the more advantages you have (or can create for yourself) before you start the fight, the more likely you are to be the victor. Putting those advantages to good use, however, is a matter of pilot skill and experience.

DOGFIGHT VS HIT AND RUN

The differences between the two basic types of aerial fighting are analogous to the contrasts between boxing and wrestling. A pilot with an advantaged approach often has the power to decide what kind of fight it's going to be, but a fast, maneuverable aircraft with an experienced pilot can force the fight to go the other way.

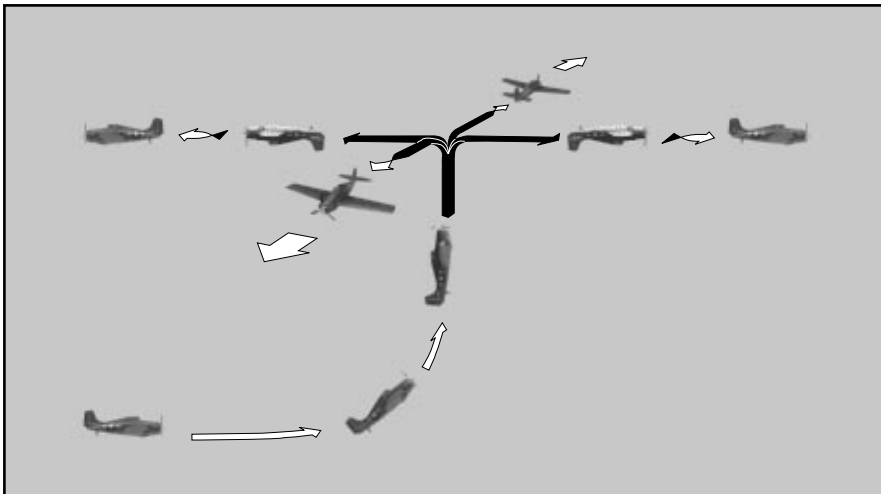
When most people say 'dogfight', they mean any midair conflict between aircraft. For simplicity, that's a good definition, but a pilot has to know better. A dogfight develops when two or more planes close with one another, getting into a close-quarters duel of maneuverability (usually a one- or two-circle fight). Obviously, if your aircraft is significantly less maneuverable than your opponent's, you will want to avoid this kind of close-contact fighting.

The other option here is an open conflict, which is sometimes called a 'hit-and-run' fight. In this type of aerial combat, the aircraft involved make repeated strafing passes ("slashing" attacks) at each other, depending on firepower, strategy, and endurance to win the day. This sort of battle emphasizes the advantages of altitude, speed, and situational awareness (knowing what's going on around you). Of course, if you know your plane isn't as tough or as hard-hitting as your enemy's, you should avoid hit and run and try to engage him in a dogfight.

IMMELMANN

The modern Immelmann is a time-honored method of gaining altitude and (potentially) changing direction. It is a combat maneuver, but not one that you want to use when an enemy is on your six. At the beginning of the Immelmann, you lose speed and become vulnerable to attack. For this reason, you should only use this particular tactic when there's no immediate threat. The modern Immelmann is best used after a nose-to-nose pass, to turn for the next pass and gain altitude for an advantaged position.

It is important that you have enough airspeed; the Immelmann is a lot like a Loop Over. To start, pull back on the stick as if you are performing a loop. When you are exactly vertical (pointed straight up), you are at the decision point of the maneuver. This is where split-second thinking and reactions come in handy. If you're on the ball, you can roll your aircraft without losing your sense of position. Whatever direction the top of your head is pointing in when you leave the decision point is the direction your plane will take when you finish the maneuver.

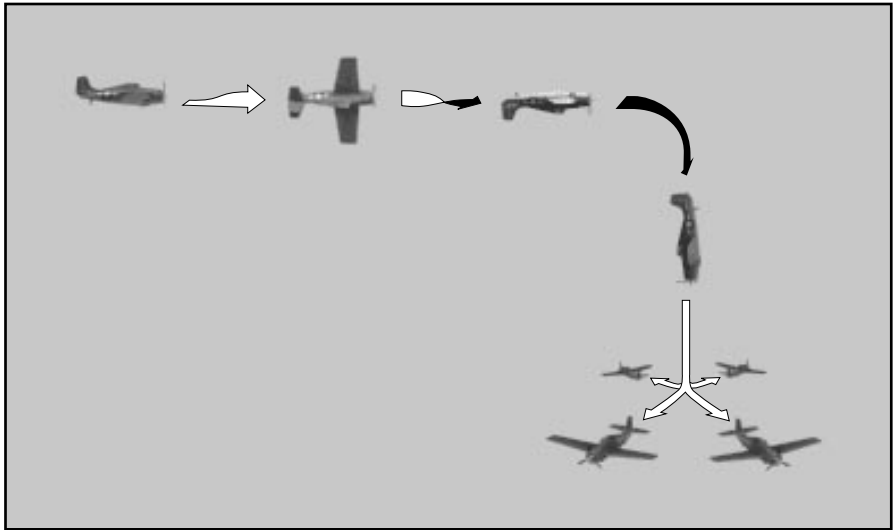


Modern Immelmann

After the roll, which should take place almost instantly, continue the loop until you reach the top. At this point, neutralize (center) the stick. Note that you are, in fact, moving in the direction that you chose at the decision point, though you are inverted. Roll the aircraft over. You have gained altitude and changed direction, though now your speed is significantly lower. If your opponent remained at the original level, you now have an altitude advantage and he doesn't yet know what direction you're going in.

SPLIT-S

The Split-S is really a vertically-reversed Immelmann, but nobody calls it that. It's a great way to drop a lot of altitude, gain speed, and change direction. This maneuver is often useful for escaping an opponent who is just about to shoot you down. Not only is it nearly impossible for your opponent to guess what direction you're turning to – making it difficult for him to follow you – but your new airspeed should give you more than enough juice to run away and end the dogfight.



Split-S

In this case, airspeed is not important; you'll be getting plenty right from the start. To begin, invert the aircraft and pull back on the stick as if you are performing a Loop Under. When you are exactly vertical (pointed straight down), you are at the decision point of the maneuver. This is where split-second thinking and reactions come in handy. If you're on the ball, you can roll your aircraft without losing your sense of position. Whatever direction the top of your head is pointing in when you leave the decision point is the direction your plane will take when you finish the maneuver.

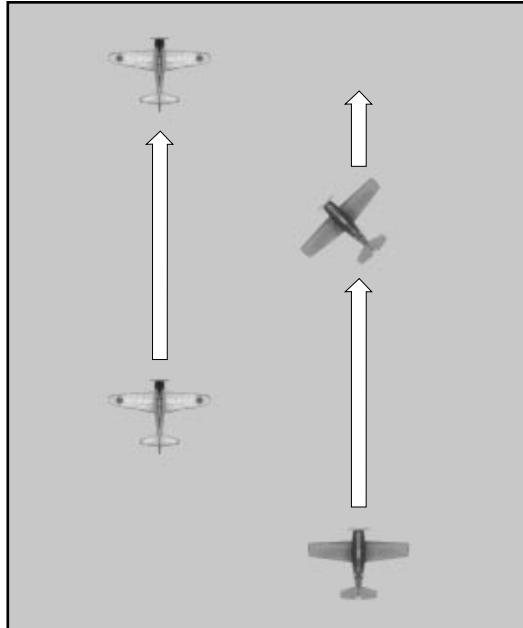
After the roll, which you'd better finish quickly, continue the loop until you reach the bottom. At this point, neutralize (center) the stick. Note that you are, in fact, moving in the direction that you chose at the decision point. You have lost altitude, changed direction, and significantly raised your airspeed. If your opponent remained at the original level, he now has an altitude advantage, but he doesn't yet know what direction you're going in.

INTENTIONAL STALL

Despite what you may have read, heard, or seen, there is absolutely no reason to stall the aircraft intentionally unless you are performing in an airshow. In combat, this will get you killed – period.

SKID

Skidding is a rudder maneuver you can use offensively, but it takes some practice. Sometimes, you're behind an opponent (at about the same altitude), but not at the right angle to take a shot at him. He knows it, and he's flying straight, counting on it. You're both moving at below top speed. If you bank toward him, you'll get a short shot, but then you'll be past and he'll be on your tail. What you need to do is swing the nose of the plane around without changing the direction of your motion. Can do!

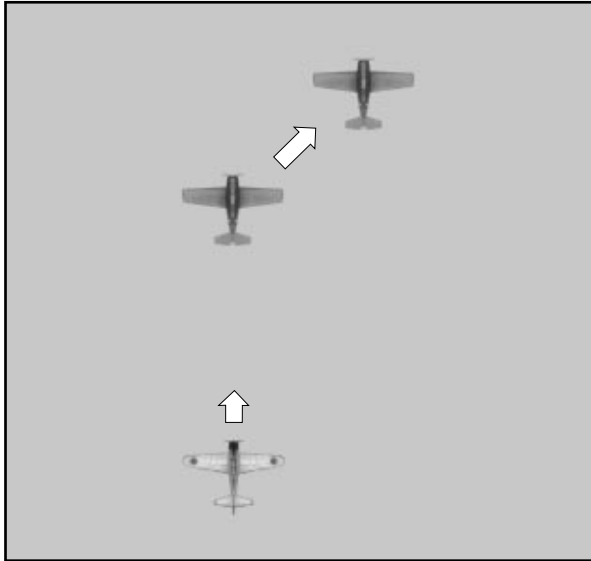


Skidding the Shot In

Jam the rudder in the direction of your enemy (that is, rudder left if he's on your left, rudder right if he's to your right). If your speed is right (in the range for good ruder control), the nose will drag itself over until you have a clear shot. Bam! What a surprise he's going to get!

SLIP

Slipping is another simple rudder maneuver, though you need to use the ailerons in this one, too. Its primary use is for momentarily dodging out of the line of fire of an opponent who has gotten the drop on you. You could probably also use it in place of a skid, to slide in behind the enemy plane.

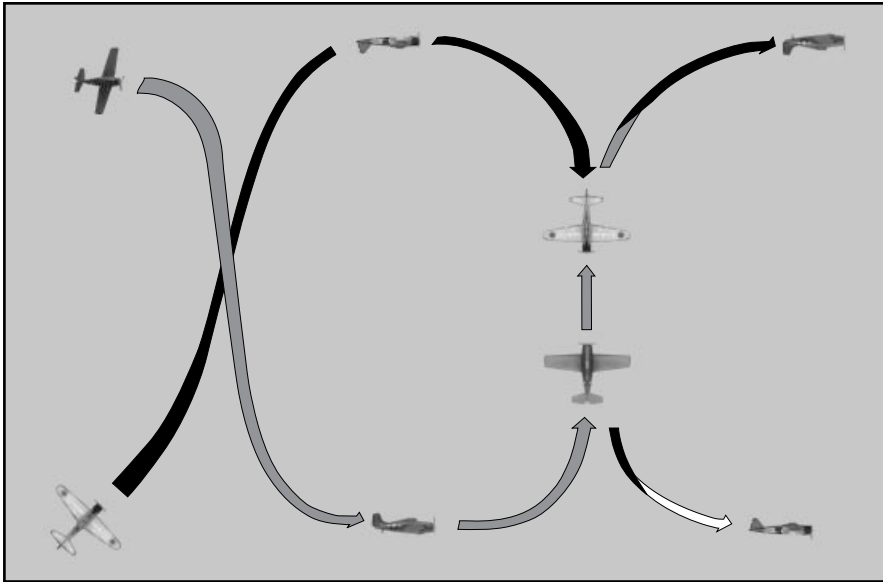


Slipping Out

Rudder hard in either direction, while at the same time banking in the opposite direction. This is a lot like compensating for a normal bank, but you want to use more rudder. The key here is that the two forces cancel each other as concerns roll; the plane should remain level. Level or not, your aircraft will “slide” to the side you banked toward. This is as close as you’ll get to flying sideways. Once your enemy catches on, he’ll slip, too, to catch you. You can repeatedly slip back and forth, thereby eluding him for quite some time. (Maybe help will come, maybe he’ll make a mistake and you can escape.)

SCISSORS

The Scissors is a basic dogfighting technique. Two planes travelling in roughly the same direction cannot easily line up for head-to-head passes. Rather, they engage in a criss-crossing pattern of banked turns, each trying to out-turn the other and shoot first. Since lower airspeeds lead to tighter turns, the scissors is sometimes called the “race to go slow”.



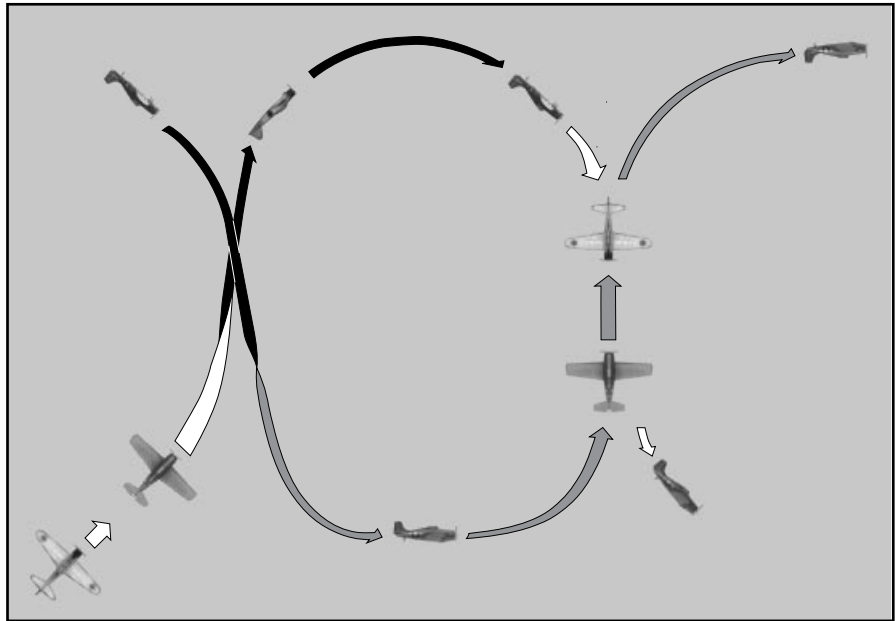
Scissors Fight

The scissors is really just a series of banked turns, as tight as they can get. Whenever the opponents can get a clear shot on each other, they blast away for all they're worth. Firepower counts in this sort of fight, but maneuverability is more vital. A Zero will almost always defeat a Wildcat or even a Hellcat in a standard scissors.

THACH WEAVE

The Thach weave (no, it's not misspelled – it's named after Lt. Cmdr. John F. "Jimmy" Thach, in command of squadron VF-3 out of San Diego in 1941) is an American tactic developed by fighter pilots for defeating the Zero. If an American fighter got trapped in a one-on-one dogfight with a Zero, the Japanese aircraft had a big advantage. Sticking to hit and run tactics helped, but with the Zeke's extraordinary climb and maneuverability, the IJN pilot could usually draw the hapless American into a close-quarters fight.

During one particular air battle (so the legend goes), Thach had an inspiration. When a Zero got behind another American fighter, Thach radioed to the doomed pilot to fly as though he was in a scissors fight with Thach. When they came around head-to-head, the unwary Japanese pilot followed and ran right into the concentrated fire of Thach's wing guns. No Zero in the sky could hold up to this sort of fire for long, and there was no escape. Either the Japanese pilot continued to follow his target, hoping to survive long enough to get one kill, or he broke off to run, exposing himself to fire from both his opponents.



Thach Weave

The key to the Thach Weave is teamwork. Once an enemy gets behind one of your compatriots, you've got to start the weave pretty quickly. The fighter pilot who's acting as "bait" has to know his stuff, too. He needs to survive long enough (with the enemy right on his tail) for the "hook" pilot to get in and do his job. Executed correctly, the Thach Weave is a deadly trap with no real hope of escape.

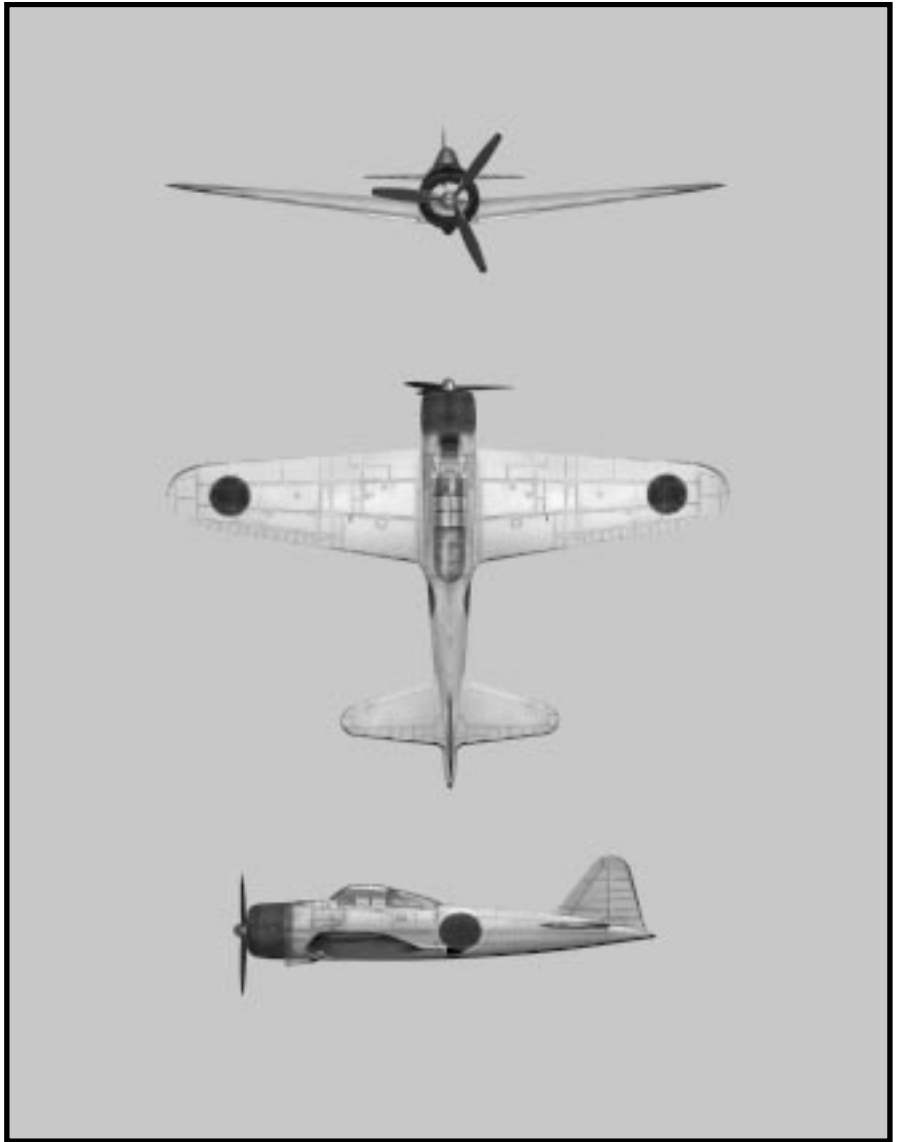


THE COCKPITS

The following pages contain identification diagrams and important information concerning the enemy's aircraft and all of the planes you might end up piloting. The American Armed Forces' official designation names have been included for ease of reference.

Those familiar with combat flying will want to review the vital statistics of the aircraft they could be running into (or piloting). They know that there's a reason these numbers are called 'vital' statistics. You won't flunk out of flight school for not knowing the Reisen Zeros' hidden weak points, but you might flunk out of combat – permanently.

Some of our experienced combat and test pilots have written down a few of their thoughts on each plane. Where these were printable, they are included at the end of the statistics list.



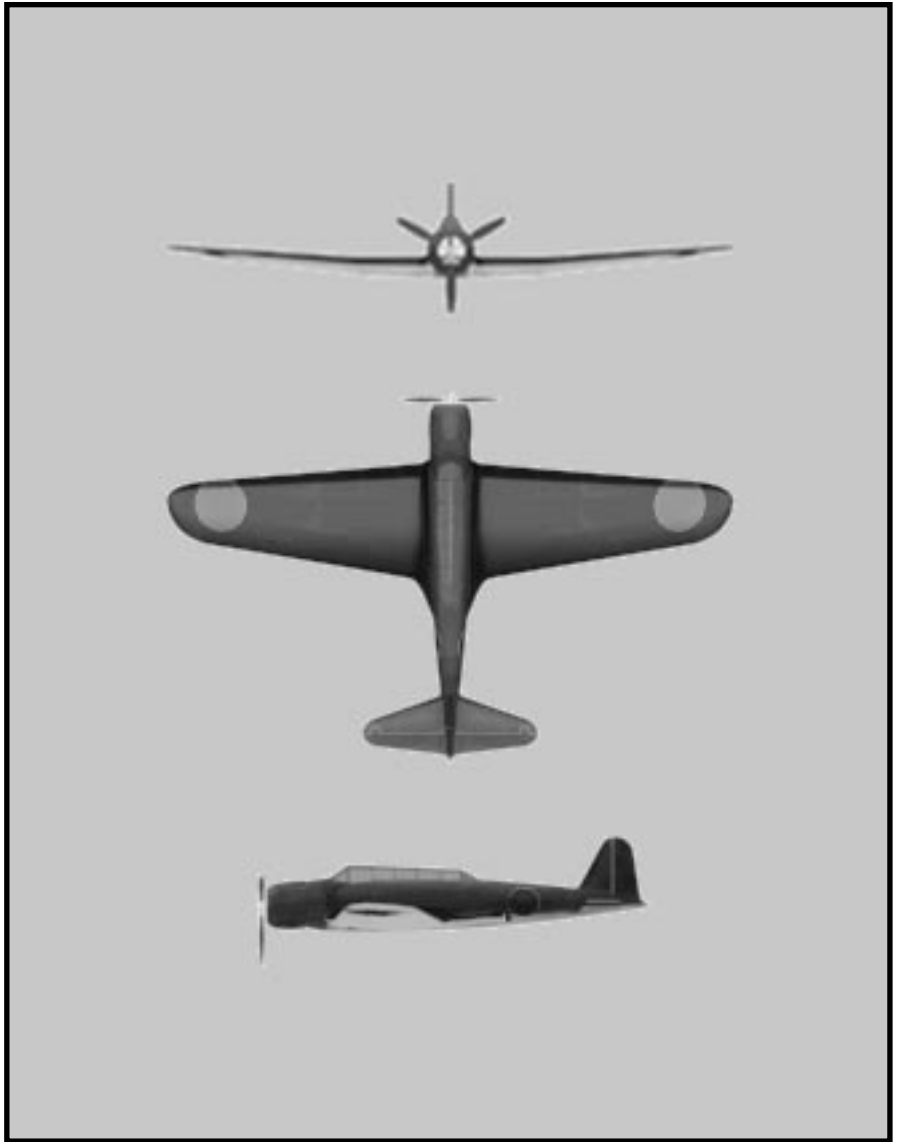
“ZEKE” - THE MITSUBISHI A6M2 AND A6M5 REISEN

Class:	Type 0 Carrier-borne Fighter Model 52	
Stations:	Pilot	
Weapons:	[Fixed]	2 Cowl-mounted 7.7 mm Machine Guns 2 Wing-mounted 20 mm Cannon
Ammunition:	[Payload]	2-132 lb. Bombs
	[MGs]	600 rd/gun
	[Cannon]	100 rd/gun
Firing Rate:	[MGs]	950-1000 rd/min (approx. 37 seconds of fire)
	[Cannon]	465-480 rd/min (approx. 13 seconds of fire)
Span:	39' 5" (M2) – 36' 1" (M5)	
Length:	29' 9" (M2) – 29' 11" (M5)	
Wing Area:	22.44 sq. meters (M2) – 21.3 sq. meters (M5)	
Engine:	Nakajima Sakae NK1F (21) (Radial)	
Max HPwr:	950 (M2) – 1130 (M5)	
Ceiling:	32,810 ft (M2) – 38,520 ft (M5)	
Cruise Speed:	180 kts (M2) – 200 kts (M5)	
Max. Spd:	288 kts (M2) – 305 kts (M5)	
Stall Spd:	71 kts (M2) – 73 kts (M5) [Level Flight]	
Std Fuel:	156 gal	
Max Fuel:	250 gal	

Pilots' Notes: The fuel tanks on the Reisen (“Zeke” or “Zero”) are completely unprotected and are not self-sealing. As fighters go, these are sleek, fragile machines. The lack of armor is counterbalanced, however, by the Reisen’s excellent maneuverability and climb rate.

Stalls are gentle in the Reisen. A good landing speed is about 65 knots (make sure to use your flaps, otherwise you’ll stall). If you come up against a Corsair, try to close with him, don’t let him have the initiative.

All of the guns on the Reisen have a slower firing rate than the American machine guns, and so will get the worst of any nose-to-nose approach. Dogfighting close with the Wildcats is the preferred strategy. The Hellcats will try hit and run tactics; do not allow them to stand off at a distance, as they are quite deadly.



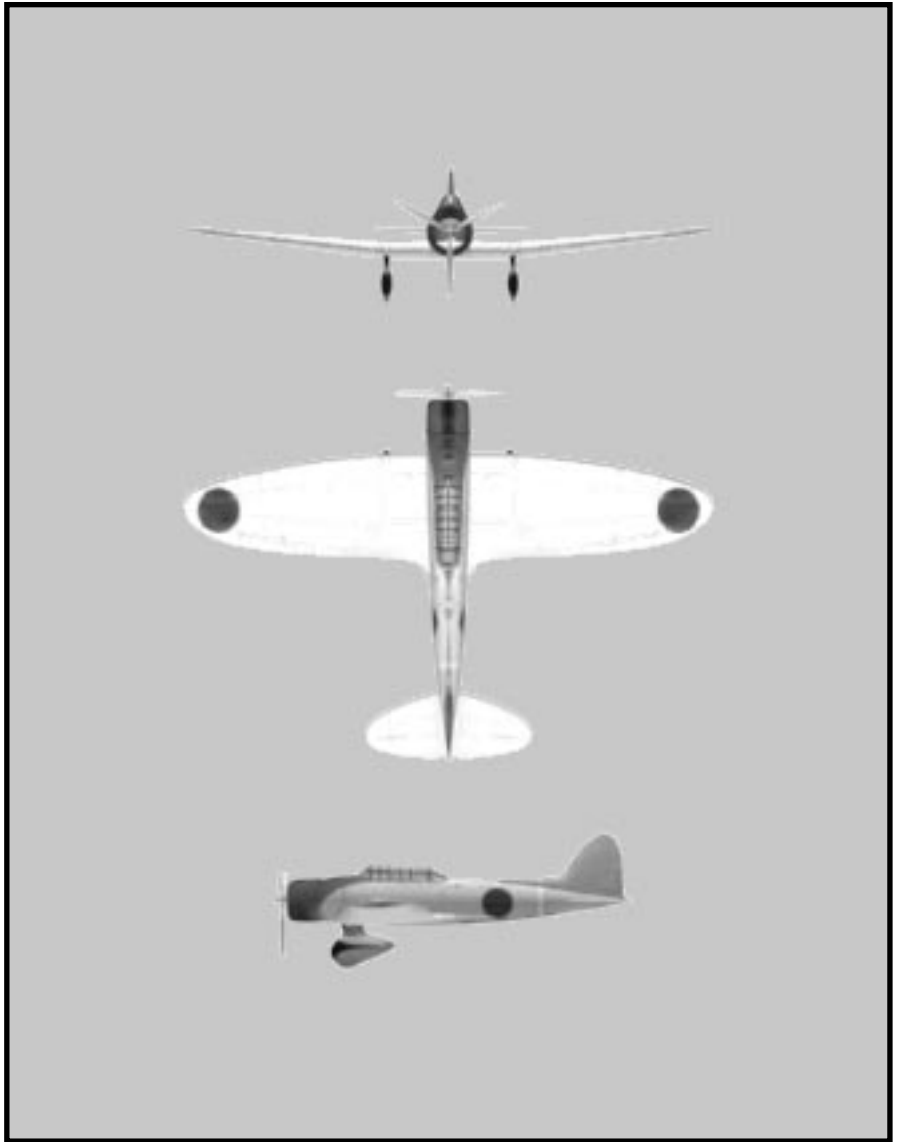
“KATE” - THE NAKAJIMA B5N

Class: Type 97 Carrier-borne Attack Plane Model 12 (Torpedo bomber)
Stations: Pilot, Rear Gunner
Weapons: [Fixed] 1 or 2 Rear-mounted 7.7 mm Machine Guns
[Payload] 1 Torpedo -or- 1800 lbs of Bombs
Ammunition: 1200 rd/gun
Firing Rate: 950-1000 rd/min (approx. 74 seconds of fire)

Span: 52' 5"
Length: 33' 9"
Wing Area: 37.7 sq. meters
Engine: Nakajima Sakae 11 (Radial)
Max HPwr: 1000
Ceiling: 27,100 ft

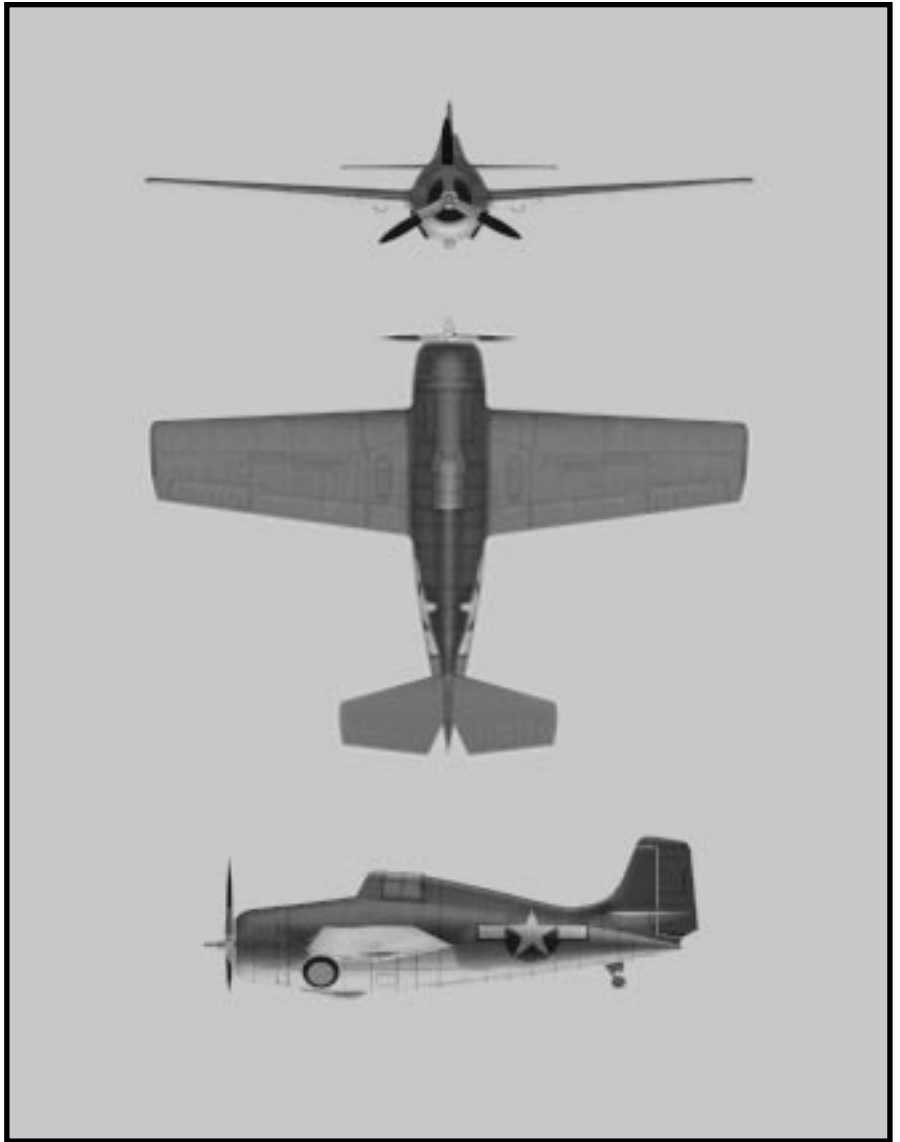
Cruise Speed: 140 kts
Max. Spd: 204 kts
Stall Spd: 66 kts [Level Flight]
Std Fuel: 306 gal
Max Fuel: 306 gal

Pilots' Notes: The Kate is quite a stable platform for torpedo bombing. The maneuverability is adequate, but certainly no match for a fighter in a one-on-one fight. The stall on the Kate is easily handled and not at all dramatic. This plane can take more punishment than a Reisen, but a successful run requires fighter cover.



“VAL” - THE AICHI D3A

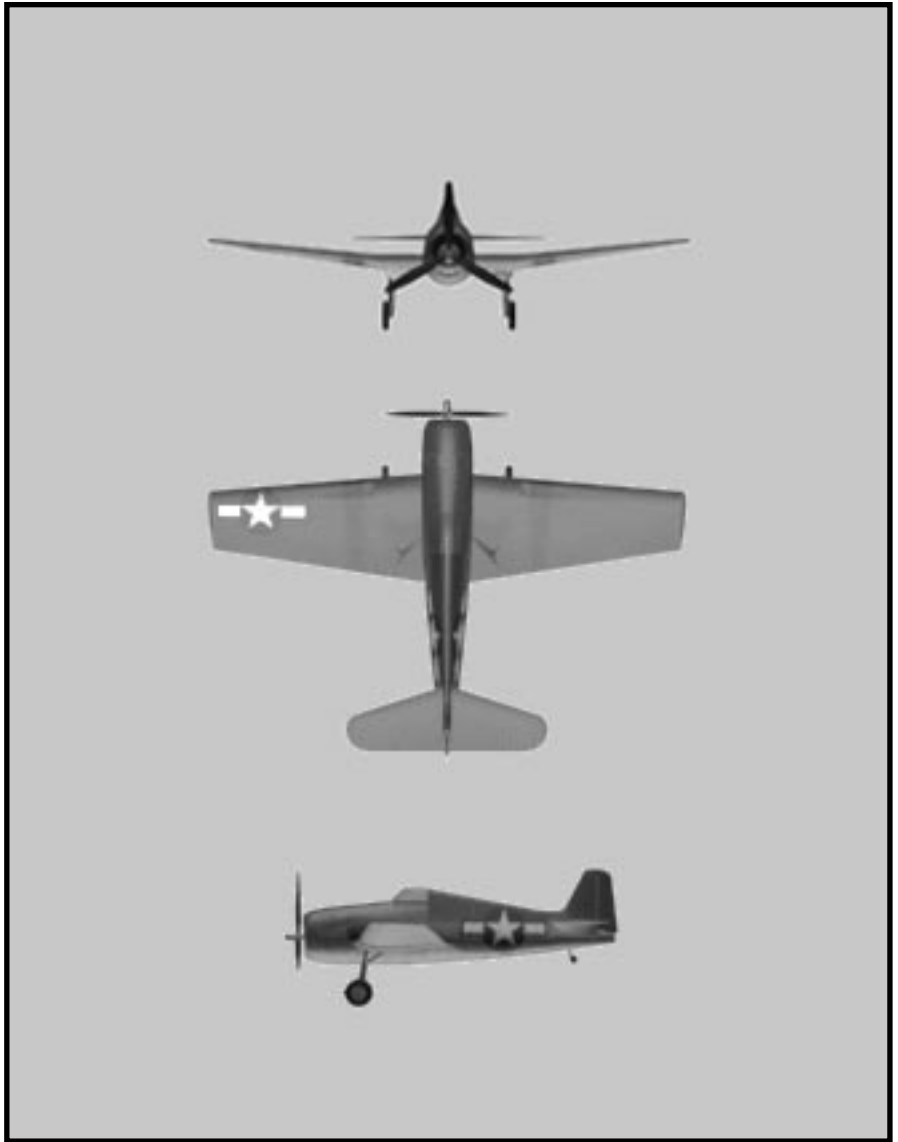
Class:	Type 99 Carrier-borne Bomber Model 22 (Dive Bomber)	
Stations:	Pilot, Rear Gunner	
Weapons:	[Fixed]	2 Cowl-mounted 7.7 mm Machine Guns 1 or 2 Rear mounted 7.7 mm Machine Guns
	[Payload]	850 lbs. of Bombs
Ammunition:	[Cowl]	400 rd/gun
	[Rear]	1200 rd/gun
Firing Rate:	[Cowl]	950-1000 rd/min (approx. 25 seconds of fire)
	[Rear]	950-1000 rd/min (approx. 74 seconds of fire)
Span:	47' 8"	
Length:	34' 9"	
Wing Area:	34.9 sq. meters	
Engine:	Mitsubishi Kinsei 54 (Radial)	
Max HPwr:	1300	
Ceiling:	34,450 ft	
Cruise Speed:	160 kts	
Max. Spd:	232 kts	
Stall Spd:	67 kts [Level Flight]	
Std Fuel:	206 gal	
Max Fuel:	206 gal	
Pilots' Notes:	The Val has good handling characteristics, especially in a dive. The maneuverability is fair (better than the Dauntless), and the dives are quite steady. The maximum dive angle is, however, slightly shallower than that of the American bomber. Fixed landing gear and strong dive brakes make this bomber slow to accelerate, which is good for your aim in a steep dive.	



“WILDCAT” - THE GRUMMAN F4F-3 AND F4F-4

Class:	Fighter
Stations:	Pilot
Weapons:	[Fixed] 4 (F4F-3) or 6 (F4F-4) Wing-mounted .50 caliber Machine Guns [Payload] 2-100 lb. Bombs
Ammunition:	[F4F-3] 430 rd/gun [F4F-4] 240 rd/gun
Firing Rate:	750 rd/min (approx. 34 [F4F-3] and 19 [F4F-4] seconds of fire)
Span:	38'
Length:	28' 9"
Wing Area:	24.15 sq. meters
Engine:	Pratt and Whitney R-1830-86 (Radial)
Max HPwr:	1200
Ceiling:	34,000 ft
Cruise Speed:	140 kts
Max. Spd:	276 kts
Stall Spd:	77 kts (F4F-3) – 79 kts (F4F-4) [Level Flight]
Std Fuel:	117 gal (w/liner) -or- 130 gal (w/out liner)
Max Fuel:	246 gal
Pilots' Notes:	The F4F is a squat, ugly, tough bird. It's not as maneuverable as the Zeros, but it can take a lot more punishment. She's got some heavy firepower, too. Even with the right pilot behind the stick, though, a Wildcat is often not a match for a Zero. Take them on in teams only, never one-on-one.

The short take-off distance and strong gear make the Wildcat perfectly suited for carrier based operations. Be careful not to over-throttle on take-off, or you can lose steering and dump over the side. Her flying stability is pretty good, and the roll rate is fast.



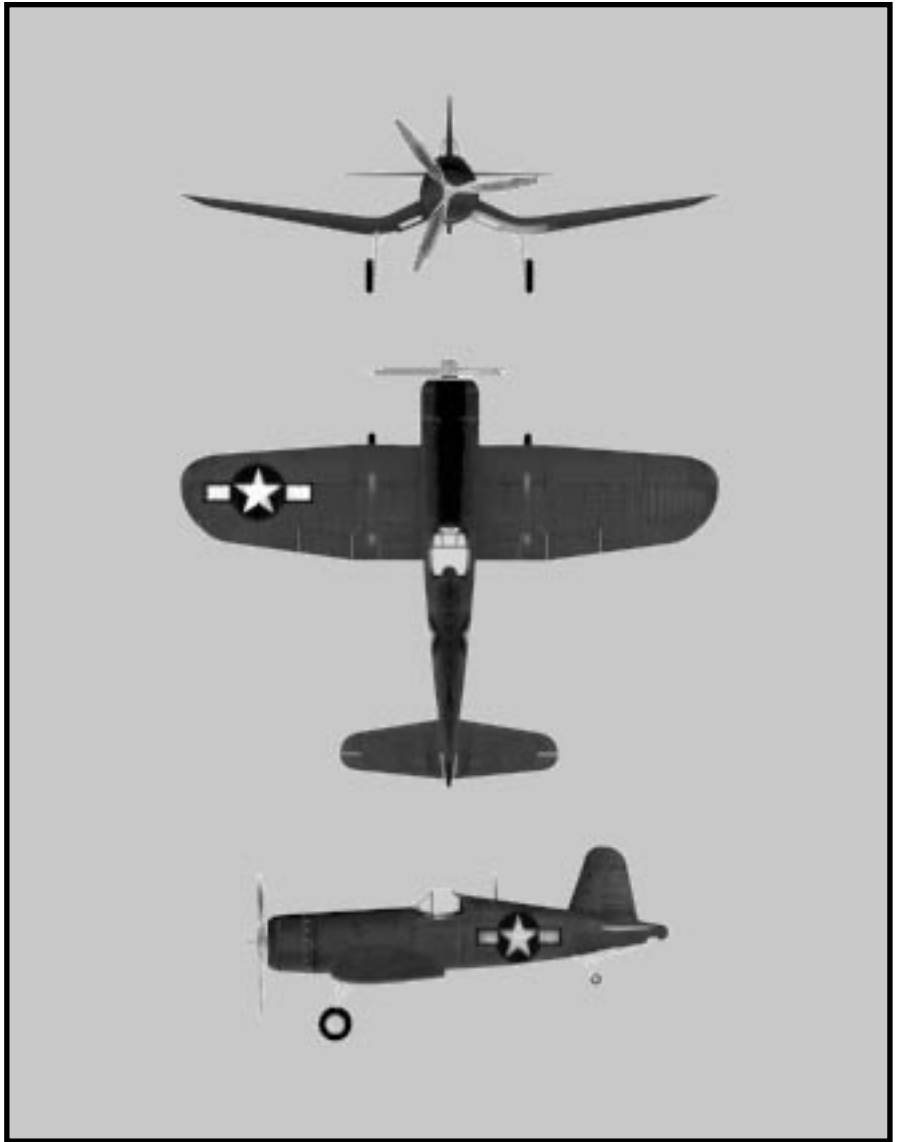
“HELLCAT” - THE GRUMMAN F6F-3

Class:	Fighter	
Stations:	Pilot	
Weapons:	[Fixed]	6 Wing-mounted .50 caliber Machine Guns
	[Payload]	2-500 lb. Bombs
		6-5” Rockets
Ammunition:	400 rd/gun	
Firing Rate:	750 rd/min (approx. 32 seconds of fire)	
Span:	42’ 10”	
Length:	33’ 6”	
Wing Area:	31.03 sq. meters	
Engine:	Pratt and Whitney R-2800-10W (Radial)	
Max HPwr:	2000	
Ceiling:	35,500 ft	
Cruise Speed:	155 kts	
Max. Spd:	326 kts	
Stall Spd:	84 kts [Level Flight]	
Std Fuel:	250 gal	
Max Fuel:	700 gal	

Pilots’ Notes: The Hellcat was specifically built to outmatch the Zekes. Grumman designed this fighter to take advantage of every known weakness of the Zeros. It’s faster and more maneuverable than the Wildcat, but without sacrificing any of the armor. The F6F’s extra firepower should be more than enough to bring a quick end to any duel.

It’s not pretty, but it turned the war in the Pacific around. Watch for sluggishness above 32,000 ft, and the controls get heavy at high speeds – not nearly as bad as in the Zero, though. Stalls happen suddenly, without much warning, but the Hellcat recovers easily. She’s rock-steady in a deck landing, but the heavy nose tends to drop as you’re coming in.

Never get lured into a close-in dogfight with a Zero; use repeated hit and run passes until you drop him.



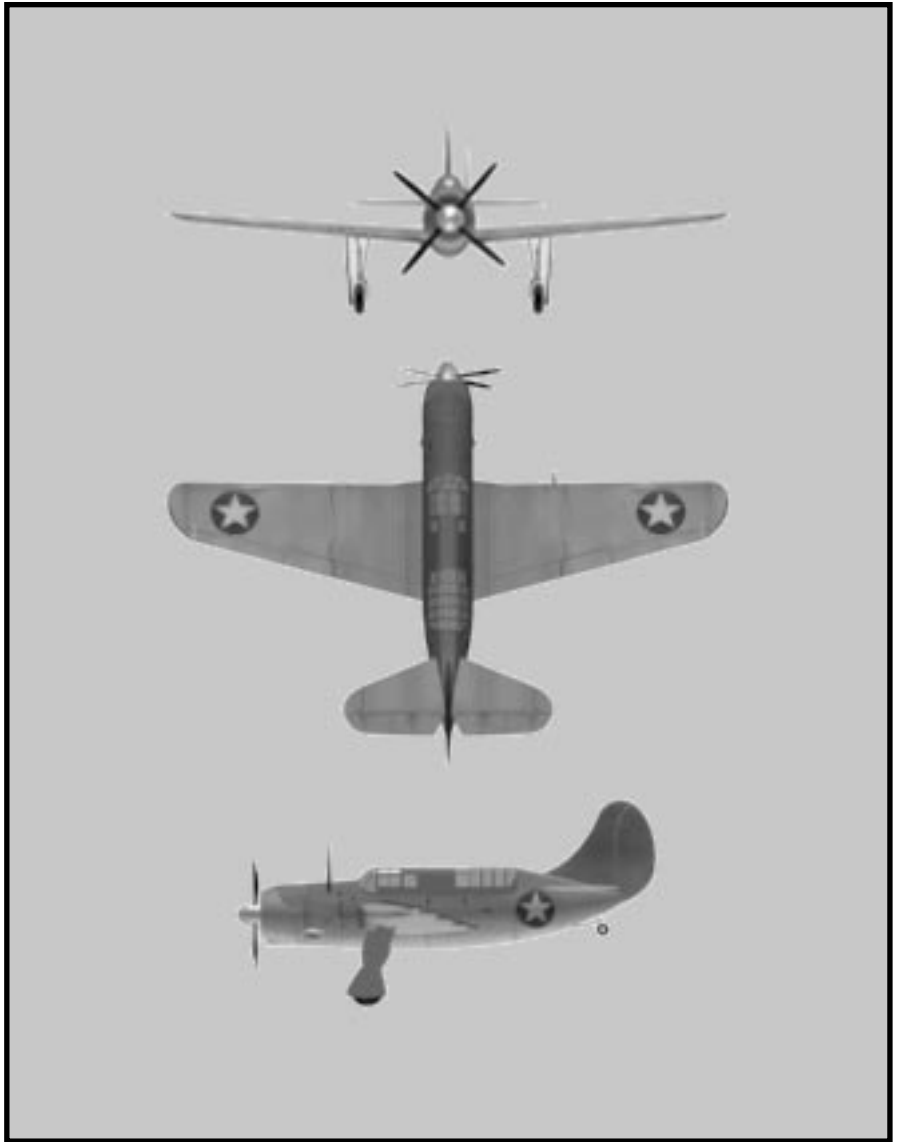
“CORSAIR” - THE CHANCE VOUGHT F4U

Class:	Fighter	
Stations:	Pilot	
Weapons:	[Fixed]	6 Wing-mounted .50 caliber Machine Guns
	[Payload]	1000 lbs. of Bombs 8-5” Rockets
Ammunition:	[4 Inboard]	400 rd/gun
	[2 Outboard]	375 rd/gun
Firing Rate:	750 rd/min (approx. 32 seconds of fire)	
Span:	40’ 11”	
Length:	30’ 8”	
Wing Area:	29.17 sq. meters	
Engine:	Pratt and Whitney Double Wasp R-2800-18W (Radial)	
Max HPwr:	2000	
Ceiling:	36,900 ft	
Cruise Speed:	218 kts	
Max. Spd:	360 kts	
Stall Spd:	88 kts [Level Flight]	
Std Fuel:	237 gal	
Max Fuel:	577 gal	

Pilots’ Notes: The Corsair is a forced marriage – the smallest airframe that can accommodate what was the most powerful radial engine in development at the time it was designed. It’s got great acceleration, but it’s heavy, so you won’t get the kind of climb rate you might expect. That engine gives out with some mighty torque, too, which is why the Navy avoids putting Corsairs on carriers. The difficulty of deck landings earned this plane its nickname – “The Ensign Eliminator”.

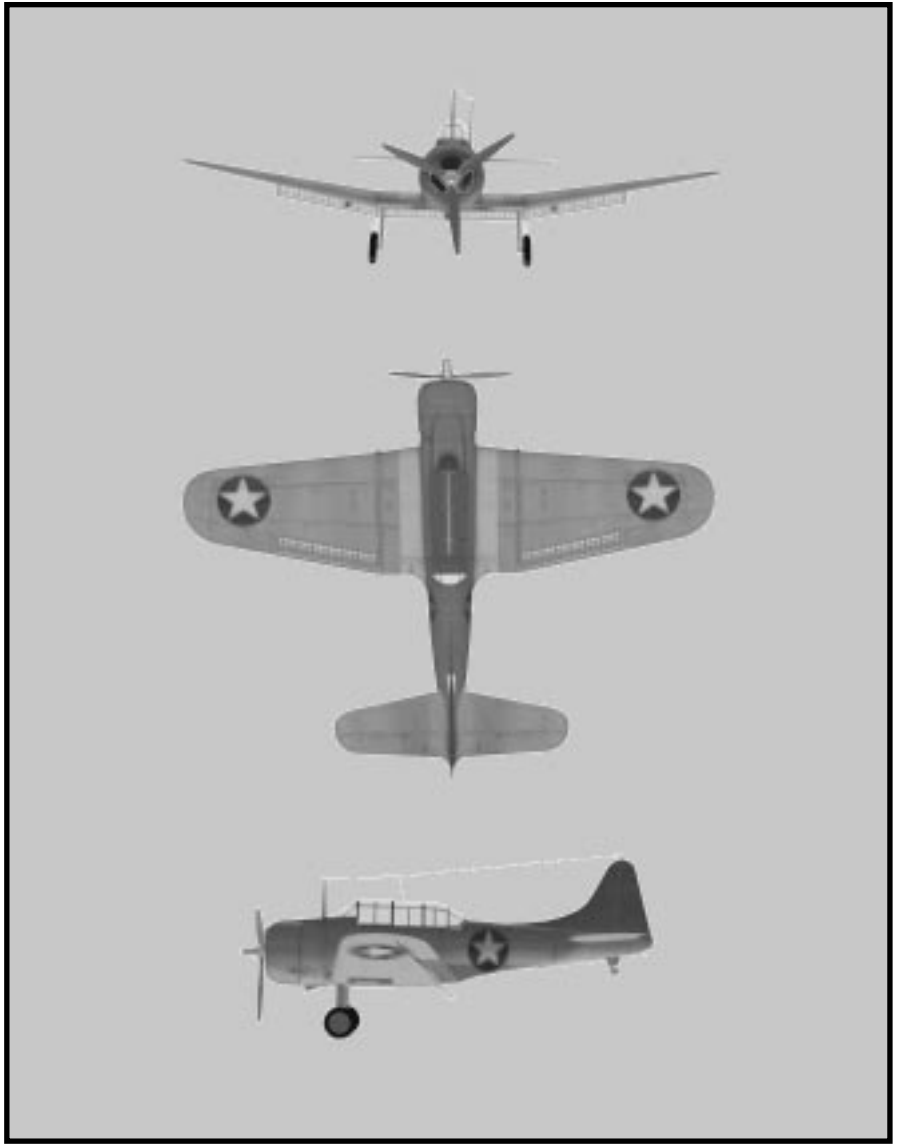
The cockpit on the Corsair is set further back than most, so your view ahead is pretty poor except when looking up. The controls are not really superbly balanced, either. The handbook recommends that you not stay inverted for more than 3 seconds, and so do I. When this baby stalls, you won’t get any warning. It stalls rough, and it puts you right into a spin.

The maneuverability is mediocre, especially at low speeds, but her roll rate is great. Corsairs are tough and hard to kill, and they’ve got the firepower you want up there. Just treat it like a Hellcat; don’t close with a Zero, pull hit and run passes.



“HELLDIVER” - THE CURTISS SB2

Class:	Dive Bomber	
Stations:	Pilot, Rear Gunner	
Weapons:	[Fixed]	2 Wing-mounted 20 mm Cannon 2 Rear-mounted .30 caliber Machine Guns
	[Payload]	2000 lbs. of Bombs 6-5” Rockets
Ammunition:	[MGs]	2000 rd/gun
	[Cannon]	400 rd/gun
Firing Rate:	[MGs]	825 rd/min (approx. 145 seconds of fire)
	[Cannon]	450 rd/min (approx. 53 seconds of fire)
Span:	49’ 8.6”	
Length:	36’ 8”	
Wing Area:	39.2 sq. meters	
Engine:	Wright Cyclone GR-2600-8	
Max HPwr:	1700	
Ceiling:	24,200 ft	
Cruise Speed:	137 kts	
Max. Spd:	244 kts	
Stall Spd:	77 kts [Level Flight]	
Std Fuel:	320 gal	
Max Fuel:	566 gal	
Pilots’ Notes:	<p>”Beast” is the right name for this bomber. Helldivers are plagued with handling problems. It’s often unstable, the elevators are heavy, and your forward vision is pretty poor, especially during take-off. It’s really not much better, in terms of performance, than the Dauntless, which it was designed to replace.</p> <p>The Helldiver has a reputation among pilots as being hard to handle. That’s true, it is, but it’s a serviceable bomber. The Beast is very mild in a stall, though there’s really no warning of a stall ahead of time. It’s pretty stable in a dive, especially without the dive brakes. When you’re coming in for a landing, the heavy nose wants to drop, and most of the controls handle pretty poorly at low speeds. The one clear exception is the rudder. The gear never bounces, but I wouldn’t want to land one of these on a carrier deck too often.</p>	

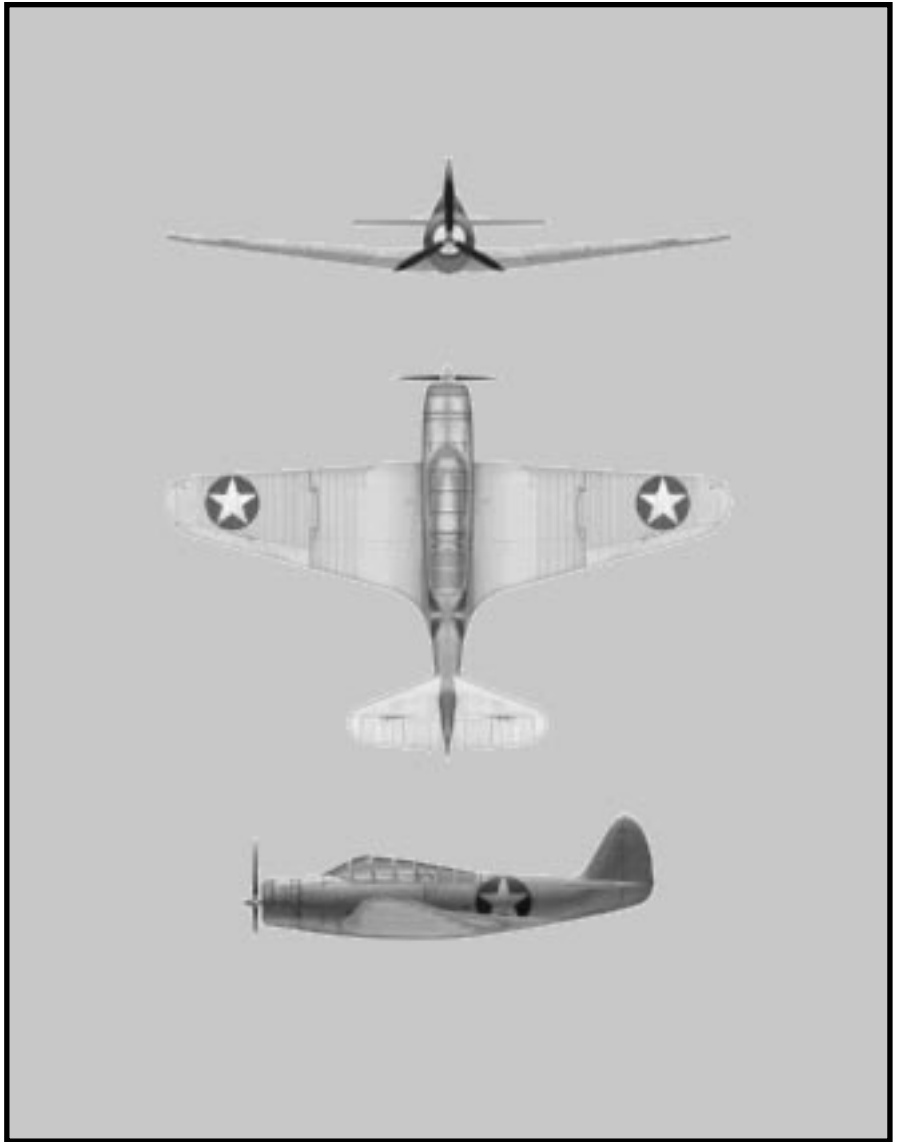


“DAUNTLESS” - THE DOUGLAS SBD-3

Class:	Scout Bomber	
Stations:	Pilot, Rear Gunner	
Weapons:	[Fixed]	2 Cowl-mounted .50 caliber Machine Guns 2 Rear-mounted .30 caliber Machine Guns
	[Payload]	1000 lbs. of Bombs
Ammunition:	[Cowl]	360 rd/gun
	[Rear]	2000 rd/gun
Firing Rate:	[Cowl]	750 rd/min (approx. 29 seconds of fire)
	[Rear]	825 rd/min (approx. 145 seconds of fire)
Span:	41' 6.1"	
Length:	32' 1.25"	
Wing Area:	30.19 sq. meters	
Engine:	Wright Cyclone R-1820-52 (Radial)	
Max HPwr:	1000	
Ceiling:	27,100 ft	
Cruise Speed:	135 kts	
Max. Spd:	255 kts	
Stall Spd:	68 kts [Level Flight]	
Std Fuel:	260 gal	
Max Fuel:	310 gal	

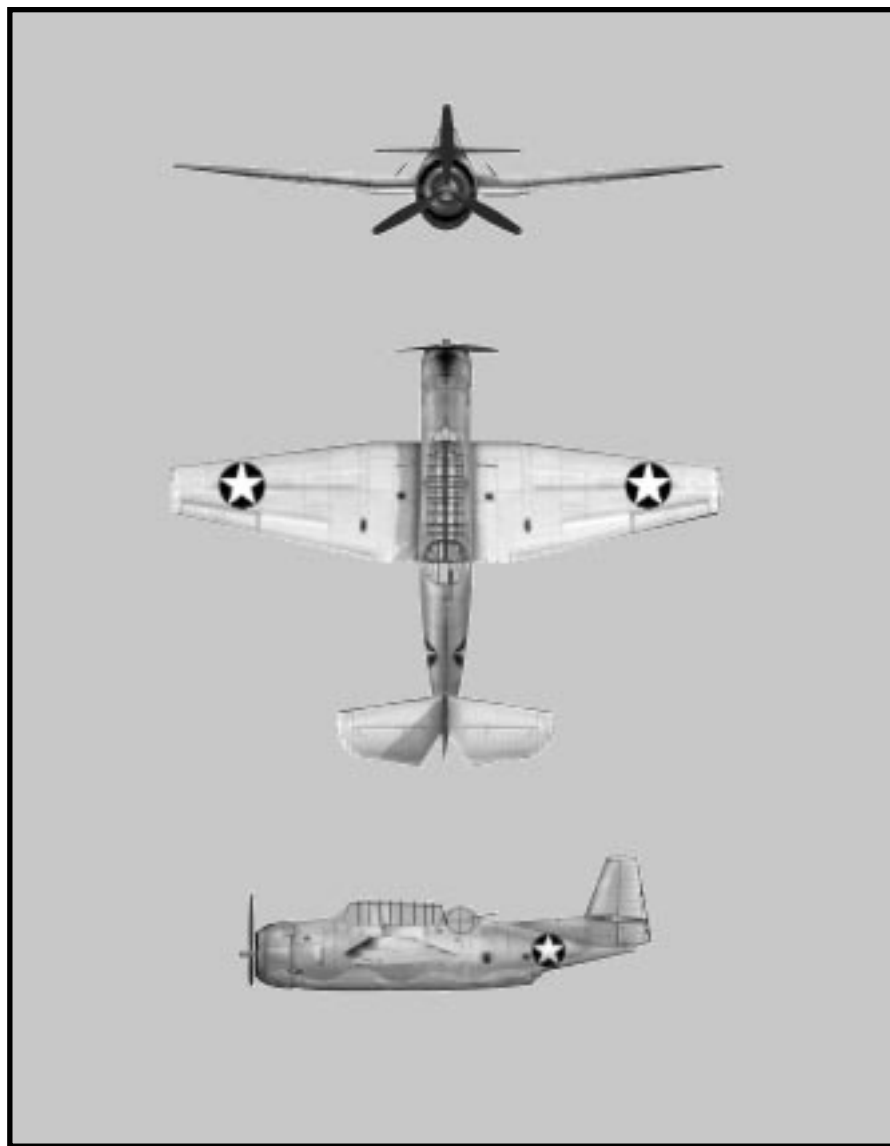
Pilots' Notes: The Dauntless is a workhorse, and has been all the way through the war. Even though it was designed before the U.S. got into things, and it's probably obsolete, it does the job. The engine's too small, so she's underpowered, but the handling is light and responsive. One thing you've got to remember is that the dive brakes go in and out really slowly. Start them out before you roll into your dive, and start them back in before you drop your explosive eggs. Otherwise, they won't really do their job.

The underpowered Dauntless is slow and lumbering on the take-off – her acceleration is not spectacular. The view over the nose is pretty good, though. When you're in a tight turn, especially to the left, watch out for her vicious g stall; sometimes she'll just snap out of the turn with no warning and try to go into a spin. If you're alert, you can avoid this. Dauntlesses are a dream to land. The gear's got a little bounce in it, but so what?



“DEVASTATOR” - THE DOUGLAS TBD-1

Class:	Torpedo Bomber	
Stations:	Pilot, Rear Gunner	
Weapons:	[Fixed]	1 Cowl-mounted .50 caliber Machine Gun 2 Rear-mounted .30 caliber Machine Guns
	[Payload]	1 Torpedo -or- 1000 lbs. of Bombs
Ammunition:	[Cowl]	300 rd
	[Rear]	2000 rd/gun
Firing Rate:	[Cowl]	750 rd/min (approx. 24 seconds of fire)
	[Rear]	825 rd/min (approx. 145 seconds of fire)
Span:	50'	
Length:	32' 6"	
Wing Area:	35.31 sq. meters	
Engine:	Pratt and Whitney R-1830-64	
Max HPwr:	900	
Ceiling:	19,700 ft	
Cruise Speed:	128 kts	
Max. Spd:	178 kts	
Stall Spd:	54 kts [Level Flight]	
Std Fuel:	207 gal	
Max Fuel:	207 gal	
Pilots' Notes:	Some say that the Devastator was obsolete when it rolled off the assembly line. That makes sense, since it was designed way back in '34. It's a stable bombing platform, but the controls are heavy, slow, and not very responsive. Take-off is basically sound, but slow. The maneuverability stinks on ice. She can't fly high and she can't fly fast, but you've got great control at low speeds, which is important in a bomber. The one bright spot is that it's really a breeze to land one of these on the deck.	



“AVENGER” - THE GRUMMAN TBF

Class:	Torpedo/Dive Bomber	
Stations:	Pilot, Dorsal Gunner, Ventral Gunner	
Weapons:	[Fixed]	2 Wing-mounted .50 caliber Machine Guns 1 Dorsal .50 caliber Machine Gun 1 Ventral .30 caliber Machine Gun
Ammunition:	[Payload]	1-22” Torpedo -or- 2000 lbs. of Bombs
	[Wing]	600 rd/gun
	[Dorsal]	400 rd
	[Ventral]	500 rd
Firing Rate:	[Wing]	750 rd/min (approx. 48 seconds of fire)
	[Dorsal]	750 rd/min (approx. 32 seconds of fire)
	[Ventral]	825 rd/min (approx. 36 seconds of fire)
Span:	54' 2”	
Length:	40'	
Wing Area:	45.54 sq. meters	
Engine:	Wright Cyclone GR-2600-8 (Radial)	
Max HPwr:	1700	
Ceiling:	21,400 ft	
Cruise Speed:	135 kts	
Max. Spd:	228 kts	
Stall Spd:	76 kts [Level Flight]	
Std Fuel:	380 gal	
Max Fuel:	771 gal	
Pilots' Notes:	<p>Before I strapped in, they told me the Avenger was a torpedo bomber and a “level” dive bomber. I say, baloney. This here's a torpedo bomber, plain and simple. You get in a steep dive in this thing and you've got almost no maneuverability at all. You couldn't hit the broad side of a barn with the broad side of another barn. Now, in a nice, shallow torpedo run, she's steady as a rock. Handles a little heavy, but it's like that no matter how fast or slow you're going. One bad thing about that is your breakaway is kind of tough. You got to stomp all over the rudder to get anywhere near a clean break. Watch out, on account of she stalls pretty suddenly. There's no warning at all – just, bloop, and over she goes. When you get home, though, the touchdown's as easy as a deck landing gets. You can't miss with that giant arrestor hook.</p>	



HISTORICAL OVERVIEW

The air war fought over the Pacific ocean during World War II is unique in military history. For one thing, the vastness of this theater, stretching thousands of miles from Tokyo to San Francisco, from Australia to the Aleutians, sets it apart from most battlefields. The continent of Europe would be lost, swallowed whole, if superimposed over a map of the Pacific. Secondly, neither the Japanese offensive nor the subsequent American island-hopping campaign would have been possible without naval aviation.

The airplane came to dominate naval strategy. It became the principal means of striking out against the enemy's ships and land bases. The following overview is intended to place your flight career within the historical context of five Pacific battles. Regardless of which side you choose to play, you're forced to contend with certain historical events that are beyond your control. The information contained within this campaign narrative will help you in understanding why your missions play-out the way they do.

THE PRE-WAR YEARS

After World War I, England and the United States emerged as the leading naval powers among western nations. With the defeat and dismantling of Germany's "luxury fleet", these two nations could fairly claim mastery of the seven seas. Japan, whose navy had crushed the Czar's fleet at Tsushima in 1905, was clearly the preeminent naval power in the Pacific (next to the U.S. Pacific fleet).

The tactics used by fleets in the Great War had progressed very little since Trafalgar. Admirals simply lined their ships up in long columns and hammered away at each other. The results were often disappointing, because capital ships were so expensive and their potential loss so devastating. No admiral was willing to take chances. Adm. Jellicoe, commanding the British ships at Jutland in 1916, was said to be, “the only man who could have lost the war in an afternoon.” Naval engagements, therefore, were straightforward slug-fests with all the subtlety of a train wreck.

Early experiments with naval aviation were unimpressive. Despite this new innovation, the old guard among naval officers the world over continued to swear by the “big guns” of their capital ships. Ships capable of carrying aircraft would accompany a fleet, but only so that their aircraft could be used for reconnaissance.

After the enemy fleet was spotted from the air, battleships were expected to take over. Airplanes were considered superfluous once battle was joined. Victory would go to the side with the thickest armor, able to fire the greatest shell-weight at opposing ships.

After World War I, the imperial policies of Great Britain, Japan, and the United States were steaming a collision course. In 1921, representatives from the three governments met in Washington, D.C. to stave off an expensive naval arms race. The Washington Naval Conference reduced the total amount of tonnage the three nations could legally own to a simple ratio – 5:5:3. For every five tons of surface shipping possessed by the United States and Britain, Japan could own three. (France and Italy, the other two signatories, were each limited to a ratio of 1.67 tons under this agreement.)

To comply with the restrictions imposed by the Washington agreements, both the United States and Japan started a trend that would ultimately lead to the supremacy of naval aviation over the “big guns” theory. Each nation converted the half-finished hulls of two would-be battleships into aircraft-carrying ships.

According to the agreement, Britain and the United States were allowed to build up to 135,000 tons of aircraft-carrying ships. Japan was only allowed 81,000 tons. Each navy could construct two aircraft carriers of 33,000 tons; the rest were limited to only 27,000 tons.

For the United States, the two large carriers were the *U.S.S. Lexington* (CV-2) and *U.S.S. Saratoga* (CV-3). For Japan, the two large carriers were the *Akagi* and *Kaga*. Each of these four ships was capable of carrying over sixty (60) aircraft. (The two U.S. vessels eventually went to 36,000 tons, in violation of the agreement, because of their armored flight deck and hangars.) These ships formed the nucleus of the naval air war in the Pacific.

Both the United States and Japan continued to view aircraft-carrying ships as auxiliaries throughout the 1920s. Even after the first of the large carriers entered service, their aircraft were initially used as scouts. It wasn't until 1929 that the offensive potential of naval aviation was realized. (During a training exercise, the *Saratoga* launched a simulated sneak attack against the Panama Canal.)

While the United States conducted exercises during the 1930s, Japan was involved in the real thing. The on-going war with China gave its naval officers practical experience in handling aircraft carriers. Both the *Akagi* and *Kaga* were used to launch raids against the Chinese mainland near Hangchow.

By the mid-30s, the Washington Naval agreements were forgotten. Unhappy with the 5:5:3 ratio, Japan formally withdrew its compliance in 1936. Six new carriers had either already joined the Japanese fleet or were about to enter service. When construction of these carriers was completed, Japan would have a naval air arm of over 350 aircraft.

The United States entered World War II on December 7th, 1941, as a result of the Japanese raid on Pearl Harbor. The following list compares the carrier forces belonging to the United States and Japan on the eve of hostilities.

**THE CARRIER
LINE-UP
(DECEMBER 7TH
1941)**

JAPANESE CARRIER FORCE			
Ship	Displacement (t)	Aircraft	Entered Service
<i>Hosho</i>	7,470	15 aircraft	1922
<i>Akagi</i>	36,500	60 aircraft	1927
<i>Kaga</i>	38,200	65 aircraft	1928
<i>Ryujo</i>	10,600	36 aircraft	1933
<i>Soryu</i>	18,800	57 aircraft	1937
<i>Shoho</i>	11,262	30 aircraft	1939
<i>Zuiho</i>	17,260	27 aircraft	1940
<i>Hiryu</i>	20,300	62 aircraft	1941
<i>Zuikaku</i>	26,000	60 aircraft	1941
<i>Shokaku</i>	26,000	60 aircraft	1941
<i>Taiyo</i>	17,900	27 aircraft	1941
Totals	232,392 tons	499 aircraft	
UNITED STATES CARRIER FORCE			
Ship	Displacement (t)	Aircraft	Entered Service
<i>Lexington</i>	39,000	72 aircraft	1927
<i>Saratoga</i>	39,000	72 aircraft	1927
<i>Ranger</i>	14,500	68 aircraft	1935
<i>Yorktown</i>	25,500	81 aircraft	1938
<i>Enterprise</i>	25,500	81 aircraft	1938
<i>Hornet</i>	29,100	85 aircraft	1940
<i>Wasp</i>	21,000	84 aircraft	1941
Totals	204,650 tons	543 aircraft	

(This list does not include the *U.S.S Langley*, which had been converted to a Seaplane Tender in 1938. At the time of the Japanese attack, only three U.S. carriers were stationed in the Pacific – the *Saratoga*, *Enterprise*, and *Lexington*.)

Although the Pearl Harbor raid is outside the scope of **1942 THE PACIFIC AIR WAR**, a brief description of this attack is in order. It changed many minds within the naval community about the value of naval aviation in a way the British raid on Taranto, the year before, failed to do. Pearl Harbor heralded a new age in naval warfare, an age in which the tiny airplane replaced the “big guns” of the convention surface fleets.

Admiral Isoroku Yamamoto, famed CinC (Commander-in-Chief) of Japan’s Combined Fleet, was the architect of the Pearl Harbor raid. Ironically, he had consistently counseled against going to war with America. Japan could run wild in the Pacific for six months following the raid, he warned, after which the industrial might of the United States would ultimately win the war. Nevertheless, he ordered Vice-Admiral Chuichi Nagumo, commander of the First Air Fleet, to proceed and carry out this historic strike.

The raid on Pearl Harbor was a stunning victory in planning and execution for the Japanese Navy. Six carriers (*Kaga, Akagi, Hiryu, Soryu, Shokaku*, and *Zuikaku*) launched 354 strike aircraft in a bid to destroy the USN in a surprise attack. Although the attack was carried out flawlessly, in a larger sense Japan had miscalculated badly. Rather than moving toward a negotiated peace, as was hoped, Americans used Pearl Harbor as a rallying cry of a type not heard since the Alamo.

JAPANESE PEARL HARBOR STRIKE FORCE

First Air Fleet

(6) Aircraft Carriers: *Akagi, Hiryu, Kaga, Shokaku, Soryu,*
and *Zuikaku*

(1) Light Cruisers: *Abukuma*

(9) Destroyers: *Akigumo, Arare, Isokaze, Hamakaze,*
Kasumi, Kagero, Shiranuhi, Tanikaze,
Urakaze

Supporting Force

(2) Battleships: *Hiei, Kirishima*

(2) Heavy Cruisers: *Chikuma, Tone*

The United States Pacific fleet was attacked by two successive waves of Japanese aircraft on the morning of December 7th, 1941. The first wave consisted of 50 Kates armed with torpedoes, 40 Kates armed with bombs, 51 Vals armed with bombs, and a covering force of 43 Zero fighters. The second wave began its attack at 0900 hours just as the first wave was retiring. It consisted of an additional 54 Kates armed with bombs, 80 Vals armed with bombs, and 36 Zero fighters. Most of the twenty-nine aircraft (9 Zeros, 15 Vals, 5 Kates) lost by the Japanese were out of this second wave.

As impressive as this victory might have seemed at the moment (all eight of the battleships at Pearl were sunk or damaged and over 300 aircraft were destroyed or damaged), the Japanese missed a chance to inflict a far more crippling blow.

Most of the damage done during the attack was centered on the battleships and heavy cruisers lying at anchor. Little attention was paid to Pearl Harbor’s adjacent facilities. The extensive dry dock and repair infrastructure was overlooked. Another vulnerable target, the tank farm storage area, with 4.5 million gallons of oil, was missed entirely. Had the tank farm and repair facilities been destroyed, the Pacific fleet would not have been in a position to challenge the Japanese advance through the South Pacific in 1942.



A Japanese bomb comes very close to hitting a U.S. carrier

Fortunately for the United States, the most important target of all, the three Pacific fleet carriers, were away from Pearl Harbor at the time of the attack. Had one or more carriers been sunk at the outset, the Japanese would likely have taken Midway and the Solomon Islands (including Guadalcanal) in 1942. New Guinea would have been indefensible, and the Hawaiian islands would have been placed under siege. The American

counterattack in the Pacific would have started sometime in 1943, along the California coast.

By concentrating on the battleships, the Japanese had done the United States a favor. Pearl Harbor was a clear demonstration of the power of aircraft over surface

**THE BATTLE
OF THE
CORAL SEA:
4-8 MAY
1942**

vessels. The attack forced American naval leadership to forget about their battleships, as they would take too long to build anew. Unwittingly, the Japanese had expended their main effort against ships that would soon be overshadowed by naval aviation. From now on, all eyes turned to the aircraft carrier as the thing of the future.

At Pearl Harbor, the Japanese missed their best opportunity to sink the American aircraft carriers. The consequences of this failed attempt would not become apparent until several months later, at the battle of Coral Sea. Less than six months later, in May 1942, the United States stemmed the tide of Japanese expansion, just as Yamamoto had predicted.

In an effort to extend their defensive perimeter farther south toward Australia, the Japanese fell victim to what was later termed “victory disease”— the belief in their own invincibility. To hold on to their conquered territory, military necessity required that they advance beyond their original war aims. Using their base at Rabaul in the Bismarck Archipelago as a starting point, the Japanese set in motion an operation designed to capture Port Moresby, a key Allied port and airbase. Port Moresby, located on the southwest coast of New Guinea, was the last defensible position between the Japanese and Australia.

The battle of the Coral Sea went down in history as the first naval engagement in which ships of the opposing fleets never sighted one other. This battle was conducted entirely from the air. Naval aviation had made it possible. Success in the upcoming operation in the South Pacific was considered a foregone conclusion.

Admiral Shigeyoshi Inouye, the Japanese commander, divided his forces (as outlined in the order of battle below) into five task groups. The Port Moresby task groups were directed to conduct an amphibious landing and capture the allied base

in mid-May. The remaining ships, including the carriers, had the job of seeking out and destroying any allied naval force daring to interfere.

Admiral Chester Nimitz, CinC of the U.S. Pacific Fleet, had been warned in advance of the impending attack. (The cryptographic team at Pearl Harbor had successfully broken the Japanese Navy's JN25b code.) Realizing that there were too few land-based aircraft at Port Moresby and Australia to stop this attack, Nimitz was prepared to gamble with his precious carriers.

The Coral Sea campaign opened on May 3rd, with the Japanese landing a small force on the island of Tulagi, north of Guadalcanal. A seaplane base was immediately established in its protected shallow water anchorage. The very next morning, aircraft from the *Yorktown* struck the base. Twelve (12) torpedo planes and twenty-eight (28) dive bombers only managed to



A destroyer burns in the Pacific

sink the *Kikuzuki* and damage the *Okinoshima*. After launching a second strike which sank the transport *Tama Maru*, Task Force 17 withdrew to the south in order to refuel and link up with Task Force 11 (Admiral Fitch's *Lexington* group).

Throughout the first week in May, the Japanese Carrier Strike Force hurried south from its naval base at Truk. By May 5th, it had rounded the island of San Cristobal and entered the Coral Sea. Now both of the opposing carrier groups were in place, desperately searching for some sign of the enemy. Victory would likely go to the side which found the other first.

JAPANESE ORDER OF BATTLE

Carrier Strike Force (Takagi)

- (2) Aircraft Carriers: *Shokaku*, *Zuikaku* (with 42 VF, 41 VB, 21 VT)
- (2) Heavy Cruisers: *Haguro*, *Myoko*
- (6) Destroyers: *Akebono*, *Ariake*, *Shigure*, *Shiratsuyu*, *Ushio*, *Yugure*
- (1) Fleet Oiler: *Toho Maru*

Support Force (Goto)

- (4) Heavy Cruisers: *Aoba*, *Furutaka*, *Kako*, *Kinugasa*

Port Moresby Attack Force (Kajioka)

- (1) Light Cruisers: *Yubari*
- (6) Destroyers: *Asanagi*, *Mochizuki*, *Mutsuki*, *Oite*, *Uzuki*, *Yayoi*

Port Moresby Close Covering Force (Marumo)

- (2) Light Cruisers: *Tatsuta*, *Tenryu*
- (1) Seaplane Tender: *Kamikawa Maru*

Port Moresby Close Support Force (Goto)
(1) Light Carrier: *Shoho* (with 12 VF, 9 VT)
(1) Destroyer: *Sazanami*

Transport Force (Abe)
(1) Minelayer: *Tsugaru*
(12) Transports

Tulagi Invasion Force (Shima)
(2) Destroyers: *Kikuzuki, Yuzuki*
(2) Minelayers: *Koei Maru, Okinoshima*
(1) Transport: *Tama Maru*

UNITED STATES ORDER OF BATTLE

Task Group 17.5 (Fletcher and Fitch)
(2) Aircraft Carriers: *Lexington, Yorktown* (with 42 VF, 74 VB, 25 VT)
(5) Heavy Cruisers: *Astoria, Chester, Minneapolis, New Orleans, Portland*

(9) Destroyers: *Anderson, Aylwin, Dewey, Farragut, Hammann, Phelps, Monaghan, Morris, Russell*

Task Group 17.3 (Crace)
(3) Heavy Cruisers: *Australia* (RAN), *Chicago, Hobart* (RAN),
(2) Destroyers: *Perkins, Walke*

Task Group 17.6 (Phillips)
(2) Oilers: *Neosho, Tippecanoe*
(2) Destroyers: *Sims, Worden*

Task Group 17.9 (Debaun)
(1) Seaplane Tender: *Tangier*

On the morning of May 7th, search planes from the Japanese carrier force spotted the fleet oiler *Neosho* and destroyer *Sims*. Mistaking the *Neosho* for an aircraft carrier, the Japanese launched an all-out strike. The destroyer was sunk immediately after suffering three bomb hits. The oiler was crippled and finally sunk four days later by friendly ships.

While Takagi's planes were engaged, however, search planes from the American carriers located Goto's Close Support Force, which included the light carrier *Shoho*. Thinking they had found the main Japanese carrier force, the two U.S. carriers launched a combined strike consisting of ninety-three (93) aircraft. By the time Fletcher discovered his mistake, it was too late. Still, his aircraft attacked and sank the *Shoho*, now only ninety miles north of the American carriers. The sailors aboard the ships of Task Force 17 went wild when over the radio came the cry, "Scratch one Flattop!" The *Shoho* was gone, giving the Americans their first taste of victory.

The next day battle was rejoined in earnest. With the sinking of the *Shoho*, each side now possessed two carriers. Overnight, the two opposing carrier groups had closed to within 200 miles of each other – a mere stone’s throw. By sunrise, search planes from the both groups had already found the enemy. The stage was set.

Both sides exchanged strikes on May 8th. The American planes found the Japanese carriers and attacked first. The strike actually consisted of less aircraft than had attacked the *Shoho* the day before (39 from the *Yorktown*, 43 from *Lexington*). This time the aircraft were destined to run into much heavier opposition. The *Zuikaku* protected itself by sailing into a rain squall. This left the *Shokaku*, about eight miles away, to receive the full weight of the attack. When it was over, the *Shokaku* had suffered several bomb hits, knocking it out of action.

The strike had arrived too late, however. The Japanese had already launched a strike of their own, made up of a mix of torpedo and dive bombers. Though fewer in number than the American strike (about seventy aircraft), the Japanese crews were experienced, most of them with over 700 hours of combat flight time.

Arriving over the American fleet, the Japanese strike broke into well-rehearsed attack formations. The *Lexington* was hit by two bombs and two torpedoes, which started fires below deck, forcing her evacuation. The destroyer *Phelps* was eventually called in to sink the “Lady Lex”. The *Yorktown* was also hit but the damage was not as severe. A single bomb had penetrated its flight deck, but flight operations were unaffected.

After the mutual strikes on May 8th, both sides retired from the field. According to the numbers, Coral Sea was a Japanese victory. They had traded the *Shoho* (a light carrier) for the *Lexington* and damage to a second carrier. True, both the *Zuikaku* and *Shokaku* would be out of action for several months (the “Zui” while replacing flight crews, the “Sho” while repairing damage), but the Americans had lost one of their



A U.S. destroyer with serious damage

THE BATTLE OF MIDWAY 4-6 MAY 1942

fleet carriers, reducing their total carrier strength in the Pacific to only three.

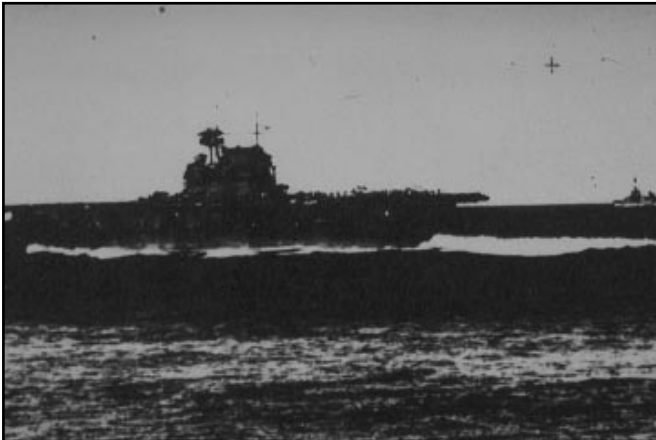
Numbers don't tell the whole story behind the Coral Sea campaign, however. Without the carrier strike force to protect them, the Japanese transports sailed back to Rabaul without landing at Port Moresby. For the first time in the war, the United States had turned back a Japanese invasion.

This set-back convinced Yamamoto that the decisive battle with the U.S. Pacific fleet needed to be fought. He knew that only by attacking an area the Americans considered strategically vital could he force the remaining American ships to fight. The area he chose was the island of Midway. He reasoned correctly that Admiral Nimitz would commit his fleet rather than risk losing Midway and jeopardizing the Hawaiian islands.

The Midway campaign was aimed at luring the United States Navy away from its home ports and out from under the protective cover of land-based aircraft. Once at sea, the American ships would be ambushed as they came forth to do battle.

The main attack would be aimed at Midway island. Aircraft from Yamamoto's carriers would first destroy any land-based aircraft found on the island. Then, his invasion force would land five thousand occupation troops on the island, capturing its airfields. With Midway out of the way, his plan to destroy the American fleet as it moved in would not be interfered with.

The plan was risky and required careful timing. However, given the overwhelming strength of the Imperial Japanese Navy (IJN), the American fleet should have had little chance. Yamamoto believed that he would be facing only two American carriers after the damage done to the *Yorktown* at Coral Sea. In fact, he would be facing three. Instead of enjoying a 2 to 1 advantage in fleet carriers, the odds were reduced to 4 to 3.



June 4, 1942 - The Enterprise at high speed during the Battle of Midway

Assigned to the operation were the four big fleet carriers (*Akagi*, *Kaga*, *Soryu*, and *Hiryu*). The "Sho" and "Zui", recovering from the Coral Sea engagement, would be sorely missed. Two light carriers (*Zuiho* and *Hosho*) were included in Adm. Kondo's supporting force. All told, the six Japanese carriers had some 277 strike aircraft aboard.

Facing this force were three U.S. carriers with some 233 aircraft aboard and another 70 aircraft based at Midway. Included in the U.S. order of battle was the damaged carrier *Yorktown*. By rights, the *Yorktown*

should have been laid up for at least three months. But instead of three months, the repair crews at Pearl Harbor had performed a miracle. The ship was fixed in just 36

hours, in time to put to sea with the others.

Aside from this unexpected addition to its order of battle, the United States Navy had another, even more important, ace in the hole. American naval officers were well informed of the Japanese plans, because U.S. intelligence analysts had long since cracked the Japanese naval codes. Only one out of every ten words was actually being decoded and translated, but this was enough to discern Yamamoto's intentions.

Rear Admiral Raymond Spruance replaced Vice-Admiral Halsey (who had been hospitalized with a skin disease after Coral Sea) as commander of Task Force 16. Spruance, a former cruiser skipper with no prior experience at commanding aircraft carriers, would exercise ultimate tactical authority over the American fleet.

JAPANESE ORDER OF BATTLE

First Mobile Force, Carrier Strike Force (Nagumo)

- (4) Aircraft Carriers: *Akagi, Hiryu, Kaga, Soryu* (with 93 VF, 85 VB, 93 VT)
- (2) Battleships: *Haruna, Kirishima*
- (2) Heavy Cruisers: *Chikuma, Tone*
- (1) Light Cruiser: *Nagara*
- (12) Destroyers: *Arashi, Akigumo, Hagikaze, Hamakaze, Isokaze, Kazagumo, Maikaze, Makigumo, Nowaki, Tanikaze, Urakaze, Yugumo*

First Fleet, Main Body (Yamamoto)

- (1) Light Carrier: *Hosho* (with 8 VT)
- (3) Battleships: *Nagato, Mutsu, Yamato*
- (1) Light Cruiser: *Sendai*
- (9) Destroyers: *Ayanami, Fubuki, Hatsuyuki, Isonami, Murakumo, Shikinami, Shirayuki, Uranami, Yukaze*

Second Fleet, Main Body (Kondo)

- (1) Light Carrier: *Zuiho* (with 12 VF, 11 VB)
- (2) Battleships: *Hiei, Kongo*
- (4) Heavy Cruisers: *Atago, Chokai, Haguro, Myoko,*
- (1) Light Cruiser: *Yura*
- (8) Destroyers: *Asagumo, Harusame, Mikazuki, Minegumo, Murasame, Natsugumo, Samidare, Yudachi*
- (4) Fleet Oilers

Second Fleet, Escort Force (Tanaka)

- (1) Light Cruiser: *Jintsu*
- (11) Destroyers: *Amatsukaze, Arare, Hatsukaze, Kagero, Kasumi, Kuroshio,*

Oyashio, Tokitsukaze, Shiranuhi, Yukikaze,
(15) Transport ships with 5,000 troops

Second Fleet, Occupation Support Force (Kurita)

(2) Seaplane Tenders: *Chitose, Kamikawa Maru*

(4) Heavy Cruisers: *Kumano, Mogami, Mikuma, Suzuya*

(3) Destroyers: *Arashio, Asashio, Hayashio*

Special Duty Force

(2) Seaplane Tenders: *Chiyoda, Nisshin*

First Supply Force

(1) Destroyer: *Ariake*

(2) Freighters

UNITED STATES ORDER OF BATTLE

Task Force 16.5 (Spruance)

(2) Aircraft Carriers: *Enterprise, Hornet* (with 54 VF, 77 VB, 29 VT)

(5) Heavy Cruisers: *New Orleans, Minneapolis, Northampton, Pensacola, Vicennes*

(1) AA Light Cruiser: *Atlanta*

Task Group 16.4 (Early)

(11) Destroyers: *Aylwin, Balch, Benham, Conyngham, Dewey, Ellet, Phelps, Maury, Monaghan, Monssen, Worden*

Task Force 17 (Fletcher)

(1) Aircraft Carrier: *Yorktown* (with 25 VF, 37 VB, 13 VT)

Task Group 17.2 (Smith)

(2) Heavy Cruisers: *Astoria, Portland*

Task Group 17.4 (Hoover)

(6) Destroyers: *Anderson, Gwin, Hammann, Hughes, Morris, Russell*

Fleet Train (Thurber)

(2) Destroyers: *Blue, Ralph Talbot*

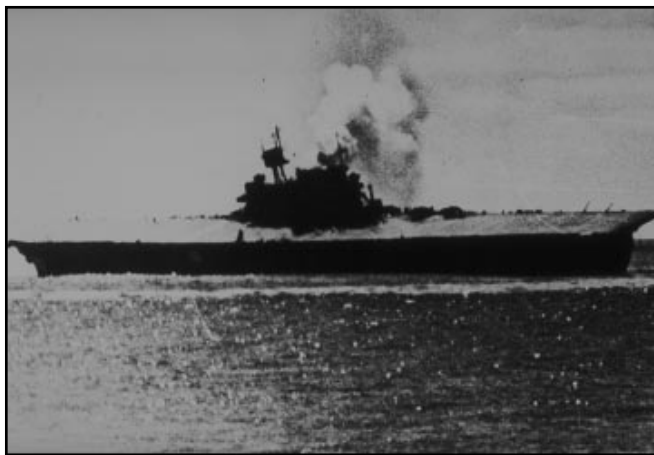
(1) Fleet Oiler

French Frigate Shoal Force

(1) Destroyer: *Clark*

According to the operational plan, Adm. Nagumo opened the campaign with an airstrike against Midway. The attack inflicted some damage, but the need for a follow-up strike was immediately recognized. The situation posed somewhat of a tactical dilemma for Nagumo. Should he order a second attack on Midway or arm his planes with torpedoes for use against any American ships that might be in the area? Now down to 167 operable aircraft, Nagumo decided to attack Midway a second time.

While rearming for a second strike, Nagumo's carriers were spotted by American search planes. Within an hour of this sighting, the *Enterprise* and *Hornet* had launched an airstrike. Spruance hoped to catch the Japanese carriers with their guard down, while the bulk of their air cover was attacking Midway. Although losses were high among the attacking aircraft, the strike caught the decks of the Japanese carriers full of gas and bombs. It was devastating.



In the space of five minutes, three of Yamamoto's four carriers were ablaze. *A damaged Yorktown, listing badly*

Only the *Hiryu* managed to escape this attack by ducking into a rain squall. Secondary explosions aboard the *Akagi*, *Kaga*, and *Soryu* turned them into flaming, sinking wrecks. The odds had been shifted dramatically in favor of the Americans, but the battle was not yet over. The undamaged *Hiryu* proceeded to launch an attack which claimed the *Yorktown*.

With three Japanese carriers on the way to the bottom, all attention was turned to the lone *Hiryu*. In contrast to the great aerial armada that had been assembled to

**THE BATTLE
OF THE
EASTERN
SOLOMONS:
24-25
AUGUST
1942**

deal with Midway only hours before, less than twenty aircraft remained. To fend off further American raids, the *Hiryu* had a mere six Zeros.

Nagumo did not have long to wait. Shortly after he transferred his flag aboard, the *Hiryu* was attacked by dive bombers from the *Hornet* and *Enterprise*. After taking four bomb hits in quick succession, the *Hiryu* exploded into flames. The last of Nagumo's carriers was sent to join the others at the bottom of the Pacific. Yamamoto now had no real choice but to order a general withdrawal, otherwise his surface ships would be at the mercy of American air power.

Midway had turned out to be the decisive naval engagement of the war. Losses had been inflicted on Japan's navy that its industrial base could not make good. From now until the end of the war, Japan would assume a defensive posture. Whereas the battle of the Coral Sea had halted their advance, Midway turned it back.

Guadalcanal sits at the southeastern end of the Solomon Islands archipelago. In 1942, the island became the focal point of the whole Pacific war. It was the place where Japan had decided to build an airbase, to resume their advance in the South Pacific. It was also the place where the United States decided to begin rolling back the Japanese advance.

On August 7, the 1st Marine Division invaded Guadalcanal and captured the partially completely airbase. After chasing off the few Japanese on the island, the Leathernecks settled in to defend the airstrip they named "Henderson Field". Most of the prisoners taken by the Marines turned out to be Korean laborers working to complete the airstrip.

The ease of the initial landing was deceptive. Guadalcanal would not be taken for many more months. The Solomons campaign lasted from August of '42 through February of '43. It was one of the toughest, most prolonged contests of the Pacific war, not only on land but at sea as well.

The fighting on land required a steady stream of reinforcements and supplies. Without domination of the surrounding seas, this stream could be cut at any time, isolating the troops ashore. From August 1942 on, both sides sought to control the situation at sea. Seven major sea battles were fought during this time, two of these battles – the Eastern Solomons engagement and the battle of Santa Cruz – involved aircraft carriers.

The Battle of the Eastern Solomons began on August 23rd, 1942, just two weeks after the initial Marine landing. As he had tried to do at Midway, Admiral Yamamoto was determined to lure the American carriers into a decisive engagement and destroy them. He assigned the destruction of the American carriers to the Third Fleet's Carrier Strike Force, commanded by Admiral Nagumo.

A secondary concern was the Marine beachhead on Guadalcanal and the land-based aircraft that would eventually make their way to Henderson Field. It was clear that the entire campaign would be influenced by whichever side held the tiny airstrip. Accordingly, Yamamoto planned to send reinforcements to the island while his carriers kept the Americans busy. Once Henderson Field was in Japanese hands, the Marines on the island would "whither and die on the vine".

The light carrier *Ryujo* was assigned to Rear Admiral Chuichi Hara's Detached Carrier Strike Force. It was Hara's job to suppress the American air forces on Henderson Field and support the Japanese landings. In retrospect, it is possible that Yamamoto was using the *Ryujo* as bait to lure the American carriers out to battle (just as the *Shoho* had unintentionally done at Coral Sea).

Admiral Nimitz was well aware that the Japanese were committing the bulk of their Combined Fleet to battle in the Solomons. On August 23rd, Adm. Fletcher's ships were lying off the eastern end of Guadalcanal, sending out scouts in hopes of

locating the Japanese carriers.

Thinking he had plenty of time before the Japanese force arrived in the area, Fletcher detached the *Wasp* south to refuel. This move left him with only the *Enterprise* and *Saratoga* to oppose the three Japanese carriers. Actually, the Japanese carriers were much closer than he thought.

A PBY (search plane) on reconnaissance patrol from Ndeni Island reported spotting the Japanese light carrier *Ryujo*. Fletcher believed the report to be false. Later, a second PBY spotted the *Ryujo* again. Fletcher could not ignore this second sighting and ordered an attack.

The first wave of dive bombers failed to score a hit, but a group of TBF Avengers damaged the *Ryujo*'s rudder with a torpedo. A second group of dive bombers pounded the now helpless carrier with four 1,000 lb. bombs, setting her ablaze. The *Ryujo* sank four hours later. Not a single American plane was lost in the attack.

JAPANESE ORDER OF BATTLE

Combined Fleet (Yamamoto)

Third Fleet, Carrier Strike Force (Nagumo)

(2) Aircraft Carriers: *Shokaku*, *Zuikaku* (with 53 VF, 41 VB, 36 VT)

(6) Destroyers: *Akigumo*, *Akizuki*, *Hatsukaze*, *Kazagumo*, *Makigumo*, *Yugumo*

Third Fleet, Detached Carrier Strike Force (Hara)

(1) Light Carrier: *Ryujo* (with 16 VF, 21 VT)

(1) Heavy Cruiser: *Tone*

(2) Destroyers: *Amatsukaze*, *Tokitsukaze*

Second Fleet, Support Force (Abe)

Vanguard Force, Close Support

(2) Battleships: *Hiei*, *Kirishima*

(3) Heavy Cruisers: *Chikuma*, *Kumano*, *Suzuya*

(1) Light Cruiser: *Nagara*

(3) Destroyers: *Maikaze*, *Nowaki*, *Tanikaze*

Support Force, Main Body (Kondo)

- (1) Seaplane Tender: *Chitose* (with 22 floatplanes)
- (1) Battleship: *Mutsu*
- (5) Heavy Cruisers: *Atago, Haguro, Maya, Myoko, Takao*
- (1) Light Cruiser: *Yura*
- (9) Destroyers: *Asagumo, Harusame, Hayashio, Kuroshima, Minegumo, Murasame, Natsugumo, Oyashio, Samidare*

Eighth Fleet (Mikawa)

Close Cover Force

- (4) Heavy Cruisers: *Aoba, Chokai, Furutaka, Kinugasa*

Convoy Escort Force (Tanaka)

- (1) Light Cruiser: *Jintsu*
- (8) Destroyers: *Isokaze, Kagero, Kawakaze, Mutsuki, Suzukaze, Umikaze, Uzuki, Yayoi*

UNITED STATES ORDER OF BATTLE

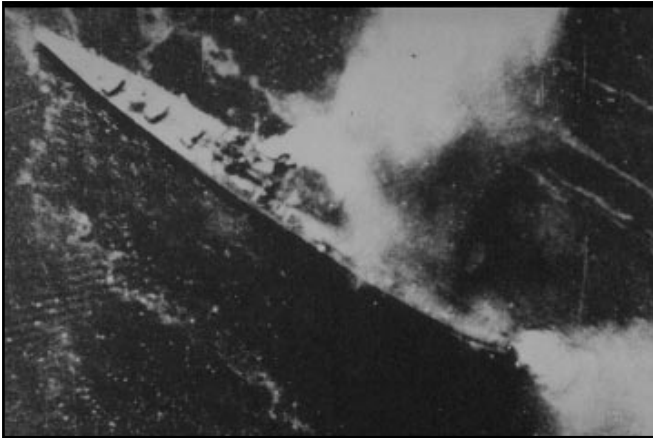
Task Force 61 (Fletcher)

Task Force 11

- (1) Aircraft Carrier: *Saratoga* (with 36 VF, 36 VB, 15 VT)
- (2) Heavy Cruisers: *Minneapolis, New Orleans*
- (5) Destroyers: *Dale, Farragut, McDonough, Phelps, Worden*

Task Force 16 (Kinkaid)

- (1) Aircraft Carrier: *Enterprise* (with 36 VF, 36 VB, 15 VT)
- (1) Battleship: *North Carolina*



Direct hit on a Japanese heavy cruiser at Rabaul harbor

- (1) Heavy Cruiser: *Portland*
- (1) AA Light Cruiser: *Atlanta*
- (6) Destroyers: *Balch, Benham, Ellet, Grayson, Maury, Monssen*

Task Force 18 (Noyes)

- (1) Aircraft Carrier: *Wasp* (with 28 VF, 36 VB, 15 VT)
- (2) Heavy Cruisers: *San Francisco, Salt Lake City*
- (1) Light Cruiser: *San Juan*
- (6) Destroyers: *Aaron Ward, Buchanan, Farenholt, Stack, Sterret, Selfridge*

While the attack on the *Ryujo* was under way, Nagumo launched his own attack against the two American carriers. (Intentional or not, the sacrifice of the *Ryujo* seemed to have the desired effect.) The first wave of Japanese aircraft hit

the *Enterprise* with three bombs, causing heavy damage. Although the *Enterprise* was on fire, it still maintained hull integrity and was in little danger of sinking. Aircraft from the stricken carrier flew to Guadalcanal to bolster the air defenses there.

In the last major carrier action of the day, two American dive bombers spotted and bombed the Japanese seaplane carrier *Chitose*. Although they never actually hit the ship, the near-misses set the planes on deck afire and damaged the engine room. The *Chitose* started to list badly. Only quick thinking on the part of her Captain saved the ship from sinking.

The next day, American aircraft attacked three Japanese troop transports as they made a daylight run for Guadalcanal. Tanaka's flagship, the light cruiser *Jintsu* and one of the transports were damaged. Tanaka was forced to withdraw without landing any reinforcements. The battle was over.

The battle of the Eastern Solomons was a clear tactical victory for the Americans. The Japanese had failed to achieve either one of their two primary objectives. The American carriers had not been eliminated, and Henderson Field still belonged to the 1st Marine Division.

At sea, the *Enterprise* had been damaged, but only twenty aircraft had been lost. The Japanese, on the other hand, had lost a light carrier and close to 90 planes. Carrier odds that had started out overwhelmingly in Japan's favor were continuing to even out after each battle.

On the homefront in both United States and Japan, Guadalcanal came to have a symbolic importance far greater than its real tactical value. Neither side was willing to give an inch; both fed reinforcements into this lengthy battle of attrition.

Yamamoto's dream of victory following a single great naval clash had long since passed. His strategy now was simply to make the American counter-offensive in the South Pacific as expensive as possible. Even so, he was willing to commit his naval forces one more time in an effort to retake Guadalcanal. The result was the battle of Santa Cruz.

**THE BATTLE
OF SANTA
CRUZ: 25-27
OCTOBER
1942**

Yamamoto divided his forces just as he had before, but this time he placed his non-carrier forces in the lead. His carrier force was kept behind, where they could launch strikes with relative impunity. He hoped that the American carriers would expend their energy attacking his leading ships and open themselves to a “Midway-type” riposte.

The plan was reminiscent of one Yamamoto had used earlier during the battle of the Eastern Solomons. While the carriers dueled, his transport ships and destroyers would sneak into Iron Bottom Sound and land reinforcements on Guadalcanal. Henderson Field would be put out of commission by naval bombardment and then captured in a land battle. Once the field was in Japanese hands, aircraft from Rabaul would be rushed to Henderson. The key to making this plan work was keeping the American carriers at bay.

JAPANESE ORDER OF BATTLE

Combined Fleet (Yamamoto)

Third Fleet, Carrier Strike Force (Nagumo)

(2) Aircraft Carriers: *Shokaku*, *Zuikaku* (with 45 VF, 47 VB, 41 VT)

(1) Light Carrier: *Zuiho* (with 18 VF, 6 VT)

(1) Heavy Cruiser: *Kumano*

(8) Destroyers: *Amatsukaze*, *Arashi*, *Hatsukaze*, *Maikaze*, *Teruzuki*,
Tokitsukaze, *Yamakaze*, *Yukikaze*

Second Fleet, Advance Force (Kondo)

(4) Heavy Cruisers: *Atago*, *Maya*, *Myoko*, *Takao*

(1) Light Cruiser: *Isuzu*

(6) Destroyers: *Kawakaze*, *Makinami*, *Naganami*, *Suzukaze*, *Takanami*,
Umikaze

Second Fleet, Close Support Force (Kurita)

(2) Battleships: *Haruna*, *Kongo*

(6) Destroyers: *Harusame*, *Kagero*, *Murasame*, *Oyashiro*, *Samidare*, *Yudachi*

Second Fleet, Vanguard Force (Abe)

(2) Battleships: *Hiei*, *Kirishima*

(3) Heavy Cruisers: *Chikuma*, *Suzuya*, *Tone*

(1) Light Cruiser: *Nagara*

(8) Destroyers: *Akigumo*, *Isokaze*, *Kazagumo*, *Makigumo*, *Tanikaze*, *Teruzuki*,
Urakaze, *Yugumo*

Second Fleet, Air Group Force (Kakuta)

(1) Light Carrier: *Junyo* (with 24 VF, 21 VB, 10 VT)

(2) Destroyers: *Hayashio*, *Kuroshio*

Support Train

(1) Destroyer: *Nowaki*

UNITED STATES ORDER OF BATTLE

South Pacific Force (Halsey)

Task Force 16 (Kinkaid)

- (1) Aircraft Carrier: *Enterprise* (with 34 VF, 36 VB, 12 VT)
- (1) Battleship: *South Dakota*
- (1) Heavy Cruiser: *Portland*
- (1) Light Cruiser: *San Juan*
- (8) Destroyers: *Cushing, Conyngham, Mahan, Maury, Preston, Porter, Shaw, Smith*

Task Force 17 (Murray)

- (1) Aircraft Carrier: *Hornet* (with 36 VF, 36 VB, 15 VT)
- (2) Heavy Cruisers: *Northampton, Pensacola*
- (2) Light Cruisers: *Juneau, San Diego*
- (5) Destroyers: *Anderson, Borton, Hughes, Morris, Mustin, Russell*

On October 25th, Rear Admiral Thomas Kinkaid (who had replaced Fletcher as commander of the U.S. carrier forces) sent the *Enterprise* and *Hornet* north from Espiritu Santo in order to intercept the Japanese carriers near the Santa Cruz Islands.

A Catalina PBY sighted Nagumo's Carrier Strike Force, but by the time Kinkaid received the report and launched a strike, the Japanese had steamed out of range. Near dawn the next day, Kinkaid renewed the search. This time, he sent out Dauntless bombers as search planes. He was determined not to waste time waiting for sighting reports from the PBYs. This bold approach paid off less than two hours later when a pair of the dive bombers spotted the Japanese carriers. Japanese fighters attacked them before they could get close, but the Dauntlesses escaped into the thick cloud cover.

Another pair of dive bombers overheard the sighting report and left their search vector to attack the carriers. They arrived over the Japanese ships while the fighters were chasing the first two bombers. This second pair managed to score a direct hit on the *Zuiho*, leaving a large crater in the carrier's deck. The stricken *Zuiho* was immediately ordered to return to the Japanese naval base at Truk to begin repairs. Admiral Kinkaid's scouting tactic had succeeded in removing one enemy carrier in record time.

Unfortunately for the Americans, a Japanese scout had spotted the *Hornet* just prior to this attack. The *Zuiho* managed to launch its aircraft before being damaged. These aircraft, plus those from the *Shokaku*, *Zuikaku*, and Junyo added up to a total of 135 planes on their way to the *Hornet*.



IJN destroyer hit by American bombers

By the time this massive airstrike found Task Force 61, a storm had obscured the *Enterprise*, leaving only the *Hornet* visible. Since Nagumo believed that only one American carrier was present, that fact that his pilots

**THE BATTLE
OF THE
PHILIPPINE
SEA 19-21
JUNE 1944**

only spotted the *Hornet* confirmed his belief.

For ten minutes, the *Hornet* took everything that the massive air strike could dish out. It was hit twice by torpedoes, leaving it dead in the water. Four bombs also hit the carrier, but the most damaging blow came from a Japanese pilot who deliberately crashed his crippled aircraft into the ship. The *Hornet* lay wrecked and abandoned. Although Japanese strikes continued to pound the ship for several more hours, the *Hornet* did not finally sink until the next day.

When a break in the clouds revealed the *Enterprise*, many of the attacking planes changed targets. Fortunately for the “Big E”, all of the torpedoes fired at the carrier missed. Two bombs, however, hit the forward flight deck causing the ship to have difficulties conducting air operations. The *Enterprise* sent its aircraft to Espiritu Santo and left the battle.

Both American carriers were out of the way at a cost of only twenty-five aircraft. Yamamoto’s plan was on the verge of success. The Japanese were now free to deal with Henderson Field and the Marines on Guadalcanal. Only one final hurdle remained. The American carriers had launched a strike of their own.

The American strike was not only weaker than the Japanese attack, it was uncoordinated and due to arrive piecemeal over the Japanese carriers. Even so, eleven of the *Hornet*’s Dauntless dive bombers found the *Shokaku* and scored 4 hits. The rest of the American planes failed to find the Japanese carriers and went on to other targets.

Now that the *Shokaku* and *Zuiho* were stricken, Nagumo had only the *Zuikaku* and *Junyo* to continue the attack. Far more costly, however, was the loss of over 100 Japanese planes so far in this campaign. Japan could ill afford this drain of experienced pilots and front-line aircraft. Production simply could not meet the increasing demand.

For this reason, Yamamoto decided to withdraw his carrier force along with their few remaining pilots. Had he pressed the attack, there’s a real possibility that the *Enterprise* would have been sunk, removing the last operational American carrier from the Pacific. As it was, Japanese pilots had done more than should have been expected. They had sunk one carrier and forced the withdrawal of another. In doing so, they made it possible for thousands of troops and tons of supplies to disembark on Guadalcanal.

The battle of Santa Cruz was a clear tactical victory for the Japanese, their first carrier vs. carrier win. It was a Pyrrhic victory, however, in light of the increasing American material superiority. The losses suffered in trained pilots and aircraft would ultimately affect the course of war.

At Santa Cruz, the United States came very close to losing both Guadalcanal and its only aircraft carriers in the Pacific. Although reinforcements would soon make their way to the South Pacific, for the moment the Marines on Guadalcanal were at the mercy of the Japanese. Fortunately, the Japanese were equally exhausted.

The 1942 time frame was deliberately chosen by the designers of this simulation because at that time in the Pacific war, both sides were still evenly matched. In fact,

if one was to be honest, the Japanese held a slight qualitative advantage. Their aircraft, especially fighters, were technically superior to those in the U.S. inventory.

It could also be argued that, man for man, Japanese pilots were better trained than their American counterparts. After all, Japan had been at war with China for years. All this practical experience gave them many more hours in the cockpit than the average pilot trainee in the U.S.

By 1944, the preponderance of American naval and air strength made an ultimate Japanese victory in the war highly unlikely. The two big advantages the Japanese held in 1942 – better pilots and better aircraft – were gone. The pool of trained Japanese pilots, which had never been very large to begin with, had been expended at Midway and Santa Cruz. The Zero, which had been such a factor in the early years, had been surpassed by the latest generation of U.S. fighters, like the new F4u Corsair and the Hellcat.

This scenario has been included despite the fact that it occurs two years after the others. The air engagement which took place during this battle was the largest of the entire war. For eight straight hours, Japanese and American aircraft were locked in a contest for control of the sky. This being the case, no flight game on the Pacific air war would be considered complete without simulating this battle.

For all you players who, as American pilots, are tired of getting pushed around by Zeros, this scenario allows you to fly the Corsair and do some pushing of your own. For those of you who like a challenge, this scenario allows you to pit your outnumbered, but trusty, old Zero against the best the Americans can throw at you.

In June of 1944, the Japanese faced American advances on two fronts. MacArthur's forces were preparing to invade the Philippines, and in the Central Pacific, Nimitz's forces were moving on the Marianas Islands. Admiral Soemu Toyoda, who would be the last CinC of the Japanese Combined Fleet, argued against taking up a strictly defensive stance. He sought to bring about the decisive battle as Yamamoto had tried to do for several years.

When the U.S. invaded Saipan, one of the Marianas Islands, Toyoda's hand was forced. If Saipan fell, enemy long-range bombers based on Saipan would be able to launch raids against the Japanese home islands. This was a threat that Toyoda could not ignore. In this respect, the invasion of Saipan was a "Midway in reverse." The United States Navy had lured the Japanese out to fight by attacking an island strategically important to their defense line.

The Japanese plan of battle, code named A-GO, required at least 500 land-based aircraft, primarily because of the superiority of the American aircraft carriers. Vice-Admiral Jisaburo Ozawa was to command the First Mobile Fleet in the Marianas. His strategy was to soften up the American naval forces by first attacking with land-based air strikes from Guam, Tinian, Saipan, and Yap. Ozawa's carriers would then move in and finish off the survivors while remaining out of range of American aircraft.

In the eighteen months since the big carrier battles in 1942, the Japanese navy had done its best to rebuild and recover. Many new aircraft-carrying ships were either purpose-built or converted from other hulls. The shortage of trained pilots was still haunting their war effort, however. Losses continued to outpace production. For this battle, Ozawa scrapped together every last pilot he could find. All told, the Japanese carrier force could launch over 400 aircraft, though many would be flown by only partially trained pilots.

JAPANESE ORDER OF BATTLE

Mobile Force, Vanguard (Ozawa)

(3) Light Carriers: *Chitose, Chiyoda, Zuiho* (with 62 VF, 9 VB, 17 VT)

(4) Battleships: *Haruna, Kongo, Musashi, Yamato*

(7) Heavy Cruisers: *Atago, Chikuma, Chokai, Kumano, Maya, Takao, Tone*

(1) Light Cruiser: *Noshiro*

(7) Destroyers: *Asashimo, Fujinami, Hamakaze, Kishinami, Okinami, Shimakaze, Tamanami*

"A" Force

(3) Heavy Carriers: *Shokaku, Taiho, Zuikaku* (with 79 VF, 77 VB, 51 VT)

(2) Heavy Cruisers: *Haguro, Myoko*

(1) Light Cruiser: *Yahagi*

(7) Destroyers: *Akizuki, Asagumo, Isokaze, Hatsuyuki, Shimotsuki, Urakaze,*

Wakatsuki

“B” Force (Joshima)

- (2) Converted Carriers: *Hiyo, Junyo* (with 81 VF, 36 VB, 18 VT)
- (1) Light Carrier: *Ryuho*
- (1) Battleship: *Nagato*
- (1) Heavy Cruiser: *Mogami*
- (8) Destroyers: *Akishimo, Hayashio, Hamakaze, Michishio, Nowaki, Samidare, Shigure, Yamagumo*

1st Supply Force

- (4) Destroyers: *Hatsushimo, Hibiki, Tsuga, Yunagi*
- (4) Fleet Oilers

2nd Supply Force

- (2) Destroyers: *Uzuki, Yukikaze*
- (2) Fleet Oilers

UNITED STATES ORDER OF BATTLE

Fifth Fleet (Spruance)

Task Force 58 (Mitscher)

Task Group 58.1 (Clark)

- (2) Aircraft Carriers: *Hornet, Yorktown* (with 85 VF, 77 VB, 35 VT)
- (2) Light Carriers: *Bataan, Belleau Wood* (with 50 VF, 19 VT)
- (3) Heavy Cruisers: *Baltimore, Boston, Canberra*
- (2) AA Light Cruisers: *Oakland, San Juan*
- (14) Destroyers: *Bell, Boyd, Bradford, Brown, Burns, Charrette, Conner, Cowell, Craven, Gridley, Helm, Izard, Maury, McCall*

Task Group 58.2 (Montgomery)

- (2) Aircraft Carriers: *Bunker Hill, Wasp* (with 79 VF, 35 VB, 36 VT)
- (2) Light Carriers: *Cabot, Monterey* (with 45 VF, 17 VT)
- (3) Light Cruisers: *Sante Fe, Mobile, Biloxi*
- (12) Destroyers: *Dewey, Hickox, Hull, Hunt, Lewis Hancock, Owen, Miller, Stephen Potter, The Sullivans, Tingley, Macdonough, Marshall*

Task Group 58.3 (Reeves)

- (2) Aircraft Carriers: *Enterprise, Lexington* (with 75 VF, 55 VB, 32 VT)
- (2) Light Carriers: *San Jacinto, Princeton* (with 48 VF, 17 VT)
- (4) Heavy Cruisers: *Indianapolis, Cleveland, Montpelier, Birmingham*
- (1) AA Light Cruiser: *Reno*
- (13) Destroyers: *Anthony, Braine, Bronson, Caperton, Cogswell, Cotten, Dortch, Gatling, Healy, Ingersoll, Knapp, Terry, Wadsworth*

Task Group 58.4 (Harrill)

- (1) Aircraft Carrier: *Essex* (with 42 VF, 36 VB, 20 VT)
- (2) Light Carriers: *Cowpens, Langley* (with 46 VF, 18 VT)
- (1) Heavy Cruiser: *Vincennes*
- (1) AA Light Cruiser: *San Diego*

(2) Light Cruisers: *Houston, Miami*

(14) Destroyers: *Ausburne, Case, Converse, Dyson, Ellet, Lang, Lansdowne, Lardner, McCalla, Spence, Stanly, Sterret, Thatcher, Wilson*

Task Group 58.7 (Lee)

Battleline

(7) Battleships: *Alabama, Indiana, Iowa, New Jersey, North Carolina, South Dakota, Washington*

(4) Heavy Cruisers: *Minneapolis, New Orleans, San Francisco, Wichita*

(14) Destroyers: *Bagley, Bennett, Conyngham, Fullam, Halford, Hudson, Monssen, Mugford, Patterson, Quest, Selfridge, Stockham, Twinning, Yarnall*



IJN transports and cruiser under attack by U.S. bombers

COMPARISON OF AVAILABLE AIRCRAFT

		Fighters	Dive Bomb
	Torp Bomb	Total	
	Japan	222	113
	95	430	
United States	475	232	184
			891

Lying in wait for the Japanese response was the U.S. Fifth Fleet's massive Task Force 58, commanded by Vice-Admiral Marc Mitscher. Mitscher's four task groups numbered seven heavy carriers, including some of the new *Essex* class (the *Bunker Hill, Enterprise, Essex, Hornet*, and the new *Wasp, Yorktown, and Lexington*) and eight light carriers (*Belleau Wood, Bataan, Monterey, Cabot, San Jacinto, Princeton, Langley, and Cowpens*). Taken together, these ships could launch almost 900 aircraft.

The Japanese plan to utilize land-based aircraft was stillborn. Between June 15th and 19th, Task Force 58 raided the Japanese airbases on Iwo Jima, Chichi Jima, Guam, and Rota. On Guam and Rota, the airfields were rendered completely useless, so rather than the 500 land-based aircraft needed for A-GO, the Japanese were left with only 50.

The plan had assumed that land-based aircraft would destroy at least a third of the

American carrier fleet before Ozawa's Mobile Force arrived. Now, Ozawa would have to face the full complement of the Fifth Fleet's carriers. Despite the fact that American carrier aircraft dominated the skies over the Marianas, the plan went forward.

As the Japanese fleet left the Philippines to challenge the U.S. Fifth Fleet, American subs found it and reported its general position. Adm. Spruance knew that the Japanese were mounting a major operation against him, so he decided to hold his forces to the west of Guam. Although submarines had located the on-coming Japanese ships, scout planes from the American carriers failed to find them. Japanese scout planes, however, found the American carriers.



The Bunker Hill, screened by destroyers, after a kamikaze attack

Ozawa launched his first airstrike, unaware that the 500 plane land-based force had been decimated. As this strike proceeded toward Task Force 58, planes from the American carriers were attacking Guam. Unfortunately for Ozawa, his airstrike was detected on radar, a relatively new invention. This gave Spruance time to recall his attacking aircraft. Spruance also positioned a picket line of battleships, cruisers, and destroyers that the Japanese planes would have to cross in order to get to the U.S. carriers. Fighters and anti-aircraft fire from these ships knocked down 42 out of the 69 planes. Not a single aircraft reached the American carriers.

The second Japanese strike of the morning ran into the same resistance as its predecessor. Only 20 planes made it past the picket defense line, and none scored any hits. Only two aircraft from the strikes made their way to Guam. The planned attack on the U.S. carriers, which was supposed to take place after they had reamed on Guam, clearly would not take place.

Throughout the battle, Ozawa remained in the dark about the losses suffered by his strike groups. Vice-Admiral Kakuji Kakuta, commander of the land-based air contingent, was feeding Ozawa false reports. He assured Ozawa that his aircraft had inflicted heavy damage on the American task force. Ozawa therefore ordered a third strike. This wave of 47 planes avoided the picket line of anti-aircraft ships but got lost in the process and was forced to return.

A fourth strike was ordered, 82 planes in all, but these aircraft fared no better. Of these, 33 planes found the southernmost of the American task groups (58.2) and were all shot down for their trouble. The others failed to find the American carriers and headed for Guam. Thirty of these were shot down before they reached the island, leaving the final 19 Japanese planes to discover that American bombers had destroyed the airfield at which they were supposed to land.

Just after noon, the U.S. submarine *Cavalla* hit the fleet carrier *Shokaku* with three torpedoes. Several hours later, the “Sho” rolled over and sank. Twenty minutes later, the *Taijo* also received a torpedo hit from the submarine *Albacore* and suddenly blew up. In both cases, ignition of the fumes from the unrefined fuel oil was the major factor in the demise of the carrier. Mitscher had not yet launched a single air strike against the Japanese carriers, yet Ozawa had already lost two of his fleet carriers.

Ozawa remained unaware of the true situation. Though he in fact had barely 100 planes still airworthy, he continued to believe that the day was his. Kakuta reported that many Japanese planes were safely on Guam and that reinforcements were on the way. These false reports, coupled with other incorrect ones stating that four American carriers had been sunk, convinced Ozawa to regroup his forces and continue the attack the next day. In reality, his forces had already suffered a decisive defeat. The Americans had lost only 29 planes, while they had destroyed a total of 346 Japanese aircraft.

Late in the afternoon of the next day, June 20, Spruance’s search planes finally located Ozawa’s Mobile Force. Mitscher ordered a full airstrike of 216 planes, even though it was already late in the day. The returning American aircraft would be forced to attempt difficult night landings. Over half of the U.S. planes, 130 aircraft in all, were lost, but the damage to the Japanese fleet was absolutely devastating.

Because of the famous “dusk raid”, the light carrier *Hiyo* was sunk; the light carriers *Junyo* and *Chiyoda* were heavily damaged. The fleet carrier *Zuikaku*, last of the Pearl Harbor raiders, continued to lead a charmed existence. Although damaged, it remained afloat.

More than half of the remaining Japanese aircraft were destroyed, leaving only 35 planes in Ozawa’s entire fleet. The battle of the Philippine Sea would forever be known among American pilots as the “Great Marinas Turkey Shoot”. The long sought-after great naval battle of the war had finally occurred. Unfortunately for the Japanese, it had come two years too late. By 1944, the industrial might of the United States had built a carrier force many times that of Japan’s.



TECHNICAL SUPPLEMENT

The **1942 The Pacific Air War** scenario supports most of the available flight add-on hardware. We have provided a configuration file for the WCS Mark II (**1942paw.adv**). Consult your Thrustmaster documentation for instructions on using this configuration file. If you have a problem using a particular device with the game, please contact MicroProse Customer Support for assistance.

COMPATIBILITY ISSUES

Please note that this list includes only the *known* conflicts and incompatibilities. Since no test procedure can ever be totally comprehensive, you may run into undiscovered problems. Please consult with Customer Service if you do.

This game has not been tested under Microsoft Windows; therefore we suggest you do not use it with Windows. Chances are very good that the two will *not* work together. If you desire to use a mouse with this game, the mouse driver *must* be compatible with the 8.20a version of the Microsoft Driver.

We strongly recommend that you not have any Terminate-and-Stay-Resident programs (TSRs) other than memory managers loaded into memory when playing the **1942 The Pacific Air War** scenario. Not only will they decrease the amount of free memory available, thus slowing the game, but there may be unpredictable interactions.

If you experience keyboard response problems using a Tandy computer, the **Alt** status of the keyboard may be reversed. That is, pressing **A** results in the **Alt** **A** and vice-versa. To fix this problem, tap on the **Alt** key until the status returns to normal. We apologize for the inconvenience, but there seems to be something unique to the Tandy keyboard BIOS that causes this problem.

In some Packard Bell, Gateways, and PS\1 computers, there may be a conflict between the standard **MicroProse** boot disk application and some memory configurations. If you experience a lock up while using a boot disk made by the **1942** installation program, you'll need to change one line in the **config.sys** file on the boot disk, thus:

```
device=c:\dos\emm386.exe ramx=b0000-c400 /d=48 frame =e000 6800  
should be:
```

```
device=c:\dos\emm386.exe 2048 ram  
for DOS version 5.0, and
```

```
device=c:\dos\emm386.exe ram highscan  
for any version higher than that.
```

If your hard drive is "doublespaced" and you experience problems using a boot disk, please add the following line to the end of the **config.sys** file on the boot disk:

```
devicehigh= c:\dos\dblspace.sys /move
```

If you are using any other kind of disk compression software, refer to that manual for questions on boot disk creation.

FEATURES UPDATE

Some of the following are changes that originated in the **1942 The Pacific Air War** update, all of which are also included with the scenario. Since many of you may not have acquired the update, the new features are described here as well. The rest are new to the **Scenario**.

NEW CAREERS

Added into the Scenario are the two careers *American Army Airforce* and *Japanese Army Airforce*. To choose either one of these careers, click on the **Pilot Career** button in the Main Menu. There, you can now select either *American Navy*, *American Army Airforce*, *Japanese Navy*, and *Japanese Army Airforce*.

Ditching

To successfully ditch your plane in the ocean, you must hit the water at an extremely slow speed. The best bet is to stall below 50 feet. For career and scoring purposes, a ditch will be treated exactly as a bail-out. The chances of being rescued, captured, or killed are the same.

Cruising Altitudes

When a strike flies to a target, there is always a lead flight that everyone else follows. For mutual fire support reasons, the flights in a strike stay close to each other until they reach their target. Because of this, you may only adjust the cruising altitude of the lead flight. All other flights will automatically adjust their cruising altitudes to match.

The Padlock Feature

The “Padlock” view is only available when you’re in **Virtual Cockpit** mode. To activate the Padlock feature, you must first choose an enemy to “lock” (just as in reality). Swivel your head around until you can see the enemy. Pressing will lock the **Padlock View** onto whatever aircraft is nearest the center of your view. Now, whenever you press **Button #2**, your virtual view will center on the locked plane. As long as you hold the button, the view will move to keep the locked plane centered.

Carrier Battle 3-D Engagement

If you abort your piloting in an engagement that is part of a **Carrier Battle** game before the mission is completed, the computer will finish the attack as though you had selected to observe the engagement. Keep in mind that, due to limitations to the number of planes that can be represented in 3-D, damage from large strikes will be a combination of the damage done in 3-D and damage calculated statistically. Your performance in 3-D, however, will have a limited effect on the outcome of the statistical damage.

Japanese Radios

This is not a bug—the Japanese pilots in this game do not receive radio messages, as the Americans do, because the Japanese pilots do not carry large and bulky radios in their planes. However, this does not effect the messages that are sent while in Modem Play. This in no way states that Japanese pilots did not actually carry radios in their planes during the War.

Scuttling Ships

In a **Carrier Battle**, when a severely damaged ship slows a Task Group down to a degree that is dangerous to the remaining ships, you should scuttle that ship. This was not an uncommon practice during the war, and was used primarily to prevent the enemy from capturing the ship. You can scuttle ships using the **Damaged Ships** option in the **Task Group** menu.

Engine Torque

As is noted in the original manual for **1942**, all planes have a slight engine torque to the left. It is possible to remove the torque so that the planes being flown are more controllable.

Spins

When a plane stalls or when it begins to fall, it starts to spin. It is possible to get out of a spin but it is very difficult. Check the Pilot's Handbook in the original **1942** game for more information.

Speed and Elevation

While in a dive, it becomes harder for a plane to pull out of the dive as the speed of the plane goes up. This represents the wind resistance on the elevators which are the primary tool that is used to elevate the plane. To offset this resistance, pull the throttle back before you enter the dive.



INSTRUCTION MANUAL

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MICRO PROSE[®]
S I M U L A T I O N



1942 THE PACIFIC AIR WAR SCENARIO



MICROPROSE SOFTWARE

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INTRODUCTION

The year was 1942, and America had entered into another World War. This was the largest confrontation in all of history, involving almost all of the powerful nations of the earth. Fighting flared on five different continents, on and under every ocean, and in the air above all of these. It was in the Pacific that the United States first faced a bona fide enemy. Fleets that rivaled small cities in size roamed the seas of the South Pacific desperately hunting for each other's weak moments. The two great fleets of the Pacific, the Imperial Japanese Navy and United States Navy, had outgrown the necessity of meeting at sea to battle one another. From every tiny island and every ship that could launch a plane, the fighter pilots and bomber crews determined the outcome of the fighting.

Playing **1942 The Pacific Air War**, you saw action at Midway, in the Coral Sea, and in the Solomons. This action was in the pilot's seat of a fighter or a bomber, or in the admiral's chair. You took the role of a young pilot—earning medals and awards for your country—and you sometimes found your end in a fish's belly.

Now, with the **1942 The Pacific Air War Scenario**, you can return to the seas and to that same iron-tough aircraft that saw you through so much hell. What we've added with this **Scenario** are more missions in the Philippine Sea. As an extra, added bonus, we're even going to let you get yourself shot up over New Guinea! **The Single Mission** mode now includes over 300 new missions.

As the real war dragged on, new planes were constantly being designed, tested, manufactured, and then finally sent into combat. This addition to the game includes six new planes: the Japanese Frank, George, and Tony and the American Warhawk, Lightning, and Mustang. Each of these planes had its part to play in the war, in victory or defeat; now, it's your turn.



This is your mission.

The computer AI that has been your constant opponent through many games, including this one, is no longer the only enemy you can go up against in **1942**. The **Modem Play** feature lets you test your flying skills against a real, live opponent and (you hope) teach him to respect your flying. Of course, you can also fly together against a common, computerized enemy. There are more than 200 new missions specially designed for modem play.

Also, let's not forget about the pilots that flew from the ground. Added into the Career Pilot section of the game are the two careers of American Army and Japanese Army. No more having to land on a bouncing carrier for you when you're stationed in Port Moresby. So get ready. The bos'n has sounded General Quarters, and pilots are running to their planes. The battle is about to be rejoin'd, and there's an empty cockpit waiting for you.

HISTORICAL BACKGROUND

The more you know, the less often you'll "take a bath". That's as true now as it was then, so we've provided a little background—a little additional history that's relevant to this scenario. The scope of this manual is, unfortunately, limited. You'll find a lot more detail in the history books, and we'd like to encourage you to do just that.

CHENNAULT'S FLYING TIGERS

Two weeks after the bombing of Pearl Harbor, a squadron that had named itself the "Flying Tigers" encountered and destroyed most of a Japanese bomber squadron. It wasn't over the Pacific Ocean, and it wasn't over one of the tiny islands like Midway or Truk where most of the fighting in the Pacific Theater took place. It was in the skies over a place much closer to Japanese soil: China.



Up and away!

To understand how this encounter came about, we must start several years before the United States declared war on Japan and all of her allies. Japan had invaded China in the early nineteen-thirties, in an attempt to form something the Emperor called the Greater East Asia Co-Prosperity Sphere. It was Japan's stated goal to capture by conquest or by treaty all of the eastern Asian countries, to gain access to their natural resources—resources that, even then, Japan either did not have or had depleted from its own lands. The Emperor wanted materials such as oil for the military and mineral ores to build weapons—to build weapons that Japan could use to expand even further.

The United States had been helping the Chinese prepare a defense against the advancing Japanese armies. Several military advisors had been sent to develop a proper Chinese Air Force, as well as to train several units of Chinese infantry. The year was 1932 when Colonel John H. Jouett and nine other American pilots came to China to build a training school for combat pilots. They also had to arrange for the purchase of several modern warplanes, for at that time the Chinese Air Force was made up of fighters that were little more than decaying remnants of the first World War. Not unexpectedly, the Japanese were not pleased with the American interference in their plans.



Zeros sometimes don't make it.

Using diplomatic and political pressures, Japan forced America to remove its soldiers from China in 1934. With the Americans out of the picture, the leader of China, Chiang Kai-shek, looked to other nations for the men and machines that he would need to fight off the coming Japanese offensive. He found that the Russians and Italians were more than happy to help his cause—for a price—and soon most of the planes that Colonel Jouett had arranged for had been shot down. Understanding that help from the United States would be crucial to any effective defense against the Japanese, Madame Chiang Kai-shek hired three pilots. These former U.S. Army Air Corps stunt fliers were to act as instructors for the Chinese Air Force.

The leader of this small group was Claire Lee Chennault, famed writer of *The Role of Defensive Pursuit*. Chennault was dismayed at the ineptitude of China's fighter pilots. Eleven of the twenty-two planes that remained from 1932 had been destroyed in landing attempts, and all of the Martin bombers had been lost in similar accidents. In order to protect the rest of the planes from Japanese attacks, Chennault organized an early warning system of lookout stations. Stations across China were linked by radio to each other and Chennault's headquarters.

With the experienced Chennault running the show, the battered Chinese Air Force earned its first air victory in the summer of 1937. Chinese pilots engaged and destroyed a group of Japanese bombers that were attacking the city of Nanking. In the end, though, Chennault knew, the availability of resupply would determine the outcome of the war. When the Nazi forces invaded Russian 1941, one route of supply was destroyed. The Russians had problems of their own to deal with and could not spare anything for the Chinese effort. The Japanese, in turn, already controlled the eastern seaports of China. This left only one other path for supplies to reach Chennault: Rangoon, Burma. This last line of resupply was quite dangerous, even without the attacks by the Japanese. The infamous Burma Road, a swerving, seven-hundred-mile roller coaster route through mountainous terrain, was the *easiest* route. The frequent Japanese bombings didn't do the road any good, not to mention the supply vehicles and their drivers. A defense for this supply line was badly needed.



Touchdown.

In the Spring of 1941, Chennault returned to the United States to ask for better planes and experienced pilots to protect his resupply line for China. After speaking with President Roosevelt, who was at that time learning of the danger that the Japanese posed to the Pacific, Chennault received a hundred P-40's—Warhawks—planes that had been turned down by Sweden. The P-40 was considered obsolete. In addition, Chennault was given permission to visit various Army and Navy bases and try to persuade troops to volunteer for the effort in China. The canny commander's photos of sunny beaches, tennis courts, and resort-like conditions persuaded many a military and civilian man to volunteer for such a duty.

Ninety pilots from the Navy and the Marines joined up between the months of May and July of 1941. Chennault also recruited one hundred and fifty ground crewmen and other non-flying personnel. Late that July, the first contingent of the American Volunteer Group left for Burma in relative secrecy. It was not until September that the AVG arrived at Rangoon, Burma. When the young pilots left the train that picked them up from the port, they felt ill at ease—there was neither country club nor golf course, and Rangoon wasn't exactly a tropical paradise. What there was was excessive heat, stultifying humidity, vicious insects, and a lot of hard work.

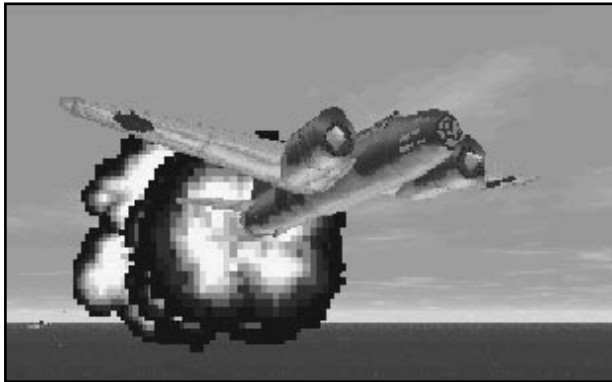
Chennault was also somewhat surprised at the extent of work that needed to be done at Rangoon in order to shake it into a proper military base. He said of what he found there, "The runway was surrounded by quagmire and pestilential jungle. Matted masses of rotting vegetation carpeted the jungle and filled the air with a sour, sickening smell." Five resignations were handed to him before he had even gotten his training sessions under way.

During the intensive training, Chennault taught his pilots all about the Zero. He showed them how it had been designed to out-maneuver most fighters. He also showed them its every weakness—chief among them that it lacked self-sealing fuel tanks and that the pilot had no armor to protect himself. In the same sessions, he would praise the obsolete P-40, though he did not particularly like the plane. He wound on about the Tomakawk's ruggedness and its ability to outdive a Zero in a dogfight. He taught unorthodox fighting styles, making out the romantic chivalry of battle in the skies for exactly what it had become after the First World War—foolishness. He showed his pilots how to use the speed of the P-40 for scathing hit-and-run tactics on highly maneuverable planes like the Mitsubishi Zero. Also, he taught his pilots to fight in pairs, how one plane, acting as a target, could allow his partner to destroy the preoccupied enemy.

The British and the Chinese found his teaching styles to be dishonorable. The British promised a swift court martial for any pilot that even considered running away from a fight, and it was understood that the Chinese would simply execute such a coward. Although such talk led to a few more pilot resignations, Chennault proved to his pilots that they could defeat the Japanese with their P-40's if they used them properly.

During training, men died and equipment failed. Since there were no spare parts, salvageable material was taken from wrecks and reused in those planes that could be fixed. Finding replacements for the men, however, proved to be a nearly impossible task. Considering these problems, the United States military did not believe that Chennault and his AVG could be ready before February of 1942. They also were not convinced that his force could last more than two weeks against the vastly outnumbering Japanese force.

Chennault did not let other people tell him what he could or couldn't do. He promised the U.S. that his pilots would be ready by November of 1941, and he was right. Of the hundred P-40's, only forty-three were still operational, and only eighty-four pilots remained. However, these men and machines were more than ready for combat. One of the pilots got the idea to paint a blood-red mouth and an evil eye on his aircraft's nose to further intimidate the Japanese. At the same time, Disney cartoonists drew up a picture of a winged tiger flying through the V (for victory) symbol. The name "Flying Tigers" was given to the group, and it stuck throughout the war.



It's going to be a 'hot time.'

Two weeks after the bombing of Pearl Harbor, the Flying Tigers finally met up with their adversary. The squadron had been moved to the Chinese city of Kunming to beef up the city's defense. Early on the morning of December 19, 1941, enemy bombers were sighted by the early warning system Chennault had put in place so long before. Four P-40's were sent to handle the situation, while several more waited in reserve. When the Tigers met up with the bombers, they saw that the Japanese had become lax as a result of their unchecked successes. The bombers had been sent out without any fighter cover at all.

One of the pilots in that first attack, Fritz E. Wolf, reported on the events of that day. "Attacked the outside bomber of the vee. Diving down below him, I came up underneath, guns ready for the minute I could get in range. At 500 yards I let go with a quick burst from all my guns. I could see my bullets rip into the rear gunner. My plane bore in closer. At 100 yards I let go with a burst into the bomber's gas tanks and engine. A wing folded, and a motor tore loose. Then the bomber exploded. I yanked back on the stick to get out of the way and went upstairs." When one bomber fell out of the Japanese formation, another moved into its place. The Japanese flew in a mechanical way that led to them losing six of their bombers while only shooting down one Tiger. Chennault had been proven right once again

The Tigers met with the Japanese again on December 23rd, when the Empire returned to bomb their base in Rangoon. This time, with the aid of the British and their lumbering Buffalo fighters, the Flying Tigers went up to meet with the fabled Zero. Many of the British fell victim to the attacks of the fast maneuvering Zero, but only four P-40's were lost in the confrontation. A total of six bombers and four Zeroes were lost by the Japanese, and most of those had been shot down by the rugged P-40's.

Their victory was, as is too often the case, incomplete. The city had been heavily bombed, and the death toll ran high. The Burmese felt the sting of war, a great loss of morale, and began to harbor serious reservations about the British and Chinese who were supposedly fighting for them. Two days later, on Christmas Day, the Japanese returned in force to finish the job. There was no advance warning, for the warning system had been severely damaged by previous Japanese attacks. The total attacking force included over a hundred fighters and bombers. The Tigers, as soon as they heard of the incoming attack, sent twenty-six planes up to stop the oncoming juggernaut.

Of the one-hundred Japanese planes that had been sent to bomb Rangoon again, thirteen bombers and ten fighters were destroyed. Only two Tigers were lost. As further demonstration of the incredible sturdiness of the P-40, one of the Tigers' pilots who had jammed all of his guns rammed one of the Zeroes. He then returned home—and landed safely—having lost only about four feet of wing material. The Japanese decided to change tactics.

This small force that had destroyed so many Japanese planes was to be decoyed. On their first attack of the New Year, fifteen Flying Tigers and British Buffaloes did not return from their attempt to fend off about sixty Japanese fighters and bombers. The Japanese trap was the only time that the Japanese were able to destroy a significant number of P-40's. It was a continuing testament to Chennault's versatility as a trainer.

Although they were graceful and cool under fire in the air, the members of the Flying Tigers lived an unenviable life on the ground. Often, they were attacked by illness and ravaged by hunger. Many members of the AVG swore that when their time was up, they would leave the country and never return. It was obvious to them that their air victories got only minor notice, even though they had won almost every battle that they were involved in. Parts and supplies received were often already broken and defective. Engines would smoke in their first test run, and machine guns would misfire and jam.

It was under these conditions that the men that made up the Fighting Tigers went up in the air day after day, fighting a battle that no one seemed to care about. History has proven that in the military aspect, the trials and tribulations of these fighting men really did not add up to much when compared with the war as a whole. If you look at what they did and what they went through, though, you cannot be anything but be amazed.

Between December 18, 1941 and July 4, 1942, the squadron dubbed the Fighting Tigers accounted for over 286 confirmed Japanese kills, although the true total may be much higher (many shot down planes were lost in the ocean or in the vast jungles that make up southern China). The total cost to the AVG was nine pilots and less than fifty P-40s. Through their successes, the United States saw that the experienced Japanese fighters could be defeated and that their aura of invulnerability was but a facade. Through them as men, we can see that anyone can make a difference if only they try hard enough.

DOOLITTLE'S RAID ON TOKYO

After the seemingly devastating attack on Pearl Harbor, an almost mystical sort of belief grew up around the apparent invulnerability of the Japanese people and their fighting force. Those in charge of the U.S. effort saw that a need had arisen from the carnage of Pearl. This was the need for a symbolic revenge, a reckoning, and a statement that said, "You can not do this to us and get away with it." Their answer to that need was as trivial in reality as it was monstrously forceful in the minds of both the Americans and Japanese—they decided to bomb the Japanese home islands and Tokyo itself.



Can that be... nah.

As there were no land bases near the center of the Japanese Empire from which to launch a strike force, a way had to be found to enable a bomber to take off, bomb targets in Japan, and then land without making this seem like a suicide mission. This was the exact problem that Captain Francis S. Low, an operations officer on the staff of Admiral Ernest J. King, Chief of Naval Operations, had to answer.

His plausible answer: a long-range, medium bomber that could take off from the deck of an aircraft carrier. King, when he heard the Captain's idea, immediately sent him to speak with another man—Captain Donald W. Duncan—in complete secrecy. It was January 11, 1942 when the two men finally talked it all over.

At the time, there was no medium bomber that could fit the bill. All of the existing bombers needed a much longer runway from which to take off, plus they did not have an arrestor hook to help them land on the short deck of a carrier. Low and Duncan came up with the idea that a bomber might be able to take off from a deck, perform its mission, then land on another runway somewhere inland. It might just work—if they could only find a bomber small enough and yet powerful enough to do the job.

On January 17, both men went to see General Henry H. Arnold, Commanding General of the Army Air Forces, about their idea. The general was thrilled with the idea, and assigned an AAF man to begin training pilots and modifying existing bombers. That man was James H. Doolittle. Doolittle had already broken several speed records and had won several awards for aerobatics. He also had been the first man to land his plane using only the instruments in his cockpit (a common, though still dangerous, practice today). Doolittle drew on his considerable expertise and decided that the best plane for this particular mission was the Mitchell B-25 medium bomber. With some slight modifications, he believed that this bomber could be successfully launched from an aircraft carrier.

Ten targets had been selected for the B-25 attacks. The cities included Tokyo, Yokohama, Kobe, and Nagoya. In order to prove that bombers could be launched from an aircraft carrier, two B-25s had been hoisted aboard the carrier *Hornet* and launched into the air. Most of the aircrews had no idea how or why such a thing would be necessary; such was the complete secrecy that prevailed over the mission. Once it was proven that it could be done, Duncan wired General Arnold to tell, “Johnny to get on his horse”. This was the code giving Doolittle the go-ahead to prepare his crew for the attack.

As soon as Doolittle had been assigned the mission, he had immediately begun to select the crews that would go. Only pilots with plenty of experience with the operations of a B-25 would be chosen for the mission, since only those with experience would have any chance of completing it. Even with all this expertise, the modified versions of the bomber proved to be difficult to work with. First off, the tail and belly guns were removed in order to provide space for the necessary extra fuel tanks that would allow them to fly over Japan and then land somewhere in China or Russia. Next, the heavy radio equipment was removed; there would be complete radio silence once the mission had begun. Finally, the new and totally secret Norden bombsight was removed. If a bomber was shot down, the technology would not be confiscated from the wreckage.

To recapitulate, the new B-25 had no communications gear, only a twin .50 caliber machine gun turret on top and a single .30 caliber gun in its nose, and a twenty-cent bombsight that was put together with a few pieces of metal found lying around. (As a side note, the sight proved quite effective in the raid over Tokyo.) Add to that the fact that the plane was going to be overloaded with both bombs and fuel and that the runway was going to be less than one tenth the normal length, and you'll understand why the air crews had a lot of training to get in before they left for the mission.

Even though the only thing anyone knew about the mission was that it was very hazardous and therefore very important, volunteers came in droves. At the last, twenty-four crews were picked and then sent to Englin Field, Florida, to begin their training. One of their first lessons would be how to take off in an extremely short space. After many weeks of training, they all were able to pull the B-25s into the air fast enough to scrape the back of the tail wheel. They practiced bombing runs by flying the B-25s as close as possible to surrounding houses and telephone lines.

During the time of training, Doolittle had one overriding fear—that he would not be allowed to join in the actual mission. Around mid-March, he went to speak with General Arnold to see if he could see this thing through to the end. Using what he later called his “sales pitch”, he got permission to fly the lead bomber of the squadron. On March 23, twenty-two planes left Englin Field for Sacramento, California, for some last minute checks and then for their transfer onto the *Hornet*, the carrier assigned to the task force.

Sixteen of the bombers were transferred with the others staying stateside for training purposes. As soon as the carrier force was under way, Doolittle was able to let all those on board in on the secret. “This force is bound for Tokyo,” was all he had to say. Instantly, a cheer rumbled throughout the carrier and her task force. Vengeance was at hand.

While discussing targets, Doolittle decided against bombing the Emperor’s “Temple of Heaven”. Only military targets such as industrial centers, oil factories, and power stations were selected for this attack. Everyone involved knew that the damage would, at best, be light, but the strike to the morale of the Japanese people could lead them to pressure for an early cease-fire. Each plane was to carry a bomb load of four 500-pound bombs—three being demolition and one for the incendiary work. It was stressed again and again that the residential districts and the Emperor’s palace were not to be touched.

The last problem that they needed to confront was where they were going to land. The only two likely places were China and Russia. Russia, however, was still at peace with the Japanese forces and would not be pleased by this encouragement of a retaliatory strike by the Japanese. China was also not very cooperative. Due to personality conflicts, the leaders of the Chinese government felt they had been intentionally left out of the planning for this secret mission. They had.

The “First Special Aviation Project” was hidden from the Chinese for a simple reason; anything that the Chinese knew about, the Japanese found out about a short time later. China was an intelligence sieve, and was also uncooperative because they, too, feared reprisals. Though it is less widely known, the horrors that the Japanese had already inflicted on the captive Chinese people equalled in proportion to the European Holocaust. In all, more than nine million people were killed, and whole towns were being used as test targets for chemical weapons; the Chinese did not want to know how much worse it could get. As far as Doolittle knew, he was going to land in a country that did not want him, but he had no other choice.

Early on the morning of April 19th, the carrier group sounded General Quarters. Men scrambled to fighters, and those of the First Special Aviation Project had begun to suit up for take-off when the All Clear sounded—false alarm. Two hours later, a scouting SBD sighted a Japanese patrol craft coming toward the task force. The SBD quickly hid inside a cloud bank, but it was too late. At 7:30 AM, the Japanese patrol boat *Nitto Maru* reported in saying, “Three enemy aircraft carriers sighted out position 650 nautical miles east of Inubo Saki at 0630.”



Talk about a traffic jam...

At 8:00, three full hours ahead of schedule, the message for the B-25s to launch was sent. One after another pulled off the flight deck, with Doolittle out in front. Only the last plane had any difficulty taking off, and it got airborne slightly less than an hour behind the first B-25. The *Nitto Maru*, three other patrol boats, and three American aircraft were sacrificed to keep the take-off a secret.

Doolittle wrote about the attack in one of his later reports. "Took off at 8:20 AM ship time. Take-off was easy. Night take-off would have been possible and practicable....Was somewhat north of desired course but decided to take advantage of error and approach from a northerly direction, thus avoiding anticipated strong opposition to the west....Encountered nine fighters in three flights of three...was not spotted...dropped first bomb 1:30...Anti-aircraft very active, but only one near hit." Further on, he wrote, "Passed on out to sea flying low. Was soon joined by Hoover who followed us to the Chinese coast...Saw three large naval vessels just before passing west end of Japan...Decided to abandon ship (over China)...left airplane about 9:30 AM after 13 hours in air."

The mission had been completed, though all but one of the plucky B-25s had been destroyed. Three of the aircraft had been shot down while over Japan. Their crews were subsequently tortured, and the pilots were put to death. Through propaganda, Radio Tokyo called the attack a "Do Nothing Raid"; that statement could not have been farther from the truth. The Doolittle Raid proved to the Japanese people that they were no longer fighting a war of offense only, that now they were fighting against an enemy who could and would bomb their towns and cities. Even despite all of the propaganda used by the Japanese to call the raid a "coward's act" and minimize the effects, the attack had accomplished what its planners had hoped it would. The effect on the people of Japan was so great that it influenced Admiral Yamamoto—he decided to push for a similar all-out attack on an island important to his enemy. That island was Midway, where many believe Japan lost the war for the Pacific.

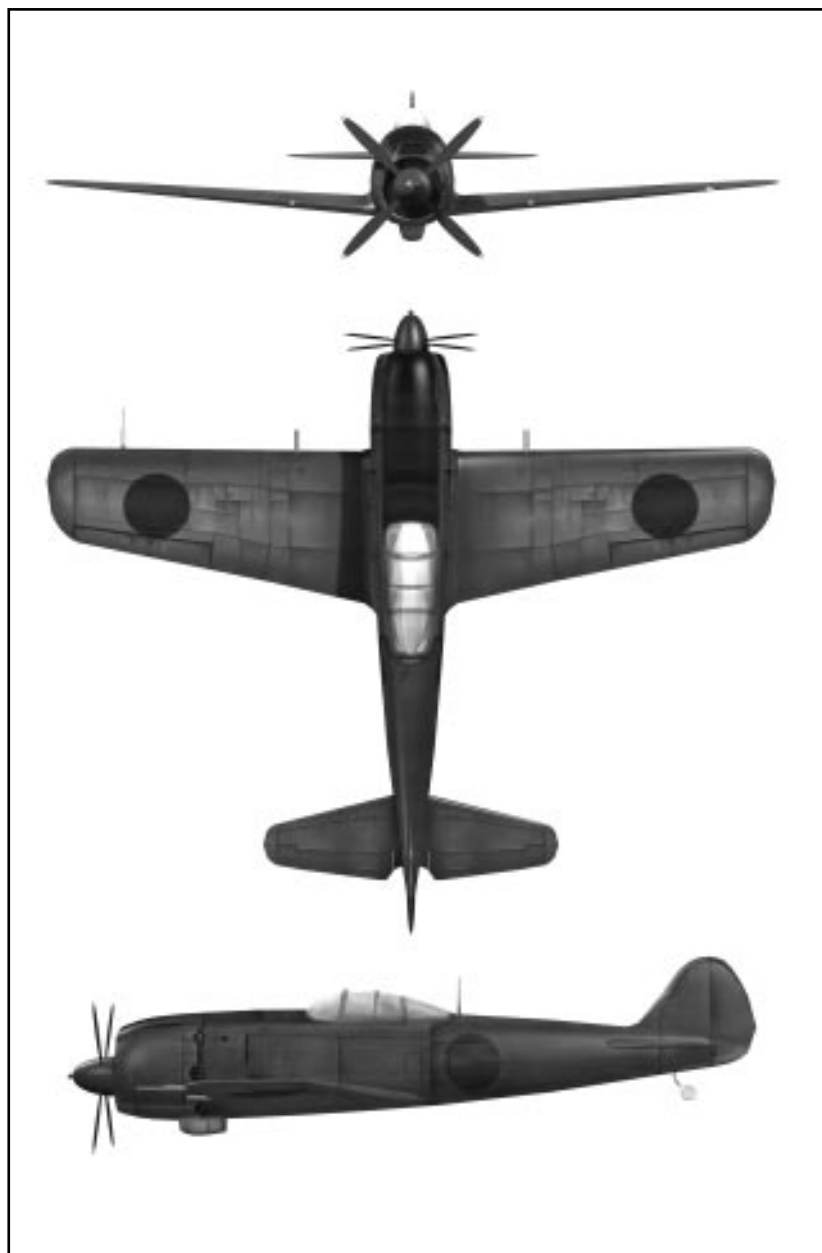
THE NEW COCKPITS

On the following pages are identification diagrams and important information concerning the new enemy aircraft and all of the new planes you might end up piloting. The American Armed Forces' official designation names have been included for ease of reference.

As with the information provided on the original planes, our experienced combat and test pilots have written down a few of their thoughts on each plane. Where these were printable, they are included at the end of the statistics list.



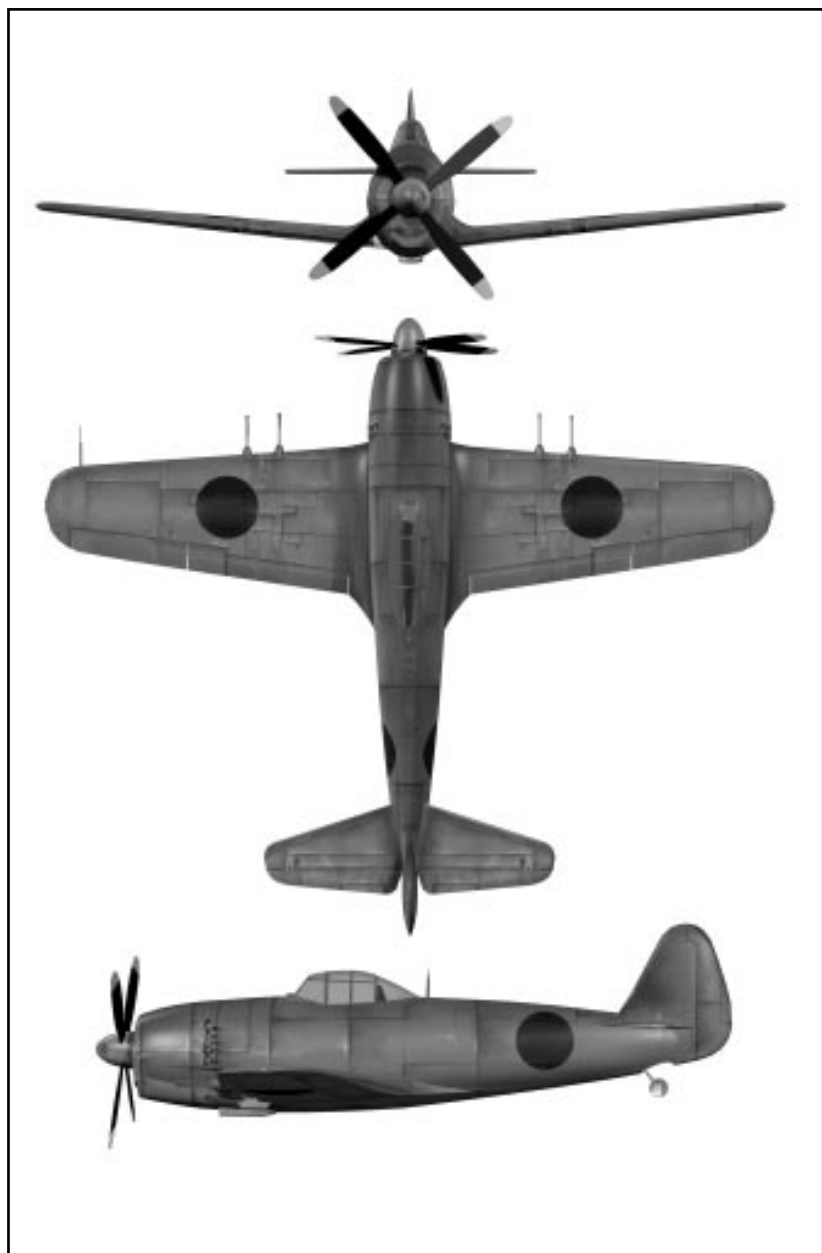
P-40 Cockpit.



FRANK - THE NAKAJIMA KI-84

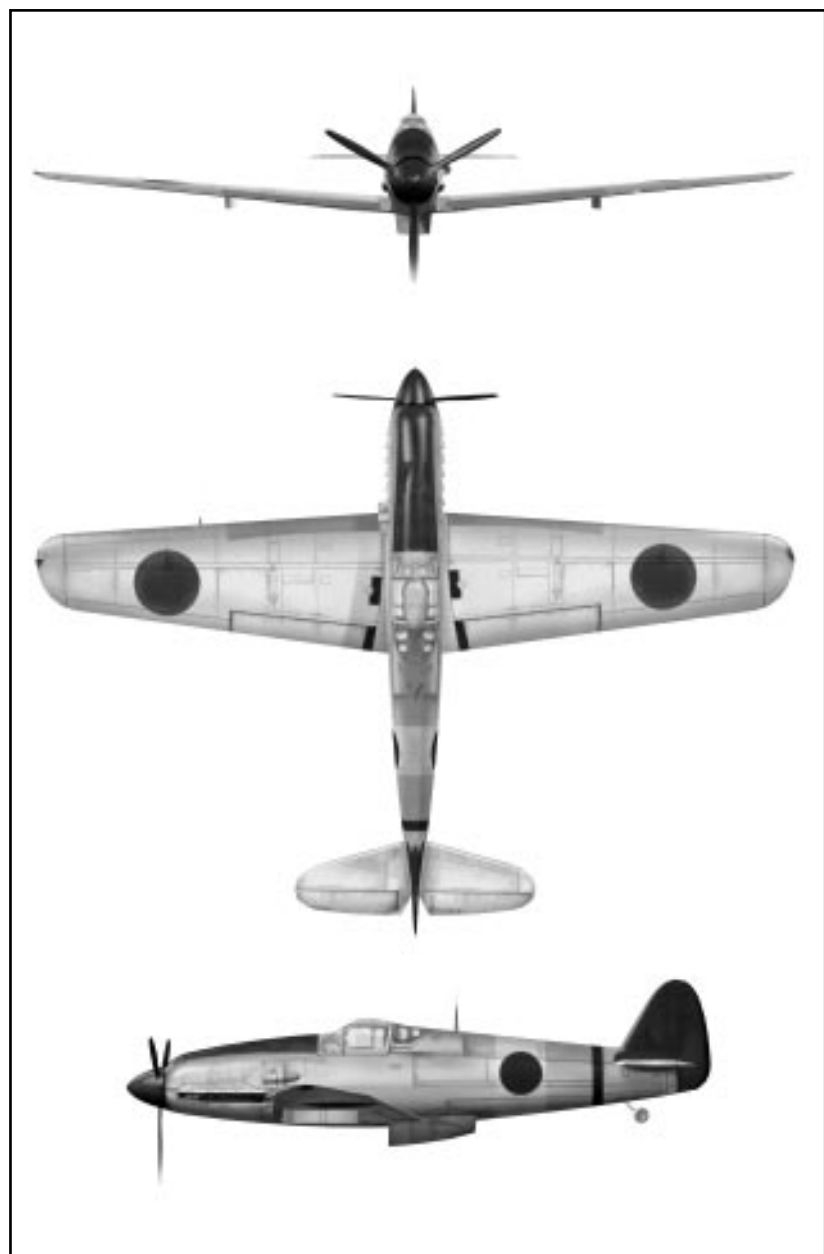
Class:	Fighter
Stations:	Pilot
Weapons:	[Fixed] 2 Wing mounted 20 mm Cannons 2 Fuselage mounted 12.7 mm Machine Guns [Payload] 2 250 Kg Bombs
Ammunition:	[Cannon] 150 rds/gun [MG] 300 rds/gun
Firing Rate:	[Cannon] 465-480 rds/min (approx. 21.5 seconds of fire) [MG] 950-1000 rds/min (approx. 18.5 seconds of fire)
Span:	37'
Length:	32'3"
Wing Area:	21 sq. meters
Engine:	Nakajima Ha (Radial)
Max Hpwr:	1825
Ceiling:	34,450 ft
Cruise Speed:	241 kts
Max. Spd:	341 kts
Stall Spd:	72 kts [Level Flight]

Pilot's Notes: At the time when this fighter was built, Japan had created an entire underground factory that had the capacity to make over 200 Franks in a year. Learning from their mistakes too late, the Japanese added extra pilot armor and self-sealing tanks to this design as an added protection for their pilots. Very maneuverable and very fast, this plane proved that the Japanese, though fighting a losing war, were not defeated yet.



GEORGE - THE KAWANISHI N1K1-J

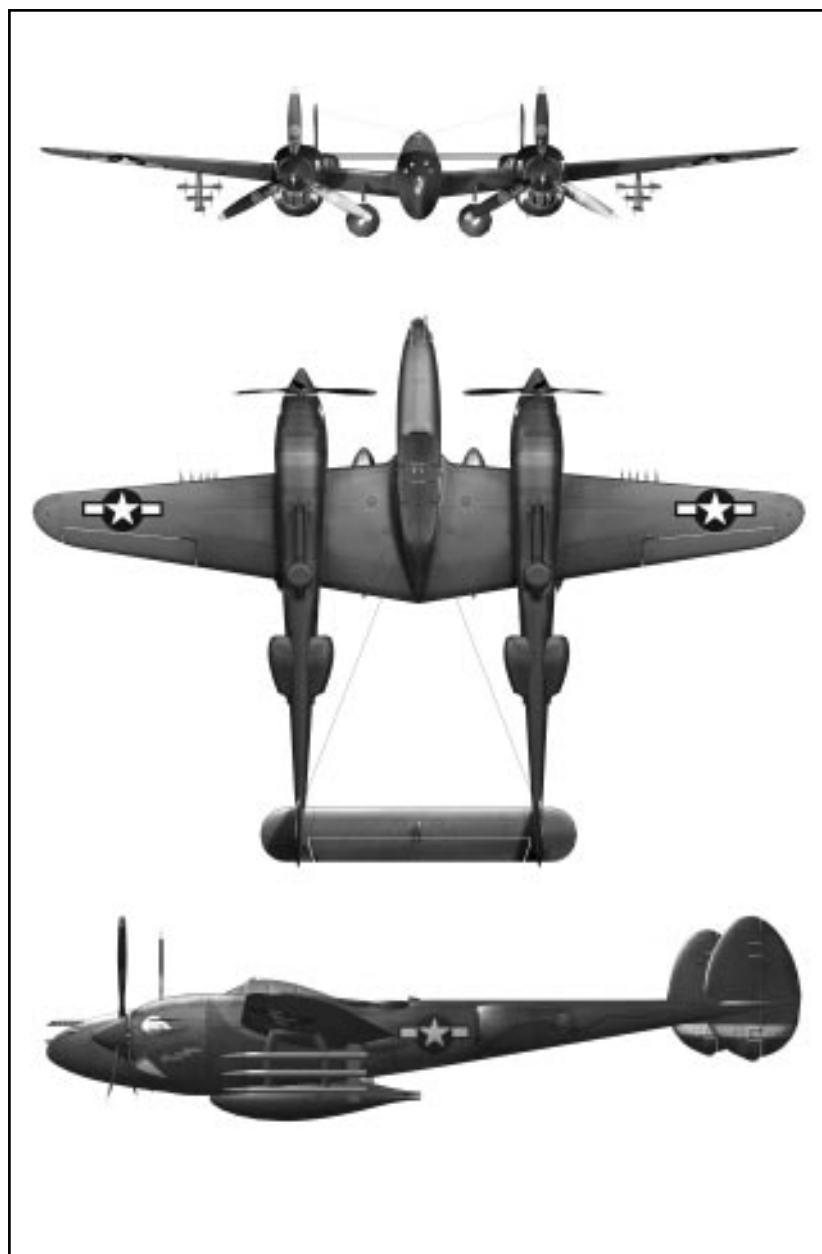
Class:	Fighter
Stations:	Pilot
Weapons:	[Fixed] 4 Wing mounted 20mm Cannons [Payload] 2 60 Kg bombs 2 250 Kg bombs
Ammunition:	200 rds/gun
Firing Rate:	465-480 rds/min (approx. 26 seconds of fire)
Span:	39'4"
Length:	29'4"
Wing Area:	23.5 sq. meters
Engine:	Nakajima Homare 21 (Radial)
Max Hpwr:	1990
Ceiling:	35,300
Cruise Speed:	200 kts
Max. Spd:	315 kts
Stall Spd:	71 kts [Level Flight]
Pilot's Notes:	The war would have had a completely different ending if this plane had shown up earlier than it did. In almost every way, this plane was better than the Mitsubishi Zero. It had self-sealing fuel tanks, as well as pilot armor for added protection. The George was the Zero's equivalent in maneuverability and diving speed. The plane came too late and too few to prove any help in the war effort, but if things had been a little different...



TONY - THE KAWASAKI KI-61

Class:	Fighter
Stations:	Pilot
Weapons:	[Fixed] 2 Fuselage 12.7 mm Machine Guns 2 Wing mounted 20 mm Cannons [Payload] 2 250 kg Bombs
Ammunition:	[Cannon] 150 rds/gun [MG] 300 rds/gun
Firing Rate:	[Cannon] 465-485 rds/min (approx. 21.5 seconds of fire) [MG] 950-1000 rds/min (approx. 18.5 seconds of fire)
Span:	39'4"
Length:	30'1"
Wing Area:	20 sq. meters
Engine:	Kawasaki Type 2
Max Hpwr:	1450
Ceiling:	37,730
Cruise Speed:	216 kts
Max. Spd:	320 kts
Stall Spd:	75 kts [Level Flight]

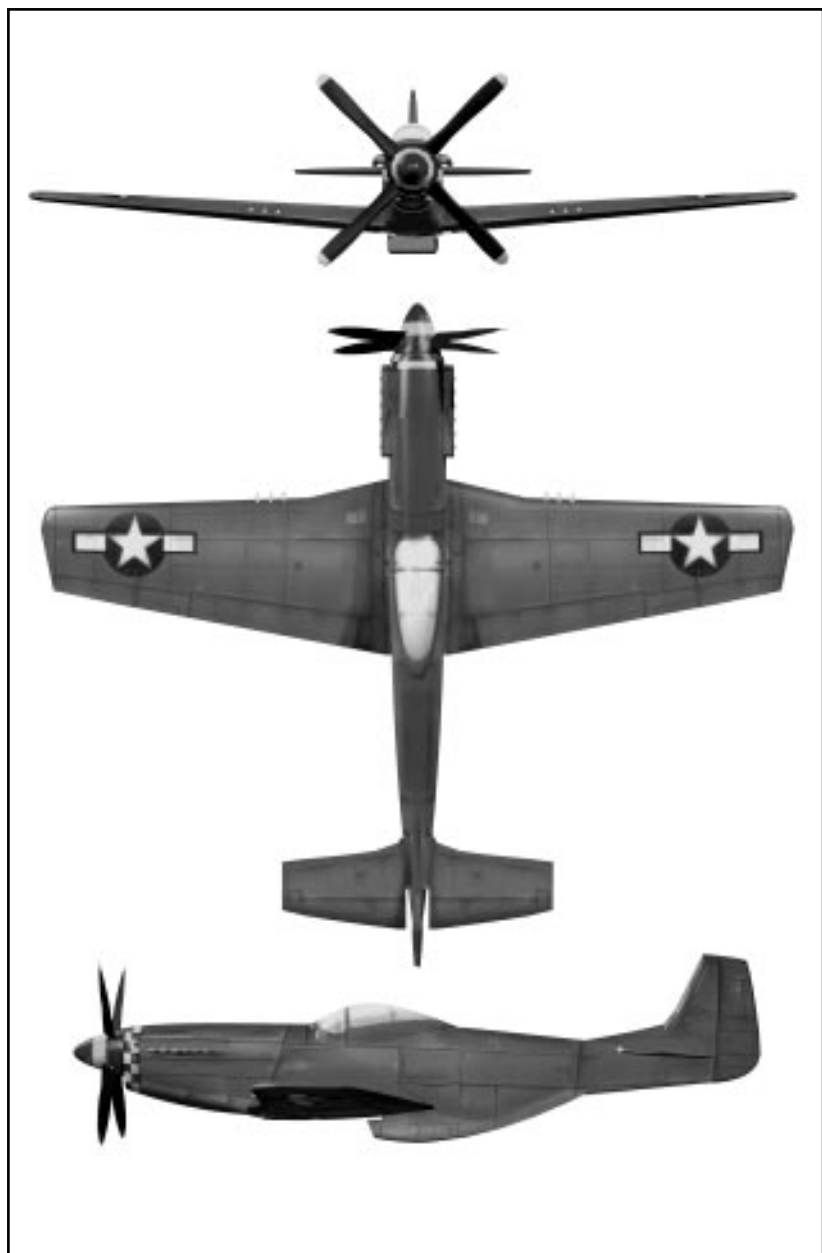
Pilot's Notes: The Kawasaki Type 2 engine, with its liquid cooling system, became a serious handicap for this already problem-riddled aircraft. The Tony's two main advantages—its dive acceleration and its ability to perform a tight turn—proved useful mainly when it needed to retreat from American aircraft. When coming up against a Tony, use high speed to outrun it, then hit and run tactics.



LIGHTNING - THE LOCKHEED P-38F

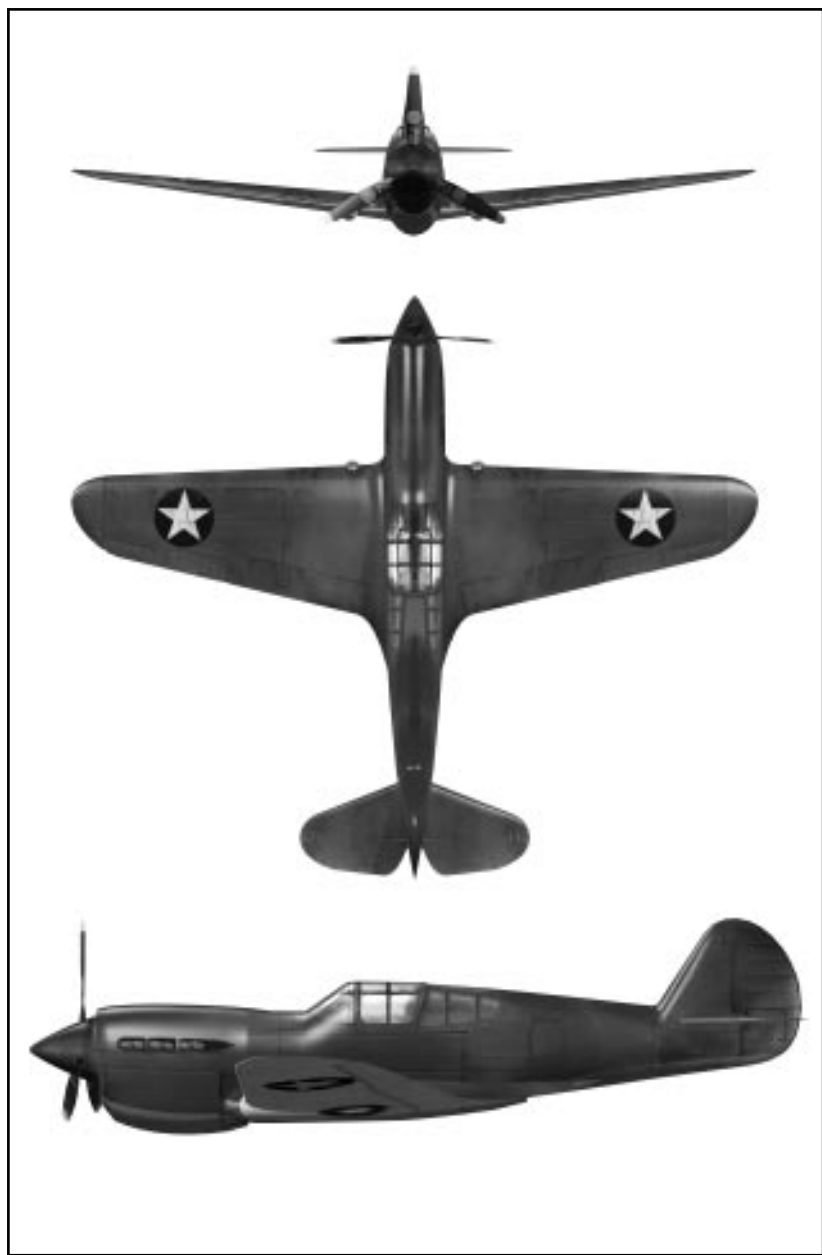
Class:	Fighter
Stations:	Pilot
Weapons:	[Fixed] 1 20 mm Cannon on nose 4 .50 caliber Machine Guns on fuselage [Payload] 2 500 lb bombs 2 1000 lb bombs
Ammunition:	[Cannon] 400 rds [Machine Guns] 360 rds/gun
Firing Rate:	[Cannon] 450 rds/min (approx. 53 seconds of fire) [Machine Guns] 750 rds/min (approx. 29 seconds of fire)
Span:	52'
Length:	37' 10"
Wing Area:	30.4 sq. meters
Engine:	Two Allison V-1710s
Max Hpwr:	1250
Ceiling:	35,000 ft
Cruise Speed:	250 kts
Max. Spd:	375 kts
Stall Spd:	74 kts [Level Flight]

Pilot's Notes: The plane that was called the Fork-tailed Devil was released in 1937. It shot down more Japanese planes than any other fighter throughout the entirety of World War II. With its combination of pilot armor, .50 caliber machine guns, and 20 mm cannons, it quite easily outmuscled any Japanese fighter. It could also outmaneuver one without much trouble. Originally designed as a bomber, this plane saw action throughout the entire War (and has been a favorite at air shows ever since).



MUSTANG - THE NORTH AMERICAN P-51B

Class:	Fighter bomber
Stations:	Pilot
Weapons:	[Fixed] 4 Wing mounted .50 Caliber machine guns [Payload] 2 500 lb bombs 2 1000 lb bombs
Ammunition:	400 rds/gun
Firing Rate:	750 rds/min (approx. 32 seconds of fire)
Span:	37' 1"
Length:	32' 3"
Wing Area:	22.13 sq. meters
Engine:	Packard V-1650-7
Max Hpwr:	1400
Ceiling:	41,900
Cruise Speed:	243 kts
Max. Spd:	378 kts
Stall Spd:	74 kts (Flight Level)
Pilot's Notes:	This fighter is still breaking records for prop planes. It was easily one of the best planes ever to enter the war. She's got a powerful engine for quick and steep climbs, plus she has the firepower to take care of any situation. When used as a bomber, she proved accurate and stable in the dive.



WARHAWK - THE CURTISS P-40F

Class:	Fighter bomber
Stations:	Pilot
Weapons:	[Fixed] 6 Wing Mounted .50 caliber Machine Guns [Payload] 6 30 lb bombs 2 500 lb bombs
Ammunition:	275 rds/gun
Firing Rate:	750 rds/min (approx. 20 seconds of fire)
Span:	37'3"
Length:	31'8"
Wing Area:	21.9 sq. meters
Engine:	Allison V-1710
Max Hpwr:	1150
Ceiling:	33,000 ft
Cruise Speed:	240 kts
Max. Spd:	320 kts
Stall Spd:	71 kts [Level Flight]
Pilot's Notes:	This plane saw action in all arenas during World War II. It could take severe punishment because of its thick pilot armor and its self-sealing fuel tanks. Many pilots felt overwhelmed by the amount of space in the roomy cockpit (it's a lot like the front seat of a car). However, the Warhawk is easily outmaneuvered in a dogfight. It was not until the Flying Tigers of China and Burma that this plane began to see victories instead of defeat. How you fly will make all the difference in this baby.

MODEM PLAY

What could be better than destroying enemy aircraft in a World War II flight simulation? How about fighting side-by-side with one of your friends in a World War II flight simulation? How about shooting each other down? One of the new features added with the **1942 The Pacific Air War Scenario** is **Modem Play** for those of you who want to fight with or against your friends in the skies over the Pacific Ocean.



Main Menu.

Using **Modem Play**, you can fight in any of the planes that you can pilot in the game, including the six new planes provided with the scenario. Modem-specific missions have been developed, or you can design your own using the **Mission Builder**. Just remember, if you want to play in a mission that you create, it is necessary for that mission to have at least two planes that players can pilot and no more than six planes all together.

PREPARING FOR MODEM PLAY

If you think no preparation is necessary, go ahead and skip over this section. Unless you're already pretty good with a modem, you'll be back.

In order for you to play **1942 The Pacific Air War** over a two-computer connection, it is necessary that the computers be connected by modems or a direct connection (such as a null modem cable). Prior to starting the game, both players should agree which computer will be designated as the *Connect* computer and which will *Wait on Connection*. The player at the *Connect* computer will make all the selections as to what type of game both players are going to play. Discussing these selections ahead of time will help to prevent disagreements.



Play Menu.

Both players must be aware of which Comm Port their modem (or direct connection) is attached to, and should know the baud rate of both of the modems being used. The slower of these two rates is the one that must be used. It's also a good idea, if you're using modems over a telephone line, for the *Connect* player to know the other player's phone number. (This might seem obvious, but you'd be surprised how often the most elementary things get forgotten.)

THE MODEM SETTINGS SCREEN

Once you know everything you need to know and both of you are ready to go, both players should left-click on the **Modem Play** button on the **Main Menu**. The **Modem Settings** screen appears. At this point, each player must specify whether his is the *Connect* or the *Wait on Connection* computer; click on the appropriate button.



Searching for Modem.

Both players must also let the game know which Comm Port the connection is attached to by clicking the corresponding button.

Use the same process to choose the **Modem Rate** at which you are going to be communicating. This rate should be the same for both machines—the speed of the slower modem.

When you've finished all of this, click on the **Done** button. If you are communicating through a direct connection, that's all you need to do; you'll see a "Modem Not Found" message, but you can ignore it. If you are communicating via modems, there's a little more to it. The **Dial Menu** will appear on the *Connect* computer; the other just has to wait.

THE DIAL MENU Now, the player at the *Connect* machine has to initiate the communication—you have to call up the other computer. The **Dial Menu** includes a storage area where you can keep a list of ten names and numbers. There are also boxes labeled **Phone** and **Name** near the bottom of the screen.

To add a number to the list or edit an existing listing, left-click on the listing you want to modify. The name and number will be copied into the two boxes. Simply type in the new number in the **Phone** box. If you want to, you can also enter a name or some other reminder in the **Name** box.

When the number you want to call is correct and is displayed in the **Phone** box, click on the **Dial** button to call that number. (If for some strange reason you decide to do something else, click on the **Cancel** button instead) If the connection is successful, the **Mission Settings** screen will appear.



Dial Menu.

MISSION SETTINGS Once the connection is successful, the player on the *Connect* computer must select which type of mission both players will be involved in. Just in case the two of you did not discuss this ahead of time, there are “chat” communication boxes at the bottom of the screen. Click on the **Message Out** area to be able to type a message to the other player. To send this message, press **Enter**. Incoming messages from that person will appear in the **Message In** area.



Mission Settings Screen.

Near the top of the screen is a list of the missions available for the two of you to play. Select a mission by left-clicking on it. Next, the *Connect* player decides which nation he (and the other player) will fly for. If you are playing cooperatively, both of you will fly for the same nation; otherwise, the *Wait On Connection* player will fly for the side not selected.

Next, but not least, select the type of play. To play one against the other, click on the **Head-To-Head** button; to fly as a team against the computer AI, click on the **Cooperative** button.

The weather selection appears as soon as all of the other decisions for the mission set-up are complete. This is exactly the same as the weather selection for the normal game. After the *Connect* player sets the weather, the pre-flight check begins. There is no difference in the way this part of the game operates.

GAME PLAY DIFFERENCES

A few features of the game work differently during **Modem Play**, and there are a couple of new bits that are not available in the regular game. These are detailed here.

One feature is the ability to send messages between the two player pilots. To do this, press **'** (the apostrophe) and begin typing your message. A small window appears at the bottom of the screen allowing you to see the message that you are typing. Messages sent to you by the other player will also appear here. Press **Enter** to send the completed message.



Chatting between players.

In the heat of battle, it can be rather hard to type a full sentence without getting shot down. That's why we've included a group of pre-set messages, which you can send at the touch of a function key. After you press **'** to begin sending, each of the keys **F1** through **F10** will send a different pre-set message to the other player. (Note that there are different messages for **Head-To-Head** and **Cooperative** play.) You can even use your own pre-set messages by editing the file *messages.txt* in the **1942** directory (using any text editing software). Simply type your messages in place of any of the existing ones; when you use the F-key, you'll get the new text.

During **Modem play**, either player can pause the game at any time using **Alt P**. This pauses the game on both computers, and play will only restart when the player who paused the game releases the pause.

When either player uses **F9** to modify the **Graphic Detail Levels**, the game will pause for both players. The adjustments to the graphics, however, affect only the computer on which the modification were done. You can not affect the other player's graphics.

The **Game Configuration Menu** works in the same way. Whenever either player presses **F10** the game pauses for both.

For better or worse, you cannot use the **Pilot Map** during **Modem Play**. This takes away the ability to find your opponent as swiftly as you may like, but that's the nature of war, right? Also, the **Time Compression** feature is not available. In other words, nothing happens if you press **M**, **R**, or **T** in a modem mission.



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Col Martin Joe Johnasen (USAF Ret.)

Thanks you for your ideas and your knowledge that helped in the creation of the game.

1942

THE PACIFIC AIR WAR

KEY REFERENCE CARD

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Flight Controls

	<i>Joystick</i>	<i>Mouse</i>	<i>Keyboard</i>	<i>Pedals</i>
Pitch Up	Stick Back	Mouse Back	↓	—
Pitch Down	Stick Forward	Mouse Forward	↑	—
Roll Left	Stick Left	Mouse Left	←	—
Roll Right	Stick Right	Mouse Right	→	—
Rudder Left	[JB2]+[Left]	[RMB]+[Left]	[,]	Left
Center Rudder	[JB2]+[Center]	[RMB]+[Center]	[.]	Center
Rudder Right	[JB2]+[Right]	[RMB]+[Right]	[/]	Right
Fire Guns	[JB1]	[LMB]	[Shift]	—

Ordnance Controls

Drop Primary Ordnance	[Enter]
Drop Secondary Ordnance	[Backspace]
Jettison External Tank	[Backspace]
Fire Rocket	[Tab]

Keyboard Throttle Control

Max Throttle	[Shift][=]
Add 10% Throttle	[=]
Throttle Back 10%	[-]
Min Throttle (Engine Off)	[Shift][-]
Go to 10% Throttle	[1]
Go to 20% Throttle	[2]
Go to 30% Throttle	[3]
Go to 40% Throttle	[4]
Go to 50% Throttle	[5]
Go to 60% Throttle	[6]
Go to 70% Throttle	[8]
Go to 80% Throttle	[9]
Go to 90% Throttle	[9]
Go to 100% Throttle	[0]

Aircraft Controls

Autopilot On/Off	[A]
Wheel Brakes On/Off	[B]
Dive Brakes On/Off	[D]
Lower/Raise Landing Gear	[G]
Lower/Raise Arrestor Hook	[H]
Cockpit Red-light	[L]
Nose Trim	[N]
Cycle Guns	[S]
Retract Flaps 1/3	[I]
Extend Flaps 1/3	[J]
Bail Out	[Alt][B]
Clear Nose Trim	[Alt][N]

Game Controls

Quit Mission or Battle	[Q]
Decelerate Time	[R]
Accelerate Time	[T]
Configure Flight Controls	[F10]
Max Time Rate	[Shift][T]
Normal (1x) Time Rate	[Shift][R]
Pause Game	[Alt][P]
Quit to DOS	[Alt][Q]
Cycle Menu/Box Choices	[Ctrl] + Arrows

Pilot View Controls

Head Max Up (Std Cockpit View)	[Shift] [I]
Tilt Head Up	[I]
Tilt Head Down	[K]
Head Max Down (Lap View)	[Shift] [K]
Map	[M]
Face Front	[F1]
Face Left	[F2]
Face Right	[F3]
Left Shoulder	[F4]
Right Shoulder	[F5]
External Chase	[F6]
External Track	[F7]
Change Plane	[F8]
Detail Levels	[F9]
Station (Rear Gunner)	[Alt] [F1]
Virtual Cockpit (Fighters)	[Alt] [F1]
Bombsight	[Alt] [F2]
External Free	[Alt] [F7]

External Camera Controls

Chase Mode	[F6]
Track Mode	[F7]
Free Camera	[Alt] [F7]
Rotate/Pan	Button 1 Left/Right or [Ctrl] [←] [→]
Zoom/Move	Button 2 Forward/Back or [Ctrl] [↓] [↑]

Map Controls

Slide Map Down	[I]
Slide Map Right	[J]
Slide Map Left	[K]
Slide Map Up	[M]
Zoom Out	[X]
Zoom In	[Z]
Leave Map	[RMB] or [Esc]

Pilot Map Commands

Quick Cruise	[C]
Toggle Auto-scroll	[Alt] [S]

Carrier Battle Map Commands

Pause Carrier Battle	[P]
Weather Visibility On/Off	[W]
Save Game	[F10]

Flight Film Commands

Motion Controls

Enter Mission	[E]
Next Frame	[N]
Observe to Frame	[O]
Pause	[P]
Rapid Motion	[R]
Slow Motion	[S]
Go to Frame	[Alt] [G]

Editing Controls

Capture Camera Viewpoint	[C]
Activate Editing Board	[M]
Use Captured Viewpoint	[U]
Write Toggle	[W]
Clear Box	[Y]
Move Box	[Alt] [M]

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