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INTRODUCTION

CARRIER STRIKE simulates naval-air battles in the South Pacific during WWII. CARRIER STRIKE can be used to recreate historical battles or random-historical battles (battles that could have happened at a particular time). The Campaign Game allows you to complete one battle and jump immediately into a new battle. Ships sunk or badly damaged in one battle will be unavailable for the next battle. The Campaign Game allows one battle per month from May 1942 to June 1944.

In CARRIER STRIKE you issue movement orders to friendly Task Forces (TFs) and direct the Flight Operations on your carriers. Flight operations consist of selecting ordnance for bombers; moving aircraft from the hangar to the flight deck; launching aircraft on CAP, search and strike missions; and selecting or changing strike targets.

YOUR GAME BOX SHOULD CONTAIN

• Disk • Rule Book • Data Card

STARTUP

BACKUP DISKS

Your game disk has no physical copy protection, so please make a backup copy and put the original away for safekeeping. Use the information that came with your computer to make the backup copy.

README FILE

Your game disk may come with a README file that contains rules updates and/or errata. Please read this file before playing the game.

INSTALLING THE GAME

Use the instructions on your Data Card to install and play CARRIER STRIKE.

SOUNDCARD SETUP

Check your Data Card for any information relating to the selection of your computer's soundcard system.

DOCUMENTATION CHECK

To verify that you have a legitimate copy of the game you will be asked to answer a question using information from this rule book. ***Note:*** *Do not count section headings as part of paragraphs. See your Data Card for any further instructions.*

GAME CONCEPTS

GAME SCALE

Each hex on the map is 17 miles across. Each daylight turn is 20 minutes. Each night turn is 1 hour (see the "Night" section on page 11).

TERRAIN AND UNITS

CARRIER STRIKE map areas contain the following types of terrain:

• Open sea (light blue or light blue with a red dot)

• Restricted waters (light blue with a dark blue dot or light blue with a dark blue and red dot)

• Coastal (gray, green, and light blue)

• Land (gray and green)

Terrain will affect naval movement as follows:

• Task Forces may never enter a land hex.

• Task Forces may never move through a land hex side.

In addition to the above movement restrictions, Task Forces (TFs) in restricted waters or coastal hexes will be easier to sight and more vulnerable to submarine attacks.

The map shows the various TFs involved in the battle by single ship icons (one TF) or double ship icons (more than one TF). Air strikes are shown by plane icons. Air units on CAP and Search missions are not shown on the map. Both sides always operate in a hidden mode unless spotted by enemy forces.

COMBAT FORCES

A typical battle in CARRIER STRIKE will contain some or all of the following:

1. Carrier TFs
2. Surface Combat TFs
3. Bombardment TFs
4. Transport TFs
5. Replenishment TFs
6. Land Based Air Groups

You will be assigned a mission to bombard or unload transports at a land base or to prevent your opponent from doing the same. You must use your carrier forces to assist friendly forces and prevent enemy forces from completing their missions. **In CARRIER STRIKE you have limited control over the air missions from airfields**. (See the section on "Airfields" on page 34.)

SHIP ABBREVIATIONS

ID	DESCRIPTION	ID	DESCRIPTION
CV	Fleet Carrier	**CVL**	Light Carrier
BB	Battleship	**BC**	Battlecruiser
CA	Heavy Cruiser	**CL**	Light Cruiser
CS	Seaplane Cruiser	**CLAA**	Light AA Cruiser
DD	Destroyer	**DE**	Destroyer Escort
AO	Oiler	**AP**	Transport
APD	Destroyer Transport		

GAME ABBREVIATIONS

A list of the game abbreviations is on page 77.

GAME TERMINOLOGY

The following three sections will help explain some of the game terms used in the manual for aircraft, ships, and weapons.

AIRCRAFT TERMINOLOGY

• **Dogfight** is the aircraft's ability to hit enemy aircraft and to avoid being hit.

• **Cannon** is the aircraft's ability to destroy enemy aircraft.

• **Load** is the aircraft's bomb load capacity.

• **Endurance** is normal time in air (number of 20 minute turns).

• **Durability** is how much damage an aircraft can take before being destroyed.

SHIP TERMINOLOGY

• **Speed** is how fast the ship can possibly travel.

• **Durability** is how much damage the ship can take before being destroyed.

• **Armor** is the ship's defensive rating against enemy bombs, shells, and torpedoes.

• **Capacity** is the amount of either aircraft or cargo that a ship can carry.

Weapon Terminology

• **Warhead** is the amount of damage and penetration the weapon can inflict.

• **Flak** is the flak effectiveness rating against enemy aircraft.

• **Range** is the weapon's surface combat range for ship-to-ship fire.

• **Accuracy** is the weapon's rating to determine hits on the enemy.

Tutorial

In order to give you an idea of how to play Carrier Strike, a tutorial has been included in the manual (see Page 48).

Summary of Game Menus

A few of the important game menus that are included in the main body of the manual have been duplicated and grouped together for you at the end of the manual. These are especially useful when playing with the keyboard.

TALKING TO THE COMPUTER

Using the Keyboard

Note for IBM users: Make sure your [Num Lock] and [Caps Lock] are off before playing.

Use the following keys to move the cursor around the map in large increments:

```
      I
   J     K
      M
```

Use the following keys on the numeric keypad to move the cursor:

```
7   8   9
4       6
1   2   3
```

Note: *Using the "2" or "8" keys will move the cursor generally either south or north, respectively, due to the hex grid.*

Hotkeys

Other options can be accessed with hotkey commands. These commands are listed on the back of this rule book and can be displayed during the game by pressing the "?" key.

Using the Mouse

Use the mouse to move the pointer over the menu items and buttons. To move around the map, click the pointer at the edges of the map. To select hexes or units, click the pointer over the desired hex. Use the left mouse button to activate the Unit Menu over a particular unit (Task Force, Air Strike, or Airfield). If you click the right mouse button, you will be given information about friendly units in the hex. To escape out of most menus, click the right mouse button.

All keyboard commands also work if you are using a mouse.

SETTING UP THE GAME

When you start a game, the Setup Menu allows you to load saved games or set up new ones. You can return to this menu while playing by selecting ESC on the General Orders Menu and SETUP on the Options Menu.

Setup Menu

SCENARIO	PLAYER	BALANCE
SAVED GAME	JAPANESE COMPUTER	MAX HELP JAPANESE
CORAL SEA	ALLIED COMPUTER	HELP JAPANESE
MIDWAY	BOTH HUMAN	EVEN
EASTERN SOLOMONS	BOTH COMPUTER	HELP ALLIED
SANTA CRUZ		MAX HELP ALLIED
TOROKINA		
MARIANAS		
	ACCEPT SETUP	

Using the mouse, place the mouse pointer over the box you wish to select and click the left mouse button. After making your selections, place the mouse pointer over the ACCEPT SETUP box and click the left mouse button. Using keyboard, you can use the "4" and "6" keys (or the left and right arrow keys) to move from SCENARIO to PLAYER to BALANCE. Use the "8" and "2" keys (or the up and down arrow keys) to alter your selection. Press <Enter> to accept your selections.

SCENARIO selection allows you to load a saved game or start one of the scenarios:

Saved Game loads a previously saved game. When you select this option, you will be asked to choose from a list of five different saved games (a-e). From the keyboard type in one of the letters (a-e) or with a mouse, place the pointer over one of the boxes (a-e) and click the left mouse button. It would be helpful to you to keep a list of your saved games while you play or look at the game directory before playing the game. ***Note:*** *When you load a saved game, remember to reset the Player and Balance options.*

Coral Sea (7-9 May 1942)

The Japanese attempt to capture Port Moresby by sea. The carriers Shokaku, Zuikaku, and Shoho were used to cover inadequate surface and amphibious forces. The Allies countered with carriers Lexington and Yorktown in history's first carrier vs. carrier battle.

Japanese Objectives:
Unload transports at Port Moresby, bombard Port Moresby, and destroy Allied fleet.

Allied Objectives:
Protect Port Moresby and destroy Japanese fleet.

Midway (4-6 June 1942)

The Midway operation was the Combined Fleet's first attempt to lure the Americans into a "decisive battle." The Japanese plan squandered their numerical advantage by spreading their ships all over the Northern and Western Pacific. The carrier strike force with carriers Akagi, Kaga, Hiryu, and Soryu was sent ahead of the fleet to neutralize the airfield on Midway. Thanks to their codebreakers the Americans knew they were coming. American carriers Yorktown, Enterprise, and Hornet surprised the Japanese near Midway on June 4th.

Japanese Objectives:
Unload transports at Midway, bombard Midway, and destroy Allied fleet.

Allied Objectives:
Protect Midway and destroy Japanese fleet.

Eastern Solomons (24-25 August 1942)

This was the Combined Fleet's first general fleet action to support amphibious landings on Guadalcanal. Carriers Shokaku, Zuikaku, and Ryujo, along with a powerful surface force of 3 battleships, 12 heavy cruisers, 3 light cruisers, and 25 destroyers were deployed to cover a pitifully weak amphibious force with just 1,500 SNLF troops (the U.S. 1st marine Division had over 10,000 combatants on the island). The Americans had the carriers Saratoga and Enterprise in the immediate area and the carrier Wasp refueling 250 miles farther south.

Japanese Objectives:
Unload transports at Tassafaronga, bomb Henderson Field, and destroy Allied fleet.

Allied Objectives:
Protect Henderson Field and destroy Japanese fleet.

Santa Cruz (25-26 October 1942)

Admiral "Bull" Halsey took command of South Pacific Forces in mid-October. To prove his aggressive spirit he planned an immediate carrier strike against the Japanese Fleet patrolling north of Guadalcanal. American carriers Enterprise and Hornet engaged the Japanese carriers Shokaku, Zuikaku, Junyo, and Zuiho in Japan's last chance for a "decisive" carrier battle.

Japanese Objectives:
Bomb Henderson Field and destroy Allied fleet.

Allied Objectives:
Protect Henderson Field and destroy Japanese fleet.

Torokina (1-3 November 1943) (Hypothetical)

When U.S. Marines hit the beach at Torokina, it was the first step in Operation Cartwheel, the plan to encircle and beseige Rabaul. The Japanese were determined to crush the Marines before an airfield could be cleared in the dense Bougainville jungle. After a year of refitting and training new pilots, the carriers Shokaku, Zuikaku, Junyo, and Zuiho were called on to halt the Allied advance. American carriers Saratoga, Essex, Bunker Hill, Princeton, and Independence gave the Allies a clear numerical and qualitative advantage over their foes.

Japanese Objectives:
Destroy Allied fleet.

Allied Objectives:
Unload transports at Torokina, bomb Rabaul, and destroy Japanese fleet.

Marianas (19-20 June 1944)

The carrier battles of 1942 had decimated the ranks of Japanese Navy pilots. From December 1942 to May 1944 they commissioned four new carriers (Taiho, Ryuho, Chitose, and Chiyoda) and trained hundreds of "new" pilots. When the Americans invaded Saipan in June 1944 the Japanese were as ready as they could possibly be, yet the Americans were far more prepared than their Japanese counterparts. Fourteen USN carriers had been added since the battle of Santa Cruz. The American pilots had received much on-the-job training during carrier raids on Kwajalien, Eniwetok, Rabaul, and Truk. The two fleets collided west of Guam on 19 June 1944. With 9 Japanese and 15 American carriers it was by far the largest carrier battle in history.

Japanese Objectives:
Destroy Allied fleet.

Allied Objectives:
Unload transports at Saipan, bombard Tinian, destroy Japanese fleet.

PLAYER CONTROL selections choose whether sides are human or computer controlled. These options may be changed during play by selecting the CHANGE PLAYER/BALANCE option. With these options you may play through games commanding the side with the most interesting strategic situation, or replay saved games to see if you could do better than your opponent in an identical situation.

BALANCE selections allow you to play with both sides on equal footing or to favor one side over the other.

EVEN means the game will operate with normal rules for both sides.

HELP gives the player being helped the following advantages:

- Reinforcements arrive sooner.
- Ships have improved damage control.
- Opponent's submarines are less effective.
- Easier for air strikes to locate targets.
- More accurate search reports.
- Increased flak disruption.
- For Japanese the Allied flak disruption is reduced.

MAX HELP gives the player being helped the same advantages listed above at the HELP level, but the effect is doubled.

ACCEPT SETUP allows you to exit the Setup Menu with the options highlighted in yellow.

Randomized Battles

You may select one of the above listed scenarios and then "randomize" it. The orders of battle, objectives, and starting locations of the forces will be altered to create a combat situation where the enemy forces and intentions are unknown. Randomized battles are recommended for those who wish to recreate a realistic "fog of war."

The computer's selection for ships for random battles may be those that actually participated in the historical scenario or those that were available at that time and could have participated. Listed below are the carriers available for each scenario:

Coral Sea (May 1942)

JAPANESE: Akagi, Kaga, Hiryu, Soryu, Shokaku, Zuikaku, Junyo, Zuiho, Shoho, Ryujo

ALLIED: Lexington, Yorktown, Enterprise, Hornet

Midway (June 1942)

JAPANESE: Akagi, Kaga, Hiryu, Soryu, Junyo, Zuiho, Ryujo, Hosho†

ALLIED: Yorktown, Enterprise, Hornet

† *Hosho appears only in historical Midway scenario.*

Eastern Solomons (August 1942)

JAPANESE: Shokaku, Zuikaku, Junyo, Zuiho, Ryujo

ALLIED: Saratoga, Enterprise, Hornet, Wasp

Santa Cruz (October 1942)

JAPANESE: Shokaku, Zuikaku, Junyo, Hiyo, Zuiho

ALLIED: Enterprise, Hornet

Torokina (November 1943)

JAPANESE: Shokaku, Zuikaku, Junyo, Hiyo, Zuiho, Chitose, Chiyoda, Ryuho

ALLIED: Saratoga, Enterprise, Essex, Yorktown*, Lexington*, Bunker Hill, Independence, Princeton, Belleau Wood, Cowpens, Victorious

Marianas (June 1944)

JAPANESE: Taiho, Shokaku, Zuikaku, Junyo, Hiyo, Zuiho, Chitose, Chiyoda, Ryuho.

ALLIED: Saratoga, Enterprise, Lexington*, Yorktown*, Hornet*, Wasp*, Bunker Hill, Essex, Independence, Princeton, Belleau Wood, Cowpens, Cabot, Monterey, San Jacinto, Langley, Bataan

* *These carriers were sunk in 1942; Essex Class carriers were renamed in their honor.*

British Reinforcements

During 1943 and 1944 there is a chance that British carriers may be deployed in the South Pacific. As a general rule the British carriers will be deployed to fill the gaps created by heavy American carrier losses.

The Campaign Game

In a Campaign Game you may fight a series of battles, one per month, to cover the South Pacific campaign of May 1942 to June 1944. The starting point for a Campaign Game may be the same as for any of the first five scenarios listed above. To start a campaign, select a scenario to reflect the desired starting point. You have the option of randomizing the first battle of the campaign or fighting the actual historical battle.

After completing a battle, all sunk ships are deleted from the available list, damaged ships will become unavailable for the period of their repairs, reinforcements will be added to the available list, and a new random battle will be generated for the next month. Note that due to heavy damage and losses of a player's fleet, it is possible that one or more months may be skipped in a campaign before the fleet is ready to engage in another battle. Pilot experience may go down when additional pilots replace pilot losses.

During June 1942, battles will be fought on the Midway map. During June 1944, battles will be fought on the Marianas map. All other battles will be fought using the South Pacific map.

The Campaign Game covers two years of combat in the South Pacific area of operations. During this time many new bases will be constructed and old ones abandoned. Most of the battles will involve one or both of the players attempting to bombard or unload transports at one of these base locations. Victories on either side will affect the progress of base construction which will never be faster than it was historically (see "Campaign Progress" on Page 48).

Battle Plan

After you exit the Randomized Battle Menu, you should see the Top Secret Battle Plan screen. Click the right button (press the space bar). Next is displayed the date and your mission orders for the battle. Click the right button (press the space bar) to continue.

Options Menu

Japanese/Allied Player
ORDERS
END TURN
SAVE
SETUP
ACCEPT

ORDERS takes you to the Orders Phase where you issue all orders regarding Task Force movement and Flight Operations. You may also examine friendly airfields, sighted enemy TFs, and evaluate the overall strategic situation.

END TURN will end the Orders Phase of each player's turn and start the Execution Phase. During the Execution Phase the computer will move TFs, search aircraft, and strike aircraft in the directions determined by the players. All combat for each 20 minute turn will be displayed and resolved at this time.

SAVE allows you to store the current game to disk. You will be asked to choose one of five letters (a-e) to save your game under. With the keyboard press (a-e) or with a mouse place the pointer over one of the boxes (a-e) and click the left mouse button. It might be helpful to you at this time to keep track of your saved games.

SETUP returns you to the Setup Menu described on page 4.

ACCEPT puts your choice into action.

Sound/Delay Menu	
SOUND	**DELAY**
ON	NONE
OFF	LOW
	MEDIUM
	HIGH
ACCEPT	

Using the mouse, place the mouse pointer over the box you wish to select and click the left mouse button. After making your selections, place the mouse pointer over the ACCEPT box and click the left mouse button. Using keyboard, you can use the "4" and "6" keys (or the left and right arrow keys) to move from SOUND to DELAY. Use the "8" and "2" keys (or the up and down arrow keys) to alter your selection. Press <Enter> to accept your selections.

SOUND ON/OFF allows you to turn the sounds of battle on or off. Turning the sound off will help speed up game play.

DELAY NONE/LOW/MEDIUM/HIGH determines how long each message will be displayed on the screen. Play with this to find the level that works for you.

ACCEPT sets your selections and exits the menu.

You can also change the sound/delay levels during the Orders Phase by selecting UTIL then DELAY using the mouse or by pressing the F10 key. You can change the levels during the Execution Phase by pressing [Space].

TURN SEQUENCE

Each game turn consists of the following sequence of phases:

Start of Turn Phase:

Wind Direction
Cloud Cover

Japanese Player Turn:

Radar Reports
Orders Phase
Land Aircraft
Resolve Surface Combat
Resolve Naval Bombardment
Unload Transports at Objective

Allied Player Turn:

Radar Reports
Orders Phase
Land Aircraft
Resolve Surface Combat
Resolve Naval Bombardment
Unload Transports at Objective

Execution Phase:

Move/Resolve Air Strikes
Move/Resolve Search Missions
Move Task Forces
Resolve Submarine Attacks
General Withdrawal
End of Battle
Repair Phase

START OF TURN PHASE

Wind Direction

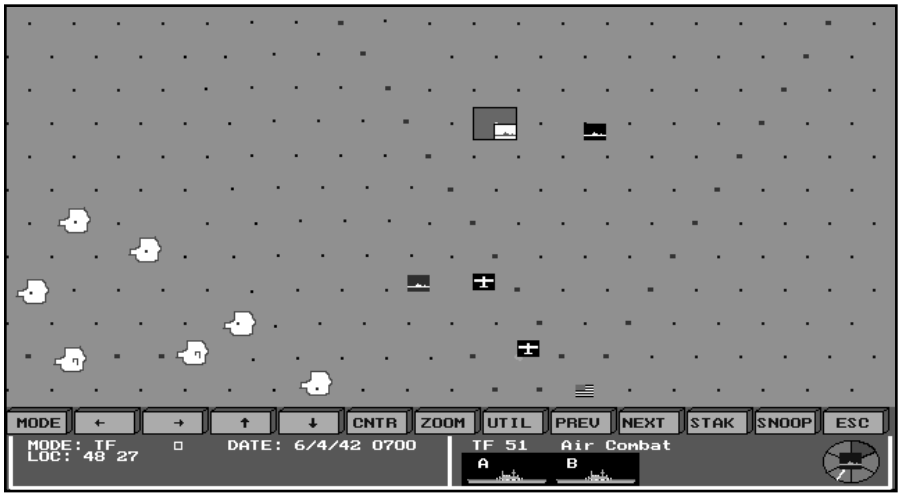
Every turn there is a 1% chance that the wind will change direction.

Cloud Cover

At the start of a scenario or battle, white clouds will be randomly placed on the map. Each turn the clouds may move a hex or disappear from the map. New clouds may also appear on the map. If clouds are in a hex with an enemy TF or land base, then there is a 67% chance that any search or strike aircraft will not locate the enemy TF or land base.

Radar Reports

Radar reports may occur any time an enemy air strike moves within 70 miles of a friendly TF. The report will tell how many enemy aircraft are in detection range and enemy strike icons will be placed on the map. Radar reports do not indicate whether strike aircraft are inward or outward bound. Allied ships are equipped with radar at the start of the game. Japanese ships do not have radar until August 1942.



ORDERS PHASE

At the beginning of the Orders Phase, you will see a map displayed on the screen. Below the map are 13 mouse buttons and below that is the text window for messages and other information. Above is a sample screen of the Midway scenario.

The map shows two Allied TFs near the top of the screen and one Japanese TF close to the middle of the screen. To the right of the Japanese TF are two Allied strike air groups which were launched from Midway towards the spotted Japanese TF. At the bottom of the map is Midway shown by the American flag icon. A storm system with numerous clouds appears on the bottom left side of the map.

The left side of the text window contains some general information. MODE:TF means that you are operating in TF Mode which allows you to access the two Allied TFs and obtain information concerning them. There are also two other Mode options: MODE:CAP and MODE:STRIKE. The next information DATE: 6/4/42 0700 is the date of the scenario June 4, 1942 and the time is 7:00 AM. The next line shows LOC: 48 27 which means that the map cursor is at X coordinate 48 and Y coordinate 27.

The right side of the text window shows TF51 Air Combat which means that the cursor is over TF51 which is an Air Combat TF. Below are two carrier pictures labeled “A” and “B.” The left carrier is the Enterprise and the right carrier is the Hornet. You can access the Flight Operations Display by pressing the letters “A” or “B” or place the mouse pointer over one of the pictures and click the left mouse button. The compass is located on the far right side of the text window and shows TF51 is heading SW, which is shown by the white line. The wind is blowing from the NE as shown by the darker shaded area on the compass.

General Rules

Task Force Movement

TFs will automatically move at maximum speed in the direction they are pointed. A TF's speed is always equal to the speed of the slowest ship in the TF or 30 whichever is lower. Each turn a TF will gain Movement Points equal to its TF Speed. When a TF has accumulated 50 or more Movement Points, it then spends 50 points and advances one hex in the direction it is heading. A TF may have 6 possible directions:

030-NE

090-E

150-SE

210-SW

270-W

330-NW

You may alter a TFs direction by 60 degrees by pressing:

< -60

> +60

To change TF direction using the mouse, move the pointer over the desired portion of the direction compass (located on the lower right side of the screen) and click the left button.

A TF will lose 33% of its accumulated movement points for each 60 degree course change it makes.

A carrier TF that performs Flight Operations during the turn may not alter its direction for the remainder of the turn.

A TF will lose one movement point for each enemy aircraft that attacks it.

A TF that has a "->" symbol next to its mission on the display has enough movement points to move one hex during the Execution Phase. A TF that has an "*" next to its mission on the display is under computer control. These TFs have either completed their mission, have crippled ships, or have received a General Withdrawal Order from the Supreme Commander. The TFs will usually proceed towards their home base.

Night Turns

Night TF Movement

Starting with the 2000 turn the game will continue to have 20 minute turns, however you will not be able to change any orders until the next hour unless you hit the space bar during the turn. Starting at 0400, you will be able to continue changing orders every 20 minutes.

Night Aircraft Movement

Night lasts from 1900 to 0540. During night turns Flight Operations will be restricted. Only float-planes and patrol aircraft may fly during the night without suffering operational losses. During night turns, search planes will not sight enemy TFs, bombers will not locate or attack enemy units, and fighters will not engage in air-to-air combat. Search planes,

CAP, and air strikes may be launched before daylight (0600 hours) but they will not search or engage in combat until the 0600 turn. Fighters and bombers that remain in the air at 1900 will lose 20% of their aircraft every hour (on the hour). These are aircraft that become lost and are forced to ditch. An exception to this rule is that CAP aircraft will not lose 20% of their number on the 1900 turn. Airborne CAP will take 20% losses on the 2000, 2100, 2200, and 2300 turns. See "Aircraft Ditching" on page 34.

Night Surface Combat

Surface combat consists of one or more rounds in which each ship has a chance to fire. When surface combat begins, a starting range will be determined. During daylight turns the starting range will be equal to 20 + Random (15). During night turns the starting range will be 5 + Random (15). After each round of combat, the range will be adjusted and another round will be fought if the TFs are still in range. During daylight the maximum range is 35 (thousand yards). During the night the maximum range is 20.

Night Submarine Contact

TFs will be harder to locate by submarines during the night turns.

Night Aircraft Repairs

Damaged aircraft may be repaired during the 2200, 2220, 2240, 2300, 2320, and 2340 game turns. Each air group may repair 1 aircraft per turn; a maximum of 6 aircraft may be repaired during the night.

Wind Direction

The wind direction is shown on the TF direction compass as a shaded blue area. This is the direction the wind is blowing from. The TF's movement direction must be aligned with the wind direction if carriers in the TF are to perform Flight Operations (launch or land aircraft). If the TF's direction is not aligned with the wind and Flight Operations are attempted, then the TF will automatically turn into the wind. When this occurs the TF's accumulated movement points will be set to zero. Whenever a TF performs Flight Operations, the TF will be unable to change its direction for the remainder of the turn even if the TF was aligned with the wind direction before Flight Operations were attempted.

Fuel Consumption

Ships will consume their fuel at a rate that varies with their TF's speed:

TF SPEED	FUEL USE
27+	1 every 4 hours
18-26	1 every 6 hours
9-17	1 every 12 hours
0-8	none

If a ship runs out of fuel, the TF speed will be reduced to 5 knots.

ORDERS

At the start of your orders phase, the map will be displayed. Just below the map are 13 mouse function "buttons." These functions may be performed by moving the pointer over the desired button and clicking the left mouse button. Listed below is a brief description of the mouse function buttons and their keyboard equivalents:

GENERAL ORDERS MENU

BUTTON	DESCRIPTION	KEYBOARD
MODE	Set Display Mode (TF, CAP, STRIKE Units)	none
←→↑↓	Move Large Increments	J,K,I,M
CNTR	Center Cursor	F2
ZOOM	Change Map Scale	F1
UTIL	Utility Menu	none
PREV	Previous Unit*	none
NEXT	Next Unit*	N
STAK	Next Unit in Hex*	Space Bar
SNOOP	View Enemy TF	P
ESC	Quit, Return to Last Menu	Q,Esc

* *the type of Unit is set with the Display MODE button.*

MODE button (no keyboard equivalent) allows you to cycle through three different unit modes: Task Force Mode, CAP Mode, and Strike Mode. The current mode you are in is displayed on the left side of the message text area below the map.

While in TF Mode, you will see displayed pictures of carriers on the right side of the message area only if the TF is an Air Combat TF. Clicking the left mouse button (or pressing the A, B, C, D keys) over the carrier picture will access the Flight Operations Display.

If you are in CAP Mode, you will see a display on the right side of the message area with F3-CAP with six aircraft symbols below it. If you place the mouse pointer over the box and click the left mouse button (or press the F3 key), a display will come up showing the planes which are on CAP over your TF.

If you are in Strike Mode, the display will have STRIKE with six aircraft symbols below it. If you click the right mouse button while over a hex containing a strike, you will see a list of the planes on strike missions; clicking the right mouse button again will give you a visual display of the strike. Clicking the right button again will return you to the map. If you click the left mouse button while over a hex containing a strike, the Unit Menu will appear.

←→↑↓ (J,K,I,M Keys) allows you to move the cursor on the map either 10 hexes to the left/right or 8 hexes up/down to move quickly around the map.

CNTR (F2) allows you to center the map on the present cursor location.

ZOOM (F1) allows you switch the map scale giving you either a tactical or strategic view of the map.

UTIL (no keyboard equivalent) allows you to access the Utility Menu.

PREV (no keyboard equivalent) moves the cursor to the previous unit accessed. Depending upon what mode you are in (TF, CAP, or Strike), the cursor will move to the last TF, last CAP Air Group, or Strike Air Group accessed.

NEXT (N) moves the cursor to the next unit. Depending upon what mode you are in (TF, CAP, or Strike), the cursor will move to the next TF, next CAP Air Group, or next Strike Air Group.

STAK (space bar) displays the next unit in the same hex only if there is more than one unit in the hex. If there is one TF in a hex, there will be a single ship icon displayed. If there is more than one TF in a hex, there will be a two-ship icon displayed.

SNOOP (P key) allows you to view the ships spotted in an enemy TF. First place the map cursor over the enemy TF and then select the SNOOP option.

ESC (Q or ESC Key) allows you to go to the Options Menu.

TEXT WINDOW ICONS

In the text window below the buttons, the following icons may be displayed:

ICON	DESCRIPTION	KEYBOARD
Carrier Pictures	Flight Ops Display	A,B,C,D
Compass	Set TF Direction	<, >
CAP	Examine TF CAP	F3
Strike	Examine Strike	E

Carrier Pictures is displayed while you are in TF Mode and the map cursor is over an Air Combat TF. There are a maximum of four carriers per Task Force. Each carrier will have a separate picture displayed on the right side of the text window. The carriers will also have a letter (A, B, C, or D) in the picture as well. Placing the mouse pointer over the carrier picture and clicking the left mouse button (or pressing A, B, C, D) will then allow you access to the carrier's Flight Operations Display where you may fuel, arm, and launch aircraft.

The **Compass** is located on the far right side of the text window. A TF symbol is displayed in the middle of the compass. There are six quadrants shown in light blue that represent the six direction headings (NE, E, SE, SW, W, NW). The TF's heading (the direction it is moving) is shown by a white line on the compass. The wind direction is shown by the dark blue shading in one of the six quadrants. You can change a TF's heading by moving the mouse pointer over the desired quadrant and clicking the left mouse button (or press the <, > keys).

The **CAP** picture is displayed if you are in CAP Mode. You will see a display on the right side of the message area with F3-CAP with six aircraft symbols below it. If you place the mouse cursor over the box and click the left button (or press the F3 key), a display will come up showing the planes which are on CAP over your TF.

The **Strike** picture is displayed if you are in Strike Mode. The display will have STRIKE with six aircraft symbols below it. Place the mouse cursor over the picture and click the right mouse button to see the planes on strike missions.

Map Icons

The following icons may be displayed on the map:

ICON	DESCRIPTION	KEYBOARD
Ship (TF)*	Examine TF	G
Strike*	Examine Strike	E

* Click the right mouse button to perform this function.

The **Ship (TF)** icon is represented on the map by a small picture of a ship. Move the map cursor to the location of the TF and click the right mouse button or press the "G" key.

A window will be displayed showing the following information about the TF:

- TF #
- TF's mission
- Destination
- Home Base
- List of all ships in the TF with each ship's id (A-Z), ship type, ship name, ship's maximum speed, ship's current damage level, ship's fire level, and the ship's current fuel level.

You can access further information about the ship upon pressing the id letter for the ship (A-Z) or by placing the mouse pointer over the letter and clicking the left mouse button. This screen displays the following information about the ship:

- Ship type and name
- What TF the ship is attached to
- The number and types of weapons
- Ship class
- Amount of ammunition and torpedoes remaining
- Ship's durability, armor, speed, capacity
- Fire level
- Number of aircraft
- Flight deck damage for carriers
- List of air groups (A-D) on the carrier

If the ship is a carrier, you may press the air group letter A-D or place the mouse pointer over the letter and click the left mouse button

to bring up a display showing the details of the air group as listed below:

- Aircraft group's designation, type, nationality
- What carrier the group is attached to
- Aircraft type
- Experience rating
- Number of aircraft operational and damaged
- Aircraft's dogfight, cannon, load, endurance, and durability

You may scuttle any ship that has greater than 50% flotation damage. To scuttle a ship in the current TF, press the "G" key or click the right mouse button to list the ships in the TF. Select the ship you wish to scuttle. A "(S)cuttle Ship" message will appear at the bottom of the ship display. Press the "S" key or place the mouse pointer over the (S) on the display and click the left mouse button. A "Scuttle Ship Y/N" question will be displayed. You must press the "Y" key to confirm your desire to sink the ship. Scuttling a ship will give the enemy points for the ship being sunk. However, some advantages to scuttling heavily damaged ships are that the TF will move faster, a small TF that was detached to escort the ship will not be a sitting duck as it travels to its home base, and you could merge the remaining ships of a detached TF into an existing TF without any loss in speed due to a heavily damaged ship.

The **Strike** icon is represented on the map by a small aircraft picture. Move the map cursor to the location of the Strike icon and click the right mouse button or press the E key. A window will be displayed showing the aircraft assigned to strike missions. Clicking the left mouse button will allow you access to the Unit Menu.

Utility Menu Options

The Utility Menu may be displayed on the screen by placing the mouse pointer over the UTIL button and clicking the left mouse button. The Utility Menu is described below along with the keyboard commands:

Utility Menu

BUTTON	DESCRIPTION	KEYBOARD
SUNK	List Types of Ship Sunk	F8
SCORE	Display Current Score	F9
VIEW-TF	Show Friendly TF	F5
VIEW-AF	Show Airfield	F6
BATTLE PLAN	Review Battle Plan	F7
AUTO MOVE	Computer Controls TF	Alt/M
EARLY END	Ends Current Battle	Alt/E
DECLINE	Refuse Current Setup	Alt/D
DELAY	Set Sound/Delay Levels	F10
SEARCH ON/OFF	Set Search Lines ON/OFF	ALT/W
EXIT	Exit Game - Return to DOS	Alt/Q
ESC	Exit the Utility Menu	None

SUNK (F8 key) lists the number of ships from both sides that have been sunk.

SCORE (F9 key) displays the Japanese and Allied total points, which is the sum of the accumulated mission and damage points. Below the total score for each side is displayed the carrier icon pictures. For every carrier that has been sunk, there will be a burning carrier icon displayed. In the text window the date and time will be displayed along with the amount of mission and damage points that have been accumulated over the campaign. Click the right mouse button or press a key to exit the display.

VIEW-TF (F5 key) shows a bird's-eye view graphic display of the various ships in the friendly TF. Click the right mouse button or press a key to exit the display.

VIEW-AF (F6 key) shows a bird's-eye view of an airfield.

BATTLE PLAN (F7 key) allows you to review the battle plan for the current month to see what your orders are.

AUTO MOVE (ALT/M) allows you to switch between automatic movement on/off. When the automatic movement is on (engaged), the computer will control the movement of all your TFs. When automatic movement is off, you have control over the movement of your TFs.

EARLY END (ALT/E) allows you to end the current battle only if there are no air strikes in the air and one of the players is withdrawing.

DECLINE (ALT/D) allows you to decline the current month's battle. You must select this option before 0500 on the first day of the battle. You will be asked a question if you wish to Decline Battle. Press the "Y" if you wish to decline the battle. If not press the "N" key to continue playing the current battle. Using the mouse, place the pointer over either the YES or NO buttons and click the left mouse button.

DELAY (F10 key) allows you to change the sound on/off and the delay levels.

SEARCH ON/OFF (ALT/W) allows you to toggle between having the search lines being displayed during the Execution Phase.
Note: *If you are playing a two player game, the search lines will always be set to off.*

EXIT (ALT/Q) allows you to exit the game and return to DOS.

ESC (None) allows you to exit from the Utility Menu.

Unit Menu Options

The Unit Menu can be accessed by moving the map cursor over a unit icon or airfield and clicking the left mouse button. When using the keyboard you can use the options listed below at any time as long as the map cursor is over a friendly TF. The Unit Menu is described below along with the keyboard commands:

Unit Menu

BUTTON	DESCRIPTION	KEYBOARD
RECALL STRIKE	Order Strike to Return to Base/CV	Alt/K
STRIKE AF	Select Airfield Target	Alt/F
STRIKE TF	Select TF Target	Alt/S
LIST TF CAP	List CAP groups	F3
LR-CAP	Order CAP Group to Cover a Different TF	L
DISP TF SEARCH	Display Search Aircraft from TF	S
SET TF SEARCH	Set the Priority Search Direction for TF	H
LIST TF SEARCH	List Search Missions	F4
REFUEL TF	Refuel TF	Alt/R
MERGE TF	Merge TF	ALT/A
DETACH TF	Detach TF	ALT/Z
DISP AF SEARCH	Display Search Aircraft from Airfield	T
LIST AF SEARCH	List Air Search from Airfield	Y
LIST AF CAP	List CAP from Airfield	O
EXAMINE AF	Display Air Groups from Airfield	F
ESC	Exit the menu	None

RECALL STRIKE (ALT/K) allows you to order a strike to return to its home base before completing its mission. To recall a strike, place the map cursor over the strike you wish to recall. Next press ALT/K or click the left mouse button and select RECALL STRIKE from the Unit Menu. The recalled strike will move the same as an unassigned strike. It will move toward its home TF but will not automatically jettison its ordnance. A recalled strike may be reassigned a new target before it lands. Recalling a strike will force the strike's home TF to break radio silence, giving the enemy a chance to detect the home TF.

STRIKE AF (ALT/F) allows you to select an airfield target to attack with the aircraft in your current strike. First place the map cursor over the strike you wish to assign the airfield target to. Next press ALT/F or click the left mouse button and select STRIKE AF from the Unit Menu. A Target Display will then be shown to allow you to choose which target you wish to attack. The display lists the target letter (A, B, C, D, etc.), the target name, and the range in miles to the target. The current target is displayed next. Using the keyboard, press the letter of the target you wish to attack. Press ESC or space bar to exit the menu. Using the mouse, place the mouse pointer over the letter of the target name you wish to attack and press the left mouse button. Press the right mouse button to exit the menu.

STRIKE TF (ALT/S) allows you to select an enemy TF to attack with the aircraft in your current strike. First place the map cursor over the strike you wish to assign the TF target to. Next press ALT/S or click the left mouse button and select STRIKE TF from the Unit Menu. A Target Display will then be shown to allow you to choose which of the spotted TF you wish to attack. The display lists the target letter (A, B, C, D, etc.), the TF#, the bearing to the target, the range in miles to the target, the number of ships in the TF, the number of CVs (carriers), and the number of transports. The current target is displayed next. Using the keyboard, press the letter of the TF you wish to attack. Press ESC or space bar to exit the menu. Using the mouse, place the mouse pointer over the letter of the TF you wish to attack and press the left mouse button. Press the right mouse button to exit the menu.

LIST TF CAP (F3 key) allows you to display the CAP flying over your TF. First place the map cursor over the TF. Next press F3 or click the left mouse button and select LIST TF CAP from the Unit Menu. A list of all your planes on CAP will then be shown. The display lists the CAP air group letter (A, B, C, D, etc.), the group designation, the type of aircraft, the number of undamaged aircraft on CAP, the number of damaged aircraft on CAP, and the time in air. Press the space bar, ESC, or click the right mouse button to exit the menu. If you wish to land some of the air groups and you are using the keyboard, press the letter of the CAP air group you wish to land. Press ESC or space bar to exit the menu. Using the mouse, place the mouse pointer over the letter of the CAP air group you wish to land and press the left mouse button. Press the right mouse button to exit the menu.

LR-CAP (L key) allows to you to fly Long-Range CAP over other TFs. You may reassign "normal" CAP groups (those covering your own carrier TFs or airfields) to fly Long-Range CAP over other TFs. Move the map cursor to the TF you wish to protect. Press the "L" key or click the left mouse button and then select LR-CAP from the Unit Menu. Next move the map cursor over a carrier TF or an airfield (which has CAP flying over it) and press F3 (or click the left mouse button) to get the TF-CAP Display. Select the group you wish to fly Long-Range CAP by either pressing the letter (A, B, C, D, etc.) adjacent to the CAP air group you wish to fly LR-CAP, or place the mouse pointer over the letter (A, B, C, D, etc.) and click the left mouse button. A delay period equal to the range between the two TFs divided by 2 must elapse before the Long-Range CAP arrives on station. The CAP will abandon their station and return to the carriers when the time in air is greater than the aircraft's endurance minus range/2.
Note: *Aircraft on CAP missions can only be assigned to Long-Range CAP if the range to the target is less than or equal to the aircraft's endurance/2.*

DISP TF SEARCH (S key) allows you to display the search patterns for your aircraft flying search missions. First place the map cursor over your TF. Next press the "S" key or click the left mouse button and select DISP TF SEARCH from the Unit Menu. If your TF has search aircraft out, you will see white lines displayed on the map coming from the TF and going out on the plane's search vector. A white circle will be drawn showing the current location of each plane. Red lines will appear on the map when the search planes are returning to their carrier.

SET TF SEARCH (H key) allows you to set the Search Priority Direction (PSD) for your search aircraft. You can set the direction that search aircraft will fly from the current TF by pressing "H" to enter the Set Search routine. With a mouse, this can be done by moving the mouse pointer over the current TF, clicking the left mouse button, and then selecting SET TF SEARCH on the Unit Menu. To alter the PSD, press the "<" or ">" keys or click on the <, <<, or >, >> buttons. With the mouse, the PSD may also be set by placing the mouse pointer on the map in the area you wish to search and then clicking the left mouse button. If you are playing the Japanese player and have a TF containing BB, CA, CL, or CS type ships, you may launch float planes from those ships to perform search missions. While in Set Search, float planes may be launched by pressing the "F" key or placing the mouse pointer over the LNCH button and clicking the left mouse button. This will cause one float plane per eligible ship to be launched. A single ship can never launch more than one float plane per turn.

LIST TF SEARCH (F4 key) allows you to view all of the air groups on search missions from the current TF. First place the map cursor over the TF. Next press the F4 key or click the left mouse button and select LIST TF SEARCH from the Unit Menu. A list of all your planes on search missions will be shown. The display lists the air group letter (A, B, C, D, etc.), the group designation, the type of aircraft, the number of undamaged aircraft on search, the number of damaged aircraft on search, and the time in air. Press the space bar, ESC, or click the right mouse button to exit the menu.

REFUEL TF (ALT/R) allows you to refuel the ships in the TF. A TF may be refueled from a land base that has more than 250 fuel points or from another TF that has a replenish mission or from other (larger) ships in the same TF. First place the map cursor over the TF you wish to refuel. Next type Alt/R or with the mouse click the left mouse button and then select REFUEL-TF on the Unit Menu. The computer will automatically select the best fuel source in the current TF's hex and attempt to transfer fuel to any ship with less than 20 fuel points. No ship can gain more than 5 fuel points per turn and no ship will ever be increased above 20 fuel points. When refueling from ships in the same TF only, ships with more than 30 fuel may transfer fuel to other ships. When a TF performs fueling operations its accumulated movement points will be set to zero. If the destroyers in a TF are running low on fuel, they may automatically attempt to take fuel from larger ships (with more than 30 fuel) in the same TF.

MERGE TF (ALT/A) allows you to merge ships only from Surface Combat TFs into the current TF. First place the map cursor over the TF you wish to add ships to. Next press ALT/A or with the mouse click the left mouse button and then select MERGE TF on the Unit Menu. Starting with the lowest numbered Surface Combat TF in the same hex with the current TF, the computer will automatically transfer ships to the current TF (largest ships first) until the current TF has 22 ships or there are no more ships in the Surface Combat TFs.

DETACH TF (ALT/Z) allows you to detach a Surface Combat TF from the current TF. First place the map cursor over the TF you wish to detach ships from. Next press ALT/Z or with the mouse click the left mouse button and then select DETACH TF on the Unit Menu. The current TF must have at least 6 destroyers to be eligible to detach a force. The newly created Surface Combat TF will take the first two battleships, the first two cruisers, and about half of the destroyers from the current TF. The current TF will always retain at least four destroyers for a screen. Ships with greater than 24% flotation damage will not be detached.

DISP AF SEARCH (T key) allows you to display the search patterns for your aircraft flying search missions from airfields. First place the map cursor over your airfield. Next press the "T" key or click the left mouse button and select DISP AF SEARCH from the Unit Menu. If your airfield has search aircraft out, you will see white lines displayed on the map coming from the airfield and going out on the plane's search vector. A white circle will be drawn showing the current location of each plane. Red lines will appear on the map when the search planes are returning to the airfield.

LIST AF SEARCH (Y key) allows you to view all of the air groups on search missions from the current airfield. First place the map cursor over the airfield. Next press the Y key or click the left mouse button and select LIST AF SEARCH from the Unit Menu. A list of all your planes on search missions will then be shown. The display lists the air group letter (A, B, C, D, etc.), the group designation, the type of aircraft, the number of undamaged aircraft on search, the number of damaged aircraft on search, and the time in air. Press the space bar, ESC, or click the right mouse button to exit the menu.

LIST AF CAP (O key) allows you to display the CAP flying over your airfield. First place the map cursor over the airfield. Next press the "O" key or click the left mouse button and select LIST AF CAP from the Unit Menu. A list of all your planes on CAP will then be shown. The display lists the CAP air group letter (A, B, C, D, etc.), the group designation, the type of aircraft, the number of undamaged aircraft on CAP, the number of damaged aircraft on CAP, and the time in air. Press the space bar, ESC, or click the right mouse button to exit the menu.

EXAMINE AF (F key) allows you to look at all the air groups that are at the airfield. First place the cursor over the airfield. Next press the "F" key or click the left mouse button and select EXAMINE AF on the Unit Menu. An airfield display will appear showing the amount of fuel points on the airfield along with the airfield capacity and damage level. A list of all your air groups will be displayed showing the air group letter (A, B, C,.D, etc.), the air group designation, the type of aircraft in the air group, the number of planes damaged (DA), the number in the hangar (HG), the number fueled (FU), and the number ready (RD). To the right of the number ready is the armament that the planes are carrying: TP (Torpedo), AP (Armor Piercing 1000 lb), ap (Armor Piercing 500 lb or 250 kg), HE (High Explosive).

ESC allows you to escape from the Unit Menu.

Hotkeys

The following is a list of "Hotkey" functions which do not have a mouse equivalent command:

HOTKEY	DESCRIPTION
N	Next TF, switch to TF mode
V	Next Strike, switch to Strike mode
Z	Next Airfield
X	Next Enemy TF-Snoop
?	Help Key

Flight Operations

Each aircraft carrier or land base is allowed to perform a certain number of Flight Operations (FOs) per turn. For a fleet aircraft carrier (CV) the FO limit is 36, for a light aircraft carrier (CVL) the FO limit is 18, and for a land base the FO limit is equal to its airfield capacity. The FO limit regulates the number of aircraft that may be launched or landed in a single turn. An aircraft carrier may never launch and land aircraft in the same turn. Each aircraft carrier in the game will contain 2 to 4 air groups; 1 Fighter Group, 0-2 Dive Bomber Groups, and 1 Torpedo Bomber Group.

Aircraft Readiness States

A Carrier Air Group (CAG) may have aircraft in varying states of readiness as shown below:

- Damaged; must remain in the hangar until repaired.
- Unready on Deck (UD); must be lowered to hangar, fueled, and raised back to deck before launching.
- In the Hangar (HG); must be fueled and raised back to the deck before launching.
- Fueled (FU); must be raised to the deck before launching or defueled for safe storage in the hangar.
- Ready on Deck (RD); ready for launch, may be lowered to clear flight deck. Must be lowered then defueled for safe storage in the hangar.
- Assigned; performing a CAP, Search, or Strike Mission.
- Waiting to Land; circling carrier waiting for flight deck to be cleared or repaired.

Accessing the Flight Operations Display

To perform Flight Operations for a carrier make sure you are in TF Mode if you are playing with a mouse. Place the map cursor over an Air Combat TF which contains a carrier or carriers. You will see the carrier picture(s) displayed on the right side of the text window. Next press the letter (A,B,C,D) to select the desired carrier. With a mouse, put the mouse pointer over the picture of the desired carrier and click the left mouse button. The Flight Operations Display will now be shown for the carrier selected.

Flight Operations Display

The Flight Operations Display will be shown with the assigned air groups listed on the left side of the screen. Aircraft icons for each air group will be differently colored. Select the letter (A,B,C,D) or place the mouse pointer over the icon of the air group and click the left mouse button to perform Flight Operations. The current air group will have all of its planes colored white and the air group icon will also be white.

Flight operations with the selected group may be performed at this time by clicking the

flight op buttons or pressing the keys described below. Press the "?" key to display the keystrokes that correspond to each flight op button. The table below is a summary of the mouse button boxes along with the corresponding keyboard commands.

FLIGHT OPERATIONS DISPLAY MENU

BUTTON	KEY	DESCRIPTION
—>>	W	lower max number of unready aircraft to hangar.
↑	E	fuel 1 aircraft.
↑↑	R	fuel max number of aircraft.
↓↓	T	defuel max number of aircraft.
ORD	Y	changes type of ordnance if there are no aircraft in Ready-On-Deck status.
MIS	H	sets group mission if 1 or more aircraft in Ready-On-Deck status.
<—	U	raises 1 fueled aircraft to deck.
<<—	I	raises max number of fueled aircraft to deck.
—>>	O	lowers max number of ready aircraft.
—>	P	lowers 1 ready aircraft from deck.
↑	[	launches 1 ready aircraft (will perform assigned mission).
↑↑	]	launches max number of ready aircraft.
SET DIR	S	set priority search direction (PSD) if Search mission selected.
TGT-TF	S	select TF target if Strike mission selected.
TGT-AF	F	select Airfield target if Strike mission selected.
ESC*	ESC	end flight ops for this carrier.

* Can also exit by clicking the right mouse button.

DESCRIPTION OF THE FLIGHT OPERATIONS DISPLAY

Carrier Name Display

The screen display which follows shows the Flight Operations Display for the CV (Carrier) Enterprise. The carrier's name is displayed in the upper left corner of the display.

Mission Display

To the right of carrier's name is the Mission Display box where the air group's missions are shown. There are three types of missions: CAP, Search, and Strike. Clicking on the MIS box or pressing the "H" key will cycle you through the three missions. Below the Mission is displayed the flight number. Below that is the aircraft's name followed by two sets of numbers. The first number is the amount of planes being launched off the carrier deck by the currently accessed Air Group. The second number is the total number of planes being sent on that mission from all the carrier's Air Groups.

Flight/Fuel/Elevator Clocks Display

To the right of the Mission Display box are the four clocks which show the level remaining to perform Flight Operations (Fl. Op), Fueling Operations (Fu. Op), Elevator Up Operations (Ev. Op), and Elevator Down Operations (El. Dn). As planes are moved around the carrier's flight deck and hangar these clocks will show less operations remaining (the amount in white).

An elevator up operation occurs whenever an aircraft is raised to the deck. An elevator down operation occurs whenever an aircraft is lowered from the deck. Elevator Operations is equal to either "elev up" or "elev down", whichever is greater. The Elevator Operations' number is frequently used in calculating carriers' flight operation limits.

There are limitations on the number and type of Flight Operations that may be performed in a single turn. Fleet carriers (CVs) have a FO limit of 36. Light carriers (CVLs) have an FO limit of 18. Flight operation limits are described below:

- A carrier may not launch and land planes in the same turn.
- The number of aircraft launched plus Elevator Operations may never exceed the FO limit.
- The number of aircraft On Deck may never exceed the FO limit.
- The number of aircraft Landed may never exceed the FO limit.
- Unready aircraft (UD) may not be lowered and fueled in the same turn.
- Aircraft in the hangar (HG) may not be fueled and raised to the flight deck in the same turn.
- The number of aircraft Fueled plus the number Defueled may not exceed the FO limit.
- Aircraft may not change ordnance and be raised to the flight deck on the same turn.

Air Group Display

The left side of the Flight Operations Display contains four Air Group boxes (A, B, C, D) which show the air group's designation, aircraft name, a description and picture of the ordnance being currently carried, and a small colored picture of a plane. The plane's colors can be gray, blue, dark green, or light green. The air group which is being accessed will have its planes and text colored white.

Target/Set Direction Display

Above the four Air Group boxes can be displayed either TGT-TF and TGT-AF when launching Strike missions or SET-DIR when launching Search missions. After launching the desired number of planes from the flight deck, you must select the desired box to either select a target to attack or a direction to search. When these boxes are displayed, pressing the "?" key will display the keyboard commands for these boxes as well. If you are on a Strike mission, place the mouse pointer over the TGT-TF or TGT-AF box and click the left mouse button. Using the keyboard, press "S" or "F". You will next be asked to select your target. If you are on a Search mission, place the pointer over the SET-DIR box and click the left mouse button. Using the keyboard press "S".

Flight Deck Display

The middle of the screen shows the carrier flight deck. In order to launch planes, they must be on the flight deck. There are two buttons on the top of the flight deck. These are the Launch buttons. The button with one up arrow ("[" key) allows one plane at a time to be launched. The button on the right with two up arrows ("]" key) allows the maximum number of planes from the currently accessed Air Group (planes are colored white) to be launched.

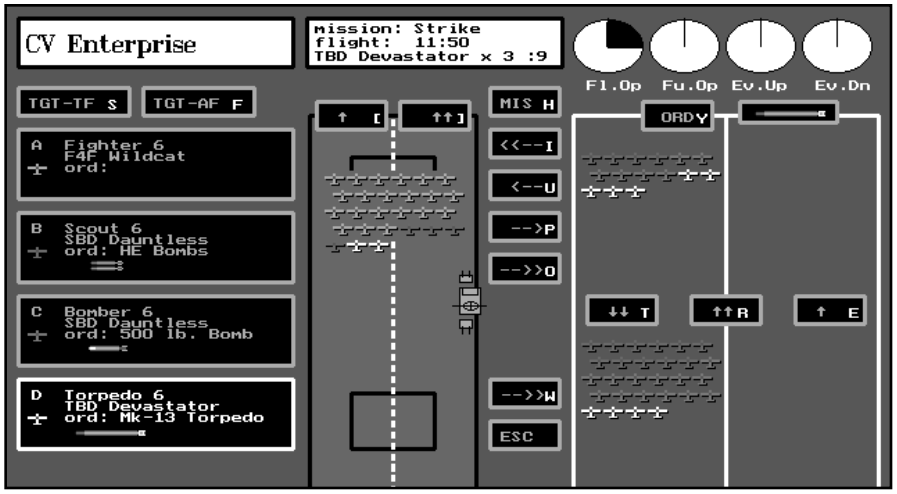
Mission and Flight Deck/Hangar Buttons

To the right of the flight deck are seven buttons. The top button labeled MIS allows you to cycle through the three possible air missions: CAP, Strike, and Search. Press the "H"

key or place the mouse pointer over the box and click the left mouse button to cycle through the missions which are displayed in the Mission Display box. The next button down will move the maximum number of planes from the hangar to the flight deck. Press the "I" key or place the mouse pointer over the <<— box and click the left mouse button. The next button down will move one plane at a time from the hangar to the flight deck. Press the "U" key or place the mouse pointer over the <— box and click the left mouse button. The next button will move one readied plane from the flight deck to the hangar. Press the "P" key or place the mouse pointer over the —> box and click the left mouse button. The next button will move the maximum number of readied planes from the flight deck to the hangar. Press the "O" key or place the mouse pointer over the —>> box and click the left mouse button. The next button will move the maximum number of unreadied planes from the flight deck to the hangar. Press the "W" key or place the mouse pointer over the —>> box and click the left mouse button. The last box is the ESC box which allows you to escape from the Flight Operations Display. Press the ESC key or place the mouse pointer over the box and click the left mouse button. ***Note:*** *You can always escape by clicking the right mouse button at any time.*

Hangar and Ordnance Display

On the far right side of the Flight Operations Display is the Hangar Deck. This is where planes are stored, fueled, and armed. At the top of the Hangar Deck is a button box labeled ORD. Pressing the "Y" key or placing the mouse pointer over the box and clicking the left mouse button will cycle through the various weapons the Air Group can carry. To the right of the ORD box is a picture of the weapon available to select. If the box is blank and you select this option, the Air Group will disarm, removing any weapons currently being carried. The Hangar Deck is separated into two parts. The lower section contains unfueled aircraft. The upper Hangar Deck has fueled aircraft which should be armed if they are going on a Strike or an armed Search mission. Near the middle of the Hangar Deck are three buttons which allow you to move aircraft on the Hangar Deck. The leftmost button with two down arrows allows you to defuel the maximum number of aircraft and will move the aircraft to the lower Hangar Deck. Press the "T" key or place the mouse pointer over the box and click the left mouse button. The middle button with two up arrows allows you to fuel the maximum number of aircraft and will move the aircraft to the upper Hangar Deck. Press the "R" key or place the mouse pointer over the box and click the left mouse button. The rightmost box with one up arrow will fuel one aircraft and move it to the upper Hangar Deck. Press the "E" key or place the mouse pointer in the box and click the left mouse button.

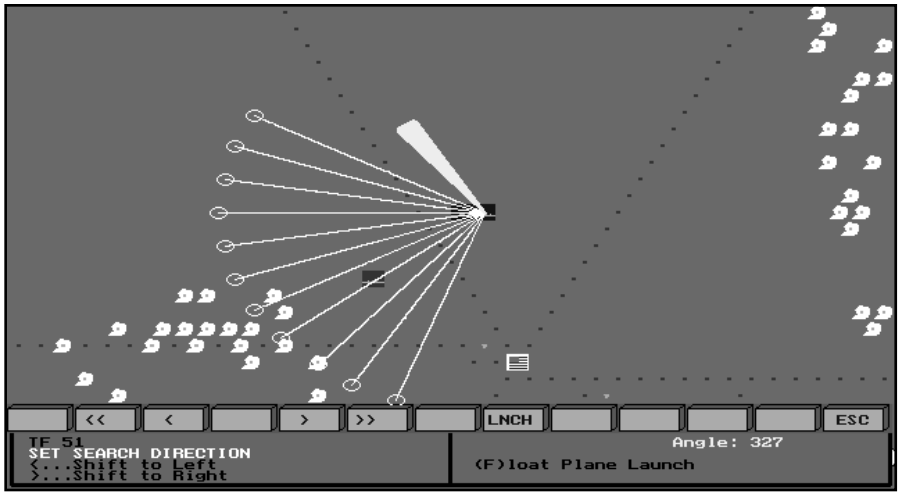


The above Flight Operations Display screen was taken from the Midway scenario and is from the carrier Enterprise, whose name is shown in the upper left corner. There are four Air Groups on the Enterprise: Fighter 6 F4F Wildcat, Scout 6 SBD Dauntless, Bomber 6 SBD Dauntless, and Torpedo 6 TBD Devastator. The last Air Group is currently being accessed with its text and planes in white. The Torpedo 6 Air Group contains TBD Devastators which are armed with MK-13 Torpedoes. The Air Group is attempting to fly a Strike mission against a spotted Japanese TF. On the Mission Display at the top of the screen is displayed its Strike mission, its flight number 11:50, 3 TBD Devastators have so far been added to the strike with a total of 9 planes (6 were Fighters which were launched earlier in the turn) on the strike. Launching the 9 planes has caused the Flight Operations clock to move to the 3 o'clock position.

Search Operations

Search Vectors

Successful search operations are critical to victory in Carrier Strike. Most of your intelligence on enemy TFs will be provided by search aircraft. Search aircraft will be launched from land bases, carrier TFs, or Japanese TFs equipped with float planes. Each search aircraft will fly along its assigned search vector out to its maximum range and return along a slightly different vector (+/- 9 degrees). Thus each search aircraft covers a 10 degree arc and 36 aircraft launched simultaneously from a TF could cover the entire 360 degrees surrounding the TF.



After aircraft have been assigned their search vectors they will appear on the TF's search display the following turn. The search display will show which vectors are being searched and where each aircraft is located along its search path. White lines will be used to designate outbound aircraft and red lines will designate returning aircraft.

Each turn an unarmed search aircraft will fly 51 miles (three hexes) along its search vector. An armed search aircraft or an unarmed TBD will fly 34 miles (2 hexes) along its search vector.

Fighter, Fighter-bomber, Dive Bomber, and Torpedo Bomber type aircraft will fly a maximum of 10 turns on the outward leg of a search mission. Float planes will fly out to the maximum of their endurance.

Setting Search Direction

You can set the direction that search aircraft will fly from the current TF by pressing "H" to enter the Set Search routine. With a mouse this can be done by moving the pointer over the current TF and clicking the left button and then selecting SET TF SEARCH on the Unit Menu. You may enter the Set Search routine from the carrier Flight Operations display by selecting a search mission for an air group and then selecting Set Search. To alter the PSD, press the "<" or ">" keys or click on the <, <<, or >, >> buttons. With the mouse the PSD may also be set by clicking the left mouse button over the area on the map you wish to search.

Above is the Set Search Direction Display. The map shows Midway with an American flag at the lower bottom of the screen. To the NW of Midway is a spotted Japanese TF. The Allied TF51 has already sent out search planes a few turns before (shown by the white search vector lines) and spotted the

enemy TF. If you wish to search the area north of TF51, place the pointer on one of the four direction buttons and click the left mouse button or use the "<" or ">" keys to move the yellow Priority Search Direction (PSD) vector until it comes to angle 337. ***Note:*** *With a mouse you can also place the mouse pointer on the map to the north of TF51 and click the left mouse button to set the direction. Press ESC, click the right mouse button, or place the pointer over the ESC button box and click the left mouse button to set the direction. If the TF had float planes, pressing the "F" key or placing the pointer over the LNCH button would launch all eligible float planes from every ship in the TF.*

Assignment of Search Vector

At the end of a turn in which search planes have been launched, the computer will automatically assign those planes a search vector as close as possible to the last PSD set for the TF. Note that each TF has only one PSD for all the carriers in the TF; therefore if you wish to launch planes on different PSDs, you must wait until the next turn to select another PSD for the TF. The computer uses the following rules in assigning search vectors:

- No more than 1 aircraft per turn will be assigned to a single search vector.
- No more than 2 aircraft can ever share the same search vector.
- An aircraft will not be assigned to a search vector if another aircraft was assigned that vector on the previous turn.

Launching Float Planes

If the Japanese player has a TF containing BB, CA, CL, or CS type ships, then he may launch float planes from those ships to perform search missions. While in Set Search Mode, float planes may be launched by pressing "F" or clicking the LNCH button. This will cause one float plane per eligible ship in the TF to be launched. ***Note:*** *A TF can only perform one float plane search mission per turn. In Carrier Strike, the Allied player does not have any float plane capability. Historically the Allied ships that had float planes did not, for the most part, use them in searching for enemy TF.*

Armed Search Planes

Fighter and Bomber aircraft may be assigned to fly search missions. To fly search, the group must be assigned a Search Mission before the aircraft are launched (see "Flight Operations"). Searching bombers may only be armed with 250 kg, 500 lb, or HE bombs. If an armed search bomber locates an enemy TF, it may get a chance to attack an enemy ship.

Spotting Enemy/Dummy TFs

If a search aircraft enters or moves adjacent to a clear weather hex containing an enemy TF, there is a 67% chance the TF will be sighted. If the TF occupies an overcast hex, there is a 33% chance the search plane will sight it. If a TF is sighted, a TF icon will be placed on the map. Enemy Task Forces in restricted waters or coastal hexes have an easier chance of being spotted. If an enemy TF is in the same hex as a friendly TF, then during daylight hours it will be automatically spotted; during night there is a random chance of being spotted.

When you receive sighting reports during the Search Phase you get a visual bird's-eye view of an enemy TF. The view may include only a fraction of the TF's total of ships. Sometimes the report will show a carrier in a non-carrier TF. Some views will show no ships at all which means the pilot was too far away to identify any ships in the TF. Some of the sighted TFs will be dummy TFs which will be mirror images of real enemy TFs located elsewhere on the map. Dummy TFs are used to simulate the confusion when search planes miscalculated or garbled the location in their sighting reports. After repeated sightings, the dummy TFs will be removed from the screen.

During your orders phase the Snoop option may be used to view the last sighting report for each detected enemy TF. Move the cursor over the TF icon and press the "P" key or with the mouse select SNOOP by clicking the left mouse button.

Search Plane Combat

When a search plane sights a TF that is covered by enemy CAP fighters, there is a chance it will be shot down. The search pilot experience and aircraft dogfight capability are compared to the quantity and quality of enemy CAP to determine the search plane's chance of survival. If the search plane is armed and it survives enemy CAP, it may get a chance to attack an enemy ship. Once again the search pilot experience is compared to the quality and quantity of enemy CAP to determine its chance of conducting an attack.

If a search plane is destroyed by CAP there is a 10% chance that a "search plane destroyed by CAP" message will be displayed. If a search plane evades an enemy CAP group there is a 20% chance that a "search plane evades enemy CAP" message will be displayed.

Breaking Radio Silence

There is a random chance that TFs may be located when they "break radio silence" to recall strikes or Long-Range CAP. In addition carrier TFs may be located when they launch strikes and pilot radio chatter betrays their position. The more planes in the strike, the greater the chance it will reveal its home TFs position.

Combat Air Patrol

Launching CAP Missions

All aircraft may fly Combat Air Patrol (CAP) missions to protect a TF or airfield from enemy bombers. In order to launch CAP you should first move the map cursor over a carrier TF. Next press the letter (A, B, C, D) or place the mouse pointer over the carrier picture you want and click the left mouse button. You are now in the Flight Operations Display. Make sure you click on the fighter icon group and that it turns white in color. Move your fighters from the hangar deck to the flight deck. Select the MIS button or press the "H" key. Stop when the mission display box shows: "mission:CAP". Use the launch buttons on the carrier deck or the "[" or "]" keys to launch your CAP. A fighter group must be assigned a CAP mission before the fighters are launched. CAP aircraft may remain on station for an entire day (in reality a fraction of them would be landing, refueling, and launching each turn but this has been abstracted for playability). The Time in Air for a normal CAP group will remain at zero during daylight hours.

CAP Effectiveness

CAP is at its peak effectiveness when it engages less than 3 enemy air groups per turn. CAP will start to lose effectiveness when forced to engage numerous enemy air groups in the same turn. Large fighter escorts protecting enemy bombers will be particularly effective at lowering CAP effectiveness. The Time in Air flag will be incremented to reflect CAP exhaustion. Normal CAP operating from an undamaged carrier will have its Time in Air flag reset to zero at the end of the next Orders Phase.

Sending Long-Range CAP

You may reassign "normal" CAP groups (those covering your own carrier TFs) to fly Long-Range CAP over other TFs. Move the map cursor to the TF you wish to protect and press "L". When using a mouse, place the mouse pointer over the TF, click the left button, and then select LR-CAP from the Unit Menu. Next move the cursor/pointer to a carrier TF and press "F3" (or click the left button) to get the TF-CAP Display. Select the group you wish to fly Long-Range CAP. A delay period equal to the range between the two TFs divided by 2 must elapse before the LR-CAP arrives on station. The CAP will abandon their station and return to the carriers when Time in Air is greater than Endurance minus Range/2. ***Note:*** *Aircraft on CAP missions can only be assigned to Long-Range CAP if the range to the target is less than or equal to the aircraft's endurance/2.*

CAP and Deck Damage

When an aircraft carrier has its flight deck damaged, CAP fighters based on that carrier will be eventually forced to land. The Time in Air flag will increment 1 for each turn the CAP is on station and 1 for each 90 enemy strike bombers engaged or 1 for every 30 enemy escort fighters engaged. The fighters will attempt to land when their Time in Air flag equals or exceeds the fighter's Endurance. The Time in Air flag will reset to zero if the carrier's flight deck is repaired.

Landing CAP

Normal CAP may be ordered to land if its home carrier has not performed any launches during the turn. To land CAP press F3 to list the CAP over the current TF (with the mouse click the left button over the current TF and select LIST CAP from the Unit Menu). Select the CAP group you wish to land. The Carrier Landing Display will be shown on the screen. Click the arrow buttons or press Q or E to land some or all of the aircraft in the group. You may exit the menu by pressing the ESC key or the right mouse button.

Landing L-R CAP

Long-Range CAP may be ordered to land after it has arrived over its objective TF. To land Long-Range CAP press F3 to list the CAP over the current (objective) TF (with the mouse click the left button over the current TF and select LIST CAP from the Unit Menu). Select the CAP group you wish to land. You may exit the menu by pressing ESC or the right mouse button. The CAP group will disappear from the CAP list and return to its home base/carrier like an air strike that has

completed its mission. The returning CAP group may be viewed using the strike display functions. Recalling a Long-Range CAP mission will force the home TF to break radio silence. When a Long-Range CAP group is ordered to land, there is a chance its home TF will be detected. This detection will not occur if the LR-CAP returns to its carrier due to normal fuel restrictions.

Air Strikes

Launching Air Strikes

Air strikes may be formed to attack enemy ships or airfields. Air strikes are formed by launching bombers and fighter escorts while in the Flight Operations Display. Targets are assigned to the "current" strike by clicking the TGT-TF or TGT-AF buttons on the Flight Operations Display and then selecting from the list of eligible targets.

Before launching aircraft, you should verify that the group has the proper mission assigned. When a group has aircraft in Ready-On-Deck status, you may assign it a new mission by clicking the MIS button or pressing "H". When the correct mission (CAP, Search, or Strike) appears at the top of the Flight Operations Display, you are then ready to launch aircraft.

You may place numerous air groups from different carriers in the same TF into a combined strike if you choose the same target. In the Mission Display box on the Flight Operations Display, you will see the type of aircraft and the number being launched currently, followed by a colon and a second number which is the total number of aircraft in the strike.

Selecting Air Strike Targets

Targets may be assigned to the current strike from the Map Display by typing Alt/S to target a TF or Alt/F to target an airfield or clicking the mouse over the current strike and selecting TGT-TF or TGT-AF from the Unit Menu (the current strike is the one displayed in the window below the map).

To assign a target from Map Mode, make sure the correct strike is displayed in the window below the map; this is the current strike. Press Alt/S to assign a TF target or Alt/F to assign an airfield target. With a mouse, move the arrow to the strike's location and click the button and select STRIKE-TF or STRIKE-AF from the menu. Select the desired target from the list of eligible targets on the Select Target Display.

Strikes with Unassigned Targets

An air strike is not required to have a target assigned on the turn it is launched. An unassigned strike will continue to orbit its parent carriers until a target is assigned. An unassigned strike may be launched on one turn and reinforced with additional aircraft on the next turn. After a strike exceeds 150 aircraft, it may no longer be reinforced with additional strike groups. When a strike has been assigned a target, it will start to move towards the target during the next Execution Phase. Aircraft that have been unassigned for two turns will attempt to land after the second turn if their home carrier is eligible to land aircraft.

Arming the Strike

The ordnance to be carried by strike aircraft must be determined before the armed and fueled aircraft are raised to the deck. You may cycle through the possible ordnance

selections by clicking the ORD button or pressing the "Y" key. Continue clicking the button or pressing "Y" until the desired ordnance is displayed in the Air Group box. A group's ordnance may not be changed when it has aircraft in Ready-On-Deck status. When the weapon picture box shows no picture, selecting this will remove any weapons on the aircraft. Listed below are the types of ordnance allowed for each type of aircraft:

Japanese:

AIRCRAFT TYPE	AVAILABLE ORDNANCE
Fighter Bomber	250 kg Bomb, HE Bomb
Dive Bomber	250 kg Bomb, HE Bomb
Torpedo Bomber	250 kg Bomb, HE Bomb, Type 91 Torpedo*
Medium Bomber	250 kg Bomb, HE Bomb, Type 91 Torpedo*

Allied:

AIRCRAFT TYPE	AVAILABLE ORDNANCE
Fighter Bomber	500 lb Bomb, HE Bomb
Dive Bomber	500 lb Bomb, HE Bomb, 1000 lb Bomb*
Torpedo Bomber	500 lb Bomb, HE Bomb, Mk.13 Torpedo*#
Medium Bomber	500 lb Bomb, HE Bomb, Mk.13 Torpedo*#
Heavy Bomber	500 lb Bomb, HE Bomb, 1000 lb Bomb*

** Aircraft are considered to be "Heavily Loaded" when carrying 1000 lb Bombs or Torpedoes; otherwise they are considered to have a "Normal Load".*

 # British aircraft used the Mk.XII Torpedo

Strike Movement

At the end of each turn, most normally loaded strikes will move toward their targets at a speed of two hexes per turn or 102 miles/six hexes every hour/3 turns (2-2-2). Strikes containing "heavily loaded" aircraft will move only 1 hex every third turn and two hexes on the other turns or 85 miles/5 hexes every hour/3 turns (2-2-1). Strikes containing "normally loaded" or "empty" TBD Devastators may never fly faster than the 85 mph or (2-2-1) rate. Strikes containing "heavily loaded" TBDs will only move 68 miles/4 hexes every hour/3 turns (2-1-1).

Note: *The speeds described above are much slower than the actual cruising speed of the aircraft. The times required to "form up" and "maneuver into attack position" have been factored in to produce an average strike speed.*

Locating the Target

When an anti-ship strike enters a hex containing the target TF, the strike must attempt to locate the target before it can attack. If the target hex is overcast (there is a white cloud symbol in the hex), then there is a 67% chance that the target will be "obscured by clouds". If the target is not obscured then the strike will successfully locate its target if:

Random (25+Strike Aircraft) > Random (100-Ships x 2)

Attacking Alternate Targets

While moving, a strike may locate TFs other than their assigned target. Under certain circumstances the strike will attack a TF that is different than its assigned target. A strike will attack a different TF if:

- the assigned target turns out to be a dummy. The strike will retarget the nearest sighted TF (which may be another dummy).

- the strike flies over and locates a TF that meets the requirements for an alternate target. A TF is determined to be a good alternate target if the number of aircraft in the strike is less than the number of ships in the enemy TF multiplied by the strike's Time-in-Air.

If the TF has no carriers in it then there is a 67% chance that the strike will ignore it, regardless of the above calculations.

Attacking Airfields

An anti-airfield strike will always locate its target unless it is obscured by clouds in which case there is a 67% chance that the target will be obscured.

Air Group Splitting Off from Strike

Whenever an aircraft's Time in Air exceeds 55% of its Endurance, those aircraft will automatically jettison their ordnance, split off from the strike, and return to their parent carrier or airfield.

Air strikes may be forced to split up when they encounter enemy TFs other than the one they are assigned to attack. If forced to split, all of the air groups from same carrier will be combined into one force. At this point one or more of these combined forces will split off to attack the enemy TF. The strike may split if the encountered enemy TF meets any of the following requirements:

- Contains 1 or more carriers
- Random (20) < CAP protecting TF
- Random (100) < number ships

In determining which of the combined forces will split off, the strike will attempt to retain 36 aircraft for each carrier in the currently targeted TF and detach 36 aircraft for each carrier in the encountered enemy TF. If there are no carriers in the encountered TF, then at least one and sometimes two combined forces will be detached.

A strike that contains more than one type of bomber may lose its cohesion and one or more of its bomber elements may be separated from the strike. This will only happen if the strike contains TBDs, tac-bombers, or heavy bombers and some different type of bomber. When the above conditions exist, there will be a 10% chance each turn that a TBD, tac-bomber, or heavy bomber element will separate from the rest of a strike (and form a new strike with the same target).

Return to Base/Carrier

When a strike has successfully attacked its target, then all of its air groups will return to their home base/carriers together. When a returning strike enters the hex with its home base/carriers, it will continue to circle until all its aircraft have either landed or ditched.

Aircraft Ditching

Whenever an air group's Time in Air exceeds the aircraft's Endurance, its aircraft will start to ditch in the following manner:

Time in Air = Endurance + 1	1/5 of the aircraft ditch
Time in Air = Endurance + 2	2/5 of the aircraft ditch
Time in Air = Endurance + 3	3/5 of the aircraft ditch
Time in Air = Endurance + 4	4/5 of the aircraft ditch
Time in Air > Endurance + 4	remaining aircraft ditch

Whenever non-recon aircraft remain flying after dark (1900 hours) some of the aircraft will become lost and be forced to ditch. Air groups that remain flying after dark will lose 1/5 of their number on every third turn (once per hour on the hour).

Recalling a Strike

A strike may be ordered to return to its home base before completing its mission. To recall the "current strike," press Alt/K or click the left mouse button over the current strike and select RECALL STRIKE from the Unit Menu. The "recalled strike" will move the same as an unassigned strike. A recalled strike will move toward its home TF but will not automatically jettison its ordnance. A recalled strike may be reassigned a new target before it lands. Recalling a strike will force the strike's home TF to break radio silence. When a strike is recalled, there is a chance the home TF will be detected.

AIRFIELDS

Airfields are located on bases shown on the map with either American or Japanese flags displaying which player controls the base. The airfield's aircraft missions are automatically controlled by the computer with a few exceptions explained below:

- The computer controls launching CAP, Search, and Strike missions. However, once launched, you may change the Strike mission's target by entering Strike Mode (if using a mouse) and placing the map cursor over the strike. Next press Alt/S or click the left mouse button to bring up the Unit Menu and select STRIKE TF or STRIKE AF. Then you may select another target on the Select Target Display.

- You may recall an airfield strike by entering Strike Mode (if using a mouse) and placing the map cursor over the strike. Press Alt/K or press the left mouse button to get the Unit Menu and then select RECALL STRIKE.

- You may assign airfield aircraft on CAP missions to Long-Range CAP missions. Place the map cursor over the hex (TF or AF) you wish to place L-R CAP over. Press "L" or click the left mouse button to enter the Unit Menu. Select L-R CAP. Next move the map cursor over the airfield and press the "A" key or the left mouse button to list the CAP over the airfield. Select the Air Groups you wish to provide L-R CAP.

When you place the cursor over an airfield you may access four different displays. Using a mouse you must click the left mouse button and bring up the Unit Menu first or if using

the keyboard you may press one of the keys as shown below:

• **DISP AF SEARCH** (T key) allows you to see the search patterns of the aircraft on Search missions.

• **LIST AF SEARCH** (Y key) allows you to view the data on each of the Air Groups flying Search missions. The data displayed shows the Air Group designation, name, number of undamaged planes flying, number of damaged planes flying, and the Time-in-Air.

• **LIST AF CAP** (O key) allows you to view the data on each of the Air Groups flying CAP missions. The data displayed shows the Air Group designation, name, number of undamaged planes flying, number of damaged planes flying, and the Time-in-Air.

• **EXAMINE AF** on the Unit Menu. A list of all your air groups will be displayed showing the air group letter (A, B, C, D, etc.), the air group designation, the type of aircraft in the air group, the number of planes damaged (DA), the number of unready aircraft in the hangar (HG), the number fueled but not on runway (FU), and the number of readied planes on the runway (RD). To the right of the number of planes ready will be the armament that the planes are carrying: TP (Torpedo), AP (Armor Piercing 1000 lb), ap (Armor Piercing 500 lb or 250 kg), HE (High Explosive). It takes one turn to move aircraft from the hangar to be fueled and another turn to be put on the runway.

When the map cursor is over an airfield, the name of the city or island will be displayed along with AF:xx where xx refers to the aircraft launch capacity of the airfield for a turn. For example, Midway has a capacity of 50 which means in any one 20 minute turn, the airfield can launch up to 50 planes.

There is a hotkey command "Z" which allows you to view the aircraft on the next airfield.

LANDING AIRCRAFT

After you have completed your orders and ended your turn, the computer may perform Automatic Landing Operations (ALOs). ALOs will occur if there are returning aircraft waiting to land and the carrier did not perform any launches during the turn and aircraft On Deck is less than the FO limit. When aircraft land they will be immediately lowered to the hangar unless all Elevator Operations have been used up. There are two different ALO procedures the computer may use for landing aircraft:

• Limited Deck Space Procedure is used if there are aircraft on deck at the start of the ALO phase.

• A Clear Deck Procedure is used if the deck is clear at the start of the ALO phase.

Limited Deck Space Procedure

A carrier will land a group of aircraft not to exceed the On Deck limit; the Landed and On Deck numbers will be incremented. If Elevator Operations remain, then those aircraft (just landed) will be immediately lowered, On Deck will be decremented, and Elevator Operations will be incremented. This cycle will continue as long as Elevator Operations plus Landed is less than the FO limit. If Elevator Operations have been used up, aircraft may still be landed up to the On Deck limit.

Clear Deck Procedure:

A carrier will land a group of aircraft; the Landed and On Deck numbers will be incremented. If Elevator Operations remain, then those aircraft (just landed) will be immediately lowered, On Deck will be decremented, and Elevator Operations will be incremented.

This cycle will continue as long as both Elevator Operations and Landed are less than the FO limit (the Clear Deck Procedure does not add Landed to Elevator Operations when calculating the limit). When Elevator Operations are used up, aircraft may still land up to the On Deck limit.

When Damaged Aircraft land, it costs 2 Landed operations.

Emergency Landings

If a carrier is sunk or damaged, then aircraft assigned to that carrier may be forced to make an "emergency landing" on another carrier or airfield. Aircraft may divert if its home carrier has:

• been sunk
• flight deck damage of 2 or more
• flotation damage of 67 or more
• a fire level of 10 or more

If any of the above requirements have been met, the aircraft may be diverted to another carrier or airfield if:

• the aircraft is returning from a Strike mission and its remaining endurance is less than the fire level of the home carrier

• the aircraft is returning from a Strike mission and its remaining endurance is less than the flight deck damage of the home carrier

• the aircraft is returning from a Search mission and has zero remaining endurance

• the aircraft is returning from a Long-Range CAP mission and has zero remaining endurance

• the aircraft is flying a normal CAP mission and its time-in-air is greater than 9 turns.

Before an aircraft can be diverted there must be a friendly airfield or a friendly carrier within range. There are no restrictions on landing at a friendly airfield. If landing on a friendly carrier, the carrier must operate the same type of aircraft as those that are diverting. The diverted aircraft will be reassigned to one of the existing air groups at its new location. The aircraft may not divert if the plane types do not match up with those existing on the friendly carrier.

When an aircraft carrier is sunk, all of its air groups may be reassigned to nearby friendly airfields. If this happens the groups will have no aircraft at the time they are reassigned. These groups may receive aircraft that were in the air when their carrier was sunk. Whenever the planes arrive at the airfield, they will be added to their assigned group.

Special Emergency Landings

Aircraft returning from Search or Long-Range CAP missions may be diverted to a different carrier if their home carrier is not eligible to land aircraft on that turn due to a full deck of planes, the carrier has already launched planes, or the flight deck is damaged. Aircraft that would otherwise be forced to ditch may make emergency landings on other carriers or airfields within 35 miles of their home carrier.

Landing Combat Air Patrol (CAP)

Aircraft flying CAP missions will not normally be required to land during daylight hours. You must order your CAP aircraft to land before you can reassign them to other missions. To land CAP move the map cursor to the TF where the CAP is flying. Press F3 or with the mouse, place the mouse pointer over the TF and click the left mouse button

and select LIST CAP from the Unit Menu. The CAP display will be shown listing all CAP groups over the TF. Select the letter of the group you wish to land.

The CAP group display will be shown on the left of the screen with the carrier deck display in the center of the screen. You may move one aircraft from the CAP display to the carrier display by clicking the —> button or pressing "Q". You may move all of the aircraft from the CAP display to the carrier display by clicking the —>> button or pressing "E". A carrier may not land aircraft in excess of or in violation of the flight operation limits.

COMBAT

Air Group Disruption

CAP and strike air groups become disrupted when engaging in air-to-air combat or when attacked by enemy flak. Disruption is a percentage of "lost effectiveness." Disruption will never exceed 90%. Disruption is gained differently for the following types of combat:

CAP Coordination Loss Disruption

When more than one CAP group is engaging an air strike, the first group will suffer no penalty. The second group will gain disruption points equal to the number of fighters in the first group. The third group will gain disruption equal to the number of fighters in the first two groups, etc. A CAP group will suffer coordination loss disruption before it engages in air-to-air combat. During 1944 Allied CAP groups will not suffer any coordination loss penalties. The Allies had developed an outstanding system of fighter direction by this time in the war.

CAP vs. Escort Combat Disruption

When a CAP fighter group pairs off to fight an escort fighter group, the smaller of the two groups will receive 90% (maximum) disruption while the larger group receives disruption relative to the size of the smaller group.

Example: *12 Escort Zeros engage 20 Wildcats on CAP. The Zero group receives 90% disruption. The Wildcat group receives 60% (12/20) disruption.*

If a fighter group has received disruption in prior combat, its ability to disrupt enemy fighter groups will be reduced accordingly.

Example: *12 Escort Zeros with 0 disruption engage 20 Wildcats with 70% disruption. The Zero group receives only 50% disruption since the "effective" number of Wildcats is only 6 (20 reduced by 70%). The Wildcat's disruption would be increased to the maximum of 90%.*

CAP vs. Bomber Combat Disruption

CAP fighter groups receive 1% disruption for each enemy bomber they attack. Bomber groups receive 1% disruption for each enemy fighter that attacks them. The number of CAP that attacks the bombers is adjusted for CAP disruption before the bomber disruption is added. CAP groups receive 2% disruption for each non-torpedo bomber destroyed and 5% disruption for each torpedo carrying aircraft destroyed.

Note: *Historically, torpedo carrying bombers attacked from very low altitude and attacking them placed CAP fighters in a poor tactical position.*

Flak Combat Disruption

The target's total flak strength will attack each bomber in the group separately. If the bomber is not destroyed or damaged by the flak, then a disruption check is made for that bomber. The bomber group gains 2% (6% if the bomber is carrying a torpedo) disruption if:

Random (Flak) > Random (Pilot Experience x Bombers in Group)

If the bomber group gains disruption, a flak explosion will appear on the screen.

Air-to-Air Combat

When an air strike locates its target, it must engage enemy CAP fighters in air-to-air combat before attacking the TF/airfield. After the strike has attacked the target, there is a 1% chance that the CAP will again engage the strike. Each CAP fighter group will attack each strike air group in the following order:

- Fighters
- Fighter-Bombers
- Dive Bombers
- Torpedo Bombers
- Tac-Bombers
- Heavy Bombers

Fighter-bombers that are carrying bombs may jettison them if engaged in air-to-air combat. If fighter-bombers receive 33% or more disruption, then they will jettison their bombs and perform as escort fighters for the remainder of the air-to-air combat.

When CAP fighters engage escort fighters, they will pair off and engage the enemy on a one to one basis with any excess CAP/Escorts remaining unengaged (and undisrupted) for that combat. If there is more than one CAP group over the target, then an escort fighter group must engage each of them (one group at a time).

In determining which aircraft are hit in air-to-air combat, the dogfight ratings and pilot experience are compared. If a hit is determined, the cannon and durability ratings are compared to determine if the plane is damaged or destroyed.

Air-to-Sea Combat

During air to sea combat each bomber group in the strike will be subjected to flak attack and then the surviving bombers will select a target and attack with bombs or torpedoes.

Flak Combat

Task Force Flak Strength is calculated by adding the flak ratings of each effective gun in the target TF. The effective flak strength of a ship is equal to the Number of Guns x Flak Rating x (100-Ship Damage Level)/100. Flak is halved between 1700 and 0700 hours. The amount of flak from airfield AA guns is reduced 10% per airfield damage level up to a maximum of 90%. Flak strength of ships is modified according to the nationality of the ship and the date of the scenario:

NATIONALITY/DATE	FLAK MULTIPLIER
Japanese Ship	x 0.75
British Ship	x 1.0
USN Ship (Jul-Dec 42)	x 1.10
USN Ship (1943-1944)	x 1.25

Flak Combat is resolved for each bomber in the strike. The bomber is hit if Random (6000) < Random (Flak Strength). If the aircraft is carrying a torpedo, a hit occurs if Random (4500) < Random (Flak Strength). If the aircraft is a heavy bomber, a hit occurs when Random (25000) < Random (Flak Strength). For each bomber hit by flak, a roll is made to determine if the bomber is damaged or destroyed. The bomber is only damaged if Random (100) < Random (Aircraft

Durability); otherwise the bomber is destroyed. If the bomber is not hit by flak, it may still be disrupted (see "Flak Combat Disruption" on page 38).

Ship Target Selection

Ship target selection occurs after flak combat is concluded. The surviving bombers in the group break up into sub-groups of four with each sub-group selecting and attacking a single ship target. If the number of bombers in the group is not divisible by four, the last sub-group will have 1, 2, or 3 bombers. If a carrier TF is being attacked and a non-carrier target is selected, then the sub-group will consist of only one bomber. In the target selection procedure each ship type is assigned a Selection Value (SV) as listed below:

SHIP TYPE	SELECTION VALUE
CV,CVL	150
BB,BC	15
CA,CL,CLAA,CS	5
DD,DE,APD	1
AP,AO	4

The chance of any ship being selected as a target is equal to the SV of the ship divided by the total SV of the target TF.

Ship Evasion Ratings

Ship Evasion Ratings are calculated by multiplying the speed of the target ship (reduced by damage) times the Ship Evasion Modifier for that type of ship. Ship Evasion Modifiers are listed below:

SHIP TYPE	EVASION MODIFIER
CV,CVL,BB,BC,CS	x 3
CA,CL,CLAA	x 5
DD,DE,APD	x 6
AP,AO	x 1

Aircraft Accuracy Ratings

Aircraft Accuracy Ratings must be considered in the bomb/torpedo hit determination procedure. The higher the Accuracy Rating, the more accurate the plane type is in delivering its weapons. The Accuracy Rating for each type of aircraft are listed below:

AIRCRAFT TYPE	ACCURACY RATINGS
fighter*	-
fighter-bomber	5
dive bomber	9
torpedo bomber	8
tac-bomber	7
heavy bomber	1
patrol bomber	8

* *Fighters cannot carry bombs or torpedoes.*

Weapon Accuracy Rating

Adjusted Accuracy Ratings are calculated by multiplying the Aircraft Accuracy Rating above times the Weapon Accuracy Rating of its bomb or torpedo. The higher the rating, the more accurate the weapon is. The Weapon Accuracy Rating is shown below:

WEAPON TYPE	ACCURACY RATING
Mk-13 Torpedo	22
Mk.XII Torpedo	34
Type 91 Torpedo	42
1000 lb Bomb	60
500 lb Bomb	60
250 kg Bomb	60

Combined Arms Effect

Bomb carrying air groups will have their disruption reduced by 1 point for each torpedo carrying aircraft that preceded it and attacked in the strike resolution. Torpedo carrying air groups will have their disruption reduced by 1 point for each bomb carrying aircraft that preceded it in the strike resolution. A maximum of 10 disruption points will be removed in this manner.

Hitting the Target

In order to hit the target, the attacking bomber must pass 3 different accuracy checks as listed below:

- Random (Pilot Experience) > Random (Ship Evasion Rating)
- Random (100) > Random (Air Group Disruption)
- Random (Adjusted Accuracy Rating*) > Random (1000)

If the bomber fails any of the three tests, the bomb/torpedo will fail to hit its target.

* *Adjusted Accuracy Ratings are calculated by multiplying the Aircraft Accuracy Rating above times the Weapon Accuracy Rating of its bomb or torpedo.*

DAMAGE

Ship Damage

All ships in the game may suffer flotation damage and fires. Aircraft carriers may suffer flight deck damage. Ships receive primary damage whenever they are hit by a torpedo, bomb, or gun shell. Ships may receive secondary damage from fires or explosions resulting from fires. Ships may repair their damage and put out fires during the course of the game.

Armor Penetration

Shells, bombs, and torpedoes can cause much greater damage if they successfully penetrate a ship's armor. An armor penetration has occurred if Random (Warhead) > Random (Armor). If the attacking weapon is a torpedo, then Armor is randomized for the purpose of determining penetration. The effects of penetration are covered in the Primary Damage section. The Warhead and Armor ratings are listed in the Charts & Tables on page 77. The Warhead ratings for aircraft weapons are shown below:

WEAPON TYPE	WARHEAD RATING
Mk-13 Torpedo	60
Mk.XII Torpedo	39
Type 91 Torpedo	45
1000 lb Bomb	47
500 lb Bomb	24
250 kg Bomb	25
HE Bomb	10

Primary Damage

Whenever a ship is hit by any type of weapon, it will gain 1 flotation damage point before any other factors are checked. Carriers will receive 1 point of flight deck damage if Random (100) < Warhead.

If the warhead penetrates the armor, the ship will receive the following additional flotation damage: Random (Warhead) x Random (40) / Durability

There is a 5% chance that any penetration will be a "critical" hit. Critical hits will cause the above flotation damage to be doubled and an additional Random (20) fire points to be added.

If the flotation damage for one hit exceeds 33, then the damage for that hit will be reduced to 33 and an additional Random (10) fire points will be added.

A ship's flotation damage level will never exceed 99. A damage level of 99 means the ship is sinking.

Starting Fires

Fires may be started whenever a ship receives a hit. When a hit occurs, three fire checks will be made before armor penetration is determined:

- If Random (150) < Warhead then add 1 fire.
- If Random (300) < Warhead then add 2 fires.
- If Random (450) < Warhead then add 3 fires.

The effects of these three checks are cumulative; thus it is possible to add 6 fire points to a ship without penetrating its armor.

Additional fires may start if the armor is penetrated or if the ship is a carrier with readied aircraft aboard. Existing fires may spread and cause additional damage or explosions during the Repair Phase.

Special Carrier Damage

When an aircraft carrier is hit, the air groups aboard the carrier may suffer casualties. For each air group aboard the carrier there is a 33% chance of being hit. If a group is hit, then the ready, fueled, empty, and unready aircraft in that group may be affected as shown below:

- If an air group is hit and the group has ready aircraft on deck, then 1/3 of those aircraft will be destroyed and 1/6 of the aircraft will be damaged. For each aircraft destroyed or damaged in this manner, 1 fire point will be added and there is a 33% chance that 1 point of flight deck damage will be added.
- If an air group is hit and the group has fueled aircraft in the hangar, then 1/3 of those aircraft will be destroyed and 1/6 of them will be damaged. For each aircraft destroyed or damaged in this manner, 1 fire point will be added and there is a 33% chance that 1 point of flight deck damage will be added.
- If an air group is hit and the group has empty aircraft in the hangar, then 1/20 of those aircraft will be destroyed and 1/20 will be damaged. No fires or flight deck damage will be added when empty aircraft are destroyed. If the group is hit and there are unready aircraft on deck (aircraft that have just landed), then 1/20 of those aircraft will be destroyed and 1/20 will be damaged. No fires or flight deck damage will be added when unready aircraft are destroyed.

Air Combat Mission Change

If an Air Combat TF's carriers are all sunk, then the TF's Air Combat mission will be changed to a Surface Combat mission.

Secondary Damage

Ships with fires raging on board may receive secondary damage during the Repair Phase of each turn. Ships with fires must first check to see if an Explosion has resulted. An Explosion will occur:

- if Random (100) < Fire during May and June 1942
- if Random (175) < Fire during July through December 1942
- if Random (250) < Fire during 1943 and 1944
- if Random (100) < Fire during 1944 for Japanese Ships only

When an explosion occurs the ship will suffer damage similar to a 1000 lb bomb hit but with an additional 5 + Random (15) fires being added.

Ships with fires burning will receive at least 1 flotation damage point each Repair Phase. If Random (100) < Fire, the ship will receive an additional flotation damage point.

If a carrier has fires burning, then the ship will suffer an additional point of flight deck damage if:

Random (100) < Flotation Damage.

Crippled Ships

Ships with greater than 66% flotation damage are considered as "crippled". Crippled ships will be automatically detached from their TF and move towards their home base. Crippled ships must continue towards their base even if their damage is repaired below the crippled level. One or two destroyers will usually be detached to escort the crippled ship. Crippled aircraft carriers may not perform Flight Operations.

Scuttling Crippled Ships

You may scuttle any ship that has greater than 50% flotation damage. To scuttle a ship in the current TF, press the "G" key or click the right mouse button to list the ships in the TF. Select the ship you wish to scuttle. A "(S)cuttle Ship" message will appear at the bottom of the ship display. Press the "S" key or place the mouse pointer over the (S) on the display and click the left mouse button. A "Scuttle Ship Y/N" question will be displayed. You must press the "Y" key to confirm your desire to sink the ship. Scuttling a ship will give the enemy points for the ship being sunk. However, some advantages to scuttling heavily damaged ships are that the TF will move faster, a small TF that was detached to escort the ship will not be a sitting duck as it travels to its home base, and you could merge the remaining ships of a detached TF into an existing TF without any loss in speed due to a heavily damaged ship.

Airfield Damage

Airfields may be damaged by either naval or air bombardment. Damage for each type of attack is described below.

Damage from Naval Bombardment

During the Naval Bombardment Phase, any Bombardment TF which is in its destination hex, will automatically bombard the enemy airfield. During naval bombardment the four largest ships in the bombarding TF will fire each of their primary guns four times. Each four shot salvo will land randomly in the target area. If the shot lands on some "critical" point of the airfield, then airfield or aircraft damage points will be added. The number of damage points added will vary with the size of the gun being fired. After the bombardment is completed, the level of airfield damage and the number of aircraft destroyed will be calculated. Ships firing during a naval bombardment will spend 2 ammunition points.

Damage from Air Bombardment

For airfield bombing attacks, the number of bombers that successfully release their bombs in the target area is equal to:

Total Bombers x (100-Disruption)/100 x Bomber Experience/100

If the bomber is carrying HE Bombs, 500 lb Bombs, or 250 kg Bombs, then the number of bombs released is equal to the bomber's load rating divided by 5. If the bomber is carrying 1000 lb bombs, then the number released is equal to the bomber's load rating divided by 10. The bombs will land randomly

in the target area. If the bomb lands on some "critical" point of the airfield, then airfield or aircraft damage points will be added. The number of damage points added will vary with the size and type of the bomb. HE bombs will cause twice as much damage to aircraft and buildings and half as much damage to runways compared to 500 lb or 250 kg AP bombs. After the bombing is completed, the level of airfield damage and the number of aircraft destroyed will be calculated.

Surface Combat

Surface combat may occur when Surface Combat or Bombardment TFs occupy the same hex as an enemy TF. For surface combat to occur a Surface Combat or Bombardment TF must be eligible to initiate the combat. Surface combat may not be initiated by a TF if any of the following is true:

- The TF is retiring due to mission completion, crippled ships, or a General Withdrawal ordered by the Supreme Commander.
- One or more of the ships in the TF has less than 6 ammunition points remaining.
- The TF was disrupted by an air strike on the previous turn.

Surface Combat Resolution

Surface combat consists of one or more rounds in which each ship has a chance to fire. When surface combat begins, a starting range will be determined. During daylight turns the starting range will be equal to 20 + Random (15). During night turns the starting range will be 5+Random (15). After each round of combat, the range will be adjusted and another round will be fought if the TFs are still in range. During daylight the maximum range is 35 (thousand yards). During the night the maximum range is 20.

Between rounds the new range is determined by comparing the convergence speed of the initiating TF with the withdrawal speed of the defending TF. If the convergence speed is greater than the withdrawal speed, then the new range will be less than the previous range. If the withdrawal speed is greater than the convergence speed, then the new range will be greater. If both TFs in a surface combat were eligible to initiate the combat, then both TFs will try to converge. The maximum range change between rounds is 10.

Example: *A Surface Combat TF with a speed of 25 engages a Transport TF with a speed of 18 at a range of 22 for round 1. The range for round 2 would be 15 (22-25+18).*

During each round of combat the ships will pair off and fire at their opponent's ships on a one for one basis. Any extra ships in the larger TF will select the best (usually the biggest) ship in the smaller TF. Ships will fire only those weapons that are in range of the enemy TF. Ships will spend 1 ammunition point each time their main guns are fired. Ships with torpedoes remaining will fire and expend one torpedo salvo each round. A torpedo salvo will consist of all, one half, or one forth of the total torpedoes a ship starts the scenario with. Listed below are the types of ships and numbers of salvoes they may fire:

JAPANESE SHIPS	# SALVOES	ALLIED SHIPS	# SALVOES
CA	4	CL	2
CL	2	CLAA	2
DD	2	DD	1
DE	2		

Note: *Most Japanese cruisers and destroyers carried extra torpedoes and had the ability to reload during a battle.*

After one or more rounds of combat, the initiating TF may be forced to try to disengage. When this happens both of the TF will diverge at the maximum rate. The following factors will cause the initiating TF to disengage:

- Any ship in the TF has less than 6 ammunition points after firing.
- The range falls below 5 for a night battle or 10 for a daylight battle.
- One or more ships in the initiating TF is sunk.

Naval Bombardment

During the Naval Bombardment Phase, any Bombardment TF which is in its mission destination hex will automatically bombard the enemy airfield. During naval bombardment the four largest ships in the bombarding TF will fire each of their primary guns four times. Each four shot salvo will land randomly in the target area. If the shot lands on some "critical" point of the airfield, then airfield or aircraft damage points will be added. The number of damage points added will vary with the size of the gun being fired. After the bombardment is completed, the level of airfield damage and the number of aircraft destroyed will be calculated. Ships firing during a naval bombardment will spend 2 ammunition points.

Unloading Transports

During the Unloading Transports Phase, any transport which is in its mission destination hex will automatically unload one point of cargo per turn. A TF which is unloading has its movement points set to zero, which means the transport will not leave the hex until it has unloaded all of its cargo. Depending upon the transport it may take up to three days to unload all the cargo. Mission points for unloading transports are still awarded to the player as long as the transports are unloading at the end of the battle.

Submarine Combat

Submarine attacks may happen at the end of each Execution Phase. Submarines for both sides are controlled by the computer. Submarines will never be displayed on the map. When a submarine contacts a TF, it will select a target and fire a spread of torpedoes. The submarine may then be attacked by destroyers in the TF.

The following factors will reduce the threat of enemy submarines:

- fast TFs will be harder to contact
- fast ships will be harder to hit
- more search planes will make a TF harder to contact (nearby submarines must dive to avoid detection)
- moving in open sea hexes will make the TF harder to contact
- more destroyers will make the target harder to hit and increase the chance of damaging or destroying the submarine
- night turns will make a TF harder to contact

Following each submarine attack the destroyers in the TF will counterattack. Points will be scored for each submarine damaged or destroyed.

GENERAL WITHDRAWAL

You are assigned the critical role of commanding your nation's naval forces. If you suffer heavy carrier losses or your missions are completed or aborted, your navy's Supreme Commander may order a General Withdrawal. When a General Withdrawal has been ordered, you can no longer control the movement of your TFs though you may still control their Flight Operations. When a General Withdrawal has been ordered, all of your TFs will automatically retire towards their home port.

The following factors may cause a player's forces to automatically withdraw from the battle area:

- The player successfully completes a transport mission. This is accomplished by unloading 75% of his transport points.
- The player scores 100 mission points for bombing/bombarding enemy bases. This will only result in a withdrawal if the player was not attempting a transport mission during the battle.
- The player has fewer than 75 operational aircraft on his carriers after 2200 hours.
- The player has no operational fleet carriers and less than 3 light carriers remaining.
- More than one half of the player's carrier strength has been critically damaged. A carrier is considered to be critically damaged if Flotation Damage + Flight Deck Damage x 10 is greater than 50.

END OF BATTLE

A battle will end if any of the following conditions are met:

- it is between 0200 and 0400 on the 4th day.
- it is between 0200 and 0400 when either player is withdrawing.
- it is after 2200 when both players are withdrawing.
- When a player selects EARLY END and there are no strikes in the air and one of the players is withdrawing.
- When a player selects DECLINE before 0500 on the first day of a battle.

The End of Battle screens will be displayed showing the following information:

- Date and Time
- Japanese Mission Points for the battle and the campaign
- Japanese Damage Points for the battle and the campaign
- Allied Mission Points for the battle and the campaign
- Allied Damage Points for the battle and the campaign

Press a key or click the mouse button to continue to the next menu which gives you the options listed next in the Home Port Phase.

HOME PORT PHASE

NEW BATTLE
SAVE
SHOW LOSSES
END CAMPAIGN
ACCEPT

Use the up arrow, down arrow, "2", or "8" keys to move around the menu. Press the <ENTER> key to select the highlighted choice. Using the mouse place the pointer in one of the boxes and click the left mouse button. Next place the pointer in the ACCEPT button box and click the left mouse button.

NEW BATTLE allows you to begin a new battle for the next month.

SAVE allows you to save your game at this point. Press the letter (a-e) or place the mouse pointer over one of the button boxes labeled (a-e) and click the left mouse button in order to save the game. You will return to the above menu.

SHOW LOSSES allows you to see the losses for the battle as described below:

- Japanese aircraft destroyed for each aircraft type for the current battle and the campaign
- Allied aircraft destroyed for each aircraft type for the current battle and the campaign

Press a key or click the mouse button to continue to the next menu which gives you the following information:

- Japanese ships sunk and damaged
- Allied ships sunk and damaged
- Date and Time
- Japanese Mission Points for the battle and the campaign
- Japanese Damage Points for the battle and the campaign
- Allied Mission Points for the battle and the campaign
- Allied Damage Points for the battle and the campaign

Press a key or click the mouse button to continue to the main menu above.

END CAMPAIGN allows you to end the game. The following information will be displayed:

- Japanese Total Points (Mission plus Damage)
- Japanese screen display showing both normal carriers and burning carriers (for those that were sunk)
- Allied Total Points (Mission plus Damage)
- Allied screen display showing both normal carriers and burning carriers (for those that were sunk)
- Date and Time
- Japanese Mission Points for the battle and the campaign
- Japanese Damage Points for the battle and the campaign
- Allied Mission Points for the battle and the campaign
- Allied Damage Points for the battle and the campaign

Pressing a key or mouse button will return you to DOS.

ACCEPT allows you to carry out the choice you have highlighted above. Press the <Enter> key or place the mouse pointer in the ACCEPT box and click the left mouse button.

REPAIR PHASE

SHIP REPAIRS

During each Repair Phase a ship may repair a maximum of 1 flotation damage point and put out a maximum of 1 fire. Carriers may repair a maximum of 1 flight deck damage point.

A ship will repair 1 flotation damage point if Random (200) < Flotation Damage. A ship will put out 1 fire if Random (150) > Flotation Damage. A carrier will always repair 1 flight deck damage point per turn.

AIRCRAFT REPAIRS

Damaged aircraft may be repaired during the 2200, 2220, 2240, 2300, 2320, and 2340 game turns. Each air group may repair 1 aircraft per turn; a maximum of 6 aircraft may be repaired during the night.

AIRFIELD REPAIRS

One airfield damage point will be repaired every six hours. Repairs will occur at 0000, 0600, 1200, and 1800 hours.

SCORING

The scoring system is divided in two categories: Mission Points and Damage Points. Mission Points are scored for successfully unloading transports and bombing or bombarding enemy airfields. Damage Points are scored for damaging or sinking enemy ships.

1. One Mission Point is scored for each cargo point unloaded at a Transport TFs destination.

2. Ten Mission Points are scored for each enemy airfield damage level that occurs during the battle. If the airfield is Port Moresby, Henderson Field, or Rabaul, then 25 Mission Points per damage level will be scored. Airfield damage may be caused by either Naval or Air Bombardment.

3. When playing a Campaign, a player will score 1000 Mission Points if his opponent is unable to fight that month due to shortage of aircraft carriers. A player will score 1000 Mission Points if his opponent declines the battle.

4. If your opponent declines the battle or you choose Early End when your Bombardment TF is not withdrawing and the enemy is withdrawing, then you receive the following mission points: 30 points per BB; 20 points per CA, CL, and CLAA; and 10 points per DD.

5. If your opponent declines the battle or you choose Early End and your Transports are not withdrawing, you will receive 1 mission point for every cargo point in your Transport TF.

6. Damage Points equal to Capacity x 10 will be scored for sinking an enemy aircraft carrier. Damage points equal to Durability x 2 will be scored for sinking an enemy combat ship. Damage Points equal to Durability will be scored for sinking an enemy auxiliary ship.

7. Damage Points equal to Durability x Damage / 100 will be scored for damaging an enemy ship.

8. If you outscore your opponent by at least one point, you will receive a Marginal Victory. If you outscore your opponent by a 2-1 margin, you will receive a Decisive Victory. If the score is equal, the Japanese win a Marginal Victory. If your opponent outscores you by at least one point, he will receive a Marginal Victory. If your opponent outscores you by a 2-1 margin, he will receive a Decisive Victory.

CAMPAIGN PROGRESS

Campaign progress can be measured by the construction of Allied bases in the South Pacific area. Japanese success in completing missions and preventing the Allies from completing their missions may delay the Allied advance. The following will affect the delay in Allied progress:

- add 1 month delay if the Japanese complete a transport mission.
- add 1 month delay if the Japanese score 100 mission points for bombarding airfields and no Japanese transport missions were attempted.
- add 1 month delay if a month is skipped because Allied carriers are unavailable.
- subtract 1 month delay if the Allies complete a transport mission.
- subtract 1 month delay if the Allies score 100 mission points for bombarding airfields and no Allied transport missions were attempted.
- subtract 1 month delay if a month is skipped because Japanese carriers are unavailable.

TUTORIAL

Following is a detailed description of a few game turns of CARRIER STRIKE. It is assumed that you have already installed the game and have gone through the opening screens and are at the Setup Menu. Although the tutorial will assume you are playing with a mouse, the corresponding keyboard commands will also be noted in parentheses.

At the Setup Menu place the mouse pointer over the box labeled Midway and click the left mouse button (press the down arrow or "2" key once). Move the mouse pointer over to the ACCEPT box and press the left button (press <Enter> key). You will now be playing the Midway scenario against the Japanese computer at the Even Help level.

The Sound/Delay Menu will now be displayed. Place the mouse pointer over the box labeled HIGH and click the left button (press the right arrow or "6" key once and then press the down arrow or "2" key three times). Place the mouse pointer over the ACCEPT box and click the left button (press <Enter> key).

The randomized battle screen should now be displayed. Place the mouse pointer over the NO box and click the left button (press "N" key).

You should now see the Allied Top Secret screen. Click the right button (press the space bar). Next is displayed your mission for the battle which is to engage enemy forces operating in the Midway area. Click the right button (press the space bar) to continue.

The Options Menu is now displayed. Place the pointer over ORDERS and click the left button (press the up arrow or “8” key three times). Place the pointer over ACCEPT and click the left button (press <Enter> key).

The map is displayed with the cursor on top of a double ship icon. The text window shows that you are in TF MODE with the cursor at location 50, 25. The cursor is currently over TF51 which is an Air Combat TF comprised of two aircraft carriers. At the far right is a compass showing you that your TF is heading west. Since you have a double ship icon you know there is at least another TF in the hex. Place the pointer over STAK and click the left button (press the space bar). TF52 which also is an Air Combat TF comes up. Click the left button again (press space bar) to return you to TF51.

Place the pointer over the carrier picture labeled “A” and click the left button (press “A” key). The Flight Operations Display for the carrier Enterprise is displayed. At the left are four Air Groups labeled as shown below:

A Fighter 6 F4F Wildcat

B Scout 6 SBD Dauntless

C Bomber 6 SBD Dauntless

D Torpedo 6 TBD Devastator

Currently the “A” Fighter 6 planes and Air Group box are in white showing you these are the planes that you can now access. Place the pointer over the “B” Scout 6 box and click the left button (press “B” key). The “B” Scout 6 box now turns white and a different group of planes turns white. Press the “?” key to see the keyboard commands for the various boxes. Place the pointer over the middle box with 2 up arrows labeled “R” and click the left button (press “R” key). Nineteen planes of the Scout 6 Air Group just moved to the top hangar area. The planes have just been fueled. Note that the Fuel Operations clock is over half used. Place the pointer in the ORD box and click the left button (press “Y” key). To the right of the ORD box is the weapons box which now shows a picture of a 500 lb bomb. Note that the Scout 6 Air Group box also displays the 500 lb bomb. Click the left button again (press “Y” key). HE bombs now appear in both areas. You have now armed your nineteen planes with HE weapons. Place the pointer back over the “A” Fighter 6 Air Group box and click the left button (press “A” key). Place the pointer over the rightmost box on the hangar deck marked with one up arrow with “E” in the box. Click the left button (press “E” key). One white fighter plane was just fueled and moved to the top hangar area. Click the left button six more times (press “E” six more times) to bring an additional six fighters up to the top hangar area. Place the pointer over the ESC box and press the left button (press ESC key).

You are now back to the map. Place the pointer over the ZOOM box and click the left button (press the F1 key). You will now see the map scale change so you can see much more of the map. Place the pointer over the American flag near the bottom of the screen and click the left button (use the down arrow or “2” key to move the cursor). The text window should show the cursor at LOC: 50 35 over the island of Midway. In the text window is also displayed AF:50 which means that Midway can launch up to 50 planes in any one turn from the airfield. Press the left

mouse button. You will see the Unit Menu displayed. Place the pointer over DISP AF and click the left button (press “F” key).

You will now see the airfield display of its Air Groups listed from A-J. Place the pointer over the “H” next to Patrol Sqn 23 and click the left button (press “H” key). You will now see the details of Patrol Sqn 23. Press the right button twice (press ESC or space bar twice) to exit the last two window displays.

Place the pointer over the ESC box on the map display and click the left button (press “Q” key). The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) in order to end your turn. You will see various messages appear on the screen until your next turn.

Place the pointer in the ORDERS box in the Options Menu and press the left button if ORDERS is not already highlighted in yellow. Place the pointer over the ACCEPT box and press the left button (press the <Enter> key). It is now the 0440 turn.

TF51 should be shown on the map with the cursor over it. Place the pointer in the SW quadrant on the compass, which is located to the far right side of the text window. Click the left button (press the “<” key). The white pointer which shows which direction the TF is moving in should now be in the SW quadrant. Place the pointer over the carrier picture labeled “A” and click the left button (press “A” key).

You should be in the Enterprise’s Flight Operations Display. Press the “?” key to toggle the keyboard commands. Place the pointer in the box labeled <<— with the “I” command. Click the left button (press the “I” key). Note that the Flight Operations and the Elevator Up clocks are in about the 2 o’clock position. Place the pointer in the box with 2 up arrows with the “R” command and click the left button (press “R” key). Place the pointer in the “B” Scout 6 Air Group box and click the left button (press “B” key). Place the pointer in the box labeled <<— with the “I” command. Click the left button (press the “I” key). Place the pointer over the ESC box and press the left button (press ESC key).

Place the pointer over the ESC box on the map display and click the left button (press “Q” key). The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) to end your 0440 turn.

The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) to end your turn without going through the 0500 Orders Phase.

Place the pointer in the ORDERS box in the Options Menu and press the left button if ORDERS is not already highlighted in yellow. Place the pointer over the ACCEPT box and press the left button (press the <Enter> key).

It is now the 0520 turn. Place the pointer over the carrier picture labeled “A” and click the left button (press “A” key). You should be in the Enterprise’s Flight Operations Display. Press the “?” key to toggle the keyboard commands. Place the pointer in the box labeled MIS with the “H” command. Click the left button (press the “H” key). You should see the Mission Display box appear with mission: CAP, Flight 6, F4F Wildcat x 0. Place the pointer in the box with 2 up arrows with the “]” command and click the left button (press “]” key). You should get a message about TF turning into the wind (unless the random wind direction is in the SW quadrant). Seven of the F4F Wildcats have just been launched on CAP. Place the pointer in the “B” Scout 6 Air Group box and click the left button (press “B” key). Place the pointer in the box labeled MIS with the “H” command. Click the left button (press the “H” key). The Mission Display box should now show mission: Search, flight: 7, SBD Dauntless x 0. Press the “?” key again. You should also see a SET-DIR box with “S” in the box on the left side of the screen. Place the pointer over the one arrow box with “[“ in the box and click the left button 8 times (press “[“ key 8 times) to launch 8 SBD Dauntless planes. Now place the pointer over the SET-DIR box and click the left button (press the “S” key).

The Set Search Direction Display will now come up showing the map with TF51 having a yellow search vector (angle) pointing to the NW. Place the pointer in the << box and click the button three times (press the “<” key three times) to move the yellow pointer into a SW direction. With a mouse an easier method of setting the search direction vector is to place the pointer on the map in the direction you wish and click the left button. The yellow vector will move to the new location. ***Note:*** *A Japanese player having float planes can launch them at this time by placing the pointer over LNCH and clicking the left button (press “F” key). Place the pointer over the ESC box and press the left button (press ESC key). You should now be back to the Flight Operations Display. Place the pointer over the ESC box and press the left button (press ESC key).*

Place the pointer over the ESC box on the map display and click the left button (press “Q” key). The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) to end your 0520 turn.

The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) to end your turn without going through the 0540 Orders Phase.

Place the pointer in the ORDERS box in the Options Menu and press the left button if ORDERS is not already highlighted in yellow. Place the pointer over the ACCEPT box and press the left button (press the <Enter> key).

It is now the 0600 turn. TF51 should be shown on the map with the cursor over it. Place the pointer in the SW quadrant on the compass and click the left button (press the “<” key). The white pointer should now be in the SW quadrant. Place the pointer over TF51 on the map and click the left button. The Unit Menu should come up. Place the pointer over DISP TF SEARCH and click the left button (press “S” key). You will now see 8 white search vectors which show the path each of the 8 SBD Dauntless planes are taking. Press the right button (press any key) to exit the display.

Using the mouse place the pointer in the MODE box and click the left button. The text window should say MODE: CAP and a F3-CAP with 6 planes box should appear in the right side of the text window. Place the pointer in the F3-CAP box and click the left button. If you are using the keyboard just press F3. You should see TF51’s CAP on the screen which contains 7 F4F Wildcats from Fighter 6. To land the CAP place the pointer over the “A” next to Fighter 6 and click the left button (press “A” key). The Flight Operations Menu now appears. Press the “?” key. To land all the CAP place the pointer over the box labeled —>> with a “E” in the box and click the left button (press “E”). Your planes should now be on the flight deck. Press the right button (press ESC or space bar) to exit the display.

Place the pointer over the ESC box on the map display and click the left button (press “Q” key). The Options Menu should now be displayed. Place the pointer in the END TURN box and click the left button (press the down arrow or “2” key). Place the pointer over the ACCEPT box and click the left button (press <Enter> key) to end your 0600 turn.

In the Execution Phase Japanese carrier aircraft attacked Midway. Search planes from Midway and TF51 supposedly located two enemy TFs.

Place the pointer in the ORDERS box in the Options Menu and press the left button if ORDERS is not already highlighted in yellow. Place the pointer over the ACCEPT box and press the left button (press the <Enter> key).

It is now the 0620 turn. ***Note:*** *Due to the game’s randomization your game may be slightly different.* If you have not sighted a Japanese TF by now, end the turn and keep doing so until you sight one. An Allied Strike icon is a few hexes from Midway. Using a mouse place the pointer over the MODE box and click the left button twice to put you in MODE: STRIKE. Place the pointer over the Strike icon and click the left button. Now click the right button (press “E” key) to display the planes in the strike. Click the right button (press ESC or space bar) to exit the display. You will now see a view of the planes in the strike. Click the right button (press ESC or space bar) to exit.

Place the pointer in the MODE box and click until MODE: TF appears. Place the pointer or move the cursor to TF51. Click the left mouse button. In the Flight Operations Display place the pointer in the “B” Scout 6 Air Group box and click the left button (press “B” key). Press the “?” key. Place the pointer in the box labeled MIS with the “H” command. Click the left button twice (press the

"H" key twice). The Mission Display box should now show mission: Strike, flight 14:51, SBD Dauntless x 0: 0. Place the pointer over the two up arrow box with "]" in the box and click the left button (press "]" key) to launch 11 SBD Dauntless planes. Next press the "?" key. Place the pointer in the TGT-TF box and click the left button (press "S" key). The Target Display comes up. Place the pointer over "A" the first target in the list and click the left button (press "A" key). Press the right button (ESC or space bar) to exit. Again you may press the right button (ESC or space bar) to exit the Flight Operations Display to the map display.

In this tutorial you have only accessed a small fraction of the numerous available commands. The major game functions revolve around sending out searches, putting up CAP for defense, and sending out strikes as covered in the tutorial. To get into the game quickly review the various menus available and if need be the explanations concerning their use.

DESIGNER'S NOTES

CARRIER STRIKE was designed to provide an infinite number of "random" carrier battles that can be linked together as a two year "historical" campaign. The random factor is crucial in creating an authentic fog of war. You can only fight the battle of Midway so many times before all of the mystery is eliminated. In CARRIER STRIKE you are never sure at the start of a battle about the enemy's location, strength, or intentions. The scenarios are not totally random. The battles are fought with ships and planes that are available at the time period of the battle.

THE CAMPAIGN

Except for Marianas, all of the scenarios included in the game may be used as starting points for a Campaign Game. The campaign allows you to fight up to one battle a month until the June 1944 ending. Ships sunk or damaged in battle will be unavailable later in the campaign. You cannot afford to use your ships like there's no tomorrow.

SEARCH OPERATIONS

The program simplifies the task of assigning search missions. You select which planes will be launched on search missions and then set a search direction. The computer "staff officer" then assigns each plane to a specific search vector.

Historically search planes were quite efficient at locating enemy Task Forces during clear weather. There were frequent failures, however, in reporting the type, strength, and location of enemy forces to the carrier force commander. Many search reports were transmitted but not received by the carrier commanders. Other reports were garbled in ways that created confusion over the location or type of ships sighted. Search pilots frequently miscalculated their location when flying over open sea.

CARRIER STRIKE attempts to simulate search report confusion in three ways. First there is a 33% chance that you will not receive a report. Second, there is a chance that the search pilot will see a carrier in a non-carrier Task Force. Third, the pilot will report a dummy Task Force that is the mirror image of a real Task Force in a different location. Dummy TFs will be removed after two or three passes by search planes.

AIR STRIKES

"The best laid plans often run astray" or "Murphy's law rules supreme." The system for resolving air strikes against enemy ships contains so much luck that almost anything can happen. Your intentions are most frequently foiled when your strikes encounter the wrong enemy TF. Large strikes of 60 or more aircraft may split up, with some groups attacking the wrong TF while the rest continue towards the desired target. Strikes of 100 or more aircraft may split up several times while flying towards their target. Smaller strikes will not split up but the whole strike may attack the wrong target.

GENERAL WITHDRAWAL

The General Withdrawal rule was placed into the game to help further simulate the actual conditions that existed during wartime. Most players usually play over aggressively in wargame simulations which tends to lead to excessive casualties and produce ahistorical results. Eliminating the entire enemy carrier force would lead to a fast and rather boring Campaign Game with some months being skipped due to the lack of enemy carriers.

STRATEGY AND TACTICS

STRATEGY NOTES FOR THE CAMPAIGN GAME

ALLIED PLAYER STRATEGY

As the Allied player you start in May 1942 with two major disadvantages. You are outnumbered in carriers and both your pilots and planes are not as good as the Japanese. Your main advantages lay in the fact that your carriers one for one match up well with the Japanese, you have radar before they do, and your defensive posture may allow you to use land-based planes (especially at Midway) to offset your numerical disadvantage. Although Midway will always be a maximum effort by both sides, you must hope that the early battles are small ones (such as the historical Coral Sea battle) where your larger carriers should have the advantage. Also your radar advantage in May, June, and July may allow you to score a big victory as was done historically at Midway. However, do not be afraid to decline a battle if your early carrier losses force you into a battle where you expect to be outnumbered in fleet carriers by 2-1. Always keep in mind that your reinforcements and ever increasing technological superiority will eventually give you advantages that the Japanese cannot match. Do not forget about your overall mission as you play since victory points include mission points as well. Try to concentrate on one enemy TF at a time. Large or continuous strikes weaken enemy CAP and increase the percentage of friendly survivors in each strike. Usually priority will be given to destroying enemy Air Combat TFs, however, in certain situations Transport and Bombardment TFs become very important for scoring purposes.

Japanese Player Strategy

As the Japanese player you must make the most of your early numerical and qualitative advantage. During 1942 you will only face six Allied carriers. Your goal must be their early destruction, for if you are successful, you stand a good chance of sweeping the Allied navy from the South Pacific for several months, or forcing the Allied player to fight several battles at an extreme disadvantage. If this happens you will be able to delay the Allied base construction program and possibly reduce the impact of Allied land based air power. You should always concentrate on sinking Allied carriers. If you have sunk enough of the Allied carriers, you may be able to keep your numerical advantage into mid 1943. By this time improved Allied planes and flak along with the arrival of several new Allied carriers will no doubt shift the initiative to the Allies. By 1944 all you can usually hope to do is show up and with luck sink an Allied carrier. This is the point at which you must be willing to decline battles in which the possible loss of carriers will outweigh any possible reward. The key to Japanese success is in scoring points in 1942 by defeating those first 6 Allied carriers. Only if this is accomplished can you hope to build a sufficient lead in victory points to survive the impending Allied onslaught. Do not forget about the overall mission you are assigned since total victory points includes mission points. Another strategy you may use if you have scored well in 1942 is to go after the Allied transports and keep your CVs floating. Gaining the mission points and keeping your damage points down may give you enough points for a victory.

Tactical Notes

Searching for Enemy TF

Finding the enemy is the first step in any carrier engagement and a full search effort should be well underway by 0600 each day. As the Japanese player you have a distinct advantage in this area due to the ability to use float planes, thus saving carrier bombers for combat while the Allied player is forced to send carrier planes (SBD's in 1942) to find the enemy. Two Japanese Task Forces each with 8-12 float planes is more than sufficient to set up a good search pattern. Players should work towards setting up a search pattern that covers a 135 to 180 degree arc away from friendly carriers. In two turns two Japanese Task Forces can usually launch 16-18 planes in such a way to cover this area. When playing on the South Pacific map during randomly generated battles, it is a good bet that the Allied player is going to be either south, southeast, or east of your position at the beginning of the battle (when fighting in early to mid 1942 they may be to the southwest). Thus a 180 degree arc should be more than sufficient (beware of surprises at Midway). Be sure to keep enough float planes in reserve so that you can dispatch follow up patrols to check out any reported spotting. Be sure to check up on your search planes, for if search planes begin to disappear you can bet that they have flown over enemy carriers and have been shot down by CAP. If this happens immediately send several new search patrols to the area. If you are unlucky enough to not have more than one Task Force capable of launching float planes you should consider using 5-10 dive-bombers from a carrier to augment your search. Remember that before you have radar

it is essential that you spot the Allied carriers groups before they spot you. As the Allied player you face a more difficult time in that you will be forced to allocate carrier planes for search. If you do not have a good land-based search capability (i.e. Midway or Henderson Field) you may be forced to use as many as 15-20 carrier planes to set up your 135-180 degree search arc. Take advantage of radar contacts of enemy strikes as they may tell you in which direction to search (of course by that time it may be too late!) It is better to use a few extra planes on search in order to find the enemy than to skimp on search planes and find yourself receiving an unanswered first strike. Due to inaccurate search reports, both sides must be ready to follow up their first search planes with additional planes as needed to verify the initial information received. It is probably best not to arm your search planes as it is not very likely the plane will do any damage; this will allow you to cover more territory faster and give you a greater range to search.

Hiding from the Enemy

If at all possible try to keep your TFs out of coastal and restricted hexes which gives the enemy an increased chance to spot your force. Use cloud cover whenever possible to avoid detection, especially if you are spotted already. If detected and you know the location of the enemy TF, check the range. If you are at a disadvantage, moving away from the enemy TF may put you out of range. Try not to recall strikes as your location could be given away.

Optimum Engagement Ranges

Early in the war the Japanese enjoy a range advantage which sometimes can be used to great effect. Japanese planes can easily strike targets up to 200 miles away while having a chance of engaging enemy forces up to 250 miles away (even further if the enemy is moving towards you since a Task Force can move almost 100 miles in the time in which it takes a strike to form up, move 250 miles, and locate its target). Allied planes in 1942 can strike targets up to 175-200 miles away with 1000 pound bombs (use 500 pound bombs only when at extreme range) but TBD's will need luck to hit anything greater than 125 miles away. Thus the Japanese player is usually best advised to strike at targets 200-225 miles away and then turn away from the enemy and attempt to outrun any counterattack. The Allied player must attempt to close the range and engage at distances of 100-150 miles. If the range to the enemy TF is close, the Allied player should use 1000 lb bombs to inflict maximum damage. As the war progresses both sides will receive new planes with slightly longer ranges, but the Japanese range advantage will remain with 50 miles added to the ranges given above.

Aircraft Management

A carrier commander's goals are simple and yet often in conflict with each other. You must be able to launch large airstrikes at enemy carriers as soon as they are spotted, while minimizing the possibility of being caught with fueled and armed airplanes on your carriers. Each morning after launching 1/3 to 2/3 of your fighters on CAP and any bombers on search missions, your next decisions involve determining if you will keep

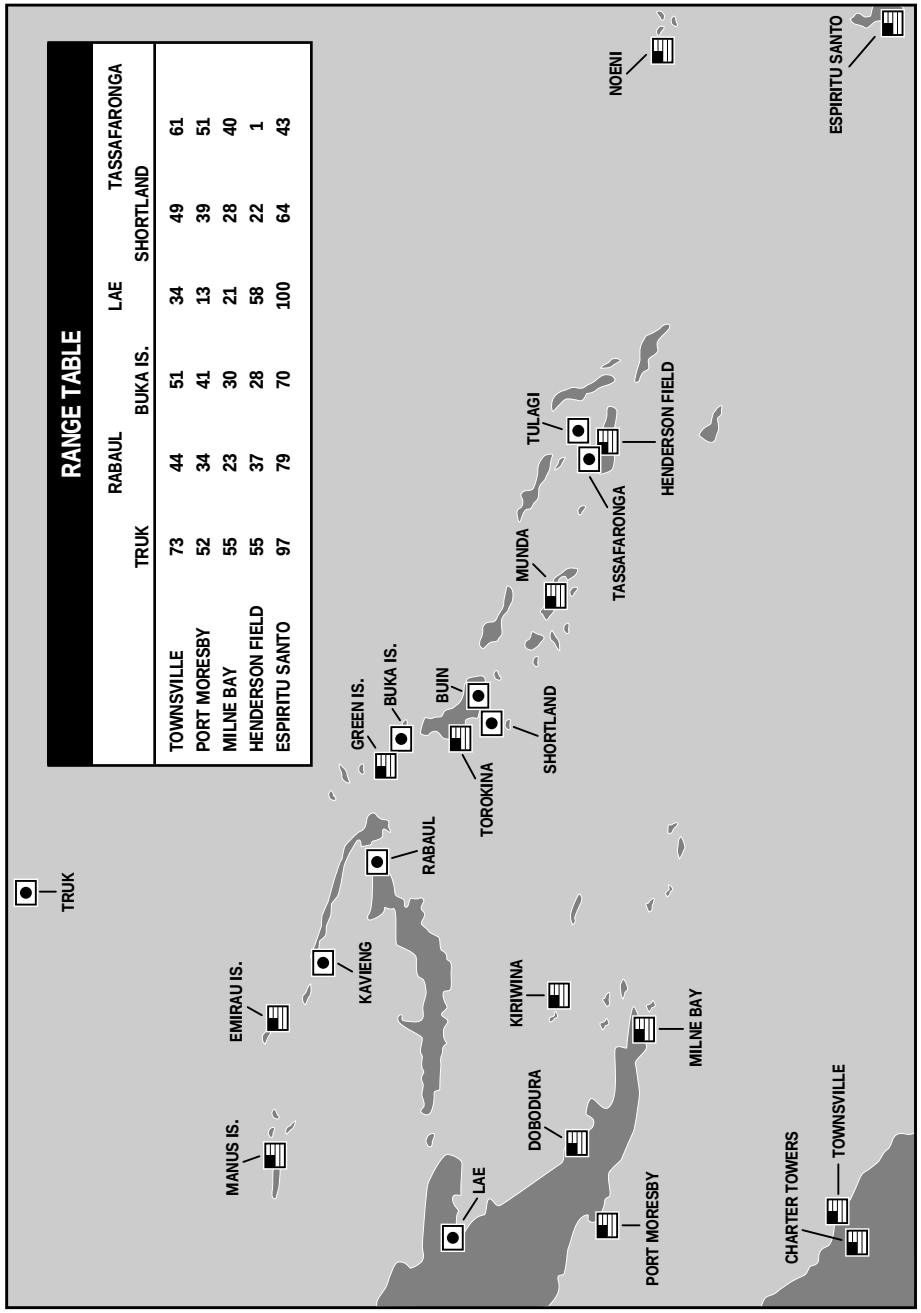
armed planes on deck, and if so, which planes and with what ordnance. Prior to obtaining radar, the Japanese player must be very careful not to keep armed and fueled planes on his carriers for more than a few turns. If you haven't sighted the enemy by 0700 to 0800 you should put your planes in the hanger and await further developments. If you have radar you can afford to risk keeping 36 planes (18 for CVL's) on deck and ready for launching (in this case your biggest risk is being hit by a submarine launched torpedo and watching the subsequent fires blow up your ship). Keep in mind that on any one turn a fleet carrier can launch 36 planes from the flight deck, or move 18 planes from the fueling area to the flight deck and then launch those 18 planes. This means that you can launch up to 54 planes in two turns. Unless you have TBD's you should try to keep a combination of torpedo and dive bombers on deck along with an escort of 8-12 fighters. The shorter range of the TBD's often requires you to launch them as part of your second strike after you have been able to close the range between carrier forces. If you have time it is often best to have your first planes hover over your Task Force (do not give them a target) until you are able to reinforce them with additional planes on the following turn. If possible try to form large strikes containing planes from different carriers as they will stand a better chance of overwhelming enemy CAP and causing maximum damage with minimum losses. Later in the war the Japanese player's only hope of getting past Allied CAP and flak is by forming strikes with over 100 planes.

Use of Non-Carrier Task Forces

Bombardment and surface combat Task Forces can be used to engage enemy carrier forces, especially crippled carriers that have broken off from the main force, and transport forces. Operating between your carriers and enemy carriers they can be used as an early warning radar screen. To the Japanese player their float planes can be critical in finding and identifying enemy forces without using carrier planes. Be sure to protect your transports as they are the most vulnerable to both air attacks and surface combat. Transports should only move into enemy territory once enemy naval forces have been engaged and neutralized. Bombardment Task Forces should stay 250-300 miles away from enemy land bases until dark in order to avoid enemy land-based airstrikes. Once night has arrived move towards your target at full speed, bombard, and then withdraw before daylight breaks and you find yourself being attacked from the air. For most of the war the Japanese player has an advantage in capital ships. The Allied player should therefore try to avoid surface combat against a Japanese Surface Combat TF if possible.

RANGE TABLE

	TRUK	RABAUL	BUKA IS.	LAE	SHORTLAND	TASSAFARONGA
TOWNSVILLE	73	44	51	34	49	61
PORT MORESBY	52	34	41	13	39	51
MILNE BAY	55	23	30	21	28	40
HENDERSON FIELD	55	37	28	58	22	1
ESPIRITU SANTO	97	79	70	100	64	43

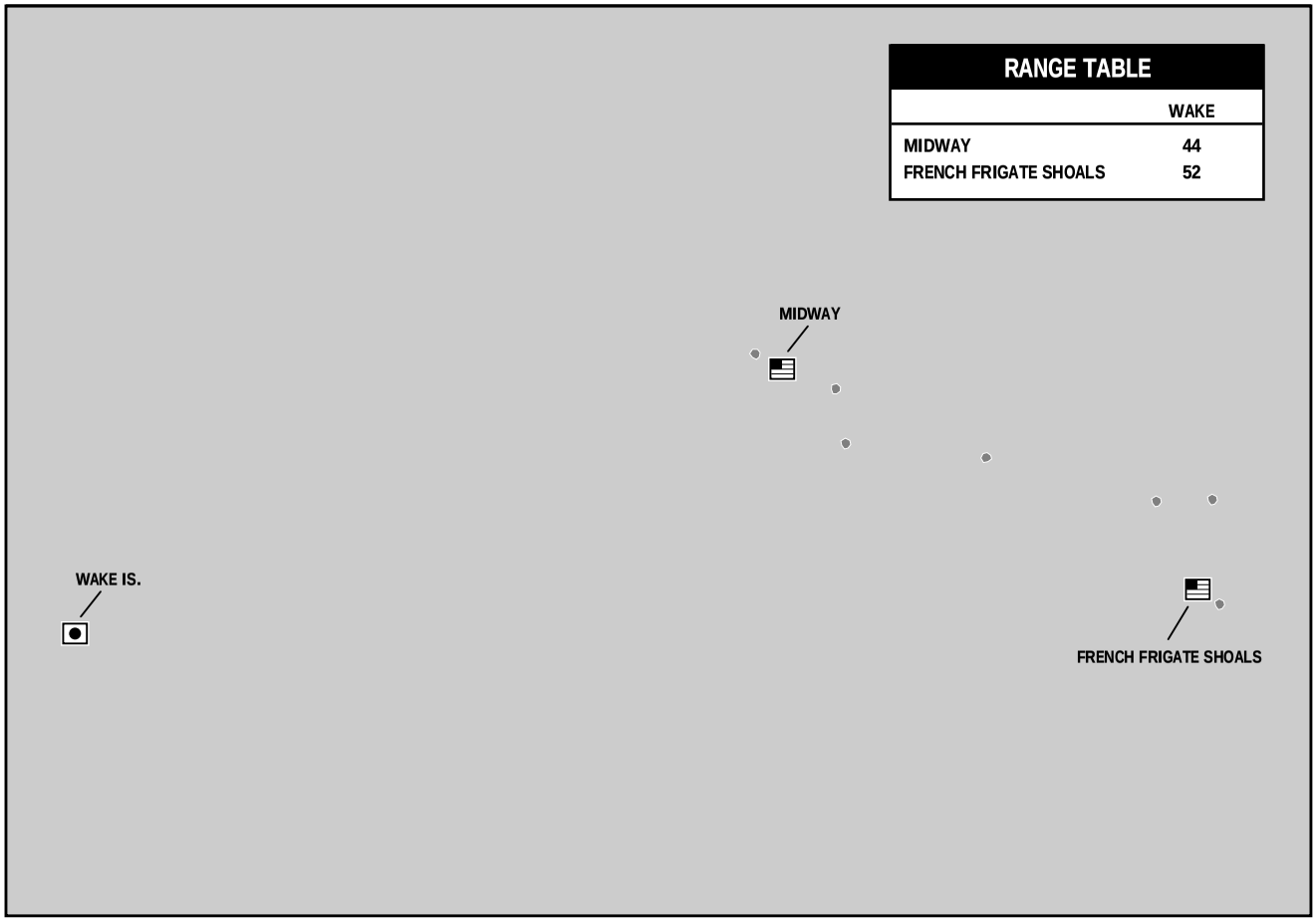


CORAL SEA, EASTERN SOLOMONS, AND TOROKINA

Note: Numbers in the Range Table refer to the range (in hexes) between the two bases.

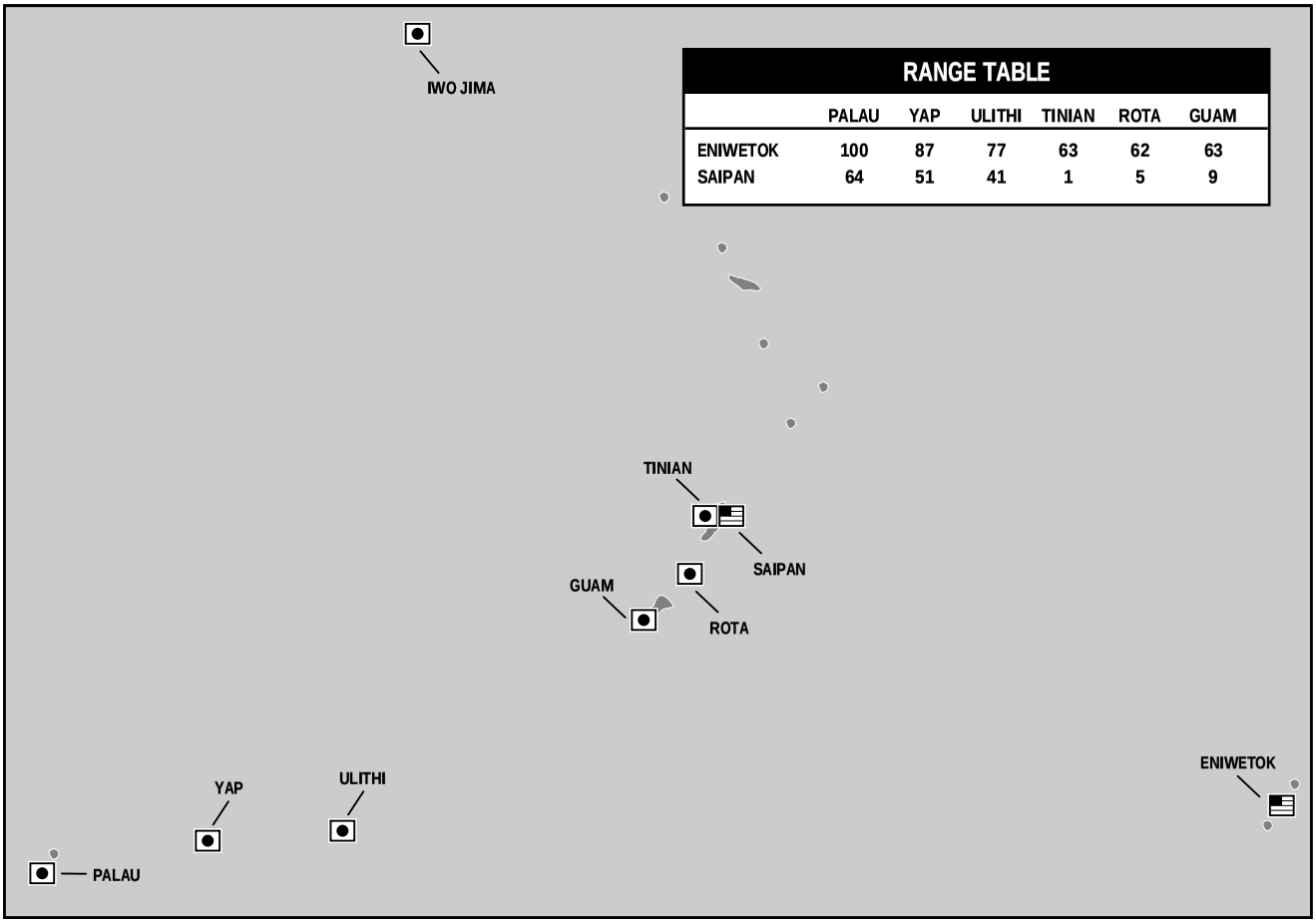
MIDWAY

Note: Numbers in the Range Table refer to the range (in hexes) between the two bases.



MARIANAS

Note: Numbers in the Range Table refer to the range (in hexes) between the two bases.



The Fast Carriers: A Weapons Systems Survey, 1917-1975

by Martin Campion

In the first decade of the Twentieth Century, when inventors began to build airplanes that could stay aloft for more than a few moments, naval officers immediately began to investigate how to use them in naval warfare. Quickly recognizing the potential of aircraft for scouting, they looked for ways that aircraft could operate with a fleet at sea.

The United States Navy took the first step toward using landplanes with the fleet by successful experiments in 1910 and 1911. In the first year, an aircraft took off from a wooden platform built on the cruiser Birmingham. In the next year, another aircraft took off and landed on the battleship Pennsylvania. However, seaplanes at first looked more valuable to naval men, so the United States, Britain and France spent their limited resources on them, not landplanes.

The aircraft carrier was gradually invented by the British during, and as a result of, experience in World War I. When the war began, the Royal Navy, after some experiments with a makeshift, had already started converting a merchant ship to a seaplane carrier with a flying deck. This ship, the Ark Royal, was able to launch seaplanes from its deck (even in heavy weather). The British built other seaplane carriers, both with and without decks, and operated them with some success during the war. However, they became disenchanted with the seaplane. The technology of aircraft made rapid progress during the war, and, by 1917, it became apparent that the wheeled landplane was greatly superior for most warlike activities to the float-encumbered seaplane. Seaplanes were particularly unable to operate very well in the rough waters of the North Sea, where the British Grand Fleet was trying to use them in its lengthy watch over the German High Seas Fleet – in bad weather, seaplanes were launched from decked seaplane carriers, but could not be recovered intact. In order to alleviate the poor performance problem, the British fleet started using landplanes, flown off from seaplane carriers, from

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platforms built on battleship turrets, and even from towed barges. Of course, none of these aircraft could be flown off more than once since they could not land again. The solution to the problem seemed to be a ship that could launch and recover landplanes on a deck – in other words, an aircraft carrier.

The first attempt to build an aircraft carrier was unsuccessful. The best and newest seaplane carrier, the Furious, which was equipped with a forward flying off deck, was sent back to the shipyard to have an after landing deck installed. The two decks were separated by the ship's conventional centerline superstructure and connected by narrow runways on either side. This arrangement did not work since the superstructure created treacherous air currents over the landing deck, and the funnel gasses obscured the pilot's vision when he tried to land. So the Furious continued to fly off aircraft that she could not recover. The first workable aircraft carrier was the Argus which joined the Grand Fleet two weeks before the Armistice.

Therefore, World War I had proven the desirability of the aircraft carrier without allowing much experience in its use. During the twenty years between the wars, navies debated the use of carriers in future wars, while the United States and Japan committed themselves by their building programs to the extensive use of carriers. At the same time, France completed one carrier and started two more, while Germany started one. Of the major seapowers, only Italy showed no interest in the new weapon.

Naval officers differed about how carriers should be built and used. Battleship admirals wanted to relegate naval aircraft to the task of spotting for their big guns, while naval aviators wanted to develop aircraft as ship sinking weapons. In the United States, naval aviators joined in antagonistic cooperation with the airman, General Billy Mitchell, to prove that aircraft could sink an unmanned ex-German battleship, but successfully fought Mitchell's idea that naval air should be separated from the navy to become a part of a unified independent airforce. In Japan, too, the naval air arm developed as a part of the navy. Each of these navies looked at the other as the most likely enemy, and planned to use the aircraft in their carriers to help achieve command of the air and sea in the Pacific Ocean fleet actions. Since the Japanese were expected to be on the defensive, it was believed they would have the advantage of using land-based aircraft in addition to carrier-based aircraft. The Americans planned to use carrier aircraft to wrest control of the air from the Japanese combination. Both sides built carriers that could carry a large number of aircraft, built carrier aircraft

that could compete with land, and planned to use attack aircraft to sink ships, especially opposing aircraft carriers. Both navies developed torpedo bombing, originated by the British in World War I, and dive bombing, invented by the United States Navy and Marine Corps in the twenties, but the Japanese emphasized the former tactic while the Americans emphasized the latter. In spite of their commitment to the use of carriers, neither the United States nor the Japanese Navies thought that carriers could replace battleships as the backbone of the fleet.

Meanwhile, the British Navy prepared for a different kind of carrier warfare. Just before World War I ended, the Royal Air Force had been formed out of army and navy air arms. The R.A.F. was dominated by a faith in strategic bombing to the exclusion of other kinds of aerial activity. Although the navy regained some control of naval aircraft as early as 1923, and the Fleet Air Arm (carrier-based aircraft) was returned completely to naval control in 1937, the unified airforce prevented naval aviators from achieving influential positions in the navy. As a result, aircraft carriers in the Royal Navy were looked on strictly as auxiliary to battleships. British carriers carried fewer aircraft than American and Japanese carriers, and British carrier aircraft were not designed to compete with land-based aircraft. The British thought that aircraft might attack battleships, but that their attacks would at best slow down enemy ships so that friendly battleships could finish them off. Aircraft carriers and battleships were both supposed to protect themselves from enemy aircraft with armor and anti-aircraft guns. In the late 1930's, as the British faced the prospect of a war against a mighty German airforce, they designed and built the four carriers of the Illustrious class, with very heavy armor and AA protection, but very few planes.

When the European war began in 1939, the major naval powers had, between them, seventeen fleet carriers. The United States had five with a combined total displacement of 120,100 tons and an aircraft capacity of over 400; Great Britain had seven with a combined total displacement of 138,000 tons, but an aircraft capacity of only around 200; Japan had five (not counting the Hoso) with a total displacement of 118,500 tons and an aircraft capacity of 300.

Meanwhile, all three navies were learning, at about the same speed, how to design aircraft carriers and how to fly aircraft from them. After the British experience with the separated decks of the Furious, some designers thought that a carrier ought to be built with a flight deck unbroken by any superstructure. So, the Furious was rebuilt with two decks, the top one

perfectly flat. The first U.S. carrier, the Langley, was converted from a collier into a true flat-top. The Japanese built their first large carriers with three decks and no superstructure. Multi-deck carriers worked fine in the twenties and early thirties, as long as the planes flown from them were lightweight, agile biplanes such as the British Fairey Flycatcher. But when aircraft got larger, most of the multi-deck carriers were given a new single deck longer than their previous top decks.

The flat-topped carrier had two problems. It proved impossible to deal with smoke, especially in large, fast ships, without a funnel. It also proved difficult to handle a large carrier without a bridge that was higher than the flight deck. The Japanese went to a great deal of trouble to design funnels that could be placed on the side of the ship and pointed down and out. They placed the bridge on a small island on the port or starboard edge of the flight deck. The British and Americans chose to use a large island, always on the starboard edge, that could accommodate the funnels (in an upright position) and the bridge.

The men developing carrier procedures between the wars arrived at a number of successful ideas for making carrier landings safer. Various kinds of arrestor gear were tried. One kind, used by the British and Americans for years, consisted of a set of longitudinal wires set on little bridges a few inches above the deck. The plane landing would snag these wires with a comb-like device between the plane's wheels. This arrangement often worked too well, since the landing planes had a tendency to nose over into the deck, and therefore, one out of every four landings resulted in damage to the plane. In the early thirties, the United States Navy operated its large carriers without any arrestor gear. By the end of the thirties, a modern kind of arrestor gear, with several transverse wires designed to catch a hook set in the tail of the landing aircraft, was in use. By that time, too, carrier men had worked out a way of helping a landing pilot find his way down, by putting a specially trained landing officer on deck, armed with brilliantly colored paddles for signaling to the pilot.

When the war began, the latest development in British carriers was the crash barrier. This was a safety aide to speed carrier operations. Previously, a newly landed plane taxied to the forward elevator, where it had to be lowered to the hangar deck. Then the elevator had to return to position before it was quite safe to land the next plane. Otherwise a badly-landed plane might careen into parked airplanes and cause fires and explosions. The crash barrier was a strong cable net which was raised

about midway across the deck while an airplane was landing, then lowered to the deck to allow the airplane to taxi to the forward part of the deck where it could be parked safely while other airplanes landed on. The barrier could be rather hard on the airplane and the pilot that hit it, but it was usually to be preferred to the alternative. Its use was somewhat controversial. In 1940, the conservative captain of the Ark Royal did not use his, while the more aggressive captain of the new Illustrious did, because he thought that speed of operations might be of great importance some day.

When the war began in Europe, the British Admiralty set about trying to find something useful for its carriers to do against an enemy that did not have a major battle fleet. At first, carriers were sent out on anti-submarine patrols, but one carrier was soon sunk and the others were quickly withdrawn. Then, the Ark Royal, with many other ships, was given the task of finding the German pocket battleship, Graf Spee, but, although the Ark Royal sailed all over the Indian and South Atlantic Oceans, the German ship was found, fought, trapped, and scuttled without her effective participation. When the Germans invaded Norway, British carriers were sent with the fleet to the defense of that nation. Their aircraft sank a few German ships, shot down some German aircraft and supported the amphibious counter-attack in northern Norway. But as soon as the Luftwaffe arrived in strength, the carriers, along with the rest of the British fleet, had to retire, because British carrier aircraft were inferior in numbers and quality to German land-based aircraft.

The German invasion of Crete a year later was similar to the German invasion of Norway. Again, a British fleet, greatly superior to any enemy fleet in the area, was unable to prevent the invasions and was even unable to protect itself very well against German land-based aircraft. The one British aircraft carrier involved, the heavily armored Formidable, was seriously damaged by German dive bombers. In Norway and Crete, the British carriers were thrown into a task they were not designed for. They were more successful when they were pitted against enemy ships unsupported by an effective airforce. In November, 1940, a carefully planned nighttime raid by carrier-based Swordfish torpedo bombers sank three of the six Italian battleships in the harbor of Taranto (two were repaired later). In the Battle of Cape Matapan, in March, 1941, an Italian fleet was being chased by a stronger, but slower British fleet. Carrier aircraft damaged an Italian battleship, which then got away and slowed down a heavy cruiser enough that it and two others were sunk by British battleships. Two months later, on the same

day that Formidable was bombed off Crete, the modern German battleship, Bismarck, was caught like the Italian ships. After sinking the Hood and taking some damage from the Prince of Wales, the German ship was heading for the safety of land-based air cover when it was attacked by fifteen Swordfish with torpedoes. They got two hits, one of which damaged the rudder and propellers, stopping the German ship and allowing British battleships and cruisers to catch up and destroy it the next day.

Probably the most important success of British carriers in the war was in an activity that had not been foreseen before the war – the support of Malta. Malta was a constant burden to Axis strategy in the Mediterranean. When the Germans were able to station a large number of aircraft in the Mediterranean, they were able to neutralize it, but when the aircraft were needed elsewhere, Malta revived and Malta-based bombers, submarines, and even surface ships wrecked Axis supply lines. Malta did not fall during periods of Axis ascendency because it was constantly resupplied by convoys, escorted often by aircraft carriers, and furnished with land-based fighters that were ferried part way to Malta on carriers and then flown off. The British lost two carriers in this work, but Malta held and thereby helped save Egypt.

The Battle of the Atlantic against the German submarines led to the invention of the escort carrier, slower and carrying fewer aircraft than a fleet carrier - also cheaper, faster to build, and more expendable. The escort carriers were largely responsible for making the mid-Atlantic safe for convoys. They also cooperated with fleet carriers in giving air support to a series of amphibious assaults in the Mediterranean - North Africa, Sicily, Salerno and Southern France, all of which were beyond the range of land-based fighters.

The war in the Pacific is the only war in which carriers fought over other carriers. It demonstrated more clearly than the war in the Atlantic and Mediterranean that the battleship had become a vessel of limited usefulness and that the aircraft carrier was the true capital ship of the mid-Twentieth Century.

It is hard to realize now how tactically brilliant and strategically shocking the Japanese attack on Pearl Harbor was when it occurred it 1941. Before it happened, few people imagined that carrier aircraft, much less Japanese carrier aircraft, were capable of delivering such a blow at such a distance. The attack was carried out by the largest carrier fleet that had yet operated, or would operate again until late 1943. The Japanese used six fast carriers carrying 418 aircraft. They attacked with 353 aircraft, of which 154 were assigned to attack ships and

199 to attack American aircraft. Although the attack was very successful, it was not decisive, because it did not catch any of the three American Pacific Fleet carriers in harbor. The eight old battleships that were put out of action or sunk would have been powerless to stop the Japanese offensive anyway.

In the next six months, the Japanese spread out over the Pacific. Their attacks were covered at all points by naval aircraft, generally land-based rather than carrier-based. Two of the fast carriers supported the second attack on Wake after the first had failed. Then the whole force struck at the East Indies in support of amphibious operations there, then at Darwin, Australia, where they carried out an attack almost as surprising as that at Pearl Harbor. Finally, five of the six carriers descended on the British fleet in the Indian Ocean, where their aircraft sank a number of ships, including the small Hermes, the first carrier to be sunk by carrier aircraft.

Meanwhile, the American aircraft carriers had commenced operations. Powerless to interfere with the main Japanese operations, the Americans carried out one- or two-carrier raids on the fringes of the Japanese Empire. Then, in April, medium bombers took off from a carrier deck to make a surprise attack on Tokyo. These raids did little material damage to the enemy, but gave Americans valuable experience.

In May, 1942, a Japanese attempt to extend their perimeter by landing at Port Moresby in Southern New Guinea led to the Battle of the Coral Sea. The Japanese operated in several groups, of which one contained a small carrier and another two large fleet carriers. The Americans, who knew the general direction of the Japanese advance but not their specific plans, countered with two large carriers. In a confused battle, during which, among other things, Japanese aircraft almost landed on an American carrier, the Japanese sank one of the American carriers while losing only their own small carrier. Nevertheless, the battle can be counted as an American victory, because the Japanese were forced to give up their invasion attempt. Furthermore, one of the two large Japanese carriers was severely damaged, and the other had lost so many planes and pilots as to be temporarily useless. Thus, both were absent from the next battle.

The Battle of Midway likewise arose from a Japanese attempt to extend their perimeter. Their immediate goal was the strategic island of Midway. Their hope was to tempt the main American fleet into an engagement in which it could be destroyed by carrier aircraft and battleship guns. Again, the Americans knew much of the Japanese plan, and so, instead of being drawn into Midway only in response to the Japanese attack, they were already waiting there when the

Japanese arrived. The Japanese again approached in several groups of ships, the foremost of which consisted of four fleet carriers and light screen. The Americans had three large, fast carriers and 115 assorted aircraft on Midway itself. Not expecting any resistance, the Japanese advanced carelessly. The battle was characterized by a large number of chance events. The Japanese bombed Midway. The Americans discovered them and launched a massive attack, which turned into a long series of little attacks by land-based planes and carrier torpedo bombers. Just as the Japanese were ready to launch a second Midway attack, they discovered the American carriers. So, in between dodging torpedoes, they rearmed their planes with torpedoes and armor-piercing bombs. The Japanese carriers were about to launch the first of their rearmed aircraft, while some were still refueling and the ordnance that had been removed was still on deck. Just as all the defending fighters were down at sea level, two separate groups of American dive bombers, one of which was short on fuel and had nearly given up looking for the Japanese fleet, appeared out of nowhere and attacked. In a few minutes, three Japanese carriers had been turned into floating infernos which had to be abandoned. Then, in an exchange of attacks later, the last Japanese carrier was sunk while its aircraft damaged the Yorktown. The American carrier was being towed to harbor with its damage under control when it was attacked and sunk by a Japanese submarine.

The last half of 1942 was taken up with a number of naval battles around Guadalcanal, which led to two carrier vs. carrier engagements: the Battles of the Eastern Solomons and of the Santa Cruz Islands. In the first of these, the carriers were handled very warily by both sides, made cautious by memories of Midway. By the time the second battle occurred, the Japanese had been encouraged by the sinking of one American carrier and the damaging of another (both by Japanese submarines), and the Americans had been invigorated by a change of leadership. So the carriers launched attacks at one another with the result that the American Hornet was sunk and the Enterprise put out of action, while the Japanese only had two of their four carriers put out of action. Tactically, the Battle of the Santa Cruz Islands lacked the confusion that characterized its predecessors. Each fleet expected to meet the other, and spotted the other at about the same time. They then launched their attacking aircraft, which sighted each other on the way. Both fleets were ready for attack, and the Americans had their combat air patrols up at several levels. The major chance factor was the weather which covered some of the carriers, and left others out in the open.

At this point, there was a pause in the carrier war in the Pacific. In one way, 1942 had been a bad year for fleet carriers – twelve of them had been sunk around the world: two British (one in the Mediterranean and one in the Indian Ocean) four American, and six Japanese. In another way, it was a good year, because all but two of these carriers had been sunk mainly by carrier aircraft, and it had been demonstrated in the course of the year that aircraft would dominate any battle in which they were used in large numbers.

During the first six months of the Pacific war, the Japanese had accomplished almost everything they had attempted, and usually in less time than they had planned, and with many fewer losses than they had feared. Their successes were due mostly to their command of the air, achieved with carrier- and land-based naval aircraft. Not only were they superior in aircraft numbers wherever they attacked, but also in quality, both of aircraft and of pilots. The "Zero" carrier fighter was more maneuverable than the American F4F carrier fighter, and much better than all of the land-based fighters it encountered. The Japanese dive bombers and torpedo bombers, with their spat-covered fixed landing gear, looked antique and funny to Americans, but, in 1941 and 1942 they were excellent craft for their tasks. Japanese carrier pilots were greatly superior to any of the pilots they met in the first months of the war, because pre-war Japanese training standards were much more rigorous that those of the Americans. But, although the Japanese grew to depend on this qualitative superiority, they took no steps to preserve it. The training program for new pilots was unable to supply replacements for losses, and therefore, the quality of Japanese pilots steadily declined. At the same time, the Japanese did not start to develop new kinds of aircraft until their planes had actually been bettered by the new Allied planes. By the end of 1942, "Zeros" were meeting dangerous land-based American fighters, the F4U "Corsair" and the P-38 "Lightning." By the middle of 1943, the carrier-borne F6F "Hellcat" had demonstrated its all around superiority to the "Zero." Another new carrier plane the TBF "Avenger," designed as a torpedo bomber, but useful for many other tasks, began to replace the antiquated "Devastator" in 1942. American carrier aviators did not like their new dive-bomber, the SB2C "Helldiver," but it could carry a 1600 or 2000 pound bomb and deliver it with accuracy to gut an enemy ship.

The new American aircraft were carried by more and more aircraft carriers. The new Essex class fast carriers and Independence class light carriers began to arrive in the Pacific in mid-1943. These had been built with many

of the lessons of the first part of the war in mind. The Japanese also built new carriers, in addition to converting other kinds of ships to carriers, but they built slower and in fewer numbers. The only up-to-date Japanese carrier that actually participated in a battle was the Taiho. On both sides, the carriers that had survived 1942 were modified mainly by the addition of many more and better anti-aircraft guns.

The Americans continued to profit from an increasingly more important advantage – radar. American ships had been equipped with ship- and plane-spotting radar from the beginning of the war, but it did not always work well. At the Battle of Coral Sea, the incoming enemy planes were spotted at seventy miles, but at Midway at only forty miles. Low-flying planes (that is, torpedo planes), frequently could not be spotted at all because the radar was blind from the horizon up to 10 degrees above it. In 1943, new radar corrected this defect. Also in 1943, the Americans tried for the first time to extend the effective range of their radar by stationing radar-equipped destroyers as pickets. In 1945, when the fast carriers steamed for four months in the same general area off Okinawa, this tactic was used systematically. By that time, too, Americans had increased the value of their radar by working out techniques for cooperation between fighters on combat air patrol and the radar-informed ships they were protecting. Airborne as well as shipborne radar was essential to the operation of night fighting units, desirable at first because the Japanese had had some success with land-based night attacks on American ships. Beginning with unsuccessful experiments in 1943, the Americans proceeded to establish small night fighter units on each carrier in late 1943. The advantages of specialization and the desire to expand night operations to night searches and night attacks led to the assignment of one and then two carriers as exclusively night carriers.

Radar could spot planes, but could not identify them, so an adaption of radar, a device called IFF – Identification Friend or Foe – was used. A transmitter on board a friendly plane broadcast a coded reply when it was challenged by a transmitter on a ship. But pilots sometimes forgot to switch on their IFF's and if there were many groups of planes on the screen, there was no telling where a signal was coming from. In complicated situations, electronic information always had to be supplemented by visual sighting. It was still possible for the Japanese planes to surprise an American carrier in March, 1945, when the Franklin was almost sunk by two bombs dropped by a plane that came apparently from nowhere. This kind of

event was rare, however, since enemy planes that penetrated the fighter screens were usually shot down by anti-aircraft guns. The 5" dual-purpose guns on the carriers used another application of radar – the VT (variable time) or proximity fuse, which exploded shells when they came close to the target and thereby added immeasurably to the effectiveness of the guns.

The main Japanese answer to these varied American superiorities was the Kamikaze suicide attack. This drastic measure hurt the carriers, but could not come close to stopping their operations.

In late 1943, the Americans, operating an increasingly powerful fast carrier fleet, began island hopping across the central Pacific. In rapid succession, Americans landed in the Gilberts, in the Marshalls, in the Marianas, on Leyte in the Philippines, on Iwo Jima, and on Okinawa. All of these operations followed the same basic pattern. These landings were all conducted out of the effective range of Allied land-based fighters, and they were all opposed by large numbers of Japanese land-based planes, operating from the target islands and constantly reinforced from nearby island groups. The American fast carrier fleet began each campaign with a series of devastating raids against the air forces and bases of the target island group and of each of the places through which reinforcements could be staged. Then the fast carriers joined forces with escort carriers accompanying the invasion fleet to support the landing and to give ground support, as necessary, throughout the battle. During the battle and after, the carriers sailed back to hit the staging bases again.

During every part of the first campaigns, the fleet of fast carriers, supported by a number of fast battleships as anti-aircraft ships, had to be prepared to turn from its immediate task to fight the main Japanese fleet if it came out to oppose the landing. The Japanese fleet did sortie to defend the Marianas and then Leyte and thereby brought on the last two big naval battles of war.

When the Americans struck at the Marianas, the Japanese had been conserving their naval airpower for six months in an effort to make up for earlier losses. They had built up an impressive number of carrier planes in the fleet and of land based planes in the Marianas and other bases. Their pilots, however, were still inadequately trained when the Americans struck. The Japanese had planned a coordinated attack by land- and carrier-based planes on the American fleet, but their land-based planes had been mostly destroyed by the time their carriers got into position to launch. The Japanese aircraft took off from a position out of American aircraft range. Their raids were strung out and the

first one was spotted by radar at a very comfortable 150 miles. The ensuing battle was a massacre – the poorly trained Japanese were slaughtered by more numerous and better-equipped American veterans – called appropriately "The Great Marianas Turkey Shoot." The Japanese lost 346 planes to the Americans' 30. Damage to ships was minor. The Japanese would have undoubtedly lost more planes if some of them had not gotten lost and been unable to find the American fleet. Meanwhile, American submarines had sunk two enemy carriers, and the carrier planes sank a third in pursuit.

The Battle off Leyte Gulf, in defense of the Philippines, came so soon after the Marianas, that the Japanese had no chance to prepare another large group of carrier pilots, even poor ones. Their aircraft carriers operated with few planes, and were supposed to launch their planes, get discovered and draw the American fast carriers away from the landing area so that Japanese surface forces could attack the transports. As the battle started, land-based planes sunk the light carrier Princeton, the only American fleet carrier to be sunk in the last three years of the war. Then, American carrier planes attacked the approaching Japanese surface forces and sank several ships, including the Japanese superbattleship, Musahi. The American carriers were lured out of the way, while the main Japanese battleship force, mistakenly considered out of action after the carrier aircraft attacks, continued to advance. It had found an escort carrier force and was mauling it although with great difficulty, when the Japanese commander decided to retreat. Meanwhile, aircraft from American fleet carriers sank the now worthless Japanese fleet carriers.

The last fleet engagement of the war, if it can be called that, occurred when the superbattleship, Yamato, came out without air cover to protest the landings on Okinawa. It carried only enough fuel for a one-way journey, but did not even get that far. Overwhelming numbers of carrier planes sank the huge ship in a little over an hour.

In the Okinawa campaign, the American carriers were joined by a British fast carrier force. The British had the same electronic advantages as the Americans, and their heavily armored ships were able to bounce Kamakazes off without interrupting flight operations. By 1945, they had overcome their previous carrier weaknesses. They now operated more planes on their carriers by parking the excess on the decks. They had solved their aircraft problem in three ways. They developed new planes, like the "Barracuda" torpedo-dive bomber. They adapted the successful land fighter, the "Spitfire" into the carrier fighter, the "Seafire." But the "Barracuda" was slow and awkward,

while the "Seafire" was too delicate for carrier operations, so the main solution was to use planes obtained on Lend-Lease from the Americans; the "Avenger" and the "Corsair."

After the fall of Okinawa, the American and British carriers began to cruise off Japan, sending their planes to hit everything they could find in preparation for the invasion of Japan. They met little air opposition, as the Japanese saved their little remaining strength for the invasion itself. Fortunately for both sides, the Japanese decided to surrender before it came to that.

THE ELEMENTS OF THE AIRCRAFT CARRIER

A fleet carrier is a complex organism. It has more people than many towns, and more destructive power than any other sort of warship. To achieve this power, many different elements had to be included. The carrier depicted is U.S.S. Enterprise. The "Big E," as she is known, saw more fighting than any other American flatop. She was off Pearl Harbor on the morning of 7 December, 1941. One of her Dauntless dive bombers was the first American plane to be shot down during the war. The "Big E" began hitting back soon enough, raiding Kwajelein and screening the Doolittle raid on Japan. She joined in the destruction of the Japanese carrier fleet at Midway, and her planes covered the invasion of Guadalcanal. She was at the battles of Eastern Solomons and Santa Cruz, and was damaged both times. Afterwards, she joined Task Force 58, "The Fast Carriers," and was eventually specially fitted for night operations. Her planes attacked shore targets in the Gilberts, Kwajelein, the Marianas, Truk, Palu, the Philippines, Iwo Jima, Okinawa, and Japan, while Japanese ships were hit at the Battles of the Philippine Sea and Leyte Gulf. Two kamikazes in late 1945 put an end to the Enterprise's wartime career. She was not used again until scrapped in 1958.

The Enterprise's career is an example of the many duties fleet carriers performed. Her nerve center was the island (A). On it was the bridge (B) from which the ship was commanded. The radar (C) gave warning of approaching planes 100 to 150 miles away. Deep inside the island is the Combat Information Center (CIC), which kept the captain and admiral on the bridge aware of the overall tactical situation. The ship's smokestack is also on the island which, as in all Anglo-American carriers, is on the right. The ship's deck (D) was, like all American wartime carriers, of wood. This saved weight and increased aircraft capacity, but made the ships terribly vulnerable to bomb and kamikaze hits. Smaller British carriers

with armored decks simply wiped splattered kamikazes off the decks. Ringing the decks were the ship's guns. Although the Enterprise's air group was her main defense, for close-in work, she could use her 5"/38 caliber guns (E), also effective against unarmored ships. Some older carriers had large guns which could only be used against enemy ships. These proved worthless. The 40mm and 20mm (F) light anti-aircraft guns were for anyone who broke through the fighters and heavy gun fire. Below the main deck was the hangar deck (G). Airplanes got to and from the hangar deck by the three elevators (H). These were, however, very vulnerable to damage, as a hit on one would not only break the elevator (leaving a large hole in the flight deck and stopping most air operations), but could communicate itself down to the hangar deck, which, in American carriers, was full of gasoline pipes and other inflammable substances. Thus, a hit reaching the hangar deck of an American flatop could often prove fatal or at least put the ship out of action. British carriers were made more fireproof by reducing the supply of gasoline on board and keeping it in protected "magazines." The Japanese used the American system, as they did with their usual use of wooden decks. The sides of the hangar deck are open, which makes for less weight, but does not add protection. Aircraft could theoretically be catapulted out the after opening, but this was never done in combat. Catapults were not installed in the forward part of the flight deck until late in the war, and even then they were seldom used. The hangar could hold all of the Enterprise's 78 to 100 aircraft. During air operations, the hangar deck was also full of bombs and other munitions, brought up from

magazines below. Secondary explosions from such bombs helped to sink the Japanese carriers at Midway.

Below the hangar deck, the Enterprise was much like any other warship. Amidships, her four engine rooms (under the waterline) (J) delivered 120,000 horsepower, driving the ship at 34 knots. A hit there could leave the ship without power and cause serious flooding, although American ships had better internal subdivision than their British counterparts. The engines, and the magazines for the bombs, torpedoes, and 5" guns were protected by the armored belt of 4" to 2 1/2" from the side. From above, they were protected by a 3" armored deck.

Further aft were the screws and rudders (K). This is always a vulnerable part of a ship, but the carriers found the fire threat outweighed the dangers of being hit there. To defend against torpedo hits, the Enterprise had a double bottom, but filling much of the cavity between the two bottoms with aviation gas made this a prime fire hazard. This again shows how U.S. Navy carriers were "offensively" oriented, while Royal Navy carriers were "defensively" oriented.

Despite these drawbacks, the Enterprise was generally an excellent design. (The mass-produced Essex class was based on Her.) This was one of the reasons why she was amongst the two survivors of America's eight pre-war fast carriers.

SINKING CARRIERS

Before the war, a major question was whether aircraft could sink a manned, fighting battleship. By the end of the war, there was no doubt that they could. But during the war, carrier aircraft were more often engaged in trying to sink enemy carriers, a task that also engaged land-based aircraft and submarines. The question then became, "How much does it take to sink a carrier?" It is impossible to give a single answer. Battle damage never simply sank a carrier. Hull damage which resulted in flooding was countered by compartmentization and counter-flooding. Fire was the worst enemy. Fire could drive the crew from a part of a ship. Fire set off secondary explosions of ordnance or fuel. Explosions not only caused hull damage but also ruptured water lines, gas lines and fuel storage tanks. Generally, ships did not sink until sometime after a fire had forced the crew off. Frequently, a carrier had to be sunk by torpedoes fired at it after it had been abandoned. The number and kind of hits that were necessary to cause fatal damage was extremely variable. The Japanese Taiho was hit by a single submarine torpedo (larger than an airborne torpedo) which did minor structural damage. But it ruptured a fuel line which allowed gasoline vapor to spread throughout the ship, through a mistakenly opened ventilation system. Then a spark blew the ship up.

A similar fate met the Lexington. Before the war, it had been estimated that the Lexington or its sister-ship, Saratoga, built on battlecruiser hulls, could absorb as many as twelve torpedoes. At Coral Sea, however, Lexington received two torpedo hits and two bomb hits, which caused it to list and started fires. Everything seemed to be under control when a spark set off gas vapor that had leaked. This caused fires, and the ship had to be abandoned. In the same battle, the small Japanese carrier, Shoho, was a victim of overkill when it was hit by thirteen bombs and seven torpedoes.

In the great dive-bombing attack at Midway, the three Japanese carriers were set on fire by two, three, and four bomb hits respectively. The fires proved to be uncontrollable, a fact attributed to the presence of rearming and refueling planes on the carriers' decks. Later, however, the remaining carrier, the Hiryu, was hit by four bombs which started similarly uncontrollable fires without the presence of readying planes.

The hardest-dying ship of the war may have been the carrier Hornet. It was hit in the first rush by four bombs, two torpedoes, and two suicide planes, one which carried two bombs which exploded. Remarkably, the damage from all this seemed to be under control, when another attack brought another bomb hit and another torpedo hit, which increased the damage enough that the ship was abandoned. Then, American destroyers tried to sink the blazing hulk with gunfire and torpedoes without success. Finally, the Japanese came up and sank the ship with four more torpedo hits.

The USS Franklin did recover after sustaining damage that might have brought about its abandonment, if it had been in contested waters. By 1945, however, there were no contested waters left in the Pacific. The Franklin sustained only two bomb hits, but the fires reached parked aircraft, some of which were armed with the new Tiny Tim rockets which carried 150 lbs. of TNT. Perfect aircover, which prevented the Japanese from launching follow-up attacks, gave the Franklin fire-fighters enough time to save their ship.

It is difficult to make any generalizations from these examples or the other stories of sunk and damaged carriers. Bomb and torpedo hits had varied results. It was generally admitted that torpedoes were more damaging to a ship, but bombs actually hurt more carriers. This was because it was easier to avoid a torpedo by turning the ship. Bombs delivered by high level bombers could also be avoided, but ships could not move fast enough to avoid very many bombs from low-level and dive bombers.

CHARTS & TABLES

Game Abbreviations

ID	DESCRIPTION
AA	Anti-Aircraft
AF	Airfield
ALO	Automatic Landing Operation
AP	Armor Piercing 1000 lb Bombs
ap	Armor Piercing 500 lb, 250 kg Bombs
AUS	Australian
Avail	Available
BR	British
CAG	Carrier Air Group
Can	Cannon
CAP	Combat Air Patrol
Dog	Dogfight
Durab	Durability
End	Endurance
FO	Flight Operations
FU	Fueled
HE	High Explosive
HG	In the Hangar
JN	Japanese Navy
L-R	Long-Range
Nat	Nationality
NZ	New Zealand
Ops	Operations
ORD	Ordnance
PSD	Priority Search Direction
RD	Ready on Deck
SV	Selection Value
TF	Task Force
Torp	Torpedo
UD	Unready on Deck
USN	United States Navy

Flak Modifiers

Japanese Ship	x 0.75
British Ship	x 1.0
USN Ship (Jul-Dec 42)	x 1.10
USN Ship (1943-1944)	x 1.25

Target Selection Values (Air to Sea)

SHIP TYPE	SELECTION VALUE
CV,CVL	150
BB,BC	15
CA,CL,CLAA,CS	5
DD,DE,APD	1
AP,AO	4

Ship Evasion Ratings

SHIP TYPE	EVASION MODIFIER
CV,CVL,BB,BC,CS	x 3
CA,CL,CLAA	x 5
DD,DE,APD	x 6
AP,AO	x 1

Aircraft Accuracy Ratings

AIRCRAFT TYPE	ACCURACY RATINGS
fighter*	-
fighter-bomber	5
dive bomber	9
torpedo bomber	8
tac-bomber	7
heavy bomber	1
patrol bomber	8

* *Fighters cannot carry bombs or torpedoes*

Weapon Accuracy Rating

WEAPON TYPE	ACCURACY RATING
Mk-13 Torpedo	22
Mk.XII Torpedo	34
Type 91 Torpedo	42
1000 lb Bomb	60
500 lb Bomb	60
250 kg Bomb	60

Japanese Aircraft Ordnance

AIRCRAFT TYPE	AVAILABLE ORDNANCE
Fighter Bomber	250 kg Bomb HE Bomb
Dive Bomber	250 kg Bomb HE Bomb
Torpedo Bomber	250 kg Bomb HE Bomb Type 91 Torpedo*
Medium Bomber	250 kg Bomb HE Bomb Type 91 Torpedo*

Allied Aircraft Ordnance

AIRCRAFT TYPE	AVAILABLE ORDNANCE
Fighter Bomber	500 lb Bomb HE Bomb
Dive Bomber	500 lb Bomb HE Bomb 1000 lb Bomb*
Torpedo Bomber	500 lb Bomb HE Bomb Mk.13 Torpedo*#
Medium Bomber	500 lb Bomb HE Bomb Mk.13 Torpedo*#
Heavy Bomber	500 lb Bomb HE Bomb 1000 lb Bomb*

* *Aircraft are considered to be "Heavily Loaded" when carrying 1000 lb Bombs or Torpedoes; otherwise they are considered to have a "Normal Load".*

 # British aircraft used the Mk.XII Torpedo

Fuel Consumption

TF SPEED	FUEL USE
27+	1 every 4 hours
18-26	1 every 6 hours
9-17	1 every 12 hours
0-8	none

Allied Aircraft

ALLIED FIGHTER

F2A BUFFALO

DOG: 17
CAN: 8
LOAD: 0
RNG: 10
DURAB: 19

ALLIED FIGHTER

F4F WILDCAT

DOG: 19
CAN: 12
LOAD: 5
RNG: 12
DURAB: 20

ALLIED FIGHTER

F6F HELLCAT

DOG: 22
CAN: 12
LOAD: 20
RNG: 18
DURAB: 27

ALLIED FIGHTER

FULMAR

DOG: 18
CAN: 8
LOAD: 5
RNG: 10
DURAB: 20

ALLIED FIGHTER

GLADIATOR

DOG: 17
CAN: 4
LOAD: 0
RNG: 10
DURAB: 17

ALLIED FIGHTER

HURRICANE I FIGHTER

DOG: 18
CAN: 8
LOAD: 0
RNG: 9
DURAB: 20

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

ALLIED FIGHTER

P-36A

DOG: 19
CAN: 3
LOAD: 0
RNG: 9
DURAB: 9

ALLIED FIGHTER

P-38F LIGHTNING

DOG: 20
CAN: 12
LOAD: 20
RNG: 18
DURAB: 37

ALLIED FIGHTER

P-39 AIRCOBRA

DOG: 17
CAN: 13
LOAD: 0
RNG: 8
DURAB: 25

ALLIED FIGHTER

P-40 WARHAWK

DOG: 19
CAN: 8
LOAD: 10
RNG: 14
DURAB: 24

ALLIED FIGHTER

P-51 MUSTANG

DOG: 25
CAN: 12
LOAD: 20
RNG: 40
DURAB: 33

ALLIED FIGHTER

SEAFIRE

DOG: 24
CAN: 12
LOAD: 0
RNG: 9
DURAB: 24

ALLIED FIGHTER

SPITFIRE IX

DOG: 25
CAN: 12
LOAD: 0
RNG: 8
DURAB: 27

ALLIED FIGHTER BOMBER

CA-3 WIRRAWAY

DOG: 12
CAN: 6
LOAD: 5
RNG: 9
DURAB: 20

ALLIED FIGHTER BOMBER

CA-12 BOOMERANG

DOG: 21
CAN: 16
LOAD: 5
RNG: 14
DURAB: 30

ALLIED FIGHTER BOMBER

F4U CORSAIR

DOG: 23
CAN: 12
LOAD: 20
RNG: 14
DURAB: 26

ALLIED FIGHTER BOMBER

FM2 WILDCAT

DOG: 20
CAN: 12
LOAD: 6
RNG: 13
DURAB: 24

ALLIED FIGHTER BOMBER

MOSQUITO FB-VI

DOG: 19
CAN: 20
LOAD: 20
RNG: 20
DURAB: 37

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

ALLIED FIGHTER BOMBER

P-38J LIGHTNING

DOG: 22
CAN: 12
LOAD: 40
RNG: 35
DURAB: 37

ALLIED FIGHTER BOMBER

P-47 THUNDERBOLT

DOG: 24
CAN: 16
LOAD: 25
RNG: 20
DURAB: 39

ALLIED DIVE BOMBER

SB2C HELLDIVER

DOG: 10
CAN: 6
LOAD: 13
RNG: 15
DURAB: 22

ALLIED DIVE BOMBER

(Historical reference not available)

SB2U VINDACTOR

DOG: 9
CAN: 2
LOAD: 12
RNG: 14
DURAB: 16

ALLIED DIVE BOMBER

SBD DAUNTLESS

DOG: 13
CAN: 4
LOAD: 12
RNG: 14
DURAB: 22

ALLIED TORPEDO BOMBER

ALBACORE

DOG: 8
CAN: 2
LOAD: 16
RNG: 15
DURAB: 20

ALLIED TORPEDO BOMBER

BARRACUDA

DOG: 10
CAN: 2
LOAD: 17
RNG: 11
DURAB: 30

ALLIED TORPEDO BOMBER

SWORDFISH

DOG: 6
CAN: 1
LOAD: 16
RNG: 10
DURAB: 18

ALLIED TORPEDO BOMBER

TBD DEVASTATOR

DOG: 4
CAN: 2
LOAD: 10
RNG: 11
DURAB: 18

ALLIED TORPEDO BOMBER

TBF AVENGER

DOG: 11
CAN: 4
LOAD: 20
RNG: 16
DURAB: 23

ALLIED TORPEDO BOMBER

TBM AVENGER

DOG: 11
CAN: 4
LOAD: 20
RNG: 16
DURAB: 26

ALLIED TORPEDO BOMBER

VILDEBEAST

DOG: 3
CAN: 2
LOAD: 22
RNG: 9
DURAB: 9

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

ALLIED TACTICAL BOMBER

A-20 BOSTON

DOG: 10
CAN: 12
LOAD: 20
RNG: 18
DURAB: 36

ALLIED TACTICAL BOMBER

A-26 INVADER

DOG: 13
CAN: 16
LOAD: 60
RNG: 18
DURAB: 64

ALLIED TACTICAL BOMBER

B-18A

DOG: 2
CAN: 2
LOAD: 65
RNG: 15
DURAB: 30

ALLIED TACTICAL BOMBER

B-25 MITCHELL

DOG: 4
CAN: 6
LOAD: 52
RNG: 30
DURAB: 43

ALLIED TACTICAL BOMBER

B-26 MARAUDER

DOG: 9
CAN: 8
LOAD: 48
RNG: 16
DURAB: 45

ALLIED TACTICAL BOMBER

BEAUFIGHTER

DOG: 13
CAN: 16
LOAD: 21
RNG: 20
DURAB: 39

ALLIED TACTICAL BOMBER

BEAUFORT

DOG: 7
CAN: 3
LOAD: 20
RNG: 20
DURAB: 26

ALLIED TACTICAL BOMBER

BLENHEIM

DOG: 7
CAN: 1
LOAD: 10
RNG: 20
DURAB: 34

ALLIED TACTICAL BOMBER

VENGEANCE

DOG: 10
CAN: 8
LOAD: 20
RNG: 25
DURAB: 20

ALLIED TACTICAL BOMBER

WELLINGTON

DOG: 6
CAN: 2
LOAD: 45
RNG: 28
DURAB: 45

ALLIED LEVEL BOMBER

B-17 FORTRESS

DOG: 1
CAN: 11
LOAD: 60
RNG: 40
DURAB: 80

ALLIED LEVEL BOMBER

B-24 LIBERATOR

DOG: 1
CAN: 9
LOAD: 90
RNG: 35
DURAB: 60

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

ALLIED LEVEL BOMBER

B-29 SUPERFORTRESS

DOG: 1
CAN: 16
LOAD: 150
RNG: 50
DURAB: 75

ALLIED PATROL

HUDSON

DOG: 10
CAN: 2
LOAD: 7
RNG: 25
DURAB: 32

ALLIED PATROL

PBY CATALINA

DOG: 2
CAN: 1
LOAD: 40
RNG: 44
DURAB: 45

ALLIED PATROL

(Historical reference not available)

SUNDERLAND

DOG: 1
CAN: 4
LOAD: 49
RNG: 44
DURAB: 62

ALLIED TRANSPORT

C-47 DAKOTA

DOG: 11
CAN: 0
LOAD: 40
RNG: 20
DURAB: 20

ALLIED TRANSPORT

(Historical reference not available)

DH-84

DOG: 10
CAN: 0
LOAD: 40
RNG: 25
DURAB: 15

JAPANESE AIRCRAFT

JAPANESE FIGHTER

A5M CLAUDE

DOG: 19
CAN: 2
LOAD: 1
RNG: 10
DURAB: 7

JAPANESE FIGHTER

A6M2 ZERO

DOG: 22
CAN: 8
LOAD: 1
RNG: 40
DURAB: 7

JAPANESE FIGHTER

A6M5 ZERO

DOG: 23
CAN: 11
LOAD: 1
RNG: 20
DURAB: 18

JAPANESE FIGHTER

J1N1 IRVING

DOG: 18
CAN: 16
LOAD: 0
RNG: 20
DURAB: 38

JAPANESE FIGHTER

J2M JACK

DOG: 20
CAN: 16
LOAD: 0
RNG: 15
DURAB: 22

JAPANESE FIGHTER

Ki-27 NATE

DOG: 19
CAN: 2
LOAD: 2
RNG: 9
DURAB: 7

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

JAPANESE FIGHTER

Ki-43-I OSCAR

DOG: 21
CAN: 4
LOAD: 1
RNG: 10
DURAB: 7

JAPANESE FIGHTER

Ki-61 TONY

DOG: 20
CAN: 8
LOAD: 2
RNG: 10
DURAB: 20

JAPANESE FIGHTER

Ki-102 RANDY

DOG: 21
CAN: 16
LOAD: 0
RNG: 15
DURAB: 34

JAPANESE FIGHTER BOMBER

A6M8 ZEKE

DOG: 14
CAN: 11
LOAD: 4
RNG: 16
DURAB: 18

JAPANESE FIGHTER BOMBER

Ki-43-II OSCAR

DOG: 22
CAN: 4
LOAD: 10
RNG: 14
DURAB: 14

JAPANESE FIGHTER BOMBER

Ki-44 TOJO

DOG: 20
CAN: 8
LOAD: 4
RNG: 14
DURAB: 19

JAPANESE FIGHTER BOMBER

Ki-45 NICK

DOG: 17
CAN: 7
LOAD: 11
RNG: 20
DURAB: 36

JAPANESE FIGHTER BOMBER

Ki-84 FRANK

DOG: 21
CAN: 12
LOAD: 11
RNG: 15
DURAB: 21

JAPANESE FIGHTER BOMBER

N1K2 GEORGE

DOG: 22
CAN: 16
LOAD: 11
RNG: 15
DURAB: 23

JAPANESE DIVE BOMBER

D3A VAL

DOG: 11
CAN: 2
LOAD: 8
RNG: 16
DURAB: 10

JAPANESE DIVE BOMBER

D4Y JUDY

DOG: 13
CAN: 3
LOAD: 11
RNG: 17
DURAB: 12

JAPANESE TORPEDO BOMBER

B5N KATE

DOG: 11
CAN: 3
LOAD: 16
RNG: 17
DURAB: 11

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

JAPANESE TORPEDO BOMBER

B6N JILL

DOG: 12
CAN: 1
LOAD: 16
RNG: 24
DURAB: 13

JAPANESE TORPEDO BOMBER

B7A GRACE

DOG: 17
CAN: 4
LOAD: 18
RNG: 24
DURAB: 25

JAPANESE TACTICAL BOMBER

G3M NELL

DOG: 7
CAN: 6
LOAD: 17
RNG: 30
DURAB: 12

JAPANESE TACTICAL BOMBER

G4M BETTY

DOG: 7
CAN: 7
LOAD: 18
RNG: 45
DURAB: 13

JAPANESE TACTICAL BOMBER

Ki-21 SALLY

DOG: 9
CAN: 6
LOAD: 22
RNG: 24
DURAB: 38

JAPANESE TACTICAL BOMBER

Ki-32 MARY

DOG: 11
CAN: 4
LOAD: 10
RNG: 14
DURAB: 19

JAPANESE TACTICAL BOMBER

Ki-48 LILY

DOG: 10
CAN: 2
LOAD: 9
RNG: 19
DURAB: 20

JAPANESE TACTICAL BOMBER

Ki-49 HELEN

DOG: 10
CAN: 7
LOAD: 22
RNG: 25
DURAB: 40

JAPANESE TACTICAL BOMBER

Ki-51 SONIA

DOG: 12
CAN: 4
LOAD: 4
RNG: 10
DURAB: 24

JAPANESE TACTICAL BOMBER

Ki-67 PEGGY

DOG: 14
CAN: 10
LOAD: 18
RNG: 28
DURAB: 43

JAPANESE TACTICAL BOMBER

P1Y FRANCES

DOG: 10
CAN: 4
LOAD: 22
RNG: 38
DURAB: 39

JAPANESE FLOAT PLANE

E8N2 DAVE

DOG: 6
CAN: 2
LOAD: 0
RNG: 14
DURAB: 8

Note: *Some of the planes listed do not appear in the game; these are listed for comparison purposes only.*

JAPANESE FLOAT PLANE

E13A1 JAKE

DOG: 9
CAN: 1
LOAD: 0
RNG: 16
DURAB: 9

JAPANESE FLOAT PLANE

F1M2 PETE

DOG: 7
CAN: 3
LOAD: 0
RNG: 12
DURAB: 8

JAPANESE PATROL

H6K MAVIS

DOG: 1
CAN: 6
LOAD: 22
RNG: 44
DURAB: 44

JAPANESE PATROL

H8K EMILY

DOG: 1
CAN: 16
LOAD: 44
RNG: 44
DURAB: 66

JAPANESE PATROL

Ki-46 DINAH

DOG: 17
CAN: 1
LOAD: 0
RNG: 24
DURAB: 15

Weapon Data

NAME	TYPE	WARHEAD	FLAK	RANGE	ACCURACY
18.1/45	gun	160	0	42	30
16/50	gun	120	0	42	40
16/45	gun	120	0	40	35
15/42	gun	95	0	38	30
14/50	gun	70	0	36	35
14/45	gun	70	0	34	30
12/50	gun	44	0	36	40
8/55	gun	13	0	32	45
8/50	gun	13	0	31	40
6/60	gun	5	0	30	45
6/53	gun	5	0	26	40
6/50	gun	5	0	20	45
6/47	gun	5	0	26	40
6/45	gun	5	0	18	45
5.5/50	gun	4	0	19	55
5.25/50	DP-gun	4	7	22	50
5/51	gun	3	0	13	55
5/50	DP-gun	3	6	20	55
5/40	DP-gun	3	5	16	60
5/38	DP-gun	3	8	17	55
5/25	DP-gun	3	6	14	50
4.7/50	DP-gun	2	5	18	55
4.7/45	DP-gun	2	4	16	55
4.5/45	DP-gun	2	7	17	50
4/50	gun	2	0	14	60
4/45	DP-gun	2	5	16	65
3.9/65	DP-gun	2	7	20	60
3.9/60	DP-gun	2	7	18	60
3/60	DP-gun	1	5	15	60
4.7 AA Rckt	flak	1	7	10	1
45mm	flak	0	3	5	25
40mm	flak	0	5	5	20
25mm	flak	0	2	5	20
20mm	flak	0	2	4	20
MG	flak	0	1	2	15
Type 93	torpedo	108	0	35	21
Type 6	torpedo	44	0	11	16
Mk-15	torpedo	82	0	15	9
Mk-VII	torpedo	74	0	16	16
Mk-IX	torpedo	81	0	15	17
Mk-14	torpedo	64	0	9	10
Type 95.m1	torpedo	89	0	13	23
Type 95.m2	torpedo	121	0	8	22
Mk-13 Torpedo	air-torp	60	0	6	22
Mk.XII Torpedo	air-torp	39	0	2	34
Type 91 Torpedo	air-torp	45	0	2	42
1000 lb Bomb	bomb	47	0	0	60
500 lb Bomb	bomb	24	0	0	60
250 kg Bomb	bomb	25	0	0	60
HE Bombs	bomb	10	0	0	75

Ship Class Data

Note: During the course of the war, both sides changed and added various weapons to the classes of ships listed below. At the beginning of any battle, each ship may possibly undergo refitting with the weapons which were available. Check your individual ship data when you access the TF to see what changes have been made. The data below are for the ships as of May 1942.

Allied Ships

ALLIED FLEET CARRIER: **LEXINGTON CLASS**

TYPE: CV
SPEED: 33
DURAB: 110
ARMOR: 30
CAP: 90
NUMBER & WEAPON NAME: 12 5/25, 8 MG

ALLIED FLEET CARRIER: **ESSEX CLASS**

TYPE: CV
SPEED: 33
DURAB: 90
ARMOR: 23
CAP: 91
NUMBER & WEAPON NAME: 12 5/38, 32 40mm, 46 20mm

ALLIED FLEET CARRIER: **WASP CLASS**

TYPE: CV
SPEED: 29
DURAB: 49
ARMOR: 10
CAP: 76
NUMBER & WEAPON NAME: 8 5/38, 32 40mm, 48 20mm

ALLIED FLEET CARRIER: **YORKTOWN CLASS**

TYPE: CV
SPEED: 33
DURAB: 66
ARMOR: 16
CAP: 91
NUMBER & WEAPON NAME: 8 5/38, 32 40mm, 48 20mm

ALLIED FLEET CARRIER: **ILLUSTRIOUS CLASS**

TYPE: CV
SPEED: 30
DURAB: 77
ARMOR: 26
CAP: 55
NUMBER & WEAPON NAME: 16 4.5/45, 48 40mm

ALLIED FLEET CARRIER: **INDOMITABLE CLASS**

TYPE: CV
SPEED: 30
DURAB: 82
ARMOR: 26
CAP: 75
NUMBER & WEAPON NAME: 16 4.5/45, 48 40mm

ALLIED LIGHT CARRIER: **INDEPENDENCE CLASS**

TYPE: CVL
SPEED: 32
DURAB: 36
ARMOR: 23
CAP: 33
NUMBER & WEAPON NAME: 24 40mm, 22 20mm

ALLIED LIGHT CARRIER: **UNICORN CLASS**

TYPE: CVL
SPEED: 25
DURAB: 43
ARMOR: 10
CAP: 37
NUMBER & WEAPON NAME: 24 40mm

ALLIED LIGHT CARRIER: **HERMES CLASS**

TYPE: CVL
SPEED: 25
DURAB: 36
ARMOR: 26
CAP: 12
NUMBER & WEAPON NAME: 6 5.5/50, 3 4/50, 18 MG

ALLIED BATTLESHIP: **COLORADO CLASS**

TYPE: BB
SPEED: 21
DURAB: 108
ARMOR: 120
CAP: 0
NUMBER & WEAPON NAME: 8 16/45, 12 5/51, 8 5/25

ALLIED BATTLESHIP: **NEVADA CLASS**

TYPE: BB
SPEED: 20
DURAB: 96
ARMOR: 110
CAP: 0
NUMBER & WEAPON NAME: 10 14/45, 12 5/51, 8 5/25

ALLIED BATTLESHIP: **PENNSYLVANIA CLASS**

TYPE: BB
SPEED: 21
DURAB: 110
ARMOR: 120
CAP: 0
NUMBER & WEAPON NAME: 12 14/45, 12 5/51, 8 5/25

ALLIED BATTLESHIP: **TENNESSEE CLASS**

TYPE: BB
SPEED: 21
DURAB: 108
ARMOR: 120
CAP: 0
NUMBER & WEAPON NAME: 12 14/50, 12 5/51, 8 5/25

ALLIED BATTLESHIP: **NORTH CAROLINA CLASS**

TYPE: BB
SPEED: 28
DURAB: 116
ARMOR: 123
CAP: 0
NUMBER & WEAPON NAME: 9 16/45, 20 5/38, 16 40mm

ALLIED BATTLESHIP: **SOUTH DAKOTA CLASS**

TYPE: BB
SPEED: 28
DURAB: 116
ARMOR: 136
CAP: 0
NUMBER & WEAPON NAME: 9 16/45, 16 5/38, 12 40mm

ALLIED BATTLESHIP: **ALABAMA CLASS**

TYPE: BB
SPEED: 28
DURAB: 116
ARMOR: 123
CAP: 0
NUMBER & WEAPON NAME: 9 16/45, 20 5/38, 12 40mm

ALLIED BATTLESHIP: **IOWA CLASS**

TYPE: BB
SPEED: 33
DURAB: 150
ARMOR: 140
CAP: 0
NUMBER & WEAPON NAME: 9 16/50, 20 5/38, 80 40mm

ALLIED BATTLECRUISER: **ALASKA CLASS**

TYPE: BC
SPEED: 33
DURAB: 91
ARMOR: 86
CAP: 0
NUMBER & WEAPON NAME: 9 12/50, 12 5/38, 56 40mm

ALLIED HEAVY CRUISER: **BALTIMORE CLASS**

TYPE: CA
SPEED: 33
DURAB: 44
ARMOR: 53
CAP: 0
NUMBER & WEAPON NAME: 9 8/55, 12 5/38, 48 40mm

ALLIED HEAVY CRUISER: **INDIANAPOLIS CLASS**

TYPE: CA
SPEED: 32
DURAB: 32
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 9 8/55, 8 5/25, 8 MG

ALLIED HEAVY CRUISER: **NEW ORLEANS CLASS**

TYPE: CA
SPEED: 32
DURAB: 33
ARMOR: 46
CAP: 0
NUMBER & WEAPON NAME: 9 8/55, 8 5/25, 8 MG

ALLIED HEAVY CRUISER: **NORTHAMPTON CLASS**

TYPE: CA
SPEED: 32
DURAB: 30
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 9 8/55, 8 5/25, 8 MG

ALLIED HEAVY CRUISER: **PENSACOLA CLASS**

TYPE: CA
SPEED: 32
DURAB: 30
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 10 8/55, 8 5/25, 8 MG

ALLIED HEAVY CRUISER: **EXETER CLASS**

TYPE: CA
SPEED: 32
DURAB: 27
ARMOR: 20
CAP: 0
NUMBER & WEAPON NAME: 6 8/50, 8 4/45, 16 40mm, 6 Mk-IX

ALLIED HEAVY CRUISER: **KENT CLASS**

TYPE: CA
SPEED: 31
DURAB: 35
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 8 8/50, 8 4/45, 8 40mm

ALLIED HEAVY CRUISER: **LONDON CLASS**

TYPE: CA
SPEED: 31
DURAB: 32
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 8 8/50, 8 4/45, 16 40mm, 8 Mk-VII

(Historical reference not available)

ALLIED HEAVY CRUISER: **NORFOLK CLASS**

TYPE: CA
SPEED: 32
DURAB: 33
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 8 8/50, 8 4/45, 16 40mm, 8 Mk-VII

(Historical reference not available)

ALLIED LIGHT CRUISER: **BROOKLYN CLASS**

TYPE: CL
SPEED: 33
DURAB: 33
ARMOR: 43
CAP: 0
NUMBER & WEAPON NAME: 15 6/47, 8 5/25, 8 MG

ALLIED LIGHT CRUISER: **CLEVELAND CLASS**

TYPE: CL
SPEED: 33
DURAB: 33
ARMOR: 43
CAP: 0
NUMBER & WEAPON NAME: 12 6/47, 12 5/38, 28 40mm

ALLIED LIGHT CRUISER: **OMAHA CLASS**

TYPE: CL
SPEED: 33
DURAB: 23
ARMOR: 33
CAP: 0
NUMBER & WEAPON NAME: 10 6/53, 8 3/60, 8 MG, 6 Mk-15

ALLIED LIGHT CRUISER: **DANAE CLASS**

TYPE: CL
SPEED: 27
DURAB: 16
ARMOR: 16
CAP: 0
NUMBER & WEAPON NAME: 6 6/50, 3 4/45, 12 MG, 12 Mk-IX

ALLIED LIGHT CRUISER: **ENTERPRISE CLASS**

TYPE: CL
SPEED: 33
DURAB: 25
ARMOR: 16
CAP: 0
NUMBER & WEAPON NAME: 7 6/50, 5 4/45, 9 MG, 16 Mk-IX

ALLIED LIGHT CRUISER: **CALEDON CLASS**

TYPE: CL
SPEED: 29
DURAB: 13
ARMOR: 16
CAP: 0
NUMBER & WEAPON NAME: 5 6/50, 6 3/60, 11 MG, 8 Mk-IX

ALLIED LIGHT CRUISER: **CAPETOWN CLASS**

TYPE: CL
SPEED: 29
DURAB: 14
ARMOR: 16
CAP: 0
NUMBER & WEAPON NAME: 8 4/45, 8 40mm, 24 20mm

ALLIED LIGHT CRUISER: **FIJI CLASS**

TYPE: CL
SPEED: 32
DURAB: 27
ARMOR: 26
CAP: 0
NUMBER & WEAPON NAME: 12 6/50, 8 4/45, 8 40mm, 6 Mk-IX

ALLIED LIGHT CRUISER: **LEANDER CLASS**

TYPE: CL
SPEED: 33
DURAB: 24
ARMOR: 20
CAP: 0
NUMBER & WEAPON NAME: 8 6/50, 4 4/45, 8 40mm, 8 Mk-VII

ALLIED LIGHT CRUISER: **SOUTHAMPTON CLASS**

TYPE: CL
SPEED: 32
DURAB: 30
ARMOR: 26
CAP: 0
NUMBER & WEAPON NAME: 12 6/50, 8 4/45, 8 40mm, 6 Mk-IX

(Historical reference not available)

ALLIED LIGHT CRUISER: **PERTH CLASS**

TYPE: CL
SPEED: 32
DURAB: 23
ARMOR: 20
CAP: 0
NUMBER & WEAPON NAME: 8 6/50, 4 4/45, 8 MG, 8 Mk-VII

(Historical reference not available)

ALLIED LIGHT CRUISER: **ADELAIDE CLASS**

TYPE: CL
SPEED: 24
DURAB: 17
ARMOR: 16
CAP: 0
NUMBER & WEAPON NAME: 8 6/50, 3 4/45, 12 MG

(Historical reference not available)

ALLIED LIGHT AA CRUISER: **ATLANTA CLASS**

TYPE: CLAA
SPEED: 33
DURAB: 20
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 16 5/38, 24 40mm, 8 20mm, 8 Mk-15

ALLIED LIGHT CRUISER: **OAKLAND CLASS**

TYPE: CLAA
SPEED: 33
DURAB: 20
ARMOR: 23
CAP: 0
NUMBER & WEAPON NAME: 12 5/38, 32 40mm, 8 20mm, 8 Mk-15

ALLIED DESTROYER: **BENSON CLASS**

TYPE: DD
SPEED: 35
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 12 40mm, 10 Mk-15

ALLIED DESTROYER: **BAGLEY CLASS**

TYPE: DD
SPEED: 35
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 4 5/38, 8 40mm, 16 Mk-15

(Historical reference not available)

ALLIED DESTROYER: **CLEMSON CLASS**

TYPE: DD
SPEED: 35
DURAB: 4
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 4 5/51, 1 3/60, 2 MG, 6 Mk-15

(Historical reference not available)

ALLIED DESTROYER: **FARRAGUT CLASS**

TYPE: DD
SPEED: 36
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 8 40mm, 8 Mk-15

ALLIED DESTROYER: **FLETCHER CLASS**

TYPE: DD
SPEED: 38
DURAB: 7
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 4 40mm, 8 20mm, 10 Mk-15

ALLIED DESTROYER: **GEARING CLASS**

TYPE: DD
SPEED: 37
DURAB: 8
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 6 5/38, 12 40mm, 11 20mm, 10 Mk-15

ALLIED DESTROYER: **GRIDLEY CLASS**

TYPE: DD
SPEED: 38
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 4 5/38, 8 40mm, 16 Mk-15

(Historical reference not available)

ALLIED DESTROYER: **MAHAN CLASS**

TYPE: DD
SPEED: 36
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 8 40mm, 12 Mk-15

ALLIED DESTROYER: **PORTER CLASS**

TYPE: DD
SPEED: 37
DURAB: 6
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 8 5/38, 8 40mm, 4 20mm, 8 Mk-15

ALLIED DESTROYER: **SIMS CLASS**

TYPE: DD
SPEED: 37
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 8 40mm, 8 Mk-15

(Historical reference not available)

ALLIED DESTROYER: **GLEAVES CLASS**

TYPE: DD
SPEED: 35
DURAB: 5
ARMOR: 6
CAP: 0
NUMBER & WEAPON NAME: 5 5/38, 12 40mm, 10 Mk-15

(Historical reference not available)

ALLIED DESTROYER: **ELECTRA CLASS**

TYPE: DD
SPEED: 35
DURAB: 5
ARMOR: 3
CAP: 0
NUMBER & WEAPON NAME: 5 4.7/45, 8 MG, 8 Mk-IX

(Historical reference not available)

ALLIED DESTROYER: **GREYHOUND CLASS**

TYPE: DD
SPEED: 36
DURAB: 4
ARMOR: 3
CAP: 0
NUMBER & WEAPON NAME: 4 4.7/45, 8 MG, 8 Mk-IX

(Historical reference not available)

ALLIED DESTROYER: **NAPIER CLASS**

TYPE: DD
SPEED: 36
DURAB: 6
ARMOR: 3
CAP: 0
NUMBER & WEAPON NAME: 6 4.7/45, 4 40mm, 2 20mm, 10 Mk-IX

(Historical reference not available)

ALLIED DESTROYER: **PALADIN CLASS**

TYPE: DD
SPEED: 36
DURAB: 5
ARMOR: 3
CAP: 0
NUMBER & WEAPON NAME: 4 4.7/45, 4 40mm, 8 20mm, 8 Mk-IX

(Historical reference not available)

Japanese Ships

JAPANESE FLEET CARRIER: **AKAGI CLASS**

TYPE: CV
SPEED: 31
DURAB: 120
ARMOR: 33
CAP: 72
NUMBER & WEAPON NAME: 12 4.7/45, 28 MG

JAPANESE FLEET CARRIER: **KAGA CLASS**

TYPE: CV
SPEED: 28
DURAB: 128
ARMOR: 36
CAP: 84
NUMBER & WEAPON NAME: 16 5/40, 22 25mm

JAPANESE FLEET CARRIER: **HIRYU CLASS**

TYPE: CV
SPEED: 34
DURAB: 57
ARMOR: 33
CAP: 64
NUMBER & WEAPON NAME: 12 5/40, 31 25mm

JAPANESE FLEET CARRIER: **SORYU CLASS**

TYPE: CV
SPEED: 34
DURAB: 53
ARMOR: 10
CAP: 63
NUMBER & WEAPON NAME: 12 5/40, 28 25mm

JAPANESE FLEET CARRIER: **SHOKAKU CLASS**

TYPE: CV
SPEED: 34
DURAB: 85
ARMOR: 10
CAP: 84
NUMBER & WEAPON NAME: 16 5/40, 42 25mm

JAPANESE FLEET CARRIER: **JUNYO CLASS**

TYPE: CV
SPEED: 25
DURAB: 80
ARMOR: 10
CAP: 53
NUMBER & WEAPON NAME: 12 5/40, 24 25mm

JAPANESE FLEET CARRIER: **SHINANO CLASS**

TYPE: CV
SPEED: 27
DURAB: 216
ARMOR: 66
CAP: 47
NUMBER & WEAPON NAME: 16 5/40, 145 25mm, 12 4.7 AA R

JAPANESE FLEET CARRIER: **TAIHO CLASS**

TYPE: CV
SPEED: 33
DURAB: 97
ARMOR: 36
CAP: 84
NUMBER & WEAPON NAME: 12 3.9/65, 71 25mm

JAPANESE FLEET CARRIER: **UNRYU CLASS**

TYPE: CV
SPEED: 32
DURAB: 57
ARMOR: 10
CAP: 64
NUMBER & WEAPON NAME: 12 5/40, 89 25mm

JAPANESE LIGHT CARRIER: **RYUHO CLASS**

TYPE: CVL
SPEED: 26
DURAB: 44
ARMOR: 10
CAP: 31
NUMBER & WEAPON NAME: 8 5/40, 38 25mm

JAPANESE LIGHT CARRIER: **RYUJO CLASS**

TYPE: CVL
SPEED: 29
DURAB: 35
ARMOR: 10
CAP: 37
NUMBER & WEAPON NAME: 8 5/40, 4 25mm, 24 MG

JAPANESE LIGHT CARRIER: **ZUIHO CLASS**

TYPE: CVL
SPEED: 28
DURAB: 37
ARMOR: 10
CAP: 30
NUMBER & WEAPON NAME: 8 5/40, 8 25mm

JAPANESE LIGHT CARRIER: **CHIYODA CLASS**

TYPE: CVL
SPEED: 29
DURAB: 37
ARMOR: 10
CAP: 30
NUMBER & WEAPON NAME: 8 5/40, 30 25mm

JAPANESE BATTLESHIP: **FUSO CLASS**

TYPE: BB
SPEED: 25
DURAB: 120
ARMOR: 93
CAP: 3
NUMBER & WEAPON NAME: 12 14/45, 14 6/50, 8 5/50, 16 25mm

JAPANESE BATTLESHIP: **KONGO CLASS**

TYPE: BB
SPEED: 30
DURAB: 105
ARMOR: 70
CAP: 3
NUMBER & WEAPON NAME: 8 14/45, 14 6/50, 8 5/50, 16 25mm

JAPANESE BATTLESHIP: **NAGATO CLASS**

TYPE: BB
SPEED: 25
DURAB: 130
ARMOR: 103
CAP: 3
NUMBER & WEAPON NAME: 8 16/45, 18 5.5/50, 8 5/50, 20 25mm

JAPANESE BATTLESHIP: **YAMATO CLASS**

TYPE: BB
SPEED: 27
DURAB: 213
ARMOR: 160
CAP: 7
NUMBER & WEAPON NAME: 9 18.1/45, 12 6/60, 12 5/50, 24 25mm

JAPANESE HEAVY CRUISER: **AOBA CLASS**

TYPE: CA
SPEED: 33
DURAB: 31
ARMOR: 26
CAP: 2
NUMBER & WEAPON NAME: 6 8/50, 4 4.7/45, 8 25mm, 8 Type 93

JAPANESE HEAVY CRUISER: **MOGAMI CLASS**

TYPE: CA
SPEED: 34
DURAB: 41
ARMOR: 26
CAP: 3
NUMBER & WEAPON NAME: 10 8/50, 8 5/40, 8 25mm, 12 Type 93

JAPANESE HEAVY CRUISER: **MYOKO CLASS**

TYPE: CA
SPEED: 33
DURAB: 44
ARMOR: 43
CAP: 2
NUMBER & WEAPON NAME: 10 8/50, 8 5/40, 8 25mm, 16 Type 93

JAPANESE HEAVY CRUISER: **TAKAO CLASS**

TYPE: CA
SPEED: 34
DURAB: 43
ARMOR: 43
CAP: 3
NUMBER & WEAPON NAME: 10 8/50, 8 5/40, 8 25mm, 16 Type 93

JAPANESE HEAVY CRUISER: **TONE CLASS**

TYPE: CA
SPEED: 35
DURAB: 37
ARMOR: 26
CAP: 5
NUMBER & WEAPON NAME: 8 8/50, 8 5/40, 12 25mm, 12 Type 93

JAPANESE LIGHT CRUISER: **AGANO CLASS**

TYPE: CL
SPEED: 35
DURAB: 22
ARMOR: 6
CAP: 2
NUMBER & WEAPON NAME: 6 6/60, 4 3/60, 32 25mm, 8 Type 93

JAPANESE LIGHT CRUISER: **KATORI CLASS**

TYPE: CL
SPEED: 18
DURAB: 19
ARMOR: 10
CAP: 1
NUMBER & WEAPON NAME: 4 5.5/50, 2 5/50, 4 25mm, 4 Type 6

JAPANESE LIGHT CRUISER: **KUMA CLASS**

TYPE: CL
SPEED: 33
DURAB: 19
ARMOR: 10
CAP: 1
NUMBER & WEAPON NAME: 7 5.5/50, 2 3/60, 8 Type 93

JAPANESE LIGHT CRUISER: **NAGARA CLASS**

TYPE: CL
SPEED: 36
DURAB: 17
ARMOR: 10
CAP: 1
NUMBER & WEAPON NAME: 7 5.5/50, 2 3/60, 2 MG, 8 Type 93

JAPANESE LIGHT CRUISER: **OYODO CLASS**

TYPE: CL
SPEED: 36
DURAB: 27
ARMOR: 10
CAP: 2
NUMBER & WEAPON NAME: 6 6/60, 8 3.9/60, 12 25mm

JAPANESE LIGHT CRUISER: **SENDAI CLASS**

TYPE: CL
SPEED: 35
DURAB: 18
ARMOR: 10
CAP: 1
NUMBER & WEAPON NAME: 7 5.5/50, 2 3/60, 2 MG, 8 Type 93

JAPANESE LIGHT CRUISER: **TENRYU CLASS**

TYPE: CL
SPEED: 33
DURAB: 10
ARMOR: 10
CAP: 0
NUMBER & WEAPON NAME: 4 5.5/50, 1 3/60, 2 MG, 6 Type 6

JAPANESE LIGHT CRUISER: **YUBARI CLASS**

TYPE: CL
SPEED: 35
DURAB: 9
ARMOR: 10
CAP: 0
NUMBER & WEAPON NAME: 6 5.5/50, 1 3/60, 2 MG, 4 Type 93

JAPANESE LIGHT CRUISER: **KITIKAMI CLASS**

TYPE: CL
SPEED: 33
DURAB: 19
ARMOR: 10
CAP: 0
NUMBER & WEAPON NAME: 4 5.5/50, 36 25mm, 40 Type 93

JAPANESE SEAPLANE CRUISER: **NISSHIN CLASS**

TYPE: CS
SPEED: 28
DURAB: 36
ARMOR: 0
CAP: 24
NUMBER & WEAPON NAME: 6 5.5/50, 12 25mm

JAPANESE SEAPLANE CRUISER: **KAMIKAWA CLASS**

TYPE: CS
SPEED: 18
DURAB: 20
ARMOR: 0
CAP: 12
NUMBER & WEAPON NAME: 2 6/60, 2 MG

(Historical reference not available)

JAPANESE DESTROYER: **AKATSUKI CLASS**

TYPE: DD
SPEED: 38
DURAB: 7
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 2 MG, 9 Type 93

(Historical reference not available)

JAPANESE DESTROYER: **AKITSUKI CLASS**

TYPE: DD
SPEED: 33
DURAB: 9
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 8 3.9/65, 15 25mm, 4 Type 93

(Historical reference not available)

JAPANESE DESTROYER: **ASASHIO CLASS**

TYPE: DD
SPEED: 35
DURAB: 6
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 4 25mm, 8 Type 93

JAPANESE DESTROYER: **FUBUKI CLASS**

TYPE: DD
SPEED: 34
DURAB: 7
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 2 MG, 9 Type 93

JAPANESE DESTROYER: **HATSUHARU CLASS**

TYPE: DD
SPEED: 33
DURAB: 6
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 5 5/50, 2 MG, 6 Type 93

JAPANESE DESTROYER: **KAGERO CLASS**

TYPE: DD
SPEED: 35
DURAB: 7
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 4 25mm, 2 MG, 8 Type 93

JAPANESE DESTROYER: **SHIMAKAZE CLASS**

TYPE: DD
SPEED: 39
DURAB: 8
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 4 25mm, 15 Type 93

JAPANESE DESTROYER: **SHIRATSUYU CLASS**

TYPE: DD
SPEED: 34
DURAB: 5
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 5 5/50, 4 25mm, 2 MG, 8 Type 93

JAPANESE DESTROYER: **YUGUMO CLASS**

TYPE: DD
SPEED: 35
DURAB: 7
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 6 5/50, 4 25mm, 8 Type 93

(Historical reference not available)

JAPANESE DESTROYER ESCORT: **MATSU CLASS**

TYPE: DE
SPEED: 27
DURAB: 4
ARMOR: 0
CAP: 0
NUMBER & WEAPON NAME: 3 5/50, 24 25mm, 4 Type 93

JAPANESE DESTROYER: **KAMIKAZE CLASS**

TYPE: DD
SPEED: 36
DURAB: 4
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 4 4.7/45, 10 25mm, 4 Type 6

JAPANESE DESTROYER TRANSPORT: **MINEKAZE CLASS**

TYPE: APD
SPEED: 20
DURAB: 4
ARMOR: 0
CAP: 25
NUMBER & WEAPON NAME: 1 4.7/50, 2 MG

JAPANESE DESTROYER: **MUTSUKI CLASS**

TYPE: DD
SPEED: 33
DURAB: 4
ARMOR: 0
CAP: 9
NUMBER & WEAPON NAME: 4 4.7/50, 10 25mm, 6 Type 93

Generic Ships

OILER: **FLEET OILER CLASS**

TYPE: AO
SPEED: 15
DURAB: 50
ARMOR: 0
CAP: 200
NUMBER & WEAPON NAME: 0

(Historical reference not available)

TRANSPORT: **SMALL CLASS**

TYPE: AP
SPEED: 16
DURAB: 10
ARMOR: 0
CAP: 50
NUMBER & WEAPON NAME: 0

TRANSPORT: **MEDIUM CLASS**

TYPE: AP
SPEED: 18
DURAB: 20
ARMOR: 0
CAP: 100
NUMBER & WEAPON NAME: 0

TRANSPORT: **LARGE CLASS**

TYPE: AP
SPEED: 20
DURAB: 40
ARMOR: 0
CAP: 200
NUMBER & WEAPON NAME: 0

Ship Availability

NAME	TYPE	CLASS	NAT	AVAIL
Australia	CA	Kent	AUS	Feb-42
Canberra	CA	Kent	AUS	Feb-42
Adelaide	CL	Adelaide	AUS	Jan-42
Hobart	CL	Perth	AUS	Jan-42
Cornwall	CA	Kent	BR	Jan-42
Devonshire	CA	London	BR	Jan-42
Exeter	CA	Exeter	BR	Jan-42
Dorsetshire	CA	Norfolk	BR	Feb-42
Caledon	CL	Caledon	BR	Jan-42
Capetown	CL	Capetown	BR	Jan-42
Ceres	CL	Capetown	BR	Jan-42
Danae	CL	Danae	BR	Jan-42
Dragon	CL	Danae	BR	Jan-42
Durban	CL	Danae	BR	Jan-42
Emerald	CL	Enterprise	BR	Jan-42
Enterprise	CL	Enterprise	BR	Jan-42
Mauritius	CL	Fiji	BR	Jan-42
Dauntless	CL	Danae	BR	Apr-42
Birmingham	CL	Southampton	BR	May-42
Caradoc	CL	Caledon	BR	May-42
Victorious	CV	Illustrious	BR	Apr-43
Illustrious	CV	Illustrious	BR	Sep-43
Indomitable	CV	Indomitable	BR	Sep-43
Unicorn	CVL	Colossus	BR	Jul-43
Foxhound	DD	Electra	BR	Jan-42
Norman	DD	Napier	BR	Jan-42
Nestor	DD	Napier	BR	Feb-42
Pakenham	DD	Paladin	BR	Feb-42
Paladin	DD	Paladin	BR	Feb-42
Decoy	DD	Electra	BR	Mar-42
Fortune	DD	Electra	BR	Mar-42
Griffin	DD	Greyhound	BR	Mar-42
Napier	DD	Napier	BR	Mar-42
Nizam	DD	Napier	BR	Mar-42
Panther	DD	Paladin	BR	Mar-42
Hotspur	DD	Greyhound	BR	Apr-42
Akebono Maru	AO	Fleet Oiler	JN	Jan-42
Kyokuto Maru	AO	Fleet Oiler	JN	Jan-42
Nippon Maru	AO	Fleet Oiler	JN	Jan-42
Shinkoku Maru	AO	Fleet Oiler	JN	Jan-42
Toho Maru	AO	Fleet Oiler	JN	Jan-42
Arizona Maru	AP	Large	JN	Jan-42
Azumasan Maru	AP	Small	JN	Jan-42
Brazil Maru	AP	Large	JN	Jan-42
Hokuriku Maru	AP	Medium	JN	Jan-42
Kano Maru	AP	Small	JN	Jan-42
Kiyozumi Maru	AP	Medium	JN	Jan-42
Meiyo Maru	AP	Small	JN	Jan-42
Nankai Maru	AP	Medium	JN	Jan-42
Toa Maru	AP	Medium	JN	Jan-42
1	APD	Minekaze	JN	Jan-42
2	APD	Minekaze	JN	Jan-42
34	APD	Minekaze	JN	Jan-42
35	APD	Minekaze	JN	Jan-42
Fuso	BB	Fuso	JN	Jan-42
Haruna	BB	Kongo	JN	Jan-42
Hiei	BB	Kongo	JN	Jan-42
Hyuga	BB	Fuso	JN	Jan-42
Ise	BB	Fuso	JN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Kirishima	BB	Kongo	JN	Jan-42
Kongo	BB	Kongo	JN	Jan-42
Mutsu	BB	Nagato	JN	Jan-42
Nagato	BB	Nagato	JN	Jan-42
Yamashiro	BB	Fuso	JN	Jan-42
Yamato	BB	Yamato	JN	Mar-42
Musashi	BB	Yamato	JN	Sep-42
Aoba	CA	Aoba	JN	Jan-42
Ashigara	CA	Myoko	JN	Jan-42
Atago	CA	Takao	JN	Jan-42
Chikuma	CA	Tone	JN	Jan-42
Chokai	CA	Takao	JN	Jan-42
Furutaka	CA	Aoba	JN	Jan-42
Haguro	CA	Myoko	JN	Jan-42
Kako	CA	Aoba	JN	Jan-42
Kinugasa	CA	Aoba	JN	Jan-42
Kumano	CA	Mogami	JN	Jan-42
Maya	CA	Takao	JN	Jan-42
Mikuma	CA	Mogami	JN	Jan-42
Mogami	CA	Mogami	JN	Jan-42
Myoko	CA	Myoko	JN	Jan-42
Nachi	CA	Myoko	JN	Jan-42
Suzuya	CA	Mogami	JN	Jan-42
Takao	CA	Takao	JN	Jan-42
Tone	CA	Tone	JN	Jan-42
Abukuma	CL	Nagara	JN	Jan-42
Isuzu	CL	Nagara	JN	Jan-42
Jintsu	CL	Sendai	JN	Jan-42
Kashima	CL	Katori	JN	Jan-42
Katori	CL	Katori	JN	Jan-42
Kinu	CL	Nagara	JN	Jan-42
Kiso	CL	Kuma	JN	Jan-42
Kuma	CL	Kuma	JN	Jan-42
Nagara	CL	Nagara	JN	Jan-42
Naka	CL	Sendai	JN	Jan-42
Natori	CL	Nagara	JN	Jan-42
Okinoshima	CL	Katori	JN	Jan-42
Sendai	CL	Sendai	JN	Jan-42
Tama	CL	Kuma	JN	Jan-42
Tatsuta	CL	Tenryu	JN	Jan-42
Tenryu	CL	Tenryu	JN	Jan-42
Tsugaru	CL	Katori	JN	Jan-42
Yubari	CL	Yubari	JN	Jan-42
Yura	CL	Nagara	JN	Jan-42
Agano	CL	Agano	JN	Jan-43
Kitikami	CL	Kitikami	JN	Jan-43
Oi	CL	Kitikami	JN	Feb-43
Oyodo	CL	Oyodo	JN	May-43
Noshiro	CL	Agano	JN	Sep-43
Yahagi	CL	Agano	JN	Feb-44
Sakawa	CL	Agano	JN	Feb-45
Kamikawa	CS	Kamikawa	JN	Jan-42
Kimikawa	CS	Kamikawa	JN	Jan-42
Mizuho	CS	Nisshin	JN	Jan-42
Nisshin	CS	Nisshin	JN	Jan-42
Akagi	CV	Akagi	JN	Jan-42
Hiryu	CV	Hiryu	JN	Jan-42
Kaga	CV	Kaga	JN	Jan-42
Shokaku	CV	Shokaku	JN	Jan-42
Soryu	CV	Soryu	JN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Zuikaku	CV	Shokaku	JN	Jan-42
Junyo	CV	Junyo	JN	May-42
Hiyo	CV	Junyo	JN	Oct-42
Taiho	CV	Taiho	JN	Jun-44
Unryu	CV	Unryu	JN	Nov-44
Amagi	CV	Unryu	JN	Dec-44
Katsuragi	CV	Unryu	JN	Jan-45
Shinano	CV	Shinano	JN	Jan-45
Ryujo	CVL	Ryujo	JN	Jan-42
Zuiho	CVL	Zuiho	JN	Jan-42
Shoho	CVL	Zuiho	JN	Mar-42
Ryuho	CVL	Ryuho	JN	Jan-43
Chiyoda	CVL	Chiyoda	JN	Dec-43
Chitose	CVL	Chiyoda	JN	Feb-44
Akatsuki	DD	Akatsuki	JN	Jan-42
Akebono	DD	Fubuki	JN	Jan-42
Akigumo	DD	Yugumo	JN	Jan-42
Amagiri	DD	Fubuki	JN	Jan-42
Amatsukaze	DD	Kagero	JN	Jan-42
Arare	DD	Asashio	JN	Jan-42
Arashi	DD	Kagero	JN	Jan-42
Arashio	DD	Asashio	JN	Jan-42
Ariake	DD	Hatsuharu	JN	Jan-42
Asagiri	DD	Fubuki	JN	Jan-42
Asagumo	DD	Asashio	JN	Jan-42
Asakaze	DD	Kamikaze	JN	Jan-42
Asanagi	DD	Kamikaze	JN	Jan-42
Asashio	DD	Asashio	JN	Jan-42
Ayanami	DD	Fubuki	JN	Jan-42
Fubuki	DD	Fubuki	JN	Jan-42
Fumizuki	DD	Mutsuki	JN	Jan-42
Hagikaze	DD	Kagero	JN	Jan-42
Hamakaze	DD	Kagero	JN	Jan-42
Harukaze	DD	Kamikaze	JN	Jan-42
Harusame	DD	Shiratsuyu	JN	Jan-42
Hatakaze	DD	Kamikaze	JN	Jan-42
Hatsuharu	DD	Hatsuharu	JN	Jan-42
Hatsukaze	DD	Kagero	JN	Jan-42
Hatsushimo	DD	Hatsuharu	JN	Jan-42
Hatsuyuki	DD	Fubuki	JN	Jan-42
Hayashio	DD	Kagero	JN	Jan-42
Hibiki	DD	Akatsuki	JN	Jan-42
Ikazuchi	DD	Akatsuki	JN	Jan-42
Inazuma	DD	Akatsuki	JN	Jan-42
Isokaze	DD	Kagero	JN	Jan-42
Isonami	DD	Fubuki	JN	Jan-42
Kagero	DD	Kagero	JN	Jan-42
Kamikaze	DD	Kamikaze	JN	Jan-42
Kawakaze	DD	Shiratsuyu	JN	Jan-42
Kikuzuki	DD	Mutsuki	JN	Jan-42
Kisumi	DD	Asashio	JN	Jan-42
Kuroshio	DD	Kagero	JN	Jan-42
Maikaze	DD	Kagero	JN	Jan-42
Matsukaze	DD	Kamikaze	JN	Jan-42
Michishio	DD	Asashio	JN	Jan-42
Mikazuki	DD	Mutsuki	JN	Jan-42
Minazuki	DD	Mutsuki	JN	Jan-42
Minegumo	DD	Asashio	JN	Jan-42
Mochizuki	DD	Mutsuki	JN	Jan-42
Murakumo	DD	Fubuki	JN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Murasame	DD	Shiratsuyu	JN	Jan-42
Mutsuki	DD	Mutsuki	JN	Jan-42
Nagatsuki	DD	Mutsuki	JN	Jan-42
Natsugumo	DD	Asashio	JN	Jan-42
Natsushio	DD	Kagero	JN	Jan-42
Nenohi	DD	Hatsuharu	JN	Jan-42
Nowaki	DD	Kagero	JN	Jan-42
Oboro	DD	Fubuki	JN	Jan-42
Oite	DD	Kamikaze	JN	Jan-42
Oshio	DD	Asashio	JN	Jan-42
Oyashio	DD	Kagero	JN	Jan-42
Samidare	DD	Shiratsuyu	JN	Jan-42
Satsuki	DD	Mutsuki	JN	Jan-42
Sazanami	DD	Fubuki	JN	Jan-42
Shigure	DD	Shiratsuyu	JN	Jan-42
Shikinami	DD	Fubuki	JN	Jan-42
Shirakumo	DD	Fubuki	JN	Jan-42
Shiranui	DD	Kagero	JN	Jan-42
Shiratsuyu	DD	Shiratsuyu	JN	Jan-42
Shirayuki	DD	Fubuki	JN	Jan-42
Suzukaze	DD	Shiratsuyu	JN	Jan-42
Tanikaze	DD	Kagero	JN	Jan-42
Tokitsukaze	DD	Kagero	JN	Jan-42
Umikaze	DD	Shiratsuyu	JN	Jan-42
Urakaze	DD	Kagero	JN	Jan-42
Uranami	DD	Fubuki	JN	Jan-42
Ushio	DD	Fubuki	JN	Jan-42
Usugumo	DD	Fubuki	JN	Jan-42
Uzuki	DD	Mutsuki	JN	Jan-42
Wakaba	DD	Hatsuharu	JN	Jan-42
Yamagumo	DD	Asashio	JN	Jan-42
Yamakaze	DD	Shiratsuyu	JN	Jan-42
Yayoi	DD	Mutsuki	JN	Jan-42
Yudachi	DD	Shiratsuyu	JN	Jan-42
Yugiri	DD	Fubuki	JN	Jan-42
Yugumo	DD	Yugumo	JN	Jan-42
Yugure	DD	Hatsuharu	JN	Jan-42
Yukikaze	DD	Kagero	JN	Jan-42
Yunagi	DD	Kamikaze	JN	Jan-42
Yuzuki	DD	Mutsuki	JN	Jan-42
Kazekumo	DD	Yugumo	JN	Feb-42
Makikumo	DD	Yugumo	JN	Feb-42
Makinami	DD	Yugumo	JN	Mar-42
Takanami	DD	Yugumo	JN	Jun-42
Akitsuki	DD	Akitsuki	JN	Sep-42
Hayanami	DD	Yugumo	JN	Nov-42
Kiyonami	DD	Yugumo	JN	Nov-42
Onami	DD	Yugumo	JN	Nov-42
Teruzuki	DD	Akitsuki	JN	Jan-43
Shimakaze	DD	Shimakaze	JN	Feb-43
Wakazuki	DD	Akitsuki	JN	Feb-43
Suzanami	DD	Yugumo	JN	May-43
Suzuzuki	DD	Akitsuki	JN	May-43
Hatsuzuki	DD	Akitsuki	JN	Jun-43
Shimozuki	DD	Akitsuki	JN	Jun-43
Fujinami	DD	Yugumo	JN	Jul-43
Hamanami	DD	Yugumo	JN	Jul-43
Niizuki	DD	Akitsuki	JN	Jul-43
Asashimo	DD	Yugumo	JN	Nov-43
Okinami	DD	Yugumo	JN	Nov-43

NAME	TYPE	CLASS	NAT	AVAIL
Hayashimo	DD	Yugumo	JN	Feb-44
Akishimo	DD	Yugumo	JN	Mar-44
Fuyuzuki	DD	Akitsuki	JN	Mar-44
Kiyoshimo	DD	Yugumo	JN	Jun-44
Haruzuki	DD	Akitsuki	JN	Nov-44
Hanazuki	DD	Akitsuki	JN	Dec-44
Matsu	DE	Matsu	JN	Jul-44
Momo	DE	Matsu	JN	Aug-44
Take	DE	Matsu	JN	Sep-44
Ume	DE	Matsu	JN	Oct-44
Kuwa	DE	Matsu	JN	Nov-44
Maki	DE	Matsu	JN	Dec-44
Kiri	DE	Matsu	JN	Jan-45
Yamafuku Maru	AP	Small	JN.	Jan-42
Achilles	CL	Leander	NZ	Feb-42
Leander	CL	Leander	NZ	Feb-42
Cimarron	AO	Fleet Oiler	USN	Jan-42
Guadalupe	AO	Fleet Oiler	USN	Jan-42
Neosho	AO	Fleet Oiler	USN	Jan-42
Platte	AO	Fleet Oiler	USN	Jan-42
Sabine	AO	Fleet Oiler	USN	Jan-42
Amer. Legion	AP	Large	USN	Jan-42
Barnett	AP	Medium	USN	Jan-42
Fuller	AP	Medium	USN	Jan-42
G.F.Elliot	AP	Medium	USN	Jan-42
Heywood	AP	Medium	USN	Jan-42
Hunter Ligget	AP	Large	USN	Jan-42
Neville	AP	Medium	USN	Jan-42
Pres. Hayes	AP	Large	USN	Jan-42
Pres. Jackson	AP	Large	USN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Zeilin	AP	Large	USN	Jan-42
N.Carolina	BB	Nrth Carolina	USN	Aug-42
Colorado	BB	Colorado	USN	Oct-42
Maryland	BB	Colorado	USN	Oct-42
Tennessee	BB	Tennessee	USN	Oct-42
Washington	BB	Nrth Carolina	USN	Oct-42
South Dakota	BB	South Dakota	USN	Nov-42
Indiana	BB	South Dakota	USN	Jan-43
New Mexico	BB	Tennessee	USN	Feb-43
Massachusetts	BB	South Dakota	USN	Apr-43
Pennsylvania	BB	Pennsylvania	USN	Jul-43
Nevada	BB	Nevada	USN	Sep-43
West Virgina	BB	Colorado	USN	Sep-43
Alabama	BB	Alabama	USN	Oct-43
Iowa	BB	Iowa	USN	Jan-44
New Jersey	BB	Iowa	USN	Jan-44
California	BB	Tennessee	USN	Feb-44
Idaho	BB	Tennessee	USN	Jul-44
Mississippi	BB	Tennessee	USN	Jul-44
Wisconsin	BB	Iowa	USN	Sep-44
Missouri	BB	Iowa	USN	Oct-44
Alaska	BC	Alaska	USN	Jan-45
Guam	BC	Alaska	USN	Mar-45
Astoria	CA	New Orleans	USN	Jan-42
Chester	CA	Northampton	USN	Jan-42
Chicago	CA	Northampton	USN	Jan-42
Indianapolis	CA	Indianapolis	USN	Jan-42
Louisville	CA	Northampton	USN	Jan-42
Minneapolis	CA	New Orleans	USN	Jan-42
New Orleans	CA	New Orleans	USN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Northampton	CA	Northampton	USN	Jan-42
Pensacola	CA	Pensacola	USN	Jan-42
Portland	CA	Indianapolis	USN	Jan-42
Quincy	CA	New Orleans	USN	Jan-42
Salt Lake Cty	CA	Pensacola	USN	Jan-42
San Francisco	CA	New Orleans	USN	Jan-42
Vincennes	CA	New Orleans	USN	Jan-42
Baltimore	CA	Baltimore	USN	Jul-43
Boston	CA	Baltimore	USN	Sep-43
Pittsburgh	CA	Baltimore	USN	Jan-45
St.Paul	CA	Baltimore	USN	Mar-45
Boise	CL	Brooklyn	USN	Jan-42
Detroit	CL	Omaha	USN	Jan-42
Helena	CL	Brooklyn	USN	Jan-42
Marblehead	CL	Omaha	USN	Jan-42
Raleigh	CL	Omaha	USN	Jan-42
Richmond	CL	Omaha	USN	Jan-42
Honolulu	CL	Brooklyn	USN	Dec-42
Cleveland	CL	Cleveland	USN	Jan-43
St.Louis	CL	Brooklyn	USN	Jan-43
Columbia	CL	Cleveland	USN	Feb-43
Montpelier	CL	Cleveland	USN	Mar-43
Santa Fe	CL	Cleveland	USN	May-43
Birmingham	CL	Cleveland	USN	Jun-43
Mobile	CL	Cleveland	USN	Jul-43
Nashville	CL	Brooklyn	USN	Jul-43
Phoenix	CL	Brooklyn	USN	Jul-43
Biloxi	CL	Cleveland	USN	Dec-43
Miami	CL	Cleveland	USN	Mar-44
Atlanta	CLAA	Atlanta	USN	Jul-42

NAME	TYPE	CLASS	NAT	AVAIL
Juneau	CLAA	Atlanta	USN	Aug-42
San Diego	CLAA	Atlanta	USN	Aug-42
San Juan	CLAA	Atlanta	USN	Aug-42
Oakland	CLAA	Oakland	USN	Feb-43
Reno	CLAA	Oakland	USN	Mar-43
Flint	CLAA	Oakland	USN	Nov-44
Enterprise	CV	Yorktown	USN	Jan-42
Lexington	CV	Lexington	USN	Jan-42
Yorktown	CV	Yorktown	USN	Feb-42
Hornet	CV	Yorktown	USN	Apr-42
Saratoga	CV	Lexington	USN	Aug-42
Wasp	CV	Wasp	USN	Aug-42
Essex	CV	Essex	USN	Mar-43
Bunker Hill	CV	Essex	USN	Sep-43
Intrepid	CV	Essex	USN	Oct-43
Franklin	CV	Essex	USN	Apr-44
Hancock	CV	Essex	USN	May-44
Bennington	CV	Essex	USN	Jun-44
Shangri-La	CV	Essex	USN	Dec-44
Randolph	CV	Essex	USN	Jan-45
Bon Hom Rich	CV	Essex	USN	Feb-45
Independence	CVL	Independence	USN	Apr-43
Princeton	CVL	Independence	USN	May-43
Belleau Wood	CVL	Independence	USN	Jun-43
Cowpens	CVL	Independence	USN	Jul-43
Monterey	CVL	Independence	USN	Aug-43
Cabot	CVL	Independence	USN	Sep-43
Langley	CVL	Independence	USN	Oct-43
Bataan	CVL	Independence	USN	Jan-44
San Jacinto	CVL	Independence	USN	Feb-44

NAME	TYPE	CLASS	NAT	AVAIL
Andrson	DD	Sims	USN	Jan-42
Aylwin	DD	Farragut	USN	Jan-42
Bagley	DD	Bagley	USN	Jan-42
Balch	DD	Porter	USN	Jan-42
Benham	DD	Bagley	USN	Jan-42
Blue	DD	Bagley	USN	Jan-42
Case	DD	Mahan	USN	Jan-42
Cassin	DD	Mahan	USN	Jan-42
Conyngham	DD	Mahan	USN	Jan-42
Craven	DD	Gridley	USN	Jan-42
Cummings	DD	Mahan	USN	Jan-42
Cushing	DD	Mahan	USN	Jan-42
Dale	DD	Farragut	USN	Jan-42
Dewey	DD	Farragut	USN	Jan-42
Drayton	DD	Mahan	USN	Jan-42
Dunlap	DD	Mahan	USN	Jan-42
Ellet	DD	Bagley	USN	Jan-42
Fanning	DD	Mahan	USN	Jan-42
Farragut	DD	Farragut	USN	Jan-42
Gridley	DD	Gridley	USN	Jan-42
Hammann	DD	Sims	USN	Jan-42
Helm	DD	Bagley	USN	Jan-42
Henley	DD	Bagley	USN	Jan-42
Hughes	DD	Sims	USN	Jan-42
Hull	DD	Farragut	USN	Jan-42
Jarvis	DD	Bagley	USN	Jan-42
Lamson	DD	Mahan	USN	Jan-42
Lang	DD	Bagley	USN	Jan-42
MacDonough	DD	Farragut	USN	Jan-42
Mahan	DD	Mahan	USN	Jan-42

NAME	TYPE	CLASS	NAT	AVAIL
Maury	DD	Gridley	USN	Jan-42
McCall	DD	Gridley	USN	Jan-42
Monaghan	DD	Farragut	USN	Jan-42
Morris	DD	Sims	USN	Jan-42
Mugford	DD	Bagley	USN	Jan-42
Mustin	DD	Sims	USN	Jan-42
O'Brien	DD	Sims	USN	Jan-42
Patterson	DD	Bagley	USN	Jan-42
Perkins	DD	Mahan	USN	Jan-42
Phelps	DD	Porter	USN	Jan-42
Porter	DD	Porter	USN	Jan-42
Preston	DD	Mahan	USN	Jan-42
Ralph Talbot	DD	Bagley	USN	Jan-42
Russell	DD	Sims	USN	Jan-42
Selfridge	DD	Porter	USN	Jan-42
Shaw	DD	Mahan	USN	Jan-42
Sims	DD	Sims	USN	Jan-42
Smith	DD	Mahan	USN	Jan-42
Stack	DD	Bagley	USN	Jan-42
Sterett	DD	Bagley	USN	Jan-42
Walke	DD	Sims	USN	Jan-42
Wilson	DD	Bagley	USN	Jan-42
Worden	DD	Farragut	USN	Jan-42
Gwin	DD	Gleaves	USN	Feb-42
Duncan	DD	Benson	USN	Oct-42
Farenholt	DD	Benson	USN	Oct-42
Fletcher	DD	Fletcher	USN	Oct-42
Lansdowne	DD	Benson	USN	Oct-42
McCalla	DD	Benson	USN	Oct-42
Monssen	DD	Gleaves	USN	Oct-42

NAME	TYPE	CLASS	NAT	AVAIL
Aaron Ward	DD	Benson	USN	Nov-42
Barton	DD	Benson	USN	Nov-42
Buchanan	DD	Benson	USN	Nov-42
Laffey	DD	Benson	USN	Nov-42
Lardner	DD	Benson	USN	Nov-42
O'Bannon	DD	Fletcher	USN	Nov-42
Chevalier	DD	Fletcher	USN	Jan-43
Grayson	DD	Gleaves	USN	Jan-43
Jenkins	DD	Fletcher	USN	Jan-43
LaVallette	DD	Fletcher	USN	Jan-43
Nicholas	DD	Fletcher	USN	Jan-43
Radford	DD	Fletcher	USN	Jan-43
Aulick	DD	Fletcher	USN	Feb-43
Claxton	DD	Fletcher	USN	Feb-43
Nicholson	DD	Gleaves	USN	Feb-43
Saufley	DD	Fletcher	USN	Feb-43
Strong	DD	Fletcher	USN	Feb-43
Taylor	DD	Fletcher	USN	Feb-43
Waller	DD	Fletcher	USN	Feb-43

NAME	TYPE	CLASS	NAT	AVAIL
DeHaven	DD	Fletcher	USN	Mar-43
Dyson	DD	Fletcher	USN	Mar-43
Pringle	DD	Fletcher	USN	Mar-43
Cony	DD	Fletcher	USN	Apr-43
Stanly	DD	Fletcher	USN	Apr-43
Stevens	DD	Fletcher	USN	Apr-43
Converse	DD	Fletcher	USN	May-43
Foote	DD	Fletcher	USN	May-43
Spence	DD	Fletcher	USN	May-43
Anthony	DD	Fletcher	USN	Jun-43
Thatcher	DD	Fletcher	USN	Jun-43
Wadsworth	DD	Fletcher	USN	Jun-43
Colahan	DD	Fletcher	USN	Jul-43
Daly	DD	Fletcher	USN	Jul-43
Luce	DD	Fletcher	USN	Jul-43
Sigourney	DD	Fletcher	USN	Aug-43
Chauncey	DD	Fletcher	USN	Sep-43
Denver	CL	Cleveland	USN.	Apr-43

FLIGHT OPERATIONS DISPLAY MENU

BUTTON	KEY	DESCRIPTION
—>>	W	lower max number of unready aircraft to hangar.
↑	E	fuel 1 aircraft.
↑↑	R	fuel max number of aircraft.
↓↓	T	defuel max number of aircraft.
ORD	Y	changes type of ordnance if there are no aircraft in Ready-On-Deck status.
MIS	H	sets group mission if 1 or more aircraft in Ready-On-Deck status.
<—	U	raises 1 fueled aircraft to deck.
<<—	I	raises max number of fueled aircraft to deck.
—>>	O	lowers max number of ready aircraft.
—>	P	lowers 1 ready aircraft from deck.
↑	[	launches 1 ready aircraft (will perform assigned mission).
↑↑	]	launches max number of ready aircraft.
SET DIR	S	set priority search direction (PSD) if Search mission selected.
TGT-TF	S	select TF target if Strike mission selected.
TGT-AF	F	select Airfield target if Strike mission selected.
ESC*	ESC	end flight ops for this carrier.

* Can also exit by clicking the right mouse button.

UNIT MENU

BUTTON	DESCRIPTION	KEYBOARD
RECALL STRIKE	Order Strike to Return to Base/CV	Alt/K
STRIKE AF	Select Airfield Target	Alt/F
STRIKE TF	Select TF Target	Alt/S
LIST TF CAP	List CAP groups	F3
LR-CAP	Order CAP Group to Cover a Different TF	L
DISP TF SEARCH	Display Search Aircraft from TF	S
SET TF SEARCH	Set the Priority Search Direction for TF	H
LIST TF SEARCH	List Search Missions	F4
REFUEL TF	Refuel TF	Alt/R
MERGE TF	Merge TF	ALT/A
DETACH TF	Detach TF	ALT/Z
DISP AF SEARCH	Display Search Aircraft from Airfield	T
LIST AF SEARCH	List Air Search from Airfield	Y
LIST AF CAP	List CAP from Airfield	O
EXAMINE AF	Display Air Groups from Airfield	F
ESC	Exit the menu	None

UTILITY MENU

BUTTON	DESCRIPTION	KEYBOARD
SUNK	List Types of Ship Sunk	F8
SCORE	Display Current Score	F9
VIEW-TF	Show Friendly TF	F5
VIEW-AF	Show Airfield	F6
BATTLE PLAN	Review Battle Plan	F7
AUTO MOVE	Computer Controls TF	Alt/M
EARLY END	Ends Current Battle	Alt/E
DECLINE	Refuse Current Setup	Alt/D
DELAY	Set Sound/Delay Levels	F10
SEARCH ON/OFF	Set Search Lines ON/OFF	ALT/W
EXIT	Exit Game - Return to DOS	Alt/Q
ESC	Exit the Utility Menu	None

GENERAL ORDERS MENU

BUTTON	DESCRIPTION	KEYBOARD
MODE	Set Display Mode (TF, CAP, STRIKE Units)	none
←→↑↓	Move Large Increments	J,K,I,M
CNTR	Center Cursor	F2
ZOOM	Change Map Scale	F1
UTIL	Utility Menu	none
PREV	Previous Unit*	none
NEXT	Next Unit*	N
STAK	Next Unit in Hex*	Space Bar
SNOOP	View Enemy TF	P
ESC	Quit, Return to Last Menu	Q,Esc

* the type of Unit is set with the Display MODE button.

COMMAND SUMMARY

ESC	Map Mode
Q	Quit Orders
F1	Strat/Tac Map
F2	Center Map
F3	List TF CAP
F4	List TF Search
F5	View TF
F7	Battle Plan
F6	View Airfield
F8	Sunk Ships
F9	Score
F10	Change Delay
<	Turn TF Left
>	Turn TF Right
J,K,I,M	Long Cursor Move
O	List AF CAP
T	Disp AF Search
Y	List AF Search
F	Examine Airfield
Z	Next Airfield
S	Disp TF Search
H	Set TF Search
G	Examine TF
N	Next TF
P	Snoop Enemy TF
L	L-R CAP
X	Next Enemy TF
V	Next Strike
E	Examine Strike
Spc	Next TF in Stack
ALT/F	Strike AF
ALT/S	Strike TF
ALT/R	Refuel TF
ALT/D	Decline Battle
ALT/M	Auto Move
ALT/E	Early Scenario End
ALT/K	Recall Strike
ALT/A	Merge TFs
ALT/W	Search Lines On/Off
ALT/Z	Detach TF
ALT/Q	Exit to DOS

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