SILENT SERVICE II™

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SILENT SERVICE II™

PLAY MANUAL

MICROPROSE®
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Silent Service II
WWII American Submarine Simulation

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Copy Protection

At the start of a game of Silent Service II, you will be asked to identify a surface vessel from among those pictured on the following pages. Simply find the vessel and select the correct name.

BBH Super-Battleships
(Yamato Class Illustrated)

BB Battleships
(Fuso Class Illustrated)
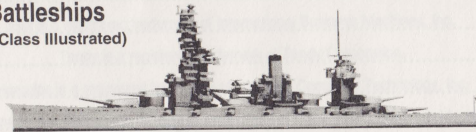
CV Aircraft Carrier
(Kaga Class Illustrated)

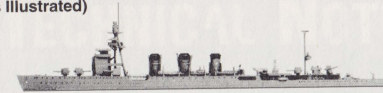**CA Heavy Cruiser**
(Myoko Class Illustrated)

CL Light Cruiser
(Kuma Class Illustrated)

DDAA Destroyer
(Akizuki Class Illustrated)

DD Destroyer
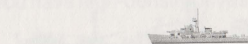(Fabuki Class Illustrated)

DE Destroyer Escort
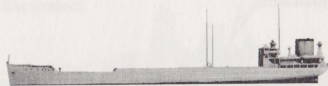(Matsu Class Illustrated)

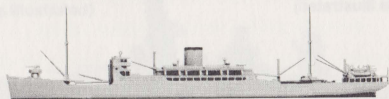**PC Patrol Craft**
(Type C Illustrated)

Troop Transport

Oil Tanker

Converted Factory Ship

Large Freighter

Small Freighter

Your *Silent Service II* package should contain this manual and 3.5" disks.

Computer: This simulation requires an IBM PC, XT, AT, PS/2 Tandy 1000, Compaq 386, or a computer 100% compatible with one of those. The machine must run under DOS 2.x, or higher. The machine must have at least 512K RAM, but 640K is better.

Controls: *Silent Service II* works just fine with a keyboard alone. A joystick is optional. The IBM version does not support a mouse.

Display : The simulation runs in any of these graphics modes: VGA and MCGA 256-color, EGA 16-color, Tandy 1000 16-color, and CGA 4-color.

Disk Drives: *Silent Service II* can be run from a floppy disk drive. However, it runs best if installed onto a hard disk drive.

Important: **Silent Service II** *cannot be played from the disks enclosed.* You must use the "install" program to create a useable copy either onto a hard disk subdirectory or on floppy disks.

Silent Service II has no disk copy protection. You can copy both the original disks and the installed disks to create your own backups. When installation occurs, the game is customized for your computer. It may not run on other computers. When moving the game to a new machine, always reinstall it on that machine from the original disks.

You are free to copy the original disks and installed disks for archival backup purposes. But neither you nor anyone else can make copies of the original disks or the "installed" program.

You must install *Silent Service II* onto floppy disks or a hard drive before you can play. You cannot play directly from the disks in the box.

Disks Required: *Silent Service II* generally requires one of the following sets of floppy disks:

5.25" double-density 360K disks:	4 required
5.25" high-density 1.2MB disks:	1 required
3.5" double-density 720K disks:	1 or 2 required
3.5" high-density 1.44MB disks:	1 required

These disks must be blank and formatted by your current version of DOS. To format a disk, look up the "format" command in your DOS manual. On most machines you simply insert a blank disk into drive A: and type "FORMAT A:". If you have high-density drives, be sure to use a high density disk.

Contents

Required Equipment

Installation Concepts

Installing Silent Service II

Floppy Disk Installation

Instructions: Insert disk A into the current disk drive (normally drive A:). If the prompt does not read "A:>" then type "A:" and press Return. Now type "INSTALL", press Return, and follow the instructions on the screen. For more information see Installation Options below.

If the installation ends in a critical error, you are trying to install onto a bad disk, a write-protected disk, have left the drive door open, or don't have that drive on your computer.

Technical Notes: The files copied to the blank disks varies with the install options you select. If the game doesn't work using these options, erase the disks and install again with different options.

Hard Disk Installation

Instructions: The disk included in this package has a program which installs the game onto your hard disk. To install, put the disk into a drive, switch to that drive (type "A:" if in drive A: or "B:" if in drive B:, then press Return). Now type "INSTALL", press Return, and follow the on-screen instructions. For more information see Installation Options.

Technical Notes: The installation program creates an MPS subdirectory if necessary, then an SS2 subdirectory within MPS, then copies the appropriate files into SS2, renaming some as necessary. Finally, it creates a SILENT.BAT loader file in the MPS subdirectory. None of these files are copy-protected. They can be erased, moved, backed up and/or reinstalled as you desire.

If you prefer a different installation approach, install first onto floppy disks, then copy the disks to a subdirectory of your choosing.

Installation Options

Graphics Options

VGA/MCGA Graphics: This option requires 640K of RAM. Select this if you have a PS/2 or any machine with VGA (Video Graphics Array) capability. This option provides 256 different colors and looks quite impressive.

EGA Graphics: This option requires 512K computer RAM and an EGA card. The EGA card must have 256K of RAM (all but the first few have this). This option provides 16 colors and is very attractive.

Tandy Graphics: This option requires a Tandy 1000. It provides 16 colors and is virtually equivalent to EGA. Your Tandy must have at least 512K of RAM, and 640K is preferred (see Memory Considerations).

CGA Graphics: This option requires 512K of RAM and a CGA graphics card. This option provides 4 colors. This version is playable, but you might consider replacing your CGA card with an EGA card. Most RGB monitors used for CGA can also be used with EGA cards.

Sound Options

IBM Sound: This is option supports the internal speaker standard on most IBM and compatible computers.

Tandy Sound: Only use this option if you have a Tandy 1000, which includes a special music chip that produces very nice sound effects. You *can* use this option with joystick control.

Ad Lib Sound: Only use this option if you have an Ad Lib sound board installed in your computer. This option uses more memory than IBM or Tandy sound.

Roland MT-32 Sound: Only use this option if you have a Roland MT-32 installed. Like Ad Lib, this option uses more memory than IBM or Tandy sound.

Digitized Speech: On all machines digitized speech uses some additional memory. On a Tandy 1000 you can use either this option or joystick control, but not both due to hardware limitations. We recommend digitized speech because it sounds superb on the Tandy DAC.

Joystick: This is optional in *Silent Service II*. In fact, many people in the original design team prefer keyboard to joystick control. On a Tandy 1000 you *cannot* use both digitized speech and joystick control.

Mouse: *Silent Service II*, when played on the IBM, does not support mouse control.

Like many simulations, *Silent Service II* requires large amounts of memory. Among the graphics versions, EGA uses the least space, CGA more, Tandy 1000 even more, and VGA/MCGA the most. The IBM and Tandy sounds use the least memory, Ad Lib and Roland use more. Digitized sounds require another significant chunk of memory. Joystick control adds nothing to memory requirements.

The DOS 4.x operating system requires considerably more memory than DOS 3.x or 2.x. If you're running under DOS 4.x, we suggest you create alternate CONFIG.SYS and AUTOEXEC.BAT files that do not use the shell, and use a minimum number of files and buffers. Otherwise, DOS 4.x can use so much memory that a 640K machine "shrinks" in size to a 512K machine!

Tandy 1000 graphics will fit in 512K, but the variety of merchant ships is reduced. The large freighter is replaced by the small freighter, and the factory ship by the oiler. This does not affect the ship identification quiz or their game statistics, only the appearance of ships in battle. To see all the merchant ship varieties, increase your Tandy 1000 memory to 640K.

You should never use any TSR (terminate and stay resident) programs with *Silent Service II*. This includes RAM disks, notepads, network drivers, etc. In addition to memory problems, keyboard and timing problems can cause unexpected lockups or crashes.

Running Silent Service II

Startup

Hard Disk: First type "cd MPS" and press Return. Make sure there's a space between "cd" and "MPS".

Second, type "SILENT" and press Return again. The game will start loading.

Floppy Disk: Put Disk A (the first disk made) into your "A:" drive. If the drive prompt is not "A:>" then type "A:" and press Return. Finally type "SILENT" and press Return to start the game.

Saving Games

Hard Disk: Your games will be saved to the subdirectory containing *Silent Service II*.

Floppy Disk: Your games are saved onto your "installed" game disks. You don't need an additional save-game disk.

Replay

There is no replay feature in the IBM version. Instead the limited system memory was used for the many different enemy ships and the comprehensive logbook. We felt a detailed logbook of past battles preferable to the replay. Our apologies to all those who looked forward to this feature.

Operating Difficulties

The latest notes regarding this program, additions, revisions, new graphics or sound drivers, etc. can be found on the original disk (not the installed disks), in an ASCII file named "READ.ME". You can read this file using standard DOS commands, such as "TYPE READ.ME".

If the program does not load or run correctly, turn off your entire machine and restart it. If you still have trouble, try installing the game with different graphics or sound options. A computer that has trouble with one mode may do much better with another. Try dropping digitized speech and/or your joystick control as well.

Memory: Make sure your computer and your graphics card have sufficient memory. An EGA graphics card must have 256K of RAM (a few early versions only had 128K). If your computer has only 512K, you cannot use VGA, and may have trouble if you're trying to use Ad Lib sound, Roland sound, and/or digitized speech. A common sign of insufficient memory is "invisible" ships. Go to training and look at the Ship ID Book (the b key). Use the cursor keys to page through to the CA Heavy Cruiser. If the text appears with no ship, then your machine doesn't have enough free memory.

Compatibility: If things still don't work, you may have a compatibility problem. Install *Silent Service II* in your configuration onto floppy disks and try it on a similar machine, preferably an IBM, Compaq or Tandy. If the disks run correctly on that machine, but not on yours, then your computer is incompatible in some way.

Many compatibility problems occur in the BIOS chips, either on the motherboard (the main BIOS) and/or the video board (the video BIOS). The BIOS is a low-level hardware-oriented program on ROM chips that plug into your machine. Check with your computer and/or video manufacturer. They may have updated ROM chips. Virtually any computer store can install these replacement chips.

If you still have trouble, you may be one of the tiny percentage with a defective disk. In such cases contact MicroProse Customer Service at (410) 771-1151, Monday through Friday, 9AM-5PM, Eastern time. Please have a pencil and paper handy when you call.

Controls

A note about keyboards: If you need to hold down the "alt" or "shift" key with another key, be sure to press the "alt" or "shift" first, keep it down while tapping the other key, then release the "alt" or "shift" last. Otherwise you may get erratic keyboard readings.

A note about joystick controls: Even if you select joystick control, all keyboard controls remain active.

Starting & Ending Options

Action	with keyboard	with joystick	Notes
Move Cursor	cursor keys	joystick	-
Make Selection	return key	joystick button #1	-
More Options	return key	joystick button #1	-
Clear the Hall of Fame	c	c	only on Hall of Fame screen

War Patrol Controls

These apply only in war patrol or war career scenarios. The controls are active only on the large map of Pacific.

Action	with keyboard	with joystick	Notes
Pacific Ocean Chart	F1	F1	-
Gauges	F5	F5	-
Damage Report	F6	F6	-
Captain's Log	F7	F7	-
Move North	numeric keypad 8	joystick up	moves boat north on Pacific map
Move Northeast	numeric keypad 9	joystick up and right	moves boat northeast on Pacific map
Move East	numeric keypad 6	joystick right	moves boat east on Pacific map
Move Southeast	numeric keypad 3	joystick down and right	moves boat southeast on Pacific map
Move South	numeric keypad 2	joystick down	moves boat south on Pacific map
Move Southwest	numeric keypad 1	joystick down and left	moves boat southwest on Pacific map
Move West	numeric keypad 4	joystick left	moves boat west on Pacific map
Move Northwest	numeric keypad 7	joystick up and left	moves boat northwest on Pacific map
See Ports	p	p	shows sub bases and enemy ports on map
End Message	return key	joystick button #1	continues with war patrol
Engage Contact	y	joystick button #1	only when logbook shows a contact
Refuse Battle	n	joystick button #2	only when logbook shows a contact
Messages on/off	alt m	alt m	toggles war event messages on/off

Battle Controls

These apply in all battles, including battles during war patrols and war careers.

Views

View	with keyboard	with joystick	Notes
Charts	F1	F1	-
Bridge Lookout	F2	F2	only if on surface
Periscope	F3	F3	only if periscope raised
Bridge TBT	F4	F4	only if on surface
Gauges	F5	F5	-
Damage Report	F6	F6	-
Captain's Log	F7	F7	-

Viewpoint Control

Action	with keyboard	with joystick	Notes
Zoom View	z	z	charts, periscope or TBT views
Unzoom View	x	x	charts, periscope or TBT views
Info Panel On/Off	v	v	toggle on charts view only
Ship ID Book On/Off	b	b	charts, lookout, periscope or TBT views
Re-Center Chart	c	c	charts view only
Look Left	,	stick left	lookout, periscope or TBT views
Look Left Fast	<	stick far left	lookout, periscope or TBT views

Action	with keyboard	with joystick	Notes
Look Right	.	stick right	lookout, periscope or TBT views
Look Right Fast	>	sitck far right	lookout, periscope or TBT views
Set View to Course	m	m	instantly changes view to "ahead"
TDC On/Off	/	fire button #2	slaves view to marked target

The Con (Movement Controls)

Action	with keyboard	with joystick	Notes
Turn Port (Left)	cursor left	cursor left	can use numeric keypad with numlock off
Turn Hard Port	shift + cursor left	shift + cursor left	can use numeric keypad with numlock off
Turn Starboard (Right)	cursor right	cursor right	can use numeric keypad with numlock off
Turn Hard Starboard	shift + cursor right	shift + cursor right	can use numeric keypad with numlock off
Dive	cursor down	cursor down	can use numeric keypad with numlock off
Crash Dive	shift + cursor down	shift + cursor down	can use numeric keypad with numlock off
Rise	cursor up	cursor up	can use numeric keypad with numlock off
Blow All Tanks	shift + cursor up	shift + cursor up	can use numeric keypad with numlock off
Straight & Level	backspace	backspace	stops turns, rises and dives
Periscope Depth	8	8	go to 55' depth
Set Course to View	n	n	-
Ahead Flank (4 engines)	4	4	use number keys, not numeric keypad
Ahead Full (3 engines)	3	3	use number keys, not numeric keypad
Ahead Half (2 engines)	2	2	use number keys, not numeric keypad
Ahead Slow (1 engine)	1	1	use number keys, not numeric keypad
All Stop (0 engines)	5	5	use number keys, not numeric keypad
Reverse (-4 engines)	6	6	use number keys, not numeric keypad

Combat Controls

Action	with keyboard	with joystick	Notes
TDC On/Off	/	fire button #2	target must be marked to turn on
Fire Torpedo	return	fire button #1	bow or stern tubes depends on sub facing
Fire Deck Gun	space bar	space bar	TDC must be locked on target
Periscope Up/Down	9	9	toggles 'scope up and down
Gun Up (+)1°	=	=	elevates deck gun 1°
Gun Down (-)1°	-	-	depresses deck gun 1°
Torpedo Fast/Slow	0	0	toggles Mark 14 torpedo speed and range
Launch Debris	7	7	only once per battle

Battle Charts Color Key
Information on battle charts is color-coded as follows

Item	VGA/MCGA 256-color	EGA/Tandy 16-color	CGA 4-color
Your Submarine	Yellow, Black bow	Yellow, Black bow	Purple, Black bow
Enemy - Visual Contact	White, Black bow	White, Black bow	White, Black bow
Enemy - Radar Contact	Gray, Black bow	Gray, Black bow	Black, Black bow
Enemy - Sonar Contact	Black, Black bow	Black, Black bow	White, Black bow
Wake (any ship)	Pale Blue	Pale Blue	White
Deep Water	Dark Blue	Dark Blue	Light Blue with Black grid
Shallow Water	Light Blue	Light Blue	Light Blue with White grid

Action	with keyboard	with joystick	Notes
End This Battle	F8	F8	unavailable if enemy too close
Accelerate Time	F9	F9	slowest time is "1", fastest is "8"
Decelerate Time	F10	F10	slowest time is "1", fastest is "8"
Animation On/Off	alt a	alt a	toggles animations on and off
Pause	alt p	alt p	pauses game
"Boss" Hide Game	alt b	alt b	toggle that hides and displays game
Save Game	alt s	alt s	saves game to one of five (5) files
Restart Game	alt r	alt r	sends you to initial options
Quit to DOS	alt q	alt q	quits game, sends you to DOS
Joystick Adjust	alt j	alt j	recenters joystick
Volume Adjust	alt v	alt v	adjusts sound from level 0 to 3

2 TUTORIAL

Combat Tutorial

Start by following the installation instructions in Chapter 1: Technical Notes. You should "install" (copy) the game onto floppy disks or a hard disk, and play from those. All controls are refered to by the name on the overlay, which appears here in *italics*.

This tutorial acquaints you with the controls and commands needed to operate your submarine. This first tutorial occurs on a practice "range" near Pearl Harbor. Your targets are old hulks unable to move or shoot. There are no "enemies" to distract you and no time limit.

Initial Options

After the title screens, you're shown a Japanese ship. To correctly identify it, compare the picture with those in this manual (pages 3 - 5), then select the name using the cursor keys.

Next a series of options appears. Please make these choices:
- "Training" is the appropriate type of game.
- "Introductory" is the appropriate difficulty level.
- Type your name where requested.
- "January 1, 1944" is a good date, although any date will do.
- "Gato" is the recommended submarine class.

You'll be assigned a submarine from the Gato class. Press any key to continue and see your first logbook entry, which notes the upcoming training exercise.

Finally, check the Technical Notes chapter to find the keyboard controls that pause the game. This allows you to read a few paragraphs of this tutorial, do it, then pause so you can read the next few paragraphs, etc.

At the Start

At the start of the exercise, you're viewing a chart of the general area. Take a moment and examine your keyboard overlay. During battle you can find every control here. On some machines a joystick and/or mouse may duplicate some of these controls (see Chapter 1: Technical Notes).

On the chart you're a dot in the middle of a box. There are four small dots north of you. These are four target hulks, anchored here for target practice. You can use the *Zoom* and *Unzoom* keys to enlarge or reduce the chart's scale.

Below this chart is the "info panel" that shows the status of your boat. At the start your speed is 0, your depth is 000 (i.e., you're on the surface), and your heading (HDG) is 000 (due north). Your view bearing (Bearing) is also 000 (north), you have 6 torpedoes loaded in the bow tubes and 4 torpedoes loaded in the stern tubes. The target information to the right is blank because you've not "marked" a target.

To the right of the chart is a panel of ten torpedo timers. These show how long before a torpedo reaches its target (if the TDC light beside the timer is on), or how long before the torpedo runs out of gas (if the TDC light is off). Right now all the timers read 0:00 because no torpedoes are running.

For a larger chart screen, tap the *Info Panel On/Off* key. This gives you a full-screen chart. Tap the key again to restore the Info Panel.

Heading vs. Bearing: Tap the *Bridge Lookout* key. You're now in the lookout position on top of the sub's conning tower. You see the ocean straight ahead. There are ships (the target hulks) on the horizon. Do not start up the sub's engines. Instead, try out *View Left* and *View Right*. Notice how your field of vision moves left and right. When your view moves, your view bearing (BEARING on the info panel) moves with it. However, heading (HDG on the info panel) has not moved because the sub's hull hasn't turned.

You must understand the difference between heading and bearing in order to command effectively. Heading is the direction your boat points, and in which it travels. Bearing is the direction of your view. The lookout, your periscope, TBT (Target Bearing Transmitter) binoculars, torpedoes and deck gun are all pointed and fired along the *bearing*, not the boat's heading.

This can be confusing. There are two keys to assist you. Tap *Set View To Course* to swing your bearing around so it points "straight ahead" (in the direction the sub points). Tap *Set Course to View* to turn the sub so it's headed in the same direction as your view bearing.

Find Your Targets: Select *Bridge TBT*. This is a pair of binoculars in a special mounting. They have a dark scale across the lower center. Turn your view left and right over the target hulks. The scale brightens when it is over a ship. This means that ship is "marked". The target information on the info panel comes to life, showing the enemy's range (in yards), speed (in knots), and course (heading).

For a better view of a target, tap *Zoom* one or more times. To return to a normal view, tap *Unzoom*.

Move the center of the scale to the center of the leftmost enemy ship and tap *TDC On/Off*. The TDC Light (on the info panel) turns on and a small black pointer appears on the scale. This means your Torpedo Data Computer (TDC) is "locked" on the target. While the TDC is running, your view automatically rotates to keep the current target point centered in your view. You can turn the TDC off by tapping *TDC On/Off* again. You can only turn on the TDC when a target is "marked", but you can turn it off anytime.

Make sure your heading (HDG) is 000 and the TDC is on. Tap *Ahead Full (3)*. This starts your sub moving north. Your speed will increase to 15 knots but the heading won't change (because you're not turning). However, as the TDC tracks the target, you'll see the view bearing rotate and the target range get smaller.

Note that when the TDC is "off" (not running) the *View Left* and *View Right* keys swing your view left and right. When the TDC is "on" (running), your view is locked on target. The keys now adjust the torpedo aim left or right. You'll see the torpedo aiming pointer move on the scale as you tap *View Left* and *View Right*.

Sinking the Enemy: Tap *Set Course to View*. This swings your sub around and heads it toward the target ship. When the range to target decreases to 1,000 yards, tap *All Stop (0)*. It's time to give your deck gun crew a little practice.

Tap *Fire Deck Gun* once. You'll hear the gun fire and see either an explosion or shell splash near the target. This is because the gun crew does their best to aim the gun at the "marked" target that you're tracking with the TDC. If the target wasn't "marked", the crew refuses to shoot (they don't have a target!).

If the splash is in front of the target, you're firing too "short". You need to elevate the gun slightly to lengthen the firing range. Tap *Gun Up (+)1°* once. The elevation indicator at the top of the TBT will change.

If the splash is behind the target, you're firing too "long". You need to depress the gun slightly. Tap *Gun Down (-)1°* once.

Adjust your gun elevation up or down until you're scoring hits. Some hits may set the hulk afire, or cause secondary explosions. Eventually the target will sink. You've scored your first kill!

Torpedoes Away: Obviously, the deck gun is rarely the best way to sink a ship — it takes many shells and a long time, and all the while you're on the surface, vulnerable to return fire. It's time to try the traditional submarine weapon: the torpedo. Torpedoes can be fired surfaced or submerged. Here we'll make a submerged attack.

Tap the *Dive* key once. Almost immediately you'll be removed from the Bridge TBT and go to the charts. After all, when a sub dives, all topside personnel must go below. On the chart, watch the depth carefully. When you reach 050 feet, tap *Rise* once. This levels out the submarine. If you tap *Rise* again, your sub starts back up. To level out at a depth, you can also tap *Straight & Level*. However, this would also straighten out any turns.

You can also dive or rise your sub to periscope depth (50 to 55 feet) by tapping the *Periscope Depth* key. Your crew will automatically take you to the proper depth, diving as necessary.

When you're steady at 055 feet, try tapping *Periscope*. Your crew will say that the scope is down. You need to raise it before you can use it. Therefore tap *Periscope Up/Down* once to raise the scope, then tap *Periscope* to look through it.

You can move the periscope view left or right, just like the bridge TBT. Since the last ship is sunk, your TDC is off and no target is marked. Swing the scope around to mark a new target, then turn on the TDC to track it.

In real battle, the TDC is very useful because it computes the enemy's course and speed, and automatically sets the torpedo's course to intersect the enemy. The TDC continually updates this setting so you can fire anytime. With the TDC running, torpedoes should always hit unless either (a) the enemy changes speed and/or course after you fire, or (b) the torpedo malfunctions. Here the enemy is anchored and you have flawless torpedoes, so every "fish" fired is a hit.

Tap *Fire Torpedo* once and you'll see what happens. A "tin fish" is launched, you see the wake running toward the target, and blammo! A hit. The amount of damage is somewhat random, so one hit may or may not sink the target. If it doesn't, keep firing until you sink the hulk.

Note that when the TDC is running your view is "locked" onto the marked target. The *View Left* and *View Right* keys adjust torpedo aim, not the view. You must turn off the TDC to change your view.

Firing Stern Tubes: Swing your periscope onto the third target hulk to "mark" it, then turn on your TDC once more.

Now Tap *Ahead Full (3)*. Notice that your sub is moving at a much slower speed than on the surface. In real battles, your slower submerged speed can be important. Now press *Turn Starbd (Right)* or *Turn Port (Left)*. You'll notice your sub's heading swings away from your bearing. Shift to the Charts (tap *Charts*) and watch your sub moving there. When your sub is travelling almost exactly away from the enemy, tap *Straight & Level* and then *All Stop (0)*. During all this, because you left your periscope up, the crew and TDC continued watching the target. The current target range, speed and course should still be visible on the info panel.

Now tap *Fire Torpedo* once. You'll see a torpedo leave your boat and head to the target. Notice that on the info panel you only have three stern tubes loaded now, instead of the original four. Meanwhile the "S1" timer is counting down the seconds before the torpedo hits.

Your crew automatically selects either bow or stern tubes to fire, whichever is closer to the target. Since your stern was facing toward the target, they fired a stern tube.

If you're quick you can get back to the periscope and watch the torpedo explode.

At some point in all this, you probably received a message that one of your bow tubes has been reloaded. As you fire your torpedoes, your crew reloads them as fast as possible. However, your torpedo supply is limited. Tap *Gauges* and look in the upper right corner. The lighted torpedo graphics show the number of tubes currently loaded. The numbers below show the number of additional torpedoes available, but not yet loaded into a tube.

Ending the Training Cruise

You can end training by sinking the last hulk with gunfire and/or torpedoes. When the last enemy ship is sunk, the battle ends shortly thereafter. Battles also end if all surviving enemy ships have escaped (are beyond 30,000 yards).

You can also tap *End This Battle*. You aren't allowed to quit if you're too close to the enemy, or they detected you (impossible in this case!).

Further Battle Training

To get more experience in battle, play some of the historical battle scenarios (see the chapter, Historical Engagements).

The first two scenarios, "Whales & Duds" and "Mush on the Loose" only have merchant ships. Three other scenarios feature battles against convoys: "Flasher's Tankers (I)", "Flasher's Tankers (II)", and "Killer O'Kane".

The most difficult scenarios are those against warships, since they move so quickly. These include "Sink the Yamato!", "Death of the Shinano", and "An Embarassment of Riches".

A good final practice — and a fine, quick game in its own right — is the "Random Encounter". This scenario generates an infinite variety of encounters appropriate for the time period you select, including single ships, merchant convoys and warship groups.

Now it's time to try out a war patrol. In a war patrol you leave port, cruise to your patrol zone, search out enemies, and sink them. When you're out of torpedoes or low on fuel, you return to port.

After the title screens, you're shown a Japanese ship. To correctly identify it, compare the picture with those in this manual (pages 3 -5), then select the name using the cursor keys.

Next a series of options appears. Please make these choices:
• "A Single War Patrol" is the appropriate type of game.
• "Introductory" is the appropriate difficulty level.
• Type your name where requested.
• "January 1, 1944" is a good date, although any date will do.
• "Imp. Gato" is the appropriate submarine class.

Now you'll see a map of the Western Pacific. Use the cursor to select an appropriate starting base. Keep tapping the cursor until "Midway - SubPac" appears. This will be your starting base. Press the return key to finish your selection.

Now a black box appears. This is a possible patrol zone. Again, use the cursor to move through the appropriate selections. Stop when you reach the "East China Sea". This will be your patrol area. Again, press the return key to finish your selection.

You'll be assigned a submarine from the Improved Gato class. Press any key to continue and see your first logbook entry, which shows your official sailing orders. Press any key to begin war patrol.

Patrolling

The war patrol begins with a map view of the entire Western Pacific Ocean. Your boat is a bright dot surrounded by a bright box. Your war patrol zone is a dark box off the coast of China, southern Korea and southern Japan.

Controls: Only a very limited number of controls are used while patrolling.

The cursor keys or numeric keypad move your boat across the Pacific toward the patrol area (for joystick or mouse controls, see Chapter 1: Technical Notes). Land and reef areas are impassable; you'll have to move around those. A larger scale navigation map is included to help you navigate through these obstacles.

Try each of the following keys, which are available during a war patrol (as well as in battle):

Captain's Log provides sailing orders, information about your boat, and your boat's past history.

Damage Report allows you to monitor damage repairs.

Gauges allows you to monitor the boat's current status in detail, especially the number of torpedo tubes and torpedoes available.

Ports is a special key only available during the patrol. It toggles symbols on and off for all friendly and enemy ports/bases. Note that these vary with time.

The computer controls (*Pause, Boss, Save Game, Exit to DOS, Joystick Adjust, Volume Adjust, Restart Game*, etc.) are all available while patrolling.

Time & Fuel: As you move, you'll see the info panel in the upper left change. The panel shows the current date and time. Time is kept using a military clock. This means 0100 is 1 AM, 1200 is noon, 1300 is 1 PM, 2100 is 9 PM, and 2400 is midnight. Below the time is the number of days cruising you have left. Most sub types (including the Gato class) have 60 days of fuel.

Move your sub across the Pacific and into the patrol zone. As soon as you enter the zone, note how many days of fuel remain. The difference is the amount of fuel it took you to reach your zone. A wise captain ends his patrol when his fuel is down to about 1 1/2 times (150%) of this amount.

For example, your patrol from Midway starts with 60 days of fuel available. When you reach the East China Sea, you're down to 45 days of fuel. Therefore, it took 15 days to reach your patrol area. To be safe, you should end your patrol with about 22-23 days of fuel remaining (15 * 1.5 = 22.5). If you remain on patrol so long that you have less than 15 days of fuel left, you won't have enough to get back to Midway. However, you can look for nearer ports by tapping the *Ports* key.

Time: Continue cruising and you'll notice that every time your sub moves, time flips past. Also notice that even if you don't move, time continues to pass. You boat cruises around at its current location if you don't move it. To freeze the patrol, you must press the *Pause* key.

Contacts: Eventually your boat encounters the enemy. Most contacts occur in your patrol zone, but an encounter is possible almost anywhere. Some contacts occur when the enemy spots you. Other times you spot them with radar or visually.

Be sure to note the time of the contact. A night contact means a night battle, where you'll probably want to fight on the surface. A day contact means you'll probably want to fight submerged. A radar contact means you will start further away from the enemy with more time to maneuver. A visual contact gives you less time. A visual contact at night results in a battle that starts at point-blank range, perhaps with your boat inside the convoy's formation!

Battle Tactics

If you encounter speedy warships, just getting into firing position is hard enough. With slower merchant ships or convoys you can circle around and attack from whatever direction seems most favorable.

As soon as you have time, it's wise to check the gauges for the current water temperature and depth under keel. There's nothing more embarrassing than making a crash dive straight into the ocean bottom!

In daylight you normally attack submerged. At night your sub is so hard to see that you can make surface attacks. However, at night deck gun flashes give away your position. Avoid using the deck gun at night if return gunfire is a threat.

If enemy destroyers pursue you, don't rely on weapons to save yourself. Destroyers are hard to hit with torpedoes. Their guns are more powerful than yours. Your best bet is to crash dive, if possible below the temperature layer (to colder water), then move away. The faster you move, the better the enemy can hear you. When evading attack, it's best to sneak away at slow speed.

③ COMMANDING A SUBMARINE

At the start *Silent Service II* presents you with various options. Using these you can select anything from an individual battle to refighting all of World War II. You also select the type of submarine you wish to command and an appropriate level of realism and difficulty.

Initial Options

Here you see a page from your boat's Ship ID book. Compare the picture shown with the various ship pictures in this manual (pages 3 - 5). Then use the cursor keys select the correct name. If you fail to make a correct identification, you're limited to the training scenario.

Ship Identification

Training: This is a single learning "battle" against four motionless, unarmed freighter hulks. You're free to cruise around and attack them with torpedoes and/or guns. Training takes an hour or two, mainly because you'll constantly refer to this manual.

Game Type

A Single Battle: Here you select one of eight actual submarine engagements, or a ninth random engagement against an unpredictable force of Japanese ships. Individual battles take a half hour to two hours, depending on the number of ships involved and your command style.

A Single War Patrol: Here you take a submarine on a complete war patrol into the western pacific, searching for enemies, engaging them, and (hopefully) returning back to a friendly base alive. A war patrol can take a few hours to an evening or two, depending on how many contacts you make, and the size of the resulting battles.

A War Career: Here you join the US Navy as a submarine skipper any time during World War II. You sail on a series of war patrols in one or more types of subs until either you're killed or the war ends. This is the longest, most elaborate version of Silent Service II. It may take hundreds of hours if you start at the beginning of the war (December 7, 1941).

Resume a Saved Game: This allows you to continue a game previously saved to disk.

See the Hall of Fame: This shows the submariner's "Hall of Fame".

Quit Game: This exits the game, returning you to the computer's operating system.

Recommended Choices: Try "Training" for your first game. Then advance to one of the first two single battles ("Whales & Duds" or "Mush on the Loose"). After that try more single battles or a single war patrol. Select dates in 1943 or 1944 for good gaming variety. Finally you'll be ready for the ultimate test: a war career starting December 7th, 1941!

Difficulty Level

Introductory: This difficulty level is designed purely for beginners. Japanese convoys do not zig-zag, your deck gun and torpedoes do large amounts of damage and your submarine always has radar (even before it was really introduced!). Japanese warship commanders are slow to react, and if they do your submarine can withstand a remarkable amount of punishment. Finally, whenever you use the Ship ID Book, your crew will automatically show you the correct page.

This version is considered "easy" by experienced players. Consequently, point scoring is greatly reduced.

Normal: This level introduces you to the dangers of real combat. Japanese warships are a bit more alert and all Japanese ships may zig-zag. You only have radar if it's historically appropriate. Your submarine is a bit more vulnerable to damage. You have a choice between "flawless" and "historical" torpedoes.

This version is suggested for "normal" players familiar with the game. It's a bit easier than the reality faced by skippers during the war (a lot easier if you select flawless torpedoes).

Advanced: This level is similar to "normal", but the Japanese are yet more skillful and frequently zig-zag, while your submarine's ability to withstand damage is fairly realistic. You can still pick between "flawless" and "historical" torpedoes.

This version is suggested for "experienced" players who routinely do very well in the "normal" version. With historical torpedoes, this version is a close approximation of WWII reality.

Ultimate: This is the most difficult setting for the game. The Japanese are sharp-eyed scoundrels who can smell you coming at long ranges. Your submarine was built slap-dash, so it's a bit weaker than normal. You're forced to use historical torpedoes.

This version is designed for players who have exhausted the challenge of "advanced" play. It's probably a bit harder than real life. On the other hand, the point scoring awards are the highest.

Enter Your Name

Typing your name here means that all orders and records reflect your name. Typical military form is a first initial and a full last name, but many submariner skippers were known by a nickname and a last name (such as "Mush" Morton or "Dick" O'Kane).

Select Starting Date

This option does not appear in single historical battles, since the date is fixed historically.

Otherwise, this determines the date you take command of your new boat. Use the cursor keys to select the month, day and year. The date affects submarines available, whether you have radar (at "normal" difficulty and higher), and what's happening in the war. In a war patrol or war career, it determines your choice of starting base. Finally, in a war career it determines how long the war will last — the later the date, the sooner the war will end.

Recommended Choice: All American submarines had radar by the start of 1943, and had fixed all torpedo defects by the start of 1944. New players are advised to select a date in early 1944 — the "happy hunting time" for American submarines. War patrols from November 1944 onward can be frustrating because most Japanese shipping was already sunk!

Select Submarine Class

Submarines are listed in ascending order. That is, the further down the list, the better the boat. Naturally, point scoring is improved if you have a poorer boat. Complete data on all classes appears in your logbook for easy reference.

Old 'S' Class: This is the worst possible boat, with a very slow surface speed, few torpedo tubes, and very few torpedoes. It also has exceptionally short range (35 days). Only experienced player should choose this class, and then be careful to stay within the operational limits of this type.

Barracuda Class: This is a modest improvement over the "S" class. The biggest gain is a longer range (50 days), making war patrols easier. It's also a large, strong submarine. Aside from the Narwhals, not until the Gato class did the US Navy produce a submarine of equivalent strength.

Narwhal Class: This class is very slow submerged, and not very maneuverable. Its only redeeming features are extremely powerful deck guns and a large capacity to withstand damage (because of its great size). It is the first of the full-ranged (60-day) submarine classes.

'P' Class: This class is the first of the "fleet boats". It has good speed, full-ranged endurance, but fewer torpedoes and torpedo tubes than you might desire. Aside from the old 'S', this class is the smallest and most vulnerable to damage.

New 'S' Class: This class is faster than the P's and has better stern torpedo armament. It is also slightly stronger.

'T' Class: This class is very similar to the "Gato". The main difference is a slightly slower speed submerged, and somewhat less strength (the 'T's were no stronger than the 'S's).

Gato Class: This is the "standard" class of US submarines. It was used throughout the war in great numbers. During 1942 and early 43 many older types were retired, with their captains and crews going to the newer Gatos.

Improved Gato Class: The main improvements are a slightly deeper diving depth and a more powerful deck gun. These began in 1943.

Tench Class: This class is virtually identical to the Improved Gato in operating characteristics. It is slightly harder to sink.

Recommended Choice: New players are *strongly* urged to select the *Gato class* or *Improved Gato class*. One or the other is available throughout the war, and gives you a strong, well-armed submarine

Select Torpedo Type

The specific type of torpedo carried (Mark 10, 14, 18-1 or 18-2) depends on your boat and the time period. Old 'S' boats automatically get Mark 10s. Later subs automatically get Mark 14s until the Mark 18s arrive. Then you have your choice of 14s or 18s.

Flawless Torpedoes: These torpedoes have no faults. They always explode when they hit a target. However, they are still governed by realistic values for maximum range and speed. The amount of damage caused is realistically variable as well.

In addition, at the "introductory" difficulty level the torpedo has a more powerful warhead which does extra damage.

Historical Torpedoes: These torpedoes have realistic faults. All torpedoes may be duds occasionally, even the late-war Model 18s. This is realistic, but sometimes frustrating to game players.

In addition the Mark 14s have all their historical faults in appropriate historical periods. This means an increased chance of premature explosions until the magnetic exploder is discarded or disabled, and an increased chance of duds (depending on contact angle) until the contact exploder is fixed.

Warning: The Mark 14 torpedo faults are very realistic, and are corrected piecemeal (as they were in real life). Historical gamers will undoubtedly enjoy this challenge. However, remember that these faults can be frustrating. Nobody likes to see a big target escape just because the silly torpedoes malfunctioned. If the prospect of this bothers you, choose flawless torpedoes.

Select Your Starting Base

This option is available if you're starting a war patrol or a war career. Your starting base affects which submarine command directs your operations (SubPac or SubSoWesPac), which in turn affects the war patrol zones available to you. Equipment upgrades and solutions to Mark 14 torpedo problems are also affected.

On most computers you use the cursor keys to toggle through the base possibilities. Press the "Enter" key to select the base of your choice.

Select War Patrol Zone

This option appears whenever you start a war patrol (including each patrol in a war career). Your starting port and high command (SubPac or SubSoWesPac) affect the war patrol zones available. If you're using an old 'S' boat, be sure to select a zone close to your base or your limited fuel may make a successful patrol impossible.

On most computers you use the cursor keys to toggle through the zone possibilities. Press the "Enter" key to select the zone.

Your Command Assignment

This is the name of a real US Navy submarine of the appropriate class. After the old 'S' class (which used numbers), American submarines were named after fish.

Sailing Orders

This is a summary of your orders for the upcoming war patrol. It includes the patrol zone you selected, sailing date, and other pertinent data. It's placed in your logbook for easy reference.
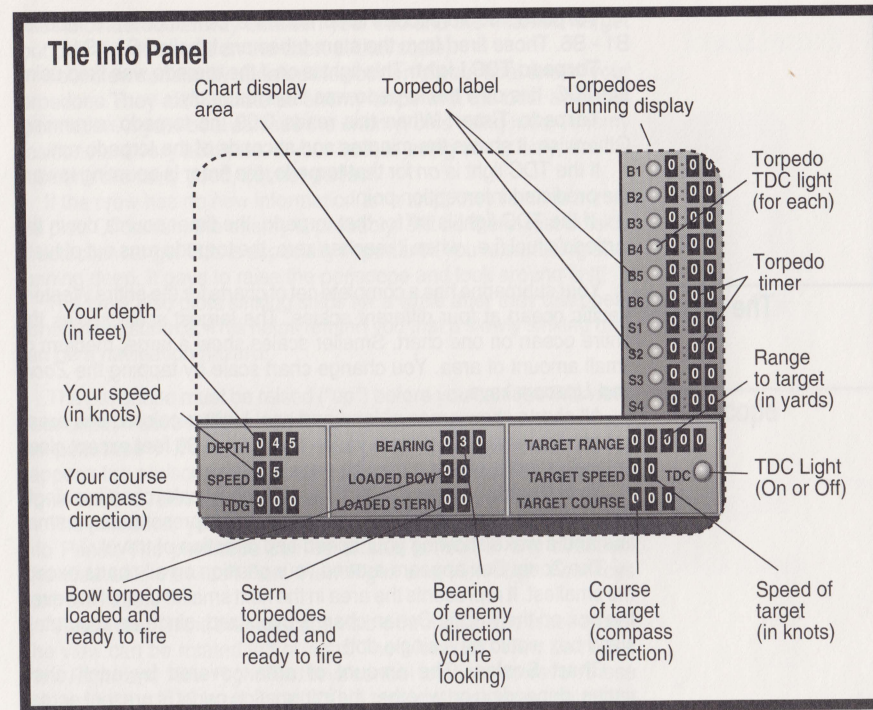
Touring The Boat

The following section is a guided tour to all the stations on your boat. Like a real submarine skipper, you should be familiar with all the details of your command!

The Info Panel

This readout panel appears over the bottom of your charts, bridge, and periscope views. On the charts it can be switched on and off by pressing the *Info Panel On/Off* key.

Depth: Your current depth, in feet. A depth of "000" means you're on the surface. "Radar Depth" is 025 or less — at these depths your radar is above water and functional. "Periscope Depth" is 055 or less — at these depths your periscope can be raised above water.

The Info Panel

Chart display area — Torpedo label — Torpedoes running display — Torpedo TDC light (for each) — Torpedo timer — Your depth (in feet) — Your speed (in knots) — Range to target (in yards) — TDC Light (On or Off) — Your course (compass direction) — Bow torpedoes loaded and ready to fire — Stern torpedoes loaded and ready to fire — Bearing of enemy (direction you're looking) — Course of target (compass direction) — Speed of target (in knots)

DEPTH 0 4 5 BEARING 0 3 0 TARGET RANGE 0 0 0 0 0
SPEED 0 5 LOADED BOW 0 0 TARGET SPEED 0 0 TDC
HDG 0 0 0 LOADED STERN 0 0 TARGET COURSE 0 0 0

B1 B2 B3 B4 B5 B6 S1 S2 S3 S4 0.00

Speed: Your current speed, in knots. One knot is 2002 yards per hour, or 33.3 yards per minute. Therefore, a boat at 10 knots travels 333 yards per minute, at 20 knots 666 yards per minute, etc.

HDG (Heading): Your current course as a compass direction. On a compass, North is 000, East 090, South 180, and West 270.

Bearing: The current bearing to the enemy. Effectively, it is the direction you're looking (as a lookout, with the TBT, or with the periscope). Note that your bearing and heading can be quite different, leading to peculiar optical illusions.

Loaded Bow: The number of bow torpedo tubes loaded and ready for action. The maximum varies with the type of sub you command.

Loaded Stern: The number of stern torpedo tubes loaded and ready for action. The maximum varies with the type of sub you command.

Target Course: The course, in compass degrees, of the target last "marked" by a lookout, in your periscope, or in your TBT.

TDC Light: This light is "on" when the TDC (Torpedo Data Computer) is running. It is "off" when the computer is turned off. The TDC computes torpedo courses and automatically "programs" your torpedoes.

Torpedoes Running: This secondary panel only appears on your charts (see below). It shows which torpedoes (if any) are running, and their predicted "hit" or "out of fuel" time.

Torpedo ID: Torpedoes fired from the bow tubes are labelled B1 - B6. Those fired from the stern tubes are labelled S1 - S4.

Torpedo TDC Light: This light is on if the torpedo was fired using the TDC. It is off if the torpedo was fired manually.

Torpedo Timer: When this reads 0:00, no torpedo is running. Otherwise, it shows the minutes and seconds of the torpedo run.

If the TDC light is *on* for that torpedo, the timer is counting toward the predicted interception point.

If the TDC light is *off* for that torpedo, the timer counts down the torpedo's fuel (i.e., when it reaches zero, the torpedo runs out of fuel).

The Chart

Your submarine has a complete set of charts for the entire Western Pacific ocean at four different scales. The largest scale shows the entire ocean on one chart. Smaller scales show a large, medium or small amount of area. You change chart scale by tapping the *Zoom* and *Unzoom* keys.

All charts show areas of land and sea. Lighter-colored sea areas are shallow water. The depth varies from 50 to 200 feet except close to land or reefs, where it may be even shallower.

Your Position on the Pacific Ocean (largest scale) chart is a single dot. On all smaller scale charts your position is represented by a small line and a wake showing your speed and direction of travel.

The Zoom Box appears around your position on all charts except the smallest. It represents the area in the next smaller chart. However, the box on the Pacific Ocean chart is oversized, since an accurately sized box would be a single dot!

Chart Scales: The amount of area covered by each chart varies, depending on whether the information panel is present across the bottom.

Chart Plots

Your crew automatically updates ("plots") each chart with the position of your boat, all enemy ships, and all torpedoes. Each of these appears as a short colored line. The color varies with the type of contact (radar, sonar or visual, in ascending priority). Each has a "tail," or wake. The size of the wake roughly represents the speed of the ship or torpedo. The direction of the ship and wake together approximate the direction of travel. See Technical Notes for symbols and colors.

Normally the chart begins centered on your submarine. However, if the TDC (Torpedo Data Computer) is running, the chart is centered halfway between your sub and the "marked" target (but only if both can fit on the chart at that scale).

Your crew constantly updates the position of your boat and all your torpedoes. They also update all enemy ships with the best available information. If your boat can see the enemy, or is using radar, enemy positions are very accurate. If your boat is using sonar only, enemy positions are fairly good, but not perfect.

If the crew has no new information an a ship, they remove it from the plot. Of course, the enemy is probably still be there, just outside of detection range! This is especially important if you're surfacing after running deep. It pays to raise the periscope and look around first!

The crew also plots sinking ships for a while after they disappear beneath the surface. This helps remind you that a slowly sinking hulk can be a navigation hazard.

Periscope

The periscope must be raised ("up") before you can use this view. Your depth must be 55' or less to use the periscope. You cannot use the periscope if it's lowered. If you press *Periscope* and nothing happens the periscope is probably down. Try tapping *Periscope Up/Down* once to raise the 'scope.

The direction your view faces appears in BEARING on the Info Panel. The periscope can be rotated to look in any direction. The *View Left, View Left Fast, View Right,* and *View Right Fast* keys control rotation.
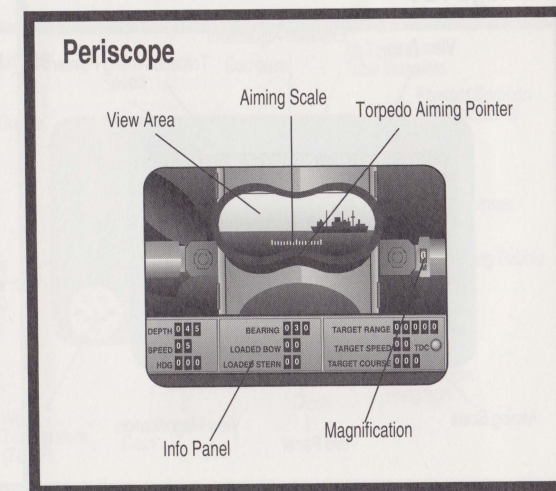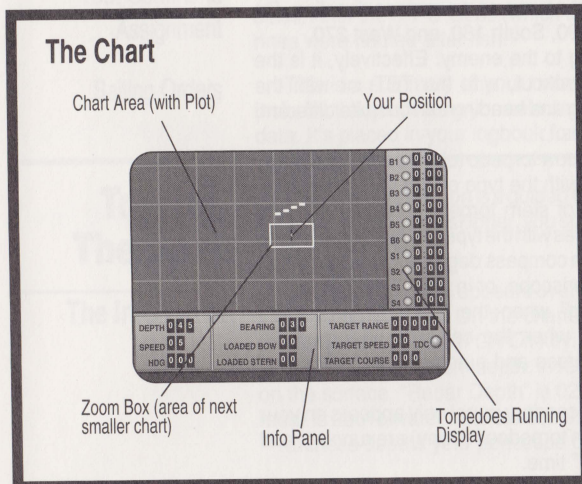
View Area: This is the seascape visible through the periscope lens. The view can be rotated left or right. The *View Left, View Left Fast, View Right,* and *View Right Fast* keys control rotation. However, these only work if the TDC is off. If the TDC is running these keys control the torpedo aiming pointer.

Aiming Scale: This scale in the bottom of the view area is used to "mark" targets and aim torpedoes. Whenever the scale brightens you have "marked" a target. Your crew automatically updates all torpedo firing data to the last "mark" given. This data also appears on the info panel.
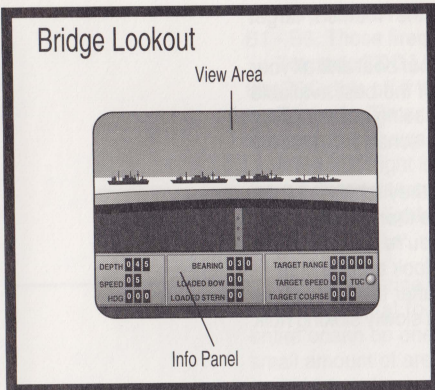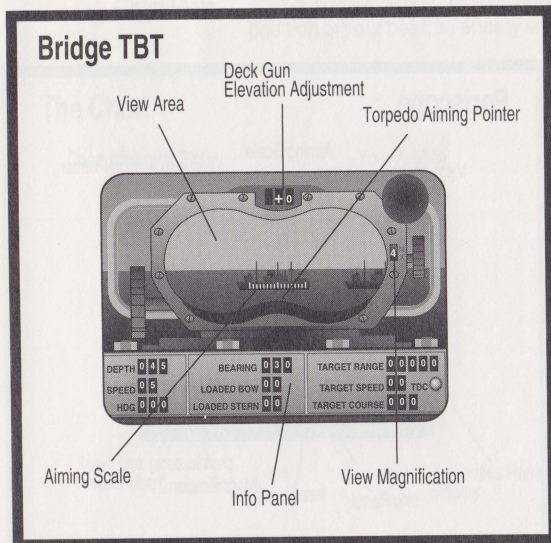
Your crew can only track one target at a time. Whenever you give a new "mark" (by moving the scale onto a target until it brightens) you erase all earlier information.

Torpedo Aiming Pointer: This appears on the brightened scale only when the TDC is on (running). It aims torpedoes left, right or directly at the target. The *View Left* and *View Right* keys adjust the aiming pointer, *not* your view area.

The Chart

- Chart Area (with Plot)
- Your Position
- Zoom Box (area of next smaller chart)
- Info Panel
- Torpedoes Running Display

Periscope

- View Area
- Aiming Scale
- Torpedo Aiming Pointer
- Info Panel
- Magnification

Bridge Lookout

Bridge Lookout

View Area

Info Panel

Magnification: Your periscope has four magnification levels: "1" (normal vision) to "4" (maximum magnification). These are controlled by the *Zoom* and *Unzoom* keys.

Info Panel: See above.

Bridge Lookout

The Bridge Lookout is available only if you're on the surface (at depth 000). It shows the view from the top of the conning tower ("bridge"), as seen by a lookout. It shows one quarter (about 90°) of the horizon around your boat. The direction you're facing appears in BEARING on the Info Panel.

The view can be rotated left or right. The *View Left, View Left Fast, View Right,* and *View Right Fast* keys control rotation.

Bridge TBT

This is available only if you're on the surface (at depth 000). It shows the view from the top of the conning tower ("bridge") as you look through binoculars mounted in the TBT (Target Bearing Transmitter).

The TBT (Target Bearing Transmitter) is used to aim your torpedoes and deck gun while you're on the surface. The direction you're looking appears in BEARING on the Info Panel.

View Area: This is the seascape visible through the binocular lenses. The view can be rotated left or right. The *View Left, View Left Fast, View Right,* and *View Right Fast* keys control rotation. These keys work while the TDC is off. If the TDC is running, these keys control the torpedo aiming pointer instead.

Bridge TBT

Deck Gun Elevation Adjustment

View Area

Torpedo Aiming Pointer

Aiming Scale

Info Panel

View Magnification

Deck Gun Elevation Adjustment: This indicates how much extra elevation or depression you're ordering to the deck gun crew. A "0" means the gun is elevated correctly for the target's current range. A "+1" or more means the gun is elevated especially high (useful if the target is opening the range to you), while "-1" or less means the gun is depressed more than normal (useful if the target is closing the range). Note: "0" does *not* mean the deck gun is shooting at "0" range.

Deck gun elevation is controlled by adding or subtracting degrees using the *Gun Down (-)1°* and the *Gun Up (+)1°* keys.

Important Note: You cannot use the deck gun unless your TDC is already tracking a target.

Aiming Scale: This scale in the bottom of the view area "marks" targets and aims the deck gun and torpedoes. Whenever the scale brightens you have "marked" a target. Your crew automatically updates all firing data to the last "mark" given. This data also appears on the info panel.

Your crew tracks only one target at a time. Whenever you give a new "mark" (by moving the scale onto a target until it brightens) you drop the previous target.

Torpedo Aiming Pointer: This appears on the brightened scale when the TDC is on (running). It aims torpedoes left, right or directly at the target. *View Left* and *View Right* keys adjust the aiming pointer, *not* your view area.

Magnification: The TBT Binoculars have four magnification levels: "1" (normal vision) to "4" (maximum magnification). These are controlled by the *Zoom* and *Unzoom* keys.

Info Panel: See above.

By tapping the *Gauges* key, you see all the important gauges reporting on the conditions of your boat and the surrounding environment.

Gauges

Critical Gauges

These gauges provide information useful in battle and unavailable elsewhere. You should consult the gauges periodically.
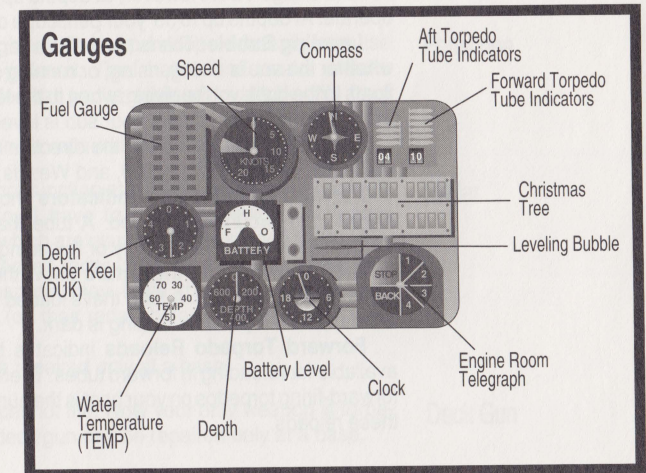
Depth Under Keel (DUK): This indicates the depth of the water (in feet) between the keel (bottom) of your sub and the sea bottom. Keep a close eye on the DUK if you're in shallow water or undertaking a deep dive. Hitting bottom can seriously damage your sub.

Water Temperature (TEMP): This indicates the temperature of the water outside the hull. This is very important if you're trying to evade detection by enemy sonar. At a middle depth (usually between 100' and 200') the water temperature suddenly drops. The boundary between the warm surface water and the cold deeper water is "the layer". This boundary line deflects sonar, which helps hide you from surface ships.

Battery Level: When submerged your sub is powered by batteries, which discharge slowly. Moving submerged increases the amount of discharge. The faster you go, the faster your batteries discharge. While sitting sta-

Gauges

Fuel Gauge

Speed

Compass

Aft Torpedo Tube Indicators

Forward Torpedo Tube Indicators

Christmas Tree

Leveling Bubble

Depth Under Keel (DUK)

Water Temperature (TEMP)

Depth

Battery Level

Clock

Engine Room Telegraph

tionary, your battery can last about 24 hours, at quarter speed about 12 hours, half speed about 5 hours, at full speed about 2 1/4 hours, and at flank speed about 1 1/4 hours.

Your batteries can only be recharged while on the surface. Whenever you're surfaced, any diesel engines not used for movement are used instead to recharge the batteries. It takes all four diesel engines a couple of hours to completely recharge the batteries. However, you must be at "all stop" to use four diesels for recharging. If you have some engines moving the boat, it takes proportionately longer to recharge the batteries (with two engines moving the boat and two recharging, it takes twice as long, with three moving the boat and one recharging, four times a long). No recharging occurs if you're moving at flank (maximum) speed.

Clock: This is a 24-hour military clock. As on all clocks, the small hand shows the hours, the large hand the minutes. On a military clock time runs from 0000 to 2400. For example 8 AM is 0800; noon is 1200, 3 PM is 1500, 10 PM is 2200, and midnight is 2400.

Useful Gauges

These gauges either repeat information on the info panel or are less critical in battle.

Speed: This shows your current speed in knots (nautical miles per hour).

Engine Room Telegraph: This shows which of the four engines are moving the sub. If "4" is lit, all engines are running for maximum speed. When "2" is lit, two are running for half speed, etc. "STOP" means none are running, "BACK" means all engines are moving the boat slowly in reverse.

If you're on the surface, any engine not currently driving the sub is recharging the batteries — if they need recharging.

Depth: This indicates the current depth (in feet) of your sub. Once you begin to submerge (go to a depth of 1' or more) all hatches are closed and locked. This prevents you from getting to the Bridge Lookout and Bridge TBT. However, at depths up to 25' your radar can still operate. At depths up to 55' your periscope can still reach the surface.

Leveling Bubble: This is much like a carpenter's level. It indicates whether the sub is diving, rising, or running steady. When the bubble floats to the right, you're diving; when to the left, you're climbing. When the bubble is in the middle, your sub is level.

Compass: This indicating the direction you're traveling. North is 000, East is 090, South is 180, and West is 270.

Forward Torpedo Tube Indicators show the number of forward torpedo tubes currently loaded. A tube that's loaded and ready is illuminated, a tube that's empty or reloading is dark.

Aft Torpedo Tube Indicators show the number of aft torpedo tubes currently loaded. A tube that's loaded and ready is illuminated, a tube that's empty or reloading is dark.

Forward Torpedo Reloads indicates the number of torpedos available for reloading in forward tubes. Therefore, the total number of forward-firing torpedos on your boat is the number of loaded tubes plus these reloads.

Aft Torpedo Reloads indicates the number of torpedos available for reloading in aft tubes. Therefore, the total number of aft-firing torpedos on your boat is the number of loaded tubes plus these reloads.

Fuel Gauge: This "column" gauge shows your remaining fuel oil. It has three columns, with each divided into a number of sections. Since oil is black, the dark areas show fuel remaining, while lighter sections show water. Note that oil floats on water, and is therefore always at the top part of the gauge.

Christmas Tree: This area shows which hatches and other openings are open (red) or closed (green). The "tree" is green when you dive.

Damage Report

This display shows the major systems on your submarine, and their damage status. Whenever a system is damaged, its current condition is lighted. If a system is undamaged or completely repaired, it's dark.

Some damage is temporary. If so, "repairing" may be lighted also. Repairs can take a few minutes to a few days, depending on the system.

Some damage is permanent. It cannot be repaired until you return to base. Once at a friendly base, all damage is automatically repaired.

Damage Percentage: Your sub cannot take damage forever. Eventually the accumulated damage will weaken your hull so much that the submarine sinks. In fact, a quick series of very bad hits could do this almost instantly. The damage percentage is an estimate from your crew of how close you've come to a catatrophic collapse and sinking. Sometimes you may find the percentage becomes less. This occurs as the crew repairs damage. If damage does not threaten the watertight integrity of the boat the crew may ignore it for percentage purposes. As a result, you may have a piece of equipment malfunctioning while the damage reads 00%.

Some damage is unrepairable except at a base. As captain you must judge when you should break off the battle or the patrol and return for repairs.

Periscope

You cannot look through a damaged periscope — usually because the tube is bent and/or jammed. This makes underwater attacks so difficult and inaccurate that you're advised to attack only from the surface.

Periscope damage can be repaired only at a base.

Radar

Wrecked radar does not function at all. As a result, your contacts are at closer ranges. You'll have to rely on eyesight, periscope observations and sonar, which are usually shorter ranged than radar.

In 1944 and 1945 wrecked radar is especially disadvantageous at night, since the Japanese may have their own radars, and therefore could spot you (on their radar) before you spot them (with your lookouts).

Wrecked radar can be repaired only at a base.

Deck Gun

A wrecked deck gun cannot fire. Now your only weapon is torpedoes. Once wrecked, a deck gun can be repaired only at a base.

Torpedo Rooms

These are the crew areas that reload and control the torpedo tubes. Most spare torpedoes are also stored here.

Flooding/Repairing: When a torpedo room is damaged it begins to flood. The crew immediately begins repairs. While repairs are in progress the tubes cannot be fired. Once the crew has completed repairs, the efficiency of the torpedo room returns to normal.

Half Out: If a flooding torpedo room suffers further damage, half or all of the tubes may be permanently out of action.

Engines

Your sub has four diesel engines. These provide power for moving on the surface and for recharging batteries. Whenever an engine is wrecked your maximum speed is reduced (and battery recharging is made more difficult).

Damaged/Repairing: A damaged engine is out of action until the crew repairs it. Once repaired, it functions normally again. Engine repairs are often lengthy — don't expect results in just a few minutes.

Wrecked: A wrecked engine is beyond repair by your crew. It cannot be used for the rest of the voyage. It can be repaired only at a base.

Fuel Tank

The fuel tanks carry oil for your diesel engines. If a fuel tank is damaged, you immediately lose a large amount of oil. This loss can seriously affect your cruising range.

The crew automatically shuts off valves to isolate the damage. However, small leaks continue. The leakage may reveal your position to a nearby enemy, but isn't large enough to cause any further reductions in your cruising range.

You can suffer multiple hits in your fuel tanks, with a one-time loss in cruising range with each hit. Leaking fuel tanks can be repaired only at a base.

Batteries

Your sub uses two large banks of batteries, one forward, one aft, to power its electric engines for underwater travel. If one battery is damaged, you're reduced to half speed submerged. If both are damaged you're immobilized until at least one is repaired, or until you surface. You can still surface and dive, regardless of battery damage

Damaged/Repairing: The battery is out of action until the crew repairs it. Once repaired, it functions normally again.

Flooded, Surface: If a damaged battery suffers further damage, flooding reaches leaking battery acids, generating deadly chlorine gas. You must surface *immediately*, before the gas kills you and your crew. In this situation you should hit the *Blow All Tanks* key and surface as fast as possible.

Once surfaced your crew immediately vents the gas fumes. You can dive again if you wish. Meanwhile, repairs continue on the damaged battery.

Dive Planes

The dive planes allow your boat to dive and surface quickly: they act as "wings," guiding the ship smoothly up or down. If the dive planes are damaged your ability to control the ship when diving or climbing is reduced. As a result, it takes longer to dive and longer to surface.

Additional damage to the dive planes can wreck them. If the planes are wrecked you cannot dive at all, and can rise only by "blowing all tanks" to reach the surface. Repairing wrecked planes is virtually impossible at sea. Expect to be stuck on the surface until you reach a base for repairs.

Fire Midships

Sometimes damage causes fires. The most likely area is the midships, where many electrical connections meet in the control panels. When a fire occurs the crew works quickly to extinguish it. However, until it's out the crew reacts slowly to all your commands. In fact, don't be surprised if the crew seems to ignore your commands (you may need to press a key multiple times to "get through" to your distracted crew).

A continuing fire causes damage to your structural strength and the submarine's overall survivability.

Bulkheads

Your submarine's structural strength largely depends on its bulkheads. These are the basic skeletal structure of the vessel. If a bulkhead buckles or cracks, the entire hull is weakened. This produces permanent damage.

Weakened/Repairing: When a bulkhead is damaged, the crew immediately starts repairs. These repairs are mainly "shoring up" the weakened member with beams carried especially for this purpose.

Once a bulkhead is weakened and under repair, your maximum safe diving depth is reduced to *half* (50%) of the normal value. Furthermore, your boat cannot turn as fast.

Shored up: If repairs are successful, the bulkhead is "shored up". Turning ability becomes somewhat better, but the safe diving depth is still half (50%) of normal. Furthermore, the overall strength of the submarine remains less than before.

Multiple bulkhead hits greatly weaken the hull of your sub, until eventually it crumples. This is true even if the bulkheads are shored up. If two or more bulkheads have been weakened, head for base immediately — even if they're shored up you're still in great danger.

Sinking: Multiple bulkhead damage can crack your hull. The sub begins to break up and sink. If you're very quick and very lucky, sometimes blowing all tanks will relieve the pressure on the hull and stop this. But this is a last, often forlorn hope. Usually you're doomed.

Captain's Log

Tap the *Captain's Log key*. At any time during play, you can consult the captain's log book. It contains current data about your boat, your sailing orders and other records.

Use the cursor keys to page back and forth in the log book.

Status Icons

The icons appear at the bottom right corner of most views. They remind you of various options currently selected.

Time Rate: Default setting is "1", which means time passes at "real life" speeds. However, time can be set as high as "8", where time passes much faster.

Time Rate

Sound Volume Level

Animations On/Off

Torpedo Speed

Radar Running

Periscope Up

Views

Views Available

View Controls-Chart

View Controls-
Damage Report

Sound Volume: This indicates whether all, some or none of the sounds are heard. See the Technical Supplement for the different settings available.

Animations On/Off: This indicates whether the game shows special animations or not.

Torpedo Speed: This indicates whether your torpedoes are set to run at high speed (short range) or low speed (longer range). This only applies to Mark 14 torpedoes. If you have Mark 10 or Mark 18 the speed is always high.

Radar Running: This indicates that your radar set is above water and functioning

Periscope: This indicates whether the periscope is up or down. You cannot look through the "scope" unless it's up.

War Patrol Icons

War Patrols allow you to sail your submarine around the Pacific Ocean. The Battle Controls are inactive until you make contact with enemy ships.

War Patrol controls apply only if you select a "War Patrol" or "War Career" option, and only during navigation between battles. War Patrol controls do *not* apply in "Training" or "Single Battles".

Only a limited number of views, often with special controls, are available during War Patrol operations.

Charts: Only the largest scale chart is available, showing the entire Western Pacific. Instead of the usual info panel, a special panel appears in the upper left showing crucial patrol information.

Gauges: The main value of these during patrol is to see the number of torpedoes available (in the upper right).

Damage Report: This is available so you can view the status of your boat.

Captain's Log: This is available, with your sailing orders, recently received radio messages, and records of your accomplishments.

Unavailable Views: Bridge Lookout, Periscope, and Bridge TBT,

In War Patrols, the normal zoom and unzoom functions are unavailable. Instead, you have one special option.

Ports: Tap the *Ports* key to see all Japanese and American ports/bases on the map. Japanese bases are areas of large naval activity, and are protected by wide-ranging enemy patrols. The base symbols automatically disappear whenever you resume navigation.

Entering an American base ends a war patrol. In a single war patrol this also ends the game. In a War Career the game continues with various options for refueling, repair, or even getting a new sub fresh from the construction yards.

As in battles, there are no special controls on the damage report screen. Select another view to exit.

The controls in the Captain's log are the same as in battle. Use the cursor keys to page through the logbook, examining your sailing orders, current data, recent radio messages and records.

During a War Patrol, simplified controls are used to "con" (maneuver) your submarine across the Pacific Ocean. You must use the Chart view for navigation.

Keyboard: Use the cursor keys to move your sub north (up), south (down), east (right) or west (left) on the map.

Each tap of the key moves your sub many miles and causes the clock to advance a number of hours.

On many machines with a numeric keypad, all the keys are the con. This allows diagonal movement (using the 1, 3, 7 and 9 keys) as well as left-right and up-down movement. See Chapter 1: Technical Notes for details.

Joystick or Mouse: If your machine has a joystick or mouse attached, in some versions this can move your sub. See the Technical Supplement for details.

Time: During a war patrol, a few hours advance every few seconds. If you sit in place and watch the clock, you'll see the hours advance. Therefore, to pause the game you must tap the *Pause* key(s).

Enemy Contact: When your sub encounters an enemy force, the war patrol temporarily halts. If the enemy sighted you first, you're forced into battle. If you sight the enemy first, you're given the choice to engage or avoid the enemy.

Note that if your sub has SJ radar (normal after the middle of 1942), many contacts (especially at night) are radar contacts. When you go to battle, these enemies are visible on your charts, but nowhere else. This is because radar "sees" further than eyesight, allowing you to detect the enemy before you can see him visually from the Bridge Lookout, Periscope, or Bridge TBT.

Before radar was installed (and sometimes afterward!), submarines could blunder into the enemy. Don't be shocked if sometimes you find enemy ships all around you.

Each key or control has a name in *italics*. This name is used on the keyboard overlay. A master list of all names and keys also appears in the Technical Supplement (in case your overlay is damaged or lost).

These controls determine which view is on your screen.

Charts: Tap this key to view your battle charts.

Bridge Lookout: Tap this key to go to the bridge lookout position. This is possible only if you're on the surface (at 000' depth).

Bridge TBT: Tap this key to go to the bridge and look out through binoculars mounted in the TBT (Target Bearing Transmitter). As in Bridge Lookout, this is possible only if you're on the surface (at 000' depth).

Periscope: Tap this key to look through the periscope. This is possible only if you're at periscope depth (55' or less) and the periscope is up.

View Controls-
Captain's Log

**Navigation
Controls**

Battle
Controls

View Controls

Viewpoint Controls

Sometimes this view suddenly disappears and you'll find yourself looking at your charts. This occurs if your periscope drops beneath the water — because your depth drops below 55', or because you've lowered the scope.

Gauges: Tap this key to view the various dials and gauges in the submarine.

Damage Report: Tap this key to see a graphic damage report about your sub.

Captain's Log: Tap this key to see your logbook.

These controls adjust the direction in which you are looking. They only apply to the Bridge Lookout, Periscope, and Bridge TBT views.

View Right: This moves your viewpoint to the right on the Bridge Lookout, Bridge TBT or Periscope view.

If the TDC is on (running), this key adjusts your torpedo aim to the right instead of shifting your view. To change your view, you must turn off the TDC.

View Left: This moves your viewpoint to the left on the Bridge Lookout, Bridge TBT or Periscope view.

If the TDC is on (running), this key aims the torpedo to the left instead of shifting your view. To change your view, you must turn off the TDC.

View Right Fast: This quickly moves your viewpoint to the right on the Bridge Lookout, Bridge TBT or Periscope view. Your viewpoint "skips" in large 10° "jumps", so just a few taps are needed to scan the entire horizon.

View Left Fast: This quickly moves your viewpoint to the left on the Bridge Lookout, Bridge TBT or Periscope view. You viewpoint "skips" in large 10° "jumps", so just a few taps are needed to scan the entire horizon.

Set View to Course: This immediately moves your viewpoint to straight ahead: the bearing changes to match your heading. Your view is now over the bow of your boat, looking in whatever direction you're travelling.

TDC On/Off: This causes your periscope or Bridge TBT to "track" a target. It also communicates correct firing information to your torpedoes.

Other Viewing Controls

These controls are available on a variety of screens, as appropriate.

Periscope Up/Down: This key raises and lowers your periscope. You can toggle your periscope up and down by tapping the *Periscope Up/Down key*. The periscope is only functional when "up" and your depth is 55' or less. You can even use the periscope on the surface

Zoom View: This magnifies (enlarges) your view. At the Bridge TBT or Periscope, it shows less area but with greater detail. The TBT or Periscope magnification ranges from "1" (normal eyesight) to "4" (maximum zoom). On the charts, it sends you to a smaller scale (more detail but less area).

Unzoom View: This reduces your view. At the Bridge TBT or Periscope, it shows more but with less detail. The TBT or Periscope magnification ranges from "1" (normal eyesight) to "4" (maximum zoom). On the charts, it sends you to a larger scale (less detail but more area).

Ship ID Book

The Ship ID Book is available while you're examing charts, on the bridge (either at the lookout or the TBT), or at the periscope. The book shows pictures of enemy naval vessels, whichs helps you to identify targets.

If you select "introductory" difficulty, your crew will point out which page of the book is correct. That is, they identify the target for you!

Ship ID Book On/Off: This key toggles the book on and off. When present, the book overlays the Info Panel on the lower part of your view.

Cursor Keys: The up/down cursor keys page through the book. The left/right keys page through different views of a ship.

Important: When you have the book open, the Con (movement) controls may be inactive. This is because in some versions (depending on your hardware) the cursor keys are also the Con keys. See Chapter 1: Technical Notes for details.

Chart Controls

The following viewing keys are available while examining the Charts.

Initially the chart view is centered on your boat. However, if the TDC (Torpedo Data Computer) is "on", instead the view is centered halfway between your boat and the TDC target if both fit on the chart.

Re-Center Chart: Tap this key to re-center your boat in the middle of the chart. However, if the TDC is running the view is centered halfway between your boat and the TDC target if both fit.

Zoom: Each tap enlarges the chart, showing a smaller area, but in more detail. The chart also re-centers automatically.

Unzoom: Each tap reduces the chart, showing a larger area, but in less detail. The chart also re-centers automatically.

Info Panel On/Off: This key shows or removes the Info Panel from the chart.

Ship ID Book On/Off: This key shows or removes the Ship ID Book from the chart.

Con & Engine Controls

The Con - Depth Controls

Your submarine automatically uses diesel engines when surfaced and slower electric engines when submerged. Maneuvering and speed (engines) controls are the same in both situations.

The "Con" are those controls used to steer your submarine. The depth controls regulate your operating depth - from surfaced (0' depth) on down to the maximum depth.

Dive: Tap this key to send your sub downward. This will submerge a surfaced sub, or cause a submerged sub to go deeper. To level off, tap either the *Straight & Level* key, or the *Rise* key.

Warning: If you don't level off the sub eventually either hits bottom or is crushed by the ocean.

Crash Dive: Tap this key to send your sub downward quickly. To level off tap either *Straight & Level* or *Rise*.

Rise: Tap this key to send your sub upward. This causes a submerged submarine to move upward. To level off, tap either the *Straight & Level* key or the *Dive* key.

Warning: If you don't level off the sub eventually surfaces.

Blow All Tanks: Tap this key to surface at maximum speed. However, you can only do this once in a battle. That's because this command pumps all your pressurized air into the ballast tanks (pushing out the water that keeps you submerged). After giving this command you cannot stop your rise. You *will* surface, regardless of subsequent commands.

Useful Note: This is the *only* way to surface if your diving planes are completely wrecked.

Straight & Level: Tap this key to "level off" your submarine at its current depth. It also stops any starboard or port turns at the same time.

Periscope Depth: Tap this key to send your boat to periscope depth. If you're surfaced, the boat will dive to 55', then level out. If you're underwater, the boat will rise or dive until it reaches periscope depth of 55', then level out.

Note that unlike all other depth controls, this one automatically levels you once you reach the desired depth.

Maximum Depth: The "test depth" of your submarine is the maximum safe operating depth. This is the depth to which your submarine was tested.

In reality, many submarines went deeper than their test depth — sometimes as much as 50% deeper. However, the deeper you go below test depth, the greater the chance of damage. If you're going below test, watch your damage control carefully. You can suffer bulkhead damage if you go too deep, or even discover the entire boat collapsing inward, killing both you and your crew.

Once your bulkheads are damaged (by going too deep, or by enemy depth charges) your test depth is *cut in half*. If your test depth was normally 300', with damaged bulkheads your new test depth is 150'. If you go below that, you may suffer further damage, or be sunk.

The "Con" also allows you to control the heading (course) of your submarine.

The Con - Heading (Course) Controls

Turn Port (Left): Tap this key to start your sub turning left. The boat continues turning until you issue the order to stop. To stop turning tap either *Turn Starboard (Right), Turn Hard Starboard,* or *Straight & Level.*

Turn Hard Port (Left Fast): Tap this key to turn your sub hard left. This puts the sub into the tightest possible turn. To stop turning you can tap either *Turn Starboard (Right), Turn Hard Starboard,* or *Straight & Level.*

Turn Starboard (Right): Tap this key to start your sub turning right. The boat continues turning until you issue the order to stop. To stop turning tap either *Turn Port (Left), Turn Hard Port,* or *Straight & Level.*

Turn Hard Starboard (Right Fast): Tap this key to turn your sub hard right. This puts the sub into the tightest possible turn. To stop turning you can tap either *Turn Port (Left), Turn Hard Port,* or *Straight & Level.*

Set Course to View: This key turns your boat until its course matches your current view (bearing). It's a fast and convenient way to order the boat to turn onto a heading.

Straight & Level: This key stops all turns and "straightens out" your course. It also stops any diving or rising, so your submarine will cruise at the current depth.

These control the speed of your submarine. You have four engines. The number of engines "on line" determines your current speed. You select this with the engine keys. The exact speed, in knots, depends on the type (class) of submarine.

The Engines - Speed Control

Diesel & Electric Power: On the surface your submarine uses diesel engines, powered by oil from the oil tanks. You sub has enough oil for 35, 50 or 60 days of cruising, depending on class. You consume oil about four times faster in battle, since the engines are not run as economically.

In war patrols you should keep a careful eye on your oil consumption and remaining fuel.

Submerged, your submarine uses batteries to power electric engines. This is because diesels running in a submerged sub exhaust all the air within a few minutes, which kills the crew by asphyxiation.

The electric engines use batteries that gradually run down. The batteries last a couple of hours at top speed, and over a day if you're stationary. The batteries are recharged by running the diesel engines when you're back on the surface. Diesels not used to move the sub are used instead to recharge the batteries.

Ahead Flank (4 engines): This is your maximum forward speed. Submerged it uses up your battery power very quickly. On the surface, all engines are used to drive the submarine, so the batteries cannot be recharged.

Ahead Full (3 engines): This is a fast forward speed. Submerged, it uses up batteries rather quickly. On the surface, three engines drive the submarine, while only one recharges the batteries.

Ahead Half (2 engines): This is a moderate forward speed. Submerged, it uses up batteries at a moderate rate. On the surface, two engines drive the submarine and two recharge the batteries.

Ahead Slow (1 engine): This is your slowest forward speed. Submerged, it uses up batteries very slowly. On the surface, one engine drives the boat while three recharge batteries.

All Stop (0 engines): Your submarine stops in place. Submerged your batteries are hardly reduced at all (only minor electrical systems draw current). On the surface, all diesel engines are used to recharge the batteries.

Reverse (-4 engines): Your submarine moves backwards at a slow speed. Unfortunately, due to gearing limitations all engines must be used. Therefore, your batteries are reduced quickly, and on the surface all diesel engines are used for reverse movement. However, submarines rarely move in reverse except for short periods.

Torpedoes are your main weapon. They can be fired either at a "marked" target, or using a "manual plot". Most captains prefer to use the easier "marked" technique.

"Marked" Target Firing Procedure: This technique is the easiest and most straightforward method of firing. It uses your boat's TDC (Torpedo Data Computer) to correctly set your torpedoes. You just line up a target in your periscope or TBT, turn on the TDC, and fire.

First you go to the Periscope or Bridge TBT view and rotate (using *View Left* and *View Right*) until you find a target. When the vessel is centered in your view, the aiming scale brightens and the Info Panel displays target information (range, course and speed). This means the target is "marked".

Quickly, while the target is still "marked", tap the *TDC On/Off* key to turn on your TDC. This causes the periscope or TBT to follow the target automatically while the Info Panel updates the target data and torpedo firing solution continually. The Info Panel TDC Light shows that the TDC is running. In addition, the torpedo aiming pointer appears on the periscope or TBT crosshairs.

When the range and firing position seem good to you (as Captain), tap *Fire Torpedo*.

To fire a "spread" of torpedoes, use the *View Left* and *View Right* keys to move the torpedo aiming pointer left and right of center. This sets the torpedo path slightly left or right of center, creating a "spread." You must do this while the TDC is on. This technique doesn't work if the TDC is off.

To switch targets, turn off the TDC by pressing *TDC On/Off* again. Rotate your view, "mark" another target, and turn on the TDC once more.

After firing, you'll see on the Charts view the torpedo timer counting down. The TDC light beside the timer will be on if the torpedo was fired under TDC control. The timer is counting down to the anticipated contact with the target.

"Manual Plot" Firing Procedure: In this technique you compute firing angles yourself. This technique does not use the TDC. Make sure the TDC is *not* running (the TDC Light is off on the Info Panel) before using manual firing.

This method is easiest to plan from the Charts. You decide what angle to fire a torpedo so it intercepts the enemy ship's course. To do this, you'll need to estimate how quickly the torpedo travels in relation to how fast the target is moving, and then fire at the appropriate instant.

In manual plotting, the torpedo fires in your view direction (bearing). The crew selects bow or stern tubes, whichever is closer to your view bearing. If the tubes are empty, the crew reports this fact and doesn't shoot. You must either change your heading or bearing to use the other tubes.

Firing Ranges: Minimum torpedo range is 300 yards. A good firing range is 600 to 1,200 yards, depending on torpedo model and situation. At ranges over 2,000 yards torpedoes are unlikely to hit a moving target. Maximum range is 3,500 to 9,000 yards, depending on the torpedo model.

Firing Position: Normally the ideal firing position is straight into the side of a ship. Firing at an angle toward the broadside is the next best (and gives early Mark 14s a better chance of exploding). Shooting at the bow of an oncoming ship is tricky because the target area is quite narrow. Shooting at the stern of a ship is the worst possible shot, since the torpedo must overtake its target.

Early versions of the Mark 14 sometimes exploded prematurely. This was generally caused by the defective magnetic exploder. Depending on the submarine command, this defect is identified and fixed sometime in 1943.

Marking a Target: You do this by centering the target in your Periscope or TBT. The target is "marked" when the aiming scale is lighted and target data appears in the Info Panel.

TDC On/Off: This toggles the TDC (Torpedo Data Computer) on and off. The TDC can be "turned on" only from the Periscope or Bridge TBT view. Furthermore, you must have a target "marked" or else the TDC won't start. A target is "marked" when the aiming scale brightens and the info panel begins displaying target data.

You can adjust your view while the TDC is running. This moves the torpedo aiming pointer left or right, causing the TDC to aim the torpedo left or right of the target. If you move the view so far that the target is no longer visible the TDC automatically turns off.

You can manually turn off the TDC by tapping *TDC On/Off* again.

To switch to a new target, turn off the TDC, "mark" a new target, then turn on the TDC once more.

Change Torpedo Speed: Normally your torpedoes are set for the fastest possible speed. In all normal firing circumstances this is the correct choice. However, the Mark 14 torpedo has a slower speed that gives it much more range than the 4,500 yards at high speed. If you think the torpedo needs to travel further, tap this key to set the torpedoes to low speed (31.5 kts) and 9,000 yards range.

This key has no effect on Mark 10 and Mark 18 torpedoes, which only have one speed.

Aim Torpedoes: You must have the TDC On (see above) to aim torpedoes. Use the *View Left* and *View Right* keys to move torpedo aiming pointer left or right of the target.

Fire Torpedo: This fires a loaded torpedo tube. Bow tubes are used for firing at targets in the 180° arc ahead of the boat, stern tubes for targets in the 180° arc behind the boat. If all tubes in the appropriate direction are empty and/or reloading, you cannot fire in that direction.

If you fire while the TDC is running (Info Panel TDC Light is "on"), the TDC (Torpedo Data Computer) automatically computes the correct course for the torpedo. After the torpedo leaves the tube it turns onto course and heads for a pre-calculated interception point with the target.

On the Charts view you'll see a timer for that torpedo counting down to the predicted interception time. The TDC light beside the timer will be on, indicating the torpedo was fired under TDC control.

If you fire when the TDC is off (Info Panel TDC Light is "off"), the torpedo fires straight out of the bow or stern. It continues straight ahead until it runs out of fuel or hits a target. The bow tubes fire if your current view bearing is closer to the bow than the stern. The stern tubes fire if your current view bearing is closer to the stern than the bow.

On the Charts view you'll see a timer for the torpedo counting down to the predicted time when the torpedo's fuel is exhausted. The TDC light beside the timer will be off, indicating the torpedo was fired under manual control.

Deck Gun Controls

Your deck gun is secondary armament. Its shells are nowhere near as powerful as your torpedoes. More importantly, you must surface to use the deck gun, which exposes your sub to hostile gunfire. Any warship larger than a patrol boat (PC) has better gun armament. Therefore, most submariners only use their deck gun to "polish off" damaged merchantmen, or if they're extremely desperate.

Deck Gun Firing Techniques

You can fire your deck gun whenever the sub is on the surface. You should use the TBT view when firing, since the gun controls are visible there. To fire the deck gun, aim at the target until it is "marked", turn on the TDC, adjust the gun elevation, then fire. On subsequent shots you simply adjust the elevation if necessary and fire again.

Maximum Range of your deck gun is 4,000 yards. This limit is due to the submarine's gun-mounting and sights; the size of the gun has no effect on maximum range.

Unmarked Targets cannot be hit by your deck gun. The target must be marked and tracked by the TDC before you can fire. This represents the gun crew ranging and following the target.

Marked Targets: A target is "marked" when the aiming scale is highlighted and target data appears in the Info Panel.

TDC & Gunfire: You must use your TDC to continually track a "marked" target. When the target is "marked", tap *TDC On/Off*. This automatically keeps you aimed at the target. Your gun crew elevates the gun to the current range of the target (as shown in "Target Range" on the Info Panel). To stop tracking, just turn off the TDC by tapping *TDC On/Off* again.

Adjusting Fire: Your gun crew aims at the target's location, taking into account whether it's moving left or right across your view. However, the crew does *not* adjust for the target's motion toward or away from you.

If you feel the enemy is moving toward you, depress the gun one or more degrees (-1° or more). If the enemy is moving away, elevate the gun one or more degrees more (+1° or more). The faster the enemy closes or opens the range, the more depression or elevation you need.

Note that if a target is closing fast, even though you depress the gun a large amount, you may find shots still landing behind the target (because of his high speed). Conversely, if a target is fleeing fast, your shots frequently land behind him until you apply sufficient elevation.

Deck Gun Firing Controls

Marking a Target: Center the target in your TBT. The target is "marked" when the crosshairs are lighted and target data appears in the Info Panel.

TDC On/Off: This toggles the TDC on and off. You must have a target "marked" in the TBT view to turn on the TDC.

While the TDC is running your view and the deck gun crew's aim rotates to follow the target. Furthermore, the gun crew automatically elevates the gun to hit at the current range (shown on the Info Panel). The crew does not take into account range changes. You must estimate how fast the range is changing, and make the appropriate adjustment to elevation/depression. Although the torpedo aiming pointer is present to adjust left/right aim, you don't need it with the deck gun (the gun crew automatically rotates to track the target).

You can manually turn off the TDC by tapping *TDC On/Off* a second time.

To switch to a new target, turn off the TDC, "mark" a new target, then turn on the TDC once more.

Gun Down (-)1°: Each tap of this key depresses (lowers) the gun barrel by 1°. This decreases the distance travelled by the shell.

When firing at a marked target, the barrel is lowered in relation to the crew's normal firing angle. You lower the gun only if you're firing at a "marked" target that's moving toward you.

Gun Up (+)1°: Each tap of this key elevates (raises) the gun barrel by 1°. This increases the distance travelled by the shell.

When firing at a marked target, the barrel is raised in relation to the crew's normal firing angle. You raise the gun only if you're firing at a "marked" target that's moving away from you.

Fire Deck Gun: This fires one shell at the enemy (on Narwhal class subs it fires a broadside of both guns in close succession). The gun only fires if a target is "marked" and/or the TDC is on and following a target.

The shell fires at the marked target's current position, plus or minus a certain distance depending on the amount of elevation or depression currently set.

If the shell hits, you'll see an explosion on the target ship. If it misses, you'll see a water-spout.

Enemy Gunfire

While you're on the surface, enemy warships or armed merchantmen may fire back at your sub. If water-spouts appear, enemy shells are landing near your boat. Eventually he'll find the range and begin scoring hits, causing damage and eventually sinking you. The only defenses are to (a) damage the enemy so badly his aim or guns are destroyed, or (b) submerge. Once you reach periscope depth (50-55') you're invulnerable to enemy gunfire.

Beware of enemy cruisers and battleships. Their guns are so powerful that one hit could blow your boat right out of the water!

Launching Debris

When you're submerged and under depth charge attack, you may want to deceive enemy into thinking you're dead. One trick is to load your torpedo tubes with various extra items (debris), and launch it. When this floats to the surface, the enemy may think you're sunk.

To attempt this deception, tap the *Launch Debris* key.

You can do this only once per battle, and it may not work.

End This Battle

Tap this key to end a battle. You cannot use this to escape possible attacks — if enemies are still in reasonable proximity, you cannot end the battle. In this case, sail away from the enemy as quickly as you feel prudent, then try again.

Computer Controls

This special set of controls adjusts the operation of your computer. These controls may vary with specific systems; see Chapter 1: Technical Notes for details.

Pause

This pauses (freezes) the action. Press any key again to resume the game action.

Animation On/Off

This toggles on and off the graphic animations of torpedo firing and depth charge attacks. Turning off the animation helps speed up the game on smaller or slower computers. It also reduces the amount of RAM needed to run the game.

"Boss" Hide Game

This temporarily hides the game behind the blank screen. The computer is inoperative until you hit the *"Boss" Hide Game* key again. Use this feature when your work or home boss approaches, then complain that you're trying to figure out why the computer isn't working!

Save Game

This saves the current game to disk, including both the current situation and any war career or war patrol information. You can select which "save game" file to use. If you reuse a file, you'll overwrite the game previously saved there. On floppy disk systems you may need a formatted disk for the saved game files.

Restart Game

This ends the current game and sends you back to the very start, but without reloading lots of files from disk.
Warning: The game is NOT saved when you do this. If you want to save the game, make sure you do that before hitting *Restart Game*.

Joystick Adjust

This readjusts your joystick. Use it if the boat or view seems to "wander" left or right, as if the joystick was in use (even though it isn't).

Volume Adjust

This adjusts the sound effects in your game. It's a multi-position switch. Each tap of the key changes you to the next lower level. After the lowest you cycle to the highest again.

Most systems have four positions: all sounds, all sounds except a few very common ones, critical (only) sounds, and no sound. However, the exact number can vary. See Chapter 1: Technical Notes for details.

Quit Game (To DOS)

This immediately quits the game and returns you to the operating system (DOS on IBM-compatible systems).
Warning: The game is NOT saved when you do this. If you want to save the game, make sure you do that before hitting *Quit Game*.

Aftermath of Battle

Replay

At the end of each battle, you have the option to view a "replay". This is an exact reproduction of what happened, instant by instant, view by view.

The exact features and capabilities of the replay vary from one computer system to another, and may vary depending on how you have (or have not) installed the game. See Chapter 1: Technical Notes for details.

After a Single Battle

After the battle you see a logbook entry listing the ships you engaged and the results. An enemy ship may have escaped your attack, been damaged (and escaped), or been sunk. You receive a point score for damaged as well as sunken ships. You receive tonnage credit only for ships you sank.

Press any key to exit this and see what awards or commendations you received (if any). Press any key again to see the Submariner's Hall of Fame.

After a War Patrol

A war patrol ends whenever you sail into a friendly base. Your performance during the patrol determines your reception at the pier. Then press any key to see what praise (or complaints) you earned on the patrol. Press again to see the Submariner's Hall of Fame.

After a War Career

A war career ends only when Japan surrenders (ending the Pacific war) or if you're killed in action. Japan always surrenders on the historical date in August, 1945. Your career then ends with a final return to port. As in a normal war patrol, press any key to see what you earned for the patrol. Press again to see the Submariner's Hall of Fame.

Scoring

Tonnage: During WWII, the US Navy used tonnage sunk as a method of measuring success in the submarine force. The most successful captain was the one who sank the most tonnage. Merchant and military tonnage are rated equally. Note that this rating does *not* take into account enemies damaged but not sunk, or the difficulty of achieving those sinkings.

Point Score: As in most MicroProse simulations, *Silent Service II* has a complex formula for scoring your performance. You receive a "point value" for each enemy ship damaged or sunk.

The value of ASW (anti-submarine warfare) vessels is based on their capabilities. The more powerful the ship, the more it is worth. Therefore DDs and DDAAs are worth more than DEs, who in turn are worth more than PCs.

The value of *damaging* other ships depends on their intrinsic strength (a strong battleship is worth more than a small cargo ship). In addition, if you sink the ship, you get a bonus based on the target's value. Target value is determined by the strength of the ships guarding it. A well-guarded target is obviously important, and therefore is quite valuable if sunk. A poorly guarded target is less important, and therefore earns a smaller bonus if sunk. A large, well-protected troop transport could be worth as much as a cruiser, or even an old, unguarded battleship!

Your point score is adjusted based on the difficulty level, the class of boat you command, and if you have historical or flawless torpedoes.

Point scores are most useful for evaluating war patrols or a war career. A higher total score for either indicates better abilities as a submarine captain. Scores are also given for individual battles, but these are small compared to what's possible in a war patrol or career.

The Hall of Fame lists your top scores. The Hall of Fame also lists various real captains and their tonnage score for historical interest. See the instructions on the screen for how to clear the Hall of Fame.

Promotion: It was US Navy policy to assign command of a submarine to either a Lieutenant Commander (Lt.Cmdr) or a Commander (Cmdr). Officers of lower rank served in junior (non-skipper) positions on a submarine. Officers of a higher rank (Captain or above) no longer commanded a boat in combat; instead they received a staff, command or similar job ashore.

You begin the game as a Lieutenant Commander. If your record after a series of patrols is good, whenever you finish an especially successful patrol you may be promoted to Commander. This is the only promotion you can earn during the war. However, if you selected a high difficulty level and survive an entire war career (starting December 7, 1941), you are promoted to Captain (at advanced difficulty) or Rear Admiral (at ultimate difficulty) at the war's end.

Medals for Valor: You receive these based on your score for a single war patrol. Each war patrol is a new opportunity to gain medals, regardless of your past record (just as it was in the real war). The hardest to achieve is the Medal of Honor, the easiest the Bronze Star for Valor. In reality, many of these medals (especially the Navy Cross and Silver Star) were awarded for tonnage sunk in a single patrol. But the Navy made exceptions based on extenuating circumstances. Therefore, the fairest method is to use scores rather than tonnage.

Unit Citations: These are awarded to especially deserving vessels. To achieve a unit citation, your submarine must have an outstanding overall record, and in addition must have just finished an oustanding war patrol. As a result, unit citations are more difficult to get than any medal (except perhaps the Medal of Honor).

The *Presidential Unit Citation (PUC)* is the most difficult to achieve. It means the President of the United States is personally aware of your accomplishments.

The *Navy Unit Commendation (NUC)* is slightly less difficult to achieve. It means that even if the President didn't notice your efforts, the Navy certainly did!

Asiatic-Pacific Campaign Medal (AP): This is awarded to skippers who survive a war career that began on December 7th, 1941 — in other words, survive the entire war.

In reality this medal was awarded to those who survived the war, regardless of starting date. The 12-7-41 start requirement lends special value to this medal in *Silent Service II*.

Also note that those skippers who selected "advanced" or "ultimate" difficulty will receive a final promotion to Captain or Rear Admiral after receiving this medal.

4 HISTORICAL ENGAGEMENTS

The Situation: You're Randall "Dan" Daspit, commanding the *Tinosa*, a Gato-class submarine. It's 0930 (morning), July 24th, 1943, west of Truk. You investigate a radar contact and discover a single, unescorted target — a huge whaling factory ship, now serving as an oil tanker. You have Mark 14 torpedoes with their worthless magnetic exploders deactivated.

Tactical Advice: You're in a fairly good position, but beyond good shooting range. The enemy is making 13 knots on the surface. You have three tactical options.

First, you can take a quick shot immediately. This might slow down the target, allowing you to approach submerged and finish him off.

Second, you can pull back to radar contact range (over 10,000 yards), surface, and "end around" ahead of him using your superior 20-knot speed, then submerge and attack.

Third, you can surface right now and shoot it out. You'll probably take damage, but a few hits might slow him down so you can submerge and approach for a good torpedo shot.

What Really Happened: Dan Daspit fired a single torpedo immediately. It hit the target (Tonan Maru #3) in the stern and disabled her propellers. The ship quickly coasted to a stop and Daspit sailed up, submerged, to 800 yards. He then proceeded to fire, one at a time, eleven torpedoes into the broadside of the Tonan Maru #3. The first was a dud, so before each subsequent shot the torpedo room crew completely "maintenanced" the torpedo to make sure it was in perfect operating order.

All eleven shots were duds or failures. Not one exploded against the ship. Eventually a destroyer arrived and towed the Tonan Maru #3 into Truk. The outraged Daspit saved his last torpedo and returned to Pearl Harbor. Admiral Lockwood was similarly outraged. He ordered tests that finally identified the design flaws in the Mark 14's contact exploder.

The Situation: You're Dudley "Mush" Morton, commanding the *Wahoo*, a Gato-class submarine. It's 0845 (morning), January 26, 1943, northwest of Wewak, New Guinea. You investigate smoke on the horizon and find three Japanese merchant ships, without an escort. You approach as closely as possible on the surface.

Tactical Advice: You'll be seen if you move much closer on the surface. You can submerge and move into a good attack position slightly ahead of the enemy, or you can turn due east and run ahead of them a bit on the surface before turning north, submerging, and moving to an attack position. The latter method generally yields a better torpedo-firing solution.

If you're using historical torpedoes, remember that Mark 14s use the unreliable magnetic exploder as well as the terrible contact exploder.

What Really Happened: Morton dived and charged straight in, giving him rear quarter shots on the enemy. He hit all three targets, sinking one, immobilizing a second, and slowing a third. The immobilized ship was a transport, which he polished off with another torpedo, then surfaced and gunned down the soldiers in the water with his light AA guns. It took him about a hour to destroy all the boats and life rafts, as well as killing many of the soldiers.

Morton then sailed in pursuit of the escaping freighter, which had since joined up with a tanker. After a long, ten-hour chase he torpedoed the tanker at dusk, surfaced and closed. The surviving freighter had manned its guns, caused a heated gun duel that Morton resolved by firing his last torpedoes to sink the enemy.

This, along with earlier exploits in the patrol, made Morton a "war hero". He received the Navy Cross while the press called the *Wahoo* "The One-Boat Wolf Pack". Given the gross unreliability of his torpedoes, Mush was an extremely lucky guy.

Flasher's Tankers (I)

The Situation: You're George Grider commanding the *Flasher*, an improved Gato-class submarine. It's 0900 (morning), December 4th, 1944. You're sweeping through the Philippines with a wolfpack. You make radar contact with a three-ship convoy headed straight toward your position. It's starting to rain, which lowers visibility significantly.

Tactical Advice: Submerge and let them approach. You may not see anything until they get within 4,000 to 5,000 yards, due to poor visibility. You choose whether to attack the escort first and then the tanker, or vice versa.

What Really Happened: Grider discovered that he was facing a single tanker escorted by two destroyers. He took the bold approach and decided to attack a destroyer first, then the tanker. His first salvo of four torpedoes hit one of the destroyers, wrecking it. However, he'd lined up his shots so the tanker was behind the destroyer. Lo and behold, the other two torpedoes hit the tanker, setting it afire.

Grider evaded a depth charge counterattack from the undamaged destroyer, returned to periscope depth, and saw it stopped to rescue survivors from the burning tanker and now sunken destroyer. Grider launched another salvo of four torpedoes, three of which hit the destroyer, sinking it almost instantly. Then he polished off the still-burning tanker.

Flasher's Tankers (II)

The Situation: You're George Grider, commanding the *Flasher*, an improved Gato-class submarine. It's 0100 (an hour after midnight), December 22nd, 1944, off the Indochina Coast — 18 days after the encounter above. You've been chasing one tanker convoy or another up and down this coast for days, frustrated by seas so heavy you couldn't fire torpedoes. Just as you're about to give up, in a weather lull your radar operator finds the enemy. He's trying to "hug the coast" and discourage sub attacks by sailing in shallow water. You decide to outwit them by moving even closer to the coast for a night surface attack. The water is so shallow that you could hit bottom before reaching periscope depth!

Tactical Advice: You're in an excellent attack position. Let the convoy come up, keeping your bow toward them (to minimize your visiblity to them) and slowly approach. The leading ships are probably escorts, furthermore beware of small PCs hovering about. The central column is the tankers. If you get within 800 to 1000 yards of one, torpedo salvos in all directions could clean up plenty. Once they spot you, crank up to maximum speed and run away from the nearest escort. If they're too close, you may have to submerge. Beware of being rammed even when submerged because of the shallow water.

What Really Happened: Grider let the leading escorts go past as he closed on the tankers. Then he fired all his bow tubes, spun around, and fired all the stern tubes into the tanker column. The three ships exploded in vast flames. Grider then eased the *Flasher* away, but there was no pursuit. Apparently the escorts thought the convoy had blundered into a minefield.

Sink the Yamato

The Situation: You're Eugene McKinney, commanding the *Skate*, a Gato-class submarine. It's 0430 (just before dawn), Christmas day, 1943, outside Truk harbor. Thanks to an Ultra message, you're in the right position to find a huge blip to the northwest on the SJ radar, moving toward you at 23 knots.

Tactical Advice: As you can guess from the title, the big baby headed your way is the *Yamato*, largest battleship in the world and flagship of the Imperial Japanese Navy. Don't be surprised if additional ships appear — the *Yamato* is probably escorted by smaller ships not visible at this range.

Get right in front of the *Yamato* and submerge. At just under 1000 yards fire everything you've got from the bow, spin around, and empty the stern tubes into him as well. Your only hope is to score enough hits to slow or temporarily stop the *Yamato*. After you achieve that you must then escape the escorting destroyers' counterattack. Then you can return and hopefully polish off a crippled monster.

This is harder than it sounds because the *Yamato* is coming on like a freight train. She's big enough to shrug off a couple hits and keep on going. Above all, don't try a surface battle. Submarines aren't built to "slug it out" with super-battleships!

What Really Happened: McKinney had difficulty with the *Yamato's* zig-zags until she suddenly made a turn straight at him. He missed setting up a good shot from his bow, but did fire all four stern tubes. Two hit the battleship in the bow, causing trivial damage. The *Yamato* steamed on at full speed into Truk, where the damage was patched.

Death of the Shinano

The Situation: You're Joseph Enright, commanding the *Archerfish*, an improved Gato-class submarine. It's 1715 (early evening), November 28th, 1944, off Tokyo Bay. After a boring day waiting to pick up any downed B-29 crews, you're released for hunting. About dinnertime your radar picks up a huge blip leaving Tokyo Bay.

Tactical Advice: This contact must be a super-ship (like the *Yamato*). Also like the *Yamato*, expect escorts. Get ahead of the group and make a night attack. Remain on the surface and use top speed until the last minute. As with the *Yamato*, the key to victory is scoring enough hits in the first attack to slow or stop the target. You can return to sink it later.

What Really Happened: Enright spent a frustrating evening dealing with enemy zig-zags. He'd race toward to a good intercept, only to see the enemy zig away. This was complicated by the fact that the enemy didn't keep on the same base course, but was instead swinging westward toward the Inland Sea.

Finally, about 0300 Enright was ahead of the oncoming target and inside its protecting destroyers. He submerged and fired four bow tubes from 1500 yards, then swung around and fired two stern tubes. Four of the torpedoes hit. Normally the *Shinano* would have survived, but it wasn't finished fitting out. The watertight doors leaked and the crew was totally untrained. As a result, flooding got worse and worse until seven hours later the Japanese were forced to abandon ship.

The *Shinano* was the largest aircraft carrier built during WWII. It was originally intended to be a Yamato-class super-battleship. During the war it was redesigned as an aircraft carrier and completed as such.

The Situation: You're Richard "Dick" O'Kane commanding the *Tang*, an improved Gato-class submarine. It's 30 minutes past midnight in the shallow Formosa Strait, October 23rd, 1944. Your radar picks up ten blips of varying size. It looks like a convoy of five merchantment with five escorts.

If you're playing with historical torpedoes, the *Tang* has shipped the very slow Mark 18-1s (O'Kane requested Mark 14s, but none were available). You'll need to get within 1000 yards for accurate shooting.

Tactical Advice: The convoy is headed away from you. You can either try to overhaul them from astern, or run around their flank and lie in wait ahead. The latter is better, since your slow Mark 18-1s are worthless in stern attacks.

As in most night battles, don't open fire with your deck gun unless absolutely necessary. Firing the gun gives away your position to every ship within dozens of miles.

What Really Happened: O'Kane made an "end around" and positioned himself in front of the oncoming convoy. He throttled down to low speed and let the merchantmen come past him, all on the same course. Now in the middle of the convoy, he opened fire with bow and stern tubes, firing nine torpedoes. The Japanese scattered in confusion, with the convoy commander (on board one of the merchantmen) accidentally ramming another ship during a ramming run on the *Tang*. Three Japanese ships went down and the *Tang* escaped untouched.

The next night the *Tang* found another convoy, sinking two ships and damaging a third. O'Kane closed on the cripple and fired, only to watch the torpedo malfunction and circle around. Despite emergency maneuvers, the torpedo hit the *Tang* in the stern and sank her. O'Kane and some of the bridge officers were blown overboard and survived. A few crewmen forward also escaped because the sub sank in shallow water. O'Kane survived Japanese POW camps and eventually received the Medal of Honor for his exploits.

The Situation: You're Herman Kossler, commanding the *Cavalla*, an improved Gato-class submarine. After days of reporting and chasing various Japanese warship and oil tanker groups in the southern Philippine Sea, you've been vectored to an intercept position. On June 19th, 1944, you "up scope" at 1048 for a routine check and

wow! — Japanese carriers! In fact, you can see it's the *Shokaku* flying off and landing aircraft. That requires the carrier to steam steadily into the wind — right past your sub!

Tactical Advice: Position your boat so the *Shokaku* will pass closely. When she does, let her have it with all you've got. As the situation develops, you'll discover that the *Shokaku* is accompanied by other attractive targets. How many torpedoes do you assign to each? Whatever you do, make your first salvo count. All these targets are warships with a maximum speed over 30 knots. If you don't slow them down with the first salvo, they'll certainly run.

One thing Kossler forgot was to make a radar check. If you do this, you'll find the *Shokaku* isn't the only juicy target around. Now you've got real problems: is it possible to get them all?

What Really Happened: Kossler got into perfect position on the *Shokaku* and fired all his bow tubes (six fish) at 1200 yards. The escorting destroyers immediately pounced on him, keeping him deep and evading for hours. Meanwhile, the *Shokaku* took four hits, setting her afire, with planes, fuel and bombs exploding everywhere. By the midafternoon the burning wreckage turned over and sank.

Meanwhile, three hours earlier, Jim Blanchard commanding the *Albacore* hit another Japanese carrier, the fleet flagship *Taiho*, with one torpedo. It jammed the forward elevator, but there was no other serious damage. But the damage control officer made a serious error that spread gasoline fumes throughout the ship. Just after the *Shokaku* sank, the gasoline-laden air was finally ignited and the *Taiho* blew up.

The planes from these carriers, as well as others, were destroyed by fighters from seven US carriers (all this occurred during the Battle of the Philippine Sea). However, the only Japanese carriers sunk in the battle were the *Taiho* and *Shokaku*.

The Situation: Here you can select the date and type of sub you wish to command. This generates a random engagement based on the types of Japanese ships operating at that time, and following their historical tactics and sailing patterns. You could encounter warships or merchantmen. These engagements are similar to those you'll experience during a war patrol or a war career.

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