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In the struggle against the enemy sea communications, i.e., in the destruction of the enemy's overseas trade, the submarine is a particularly suitable weapon with which to challenge the enemy's naval superiority. The continuous successful use of the submarine in the war on merchant shipping is, therefore, in the long run, of decisive strategic importance for the total course of the war, since the enemy, who is dependent on his overseas trade, is in the position that, for him, the loss of his sea communications means the loss of the war.

From *The U-Boat Commander's Handbook, 1943 Edition.*

Welcome

SILENT HUNTER II is the long-awaited sequel to Silent Hunter, the best selling World War II submarine simulation ever. It incorporates numerous improvements over the original, including a true 3D-rendered environment, 32-bit graphics, 3D sound, accurate floatation physics and a host of user-interface enhancements.

SILENT HUNTER II takes you to the frigid waters of the North Atlantic where you will command a U-boat in the service of the German *Kriegsmarine*. You will fight U.S. and British forces in the Battle of the Atlantic and attempt to prevent vital supplies and weapons from reaching the Allies in Europe.

Can you beat the odds and survive the entire war as a U-boat commander? Will you become an ace commander or just a grim statistic? Will you wear the Knight's Cross or a shroud of seaweed?

Find out in SILENT HUNTER II!

Getting Started

This section will help you get started playing SILENT HUNTER II. Users familiar with the original SILENT HUNTER should still scan this section for up-to-date information.

System Requirements

SILENT HUNTER II is designed for Windows 95C/98, and Windows Millennium Edition. In addition, your system should be equipped with the following:

Pentium II 266 MHz or faster CPU

64 megabytes of RAM

650 megabytes of free disk space

8x CD-ROM or 1x DVD-ROM drive or faster

Direct-X 8 or later (included on the CD)

DirectX 8 compliant 3D accelerated video card with 16 megabytes of video RAM

DirectSound-compliant audio

QuickTime 4.0 or later (included on the CD)

For best performance, we recommend the following:

Pentium II 600 MHz or faster

128 megabytes of system RAM

3D accelerated video card with 32 megabytes or more of VRAM

DirectSound-compliant audio with DirectSound3D acceleration.

Note: In the interest of product improvement, information and specifications represented here are subject to change without notice. Any online services advertised as part of this product may be changed or discontinued at any time for any reason.

Installation

SILENT HUNTER II must be installed before you can run the game. To install, insert the SILENT HUNTER II CD and wait for the launch screen to appear. Click **Install** and follow the instructions as they appear.

If you have auto-run disabled, you may launch the installer manually. Choose Windows Explorer from the Programs submenu on your Windows Start Menu. Choose the SILENT HUNTER II CD icon to display the files located on the CD. Look for **Setup.exe** among those files and double-click it to run the installer.

Uninstalling the Game

To uninstall the game, select **Uninstall** from the Silent Hunter Start menu item. You can also choose Settings from the Windows Start menu and select Control Panel, select Add/Remove Programs, left-click on Silent Hunter II, and click on the Add/Remove button. The game and all its components are then removed from your system, except for your saved games.

Running the Game

From the Start Menu, select:

Programs:Silent HunterII:Silent Hunter II

If this is the first time you've run SILENT HUNTER II, the configuration program will launch (see below for details.) Otherwise the intro video will play, after which the Main Menu will appear. From the Main Menu you can access all of the game's features. See the sections below for details.

The Configuration Program

Before you can run SILENT HUNTER II, you must select a video device and an audio device that the game will use. Pop-up menus

are available on the configuration dialogue for selecting these items.

For most systems, selecting Primary Display Driver and Primary Sound Driver will work fine. However, if you have multiple monitors or multiple audio options, you may have to select from several available choices. The configuration program is smart enough to present only options that will work for SILENT HUNTER II.

Your video card will have the single greatest impact on performance in the game of any hardware in your system. If you have multiple monitors to choose from, we recommend choosing the option with the highest 3D-accelerated performance.

Accelerators have made enormous strides in the last few years. If you have an older 3D accelerator, you may want to upgrade to something newer. Not only will you get better performance, but, depending on the features supported, you may see improved image quality as well.

If no video or audio options are available, you will need to make sure your drivers are correctly installed and that your hardware meets the system requirements detailed in the section titled *System Requirements*.

You may also select a video mode in which the game will run. Depending on your hardware, you may see the following choices in the display mode menu:

- 640x480 High Color (16)
- 800x600 High Color (16)
- 640x480 True Color (32)
- 800x600 True Color (32)

Note that some video devices don't support 32-bit true color rendering, while some others don't support 800x600 pixel resolutions.

Note also that higher resolutions and color depths are more

demanding of the hardware. If you find yourself experiencing performance problems in the game, we recommend first reducing color depth as this will have the greatest impact.

Conventions

SILENT HUNTER II is designed to be operated primarily with the mouse or an equivalent pointing device. Many keyboard commands are also supported and these are explained in the appropriate sections of the manual. When the simulation is running, you can view the available key commands by hitting **F1** and mission objectives by hitting **ESC**.

In most cases the left mouse button is used to choose from a menu of alternative actions or to activate a user-interface control. Occasionally the right mouse button is used to access certain features—for example, activating a context menu.

If your pointing device is equipped with a wheel or the equivalent, you can use it to scroll through lists. The wheel can also be used as an alternative way to access other features and these are documented in the appropriate areas of the manual.

SILENT HUNTER II is not specifically designed for joysticks or alternative input devices. However, if your input device is programmable (many are) you may find it useful to program some key commands into that device.

Many screens have controls which may not be readily apparent. While these are documented in the manual, moving the mouse over various objects on the screen will bring up "tool-tips", messages which explain the functions of those objects.

Some screens in the game have part or all of their area dedicated to a 3D view of the game world. In most cases you can rotate the view by using the left, right, up and down arrow keys. Mouse view control is also an option. Click the right mouse button to toggle in and out of mouse control view. While activated, mouse control view allows you to rotate, elevate and depress your view

by moving the mouse. Whether you are using the mouse or the keyboard to rotate the view, you can slow the rotation for fine adjustment by holding down the shift key. Screens in which you can utilize these view controls are the periscope, UZO, bridge, anti-aircraft machine guns and the external 3D view.

If You Have Problems

The most common problem encountered with any new game installation is an outdated video driver. We recommend that you visit your video card manufacturer's website for the latest driver—especially if you have installed a new version of Direct-X.

If that fails, the official SILENT HUNTER web page will have the latest troubleshooting information:

http://www.silenthunter2.com

Contact technical support over the Internet

Before contacting Ubi Soft Technical Support, please carefully read through this manual. Also, help is available online at:

http://www.ubisoft.com/support

This site takes you to the Ubi Soft Solution Center. Here you can browse our FAQ listings, or search the solution database for the most recently updated information since the game's release or, for fastest e-mail response, you can send in a request for Personal Assistance from a Technical Support Representative.

If you are unable to find an answer to your question using http://www.ubisoft.com/support or this manual, please contact us via one of the following methods:

Contact technical support by e-mail

You can contact Ubi Soft Support by e-mailing them directly at support@ubisoft.com.

It may take anywhere from 24-72 hours for us to respond to your e-mail, depending upon the volume of messages we receive and the nature of your problem.

Contact technical support by phone

You can also contact us by phone by calling (919) 460-9778. Note that this number is for technical assistance only. **We cannot give hints or tips over the Technical Support line.** When calling our Technical Support line, please make sure you have the game active at the point where you are experiencing difficulty.

Be advised that our Technical Support Representatives are available to help you Monday - Friday from 9 am - 9 pm (Eastern Standard Time), excluding holidays.

While we do not charge for technical support, normal long distance charges apply. To avoid long distance charges, or to contact a support representative directly after these hours, please feel free to use one of the other support avenues listed above. E-mail responses usually receive a response in less than 2 business days. If we receive your e-mail, you will receive a response!

Contact us by Standard Mail:

Please do not send returns directly to Ubi Soft without first contacting a Technical Support Representative. If you need to return a product, review the Replacement Policy / Warranty in this manual.

Ubi Soft Entertainment
Attn: Customer Support
2000 Aerial Center, Suite 110
Morrisville, NC 27560

The Main Menu

The main Silent Hunter II menu allows you to access the following menus: Single Mission, Campaign, Configuration and Museum. Selecting the last option, Quit, will exit out of Silent Hunter II and return you to the Windows Desktop.

Playing Single Missions

This section explains the Single Mission interface. The campaign is discussed in a later section.

To access the Single Mission interface, select **Single Mission** from the Main Menu.

The Single Mission Menu

The Single Mission Menu gives you access to individual historical scenarios and the mission generator facility. The following options appear on this menu:

Start a New Mission

Create a Mission

Select a Saved Mission

Main Menu

The last option returns you to the main menu.

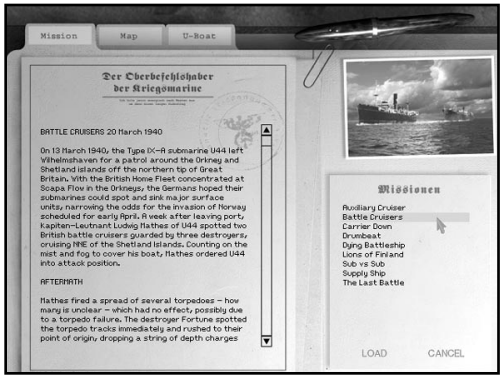
Start a New Mission

This option allows you to choose from a list of historical and instructional training missions. The historical missions simulate actual documented encounters between U-boats and Allied forces.

The Single Mission screen consists of two main parts:

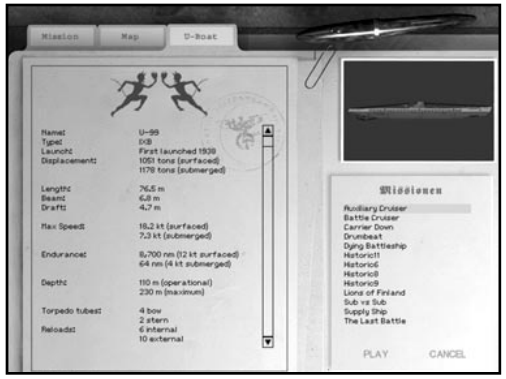
The list in the lower right corner shows the available missions.

The area to the left shows one of three things depending on which of the tabs located at the top of the screen is selected



Mission tab: This presents a text description of the mission and any additional information.

Map tab: This presents a map view of the area of operations and objective points.



U-Boat tab: This gives you some stats and notes regarding the U-boat you will be commanding in this mission, allows you to change the conning tower insignia and allows you to view the U-boat model in 3D.

The insignia of the U-boat is shown at the top of the U-boat text and on the U-boat in the 3D view. You can change the insignia by clicking in the insignia area above the text to cycle through all of the available insignia.

Insignia textures are stored in the following directory: SH2\Insignia. The insignia artwork in this folder is in TGA format and can be modified. Additional textures placed in that folder will be available when the game is run. If you wish to create your own insignia, each insignia texture must be a 128x128 32-bit alpha-channel TGA. The upper 128x64 segment is applied directly to the front of the conning tower. The lower part is split into two 64x64 segments. The left segment is applied to the starboard side of the conning tower, while the right segment is applied to the port side of the conning tower. Typically these are mirror images, but this is not a requirement.

To rotate the view of the 3D model, right click in the U-boat window in the top right section of the screen and drag with the mouse. You can also zoom in and out on the U-boat model by left clicking on the U-boat window and dragging with the mouse. A mouse wheel can also be used to control the zoom level.

To play the currently selected mission, click on the word **Play** located at the bottom of the available mission list.

To return to the Single Mission Menu, click on the word **Cancel** located at the bottom of the available mission list.

Create a Mission

This option allows you to access the Mission Generator facility. Using this interface, you can set up a variety of U-boat missions.

When creating a custom mission, the Mission tab presents you with a list of menus that allow you to change the parameters of the mission.

To change a parameter, move the mouse cursor over the one you wish to change and click with the left mouse button. For example, to change the weather in the above mission, move the cursor over the word Clear and click once. In every case, repeatedly clicking over the option will cycle through all of the available options for

that parameter. You can also click the right mouse button to move through the options in reverse order.

The following sections describe each parameter and its effect on the mission generated.

Mission Type

There are three options available for this parameter:

Convoy encounter—In this type of mission, you will encounter a convoy of merchant ships.

Warship encounter—In this type of mission, you will encounter various Allied warships.

Submarine encounter—In this type of mission You will encounter one or more enemy submarines.

Period

This option allows you to specify the period of the war in which the mission takes place. There are three options:

- Early (1939-1941)
- Middle (1942-1943)
- Late (1944-1945)

These selections will determine the characteristics of the enemies you will encounter and the technology available to both sides. Late war missions tend to be more challenging because the Allies have much better detection equipment and weapons as well as more ships dedicated to antisubmarine warfare.

Patrol Area

There are seven possible patrol areas in which your scenario may take place:

- North Atlantic
- Mediterranean
- Eastern U.S.
- Caribbean
- South Atlantic
- North Sea
- Indian Ocean

The Patrol Area determines not only the location of the mission scenario, but the enemy forces you will be facing as well. For example, in the Eastern U.S., Caribbean and South Atlantic areas you will encounter primarily American forces, while in all other areas you will encounter primarily British forces.

Weather

A scenario may have several possible weather conditions. Choose from the following:

- Clear—Blue skies, smooth waters, no clouds
- High Clouds—Wispy clouds, relatively calm seas
- Overcast—Continuous gray clouds, reduced visibility, heavier seas
- Rain Squalls—Variable clouds, reduced visibility, variable sea conditions
- Foggy—Gray skies, limited visibility, heavier seas
- Storm—Limited visibility, rough seas

Time of Day

You can set the local time of day using this parameter. Options include:

- Dawn
- Morning
- Noon
- Afternoon
- Dusk
- Night

Enemy Forces

This option determines the size of the main force you will encounter:

- Small
- Medium
- Large

It also affects the number of escorts encountered, if they are present.

In Warship encounters, it also determines the size of the largest warships you will face:

- Small – light cruiser.
- Medium – heavy cruiser
- Large – battleship and/or aircraft carrier

Escorts

This parameter allows you to decide whether or not you want the enemy units to be escorted. Escorts usually consist of destroyers, destroyer escorts, or corvettes. These units are primarily tasked with antisubmarine duties and their presence will make the mission much tougher. Options are:

- Yes
- No

U-Boat

This parameter allows you to select which type of U-boat you will command in the mission. Choose from the following:

- Type IIA
- Type IIB
- Type IIC
- Type IID
- Type VIIB
- Type VIIC
- Type VIIC/41
- Type IXA
- Type IXB
- Type IXC
- Type IXC/40
- Type XXI

Details on each of these boats is available in the reference section of this manual or in the in-game vehicle viewer.

Position

This parameter determines the initial position of your U-boat with respect to the enemy forces. The following options are available:

Ahead This is the ideal position for setting up an attack as the enemy is headed straight for you.

Abeam This is still a fairly good position, especially for attacking large convoys.

Behind This is the most difficult position, as you will need to overtake the convoy before launching an attack.

Launching the Mission

Once you have all of the parameters set up, click **Play** located in the lower right corner of the screen to launch the scenario.

Select a Saved Mission

SILENT HUNTER II allows you to save missions that are in progress. This is done from within the Simulator (see the section titled *Saving Missions* below under *Commanding the U-Boat* for details.) This option is used to return to those missions at the place where you left off.

In most respects, the interface is identical to the Start a New Mission option. The main difference is that the list of missions shows those missions that were previously saved. You can review the briefing, the area of operations and the U-boat assigned to the mission using the interface tabs.

To select a saved mission, just move the mouse cursor over the mission name and click the left mouse button. When you're ready to play, just click on the word **Play** below the available mission list.

Returning from Missions

To end a mission (campaign or single) press the **ESC** key or the **End Mission** button on the right side sliding panel.

You will be presented with a debriefing evaluation rating your performance based on the mission objectives.

This screen has three options:

- Quit returns you to the Single Mission interface
- Save allows you to save the game in progress (not available for campaign games, see campaign section for details). Saved game names can be up to 28 characters long (letters or numbers only).
- Resume allows you to return to the game in progress

Campaign

The Campaign allows you to pursue a career as a U-boat commander that spans the entire duration of World War II. In the Campaign you will do battle with a variety of Allied forces in the desperate sea battles that would decide the Battle of the Atlantic.

The Campaign Menu

Selecting **Campaign** from the Main Menu brings up the Campaign Menu, which contains the following options:

- Start a New Campaign
- Select an Existing Campaign
- Main Menu

Start a New Campaign

Selecting **Start a New Campaign** brings up the Campaign sign-in screen. Type the name you want to use in this campaign (up to 28 letters or numbers only) into the edit field and then click the **Play** button at the bottom of the screen to begin.

Your campaign records are stored in the 'Campaigns' subdirectory of the 'Save' folder that is located within the Silent Hunter II directory. It goes without saying that backing up this file occasionally is a good idea in case you suffer a disk failure.

Campaign Realism Settings

Next you will be asked to select the realism level for this campaign. Three preset difficulty levels are available: **Easy**, **Medium** and **Hard**. If you choose to customize the difficulty, there are a number of settings which can be used to reduce the realism (and hence the difficulty level) of the game. For details about each setting, see the section *Realism Settings* later in this document.

Note that once you select realism settings for the campaign, they cannot be changed. If this is your first time playing Silent Hunter II, we suggest starting your first campaign using a low level of realism. You can start new campaigns at different realism settings later on, or maintain multiple different campaign files with different settings.

Beginning the Campaign

The Campaign begins with a note from your commanding officer. These appear whenever you are reassigned to a new U-boat and/or area of operations and set the stage for the missions which follow. Click on the word **Continue** at the bottom right corner of the screen when you are finished reading.

The next screen is your office at your current home base. The office serves as the primary interface to the campaign features. Take a minute to look around.

The folder located on the desk takes you to the next Mission Briefing, which we will discuss later in this section. It's very similar to the Single Mission interface described previously.

From the office you can leave the campaign at any time by clicking on the door at the right. This will return you to the Campaign Menu.

The chalkboard gives you access to the Top Commanders list. This is a list of the historically top scoring U-boat commanders based on tonnage sunk. You will need to score well to get on the Top Commanders list, but perseverance pays off.

The map gives you access to the same world map data used in the simulation. It also includes a record of the ships sunk by you in the campaign at specific locations.

The plaque above the map gives you access to your medals case. Any medals you earn during the course of the campaign will be displayed herein.

At certain points in the campaign, you will be resupplied at sea and will not return to the base office for briefing. In this case, you will be briefed in the captain's cabin. All of the Office interface features are available at this screen.

Select an Existing Campaign

This option allows you to return to a campaign in progress. A list of existing campaign files is shown on the left. Click on the one you wish to load with the left mouse button, then click on the word **Play** at the lower right corner of the screen. This will return you to the office and the mission where you left off.

Campaign Mission Interface

This tabbed screen, which displays the Mission Briefing, Mission Map and U-Boat Stats, is in most respects identical to the Single Mission Interface. In summary:

The Mission Tab shows the current mission briefing, a textual description of the mission which gives you details, including your primary and secondary objectives, environmental conditions and area of operations.

The Map Tab shows the mission area you will be operating in.

The U-Boat Tab shows you information about the U-boat you have been assigned. Whenever you are reassigned to a new area of operations you will be given a new U-boat to command we recommend that you study its capabilities before launching any missions.

The primary difference between the Campaign Mission Interface and Single Mission Interface is in the mission list shown at the lower right.

While in the Single Mission Interface this was a list of available missions, in the Campaign Interface this lists all of the missions that you have played in the campaign so far. These are listed in

reverse chronological order—that is, the latest mission is at the top while the earliest mission is at the bottom.

By default, the latest mission is always selected when you enter the Campaign. To launch the mission, click the left mouse button with the cursor on the word **Play** at the lower right corner of the screen.

You can go back and replay an earlier mission at any time by selecting it from the list and left-clicking **Play**. Note that when you choose to replay an earlier mission in the campaign, the results of playing that mission will not affect your campaign.

When you want to return to the Office, left-click on the word **Cancel** or click on the area above the briefing folder.

Returning from a Campaign Mission

When the mission has ended (either by pressing the **ESC** key, returning to base, or getting killed) you will be returned to the Campaign Interface.

Your performance is recorded for every mission you play in the campaign. When you have performed well, you may receive a medal, though this is also dependent on realism settings. If you have chosen less realistic settings, your likelihood of receiving a medal is reduced.

If you have been killed or captured in the course of a campaign mission, you will need to replay that mission.

Most missions have both primary and secondary objectives. If you have failed to achieve all primary mission objectives, you will be required to replay a mission. Secondary mission objectives are optional, but will increase the likelihood of your receiving medals and commendations.

Campaign Features

This section discusses additional features that are part of the campaign experience.

Top Commanders List

This board shows the most highly rated commanders based on tonnage sunk. This information is taken out of all of the campaign files stored on your computer, plus those commanders in the SILENT HUNTER II "Hall of Fame." You will need to score well go get on the Top Commanders list, but perseverance will pay off.

The Campaign Map

Located in the office next to the Top Commanders list, the Campaign Map gives you access to the world database developed for SILENT HUNTER II.

The entire map is not visible at any one time. You can pan around the map by clicking the right mouse button. Just click on the location where you want the map to be centered and the map will be redrawn at the new location.

A floating window provides access to some additional map features:


Clicking this button enlarges or zooms the map view in to show small details.


Clicking this button shrinks or zooms the map view out for the "big" picture.


Clicking this button cycles between grid modes, showing longitude/latitude lines, Kriegsmarine grid lines, or no grid at all.


Clicking this button will center the map on the starting position of your U-boat.

A map thumbnail located in the floating window allows you to center the large map on any location by clicking the left mouse button in the thumbnail image.

If you have a wheel mouse, you can also zoom the map in or out by rotating the wheel.

The map shows Allied and Axis bases and cities, as well as the locations of all of the ships sunk by you in the course of the missions you have played.

If you roll the mouse cursor over any of these markers, some additional information will be displayed, including date of sinking, mission in which the sinking occurred and the longitude/latitude of the location.

When you are finished looking at the Campaign Map, click the close box in the upper-right corner of the map display and you will be returned to the Office.

Medals Case

Clicking on the plaque located above the Campaign Map gives you access to the Medals Case. This contains all of the medals you have earned in the course of your missions.

Leaving and Returning to a Campaign

You can leave the campaign at any time by clicking on the door on the right side of the Office. When you leave, the campaign file is automatically saved so that, when you return, everything will be restored.

Whenever you leave a campaign mission, if you have not completed your primary objectives, the game will automatically save the current scenario (if one is in progress). This is stored alongside the campaign file.

When you return to this campaign, the program will note that a

saved mission is available, but you will return to the Office interface nonetheless. This allows you to review the briefing and other campaign information before returning to the game in progress.

To return to that game, go to the Mission Briefing, then click on the word, **Play**. You will be notified that a saved game is available for this mission and you will be given the option to reload that game. Click **Yes** to return to the mission in progress.

If you decide you want to restart the mission from the beginning, just click **No** when offered the option to reload the saved game.

Commanding the U-boat

This section describes the heart of SILENT HUNTER II: the U-boat simulation. Here you will learn the ins and outs of commanding a U-boat.

German U-boats of World War II were complicated weapons platforms designed primarily for one purpose: attacking enemy shipping using the advantages of stealth and surprise. We recommend reading this section carefully and playing through the training missions a few times to get familiar with U-boat operations.

Even experienced players of the original SILENT HUNTER should at least skim this section to familiarize themselves with the various control interfaces. Although we've attempted to capture the spirit of the original, there were significant differences between U-boats and U.S. Navy submarines and there are, as well, numerous user interface improvements embodied in SILENT HUNTER II.

When reading the following sections, it will help you to understand some of the concepts if you are at your computer running the game. We suggest starting one of the tutorial missions and trying out some of the game features as you read about them.

Getting Around the U-boat

Mastering SILENT HUNTER II is a process of learning to use the various stations of the U-boat simulator to best effect. Each station simulates a different aspect of U-boat operations, including navigation, sensors, fire control, communications and engineering functions.

The various stations are accessible using the station bar located at the bottom of every screen:

Clicking on any one of the buttons in the station bar will take you to the corresponding station.

Taken from left to right, the stations are:

 Help Screen

 The Periscope

 The Plot Screen

 The Helm Controls and Gauges

 The Torpedo Fire Control System

 The Deck Gun

 The Machine Guns

 The UZO Station

 The Bridge

 The Damage Control Station

 The Torpedo Status Screen

 The External Camera View

 The Radio Room

 The Sound Station

 The Radar Station

 The Captain's Quarters

Note that at various times some of these stations may be disabled or they may not be features of the U-Boat you are commanding.

For example the Bridge, Deck Gun, UZO and Machine Guns will not be available when the U-boat is submerged and the type II and XXI U boats do not have deck guns.

Keyboard equivalents:

ESC	*Exit the simulator*
F1	*Help*
F2	*Periscope*
F3	*Plot*
F4	*Helm and Gauges*
F5	*Torpedo Fire Control*
F6	*Deck Gun*
F7	*Machine Guns*
F8	*UZO*
F9	*Bridge*
F10	*Damage Control*
F11	*Torpedo Status*
F12	*External View*
PrintScr	*Radio Room*
Scroll Lock	*Sound*
Pause	*Radar*
NumLock	*Captain's Quarters*

Time and Time Compression

Unlike real life, as the player in SILENT HUNTER II you have complete control of the passage of time in the simulation.

At the lower right corner of every screen you will see the time control panel, which looks like this:

The top part of the time control panel is the boat's chronometer. This will tell you the time of day in the Greenwich Mean Time.

Below that you will see the time compression setting flanked by two buttons. The up arrow button increases time compression while the down arrow button decreases time compression.

Keyboard equivalents:

+	*Increase Time compression*
-	*Decrease Time Compression*
Backspace	*Pause the game (0x)*
\	*Real time (1x)*

If you're new to this type of simulation game, time compression is a feature which allows you to increase the rate at which time passes in the game. Why would you want to do this?

Well, some war patrols may take place over an extended period of time and require you to travel several thousand miles. Without time compression, it would literally take you several days to finish a mission.

In addition, in some missions a lot of the time will be spent patrolling an area looking for enemy ships to sink. Time compression allows you to rapidly get through these "boring" parts so you can focus on the important business of torpedoing enemy shipping.

How does it work? Each time you increase time compression you double the rate at which time passes. Look at the time control panel again. When you see '0x' in the time compression window it means that the game is paused. You can always pause the game by reducing time compression to '0x' if you want to take a breather.

When you see '1x' in the time compression window, it means the game is running in 'real' time; that is, one second of game time takes one second of real world time.

You can increase time compression from 1x up to a maximum of 2048x. At this setting, in each second of real time 2048 seconds (or about 34 minutes of game time) will pass.

There are times when the simulator will reduce time compression automatically down to 1x. Usually this will happen when your sensors encounter a new contact or you are fired upon by an enemy unit.

There are also times when the simulator will limit time compression to a value lower than 2048x. When other units are in visual range time compression will be limited. This is to allow the computer to simulate nearby units with a higher level of fidelity, and to prevent unfortunate occurrences (such as collisions) from happening without giving you a chance to react.

On slower computers and with very complex missions, the simulator may limit time compression due to performance limitations. While we have made every effort to optimize SILENT HUNTER II for the most popular computer systems, it is, at heart, a complex simulation with many computations being performed at any given moment. This overhead is magnified at high time compression levels. There may be moments when your CPU will not be able to keep up with the requested level of time compression, so the simulator will reduce time compression as a means of catching up.

The Message Log

The Message Log informs you of specific events that occur during your mission and records orders that you issue. The log stores messages and events in chronological order so that you have a history of what went on during the mission.

Messages scroll on one at a time and pause for a few seconds to give you time to read them. If a lot of messages are generated, they can stack up a bit. If you like, you can expand the message log by clicking within the log window. Click within the window again to restore the default setting.

You can scroll back and forth through the message log using the arrow buttons adjacent to the log window. The **up arrow** button lets you view older log messages while the **down arrow** button takes you through the newest messages.

If you want to view the log in a more convenient form or add your own annotations to the log, the Captain's Quarters interface gives you access to a larger format logbook. See the *Captain's Quarters* section below for more details.

Sliding Control Panels

Many of the game features may be accessed via sliding control panels, which appear on the left or right side of the screen. In some cases, the functions of specific stations are duplicated on the sliding control panel as a convenience when you want to avoid switching stations.

Moving the mouse pointer to the left or right side of the screen accesses the sliding control panels. When you do this, the panel will appear after about a second. If you're running the game, try this now so you get a feel for the behavior. Keyboard shortcuts are also available for each of the sliding panel sections. Note that the sliding panels are not accessible when you have mouse view control enabled.

The panel on the left has controls specifically designed for manipulating the 3D view, while the panel on the right is a multifunction panel, which has four tabs that allow you to select the functions you want to access. The left side panel functions are contextual–they will only function at the appropriate view. These functions will be discussed in the appropriate station sections.

Note the push pin button located near the bottom of both sliding panels. Normally, when you move the mouse away from the panel, it disappears, freeing up the screen for other controls. However, if you press the push pin button, that panel is "pinned" in place and will stay up for as long as you like. You can make the panel go away again by pressing the push pin button again to deselect it.

The four tabs of the multifunction panel (the one on the right) give you access to the following functions:

Helm Control Panel – Here you can set the boat's heading, its speed and its depth. You can also manually set the rudder position and view the boat's current speed.

Torpedo Fire Control Panel – This panel allows you to fire torpedoes at the current target or to manually set up a torpedo fire solution.

Command Panel – This panel contains general commands that you may issue to your U-boat crew. Commands include:

- Blow Ballast – emergency ascent
- Crash Dive – emergency descent
- Periscope Depth – orders boat to periscope depth
- Surface – orders boat to the surface
- Rig for Silent Running – orders ahead 1/3 and lowers probability of detection by enemy units (submerged only)
- Rig for Red – orders red light condition for night operations
- Man Deck Gun – orders crew to operate deck gun (you must specify the target from the plot screen)

- Man AA Guns – orders crew to operate AA guns
- Abandon Ship – if your boat is severely damaged, you have the option of abandoning ship, you may or may not survive
- End Mission – gives you the option to quit or resume in both campaign and single mission and save in single mission only

Vessel ID Panel– This panel allows you to view all of the ships and aircraft you may encounter in the game. You can rotate each model to view it from any angle.

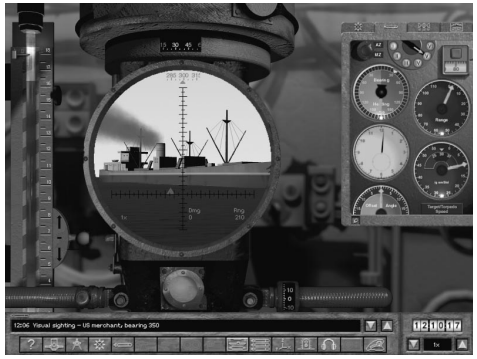
We will explain in detail the functions of each of the above panels in the following sections (for example, the helm panel is discussed in the Helm Controls section below.) As you play the game, it will become evident that the sliding panels provide convenient way to control many aspects of your U-boat.

Keyboard Equivalents:

Q	*Show the Helm Control Panel*
W	*Show the Torpedo Fire Control Panel*
E	*Show the Command Panel*
R	*Show the Vessel ID Panel*

The Periscope Station

The Periscope is the primary tool for helping set up underwater torpedo attacks in SILENT HUNTER II. You will want to get familiar with its operations before venturing forth into the deep.



The Periscope can only be operated when the submarine is at or above periscope depth, which varies somewhat between the different U-boats, but is usually about 10 to 12 meters.

*Note: The Command Panel has a button labeled **Periscope Depth**. Pressing this button will order the crew to set the boat to periscope depth. Additionally, the 'P' key will also order periscope depth.*

The Periscope gives you a 360-degree view of the area where your U-boat is located. *To use the periscope, you must first raise it.* You can raise and lower the periscope by clicking on the lever, located above the left periscope handle. You can also use the **PageUp**/**PageDown** keys to raise and lower the periscope. You can rotate the periscope view by enabling mouse view control by right clicking or by clicking on either of the periscope handles. The left handle will rotate the view left, while the right handle will rotate the view right. The periscope has two zoom magnification levels, 1X and 4X. You can toggle zoom levels by moving your cursor over the lever above and to the right of the left periscope handle or by pressing the **Z** key.

A degree indicator at the top of the periscope body shows you the current periscope rotation angle. Note that this angle is *relative* to the U-boat's current heading (where the bow is pointed). This is an important angle to note if you are setting up manual torpedo fire solutions. The red degree indicator within the periscope view glass shows you the absolute compass bearing of your current view.

You can also rotate the periscope view up and down to a limited degree. The degree indicator located next to the right handle shows the current vertical rotation. To rotate the periscope view up or down, click inside this degree indicator. Clicking in the upper half will rotate the view down, while clicking in the lower half will rotate the view up.

The Periscope is one of three stations where torpedo target selection can take place (the others being the UZO and Plot screens, which we will discuss later.) When a valid target appears in the periscope viewfinder, a flashing red triangle will appear beneath it. This indicates that the target is selected for firing and that torpedoes fired using automatic fire control will be aimed at that target.

The red button located on the periscope's left handle has a special function. Normally, if you switch to another station, or point the periscope away from the target the fire control system will not track what target you are interested in. The red button "locks" the current target, indicating that all subsequent operations should be directed against it.

When you do this, the triangle indicator will stop flashing and remain steadily on the target, no matter where you aim the periscope. To cancel target lock, just hit the red button again and the fire control system will revert to its normal behavior. When you have a target locked, the small torpedo icon at the lower right above the message box will be colored red. Pressing the **L** key will also target lock/unlock targets.

Now is a good time to discuss some of the features of the view control panel (the one on the left.) The two buttons at the top have functions relevant to (but not unique to) the Periscope.

Heading to view - Orders the crew to change the boat's heading to match the direction you are looking. This works not only in the Periscope view, but the Bridge, UZO and External views as well.

View to heading - Rotates the current view to face the U-boat's current heading, basically facing forward. It works in the Periscope, Bridge, UZO, deck and AA gun and external views too.

Padlock View - Locks your view on the currently selected target. It works in the Periscope, Bridge and UZO.

Torpedo Camera - Switches into torpedo camera view. If you have External View turned off in your realism settings, this feature will not work. While in torpedo view, it cycles through the torpedoes currently in the water.

The other buttons will be discussed in the appropriate sections.

Keyboard equivalents:

Left arrow	*Rotate periscope left*
Right arrow	*Rotate periscope right*
Up arrow	*Rotate periscope down*
Down arrow	*Rotate periscope up*
L	*Lock or unlock selected target*
H	*Heading to view*
V	*View to heading*
P	*Order crew to move to periscope depth*
T	*Lock view on current target*
X	*Toggle padlock view*
Z	*Zoom in/out*

The Plot Screen

Successful U-boat operations require precise navigation in order to reach the convoy routes and to attack targets designated by Commander U-boats.

The Plot screen provides a detailed map view of your area of operations. Depending on your realism settings, it also shows you:

- The current location of your U-boat
- The estimated locations of other units which are in range of your sensors
- Heading, speed, and damage information for other units
- Contact reports gathered by spotters, aerial reconnaissance and other U-boats
- Locations of major bases, ports and cities
- Tracking information for any torpedoes you may have fired
- Navigation waypoints you may have entered for your U-boat
- Longitude/latitude grid lines (optional)

- The Kriegsmarine coordinate grid (optional)
- Location of mission objectives

In addition, a floating window provides access to some additional features:

- A map thumbnail which allows you to quickly zero in on specific locations
- Zoom in/out buttons to allow you to magnify very small features or zoom out to show more of the map
- A grid selector to switch between the standard latitude/longitude grid, the Kriegsmarine grid, or no grid
- A center button which immediately centers the map on your U-boat

General Map Features

The chart data used in SILENT HUNTER II is based on the latest USGS and NOAA global information and is accurate down to 30 arc-seconds of resolution. This is a huge amount of information and allows us to zoom in to show very specific details of coast-line, elevation and depth information.

If you look closely at the map, you will notice that the ocean areas are rendered in a medium beige color while the land areas are rendered in a brown color. The shading also provides information. The lighter the ocean color, the shallower the water in that area and the lighter the land color, the higher the elevation.

The text area in the floating window can give you more accurate information about depth. When you move the mouse over the map display, the floating window will show you data about the location under the mouse cursor, including:

- The grid location in the Kriegsmarine grid system
- The longitude and latitude

• The depth in meters below sea level

Note that because of space limitations the amount of depth information stored in the map database is limited. Consequently, any areas of the ocean deeper than 480 meters are shown as '∞.' Since this is below the crush depth of even the Type XXI U-boat, it should never be an issue.

Getting Around the Map

One of the first things you will notice about the Plot screen is that it is impossible to display the map in its entirety, even at the highest resolution supported by SILENT HUNTER II. In addition, at times you will want to see a large area of the map (for instance, when you are planning a navigation route) and at other times, you will want to zoom in on a very small area (such as when you are planning an attack.)

Fortunately there are a lot of options for moving the map around and zooming in on areas of interest.

First, the zoom in/zoom out buttons on the floating window allow you to:


Enlarge portions of the map to view small details.


Shrink large areas of the map for the "big" picture.

A faster, more flexible technique is available. If you press and hold down the **Z** key, the cursor turns into a magnifying glass tool. Now when you left-click the mouse, the map zooms in and centers on the place you click. To zoom out, right-click the mouse in a similar fashion. You can put away the magnifying glass by releasing the **Z** key.

The **PageUp** key will increase the level of zoom, leaving the map centered where it is. Similarly, the **PageDown** key will decrease the level of zoom.

If you just want to shift the map position without zooming, press and hold down the space bar. This brings up the hand tool. Wherever you click with the hand tool, the screen will center.

If your mouse is equipped with a wheel you can use it both to zoom and shift the map center. Rotate the wheel to zoom in and out. Click on the wheel to center the map at the position under the mouse cursor.

If you have a three-button mouse, the center mouse button can still be used to center the map, though the zoom function of the wheel is unavailable.

Sometimes it can be hard to place the area you're looking at in the larger picture. The thumbnail map on the floating window can help you with this. First, it shows you the location of the place you are looking in the context of the entire Atlantic region. Second, by clicking in the thumbnail view, you can instantly shift the larger map view to that new location, allowing you to rapidly shift your viewpoint thousands of miles.


It's pretty easy to lose track of your U-boat when shifting the map view around a lot. The center button on the floating window will shift the map to focus on the current location of your U-boat.

Additional view commands are available by right clicking anywhere on the map screen. These options include:

• Center—allows multiple options for centering the map view

• Set Zoom—allows you to set the map magnification from 1X all the way to 640X

• Grid—allows you to turn on and off display of the latitude/longitude grid and Kriegsmarine grid.

If you want to know the distance from any point on the map to any other point on the map, you can use the ruler tool. To bring

up the ruler tool left-click anywhere to set an anchor point, hold down the left mouse button and drag it around. A line will be drawn from the anchor point to the current mouse position.

As you drag the mouse around, note the numbers that appear next to the mouse cursor. The top number is the distance between the two points. If the points are less than 1,000 meters apart, this number will be in meters. Otherwise, it is converted to nautical miles. The bottom number is the bearing from the first point to the current mouse position.

Global Coordinates and the *Kriegsmarine Grid*

Most navigational charts in the real world rely on standard longitude/latitude coordinates to uniquely specify any location on the planet.

SILENT HUNTER II supports the standard coordinate grid, but it also uses a special grid system developed by the Germans known as the *Kriegsmarine grid*. In fact, when you receive location information via radio messages that information will be in the form of *Kriegsmarine grid* coordinates. For this reason it will be very helpful to understand the grid system when playing the game.

Fortunately, the Plot Screen can be configured to display either longitude/latitude lines or the *Kriegsmarine grid*. The grid select button on the floating window cycles between three different modes:

1. Standard latitude/longitude coordinate grid

2. Kriegsmarine grid

3. No grid

Kriegsmarine grid coordinates take the form:

XXnp

Where XX specifies the grid area, n specifies one of 9 sectors

within that area and p specifies one of 9 sub-sectors within that sector. A typical grid area looks like this:

Note how the grid is broken down into a 3x3 group of 9 sectors, and how each of those sectors is broken down into a 3x3 group of 9 sub-sectors. If grid sector DR75 is specified in a radio report, for example, you would find area DR, look for the lower left sector (7) and note that sub-sector 5 is right in the middle.

Entering Way Points and Setting Up Patrols

Often you will want your U-boat to travel to a specific location or patrol a specific region of the ocean. This can be done very easily using waypoints.

Waypoints are map locations which represent navigation points toward which your U-boat will travel. When laid down in sequence, your crew will attempt to visit each waypoint in succession until all waypoints have been visited.

It is also possible to create a patrol "loop" where the U-boat will continue to visit every waypoint in sequence until you issue a new movement order (or run out of fuel.)

1. Creating waypoints is very easy:
2. Locate your U-boat on the map.
3. Click on the data tag for your U-boat with the left mouse button. While holding down the left mouse button, drag out a line from your U-boat to the location of the first desired waypoint.

Release the left mouse button where you want the first waypoint.

4. Now you can add subsequent waypoints by clicking on other map locations where you want the U-boat to travel. Waypoints are numbered in succession and connected by lines to show the path of intended motion.
5. When you are finished adding waypoints, click the right mouse button.

Once you have laid the last waypoint, your crew will automatically begin the process of navigating the U-boat to all the placed waypoints.

A patrol loop is only slightly more complicated. After you have placed the last waypoint, instead of pressing the right mouse button, position the mouse over the first waypoint (or any other way point you want to be the starting point for the patrol loop) and press the left mouse button. The cursor will change to the "loop" indicator when you've positioned the mouse correctly.

If you want to move your waypoints after placing them you can do so. Left-click the waypoint you want to move to select it, then drag it to a new location. You can also delete waypoints: select the waypoint you wish to delete and press the **Del** key on your keyboard.

Tactical Use of the Plot Screen

The Plot Screen is more than just a navigational tool. When other ships and aircraft are detected by your sensors or when a contact report is made, a data tag is displayed on the map representing that contact.

The shapes displayed in the data tag denote the different types of units, as follows:


Merchant ship or convoy


Warship or task group


Submarine or U-boat


Aircraft


Torpedo


Gun emplacement or other shore-based unit

The color displayed in the data tag also has significance:

- Blue denotes a friendly unit
- Red denotes an enemy unit
- Green denotes a neutral unit
- Gray denotes a unit of unknown affiliation

Note that the location of any given unit is only an estimate based on input from your U-boat's sensors. Radar and lookouts are the most accurate, while sound and radar detectors can provide only rough estimates as to range and bearing. At different times of the war, you may have different sensors on your U-boat, which gives you better or worse detection and localization of potential targets.

To help you gauge the accuracy of a target's location, a light-colored region may be drawn around the data tag. This is what we call the "uncertainty" region. This region will grow and shrink based on the age and accuracy of the sensor information acquired for that contact. What the uncertainty region is showing you is an estimate of all the possible areas that unit may be located, based on the knowledge at hand.

Each data tag may also be accompanied by a "tail"—a short line indicating the path of motion or the facing direction of the unit. Note that the facing direction is actually *opposite* the direction the tail is pointing. In other words, the tail points behind the unit. The tail is only visible when the path of motion or facing direction is known.

Depending on your chosen realism settings, when you move the mouse over a data tag, a small window appears giving you known information about that contact, including its location, heading, speed, composition and the time at which it was last detected. The info window is somewhat context-dependent and will give you slightly different information depending on the nature of the contact.

Because units may be very close together when the map is zoomed out a lot, the Plot Screen will condense groups of units into single data tags when the map view area is very large in order to keep the display from getting too cluttered up.

At the highest zoom levels the data tags are replaced by representational "top-down" drawings of each unit, giving you a more intuitive feel for relationships between different units. In this view each marine unit is accompanied by a "wake," which gives you a sense for the maneuvers that unit has been making recently. This feature is especially interesting when you have torpedoes in the water and want to track their progress towards the target.

Again depending on your realism settings you can select a target for torpedo attack by clicking on it with the mouse pointer. If selected, a red outline will be drawn on the icon. Note that some units cannot be selected for torpedo attack (land units and aircraft, in particular.) In addition, you cannot select a group, so you must be zoomed in enough to select an individual unit.

When selected in this way, the target is considered "locked," just as if you had pressed the Target Lock button on the Periscope screen or the **L** key. If you switch to the Periscope or UZO

screens, you will see this unit indicated with a red, non-blinking triangle. When you have a target locked, the small torpedo icon at the lower right above the message box will be colored red.

Since the target is locked, you can go to the Torpedo Fire Control station or panel and fire torpedoes at it.

The Helm Controls

One of the first things you will want to do with your U-boat is to travel to different places in the game world. To do this, you will need to understand the U-boat's helm controls.

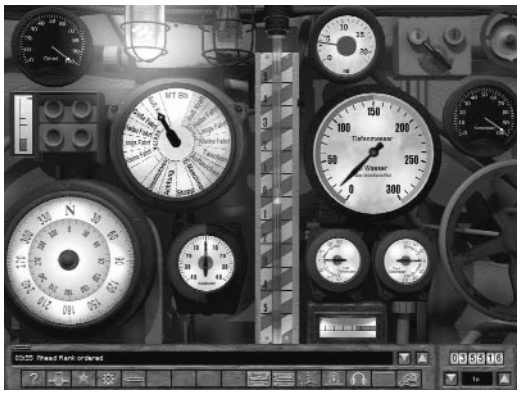
There are two ways to access the helm controls:

- The Helm and Gauges screen (accessed by hitting the helm button on the Station bar or the **F4** key.)
- The Helm control panel (accessed using the helm tab on the multifunction sliding panel or the **Q** key.)

The full Helm and Gauges screen has the following features:

1. The heading indicator/control dial.
2. The engine telegraph.
3. The rudder indicator/control dial
4. The knot meter
5. The depth indicator/control dial
6. The dive plane indicators (fore and aft)
7. The dive bubble
8. The fuel gauge
9. The diesel engine controls
10. The battery charge indicator

11. The snorkel controls (not available on all U-boats.)
12. The compressed air gauge
13. The CO_2 gauge



The Helm control panel duplicates a subset of these features:

1. The heading indicator/control dial
2. The engine telegraph
3. The rudder indicator/control dial
4. The knot meter
5. The depth indicator/control dial

The Heading Indicator/Control Dial

This circular dial tells you the U-boat's current compass heading. The current heading may be read from the top of the dial. You can also enter a new heading order by clicking on any compass heading on this dial. A red line appears when you do this, showing you the current heading order. Your crew will attempt to steer the boat to that heading. During the course of your mission, if you deviate from

the ordered heading, perhaps to investigate a contact, and want to return to your previous heading, press the **J** key.

The Engine Telegraph

This dial allows you to order a new speed setting for the U-boat. The black settings to the left are, from bottom to top, ahead slow, ahead one third, ahead standard, ahead full and ahead flank. The red settings to the right are, from bottom to top, back slow, back standard, back full and back emergency. The "Stop" setting at the bottom of the screen shuts down the engines, but does not immediately stop the U-boat's forward motion.

Note that the actual speed you get from any setting depends on several factors, including whether the boat is surfaced or submerged, whether the diesel engines or the electric motors are engaged, whether one diesel engine is charging batteries, whether any of the engines are damaged and what sea conditions currently prevail in the U-boat's area.

It is also important to note if you run your engines at high rates of speed for extended periods of time you run the risk of experiencing mechanical difficulty.

The telegraph also has several other settings besides those which allow you to set speed. The settings Tauchen (dive), Auftauchen (surface) and Achtung (attention), while historically correct, have no function in the game and are not clickable.

The settings Dieselmotoren and E-Maschinen allow you to specify which powerplant should drive the boat while surfaced.

The Rudder Indicator/Control Dial

This dial shows you the current position of your rudder, which is used to turn the U-boat. It can also be used to manually set the turning rate, something you may want to do depending on your current situation.

To set the rudder position, click on the dial for the rudder position you want. Positions to the left will turn the boat to the left, while positions to the right will turn the boat to the right. Select the 0 setting to make the U-boat go straight again.

The Knot Meter

This dial shows you how fast your U-boat is going in nautical miles per hour (knots).

The Depth Indicator/Control Dial

This dial shows you the depth of your keel (the bottom of the boat) in meters below the surface of the ocean. For this reason, the depth meter will never actually read "0" but will always read some distance below 0 (about 5 meters for a type VII U-boat.) For reference, the water depth under the keel of your boat is also shown on this gauge by the gray arrow.

When you want to submerge the U-boat, click on any depth setting you want and the crew will attempt to reach and maintain that setting. The red needle will move to indicate the new depth order.

Be warned that diving too deep may cause a structural failure due to excessive pressure. Every U-boat has what is known as its operational depth, which is shown on the Depth Indicator as the green area. Operating the U-boat below this depth will increasingly risk destroying the U-boat the deeper you go. Your crew will also warn you if you are entering shallow waters, that is, areas where depth below keel is less than 30 meters.

Large bodies of water will have layers where the temperature of the water is warmer or cooler. When you pass through a thermal layer or thermo cline, the crew will alert you to this event. Thermal layers reflect sound waves, which travel very efficiently through water, making it difficult for perusing destroyers to locate your submarine by using hydrophones or active sonar. Operating below the thermal layer can provide you with valuable cover in a combat situation.

The Dive Plane Indicators

These gauges show you the positions of your dive planes. The gauge on the left shows the position of the aft dive planes, while the one on the right shows the position of the forward dive planes. The dive planes are controlled automatically and are adjusted to make the U-boats forward motion "drive" the boat to the desired depth.

The Dive Bubble

The dive bubble rides in a tube at center screen and shows the current dive angle of the U-boat. Positions above the zero line indicate that the U-boat is oriented downward, while positions below the zero line indicate an upward attitude.

The Fuel Gauge

This shows the quantity of diesel fuel remaining in your fuel tanks. You will want to monitor your fuel consumption carefully if you are on a long voyage.

The Diesel Engine Controls

These buttons allow you to view and to change the way your diesel engines are used. The top set controls the portside diesel engine while the bottom set controls the starboard-side diesel engine. Note that these controls are only active when the U-boat is surfaced or, if the boat is equipped with a snorkel, when you are at snorkel depth.

When the red button is lit, the corresponding engine is being used to charge your batteries. If the green button is lit, then the corresponding engine is being used to propel the U-boat. If both buttons are dark, it means that the engine is currently off line.

The Battery Charge Indicator

Speaking of batteries, this gauge shows you the current battery charge state. When the boat is submerged and running on electric motors, your batteries will gradually be depleted. High speeds will deplete batteries much faster, so watch your throttle settings when traveling submerged.

Running your diesel engines is the only way to recharge batteries. Plan on staying on the surface a while since it takes a long time to fully recharge the batteries if they are very low.

The Snorkel Controls

Some U-boats are equipped with a snorkel, which allows it to run its diesel engines while submerged (albeit at a very shallow depth.) If the snorkel switch is set to the green position, the snorkel is active and you may run your diesel engines. If set to the red position, the snorkel is inactive and you must surface to run your diesels. If the U-boat dives below snorkeling depth, the snorkel will be shut off automatically. While operating with the snorkel extended, your

U-boat is limited to moving forward only, at a maximum throttle setting of ahead 1/3 regardless of depth.

The Compressed Air Gauge

U-boats use compressed air to empty the ballast tanks, generating positive buoyancy and allowing the U-boat to surface. Most of the time, compressed air usage is not an issue. However, if you overuse the "blow ballast" command to quickly bring the U-boat to the surface, you may run out, which can, in some situations, make it impossible to surface the U-boat.

Normally it takes about two hours to fully-recharge the compressed air tanks and you must be on the surface to do so.

The CO_2 Gauge

As you run submerged, the crew will consume oxygen at a steady rate. As the crew uses oxygen, their respiration replaces it with Carbon Dioxide (CO_2). Normally you have about 48 hours worth of oxygen before you need to surface. Oxygen is refreshed when the U-boat surfaces.

Helm Control Keyboard Equivalents:

[	*Left rudder in 5 degree increments*
]	*Right rudder in 5 degree increments*
ctrl-[	*Left full rudder*
ctrl-]	*Right full rudder*
'	*Rudder amidships*
~	*All stop*
1	*Ahead slow*
2	*Ahead 1/3*
3	*Ahead standard*
4	*Ahead full*

5	*Ahead flank*
6	*Back slow*
7	*Back standard*
8	*Back full*
9	*Back emergency*
P	*Set periscope depth*
D	*Set snorkeling depth*
F	*Raise/Lower Snorkel*
C	*Crash dive*
B	*Blow ballast (Emergency surface)*
S	*Surface the boat*

The Torpedo Fire Control System

In most cases, World War II torpedoes were unguided weapons that traveled in a straight line with the aid of a gyroscope for stabilization. Determining the course a torpedo must follow in order to impact with a moving target is the problem that must be solved in order to make a successful torpedo attack.

The Torpedo Fire Control screen and the Torpedo Fire Control Panel are your primary interfaces to the torpedo fire control system. In both cases, you may fire automatically at a selected target, or manually set up a fire control solution using the input gauges.

Automatic Mode

Auto mode is the default and recommended mode for most situations. To use the Angle Solver in Auto mode, make sure the "Auto" switch is set to "On".

Before you can use the Torpedo Fire Control screen you must lock a target in the Periscope, UZO or Plot Screen stations (see the Periscope, UZO and Plot Screen sections for information

about target locking.) This informs the fire control system which contact to monitor for targeting information.

The Torpedo Fire Control Panel has no such limitation since it can be viewed from any of the above stations. With the Control Panel, you can fire at any target in view which has a triangle beneath it, indicating that it is selected.

Once you have locked a target, the gauges of the Torpedo Fire Control will reflect the most up-to-date information acquired by the U-boat's sensors. The gauges show:

1. Target Position. This gauge shows both relative target bearing (also known as "angle off the bow") and the heading of the target relative to your U-boat. The outer needle shows relative bearing while the inner needle shows the target's heading. Again, both of these settings are relative to your own U-boat's position. So, if a target was both directly behind you and heading in exactly the opposite direction, then both needles would be set to '180'.
2. Offset angle chosen for the torpedo. Normally this reads "0," but you can make slight alterations in a torpedo's course by selecting a port or starboard offset using this gauge. This is useful for firing a spread of torpedoes.

3. Both the target's speed and the speed of the selected torpedo (see the Torpedo Status Screen section for details about selecting torpedo speed.)
4. Target range estimation, in hundreds of meters (hectometers). Using this scale, the dial is set to '10' when the target is 1000 meters away.
5. Aft gyro setting. This is the gyro angle chosen for aft-fired torpedoes.
6. Forward gyro setting. This is the gyro angle chosen for forward-fired torpedoes. The gyro setting is important. Early torpedoes could only be fired if the gyro setting is within ± 90 degrees. Later in the war, this was increased to ± 135 degrees. You will be warned if you attempt to fire a torpedo with a gyro setting outside this range. If this happens, your only choices are to turn the U-boat until the gyro setting falls within range or to fire torpedoes from the aft tubes (if present.)
7. The U-boat's current heading.
8. The current firing solution for the selected target. This will increase as better information is acquired for the target. It may also decrease if you lose track of the target for some reason, such as the U-boat submerging or the periscope being lowered or damaged.
9. The run time, in minutes, that will be required for this torpedo to reach the target impact point. When torpedoes are fired, a red needle appears on the same gauge for each torpedo. A red needle gradually ticks off the duration of the torpedo's run. When a red needle reaches zero, the corresponding torpedo should have impacted the target.

In addition to the gauges, there are indicator lights for each torpedo tube (up to a maximum of six tubes for type IX and type XXI U-boats.) These lights change color to indicate the status of the tube:

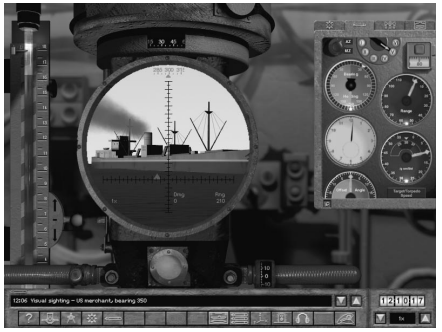
- Green indicates a tube that is loaded and ready to be fired.
- Red indicates a tube that is currently being reloaded.
- Grey indicates either that a tube is damaged or that there are no more torpedoes available to load in that tube.

Firing a torpedo is as simple as selecting a torpedo tube using the tube selector (10) and pressing the red fire button (11) adjacent to the solution gauge (8.)

Type II U-boats only have three torpedo tubes, all firing forward. For type VII and type IX U-boats, tubes I through IV fire forward and tubes V (types VII and IX) and VI (type IX only) fire aft. On the type XXI U-boats, all six torpedo tubes fire forward.

Using the Torpedo Fire Control Panel

The control panel has a significant subset of the controls available on the full Torpedo Fire Control screen and has the advantage of being very convenient to use from the Periscope or UZO screens, as illustrated below:



Though smaller, the gauges on this control panel are all duplicates of gauges on the full Torpedo Fire Control interface. Missing are the gyro angle and heading gauges. Otherwise, the control panel has all of the same functionality and may even be used to set up manual firing solutions.

An additional advantage to using the control panel is that you don't need to remember to lock the target for automatic tracking. Keep the desired target in your cross hairs so that it remains selected (i.e. the triangle is present) and the control panel will continue to track it. You can also use this technique to quickly shift between multiple targets, which can be useful for convoy encounters.

Using Auto Mode for Torpedo Attacks

Making torpedo attacks in Auto mode is mainly a matter of "point and shoot." The simplest approach is to go to the Periscope screen, line up the scope on the desired target until you see the flashing red arrow beneath it.

Bring up the sliding control panel on the right and choose the second tab, which displays the Torpedo Fire Control panel. Make sure the switch labeled **MZ/AZ** is set to **AZ**, indicating that you want to use auto mode.

Use the tube selector at the top of the screen to select the torpedo tube you wish to fire. Just click on the tube number to select that tube, the dial will indicate your selection.

There are several things to consider when selecting a torpedo tube. First, choose one whose indicator is colored green so you know that it is ready to fire.

Second, you need to be aware of the bearing to your target. If the relative target bearing is less than 90 degrees or greater than 270 (you can read this from the angle indicator at the top of the periscope) you should have no problem firing your forward torpedo tubes. However, if the angle is greater than 90 degrees and less than 270 degrees you should either:

- Choose an aft firing torpedo tube (if you have one.)
- Turn your U-boat until the target is within the forward firing arc.

The reason for this restriction is that torpedo gyroscopes can only turn through ±90 degrees. (Later in the war this increased to ±135 degrees for German torpedoes.) In general, though, the closer the torpedo tubes bear to the target, the better, since torpedo gyros are more accurate at smaller angles than larger angles.

You can fire a torpedo any time you have a valid tube selected. However, you will probably want to wait until you get fairly close to the target. With straight running torpedoes, your odds of a hit greatly improve if you can attack from less than 2000 meters. Many U-boat commanders chose to made their attacks from extremely short distances, under 600 meters.

Use the solution gauge to determine the probability of a torpedo hitting the target. If it reads less than 75%, you should probably try to get closer.

Using Manual Targeting Mode

Manual targeting should be considered by advanced players only as it involves a deeper understanding of the torpedo fire control problem.

To set up a manual firing solution, you will need several pieces of information:

Relative bearing to the target

- The target's course relative to your U-boat
- The target's speed
- The target's range

One way to get this information is by reading the best estimates of your sensors from the Plot screen. Find the object on the plot and move the mouse cursor over it to bring up the info window. Note that sometimes this information is not available because your sensors don't have an accurate fix on the target.

Relative bearing can be determined pretty easily using the Periscope or the UZO, which both provide this information for the target in your crosshairs. This assumes, of course, that you can make visual observations of the target.

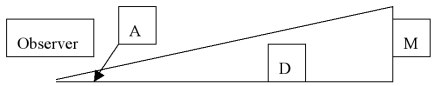
Relative heading is trickier to determine from visible observations. A good way to do this is to use the Vessel ID panel on the multifunction control panel. Select the vessel you are observing in the Vessel ID panel and then rotate it until it looks like it has the

same angle as the target you are observing. The angle shown on the Vessel ID panel will approximate the target's relative heading.

Range can be read accurately from the radar station—if you have radar. Otherwise, you will have to estimate range from your observations or by using the ruler tool on the Plot. The Periscope and UZO screens have graduated markings which can help you with this. These markings correspond to degrees of arc, .5 degrees at the normal zoom setting and .25 degrees at the highest zoom level. The ship ID panel also shows mast height information for all ships.

For you diehard manual TDC operators, here is the mast height/distance formula:

The observer point, the location of the ship and the mast height form a right triangle, thus:



Where M is the estimated mast height, A is the observed angular distance from the top of the mast to the water line and D is the distance we want to find.

From simple trigonometry, we know that:

tanA = M / D

To find D, we rearrange the equation:

D = M / tanA

The value of A can be read from the SH2 periscope or UZO. The cross hairs on these two devices have tick marks which are designed to allow you read the angle of arc subtended by any object in view (such as a ship's mast). The largest marks represent full degrees, while fractional markings are calibrated down to a degree.

The value of M can be determined from the vessel ID screen for most ships.

Remember that the results are only as good as the estimates. At low visibility and large distances it is difficult to accurately measure the value of A, and the quality of this measurement will determine the accuracy of your results.

The target's speed can also be tricky to measure. Patient observations, experience and knowledge of the vessel's capabilities will help you here. The Vessel ID control panel can give you a maximum speed for the target if you can determine the correct type of ship that you are dealing with.

Once you have all of this information, entering it into the fire control system will determine a gyro angle for your torpedoes.

Use the Target Position gauge to set up relative bearing and heading. The outer needle of this gauge indicates relative bearing. Click within the outer ring of the gauge to move the needle to the new bearing or drag the needle to the bearing you want.

Relative heading is entered in a similar manner, but this uses the inner needle of the gauge. Again, click on the angle you want or drag the needle to the angle. You will need to stay inside the outer ring to move the heading needle.

Target speed is set using the Speed gauge. Click or drag the needle to the targets estimated speed.

Target range is set in a similar fashion using the Range gauge.

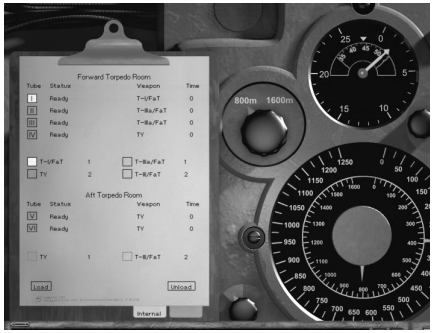
Once all of these settings are made correctly, you are ready to fire.

If you are setting up a manual solution for FaT-I pattern-running torpedoes you will also want to manually set up the pattern information. See the *Torpedo Settings* section under *The Torpedo Status Screen* below for more information about doing this.

The Torpedo Status Screen

This screen provides some additional controls and information regarding your torpedoes. It complements the Torpedo Fire Control screen and adds three primary functions:

- It shows you the load status of all of your torpedo tubes and allows you to select the type of torpedo to load in each tube, letting you choose the appropriate ordinance for different situations.
- It allows you to transfer torpedoes from the external storage to your torpedo rooms. Most type VII and type IX U-boats carry extra torpedoes in external storage compartments and these must be transferred to your torpedo rooms before they can be used.
- It allows you to set torpedo-specific settings such as speed and depth. Later war FaT-I pattern-running torpedoes had additional settings that you can manually adjust from this screen. If these torpedoes are not available, the additional gauges will not be shown.



Torpedo Load Status

The left side of the screen contains the load-out information. At the beginning of a mission each tube is loaded with one torpedo of a specific type.

The load status section may have two subsections depending on whether or not you have one or two torpedo rooms. Type VII and type IX U-boats have aft torpedo rooms, while type II and type XXI U-boats do not.

Each subsection shows the status of each of its torpedo tubes. The status includes the current load state (loaded, unloaded, empty or damaged), the type of torpedo loaded and the amount of time left to complete the current operation.

Each torpedo room stores a set of reloads for its torpedo tubes. In most cases, there is one reload per tube. The type XXI U-boat is the exception, storing 17 reloads for its six torpedo tubes.

Note that reloads are shown by type. The reload section shows the number of reloads of each available type stored in that torpedo room.

Each tube may be selected for specific operations by clicking on its number on the left side of the clipboard. You must select a specific tube before you can change its load configuration.

When a tube is selected, you can change the type of torpedo you want loaded by selecting the type from the reload section, which is shown below the tube status section. To select a different type, just click on the box next to the type you want to load.

Now the tube will be reloaded with that type, but only *after* the torpedo it currently holds has been fired. If you want to change the torpedo in the tube immediately with the new type, click the **Load** button at the bottom of the clipboard. Note that this takes longer than reloading a tube that has been fired since the crew has to remove the currently loaded torpedo. In a combat situation, it is probably better to fire whatever you have loaded than try to carry on a reload operation.

Reloading torpedo tubes can take a long time—generally about 20 minutes each, sometimes more depending on the situation. The type XXI U-boat comes with special reloading gear that reduces this time dramatically.

Sometimes a torpedo tube is damaged, but may still have a torpedo loaded. If the outer doors aren't destroyed, you may be able to unload the torpedo, allowing you to transfer it to a working tube.

To do this, select the tube and click the **Unload** button at the bottom of the clipboard.

SILENT HUNTER II models seven different types of U-boat torpedoes:

T-I (G7a.) Straight-running torpedo and the standard type for U-boats at the beginning of the war. Engine is steam-powered, which creates a telltale wake of bubbles that can be spotted by surface ships. Speed is adjustable, with three settings: Slow (30 knots) allows the maximum range of 12500 meters, Medium (40 knots) results in a range of 7500 meters, and Fast (44 knots) reduces the range to 5000 meters. Most commonly set to Medium speed.

T-II (G7e.) Straight-running torpedo of same size and warhead as T-I, but uses an electric propulsion system, which makes the torpedo completely wakeless, and also less expensive to produce. The only speed setting is 30 knots, and range is guaranteed to at least 5000 meters.

T-III (G7e.) A straight-running electric torpedo with a range of 5000 meters at 30 knots speed. Otherwise identical to the T-II, the T-III has a more reliable warhead pistol, and is introduced in late 1942.

T-I FaT-I (G7a.) A pattern-running torpedo based on the T-I, introduced at the end of 1942. 12500 meters range at 30 knots. Can run 800- or 1600-meter pattern legs in a ladder-search pattern after a pre-determined run length (see the *Torpedo Settings* section below for more information.). Best suited for use against closely-packed convoys, the FaT torpedoes are usually set to their slowest speed of 30 knots, and maximum range of 12500 meters.

T-III FaT-II (G7e.) Another pattern-running torpedo, based on the electric T-III, first used in 1943. Pattern settings are identical to the T-I FaT I. Due to short range (5000 meters at 30 knots) this torpedo is generally reserved for aft torpedo tubes and use against pursuing escorts.

T-IIIa FaT-II (G7e.) A further refinement of the FaT II, this torpedo uses a larger battery, which increases the maximum range to 7500 meters.

T-V (G7es.) An acoustically-guided torpedo based on the T-III. Introduced in late 1943 specifically to counter Allied escorts. Range is 5700 meters at 24 knots. Acoustic seeker will attempt to acquire a target but a fairly loud signal is required. The seeker is not completely reliable and poses a risk of targeting the U-boat that fires it. Standard procedure after firing is to either submerge to a safe depth or to move away from the torpedo on the surface.

For more torpedo information, refer to the U-Boat and Weapon Data section later in this manual.

External Torpedo Stores

A U-boat that has extra torpedoes stowed externally will have a pair of tabs at the bottom of the clipboard marked **Internal** and **External**. When you select **External**, the Load Status section switches to external mode.

The layout is similar to internal mode but the torpedo tube status is replaced by a reload list for each torpedo room. If there is room for more torpedoes in the torpedo room, the list will contain entries marked "Available." You cannot remove torpedoes from a torpedo room except by firing them, so careful consideration should be given to the types of torpedoes you want to use (assuming you have a choice) before transferring from external storage.

The bottom section represents your external storage. Each entry in this list shows a specific type of torpedo and the number currently located in external storage. Each entry is also accompanied by two buttons labeled **Fwd** and **Aft**. To transfer a torpedoof a specific type to the other location , click on either the **Fwd** button to transfer to the forward torpedo room or the **Aft** button to transfer to the aft torpedo room.

When you initiate a transfer, an "Available" slot in one of the torpedo room lists will change to show the new torpedo type and will give you an estimate of the time required until the operation is complete.

There is also a check box next to each of these entries which allows you to select them one at a time. You can cancel each reload request individually by selecting it, then pressing the **Cancel** button located at the bottom of the clipboard.

One other thing: external torpedoes can only be accessed when the U-boat is surfaced! You can submerge if you need to, but any pending reloads from external storage will be cancelled regardless of how much progress has been made. We recommend breaking contact with any enemy units in the area and waiting until night to do this if you can.

Torpedo Settings

All torpedoes presented in SILENT HUNTER II have certain settings that may be adjusted for more effective performance. The right side of the Torpedo Status Screen is dedicated to adjusting these settings.

Note the **AZ/MZ** switch located in the upper-right corner of this screen. This allows you to select automatic (AZ) or manual (MZ) torpedo settings. In AZ mode, the computer will determine settings based on its knowledge of the target and the type of torpedo being fired. This is the default mode and can be used to "point and shoot" any torpedo.

In fact, if you are happy with the computer's settings there is little need to adjust them here. However, if you want to experiment with the effects of different settings, you may do so by selecting manual mode. Also, if you are setting up manual firing solutions for pattern-running torpedoes, you will probably want to set up the pattern settings manually as well.

Before you can adjust a torpedo's settings, you must select the torpedo tube which contains the torpedo you want to set up. Click on the tube number at the left side of the clipboard to select a torpedo tube, just as you would if you were going to change the tube load-out. Once a tube is selected, the adjustment controls available for that torpedo type are enabled.

All torpedoes have a run depth that can be adjusted using the depth dial at the top of the screen. click on the depth you want or drag the needle until it reads at the depth you want the torpedo to run at.

Generally, you want to set the run depth fairly deeply on the target—especially if the target is a warship with an anti-torpedo armor belt. Targets with shallow drafts, like escorts will require a more shallow setting.

You can also set the depth deeper if, for example, you want the torpedo to run under any intervening escorts but still hit a merchant ship in a convoy.

Note that valid setting on the gauge are still limited by the depth-keeping mechanism on the torpedo. On most torpedoes during the war, this depth was 15m

The T-I torpedoes also have three speed settings. When the selected tube holds a T-I, the speed selector will be available. Higher speeds generally result in more accurate fire since there is less time for the torpedo to get pulled off track by currents and less deflection caused by gyro setting errors. Remember, though, that high speeds generally mean reduced range. You will want to take this into account when adjusting torpedo speed.

FaT-I torpedoes have some additional settings that allow you to adjust the search pattern. When you select a tube with a FaT-I torpedo, the additional controls are displayed. They are:

Initial run length. The large outer dial on the FaT-I control allows you to set this length. The search pattern commences once the torpedo has reached this distance from the firing position. Generally, you should set this at least a few hundred meters beyond the target distance so that the target falls well within the search pattern.

Initial turn direction. The search pattern is a "ladder" at a right angle to the initial run direction. For this reason, FaT torpedoes are best fired from directly abeam the target. This control determines the direction the search pattern will take. Set this based on the relative movement of the target. If the target is moving left to right with respect to your U-boat, set the initial turn to starboard. If the target is moving right to left, set the initial turn to port.

Search leg length. This allows you to determine the length of each "rung" of the "ladder." This can be set to either 800 or 1600 meters. The smaller value will result in a faster search and should be used where the target has a fairly high speed (more than about 4 knots.) When the target is slower, use the larger value.

The UZO Station

Like the Periscope, the UZO (Uboot Zieloptik) station's primary purpose is to enable torpedo attacks. Located on the bridge, the UZO is only available while the U-boat is surfaced. Thus, it is most often used in low light conditions.

The UZO provides a highly magnified view which allows you to accurately read the relative bearing to any target and to observe details at great distances. The view is also stabilized so you can easily observe distant objects even in rough seas.

You can rotate the UZO view using the mouse view control. right click to enable mouse view and move the mouse left or right to rotate the view. You can also elevate or depress the view angle slightly to make it easier to see objects on the horizon. The arrow keys can also be used to change your view angle.

Note the circular degree scale at the base of the UZO instrument. This gives you the relative bearing to the target, or the "angle off the bow." This can be used for manual torpedo firing solutions. Depending on your realism settings, the range to the current target will be shown in the lower right section of the UZO.

When a target is within the UZO viewfinder, target selection and locking may be performed in a manner similar to the Periscope.

To reiterate, a flashing triangle beneath the target indicates that it is selected for torpedo firing. You can use the Torpedo Fire Control panel in auto mode to attack the target. You can also lock a target so that it remains selected when you switch stations. Hit the **L** key on your keyboard to do this. Pressing **L** again unlocks the target.

Keyboard Equivalents:

Left Arrow	*Rotate left*
Right Arrow	*Rotate right*
Up Arrow	*Elevate*
Down Arrow	*Depress*
L	*Target lock/unlock*
X	*Toggle padlock view*

The Bridge Station

The Bridge is primarily a lookout station, allowing you to observe the world as a watch officer aboard a real U-boat would have done. The Bridge is only accessible when your U-boat is on the surface.

The bridge view is accompanied by degree indicators located at the top and right sides of the screen. The indicator at the top gives you the true compass heading of the direction you are looking. The indicator at the right gives you the vertical angle from the horizon of the direction you are looking. These degree indicators are also available on the UZO, Deck Gun, Machine Gun and External View stations.

The bridge view can be rotated left or right by enabling mouse view control or using the keyboard arrow keys. You can also toggle binocular view by pressing the **Z** key.

Some of the left side view control panel options are especially handy here:

Heading to view: this button orders the crew to change the boat's heading to match the direction you are looking

View to heading: this button rotates the current view to face the U-boat's current heading.

Toggle compass heading indicator on or off

Toggle elevation angle indicator on or off

Keyboard equivalents:

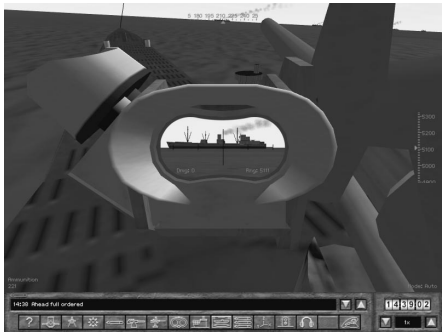
Left arrow	*Rotate view left*
Right arrow	*Rotate view right*
Up arrow	*Rotate view down*
Down arrow	*Rotate view up*
H	*Heading to view*
V	*View to heading*
Z	*Toggle binocular view*

The Deck Gun

Type VII and type IX U-boats came equipped with an 88mm or 105mm deck gun, designed as an auxiliary weapon. Since a U-boat is both more fragile and more lightly gunned than almost any conceivable adversary, it's a good idea to pick targets that aren't able to shoot back!

The deck gun can be fired autonomously by your crew by using the **Man Deck Gun** command, located on the Command Control Panel, which is the third tab on the multifunction (right) sliding control panel.

The deck gun can also be operated in first person mode when you go to the deck gun station.



The deck gun can be rotated using the mouse by pressing the left and right arrow keys on your keyboard. To fire at a target, center it in your crosshairs until the flashing red arrow appears, indicating selection of the target. You have the option of adjusting the range setting. By default, the deck gun is always in automatic mode. To change modes, click on the word **Auto** at the lower right so that it changes to **Manual**.

Once you have the target lined up, press the space bar to fire the deck gun. After the gun is fired, the gun crew will take some time to reload. The message "Reloading" will be displayed while this is occurring.

If you miss, you will see a shell splash showing where your shot landed. When operating in manual range finding mode, if you are consistently over- or under-shooting your target, you can adjust for range. Use the up and down arrow keys to do this. The up arrow key decreases range while the down arrow key increases range.

Note the sliding scale on the right side of the viewfinder. This indicates the amount of range adjustment you've applied. Generally, once you dial in the range correctly you'll be able to hit the target consistently several times in a row.

As naval guns go, the deck guns on a U-boat are rather small, so it may take a lot of shots to sink a target. For this reason, the deck gun is probably best used to issue the *coup de grace* on a ship that has already been severely damaged by torpedoes.

Keyboard Equivalents:

Left Arrow	*Rotate gun left*
Right Arrow	*Rotate gun right*
Up Arrow	*Decrease range setting*
Down Arrow	*Increase range setting*
Space Bar	*Fire the gun*

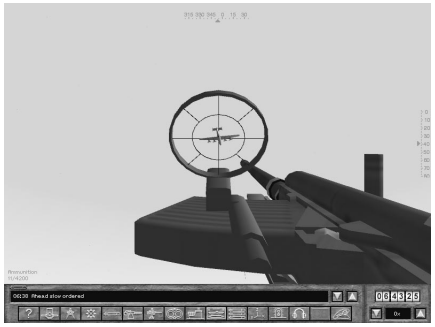
The Machine Guns

Among the many perils faced by U-boat crews, aircraft were among the most deadly. For this reason, all U-boats were equipped with one or more anti-aircraft machine guns.

Machine guns may be fired automatically by issuing the Man AA Guns order, located on the Command Control Panel.

You can also operate a machine gun manually by going to the machine gun station.

The machine gun is best controlled using the mouse. When you are at the machine gun, click the right mouse button to begin operating it. Now when you move the mouse, the machine gun will track your movements. This allows very precise aiming control. The machine guns can also be controlled with the arrow keys.



To fire the machine gun, press the left mouse button when you have the target lined up. Depending on your realism settings, the red target indicator will help you pick up your targets and the target range and damage state will be indicated on screen.

Note that machine gun bullets are influenced by gravity and will tend to drop over long ranges. You will probably need to aim high in order to hit the target. Also, aircraft tend to move pretty fast, so you will need to lead the target by aiming ahead of its flight path.

To make this easier, the machine gun ammunition includes tracer rounds that show you the exact path your bullets are taking.

Note that the machine gun will fire for as long as you hold down the left mouse button. Eventually, however, the gun will run out of ammunition and will need to be reloaded. When this happens, the message **Reloading** will be displayed until the gun has been reloaded.

When you want to leave the machine gun station, hit the right mouse button again to relinquish control of the machine gun.

The type IX and type XXI U-boats have multiple machine guns, any of which you can operate yourself. To cycle among multiple guns, use the < and > keys, to zoom the crosshair view, press the **Z** key.

Keyboard Equivalents:

>	*Next machine gun*
<	*Previous machine gun*
Z	*Toggle zoom view*
Space Bar	*Fire the gun*

The External View

The External View gives you a seagull's-eye view of the action, allowing you to watch your U-boat as it follows your orders.

The External View camera is attached to the U-boat and follows it as it moves across the ocean. You can control the view direction by toggling free mouse view. The left and right arrow keys can perform the same function. You can also change the view elevation by using the up and down arrow keys.

Like some of the other stations, the external view is accompanied by heading and elevation indicators at the top and right sides of the screen respectively.

The camera will automatically shift to a more favorable position if the U-boat submerges or surfaces so that your vessel is always in view.

In addition, you can move the view to other ships that are within visual range of your U-boat, but not to ships which are outside of visual range. The following buttons on the View Control Panel allow you to change the view target:

Change view to next ship.

Change view to previous ship.

Return view to your U-boat.

Keyboard Equivalents:

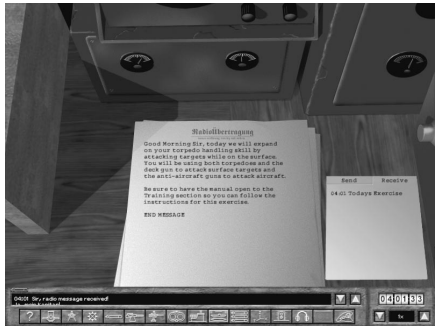
>	*View next ship*
<	*View previous ship*
/	*Return to U-boat*

The Radio Room

The primary function of the Radio Room is to view incoming radio messages and send information back to base.

You will often receive radio messages while on a mission. Some of these will be special orders from headquarters (or BdU), while others will be simple contact reports. Missions in which you are participating in a wolf pack will generate a fair amount of radio traffic.

When a radio message is received, a notification is shown in the message log at the bottom of the screen and a crewmember will announce the receipt of a new message. When this happens you should go to the radio room at your earliest opportunity.



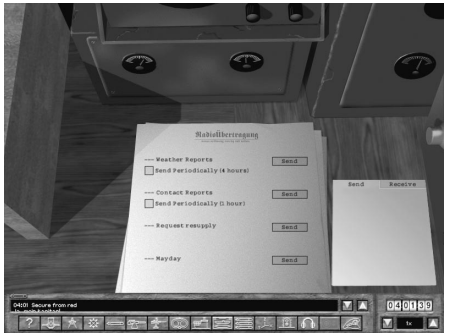
The most recent message will be displayed on a large piece of paper near center screen. To the right, a small pad of paper holds

the list of all previous messages. You can view any message by clicking on its heading within this list.

Note that radio messages may only be received while the U-boat is surfaced. If you are forced to remain submerged for a long time, you may miss out on tactically useful updates.

To send radio messages, left click on the send button on the pad of paper located at the right hand side of the screen. In later war scenarios, beware that in sending radio messages there is the possibility of triggering detection by enemy units using high frequency radio direction-finding equipment (or HF/DF).

There are four types of radio messages that can be sent; weather reports, contact reports, resupply requests and mayday.



Weather reports U-boats were routinely tasked with providing weather information for headquarters. Sending weather reports may often be included as secondary mission objectives. You also have the option of automating this process somewhat by specifying a weather report be transmitted every four hours.

Contact reports When operating in a Wolfpack, the first boat to spot enemy units was tasked with shadowing the enemy and sending positional reports until the Wolfpack was in a position to attack. Once the attack began, the U-boat sending contact reports

was relieved of shadow duty and free to attack. Sending contact reports may often be included as a secondary mission objective. You also have the option of specifying a contact report be transmitted every hour.

Resupply requests If you become low on diesel fuel or munitions, a resupply request may trigger the appearance of a supply ship or 'milk cow' with which you may rendezvous. To initiate resupply operations, pull alongside the resupply ship or U-boat, this will automatically initiate the transfer of fuel and munitions.

Mayday This will request a rescue operation, which will have some small chance of succeeding. It is meant as a last-ditch attempt to salvage a mission scenario if you have taken too much damage to return to base. Mayday requests will only have a chance of success and you must have broken contact with enemy units and be on the surface.

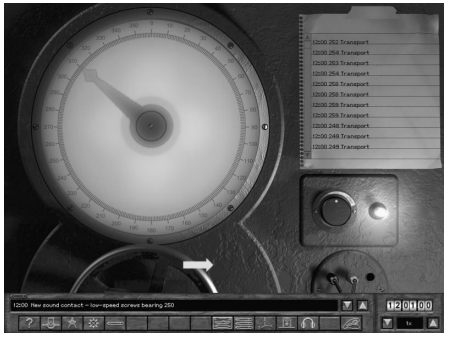
The Sound Station

The Sound Station provides access to the U-boat's hydrophones, which could be used to listen for ships and other submarines.

The primary advantage of the hydrophones is stealth. Unlike radar or active sonar, hydrophones are essentially passive, so there are no betraying emissions that could be detected by the enemy. Additionally, hydrophones do not leave the telltale wake left by a periscope.

The disadvantage is that sound can only be used to determine bearing (not range) to the target, and that bearing isn't always very accurate. Thus, the sound sensors, while good at detection, cannot by themselves generate a target solution for torpedo fire (although acoustically-guided torpedoes like the T-V can be fired blind if necessary with some chance of hitting the target.)

Normally, the Sound Station is automatically manned by one of your crewmen and sound contacts can be seen plotted on the Plot screen. However, you can go to the sound station yourself and operate the hydrophone gear manually.



When activated, the main dial will light up and your audio mode will change to let you hear what the hydrophones are picking up, as if you had put on the sound operators headphones.

The wheel at the bottom of the screen allows you to control the rotation of the sound head, essentially controlling the bearing at which you are listening. Click on the wheel and drag the mouse left or right to turn the wheel.

Notice that the large needle on the main dial will turn with the wheel. You can modulate the speed at which the dial turns by how far you drag the mouse left or right.

As you turn the sound head, the sounds you hear will change because the hydrophones are highly directional. The sound of ship propellers and engines can be heard faintly at long distances and will gradually increase as you get closer to the source. A large convoy can generate a cacophony of sound which can be heard at long range.

It's fairly easy to distinguish merchant ships from warships in SILENT HUNTER II. Warships have high-speed screws which are

louder and beat the water faster than merchant ships, which tend to operate at lower RPMs. Submarines are also pretty distinctive, but much more elusive. If you can hear another sub, chances are they can hear you too.

Notice that when you rotate the sound head near 180 degrees that you lose the audio signal. This is because U-boat hydrophones are not designed to listen behind the boat, and really couldn't hear anything anyway because of the noise of your own engines.

Note also that the sound system becomes much less effective when the U-boat is surfaced or if its diesel engines are running. Surface noise drowns out any meaningful signals and, of course, the diesel engines are too noisy to make listening possible.

Tactical note: It's a good idea to periodically submerge the U-boat, even when no enemy is in sight. This allows your sound operator to spend some time listening for contacts. You just might catch an enemy convoy this way.

The signal pad to the right of the main dial records the sound contacts as you make them and updates their bearings whenever you have the specific contact within the sound pickup. These contacts are also shown on the Plot screen.

Keyboard Equivalents:

Left Arrow	*Rotate sound head counterclockwise*
Right Arrow	*Rotate sound head clockwise*

The Radar Station

Radar appeared comparatively late in the war for U-boats, but was eventually installed in most operational boats by the end of the war.

SILENT HUNTER II models the FuMo-30 radar set, which appears around mid-1942.

The FuMo-30 has a range of about 7,500 meters against surface ships and up to 15,000 meters against aircraft.

Normally, the radar operator handles the radar set and the contacts generated by radar are shown on the Plot screen. By default, the radar is on and will activate automatically whenever the U-boat is surfaced. Note that radar cannot be used when the U-boat is submerged.

Tactical note: You will be notified by your crew when the radar is activated or deactivated when the U-boat surfaces or submerges so that you will always know when it is active.

You can turn the radar system off using the power switch located below the radar scope. When you do this the radar will stay off until you turn it back on again.

Tactical Note: While the effectiveness of your radar is degraded by adverse weather conditions, it is not hampered as much as your lookouts are. In poor weather or at night, radar can be a critical edge for the side that possesses it.

The scope gives you a graphical representation of the radar signal, though it's quite different from what you would find on a modern-day radar set.

Note the green line that runs vertically down the scope. This is the signal trace. The trace is relatively flat unless a radar echo is returned. When this happens, a spike appears in the signal. The width of the spike tells you the signal strength. You can use this to get a rough measure of the size of your contact.

The vertical position of the spike tells you the approximate range to the target. This range scale is logarithmic, thus closer ranges are represented with more resolution than longer ranges.

Speaking of range, the radar set has two range settings that basically change the scale at which the signal is plotted. The switch at the top right is used to set the radar range scale. The left setting is 4.5 km while the right setting is 15 km. At 4.5 km, the highest range which can be read on the scope is 4.5 kilometers, or 4,500 meters. 15 km corresponds to a maximum range of 15 kilometers or 15,000 meters.

Note that the scale markings on the scope are different on the left side than on the right side. The left side is the 4,500 meter scale while the right side is calibrated to 15,000. It's important to note the range setting when reading the distance to the target. If you read the wrong scale, you might get taken by surprise by an Allied bomber which is much closer than you thought it was!

You can also read the range off the digital readout next to the power switch. Note, however, that if you have multiple radar contacts this will only show the range to the nearest contact.

You're probably wondering how to determine the bearing to the target. The digital readout just below the large knob on the right shows the position of the radar antenna while it is sweeping around.

While the radar is continually sweeping, signal traces are somewhat transient. A spike will only appear for a contact when the radar antenna is pointed at that target. It can be difficult to read the bearing while the radar is sweeping.

This is where the **Sweep/Focus** button comes in. When you want to read the bearing accurately, you can stop the radar sweep by setting Focus mode using this switch.

In Focus mode, you have manual control of the direction the antenna is pointing. The large knob just above the bearing indicator is used for this purpose. click on this knob with the mouse cursor and drag up and down with the mouse. This will rotate the knob, and consequently the radar antenna, clockwise or counter-clockwise.

While you are rotating, watch for the spike on the radar scope. When the spike reaches its maximum width, the radar antenna will be pointed right at the target. You can then read the bearing from the bearing indicator.

Tactical Note: It is best to put the radar back into sweep mode when you are finished so that it can effectively scan the horizon for contacts.

The Damage Control Station

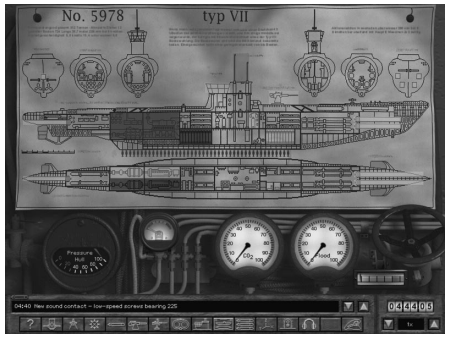
U-boats are relatively fragile craft for fighting vessels and cannot take very much punishment. However, when you do take damage, rest assured that your crew will do its utmost to repair the boat. After all, their lives depend upon it.

The Damage Control station has two primary functions:

- To show you at a glance which systems have taken damage and their current condition.
- To allow you to set repair priorities for various systems.

The top part of the Damage Control screen is taken up by a blueprint of your current U-boat. The status of each individual system is shown on this blueprint. If all is well the blueprint will be empty. When a system is damaged, it will be highlighted using a color-coded indicator to show its status. The colors mean the following:

- Green – okay
- Yellow – damaged
- Red – inoperable
- Black – destroyed and beyond repair



Normally, systems that are green aren't highlighted. However, if you press and hold down the space bar you can see all systems highlighted regardless of damage state. This can be handy if you want to get a feel for the layout of your U-boat and the positions of all the different systems. You can read which system each highlight represents by moving the mouse over the highlight. A tool-tip indicator will appear telling you what system you are looking at.

- Systems which may be damaged include:
- Diesel engines
- Electric motors

- Air compressor
- Rudder
- Dive planes
- Batteries
- Radio
- Radar
- Sound equipment
- Radar detectors
- Torpedo tubes
- Periscope
- Snorkel
- Deck gun
- Machine guns

Any system may be repaired so long as its status is not destroyed. A destroyed system may not be fixed until the U-boat is returned to port. Obviously, if your engines are destroyed, you may not be returning to port.

Also note that systems which are inoperable will need to be repaired before they can be used.

When systems are damaged, repair resources are allocated evenly to all damaged systems. However, you may want to give higher priority to some systems than to others—engines and dive planes, for example.

To do this, click on the highlight corresponding to that system. This will bring up the priority repair pad and place that system at the highest priority. The pad shows you the top five systems currently being worked on. Systems you place on the pad get the lion's share of your repair resources with the number one system

getting the most attention. You can move a system already on the pad to the top spot just by clicking on it. Note that, diesel engine repair will not be conducted if you are running above one-third speed.

It is important to note that if your boat is on fire or flooding, these items are automatically given highest priority. If you wish to change the priority of a list item, left click the item to move it to the top of the list. You can also right click an item to remove from the list.

If you want to get rid of the pad, just click the right mouse button and it will go away.

The gauges at the bottom of the Damage Control screen provide additional information about the state of your U-boat. Taken from left to right they are:

The pressure hull damage state As stated before, your U-boat is a fairly fragile vessel. Damage to the pressure hull can mount up quickly—especially if you are taking incoming shells on the surface. When pressure hull integrity reaches 0%, your U-boat is considered destroyed and you lose the mission.

Fire level This gauge indicates the severity of fires on board your U-Boat.

The current CO2 level Normally the amount of carbon dioxide in the boat's atmosphere remains at a safe level while the U-boat is on the surface or snorkeling. However, if your U-boat remains submerged for many hours, CO2 levels can reach unsafe levels. If the boat's atmosphere becomes unbreathable, the entire crew (including you) will die.

The current flood level This gauge shows the total amount of cumulative amount of water than has entered the boat's hull from flooding. Flooding will cause additional damage to the boat's hull, affect buoyancy when submerged, and impact the U-boat's handling when on the surface. After damage control efforts are

successful, water is slowly pumped out of the ship, returning this gauge to zero.

Flood rate A leaking hull can quickly become fatal to a U-boat. This gauge shows you the rate that water is entering the hull of your U-boat. When the boat is flooding, damage control efforts by your crew will gradually reduce the flooding rate until it reaches zero.

Additionally, crew casualties are tracked. You will notice the individual crewmember icons located on the blueprint in a row between the U-boat profiles. Once a crewmember is incapacitated, the icon will turn red. Losing crewmembers will affect torpedo reload times as well as damage control efforts. Additionally, certain deleterious changes to the U-boat's atmosphere (including CO2 buildup and chlorine gas leaks) can kill the entire crew, while leaving the boat otherwise unscathed.

Tactical Note: If you can't control the flooding or if your U-boat is hopelessly damaged, it is best to surface and issue the "Abandon Ship" command. If you do this without enemy units present, you have a chance to survive and continue the campaign.

The Captain's Quarters

The Captain's Quarters screen provides access to two useful informational functions:

- The Calendar
- The Log

The Calendar may be accessed by clicking on the calendar image located near the center of the screen. This will display a standard calendar showing the current month with all of the days prior to the current date marked off. In addition, the phases of the moon are shown and running your mouse cursor over any day will show times for sunrise, sunset, moonrise and moonset.

You can get rid of the Calendar again by clicking anywhere with the mouse.

The log gives you expanded access to the U-boat log, shown in smaller format at the bottom of every station. The log records a myriad of events and orders that you issue, including the time at which the event or order occurred. You bring up the log by clicking on the logbook located underneath the calendar.

Over the course of a long mission, the log can grow to encompass many pages. The arrow buttons at the top of the log screen take you forward or backward through the log pages.

You can also add annotations to the log, allowing you to embellish your log with your own insights or make handy notes that you can use later for reference.

To make an annotation, click on the line *before* which you want the annotation to appear. A small arrow indicator will show you the line that is currently selected. Click in the text entry area at the bottom of the logbook and begin typing. Click the **Ins** button to insert your entry into the log. Log annotations are printed in blue so they can be easily distinguished from normal messages.

You can also delete an annotation. select the annotation entry to select it and hit the **Del** button in the lower right corner. Don't worry about deleting normal messages; you can't.

To return to the Captain's Quarters screen, just click on the area at the top of the log screen.

The log is saved in a text file (*.txt) when you quit the program, so you can edit it later or share it with a friend. Log files are stored in the **Logs** folder located inside the folder where SILENT HUNTER II was installed. Note that a new log file is created every time you play a mission, so this folder can get cluttered over a long period of time.

Training Missions

This section contains a series of tutorial "walk-throughs" that will help you get started playing Silent Hunter II. Even experienced players of the original Silent Hunter should consider at least skimming this section for important details. If you're new to Silent Hunter or submarine simulations in general, you've come to the right place.

The tutorial is broken down into three sections, each with a corresponding mission:

- Training Mission 1: Interface, Helm and Navigation
- Training Mission 2: Torpedo Attacks
- Training Mission 3: Guns and Surface Attacks

The training sections are designed to be read while playing the training missions. We recommend that you take the time to do this because it will quickly reinforce the techniques we will discuss. Subsequent tutorial sections build on skills learned in previous tutorials, so it is important to go through these sections in order.

To access the training missions, Select **Single Mission** from the Main Menu, and then select **Start A New Mission** from the Single Mission Menu. Now select one of the three training missions from the list on the right and click **Play** at the lower-right corner of the screen.

We highly suggest playing these missions with low realism settings for ease of use.

Training Mission 1: Interface, Helm and Navigation

This first mission will teach you the basics of the U-boat command interface. Successfully commanding a U-boat requires an intimate familiarity with the equipment and its capabilities. There are several action stations aboard this Type II U-boat and we will examine them as you proceed through the training missions.

Note: we assume at this point that you are running the simulation and that you have loaded Training Mission 1. You should see a view from the UZO station and the game should be paused. Note that the pause dialogue can be moved around the screen by left clicking on the dialogue and dragging to the desired location.

Accessing U-Boat Stations

Notice the row of buttons at the bottom of the screen. This is the Station Bar. There are 16 buttons here, each of which takes you to a different station on the U-boat when clicked on.

At first it's not always obvious what each button does. You can move your mouse cursor over the button and wait for a "tool tips" message to appear. This will tell you the station at which you are pointing. To access a different station, click the left mouse button while the cursor is positioned over the corresponding button.

You can also access a station using the row of function keys at the top of your keyboard. While the "tool tips" messages will show you the corresponding function key for each station, the following table may be useful:Taken from left to right, the stations are:


F1: Help Screen


F2: The Periscope


F3: The Plot Screen


F4: The Helm Controls and Gauges


F5: The Torpedo Fire Control System


F6: The Deck Gun (not available on the typ II)


F7: The Machine Guns


F8: The UZO Station


F9: The Bridge


F10: The Damage Control Station


F11: The Torpedo Status Screen


F12: The External Camera View


Print Screen: The Radio Room


Scroll Lock: The Sound Station


Pause/Break: The Radar Station


NumLock: The Captain's Quarters

Note that some of the stations may be disabled. Sometimes stations are inaccessible, especially if the U-boat is submerged. These stations may be enabled when the U-boat surfaces again. Note that this U-boat does not have a radar set or a deck gun, so these stations will not be enabled during this training mission.

Take a moment to visit each station. It's important to get familiar with the layout of the command interface so that you can quickly reach important stations.

Using the Time Controls

Right now the simulation is paused. In the pause state, no time will pass in the game. This can be handy when you want to take a breather or if you need to walk away from the game for a while..

The small section in the lower right corner of the screen contains the time controls. The 0x in the black area is the current time compression setting. 0x means that the game is paused. To enable the passage of time, click on the **up arrow** button next to the time compression setting. This will increase time compression to 1x, which means that game time is passing normally. When the game is paused, a pause dialog will appear.

Each time you click on the **up arrow** button the time compression rate will double. In this case, clicking again will bring time compression up to 2x, meaning that for every second of real time, 2 seconds of game time will pass. The maximum time compression rate is 2048x or about 34 minutes of game time for each second of real time.

You can also use the **-** and = keys to adjust time compression, as well as the **-** and + keys on the numeric keypad, if your keyboard is so equipped. In either case, pressing **-** will reduce time compression and hitting = or + will increase time compression.

Now press the **backspace** key on your keyboard. Note that time compression is at 0x and the game is once again paused. You can think of this as the 'panic' button in case events in the game come to seem overwhelming.

If you're new to this type of simulation game, you may be wondering what this time compression stuff is all about. It has been said that combat consists of long periods of boredom punctuated by brief moments of sheer terror. Time compression allows you to speed through periods of relative inactivity, such as when you are moving at high speed to get into a position to intercept a convoy.

Take a moment to practice using the time compression controls.

Your crew will alert when radio messages are received. Pause the game when you are ready to read on.

Reading Radio Messages

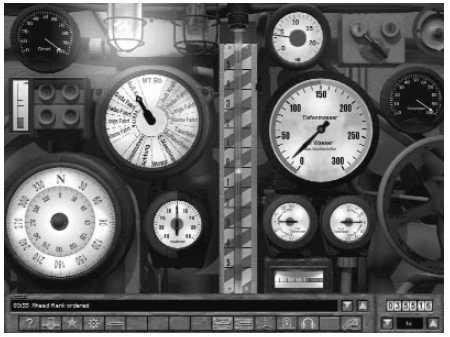
Occasionally you will receive messages from headquarters that contain new orders or sighting reports. You will want to read these at your earliest opportunity since they may affect the outcome of your mission.

Soon after the start of this training mission you will receive a radio message, lets read it. To do so, first go to the radio room by pressing the corresponding button on the Station Bar, or by pressing the **Print Screen** key on your keyboard.

Note that all messages received during the current mission are displayed in a list to the right of the current message. This allows you to review past messages at any time during the mission. You can review any message just by clicking on its title with the left mouse button. For now, there should be at least one message in the list. You will also notice that there is a send tab on the message pad. In certain missions you will be required to periodically send radio messages. You can call for resupply or send a mayday. These last two send options are conditional and may not always result in the desired outcome!

You will receive a second radio message, a movement order and in the next few sections we will learn how to maneuver the U-boat to comply with this order.

Basic Helm Controls



There are two basic ways to maneuver your U-boat to a desired destination. In this section, we will discuss how to do this manually by controlling the speed and rudder settings of the U-boat.

First, set time compression to 1x so that time passes normally in the game.

Next, bring up the Helm and Gauges Screen by clicking the appropriate button in the Station Bar or by pressing the **F4** key on your keyboard.

At first this station may seem a bit overwhelming, but given time you'll be able to tell at a glance the status of your U-boat with surprisingly little effort.

Engine and directional controls are on the left side of the screen. At the lower left corner of the screen is the Compass, which shows the direction your U-boat is heading.

Above and to the right of this is the Engine Telegraph. You will use this to issue speed orders to the engine crew.

Now click on the left side of the Engine Telegraph on the word "Halbe Fahrt" (which in German means literally, "half speed.") Be sure not to click on the red-lettered version of this on the right

side of the Engine Telegraph. The red-lettered settings indicate reverse movement, now we're interested in going forward.

Note that the Chief of the Boat acknowledges your order, as are many other orders entered in this way. Also, note that you should hear the engines running now.

The round gauge at top right is your knot meter, which tells you how fast you are moving in knots, or nautical miles per hour. You should see the needle on this gauge gradually creep up to around seven knots.

The settings above "Halbe Fahrt" increase the U-boat's speed while those below decrease it. At the fastest setting a Type II U-boat will move at about eleven knots, while at the lowest setting it will creep forward at less than two knots. Try a few different settings to get a feel for the speed at each setting. When you are finished, set "Halbe Fahrt" again and wait for the speed to settle at approximately seven knots.

Now we're going to show you how to bring your U-boat quickly to a stop. Press on the red-lettered version of "Halbe Fahrt" located on the right side of the Engine Telegraph. This will put your engines in reverse and will quickly slow the U-boat. You may need to do this in an emergency to avoid collisions.

If you leave the engines running in reverse, you will eventually begin to move backwards. Note that the knot meter will continue to show the speed but doesn't indicate moving backwards.

Set your engines for forward motion again and, when the knot meter reads zero, click on the word "Stop" at the bottom of the engine telegraph. Your U-boat should now be stopped.

Let's continue. Set your engines for forward motion again and we'll show you how to maneuver.

It is also important to note if you run your engines at high rates of speed for extended periods of time you run a greater risk of experiencing mechanical difficulty.

The Compass at the lower left corner of the screen is actually more than it seems. Right now the heading should read somewhere close to 180 degrees. We're now going to show you how to turn to a different heading.

Move the mouse over the 90-degree mark on the outer ring of the compass and click the left mouse button. Note that the Chief of the Boat acknowledges your order and begins the process of turning to the new heading. A red needle appears on the compass ring indicating the most recent course change order.

Observe the rotation of the compass. It takes several seconds to turn a U-boat through 90 degrees, a fact you should note carefully. Although U-boats are among the most maneuverable of fighting vessels, careful planning is still required to execute some maneuvers.

While you were observing the compass, you may have noticed some movement of the Rudder gauge, which is located just to the right of the Compass. This gauge indicates the current position of your rudder. It also gives you manual control of the rudder position, allowing you to take control of the U-boat steering mechanism.

Move your mouse cursor over the 20-degree mark on the left side of the Rudder gauge and then click the left mouse button. Note the speed at which your U-boat is turning. Now click on the left 40-degree mark. This is the fastest your U-boat will ever turn, something you should always be aware of.

Wait for the compass to come around to the 90-degree mark again, then click on the 0 mark on the Rudder gauge. You should be back on a course of 90 degrees again.

You can also use the keyboard to control the rudder. The **[** and **]** keys move the rudder in five-degree increments left and right respectively.

If you want to go immediately to left full rudder or right full rudder, hold down the **Ctrl** key while simultaneously pressing **[** or **]**. This can be handy if you need to turn quickly.

You can also set the rudder immediately back to the '0' position by pressing the **'** key.

Experiment with the rudder controls so you get a feel for the U-boat's maneuverability. When you are finished, return to a course of 90 degrees.

Basic Navigation

By now you may be wondering where you are. Let's go to the Plot screen and find out. Click the button on the Station Bar for the Plot screen or hit the **F3** key on your keyboard.

At the beginning of the mission, your U-boat was located just outside the U-boat base at Wilhelmshaven. The base is located on a bay that lets out into the North Sea west of Denmark. We are going to show you how to navigate your U-boat out into the North Sea and beyond.

Initially the map will be zoomed out to show a large part of Northern Europe. We are most interested in the area centered on Wilhelmshaven in Northern Germany.

Not coincidentally, the icon representing your U-boat is located in this area and should be visible on the map. Let's zoom in on that area.

There are several ways to move and zoom the map. The simplest is using the Zoom option. Press and hold down the **Z** key on your keyboard. The cursor will change to a magnifying glass. Move it over your U-boat and click the left mouse button. This will zoom in on your U-boat's location. You can zoom out using the right mouse button.

If you have a wheel mouse, you can rotate the wheel to zoom in and out as well.

Read on after you have centered your view on your U-boat and set the zoom level to 160x or better.

If you've been following along with the training text your U-boat will be heading east now. North of your position you should see an icon which looks like 4 diamonds arranged in a cross shape. If you can't see it, you may need to move the map until the icon becomes visible.

The easiest way to do this is using the move tool. Hold down the space bar and click the right mouse button on the location where you want the map to be centered. If you have a wheel mouse or a three-button mouse, you can just click the wheel or the middle mouse button to center the map.

The icon is an Objective Point. Some missions require you to navigate to specific locations to carry out certain operations. The Objective Point is a visual guide to the location you need to reach.

You can manually steer a course for the objective point, but there is a better way.

Click on the icon which represents your U-boat with the left mouse button but don't release the mouse button. Move the mouse until a line appears between your U-boat and the mouse cursor. This is the Way Point line. The cursor should also change to a cross to indicate that you are using the Way Point tool.

Now, while still holding down the left mouse button, move the mouse cursor until it is over the Objective Point, and then release the mouse button.

You've just created your first waypoint. However, your U-boat won't change course just yet because the Way Point tool is still active. You can add additional waypoints by positioning the mouse at a new location and clicking the left mouse button.

Let's add another waypoint. Move the mouse well north of the Objective Point and click the left mouse button. A new waypoint indicator labeled '2' should be visible now, with a line drawn from the previous waypoint.

Now we'll complete the Way Point order. Just click the right mouse button to finish. Your U-boat will then steer a course towards the first waypoint.

When you finished entering the Way Point order, if any part of your course intersected land, you will need to adjust your course to avoid running aground. This may entail the addition of one or more new waypoints to steer around land.

Zoom in on the Objective Point icon as close as you can. Note that the Way Point you placed may not be perfectly centered over the objective point. You can make fine adjustments to the Way Point.

First, left-click on the Way Point icon to select it. A square outline will surround the Way Point when it is selected. Now left-click again on the Way Point icon and, while holding the left mouse button down, move the mouse. The Way Point icon should track your mouse movements. Move the mouse cursor dead center over the Objective Point and release the mouse button.

You can use this technique at any time to fine-tune the position of a waypoint. This is important for reaching Objective Points since you will have to approach the position very closely to get credit for the objective.

This is a good time to increase time compression as it will take you a while to get through these waypoints at 1x.

Your First Watch Officer will notify you when your U-boat reaches the Objective Point, and will also inform you that the Way Point was reached also. When the U-boat reaches a Way Point, it will automatically steer towards the next Way Point. Once it reaches the last of a set of Way Points, the U-boat will just continue moving on its last course until you give it new orders.

Let your U-boat reach the last Way Point before continuing to the next part of this Training Mission. Pause the game and read the next section.

Using the Helm Control Panel

So far we have been doing all of our maneuvering without a good view of the outside world. While this is useful as a training exercise, it pays to have a good idea of what's going on around your boat when issuing movement orders—especially when maneuvering in tight situations. We're now going to teach you how to operate the helm controls from any station on the ship.

First, set time compression back to 1x if you haven't already done so. A quick way to do this is by pressing the \ key on your keyboard. You can also use any of the other time compression controls previously discussed.

Now let's go to the bridge. Click on the Bridge button on the Station Bar or press the **F9** key on your keyboard.

That's better! From the Bridge you can see everything around your U-boat. To rotate the view, move the mouse cursor into your field of view and click the right mouse button. Now the camera is slaved to your mouse. Just move the mouse left and right to rotate the view left and right. You can also look up and down by moving the mouse up and down. Move the mouse until you are looking forward again, then click the right mouse button to release the mouse view control. Your mouse cursor should reappear. Remember, you can also use the keyboard arrow keys to change your view.

Note the red-colored gauge at the top of the screen. This shows you the compass heading along the direction you are looking. You will see this gauge on various other stations. It will be very useful to know the direction you are looking when you are operating your U-boat against enemy shipping.

Now let's bring up the Helm Control Panel. Move the mouse to the right edge of the screen about halfway down. The Control Panel should appear.

Normally the Control Panel will disappear when you move the mouse away from it. The "Push Pin" button at the lower right corner of the Control Panel allows you to "pin" the Control Panel in place. Let's do that now. Left-click on the "Push Pin" button. Now the Control Panel will stay open as long as you want it to.

Make sure the Helm/Gauges tab is selected (this is the left-most of the tabs running across the top of the Control Panel.) If it isn't, move the cursor over the Helm/Gauges tab and click the left mouse button.

Your keyboard provides quick alternative to using the mouse to bring up the Control Panel. If you press the **Q** key, the Helm/Gauges Control Panel will appear and will be pinned in place as well. Pressing **Q** repeatedly will make the Helm/Gauges Control Panel appear and disappear, allowing you to make a quick change and then get rid of the Control Panel when you're finished.

Note that the gauges and controls displayed here look just like those on the Helm and Gauges Station. In fact, they work just the same way. Right now you should be steering a course near 0 degrees, which is dead North.

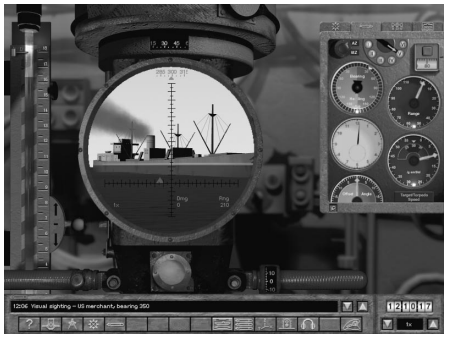
Use the Compass on the Control Panel to steer a course of exactly 0 degrees. Recall that to order a course change you left-click in the outer ring of the Compass.

Alternatively, you can manually steer to 0 degrees using the rudder control in the upper left corner of the Control Panel, or by using the **[** and **]** keys on your keyboard.

Spend some time getting familiar with the Helm Control Panel. Most of the time you will find it more convenient than going to the Helm and Gauges screen.

Diving and Surfacing

The U-boat's chief tactical strength is its stealthy nature. To take advantage of this, however, you will need to learn how to pilot the U-boat underwater, how to dive and how to surface. More importantly, you will need to learn the U-boat's limitations when operating submerged. This section will help teach you these skills.



Access the periscope by clicking on its button in the Station Bar, or by pressing the **F2** key on your keyboard. Initially, the periscope is lowered, raise the periscope by pressing the **PageUp** key or by clicking the lever described below.

The Periscope can be rotated by clicking the left mouse button on the left or right handles located at the bottom of the screen. Clicking the left handle will rotate left while clicking the right handle will rotate right. You can also rotate the view up and down by clicking in the view angle gauge located in the right periscope handle.

Alternatively, the left, right, up and down arrows on your keyboard can be used to rotate the view. Incidentally, this also works at the bridge and UZO stations.

Like the Bridge view, the Periscope can be rotated more easily using the mouse. Click the right mouse button to slave the view to

the mouse. Now moving the mouse left, right, up or down will rotate the view accordingly.

The periscope view can also be zoomed to 4X magnification. To toggle this setting, press the **Z** key on your keyboard or activate the small lever directly above the left periscope handle.

The black gauge at the top of the Periscope is the Horizontal View Angle Gauge and shows the angle at which you have rotated the view relative to the U-boat's current heading. Thus, angle '0' always faces the front, or *bow* of the U-boat while angle '180' always faces the rear, or *stern* of the U-boat. In addition, angle '90' always faces directly right, or *starboard*, and angle '270' always faces directly left, or *port*.

Being aware of the direction you are looking is extremely important to using the Periscope effectively, and you will need to learn how to do this to become proficient at guiding the U-boat while submerged.

Now let's submerge the U-boat. The gauge labeled "Tiefenmesser" on the left side of the Control Panel just below the Rudder Control Gauge is the Depth Gauge and it shows you the current depth of your U-boat, which should read something a bit above '0'.

This gauge also allows you to submerge the boat. Move the mouse cursor over the first green mark above '0' on the Depth Gauge and click the left mouse button. This will set a depth for the U-boat of about 10 meters. *Do not* attempt to set a deeper depth than this. The waters in this part of the North Sea are very shallow and you will probably run aground if you do so, which may damage your pressure hull.

Alternatively, you can press the **P** key on your keyboard to set periscope depth, which is about 12 meters for a type II U-boat.

Note that it takes a while to dive a U-boat. It is important to get a feel for how long this takes because it may be a matter of life and death to get the U-boat submerged in a combat situation.

Even though you are at or close to periscope depth, the periscope lens may not be above the water. Since it isn't very useful under water, you will need to know how to move the periscope up and down.

The lever located above the left Periscope handle is used to move the Periscope up and down. Position the mouse cursor above the handle then click and hold the left mouse button to move the Periscope up. You can also move the Periscope down by positioning the mouse cursor below the handle and performing the same action.

Alternatively, you can use the **Page Up** key on your keyboard to move the periscope up and the **Page Down** key to move it down.

In any case, move the periscope up until you can see what's going on above the water.

Note the red-colored gauge at the top of the periscope view. Just as in the bridge view, this is a Compass Gauge showing you the direction in which you are looking. Right now it should read close to the same angle as the Horizontal View Angle Gauge.

Rotate the periscope view until the green compass gauge is reading 90 degrees. We're going to show you a quick and easy short cut for steering the U-boat.

There is another Control Panel, this time, on the left edge of the screen. Move the mouse cursor to the left side of the screen about half way down. The left Control Panel should appear.

This Control Panel has several buttons that control the current view settings. The button at the top is the one in which we are most interested. This is the **Heading to View** button. Move the mouse cursor over this button and click the left mouse button.

What you have just done is order the crew to steer a course in the direction in which you are looking. As an alternative, you can use the **H** key on your keyboard to issue the same order. Incidentally, this will work in every station with an external view.

Once the boat has settled on the new course, we'll surface. To do so, go to the gauge screen or pull out the helm control panel by pressing the **Q** key. Position the mouse over the '0' mark on the depth gauge at either the helm control panel or helm station and click the left mouse button. Alternatively, you can press the **S** key at any time to order the crew to surface the boat.

End of Training Mission 1

Congratulations, you have completed your first training assignment! Only one thing remains to complete this mission: you must return to base.

If you wish to navigate back to the port at Wilhelmshaven, we leave that as an exercise for you to complete. When you get within range of the base, the mission will end.

If you're anxious to move on, there is an alternative.

Bring up the Command Control Panel by selecting its tab on the right Control Panel (third from the left) or by pressing the **E** key.

Near the bottom of the Command Control Panel is a command button labeled, **End Mission**. Press this button in order to exit the scenario. The mission will end immediately. It is important to note that this command checks several variables to determine if you can actually make it back to base. Once you issue this command, the game checks your current damage state, fuel level, proximity to any enemy units and distance to the nearest friendly base. If you cannot make it back to base, your crew will let you know why, at that point you should seriously consider transmitting a 'Mayday' radio message.

Training Mission 2: Torpedo Attacks

This training mission is designed to teach you the basics of making a torpedo attack. Torpedoes are the primary weapons of a U-boat, so you will want to pay special attention to this section.

Note: we assume at this point that you are running the simulation and that you have loaded Training Mission 2. You should see a view from the UZO station and the game should be paused.

Making the Approach

The first consideration for a successful torpedo attack is your ability to close to within optimum firing range of the target—about 2000 meters or less for early war torpedoes. Since this mission takes place in daylight conditions with good visibility, you will have to approach the target submerged in order to avoid giving away your presence.

Remember that submarines are designed for stealthy attacks. Although the targets in this mission are unarmed, most of your opponents will be escorted or even armed in their own right. In addition, early detection of your presence might allow the enemy to take evasive action, rendering your torpedo attack largely ineffective. Thus the importance of remaining undetected.

Let's see what's out there. Press the + key on your keyboard to set time compression to '1x' or click **Ok** on the pause dialogue. After a few seconds, your crew should report a contact to your North.

Aim your view to the North (0 degrees) and look for the ships. After a few more seconds you should see a blinking red arrow indicating the presence of a potential target.

The enemy convoy consists of three ships in a column moving west at about eight knots. Note that as you rotate the UZO left and right the blinking target arrow will switch to the ship that is closest to the center of your view. This is how you select a target for your weapons.

Your torpedo officer will track the target marked with the blinking red arrow. As the target is tracked, a firing solution will be developed. We'll talk more about this a bit later.

The estimated range to the selected target will also be displayed if you go to the periscope view. In this case, range should be 10,000 to 12,000 meters. Although in theory the T-I steam-powered torpedo can reach this far, the likelihood of a hit at this range is vanishingly small. You will have to get closer before firing your weapons if you expect to have any chance of sinking these ships.

The problem now is how best to make the approach. In order to make this a more challenging learning exercise, we have placed your ship in a moderately tricky position. You could submerge now and try to approach the targets straight on, but at your best submerged speed the lead ships will probably leave you behind. Since we don't want to be satisfied with killing only one of these ships, you will have to improve your position before making the attack.

The best position to attack from is on the "beam" (to the side) of and ahead of the convoy. In this way, the targets will be heading somewhat towards your position and you will be able to launch your torpedoes directly at their flanks where they will both have the best chance of hitting and where they will do a lot of damage. Because ships are narrow targets relative to their length, you don't usually want to fire at a ship that's moving towards you or away from you if you can avoid it.

Our first step will be to try and get ahead of the convoy. Set your speed to "Ahead Flank" by pressing the **5** key or by selecting *Auß Kraft* using the Engine Telegraph control on the Sliding Helm Control Panel or the Helm and Gauges screen.

Now turn to a course of 270 degrees. Recall that the compass control on the Helm/Gauges screen and control panel allow you to select a course for your U-boat. You can also steer this course manually using the rudder control. If you don't remember how to do this, refer back to Training Mission 1.

Even at flank speed it will take you a while to get ahead of the merchant ships. At best your Type II U-boat will only go 11 or 12

knots in this sea, while the convoy is moving at about 8. Also, remaining at flank speed for a long period of time is hard on your engines. If you keep it up for too long, you may have an engine failure.

You can use time compression to speed things up at this point. Set it to 16x or 32x if you'd like. After about an hour and a half (12:30 on the chronometer) at this speed you should be far enough ahead of the convoy to attempt to engage them. Reduce time compression to 1x so that things happen at a manageable rate for a time.

Now submerge your U-boat to periscope depth by hitting the **P** key on your keyboard. Extend the periscope by pressing the **Page Up** key or clicking the periscope extension lever so you can still see the convoy.

Once the boat has submerged, steer to a course of 315 degrees. Reduce speed to standard (*Halbe Fahrt*) to conserve battery power. At this point, you should be in a good position to intercept the convoy. Note that you may lose visual contact with the ships. Don't worry. If they continue on their course (and they will) you should see them again fairly soon.

We will close the distance to the lead ship first and fire when we are within 2000 meters. This may take a while, so again you may want to use time compression to speed up the process. When you get within 2000 meters of the lead ship, set time compression to 0x and read on.

Making the Attack

Attacking with torpedoes can be as simple as selecting the target with the periscope and pressing the fire button. In this case, the Torpedo Fire Control system will be used in automatic mode. While it is possible to use the Torpedo Fire Control panel and screen in manual mode, we'll leave that for advanced players.

Open the Torpedo Fire Control panel by pressing the **W** key or by moving the mouse to the right side of the screen until the control panel appears and then clicking the Torpedo tab (second from the left) on the control panel. If you do not use the keyboard shortcut to activate the torpedo control panel, use the "push-pin" button to pin the control panel in place.

At the top of the control panel you will see the torpedo selector dial. Since this is a Type II U-boat, there are only three positions on the dial, corresponding to torpedo tubes I, II and III. All of these tubes fire forward. That is, these tubes can only hit a target located within ±90 degrees of the U-boat's bow (front.) Thus, your U-boat should be facing the target (more or less) in order to hit it with the forward tubes.

Some U-boats (the type VII and type IX) have aft firing tubes. These tubes can only be fired at targets within ±90 degrees of the U-boat's stern (back.) To use these tubes you would want your U-boat to be facing away from the target in order to hit it.

Since we only have three torpedo tubes in our type II U-boat, we will fire one torpedo at each of the three ships in the convoy.

To the right of the Tube Selection dial is the solution gauge. This represents the quality of the targeting solution for the selected target. Set time compression to 1x, if you have not already done so. Now line up the lead ship in the periscope until the blinking arrow appears.

When the target is selected, the dials on the Torpedo Fire Control Panel will reflect the known data about the target. The most important of these dials are the Range and Bearing dials. Range repeats the known range as displayed in the Periscope view.

The Bearing dial is more interesting. The outer needle shows the *relative* bearing from your U-boat to the target. When this needle is between –90 and +90 degrees then the target may be attacked with your forward-firing torpedo tubes. The inner needle is the direction (or heading) that the target ship is making *relative* to

your U-boat. Ideally this needle should be between 45 and 135 degrees in either direction for a successful torpedo attack, indicating that the target is moving across your course rather than towards you or away from you.

If you have achieved the above conditions then you are ready to fire. If not, steer more towards the lead ship. This should give you better conditions for firing.

With the lead ship selected in the periscope, the solution gauge should now read close to 100%. If it does, go ahead and fire. The red button above the solution gauge will fire the selected torpedo tube. Press it now, or hit the **Enter** or **Return** key on your keyboard to fire the torpedo.

It will take about two minutes for that torpedo to impact the lead ship. While we're waiting, let's fire the remaining torpedoes at the other two ships. Rotate the periscope towards the next ship in the convoy until it is selected. When the solution gauge gets close to 100%, fire the next torpedo.

For the last torpedo we're going to do something a little different. Rotate the periscope towards the last ship. When you have it selected, click the red button on the left periscope handle or hit the **L** key. This will lock the selected target. Now when you rotate the periscope, that target will remain selected. You can undo this at any time by clicking the red button or **L** key again, but let's not do that just now.

With the last ship locked, bring up the Torpedo Fire Control Screen by pressing **F5** or by clicking the fifth button from the left on the Station Selection Bar at the bottom of the screen. Close the Torpedo Fire Control panel by clicking on the "push-pin" button or by pressing the **W** key. This will allow you to view the full Torpedo Fire Control screen.

Set time compression to 0x so that you have some time to read the following before things start happening.

Tracking Torpedoes

Take a look at the torpedo timer, located on the left side of the torpedo control panel or the lower right corner of the Torpedo Fire Control screen.

For each torpedo you have in transit, you will see a red needle on the timer. These needles move in a counterclockwise direction as the torpedo progresses through the water. If the torpedo is on target, it should impact when the red needle reaches the '12' on the dial. Chances are, if the red needle goes past the '12' without an impact occurring, the torpedo will have missed its target.

You should also take note of the "Spread Angle" dial. This is repeated at the bottom of the Torpedo Fire Control panel. This dial allows you to alter the course of a torpedo by an angle left or right of its base course. This is used to fire a "spread" of torpedoes at a high value target in order to increase the probability of a hit. To use this, left-click on the desired angle before firing the torpedo.

Now let's fire the last torpedo from the main Torpedo Fire Control Screen. If you locked the target properly in the periscope view, all of the torpedo fire control settings should reflect the data known about that target.

Set time compression back to 1x. The solution gauge to the right should indicate close to 100%. If so, press the red button above it to fire the last torpedo. A new red needle will appear on the torpedo timer, indicating the impact time for the newly fired torpedo.

By now tracking needle for your first torpedo should be close to the '12', if the torpedo has not impacted the target already. If it is indeed close to impacting, you may want to go to the periscope view to watch the fireworks.

You can also track torpedoes on the Plot screen. You can go there by pressing the **F3** button on your keyboard or by clicking the third button from the left on the Station bar at the bottom of the screen.

If you do so, use the right-click menu to center the map on the battle area, then zoom in using the **Page Up** key (or by rotating the mouse wheel if you have one) until you can see the individual ships and their wakes.

Torpedoes that you fire appear on the plot at their current estimated locations. This can be very useful if you're learning about torpedo fire control since you can see the course that the torpedo must take in order to impact the target. Clearly the torpedo must lead the target by a certain angle because the target is moving. The computation of this course angle is the central element of the torpedo fire control problem.

In Auto mode, the Torpedo Fire Control system computes this angle for you without your intervention. In this mode, the system acquires target information from the Plot and automatically computes a firing solution.

In manual mode, many of the dials of the Torpedo Fire Control Screen and control panel become input controls that you must set correctly to develop an accurate firing solution. A discussion of manual mode is beyond the scope of this tutorial. If you are interested, see the section titled *Using Manual Targeting Mode* in the *Torpedo Fire Control System* section earlier in this manual.

Torpedo Reloading

By now, if you have left time compression at 1x, most of your torpedoes will either have impacted or missed their targets. If all of them hit, congratulations! If not, you may want to make a second run at those targets which got away.

Unfortunately, it takes time to reload torpedo tubes—about twenty to thirty minutes. If this convoy had been escorted, they would be unlikely to allow you the time to reload, but would be overhead immediately pounding you with depth charges.

Let's go to the Torpedo Status Screen and check on our reloads. Press the **F11** key or click the Torpedo Status button on the Station Bar.

The clipboard on the left side of the screen shows the status of all of the tubes in the Forward Torpedo Room. If this U-boat had an Aft Torpedo Room, those tubes would be shown as well.

For each tube you can see its current status, the type of torpedo being loaded (or already loaded) and the amount of time until the load operation is finished.

The first tube will probably have a status of "Loading" while the others will have a status of "Empty." The time column shows the number of minutes until the tube is loaded. Note that it will be more than an hour before the last tube is loaded!

The type of torpedo is something you should note carefully. Initially your tubes will be loaded with T-I torpedoes. However, your reloads will all be T-III torpedoes. The differences are significant.

The T-I torpedoes are steam powered, are faster and have better range than the T-III torpedoes. However, the steam torpedoes leave a visible wake which may be backtracked to the firing U-boat. The electric torpedoes don't have this problem, being wakeless, but suffer from more limited range and speed.

The choice of torpedoes is largely a matter of what you have on hand, and more especially what you have in your tubes. Since it takes a long time to change torpedo loads, you're better off using what you have loaded. If you have a long time to prepare before a battle, you can use this screen to change torpedo loadouts. For detailed information about doing this, see the section titled *The Torpedo Status Screen*.

While we're here, let's look at some of the other features of this screen, which are dedicated to changing settings on the torpedoes themselves.

The switch in the upper right corner controls whether torpedo settings are applied automatically or may be changed manually by the commander. For now, switch to Manual (**MZ**) mode so that you can try out some of the settings.

The rotating switch on the right side midway down controls torpedo speed. Electric torpedoes have only one speed (30 knots) but steam torpedoes have three: slow, medium and fast (30, 40 and 44 knots respectively.) The selected torpedo speed is shown on the dial just to the left of the Auto mode switch. The inner dial shows the selected speed.

The outer dial shows the selected depth for the torpedo, in meters. You can change the depth by clicking on any of the numbers along the outside of the dial.

Why would you want to do this? Different ships have different drafts (the distance which the hull extends under the water.) In general, cargo ships and large warships have fairly deep drafts—five to ten meters or more—while escort ships usually have drafts of less than five meters.

A torpedo which hits lower will have a better chance of doing catastrophic damage to the target, causing it to take on water faster than its crews can pump it out. By default, the automatic torpedo settings attempt to pick a depth low on the target, but you can set this up manually yourself if you wish.

By the way, if you want to know the draft of a target, use the Vessel ID control panel (the fourth tab on the control panel, or you can use the **R** key to bring it up.) Find the ship using the panel's menus and you will see its draft among the information presented.

Taking Out the Stragglers

If any of the ships from the convoy got away, you might want to try your hand at running them down. They may be moving faster than you can under water, so you'll probably have to surface to get ahead of them again.

As an exercise, we recommend distancing yourself from the convoy before surfacing. Set a course that angles north or south of the convoy and surface when you get 10,000 meters or more away. At this range you should be able to see them with little chance of them spotting you. Use your diesel engines to get ahead of them again and repeat the approach procedures outlined above. By the time you do get ahead, your torpedo tubes should have been fully reloaded.

End of Training Mission 2

Congratulations! You should now have all of the basic techniques you need to get started in your battles against Allied shipping. However, there is still a lot to learn. We recommend spending some time reading the reference sections, especially those under *Commanding the U-Boat*, and most particularly the *Torpedo Fire Control* section. After all, knowledge is your most important weapon.

Training Mission 3: Guns and Surface Torpedo Attacks

This section discusses secondary U-boat armaments, the deck gun and anti-aircraft guns, as well as the strategy for making torpedo attacks while surfaced. You will first disable a merchant ship with

a torpedo while running surfaced and then finish it off with the deck gun. Once you have completed this task, you will have the opportunity to practice shooting down enemy aircraft.

Note: we assume at this point that you are running the simulation and that you have loaded Training Mission 3. You should see a view from the UZO and the game should be paused.

Surface Torpedo Attacks

Attacking with torpedoes while surfaced was the preferred method of attack for most all U-boat commanders. The increase in visibility and situational awareness allows greater flexibility in setting up an attack. The low silhouette of a surfaced U-boat made it almost impossible to spot, particularly at night, especially when there was little or no moon. Attacking while on the surface also allowed the U-boat to utilize its diesel engines for greater speed and maneuverability.

Training mission 2 taught you the intricacies of the torpedo computer and the torpedo status screen. Those skills translate directly to this training mission. In fact, the only real difference between a surface torpedo shot and a submerged one is the optics used for targeting. The UZO provides a highly magnified view which allows you to accurately read the relative bearing to any target and to observe details at great distances. The view is also stabilized so you can easily observe distant objects even in rough seas.

You can rotate the UZO view using the mouse view control. Right click to enable mouse view and move the mouse left or right to rotate the view. You can also elevate or depress the view angle slightly to make it easier to see objects on the horizon. The arrow keys can also be used to change your view angle.

Note the circular degree scale at the base of the UZO instrument. This gives you the relative bearing to the target, or the "angle off Depending on your realism settings, the range to the current target will be shown in the lower right section of the UZO.

When a target is within the UZO viewfinder, target selection and locking may be performed in a manner similar to the Periscope.

To reiterate, a flashing triangle beneath the target indicates that it is selected for torpedo firing. You can use the Torpedo Fire Control panel in auto mode to attack the target. You can also lock a target so that it remains selected when you switch stations. Press the **L** key on your keyboard to do this. Pressing **L** again unlocks the target.

Increase the time compression to 1X by clicking on **Ok** or by using any of the other time control options, your crew will soon report a contact. Pan your view to see three oil tankers in column formation moving westward at about 4 knots.

Using the sliding panel or the helm controls, set your speed to "Ahead Flank" by pressing the **5** key or by selecting *Auß Kraft* using the Engine Telegraph control on the Sliding Helm Control Panel or the Helm and Gauges screen. Set a course of 340 degrees to intercept the convoy.

Notice the position of the rising sun. It is important to always attack from a position where the light source is behind the enemy. That way the enemy ships are silhouetted on the horizon and most easily targeted. We have some time before the sun will be fully up, so we will use this chance to surprise the convoy.

Switch to the bridge view (**F9**) and Take a moment to orient yourself to the layout of the bridge and have a look around. Scan the horizon for your contacts. You can toggle binocular view by hitting the **Z** key.

Go to the UZO screen (**F8**), using the mouse or keyboard controls, center your view on the lead ship. As you come to within 3000 meters of the first ship in the convoy, reduce your speed, a red flashing triangle will indicate this ship is currently targeted. Notice the range estimation at the lower right, at 3000 meters, this ship is still outside of range for a solid shot. Notice the graduated markings beneath the UZO optics. This indicates the relative

bearing of your target, the indicator at the top of the screen shows you the absolute bearing of the target.

Once you are within favorable range (under 2000 meters) and position, launch one torpedo at the lead ship. At your discretion, fire on the remaining ships in the convoy. You may want to leave one ship undamaged and attack it with the deck gun to get a feel for the number of shells needed to sink a ship with that weapon. You are now ready to move on to the next section of this training mission. Set the time compression to 0X so you can read the introduction to the deck gun.

Deck gun

The deck gun was used primarily to sink enemy ships which had been disabled by torpedoes. The number of torpedoes that a U-boat could carry was limited, so commanders would often use this tactic to save torpedoes and extend their patrols. Some U-boat commanders, most notably Reinhard Hardegen, achieved a great deal of success using the deck gun.

The deck gun can be operated in manual or automatic mode. By default, the deck gun is set to automatic mode. To switch between modes, click on the word **auto** at the lower right. It will switch to **manual** indicating that you have engaged manual mode. In manual mode, you are responsible for making adjustments to the deck gun range setting. Changing the range setting is discussed below.

Set the time compression to 1X and switch to the deck gun station (**F6**). Note that you have to use the arrow keys on the keyboard to control the deck gun. This is due to the fact that the gun has a limited traversal speed. Center the disabled merchant in your crosshairs until the flashing red arrow appears, indicating target selection. Once you have the merchant lined up, press the space bar to fire the deck gun. After the gun is fired, the gun crew will take some time to reload. The message **Reloading** will be displayed while this is occurring.

If you miss, you will see a shell splash either in front of or behind the merchant. If you are hitting consistently on one side or another, you can adjust for range. To adjust the range setting, press the **up or down arrows** (to increase or decrease range). The sliding scale on the right side of the viewfinder indicates the amount of range adjustment you've applied. Once you dial in the range correctly, your shells should hit the target consistently.

Continue firing until you are comfortable with the operation of the deck gun. If you did not sink all three ships, you may want to try sinking one using the deck gun alone, but beware, it may take a few shells! This is due to the fact that Silent Hunter II physics modeling is highly detailed. A ship may take many hits and be mortally damaged, but still take time to sink. This is because the game is calculating flooding rates relative to the damage inflicted. If you have the 'Limited Target Data difficulty setting off, this makes it even more challenging because you will not get a 'target destroyed' message. When you are done, set the time compression to 0X so you can read the introduction to the anti-aircraft guns.

AA guns

As the war progressed, the single greatest threat to U-boats was the increasing presence of allied aircraft. Equipped with radar, these aircraft could locate a surfaced U-boat at great distances, at night, and in poor visibility conditions. The presence of aircraft prohibited U-boats from performing the critical task of recharging their batteries. Aircraft would also generally mean that enemy warships were not far behind.

Increase time compression and proceed to the reach objective (covered in training mission 1) noted on your tactical plot. The objective point is a ways away, so you may need to run time compression up to one of the higher settings. As you near the reach objective, your crew will warn you of enemy aircraft in the area. These aircraft are flying in a loop pattern that will enable you to try firing at them from several different angles.

From the bridge view, scan the skies for the allied aircraft, using the binocular view will help to locate your target. Once you have acquired the target, switch to the machine gun station (**F7**). Click your right mouse button to gain mouse view control of the weapon. Depending on your realism settings, the red target indicator will help you pick up your targets and the target range and damage state will be indicated on screen.

A group of three aircraft will be approaching your U-boat from the port (left) side. Remember that aircraft will be moving at a very high rate of speed so it is important to lead your target. Line up the lead aircraft in your sights, and adjust your aim so that it is slightly ahead of the aircraft in your sights. Fire a short burst by pressing the left mouse button. Use the tracer rounds your weapon is firing to help you adjust your aim. You can also press the Z key to toggle zoom mode to make it easier to track your target.

After prolonged firing, the AA gun will need to be reloaded, the message **Reloading** will be displayed as this is occurring. You can also switch between the anti-aircraft guns by pressing the < and > keys, allowing you to move to a gun that is loaded and ready to fire. To make targeting easier, you can also toggle zoom view by pressing the **Z** key.

If you have taken aim properly, you will see a flash as your shells impact the plane. If you have inflicted enough damage on the plane, it will break formation and crash into the ocean. Keep firing at the formation until you have taken out all the aircraft. Downing all the aircraft out on their first pass can be a bit tricky, don't worry though, they will swing back around to make another pass at your U-boat.

Later U-boats may be equipped with two types of anti-aircraft gun, the 20mm and the 37mm. The 37mm gun mount has slightly different targeting optics and a slower rate of fire (but packs a much stronger punch) than the 20mm guns. On boats with multiple guns, you can switch between the different guns by pressing the < and > keys.

In a real combat situation, a U-boat commander had a tough decision to make when it came to dealing with aircraft. He could either fight it out on the surface, or try and hold the planes off long enough to dive. Given the opportunity, most commanders would opt to dive, unfortunately, a U-boat is most vulnerable when diving, so be sure to man the AA guns for as long as possible.

End of Training Mission 3

Congratulations Herr K. Leu! With the completion of this section, your training is complete. You are ready to ply the high seas in search of the enemy and put your training to the test. Remember that every patrol yields valuable experience no training can give you. Remain alert and vigilant, your life and the life of your crew are in your hands.

U-boat and Weapon Data

SILENT HUNTER II models a good cross-section of the U-boats available throughout World War II. The following sections discuss the different U-boat types and the weapons they used.

The Type II U-Boats

Nicknamed the "dugout canoe" by their crews, the type II U-boats were the first production submarines constructed for the Kriegsmarine after World War I. While the earlier type I prototype (which would eventually evolve into the type IX long-range U-boat) was designed as a fleet submarine, the type II was designed as a short-range coastal boat primarily for defensive use.

Because of their short range and relatively weak armament (with three torpedo tubes and a machine gun) the type II U-boats were mostly relegated to training duties after 1940.

However, six type II-B's were dismantled and shipped by barge, road and rail to the Black Sea port of Constanza, from which they operated against Soviet shipping.

Type II-A

The original variant. First launched in 1935.

Displacement:	254 tons (surfaced) 301 tons (submerged)
Length:	40.9 m
Beam:	4.1 m
Draft:	3.8 m
Max Speed:	13.0 kt (surfaced) 6.9 kt (submerged)
Endurance:	2,000 nm (8 kt surfaced) 35 nm (4 kt submerged)

Depth:	100 m (operational) 150 m (maximum)
Torpedo tubes:	3 bow 0 stern
Reloads:	3
Guns:	1 20mm machine gun

Type II-B

First launched in 1935, the Type II-B represents an attempt to increase endurance in the Type II series. The hull was increased in length to accommodate an additional fuel bunker.

Displacement:	279 tons (surfaced) 329 tons (submerged)
Length:	42.7 m
Beam:	4.1 m
Draft:	3.9 m
Max Speed:	13.0 kt (surfaced) 7.0 kt (submerged)
Endurance:	3,900 nm (8 kt surfaced) 43 nm (4 kt submerged)
Depth:	100 m (operational) 150 m (maximum)
Torpedo tubes:	3 bow 0 stern
Reloads:	3
Guns:	1 20mm machine gun

Type II-C

The Type II-C was a lengthened version of the Type II-B, allowing further increases in range and room for additional equipment. A pair of Type II-Cs were the first U-boats fitted with operational snorkel devices, allowing them to cruise under diesel power while submerged.

This variant was first launched in 1938.

Displacement:	291 tons (surfaced) 341 tons (submerged)
Length:	43.9 m
Beam:	4.1 m
Draft:	3.8 m
Max Speed:	12.0 kt (surfaced) 7.0 kt (submerged)
Endurance:	4,200 nm (8 kt surfaced) 42 nm (4 kt submerged)
Depth:	100 m (operational) 150 m (maximum)
Torpedo tubes:	3 bow 0 stern
Reloads:	3
Guns:	1 20mm machine gun

Type II-D

This final variant of the type II was had extra "saddle" tanks similar to those used on type VII U-boats, giving it sufficient range to operate around the British Isles. First launched in 1940, the II-D saw active service only briefly as the need for training boats was so great. By 1941 all had been relegated to training duties.

Displacement:	314 tons (surfaced) 364 tons (submerged)
Length:	44.0 m
Beam:	5.0 m
Draft:	3.9 m
Max Speed:	12.7 kt (surfaced) 7.4 kt (submerged)
Endurance:	5,680 nm (8 kt surfaced) 56 nm (4 kt submerged)
Depth:	100 m (operational) 150 m (maximum)
Torpedo tubes:	3 bow 0 stern
Reloads:	3
Guns:	1 20mm machine gun

The Type VII U-Boats

The Type VII design was selected over the earlier type I-A design, due partly to its smaller size, which allowed more U-boats to be constructed within the tonnage limitations established by treaty.

However, the design was very sound and would form the backbone of the U-boat fleet, with over 700 of all subtypes completed, by far the most numerous U-boat type.

Type VII-B

The original type VII variant had a single rear-firing torpedo tube that was mounted externally. This awkward arrangement was corrected in the type VII-B, which had a real aft torpedo room and room for one reload for the single aft tube.

The VII-B was also equipped with four water-tight compartments on the upper deck which were used to store additional torpedo reloads, bringing the total torpedo load to fourteen.

The type VII-B was also gifted with additional range and speed over the original, allowing it to range farther out into the Atlantic.

First launched in 1938, the type VII-B would pave the way for the most numerous U-boat variant of them all, the type VII-C.

Displacement:	753 tons (surfaced) 857 tons (submerged)
Length:	66.5 m
Beam:	6.2 m
Draft:	4.7 m
Max Speed:	17.2 kt (surfaced) 8.0 kt (submerged)
Endurance:	6,500 nm (12 kt surfaced) 90 nm (4 kt submerged)
Depth:	100 m (operational) 200 m (maximum)
Torpedo tubes:	4 bow 1 stern
Reloads:	5 internal 4 external
Guns:	1 88mm naval gun 1 20mm machine gun

Type VII-C

The Type VIIC represents by far the most numerous variant of any U-boat built, with 577 units completed by the end of the war. Length was increased over the VII-B, but engine power was not, leading to a slight reduction in submerged performance. First launched in 1940, these units formed the backbone of the U-boat forces employed in the Battle of the Atlantic.

Displacement:	761 tons (surfaced) 865 tons (submerged)
Length:	67.1 m
Beam:	6.2 m
Draft:	4.8 m
Max Speed:	17.2 kt (surfaced) 7.6 kt (submerged)
Endurance:	6,500 nm (12 kt surfaced) 80 nm (4 kt submerged)
Depth:	100 m (operational) 200 m (maximum)
Torpedo tubes:	4 bow 1 stern
Reloads:	5 internal 4 external
Guns:	1 88mm naval gun 1 20mm AA

Type VII-C/41

In the face of increased Allied ASW efforts, it was decided that there was room for improvement in the Type VII-C design. Increases in pressure hull thickness allowed this variant to dive

deeper, and a new bow design improved seakeeping. A further variant, the type VII-C/42 was planned, but no examples were ever constructed as priority was shifted to the newer type XXI U-boats. First launched in 1943, this was the last major type VII variant produced.

Displacement: 860 tons (submerged)	759 tons (surfaced)
Length:	67.2 m
Beam:	6.2 m
Draft:	4.8 m
Max Speed:	17.0 kt (surfaced) 7.6 kt (submerged)
Endurance:	6,500 nm (12 kt surfaced) 80 nm (4 kt submerged)
Depth:	120 m (operational) 250 m (maximum)
Torpedo tubes:	4 bow 1 stern
Reloads:	5 internal 4 external
Guns:	1 88mm naval gun 1 20mm AA

The Type IX U-Boats

Derived from the earlier type I-A U-boat prototype, the type IX was envisioned as a long range U-boat, with much greater endurance than could be managed by the type VII. The type IX U-boats operated as far away as the Caribbean, the South Atlantic and even the Indian Ocean.

The type IX U-boats were naturally larger than the type VII vari-

ants in order to carry sufficient fuel and supplies to operate at long ranges. This made them unsuitable for some theaters—particularly the Mediterranean, where large size was considered a disadvantage in light of the Allied air presence.

Type IX-A

First launched in 1938, this is the original variant of the type IX family.

Displacement:	1032 tons (surfaced) 1153 tons (submerged)
Length:	75.5 m
Beam:	6.5 m
Draft:	4.7 m
Max Speed:	18.2 kt (surfaced) 7.7 kt (submerged)
Endurance:	8,100 nm (12 kt surfaced) 65 nm (4 kt submerged)
Depth:	110 m (operational) 230 m (maximum)
Torpedo tubes:	4 bow 2 stern
Reloads:	6 internal 10 external
Guns:	1 105mm naval gun 3 20mm AA 1 37mm AA

Type IX-B

This first improvement to the type IX illustrates the design history of this class: mainly the search for extended range. This variant mainly incorporates greater fuel capacity for a slight range improvement at the expense of performance. Otherwise, this variant, first launched in 1938, is similar to the type IX-A in most respects.

Displacement:	1051 tons (surfaced) 1178 tons (submerged)
Length:	76.5 m
Beam:	6.8 m
Draft:	4.7 m
Max Speed:	18.2 kt (surfaced) 7.3 kt (submerged)
Endurance:	8,700 nm (12 kt surfaced) 64 nm (4 kt submerged)
Depth:	110 m (operational) 230 m (maximum)
Torpedo tubes:	4 bow 2 stern
Reloads:	6 internal 10 external
Guns:	1 105mm naval gun 3 20mm AA 1 37mm AA

Type IX-C

This second type IX variant extended the range of this series to 11,000 nautical miles, a significant improvement over its predecessors. Power plant improvements helped maintain performance parity with earlier type IX's.

First launched in 1939, the design remained relatively stable, with 54 units produced in total of the type IX-C.

Displacement:	1120 tons (surfaced) 1232 tons (submerged)
Length:	76.8 m
Beam:	6.8 m
Draft:	4.7 m
Max Speed:	18.3 kt (surfaced) 7.3 kt (submerged)
Endurance:	11,000 nm (12 kt surfaced) 63 nm (4 kt submerged)
Depth:	110 m (operational) 230 m (maximum)
Torpedo tubes:	4 bow 2 stern
Reloads:	6 internal 10 external
Guns:	1 105mm naval gun 3 20mm AA 1 37mm AA

Type IX-C/40

This was the most numerous variant of the type IX series, with 87 units completed through 1944. Though more were ordered initially, many were cancelled to accommodate type XXI production. First launched in 1941, this variant included even greater range than its predecessors, though it was similar in most other respects.

Displacement:	1144 tons (surfaced) 1257 tons (submerged)
Length:	76.8 m
Beam:	6.9 m
Draft:	4.7 m
Max Speed:	18.3 kt (surfaced) 7.3 kt (submerged)
Endurance:	11,400 nm (12 kt surfaced) 63 nm (4 kt submerged)
Depth:	110 m (operational) 230 m (maximum)
Torpedo tubes:	4 bow 2 stern
Reloads:	6 internal 10 external
Guns:	1 105mm naval gun 3 20mm AA 1 37mm AA

Type IX-D2

In the quest for greater operational range, the Germans attempted to stretch the type IX series to its ultimate limit with the type IX-D. Physically larger than their predecessors, the D variants included two sets of diesel engines instead of the usual single pair. One set were smaller and designed for low-speed cruising, while the other set was larger and could propel the boat at its maximum speed. This arrangement allowed for a phenomenal doubling of the boat's endurance.

Unfortunately, the original IX-D1 engines were very troublesome and only a few were built. All were converted to transports.

First launched in 1942 with a revised power plant, the type IX-D2 successfully extended the Ubootwaffe's range as far as the Indian Ocean and beyond, giving the Germans the ability to assist their Japanese allies in the Far East.

Displacement:	1616 tons (surfaced) 1804 tons (submerged)
Length:	87.6 m
Beam:	7.5 m
Draft:	5.4 m
Max Speed:	19.2 kt (surfaced) 6.9 kt (submerged)
Endurance:	23,700 nm (12 kt surfaced) 57 nm (4 kt submerged)
Depth:	110 m (operational) 230 m (maximum)
Torpedo tubes:	4 bow 2 stern
Reloads:	6 internal 12 external

Guns:	1 105mm naval gun 3 20mm AA 1 37mm AA

The Type XXI U-Boat

Derived from the Walter-designed Type XVIII, the Type XXI represented the state of the art in submarine design in World War II and was the basis for most post-war submarine development among the major powers.

The Type XXI was designed first and foremost for excellent submerged performance. The deck gun, always considered an auxiliary weapon anyway, was removed, and numerous streamlining measures incorporated.

The result was a phenomenal submerged speed of 17 knots—faster even than the boat could travel while surfaced—and unparalleled submerged range. In addition, large internal storage for torpedoes and a new fast reload mechanism made this model a formidable opponent.

Unfortunately for the Germans, the revolutionary technology and complex production process meant that few of the 120 units built would ever become operational.

Displacement:	1621 tons (surfaced) 1819 tons (submerged)
Length:	76.7 m
Beam:	6.6 m
Draft:	6.3 m
Max Speed:	15.7 kt (surfaced) 17.2 kt (submerged)
Endurance:	11,150 nm (12 kt surfaced) 285 nm (6 kt submerged)

Depth:	180 m (operational) 280 m (maximum)
Torpedo tubes:	6 bow 0 stern
Reloads:	17 internal
Guns:	2 20mm AA

Torpedo Armaments

Initially, German torpedoes resembled those of most of the other major powers in World War II. However, the desperate attempts to interdict Allied convoys in the face of increasingly effective anti-submarine efforts and the customary German ingenuity would combine to produce some of the more exotic weapons of the war.

Early War Torpedoes

When the war began the Germans had two basic torpedo types in service.

The **T-1** (model G7a) was a steam-powered torpedo of 533 millimeters diameter with a maximum range of 12,500 meters at its slowest speed, which was 30 knots. A medium speed yielded 7,500 meters at 40 knots and a fast speed yielded a range of 5,000 meters at 44 knots. Because of the highly visible wake left by steam torpedoes, German doctrine dictated that these be used only at night, if possible.

The **T-III** (model G7e) was an electric torpedo with a range of 5000 meters at 30 knots. The electric power plant made these essentially wakeless, but the batteries required preheating if these torpedoes were to achieve their maximum range. In 1942 the improved T-IIIa was developed which increased electric torpedo range to 7500 meters at 30 knots.

In both cases, a mechanical depth-keeping device and a gyro-

scope comprised the guidance system, allowing the torpedoes to, in theory, run a straight course at a fixed depth until intersecting a target or running out of power.

The Germans also had both impact and magnetic influence detonators. The magnetic detonators were designed to allow a torpedo to run under the keel of the target before detonating, causing catastrophic structural damage.

Problems

German submariners experienced a number of torpedo failures that were remarkably similar to those their American counterparts would face a few years later in the war against Japan.

The problems were traced to a whole series of technical difficulties with the German torpedo designs:

A faulty depth-keeping mechanism caused torpedoes to run deeper than they were programmed to. When this was discovered, the U-boat crews were ordered to set their torpedo depths to zero until a revised mechanism could be designed.

The magnetic detonators tended to be oversensitive, resulting in premature detonation once the torpedo had armed itself. U-boat crews were forced to disable the magnetic detonators and rely on their impact detonators until a new magnetic influence pistol could be devised. Even then, many commanders would continue to disable the magnetic detonator, preferring to trust their lives to the more reliable contact detonators.

Unfortunately, there were problems with impact detonators as well. A series of “whiskers” on the front of the torpedo were designed to trigger a detonation. However, a fault in this mechanism resulted in an increasing likelihood of failure at angles of impact other than 90 degrees.

Over the early months of the war these problems were gradually discovered and redesigned torpedoes were issued to the U-boat

crews, improving the effectiveness of U-boat operations immensely. But this was just the beginning.

Improved Guidance Systems

As the Battle of the Atlantic raged on, it became more and more difficult for U-boat commanders to approach a convoy closely enough to attack effectively with the basic straight-running torpedoes. Allied ASW had become more effective at keeping the U-boats "at arms length."

The Kriegsmarine sought ways to improve the odds of hitting a target at long range in order to give their U-boats a fighting chance. This resulted in a series of guidance-system improvements that allowed torpedoes to behave more intelligently.

The effort proceeded down two separate paths:

Torpedoes, which could run pre-programmed patterns, would be able to increase the odds of a hit by searching along the convoy's path of motion.

Acoustically guided torpedoes could home in on the sound of a ship's engines, overcoming the target's ability to evade incoming torpedoes.

Pattern-Running Torpedoes

The idea behind these designs was to produce a torpedo that would perform normally over an initial run distance but would, if no target was impacted, go into a search mode that allowed it to proceed along the convoy's track and, hopefully, find something to impact along the way.

One of the most successful of these designs was the *Federapparat Torpedo,* or FaT, which was fitted to both the T-I and T-III torpedoes.

The FaT-I guidance system was programmable to a limited

degree. A gyroscope guided the torpedo along its initial run, a distance which was computed to carry the torpedo into the midst of a convoy. The torpedo officer could set this distance.

If no target was impacted over the initial run, the torpedo would perform a 180 degree turn to port or starboard—which could also be set by the torpedo officer—and back track in search of a target.

The torpedo would then, if no target was impacted, proceed a distance of 800 or 1600 meters—again selectable by the torpedo officer—and perform another 180-degree turn in the opposite direction. This would repeat until the torpedo impacted a target or ran out of steam.

The result was a search pattern that resembled the rungs of a ladder and which was designed to advance at a fixed speed along the convoy's path of motion.

To achieve this ideal search pattern, the U-boat commander would have to maneuver such that his U-boat was close to a position directly abeam the convoy and fire across the convoy's path.

Other pattern-running variants were designed and deployed.

The LuT torpedo was designed to overcome some of the limitations of the FaT-I, including the use of the electric propulsion for wakeless performance. The LuT guidance system was more difficult to program, including a second gyroscope for more flexible targeting options. In any case, only about 70 of these were made.

The FaT-II was also electrically powered. Designed to run a circular pattern after its initial run length, these were meant to be fired defensively at escort ships.

Acoustically-Guided Torpedoes

German U-boats increasingly fell prey to escort ships as the Allies improved their ASW techniques and equipment. Some means of safely keeping the escorts occupied would help improve the odds for U-boats in the Atlantic.

The T-V acoustically guided torpedo was designed to provide the edge needed. Based on the T-III electric torpedo, the maximum speed of the T-V was reduced to 24.5 knots in order to reduce "self-noise"—a constant problem with the acoustic guidance systems. This had the side benefit of increasing range to 5750 meters.

There were additional limitations to the acoustic seeker technology. A fairly loud engine sound was required to attract the seeker, limiting its use to targets that were moving at twelve to fifteen knots or faster. This also made it possible for the Allies to easily devise decoys to draw off acoustic torpedoes.

Also, the seeker was as likely to acquire the U-boat as any target, so standard practice was to dive after firing a T-V in order to avoid this eventuality. This had the effect of reducing the U-boat commander's knowledge about the effectiveness of his fire control, leading to unfortunate exaggerated claims about the T-V's effectiveness.

In any case, actual effectiveness of the T-V was probably only around 30%, making it an interesting, if not very successful, exercise in weapon design.

Deck Guns

8.8 cm and 10.5 cm naval guns were fitted to type VII and type IX U-boats as auxiliary weapons. In the most optimistic view, these weapons could be used to finish off targets that had already been torpedoed or otherwise rendered helpless.

As a practical matter, U-boats were fragile craft designed for stealth and not for gun fighting. Against any target that could shoot back, a U-boat was much better off diving deep and running away.

In addition, U-boats were poor gun platforms due to their low position in the water and their tendency to roll and pitch in heavy seas. However, the practice of fitting naval guns to submarines continued through much of the war, only giving way

when it was clear that they were mainly adding weight and drag to the submarine without contributing much to its capabilities. In fact, the advanced type XXI U-boats were designed without deck guns to improve underwater performance.

There were a few U-boat commanders who garnered some success with their deck guns. Kapitän-leutnant Reinhard Hardegen, for instance, sunk several merchant ships using the 10.5 cm deck gun on his type IX-B U-boat during Operation Drumbeat.

However, given situations where escorts were present in force, attacking with gunfire would have been a near-suicidal act.

8.8 cm Deck Guns

These were fitted to type VII U-boats for much of the war. In spite of having the same caliber, these were unrelated to the famous 8.8 cm flak guns used so successfully by the Wehrmacht.

10.5 cm Deck Guns

These larger weapons were fitted to type IX U-boats.

Machine Guns

One of the greatest enemies of the U-boat in World War II was Allied aircraft. Equipped with centimetric radar and a brace of depth charges, patrolling Catalinas, Sunderlands and Liberators made the Bay of Biscay a nearly impassable area for U-boats during the latter half of the war.

Until the development of the snorkel, U-boats were forced to travel on the surface for much of the long, dangerous voyage to the convoy lanes, diving only when attacked.

Most U-boat types were designed from the beginning to carry machine guns to fend off attacking aircraft. Usually this was a single 20 mm machine gun.

The type IX U-boats, which were considered to be more vulnerable to aircraft due to their larger size, were normally equipped with a single 37 mm gun in addition to the 20 mm. The 37 was a heavy, slow firing weapon, but packed considerably more punch when it hit. These were occasionally used against shipping, with some success.

In general, the number of machine gun mounts increased throughout the war. Often twin 20 mm machine guns replaced the singles. A series of type VII submarines were specially equipped with quad 20 mm machine guns and were designed to escort groups of U-boats across the Bay of Biscay. Known as the 'U-Flak' these boats were less than successful in their assigned roles.

As a practical matter, a U-boat was much better off diving deep and avoiding aircraft. In hindsight, the development of radar detectors, radar and snorkels were of more practical use to U-boat crews, though the machine guns at least gave them a way to fight back.

20 mm Machine Guns

The German 2 cm/65 C/30 and C/38 AA MG were manufactured by Rheinmetall and were developed from an earlier Solothurn design, the ST-5. Both models were fully automatic. The C/30 model was prone to jamming and used a small magazine (20 rounds), which meant frequent pauses for reloading. The later C/38 was a much-improved gun, which used a 40 round magazine. A very successful variation of this weapon was the Flak 35, which combined four C/38 guns in a single quad mounting. A three-dimensional stabilized navy-mount was introduced in 1944. The C/38 was also produced in very sophisticated twin mounts for U-boats. These were able to withstand a 550-foot (200 m) diving depth.

37 mm Anti-Aircraft Guns

The 3.7 cm/L83 was used on every major combatant ship in the German Navy. A unique feature of this weapon was a third axis of movement that stabilized the gun carriage when the ship rolled or pitched. This allowed the gun to track an airplane without interference from the motion of the ship. However, problems with this mounting led to its abandonment in subsequent designs of 3.7 cm guns.

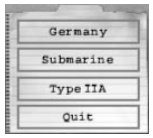
These guns were in use until the last years of the war. However, this weapon was only capable of semi-automatic firing, with each shell being individually loaded. This made it a rather slow-firing weapon for anti-aircraft defense, approximately 30 rounds per minute.

Museum

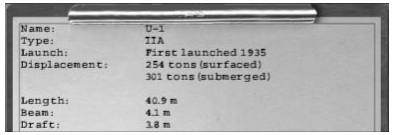
The museum option in the Main Menu allows you to choose from two informational components, the vehicle viewer and the Erich Topp interviews.

Vehicle Viewer

Silent Hunter II allows you to view the ships, submarines and aircraft from all the major powers portrayed in the game. You may want to do this from time to time to keep yourself well educated as to the appearance and relative strengths and weaknesses of the units you will be encountering.



On the lower left hand side of the viewer window are the controls for specifying the unit you wish to view. The available options, from top to bottom, are country of origin, type of unit and class of unit. Left click on an option to select from the available countries, unit types and classes.



The center of the viewer window contains information pertinent to the unit you are viewing.

On the right hand side of the viewer window are the view controls. Clicking the arrow buttons will allow you to change the angle from which the unit is displayed. The left and right arrows will rotate the view horizontally around the unit while the up and down arrows will increase and decrease the view elevation respectively. You can also click and hold the right mouse button to use the mouse to control rotation of your view.

The lower section of the view controls contains the magnification controls. Left clicking on the + and - symbols will increase and decrease the size of the unit respectively. To use the mouse to control your zoom level, just left click and drag.

To leave the Vehicle Viewer, left click on Quit, located in the lower left hand corner of the screen or press the ESC key on your keyboard

Erich Topp Interview

Selecting the Erich Topp Interview will allow you to view any of eight segments in which Admiral Topp discusses his experiences as a U-Boat commander.

To view an interview segment, move your mouse cursor over any of the eight buttons in the lower portion of the window. As you move your cursor over these buttons, they will light up. Left clicking on a lit button will begin playing that interview segment.

To exit the U-Boat Tour, left click the close button located at the top right, or press ESC on your keyboard.

Game Options

Silent Hunter II is designed to run on a wide range of computers. It is important to be familiar with the configuration of your system and what options will affect your enjoyment of the game.

Realism

Silent Hunter II allows you to adjust numerous realism settings that can make the game easier or more difficult to play. By default, these are set to allow for a moderate level of play. If you turn all of the options on, the game can be very difficult to play. Remember that 75% of the brave men who went to sea in World

War II U-Boats never returned.

There are three pre-set levels of difficulty you can choose which offer a quick way for you to set your level of play:

Easy turns off most options, offers new users the most favorable experience

Medium offers a challenging mix of difficulty settings

Difficult all options on, the most challenging level of play

If you want to customize your gaming experience, you can select any combination of individual settings detailed below.

Limited Ammo Turning this option off will give you unlimited torpedoes and deck gun/anti-aircraft gun ammunition.

Limited Fuel Turning this option off will give you unlimited diesel fuel.

Dud Torpedoes Like their American counterparts, the U-Boat crews experienced a wide variety of problems with torpedo reliability in the early stages of the war. Turning this option off will give you torpedoes that always work.

Limited Batteries Turning this option off will give you unlimited battery power for submerged operations.

Limited Visibility With this option on, only units visible to the crew will appear at the plot station. When the U-Boat is submerged with the periscope lowered, only the most recent observed contacts will be shown on the Plot. Turning this option off will enable you to see all units in the world from the Plot station.

Limited Depth Turning this option off will allow you to dive to any depth. Note that depth information will still be shown on the mini map and the gray depth below keel indicator is removed from the depth gauge.

Realistic Reloads Turning his option off will result in dramatically faster torpedo reload times.

Vulnerability Turning this option off will make your U-boat impervious to any type of damage.

Vulnerability Level With the vulnerability option set to On, this option allows you to scale your U-boats susceptibility to damage. 0% = invulnerable, 100% = fully vulnerable.

Run Aground Turning this option off will allow your U-Boat to run aground without sustaining any damage or getting stuck.

External View Turning this option off disables the in-game external view feature.

Realistic Sailing Turning this option off allows you to utilize a less realistic physics model for both U-Boat performance as well as the ocean environment.

Limited Target Data Turning this option on turns the target range, ID and damage state indicators off, restricts the data shown in the Plot unit info window, turns off crew 'target destroyed' messages and disables the selection of targets while at the Plot screen.

Translate Crew This setting allows you to specify whether the in-game crew voices will be in English (on) or German (off). This setting does not affect the Realism Rating.

Realism Rating This is the aggregate value of the various realism settings you have chosen. This value can range from 100% (the most difficult) to 0% (the easiest).

Graphics

The graphics options allow you to change the game screen resolution and general visual details. If you are experiencing slow performance in the game, you can make adjustments here which will improve the situation, at the expense of some virtual realism.

Display Mode Silent Hunter II supports two screen resolutions and two color depth settings. Higher resolutions and color depth settings look better but require more CPU power and video RAM. Lower resolutions and color depth settings may not appear as sharp, but will provide smoother frame rates and more economical use of video RAM on slower machines. The following resolutions and color depth settings are supported: 640x480 High Color (16 bit), 800x600 High Color (16 bit), 640x480 True Color (32 bit), and 800x600 True Color (32 bit). A video card with 16 megabytes of video RAM is required for 32-bit color depths. We recommend a video card with 32 megabytes or more for true color at the highest resolution.

Fog This option allows you to turn atmospheric effects within the game on or off.

MipMapping This option enables the use of multiple levels of texture detail for smoother textures at the expense of more video RAM usage. Disabling this feature may improve performance on some systems.

Range Fog This technique provides more accurate rendering of fog when applied to large-scale objects such as land, but comes at the expense of some CPU overhead.

Table Fog This technique improves atmospheric effects using per-pixel computations. Not all video cards support this in the same way. If your 3D views look completely white or lacks any fog at all, you may need to disable this feature.

Bump Mapping This option enables environmental bump mapping for those video cards that support this feature.

Specular Highlights This feature enables specular lighting effects, which allow for proper rendering of "shiny" surfaces. This can be a CPU-intensive computation. You may see improved performance on some systems if you disable this feature.

Hot Text This option allows you to turn the in-game hot text on or off.

Level of Detail This option allows you to change the bias used in selecting level of detail for polygonal models. At lower settings the renderer will choose lower-detail models more often and at closer distances, which may provide for better performance on some systems at the expense of visual quality.

Sound

There are a wide variety of sounds and voices in Silent Hunter II that add to the overall ambience and allow you to become fully immersed in the game. There are important sounds and warnings that occur, you would be at a serious disadvantage if you could not hear them. After all, when any submarine is submerged, its eyes are its ears.

Moving the sliders for the following options allows you to set the desired volume from off (far left) to maximum (far right).

Master Volume This option allows you to set the overall volume of all game sound.

Sound Effects Volume This option allows you set the level of the in-game sound effects.

Music Volume This option allows you to set the level of the game menu music.

Voice Audio Volume This option allows you to set the level of the voice messages delivered by your U-Boat crewmembers.

Movie Volume This option allows you to set the volume level for the game videos.

Reference

Excerpts from Thoedore Savas' *'Silent Hunters'*

From Fritz Guggenberger: *Bavarian U-boat Ace*

By Eric C. Rust

The African coastline rose over the horizon as U-81 slowly moved along toward Tangier and Tarifa. Guggenberger had to be careful not to betray his presence to a Spanish freighter and several fishing boats in the vicinity as he angled silently toward the strait. The weather was partly cloudy with light westerly winds and occasional rain showers. By nightfall navigational lights along both the Spanish and African coast were clearly visible. Still on the surface, even though the moon peeked through the clouds from time to time, Guggenberger reached Cape Tarifa, Europe's southernmost tip, at 0150. Forty-five minutes later U-81 passed Gibraltar itself. As his war diary bears out, Guggenberger was both surprised and delighted over the absence of British patrol vessels, although he found the abundance of small fishing boats with their nets attached to lighted buoys an annoyance he had to sidestep as he carefully proceeded eastward. Shortly after 0600 on November 12, with U-81 safely through the danger zone, Guggenberger received a radio message ordering him and Reschke's U-205 to occupy a patrol position east of Gibraltar. The boats were to observe radio silence except to warn other boats of unexpected dangers or to report enemy vessels. Early the next morning, a Friday, having spent most of the intervening hours submerged, U-81 picked up a follow-up message advising that Italian reconnaissance planes had located a British task force of a battleship, an aircraft carrier and cruisers and destroyers heading in his direction from Malta. "Force K" was composed of the aircraft carriers *Ark Royal* and *Argus*, the battleship *Malaya*, the light cruiser *Hermione* and seven destroyers. They had delivered urgently needed aircraft to the British island bastion of Malta and were now homebound for Gibraltar. Shortly after Guggenberger received notice of the approaching naval vessels, U-205 reported

contact with the enemy force, which was steering west at an estimated 16 knots.

Guggenberger saw to it that U-81 got ready for what now seemed an inevitable encounter. He deliberately closed to within 25 miles of Gibraltar "to improve our chances of scoring hits," since the restricted waters would require the enemy to steer predictable courses. He also ordered a test dive to ascertain that the boat functioned properly in every respect. A minor problem with the diesel engines and their exhaust systems restricted his surface speed somewhat but not enough to cause concern. During the afternoon a destroyer and several distant aircraft forced Guggenberger to submerge, but U-81 remained undetected by the enemy. At 1530 "Force K" itself steamed in sight in good visibility. Maneuvering carefully at periscope depth and estimating enemy speed at 16 knots, Guggenberger prepared to launch a spread of four torpedoes running 150 meters apart and set to hit their targets five meters below the waterline. At 1636, when the enemy had closed to within 4,000 yards, he gave the order to fire. The sudden weight loss of four torpedoes almost forced the boat to the surface, but by sending all hands into the forward compartment and by quickly adjusting the ballast tanks, Guggenberger and his chief engineer managed to keep the submarine's bow beneath the waves. With the torpedoes on their way, Guggenberger took U-81 down to 120 feet to await developments.

For a long time nothing happened. Then, six minutes and six seconds after launching the torpedoes, a loud detonation echoed through the boat. Guggenberger, who had taken aim at the battleship, thought the explosion signified a hit against her. A second explosion followed some 90 seconds later. The delay between the explosions caused Guggenberger and his crew to assume that they had scored a hit on a large destroyer or even an aircraft carrier farther off to starboard. At any rate, there was little time for speculation. Acting quickly, enemy destroyers moved out and caught U-81 in their sonar and counterattacked. Over the next five hours, from 1725 to 2220, while Guggenberger slowly moved off to the

northeast and frequently changed speed, course and diving depth to throw off his pursuers, the British destroyers dropped some 160 depth charges around U-81. Fortunately for the boat's occupants, none of them detonated too closely. Shortly before midnight, after the enemy had given up the chase, Guggenberger brought his boat to the surface and ventilated U-81 with the clear air of a peaceful Mediterranean night. After recharging his boat's batteries, he moved U-81 closer to the African continent and spent most of November 14 resting on the sea floor four miles off the coast. Not until 0553 on Sunday morning, November 15, did he go on the air to report to Admiral Dönitz at U-Boat Command: "13 Nov 1636. Spread of 4 torpedoes against battleship, *Ark Royal*, *Furious.* First hit against battleship, second target uncertain. Square CH 7645." Later that day, after listening to Wehrmacht reports and other news, Guggenberger noted in his war diary that the first torpedo apparently had left the *Malaya* afloat but dead in the water, while with the second he had hit and sunk the *Ark Royal*.

In actually Guggenberger had missed the *Malaya* altogether. At 1541 (1641 German time) one of his torpedoes had exploded under the bottom of the *Ark Royal* (22,600 tons) between her keel and starboard side. The detonation opened the carrier's starboard boiler room to the sea, and within a quarter hour the massive warship was listing 18 degrees. Over the next fourteen hours rescue efforts to save the carrier continued and an attempt was made to tow her to Gibraltar. While some initial progress was made and power and steam restored temporarily, the ship continued to take on water and the listing increased. Uncontrollable fires and explosions in her engine rooms signaled the death knell for the British carrier. Gradually those members of her crew who had remained aboard were taken off, and at 0613 on November 14, her list now at 45 degrees, the *Ark Royal* rolled over and sank just a few miles east of Gibraltar. Incredibly and fortunately, only one man lost his life in the disaster. In the words of an English chronicler, Guggenberger and his crew had "destroyed the very core of the Royal Navy's striking power in the Mediterranean" and were enti-

tled to a special sense of satisfaction inasmuch as the *Ark Royal* had played a key role in the destruction of the German battleship *Bismarck* earlier that year.

From Ralph Kapitsky: *'Battle in the Caribbean and the Death of U-615'*

By Gaylord T.M. Kelshall

It was at this point in the ongoing battle that the warrior Ralph Kapitsky obviously was came to the fore. U-615 was so badly damaged that she could never safely dive again, and at two knots on a single electric motor without any means of recharging the batteries, her life span was obviously drawing to an end. In addition, she was taking on water, and only the heroic efforts of her mechanics working feverishly below decks held the bow above the surface, with her stern just awash. Under similar circumstances most U-boat commanders would have abandoned ship. But Kapitsky refused to do so. Instead, he ordered all the AA ammunition piled on the bridge and personally directed the gunners, while urging his crew below to contain the water flooding into the boat and repair what they could.

Even before the second radio message from Mariner P-4, the duty reserve crew under Lt. L. D. Crockett, VP-204, had been alerted. The airplanes from Crockett's squadron, however, were either already airborne or badly damaged from the frequent and bloody July clashes with the U-boats. Undaunted, Crockett borrowed Mariner P-11 from VP-205, which was the only available machine at a base that housed five squadrons of flying boats. Within minutes Crockett was airborne in the Mariner and heading for the site of the developing crisis, one hundred and eighty miles northwest of Trinidad.

During the hour or so that it took Crockett to get to the scene of the fight, Chaguaramas was hurriedly recalling aircraft to refuel and back up P-11. The other anti-submarine bases in Trinidad were also informed of the situation and they, too, began recalling

and reassigning aircraft. For months, sometimes for more than a year, these flight crews had crisscrossed the Caribbean looking for U-boats. Although their patrols had turned the area into an extremely dangerous theater for the submarines, many of the pilots had never seen one, let alone sunk one. Now, at last, they had caught a U-boat that could not get away, and there were many volunteers who itched to get involved.

While Crockett was approaching in the Mariner and the several bases were planning the U-boat's demise, the Germans were feverishly attempting to stabilize their floating platform. Kapitsky managed to raise the stern of U-615, bringing the boat back to something approaching an even keel. Pouring lubricating oil by hand, one diesel engine was coaxed into life, though only for short spurts. As many of the crewmen labored, the gunners kept a sharp lookout for the expected American attack. At 3:30 p.m., Crockett found U-615.

L. D. Crockett had some experience fighting U-boats. Just three weeks earlier, as the captain of a VP-204 Mariner, he had watched helplessly as his co-pilot died with a 20mm shell in his stomach, fired from Horst Dietrichs' U-406. With Crockett's attention focused on coaxing his badly damaged Mariner back to home base and saving the lives of the rest of the crew, U-406 made good its escape. Although he had an intense desire for revenge, Crockett was a cautious, experienced pilot who resisted impulses to rush rashly into an attack. Instead, he circled the damaged U-615 from three miles out at three thousand feet. The crippled boat was proceeding very slowly northward, a cloud of blue diesel smoke trailing above its wake. On his second circuit he could see a few puffs of smoke as 20mm shells self-destructed immediately behind the Mariner. Surprised by the accuracy of the long distance shooting, he pulled P-11 even further away from the still dangerous U-boat. Having passed a full appreciation of the situation to Chaguaramas, Crockett decided to carry out his attack.

Kapitsky and his men watched the Mariner circling their crippled boat, fully aware that this was the beginning of the end. We will never know whether Kapitsky questioned his decision to continue the fight knowing he could never save U-615. Apparently his sense of duty was stronger than his desire for mere survival. Kapitsky was determined that his boat was going to go down fighting. When the Mariner P-11 began its attack run, Kapitsky brought his gunners to the ready. Crockett was trying a high level attack from fifteen hundred feet with explosive bombs. It was a cautious assault on the boat, intended more to keep the submarine busy while he waited for reinforcements than to bring about its destruction. At almost a mile the twin .50 caliber machine guns of the nose turret began walking their bullets towards the U-boat, while Crockett judged his position by eye, intending to bomb without the benefit of a bomb site.

U-615's guns remained silent even when the heavy American bullets began hammering the U-boat. Kapitsky was holding his fire, waiting until the Mariner was within effective range. At three hundred yards he gave the command and all eight barrels of his anti-aircraft battery erupted. Mariner P-11 was repeatedly hit by the wall of fire, but Crockett was still able to drop his bombs, which exploded off the U-boat's port quarter. Although U-615's crew felt the surge from the blast, it did little if any harm to the boat. The same was not true for the Mariner. Besides the many holes in the aircraft and smashed equipment, a 20mm shell had ripped a huge hole in the starboard wing root, causing a spectacular gasoline-fed fire. Crockett realized that sooner or later the fire would reach a main fuel tank, and P-11 would disintegrate. He did not harbor a death wish, but if in-flight immolation was to be his fate, then the U-boat would also have to die.

Kapitsky slowly turned U-615 to starboard and watched in amazement as the huge Mariner, instead of flying out of range, came spiraling down toward the boat. Unbeknownst to Crockett, as the aircraft swept downwards Navy Machinist A. S. Creider had hauled himself up into the wing root, where he began tackling

the source of the fire. Crockett pulled out of his dive at two hundred feet, boring straight in towards the U-boat, which was now heading south. Trailing a long column of smoke and flame, the Mariner shuddered under the impact of numerous cannon shells and machine gun bullets as it closed the distance. Hitting back with its own heavy machine guns, Crockett passed right over U-615 and bracketed the U-boat with four MK-44 depth charges. As the pilot hauled the badly damaged aircraft around, he could see four tall towers of water spewing up around U-615.

Once again chaos reigned aboard the U-boat. The depth charges had opened up numerous cracks in the hull and water was pouring in. Down below in the dark cigar-like hull, terrified sailors were working up to their knees in seawater, and the boat's stern was once again beneath the sea. This time, however, the boat's bow was well out of the water, a particularly precarious position for a U-boat. If the nose of a submarine rises too high, water contained in the forward ballast tanks will empty into the sea through the open bottoms of the tanks, making the submarine highly unstable and liable to slide underwater stern first. Concerned about the boat's dangerous angle, Kapitsky shouted orders down the hatch to assist the dazed men working below, who were feverishly attempting to properly trim the boat. Meanwhile, his gunners kept a wary eye on the Mariner as it sped away. Aboard the aircraft, Creider had miraculously brought the fire in the wing root under control. Although the machine was riddled with holes and the pilot could no longer transfer fuel, it was still flyable.

By this time the sinking boat could only make two knots with a rudder jammed hard a starboard, which meant that U-615 steamed in a continuous circle. Despite his desperate condition and the fact that the crippled boat was but one hour's flying time from the dreaded anti-submarine bases on Trinidad, Kapitsky still refused to surrender. Instead, his shocked and battered men continued to attempt to restore some semblance of order as only a veteran crew who loved their commander could. As his men feverishly moved about their tasks, the badly damaged Mariner was still circling the

U-boat just out of range. There would be no time to effect major repairs, for Kapitsky knew that this was a sign reinforcements were on the way. Forty-five minutes later, Harpoon B5 of USN anti-submarine squadron VB-130 [pilot unknown], out of Edinburgh Field, arrived on the scene.

Determined to be in on the kill, Crockett in his battered P-11 took overall command of the attack and arranged for both aircraft to come in together. The Harpoon was armed with four fixed forward-firing .50 caliber machine guns, which delivered 2,000 rounds per minute. When combined with the fire from the nose turret of the Mariner, U-615 would be saturated with flying metal—just before the Harpoon delivered what its crew hoped would be the coup-de-grace with her depth charges. The airmen anticipated that the two aircraft attacking simultaneously would divide the fire of the U-boat. Crockett's plan ultimately worked, although not quite the way he expected.

At Crockett's signal both aircraft, the Mariner on the right and the Harpoon on the left, turned towards U-615. Kapitsky could see the two machines move lower until they were hugging the ocean at full speed, just fifty feet above the surface. He wisely reminded his gunners to ignore the damaged Mariner and concentrate on the Harpoon, which carried the depth charges. At long range the two aircraft began hosing their heavy machine gun bullets into the U-boat. Kapitsky allowed his 20mm guns to return fire, holding back his machine guns until the range had tightened. While the German gunners manfully held their positions while braving the storm of bullets, both sides saw their plans thrown askew by the speed of the Harpoon. At two hundred and eighty knots, way over the top speed of the Mariner, the Harpoon began to leave the flying boat behind. In fact, the Harpoon was so fast that it left the German tracer fire trailing behind it and flew straight through the fire of the Mariner's bow guns without being hit. As the Harpoon flashed over U-615, four depth charges plummeted down, once again bracketing the U-boat. The Harpoon was long gone and the German gunners were seeking protection from the expected blast

of the depth charges when Crockett safely passed over the U-boat in his battered P-11.

Although the attack was delivered perfectly, U-615 was probably saved by the fact that she was on the surface. Had she been diving or underwater, the explosions would have broken her apart. Strangely, instead of hurling the U-boat upwards, the simultaneous detonation of all four charges had the unusual effect of forcing U-615 underwater. The gunners were immediately washed overboard, while Kapitsky and the lookouts, tethered to the submerged boat, were sucked beneath the sea. As the water subsided and U-615 rose back above the surface, her gallant gunners swam back to the casing and clambered aboard, where they once again manned their guns. Survivors claimed that U-615 was underwater for a full fifteen seconds—a quarter minute that must have been completely terrifying to those roped to the bridge and trapped inside. Crockett could see that U-615 had been hard hit by the Harpoon's charges, and he hauled his flying machine around in a tight turn intending to deliver the killing blow with his single remaining depth charge. To his surprise, the gunners were back aboard and his approach was met by a withering hail of fire. He quickly turned P-11 out of the way, rejoining the Harpoon at a safe distance.

While her gunners were still full of fight, U-615 was barely alive. Below decks the U-boat was a complete wreck. Everything breakable that had survived the previous attacks was now smashed, and only the single electric motor was operable. Lighting was a thing of the past, and water stood in places waist deep. A few gallant members of the engineering staff gingerly worked the remaining motor, while the rest of the crew, unoccupied now that damage control efforts were useless, clustered in the control room and conning tower directly above. The bridge was occupied by Kapitsky, his First Watch Officer Herbert Schlipper, six gunners and an unusually large number of loaders, who worked non-stop to keep the magazines of the weapons full.

Even the most optimistic crew member knew that U-615 was sinking, and that other than freeing the jammed rudder, which they accomplished, there was little else to be done to save the boat. Kapitsky and his men may well have recalled their three previous patrols, when at times it seemed all was lost. This was true especially on their second patrol, when they had spent Christmas 1942 facing the worst North Atlantic gales of the century, with engine breakdowns plaguing them in hurricane force winds. Their current predicament—riding a U-boat that was nothing more than a slowly sinking platform for a battery of guns, while being attacked by aircraft—was infinitely worse. Yet not once, either at the time of the sinking or in the years since that traumatic afternoon, did any of them question Kapitsky's decision to keep fighting. The crew of U-615 stood behind their commander with boundless faith in the fact that he was doing the right thing. Kapitsky himself may have questioned his decision as he stood on the bridge and followed the course of the desperate battle. Before the trip to the Caribbean he had confided to his diary his doubts about the Nazi Party and Hitler's leadership. He even went so far as to discuss these matters with friends. Kapitsky's duty, however—and allegiance—was to his country. He was a free thinker, a leader of considerable ability and a veteran warrior with considerable air and sea combat experience. Now, however, he found himself fighting a soldier's battle. Unable to maneuver his boat as a naval vessel, he was simply the commander of a besieged fortress, determined to go down fighting against considerable odds.

U-615's commander was also facing a warrior of considerable ability in Lieutenant Crockett. The redoubtable pilot was still on the scene, flying a machine that the average flyer would long ago have retired from the fight. Just as Kapitsky was determined to go down fighting, Crockett intended to see the end of the U-boat. The fight had developed into one of brutal endurance and iron courage, and the Mariner pilot was intrigued by this submarine that refused to die. While the scenario continued to play out,

Crockett kept up a continuous running commentary with Chaguaramas, where the staff was also fascinated by the fight being put up by the lone U-boat. Aircraft were being vectored to the scene of the fight from all over the Trinidad theater, and the pilots were eager to be in on the kill. At the three largest airbases in Trinidad—Chaguaramas, Edinburgh Field and Waller Field—pilots impatiently waited on armorers and re-fuelers to get their aircraft combat ready. In many ways, this personal duel between Kapitsky and Crockett was developing into a clash of titans.

Kapitsky may have wondered why the battered circling Mariner remained on scene and why a pilot would jeopardize himself and his crew when so many reinforcements were so close, perhaps not accepting the fact that he was also doing the same thing—without any hope of reinforcement. In any case he had little time for contemplation because the Mariner and Harpoon had only completed two circuits of his boat before the next aircraft arrived on scene. Released from convoy coverage, Mariner P-8 of VP-204, flown by Lieutenant jg. J. W. Dresbach, had raced to the scene of the battle.

Once again Crockett took control and coordinated the attack. The Harpoon on the right and Crockett's battered P-11 on the left were to come in slightly ahead of P-8, attacking from the south. All three aircraft changed places several times in order to confuse the U-Boat's gunners as to which of the attacking machines actually carried the depth charges. On Crockett's order the three planes turned toward U-615. At long range the two outermost aircraft began firing their deadly .50 caliber bullets at the U-boat. This heavy fire was soon joined by guns from the P-8. The attack order solidified, with the faster Harpoon storming toward U-615, followed closely by P-11 and then P-8. The fire from their guns created a sea of mini-geysers around the stricken U-boat, and eventually hammered the hull and battered the conning tower. Although Crockett's elaborate and well developed plan seemed to be working, his diversion failed.

Kapitsky, who had been carefully tracking the new Mariner P-8, directed his gunners to hold their fire and concentrate only on the third attacker—the one in the center. They remained at their weapons as the U-boat rattled and clanged from the sounds of striking machine gun bullets. Kapitsky stood with his men in full view of the action, ensuring that every gun was trained on Mariner P-8. As Crockett's Mariner P-11 swept overhead, its waist gunner, followed by the twin tail guns, rained bullets onto the U-boat which opened fire on P-8. The combined fire of the U Boat's guns shattered the nose of the Mariner and a 20mm shell slammed into Lieutenant Dresbach. The fatally injured Dresbach's last conscious act was to release his depth charges, which he accomplished just moments before his corpse slumped forward onto the control column. P-8's co-pilot, Lt. jg. A. R. Christian, struggled with the controls while trying to hold Dresbach's body back, shouting for the crew to remove the dead pilot from of his seat.

The depth charges, released fractionally early by the dying pilot, fell about ten yards astern of U-615. The blast from the four charges, which detonated twenty-five feet underwater behind the boat, kicked the stern completely out of the water and smashed the recently fixed rudder and aft diving planes, hurling everyone off their feet. By the time P-8's crew managed to drag Dresbach's body out of his seat, the nose of the Mariner was a twisted mass of torn aluminum and smashed perspex, and the cockpit was covered with blood. White hot anger boiled inside Lieutenant Christian at the sight of his dead companion. Instead of trying to evade the U-Boat's pointblank fire, he hauled the big flying boat around in a tight upward circle. Ignoring Crockett's shouted radio commands to withdraw, Christian maneuvered P-8 across U-615 again, releasing two bombs in the process. The explosives, dropped from high above the boat, detonated harmlessly three hundred feet off the U-boat's port side. Christian's decision once again pitted the Mariner against U-615's AA battery, as the crews of the two other aircraft watched helplessly from a distance. Somehow the Mariner managed to avoid serious injury the second

time around and P-8 flew out of range of Kapitsky's spitting guns. Christian turned for home with his dead pilot and four seriously wounded crew.

In both the attacking aircraft and the operations room in Chaguaramas, there was incredulous dismay followed by intense anger. Everyone thought that this coordinated attack by three aircraft would finish off the stubborn U-boat. No one could understand how it had survived. The offending undersea intruder was effectively thumbing its nose at the mighty U.S. Navy—a navy that had just defeated a major U-boat offensive against the Caribbean Theater. Convoys were stripped of their air cover and every available machine was directed to proceed to the scene of the battle. In addition, three surface ships were detached from near Grenada, and the new destroyer *U.S.S. Walker* was ordered out of the Gulf of Paria at full speed.

The withdrawing aircraft provided a brief respite for the men on U-615. Whatever relief they may have felt watching Christian's Mariner leave the scene, however, was dashed away when they realized that their commander had been hit during the attack. A prone Ralph Kapitsky was lying slumped on the deck, his shredded leather garments initially hiding the grievous wound he had suffered. A heavy caliber bullet had smashed into the U-boat commander's upper thigh near the hip. The wound was bleeding profusely and it was impossible to apply a tourniquet to halt the loss of blood. Kapitsky lay in a grotesque pose, with one of his legs completely dislocated and thrown up and back across his chest, a grimace of intense pain masking his face. There was nothing that the crew could do about his wound other than administer morphine to ease the pain.

One of the 20mm gunners was also lying on the deck. The boat's senior mate, Helmut Langner, had suffered a grievous wound when a fifty caliber bullet smashed through his knee. Langner was the gunner who had brought down the Whitley bomber in the Bay of Biscay. The disabled mate struggled into a sitting posi-

tion and called for rope, which he used as a tourniquet on his thigh to stop the bleeding.

Kapitsky was conscious and lucid despite his terrible wound. He even joked with his men while they propped him against the periscope standard. First Watch Officer Herbert Schlipper attempted to have both Kapitsky and Langner taken below, where they might lie on their cots in greater comfort, but both men refused. They wanted to die on the bridge, in action. Realizing he could no longer effectively lead his men, Kapitsky turned over command of U-615 to Schlipper, and asked that he pass along his last regards to his parents. It is significant to note that even though Schlipper was now in command, he too elected to fight on, as Kapitsky wished him to do.

While the last attack by P-8 had been in progress, Lt. Cmdr. Hull, in Mariner P-2 from VP-205, arrived on the scene. Hull's machine was part of a third squadron employed in the battle to sink U-615. Lieutenant Crockett had ordered him to wait until Christian's P-8 had finished its attack. Although annoyed that a mere lieutenant would attempt to tell him what to do, Hull nevertheless held off. Crockett had a vested interest in U-615 and he intended to maintain control of the situation. Once Christian left the scene with his dead and dying crew in an aircraft that was little more than a mass of holes, Crockett set up another coordinated attack, this time with Hull's Mariner P-2 in the center position. Once again the three aircraft barreled in toward U-615, and once again the attack failed. Because of a mechanical malfunction, the depth charges were released when the Mariner's bomb doors opened, and they exploded harmlessly six hundred feet astern of the U-boat. Despite Crockett's plea not to attack again, an upset Hull turned his Mariner—in a stunt similar to Christian's second attempt—and climbed up to fifteen hundred feet for a high level bombing run. The explosives landed harmlessly five hundred feet from the U-boat. Hull, however, was not as fortunate as Christian had been the second time around, and Crockett and the pilot of the Harpoon watched helplessly as P-2 was ravaged by the U-

Boat's guns. The fire penetrated the aircraft and seriously wounded some of its crew, forcing Hull to turn and head for home. Shortly afterwards the pilot of the Harpoon announced that he was low on fuel and had to head for home as well. Probably feeling like he had come full circle, Crockett and his battered Mariner P-11 were once again alone with the U-boat that refused to die.

Reinforcements were not long in arriving. Next on the scene was Lt. Jg. Wallace Wydean's U.S. Navy Airship K68, from squadron ZP-51. The giant blimp had been almost at the end of what was known as a Golden Triangle patrol when Wydean, hearing of the battle to the westward, had elected to join it. Though he was keen to make an attack on U-615, Crockett ordered him to hold off. Almost every aircraft that had attacked U-615 had been badly chewed up, with the only plane able to avoid serious damage being the fast Harpoon. The U-boat's gunners would have taken enormous delight in clawing apart the slow moving airship, which could only make about seventy knots. Only once in the Caribbean war had a blimp attacked a surfaced U-boat, and the airship was destroyed in the attempt. Reluctantly obeying his senior officer, Wydean, representing the fourth squadron to join the epic struggle, kept the airship out of range.

By now it was late evening. Darkness was falling, the sea had turned rough, and to Crockett's dismay, the weather was growing worse by the minute. August was the height of the Caribbean hurricane and wet season, and U-615's battle with Trinidad's anti-submarine aircraft was taking place in a sector notorious for the development of frightful nighttime thunderstorms. What is commonly referred to as a "tropical wave" was pushing through the area, and it was becoming increasingly difficult to see the tiny silhouette of the U Boat's wallowing conning tower and still stay out of range of its guns.

As night fell a representative of the fifth squadron to take part in the action appeared on the scene. The aircraft was a B-18 bomber from the 10th Bomber squadron, operating out of Edinburgh

Field. The B-18 was a hybrid aircraft with a shark nosed fuselage mated to the wings of the DC-2 airliner. Too slow for bombing raids, it was quickly superseded by the legendary B-17, but it carried a useful bomb load and was suitable for anti-submarine work. Many B-18s had been destroyed at Pearl Harbor during the Japanese surprise attack of December 7, 1941. Afterward, the remainder were concentrated in the Caribbean, where for a time they constituted the major anti-submarine weapon. By mid-1943, the B-18 was being phased out and replaced by the B-24 and B-25, but there were still quite a few of them in operation during the 1943 U-boat offensive.

Crockett set up his last attack just as the light was fading. As the two aircraft set up and began their coordinated run at the submarine, U-615 simply disappeared from view. Kapitsky's replacement, Herbert Schlipper, had managed to maneuver the crippled boat into a rain storm which, together with the gathering darkness, effectively swallowed the U-boat. The frustration of the attackers was beyond description. They set up a crisscrossing search grid and regularly dropped flares, but it was little use in the deteriorating weather. Shrugging off the appalling conditions, the giant airship K68 nosed into the clouds and rain close to the water, with Wydean relishing the fact that he was now useful to the operation. As the search continued, more Mariner flying boats arrived in the area, all anxious to be in on the kill.

By 8:00 p.m. the hunters had still not located the elusive U-boat. The attackers had other problems as well. Since none of the aircraft were showing lights, there was a danger of collision as they flitted into and out of rain showers. Lt. Cmdr. Joster's Mariner P-15, of VP-205, arrived on scene and he took control of the growing operation. The first thing he did was order Crockett to take P-11 home. The disappointed pilot had no choice. He was low on fuel in a badly shot up aircraft with wounded crew aboard who needed medical attention. How Crockett had been able to operate without even a compass in the airplane was a wonder. But by this stage of the operation he had become a liability, and just getting

home would be a significant achievement. He managed it in the appalling weather by finding the Venezuelan coast visually and creeping eastward at very low level. All afternoon damaged flying boats had been coming home to Chaguaramas. When they landed they had to be taxied straight to the ramp, since none of them could float for very long. The ambulances had been busy ferrying the wounded crew and the dead to the naval base hospital, and so it was to be with P-11 when she arrived.

Northwest of Trinidad the epic struggle continued, and at 9:15 p.m. the giant airship finally located U-615. The boat was visible between two rain squalls, and Wydean vectored the B-18 bomber into an attack run. Once again, and for the last time, an aircraft came barreling in at low level against the submarine. And once again, fire from an attacking aircraft peppered the U-boat, whose gunners responded with a deadly barrage. The B-18's depth charges plummeted into the sea and the hammer blows of the explosions rocked the U-boat. The charges were close, but not close enough to send U-615 below the waves. By the time the B-18 was able to turn for another run, U-615 was gone. Schlipper had managed once again to find temporary sanctuary in another rain storm.

Wydean had been so eager to be in on the kill of U-615 that he had neglected to tell anyone that even an airship needed fuel, and now he was running critically short of the precious liquid. Only after the B-18 attack did he confess the shortage, and Lt. Cmdr. Joster ordered him to return to base immediately. The airship didn't make it. Wydean ran out of fuel and had to attempt an emergency landing on Blanquilla Island, which wrecked the machine.

Below the searching aircraft a macabre scene was playing out on the crippled U-615. Propped against the periscope housing, Kapitsky still clung to life. Lightning flashed through the skies and thunder cracked as the storm continued unabated. The sight was a tragic one as the mortally wounded commander greeted his crewmen individually and said his farewells as they came up from

below. Somehow the wounded commander managed to retain a sense of humor. When Engineering Petty Officer Stefan Lehner stood before him, Kapitsky joked that, because of their present prospects, nothing would come of his recently completed training course as a chief machinist. He shook hands farewell with each of his crew while the accompaniment of humming aircraft engines, methodically searching to find them, played in the distance. Only the weather hid them from their numerous attackers, and by this time the sky was full of them. There were no fewer than twelve Mariner flying boats overhead, all hunting for U-615. The search had evolved into the largest anti-submarine operation of the war conducted against a single U-boat. At regular intervals the senior officer would order all the aircraft to simultaneously drop flares, lighting up one hundred square miles of sea, but the weather still hampered them and U-615 remained in the shadows.

By now the crew of U-615 was assembled on the casing. For safety reasons, Schlipper had Kapitsky, Langner and one other wounded man placed into a two-man life raft. The small craft was resting on the U-boat's deck, but because of U-615's slow speed on its dying batteries and the need to stay in the rain showers, it was not always possible to keep the boat's bow heading into the rough sea. As a result, a bigger than usual wave washed the life raft and the two seamen who were attending it off the casing and into the water. Within seconds the raft and its three wounded occupants, with two sailors clinging to it, disappeared in the rain and darkness. Schlipper maneuvered U-615 as best he could in a frantic attempt to find the raft. For an hour they searched until, ironically, they spotted it by the light of the flares that the Mariners were dropping. As the U-boat approached the lifeboat, Seaman Richard Suhra dived overboard to try and secure it, but he in turn disappeared in the rough sea and was never seen again. After a strenuous operation the raft was finally recovered and hauled back onto the U-boat, where it was made secure. Even after enduring this, Kapitsky was still conscious and able to joke

about his plight, commenting to Schlipper that he was now qualified to receive the silver wound badge.

Ralph Kapitsky died at 1:00 a.m. on August 8, 1943. The commander of the U-boat that had fought the greatest battle of the war against aircraft passed away against the background sound of snarling hunter's engines overhead, complimented by lightning and rolls of thunder, with the lashing rain soaking everyone. The sailors of U-615 sewed his body into a hammock with a weight between his feet. To the singing of the traditional naval hymn, the words of which were unheard in the fierce wind and rain, his remains was committed to the deep in a solemn and intensely moving improvised ceremony. Even as the body of their much beloved commander slid over the side, U-615's gunners stood to their weapons, waiting and watching. They were still ready to fight.

But the epic battle was over, for the hunters never found U-615. She was dead regardless, slowly sinking as the water level below climbed and the last power drained from her batteries. There was nothing that could be done to repair the boat and indeed she was still afloat only because her engineers were slowly bleeding the last of her high pressure air into the ballast tanks. From the moment Lieutenant Erskine had found her and his Mariner had delivered the first attack, U-615 had taken a fearsome beating and had survived thirteen separate depth charge and bomb attacks. Even for a Hamburg-built boat—which many U-boat crews considered as the best constructed submarines—she had proved to be exceptional, equal perhaps to her indomitable commander.

As dawn approached with U-615 dead in the water and the waves washing over her, Schlipper ordered her battle ensign raised. He sent engineer Oberleutnant Herbert Skora, Petty Officer Claus von Egan and the boat's Mate Abel back down into her control room to prepare to flood the boat. They could still hear the angry swarm of hunters overhead, although by this stage they were widening their search patteren in the belief that U-615 had eluded them and was escaping.

As the final scenes were playing out on U-615, the new Fletcher Class destroyer *USS Walker*, under Lt. Cmdr. Townsend, was racing to the scene in the hope of finishing off the U-boat. Other surface ships were also drawing near, and additional aircraft were being made ready to take over at daylight. At 5:25 a.m., just as the first touch of dawn was lighting the eastern horizon, Schlipper fired a red flare. The burst of light was seen from the bridge of the *Walker,* which immediately altered course and headed in that direction. In the gathering light the U-boat's crew could see the topmast of the destroyer racing toward them. The end had indeed arrived. On Schlipper's command the engineering crew opened the sea cocks and flooded the boat before joining the remainder of the lifejacketed crew in the water. They watched silently as their gallant boat slid beneath the surface and made her final dive to the ocean floor 10,000 feet below, just to the west of the underwater Aves Ridge. "She sank under us," was how one survivor described it. The last thing her crew saw was U-615's war flag as it dipped below the waves.

Ranks

Fähnrich zur See (Midshipman,cadet)

After serving a good year in the Kriegsmarine future officers reached the Fähnrichs-rank. Then they usually started the officer course on the Marineschule Mürwik.

Oberfähnrich zur See (Sub-Lieutenant)

During the last months before promotion to the rank of Leutnant, the Fähnrichs became an Oberfähnrich. Prewar, 6 months was the usual period of time to hold this rank, as the war progressed, one to three months at this rank was average.

Leutnant zur See (Lieutenant-Junior)

In the Reichsmarine (till Crew 1930) it took 4 and half years to reach the rank of Leutnant. After 1938, the time needed to reach the rank of Leutnant averaged 2.5 years.

Oberleutnant zur See (Lieutenant-Senior)

In the prewar years the Leutnant needed about a year and a half to reach this rank. In 1938, it was not uncommon to take 2 to reach this rank.

Kapitänleutnant (Lieutenant-Commander)

Reaching K. Leu usually took 3 to 4 years, but is was possible to reach this rank in as little as 18 months, depending on the amount of success achieved.

Korvettenkapitän (Commander)

The Kapitänleutnant had to serve average 5 years and longer (Dönitz needed almost 8 years in the twenties), but during war this time became much shorter. 'Teddy' Suhren got this rank after 8 months!

Fregattenkapitän (Captain-Junior Grade)

There were no exact rules for reaching this rank. It took an average of 18 months and longer to reach this rank in wartime.

Kapitän zur See (Captain)

No exact rules. Outstanding was Wolfgang Lüth's promotion from Korvkpt., after 18 months he reached the rank of Fregattenkapitän and Kapitän zur See twice. (The promotion to Fregattenkapitän was postdated a month.)

Decorations

Das Eiserne Kreuz (The Iron Cross)

The most awarded and famous German war decoration was awarded in several classes. The Iron Cross first and second class appear in Silent Hunter II.

The first EK 1 awarded to the U-Boat-force by order of the Commander in Chief Kriegsmarine went to the commander of U-29 on 18th September 1939. Successful commanders often received both Iron Crosses after their first patrol, like Kptlt. Kentrat (U-74) and Kptlt. Mützelburg (U-203)

The EK 2 was awarded for the first time to the U-Boat-force with order of the Commander in Chief Kriegsmarine for the whole crew of U-29 on 18th September 1939. The day before, U-29 sank the 22,500-ton British aircraft carrier HMS Courageous.

Das Deutsche Kreuz in Gold (The German Cross in Gold) The German Cross in Gold was stationed between the Iron Cross and the Knights Cross in rank. It was awarded to 530 U-boat men. Kptlt. Otto Salman, the commander of U-52, received the first German Cross on December 9 1941.

Das Ritterkreuz (The Knights Cross)

The highest class of the Iron Cross, the Knights Cross came in seven grades, two of which appear in Silent Hunter II, the Knights Cross with Oak Leaves and the Knights Cross with Oak Leaves and Crossed Swords. One had to win the I.C. second class in order to be considered for the first class award. Roughly 7300 of these were awarded during the war and 144 went to the U-boat service.

The Knights Cross was a highly respected decoration and among U-boat men it was the greatest honor one could achieve for many. U-boats crews took great pride if their captain received this medal and sometimes it was added to the boat's insignia (on Schnee's U-201 for example).

U-boat captains would often joke about having "an itchy neck" (Halsschmerzen in German) that could only be cured by wearing the Knights Cross ribbon :)

The Knights Cross of the Iron Cross was introduced in 1939 as an addition to the Iron Cross family. Like the Iron Cross itself it had the year of its introduction incorporated into it. About 7,318 of these awards were presented to members of all branches of the German armed forces. U-boat men received 144 of those.

The Knights Cross with Oak Leaves, introduced on June 3, 1940, was awarded to Knights Cross recipients for further acts of courage. A fan of 3 Oak Leaves in silver surmounted the paper clip hanger. There were only 853 of those awarded and 29 went to the U-boat force.

Knights Cross with Oak Leaves and Crossed Swords Introduced on July 15, 1941 this award was meant for recipients of the Oak leaves who showed further acts of courage. A pair of crossed swords at 40 degrees was added below the Oak Leaves cluster. Only 150 of these were awarded and 5 went to U-boat men.

Knights Cross with Oak leaves, Crossed swords and Diamonds Introduced at the same time as the Oak Leaves and Crossed Swords and again presented for yet further acts of bravery. Only 27 received this award, 2 of which went to the Kriegsmarine and both to U-boat commanders.

U-Boots-Kriegsabzeichen 1939
(The U-boat war badge 1939)

The decoration was awarded from October 1939, usually after two patrols. But some successful commanders got the badge already after one patrol, like Kptlt. Thomsen (U-1202)

U-Boots-Kriegsabzeichen mit Brillanten
(U-boat badge with diamonds)

Awarded from 1941. The U-Boot-Kriegsabzeichen mit Brillanten looks similar to the usual U-Bootskriegsabzeichen, but is was made from gilding silver with 9 small diamonds. The badge was presented roughly 30 times, it was usually awarded when a commander was decorated with the Oak Leaves. Admiral Dönitz wore a special piece of this decoration.

U-Boot-Frontspange (U-boat front clasp)
The two classes of the front clasp, Silver and Bronze, appear in Silent Hunter II.

The U-boat front clasp (or combat clasp, as it is better known) was established by the Kriegsmarine on 15 May 1944, in bronze. This was done to equate with the means of recognition already enacted by the other services. This award recognized close combat and acknowledged courageous service.

The award was recommended by the U-boat commander based on one of three criteria: the number of sorties against the enemy, or the risk factor relative to sortie numbers, or personal bravery. The award was made after approval by Grand Admiral Dönitz.

On 24 November 1944, a silver grade was introduced to recognize further valor. The exact criteria for this grade of the award are uncertain. Some gold versions were produced, but none awarded.

Long Service Award

On March 16, 1936, Hitler reinstated the general draft. At the same time, the Service Award of the Armed Forces was also reinstated. This award was given in four classes, the first of which, for 4 years of service, appears in Silent Hunter II.

Crew compliment and duties

Kommandant	(commander)
Leitender Ingenieur (LI)	(leading engineer)
Wachoffizier	(watch officer, exec officer)
Obersteuermann	(helmsman)
Obermaschinist	(warrant machinist)
Bootsmann	(chief boatswain mate)
Seemännisches Personal	(nautical personnel)
Technisches Personal	(technical personnel)
Zentrale-Personal	(control room personnel)
Funk-Personal	(radio personnel)
Torpedo-Personal	(torpedo personnel)
Artilleriemechaniker-Personal	(gunnery mechanical personnel)
Koch, ‘Smutje’	(cook)
additional crewmembers	
Bordarzt, Sanitätsmaat	(doctor)

Flak Personal	(anti aircraft personnel)
PK-Leute	(war correspondent)
Meteorologe	(meteorologist)
B-Dienst	(intelligence personnel)

Top Commanders

Commander	Ships Sunk	Tonnage
Otto Kretschmer	42.5	238,327
Wolfgang Luth	47	229,000
Gunther Prien	32.3	211,393
Viktor Schutze	36	187,279
Erich Topp	34	185,434
Herbert Schultze	28	183,432
Heinrich Lehmann-Willenbrock	25	183,223
Karl-Fredrich Merten	27	170,163
Heinrich Liebe	31.5	171,003
Heinrich Bleichrodt	28	162,491

Historians are still debating these figures, as recording actual tonnages and number of ships sunk was not an exact science during World War II.

U-Boat Glossary

Aal Nickname for torpedo (eel).

Agru-Front (Ausbildungsgruppe für Front-U-Boote). Training unit for frontier U-boats

AK Äusserste Kraft (voraus). Command for “full speed”.

Alarm Emergency dive order on a U-boat.

Alberich Special rubber foil to protect the U-boats from ASDIC. First attempted on U-67 in 1941.

Aphrodite (FuMT 30) Radar faking device.

As A famous U-boat commander (Ace).

Asto (Admiralstabsoffizier). Staff officer for the BdU. From Nov 1941 to May 1945 the 1. Asto/BdU was Fregkpt. Hessler (former Com. U-107).

Athos (FuMB 35) An advanced radar detection device.

Ato Atmosphärisch getriebener Torpedo (also A-Torpedo) A compressed-air-driven torpedo.

Aussteigen Leaving the U-boat in emergency situations.

B-Dienst (Beobachtungsdienst). The German wireless observation service.

Bachstelze A motorless helicopter device for type IXD U-boats. (Watertilt)

Backbord Portside

Bali I FuMB 29 antenna.

Baubelehrung The time before commissioning, when the future crew make themself familiar with their new U-boat.

BdU Befehlshaber der Unterseeboote Commander-in-Chief for submarines, Karl Dönitz from 19 September, 1939.

Berlin Name for an advanced radar detection device (FuMO 84).

Betasom Italian submarine command in Bordeaux.

Biber Mini U-boat-type. One man crew (Beaver).

Biene Nickname for aircraft (bee).

Biskaya-Kreuz Nickname for the first radar detection device (FuMB 1). (Biscay Cross), see also Metox.

Blechkoller A form of nervous tension ("tin fright") that could be caused by depth charge attacks and resulted in violence or hysteria.

Bold A tool for deception of the enemy Asdic.

Borkum Name for a radar detection device (FuMB 10).

BRT Bruttoregistertonne Gross register ton (also as GRT).

Bugraum (Bow room) The room in front of the U-boat. Home of the crew.

Bundesmarine The German Navy from 1848 - 1852 and again after 1956.

Cypern Name for a radar detection device (FuMB 9). (also W-ANZ G 2; see also "Wanze").

Delphin Midget U-boat

Dreisternemeldung (Verlustmeldung) Casualty report.

Druckkörper The pressure hull.

E-Mixer Nickname for the electro-mechanics.

Einbaum Nickname for the U-boat type II.(Long-canoe)

Eisernes Kreuz Iron Cross.

Elektroboot The U-boat types XXI and XXIII.

Enigma The German Navy cipher machine.

ES Erkennungssignal Recognition signal given by flags, Morse signal or by signal pistol (the last was usual by U-boats).

Etmal The distance the U-boat traveled in 24 hours (from high noon to high noon).

Eto Elektrischer Torpedo Electric-driven torpedo.

Fächer The simultaneous fire of two or more torpedoes. (Fan shot)

Fähnrich z. See Officer cadet

Falke Name for acoustic torpedo T 4. (Falcon).

Fangschuß Finishing shot (coup de grâce).

FAT Flächenabsuchender Torpedo A torpedo that was capable of running in pre-programmed patterns and loops.

FdU Führer der Unterseeboote Chief/Leader/Head/Commander of U-boats.

Feger Nickname for destroyer. (sweeper).

Feindfahrt War cruise/patrol against the enemy.

Flak (From FLieger-Abwehr-Kanone) Anti-Aircraft gun.

Fliebo (From Fliegerbombe) Air bomb.

Fliege (FuMB 24) A radar detector. (Fly)

Flottille Flotilla.

Frontboot U-boat which finished all training courses and was detached to a front flotilla.

FT Funktelegramm Wireless message.

FuMB FUnk-Mess-Beobachtung
Radar detection.

FuMO FUunk-Mess-Ortung Radio detecting or Radar.

Funker Radioman (wireless operator).

Funkraum Radio room.

Funkspruch Wireless message.

G 7a Geradlaufapparat 7 (meters length) a (atmosphärisch) A compressed-air-driven torpedo.

G 7e Geradlaufapparat 7(meters length) e (elektrisch) Electric-driven torpedo.

Geheim Secret (i.e. secret documents and so on).

GeKDos (Geheime Kommandosache) Top secret level.

Geleitzug (also Geleit) The convoy.

GHG GruppenHorchGerät The underwater sound detector.

Goldbutt Codename for the torpedo G 5ut. Planned for the small Walther U-boats.

Goliath Codename for the Kriegsmarine long wave radio station in Kalbe near Magdeburg. With this transmitter BdU could maintain contact with long range U-boats. (17 pylons between 170 and 200 meters high). This station's radio transmissions could be received as much as 25 meters underwater!

Hagenuk (FuMB 9) A radar dedector (see also Wanze)

Hakenkreuz The Swastika.

Halsschmerzen ("Having a sore throat") - The commander is itching for the Knights Cross.

Hartmut Codename for German U-boat operations during the occupation of Norway.

Hecht Midget U-boat (Pike).

Heizer Stoker crew.

Hohentwiel A radar device (FuMo 61 and 65).

Horchraum Sound detection room.

I WO Erster Wachoffizier First Watch Officer.

II LI Zweiter Ingenieur Second Engineering Officer.

II WO Zweiter Wachoffizier Second Watch Officer.

III WO Dritter Wach-Offizier Third Watch Officer (as a rule the "Obersteuermann").

Kaiserliche Marine The German Navy between 1871 - 1919.

Kaleu (also Kaleun or Kaleunt). Abbreviation for "Kapitänleutnant"

Kaleu Kapitänleutnant (also Kaleun or Kaleunt).

Kaptlt. Kapitänleutnant (also Kl, KL, Kptlt.) Lieutenant Commander.

Kimm The visual horizon.

Klappbuchs Nickname for the (morse-) signal light, also "Varta-Lampe".

Kolcher Nickname for small ship.

Kolibri The perfume for U-boat crews.

Kommandant Commander.

Kommissbrot Hard and black bread of the Kriegsmarine.

Konfirmant Nickname for future commanders, who one training patrol on a U-boat. (Confirmand).

Koralle The Codename for the Headquarters of Admiral Doenitz located near Berlin from 12.43 - 02.45.

Korvkpt. Korvettenkapitän Commander (also KK).

Kriegsmarine The German Navy between 1935 - 1945.

Kriegstagebuch (KTB) War Logbook (War diary).

KTB Kriegstagebuch War Logbook (War diary).

Kurzsignal A very short radio signal.

LI Leitender Ingenieur Chief Engineering Officer.

Ltnt. z. S. Leutnant zur See Lieutenant (also L, Ltn. or Lt.).

Luftwaffe German Air Force 1935 - 1945.

LUT Lagenunabhängiger Torpedo A torpedo that was possible to shoot every position and bearing.

Mücke (FuMB 25) A radar detector. (Gnat)

Mülltonnen An unfriendly word for wabos (depth charges) often used by seamen. (Garbage cans).

Mündungsklappen The bow caps of torpedo tubes.

Maat Petty officer.

Mahalla Nickname for convoys.

Malings (Comic-) Pictures on the U-boat conning tower.

Marder One man torpedo (see Midget U-boats).

Matrose Seaman.

Metox A radar detection device (FuMB 1). (Name of the French producer).

Milchkuh A nickname for the type XIV supply U-boat. (Milk Cow).

Mine A mine.

Mixer A nickname for the torpedo-mechanics.

MND Marine-Nachrichten-Dienst German Naval radio intelligence service.

Monsunboote U-boats that operated in the Far East and the Indian Ocean.

Naxos An advanced radar detection device (FuMB 28).

Neger One man torpedo. (See Midget U-boats).

Nibelung An advanced sonar device on U-boat type XXI (also called S-Anlage).

ObdM Oberbefehlshaber der Marine Commander-in-Chief of Navy.

Oblt. z. S. Oberleutnant zur See Lieutenant-Senior (also OL, Oblnt. z. S.).

OKM Oberkommando der Marine Equal to Britain's Admiralty.

OKW Oberkommando der Wehrmacht High Command of the Armed Forces.

Papenberg A depth meter for small ranges, named after its inventor (a WWI U-boat engineer).

Pastorius Codename for a spy operation when U-202 and U-548 set 8 agents ashore in the USA in June 1942.

Paukenschlag Operation Drumroll / Drumbeat against allied shipping in US and Caribbean waters the first half of 1942.

Peter Codename for a mining operation of U-589 in the Arctic Sea in August 1942.

Pillenwerfer A small device the German Navy created to help subs confuse the enemy sonar. It is released from the U-boat and the salt water starts a chemical reaction that produces millions of noisy bubbles. This "clouds" the sonar. It worked to some extent, but the slow U-boats usually couldn't get very far away to be happy about it.

Reichsmarine The German Navy between 1919 - 1935.

Ritterkreuz Knight's Cross (of the Iron Cross).

Rohr (also Torpedorohr) Torpedo tube.

Rudel (Wolf)-pack

Samos An early radar detection device (FuMB 4).

Schlüssel M The German Navy code.

Schleichfahrt Silent running.

Schlicktown Nickname for Wilhelmshaven. (Sludge town).

Seehund Midget U-boat for two-man crew.

Seekuh Nickname for large U-boats of type IX (Sea Cow).

Seerohr The periscope.

Seetakt An early radar device (FuMO 29).

SKL Seekriegsleitung German Supreme Naval Command.

Soldatensender Calais British broadcast for psychological warfare against the U-boat force.

Sonderführer Special Commander. Lothar-Günther Buchheim, the author of "Das Boot", was such a Sonderführer-Leutnant, which means that he was a war correspondent and not a naval officer.

Spargel Nickname for the periscope (Asparagus).

Spiegelei Nickname for the Deutsches Kreuz in Gold (fried egg).

Steuerbord Starboard.

T 5 Codename for the acoustic torpedo (homing weapon).

Tauchretter Life-jacket with respirator.

Tauchtanks The tanks into which the water rushes when the U-boat submerges.

TEK Torpedo-Erprobungs-Kommando
An institution for testing the new developed torpedoes.

Tiefenruder The depth rudder.

Tunis An advanced radar detection device (FuMB 26).

TVA Torpedo-Versuchs-Anstalt An Institution for torpedo experiments

U-Boot Päckchen Nickname for the (leather-) working clothes for the crew.

U-Boot-Frontspange A U-boat decoration awarded from 1944.

U-Bootkriegsabzeichen A U-boat decoration usually given after 2 patrols.

UA A U-boat that was built for Turkey in 1938-1939 as Batiray, in German duty as UA 21 Sept, 1939.

UAA Unterseeboots-Ausbildung-AbteilungA department for training men to become U-boat men.

UAK Unterseeboots-Abnahme-Kommando This unit took over the recently constructed and commissioned U-boats at the shipyards.

UB The former British submarine HMS "Seal". Commissioned into the Kriegsmarine as UB.

UC Former Norwegian submarines.

UD Former Dutch submarines.

UF Former French submarines.

UIT Former Italian submarines.

UJ Unterseeboots-Jäger German submarine chasers, often old trawlers.

ULD U-Boots-Lehr-Division U-boats training division.

UT Unterwasser-Telefonie Underwater telephone.

UZO U-Boot-Ziel-Optik U-boat target optic (aiming binoculars).

Valentin Name of a U-boat bunker near Bremen, Germany.

VO Verwaltungsoffizier Administrative officer.

Vorhalterechner Electro-mechanical deflection calculator; produced the attack coordinates for the torpedoes.

Wabos Nickname for Wasserbomben (Depth charges).

Waffen Weapons.

Wanze (FuMB 9 - correct W-Anz [Wellenanzeiger] A radar detector. (Bedbug).

Werft A shipyard.

Werftgrandi Nickname for shipyard-workers.

Wintergarten Nickname for U-boat's anti-aircraft platform. See U-boat Flak.

Zaunkönig Nickname for acoustic torpedo T 5. (Wren).

Zentrale The U-boat control room.

Keyboard Shortcuts:

Esc	Exit the Simulator

In-Game Stations

F1	Help
F2	Periscope
F3	Navigation
F4	Helm and Gauges
F5	Torpedo Fire Control
F6	Deck Gun
F7	Machine Gun
F8	UZO
F9	Bridge
F10	Damage Control
F11	Torpedo Status
F12	External View
PrtScn	Radio Room
Scroll Lock	Sound Room
Pause/Break	Radar
NumLock	Captains Cabin
Q	Navigation control panel
W	Torpedo fire control panel
E	Command control panel
R	Vessel ID control panel

View Controls

Left Arrow	Rotate view left
Right Arrow	Rotate view right
Up Arrow	Lower view
Down Arrow	Raise view
H	Heading to view
V	View to heading
X	Toggle padlock view
Z	Zoom view (bridge, periscope and machine guns only)

J	Return to set heading
Home	Center on your U-Boat (Plot screen only)
<	Previous ship (external view only)
>	Next ship (external view only)

Time Compression Controls

-	Decrease time compression
+	Increase time compression
\	Set 1x time compression
Backspace	Pause (0x time compression)

Helm Controls

~	All stop
1	Ahead slow
2	Ahead 1/3
3	Ahead standard
4	Ahead full
5	Ahead flank
6	Back slow
7	Back 1/3
8	Back standard
9	Back emergency
[	Left rudder, 5-degree increments
]	Right rudder, 5-degree increments
‘	Rudder amidships
Ctrl-[	Left full rudder
Ctrl-]	Right full rudder
S	Surface the boat
P	Periscope depth
D	Snorkel depth
F	Raise/Lower Snorkel
C	Crash dive
B	Blow ballast

Weapons/Targeting Controls

L	Lock selected target
T	Cycle torpedo tube selection
Enter	Fire currently selected torpedo tube
<	Previous gun (machine guns only)
>	Next gun (machine guns only)
Up Arrow	Decrease range (machine guns/Deck gun only)
Down Arrow	Increase range (machine guns/Deck gun only)
Right Arrow	Move right (machine guns/Deck gun only)
Left Arrow	Move left (machine guns/Deck gun only)
Spacebar	Fire gun (Deck gun/AA guns only)

Miscellaneous

Ctrl+PrtScn	Screen Capture (saved in root of Sim folder)

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