Harpoon 97 Classic Operations Manual

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Preface

Welcome to the most realistic naval war simulation on the market! To help you get started, this section reviews the organization of this manual so that you will get the most enjoyment from the game simulation.

The introductory material discusses the basic concepts around which *Harpoon* is designed. You will find instructions on how to load the game, a description of the windows on which it is played, and some things that you'll need to keep in mind when playing. We have included a sample scenario in Quick Start. *If you are particularly anxious to play, we suggest that you first follow along with this sample scenario before attempting the more complicated scenarios.*

Appendix A, "Superpower Politics & Maritime Strategies," provides background information on the realities of geopolitics as related to modern conventional warfare, the capabilities of today's weaponry, and the real-world strategies which would be employed by both NATO and the Soviet Union in the event of actual hostilities. This appendix is somewhat technical in nature and will probably appeal mostly to the wargaming aficionado. Although this section is not critical for you to play *Harpoon,* the information will help you to get the most enjoyment from it because it will help you to understand the basis for modern tactics. Remember that *Harpoon* is a simulation and not an arcade-style game, so it is designed to reproduce actual tactics. For instance, you might order an ASW (anti-submarine warfare) helicopter to attack a submarine, yet it might appear that the helo is aimlessly wandering around instead of carrying out its attack order. But if you read Appendix A, you will understand how things really work in modern

warfare. That is, you would realize that the helo is actually flying to different locations, dipping its on-board sonar into the water, and trying to get a solid fix on the sub's location so that an attack can be launched. So take some time to read this appendix if you want to understand the basis on which *Harpoon* is designed.

Appendix B is a glossary of the terms, abbreviations, and acronyms found in this manual. Please refer to it if you have questions.

Since *Harpoon* is mouse and menu-driven, the technical aspects of controlling it are fairly easy. However, the realistic situations you will encounter, combined with user-selected options and variable windows, make *Harpoon* a continuing challenge even for the seasoned expert.

What's New in *Harpoon Classic 97*

Harpoon Classic 97 is very similar to the original Harpoon Classic. If you're familiar with that version of the game, you should have little or no trouble picking up this version. Most of the game features are the same. However, you should become familiar with the following new features:

- **New interface layout.** *Harpoon Classic 97* conforms with the standard Windows 95 interface.

- **Color maps.** *Harpoon Classic 97* provides color maps, which improve the aesthetic and gaming experience.

- **Combined Group/Unit window functionality.** In *Harpoon Classic,* zoom levels below x8 were only available on the unit map. In *Harpoon Classic 97,* the zoom levels are much greater and are now available on the Group map. In this version of the game, once you go to x16 or lower, you have essentially the Unit map views, but can still issue the commands that are not available in the Unit map. See page 3-4 for more information.

- **New Formation Editor (on the map formation editing).** *Harpoon Classic 97* allows you to edit a group's formation right on the screen. See "Formation Editor" on page 4-8 for more information.

- **New pulsing radar animation feature on selected group.** Under the **Settings** menu, a new pulsating radar feature has been added to the Staff Options display. If this option is activated, then any selected group, with a radar on, will have the circles pulse outwards. See "Staff Options" on page 4-18 for more information.

- **New Show Formation Layout (Grid) feature on selected group.** Under the **Settings** menu, a new show formation grid feature has

been added to the Staff Options display. If this feature is on, then any selected friendly group will show the formation grid on the screen. See page 4-18 for more information.

- New Artwork
- New Scenarios
- Online Play

Foreword—by Tom Clancy

I met Larry Bond as the result of an accident. Soon after joining the U.S. Naval Institute, I saw in their monthly journal, *Proceedings,* a small advertisement for the original *Harpoon.* I hadn't played war games since college days, but I knew that there had to be something better than those, and I figured that for ten dollars or so, I couldn't go too far wrong. On receiving the game, and reading it over a period of days, I availed myself of the comment sheet tucked in the back to offer a suggestion. I saw what I thought was an error in the damage points section, and pointed it out, along with some complimentary remarks on the overall quality of the concept. Larry replied almost at once, confirming that there was a goof in his numbers (he was in the process of doing a correction). The ready admission of error told me everything about Larry that I'd ever need to know. Larry Bond is a serious student of this subject, a man for whom accuracy is more important than ego. In a word, Larry is someone of integrity. I know no higher praise.

Harpoon was a priceless asset in the preparation of my first novel, *The Hunt for Red October.* There are several reasons for this. First of all, the technical database included in the ship specification book is easily the equivalent of $5,000 in reference books, superbly organized. More importantly, however, the game rules explain, with the astounding combination of simplicity and detail, the mechanics of ships, sensors, and weapons. The principles explained can be easily applied to specific ships, called "platforms" by insiders, found in the ship specification book. *Harpoon* is a tool for understanding things that happen in the real world. The player can use this game to simulate reality. How closely, you ask? Closely enough that every naval officer I meet in more than one navy asks where I got my information, and frequently they don't believe my answer. The net result, however, is that *Red October* is now used as an introductory textbook at the Naval War College, Newport, Rhode Island. A lot of credit for this goes to Larry Bond. In short, *Harpoon* is almost certainly the best naval simulation available to the public. The only games more detailed are classified, which does not

necessarily mean "better," by the way, and a lot more expensive. It is the perfect starting point for discovering what navies do, and how. It worked for me.

Tom Clancy
Prince Frederick, MD
September 19, 1989

Final Note from Larry Bond

Harpoon, the computer product, is a sophisticated version of the award-winning war game published by Games Designers' Workshop. You will assume the role of a fleet commander, making the same type of decisions he has to make, using the same type and quality of information he might expect to get in wartime. This does not mean worrying about the fuel state of a helicopter somewhere, or the present course and speed of a maneuvering ship. You are trying to keep the Big Picture, and move the course of the war in the direction desired.

We want you to have fun playing *Harpoon.* After all, that's why you bought it. But with that requirement satisfied, we want you to see some of the tactical and strategic problems that a modern formation commander faces. A modern carrier battlegroup has tremendous combat power, but also some very real limitations.

Larry Bond and **Don Gilman**
September 1, 1989

EC2000 Scenario Background

In the late summer of 1996, as the American presidential season was beginning in earnest, unknown terrorists conducted a series of suicide bomb attacks against American forces attached to the 1st Armored Division in Bosnia. Casualties were very high. The American president, bowing to growing election year pressures, announced an immediate withdrawal of all U.S. ground forces in the Bosnian theater of operations (BTO). The presidential declaration stated that peace in Bosnia was now at hand, that despite the recent U.S. casualties the ongoing U.S. military operation was a success, and that the mop-up phase now underway could be handled by NATO forces remaining in theater reinforced by additional European forces staged in nearby countries, if required.

Outraged at this unilateral action, senior members of the NATO military council appealed to the U.N. General Secretary to use the power of

the U.N. Charter to block the U.S. action and order American forces to hold their ground and fulfill their U.N. commitment. Reluctantly, the General Secretary agreed and through his liaison officer attached to the NATO military council ordered that all forces operating under U.N. charter hold their position and maintain clear lines of communication with NATO high command in Brussels. The final instruction in this order noted that this order superseded all other operational orders, no matter what their source.

In a hastily called emergency meeting in Brussels, the U.S. Secretary of Defense (SECDEF) accompanied by the Chairman of the Joint Chiefs of Staff (JCS) was informed by the balance of NATO commanders that U.S. forces assigned to a joint NATO operation could not unilaterally withdraw from that operation until their commitment had been fulfilled. The SECDEF repeated the presidential directive and told the NATO ministers that U.S. forces would indeed withdraw according to the announced time table. A German air force general, clearly the spokesman for the remaining NATO council members, repeated the NATO position again with one addition: Any forces assigned to NATO operations not following the U.N. directive would be declared a rogue force and be subject to further NATO action.

Outraged by this not-so-subtle threat, the SECDEF closed the meeting and with the JCS boarded his plane for the return trip to Washington. As the plane touched down in Iceland for refueling, word came that European forces using U.S.-devised counterterrorist plans for base security were seizing U.S. installations all over Europe.

The host governments of England, France, Germany, and Italy had acted on the U.N. declaration and seized U.S. forces operating on their territory. America was confronting the one world government it had worked so hard to create. The military command in Brussels again transmitted orders to the 1st Armored Division to hold its ground and maintain its defensive operations or face U.N. reprisal. U.S. operational commanders ignored the U.N. order and continued their preparations for withdrawal according to the presidential directive. The stage was now set for a world conflict few could have foreseen.

From the U.S. perspective, the European move caught the struggling American president off-guard and sealed his fate politically. The American press called the European action Pearl Harbor Part II and began to goad the President into military action. Faced with the loss of all in-theater air assets and facilities and with unknown numbers of hostages, the president ordered 1st Armor to hold its ground and await further orders.

The U.S. 6th Fleet, however, received a much different set of orders. Withdrawal of 1st Armor would take place only after the 6th Fleet had established a zone of control in the Adriatic that would permit a safe operation. NATO, it seems, had underestimated the desperation of the now wounded American President and the power of the U.S. 6th Fleet.

Russia was the first to warn that American naval forces were assembling in the safe waters off Israel under the protection of the Israeli Defense Forces. Israel was repaying America for the billions they received in aid. The cat, though, was out of the bag.

NATO forces were now aware of the upcoming American action and began to prepare for the engagement. Russia followed the satellite information with an offer that shocked most of the remaining NATO ministers. Russia would, as part of its military contribution to the NATO mission in Bosnia, provide elements of its military to replace U.S. forces no longer available. The initial shock of the offer was dwarfed by reaction to an agreement by the Russians to place these forces under the operational control of NATO commanders in-theater. A new age in European cooperation had arrived.

The outbreak of hostilities was sudden and severe. U.S. 6th Fleet forces entered the Adriatic and established local air superiority after a fierce air battle. The removal of the 1st Armored Division began soon after. NATO, which was clearly unprepared for this conflict but holding large numbers of American military personnel, soon realized a negotiated peace would yield a higher return than the continued conflict in the Mediterranean.

The cessation of hostilities on terms that seemed to favor the Europeans gave those in power across Europe a badly needed political victory. Public concern over the incident quickly turned into a quiet euphoria. Many on the continent it seemed had a deep-seated desire to see the "Yanks" get theirs.

Negotiations soon began regarding the return of U.S. military personnel and equipment stationed in Europe when the conflict began. As the current administration drew to a close, negotiations with the U.N. stalled. The Europeans hoped to catch the new administration off guard and further improve their position. Much to their surprise, soon after the inauguration the new administration began to pursue a very hard line with the European Union, demanding the return of all U.S. property before negotiations could continue.

The U.N. General Secretary, backed by overwhelming support of the membership at large, passed a resolution ordering the United States to

pay all back dues owed the U.N. or face immediate suspension from the Security Council.

The President's response to the U.N. was clear and to the point. The U.S. would not even discuss U.N. financial obligations until the U.N. addressed American military assets in the hands of the European Union. The general secretary wasted no time in convening the entire U.N. body; debate was short and the vote quick. America had become an outcast. With a few notable exceptions, the United States was isolated. The American president responded to the U.N. action by revoking all U.N. personnel visas and demanding that they leave the country within 48 hours.

In the months that followed the U.N. reconvened in Brussels and set about the business of condemning the U.S. and her few remaining allays for a host of alleged violations. The once bipolar world had now fragmented itself into four district trade and military organizations:

- *China,* in a loose confederation with Japan and other Pacific rim nations, established the Asia Pacific Pact (APP).

- *Iran,* the most vocal of the Arab states established the Islamic Federation of Independent States (IFIS). This organization united the oil-producing states of the Persian Gulf—with one notable exception—and established close political and military ties with India and other nonaligned nations.

- Former *NATO and Warsaw Pact countries* expanded the European Union and replaced the now defunct NATO military structure with the European command (EC).

- The last trading block chaired by the *United States* shared almost no commonality with its members other than their reliance on the U.S. to protect them from their neighbors.

Kuwait Israel, Taiwan, and Norway are now all that stands between the United States and total isolation. Even Canada, a long-time ally of the U.S., has recalled all its military personnel and openly declared its neutrality.

As time passed, relations between the trading blocks ebbed and flowed. America and its allies had become the world's pariahs. The remaining trade coalitions began a wide-reaching plan under the auspices of the United Nations to strangle the economies of the U.S. block and force them under U.N. control.

As historians record the past, 1996 will be noted as a year to compare with the stark events of 1939 and 1941. Most of the major world's

powers will for the first time in history see a dramatic change in leadership largely through peaceful means.

Elections in Russia, the United Kingdom, and Israel reversed the course of those nations' policy. The sudden fall of the House of Fahd in Saudi Arabia and the passing of the aged leadership in China set the stage for a vast realignment in the world's political environment.

1 Introduction to Harpoon

There are two types of war games that rely on the use of actual data: historical and contemporary. Historical war games re-enact encounters set in the past, the object being to see how your decisions might have affected the course of history. Historical naval war games benefit from hindsight and the historical record. A contemporary naval war game, on the other hand, can be defined as a set of rules that simulate naval combat of the current era. There is little historical data from which one can benefit. Mostly, there is only raw unclassified data on the capabilities of the contestants. There is no history as to what might constitute a "good" decision or a "bad" one; the results of the contest itself will bear the answer. Consequently, there are two tests a contemporary naval war game must meet: whether it can accurately duplicate existing naval scenarios, and whether it can accurately predict future ones. In this regard, *Harpoon* is the most sophisticated and realistic contemporary war game available to the public at this time.

Larry Bond's original naval war game appeared in 1980 as a board game. It drew on the experiences of the past in an effort to produce a true contemporary naval war game. Designed by an experienced naval officer, the game combined a simple game system with the specific details of a variety of naval weaponry. Because it was deliberately conceived as an open-ended game system, Bond's game could be fitted with new rules, statistics, or data as they became available, virtually guaranteeing that it would remain a viable, valuable resource for naval war gamers. In 1988, Larry Bond's board version of the game set the standard by winning a second N.C. Wells award at the prestigious Origins Wargaming Convention, the only game to ever do so.

Bond's game system is, at its heart, a simple one. Damage point values for ships are based on their tonnage (with suitable modifications for ship type or construction), damage inflicted by warheads and guns is based on the weight and type of the explosive.

Your computer version of *Harpoon* is identical in concept to the original game. However, it also incorporates a few convenient features that allow for greater flexibility. Some of the main differences between the board game and this computerized version are as follows:

- The most obvious time-saving feature is that the computer handles all the "number crunching" required to play the board game.

- The computer version has a "layered" design. That is, the player can choose the amount of realism and/or detail, thus making this product an attractive challenge to both expert and novice war gamers. Toward this end, you have been furnished with a "Staff Assistant." Normally, Task Force Commanders have staffs to help them keep track of the details regarding the conditions of the fleet, as well as intelligence concerning the enemy. Your Staff Assistant attempts to perform the same function. When you give an order, or ask for information, he will take care of it for you.

- The computer lets you command many task forces instead of just a single one.

- The computerized version incorporates a time-compression feature. Normally, naval engagements in the "real world" might require several days to resolve as units travel from one point to another. To alleviate this dead time, you can speed up computer time when nothing important is happening. The computer will automatically return you to "real time" once contact is made with the enemy. Or, you can slow *Harpoon* down whenever you want.

- An exciting feature, especially for the war game aficionado, is the vast amount of detailed information available on both friendly and enemy units. With a keystroke, you can display detailed data on NATO and Soviet units. This makes *Harpoon* a valuable learning experience, in addition to being a challenging war game simulation.

Harpoon Classic 97 comes with four new battlesets in addition to the original sixteen from *Harpoon Classic.* You have more than 250 different scenarios, offering literally thousands of hours of game play.

In short, the computerized version of *Harpoon* can assist you in making the decisions that a ship commander or battle group commander makes in a modern sea battle. *Harpoon* displays information available to the commander, and shows how he uses it to make those decisions.

Most importantly, it allows you to make those decisions, and to see their results in a simulated combat setting.

Although *Harpoon* is a "game," there is no built-in play balance. *Harpoon* is more accurately a simulation. The data is a reflection of real-world weapons and equipment, used with a computer system that allows them to interact. We cannot say that you will win 50% of the time. The vagaries of modern warfare do not allow for such niceties; neither does *Harpoon*. In fact, each time a scenario is played it will be different. Whether or not you win will depend on the initial situation presented to you by the computer, and how well you meet the challenges of those situations.

Harpoon Interface

The interface of *Harpoon Classic 97* conforms to the standard Windows 95 conventions. If you're familiar with the original Harpoon Classic, you'll see the differences immediately. However, you'll also notice that, by and large, the features are very similar.

Definitions

The following terms are used throughout this manual:

- *click.* Press and release the left mouse button.
- *double-click.* Quickly press and release the left mouse button twice.
- *right-click.* Press and release the right mouse button.
- *select.* Choose a command, either with the mouse (by clicking) or by using the keyboard command

Screen Layout

At any given time, there will be three to four different game windows open. The Unit and Group maps, the Strategic map, and the Report window usually appear on-screen at all times. As you play, you can lay out the windows yourself and the program will remember where you place everything. Just drag the windows around and resize them to fit your playing style.

Using Buttons

Buttons are used on many windows within the program. To active a button, click it or use the keyboard command, if available. A button labeled **E**xecute is activated by the **E** key, and the button labeled **F**ull

Report is activated by the **F** key. To activate a command by pressing a key, you must either press the **Alt** key or the **Control** key as well. Chapter 5, "Keyboard Commands," for a full listing of the keyboard commands.

Using the Menus

To operate the menus using a mouse, move the mouse pointer to the menu heading and click the left mouse button.

Certain menu items are not always available. When a menu item is not available, then it is grayed out ("dimmed").

Grayed-out menu item
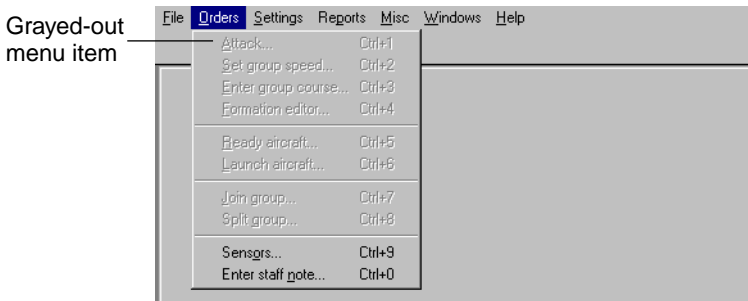
The **Orders** menu is always directly linked to the selected Group or Unit in the currently active window (that is, if the Group window is active, the selected group and if the Unit window is active, the currently selected unit). Note that most of the Order items do not work for units.

Using Dialog Boxes

Many action require you to use dialog boxes. Use the cursor to move around the dialog box. Items within a dialog box are grouped into logical "families."

There are four different kinds of items in dialogs boxes:

- *Radio button.* Only one radio button item within a family can be turned on, similar to a car radio's station selection buttons. These are represented as a small circle, and if on the circle is filled in.
- *Check box.* A check box item is either off or on. If it is off, it is blank inside the box, and if on it has an X or a check in the box.

- *Text edit box.* You can type numbers or text in this type of dialog item.
- *Buttons.* Buttons are normally used to accept or reject the entries you make within a dialog. See "Using Buttons" on page 1-3 for details on using buttons.

Using Lists

Lists appear at various points within the program. Click an item in the list to select it. If two or more lists are visible, clicking any item in a list makes that list the active list. Alternatively, you can use the up and down arrow keys to move the selection bar within the current list. If more than one list is visible, the **Tab** key switches between them. The active list has a selection border.

Grid Lists

A grid list is a multicolumn list that allows you to control the width of its columns. To resize a column, drag the edge of the column in the top (or heading) row.

Quick Start

This walkthrough will help you familiarize yourself with the game commands while participating in an actual (albeit simple) scenario. There are a couple of things to take note of:

- Missed contacts

    Throughout the walkthrough you will be encountering enemy ships. Because of the unpredictability of the computer artificial intelligence, there is a chance that enemy ships will not appear where expected. If this happens to you, explore the expected meeting area (by setting your course with the **Course** button as explained in the walkthrough) at a slow speed. If you are still unable to make the enemy contact, either start over or skip to the next section.

- SOSUS contacts

    Occasionally, while playing this walkthrough, you may detect enemy units located far away from yours, via SOSUS (as indicated in the staff message that you receive). SOSUS are large fields of sea-bed sensors located in the North Sea which track enemy vessels through advanced passive sonar techniques. If you receive this type of contact, ignore it by clicking the **Continue** button in the Staff

Message dialog box. You will quickly lose contact with the enemy ship.

- Pausing the game

  This walkthrough is best played by reading ahead a section at a time. While doing so, you can pause the game by pressing **Ctrl-P.** This will ensure that no game time passes while you are reading the text.

Starting the Scenario

1. Start the *Harpoon Classic 97* game.
2. In the Select a Battleset window, select the GIUK battleset and click the **OK** button.
3. In the Select Game Options window, click the **OK** button.
4. In the Select Scenario window, select the **1.0 BLUE SIDE ONLY: Beginners Walk-Thru Scenario.** Click the **New Game** button.

Movement

Report window

Select the NATO Submarine Group, AAU, located off the coast of Norway by clicking on the icon in the Group window. Notice that the details of the group are displayed in the Report window. This group consists of two submarines at shallow depth.

Unit window

1. Right-click on the submarine group icon in the Group window. A close-up of the group appears in the Unit window.
2. Click the **2x** button at the top of the Unit window. This zooms in on the vessels.
3. Click the uppermost submarine in the Unit window. Notice that the information in the Report window changes to display information about this particular submarine, the *Miami,* an improved Los Angeles–class sub. Notice that it is not currently moving.

Setting a Course

1. Click on the sub group AAU again in the Group window. Notice that this changes the command buttons that are available across the top of the main window.

2. Click the **Course** button to display the Set Orders dialog. Most of the buttons here are grayed out, because the sub currently has no orders.

3. If the **Enter New Legs** check box isn't checked, click it. This lets you give the group a course.

4. Click the Group map on a point just north of the northeast corner of Iceland. Notice that a line appears from your group to the point selected. This is the course that the sub will follow. More legs could be added to this course by clicking more points on the Group window.

5. Click the **OK** button in the Set Orders dialog box.
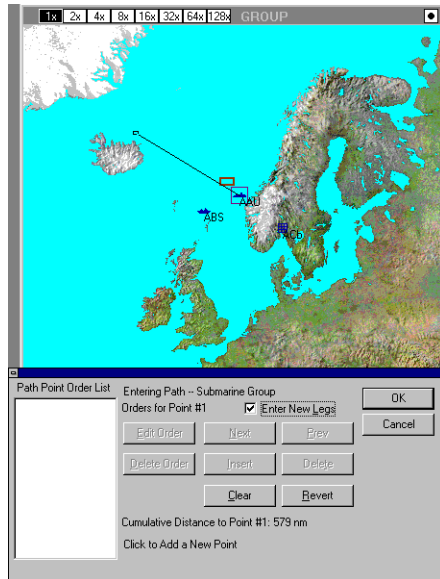
Setting Speed

In the Report window you can see that although you have set a course, the speed of the group is still 0.

1. Click the **Speed** button at the top of the main window to display the Set Depth and Speed dialog box.

2. Click **Cruise.** The speed displayed in the dialog changes to 15 knots.

3. Move the sub to periscope depth by clicking on **Peri.**

4. Click **OK.** Notice that the speed in the Report window is now 15 knots and a small arrow has appeared next to the icons in the Unit window indicating that they are moving.

Range Circles

Notice the circles around the subs in both the Group and Unit windows. These indicate ranges for such things as sonar, radar, and weapons.

1. Select the **Settings** menu and then the **Set Range Circles** menu item. The Set Range Circles dialog box is displayed. Using this dialog, you can toggle the range circles so that only those in which you are interested are displayed. For now, let's only worry about sonar ranges.

2. Uncheck all of the boxes except **Best Active Sonar** and **Best Passive Sonar** for the Blue side.

3. Click **OK.** Notice that only green circles remain on the Unit window. These are the ranges for the passive sonar which we are currently using.

Setting the Sensors

1. Click the **Sensors** button at the top of the main window. The Set Group Sensors dialog box is displayed. Currently, the sonar and radar (which is usable only because we are at periscope depth or less) are both off, or passive.

2. Set both to **Active** and click **OK.** Now the range circles have changed to smaller yellow circles indicating the range of our active sonar.

3. Since it is typically better to run with passive sonar and radar until an enemy is found, use the Set Group Sensors dialog box to turn off both your sonar and radar.

Sub-to-Surface Missile Attacks

Time Compression

Okay, let's go hunting for an enemy. First, let's speed up the time compression so that things happen a little more quickly. Click on the **+ Fast** button at the top of the main window. Notice that the text next to the button changes to 5 sec. This indicates that five seconds of game time are passing for each second of real time. Continue clicking the **+ Fast** button until you are at "1 min." Your subs are now visibly moving in the Unit window.

Mission Time & Orders

The time remaining indicator is in the lower right corner of the main window. This shows the time remaining to complete the current mission. It looks as though we have plenty of time, more than nine days.

1. Click the **Reports** menu and then the **Show Orders** menu item. This displays the Scenario Description dialog box, where you can review the mission orders.

2. Click the **Close** button.

3. Click the + **Fast** button until the text next to the button reads 30 min. Your subs are now visibly moving in both the Unit and Group windows.

Encountering the Enemy

Soon, you receive a staff message indicating that your subs have made a contact.

1. Click the **1:1 time** button. This sets your time compression back to one second of real time equaling one second of game time, so that you have more time to react to the threat.

2. Click the red ship icon that has appeared in the Group window (pressing the **Backspace** key to toggle between the groups may be helpful if the enemy group is difficult to select). The Report window indicates that this group, USSR Surface Group ZZS, contains one ship.

3. Scroll the Unit window until the red ship icon appears there as well. Select the Russian ship in this window. This allows you to get information on individual enemy ships. In this case, there is not much more information than what the Group window told us.

Getting a Fix on the Enemy

There may be an elongated red diamond visible around the enemy ship. This indicates that the exact location of the enemy is unknown. We only know that is lies somewhere within the area of the diamond. Don't worry if you lose contact with the enemy. If this happens, slow your speed to "Creep" (5 knots) and continue moving in the same direction. You will soon pick up the enemy again. Notice that as your subs approach the enemy, the size of the diamond gets smaller and may disappear altogether, indicating that you have an exact fix.

Launching Missiles

1. When the enemy is detected, select your sub group in the Group window.

2. Now click the **Attack** button at the top of the main window. The Select Enemy Target dialog box is displayed. In this case there is only one enemy, so click the **OK** button. The Sub vs. Ship Attack dialog box is now displayed.

3. For this battle we will use missiles, so choose **Missile Attack** and click the **OK** button.

4. Now the Attack Allocation dialog box is displayed. Your two subs are listed in the upper left list, and the lower left list shows the enemy targets. In the lower right are the current number of missiles allocated to be fired in this attack, in this case four Tomahawk missiles from the Miami. The upper right list indicates the weaponry that remains onboard, in this case five Tomahawk missiles and six Harpoon missiles.

5. Click the **Execute** button to launch your Tomahawks. You will see a graphic of the missiles being fired from the sub and a missile icon will appear in both the Unit and Group windows. Watch until the missiles reach the enemy unit. You may want to increase the time compression slightly to speed the action. The enemy ship may attempt to down the incoming missiles as indicated by a graphic of the enemy ship firing and small explosions occurring on the missile icon. Once the missiles reach the enemy, another graphic will appear showing their explosions on or near the enemy.

6. If the missiles are destroyed or miss, continue attacking until the enemy ship has been sunk. Once it is sunk, you will see a dialog with a graphic of the sinking ship to let you know that the enemy has been destroyed.

7. Click the **Close** button.

Sub-to-Surface Torpedo Attacks

Encountering the Enemy

1. Bring your submarine group to the surface by using the Set Speed and Depth dialog box, and if the speed is not set to Cruise, set it now.

2. Set the time compression to 1 sec. = 30 min. and continue on your way toward Iceland. Make sure your sonar and radar are off. You will soon encounter another single enemy ship, USSR Surface Group ZVS.

Using Torpedoes

1. Lower the time compression to 1 sec. equals 1 sec.

2. Set your course directly towards the enemy by displaying the Set Orders window, clicking the **Clear** button to clear the previous course, and entering a new course directly toward the enemy.

3. Attack this ship exactly as you did the previous one. When the Sub vs. Ship Attack dialog is displayed, choose **Torpedo Attack** and click **OK.**

4. You have allocated one Mk 48 torpedo to fire at the enemy. Increase this to three torpedoes by selecting the Mk 48 line in the Unit Weapons Loaded window (notice that you have 21 more onboard), and selecting the **Allocate** button twice.

5. Select the Sturgeon–class Sea Devil in the Attacking Units window. Notice that it has 17 torpedoes on board. Allocate three of this sub's torpedoes to fire as well by using the **Allocate** button. Each sub should now be firing three torpedoes.

6. Click the **Execute** button to begin the attack, which now proceeds exactly as before. Note that it is sometimes difficult to attack enemy ships with torpedoes without having an exact fix.

7. If you have trouble scoring a hit, try turning on your radar and sonar to get an exact fix or use a missile attack.

8. Continue the attack until the enemy vessel is destroyed.

9. Once this is accomplished, set the speed of your sub group to 0 by using the **Stop** setting in the Set Speed and Depth dialog box.

Attacking from an Airbase

Viewing your Aircraft

1. Select the NATO Port & Airfield, ACb, located at Oslo, Norway, in the Group window.

2. Click the **Ready Air** button near the top of the main window to display the Ready Air dialog box. This dialog shows you the available aircraft at this airbase and the mission type for which they are currently ready. At the moment you have two EA-6B Prowlers available for patrol and a squadron of four A-6E bombers.

3. Click the **Cancel** button to close this dialog.

Setting Patrols

1. Select the **Launch** button.

2. In the dialog that appears, select **Patrol** and click **OK.** Another dialog is displayed asking you to choose a patrol destination on the Group map.

3. Click a point just to the west of the two small islands off of the Soviet coast in the Baltic Sea (due east of the airbase) and click **OK.** The Launch Aircraft dialog is displayed.

4. Select the row that contains the EA-6B Prowler aircraft and click the **Move >>** button.

5. Another dialog is displayed asking you how many aircraft you want to move. Since this is a patrol, type **1** and click **OK.**

6. Now click **Launch.** The aircraft launches and begins moving toward its patrol point.

7. Increase the time compression to 1 sec. equals 1 min.

8. Set the radar on your patrol to **Active** by selecting it in the Group window and using the **Sensors** button.

9. If a staff message appears to inform you that your patrol is nearing Bingo fuel, launch your other EA-6B Prowler to patrol near the same point.

10. When the next staff message appears to inform you that your Air Group has reached Bingo fuel, order them back to the base by clicking **Yes.**

11. Continue patrolling in this way until you detect an enemy ship, USSR Surface Group ZWS, near the patrol point.
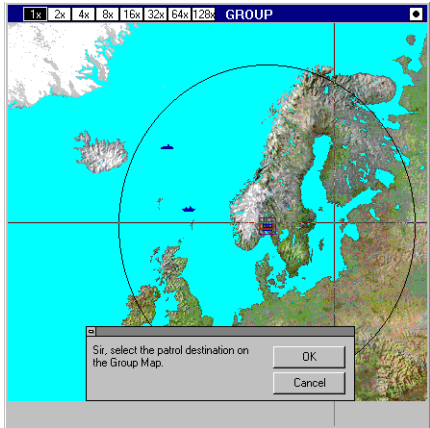
You may want to increase the time compression to speed things along. Remember to keep your radar active on your patrol aircraft.

Be careful not to let your patrol approach the enemy ship too closely or it may be shot down. If this happens, remember the location of the enemy ship and quickly launch another patrol.

Launching an Attack

1. Once you've detected the enemy ship, launch your four bombers from the base on an attack mission against the enemy group.

2. Center the enemy ship in the Unit window.

3. Once your bombers arrive, attack the enemy using your Harpoon missiles according to the defaults suggested.

4. Continue flying patrols and attack missions until you have sunk the enemy ship. Note that the enemy ship may try to shoot down your aircraft when they approach too closely.

5. Send your aircraft units home by selecting them in the Group window and then selecting the **Land Air** button at the top of the window and clicking **OK** on the resulting dialog.

Surface-to-Sub Attacks

Formation Editor

1. Set your time compression to 1 sec. equals 1 sec.

2. Select the NATO Surface Group ABs located north of the British Isles in the Group window.

3. Notice in the Report window that these four ships have five helicopters landed. Let's use the helicopters to set patrols around the ship. Select the **Formation** button at the top of the window. The Unit window disappears, the Group window zooms to 64x, and the Formation Editor dialog box is displayed.

4. Select the 1 SH-2F Seasprite line and click **Set Air Patrol.**

5. Click the lowest left sector of the outer ring displayed in the Group window. A helicopter icon appears and this sector's outline turns to yellow. In the dialog, you now have 1 ASW Patrol listed.

6. Set another patrol to the left of your ship and another above it.

7. Now click **Execute** to set the patrols.

8. Zoom the Group window back out to 2x. Notice that the Unit window reappears. The Unit window is only available when the Group window is set to 8x zoom or less.

Searching for the Enemy

1. Set the course for the ship group to move it just north of the Scottish coast and then add another leg to move it west (or left) until it is away from the coast.

2. Click **OK** to set the course.

3. Set the speed of the group to **Cruise** (19 knots).

4. Center the group in the Unit window.

5. Now increase the time compression and notice that your helicopters are now flying patrols and dropping sonar buoys (small black squares) near your fleet.
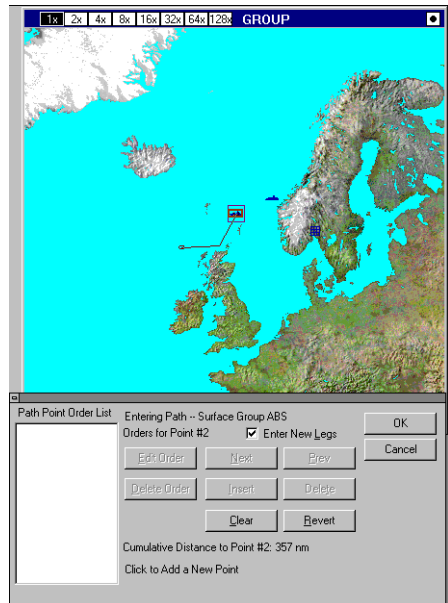
Attacking a Submarine

Somewhere north or Scotland, you will detect an enemy group, USSR Submarine group ZYU, a single submarine. If you reach the end of your course without finding the enemy sub, set a course to backtrack along the northern Scottish coast at a speed of five knots until you find it.

1. When you find the sub, select your surface group in the Group window.

2. Click on the **Launch** button at the top of the window, which lets you launch airborne attacks from the ship against the sub. The Select Destination Type dialog box appears.

3. Select **Attack** and click **OK.**

4. Select the sub group and click **OK** in the Select Enemy target dialog. You have one, possibly two, Seasprite helicopters ready to go.

5. Select the aircraft and move it to the Launching Group window by clicking the **Move** >> button.

6. Click **Launch** to launch the aircraft. A helicopter icon appears in the Unit and Group windows moving towards the sub.

7. Select the enemy sub in the group window. Notice that an **Intercept** button has appeared near the top of the window. This is another method for attacking enemies if you have qualified aircraft in the air.

8. Click **Intercept** and select one of the listed aircraft.

9. Click the **Intercept** button and then the **Execute** button to divert these aircraft to an attack on the enemy sub.

10. Repeat this for any other aircraft that were listed in the Intercept dialog. If there are no qualified aircraft in the air, a dialog will inform you of this fact.

11. When an aircraft gets within range of the enemy, the Attack dialog box is displayed. Accept the default of firing one Mk 46 torpedo by clicking the **Execute** button.

12. Shortly thereafter, the Attack dialog box appears again. Fire the helicopter's second torpedo.

13. The helicopter will now return to the ship to reload. Continue attacking with the helicopters until the enemy sub is sunk.

14. You may also wish, if you are within range, to attack the sub directly from the ship by using the **Attack** button with the ship group selected in the Group window.

Surface-to-Surface Attacks

Searching for the Enemy

Once the enemy sub has been destroyed, set the course of your ship group south along the western coast of Ireland and set its speed to **Cruise.** Note that you may have to clear the previous course by clicking **Clear** from the Set Orders dialog box before entering your new course. This new course may require multiple legs to navigate around the coast of Ireland. Soon, you will encounter another enemy ship, USSR Surface Group ZXS. If you are unable to find this enemy, explore the waters to the west of Ireland and Scotland. You may also wish to move your submarine group, AAU, into the area to aid with the search.
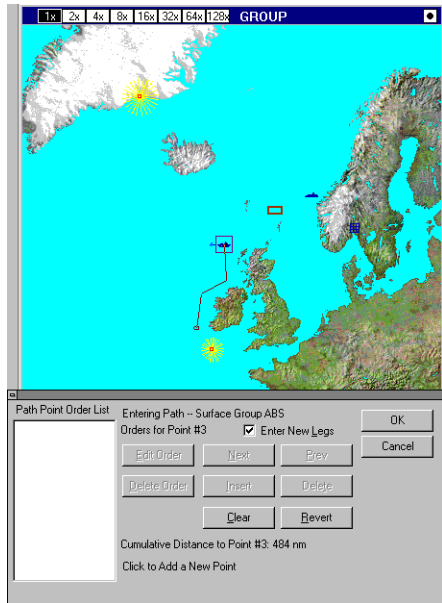
Launching a Missile Attack

1. Select **1:1 Time** from the Staff Message dialog box.

2. Select **Attack** from the buttons near the top of the window.

3. Your helicopters are useless in this attack, because they are equipped for anti-submarine warfare. Select the enemy unit and click **OK.**

4. The Ship vs. Ship dialog box is displayed. Choose **Missile** (most likely the only type of attack available) and click **OK.** Allocate some missiles from your fleet to fire and click **Execute.**

5. If this is a bearing-only attack (that is, you don't have an exact fix), the Bearing Only Attack dialog box is displayed. Select the default settings by clicking **OK** and continue to approach and attack the enemy ship until it is sunk.

Conclusion

If you were able to sink all of the enemy craft, a victory dialog will soon appear, indicating to you that you have accomplished the mission objectives. Congratulations! You have just successfully completed your first *Harpoon Classic 97* scenario and learned the fundamentals of movement and attack. Now you have more than 250 more scenarios to challenging your growing strategic naval warfare skills.

2 Overview of Operations

In computer *Harpoon Classic 97* you play the role of a "side com-
mander," commanding all naval and air units for one side of a sce-
nario. Because the scenarios can vary from a single ship group to
multiple ship groups and bases, the scope of the role you play can vary
immensely. Your job is to direct all the groups within your control to
achieve the task set in your scenario orders.

Groups, Units, & Classes

Understanding groups, units, and classes is the key to playing *Harpoon*
effectively.

A *class* is a single platform type, such as an Iowa class battleship, an
F-15 Fighter, or a Nimitz–class aircraft carrier.

A ship or submarine *unit* consists of a single (named) individual class
member, such as the *New Jersey,* an Iowa class battleship. In an aircraft
or missile unit, a single unit may contain multiple members (for exam-
ple, six F-15 fighters with the same air-to-air loadout, or nine Toma-
hawk missiles launched from the same ship at the same target, would
be represented by a single unit).

A *group* is the primary unit of control in *Harpoon* and is defined as one
or more units. An example ship group might contain one battleship
unit and two destroyer units. As the side commander, you give orders
to groups, and the (computerized) group commander uses the individ-
ual units to carry them out.

Sides & Countries

Two sides are modeled in each of the *Harpoon* battlesets. Sides typically represent alliances (such as NATO or the Warsaw Pact) made up of multiple countries. These two sides are labeled Blue and Red and all of their groups and units will be colored accordingly within the game.

NOTE: An uncertain contact will show up as the enemy side/color until you establish an exact contact, because within the game you can only shoot at enemy contacts. Each side can have multiple countries represented. In the first battleset, GIUK, the Blue side has the USA, United Kingdom, and Norway aligned together, although other countries may be in the alliance. Only countries with classes used in the battleset are represented in *Harpoon*. Countries have many variables associated with them, including the percentage of breakdowns their equipment will experience, how effective their repair capability is, how effective their weapons are, and more!

In *Harpoon,* you can either play the Red or Blue side. This allows you to see the conflict and its tactical nuances dictated by differing missions and equipment from both sides.

Environment

In *Harpoon* the environment consists of several elements. The first element is altitude (or depth). To simplify the range of possibilities, altitude bands (alt bands) are used.

- *Vhigh.* Very High altitude is 20,000 meters and higher. Only some jet aircraft have the capability to fly at this altitude.
- *High.* High altitude is between 3,500 and 20,000 meters.
- *Medium.* Medium altitude is between 600 meters and 3,500 meters. This is the maximum altitude for all helicopters.
- *Low.* Low altitude is between 30 meters and 600 meters.
- *Vlow.* Very Low, is "wave-height" or "terrain-following" flying, keeping your aircraft below 30 meters. In a fixed-wing aircraft (not a helicopter), there is a significant chance that you will hit the water due to pilot error and the aircraft will be lost. The advantage is that aircraft flying at the VLow altitude can only be detected at less than half the range of an aircraft flying at Low altitude.
- *Sea Level.* The surface of the ocean.

- *Periscope.* Right below the surface where you can see out your periscope. Use with caution because you can be spotted by low-flying aircraft.
- *Shallow.* Above the thermal layer, deeper than Periscope depth.
- *Intermediate.* Below the thermal layer, but shallower than the max safe depth for most submarines. Submarines are harder to detect when at this depth or deeper. Speeds up to 24 knots are possible without cavitating at this depth.
- *Deep.* The maximum safe depth for most submarines, used to evade detection. Submarines can go up to 29 knots without cavitating at this depth.
- *Very Deep.* Can only be achieved by a few submarine classes, and eliminates all cavitation noise.
- *Too Deep.* Too Deep is deeper than any submarine can go, extending to the ocean floor.

In computer *Harpoon* all the land is of uniform height, so you do not have to worry about your planes crashing into mountains. Water depth is directly relative to how close you are to land (that is, no realistic undersea maps). In general the higher you go, the easier it is to be spotted by the enemy. So submarines tend to stay as deep as they can unless attacking and planes tend to fly low unless searching for the enemy or trying to improve endurance.
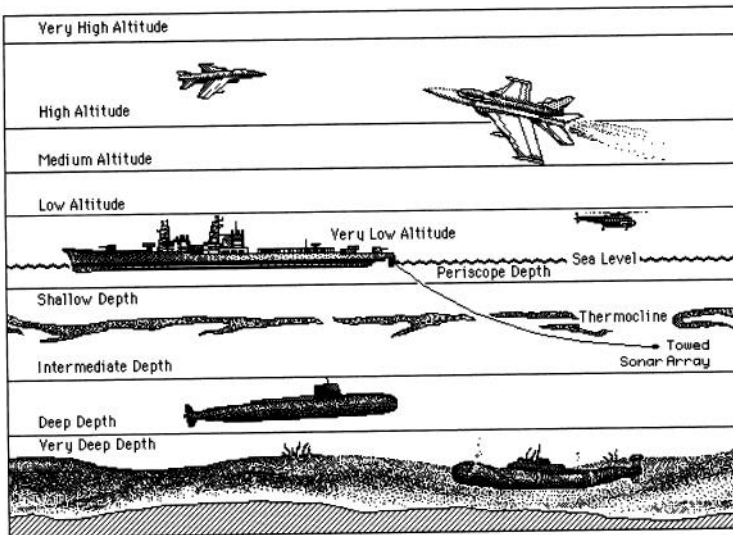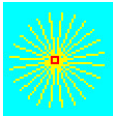
Weather systems or cells can appear in *Harpoon*, and your groups and units can be affected while within the range of the Weather icon. Some weapons cannot be used at certain sea states (which are directly linked to the strength of the weather cell) and you may not be able to be launch some aircraft. Weather also affects sensors making visual, radar and sonar contacts more difficult.

Weapons

Weapons within *Harpoon* are designated by the term "mount." Each mount contains one or more weapons. A mount also has an associated number of barrels/rails/tubes, an ammunition amount, a weapon firing arc and possibly a specific sensor for the mount, called a director. Directors direct weapons to specific target(s), and if the director is damaged the mount may not be capable of firing at all! Note that directors can only track a limited number of targets, so a major factor in maximizing the effectiveness of your attacks is overwhelming the capacity of the defending mounts.

To examine your weapons in computer *Harpoon,* select the **Display** button in the Report window to view the Platform Display window.

Select the **Weapons** button to display the Weapons window. For ships and submarines you get a window that looks like this:
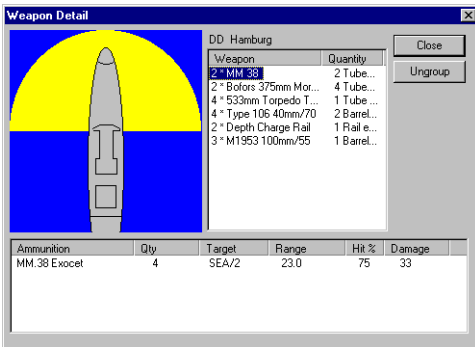
For aircraft, the window looks like this:
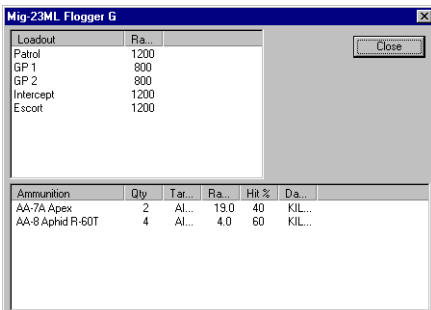
The lower list in either window provides the following information about your mounts:

- *Ammunition.* The type of ammunition this mount fires or carries.
- *Qty.* The maximum quantity of this ammunition in the mount.
- *Target.* The type of target this mount/ammunition can shoot. It is labeled AIR (flying targets), SURF (surface targets), SUB (submarines) or N/A (not applicable). The number following the "/" is the number of targets that the director can track concurrently.
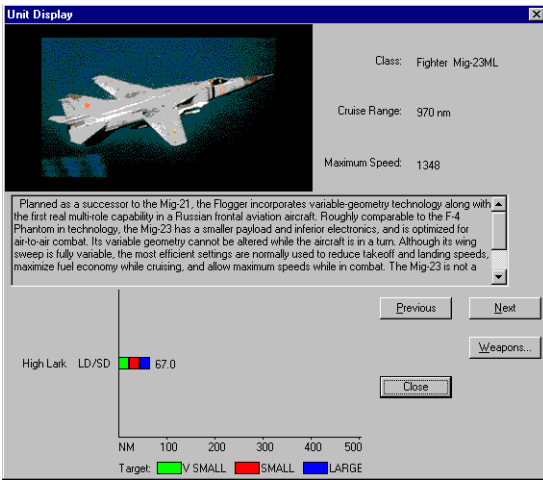- *Range.* The range in nautical miles that the weapon can hit targets. If HORIZ is listed, the lesser of your current radar horizon or weapon range is the weapons maximum range.
- *Hit %.* The percentage chance that this weapon will hit if fired at a target that is within range (and if it is not shot down by the target as in the case of a missile).
- *Damage.* The maximum number of damage points that this weapon can inflict if it hits a target. Some weapons have KILL listed, meaning if they hit the target type, they will kill it. Another special damage type is NUKE, where nuclear explosion damage is done to the target and nearby units.

NOTE: When you start a game, one of the setup options is Possible Nuclear Release (see page 2-19). Nuclear weapons (nukes) are only available in computer *Harpoon* after you have been granted nuclear release. If you select **Yes** in the Possible nuclear release option, you may receive nuclear release at some point in the game. If the enemy uses a nuclear weapon, you are automatically granted nuclear release. Any nuclear weapons carried and/or aircraft loadouts are then available for use.

Sensors

In computer *Harpoon,* enemy and neutral groups and units are hidden until you detect them. Detection is always by a sensor, and the module within *Harpoon* that does the detection is called search. Every 30 seconds of game time, each sensor on each Unit "searches" to see whether a non-friendly unit has been detected. Variables that affect this search process include distance, absolute size, altitude/depth, weather, and speed of both the searching and detected units. In general, units that are larger in size, faster moving, and radiating energy (via propulsion noise or active radar or sonar) are easier to detect. A larger unit is easier to see, and returns more energy if "painted" or hit by radar or sonar

waves. A faster-moving unit radiates more sound energy, and the air/water it disturbs at high speeds also increases that unit's size for radar/sonar detection. Finally, a radiating unit (radar or sonar) can always be passively detected beyond the effective range of whatever active sensor is used.

Passive & Active Contacts

Contacts are either passive or active, meaning either you are detecting radiated energy or you are detecting reflections of your own radiated energy. When you detect a radiating target (that is, their radar or sonar is on or they are making noise based on their movement) you have a passive detection. If you are radiating (that is, your radar or sonar is on) and detect a target, this is an active detection.

Types of Contacts

Detection of either the passive or active type can be exact, area, or bearing-only. An exact detection means you know exactly where the detected unit is. An area detection means you know that the unit exists in a given area. This area is defined by a uncertainty zone or region represented by a colored diamond shape that surrounds the icon. A bearing-only detection is a special case of an area detection in which you know that a contact is a certain bearing from your position, but you only know the minimum and maximum distance it might be from you. All detections degrade over time if not repeated. As contacts degrade, the area of uncertainty will grow at the rate the detected unit could move since the last detection.
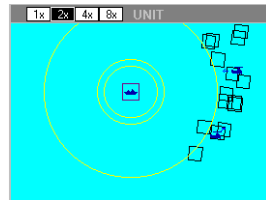
Notice that the submarine shown in the graphic above is an exact detection, with no uncertainty area shown. Notice the long diamond-shaped uncertainty zones that indicate bearing-only detection.

Notice the large diamond shaped uncertainty region in the graphics on the right indicating an area contact. This uncertainty region will decrease in size as the contact's position becomes more certain or increase as the contact's position becomes less certain.
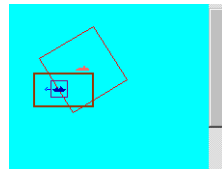
Fire Control Solutions

Fire control solutions in computer *Harpoon* are either exact, nearly exact, or bearing-only. Whether a detection is from passive or active sensors is immaterial, only the accuracy and type of solution is important. Some weapons require an exact detection, others a bearing-only or nearly exact area detection. The computer determines whether you have a sufficient detection level to attack with your current weapons, and will either let you attack or inform you of an inadequate fire control solution.

Radar

Radar is the use of airborne radio waves sent out at a certain frequency, combined with a detector that listens for "returns" of this same frequency, caused by this energy bouncing off a potential target. Radars in *Harpoon* are divided into two classes: air and surface search. Radars are limited in the distance they can be effective by the radar horizon.
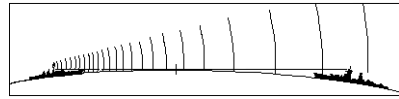
Table 2-1 shows you the maximum distance you can pick up targets given the altitude of your radar transmitter and altitude of the target, assuming the radar would be strong enough to reach that far.

Table 2-1   *Radar line of sight (nm)*

Ht	VHigh	High	Med	Low	Vlow	Lrg Ship	Med Ship	Sm Ship	Peris
VHigh	700	582	446	389	362	364	362	360	351
High	582	460	325	242	219	264	242	340	231
Med	446	325	191	134	108	109	107	105	96
Low	389	242	134	78	51	53	50	48	40
Vlow	362	219	108	51	25	26	24	22	13
Lrg Ship	364	264	109	53	26	27	26	24	15
Med Ship	362	242	107	50	24	26	24	22	13
Sm Ship	360	340	105	48	22	24	22	19	10
Peris	351	231	96	40	13	15	13	10	1.23

(Radar Altitude)

- Air Search Radar

    Air Search (AS) radar is used to locate and track airborne targets, such as missiles, planes, and helicopters. Air Search radar is generally used to detect targets at medium altitude or higher. These radars can be effective against targets at low or very low altitude, but only at five percent or less of their maximum range. Three special-purpose air search radars are:

    – *Height Finding (HF)*. A Height Finding (HF) radar not only detects airborne contacts, but also determines which altitude they are at. It can also detect surface contacts.

    – *Range Only (RO)*. A Range Only (RO) radar can only detect targets directly in front of it, and is mainly used in aircraft as a gunsight radar.

    – *Look Down/Shoot Down (LD/SD)*. A Look Down/Shoot Down (LD/SD) radar is an air search radar (mounted on an aircraft) that has much greater capabilities than a normal airborne radar.

- Surface Search Radar

    Surface Search (SS) radar is used to detect surface units and airborne targets at Low and Very Low altitudes. A special surface search radar is the Periscope Radar (PR) which is mounted on the periscope of a submarine and is used to help targeting submarine weapons against surface targets.

Sonar

Sonar is the use of sound energy traveling through the water to detect and track surface ships or submarines. Sonar can be passive or active. Sound travels underwater in strange ways as shown in this illustration:
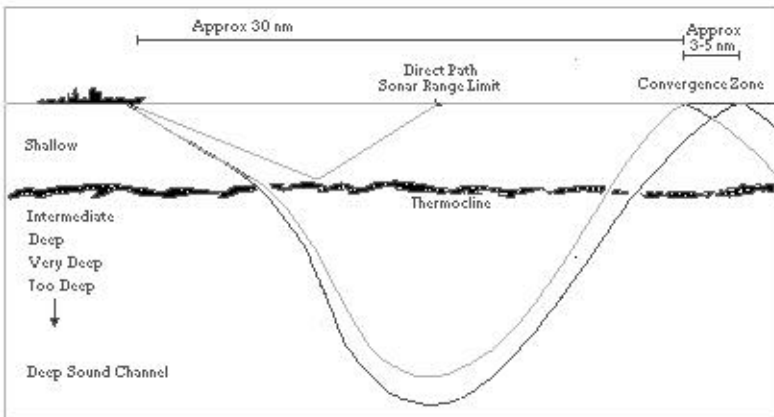
As you can see, your direct sonar reflects off of the thermocline (also called the thermal layer) and this limits its range. Sound that makes it through the thermocline "bends" back to the surface due to the immense pressure of the ocean at depths over 1,000 fathoms, then may reflect off the surface and repeat the process.

This area where you can detect distant targets is called a convergence zone (or CZ). Modern sonar can sometimes detect targets out to three CZs. This illustration shows the areas where you might pick up a target, and the corresponding "blind" zones. If the water is not Very Deep, you will not get convergence zone detections.

Limit of passive sonar

Limit of active sonar

Convergence zones
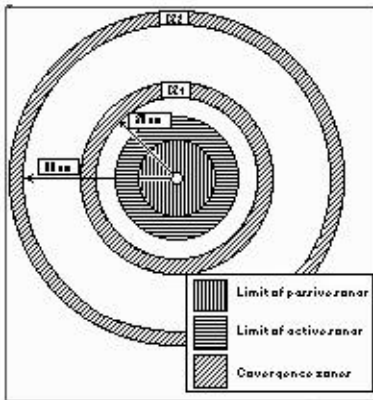
- Passive Sonar

  Passive sonar works by listening to sounds traveling in the water, classifying them and refining the contact. The primary advantage of a passive sonar is that it does not give away your position. The main disadvantage is that it often takes a longer time to classify a target, and get an exact location on it.

- Active Sonar

  Active sonar works similarly to radar in that it sends out sound energy and then listens for reflected returns of this sound off possible targets. The main advantage of an active sonar is that it gives exact distance and bearing information on any contact it detects. The disadvantage is that enemy units can detect the sound energy used in active mode at 2–3 times the range an active sonar can detect a target. A common tactic is to use passive sonar to generate an initial contact, then turn on active sonar just long enough to generate an exact contact for your fire control solution.

- Hull Sonar

  Hull Sonar (H) is built into the hull of a ship or submarine. They usually have both active and passive sonar capability. Hull sonar have two restrictions, the first being the "blind spot" in the baffles, caused by propulsion noise and turbulence. The second restriction is that when you travel at or above 20 knots, the flow noise caused by water flowing over the sonar eliminates the ability to detect anything.

- Towed Sonar

  Towed Sonar (T) is trailed behind some ships and submarines on a long cable. Most towed sonar are always below the thermal layer, but units with variable depth sonar (VDS) can change the towed sonar depth to either above or below the layer. Towed sonar greatly increases the effectiveness of a unit, as you have a much better chance of detecting targets below the layer. In computer *Harpoon* all towed sonar deployment and retrieval is automatic. Each time you change course, towed sonar will stop working or work at greatly reduced effectiveness until it can straighten back out.

- Dipping Sonar

  Dipping Sonar (D) is used on helicopters. They are suspended on a cable and lowered into the water while the helicopter hovers. In computer *Harpoon* use of dipping sonar is mainly automatic, as any helicopter with this capability will use it if assigned to a patrol zone within the formation editor. To manually dip your sonar, hover your helicopter at very low altitude. If your unit has a dipping sonar, it will automatically lower it.

- Mine Hunting Sonar

  Mine Hunting Sonar (M) are used only to hunt mines, although *Harpoon* does not employ mines.

- Sonobuoys

  Sonobuoys (S) are small sonar sensors combined with a short-range radio transmitter. Sonobuoys are dropped into the water in "fields" of 6–12 sonobuoys by aircraft, and then monitored. Fields of sonobuoys only last a few hours then turn themselves off and sink to the bottom of the ocean. In computer *Harpoon,* this process is automatic if an aircraft with sonobuoys is in a patrol zone within the formation editor. To manually lay a sonobuoy field, hover/loiter your aircraft, and it will lay a sonobuoy field and begin to monitor it.

Visual Detection

Prior to modern times, human
vision was the only way to detect
distant threats. Human vision is
limited to the visual line of sight
and affected by time of day and weather conditions. In today's environ-
ment there are several visual methods of detection available.
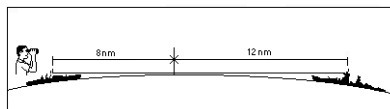
Table 2-2 shows you the maximum distance you can pick up targets
given your altitude and the target's altitude, assuming the perfect
visibility.

Table 2-2   Visual line of sight (nm)

	Ht	VHigh	High	Med	Low	Vlow	Lrg Ship	Med Ship	Sm Ship	Peris
Visual Altitude	**VHigh**	521	434	332	290	270	269	267	266	261
	High	434	345	243	181	164	180	178	177	173
	Med	332	243	143	101	81	80	77	76	72
	Low	290	181	101	59	38	37	35	34	30
	Vlow	270	164	81	38	19	17	15	14	10
	Lrg Ship	269	180	80	37	17	19	17	15	11
	Med Ship	267	178	77	35	15	17	14	12	6
	Sm Ship	266	177	76	34	14	15	12	10	5
	Peris	261	173	72	30	10	11	6	5	1

A technological addition to vision is the detection of infrared (IR) radi-
ation (that is, heat). On some aircraft, Forward-Looking Infrared (FLIR)
and Infrared Search and Track (IRST) sensors are available. These sen-
sors can spot surface ships and submarines on the surface or snorkel-
ing. Ships may also have passive IR sensors to detect other ships or
aircraft.

Other Detection Methods

The other detection methods supported in computer *Harpoon* are
described below:

- *Electromagnetic Intercept/Electronic Support Measures (ESM)*. All com-
  bat ships of frigate size or better have ESM capability allowing them
  to rapidly detect any (active radar) radiating target within

110 percent of your current radar horizon (against the target). This is considered a passive radar detection, comparable to a passive sonar detection.

- *Magnetic Anomaly Detectors (MAD).* Some ASW aircraft carry a sensor that can detect large metal objects close beneath them under the surface of the water. The aircraft must be at low or very low altitude for this sensor to be effective. Some submarines have titanium hulls, which greatly reduce the effectiveness of this sensor.

- *SOSUS/Caesar.* In the GIUK battleset, the NATO SOSUS system and USSR Caesar systems may generate detections. These systems are large fields of seabed sensors laid in the North Sea to track enemy vessels through advanced passive sonar techniques. Occasionally, you may be notified of a contact using this detection method, giving you advance warning of a threat.

Aircraft

Aircraft are the primary scouts and a major portion of the offensive power available to today's naval forces. Effective use of aircraft is essential if you want to succeed in *Harpoon*.

Aircraft in *Harpoon* carry a selection of weapons/sensors/fuel pods for a specific mission in a grouping called a loadout.

The types of loadouts are:

- Search

  Aircraft assigned only to look for the enemy carry only fuel, sensors, and crew. Some of these sensors may detect other aircraft, surface shipping, or even submarines.

- Ferry

  Normally has minimal or no weapons setup for a one-way trip to another base. Typically carries external tanks full of fuel.

- Tanker

  This configuration consists of many external or internal tanks and a special attachment so other planes can draw fuel. A tanker can refuel planes that are part of the same group. The tanker can originate with that group or join it while in flight. When a plane drops to approximately 25 percent of its fuel capacity, it is refueled by the tanker. You can force the plane group to refuel by pressing the **Alt-R.** A tanker can refuel the group only once.

Fuel Available or **Fuel** is displayed in the Report window when tanker refueling is permitted.

Tankers cannot refuel themselves.

- Patrol

  Used for electronic warfare and early warning aircraft.

- Nuclear or Strike

  This loadout contains nuclear weapons ready to do massive damage to the enemy. The type of weapon depends on aircraft type and country.

- Standoff

  Cruise missiles that fly the distance from release to target without requiring guidance from the aircraft, thus reducing the risk to the launching aircraft.

- LR Standoff

  Same as above, but some cruise missiles (and/or AAMs) are replaced with fuel tanks to extend your range.

- Anti-Radar

  A special type of weapon, normally a missile, that looks for any enemy radar that is turned on. If it hits, the radar is destroyed. If used against ships, a great deal of additional damage may be caused. If the radar is turned off, most of these weapons "go stupid" and self-destruct; a few home in on the last broadcasting location.

- LR Anti-Radar

  Same as above, but some anti-radar missiles (and/or AAMs) are replaced with fuel tanks.

- Guided

  These are "smart bombs" or shorter-range missiles, which are guided by the launching aircraft to the target. Unlike cruise missiles, they have very short ranges, but the smart bombs can do more dam-age. They also cost a lot less, so a country is likely to have more of these than cruise missiles.

- LR Guided

  Same as above, but some smart bombs (and/or AAMs) are replaced with fuel tanks.

- Unguided

  This loadout represents rockets, cluster bombs, fuel-air explosives, and other "area" weapons. Typically, many unguided weapons are

in a loadout due to their small size. These function like a grenade, spewing fragments over a wide area.

- LR Unguided

  Same as above, but some of the "area" weapons (and/or AAMs) are replaced with fuel tanks.

- IronBomb

  This is what most countries used in WWII. It is a simple weapon that is "thrown" at or dropped on the target based on the movement of the aircraft, the wind, and temperature. These weapons are very potent (they are all explosives and metal case), but are very difficult to target effectively.

- LR IronBomb

  Same as above, but some bombs (and/or AAMs) are replaced with fuel tanks.

- Air to Air

  Fighters and some better attack aircraft load with infrared and radar-guided missiles to destroy other aircraft and helicopters. Some extra fuel is carried for some aircraft types.

- LR Air to Air

  If the target is far away or the fighters must stay aloft for a long time, some missiles are replaced with additional fuel tanks.

- AntiSub

  Submerged submarines are only killed by torpedoes and depth charges. Some aircraft may be able to do this with nuclear depth charges (see "Nuclear or Strike" above).

- LR AntiSub

  Same as above, but some ASW weapons are replaced with extra fuel tanks. Helicopters that cannot carry extra fuel tanks drop weapons to reduce weight and increase airborne endurance.

- AntiRunway

  To destroy an enemy runway, iron bombs, guided weapons, or special "runway-busting" weapons can be used. (The type used depends on the aircraft and the country that owns it.)

- LR AntiRunway

  Same as above, but some anti-runway ordinance (and/or AAMs) are replaced with fuel tanks.

Most aircraft only have a limited number of possible and/or available loadouts. Loadouts are subject to both the missions for which the aircraft are designed and availability.

If you see some "extra" weapons in a loadout do not be surprised. For example, the UK Nimrod can carry torpedoes, Harpoon ASMs, and Sidewinder AAMs mixed on its various loadouts.

Airborne Threat Detection

Sometimes in computer *Harpoon* a new threat that can be countered by patrolling aircraft is detected. Instead of having to launch new aircraft or selecting a group with patrolling aircraft and splitting them off to attack the threat, we provide the Intercept window.

You see each available unit and its current distance to the intercept target. Select the units you want to use to intercept the threat and select the **Intercept** button. Selected intercept aircraft are marked with an asterisk (*) to the left of the number of aircraft. Select the **OK** button to finish your intercept assignments.
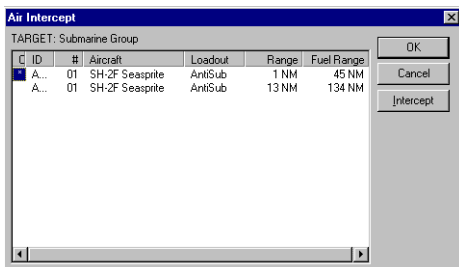
Bases

The following bases are available in *Harpoon:*

- *Airfield.* An airfield.
- *Port.* A port facility for submarines and surface craft.
- *Port & Airfield.* A combination of a port and an airfield.
- *Installation.* A facility for land-based units and nonmilitary structures.

Bases typically have various radar sensors and defense weapons mounts that automatically defend against attacking enemy targets (that is, you don't have to make your bases attack using the attack order).

Damage & Repairs

Harpoon uses a simple damage point system to represent the possible damage to units. Each primary unit class in *Harpoon* has a certain number of damage points it can absorb before being destroyed. Each weapon can deliver a certain number of damage points. In addition to damage points, all bases, ship classes, and submarine classes can receive critical hits.

The categories of critical hits and which types of platforms they can apply to are shown in Table 2-3.

Table 2-3   *Critical hit categories*

Platform	Base	Ship	Carrier	Submarine
Weapon mounts	✔	✔	✔	✔
Sensors	✔	✔	✔	✔
Flooding		✔	✔	✔
Fire	✔	✔	✔	✔
Engineering		✔	✔	✔
Bridge/CIC		✔	✔	✔
Rudder		✔	✔	✔
Flight deck/runways	✔		✔	
Hanger	✔		✔	
Cargo		✔		
Pressure hull				✔
Keel		✔	✔	✔
Sonar		✔	✔	✔
Aircraft	✔	✔	✔	

Most of the critical hits have a chance of being repaired within 48 hours. Fire and flooding critical hits are the most distressing, because they can spread and cause additional damage and critical hits, destroying the unit.

Your unit reports in the Report window show both your current dam-age points and current critical hits. Note that in *Harpoon* all repairs are automatic and require no input from the side commander. If a surface or submarine unit is severely damaged, you might want to split it off from your group into its own group.

Aircraft in *Harpoon* can only be killed so they have no damage points or critical hit areas.

Set-Up windows

This section discusses the windows that you use to set up your *Harpoon* simulation.

Battleset Selection window

A "battleset" is a series of scenarios that simulate various naval engage-ments in a particular part of the world. The Battleset Selection window lets you select any battleset you have loaded into your computer.
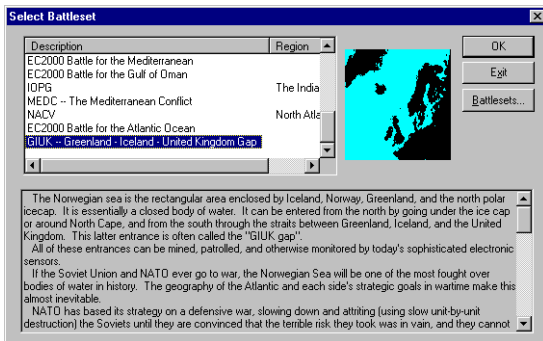
When you start *Harpoon,* the Battleset Selection window is displayed. Click a battleset to display its description in the lower half of the win-dow. Select a battleset and click the **OK** button to load it. If you decide not to play, click **Exit** to quit.

Select Game Options window

After you select a battleset, the
Options window is displayed.

The following options are available:
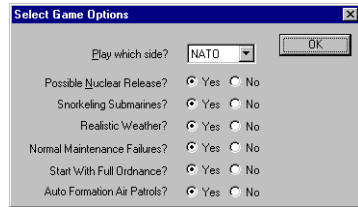
• *Play Which Side?* Your options are
NATO and USSR. NATO is the
default setting, and allows you to
control all NATO forces that are a
part of the scenario you select in the next window. You can also
choose to be the Soviet admiral in charge of Soviet task forces. For
other battlesets, your choices might be RED or BLUE.

• *Possible Nuclear Release?* Your options are Yes and No. The default
setting is Yes. If a scenario contains a nuclear release, this option
will enable it. Some scenarios start with a "nuclear weapons free";
others may not give you release until later in the scenario. If one
side uses nuclear weapons, the other side is granted immediate
nuclear release. Whichever option you choose has profound impli-
cations for your tactics. For one thing, you will have to spread out
the units which form your groups so that they will not be vulnera-
ble to a single nuclear weapon. However, if you do so, then you are
leaving them more open to attack by submarines.

• *Snorkeling Submarines?* Your options are Yes and No. Diesel-powered
submarines must take in air to run their engines. If they need to go
deep they run on batteries. If you choose Yes, then your radar and
infrared sensors may be able to detect the snorkels of diesel subs
when they are snorkeling. If you select No, then you will be able to
detect submarines with your sonar only.

NOTE: If you select No, the diesel subs will act like nuclear subs and
never snorkel. If your active or passive sonar detects a sub, you can
select the **Display** button in the Reports Window to learn whether it is
diesel or nuclear powered.

• *Realistic Weather?* Your options are Yes and No. Weather can be a
powerful factor in a naval engagement, especially in the Norwegian
Sea, which is constantly whipped by gale-force winds. In high seas,
your ships cannot travel at maximum speed. High seas also reduce
your surface search radar's detection range. Some weapons cannot
be fired in sea states of 5 or greater (see description of the "Weather
Report" command on the Reports Menu). We recommend that you
play the No option until you become familiar with the game and
are able to operate under full simulation.

- *Normal Maintenance Failures?* Your options are Yes and No. In the real world, nothing works perfectly all the time. A modern naval vessel or aircraft is packed with electronic gear and high-tech weapons. Periodic breakdown of systems happens often. If you choose the Yes option, some of your units may experience electrical and/or mechanical failures during the course of the game just as they would in real warfare. Use the Yes option for maximum simulation and the No option while you are becoming familiar with *Harpoon*.

- *Start with Full Ordnance?* Again, your options are Yes and No. Real warfare is an exercise in logistics. That is, supplies, fuel, and ammunition must be transported from the supply bases to the combat units. When war breaks out, ships must begin with whatever they have on board. Often, they are not up to full strength. If you choose No, you are working under real-world conditions. A No setting in *Harpoon* means that you have a 50% chance that your missile and/or torpedo loadout of any particular unit is 80–99% of full capacity. Beginners should start with full ammunition load-outs by selecting the Yes option.

- *Auto Formation Air Cover?* If this option is selected. the computer staff automatically puts up AAW, AEW, and ASW patrols for your groups that have this capability. If you do not select this option, you are responsible for all patrolling air asset deployment.

To select an option, click it. When you have selected all your options, press **Enter** or click **OK** to proceed.

Scenario Selection window

Once you select the options, the Scenario Selection window for the selected battleset is displayed. The Scenario Selection window allows you to engage in one of a number of scenarios. These scenarios generally become more difficult as you progress from the top to the bottom of the list.
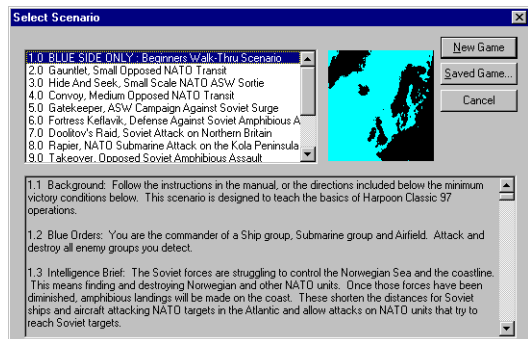
Use the scroll bar or your up/down arrow key to move through the various scenarios. A description of the highlighted scenario is displayed in the lower half of the window. This text is divided into three paragraphs:

- *Background.* This paragraph gives you an overview of the strategic importance of the scenario and any other pertinent background information.

- *Blue Orders (or Red Orders)*. These orders instruct you on what you must do to accomplish your mission.

- *Intelligence Brief.* This paragraph gives you a description of what is known about the enemy's intentions.

Press **Enter** or select the **New Game** button to choose the highlighted scenario and begin play.

3   How to Play

Harpoon's interface has a command & control bar, a main window showing a map of the area where the battles will be fought, and various dialog boxes, menus, report windows, and a status bar, which are displayed (or reflect information) during the contest.

Main window

The Main window associated with the scenario you have selected is displayed after you click the **New Game** button in the Scenario Selection window. This is where you play *Harpoon,* and it has three primary areas: command & control bar, maps, and a Reports window.
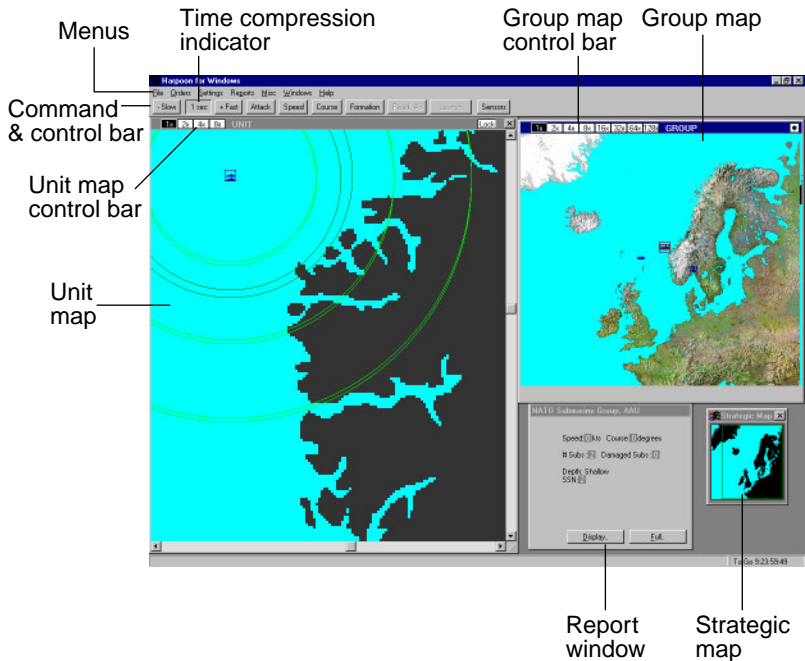
Command & Control Bar

The command & control bar contains frequently used orders; most of your commands should be initiated from here. The following commands are available when in the Group window:

• Attack (or intercept)
• Speed
• Course
• Formation
• Ready Air
• Launch
• Time compression
• Sensors

When in the Unit window, only time compression and sensors commands are available.

Time Compression

The time compression indicator box is part of the command & control bar. Its default setting is one second. This indicates that one second of simulation time is equivalent to one second of real time. When *Harpoon* is compressing time, the number in this box indicates how much simulation time passes for each second of real time. For example, if time compression is set to "30 seconds," then one second of real time equals 30 seconds of simulation time (that is, *Harpoon* is set to operate 30 times faster than real time). To increase time compression, click the **Fast** button. To decrease the time compression, click the **Slow** button. (You can also press the + and - keys, respectively.)

NOTE: Game updates do not always occur each second, especially in the more complex scenarios.

Menus

Across the top of the window are seven menus: File, Orders, Settings, Reports, Misc, Windows, and Help. To use a menu command, place your cursor over a menu name and click and hold the left mouse button. This displays the menu. Continue to hold down the mouse button, and move your cursor to the choice you want. Release the mouse button to issue the command.

Maps

There are three maps on the Main window: the Strategic map, the Group map, and the Unit map.

NOTE: To make anything happen on a map, you must first select that map by clicking it. The map's title bar changes color to indicate that it is active.

Strategic map

The Strategic map represents the entire geographical area for the current battleset. A rectangular box representing the Group window appears on this map. The area within this box is displayed on the Group map.

To move the Group window, click on the Strategic map. The rectangular box centers itself around the area where you clicked.

Group Map

The Group map has two main components:

- **Group map.** This represents the area enclosed by the rectangular box on the Strategic map. On this map you see symbols indicating the various groups that you control during the scenario. When you first start a scenario, you will see a box surrounding one of your groups. The units in this group can be viewed on the Unit map.

- **Group map control bar.** This is the bar across the top of the Group map. To the left are eight zoom boxes, marked 1x, 2x 4x, 8x, 16x, 32x, 64x, and 128x; the default setting is lx. Press **Z** to zoom in on the Group map, and press **X** to zoom out. To zoom to a specific setting, click the appropriate zoom box.

NOTE: If the Group map is zoomed to 16x or higher, the Unit map disappears and the Group map assumes the functionality of both.

A tiny box appears on the Group map. This represents the Unit window. The area surrounded by this box is displayed on the Unit map.

Unit map

The Unit map has two parts:

- **Unit map.** This is similar to the Group map, but is used for close-in viewing of a specific tactical situation. Symbols on this map indicate individual units, not groups.

- **Unit map control bar.** This is the bar across the top of the Unit map. Like the Group control bar, there are zoom boxes labeled lx, 2x, 4x, and 8x. The zoom setting of the Unit map does not affect the zoom setting of the Group map.

Report window

The Report window displays information or options about items you select. Also, the Report window serves as an animation window. When an engagement between units occurs, an animation of the unit launching its point defense weapons and missile strikes is displayed. You also see animations of weapons arriving on their targets.

When you start *Harpoon,* the Report window contains information about the selected group. To view information about another group, you must first select it. Click a group to select it. You can also press the spacebar to cycle the designation square to the next group south or **Backspace** to cycle it to the next group north.

Select the **Full Report** button at
the bottom of the Reports win-
dow to display a report on the
currently selected group or unit
(depending on which window is
active). Unit reports resemble the
platform display for a class of
units; but they also displays the
unit's current status including
damage, armament loads, and sensor status.

The **Display** button has the same effect as selecting the **Reports** menu
and then the **Platform Display** item. The only difference is that if you
are in the group window you see the normal platform display selection
screen, which lets you choose between ships/subs/aircraft and all
classes in the scenario or battleset. In the Unit window, the platform
display for the current unit's class is displayed.

Status bar

The status bar at the bottom of the window shows the current date and
time on the right. Initially, the time shown on this display is the Green-
wich Mean Time (GMT), which corresponds to actual date and time as
determined by your computer clock. This time can be compressed, as
described in "Time Compression" on page 3-3.

The status bar also displays ongoing information, such as patrols being
formed and patrol launches, on the left.

4 Command Summary

This chapter contains detailed information on the commands you use to operate *Harpoon Classic 97*. These commands can be accessing using the menus at the top of the main window. It is not necessary to memorize each and every item since many of the selections are self-explanatory. However, you can refer to this summary if you have any questions during a contest.

You can issue these commands using the menus or using keyboard commands. In this chapter, each menu's commands are described. Refer to Chapter 5, "Keyboard Commands," for the corresponding keyboard commands. Most menu keyboard equivalent are also listed to the right of the menu item on the menu itself.

File menu

This menu contains commands related to the interface between *Harpoon* and the player. It has little to do with the actual playing of the simulation itself. Commands contained in this menu are as follows:

File	
New...	Ctrl+N
Open...	Ctrl+O
Save...	Ctrl+S
Save as...	
Load user scenario...	Ctrl+L
Pause...	Ctrl+P
Status...	Ctrl+H
Exit...	Ctrl+Q
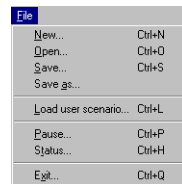
New

Select this item to end the current game and start a new one.

CAUTION: The game being played will not be saved unless you first select the **Save Game** menu choice.

A dialog box is displayed. If you want a new game, click **Yes** or press **Enter.** If you want to return to the current game, click **No** or press **Esc.** If you select **Yes,** you are returned to the Battleset Selection window.

Open

Lets you reload a saved game and continue play. A dialog box is displayed. If you want to open a saved game, click **Yes** or press **Enter.** If you want to return to the current game, click **No** or press **Esc.** If you select **Yes,** a standard Windows Load File dialog box is displayed.

Save

Lets you save the current game, so that you can continue playing the current game at a later time. If the file name you assign to the current game is the same as an existing file name, you are asked to confirm your decision to overwrite the existing file.

Save As

Lets you save the current game and specify a name for the file, even if you previously saved the game.

Load User Scenario

Select this option to load a scenario that you created using the *Harpoon Classic 97 Scenario Editor.*

Scenario Editor

Refer to the online documentation for information about the Scenario Editor.

Pause

Pauses the current game in the current setup. Press **Enter** to resume.

NOTE: If you use **Pause,** you cannot switch to other Windows applications. If you want to pause the game to use another application, minimize the main window. This also pauses the game.

Status

Displays a status report for Blue and Red forces. The boxes on each side of the window show the losses and damage sustained by each side.

Exit

Lets you quit the game without saving it. If you want to continue the same game at a later time, first select **Save Game** and then select **Quit.** A dialog box is displayed. Press **Enter** to exit the game. Press **Esc** to cancel the Quit command.

Orders menu

From the Orders menu, you can order forces to move, attack, launch aircraft, and adjust the composition and formation of your task forces.

Attack

This command allows you to attack with whatever forces and weapons you have. It takes the currently selected group, evaluates the weapons within your group, then shows you a list of possible target group that you can attack.
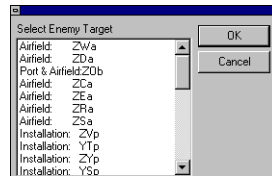
If the target group contains more than one type of target, you choose which type of target within the group to attack.

Once you select the target group (and type) you want, one of three things happen.

If you are out of range of any of your weapons, the Staff Assistant will ask if you want to close and attack.
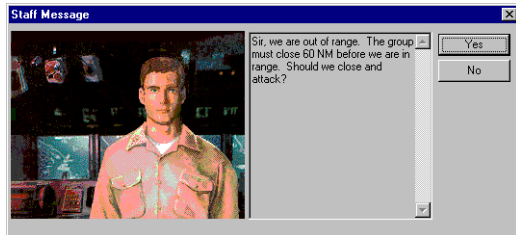
If the target has not been sufficiently localized, then the Staff will ask whether you want to attempt to get a better contact, then attack.

If you are in range of any of your weapons, you can select the type of weapon to use dependent on what type of group you are attacking from and what your target group is.

Once you are close
enough to the target to
be within the range of
your weapons, the Weap-
ons Allocation window
is displayed. The screen
has four boxes:

Submarine Group AAU attacking Surface Group ZZS			☒
Attacking Units:		**Unit Weapons Loaded:**	Cancel
ID Class Name		Name Qty	Execute
00 Imp. Los Angeles Miami		Tomahaw... 05	Allocate
01 Sturgeon Sea D		Harpoon 1C 06	Deallocate
Enemy Units:		**Weapons Allocated:**	
ID Target		ID Name Qty	
00 Surface contact ...		00 Tomahawk 04	

• *Attacking Units.* Lists
the units in your
attacking group.

• *Unit Weapons Loaded.* Lists the weapons each unit has at its disposal.
If a particular weapon cannot be used against this target, the quan-
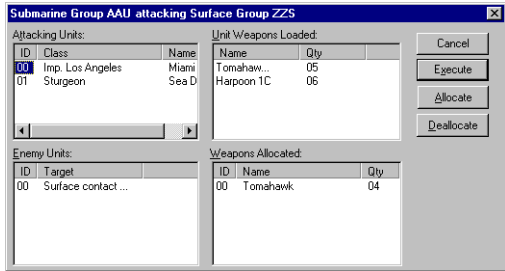tity column indicates why. The weapons shown belong only to the
unit selected in the Attacking Units list.

• *Enemy Units.* Lists each of the enemy units in the group you are
attacking.

• *Weapons Allocated.* Lists which weapons you have allocated against
the enemy unit selected in the Enemy Units list.

The Staff Assistant will automatically allocate weapons against most
targets.

If you want to change the allocations, follow these steps:

1. In the Attacking Units list, select the unit with whose weapons you
want to attack.

2. Next, select the unit (in the Enemy Units list) you want to attack. If
your unit has weapons that can attack this enemy unit, they are
displayed in the Unit Weapons Loaded list. If this unit's weapons
are already allocated or out of range, that information is displayed
in the Weapons Loaded list.

3. Find a unit that shows weapons within your Weapons Loaded list,
then select the **Allocate** button. Notice that one weapon appears in
the Weapons Allocated list. Also notice that one less weapon
appears in the Unit Weapons Loaded list.

4. Continue to allocate the units until you have allocated as many
weapons as you want against that enemy unit. If you feel too many
weapons are allocated, select one and select the **Deallocate** button.

5. Repeat steps 1–4 until you have allocated all the weapons you
want to use against the various enemy units.

6. Select the **Execute** button when you have finished allocating weapons. Select the **Cancel** button if you decide not to attack the enemy.

Set Depth & Speed

For Ship & Carrier Groups

For ship and carrier type groups you are only allowed to set the speed they will travel. There are four quick settings:

- *Stop.* Used to stop your group dead in the water.

- *Creep.* Normally 5 knots or less, just enough speed to maintain steerage. This speed also gives maximum sonar performance.

- *Cruise.* This is 60 percent of the slowest unit's maximum speed within the group, or 19 knots, whichever is less. Speeds of 20 knots or more eliminate hull sonar performance.

- *Max Group.* The maximum speed of the slowest unit within the group.
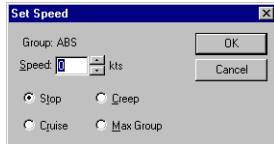
With surface units, you can also type a speed between zero and the Max Group speed in the Speed text edit box. If you enter a speed greater than the Max Group speed, it will be reduced to Max Group when you exit the dialog by selecting the **OK** button.

For Submarine Groups

Submarine group speeds are set in the same manner as surface groups. In addition you set the depth at which you want the group to operate at. The available depths are:

- *Surface.* Puts your submarine group on the surface.

- *Periscope.* Right below the surface where you can see out your periscope and sometimes be spotted by low flying aircraft.

- *Shallow.* Above the thermal layer, but deeper than Periscope depth.

- *Intermediate.* Below the thermal layer, but shallower than the maximum safe depth for most submarines. Submarines can go up to 24 knots without cavitating at this depth.
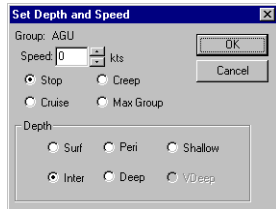
- *Deep.* The maximum safe depth for most submarines, used to evade detection. Submarines can go up to 29 knots without cavitating at this depth.

- *Very Deep.* Can only be achieved by a few submarine classes, and eliminates all cavitation noise.

For Aircraft Groups

Like submarines, aircraft groups can change both their speed and altitude. Unlike submarines and surface units, you can only use throttle settings, not enter a specific speed. The *Harpoon Classic 97* system uses an endurance measurement which equates to how long an aircraft can stay aloft without crashing and still make base to the originating point; this measurement is expressed as a percentage of fuel.

You can display the available endurance by selecting the **Settings** menu, and then **Set Range Circles.** In the window that is displayed, select the **Airborne Mission Radius** checkbox to display available endurance on your Group and Unit maps. It is also displayed as a percentage in the Reports window.

The throttle settings available are:

- *Loiter/Hover.* A helicopter hovers in a single location; a fixed-wing aircraft flies in a tight circle at minimum speed. This increases your airborne endurance tremendously for planes; helicopters use the same endurance as cruise throttle setting while hovering. Aircraft with sonobuoys drop them at this throttle setting and helicopters with dipping sonar will lower this sensor when hovering at very low altitude.

- *Cruise.* The most efficient speed to cover distance.

- *Full Military.* This is the full rated speed of the engine without using an afterburner, and top speed for those without afterburners. Endurance is reduced at a rate of 2–3 times more than the rate at Cruise throttle setting.

**NOTE:** For some types of aircraft, cruise and full military speed are the same.

- *Afterburner.* Some high-performance jet fighters have afterburners allowing them to dump fuel into the exhaust nozzle to increase speed. It reduces your airborne endurance at over 12 times the rate of Cruise speed, and should only be used in critical evasion/intercept situations.

Altitude settings available to aircraft are:

• *Very Low.* This is "wave-height" flying below 30 meters. If in a fixed wing aircraft, there is a significant chance that you will hit the water due to pilot error and lose aircraft, especially if you order a course change at this altitude.

• *Low.* Low altitude is between 30 meters and 600 meters.

• *Medium.* Medium altitude is between 600 meters and 3,500 meters.

• *High.* High altitude is between 3,500 meters and 20,000 meters.

• *Very High.* Very High altitude is 20,000 meters and up. Only some jet aircraft have the capability to reach this altitude.

Enter Group Course

This selection displays a window with several different options, where you can set up to 48 course legs for the selected group, and at the same time, give orders for that unit when it reaches each designated point. The following commands are available:
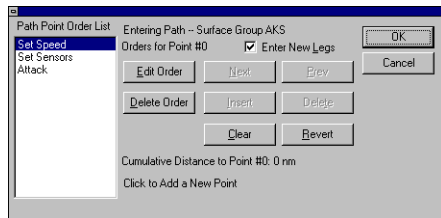
• *Enter New Leg.* Press **L** or click the check box to select it. On the Group map, click where you want your group to travel. For the next destination point, click again. When you have finished entering legs, click the Enter New Leg check box to deselect it. To cancel the leg when in the cross-hair mode, press **Esc.**

• *Next* and *Previous.* If you have entered a course with multiple legs, selecting either **Next** or **Previous** moves the small square on the course leg to the next or to the previous leg. This lets you insert or delete a course leg or add, edit, or delete an order at the point where the small square is located (see following paragraphs on how this is accomplished). To use these commands, you must first de-select the Enter New Leg check box.

• *Insert.* Lets you insert a course leg point. Click where you want your additional leg point to appear. You must deselect Enter New Leg before using Insert.
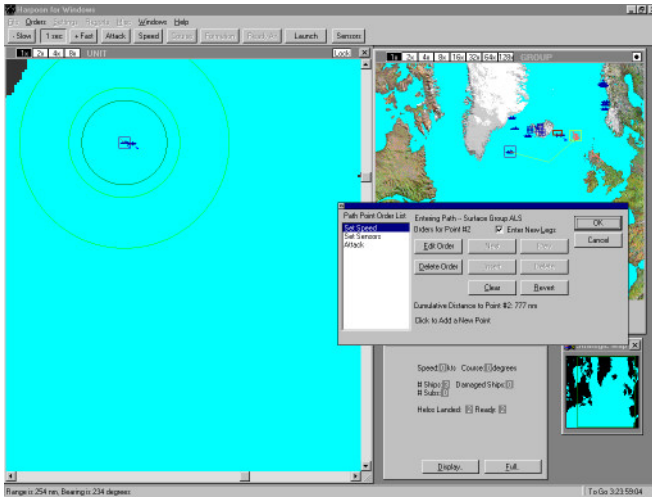
- *Delete.* Use Previous or Next to select the leg point you want to delete, then click Delete. In the confirmation dialog box, press Enter to confirm your choice. You must deselect Enter New Leg before using Delete.

- *Clear Current Path.* Completely clear the current path of your group, as well as any orders to be executed on these legs.

- *Add Order Field.* Lets you give your group an order at the completion of a specific leg. Use the Orders menu to add an order on any leg point.

- *Edit Order.* If the selected order is editable, you can use this command. Some orders cannot be edited; you must delete them and reenter them to change them.

- *Delete Order.* Deletes the selected order.

Formation Editor

The Formation Editor lets you review and change the disposition of the individual units within a group. When you select this option, the Group map focuses on the group you've selected on the map and zooms down to about x32. This allows you to rearrange the units of the group directly on the map

To start, we need to review the basic concepts behind a *Harpoon Classic 97* formation. *Harpoon* uses a simplified model of a surface for-

mation, dividing your formation into four rings and eight sectors. The four rings and their purpose are:
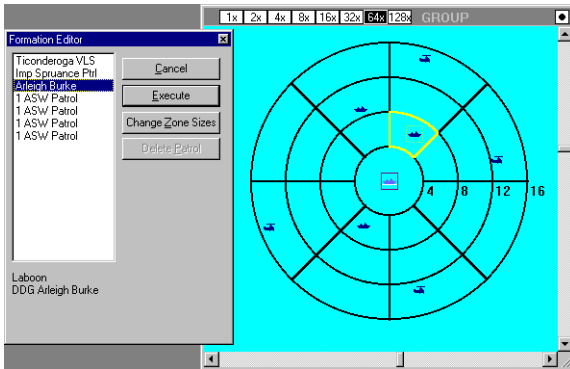
- Main Body

  The innermost circle of your formation, normally reserved for high-value units and units with limited defenses (such as aircraft carriers, oilers, and freighters). Units within the main body hold their position and have the exact course and speed of the entire group at all times.

- AAW (Anti-Air Warfare) Ring

  The second innermost ring of your formation. It should be used for platforms that have the ability to engage air targets such as missiles and aircraft (such as Aegis Missile Cruisers, Slaves). You should place them in sectors that correspond to the anticipated direction of an airborne threat.

- ASW (Anti-Submarine Warfare) Ring

  The next to outermost ring of your formation. Units placed in this ring should have ASW capabilities, so they can detect and kill any submerged threats before they penetrate into your main body or AAW ring. Typical units used in this ring would include ASW helicopters and destroyers and frigates with significant ASW weapons/ sensors. Units within this ring patrol within their sectors, sprinting from place to place, then slowing down or hovering to check for sonar contacts.

- Picket Ring

  The outermost ring of your formation. Used to place scouting assets that can give early warning of incoming threats. Units used for picket duty include AEW (airborne early warning) aircraft and low-

value ships with good sensors. All units in this ring patrol within their sectors, speeding up and slowing down to cover it while moving with the formation.

Each of the areas and buttons in the Formation Editor window is described below:

• Unit Selection list

   The box to the right of the window lists all the ships and aircraft in your group. Use the up/down arrow keys to move to and select the unit you want to position (or simply click it). When the cursor is placed over the name of a unit, a designation square (on the Group Map) will appear over that unit in the formation, and the sector being patrolled by that unit will be highlighted if it is not in the Main Body. A full description of the unit will appear below the Unit Selection list.

• Set Air Patrol/Delete Patrol

   If you select a helicopter or plane unit, you can set it up as an air patrol unit. If you select a unit that is already an air patrol unit, the **Delete Patrol** command appears, allowing you to stop the patrol.

   To patrol multiple sectors with a mouse, hold down the **Shift** key when clicking on the sectors you want the unit to patrol. If you have sufficient units, you should only designate one sector per unit to improve the quality of the patrol coverage they can provide. If you only have a limited number of patrol units, you may have them patrol multiple sectors within a ring, but since they have more area to cover, the likelihood of a threat slipping in will rise.

• Change Zone Sizes

   This command lets you set the radius of each the four patrol zones. Each zone must be at least one nautical mile larger than the previous zone. The picket zone cannot be more than 255 nautical miles in radius for any formation.

• Cancel

   Select this button to cancel your changes.
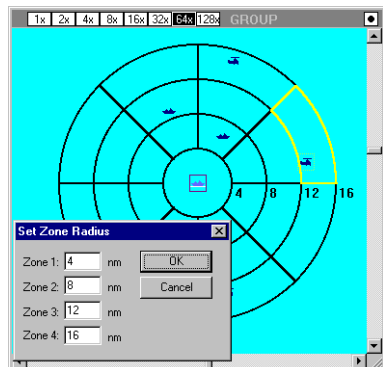
• Execute

   Accepts all your changes to the formation. Units may take some time to reach their new formation locations, because they must keep moving with the formation while maneuvering to their new positions.

To move a unit from one ring/sector to another:

1. Click the unit you want to move. This will highlight the sector that the unit is currently in and move the designation square over the unit.
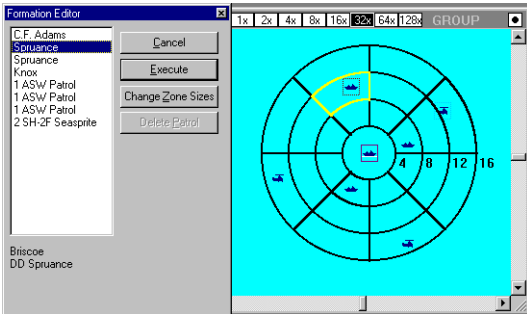
2. Click the ring/sector to which you want the unit to move. The unit will move to that ring/sector.
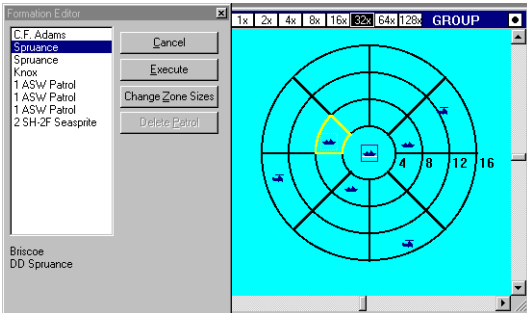
Ready Aircraft

This option allows you to prepare aircraft for particular mission profiles. Normally, your aircraft are readied by the Staff Assistant when they land into their default mission profile. To prepare them for particular missions, you can choose from the list of available loadouts.
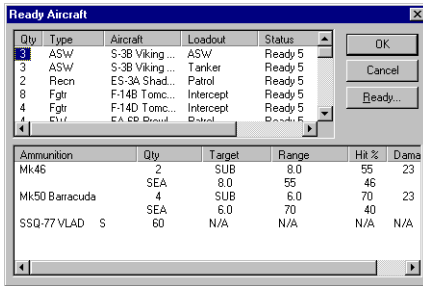
When you select the **Ready** button, you can select how many aircraft you want to ready.
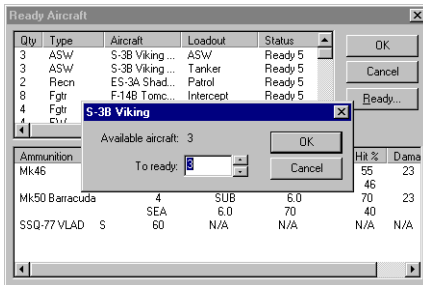
Once you have selected the number of aircraft to ready, the Loadout Selection window is displayed.
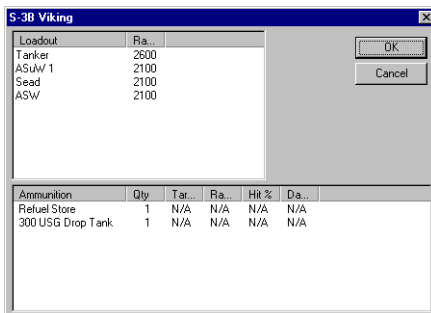
Use this window to browse the available loadouts and find one that matches the mission you need.

To select a loadout for your aircraft, click it or use the up/down arrow keys, then select the **OK** button.

Launch (Land) Aircraft

If your group is an air group, you see a selection of locations to land that can accept your aircraft (based on runway length and endurance).

Launching Aircraft

If your group has air assets you can launch, then you can select the mission type for the launch.

If you select the Attack destination, the Select Enemy Target selection box is displayed.

If you select the Ferry destination, you will be presented with the possible landing sites to ferry your aircraft to.
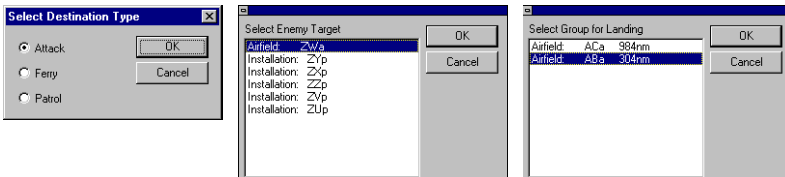
If you select the Patrol destination, one of two things will happen depending on whether or not you have the Repeatable Patrols Staff Option set. If it is set, you then pick a place for the patrol to go at this point. If not, you will go directly to the Launch Aircraft screen.
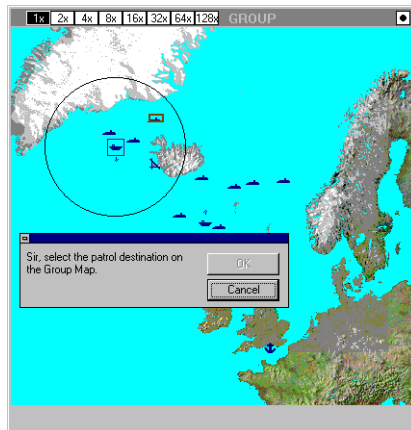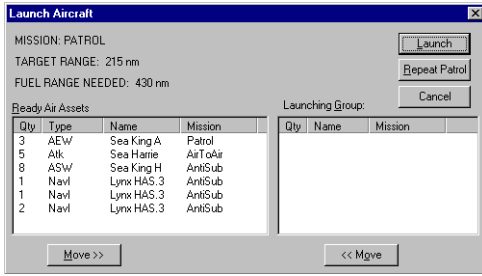
Once you select the type of mission for your launch and its particular information, the Launch Aircraft Selection window is displayed.

All currently readied aircraft are shown in the list on the left. You can launch aircraft in groups.

To do so, select an aircraft and click the **Move** button to move that aircraft to the Launching Group list. Repeat this with each aircraft you want in your launching group.
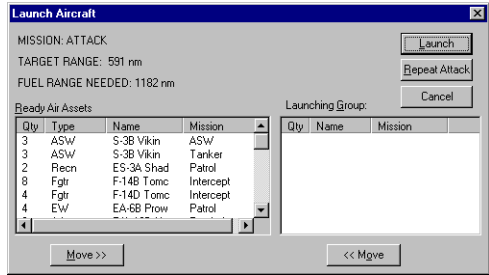
Once you have the group you want to launch in the Launching Group list, then you can either launch it by selecting the **Launch** button or the **Repeat Attack** button (if it is available). If you select the **Repeat Attack** button, you must indicate
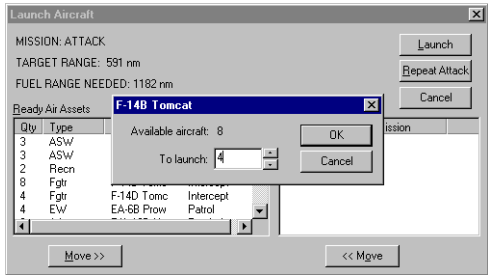
how often to repeat the attack or patrol. A box appears in the Reports window, which lists the groups that can be joined to the group inside the designation square.

Join Group

Allows you to join two separate groups into a larger one. A box appears in the Reports window, which lists the groups that can be joined to the group inside the designation square.
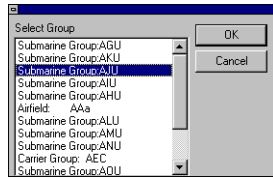
Select the groups you want to join to your designated group, then select **OK.** If they are within range, a new window is displayed. All the units in one group are displayed in one list, and all the units in the other groups are displayed in the other.
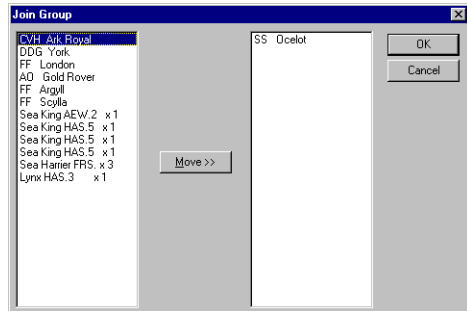
In the left list, select the units you want to join to the units in the right list. Then select the **Move** button. Select **OK** when you are done to join the selected units.

Split Group

This is the opposite of Join Group command. To split a group, highlight the unit(s) to be split from the group and select the **Move** button to move them to the other list. Once you select the **OK** button, you return to the Main window.
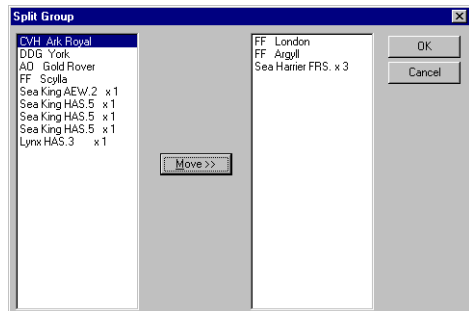
If you want to issue commands to the group you have just split off, select the group. Even though the window does not change, you can see that you are on the new group by its call letters. After a split, the new group has no movement or other orders.

Sensors

This allows you to set sonar and radar of selected groups or units. The Set Group Sensors window shows all the types of sensors you have in your designated group. Off means that no sensors are emitting. Active means that they are on. Mixed means that sensors of units in a particular range ring have different settings, both active and off.

If you select **Mixed** for any sensor, another window is displayed. (The exact name of the window depends on which sensor you choose. For sonar, it is the Set Mixed Active Sonar window.) You can select On, Off, Mixed, and Intermittent for the main body, the AAW ring, the ASW ring, and the picket ring.

If a ring does not contain ships or if the ships in the ring do not have this particular type of sensor, the radio buttons for that ring are grayed out. For example, imagine that you select mixed on the Set Group Sensors window, your units are positioned in the main body circle and the AAW circle only, the main body has no air search radar. In this case, Set Mixed Air Search Radar window is displayed, and every line except the AAW line will be grayed out.

The intermittent setting lets you periodically activate, then automatically deactivate, your sensors. After you select Intermittent, another window is displayed where you set the base period, the variance, and the duration of emission. The base period is the time between sensor activations. The variance lets you make the base period irregular, and the duration is how long the sensor is active. For example, if you set the duration to 5 minutes, the variance to 2 minutes and the duration to 30 seconds, then the sensors will turn on every 5 minutes, plus or minus 2 minutes, for 30 seconds.
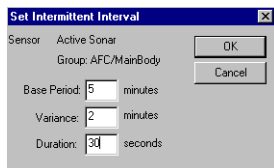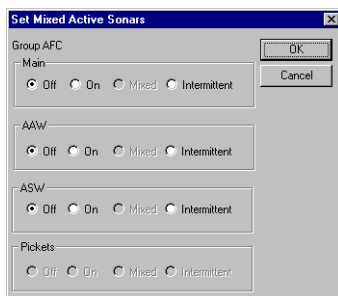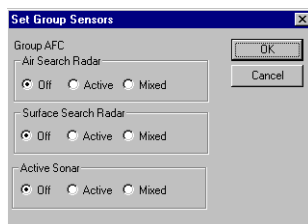
Enter Staff Note

When you select Enter Staff Note, a
dialog box is displayed where you
can type a message for your Staff
Assistant to give to you. Type your
note and click **OK.** Another dialog box prompts you to specify when
you want the note delivered.
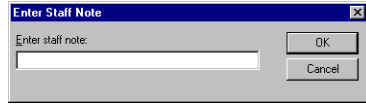
NOTE: The time you specify will be elapsed time (delta time), *not*
actual clock time. That is, the time will be measured from the time
that the staff note is inserted.

Settings menu

The selections on this menu do not in any way affect
the outcome of the game; they are used to set various
references and game features.
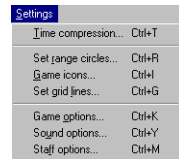
Time Compression

Sets the time compression feature. The radio
buttons are labeled with the compression fac-
tor. That is, if you select **1 minute,** then 1 sec-
ond of real time equals 1 minute of game
time. To go back to regular time, click the
1 second button (1 second of game time
equals 1 second of real time).
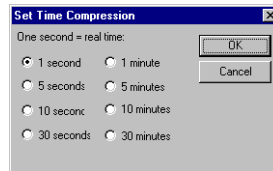
NOTE: You can also set time compression using the command &
control bar. For more information, see page 3-2.

Set Range Circles

The Range Circles option lets you
display information about your
weapons' range on your maps.
Note the window(s) in which each
range circle is active and the color
they display. By default, weapon
range circles are red, active sensor
range circles are yellow, passive sen-
sor range circles are green, and air-
borne endurance range circles are
in blue. If you want to change the
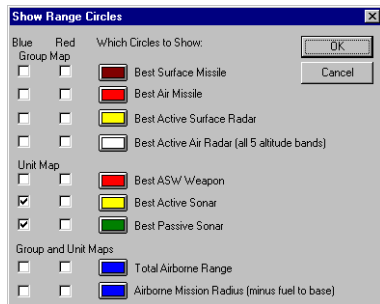
colors, click the colored button, and select a new color. Range circles are centered around your group or unit icon, with the icon designating the center of your group formation in the Group window, and the actual location of the unit in the Unit window.

Game Icons

Lets you set different styles for game icons. The default setting is **Stylized** (that is, civilian symbols), the alternate style is a modified NATO CDS system. Select the **Other** button to display icons not listed on the main **Show Game Icons** window. These other icons cannot be changed.

Set Grid Lines

Lets you toggle the display of latitude and longitude grid lines on the Group map. When selected, a box in the Reports window shows that the grid lines are off. If you want to turn them on, select **On,** and the latitude and longitude interval settings display the default setting. You can change the default settings. After you click **OK,** the latitude and longitude lines are displayed on the Group map.
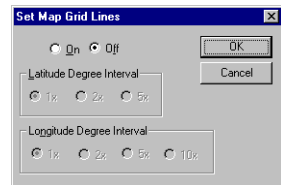
Staff Options

This option is used to enable/disable various staff options. Below is a description of each option.

• *Ignore options* (New Contacts, Ships Running Aground, Ignore Subs Too Deep, No Movement Orders, Too Close To Map Edge, Lost Contacts). Selecting the Ignore options keeps the respective information from being displayed on the Staff Message window. In other words, during your play, you will not receive this information in updates.
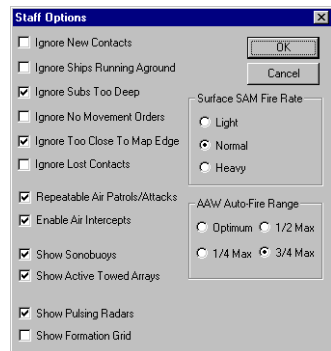
- *Repeatable Air Patrols/Attacks.* Allows you set up repeatable patrol and/or attacks within the game. On any aircraft launch for patrolling or attack, a **Repeat** button lets you set that particular patrol or attack to be repeated at certain intervals.

- *Enable Air Intercepts.* Displays the **Intercept** button on the new contacts staff dialog window if any aircraft are available that could intercept the target detected. Without this button, you can still perform an intercept operation by selecting the enemy unit you want to intercept and selecting the **Intercept** button.

- *Show Sonobuoys.* Shows all sonobuoys laid by friendly units. They are represented as black squares on the Unit map.

- *Show Active Towed Arrays.* Displays all operating towed arrays on friendly ships and subs. The towed array is represented by a straight line coming from a ship or sub icon on the Unit map. Towed arrays are not displayed if the ship or submarine is moving too fast or erratically.

- *Show Pulsing Radars.* Pulses the selected group's radar at its three distinct ranges for very small, small, and large targets. Note that this is the best possible range and dependent on the height of your radar and line-of-sight calculations; thus, an object may be well inside the indicated ring before it is detected.

- *Show Formation Grid.* Shows the size and layout of the formation of the selected friendly group. It gives you a good idea of what area your formation covers.

- *Set Surface SAM Fire Rate.* Gives you some control over the number of SAMs your units fire at each enemy aircraft or missile.

- *Set Aircraft AAW Auto Fire Range.* Lets you set the range at which units start firing at incoming aircraft or missiles. The default option is **3/4 Max.**

Game Options

This option lets you configure which animations appear during game play. You can also toggle the display of killed ship pictures. You can toggle the time display on the Group window from a time of day display to a game time remaining display. You can change the color of the land to suit your monitor. You can change the color from
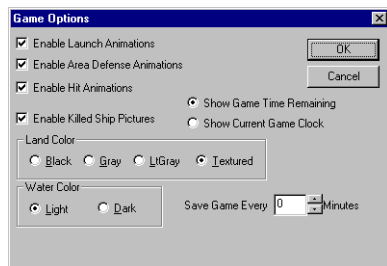
Light to Dark. Finally, you can have the game automatically save at an indicated time. All these settings are saved.

Sound Options

You can choose which sounds you want during the game.
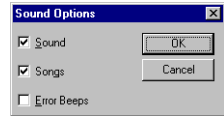
Reports menu

This menu is used as an "intelligence" source. Use it to display information you may want.

Show Orders

Displays the orders you were given at the beginning of the game when you selected a scenario.

Order of Battle

Displays the Order of Battle window. The list on the left lists all the groups available to you. When you highlight a group, the list on the right displays the units associated with that group. To learn more about that highlighted group, double-click the group.
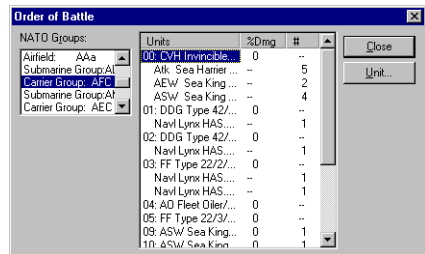
Platform Display

Displays a window with information about your platform types. Click a unit type to display a list of the active classes; that is, the unit classes associated with the scenario you are playing.
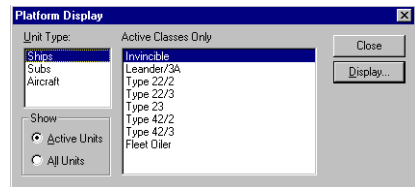
To display *all* active unit classes for the selected type (ships, subs, or aircraft), select **All Units.**

NOTE: The default setting lists only the classes used *within this scenario.* For instance, if Aircraft is highlighted, only information on the aircraft classes active in this particular scenario will be shown. You can use this to find out about the capability of various classes of units.

If you want to view details about a particular class, select the class on the Platform Display window, then click the **Display** button. This displays the Unit Display window with detailed information about that platform class.
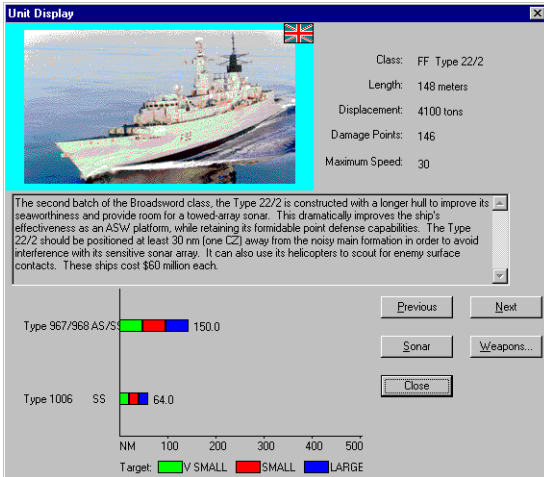
Use the **Next** and **Previous** buttons to browse the various classes. By default, the radar information is displayed in the lower left of the window. Click the **Sonar** button to display the sonar of the class, and toggle the **Sonar** button to **Radar.** Click the **Weapons** button to view the weapons of the class.
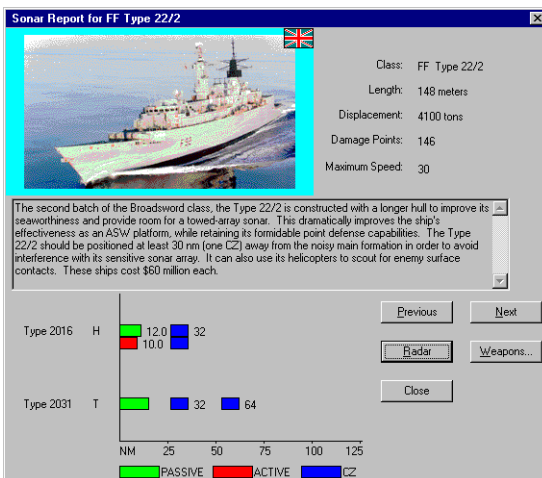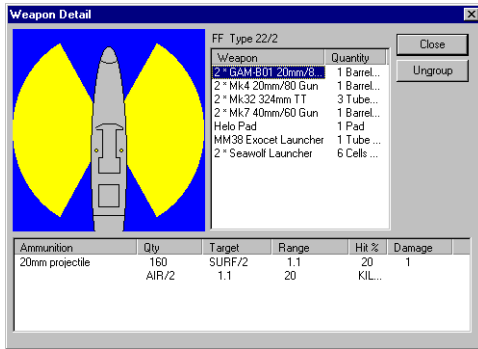
Weather Report

Displays the weather conditions.
Most of the report is self-explanatory.
The report on "Seas" shows the height
of sea swell, followed by a number for
sea state. Sea state 1 means that there
is virtually no "chop" to the waves—
the sea is more or less glassy. As the

wind picks up, seas will become more turbulent and the sea state num-
ber will grow larger. Weather can affect sensors, weapons, and smaller
ships.
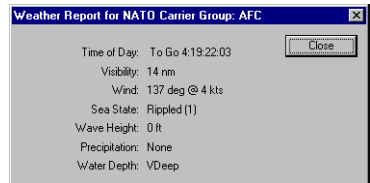
Misc menu
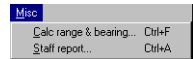
Calc Range & Bearing

Lets you calculate range and bearing of a group or unit. The Reports
window lists the objects on the map (other groups, ports, airfields,
etc.).

Select an object and click **OK.** Another win-
dow gives the bearing and range to the
object, the time to arrive there at the current
speed, and the speed at which your selected
group is now traveling. You can use this
report to calculate a new time of arrival if you
change speed.
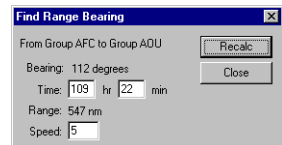
Staff Report

The Staff Assistant will make any appropriate recommendations for the currently selected group.

Windows menu

The **Windows** menu is standard in most Windows applications. You can use the menu choices to arrange the open windows and to select an active window. For more information about the **Windows** menu, please refer to your Microsoft documentation.

Help menu

Use the **Help** menu to display the *Harpoon Classic 97* on-line help. It also lets you display an information window showing you which version of *Harpoon* you are currently playing.

5   Keyboard Commands

Table 5-1 lists the keyboard commands. The keyboard equivalents for the menu commands are listed in the following section.

Table 5-1   *Keyboard commands*

Key	Description
Tab	Toggles whether Group or Unit window is active in the main window.
Arrow keys	Scroll the currently selected window, either the Group window or the Unit window.
5 (keypad only)	Centers the map view in the currently selected window around the selected object.
Z	Zooms in the current window (group or unit).
X	Zooms out the current window (group or unit)
F	Gives a full report on the selected object if a mini-report on the object is displayed in the dialog box.
D	Displays unit display.
+	Compresses time by one increment.
-	De-compresses time by one increment.
Spacebar	Selects the next object to the south (down) in the current window.

Table 5-1   *Keyboard commands (continued)*

Key	Description
Backspace	Selects the next object to the north (up) in the current window.
U	Selects the first unit of the currently selected group (in the Unit window)
C	Centers the Unit window around your currently selected group.
Enter	Sets time compression to 1:1.
Alt-T	Toggles paths on/off for all friendly groups.
Ctrl-L	Loads scenarios created with the Scenario Editor.
I	Toggle the Group and Unit IDs' display on the map views.
Alt-3	Grants you nuclear release status in any scenario, regardless of the original setting in the scenario.

Menus

This section lists the keyboard equivalents for the menu commands.

Table 5-2   *Game menu commands*

Command	Key
Pause Game	Ctrl-P
New Game	Ctrl-N
Load Game	Ctrl-O
Load User Scenario	Ctrl-L
Save Game	Ctrl-S
Game Status	Ctrl-H
Quit	Ctrl-Q

Table 5-3   *Orders menu commands*

Command	Key
Attack or Intercept	Ctrl-1
Set Group Speed (Set Depth and Speed)	Ctrl-2
Enter Group Course	Ctrl-3
Formation Editor	Ctrl-4
Ready Aircraft	Ctrl-5
Launch (Land) Aircraft	Ctrl-6
Join Group	Ctrl-7
Split Group	Ctrl-8
Sensors	Ctrl-9
Enter Staff Note	Ctl-0
Force Refueling	Alt-R

Table 5-4   *Reports menu commands*

Command	Key
Show Orders	Ctrl-E
Order of Battle	Ctrl-B
Platform Displays	Ctrl-D
Weather Report	Ctrl-W

Table 5-5   *Settings menu commands*

Command	Key
Time Compression	Ctrl-T
Set Range Circles	Ctrl-R
Game Icons	Ctrl-I
Set Grid Lines	Ctrl-G
Game Options	Ctrl-K
Sound Options	Ctrl-Y
Staff Options	Ctrl-M

Table 5-6   *Misc menu commands*

Command	Key
Calc Range & Bearing	Ctrl-F
Staff Report	Ctrl-A
Toggle Group/Unit IDs	I

A Superpower Politics & Maritime Strategies

Soviet Union

Prior to the October Revolution of 1917, power was in the hands of the Czars; today it is in the hands of the Communist Party of the Soviet Union (CPSU), especially those Party members who belong to the Politburo. Control of the Soviet military is exercised by Politburo members sitting on the Defense Council, chaired by the General Secretary of the Communist Party. Today, the only military officer of higher rank sitting on this council is the Minister of Defense. He holds the military rank of "Marshall of the Soviet Union" and is its highest-ranking military of officer. The Defense Council is responsible for implementing all the Party's wishes with respect to national defense. The presence of the military on this council ensures that direct action is taken on its decisions.

The absence of checks, balances, civilian control, and diffused power makes the Soviet military a factor to be reckoned with in domestic and international strategic planning. However, Party control over the military establishment is solidly maintained by the KGB, which has political officers assigned to monitor the behavior of individual unit commanders.

Since the Soviet Union believes in the rapid and efficient transformation from peacetime to wartime posture, all major political and military structures approximate the anticipated wartime structure, thus ensuring minimal organizational disruption. Direct leadership of war

is the responsibility of the Supreme High Command (VGK), composed of the Minister of Defense, his five commanders-in-chief, plus six other deputy Defense Ministers for civil defense and other matters. In the event of hostilities, the Soviets would create Intermediate High Commands (TVDs) in the various theaters of operation subordinate to the VGK. In this manner they would maintain a strong centralization of strategic planning and decentralized battle management. Moreover, subordinate Warsaw Pact members would instantly be integrated as an extension of the Soviet armed forces under a unified command structure within Western and Southwestern TVDs. The philosophy behind such an approach to war is that a unified, cohesive, well-trained force controlled by a superior command will defeat any loose coalition of forces such as NATO.

In light of the foregoing discussion, many people may consider the Soviets to be an aggressive people. But such is not the case, for the Soviet Union is not an overtly aggressive nation. Indeed, they have a healthy respect for war, having suffered staggering losses in World War II. But, like an enraged mother bear who senses a threat to her cubs, they will react violently towards any perceived threat to the Motherland.

And yet, parallel to this aspect of their national character is the fundamental tenet of communism that the inexorable forces of history will lead to the eventual victory of the communist system over the contradictions of capitalism. To this end, they will use any covert and/or political means to assist history in reaching its foregone conclusion. In short, the Soviets believe in taking the long view. They will wait patiently for their eventual triumph since they see long-term trends as being on their side. This means that they will only use military force when they think they are backed into a corner. When they do attack it will probably be because they see no other solution to their problem, and because they see the safety of their nation at stake. Strategically, they will fight a defensive war, one designed to remove some threat to the Soviet Union.

Maritime Strategy

This "scientific" view of history which is so peculiar to Communism also carries over into their military doctrine. The Soviet definition of military doctrine states that it is based on a "system of scientifically founded views." This theme of science is a constant throughout all aspects of the Soviet military. When a Soviet officer must decide how many aircraft to use in attacking a target, he uses a formula. When a

Red Army lieutenant is asked how to act in a specific tactical situation, there is only one correct solution, just as there is only one correct answer to a mathematical equation.

Soviet doctrine is based on both a combination of political and economic inputs from their leadership and on military science (the scientific "physics" of war). Based on these two sources they have developed the Military Art: the theory and practice of war in a specific time and place. From this formidable body of work, the Soviets have developed a list of missions to be performed by their Navy in wartime. In order of priority, they are:

1. Operations against the land (strategic strike)

2. Anti-naval nuclear forces (Anti-SSBN)

3. Protection of their SSBNs (Pro-SSBN)

4. Anti-surface lines of communication (anti-convoy)

5. Protection of their own lines of communications

6. Support of the army

When compared with an equivalent list of U.S. missions, there are many differences. The U.S. does not prioritize its missions, except to place primary emphasis on deterrence. Soviet missions are more carefully and completely defined. But this attention to detail and structure could be a two-edged sword: Soviet forces are less flexible than the NATO forces, imposing greater restriction on Soviet forces and allowing for less strategic and tactical creativity.

Strategic Strike

Since the Soviet Union bases its military strategy on the land, this is also called "Operations Against the Land." These missions would be executed by Delta and Typhoon class nuclear ballistic missile submarines (SSBN) firing from protected areas in the Barents and Kola Seas, and from under the polar ice cap. Older Yankee-class boats would have to fire from positions off the coasts of the United States. Today, the very newest Soviet attack submarines (SSN) also have a strategic strike capability as do American attack subs. However, unlike American submarines, which can launch either nuclear or conventional cruise missiles, Soviets submarines fire only the nuclear SS-N-2 1.

These subs are so valuable for other roles that their participation in a nuclear strike is unlikely.

Anti-Naval Nuclear Forces

Since World War II, the Soviet Union has viewed the nuclear strike capability of first the US, then other navies, as the primary naval threat to the Soviet State. These threats would come from American carrier-based strike aircraft, nuclear ballistic missile Subs (SSBN), and (most recently) from cruise missiles capable of being launched from a variety of platforms. Defense of the Motherland against nuclear strike is not the responsibility of the Navy, alone; the air defense force has a role to play in the event that missiles are launched. However, the role of the navy is to track and attack potential launch platforms as they approach within firing range. In actual wartime, they would immediately attempt to destroy such platforms.

Protection of their SSBNs

To protect their own nuclear strike force, the Soviet navy will probably form "bastions" in the Barents and Kola seas, even stationing ballistic missile subs under the polar ice caps. A bastion consists of an area of water, partially enclosed by friendly shoreline, cornered off by mines, Surface, submarine, and aircraft forces will patrol inside and outside this area. Acoustic sensors in the seabed will help detect hostile submarines. In the event that Soviet SSBNs are required to leave their bastion. they will be escorted by the newest and best attack submarines. Where there is no ice, patrol aircraft and helicopters will continuously patrol overhead. The most capable ASW ships will form hunter-killer groups. Hence, a major part of the Soviet navy will be organized with the one goal of preserving the land-attack capability of the Soviet naval forces.

Attacking Enemy Lines of Communications (Anti-Convoy)

Once the Soviets secure their own ability to strike the enemy's home-land and reduce its ability to strike their own country. they will use their remaining forces to attack the enemy's strategic and tactical supply lines, which would normally consist of large naval convoys and other merchant traffic. Given the fact that none of the NATO allies are economically, strategically, or militarily self-sufficient, this action would be aimed at strangling the NATO war effort on land. To accomplish this task, the Soviet navy would have to leave home waters and even go beyond the Norwegian Sea, using submarines and long-range strike aircraft. Mines would be laid in shallow waters near enemy ports, and the ports themselves might be attacked by air strikes and/or commando teams with sabotage responsibilities.

Support of the Army

The lowest-priority mission defined by the Soviet strategists is supporting the army. This would be performed by amphibious forces and small combatants. Small landings would be made to outflank the enemy. Supply cargo would be carried in the waters off friendly coasts, escorted by naval warships.

United States and Her Allies

To understand the thinking behind Western military philosophy and strategy you must remember that the United States and her allies represent the greatest coalition of economic powers ever witnessed in world history. Within this consortium of power, no nation is as economically self-sufficient as is the Soviet Union. Instead, the stability and well-being of the West is dependent upon an unimaginably complex web of financial and trade arrangements designed to allow each nation a maximum economic benefit consistent with the overall health of the other members of this trading society. Within this system, the economy of any one major nation is largely dependent upon the state of the economy of any other major nation. Because of this, the capitalistic societies have come to realize that no one nation can pursue a policy too detrimental to the well-being of any other nation. Should the economy of any one of the major trading partners collapse, the repercussions would be severely felt throughout the entire free world.

Western politics tends to be strategically less long-range than do Soviet politics, focusing more on the immediate state of the economies of member nations. But because of this world-wide economic arrangement, Western military planners have developed strategies built around the rapid deployment of forces to sensitive areas, with the goal to protect the vital arteries which sustain the health of allied powers. So whereas the Soviets would view control of the seas as a means of both protecting the Motherland and isolating land-based battles from allied support, the U.S. and her allies view sea power as a vital necessity towards allowing the free flow of both economic and wartime materials.

Because of the nature of Western economic arrangements. American political and military philosophy with regards to communist countries is one of "containment"; that is, preserving the status quo by erecting a series of alliances with countries inside our sphere of influence. Of these alliances, the best-known, most powerful, and most crucial to the

defense of worldwide democracy is the North Atlantic Treaty Organization (NATO).

By comparison to the relatively simple. straightforward, and somewhat streamlined peacetime military organization of the Soviet Union, that of the United States would appear absolutely muddled. And in many respects it is. Yet just as political ideologies and national self-perceptions have given rise to the Soviet military organization, so too have historical Western ideologies and concerns shaped our own political-military system.

The United States has traditionally avoided a centralized "general staff" concept in its military organization. In one respect, this concern originated with the framers of the Constitution, who realized that the British general Oliver Cromwell had established a military dictatorship that had almost throttled democracy in its infancy. In part, also, is the concern over the establishment of a general staff which would operate as a "state within a state" as did the German General Staff in World Wars I and II. As a result, control over the American military is diffused through a vast interlocking and complex bureaucracy of civilian agencies and military commands administered under civilian control through the Department of Defense. From the perspective of Western ideologies concerning the inviolability of personal and social freedoms, this concept is almost sacrosanct. There are, however, both organizational and economic prices to be paid for this concept: an economically wasteful lack of cohesiveness in military planning and procurement, unclear and uncoordinated objectives among the three armed services (Army, Navy, and Air Force), and a burgeoning military-civilian bureaucracy that consumes tax dollars at a formidable rate.

With regards to the administration of our military treaties, much the same ideology applies. Each member country is responsible for maintaining a military presence consistent with its national interests. In the event of a worldwide conflict, each nation would be faced with the dilemma of how best to contribute its military resources in defense of the common cause against the protection of its own borders and its own population. For example, in the event of a Soviet incursion into West Germany, our British allies would have to decide between committing their troops to that front, or protecting their own soil against a simultaneous Soviet threat.

Moreover, in the event of a large-scale conflict, the Western philosophy calls for a coalition between the armed services of each country, with strategic and tactical responsibility for the execution of the war falling upon military representatives from each member country acting in

concert. But while the difficulties inherent in a system lacking a strong monolithic command structure are obvious, there is also one very important strength. Once the fundamental strategy has been established, each military commander has great latitude on how best to execute his responsibilities. This concept of individual responsibility for decisions reaches down even to platoon and squad level. This strength of the democratic tradition renders a war effort less prone to deterioration should key individuals or units within the command structure be killed or otherwise removed from action.

Maritime Strategy

America's maritime strategy is a part of its overall National Military Strategy. National Military Strategy is built around the tripartite concepts of:

1. Deterrence and transition to war

2. Seizing the initiative

3. Carrying the fight to the enemy

Deterrence and Transition to War

Deterrence, both nuclear and conventional, is designed to limit Soviet options and to convince them that any military solution to a crisis will fail. The concept of nuclear deterrence, the so-called "balance of terror," is familiar to everyone. Less well-understood is that of conventional deterrence. Under this concept, the U.S. and her allies will place naval and land units in or near crisis situations, altering the balance of forces so that the chance of a hostile military solution to the crises is lessened. Of course, the opponent may see these forces as something to be matched, so the amount and nature of the force is critical. However, a key factor in this philosophy is the fact that the Soviets and her Warsaw Pact allies enjoy a considerable advantage in the size of their conventional forces. In most scenarios it is assumed that the Soviets will enjoy a numerical superiority in the event of a full-scale conventional conflict. Therefore, for a Western conventional deterrence to be effective the Soviets must be made to realize that superiority by virtue of numbers is illusory. Critical to this strategy are superior NATO firepower resulting from technologically superior weapons systems, surrendering large tracts of territory in order to gain both maneuvering rooms for counterattack and to gain time in bringing our industrial superiority to bear, and superior mobility in placing both regular and reserve forces

into theaters of crisis situations and in reinforcing the front with our industrial output.

Seizing the Initiative

If deterrence fails the Soviets will probably make the first move. Since NATO is a coalition, the Soviets have the initiative as a single player. Having the initiative is vital in a military campaign because the force with the initiative will get his enemy to react to his actions, and will be able to choose the time and place for engagement. The U.S., therefore, must seize the initiative and turn the battle to her favor.

The Allies will first try to counter the enemy's initial attack, causing them to stall and to lose the timing of their pre-planned campaigns. The Allies may also attempt to disrupt the Soviet's "scientific" approach to campaigns by launching attacks or maneuvers designed to force the Soviets to react to unanticipated threats. In this stage of conflict, the line between NATO offensive and defensive actions may be blurred. For instance, an apparently offensive strike against airfields on the Kola Peninsula may, in fact, be designed to protect convoys from attacks by land-based bombers. "Seizing the initiative," then, refers to changing from a defensive posture to an offensive one. The amount of time this may take to happen will vary with the situation, but it has to happen.

Carrying the Fight to the Enemy

Once NATO has the initiative it will try to turn the tide of battle and carry the fight to the enemy. This is what the navy means by "power projection," and it entails moving into the adversary's home waters and attacking him there so that his forces will have to be used to defend his own territory. Tasks to be performed might include recapturing con-quered territory, clearing the seas of submarines so that ships can move through it, or eliminating enemy air capability by striking at enemy bases. If the Navy is able to project its power, the U.S. and her allies should have the upper hand. Yet this might also be the most critical part of the war. Hopefully, of course, the enemy will sue for peace at this point, realizing that his military and political goals are now impractical or unobtainable. But, on the other hand, we cannot press a nuclear opponent too closely. If he thinks that his national survival is at stake he might use strategic nuclear weapons, or threaten their use, in order to gain better terms. The risk of nuclear weapons being used is present throughout modern conventional war, but the real danger of their being used will most likely occur if one side feels that it is losing, or has lost.

U.S. Navy Organization

The U.S. Navy engages in the projection of power all over the globe in support of American policy and goals. It maintains bases in, and has ships on, virtually every ocean in world. For command and control purposes, Naval forces are divided into numbered fleets, each with their own geographic responsibilities: Second Fleet (Atlantic), Third Fleet (Pacific), Sixth Fleet (Mediterranean), and Seventh Fleet (Far East). Within each Fleet, units are organized into "task forces"; that is, groups of ships chartered to perform specific tasks such as convoy escort, amphibious landing and support, strikes against enemy bases, etc. Because some tasks are constantly being undertaken, planners simplify matters by using several standard task force organizations.

Carrier Battle Groups (CVBG)

The first and most important type of task force is the Carrier Battle Group. Centered on a single aircraft carrier (CV), the CVBG includes two or three guided missile cruisers (CG) for long-range air defense, a few guided missile destroyers (DDG) for close-in air defense, two destroyers (DD) or frigates (FF) for anti-submarine defense, and a few submarines patrolling in front of the task force that are used for both offensive and defensive purposes. The CVBG may also include support ships and auxiliaries to support the task force with fuel, ammunition, and stores. A carrier battle group has an impressive array of firepower. It can attack surface targets with strike aircraft, missiles from the escorts, or torpedoes from the submarines. It can attack hostile submarines with ASW helicopters, its own subs, or ASW weapons from escort ships. It can destroy incoming aircraft with either its own fighters or surface-to-air missiles (SAM). It can also strike enemy shore bases either with aircraft or with long-range cruise missiles. The American CVBG is the most flexible and powerful combination of naval forces that exists.

The navy also uses light carrier battle groups centered on a VTOL (vertical take-off and landing) or helicopter carrier. Although these battle groups are quite inferior to the CVBG in terms of overall firepower, they are invaluable for ASW, escort, or support roles.

Surface Action Groups (SAG)

A surface action group is centered on one or more powerful surface ships such as cruisers and/or battleships, and includes several escort ships for protection. Its mission is to provide heavy firepower when needed, as in support of an amphibious landing. A SAG would also use missiles (or guns, in rare instances) to attack hostile surface units. But

since the Soviet navy does not usually deploy its surface ships in distant waters, the chances of a SAG being used in this role is somewhat limited.

Review of Modern Weaponry—the Impact of Technology

Technology is the driving force behind modern naval warfare, much more so than warfare on land. On land, there have certainly been technological improvements in such systems as tanks, troop carriers, helicopters, artillery and explosives, visual detection systems, and the like. Nevertheless, the dominant force on land continues to be the individual infantry soldier; technology has not changed this fact. At sea, however, the development of new weapons and sensors has had a dramatic effect. Modern naval warfare fundamentally involves machines fighting other machines, with humans directing them and serving as parts of the machines, performing tasks that electronic subsystems are not yet capable of doing. Ever since war at sea became mechanized, the goal has been to remove humans from the loop and to maximize speed and efficiency. The effect has been to improve reaction time and, simultaneously, to reduce manpower support overhead. The ultimate example, to date, is the Aegis anti-air warfare system: under human direction it detects, classifies, and engages hostile aircraft without human intervention. Advanced technology makes this system possible, but it also increases the burden on the person ultimately responsible—the naval commander.

Search and Detection Systems

Before an enemy can be engaged and destroyed he must first be detected. If he cannot be detected, located, and tracked no amount of firepower will be to any avail.

Modern detection and military intelligence capability commences with reconnaissance satellites orbiting the earth at a distance of 150 miles or further. These "spy-in-the-sky" systems can monitor the movement of enemy troops and materials in and out of port, as well as the location of hostile naval task forces at any point on the globe. Although they currently would play little part in an actual tactical engagement, their information is invaluable to military commanders in determining enemy positions and strengths. The capability of technological nations to exploit outer space is currently giving rise to a new phenomenon: space warfare. In order to deny an enemy access to intelligence data

derived from spy satellites, we are now witnessing the advent of anti-satellite weapons such as killer satellites (orbiting satellites whose sole purpose is to destroy an enemy's reconnaissance satellites) and anti-satellite missiles.

At the tactical level, enemy forces are located, tracked, and identified by a variety of sophisticated sensors. Air search radar can detect and track aircraft at ranges of more than 200 miles, while surface search radar perform similar tasks on targets over 40 miles away. Passive electronic listening systems receive and analyze the various enemy radar emissions, allowing naval commanders to precisely classify what kinds of ships, aircraft, and other weapons systems he will be encountering. In fact, since receivers can detect emissions at distances far beyond radar range, task force commanders can know the composition of their adversaries long before they are detected and tracked by radar. Information from active and passive devices is fed into computers where it is analyzed, with the results displayed on consoles. In fact, the state of the art is such that all information being obtained by one naval unit can be networked to other units so that any one ship has access to the same information as any other ship.

But as important as it is to know the composition and the whereabouts of the enemy, it is equally important to deny him access to similar information. As a result, modern naval units employ a variety of systems designed to jam and/or deceive enemy radar. Such systems run the gamut from simple chaff (strips of aluminum foil cut to lengths effective against specific electromagnetic wavelengths), to electromagnetic jamming beams tuned to the specific frequencies of enemy radar, to systems designed to confuse enemy commanders by producing phantom or misleading electronic targets.

All that has been said about surface detection systems can also be said about subsurface systems. Sonar is to undersea warfare as radar is to surface warfare, with the difference being that sonar operates on the principle of reflected sound waves, as opposed to reflected electromagnetic waves. All submarines and surface combatants have onboard sonar systems which are used for precise target tracking and torpedo fire control. Some systems are integral to the ship itself, and some are towed behind the ship to reduce the effects of ship noise on sonar reception. In addition to these active devices, submarines are equipped with long-range passive listening devices. These systems are capable of alerting submarine captains to the presence of enemy subs at distances far beyond sonar range. By being passive they also have the advantage

of not alerting the enemy to one's presence. Their only disadvantage is that they cannot track a target as precisely as can active sonar.

Anti-submarine helicopters use sonar devices which are dipped into the water from the hovering platform, as well as sonobuoys (expendable sonar devices dropped into the vicinity of where a submarine is suspected of being). Anti-submarine fixed-wing aircraft also employ sonobuoys as well as Magnetic Anomaly Detection (MAD), a system that is capable of sensing disturbances in the earth's magnetic field caused by the presence of a large metallic object, such as a submarine.

Air and Anti-Air Weaponry

It is an axiom of warfare that the force which controls the high ground controls the battle. Since World War II, winning the high ground has meant control of the skies. In the early 1940s, of course, controlling the skies meant controlling the airspace in the immediate vicinity of a task force. Today, however, advances in both aircraft design and in guided missile capability have expanded the threat envelope to ranges of hundreds of miles from the fleet.

Control of the skies (and hence, control of the seas) is a function of guided missile technology. Fundamentally, there are three types of guided missiles: Surface-to-surface missiles (SSM), surface-to-air missiles (SAM), and air-to-air missiles (AAM). Tactical missiles are normally guided to their targets by one or more types of guidance systems: inertial navigation, active homing, semi-active homing, or passive homing. (A fifth type of missile, the beam rider, has been phased out of active use).

Inertial navigation is primarily employed in SSMs, and means that the precise geographic location of both the launch platform and the target are fed into a computer on board the missile. Based on this information the computer programs the missile's flight to the target. Of course, in naval warfare the target is in motion and cannot be expected to be in the same location as it was when the missile was launched. Consequently, anti-ship missiles employing inertial navigation often have a second type of guidance system (normally active homing, as described below) which takes over once the missile approaches within a specified distance of the target. The *Harpoon* missile is an example of a SSM employing both inertial navigation and active homing guidance systems, as is the hypermodern AMRAAM (Advanced Medium Range Air-to-Air Missile).

Active homing means that the missile itself radiates a coded radar beam, called an "illumination" beam. The beam is coded so that the missile can recognize its own beam from all the other radar beams that will exist in an hostile environment. When this signal is reflected from the target, the missile receives it, processes the signal for target location and predicted intercept point, then guides the missile to the target. The advantage of active homing is its "fire and forget" capability, that is, once the missile has been launched the platform can turn its attention to other threats. The disadvantage is that target destruction information may not be available except by search radar. Active homing systems are also complex and costly. Semi-active homing is similar in concept. except that the target is illuminated by a coded beam originating from the launch platform. Systems called Fire Control Directors radiate both a target tracking beam and a separate illumination beam electronically aligned to the axis of the tracking beam. Once the fire control director "locks on" with its tracking beam the missile is fired and uses the information received from the encoded illumination beam to process an intercept course. Because the target is being continuously tracked by the highly precise tracking beam, target destruction information can be immediately obtained. The disadvantage is that the fire control director must be occupied with a single target until intercept occurs; otherwise, the missile will have no target illumination information. Most SAMs and AAMs currently use semi-active homing systems, with the most notable shipboard missile being the Standard RIM-66/67 and the most notable air-launched missile being the Sparrow AIM-7.

Passive homing means that neither the missile nor the launch platform radiate a guidance beam. Instead, the missile homes in on specific radiation emitted from the target itself. Some missiles (such as the fabulously successful Sidewinder AIM-9) will home in on a source of intense heat, such as a jet engine's exhaust. Others, such as the Standard ARM (anti-radar missile), will home on any radar beam emitted by the target. Passive homing missiles generally have the advantage of simplicity and low cost, combined with a high degree of effectiveness. However, they are usually of much shorter range than their semi-active counterparts, usually in the 15+ mile neighborhood.

Many guided missiles have back-up systems to increase their chance of intercept should the target employ some sort of defensive countermeasure. Active and semi-active homing missiles often have a "home-on-jam" capability which is automatically activated should the target attempt to jam their illumination beams. Anti-radar missiles are designed to continue their flight to the last predicted intercept point if

the enemy should turn off his radar; this can be fairly effective against slow-moving ships or stationary ground radar. And heat-seeking missiles, which formerly could be foiled by aircraft dropping flares, are now designed to ignore such spurious heat sources. Despite all the advantages of guided missiles, they are still ineffective against targets that are very close (inside one mile). Because of this fact, and because of the threat of low-flying cruise missile which might not be detected until impact is imminent, modern gun systems such as the 20-mm Phalanx MK 15 & 16 have been developed. Composed of a fire control radar and a six-barreled "Gatling gun," over 400 of these self-contained units have been installed on over 125 U.S. ships and many more supplied to foreign buyers. This "last-ditch" defense system has been proven effective against the French Exocet missile in live firing tests.

Warfare Systems

There are fundamentally only two major types of anti-submarine weapons: depth charges (conventional explosive and nuclear) and torpedoes (including rocket-boosted stand-off models).

The conventional depth charge, of course, was the old stand-by of World War II. Today, because of technological advances that have led to the increased reliability of torpedoes, the conventional depth charge generally plays a less important role than it did in the past. It sees greatest use in the navies of Europe and Asia, and is also used by the U.S. Navy when attacking targets in shallow water.

Western arsenals contain nuclear depth charges in yields ranging from 1.5–15 kilotons. These weapons can be rocket-launched from submarines or surface vessels or they can be dropped by aircraft. The danger, of course, in employing such weapons is the risk of further nuclear escalation. Therefore, for all practical purposes, any conventional undersea conflict would be fought using torpedoes with conventional warheads.

In many respects, modern torpedoes are like guided missiles adapted to an undersea environment, but instead of rocket motors, torpedoes are driven by propellers turned by steam, gas generators, or electric motors. Like missiles, torpedoes have various types of homing or guidance systems; or they can be free-running. However, the most effective ones incorporate self-contained guidance. Active homing systems are common; but unlike missiles which home on reflected electromagnetic energy, torpedoes utilize on-board sonar to detect and lock on targets. Many also incorporate either a passive homing system whereby the target is tracked by the noise it makes, or they use a wire-guidance system

where data from shipboard sonar computers feeds target information to the torpedo through a thin wire trailing behind it. Most torpedoes utilize a combination of either passive homing or wire guidance, along with active homing.

The key to a successful attack against submarines is to not let the enemy know that he is being attacked until it is too late for him to make effective evasive maneuvers. Consequently, ASW units will first try to locate and identify an enemy using passive means, for once a submarine hears the pinging of active sonar he is alerted to possible attack.

Torpedoes can be launched from a variety of platforms: surface ships, submarines, helicopters, or fixed-wing aircraft. The torpedo launched most often from helicopters or aircraft is the MK 46. This relatively light weight active/passive acoustic homing weapon uses a thermo-chemical cam engine to provide up to 45 knots of speed with a range of about 3–4 miles at a depth of 1500 feet. But the staple of today's sub-marine-launched arsenal is the MK 48. This torpedo has a diameter of 21 inches and carries 650 pounds of high explosive. It has a variety of sophisticated homing devices, including two-way wire-guidance (which allows the launching submarine to receive target data from the torpedo itself for greater control), along with active and passive sonar. It also incorporates a "fire-and-forget" mode which can be initiated if the torpedo's own noise masks the launch submarine's passive sonar detection system. It can attain speeds of up to 55 knots and has a range of over 23 miles.

Stand-off torpedo launch capability for surface ships is afforded by the ASROC (anti-submarine rocket) which incorporates a MK 46 torpedo with a rocket booster, propelling the weapon to submarine targets over 5 miles away. Some US submarines will achieve a stand-off capability with the Sea Lance anti-submarine stand-off weapon (ASW-SOW). This system uses either a MK 46 or MK 50 torpedo with a rocket booster. It is launched from a torpedo tube, and can be effective against subsur-face targets at ranges of up to 100 miles.

B Glossary

AAM. Air-to-Air guided Missile.

AAW. Air-to-Air Warfare.

AEW. Airborne Early Warning.

AIM. Department of Defense designation for any air-launched anti-aircraft missile.

airfield. A base unit that has runways to launch aircraft.

altitude bands. The altitude and depth representations used in the *Harpoon Classic 97* system.

ARM. Anti-radar missile.

AS. Air Search, used in Sensors Screen displays.

ASM. Air-to-Surface guided missile.

ASROC. Anti-Submarine Rocket. A ship-launched weapon composed of either a homing torpedo or a nuclear depth charge attached to a rocket booster.

ASuW. Anti-surface warfare.

ASW. Anti-submarine warfare.

AS/SS. Dual mode radar, both air and surface search capable in one unit, used in the Sensor Screen displays.

baffles. The rear part of a ship or submarine where the power plant noise combined with the propulsion noise creates an area where hull sonar cannot detect contacts directly behind a platform in a 60-degree arc.

base. In *Harpoon Classic 97* the general term referring to airfields, ports, cities and combined port/airfield units.

bastion. Any heavily-defended area of water. Normally, a bastion includes water partially enclosed by friendly shoreline, and cornered off by mines. Surface, submarine, and aircraft forces would patrol inside and outside this area, and acoustic

sensors in the seabed would help detect hostile submarines.

bearing. The direction in degrees from a detecting unit to a contact.

bridge. The place within a ship where navigation and piloting occurs.

call sign. In computer *Harpoon Classic 97,* each unit and group has a call sign. Groups have a three-letter call sign, a BLUE group might be AAS, while a RED group could be ZS. Units within a group share the first two letters of the Group call sign, with a two digit unit indicator (i.e. the first unit of Group AAS would have the call sign of AA01). The third letter of the Group call sign indicates the known group type, namely:

- C—Carrier Group
- S—Ship Group
- U—Submarine Group
- A—Plane Group
- H—Helicopter Group
- M—Missile Group
- T—Torpedo Group
- a—Airfield Group
- P—Port Group
- b—Airfield and Port Group

Ceaser. The Soviet fixed seabed passive sonar sensor system. Located on the ocean floor in the North Sea.

cavitation. Submarine and surface ship propellers create small bubbles in the water if they spin at high speeds. These small bubbles almost immediately collapse, creating a sound called cavitation noise. As submarines go deeper, the pressure allows their propellers to spin faster without creating this sound.

CG. Cruiser Guided Missile. American designation for any cruiser armed with surface-to-air guided missiles.

chaff. Strips of metallic foil, cut to the wavelengths of specific radar, used for jamming.

CIC. Combat Information Center, the tactical center of the ship, where enemy contacts are plotted and tactics planned and executed.

class. In *Harpoon Classic 97* this refers to a specific platform type, which may have many individual members. For example, the Iowa class of battleships includes the Iowa, New Jersey, Wisconsin and Missouri as members of that class of ship.

CSUP. Communist Party of the Soviet Union.

CV. American designation for any aircraft carrier.

CVBG. American designation for an aircraft carrier battle group.

CZ. Convergence Zone used in Sensor Screen displays.

D. Dipping Sonar used in the Sensor Screen displays.

DD. American designation for any destroyer.

DDG. Destroyer Guided Missile. American designation for any destroyer armed with surface-to-air guided missiles.

director. A sensor specific to a particular weapons mount, used to target the weapon before and/or during firing.

electronic countermeasures. Any device or system capable of either jamming or deceiving enemy radar.

ELINT. Electronic Intelligence. The identification of specific enemy radar, as well as the platforms employing these radar, by the analysis of received radar signals.

endurance. In *Harpoon Classic 97* this refers to airborne endurance (that is, how far you can go before running out of fuel). By using the range circle options, you can visually determine your endurance distance for a currently set altitude and throttle setting.

ESM. Electronic Support Measures. Any system capable of detecting and analyzing enemy radar signals.

FF. American designation for any frigate. Frigates are normally smaller than destroyers.

FLIR. Forward Looking Infrared sensor, carried by some aircraft and used to spot surface ships and surfaced or snorkeling submarines, used in the Sensors Screen displays.

GIUK. Greenland-Iceland-United Kingdom. The opening between Iceland and the Faeroe Islands, leading to the straits between Scotland and Denmark.

group. A collection of one or more units within computer *Harpoon Classic 97.* Most of your orders are given to groups.

H. Hull Sonar, used in the Sensors Screen displays.

H/T. Combination Hull/Towed sonar. used in the Sensors Screen displays.

HF. Height Finding air search radar, used in the Sensors Screen displays.

hunter-killer. A naval unit whose purpose is to seek out and destroy enemy submarines.

IR. Infrared, detecting radiating heat.

KB. Kilobyte, or 1,024 bytes of information.

KGB. Governmental branch of the Soviet Union responsible for State security. Combines the functions of the American CIA, FBI, and NSA.

knot. Nautical miles per hour. A nautical mile is about 14% greater than a statute mile.

LD/SD. Airborne Look Down/ Shoot Down radar, used in the Sensors Screen displays.

loadout. In *Harpoon Classic 97* this refers to an aircraft's' specific ordnance load for a given mission type.

LOC. Line of Communication. Military term for any supply line extending from a country engaged in hostile activities to the front lines.

LR. Long Range.

M. Mine Hunting Sonar, used in Sensors Screen displays.

MAD. Magnetic Anomaly Detection. A system which is capable of sensing disturbances in the earth's magnetic field caused by the presence of a large metallic object, such as a submarine.

MB. Megabyte, or 1 million bytes of information.

mount. A weapons mount in *Harpoon Classic 97.* A mount contains a weapon, the ready ammunition for that weapon and possibly a sensor used to target the weapon, called a director.

NATO. North Atlantic Treaty Organization, composed of the United States and her European Allies.

nm or NM. Abbreviation for Nautical Mile.

OTH. Over the Horizon radar (normally land based), used in the Sensors Screen displays.

picket. A scout, looking for the enemy. In *Harpoon Classic 97* this normally refers to the Picket zone of your formation, the outermost ring.

platform. Any vehicle capable of carrying a weapons system.

PR. Periscope Radar, used in the Sensors Screen displays.

radar. Radio Detection and Ranging. A sensor system capable of detecting targets using reflected electromagnetic energy.

RIM. Department of Defense designation for any ship launched anti-aircraft guided missile.

RO. Airborne Range Only radar, used in Sensors Screen displays.

S. Sonobuoys, used in Sensors Screen displays.

SAG. Surface Action Group. A surface action group is centered on one or more powerful surface ships such as cruisers and/or battleships and includes several escort ships for protection. Its mission is to provide heavy firepower when needed, as in support of an amphibious landing.

SAM. Surface-to-Air guided missile.

side. In computer *Harpoon Classic 97,* the alliance to which a group or unit belongs, represented as BLUE or RED.

sonar. Sound Navigation and Ranging. A sensor system capable

of detecting underwater targets whether actively (that is, through reflected sound waves) or passively.

sonobuoy. An expendable sonar device used in anti-submarine warfare, normally dropped by aircraft.

SOSUS. The NATO seabed passive sonar listening system.

SOW. Stand-Off Weapon. Normally applied to an antisubmarine weapon (torpedo or depth charge) attached to a rocket booster.

SPIR. Shipboard Passive Infrared sensor, used in the Sensors Screen displays.

SR. Short Range.

SS. Either a Surface Search radar or the designation for a Diesel (non-nuclear) Attack Submarine, dependent on context.

SS-N-21. A type of Soviet cruise missile carrying a nuclear warhead.

SSBN. Submarine Ballistic Nuclear. American designation for any nuclear- powered submarine armed with intercontinental ballistic missiles.

SSM. Surface-to-Surface guided missile.

SSN. Submarine Nuclear. American designation for any submarine propelled by nuclear power.

T. Towed array sonar, used in Sensors Screen displays.

thermal layer. The depth at which a sudden temperature change creates a "layer" that tends to reflect sound waves, reducing sonar effectiveness. Also called the Thermocline.

towed array sonar. Any sonar device capable of being towed behind a surface ship. The advantage of a towed array sonar is that it can be employed beneath ocean thermal layers where a submarine might hide.

TVD. Soviet Intermediate High Commands in the various theaters of operation. TVDs are subordinate to the VGK (the Supreme High Command).

unit. In *Harpoon Classic 97*, a unit consists of any single ship, submarine or base. Missiles, torpedoes and aircraft can have multiple members in a single unit, but must share the same target or loadout.

VDS. Variable Depth Sonar, normally a towed array sonar that can vary its depth, allowing it to listen both above and below the thermal layer, used in the Sensors Screen displays.

VGK. Supreme High Command of the Soviet Union responsible for all military actions. Composed of the Minister of Defense, his five commanders-in-chief, plus six other deputy Defense

Ministers for civil defense and other matters.

VTOL. Vertical Take-off and Landing. Abbreviation for any fixed-wing aircraft capable of a direct vertical take-off.

Warsaw Pact. The Soviet equivalent of NATO, composed of the Soviet Union and her eastern European allies.

C Original Harpoon Battlesets

GIUK Battleset

The Norwegian Sea is essentially an enclosed body of water bounded by Greenland, Iceland, the north polar ice cap, and Norway. This somewhat rectangular area can be entered by three ways:

- From the north by going under the polar ice cap
- Through the Denmark strait between Iceland and Cape Farewell in Greenland
- Through the opening between Iceland and the Faeroe Islands—the so-called GIUK gap

NATO Strategy

Because of its geography, this area would be defended against Soviet air and naval attack by task forces composed of units from the United States, Great Britain, and Norway.

NATO forces would be attacking Soviet forces as they advanced along the Norwegian coast, pinning them down and even putting them on the defensive. This holding action would tend to draw valuable assets needed by the Soviets on the European central front. Simultaneously, NATO nuclear attack submarines would locate and destroy any Soviet nuclear ballistic missile submarines hiding in "The Bastion." If successful, these same attack submarines could also launch Tomahawk strikes against Soviet bases located on the Kola Peninsula adjoining Finland.

Soviet Strategy

From the Soviet viewpoint, their highest priority is to protect their nuclear ballistic missile submarines; keeping them secure as a "bargaining chip" for post-war negotiations. Their second priority is to defend their homeland against NATO strikes. To do this, they must detect and destroy NATO units as they enter the Norwegian Sea. Thirdly, they will send submarines and long-range aircraft into the North Atlantic to attack and destroy NATO convoys, for although control of this area is crucial to the Allies, requiring an immense investment in support of shipping, only a relatively small attacking force will be sufficient to wreak havoc on these convoys. Finally, they will support their army's attacks against Norway, gaining control of the coastal seas and providing air cover for support of their own sealifts. They will probably engage in a series of "coast-hopping" assaults with the idea of outflanking the defenders.

Playing this Battleset

In this battleset you will find twelve different scenarios, each requiring you to command a different NATO unit in implementing NATO strategy. In these scenarios, you will assume command of anything from a small squadron of missile boats up to a much larger unit, including the entire strike fleet in defense of the British Isles. (If you choose to play the Soviet side, you can even control a full-scale Soviet amphibious assault force.) You will be up against the powerful Soviet Northern Fleet which is composed of two aircraft carriers, 75 principal combatants (guided missile cruisers, frigates, destroyers, etc.), 88 other combatants (ASW and AAW escort vessels), 170 submarines (including nuclear ballistic missile and attack subs and diesel subs used primarily for coastal defense), along with over 440 naval aircraft of all types.

Fighting in the North Atlantic environment is an arduous task for even the most experienced commander. Not only will you have to engage trained and committed Soviet forces, but you must also contend with high seas, fierce winds, and thousands of miles of craggy coasts that could afford hostile forces the opportunity for surprise attacks.

You will be given orders for your mission and strategic objectives, as well as intelligence information about Soviet objectives and the forces you can expect to encounter. In addition, you will be briefed on the background behind your mission and its importance to the overall war effort.

The success of the European defense is in your hands. Good luck and good hunting!

About the Maps

The on-screen maps used in this simulation are called "Lambert Conformal Conics." Because they have been digitally scanned from the Defense Mapping Agency Global Navigation charts GNC3 and GNC4, they are absolutely accurate in all detail. However, since the earth is a globe and not a flat plane, any map must necessarily contain distortions. Most maps used by the public (like street maps) use "Mercator projections." The Mercator projection is equivalent to putting a light inside a globe and wrapping a transparent cylinder around this globe, touching it at the equator only. With the light shining through the globe, the images of the land masses on the globe are projected onto the cylinder. As distance from the equator increases, both to the north and to the south, the images of the land masses are increasingly distorted. In fact, at or near each pole the distortion is so great that the map is virtually useless. Mercator projections are very useful in representing map data either of relatively small areas of the earth, or areas somewhat distant from one of the poles.

Because the battleset furnished with this module of *Harpoon* enacts situations at extreme northern latitudes, the Lambert Conformal Conic was used as the basis for the on-screen maps to eliminate the difficulties inherent with Mercator projections. To understand how this type of map is produced, imagine a transparent sheet of plastic is rolled into a cone with the tip of the cone placed directly over the north pole. Now imagine that the cone is "pushed" down so that its edges pass through the earth at 65 degrees north latitude (about where Iceland is), and exit at 35 degrees north latitude (about where North Carolina is). Shine a light through the globe and project the images of the land masses onto this cone, you now have the type of map furnished with this battleset. Although there are still distortions at extreme northern and southern latitudes, the distortion in the geographical area of where *Harpoon* is played is relatively slight.

NACV Battleset

It is the year 1996; *perestroika* and *glasnost* have backfired. The Soviet hardliners have ousted Gorbachev and seized power in the Kremlin. To turn the people's attention from the desperate condition of the Soviet

economy and unite the various ethnic factions, they have launched an all-out attack on NATO.

The years of wishful thinking and premature defense cuts have taken their toll. The land forces on the European continent are few in number and ill-prepared for this lightning attack. At the same time, the Soviet forces are not prepared to engage in a long campaign and must secure all their objectives in less than one month's time. If NATO can rapidly resupply and augment their forces, the Soviets will be stalemated and possibly routed. If the Soviets can shut off the flow of supplies, they will almost certainly dominate the European battlefield, and thus all of Europe.

This battleset focuses on the NATO resupply effort and the Soviet effort to interdict it. You will be able to experience the strategic and tactical nuances of this resupply effort in scenarios that use the independent steaming, convoying, and defended sea-lane tactics.

NATO Strategy

Your overriding goal will be to get as many merchantmen and planes to Europe from the United States as quickly as possible. Every ship or plane lost is a double blow, in that the supplies (or troops) carried are lost to the war effort, and lost units cannot be used for future shipments. Defense of these ships and planes is imperative. Offensive operations should be limited to those which can produce quick kills of threatening enemy units. As the majority of the threat is limited to air and submarine attacks, you should focus on aggressive ASW and AEW/ AAW patrolling, ringing your valuable transport vehicles with a shield composed of your warships and aircraft.

Soviet Strategy

As NATO desperately struggles to resupply and reinforce their limited continental forces, the Soviets must move to cut that supply line from a torrent to a mere trickle. Particularly aggressive naval and air tactics are encouraged, since limiting resupply guaranties an early ground war victory. Since the overall Soviet strategy depends on this early victory, the initial resupply effort must be stymied. Soviet submarines should search for enemy convoys, and coordinate their attacks with available long range aircraft. If no aircraft are available, they should strike as aggressively as possible on their own. Soviet aircraft must both monitor and harass the enemy escorts at every opportunity, and be prepared to deliver devastating attacks whenever possible.

Playing this Battleset

In this battleset you will find sixteen different scenarios, each requiring you to command large groups of forces with one or more objectives. While there were many threats in the GIUK battleset, there are many more in the North Atlantic Convoys battleset. The glory of naval combat is overshadowed by the vastness of the Atlantic and the critical nature of your mission. Here, the war is the worst combination of boredom, tension, and possibly an ugly and sudden demise. To make a bad situation worse, the world's attention is focused on the land and air battles on the European front, while your crews sweat and die to deliver the supplies that keep your side in the fight. The North Atlantic Convoys Battleset will test your skills as a naval commander like nothing you have ever experienced.

The success of your forces fighting in Europe weighs in the balance. Your skill in directing these forces can make the difference! Good luck!

North Atlantic Convoys—Available Platforms

Section A—Bases

Table C-1   *NATO bases*

Country	Name	Type	Runway Class
Canada	St. John	Port/Airfield	VLarge Aircraft
France	Brest	Port/Airfield	VLarge Aircraft
	Cherbourg	Port/Airfield	VLarge Aircraft
	Lorient	Port/Airfield	VLarge Aircraft
Iceland	Keflavik	Airfield	VLarge Aircraft
Norway	Bergen	Port	VTOL
Portugal	Santa Maria	Airfield	VLarge Aircraft
Spain	La Coruna	Port/Airfield	VLarge Aircraft
	Rota	Port/Airfield	VLarge Aircraft
UK	Bermuda	Airfield	VLarge Aircraft
	Faslane	Port	VTOL
	Gibraltar	Port/Airfield	VLarge Aircraft

Table C-1   NATO bases (continued)

Country	Name	Type	Runway Class
	Kinloss	Port/Airfield	VLarge Aircraft
	London	Port/Airfield	VLarge Aircraft
	Portsmouth	Port	VTOL
	St. Mawgan	Port/Airfield	VLarge Aircraft
	Stornoway	Port/Airfield	VLarge Aircraft
	Vagar	Port/Airfield	Large Aircraft
USA	Boston	Port	VTOL
	Brunswick	Port/Airfield	VLarge Aircraft
	New York	Port	VTOL
	Norfolk	Port/Airfield	VLarge Aircraft

Table C-2   Soviet bases

Country	Name	Type	Runway Class
Iceland	Keflavik	Airfield	VLarge Aircraft
Norway	Orland	Port/Airfield	VLarge Aircraft
USSR	Kildistenroy	Airfield	VLarge Aircraft
	Shagui	Airfield	VLarge Aircraft

Section B—Fixed-Wing Aircraft

Table C-3   *Fixed-wing aircraft*

Country	Type	Class Name	Required runway
USA	Bomber	A-6E Intruder	Small Aircraft
	Attack	AV-8B Harrier II	VTOL
	Transport	C-141B StarLifter	VLarge Aircraft
	AEW	E-2C Hawkeye	Small Aircraft
	AEW	E-3 Sentry	VLarge Aircraft
	EW	EA-6B Prowler	Small Aircraft
	EW	EF-111A Raven	Large Aircraft
	Bomber	F-111F Aardvark	Large Aircraft
	Fighter	F-14A Tomcat	Large Aircraft
	Fighter	F-15C Eagle	Small Aircraft
	Attack	F-4E Phantom II	Small Aircraft
	Attack	F/A-18 Hornet	Small Aircraft
	ASW	P-3C Orion	VLarge Aircraft
	ASW	S-3 Viking	Small Aircraft
UK	Attack	Jaguar GR.1	Small Aircraft
	ASW	Nimrod MR.2	VLarge Aircraft
	Attack	Phantom FGR.2	Small Aircraft
	Attack	Sea Harrier FRS.2	VTOL
	Fighter	Tornado F.3	Small Aircraft
	Fighter	Tornado GR.1	Small Aircraft
France	ASW	Alize	Small Aircraft
	ASW	Atlantique	VLarge Aircraft
	Attack	Etendard IV M	Small Aircraft
	Fighter	F-8E(FN) Crusader	Small Aircraft

Table C-3   *Fixed-wing aircraft (continued)*

Country	Type	Class Name	Required runway
	Attack	Super Etendard	Small Aircraft
Spain	Attack	Matador AV-8B	VTOL
	ASW	Orion	VLarge Aircraft
USSR	ASW	Il-38 May	VLarge Aircraft
	AEW	Il-76 Mainstay	VLarge Aircraft
	Attack	MiG-29 Fulcrum	Small Aircraft
	Attack	Su-24 Fencer	Small Aircraft
	Attack	Su-27 Flanker	Small Aircraft
	Bomber	Tu-16 Badger G	VLarge Aircraft
	AEW	Tu-16 Badger J	VLarge Aircraft
	Bomber	Tu-22M Backfire	VLarge Aircraft
	Fighter	Tu-22MP Backfire D	VLarge Aircraft
	Reconnais-sance	Tu-95 Bear D	VLarge Aircraft
	Bomber	Tu-95 Bear G	VLarge Aircraft
	Attack	Yak-38 Forger	VTOL

Helicopters

Table C-4   *Helicopters*

Country	Type	Class name
USA	Naval	SH-2G Seasprite
	ASW	SH-3H Sea King
	Naval	SH-60B Seahawk
	ASW	SH-60F Oceanhawk
	Naval	Lynx HAS.3

***Table C*-4**   *Helicopters (continued)*

Country	Type	Class name
UK	AEW	Sea King AEW.2
	ASW	Sea King HAS.5
France	Naval	Lynx Mk4
	ASW	SA.321G Super Frelon
Spain	ASW	AB-212ASW
	AEW	SH-3 AEW (Spain)
	ASW	SH-3D Sea King (Sp)
	Naval	SH-60B Seahawk (Sp)
USSR	ASW	Ka-25A Hormone
	Search	Ka-25B Hormone
	ASW	Ka-27 Helix A

Carrier Air Wings

***Table C*-5**   *USA: CV Forrestal*

Number	Class name	Type
24	F-14A Tomcat	Fighter
18	F/A-18 Hornet	Attack
20	A-6E Intruder	Bomber
10	S-3 Viking	ASW
5	EA-6B Prowler	AEW
5	E-2C Hawkeye	AEW
6	SH-60F Oceanhawk	ASW

Table C-6   *USA: CVN Nimitz*

Number	Class name	Type
24	F-14A Tomcat	Fighter
24	F/A-18 Hornet	Attack
12	A-6E Intruder	Bomber
10	S-3 Viking	ASW
5	EA-6B Prowler	AEW
5	E-2C Hawkeye	AEW
8	SH-60F Oceanhawk	ASW

Table C-7   *UK: CVH Invincible*

Number	Class name	Type
8	Sea Harrier FRS.2	Attack
9	Sea King HAS.5	ASW
3	Sea King AEW.2	AEW

Table C-8   *France: CV Clemenceau*

Number	Class name	Type
16	Super Etendard	Attack
10	F-8E(FN) Crusader	Fighter
8	Alize	ASW
2	SA.321G Sup Frelon	ASW
2	Lynx Mk4	Naval

Table C-9   *France: CVH Jeanne d'Arc*

Number	Class name	Type
8	Lynx Mk4	Naval

Table C-10   *Spain: CVH Principe de Asturias*

Number	Class name	Type
8	Matador AV-8B	Attack
6	SH-3D Sea King	ASW
3	SH-3 AEW	AEW
4	AB-212ASW	ASW

Table C-11   *USSR: CVHG Baku*

Number	Class name	Type
13	Yak-38 Forger	Attack
14	Ka-27 Helix A	ASW
3	Ka-25 Hormone B	Search

Ships

Table C-12   *Ships*

Country	Type	Class name
USA	AOE	Sacramento
	CG	Belknap
	CG	Leahy
	CG	Ticonderoga
	CG	VLS Ticonderoga
	CGN	Virginia
	CV	Forrestal
	CVN	Nimitz
	DD	Improved Spruance
	DDG	Arleigh Burke
	DDG	Kidd
	FF	Knox

Table C-12 *Ships (continued)*

Country	Type	Class name
	FFG	O.H. Perry
	LHA	Tarawa
	AVS	Arapaho
	CONT	Container Ship
	TRAN	Transport
UK	AEFS	Fort Class
	CVH	Invincible
	DDG	Type 42 Batch 3
	FF	Leander Batch 3A
	FF	Type 22 Batch 1
	FF	Type 22 Batch 3
	FF	Type 23
France	AO	Durance
	CV	Clemenceau
	CVH	Jeanne d'Arc
	DD	Tourville
	DDG	Cassard
	DDG	Georges Leygues
	DDG	Suffren
Spain	CVH	Principe de Asturias
	FF	Baleares
	FF	Descubierta
	FFG	Santa Maria
USSR	AFS	Berezina
	AGI	Okean
	BCGN	Kalinin

Table C-12   Ships (continued)

Country	Type	Class name
USSR	CG	Slava
	CVHG	Baku
	DDG	Sovremenny
	DDG	Udaloy
	MRCH	Merchant
	TANK	Tanker
INTL	MRCH	Merchant
	TANK	Super Tanker
	TANK	Tanker

Submarines

Table C-13   Submarines

Country	Type	Class name
USA	SSN	Los Angeles
	SSN	Improved Los Angeles
	SSN	Seawolf
	SSN	Sturgeon
UK	SS	Oberon
	SSN	Swiftsure
	SSN	Trafalgar
France	SS	Agosta
	SSN	Rubis
USSR	SS	Foxtrot
	SS	Kilo
	SSGN	Charlie II
	SSGN	Oscar

Table C-13   *Submarines (continued)*

Country	Type	Class name
	SSN	Akula
	SSN	Sierra
	SSN	Victor II
	SSN	Victor III

MEDC Battleset

The Mediterranean Conflict differs from the first two battlesets in two significant ways.

First, the Mediterranean Conflict (MEDC) does not emphasize a US–USSR conflict. The conflicts in the Middle East have affectedthe Western powers have been affected, but never on a level remotely approaching the mobilization that a superpower confrontation requires.

The highest level of conflict potential for either of the two superpowers have been the "Superpower alert" during the October '73 War, the Kuwaiti tanker reflagging of '88–89, and of course, Operation "Desert Shield." The retaliatory strike on Libya was merely a live-fire exercise for two carriers and a squadron of USAF F-111s. The same could be said for the New Jersey's obliteration of several Syrian gun positions in Lebanon.

Consequently, we have tried to focus on this region's countries and their potential conflicts, bringing in the superpowers as needed for contrast and comparison. In fact, you might wonder why we left out the "whiz-bang" units, the reason is primarily play balance: the entire Syrian Air Force would be hard-pressed to penetrate any American task force centered on an Aegis Cruiser. One might consider the lack of "neat" units to be your portion of the U.S. "peace dividend."

The second difference is that we have included scenarios called "studies." In the earlier battlesets, almost all of the scenarios followed a single central theme for the battleset. The Med features a potpourri of different nationalities, each with long-standing blood feuds, special strengths, fatal weaknesses, numerous enemies, and too few real friends. Finally, we assume that the following countries have nuclear weapons that might be used if an enemy country detonated a weapon against home soil or a capital unit: USA, USSR, France, Israel, Syria

NOTE: Iraq and Libya probably don't have working nuclear weapons; if they did, they probably would not have such huge chemical weapons programs.

All of us hope that you find MEDC to be a fresh look at naval warfare And remember, you are much more likely to see some of these smaller battles on the evening news than you are full East-West confrontation.

Designers' Notes

Because "depth" in *Harpoon* is estimated, rather than based on actual data, portions of the Mediterranean Sea will appear to be "Very Deep,"

where in reality, the actual depth is closer to "Intermediate." To overcome this discrepancy, we have limited all submarines to "Intermediate" depth, even though they have the ability to descend to "Deep" depth. Additionally, the Mediterranean is also known for its poor sonar conditions: to reflect this, we have reduced sonar performance unilaterally. We believe that these adjustments will help to make the Mediterranean battleset more realistic and interesting to play.

Available Platforms

Section A—Bases

Table C-14   Blue bases

Country	Name	Type	Runway	Class
Corsica	Solenzara	Airfield	Vlarge	Aircraft
France	Marseille	Port/Airfield	Vlarge	Aircraft
	Nice	Port/Airfield	Vlarge	Aircraft
Greece	Nea/Ankhialo	Airfield	Large	Aircraft
	Larisa	Airfield	Vlarge	Aircraft
	Tanagra	Port/Airfield	Large	Aircraft
	Souda	Airfield	Vlarge	Aircraft
	Araxos	Airfield	Vlarge	Aircraft
	Thessaloniki	Port/Airfield	Large	Aircraft
	Hellenikon	Airfield	Vlarge	Aircraft
Israel	Ramat/David	Airfield	Large	Aircraft
	Haifa	Port/Airfield	Small	Aircraft
	Tel Aviv	Port/Airfield	VLarge	Aircraft
	Hatzor	Airfield	Large	Aircraft
	Nevatim	Airfield	Large	Aircraft
	Ramon	Airfield	Large	Aircraft
	Ovda	Airfield	Large	Aircraft

Table C-14 *Blue bases (continued)*

Country	Name	Type	Runway	Class
Italy	Brindisi	Port/Airfield	VLarge	Aircraft
	Rome	Port/Airfield	VLarge	Aircraft
	Crotone	Airfield	VLarge	Aircraft
	Naples	Port/Airfield	VLarge	Aircraft
Turkey	Topel	Port/Airfield	VLarge	Aircraft
	Cigli	Airfield	Large	Aircraft
	Erhac	Airfield	VLarge	Aircraft
	Merzifon	Airfield	VLarge	Aircraft
	Murted	Airfield	VLarge	Aircraft
	Konya	Airfield	VLarge	Aircraft
	Incirlik	Airfield	VLarge	Aircraft
Sardinia	Cagliari	Airfield	VLarge	Aircraft
	La Maddalena	Port	VTOL	
Sicily	Sigonella	Airfield	VLarge	Aircraft
	Trapani	Airfield	VLarge	Aircraft
Egypt	Habata	Airfield	Large	Aircraft
	Mersa Matruh	Port/Airfield	Large	Aircraft
	Gebel El Bas	Airfield	Large	Aircraft
	Cairo West	Airfield	VLarge	Aircraft
	Al Mansurah	Airfield	Large	Aircraft
	Faid	Airfield	Large	Aircraft
	El Arish	Port/Airfield	VLarge	Aircraft
	Port Said	Port	VTOL	
	Ras El Nakab	Airfield	VLarge	Aircraft

Table C-15   Red bases

Country	Name	Type	Runway	Class
Egypt	Mersa Matruh	Port/Airfield	Large	Aircraft
	Gebel El Bas	Airfield	Large	Aircraft
	Cairo West	Airfield	Vlarge	Aircraft
	Al Mansurah	Airfield	Large	Aircraft
	Faid	Airfield	Large	Aircraft
	El Arish	Port/Airfield	Vlarge	Aircraft
	Port Said	Port	VTOL	
	Ras El Nakab	Airfield	Vlarge	Aircraft
Libya	Okba Ibn Naf	Airfield	Vlarge	Aircraft
	Tripoli	Port/Airfield	Vlarge	Aircraft
	Ghurdabiyah	Airfield	Large	Aircraft
	Bengasi	Airfield	Vlarge	Aircraft
	Tobruk	Port/Airfield	Vlarge	Aircraft
Syria	Minakh	Airfield	Large	Aircraft
	Latakia	Airfield	Large	Aircraft
	Hamah	Airfield	Large	Aircraft
	Damascus	Airfield	Vlarge	Aircraft
	Shayrat	Airfield	Large	Aircraft
	As Suwayda West	Airfield	Large	Aircraft
Turkey	Topel	Port/Airfield	Vlarge	Aircraft
	Cigli	Airfield	Large	Aircraft
	Erhac	Airfield	Vlarge	Aircraft
	Merzifon	Airfield	Vlarge	Aircraft
	Murted	Airfield	Vlarge	Aircraft

Table C-15 *Red bases (continued)*

Country	Name	Type	Runway	Class
USSR	Kiev	Airfield	Vlarge	Aircraft
	Odessa	Port/Airfield	Vlarge	Aircraft
	Sevestopol	Port/Airfield	Vlarge	Aircraft
	Tiflis	Airfield	Vlarge	Aircraft
	Krasnodar	Airfield	Vlarge	Aircraft

Section B—Fixed-Wing Aircraft

Table C-16 *Fixed-wing aircraft*

Country	Type	Class name	Required runway
France	ASW	Alize	Small
	ASW	Atlantique 2	VLarge
	AEW	E-3F Sentry	VLarge
	Attack	Etendard IV M	Small
	Fighter	F-8E(FN) Crusader	Small
	Attack	Mirage 2000	Small
	Attack	Mirage F.1C	Small
	Attack	Super Etendard	Small
Greece	Attack	F-4E Phantom II (USA Export)	Small
	Attack	F-16C Falcon (USA Export)	Small
	Attack	F-104G Starfighter (FRG Export)	Large
	Attack	A-7H Corsair II	Small
	Attack	Mirage 2000 (France)	Small
	Attack	Mirage F.1G (France)	Small

Table C-16   *Fixed-wing aircraft (continued)*

Country	Type	Class name	Required runway
Israel	Fighter	A-4H Skyhawk	Small
	AEW	E-2C Hawkeye (USA)	Small
	Attack	F4E Phantom II	Small
	Fighter	F- 15C Eagle	Small
	Attack	F- 16C Falcon	Small
	Attack	Kfir C.7	Small
Italy	ASW	Atlantique	VLarge
	Attack	AV-8B Harrier II	VTOL
	Attack	F-104ASA Starfighter	Large
	Attack	Tornado	Small
Turkey	Attack	F-4EPhantom II (USA Export)	Small
	Attack	F-16C Falcon (USA Export)	Small
	Attack	F-104G Starfighter (FRG Export)	Large
	ASW	S-2E Tracker	Small
USA	Bomber	A-6E Intruder	Small
	Attack	AV-8B Harrier II	VTOL
	AEW	E-2C Hawkeye	Small
	AEW	E-3 Sentry	VLarge
	EWE	A-6B Prowler	Small
	Fighter	F-14D Tomcat	Large
	Fighter	F-15C Eagle	Small
	Attack	F-16C Falcon	Small
	Bomber	F-111 F Aardvark	Large
	Attack	F/A-18 Hornet	Small

Table C-16   *Fixed-wing aircraft (continued)*

Country	Type	Class name	Required runway
	ASW	P-3C Orion	VLarge
	ASW	S-3 Viking	Small
Egypt	AEW	E-2C Hawkeye (USA)	Small
	Attack	F-4E Phantom II	Small
	Attack	F-16C Falcon (USA)	Small
	Attack	Jian-7 Fishbed	Small
	Attack	MiG-21 Fishbed J/H	Small
	Attack	Mirage 5 (France)	Small
	Attack	Mirage 2000 (France)	Small
	Bomber	Tu-16G (Egypt)	VLarge
Libya	ASW	IL-38 May	VLarge
	Attack	MiG-23MS Flogger E	Small
	Fighter	MiG-25 Foxbat E (USSR)	Small
	Recon	MiG-25 Foxbat R (USSR)	Small
	Attack	Mirage 5 (France)	Small
	Attack	Mirage F.1ED	Small
	Attack	Su-24 Fencer (USSR)	Small
Syria	Attack	MiG-21 Fishbed D (USSR)	Small
	Attack	MiG-23 Flogger (USSR)	Small
	Fighter	MiG-25 Foxbat E (USSR)	Small
	Attack	MiG-29 Fulcrum (USSR)	Small
	Attack	Su-24 Fencer (USSR)	Small
USSR	ASW	Il-38 May	VLarge
	AEW	Il-76 Mainstay	VLarge
	Attack	MiG-23 Flogger	Small

Table C-16   Fixed-wing aircraft (continued)

Country	Type	Class name	Required runway
	Attack	MiG-27 Flogger J	Small
	Attack	MiG-29 Fulcrum	Small
	Attack	Su-24 Fencer	Small
	Attack	Su-27 Flanker	Small
	Bomber	Tu-16 Badger G	VLarge

Section C—Helicopters

Table C-17   Helicopters

Country	Type	Class name
France	Naval	Lynx Mk4
	ASW	SA.321G Sup Frelon
Israel	ASW	SA.365G Dauphin
Italy	ASW	AB-212ASW
	ASW	ASH-3D Sea King
USA	Naval	SH-2G Seasprite
	Naval	SH-60B Seahawk
	ASW	SH-60F Ocenhawk
Egypt	Attack	SA.342L Gazelle
	ASW	Sea King Mk47
Libya	ASW	Mi-14 Haze (USSR)
	Transport	SA.321M Sup Frelon
Syria	ASW	Ka-25 Hormone A (USSR)
USSR	ASW	Mi-14 Haze (USSR)
	ASW	Ka-25 Hormone A

Table C-17   *Helicopters (continued)*

Country	Type	Class name
	Search	Ka-25 Hormone B
	ASW	Ka-27 Helix A

Section D—Carrier Air Wings

Table C-18   *USA: CV Forrestal*

Number	Class name	Type
24	F-14A Tomcat	Fighter
18	F/A-18 Hornet	Attack
20	A-6E Intruder	Bomber
10	S-3 Viking	ASW
5	EA-6B Prowler	EW
5	E-2C Hawkeye	AEW
6	SH-60F Oceanhawk	ASW

Table C-19   *France: CV Clemenceau*

Number	Class name	Type
16	Super Etendard	Attack
10	F-8E(FN) Crusader	Fighter
8	Alize	ASW
2	SA.321G Sup Frelon	ASW
2	Lynx Mk4	Naval

Table C-20   *Italy: CVH Guiseppe Garibaldi*

Number	Class name	Type
18	SH-3D Sea King	ASW

Section E—Ships

Table C-21   Ships

Country	Type	Class name
France	DDG	Cassard
	CV	Clemenceau
	DDG	Georges Leygues
	DDG	Suffren
	DD	Tourville
Greece	FF	Cannon
	PM	Combattante II
	PM	Combattante III N
	PM	Combattante III Nb
	DD	FRAM I
	FF	Kortenaer
Israel	PTM	Sa'ar 2
	PTM	Sa'ar 3
	PTM	Sa'ar 4
	PTM	Sa'ar 4.5
Italy	CG	Andrea Doria
	DDG	Animoso
	DDG	Audace
	CVH	Guiseppe Garibaldi
	FFG	Lupo
	FFG	Maestrale
	PHM	Sparviero
	CHG	Vittorio Veneto
Turkey	PTM	Dogan
	DD	FRAM I

Table C-21   Ships (continued)

Country	Type	Class name
	PTM	Kartal
	FF	Yavuz
USA	CG	Belknap
	CGN	California
	AO	Cimarron
	DDG	Coontz
	CV	Forrestal
	BB	Iowa
	DDG	Kidd
	FF	Knox
	CG	Leahy
	LST	Newport
	PHM	Pegasus
	DD	Spruance
	LHA	Tarawa
Egypt	PGAl	Nour
	FF	Descubierta
	FF	Jianghu III
	PTM	Osa I (Egypt)
	PTM	Ramadan
Libya	FF	Al Hani
	FF	Dat Assawari
	PTG	La Combantante IIG
	FFL	Nanuchka II
	PTM	Osa II (Libya)

Table C-21   Ships (continued)

Country	Type	Class name
Syria	PTM	Osa I (Syria)
	PTM	Osa II (Syria)
	FFL	Petya II (Syria)
USSR	CG	Kara
	FFG	Krivak II
	DDG	Mod Kashin
	CHG	Moskva
	FFL	Nanuchka III
	PTM	Osa II (USSR)
	FFL	Petya II (USSR)
	DDG	Sovremenny
	CL	Sverdlov
INTL	AO	Fleet Oiler
	MRCH	Merchant
	TANK	Tanker

Section F—Submarines

Table C-22   Submarines

Country	Type	Class name
France	SSN	Rubis
Greece	SS	Type 209
Israel	SS	Vickers Type 540
Italy	SS	Enrico Toti
	SS	Nazarino Sauro
Turkey	SS	Type 209
USA	SSN	Sturgeon

Table C-22   *Submarines (continued)*

Country	Type	Class name
Egypt	SS	PRC Romeo
Libya	SS	Foxtrot
Syria	SS	USSR Romeo
USSR	SSGN	Charlie II
	SS	Tango
	SSN	Victor III

IOPG Battleset

Welcome to the Indian Ocean/Persian Gulf battleset. We have made several changes to the way *Harpoon* works in the IOPG, and think you will enjoy the changes. Some of these changes are obvious; others are more subtle.

First, we have attempted to include all the major platforms that are likely to appear in the Indian Ocean region, concentrating on the countries of the area. While we have left out a few classes, these will probably not play a significant role in any IOPG area–related conflict.

Second, we have attempted to add several "fun" units, while maintaining the accuracy of the simulation. *Harpoon* is first and foremost an accurate simulation of modern naval warfare. Unfortunately, due to limitations of the main *Harpoon* program (caused by the restraints of the computer platforms on which it executes), several unrealistic elements can develop. Among these are lack of logistic elements (for example, the lack of ordnance limits on aircraft) and lack of "full modeling of reality" (such as lack of realistic director limitations on some units). We have attempted to design the included scenarios with a naval focus to minimize the effects of these inherent limitations of *Harpoon.* However, several units are included for those who like to "push *Harpoon* to the limit" (that is, write unrealistic scenarios) with the scenario editor.

In addition to the above, we have also attempted to add several new features for the "professional" wargamer/*Harpoon* user. Some examples of these features are:

- Iron bomb accuracy varies with aircraft, reflecting advanced bombing capabilities.
- Aegis-controlled guns and other autonomous point defense weapons have more accurate rates of fire.
- Stealth aircraft have been included (F-117A).
- Surface ships that carry helicopters can now have those helicopters assigned in the scenario editor, rather than the previous "automatic" loads.
- Soviet standoff missiles are now capable of high and low cruise approaches.

- Satellite intelligence (RORSAT and PAVESAT) is implemented for the major powers and their allies.
- Sonobuoys now have differing characteristics based on nationality and type.

There have been several other changes (major and minor) to the battleset resource structure. Some of these are already incorporated into *Harpoon* (and you will be surprised by them when the time comes) while others are improvements that will only surface when future versions of *Harpoon* become available. We believe you will enjoy them all, whether you realize they are occurring or not.

We have also included some additions that are "realistic" but not necessarily accurate. We have attempted to minimize these additions, but felt that the simulation value of some elements outweighed the value of strict reality. One such element is the Indian "Cochin" class CV. While not yet in service, it should be completed by the end of the century (when several of the "Bengal War" scenarios occur). Another element is the "Deadeye" SALH round for the Mk45. While also not in service, it could make a significant improvement in the quality of U.S. naval gunfire support. They are included for your experimentation. The battleships are also included for historical scenarios and use with the Scenario Editor; they will not be in service much longer. The subcaliber rounds on the battleships are included for your experimentation. They, along with battleships, will not be part of the future of the U.S. Navy.

For those of you with the Scenario Editor, we would like to mention a few things about bases. Since *Harpoon* uses Lambert Conic map projections, it is not feasible to cover areas below the equator. However, Diego Garcia is a key to U.S. maritime strategy in the Indian Ocean Region. It had to be included, and it is. However, its placement in the IOPG is several degrees north of its actual location (we were considering calling it "Son of Diego Garcia"). However, since there is still plenty of blue water around it and it is comfortably distant from any enemy bases, this should not greatly affect its simulation value. Another base oddity is that the Afghani bases are represented in triplicate with widely varying statistics. These represent:

- The base under Soviet control.
- Mujahedin activity in the base region (that is, the firing of U.S.-built Stinger missiles at flare-chucking Soviet aircraft).
- The base without Soviet "advisors" and military equipment.

Several other bases are listed more than once. Dhahran and Ras Tanura are listed twice, the listing with the (USA) suffixed to the name is not

meant to indicate that Saudi Arabia has become a state, but that American troops and Patriot missiles are present, helping to defend our Saudi brothers and allies. Other bases are included multiple times if they have historically been occupied by different countries, and their defenses are different for the different entries, or if the base could be on either side of a conflict; through diplomacy, treachery, military action, or a change in perspective of Red and Blue.

You may also notice that submarines can now only fire as many torpedoes as they have tubes. This was done to increase the accuracy of the simulation (no more 21 torpedo salutes) and to allow the IOPG to be compatible with possible future versions which will support reloading of torpedo tubes. Don't worry, the other torpedoes are in there, but the current *Harpoon* version can't find them. In order to be informed when future versions of *Harpoon* becomes available, just send in the warranty card which accompanied your original *Harpoon* program.

In conclusion, we hope that you enjoy the Indian Ocean/Persian Gulf Battleset. We would also like to point out the fact that Secretary of Defense Richard Cheney does not surf.

Air Forces

Table C-23   Air forces

Country	Qty	Aircraft	Role
Afghanistan	12	MiG-19S Farmer C	Inter
	40	MiG-21MF Fishbed N	Inter
	20	Su-7 Fitter A	Attack
	12	Su-17 Fitter C	Attack
Bangladesh	30	Jian-6 Farmer	Inter
	9	MiG-21MF Fishbed N	Inter
Bahrain	12	F-5E Tiger II	I/A
	12	F-16C Falcon	Inter
India	116	Jaguar Intl	Attack
	127	MiG-21F Fishbed D	I/A
	118	MiG-21MF Fishbed N	I/A

Table C-23 *Air forces (continued)*

Country	Qty	Aircraft	Role
	69	MiG-23BN Flogger F	Attack
	40	MiG-23MF Flogger	Inter
	6	MiG-25R Foxbat D	Recon
	165	MiG-27 Flogger J	Attack
	44	MiG-29 Fulcrum	Inter
	45	Mirage 2000H	Attack
	4	Il-38 May	MR/ASW
	16	Sea Harrier Mk.51	I/A
	3	Tu-142 Bear F	MR/ASW
	12	SA.319B Chetak	Naval
	5	Ka-25 Hormone	ASW
	18	Ka-27 Helix	ASW
	35	Sea King Mk.42 A/B	Naval
Indonesia	29	A-4E Skyhawk	Attack
	14	F-5E Tiger II	I/A
	12	F-16A Falcon	Inter
	26	AS.332F Super Puma	Naval
	9	Wasp HAS.1	ASW
Iran	19	F-4D/E Phantom II	I/A
	19	F-5E Tiger II	I/A
	10	Jian-6 Farmer	Inter
	18	Jian-7 Fishbed	Inter
	2	P-3F Orion	MR/ASW
Iraq	40	J-6 Farmer	Inter
	80	J-7 Fishbed	Inter
	79	MiG-21MF/PFM	FishbedInter

Table C-23   *Air forces (continued)*

Country	Qty	Aircraft	Role
	81	MiG-23BN Flogger F	Attack
	21	MiG-25 Foxbat A	Inter
	24	MiG-29 Fulcrum	Inter
	104	Mirage F1EQ	25%Int/ 75%Atk
	34	Su-7 Fitter A	Attack
	30	Su-20 Fitter D	Attack
	8	Tu-16 BadgerC	Bomber
	9	Tu-22 Blinder	Bomber
	8	AB.212 ASW	Naval
	11	SA.321 Super Frelon	Naval
Kuwait	24	A-4KU Skyhawk	Attack
	33	Mirage F1CK	Inter
Malaysia	33	A-4PTM Skyhawk	Attack
	17	F-5E Tiger II	Inter
	6	Wasp HAS.1	ASW
Oman	22	Jaguar GR.1	Attack
	8	Tornado F.3	Inter
Pakistan	147	J-6 Farmer	I/A
	60	J-7 Fishbed	Inter
	40	F-16A Falcon	Inter
	19	Mirage IIIEP	I/A
	58	Mirage 5PA	Attack
	3	Atlantic	MR/ASW
	4	SA.319B Alouette 3	Naval
	5	Sea King Mk.45	ASW

Table C-23   *Air forces (continued)*

Country	Qty	Aircraft	Role
Qatar	12	Mirage F.1E	I/A
Saudi Arabia	5	E-3A Sentry	AEW
	79	F-5E Tiger II	Attack
	69	F-15C Eagle	Inter
	24	Tornado F.3	Inter
	48	Tornado GR.1	Attack
	24	SA.365F Dauphin 2	Nav Atk
Somalia	26	J-6 Farmer	I/A
	6	MiG-21MF Fishbed N	Inter
Thailand	13	F-5A Freedom Fighter	Attack
	36	F-5E Tiger II	I/A
	18	F-16A Falcon	Inter
UAE	19	Mirage 5AD/EAD	I/A
	28	Mirage 2000DAD/EAD	I/A
	6	AB.212 ASW	Naval

Ship classes used by more than one country

Table C-24   *Lurssen FPB 45*

Country	Ship names
Bahrain	Ahmad El Fateh, Al Jabiri, Al Fadel, Sabah
Kuwait	Al Boom, Al Betteel, Al Sanbouk, Al Saadi, Al Ahmadi, Al Abdali
UAE	Ban Yas, Marban, Rodqm, Shaheen, Sagar, Tarif

Table C-25 *Hegu/Type 024*

Country	Ship names
Bangladesh	Durbar, Duranta, Durvedya, Durdam
Pakistan	Halibat, Jajalat, Jurat, Shujat

Table C-26 *Hainan*

Country	Ship names
Bangladesh	Durjoy, Nirbhoy, P813, P814, P815, P816, P817, P818
Pakistan	Baluchistan, Sind, Sarhad, Punjab

Table C-27 *Shanghai II*

Country	Ship names
Bangladesh	Shaheed Daulat, Shaheed Farid, Shaheed Mohibullah, Shaheed Akhtaruddin, Taweed, Tawfiq, Tamjeed, Tamveer
Pakistan	Quetta, Lahore, Mardan, Gilgit, Pishin, Sukkur, Sehwan, Bahawalpur, Banum, Kalat, Larkana, Sahiwal
Sri Lanka	Sooraya, Weeraya, Rankamee, Balawatha, Jagtha, Rakshaka

Table C-28 *Durance*

Country	Ship names
Saudi Arabia	Boraida, Yunbou
Australia	Success
France	Durance, Meuse, Var, Marne, Somme

Table C-29 *Osa I*

Country	Ship names
India	Vidyut, Vinash, Nipat, Nirghat
Iraq	Nisan, Hazirani, Kanon-el-Tani, Tamouz

Table C-30   Osa II

Country	Ship names
Ethiopia	FMB 160, FMB 161, FMB 162, FMB 163
India	Prachand, Pralaya, Pratap, Prabal, Chapal, Chamak, Chatak, Charag
Iraq	Al Walid, Said, R 21, R 22, R 23
Somalia	P1, P2
	The true designations for the Somali vessels are unknown.
Yemen	P116, P117, P118, P119, P120, P121
	These vessels' designations in Yemeni service are just the numbers. The letter P was prefixed to them for this battleset.

Table C-31   Perry

Country	Ship names
Australia	Adelaide, Canberra, Darwin, Melbourne, Newcastle, Sydney
USA	All others

Table C-32   Tarantul I

Country	Ship names
India	Veer, Nirbhik, Nipat, Vipul, Vibhuti, K 45, K 46, K 47, K 48, K 49, K 50, K 51, K 52, K 53, K 54
Yemen	F201, F202
	These vessels were tranfered to Yemen in early 1991 and their Yemeni names are not known

United States Navy Air Carrier Wings during Operation Desert Storm

Table C-33   *U.S. Navy carrier wings during Operation Desert Storm*

Carrier	Squadrons
CV-62 Independence	2 squadrons F-14A Tomcat
	2 squadrons F-18C Hornet
	1 squadron A-6E Intruder
	1 squadron S-3A Viking
CVN-69 Eisenhower	2 squadrons F-14A Plus Tomcat
	2 squadrons F-18A Hornet
	1 squadron A-6E Intruder
	1 squadron S-3B Viking
CV-60 Saratoga	2 squadrons F-14A Plus Tomcat
	2 squadrons F-18C Hornet
	1 squadron A-6E Intruder
	1 squadron S-3B Viking
CV-67 Kennedy	2 squadrons F-14A Tomcat
	2-squadrons A-7E Corsair II
	1 squadron A-6E Intruder
	1 squadron S-3B Viking
CV-41 Midway	3 squadrons F-18A Hornet
	2 squadrons A-6E Intruder
CV-61 Ranger	2 squadrons F-14A Tomcat
	2 squadrons A-6E Intruder
	1 squadron S-3A Viking
CV-66 America	2 squadrons F-14A Tomcat
	2 squadrons F-18C Hornet
	1 squadron S-3B Viking
	1 squadron A-6E Intruder

Table C-33 *U.S. Navy carrier wings during Operation Desert Storm (continued)*

Carrier	Squadrons
CVN-71 Roosevelt	2 squadrons F-14A Tomcat
	2 squadrons F-18A Hornet
	2 squadrons A-6E Intruder
	1 squadron S-3A Viking

Each squadron consists of ten to twelve aircraft, except A-6 and S-3 squadrons, which are always ten aircraft. All U.S. carriers also carry one squadron of five E-2C Hawkeye AEW aircraft, one squadron of five EA-6B Prowler EW aircraft, and one squadron of six to eight SH-3H antisubmarine helicopters.

F-18A Hornets	Use F-18C, but cannot currently carry AMRAAM or the AGM-65F Maverick.
S-3A Vikings	Use S-3B, but cannot carry Harpoons.

These loads are included as examples of the wide variety of carrier air wings deployed on American carriers. All of these are suitable for deployment on the carriers included in this battleset.

Carrier Air Wings

Table C-34 *Carrier air wings*

Country	Ship	Load	Alternative load
France	Clemenceau	10 F-8E Crusader	20 Super Frelon and Lynx
		16 Super Etendard	
		6 Alize	
		8 Super Frelon	
	Charles de Gaulle	10 Rafale M	24 Rafale M
		16 Super Etendard	10 Super Frelon
		8 Super Frelon	

Table C-34 *Carrier air wings (continued)*

Country	Ship	Load	Alternative load
United Kingdom	Invincible	8 Sea Harrier FRS.2 9 Sea King HAS.6 3 Sea King AEW.2	
USSR	Kiev	18-Yak-38 Forger or Yak-141 Freestyle 8 Ka-27 Helix A 4 Ka-25 Hormone B or Ka-27 Helix AEW	12 Yak-38 forger or Yak-141 Freestyle 16 Ka-27 Helix A 4 Ka-25 Hormone B or Ka-27 Helix AEW
	Kusnetsov	12–18 SU-27K Flanker 12–18 MiG-29K Fulcrum 10 Ka-27 Helix A 4 Ka-27 Helix AEW or other AEW aircraft	
India	Vikrant	6 Sea Harrier FRS Mk.51 8 Sea King	12–15 Sea King and Helix
	Viraat	20 Sea Harrier FRS Mk.51 8 Sea King	6–8 Sea Harrier 20 Sea King and Helix
	Cochin	20–30 fighters: MiG-29, Harrier, Yak-141 8–10 Sea King	

D Credits

Harpoon Classic 97

Publisher	Interactive Magic, Inc. PO Box 13491 Research Triangle Park, NC 27709
Producers	Brent Smith Jim Harler
Windows and Windows 95 Programmers	John Keene Gordon Walton
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Multimedia Support	Robert Stevenson
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Harpoon Classic

Publisher	Alliance Interactive Software, Inc.	
Harpoon Rules by	Larry Bond	
Published by	Game Designers' Workshop	
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Revised 8/94 by	Jim Masterson	
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MEDC Battleset coordinated by	Mike Jones	
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