About Your Role

In computer Harpoon you play the role of a Side Commander, commanding all naval and air units for one Side of a scenario.   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

Training Scenario

Introduction

Welcome to Harpoon Classic '97. This walkthrough is designed to 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 A.I., 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 seabed 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 simply clicking the "Continue" button on the `Staff Message' dialog. 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 may pause the game by pressing CTRL-P. This will ensure that no game time passes while you are reading the text.

1.5   Starting the Scenario

Start the Harpoon '97 game. In the `Select a Battleset' dialog, select the 'GIUK - Greenland - Iceland - United Kingdom Gap' and click the "OK" button. On the `Select Game Options' dialog, click the "OK" button. On the `Select Scenario' dialog, highlight the "1.0 BLUE SIDE ONLY: Beginners Walk-Thru Scenario". Click the "New Game" button.

2.   Movement

2.1   The Report window

Select the NATO Submarine Group, AAU, located off of the coast of Norway by left 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.

2.2   The Unit Window

Right click on the submarine group icon in the Group window. A closeup of the group appears in the Unit window. Click the "2x" button at the top of the Unit window. This zooms in on the vessels. Left click on the uppermost submarine in the Unit window. Notice that the information in the Report window has changed to display information about this particular submarine, the `Miami', an Improved Los Angeles class sub. Notice that it is not currently moving.

2.3   Setting a Course

Left click on the sub group AAU again in the Group window. Notice that this changes the command buttons which are available across the top of the screen. Click on the "Course" button. The `Set Orders' dialog appears. Most of the buttons here are greyed since the sub currently has no orders. Click on the "Enter New Legs" checkbox. Checking this option allows you to give the group a course to follow. Click on 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. Click the "OK" button in the `Set Orders' dialog.

2.4   Setting Speed

In the Report window you can see that although you have set a course, the speed of the group is still 0. Click on the "Speed" button along the top of the screen. The `Set Speed and Depth' dialog appears. Click on "Cruise". The speed displayed in the dialog changes to 15 kts. Let's also move the sub to periscope depth by clicking on "Peri". Click "OK". Notice that the speed in the Report window is now 15 kts. and a small arrow has appeared next to the icons in the Unit window indicating that they are moving.

2.5 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. Click on the Settings menu and then the "Show Range Circles." menu item. The `Show Range Circles' dialog appears. 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. Uncheck all of the boxes except "Best Active Sonar" and "Best Passive Sonar" for the Blue side. 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.

2.6   Setting the Sensors

Click on the "Sensors" button on the top of the screen. The `Set Group Sensors' dialog appears. Currently the sonar and radar (which is useable only because we are at periscope depth or less) are both off, or passive. Set both to "Active" and click "OK". Now the range circles have changed to smaller yellow circles indicating the range of our active sonar. Since it is typically better to run with passive sonar and radar until an enemy is found, use the `Set Group Sensors' dialog to turn off both your sonar and radar.

3.   Sub to surface missile attacks

3.1   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 on the top of the screen. Notice that the text next to the button changes to "5 sec.". This indicates that 5 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.

3.2   Mission time & orders

The time remaining indicator is in the lower right hand corner of the screen. This show the time remaining to complete the current mission. It looks like we have plenty of time, more than 9 days. Click on the "Reports" menu and then the "Show Orders." menu item. This brings up the `Scenario Description' dialog which you can use to review the mission orders. Click on the "Close" button. Click on 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.

3.3   Encountering the Enemy

Soon, you will receive a `Staff Message' indicating that your subs have made a contact. Click on the "1:1 time" button. This sets your time compression back to 1 sec. = 1 sec. so that you have more time to react to the threat. Click on the red ship icon which has appeared in the Group window (using the backspace key to toggle between the groups may be helpful if your sub group is difficult to select). The Report window indicates that this group, USSR Surface Group ZZS, contains one ship. 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.

3.4   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 kts.) 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.

3.5   Launching missiles

When the enemy is detected, select your sub group in the Group window. Now click on the "Attack" button on the top of the screen. The `Select Enemy Target' dialog appears. In this case there is only one enemy, so click the "OK" button. The `Sub vs. Ship Attack' dialog now appears. For this battle we will use missiles, so choose "Missile Attack" and click the "OK" button. Now the `Attack Allocation' dialog will appear. In the upper left window your two subs are listed and in the lower left is a list of the enemy targets. In the lower right are the current number of missiles allocated to be fired in this attack, in this case 4 Tomahawk missiles from the Miami. The upper right window indicates the weaponry which remains onboard, in this case 5 Tomahawk missiles and 6 Harpoon missiles. Click on 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. 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. Click the "Close" button.

4. Sub to surface torpedo attacks

4.1 Encountering the enemy

Bring your submarine group to the surface by using the `Set Speed and Depth' dialog, and if the speed is not set to "Cruise", set it now. Set the time compression to 1 sec. = 30 min. and continue on your way towards Iceland. Make sure your sonar and radar are off. You will soon encounter another single enemy ship, USSR Surface Group ZVS.

4.2 Using torpedoes

Lower the time compression to 1 sec. = 1 sec. Set your course directly towards the enemy by bring up the `Set Orders' dialog, click the "Clear" button to clear the previous course you had set, and entering a new course directly towards the enemy. Attack this ship exactly as you did the previous one. When the `Sub vs. Ship Attack' dialog appears, choose "Torpedo Attack" and click "OK". You have allocated 1 Mk 48 torpedo to fire at the enemy. Increase this to 3 torpedoes by selecting the Mk 48 line in the `Unit Weapons Loaded' window (notice that you have 21 more onboard), and pressing the "Allocate" button twice. 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. 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. If you have trouble scoring a hit, try turning on your radar and sonar to get an exact fix or use a missile attack. Continue the attack until the enemy vessel is destroyed. 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.

5. Attacking from an airbase

5.1 Viewing your aircraft

Select the NATO Port & Airfield, ACb, located at Oslo, Norway in the Group window. Click the "Ready Air" button near the top of the screen. The `Ready Aircraft' dialog appears. 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 2 EA-6B Prowlers available for patrol and a squadron of 4 A-6E bombers. This is fine so click the "Cancel" button to close this dialog.

5.2 Setting patrols

Select the "Launch" button. In the dialog that appears, select "Patrol" and click "OK". Another dialog appears asking you to choose a patrol destination on the Group map. Left click on 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 appears. Select the row which contains the EA-6B Prowler aircraft and click the "Move >>" button. Another dialog appears asking you how many aircraft you wish to move. Since this is a patrol, enter `1' and click "OK". Now click "Launch". The aircraft launches and begins moving toward its patrol point. Increase the time compression to 1 sec. = 1 min. Set the radar on your patrol to `Active' by selecting it in the Group window and using the "Sensors" button. 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. 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". Continue

patrolling in this way until you detect an enemy ship, USSR Surface Group ZWS, near the patrol point. You may wish 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.

5.3   Launching an attack

Once you've detected the enemy ship, launch your 4 bombers from the base on an `Attack' mission against the enemy group. Center the enemy ship in the Unit window. Once they arrive, attack the enemy using your Harpoon missiles according to the defaults suggested. 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. Send your aircraft units home by selecting them in the Group window and then selecting the "Land Air" button at the top of the screen and clicking "OK" on the resulting dialog.

6.   Surface to sub attacks

6.1   The formation editor

Set your time compression to 1 sec. = 1 sec. Select the NATO Surface Group ABs located north of the British Isles in the Group window. Notice in the Report window that these 4 ships have 5 helicopters landed. Let's use the helicopters to set patrols around the ship. Select the "Formation" button at the top of the screen. The Unit window disappears, the Group window zooms to 64x, and the `Formation Editor' dialog appears. Select the `1 SH-2F Seasprite' line and click on "Set Air Patrol". Left click on 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. Set another patrol to the left of your ship and another above it. Now click "Execute" which causes the patrols to be set. 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.

6.2   Searching for the enemy

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. Click "OK" to set the course. Set the speed of the group to "Cruise" (19 kts.). Center the group in the Unit window. Now increase the time compression and notice that your helicopters are now flying patrols and dropping sonar buoys (small black squares) near your fleet.

6.3   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 5 kts. until you find it. When you find the sub, select your surface group in the Group window. Click on the "Launch" button at the top of the screen, allowing you to launch airborne attacks from the ship against the sub. The `Select Destination Type' dialog appears. Choose "Attack" and click "OK". Select the sub group and click "OK" in the `Select Enemy target' dialog. You have one, possibly two, Seasprite helicopters ready to go. Select the aircraft and move it to the `Launching Group' window by clicking the "Move >>" button. Click "Launch" to launch the aircraft. A helicopter icon appears in the Unit and Group windows moving towards the sub. Select the enemy sub in the group window. Notice that an "Intercept" button has appeared near the top of the screen. This is another method for attacking enemies if you have qualified aircraft in the air. Click "Intercept" and select one of the listed aircraft. Click the "Intercept button" and then the "Execute" button to divert these aircraft to an attack on the enemy sub. 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. When an aircraft gets within range of the enemy, the `Attack' dialog will appear. Accept the default of firing 1 Mk 46 torpedo by clicking the "Execute" button. Shortly thereafter, the `Attack' dialog will appear again. Fire the helicopter's second torpedo. The helicopter will now return to the ship to reload. Continue attacking with the helicopters until the enemy sub is sunk. 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.

7.   Surface to surface attacks

7.1   Searching for the enemy

Once the enemy sub has been destroyed, set the course of your ship group south along with 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 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.

7.2   Launching a missile attack

Select "1:1 Time" from the `Staff Message' dialog. Choose "Attack" from the buttons near the top of the screen. Your helicopters are useless in this attack since they are equipped for anti-submarine warfare. Select the enemy unit and click "OK". The `Ship vs. Ship' dialog appears.   Choose "Missile" (most likely the only type of attack available) and click "OK". Allocate some missiles from your fleet to fire and click "Execute". If this is a bearing only attack (i.e. you don't have an exact fix), the `Bearing Only Attack' dialog appears. Select the default settings by clicking "OK" and continue to approach and attack the enemy ship until it is sunk.

8.   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 '97 scenario and learned the fundementals of movement and attack.   Now you have more than 250 more scenarios to challenging your growing strategic naval warfare skills.

At this point you have learned the major elements of controlling groups and attacking various types of targets within Harpoon Classic 97'!

Groups, Units & Classes

Understanding Groups, Units and Classes is the key to effectively playing Harpoon.

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 (i.e. six F- 15 Fighters with the same Air-to-Air Loadout, or nine Tomahawk 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 will give orders to Groups, and the (computerized) Group commander uses the individual Units to carry them out.

Formation

When the Group map is being viewed at x16 zoom or higher, the center unit of the group formation is indicated by a white underline.   This white line indicator only appears on the Group Map, and only at x16 or higher.

To change a group's formation, select that group on the Group Map and click on the Formation button of the Command and Control Bar.   You will notice that a formation grid appears around your unit formation, and that the units within it are named on the Formation Editor pop-up.   To move one of the units, select it by name on the Formation Editor and click on the area of the formation grid where you would like that unit to be moved.   There may be a short delay, but the unit will appear in the specified area of the grid.   NOTE: If any of the units named on the Formation Editor is an aircraft, the Set Air Patrol button will become active.   You can set air patrol by clicking on the name of the aircraft, clicking on the Set Air Patrol button, and clicking on the area of the grid where you want that aircraft to patrol.

You can choose to have the formation grid show automatically on the Group Map (on units you have selected with the left mouse button) by activating that option on the Staff Options screen under the Settings menu header.

Formation Editor

Access the Formation Editor by clicking on Formation on the Command and Control Bar.   The Formation Editor allows you to review the disposition of the individual units within a Group, and change this disposition if desired.   See Formation Grid for further information.

Sides & Countries

Two sides are modeled in each of the Harpoon BattleSets.   Sides typically represent alliances (such as NATO, Warsaw Pact, SEATO, etc...) 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, this is because within the game you can only shoot at enemy contacts.   Each side can have multiple countries represented, as in the first BattleSet, GIUK, where the BLUE side has the USA, United Kingdom and Norwegian countries aligned together, while 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 bearing only weapons are, and more!

In Harpoon you can either play the RED or BLUE side.   This allows you to see the conflict and it's tactical nuances dictated by differing missions and equipment from both sides.

Options

The Game Options selection under the Settings pull-down menu allows you to configure display options during game play.   Options include the following: Enable Launch Animations, Enable Area Defense Animations, Enable Hit Animations, Enable Killed Ship Pictures, Show Game Time Remaining, Show Current Game Clock, Land Color, Water Color, and Save Game every (#) Minutes.

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.   In 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 (i.e. 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.

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, but 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.

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 they are 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 use the Unit Full Report or Display options to get to a Platform Display screen.   Choose the Weapons option to get to the weapons screen.   The descriptions in the weapon reports are:

Ammunition

The type of ammunition this mount fires or carries.

Qty

The maximum quantity of this ammo in the mount.

Target

The type of target this mount/ammunition can shoot.   It will be 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.

Nuclear weapons are only available in computer Harpoon after you have been granted nuclear release.   At some point in the game, if you choose "YES" to the Possible nuclear release option, you may receive nuclear release. If the enemy uses a nuclear weapon, you are automatically granted nuclear release.   Any nuclear weapons carried and/or aircraft loadouts will now be available for use.

Detection

In Harpoon, enemy and neutral Groups and Units are hidden until you detect them in some fashion.   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 if 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 which 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 is radiating more sound energy, and the air/water it disturbs at high speeds also increases that Units' 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

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 (i.e. their radar or sonar is on or they are making noise based on their movement) you have a passive detection.   If you are radiating (i.e. your radar or sonar is on) and detect a target, this is an active detection.

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 which 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.

Fire Control Solutions

Fire control solutions in 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.

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 5% or less of their maximum range.   Three special purpose Air Search radars are the Height Finding (HF), Range Only (RO) and the Look Down/Shoot Down (LD/SD) radars.   A Height-Finding (HF) radar not only detects airborne contacts, but also determines which altitude they are at.   It can also detect surface contacts.   A Range Only (RO) radar can only detect targets directly in front of it, and is mainly used in aircraft as a gunsight radar.   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.

Show Pulsing Radar

You can choose to show pulsing radars by activating that option on the Staff Options screen under the Settings menu header.

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 through thermal layers called Thermoclines.   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 3 CZ's.   If the water is not Very Deep, you will not get convergence zone detections.

Passive Sonar

Passive Sonar work 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 work similarly to radar in that they send out sound energy and then listen 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 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 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 a towed sonar will stop working or work at greatly reduced effectiveness until it can straighten back out.

Dipping Sonar

Dipping Sonar 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 and if your unit has a dipping sonar it will automatically lower it.

Sonobuoys

Sonobuoys 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 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.

Other Detection Methods

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 modified by time of day and weather conditions.   In today's environment there are several visual methods of detection available.   Visual Line of Sight is the maximum distance you can visually detect targets given your altitude and the targets altitude, assuming the perfect visibility.

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

Electromagnetic Intercept / Electronic Support Measures (ESM)

All combat ships of frigate size or better have ESM capability allowing them to rapidly detect any (active radar) radiating target within 110% 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 which can detect large metal objects which are close beneath them under the surface of the water.   The aircraft must be a 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 an advanced 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 are fitted with Loadouts, which have a selection of weapons/sensors/fuel pods for a specific mission.   Most aircraft only have a limited number of possible and/or available Loadouts.   All aircraft have a Ferry Loadout available while other Loadouts are subject to both the missions which the aircraft are designed for and availability.

The Loadouts are:

Search
Aircraft assigned only to look for the enemy do not carry anything but fuel, sensors and crew.   Some of these sensors may detect other aircraft, surface shipping, or even submarines.

Ferry
Normally has minimal or no weapons set up for a one way trip to another base.   Typically carrying external tanks full of fuel.

Tanker
This configuration consists of many external tanks and a special attachment so other planes can draw fuel.   In order for a tanker to refuel a group it must be part of that group.   It can originate with that group or join that group.   The tanker will refuel the group when the BINGO fuel percentage is about 50% of total capacity.   You may force the refueling by selecting Alt+R.   A tanker will only refuel a group once.

Patrol
Used for Electronic Warfare and Early Warning aircraft.

Nuclear
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 which 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 AAM's) will be 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 will "go stupid" and self-destruct while others home in on the last broadcasting location.

LR Anti-Radar
Same as above, but some anti-radar missiles (and/or AAM's) will be 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 can do more damage.   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 AAM's) will be 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 AAM's) will be 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 AAM's) will be replaced with fuel tanks.

Air to Air

Fighters and some better attack aircraft will 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 will be 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 loadout).

LR AntiSub

Same as above but some ASW weapons will be replaced with extra fuel tanks.   In the case of helicopters that cannot carry extra fuel tanks, weapons will be dropped 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 which owns it).

LR AntiRunway

Same as above, but some anti-runway ordinance (and/or AAM's) will be replaced with fuel tanks.

Airborne Threat Detection

Sometimes in computer Harpoon a new threat which can be countered by patrolling aircraft will be 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 Screen.

Each available unit is shown, including their current distance to the target that needs to be intercepted. Move to the Unit(s) you want to use to intercept the threat and click your mouse on the Intercept button. Selected intercept aircraft will have a "*" show up to the left of the # of aircraft. When you have selected the units to use to intercept, select the OK button.

Bases

There are 3 different kinds of Bases available in Harpoon and each is described below:

<u>Airfield</u>
An airfield.

<u>Port</u>
A port facility for submarines and surface craft.

<u>Port & Airfield</u>
A combination of both a port and an airfield.

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

Damage

Within Harpoon there is a simple Damage Point system used 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 and Submarine Classes have the possibility of receiving Critical Hits. Most of the Critical Hits have a chance of being repaired within 48 hours. Fire and Flooding Critical Hits are the most distressing as either may spread and cause additional damage and critical hits, destroying the unit.

Your unit reports will show both your current Damage 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 may 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.

The Main Screen

The main screen associated with the scenario which you have selected will appear once you have activated the NEW command on the scenario selection screen.   This is the arena in which harpoon is played, and it is comprised of 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.   Commands are only available when in the Group window: Attack, Speed, Course, Formation, Ready Air, Launch Air, Sensors and the Time compression utility.   When in the Unit window   you will notice that not all commands are available.

Strategic Map

The Strategic map is the small map located in the upper-left of the Main Screen.   It represents the entire geographical area for the current BattleSet.   A rectangular box, called the Group Window, appears on this map. The area within the group window appears on the large map to the right of the Strategic Map (i.e., the Group Map, as discussed later).

Directly beneath the Strategic Map is a representation of a numeric keypad.   Use the corresponding arrows on your keyboard to position the Group Window box which appears on the Strategic Window.   This will allow you to view details of the enclosed area on the Group Map.

Using the mouse, you can simply point to an area on the strategic map, "click" the left mouse button, and the green square will center itself around the area to which you have pointed.

Group Map

The Group Map is the large map located on the upper-right of the screen.   It is primarily comprised of two parts: a map showing the location of some, or all, of your groups, and the Group Map Control Bar.

Unit Map

The Unit Map is in the lower left of the Main Screen.   To make anything happen on the Unit Map, you must first select that map, by moving the cursor to that window and click the left mouse button or by pressing the TAB key. When the Unit map is selected, the control bar will change color, indicating that the Unit Map is now the "active" one.   To make the Group Map active move the cursor to the Group Map and click the left mouse button or press the TAB key again.

Report Window

The Report Window is located in the lower right of the Main Screen.   When an item is selected from a menu, options or information related to that item will appear in the window.   Also, the Report Window serves as an "animation" window.   That is when an engagement between units occurs, an animation of the unit launching its point defense weapons and missile strikes will appear.   Also, you will see animations of weapons arriving on their targets.

Moving Maps & Windows

If the map you want to see is behind another window, click once on any part of the map you want to see, and it will be brought to front.   If you want to drag a map to another location on the screen, select the colored bar that runs across the top of the map (labeled Unit, Group, Strategic Map, etc.) by clicking and holding the left mouse button on it.   Then, still holding the left mouse button, drag the map to the desired screen location and release the mouse button.

Selecting Maps & Windows

To make anything happen on a map, you must first select that map.   To select a map, click on it with the left mouse button.

Sizing Maps & Windows

To change the size of a map, select the map by clicking on it; then place the cursor on an edge of the map so that it becomes two arrows and drag the map to make it larger.

Textured Map

''Textured'' is a new option for land color.   All land color options appear on the Game Options screen under the

Settings menu header.

<u>Zoom</u>
When zoom has been selected at x16 or higher on the Group Map, the Unit map "disappears".

<u>Range Circles</u>
You can set weapons range circles that indicate the best or furthest reach for of a given weapon, both for your own assets and for your enemy's alike.   This allows you to determine what weapon to use, or what weapon your enemy might choose to use against you.   To set Range Circles, Select the Settings menu header and choose the Set Range Circles option.   Click the box beside the Range Circle you want to select; make sure you are clicking in the desired column (Blue or Red) if you only intend to set Range Circles for one Side.   Categories of Range Circle options include Group Map, Unit Map, Group and Unit Maps, as well as Blue and Red sides.

To select range circle color for one or more range circles, select the Settings menu header and choose the Set Range Circles option.   Double-click on the color bar beside the range circle name to receive an array of color options.   Click on the color option of your choice and click on OK.

<u>Reports</u>
You can show the weapons and unit display reports at the same time and in different windows.   Select the Platform Displays option under the Reports pull-down menu.

Keyboard Commands

GAME Menu Commands
CTL+P   Pause Game
CTL+N   New Game
CTL+O   Load Game
CTL+L   Load User Scenario
CTL+S   Save Game
CTL+H   Game Status
CTL+Q   Quit

ORDERS Menu Commands
F1 / CTL+1   Attack or Intercept
F2 / CTL+2   Set Group Speed (Set Depth and Speed)
F3 / CTL+3   Enter Group Course
F4 / CTL+4   Formation Editor
F5 / CTL+5   Ready Aircraft
F6 / CTL+6   Launch (Land) Aircraft
F7 / CTL+7   Join Group
F8 / CTL+8   Split Group
F9 / CTL+9   Sensors
F10 / CTL+0   Enter Staff Note

ALT+R   Force Immediate Refueling

REPORTS Menu Commands
CTL+E   Show Orders
CTL+B   Order of Battle
CTL+D   Platform Displays
CTL+W   Weather Report

SETTINGS Menu Commands
CTL+T   Time Compression
CTL+R   Set Range Circles
CTL+I   Game Icons
CTL+G   Set Grid Lines
CTL+K   Game Options
CTL+Y   Sound Options
CTL+M   Staff Options

Alt Key Commands
ALT+I   Toggle Group / Unit IDs
ALT+3   Player Nuclear Release

MISC Commands
CTL+C   Calc Range & Bearing
CTL+A   Staff Report

Tab key
Alternates selected window between group and unit window.

Arrow keys
Scrolls the currently selected window, either the group window or the unit window.

<u>5 key</u>
Centers the map view in the currently selected window around the selected object.   Note: you must use the "5" key on the numeric keypad, not the numbers across the top of your keyboard.

<u>Z key</u>
Zooms in the current window (group or unit).

<u>X key</u>
Zooms out the current window (group or unit)

<u>F key</u>
Gives a full report on the selected object if a mini-report on the object is showing in the dialog box.

<u>D key</u>
Brings up unit display.

<u>+ Key</u>
Compresses time by one increment each time key is pressed.

<u>- Key</u>
De-compresses time by one increment each time key is pressed.

<u>Spacebar</u>
Selects the next object to the south (down) in the current window.

<u>Backspace</u>
Selects the next object to the north (up)in the current window.

<u>U Key</u>
Selects the first unit of the currently selected group (in the unit window)

<u>C Key</u>
Center the unit window around your currently selected group.

<u>Enter Key</u>
Takes you to 1:1 time compression immediately.

<u>Alt-t</u>
Toggle paths on/off for all friendly groups.

Glossary of Terms and Abbreviations

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 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 comprised 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 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.

BINGO FUEL: Bingo Fuel refers to the amount of fuel until you must return to base, normally with a small reserve added.   When you hit BINGO you must return to base or risk crashing for lack of fuel.

BO or BOL: Bearing Only or Bearing Only Launch.   This refers to contacts for which you only have the bearing and not the distance and a Bearing Only Launch is the firing of a missile or torpedo down a bearing without having a complete bearing plus distance solution.

Bridge: The place within a ship where navigation and piloting occurs.

Call Sign: In computer Harpoon 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

Caesar: 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 this refers to a specific platform type of which there may be 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 Counter Measures (ECM): Any device or system capable of either jamming or deceiving enemy radar.

ELNT: 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 this refers to airborne endurance (i.e. 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.   Most of your orders are given to Groups.

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

H/T: Combination Hull/Towed sonar. used m 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: Kilo Byte, 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 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: Mega Byte, or 1 million bytes of information.

Mount: A weapons mount in Harpoon. 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, comprised 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 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 by way of 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, 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 (i.e., 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, 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. Comprised 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, comprised of the Soviet Union and her eastern European allies.

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