

before deciding what to do with the next. There are seven types of actions which each Ship may perform in its turn:

- A. Attempt to increase the Contact Rating on some/all opposing Ships by playing a "Sensor Detection" card (4.1). If a Helicopter plays a "Sensor Detection" card, it must draw a RN to see if that Helicopter is discarded (10.3).
- B. Attempt to decrease the opposing Contact Rating on that Ship by playing a "Contact Reduction" card (5.2).
- C. Attack one Ship by playing one or more appropriate "Weapon Lockon" cards (6.1). If a Helicopter attacks, it must draw a RN afterwards to see if the Helicopter is discarded (10.3).
- D. Remove damage to that ship by playing a "Damage Control" card (6.7).
- E. Decrease or increase the Contact Rating of that Ship and all opposing Surface Ships (or one Submarine) it is played against by playing an "Open/Close Range" card (8.1). Alternatively, a reinforcement may attempt to enter play with a "Close Range" card (11.1).
- F. Repair a System Malfunction on that Ship by playing a "Technician" card or by drawing a RN ≥ 4 (9.4).
- G. Launch a Helicopter from a Helicopter-equipped ship by playing a "Helicopter" card (10.1) as that Ship's action.

Helicopters may perform only Actions A and C above.

3.2 REACTIVE PLAYS: A Ship may play only one red card [Exception: Battle Stations, 3.6] in response to each black card played against it during an opponent's turn. Red "Passive Sonars" played by Ships which are not attacked or subjected to an "Active Sonar" search because the Searcher chooses not to "ping" them, do not count in the maintenance of this 1:1 ratio. There are four possible defensive plays:

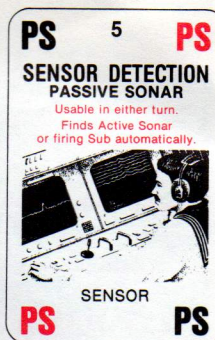
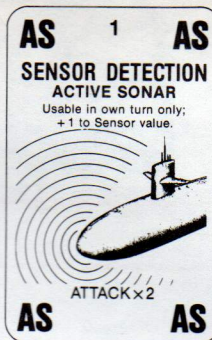
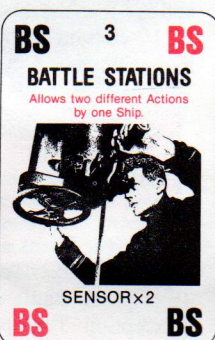
- A. A "Close/Open Range" card may be played to negate the effects of an opposing "Close/Open Range" card (8.5) if already in contact with the playing Ship(s).
- B. An "Evasive Action" card may be played to modify the effect of a "Weapon Lockon" card (7.1).
- C. A "Contact Reduction" card may be played to lessen the Sensor values of any "Sensor Detection" attempt (5.3).
- D. A "Passive Sonar" card may be played to automatically increase the Contact Level of any opposing Ship using "Active Sonar" (4.22), or any attacking Submarine (6.8). The "Passive Sonar" card may be played by a Ship which is not a target of the search/attack.

3.3 HELICOPTER CHECKS: If a "Helicopter" card appears while drawing for a RN, a "Helicopter Check" (10.31) must be made for any airborne helicopters of the drawing player.

3.4 DISCARDS: A player who takes no actions during his turn must discard one or more cards. A player who takes any action during his own turn (including a Reinforcement attempt) may not discard any cards.

3.5 FILLING YOUR HAND: At the end of his own Player Turn, a player may draw enough cards to refill his Hand. Players who play red cards during their opponent's turn must wait until the end of their own turn to fill their Hand. A player whose Hand Size is for any reason decreased beneath his current total of cards need not discard the excess, but he cannot draw new cards while currently exceeding his maximum Hand Size.

3.6 BATTLE STATIONS (BS): Anytime a player plays a "Battle Stations" card on a Ship, it may take two Actions during that turn instead of one. However, the two actions cannot be identical such as two "Close/Open Range" cards or two "Weapon Lockons" exceeding the target Contact Level. [EXCEPTION: A Ship could play two "Evasive Action" cards provided they were different types; such as a "High Speed Turn" and a "Noisemaker". A Ship could also make two Repair attempts provided they were to different systems, or one used a "Technician" card while the other used a Random Number draw.] Playing a BS card does not allow an action plus a discard.



4. SENSOR DETECTION (A/P/S):

4.1 OVERVIEW: Ships locate each other by playing a "Sensor Detection" card and drawing a RN for each enemy Ship in play for which the searcher desires a stronger contact. Searching is optional; a searcher need not draw a RN to check for every opposing vessel, but if he plays a Sensor card he must search for at least one Ship. The RN is added to the Sensor value of the Ship performing the action and modified by any Contact Reduction cards played by the defending Ship (5.1). If this modified number is \geq the target Ship's current "Detection Value", move the Contact marker of the searcher one box to the right on the target's Contact Level Track.

4.2 ACTIVE/PASSIVE SONAR (A/P/S): A Submarine may not play a Sonar card against a Helicopter. Some Sensor cards contain both Active and Passive (A/P/S) capabilities and may be used either way at the owner's option.

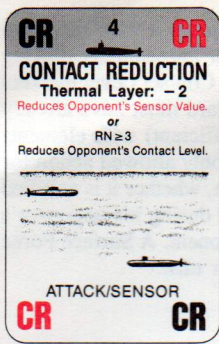
4.21 ACTIVE SONAR (AS): An "Active Sonar" card may be played only during a player's own turn and adds one to the Sensor value during that turn. When playing an "Active Sonar", the player must designate the target(s). Other opposing Ships, whether a Sensor attempt is resolved against them or not, may play a "Passive Sonar" even though the black card wasn't directed at them.

4.22 PASSIVE SONAR (PS): A "Passive Sonar" card may be played either during one's own turn or during the opponent's. If played in a friendly turn, the searcher's Sensor Value is not increased; however, the searcher is immune to the defender's play of a "Passive Sonar" card. When any opponent uses an "Active Sonar" card in a search attempt, any defending Ship may play a "Passive Sonar" card to increase its Contact Level on the searching Ship. This "Passive Sonar" card is immediately discarded and cannot be used against other searches; however, the defender could play another "Passive Sonar" card to increase its contact against any new searchers. See 6.8 for use of Passive Sonar against attacking Submarines.

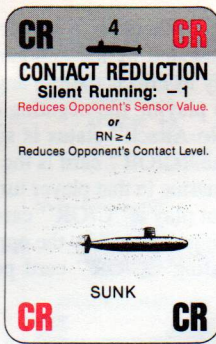
4.3 MAXIMUM/MINIMUM CONTACT: A Contact marker cannot be advanced farther than Level 4, although it can be decreased. Once reduced, Contact Levels can be subsequently increased again to 4. Contact can never be reduced lower than the "No Contact" box. Sensor cards cannot be played if all potential targets are at maximum contact levels. *In general, no card can be played without a legitimate game function;* that is, a Damage Control card cannot be played on an undamaged Ship or an Evasive Action card played by a Ship which is not under attack just to rid the Hand of these cards.

CONTACT LEVEL	No Contact	1	2	3	4

4.4 SUB/SURFACE CONTACTS: A Submarine's Sensor findings belong to it alone—the Contact information is not shared between other vessels of the same side as is done with Surface Ships. Therefore a Contact marker matching the color of the system markers of the searching Submarine is necessary for each opposing vessel. However, whenever a Surface Ship/Helicopter increases the contact it has on an opponent, that new Contact Level is instantly enjoyed by all Surface Ships on its side. Thus, movement of only one Nationality marker on the Submarine's Contact Level Track is necessary to update the Contact Level for all Surface Ships against that Submarine.



Sub Only



Sub Only



SUNK



SUNK



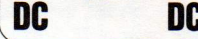
SENSOR x2



SUNK



SUNK



SUNK

5. CONTACT REDUCTION (CR)

5.1 OVERVIEW: "Contact Reduction" cards may be played in either player's turn. During a friendly turn, they are used to attempt to reduce the contact level that enemy Ships have on a friendly Ship. In the enemy's turn, one may be played on each Ship in response to a "Sensor Detection" card to modify the chance of success of that and all subsequent search attempts against that Ship for the rest of that Player Turn.

5.2 FRIENDLY TURN: To reduce its current Contact level, a Ship may play a "Contact Reduction" card and draw a RN \geq the number listed on the card. If successful, all Contact markers on that Ship's Contact Level Track are lowered by one (moved one space to the left).

5.3 OPPONENT'S TURN: Before an opponent draws a RN to resolve a "Sensor Detection" attempt against a Ship, the defender may play one "Contact Reduction" card to modify the Sensor value used against it. Subtract the red number indicated on the card from the Sensor Value of the searching Ship. The effects of a card can only be used to modify Detection attempts against the Ship actually playing it, although it affects all attempts against that Ship for the remainder of the current Player Turn. For this reason, players should resolve each announced Sensor attempt before revealing what they'll do with their other Ships as the presence of a played "Contact Reduction" card may discourage further Sensor attempts during that Player Turn. Only one "Contact Reduction" card can be played to assist each Ship during a single opponent's turn.

5.4 SUB ONLY: Those "Contact Reduction" cards with a submarine silhouette in the center beneath the RN can only be used by Submarines. To aid in easy identification, the top portion of a "Sub Only" card is light grey.

5.5 PLAYING DEAD: A Submarine may shut down all non-essential equipment and even release flotsam in an attempt to slip enemy contact as its immediate reaction to any hit upon it (including a Dud) by placing a marker on the Sub's "Systems Shutdown" box. The declaration (which is made during the opponent's turn) must be made after the hit resolution and before the next play. This reduces all Contact Levels on that Submarine by one and allows it to draw one RN in each subsequent turn. If the RN is ≥ 4 it reduces Contact by one level, or the Sub may drop Systems Shutdown status and immediately play any playable card. While in "Systems Shutdown" it may play no Black cards, take no action in its own turn, and does not add to maximum Hand Size. The only red cards it may play are:



Surface Noise



Thermal Layer



Passive Sonar

The drawing of a RN by a "Systems Shutdown" submarine is not an action and does not prevent the player from discarding.

6. WEAPON LOCKON (WL)

6.1 REQUIREMENTS: To attack, a Ship or Helicopter must play a "Weapon Lockon" card. The target must have a current Contact Level by the firing Ship or Helicopter \geq the Contact number printed inside the Sonar Screen of the "Weapon Lockon" card. Targets whose current Contact Levels are "No Contact" or "No Attack" may not be attacked.

6.2 ATTACK VALUES: Most Ship cards have two Attack Values for each damage status. The bottom value with the submarine silhouette is used to resolve attacks against Submarines. However, the top value differs depending on the Ship type. For Submarines, it is used to resolve attacks against Surface Ships. For Surface Ships it is the number of Helicopters that Ship can support in play at one time given its current Attack Value status.

6.3 Each Ship or Helicopter may attack only one target per turn.

6.4 MULTIPLE FIRE CARDS: More than one "Weapon Lockon" card may be used in a combined attack if the Contact Level of the target equals or exceeds the sum of all the Contact Values on the "Weapon Lockon" cards used. The strength of multiple card attacks are added together, modified once by the attacker's Attack Value, and resolved with a single RN.

EXAMPLE: An undamaged *John Rodgers* has a Contact Level of 3 on an opposing *Victor III* Submarine. The *John Rodgers* plays a "Weapon Lockon" card with Fire and Contact values of 2, plus another "Weapon Lockon" card with a Fire value of 2 and a Contact value of 1. The total of the Contact values played is 3 which equals the Contact Level on the Submarine. The strength of the attack prior to the RN draw is 6 (*John Rodgers* Attack Value +2, Fire Value +2, Fire Value +2). However, because the *John Rodgers* played two black cards against the Submarine, the Soviet player may now play up to two red cards in reaction on that Submarine—either two "Evasive Action" cards, or an "Evasive Action" and a "Passive Sonar", or two "Passive Sonars". This combined attack is resolved by drawing one RN.

6.5 RESOLUTION: The fire strength on the Weapon Lockon card(s) is modified by the current Attack Value on the attacking Ship or Helicopter card and any Evasion card played by the defender. If that total plus that of a RN is \geq the target's Defense Value, the Ship has been hit. If not, there is no effect. If hit, draw another card from the Draw pile and apply the Hit result listed on the bottom of the card by moving the target's Attack and/or Sensor Value markers one or two boxes to the right along their respective Tracks as directed by the card. Any target whose hit result is "Sunk", or whose "Attack" or "Sensor Value" marker is moved into its "Sunk" box is removed from play. A hit result of "Dud" signifies that the warhead did not detonate, and therefore the target is not damaged.

6.6 DAMAGE: If a Ship is damaged, its Detection and Defense values are both reduced by one thereafter regardless of any subsequent Damage Control efforts. Show the reduced values of the Ship by sliding the Detection Value marker to the top so that its arrow points down at the reduced value, and placing a "7" Defense marker on the Defense box. Subsequent hits will not further reduce these values.

6.7 DAMAGE CONTROL: A damaged Ship may move a damage marker one box to the left by playing a "Damage Control" card in its turn and thereby recover lost Sensor or Attack values. However, a reduced Detection/Defense value is never restored. "Damage Control" cannot save an already "sunk" ship, nor repair a malfunctioning system.

6.8 SUB ATTACK CONSEQUENCES: Whenever a Submarine attacks, all opposing Surface Ships/Helicopters increase their Contact Level by one on that Submarine if a defending Surface Ship/Helicopter plays a "Passive Sonar" card as a reaction to that attack. Individual Submarines of the defender may each increase their Contact Level on the firer by playing a "Passive Sonar" card. NOTE: Passive Sonars

played against Active Sonar searches (3.2) and Submarine attacks are the only instances in which a Ship may play a red card in response to a black card directed against a different Ship. Such a play does not prevent that Ship from being able to play another red card against any black card directed against it subsequently during that turn.



7. EVASIVE ACTION (EA)

7.1 OVERVIEW: “Evasive Action” cards may be played to modify the strength of an attack in response to an opponent’s “Weapon Lockon” card. Subtract the number indicated on the card from the attacking Ship’s/Helicopter’s Attack Value. One “Evasive Action” card may be used against each “Weapon Lockon” card [EXCEPTION: Battle Stations; 3.6]. Once played, the EA card is worthless against subsequent attacks and is discarded.

7.2 SUB ONLY: “Evasive Action” cards containing a Submarine silhouette beneath the RN can only be used by Submarines.



8. CLOSE/OPEN RANGE (C/OR)

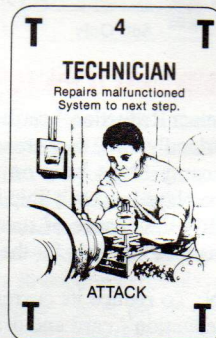
8.1 OVERVIEW: A “Close/Open Range” card is played during a player’s own turn to either increase or decrease Contact Levels, but it cannot be played unless the moving vessel has established a minimum Contact Level (anything above “No Contact”) on an opposing Ship (Exception: Reinforcements: 11.1) that is the object of that play.

8.2 SHARED PLAYS: All Surface Ships/Helicopters must share the play of a “Close/Open Range” card, and therefore may conduct no other actions that turn (Exceptions: Reinforcements 11.1 and Transports 12.3). Submarines cannot share “C/OR” cards and must play them individually. If a Submarine plays a “C/OR” card against another Submarine, it affects the Contact Levels of only those two Submarines.

8.3 OPEN RANGE: Playing a “C/OR” to “open” the range between Ships reduces the Contact Level of the moving Submarine and all opposing Surface Ships (or one opposing Submarine of his choice) one box on their respective Contact Levels. If a Surface Force plays an “Open Range” card, the Contact Level of the Surface Force and one opposing Submarine of its choice is reduced one level on their respective Contact Levels.

8.4 CLOSE RANGE: Playing a “C/OR” to “close” the range between Ships increases the Contact Level of the moving Submarine and all opposing Surface Ships (or one opposing Submarine of its choice). If a Surface Force plays a “Close Range” card, the Contact level of the Surface Force and one opposing Submarine of its choice is increased one level on their respective Contact Levels.

8.5 REACTIVE PLAYS: Whenever a player plays a “C/OR” card in his turn, it may be negated by his opponent immediately playing a “C/OR” card to nullify its effects (before any Contact Level markers are changed). The Ship playing the negating card must have already established contact (“No Attack” status is sufficient) with elements of the moving force. The “C/OR” card is the only allowed action for that Surface Force/Submarine in that player turn, whether it is nullified or not. A player may not play a “C/OR” card during his opponent’s turn except to negate one just played by the opponent. A Surface Force can play only one negating “C/OR” card per turn.



9. SYSTEM MALFUNCTIONS (X)

9.1 OCCURRENCE: A System Malfunction occurs whenever an “X” Random Number is drawn to resolve a Sensor Check or Attack. When it occurs, the Attack or Sensor Check fails and a circular Malfunction marker is placed on top of the corresponding System marker of the acting Ship. That ship must apply a -1 modifier to that system value until it is repaired. Should a malfunction occur during a Helicopter Duration/Sensor Check or Attack, that Helicopter is discarded.

9.2 SENSOR MALFUNCTION EFFECTS: All Contacts of the malfunctioning Ship are reduced by one and no more Sensor checks may be attempted with that card. EXCEPTION: A Surface Ship with a malfunctioned Sensor does not reduce its existing contact marker if there is another friendly Surface Ship (not Helicopter) in play without a Sensor system malfunction of any kind.

9.3 SUBSEQUENT MALFUNCTIONS: Should a System malfunction again before it is repaired, the System marker should be replaced with a -2 circular Malfunction marker which will reduce the System value by two until it is repaired. A lone Surface Ship suffering a subsequent malfunction must lower its present Contact levels by one. Should a System malfunction a third time before it is repaired, replace the -2 System Malfunction marker with a “Down” circular marker (and in the case of a Down Sensor system, reduce all Contacts on its Contact Level Track to No Contact). The affected Ship’s System may not be used, nor may that Ship attack until it is repaired at least to the -2 level.

9.4 REPAIRS: A System Malfunction is repaired to the next best step by declaring a Repair attempt as that vessel’s sole action for a turn and drawing a RN ≥ 4 or by playing a “Technician” card. A single Repair operation will not return a “Down” system to full operational status—it would have to undergo three successful Repair attempts. If any Repair attempt draws an “X” RN, the system reverts to “Down” status until repaired. A Repair attempt is an Action and therefore prevents discards by that player during that turn.

9.5 RN X: Unless specified otherwise, a Random Number draw of “X” is treated as “0”.





10. HELICOPTERS (HE)

10.1 LAUNCHING: Surface Ships having a Helicopter symbol in the upper right-hand corner may play "Helicopter" cards which may, in subsequent turns, be used to search for or attack Submarines. The number in the top-left triangular half of the Ship's current Attack Value status indicates the maximum number of "Helicopter" cards that Ship may have in play. As its sole action during its own turn, such a Ship may play one "Helicopter" card which is placed adjacent to the Ship.

10.2 EFFECT: A Helicopter has the same Contact Level as the Ship which launched it, but may be used on subsequent turns to perform independent Sensor Checks and attacks of its own using the Sensor/Attack values (2) printed on the Helicopter card. As such, it is considered a separate Ship for purposes of conducting Operations and determining a player's Hand size.

10.3 DURATION: Each Ship Helicopter symbol contains a circled number inside its silhouette which reflects the relative length of time any "Helicopter" card from that Ship remains in play. Each time a Helicopter is used to perform a Sensor Check or attack, a Helicopter Check must be drawn at the end of that operation for that particular Helicopter. If the RN drawn is \geq the Helicopter Duration Number, that Helicopter may stay aloft. Otherwise, it is discarded.

10.31 HELICOPTER CHECKS: Every turn that a player with Helicopters in play draws a RN (not a Hit resolution card) which is also a "Helicopter" card or plays a "C/OR" card on his Surface Force (whether in his turn or his opponent's), he must make a Helicopter Check for each of his Helicopters in play at the end of that player turn. If the RN is not \geq the Helicopter's Duration Number, that Helicopter must be discarded. No matter how many times a player draws a Helicopter RN during a turn, he is never required to make more than one Helicopter Check per turn for each Helicopter in play, plus one immediate Helicopter Check for each Helicopter after it performs an operation.

EXAMPLE: The *Udaloy* has its one allowed Helicopter aloft. That Helicopter makes a Sensor Check, and fails the resulting Helicopter Check by drawing a "1", and is discarded. The *Udaloy*, which has not yet performed an action, may now launch another Helicopter (if it has one) in the same turn.

10.32 BAD WEATHER: Whenever an "X" RN is drawn during a Helicopter Check, bad weather grounds all Helicopters. Discard all airborne Helicopters. No new Helicopters can be launched until the weather clears. The Surface Force player may draw one RN at the end of each of his subsequent turns to check the weather. If he draws a RN \geq 4 the weather clears and he may launch new Helicopters in subsequent turns. This Weather Check is not considered an action and does not prevent discards.

10.4 ORPHANS: Helicopters cannot be attacked directly. However, any already airborne Helicopter whose Ship is sunk/exitted is removed from play. Similarly, a ship whose Attack status declines to the point where its Helicopter Attack Value number is less than the current number of its Helicopters in the air, must immediately remove excess Helicopters.

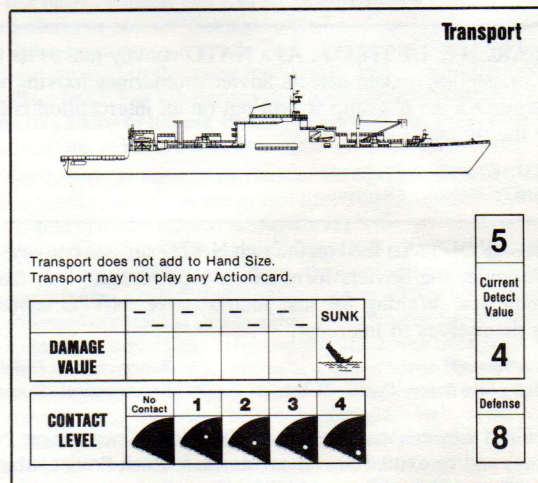
10.5 SUB-ONLY SCENARIOS: In scenarios with no Ship capable of launching a Helicopter, "Helicopter" cards remain in play for use as RN and Damage cards, although they fulfill no useful function in a player's hand and can only be discarded normally.

11. REINFORCEMENTS

11.1 ENTRY: Some scenarios list Ships available as reinforcements. These Ships are not available at first and do not add to Hand Size until they enter play. A reinforcement may enter play whenever its owner plays a "Close Range" card for it and draws a modified RN \geq 6. The RN drawn is added to the number of the current deck. Only one reinforcing Ship may enter per successful "C/OR" play and the second listed reinforcement may never enter before the first listed reinforcement arrives. A reinforcement's entering "C/OR" card may not be negated by an opponent's red "C/OR" play. This attempt does not count against the options of any other Ship but does prohibit discards by that player in that turn. The entering Ship may not perform any other action on its player turn of entry unless it plays a Battle Stations card after its successful entry to allow one additional action.

11.2 CONTACT: No adjustment to any Contact marker is made as a result of an entering reinforcement, although an entering Surface Ship automatically gains the Contact Level of other friendly Surface Ships in play.

11.3 DURATION: If all Ships of a side are sunk before its reinforcements enter play, the scenario ends.



12. TRANSPORTS

12.1 HIT EFFECTS: Transports have neither Attack nor Sensor values. If hit, the marker on the Damage Track of a Transport is moved one box to the right for each "Attack" or "Sensor" hit result.

12.2 HAND SIZE: Transports have no effect on a player's Hand size.

12.3 ACTION CARDS: Transports may not play any card—even "C/OR" cards played to negate a Submarine "C/OR" play affects only their escorts; not the Transports.

EXAMPLE: A Victor III Submarine plays a "Close Range" card which is immediately negated by play of an "Open Range" card by a Transport's escort. The net result is that the Submarine increases contact on the Transport but the contacts of the opposing escort and Submarine on each other remain unchanged.

13. SCENARIOS

The scenarios are hypothetical encounters based on probable situations in contemporary conflicts. Players may augment those provided with their own designs. The strategy varies a great deal from one scenario to another. Players are encouraged to sample them all rather than concentrating solely on the introductory ones.

13.1 CV SENSORS: The *Kennedy* has no Sensor values (-) and is dependent on its launched Helicopters to detect Submarines. However, its Sensor Value Track is still used to determine Ship damage.

13.2 CV ATTACK VALUES: The carriers *Moskva*, *Kennedy*, and *INVINCIBLE* have no attack values (-) and are dependent on their Helicopters to attack Submarines. Those Helicopters have an Attack Value of "2" regardless of the damage status of their carrier. However, Ships with an Attack Value of "0" may attack.

13.3 SEAWOLF: The "swimmout" torpedoes of the *Seawolf* allow attacks without detection by Passive Sonar (6.8).

13M CONVOY SCREEN: A NATO troop convoy is on its way to Europe and the ASW group screening the convoy has noted heavy submarine activity and called for help to prevent any "leakage" from getting through to the convoy. The Soviets, for their part, likewise direct additional forces to the area.

NATO: *Arleigh Burke, Bowen*
Reinforcement 1: *John Rodgers*
Reinforcement 2: *Los Angeles*
SOVIET: *Ivan Rogov, Skvortsov*
Reinforcement 1: *Yenisey*
Reinforcement 2: *Grif*
Reinforcement 3: *Sura*

The Soviets win by scoring any combination of five sunken NATO ships and/or exited Soviet Subs (13.5). No Soviet Sub may attempt to exit before it has spent at least one entire deck in play. NATO wins by avoiding the Soviet Victory Conditions.

NOTES FROM THE SKIPPER

When Avalon Hill first approached me about doing a modern submarine game I was currently working on a more detailed simulation of modern naval combat. This posed a different type of challenge because although they wanted the game to represent the weapons and decision making of contemporary submarine warfare, they also required that it be simple to play. Those familiar with my past designs know that I've never been happy with the constraints of hexagonal maps and traditional counters. The choice to use cards rather than the more traditional hexagonal map was an obvious starting point. Action cards allow one to incorporate all random result tables and player interaction in an easily used and understood manner. As a side benefit, they also allow almost any probability distribution. But most importantly, cards allow for fast play. This is a must for the less serious *game* player who is the primary audience for which this game was intended. One final, but overwhelming, argument for cards was that of physical appearance. With all the games currently on the market, a newcomer must stand out from the crowd. To do this, a game first has to be noticed and the most eye-catching device yet found in boardgames is a deck of attractively illustrated cards.

With that said, I'll step down off my soapbox and address some specific design decisions. Contemporary submarine warfare can be a very complicated subject to simulate in detail. What makes it especially difficult for a simpler game is the sorting through of all the information related to the subject while retaining and emphasizing only the most important characteristics to be learned. Let's start with the detection process. In most naval combat situations the main objective is to remove an enemy threat from an area. Invariably this is done by sinking enemy ships or rendering them hors de combat by applying sufficient damage that they will take it upon themselves to retreat. But to damage a ship, one must first find it. This is where sensors (or more specifically in submarine combat, sonar) come in. If you think sonar is simple, you've been watching too much television. Breaking it down to the basest fundamentals, sonar is sound traveling through water. "Passive" sonar consists of listening for the enemy without sending out any signals of one's own which might give away your own position. "Active" sonar gives out a signal (the familiar "pinging" sound of the Hollywood "B" movies) in hopes of creating an echo when that signal bounces off a hull. Two things happen. More detailed information is obtained about ships operating in the area, but at the expense of revealing one's own position to a listening enemy ship (i.e. passive sonar). Thus, the effective use of sonar is the most basic element of contemporary submarine warfare. Should a vessel use active sonar to optimize chances of collecting information about enemy ships in the area while thereby increasing the chances of his own detection, or wait and continue to listen quietly in hopes of gathering more information than you're giving away. Layered on top of this are other important considerations. How much information is enough to launch a weapon system and obtain a kill? The initial information from sonar is rather limited, especially for passive sonar. Bearing or direction to the enemy may well be all the information you might obtain. Firing at a target with "bearing" information only will usually result in a miss. The missile may activate its homing radar too late and miss its target altogether, or too early and give itself away, allowing it to be easily defeated by ECM (Electronic Counter Measures) or ASM (Anti-Surface Missiles). Torpedoes have similar problems. Activating a torpedoe's homing sonar too early gives the target more time to react and deploy countermeasures. Torpedoes with their more limited range, fired at targets that are out of range or that can be "outrun" become an obvious waste.

The more one listens, either actively or passively, the more information is gathered and the greater the accuracy of the contact solution. Active sonar gathers data quicker and more accurately, but passive solutions

can be just as accurate given sufficient time to collect the necessary data. Even the actual ship type can be determined, given sufficient information just by listening to the sounds generated by a ship and comparing these with a computerized library of sound profiles. But how much information is enough? Obviously, the more information you have, the better your chances to score a hit. But if you fire prematurely, not only will you most likely miss your target, but you will undoubtedly alert him to your presence. And all the time you are looking for him, he is also trying to find you. It is, in many respects, the ultimate game of "chicken": two gunfighters staring each other down. Who will blink first?

In game terms all these factors come into play in a much less complicated manner. Weapon attacks can be made at the lower "contact levels" but the chances of a successful hit are less than if you wait for a better target solution, i.e., high "contact levels". To get that higher level you can use either passive or active sonar detection cards or move towards the target. Active cards will raise the enemy Contact levels faster due to their +1 modifier, but may give away your own position even faster. I should also dispel the notion that the playing of a sonar card equates to that system only being used when the card is played. Playing the card simulates the actual updating of ongoing sonar information. Not drawing the right card simulates difficulty obtaining better information. Whether it is because of temperature changes "bending" the sound waves or human error on the part of your crew, it all amounts to a slower increase in enemy contact levels in game terms.

But other elements can also effect how sound waves travel in water. Hiding above or below "thermal layers" and/or "surface noise" created by drift ice or storms are not the only elements affecting sonar contacts, but these are used in the game to visualize the overall effect of reducing the contact level. For submarines, Silent Running (creeping at low speeds around five knots) or turning away from a contact can be an effective means of maintaining a low contact level or reducing a high one.

Surface ships have a number of disadvantages when facing submarines, both in the game and in real life. They're generally noisier, have fewer places to hide, and their sonars are less effective because they operate from the surface. However, they do have two important advantages that the game portrays effectively. First, they are generally all tied together electronically by a "data link". This feature allows all surface ships to use information obtained by any other surface ship. Secondly, many surface ships have helicopters. Helicopters can hover over an area, unseen by a submarine and lower an active or passive sonar buoy into the water. The first and last sound that a submarine may hear from a helicopter is a torpedo entering the water before it hits home. Helicopters can also be electronically linked to all the other surface ships in the area and be dispatched to any location faster than any submarine can leave it. However, helicopters are not without their limitations. Weight limits allow only one or two torpedoes to be carried as well as limiting the number of sonar buoys. In game terms we see the tactical advantage of an airborne helicopter by the larger Hand size, but you take a chance of losing your helicopter (i.e., forcing it to return to its mother ship) if you perform an action with it. You can also lose it randomly with the passage of time due to fuel and weather restraints. One might wonder why a ship can't just launch another helicopter whenever it likes. Why does a card need to be played? Launching a helicopter in a rolling sea is not all that easy. More time (i.e. drawing a helicopter card) may be necessary for the helicopter to be prepared with fuel, weapons, and sonar buoys. Such time requirements translate in game terms to the need to draw (and play) a card.

Few of these systems have been "tested" in combat situations. Things can and do go very wrong—which is why the Falklands War was of so much interest to naval strategists. At this level, what actually goes wrong when obtaining a "malfunction" result is not important. The effect of the malfunction is! A torpedo tube door may lock up or a computer may break down. Whatever the problem, the result is a system operating at a reduced level of efficiency.

Damage to ships in modern combat is often a hit or miss affair with a single hit disabling or sinking a ship more often than not. In game terms this has been adjusted somewhat and a more optimistic view of ship mortality taken to make the game more entertaining. It should also be noted that some of the submarines seem to have the potential to absorb as much damage as many of the surface ships. This is not the case. As a general rule the torpedoes fired from submarines are much larger and carry twice the explosives. Surface ships generally use what are termed "stand-off" weapon systems. These systems must fire a missile (or something simpler) that carries the torpedo to the approximate location of the submarine and releases its homing torpedo at that point. Since the torpedo must be carried by the missile, the torpedo's weight (including warhead) plays an important role in limiting the size of the warhead. Torpedoes carried by helicopters suffer from the same limitation although they are carried to the target location by the helicopter rather than a missile.

The last element of the game we'll discuss concerns the relative values of the ships themselves. Detection is directly related to the noise the ship

generates. NATO ships have always enjoyed an advantage when compared with the noise their Soviet counterparts generate. But this gap is slowly closing, especially with the new generation of submarines coming out of Russia. Thus we see ships like the Victor III with a fairly high detection rating. The Soviets also use acoustic coatings on many of their newer sub hulls which can absorb sonar signals. Probably the hardest ships to detect are the diesel/electric submarines whose electric engines are so quiet, yet require snorkeling near the surface to recharge batteries. The Soviets use a number of the latter type in their coastal waters where they are effective in avoiding detection. Surface ships, even when "quieted", like many of the newer NATO ships, are generally noisier than most submarines. Knowing that they are noisier and therefore operating at a disadvantage, surface ships (and many of the noisier submarines) operate continually with active sonar believing that the best defense is a good offense.

Much of the technological advantage of the West also shows up in the quality of their sonar systems. Most NATO subs operate with not only more effective sonar, but also with "towed arrays". Not only are these systems more effective than the usual hull mounted sonars, but they also have a full 360 degree arc unlike hull sonars. Noise from the propellers and wake of the ship disturb incoming sound signals in an arc approximately 60 degrees astern. This dead area can be used by a good captain to approach an enemy ship undetected. To reflect this in game terms, sonar values are larger for better Sonar systems and/or if the system is a "Towed Array".

For game purposes, attack values portray a number of different elements all rolled into one. For example, most submarines can use a number of weapons to attack a ship. The Los Angeles class submarine, for example, can fire a "Harpoon" cruise missile against surface targets from its torpedo tubes as well as a Mark 48 torpedo against either surface or submerged targets. The "Harpoon" is an excellent anti-ship missile and its +3 rating in the game reflects its high accuracy and survivability to air-defense systems. By way of explanation, it should be noted that when a defensive card such as "Evasive Action" is played against such an attack it represents not only the maneuvering of the ship, but more importantly the effective use of air defensive systems to shoot down the missile. The Mark 48 torpedo also receives a high rating. It is a wire-guided torpedo with active and passive sonar for searching and homing on its target. Even after launch a wire-guided torpedo can have its targeting data updated through the guide-wire. Once it reaches a position close enough to its target, it's built-in sonar takes over. These torpedoes can prove to be very difficult to evade once a "good" weapon system lock is obtained.

I hope walking through some of the rationale behind the rules has made the game more enjoyable for you by increasing your appreciation for the realism factored into the game mechanics. Although simple, the game is far from simplistic. Players looking for a more involved contemporary naval game should watch for my next game, BLUE WATER NAVY, which includes all aspects of naval combat including surface ships, submarines, and aircraft. Check the pages of *THE GENERAL* for information about this and other games of skill by Avalon Hill.

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THE GENERAL

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