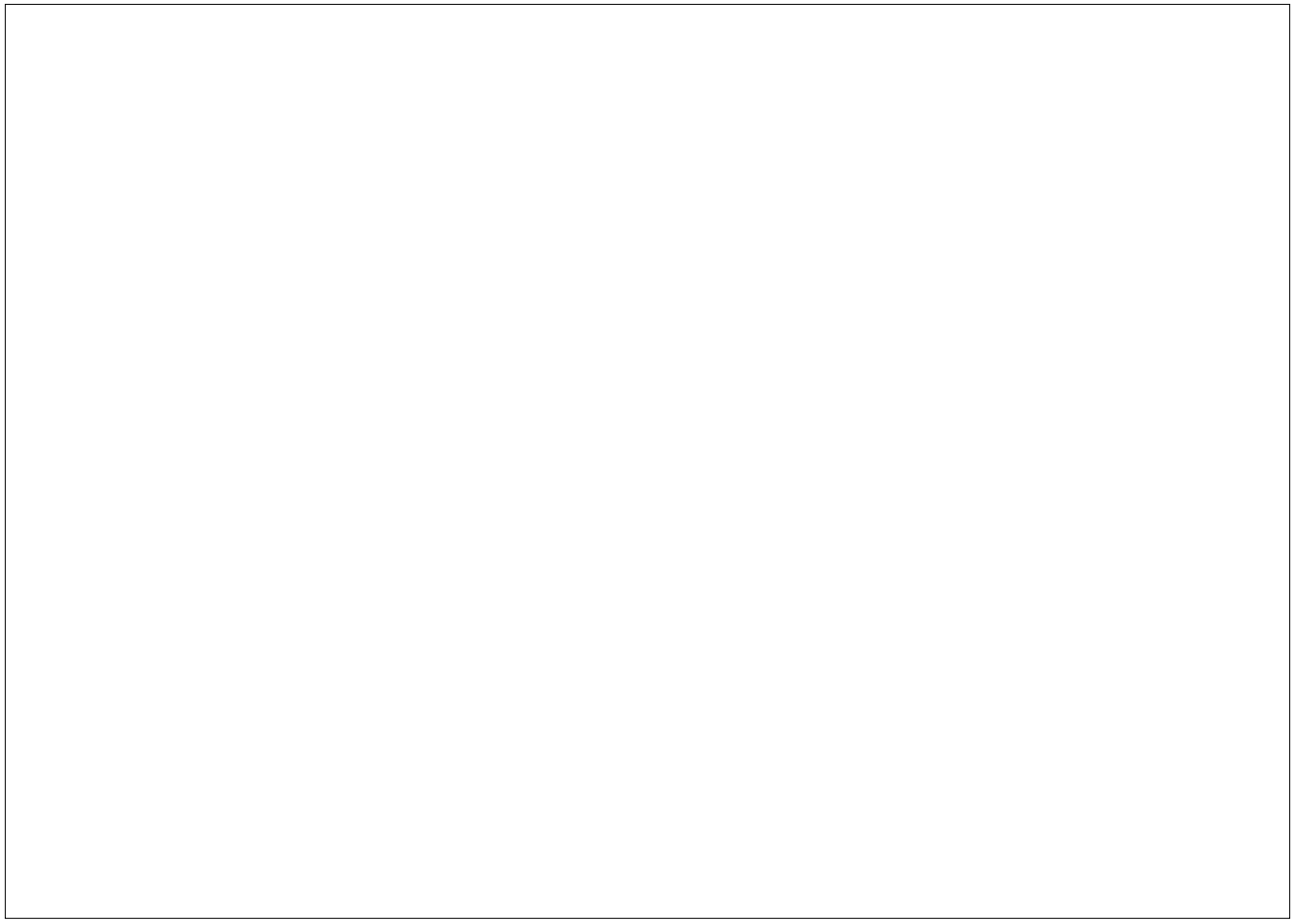
Command at Sea - Jumpstart

3rd edition



An Introduction to the *Command at Sea* System

Introduction

This Jumpstart guide is designed to show you how to play *Command at Sea* in as short a time as possible. It includes a rules summary, a sample scenario and the rules necessary for playing the battle. The charts and tables needed to play the game are not included here, so you cannot play a game without the full rules set. You can, however, read these rules and then play, using the full rules as a reference.

These rules are extracts from the 3rd edition rules booklet. Most of the explanation, and all of the illustrations, sidebars, and optional rules have been removed. They are repeated in the full rules set. You do not need this booklet to play the full game.

Command at Sea (CaS) covers air, naval, and submarine actions of WW II. Scenario supplements cover different parts of WW II at sea. The first covers the Pacific war from 1941-1943. Others will cover the rest of the Pacific War, the Mediterranean, the Atlantic, The Baltic/Barents, the Atlantic, and so on.

This battle concentrates on the movement, visibility, gunnery, torpedo, and damage rules. Although the game could be simplified by ignoring visibility, it was such an important part of WW II at sea that playing battles without it produces unrealistic results.

Rules Summary

If you are familiar with wargaming, you can probably get most what you need from this one-page summary and use the rules booklet as a reference. Wargamers are an impatient lot.

Tactical Turns are three minutes long, with movement and fire simultaneous and plotted in advance. A thirty-minute non-combat Intermediate Turn is provided for long movements.

Plotting is followed by movement, then planned fire, detection, and reaction fire phases. Reaction fire allows players to fire at targets detected that turn, with reduced effectiveness. The phases are performed simultaneously by both players.

Gunnery attacks against surface targets have a fixed chance to hit with modifiers based on the range band: Short, Medium, Long (normal “effective” range), and Extreme. One roll is made for each attack. The damage per mount is fixed, and is affected by range.

Armor penetration is fixed and is based on range. Ships have a belt and deck rating, which is compared with the penetration ability of the shell. If it is equal to or greater than the rating, then the shell penetrates. Non-penetrating hits have reduced effect.

Antiaircraft fire is abstracted, with two values: An Area Strength for 75 mm and larger calibers) and a Light AA Strength for 65mm and smaller. Area AA fire can be used any time an aircraft is within range. Light AA can only be used against planes directly attacking that ship or passing within 2,000 yards. For both types, a single die roll is made for each firing ship, and the result shows how many aircraft are shot down.

Surface ship and submarine torpedo attacks are made by a using table to find the correct lead angle, then firing the torpedoes along that line, marking the spot of launch. Torpedoes move at their rated speed along their course line until they are within 500 yards (optional flexible size depending on the run length). Players roll on hit tables based on the apparent size of the target, the length of the torpedo run, and the number of weapons in the spread.

Aerial torpedo attacks are based on the number dropped and modifiers. A single die roll then gives the number of torpedoes hitting the target ship. Dive bombing attacks are made in the same way, with the number of bombs dropped and a die roll indexed to find the number that actually hit. Planes can also strafe ships, but with limited effectiveness.

Air-to-air combat is abstracted, with all dogfights occurring in an imaginary circle one nm in diameter. Within that circle, an aircraft’s exact position is undefined. There are six thirty-second air combat rounds in a tactical turn. Three happen during the planned fire phase, the other three during the reaction fire phase. Players compare Maneuver Ratings of opposing aircraft and roll dice to find out who gets in position for a shot. Gun attack ratings are then matched against the target’s damage rating and a die roll to see if the target is shot down. There are rules for formation flight and pilot quality.

Maneuver Ratings are also used in determining an aircraft’s turning and climbing abilities.

Rules are provided for night combat, including searchlights, aircraft flares, starshells, and radar.

Ships can attack submerged subs with depth charges or ahead-thrown weapons. Unless the ship is fitted with a depth-finding sonar (rare in WW II), the attacking player must estimate the sub’s depth. The effectiveness of individual depth charges is combined into a single pattern, with a single die roll for its effect. Ships can lay different types and sizes of patterns, depending on how many depth charge launchers/rails they carry.

Planes can attack subs with rockets, depth charges and homing torpedoes; rolling percentile dice to see if they hit.

Amphibious landings are abstracted, with the ground combat (including movement) modeled as point strengths for each side. Once every 30 minutes, the odds are computed and a die rolled to see if the attackers are stalled, losses are inflicted, or the attackers achieve breakthrough. While the landing is in progress, ships and planes may attack point targets on the beach or in the landing area normally.

Rules Extracts

Chapter Two- Game Mechanics

2.2.1 Filling Out the Ship Reference Sheet (*CaS* Form 1). Consult Annex A (in the Data Annex Book) and find the information for a ship in the scenario under its nationality and name. By entering this data on the sheet, it will speed up play and reduce page flipping once the game begins. The listing provides information for all ships of the class. Exceptions for individual ships of the class are listed in the remarks.

2.2.1.1 Basic Data. The first portion of the ship listing provides basic data about statistics and performance. Enter on the Ship Reference Sheet (in items 1 to 9) the ship's name, class, type, size class, maximum speed (in knots), propulsion system, crew, total mounts, and armor ratings.

2.2.1.2 Damage and Speed Breakdown. Transfer the damage and speed breakdown figures from Annex A entry to the appropriate section of the Ship Reference Sheet. If the vessel is a surface ship, line out the submerged speed section on the sheet.

2.2.1.3 Sensors. Sensors may be radars (Annex G), sonars (Annex H), or HF/DF.

2.2.1.3.1 Radars. Find the Sensors section of the ship listing and enter the name of every radar in the radar section of the Ship Reference Sheet. Then turn to Annex G1, find each radar type, and transfer its statistics to the proper line of the Ship Reference Sheet.

2.2.1.3.2 Sonars. Return to the Sensors section of the ship listing and enter the name of every sonar in the Sonar section of the Ship Reference Sheet. Then turn to Annex H, find each sonar type, and transfer its statistics to the proper line of the Ship Reference Sheet.

2.2.1.4 Weapons. Find the Weapons section of the ship listing and read each weapon line, noting its annex letter (in the right margin). Enter the name of the weapon in the appropriate section of the Ship Reference Sheet, then turn to Annex C (for guns), D (for ASW systems), and E (for torpedoes), find each specific weapon type, and transfer its statistics to the proper lines of the Ship Reference Sheet. The number and type of planes carried are copied down in the Embarked Aircraft portion of the Ship Reference Sheet.

Weapons are presented in the ship listing in a specific format which shows the weapon's firing arc, number of barrels/rails/tubes per mount, the number of mounts on the ship, the weapon name, the ammunition available per mount, and any weapon director present. The Weapon Data line examples shows this format and helps decipher this information.

If more than one mount is present, the mounts are equally split between the available arcs. Similarly, if more than one director is present, they are split between the available arcs.

Some weapons do not have firing arcs. Some are catapults or aircraft, that do not require an arc. Others have a predefined arc, and cannot pivot. This includes such things as depth charges, which are rolled off a ship's stern. These will be discussed in the rules for their use.

2.2.1.5 Remarks. Find the Remarks section of the ship listing and read the data presented carefully. Note any information which applies to the specific ship being written up, and transfer that data to the Remarks section of the Ship Reference Sheet. Especially important are such items as changes to the weapon and sensor fit.

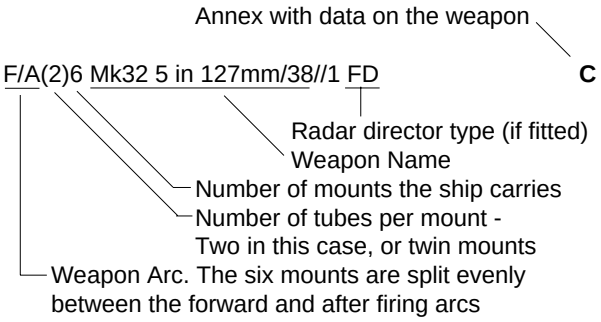
2.2.1.6 Weapon Firing Arcs. Each weapon mount has an arc of fire. A weapon mounted forward may not be able to fire aft because part of the ship's structure blocks its fire. Some weapons may not be able to pivot, and the arc is limited by the weapon's ability to turn after launch. The arc which can be used by each weapon mount is shown in the ship listing in Annex A. If a target is not within the firing arc of a weapon, that weapon will not be able to fire at that target.

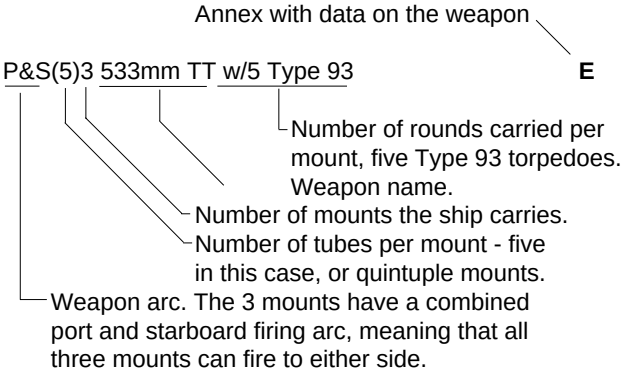
Some weapons can fire into more than one arc: a gun mount may be able to fire into both the Port Quarter and the Port Arc; its firing arc is expressed by combining the appropriate abbreviations with an ampersand (in this case, P&PQ).

A stroke (/) splits the arcs of multiple mounts: P/S(1)2 indicates that there are two mounts, one firing into the Port Arc and one into the Starboard Arc. The parentheses refer to the number of tubes each mount has.

Example: P&PQ(1)1 indicates that there is one mount firing into both the Port Arc and the Port Quarter. P&PQ/S&SQ(2)2 indicates that there are two mounts, one firing into both the Port Arc and the Port Quarter, and one firing into both the Starboard Arc and the Starboard Quarter.

WEAPONS DATA LINE EXAMPLES





2.3 Turn Sequence (extract). All play in *CaS* is simultaneous. Both players plot their actions at the same time; they reveal their orders and move their vessels at the same time; they fire their weapons at the same time.

Each Turn (Tactical or Intermediate) is divided into phases. These divide the turn into specific periods when specific actions may be taken.

Turns should be recorded in units of real time. For example, the first Intermediate Turn might be at time 0100 (zero one-zero zero hours on the twenty-four hour clock). The next would be thirty minutes later, at time 0130, the one after at 0200, and so on. If two units moved into detection range during the 0115 Intermediate Turn, the first Tactical Turn would be 0115. The next would be 0118 then 0121, and so on.

2.3.4 Tactical Turn Sequence. The following sequence of phases is executed by the players each Tactical Turn.

2.3.4.1 Plotting Phase. Players write down (log) movement, firing, and other orders for their forces. Players may plan fire for the coming Planned Fire Phase only against targets detected in the previous turn's Detection Check Phase.

Plotting ahead *(optional rule).* If one or both sides are undetected at game start, and if both players agree, players can write their movement orders for three Tactical Turns (the current and two more). While undetected, miniatures or counters may be present on the game board, and visible to both sides. Writing movement orders for a future turn will prevent a player from reacting (even subconsciously) to an "undetected" movement made by the other side.

As soon as an opposing ship is detected, the future orders are voided, and the player can plot normally.

If torpedoes are to be fired by surface ships or submarines, players should plot movement at least one turn ahead (the current and one more). This artificiality is required because opposing players may see each other plotting torpedo fire or placing markers down in the Planned Fire Phase, but the weapons do not move until the following Movement Phase. If players are using hidden fire with a referee, plotting ahead is unnecessary.

2.3.4.2 Movement Phase. Surface ships and torpedoes move a distance equal to three minutes of travel. Torpedoes that reach their target in this phase have a chance to hit and inflict damage immediately.

2.3.4.3 Planned Fire Phase. All weapons ordered to fire in the Plotting Phase are fired simultaneously. Gunfire and attacks by aircraft are resolved immediately during this phase. ASW mortar and depth charge attacks made in this phase are resolved immediately.

2.3.4.4 Detection Check Phase. Players attempt to detect ships using radar and lookouts. A unit can react only to detected threats, even though the controlling player may be aware of others.

2.3.4.5 Second Air Movement Phase. (not applicable)

2.3.4.6 Reaction Fire Phase. All shipboard weapons which have not been used so far this turn may now fire at either newly detected threats or against previously known targets. Gunfire is resolved immediately. Guns fired only in the reaction fire phase do half normal damage.

2.3.4.7 Resolution Phase. This phase is not applicable in this limited game.

2.4 Ship Size classes. Throughout the rules, actions will be taken based on the size of the vessels involved. This includes maneuvering, detection and damage. To simplify things, ships are grouped into **size classes**. The rules will refer to size A, or size C, or so on. The classes are:

SIZE CLASS TABLE

Class	Ship Types
A	CV, BB, BC
B	CA, CL, CVL, Large Merchant
C	DD, CVE, Medium Merchant
D	DE, PC, SS (surf), Small Merchant
E	PT boat, fishing boats, barges

2.5 Target Aspect. Gun and Torpedo fire depend on the apparent aspect of the target. A bow-on battleship is a smaller target than a destroyer broadside to an observer.

Using the target aspect table below, players can determine whether they have a broad, quarter, or narrow aspect on the target.

2.6 Plotting Movement Orders. Since the players move simultaneously, movement must be plotted ahead of time. For surface ships, players can record a speed, which cannot be changed during the turn. Any increase or decrease in speed should be checked against the ship's acceleration/deceleration (section 3.1.1) ability. If the player wants the ship to steer evasively, (section 3.1.3), he should figure out the ship's final speed over the water.

Direction and course changes can be written in any clear, consistent manner. It may be in terms of a destination ("Head for Lunga Point") or be based on another ship's movements ("Close on enemy battleship, turn to parallel its course at 1500 yards.") Remember to keep it simple and focus on the goal of the movement, not the process itself.

Subs and planes will need to have their depth or altitude specified, as well as speed and course.

2.6.2 Torpedo Movement. Torpedoes move in each Movement Phase starting the Tactical Turn after they are fired. Torpedoes are moved like any other units, however, the firing player can invoke proportional movement if it looks like the torpedo has a chance of hitting (see sections 3.0.1 and 6.3.1)

Chapter Three - Ship Movement

3.1 Ship Movement. Ships (including submarines) have a maximum speed stated in Annex A. This maximum speed is reduced by damage received in combat. Ships may move at any speed up to the maximum speed available to them.

When a ship is damaged, consult the Damage and Speed Breakdown Chart on the Ship Reference Sheet. As it accumulates damage, its speed is automatically reduced. Each 25% of its maximum damage reduces its speed by 25%, until it reaches 90% damage, when its speed is zero (it is "dead in the water"). The ship sinks if it reaches 100% damage.

3.1.1 Speed Change. Players order speed changes in the Plotting Phase of a Tactical Turn. The amount of acceleration or deceleration is limited by the type of ship, and for acceleration, its starting speed.

A ship can move from a dead stop to three-quarters of full speed quickly, but over that water resistance increases greatly and the rate of acceleration is less. The amounts are listed in the Ship Acceleration/Deceleration Table. There are separate tables for warships and merchants. Submerged and surfaced submarines are treated normally, rated by their size class.

Speed changes ordered for a thirty-minute Intermediate Turn are assumed to happen immediately.

3.1.2 Astern. Maximum speed astern for any surface ship or submarine is half its maximum speed forward.

3.1.3 Course Changes and Turning. Ships need a minimum distance to turn. Called “advance,” it is the distance the ship moves in the original direction as the rudder bites and the ship changes direction. Large ships need more space than small ones.

In many cases, such as maneuvering in open water, advance distances will not be an issue. At other times, such as at slow speed or in restricted waters, the exact amount needed will be very important. When navigating through narrow channels, US Navy navigators will not only mark the point of the turn, but will precalculate the advance and mark that spot on the chart. The order to turn is given at that point.

The Ship Turning Distance table lists the advance for each ship by size class for both a Standard and Hard rudder. Most turns are made with Standard rudder, but in emergency situations a player can order Hard rudder, “putting it over to the stops.” There is a risk of the rudder jamming, though, 5% (5 or less on a D100). If it does jam, treat it as a Rudder Critical Hit. The ship continues to circle in that direction until the Critical Hit is fixed.

Unless otherwise plotted, all turns are assumed to use Standard rudder.

Merchants are less maneuverable than warships, and have their own table.

To turn, first move the ship the required distance, based on its size class and the rudder used, then pivot it in place up to 45°. A turn greater than 45° must be made in steps of 45° or less. There is no reduction in the distance required for a turn of less than 45°, except that adjustments of 10° or less per turn do not need to be accounted for.

Even if a ship has moved in a straight line for several turns, the player must still move it the required advance in a straight line before changing course. Advance is the distance the ship moves along its original course line *after* the rudder is put over. If a player knows ahead of time that he will turn in a particular spot, and there is sufficient maneuvering room, he can order the turn then, and the ship will be allowed to make a turn at the start of its next Movement Phase.

Example: A battleship (size class A) is moving at five knots. It covers 500 yards in a three-minute Tactical Turn. At the beginning of the turn, in the Plotting Phase, the player writes that he wants to change course 90° to the left, using Standard Rudder. In the Movement Phase, he moves the battleship 400 yards, then pivots it 45°. Finally, he moves it the last 100 yards. The turn reduces its speed by three knots, but acceleration compensates for the speed loss. Next Turn, he must move another 300 yards in a straight line before he can turn another 45°.

In the above example, the amount turned was critical because of the ship’s slow speed. Perhaps the battleship, damaged or caught at slow speed, needed to unmask her batteries, or was attempting to comb a spread of torpedoes. In cases such as these, the table becomes critical. At higher speeds, a ship can maneuver more freely.

Example: A destroyer (size class C) moves at 30 knots. It will cover 3000 yards in a three-minute Tactical Turn. Turning 45° after each 300-yard increment, it could make one and a quarter circles in the water in three minutes.

Ships also lose speed when they turn, because of the drag of the rudder as it goes over. The amount of loss per 45° turn is shown on the Turn Distance Table. In most cases, the speed lost will be regained during the Tactical Turn, unless the ship is moving slowly or makes a large course change. The Ship Acceleration Deceleration Rate Table (see also section 3.1.1) shows the amount a ship can accelerate in one three-minute Turn. For example, a Size Class C destroyer, moving at 35 knots, makes two 45° turns with standard rudder. This causes a speed loss of 4 knots, while it can accelerate 3 knots at the same time. The normal acceleration of 6 knots is halved because the destroyer turned. If the total speed loss from the ship’s turns in a Tactical Turn exceeds the acceleration for the ship in a the same turn, reduce its speed for the present turn by the difference.

3.1.4 Evasive Steering. Ships that want to become harder surface gunfire targets can steer irregular courses, or “chase salvoes.” By turning toward the shell splashes from the last enemy salvo, a ship can throw off the enemy’s gunfire corrections. It is not foolproof, but it does help.

Of course, the rapid, unexpected turns also throw off the maneuvering ship’s gunners as well, and ships steering evasively cannot fire torpedoes.

Rather than try to model every twist and turn of a ship in the water, a ship that wants to maneuver evasively just plots it and declares it during the Movement Phase. The ship moves normally, but covers only 75% of the distance it normally would. The distance lost is due to steering to the left and right of the base course, and the speed loss caused by all the turns.

A ship must have a speed of 20 knots or more to steer evasively. Speeds slower than that do not give the ship enough maneuverability. Ships of size class B or smaller can steer evasively. Larger ships (size class A) are not maneuverable enough to use the tactic effectively. While a ship is steering evasively, subtract 10% from gunfire attacks on it if it is a B class, and 20% if it is a C or D and 30% for an E class. Also subtract 15% (20% for Japanese ships) from its own gunfire attacks.

3.3 Torpedo Movement. Torpedoes are fired in the Planned Fire Phase, after movement for the Turn is completed. When fired, place two counters next to the firing ship. One marks the torpedoes’ starting position, the other is for the torpedo salvo itself. The torpedo salvo marker is not moved until the following Movement Phase.

On one side of the torpedo salvo counter, put a letter or symbol showing that it is a torpedo salvo and its speed. On the other, put the number of weapons and the type.

In the Turns following the launch, the torpedoes move in a straight line in a direction chosen by the firing player (within firing arc limits). Counters can be used to show the location of torpedoes on the way to their targets. Torpedo speeds are listed in Annex E.

3.3.1 Speed. Some torpedoes have two or more speeds listed in Annex E. Slower speeds give the torpedo a longer range. Any speed can be chosen at the time of launch. It cannot be changed once the torpedo is launched.

3.3.2 Course Changes. An unguided torpedo can make one course change to anywhere within the firing arc of its mount. Torpedoes were fitted with gyros which were set before launch, and surface ships had trainable tubes. Once on course it will not turn (Exception: Pattern-running torpedoes will automatically make course changes around a base course)

There is no limit to the size or number of turns made by homing torpedoes as they turn toward their target. The target must lie within the torpedo tube's firing arc when the torpedo is launched.

3.3.3 Depth Changes. Unguided or pattern-running torpedoes may be launched from the surface, Periscope/ Snorkeling, Shallow, or Intermediate Depth I against a target at Periscope Depth or on the surface.

Homing torpedoes can be launched from the air, surface, or underwater against a submarine at any depth. Once it has acquired its target, a homing torpedo will change depth to follow its target.

3.3.4 Range. The maximum range for each torpedo is listed in Annex E. If the torpedo reaches maximum range without hitting anything, it runs out of fuel and stops. It does not explode.

Minimum arming range for all torpedoes is 250 yards (1/8 nm). If one is fired at a target inside that distance, it will not arm and will not explode.

Chapter Five - Detection

5.2 Radars. Radars use electromagnetic energy to detect and track objects. Pulses of radio waves are broadcast into space by an antenna. Objects in their path reflect them back to the antenna where the direction of the reflection gives the bearing, and the time the echo takes to travel to the target and back gives the range.

5.2.1 Radar Specifications & Availability. Radars are listed in Annex G1 (for ships and subs), G2 (for land-based radars) and Annex G3 (for aircraft). They all have a detection range based on the contact's size and the radar's function. The function describes what targets they can see. Surface search radars are designed to see surface contacts, air search radars look for aircraft. Height-finding radars can tell the height of an air target.

At the beginning of WW II, only a few ships were fitted with primitive radar sets. Radar technology matured quickly under wartime urgency and during the war many ships were fitted with several different radar sets. Once a new radar was developed, it was quickly rushed into production, and within a few months it was fitted to every ship in the fleet.

There is no way to list the changes in the radar fit to every ship over the entire course of the war. To see what radars are fitted to a ship for a particular scenario, first check the scenario itself to see if there are any notes on the ship's equipment. If there are none listed, or you are not using a prepared scenario, note the date and check Annex A. In the remarks section for each class we have included information on each ship's sensor fit.

If these do not have the information, then look at Annex G1, Naval Radars. It has a series of charts, listing all shipboard radars by country and function and date of availability.

5.2.2 Detection by Radar. All radars have a 70% chance of detection inside their effective range. This roll is made during the Detection Phase. If unsuccessful, keep rolling on following turns to attempt to detect the same unit as long as it is within detection range. Once detected, the contact will not be lost unless the radar is put out of action, turned off, the contact moves out of detection range, moves below the radar horizon, or behind terrain.

Radar gunfire directors could also be used as search radars, but they were not designed for this purpose, instead, the controlling player must pick a sector 90° wide for the radar director to search. The sector can be changed each Tactical Turn. The probability of detection is 60%. Gunfire control radars were not designed to be operated for very long periods of time in a search mode. There is a 10% chance each Intermediate Turn that the radar is on that the radar breaks down. See equipment serviceability in section 8.4 for repair rules.

5.2.2.1 Size of Contacts. The larger the contact, the farther away a radar can detect it. The size of a potential radar contact is measured in square meters, which is called the radar cross-section, or RCS. The Radar Contact Size Table (next page) shows the size classifications for aircraft and ships.

The detection range given in Annex G is for a Large, Small, or Very Small contact. A Large contact is a bomber-size aircraft (10 square meters), or a size class A or B ship (cruiser or larger). A Small contact is a fighter-size aircraft (2 square meters) or a size class C, D, or E ship. Periscopes, submarine masts, and missiles are Very Small contacts. They have a radar cross-section of 0.1 square meter or less. Periscopes and submarine masts cannot be detected by radar at all over sea state 4.

5.2.3 Tracking. Once detected by radar, players do not have to roll to detect a unit each turn. A contact is detected until it drops below the radar horizon, moves out of range, or all the radars capable of maintaining track are turned off.

5.2.4 Shipboard Radars. Characteristics of shipboard radars are listed in Annex G1. There are four main types of radars:

5.2.4.1 Shipboard Surface Search Radar (SS). Surface search radars are medium-range radars which will pick up ships, land, and air contacts at Low and Very Low altitude. They are also called navigation radars. Shipboard SS radars are the only type of radar that can detect periscopes.

5.2.6 Environmental Effects on Radar. Despite its ability to pierce darkness and storms, a radar's effectiveness is reduced by rising sea states and nearby land masses.

5.2.6.1 Radar Line of Sight. The distance at which units can detect each other is limited by the range to the horizon. This depends on the height of the two units attempting to detect each other. To determine the maxi-

mum line of sight, consult the Radar Line of Sight Table for the height of the sensor being used. The Radar Line of Sight Table is also used for determining possible DF intercepts (110% of radar horizon, see section 5.6).

Example: An A or B class-sized ship with an air search radar attempts to detect a bomber at Medium altitude. The radar has a range against a large target of 120 nm. Referring to the Radar Line of Sight Table, find the searching ship in the left hand column (as A or B-sized ship), and the target column (as Medium Altitude); at the junction of the row and column, find the value 172. This is the maximum distance at which a target can be detected, regardless of the stated range of the radar. The height of eye of a ship is determined by its type with categories listed in the Ship Class Table in section 2.4.

5.2.6.3 Land Mass Effects. Nearby land may reduce a surface search radar's effective range. Air search radar beams are angled up, so they never ”see” land.

WW II radars lacked good directional antennas and the electronics to filter out land masses within detection range. In order to avoid having their scopes completely blanked out by the echoes from land, operators had to turn down the gain (the signal strength) which meant a reduced detection range.

If there is an island or land anywhere in the radar’s detection range, the range is halved. If land occupies three or four 90° quadrants within the radar's range, the range is quartered.

5.2.6.3.1 Detecting Ships Near the Shore. Surface ships within 1 nm (2000 yds) of a shoreline cannot be detected if they are between the detecting radar and some part of the shore. These targets may be detected by other sensors. Aircraft flying next to hillsides or the shoreline may also be screened by this method.

5.2.6.3.2 Land Blocking Radar Line of Sight. Land masses between a radar and a potential contact block line of sight, unless specifically stated in a scenario.

5.2.6.3.3 Fire Control Radars and Land. Radar gunfire directors can be confused by land behind a target. If there is land in the same 90° quadrant as a target (45° to either side) and within Extreme gun range, halve the benefit of the radar (+2 becomes +1, +1 becomes +0).

5.4 Visual Detection. The human eye was still the most widely used sensor in WW II, even though radar was quickly becoming more useful.

5.4.1.1 Sighting Conditions. The distance someone can see is affected by the light (day or night) and the weather (haze, rain, or snow). The Sighting Conditions Table shows how the range is reduced by various conditions.

There are four categories: Clear Day, Clear Night, Day Precipitation, and Night Precipitation. Days and Clear Night are modified by weather. Clear Night is also modified by the phases of the moon. Night Precipitation is not modified by the moon since the clouds obscure it.

The visibility will be provided in the scenario description, or can be determined based on the existing conditions. For example, on a clear night with a half moon, the average sighting distance to a darkened ship is 6-9 kyds. This will be reduced or increased by events during the battle. For example, gun flashes at night increase visibility by two tables (25% surface visibility would be increased to 50%). These are listed in the Visibility Variation Table.

Sighting ranges are further modified by a “sigma,” or variation. This represents not only local variations in the sighting conditions but differences in the performance of the lookouts themselves. The amount of variation changes depending on the sighting conditions. For example, with 100% visibility, the sigma is 6 kyds, meaning that the sighting range will actually vary by ±6 kyds from the specific table value. This is rolled on the Visibility Variation Table when a player attempts to detect something visually.

If a player is using more than one table (trying to detect both ships and aircraft in the same turn, for example) use the same D10 roll for the Sigma on both tables. The die roll represents the variation in sighting conditions immediately around the unit for that Tactical Turn. It will vary from one turn to the next, and must be rerolled for each unit each turn it attempts detection.

5.4.2 Making Detections. Players trying to see another unit must find out if it is in visual range. If it is, detection is automatic.

Visual sighting range depends on the sighting conditions (weather and light) and the type of units involved. There are four combinations of units, each with its own table: surface-to-surface, air-to-surface, and air-to-air and surface-to-air; the last two being rolled on the same table.

Sighting ranges are either expressed in thousands of yards, or as a percentage of maximum. Maximum sighting range against a ship is 50 kyds (25 nm) for planes and 38 kyds (19 nm) for another ship.

Detection is checked from a unit to an enemy formation or group of units, not to each individual unit in a formation. The human eye, once cued to a location, can easily detect nearby units, and sighting conditions to each unit in the formation are usually identical.

Test sighting ranges to an aircraft formation as a single group. If one plane is spotted, all are spotted. For ship formations, test detection to the nearest ship of a formation. If it is spotted, all the ships in sighting range are seen. This may be all of the formation, or just part of it.

5.4.2.1 Sighting from Ships. The farthest sighting range for a ship is affected by its “height of eye,” the distance of the observer above the water. The higher the observer, the greater the visual horizon.

This horizon is reduced by the sighting conditions to give the effective range in the existing sighting conditions. The Surface-to-Surface Sighting Table includes the modified horizon distances.

In the Detection Phase of a turn, when a player wants to have one ship try to see another ship, they should first find the maximum line of sight on the appropriate Surface-to-Surface Sighting Table for the existing conditions, then roll D10 for the sigma and apply it to that sighting range.

Example: A battleship (size class A) tries to see a cruiser (size class B) on a clear night with a half moon (25% visibility). On the Surface-to-Surface table for 25% visibility sighting conditions, base range between two units of that size is 9500 yds. The sigma for 25% visibility is 2 kyds. Rolling D10 on the 2 kyd line, the player gets a 2, or -1 kyds, so the maximum range that the battleship can see the cruiser in that Tactical Turn is 8500 yards. If the actual range is less than or equal to this, the battleship can see the cruiser and any other size class B ship or larger inside that radius.

If the cruiser was firing its guns, increase the visibility by two tables (from 25% to 50%). This changes the base range from 9.5 kyds to 19.0 kyds and the sigma from 2 to 3 kyds.

5.4.2.4 Sighting torpedo wakes. Torpedo wakes could be detected by alert lookouts, sometimes in time for the ship to maneuver to 'comb the wake' of the incoming weapons. For ships without sonar, this is the only way to detect an oncoming torpedo attack.

- If the attacking torpedo uses steam propulsion,

In daylight:	20%
In morning or twilight:	15%
At night:	25%

- Electric torpedoes are wakeless, and cannot be visually detected.

If an attacking torpedo is detected, the targeted ship is allowed to reduce its apparent size class by one table (two for DDs and smaller) as it turns to comb the wake. After the torpedo has passed, the ship will automatically assume its original course, so no actual maneuver is necessary.

5.4.4 Nighttime Illumination. A unit can be detected visually at night, but it is still a poor target for gunnery purposes. Without a light source of some kind, a ship is only a shadow, with its shape, course, and even its direction uncertain. A target must be illuminated for visually-controlled gunfire to be fully effective. There are many ways of doing this.

Searchlights can be manually or radar controlled. Radar-controlled searchlights are land-based. Flares include aircraft dropped flares and star shells fired by guns. Searchlights, flares, and star shells are limited by weather. If the weather conditions reduce the sighting range below 25% visibility, then use the most limiting range as the maximum illumination radius.

Ships or land bases may also use their own lights. Normal running lights and other nighttime illumination were usually kept off, "blacked out," if there was a chance of attack. Sometimes, though, it was necessary to use them. Admiral Marc Mitscher is legendary for turning on the carrier's lights, and the lights of every ship in the task force, after the Battle of the Philippine Sea. This enabled his planes, aloft long after dark, to find the carriers and safely land. The Japanese performed a similar act during the Battle of the Coral Sea.

Use of lights will allow operations at night or poor weather, but the units using them are illuminated.

5.4.4.1 Ship Based Searchlights. Ships were equipped with searchlights in order to illuminate targets in night surface actions. Searchlights have a range of 8 kyds (4 nm) and must be ordered to be turned on or off during the plotting phase. Any ship using searchlights is illuminated itself for gunfire purposes. Any ship in the beam of a searchlight is treated as illuminated.

Searchlight illumination is ordered during the plotting phase, and is available for targeting purposes in the planned fire phase of that turn. Any new targets found in the detection phase cannot be illuminated until the following planned fire phase. It takes a little time to coach the searchlight operator onto the target.

A searchlight can only illuminate a target once it has been detected, either by radar or visually.

5.4.4.4. Firing Starshells. Starshells can be used to illuminate a surface target. They may be fired by a minor combatant's primary battery, a major combatant's secondary battery, or sometimes by a special gun. In the Plotting Phase, designate one mount (it must be able to fire in the desired direction) as firing illumination rounds (starshell). That mount may do nothing else that Tactical Turn, but the other mounts in the battery may fire normally.

In the Planned Fire Phase, resolve the starshell guns first for hits and misses and the location of the fire. After that, the other guns fire, and can benefit from any illumination the starshells provide. Like other guns, starshell guns fire throughout the Tactical Turn, with no further resolution of their fire needed.

Starshell illumination actually requires a series of shells, fired over the entire three-minute Tactical Turn. Individual starshells burn out quickly and if the mount ceases fire, the light quickly fades. If the mount stops at the end of a turn or shifts to another target, the target ceases being illuminated in the following turn. Starshell must be renewed for each Tactical Turn.

Starshells have a minimum range of 4000 yards (2 nm). Inside that range, the shell is moving too fast for the chute to deploy without shredding.

In the Planned Fire Phase, the player rolls the chance to hit for the gun normally. If it is a hit, the starshells land at the desired location, either a plotted point on land or a designated ship. If they miss, roll D10 again. On a 1-5, the fire lands 500 to 2500 yards short. On a 6-10, it lands 500-2500 yards long.

STARSHELL MISS TABLE

D10 roll	Miss distance
1	2500 short
2	2000 short
3	1500 short
4	1000 short
5	500 short
6	500 long
7	1000 long
8	1500 long
9	2000 long
10	2500 long

If the modified range is inside the starshell's minimum range of 4000 yards (2 nm), the chute shreds and it fails to function.

Any unit within 1000 yards (one-half nm) of the point is immediately illuminated for that Tactical Turn. Units between the starshells and another unit are silhouetted to a range of 6 kyds from the point of impact.

5.4.5. Smoke Effects. Smoke was used in WW II to obscure a target and reduce its chance of being hit during an attack. It could also reveal a target's location.

Smoke generators could be land-based, positioned around some valuable installation. They were also carried by destroyers, and used to screen other ships from gunfire attack or accurate torpedo fire. Visibility in or through a dense smoke screen is reduced to 1000 yards (.5 nm) in the daytime and 500 yards (.25 nm) at night. On the last turn that the smoke exists, it is dissipating and the surface visibility is reduced to 1/4 of the unobstructed visibility.

Smoke does not block radar detection, so radar-controlled gunfire or bombing is not affected by smoke. Gunfire spotting aircraft are not affected unless the target is actually in the smoke screen.

If a ship moves into smoke during the Movement Phase, and ends the phase within the smoke, it may still be fired on if it spent at least half of its movement outside the smoke. If the ship is obscured for more than half but not all of the turn, all gunfire suffers a -20% dead reckoning penalty for that turn only. This is 2/3 of the normal blind fire modifier, since the ship's location was known before it became obscured. If the ship remains hidden on following turns, it can't be fired on at all.

5.4.5.1. Shipboard Smoke Screens can be created in any Plotting Phase. In the Movement Phase of that turn, a ship will leave a smoke screen in its wake. The smoke screen can be turned on or off each turn as the player desires. The screen extends only into the VLow altitude band. The smoke screen will remain for four Tactical Turns (in calm weather), then disperse.

Reduce this time by one turn for every 10 knots of wind. (e.g., If it is from 1 - 10 knots, it will last three turns. If the wind is 11 - 20 knots, the smoke screen will only last two turns.) Smoke is removed in the Plotting Phase of the turn in which it disappears.

Chapter Six - Surface Combat

6.1 Surface Gunnery. Surface ships and surfaced submarines can attack other surface targets with guns. Many ships carried several different calibres of guns. Large-bore long-range weapons were the principal ship-killing weapons of the day, and ships were rated by the size of the gun they carried. Destroyers mounted guns smaller than six-inch, light cruisers mounted six-inch guns, heavy cruisers eight-inch guns, and capital ships mounted guns of ten inches and higher.

Larger ships mounted a medium-caliber secondary battery, both for antiaircraft protection and for smaller surface targets, so as to not distract the main battery from its primary work of destroying capital ships. Finally, small-bore automatic weapons were carried on all ships for antiaircraft protection. These could also be used against surface ships if they were close enough.

Ships of destroyer size and smaller will mount a medium-caliber main battery, usually dual-purpose.

6.1.1 Directors. Guns of 40mm calibre and higher on surface ships were usually aimed by a "director." Mounted high on a ship, directors used powerful optics, sometimes radar, and analog fire control computers to track a target. This is the device knocked out when a gun battery takes a fire control hit. Its loss reduces the guns to local control.

As the director tracked a target, guns located all over the ship would automatically follow its movements, with corrections added to allow for the range to the target, wind, distance between the director and the mount ("parallax") and on large guns, even the rotation of the Earth.

Guns could be controlled "locally," that is, on the mount or turret itself, but this was always less effective than using the director. Rules for local control are provided in section 6.1.3.

Each gun type on a ship was usually controlled by a different director. A single director could control many gun mounts, but a ship can only engage as many surface targets as it had gun directors unless the individual gun mounts or turrets were in local control. A director can control as many guns of the same type as a ship has. All guns linked to a director fire as a group, rolling one die roll to hit. Locally-controlled mounts roll to hit individually.

In Annex A, each ship's gun equipped with a radar director will have it listed on the same line as the weapon. All main and secondary batteries have optical directors.

6.1.2 Radar Gunfire Control. Radar technology advanced during WW II to the point where it could be used not only to detect a target, but to improve a gun's chance to hit as well. This was a great benefit. Without radar, range to a target had to be measured using a stadimeter or by coincidence ranging, both optical methods. These are slow, and are affected by haze or darkness. With radar the exact range could be determined instantly, day or night, and fed into the gunfire computer.

Radar gunfire directors can be confused by land behind a target. If there is land in the same 90° quadrant as a target (45° to either side) and within the radar's unmodified range, subtract 10%.

6.1.3 Gunfire in Local Control. Some guns may be fired without their director, in "Local Control." Any gun mount can be put in local control by ordering it in the Plotting Phase. In local control, the crew in the gun mount aim the gun themselves, instead of relying on an external director. This is the normal procedure when the director has been knocked out.

If a gun has lost its director, or only functions in local control, subtract 15% from the chance to hit.

The gun director is located at one of the highest points on the ship, while the gun mounts and their sights are mounted much lower, usually on the main deck itself. This meant that if the gun crew depended on the mount's sights, the visual horizon and spotting range was reduced. In local control, reduce the ship's size one class for gunnery purposes.

Example: A heavy cruiser (size class B) has its main battery director knocked out. Its after main battery director, located aft, takes over. For the purposes of spotting targets for the main battery, treat the cruiser as size class C. In addition, it cannot engage targets forward unless those turrets drop into local control. A second director hit knocks out the after director. All turrets now drop into local control. For the purpose of spotting targets for the main battery, treat the ship as size class D.

6.1.4 Gunnery Procedure. Gun ranges are divided into four range bands: Short, Medium, Long, and Extreme. Long range is often called "effective" range.

The ballistics of a shell in flight are the same for all guns. The only thing that changes is the size of the shell and its muzzle velocity. These two things affect how far it flies and what damage it will do if it hits something.

Since the ballistics are the same, the chance of a hit is the same for each range band. A gun at Short range has a base 70% chance to hit. A Medium-range shot has a 50% chance, a Long-range shot has a 20% chance, and an Extreme-range shot is only 10%. These chances can be changed up or down by various modifiers. The chance to hit cannot be raised over 90%, even with modifiers.

While the base hit chances are the same, the size of the range bands vary for each gun. A US 16"/50 has a "short" range of 6300 yards, while a Japanese 10th Year Type 120mm/45 has a short range of 2600 yards. The terms Short, Medium, Long, and Extreme are relative, depending on the gun. Only the chance to hit remains unchanged.

To attack a surface ship with guns, measure the range from the firing ship to the target and note the target's aspect. Choose the proper range band (short, medium, long, or extreme) by comparing the measured range with the numbers for that gun in Annex C. Count the number of barrels firing. Be sure to consider arcs of fire (section 2.2.1.7) and that guns can actually fire on the target. Adjust the chance to hit up or down by using the Gunfire Modifiers Table.

If a target is within Extreme range, a ship can always fire a "ranging" shot, even if the modified chance to hit is less than zero. It counts toward any consecutive turn gunfire modifiers.

Roll D100. If the roll is less than or equal to the adjusted chance to hit for that range band, the target has been hit.

Note the number of damage points inflicted by the gun in that range band (found in Annex C). Look on the Gun Damage Multiplier Table, cross-indexing the number of barrels firing and the range band. This gives a multiplier for the damage inflicted in Annex C. Multiply the two numbers to get the number of damage points suffered by the target. *Guns that fire only in the Reaction Fire Phase (in response to a newly-detected target) have their damage halved.*

GUN DAMAGE MULTIPLIER TABLE

No. of Barrels Fired	Value Multiplied with Annex C Gun Damage			
	Short	Medium	Long	Extreme
1 - 3	1	1	1	1
4 - 6	2	2	1	1
7 - 9	3	3	2	1
10 - 12	4	4	2	1
13 - 15	5	5	3	2

Example: A US *Brooklyn*-class light cruiser is operating at night as part of a formation when the lookouts detect a Japanese formation. The cruiser opens fire. The target, a heavy cruiser, is at medium range off the starboard beam of the light cruiser. All five turrets of the American cruiser's main battery will bear (15 barrels total). The Japanese cruiser is full broadside to the firing ship, and is steaming at 20 knots.

The base chance of a hit at medium range is 50%. The player applies the following modifiers: visibility less than 40% due to it being night (-10%), 15 barrels firing (+20%), size class B broad aspect (+5%). The adjusted chance to hit is 65%. No radar is used here, but if the ship was fitted with a FC (Mk3) radar with a +10% modifier, the chance becomes 75% or less.

The player rolls D100 and gets a 26, resulting in a hit. The cruiser's guns (firing AP) inflict 10 points, and the multiplier for 15 guns at medium range is 5, so the cruiser inflicts 50 damage points.

Players do not have to keep track of gun ammunition. It is very rare for a naval gun mount to run out of ammunition during an engagement.

6.1.5 Overconcentration. Optical directors and even radar could only get the shells close to the enemy ship. Adjusting the fire required being able to see the shell splashes and correct the next salvo based on whether they were long or short of the target. These corrections were added manually, by the director officer.

If a second ship fires at the same target, the director officer will have a hard time telling which shell splashes belong to him and which belong to the other ship. A third ship makes the problem even worse, and so on.

The problem is most acute at longer ranges, when the extended time of flight makes it hard to link a salvo with its shell splashes.

For overconcentration to occur, the shell splashes must be of roughly the same size. No battleship would be confused by the splashes of a destroyer firing at the same target, but a battleship with 16-inch guns would certainly not be able to tell its splashes from those of 15-inch guns also firing at the same target.

For figuring overconcentration, large shells are 11 to 18 inches, medium shells are 5.9 to 10.9 inches, and small shells are less than 5.9 inch diameter.

If more than one ship fires at the same target, all the ships firing the same size guns at that target at Long and Extreme range are subject to a gun hit chance modifier equal to the number of ships firing at that target minus one.

It doesn't matter if some of the ships firing at the target are at Short or Medium range. Those ships can easily link their shots with the splashes and adjust their fire, but their splashes will cause problems for ships at longer ranges.

Example: A heavy cruiser is fired on by a battleship's main (15 inch) and secondary (5 inch) batteries, two heavy cruisers' main (8 inch) and secondary (4.5 in) batteries, and one destroyer (4 in). All guns are firing at Long or Extreme Range. The overconcentration penalties are:

• BB main battery: no overconcentration, only one ship firing shells of that size.

• CA main battery: Two ships firing medium-sized shells, penalty of -10%.

• DD & BB & CA secondaries: 1 DD + 2 CA +1 BB , four ships total, penalty of -30%.

Some navies used colored dye in their shells to help the ships keep track of their shots. In practice, this only had a marginal effect and allowed two ships to fire at the same target without a penalty. If a navy uses colored dye in their shells, the overconcentration penalty is equal to the number of ships firing shells of that size, minus two times 10%.

6.1.6 Line of Fire Restrictions. A ship's line of fire to a target may be blocked. This will happen if another ship is in the gun's Short or Medium range band and is within 10° of the line of fire (20° total arc).

Land of 100 m elevation or more will block a ship's line of sight, although a plane may provide over-the-horizon spotting to replace it. Land of less than 100 meters elevation may still block line of sight. This will be specified in the scenario description.

Ships carrying floatplanes on after catapults have their line of fire blocked ±30° of centerline aft for main and secondary batteries. The muzzle blast from even a

medium-caliber gun was enough to damage a plane or even start a fire.

If a ship's main or secondary battery fires within 30° of the aft centerline when there are floatplanes on aft catapults, there is a 50% chance they will be damaged (roll each Tactical Turn). Treat it as an aircraft critical hit.

6.3 Surface-Launched Torpedoes. Torpedoes must be fired against a detected target, or a fire control solution against an "blind" target must be achieved. They cannot hit small craft, such as PT boats or barges (size class E).

Range for torpedoes is measured from the geographic point of firing to the torpedo's current position. If the distance traveled by the torpedo since its launch is greater than the listed range, the torpedo runs out of fuel and automatically misses. A ship may reveal its bearing when it fires a torpedo against any ship with effective sonar.

The following rules apply to torpedo attacks from surface ships and submarines. All the torpedoes listed in Annex E1, E2, and E3 fall into one of three groups: Straight-running torpedoes, pattern-running torpedoes, or acoustic homing torpedoes.

6.3.1 Straight-Running Torpedoes. These weapons have no guidance systems. They are preset to a particular course, which will hopefully intersect that of their targets. They travel in a straight line until they hit something or run out of fuel and sink.

On a ship, fire control equipment is used to track a potential target and compute the intercept course for the torpedo. In most cases, the speed of a torpedo is not that much greater than that of its target. This means the "Deflection Angle", the amount of lead, must be very large. *CaS* players use a table provided in the rules to compute their own "lead angle" and fire their spreads.

On the turn of launch, a ship or submarine must steer in a straight line. It is allowed to make one turn (within normal maneuvering limits) at the beginning of the three-minute tactical turn, but afterwards must steer in a straight line. Surface ships cannot use evasive steering, and submarines cannot evade depth charges.

Torpedoes must be set at the time of launch to run shallow or deep. Shallow weapons will hit any ship, but will strike the belt armor of larger ships, which reduces their effectiveness. Deep torpedoes will run under smaller ships (size classes C, D, and E) but will hit a larger ship on the underwater hull, instead of the armor.

On the turn of launch, place a torpedo counter next to the firing ship, along with a Datum marker that will let the player measure the length of its run. The torpedo moves in the movement of following turns. Torpedoes move before any other units.

After a torpedo is launched, its course cannot be changed. If a target maneuvers, changing either course or speed, the torpedo may miss, passing through the predicted point but with no ship there to meet it. Enemy ships may zig-zag to frustrate a torpedo firer's aim, and if a ship sees an approaching torpedo, will almost certainly try to "comb the wake," turning bow or stern-on the weapon, to present the smallest target aspect possible.

Aiming torpedoes: Measure the *target angle* of the enemy ship to be attacked by torpedoes. The target angle is measured between his bow and a line drawn between the firing ship and the target. Target angle and target speed combine to create the target's apparent motion across your line of sight.

On the upper part of the Torpedo Deflection Angle Table, cross-reference the target angle and target speed. The resulting number is the target's apparent crossing speed, its speed across the firer's line of sight.

Next, on the lower part of the table, find the column that matches the torpedo's speed and go down it until you find the closest match to the apparent speed. In case of an even split, average the two values. Follow that row to the right and this is the deflection angle that you must use to hit the target. This is the hard part: If the firer is on the target's starboard side, add this angle to the bearing to the target. If the firer is on the port side, subtract it from the bearing.

The result is the torpedo course that will hit the target provided it does not maneuver.

Often, a spread of torpedoes, fanned out at slightly different angles, were fired to increase the chance of a hit. If a player wants to fire more than one weapon, he just decides how many torpedoes are in the spread. This can be as many weapons as he wants, up to the number of tubes in an individual mount.

For example, a U.S. *Fletcher*-class destroyer has two quintuple torpedo tube mounts. Thus, this destroyer can fire two salvos of five torpedoes each. Torpedo mounts are aimed separately, so two five-tube mounts cannot combine their weapons into a ten-torpedo spread.

No angle calculations for individual torpedoes in the spread are needed. These are made automatically by the torpedo officer, and are factored into the chance to hit.

Mark the position of the ship when the torpedoes are fired, either with a marker on the playing surface, or secretly if hidden movement is being used. In daylight, if an enemy ship can be seen, any torpedo launch can be seen as well. *Make sure that the direction of the spread is within the firing arc of the torpedo tubes for that ship.*

Torpedo Movement to target. In every movement phase the turn after they were fired, torpedoes move at their rated speed in a straight line on the course decided by the player (within the tubes' firing arc). Depending on the targets' maneuvers after launch, it may or may not be at the expected point of intercept. In addition, another ship (friendly as well as enemy) may be struck by the torpedoes if it gets in the way.

If a torpedo spread comes within 250 yards (500 yards total width) of any eligible torpedo target, that unit is attacked by the spread, and the torpedo attack should be resolved against it.

Torpedoes move like any other surface ship or sub. If there appears to be a chance of a torpedo spread and a ship's path intersecting, use proportional movement to see if the torpedoes pass close enough to resolve an attack. If the players are not using a referee, they will have to plot movement one turn ahead. See section 2.3.4.1.

6.3.1.1 Resolving Torpedo Attacks. When a torpedo reaches a ship (its intended target or another that gets in the way) the attacking player must roll to see how many torpedoes actually hit.

This is based on the target's actual size (Battleship, Cruiser, Destroyer, etc.) and the angle that the torpedoes attack from. A side shot on a destroyer stands a better chance of hitting than a bow-on attack on a battleship.

Find the target's *effective length* by using the Torpedo Aspect Table on page 6-15.

First look at the diagram to see from what angle the torpedoes are attacking the ship. The degree numbers around the edges of the box refer to *relative* bearing, in other words, the bearing of the torpedo relative to the ship's bow. Most shots will be on one of the quarters. Broad is the best, narrow is the worst.

Cross-indexing the ship's real size with its angle, the resulting Roman numeral is the table to use to resolve the attack. Attack Table I is the best, Attack Table VI is the worst.

Once on the correct Torpedo Attack Table choose the appropriate chart for the number of torpedoes in the spread. There are six charts, the maximum spread being six weapons.

Now measure the range from the impact point back to the firing point. *Note: torpedo run at impact is not necessarily the same as target range at time of fire.* The range that matters is not the range at firing, but at impact. This is how far the torpedo has actually traveled, and this is what affects its chance to hit.

Look down the Range column for the range closest to the torpedo's run. Round even splits up, i.e., 8500 yards becomes 9000 yards.

Roll D100, and starting at the right, compare the result to the hit chances in the corresponding row. If the die roll is less than or equal to that value, the number at the top of the column is the number of torpedoes that have hit the target. If the die roll is greater than that number, look at the next number to the left in that row and compare the die roll with it.

As the number rolled gets bigger, the number or torpedoes hitting gets smaller. If the die roll is bigger than the number in the column with "1" at the top, all the torpedoes in the spread missed.

Example: A *Gato*-class sub fires a spread of three Mk14 torpedoes at a large (size class B) merchant ship. At the time of impact the merchant had a broad aspect and the torpedo run was 1,400 yards. Looking on the **Torpedo Aspect Table** we find that a large merchant with a broad aspect is resolved on **Torpedo Attack Table II**. Finding the **Spread Size =3** section and cross referencing a torpedo run of 1,500 yards (closest to 1,400 yards) we get the following probability of hit values:

Range	1	2	3
1500	87	37	12

This means:

Die roll of 88 - 00	no hits
Die roll of 38 - 87	1 hit
Die roll of 13 - 37	2 hits
Die roll of 01 - 12	3 hits

Rolling D100, the result is 22 which is less than 37 but more than 12 thus the merchant was hit by two Mk14 torpedoes.

Any torpedoes in the spread that miss the intended target have the opportunity to hit other nearby targets, if they exist. However, only the first target is attacked by the full spread. All remaining torpedoes are treated as individual weapons i.e. **spread size =1**. The only exception to this rule is if the salvo misses the first target completely, then the second target in the torpedoes path would be attacked by the full salvo.

If the target ship is stationary (speed zero, dead in the water), move two lines up on the torpedo table.

Example: A single torpedo is fired at a stationary ship. At the end of its run, it has covered 5000 yards. Instead of using the 5000 yard line, use the 3500 yard line. This compensates for the difficulty in estimating a target's exact speed, which does not exist with a stationary ship.

6.3.4 Torpedo Depths. Torpedoes can be set to attack either shallow-draft or deep-draft targets. Torpedoes set deep will not hit destroyers or smaller craft (size class C, D, or E), but will hit larger ships below the armor belt. If they are set shallow, they will hit any ship, but if they hit a CL or larger vessel (Size class A or B) with armor, it will hit the main armor belt and will have a reduced effectiveness. The effect of armor on torpedoes is described in section 8.1.7.

6.3.5 Plotting Secret Torpedo Fire. The surprise nature of torpedo attacks is hard to reproduce in a two-player game. If both players agree to secret attacks, though, they can be simulated to some degree.

First, mark some spot on the playing surface as a common, fixed, reference point. Also mark the point on graph paper, and plot the locations of all the ships involved. As the game progresses, the sub's player can update the ship's positions on the graph paper.

When a sub player wishes to fire torpedoes, he calculates and records the fire normally, but does not announce it. Instead, he just tracks the position of the torpedo on paper until the wakes are sighted (section 5.4.2.4) or they attack a target.

6.8 Combat Considerations. Combat is restricted by the following considerations.

6.8.1 Weapons Danger Space. Surface ships may not fire their guns at other surface targets if friendly ships are in the line of fire. The danger area between the firer and the target within ten degrees of either side of the line of fire in the gun's Short and Medium range band. By the time a shell has passed into the Long range band it is high enough so that it will pass over any friendly ships.

For a friendly ship to be included in the weapons danger space surrounding an enemy ship, it must be inside the space for at least half of the enemy ship's Movement Phase.

There is a second danger space directly around the target. It lies within five degrees of the line of fire and ten percent of the range between the firer and the target.

If a friendly or enemy ship passes through either danger space, it is also subject to an attack at half the modified chance to hit and if hit, half the damage for that range band.

This danger space represents the occasional shell that does not follow a predicted ballistic path, an unexpected roll that a stabilization system cannot account for, or aiming errors by the director. Such errors would usually just include a single shell or a single salvo, but the damage values in Annex C actually represent only a few shells out of the many fired actually striking an intended target.

6.8.2 Rates of Fire: If a weapon does not have a rate of fire listed in the remarks section of Annex A for that ship, it may fire once per rail or tube per turn. Guns may be firing many rounds, depending on their bore, and multiple-barreled weapons, like the Mousetrap series, will fire all their tubes in one "salvo" or pattern.

Chapter Eight - Ship Damage Results

8.1 General Concept. Players resolve attacks as shown on the Combat Resolution Summary Table. Some attacks, such as gun and rocket attacks, are rolled for immediately. Others are resolved at the end of the turn.

Combat Resolution Summary

Plotting Phase. No combat resolution occurs.
Movement Phase. Resolve torpedoes which come within 500 yards of a ship after all movement is completed.
Planned Fire Phase. Gunfire, ASW mortar, and depth charge attacks made in this phase are resolved in this phase.
Detection Phase. No combat resolution occurs.
Reaction Fire Phase. Gunfire, ASW mortar, and depth charge attacks made in this phase are resolved in this phase.
Resolution Phase. Bombing attacks by planes and AA fire at them, guided missile attacks by aircraft are resolved.

Note: Critical hits are computed and inflicted after every phase, before the next phase begins. Additional damage points received as a result of critical hits are accumulated during the turn and inflicted in the next Intermediate turn.

8.1.1 Computing Hits. Damage in *CaS* is measured in "damage points." These are used to measure the amount of damage a weapon will do, and the amount of damage a ship can absorb before it sinks. The bigger a ship, the more damage it can take, but it is not a linear scale. Larger ships get fewer points for each ton of displacement than smaller ships.

When a weapon inflicts damage on a target, the weapon must penetrate any armor in the location of the hit before it can do internal damage. Non-penetrating hits will still cause some damage anyway.

The effects of damage, including critical hits, are applied simultaneously to both sides at the end of the phase. *If a critical hit, like a fire or flooding, inflicts more damage points, they are applied in the Resolution Phase of the Following Tactical Turn. Secondary effects, like explosions, are applied immediately, in the phase in which the damage is resolved.*

Whenever a ship is hit by a weapon, subtract the damage points inflicted by the weapon from the ship's damage point total. When the ship's total reaches zero the ship sinks.

8.1.2 Speed Reduction. As a ship or sub's damage point total is reduced, its speed goes down as well. Loss of structural strength may force a ship to slow down, drag on the hull will slow it as its smooth lines are broken by holes and other damage, and general damage to the propulsion plant will affect its efficiency.

A ship's speed is reduced by one quarter each time it takes one quarter of its original damage point level, and is reduced to zero at the 90% damage level.

The break points for damage are 0%, 25%, 50%, 75%, 90%, and 100%. The speed percentages are 100%, 75%, 50%, 25%, 0%, and sunk.

Each ship class has a different table which is included with its other characteristics in Annex A. The top line represents the damage point levels where the speed is reduced, while the bottom line shows the new maximum speed at that level of damage.

Example: A Japanese *Nachi*-class cruiser takes 333 points of damage. Its damage and speed breakdown table is shown below:

Damage and Speed Breakdown:

Dam Pts:	0	83	166	250	299	333
Surf Speed:	33	25	16	8	0	Sinks

With no damage (0), the *Nachi* is capable of 33 knots. At 82 points of accumulated damage, it can still do 33 knots, assuming no propulsion criticals or other restrictions. At 83 points, though, its maximum speed is 25 knots. From 83-165 points of damage, it can make 25 knots. The 166th point reduces its speed to 16 knots, and so on.

If a ship has taken propulsion criticals or other damage that also reduces its speed, these are applied to the ship's maximum speed as it changes.

8.1.3 Surface Ship Critical Hits. Damage to a vital component of the ship is called a critical hit. These include not only weapons and sensors, but engineering (propulsion), the rudder, and flight decks. In CaS, whenever a ship is hit, the severity of the hit will be used as a way of determining if there is a chance of one or more critical hits.

In each phase that a ship takes damage, divide the damage points taken by the points the ship has remaining after that phase's damage points are applied. This is the damage ratio and is used to figure out how many critical hits a ship may have suffered.

Roll D6 and cross-index the result with the ratio on the Damage Ratio Table. The number at the intersection of the row and column is the number of critical hits inflicted on the ship.

Example: A *Fletcher*-class destroyer has 104 damage points. If it takes 22 points of damage from gunfire in the Planned Fire Phase, the critical hit ratio is 22/(104-22) or 22/82 = .27. The players use the .20 line (always round down).

Once the number of critical hits is determined, find the nature of each on the Critical Hit Table. Each type of ship has its own column. Roll D10 for each critical hit on that column to see what its effect on the ship is. The critical hit types with asterisks are armored (*) if the ship has an armor rating greater than one. Section 8.1.6 has the rules for armor.

In addition to the critical hits inflicted on a ship by any weapon, certain weapons will automatically inflict certain types of critical hits.

• Each torpedo which hits a ship or submarine will automatically inflict a flooding critical hit, in addition to any other critical hits. If the ship hit has a torpedo protection system (see section 8.1.7.2) the system must be penetrated for the critical to occur.

• Each turn of shellfire of 120mm or larger which hits a carrier automatically inflicts a flight deck critical hit (penetration allowing), in addition to any other criticals caused by its damage points.

8.1.5 Effects of Massive Damage. Even though most of a ship's weapons may still be intact, there is a point where massive damage to the ship overall will prevent the operation of various weapons.

When a ship has only 25% of its original damage points remaining, all primary and secondary batteries, torpedo tubes, and ASW weapons are out of action. Remaining Light AA is unaffected. Submarines must surface. Aircraft carriers cannot launch or land aircraft on the flight deck.

When a ship has only 10% of its original damage points left, all of its weapons, including catapults, are out of action.

8.1.6 Effects of Armor. Armor reduces the amount of damage a ship takes and provides special protection to critical areas of a ship. In World War II, ships larger than a destroyer carried armor covering the magazines and engineering spaces (belt), major weapons (turret top and faces), and the deck. Other critical items, such as the conning station, could also be armored. The armor belt provided protection against close-range shell fire and shallow torpedoes. The deck provided protection from bombs and plunging fire at long ranges.

Larger warships also had special protection against torpedoes. Below the waterline, the ship had a series of empty compartments, called voids. These were designed to absorb the force of a torpedo's warhead, and prevent the true inner hull from being ruptured. The voids were filled with air or fluid. While a torpedo would destroy the voids, no real harm would be done to the ship.

Each weapon has a **penetration rating** as part of its statistics. These values are precalculated for each gun at each range bracket, and are listed in Annex C. To find a gun's penetration, measure the range and find the appropriate range band in the Annex for that gun and shell type. The most common shell types are Armor-Piercing (AP), High Explosive (HE), Semi-Armor Piercing (SAP), Common (COM), and Special Common (SCOM)

Short and Medium-range gunfire has a relatively flat trajectory, and will strike the side of a ship on the armor belt. Long-range and Extreme-range fire must arc much higher and is called plunging fire. It always strikes the deck armor.

Bombs are classed as Armor-Piercing (AP), Semi-armor piercing (SAP) or MC (for medium-capacity), general-purpose (GP) or HC (for high-capacity). Armor-Piercing bombs have specially forged casings, and are almost solid metal with only a small bursting charge. Semi-Armor Piercing bombs have a thinner casing but a larger explosive charge. General-purpose bombs have relatively thin-walled casings and a very large explosive charge.

One of an attacking player's tasks is to decide which types of bombs should be carried for a target. Aircraft loaded with specialized AP bombs can damage a capital ship, but will not do much to a lightly armored warship or merchant. The amount of damage inflicted by GP, SAP, and AP bombs and other weapons is shown in Annex F1.

Bombs and rockets always strike the deck armor, except skip bombs which strike the belt. Bombs will have two penetration ratings which are listed in Annex F1. The first penetration rating is for "pressed home" dive bombing attacks and level bombing attacks from Medium altitudes. The second rating is for regular dive bombing attacks and level bombing attacks from High altitude. Much of a bomb's penetration comes from kinetic energy, not explosive force. This means that for AP bombs to get full penetration they must be dropped from High altitude. For the rare case of a Low altitude level bombing attack, AP bombs have a penetration of 2, SAP bombs have a penetration of 1, and all other bombs have a penetration of 0.

Strafing attacks will not penetrate armor.

Deck and belt **armor ratings** are provided for each ship. For example, the *Baltimore*-class heavy cruisers have a rating of 13/6, meaning a belt thickness equivalent to 13 centimeters, and a deck armor equivalent to 6 cm. The deck is much thinner than the belt, but shells at Long range do not penetrate as much armor and the chance of getting a hit is much less as well. This does not take into account the effects of a bomb hit though.

Compare the penetration ability of a weapon with the armor rating where it struck (Deck or Belt). If the weapon's penetration is greater than the armor rating, full damage will occur.

If a shell or bomb does not penetrate, divide the damage depending on the type of bomb or shell by:

AP or SAP/SpCOM:	
Short and Medium range shellfire	3
Long and Extreme range shellfire	2
Bombs	2
HC, HE, COM	
Short and Medium range shellfire	6
Long and Extreme range shellfire	4
All other bombs (HE, GP, MC, HC)	4

The smaller reduction for Long and Extreme-range shellfire is because less of the shell's damage is caused by kinetic energy at these ranges. For free-falling and low-velocity ordnance, almost all of the damage is inflicted by the explosive.

If the weapon does not penetrate the armor where it struck certain critical hits will not happen, either. These are marked with an asterisk (*) on the critical hit table. For example, to knock out a ship's main battery, a bomb must penetrate the ship's deck armor. A shell must penetrate the deck armor at Long or Extreme range, or the belt armor at Short or Medium range. If it penetrates, the critical is inflicted as well as full damage.

8.1.7 Armor and Torpedoes. Torpedoes can be set to run shallow or deep. Torpedoes must run shallow to hit size C-class (destroyer) and smaller ships. A shallow torpedo will strike a larger ships belt armor, however. Deep torpedoes will run under small ships and will strike larger ship below the belt armor, on their torpedo bulges if they have any. While some large ships carried torpedo protection systems (described later) many did not.

Whatever their depth, torpedoes that strike a ship from the narrow aspect (see chart section 6.3.1) strike outside the armor belt or the torpedo protection system.

8.1.7.1 Shallow-Running Torpedoes. If a shallow-running torpedo strikes the armor belt, its damage is reduced according to the following table.

Target's Belt Armor	Damage Point Reduction
0-5	None
5-10	10%
11-20	25%
21-30	40%
31-40	50%

8.1.7.2 Deep-Running Torpedoes. Deep-running torpedoes strike under a large ship's armor belt. They will run under a ship of Size class C or smaller.

8.1.8 Torpedoes & Target Aspect. If a torpedo hits a ship at a narrow aspect (bow or stern), divide the torpedo's damage by two. An extreme bow or stern hit wasted a lot of its energy moving water and not damaging the ship. If the ship is hit in the stern, the first two critical hits, beside the automatic flooding which doesn't count against the critical hit number, are automatically engineering and rudder hits. Roll the remaining critical hits as per sections 8.1.3 and 8.1.4.

8.1.9 Sinking. A ship or surfaced sub that has received damage sufficient to sink it rolls D10*10 for the number of minutes it will take to sink; the final disappearance occurring during the Movement Phase. Submerged submarines and ships that have magazine explosions sink immediately.

8.2 Effects of Critical Hits. Critical Hits result in systems going out of action, affecting the warfighting capability of the target.

8.2.1 Aircraft. An aircraft has been destroyed. There is also a chance that a fire has stared. Roll D10-4 on the fire critical table. A result of less than one means there is no fire.

8.2.2 Ammo/Fuel. Roll D10 with a 1-3 indicating a hit in the aviation ordnance magazine, a 4-10 a hit in the fuel storage.

If the magazine was hit, roll another D10. A roll of 9 or 0 means that the magazine has detonated, destroying the ship.

If the aviation fuel storage tanks have been hit, there is a Fire, adding two to the D10 roll for the severity of the fire. In addition, the chance of reducing the fire is reduced by 2 on a D10.

The player has the option of flooding/gas purging the Ammo/Fuel stowage areas. This automatically puts out the fire, but the carrier cannot launch or arm any aircraft for the rest of the game.

8.2.3 Area AA. Roll D10. On a 1-2, the fire control for the Area AA battery has been knocked out (armor penetration not required). See 8.2.9. On a 3-9, one of the gun mounts/turrets in the ship's Area AA battery is out of action. On a 0 (10), a gun's magazine has been hit. The mount/turret is out of action, and roll D10 again. On a roll of 9 or 0 the magazine detonates, inflicting four times the mount's Short Range damage points (HE shell) on the ship.

If an AA battery mount/turret is hit, roll randomly to see which one is destroyed. All mounts/turrets are counted, even if they are already out of action. If the mount has already been destroyed, no further damage is inflicted.

Each time mounts totaling one-quarter of the ship's area AA battery are lost (rounding up), reduce the Area AA strength by one-quarter.

Example: A *Fletcher*-class destroyer has five Mk30 127mm/38 guns in its area AA battery (these also serve as its main battery). If it loses one mount, that is not one-quarter of its battery. Losing two mounts is. Losing the third takes it to half, losing the fourth to three-quarters.

8.2.5 Bridge. The main conning station has been damaged. Roll D10. 1-6 it maintains current movement orders. 7-8 it circles to starboard at current speed. 9-10 it circles to port. Circles are made in 45° increments.

It takes four tactical turns to correct the steering problem. After the problem has been corrected, all changes to course and speed take two tactical turns to execute. Submarines lose all fire control solutions, and come to periscope depth. Submarines broach (involuntarily surface) on a roll of 1 on D10. Carriers cease flight operations. Minor fire in the bridge/control room.

8.2.6 Cargo. Some of the ship's cargo has been destroyed. If possible, allocate cargo to a hold/tank, then determine which hold or tank was hit. Refer to the cargo damage table to see what the results are.

8.2.7 Engineering. The ship's engineering plant has been damaged. Reduce speed to the next lower level on the Damage and Speed Breakdown chart. A Minor Fire has started in the engineering spaces.

8.2.8 Fire. A fire has started. Roll D10 to find out how bad it is.

1-5 Minor Fire. The ship loses 2% of its original damage points per intermediate turn until the fire is extinguished. Submarines must snorkel to ventilate the boat, or surface if not equipped with snorkel.

6-8 Major Fire. The ship loses 4% of its original damage points per intermediate turn. Ships must cease flight operations, maneuver to put the wind 30 degrees on either bow and slow to 15 knots or less. If they do not maneuver and reduce speed, add +2 to the die roll for reducing the fire.

The ship is considered illuminated at night for visual detection and gunfire purposes. It will also illuminate or silhouette other ships similarly to a flare or starshell.

9-10 Severe Fire. The ship loses 6% of its original damage points per intermediate turn. Ships must cease offensive and flight operations, maneuver to put the wind 30 degrees on either bow and slow to 15 knots or less. If they do not maneuver and slow, add +2 to the die roll for reducing the fire.

The ship is illuminated at night for visual detection and gunfire purposes. It will also illuminate or silhouette other ships similarly to a flare or illumination round.

Conflagration: A conflagration is defined by the US Navy as a fire which is out of control. If the total percentage of fires present on the ship is 15% or more, the ship is suffering a conflagration. There is a 25% chance per Intermediate turn (cumulative) that the ship's magazines will explode and sink the ship immediately. This may be avoided by ordering the magazines flooded in the plotting phase of an intermediate or tactical turn, but the ship loses all main battery, secondary battery, and aircraft ammunition. Only light AA ammunition is unaffected.

If the total percentage is not reduced below 15% on the next Intermediate turn, the fires are out of control and the order is given to abandon ship. If the percentage is reduced below 15%, the danger of conflagration is removed.

Damage Control: Reducing Fires. For each fire, roll D10 before the Plotting Phase of the following Tactical Turn and each following Intermediate Turn: 1-4 means that the fire has been reduced one level (2%), and minor fires have been extinguished; 5-8 means that the fire continues as before; 9-10 means that the fire increases one level of intensity (2%). A severe fire will not increase in severity beyond 6%.

Ships which reduce all fires to minor before the planned fire phase are not illuminated. If they have a major or severe fire, they are illuminated.

8.2.9 Fire Control. The fire control system has been damaged (main, secondaries or backup). Control must be shifted to either backup or local fire control systems.

8.2.11 Flooding. If a major breach is made in the hull, the affected area must be quickly isolated or the ship will sink. Damage to other sections, or failure to close off all possible paths for flooding water may make this difficult. Many ships in WW II were lost due to “progressive flooding.” For each flooding critical, Roll D10 to find out how bad it is.

1-5 Minor Flooding. The ship loses 2% of its original damage points per intermediate turn until the flooding is isolated.

6-8 Major Flooding. The ship loses 4% of its original damage points per intermediate turn. Ships must slow to 15 knots or less.

9-10 Severe Flooding. The ship loses 6% of its original damage points per Intermediate turn. Ships must slow to 15 knots or less.

Capsizing: If the total percentage of all flooding casualties on the ship totals 15% or more there is a risk that the ship will capsize (roll over). It is not the total amount of water in the ship, but the uncontrolled rate of entry, that creates a risk of capsizing.

The chance of this happening is 25% (cumulative), rolled each Intermediate turn until the flooding casualties are isolated reducing the percentage below 15%.

Damage Control: Isolating Flooding. For each flooding critical, roll D10 before the Plotting Phase of the following Tactical Turn and each following Intermediate Turn: 1-4 means that the flooding has been reduced one level in intensity (2%), and minor flooding is completely isolated; 5-8 means that the flooding continues as before; 9-10 means that the flooding increases one level of severity (2%). Severe flooding will not increase in severity beyond 6%.

8.2.14 Light AA battery. The ship’s light AA strength is reduced by one quarter.

8.2.15 Main Battery. Roll D10. On a 1-2, the fire control for the main battery has been knocked out (armor penetration not required). See 8.2.9. On a 3-0, one of the gun mounts/turrets in the main battery is out of action. Roll D10 again. On a roll of 9 or 0 the magazine detonates, destroying the ship. Ships within 500 yards of the exploding ship suffer damage equal to the battery’s HE damage at Short range.

If a main battery mount/turret is hit, roll randomly to see which one is destroyed. All mounts/turrets are counted, even if they are already out of action. If the mount has already been destroyed, no further damage is inflicted. If the main battery is also the Area AA battery, see also 8.2.3.

8.2.16 Other Weapon. One of the weapons listed for the ship in Annex A, except a main battery, has been knocked out. Roll randomly to find out which mounts have been hit. Previously hit mounts can be hit again. If the mount has already been destroyed, no further damage is inflicted. If there are no applicable weapons, ignore the critical.

If the weapon destroyed is part of the Area AA battery, see also 8.2.3. If it is a torpedo tube or an ASW weapon, see 8.2.20. If the weapon is an aircraft, see 8.2.1.

8.2.17 Rudder. The ship’s steering or control surfaces are damaged. Maximum speed is reduced to 1/3 of the ship’s undamaged speed. Course changes after moving the required advance are reduced from 45° to 15°.

Submarines lose depth control. A submerged submarine has a 5% chance times its speed to involuntarily change depth. Roll before each Plotting Phase. If the submarine does accidentally change depth, roll D10. 1-5 it goes up one level, 6-10 it goes down one level. The submarine will not exceed crush depth. A submarine which is at periscope depth and goes up one level will broach, but will automatically dive the following turn, unless another ‘up’ roll occurs.

8.2.18 Sensor. One of the radars, sonars, ESM, HF/DF, or searchlights is destroyed. Roll randomly to determine which one is affected. If all of the ship’s sensors are already knocked out from damage taken in previous turns, a minor fire is started instead.

8.2.20 Torpedo or ASW Weapon. A torpedo mount, depth charge rail or thrower, or ahead-thrown ASW weapon has been hit. Roll D10. On a 9 or 0, the mount’s ammunition explodes, doing one warhead’s worth of damage to the ship. If the mount has fired all of its weapons, there is no danger of explosion.

If a torpedo or ASW weapon does detonate, and the mount is above the waterline, treat the warhead damage as a bomb or gunnery attack for critical hit purposes. In other words, do not roll on the DC or torpedo attack table, since these columns assume underwater impacts. Use the critical hit column that best matches that ship’s type.

If a torpedo in the tube detonates, and is below the waterline (either on a sub or a surface ship) it inflicts an automatic flooding critical, and the damage points should be applied as underwater damage. Battleships with submerged torpedo tubes should ignore any torpedo protection system they are fitted with.

8.2.21 Weapon. One of the ship’s weapons has been knocked out. Check the total number of mounts carried by the ship and roll randomly to see which one has been hit. If the weapon destroyed is part of the ship’s Area AA battery, see 8.2.3. If is the Main Battery, see 8.2.15. If it is a torpedo tube or ASW weapon, see 8.2.20. If the weapon is an aircraft, see 8.2.1.

Startup Battle

This battle is typical of many that occurred near Guadalcanal. It is designed to be as simple as possible, the only deliberate complication being the visibility. Most WW II naval battles were close-range, fought either at night or in dirty weather. Long-range daylight surface actions were definitely the exception. The sooner the players become familiar with the visibility rules, the better.

First, read the rules on pages 1 to 14, then read the scenario information below. Statistics for the ships involved are on page 16.

Location: Iron Bottom Sound, 0000, Late 1942

Operational Situation: American Forces on Guadalcanal are struggling to defend their position around the island. Japanese naval forces attempt to resupply their garrison during the night, while US forces do the same thing in the daytime.

Tactical Situation: The Japanese Bombardment Group is screening a run of the "Tokyo Express," carrying reinforcements and supplies. The US force is screening the Marine positions from bombardment and also interdicting Japanese resupply efforts.

Environment: Night, visibility 25% (5 nm surface-to-surface), sea state 3. Dawn is 0430. There is a low solid overcast precluding the use of scout planes.

Japanese Forces:

Aoba, Kinugasa (Aoba class)
Asashio, Oshio, Michishio (Asashio class)
Kinryu Maru, Kinka Maru (*Kinryu Maru* class), carrying troops and supplies.

Japanese Orders: The Bombardment Group is to shell Henderson Field. The Reinforcement Unit carrying troops for the offensive to retake the airfield. The reinforcements will land at Tassafaronga during the bombardment.

Japanese Victory Conditions: *Decisive:* Both transports reach Tassafaronga by 0300 hours, and Henderson Field receives 500 points of damage. *Tactical:* At least one transport reaches Tassafaronga by 0300 hours and American damage points are double Japanese (counting Henderson Field).

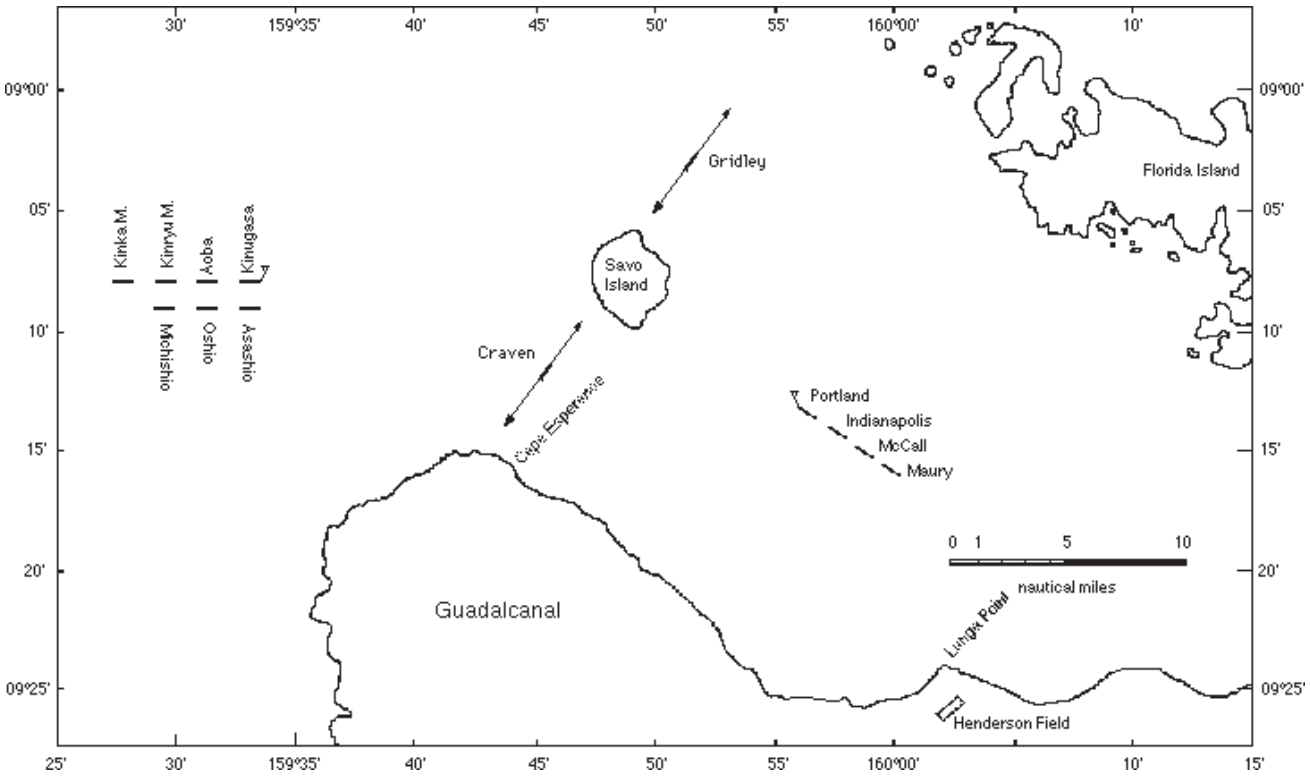
Allied Forces:

Portland, Indianapolis (*Portland* class)
Gridley, Craven, McCall, Maury (Gridley class)

Allied Orders: Intercept and prevent the Japanese from bombarding Henderson Field, and also prevent enemy resupply efforts in the vicinity of Tassafaronga Point.

Allied Victory Conditions: *Decisive:* Allies damage both transports over 50%, and Henderson receives zero damage. *Tactical:* Allies prevent Japanese from shelling Henderson (see special rules).

Setup: Place two of the American destroyers on picket duty, one between Savo Island and Cape Esperance, the other to the northeast of Savo Island. They are patrolling a 5-nm long track at 10 knots, and start at the southern end. The two American heavy cruisers and the other two destroyers should be placed in column 5-10 nm southeast of Savo Island. The Japanese are placed 10-15 nm west of Savo Island. Both formations are steaming at 15 knots.



Annex A- Ships (Extract)

Aoba (1940) — CA

Displacement: 9000 std
Size Class: B
Propulsion: Steam Turbine
Weapons:
In Class: 2
In Service: 1940
Crew: 657 - 680
Armor Rtng: 6/4

2F/A(2)3 Type II 8 in/50	**C**
P/S(1)4 10th Year Type 120mm/45	**C**
P/S(4)2 610mm TT w/8 Type 93 torp [4 reserve torp/mount available for quick reload]	**E**
1 Midships catapult	**-**
2 E7K2 [Alf]	**B**
Area AA: (1)4 10th Year 4.7 in/45	**(0.6)**
Light AA: (2)4 Type 96 25mm, (2)2 Type 93 13mm	**(1.2)**

Sensors: F/A 2 Type 94 LA fire control directors
Remarks: *Aoba, Kinugasa*. Originally commissioned 1927; rebuilt 1937 - 40. Configuration listed above is after 1940 refit.
Damage and Speed Breakdown:

Dam Pts:	0	64	128	192	230	256
Surf Speed:	33	25	16	8	0	Sinks

Asashio — DD

Displacement: 1992 std
Damage Points: 75
Damage Modifier: 1.00
Propulsion: Steam Turbine
Armor Rtng: 0
Weapons:
In class: 10
In Service: 1937
Speed: 35
Crew: 200
Size Class: C
Total Mounts: 12

F/2A(2)3 3rd Yr 5 in/50	**C**
6 DC rail w/1 DC	**D**
(2)1 Model 94 Y-gun w/8 DC	**D**
P&S(4)2 610mm TT w/ Type 93 torp	**E**
Area AA: (2)3 3rd Yr 5 in/50	**(.7)**
Light AA: 4 Type 96 25mm/60	**(.5)**

Sensors:
Type 93 (passive), Type 93 Model 1 (active) sonar
Remarks:
Four Type 93 torp reloads carried for each mount. Carried special reloading gear for TT, reload time 6 min. Total of 18 DC carried.
• 1942/43: 2 DC rail w/8 DC, (2)2 Model 94 Y-gun w/8 DC, 36 DC carried.
• 1943/44 Survivors had F/A(2)2 127mm, 15 25mm.
• Jan 44: Mark 2 Model 2 radar added.
• Apr 44: Type 3 Mark 1 Model 3 radar, Kai 3 and Model 3 ESM fitted.
• Jun 44: Lt AA increased to 28 25mm, 4 13mm, 4 DC proj and 36 DCs added, reload torpedoes removed.
Damage and Speed Breakdown:

Dam Pts:	0	19	38	57	68	75
Surf Speed:	35	26	18	9	0	Sinks

Kinryu Maru — AP

Displacement: 9310 grt
Size Class: B
Propulsion: Diesel
Weapons:
In class: 2
In Service: 1937
Crew: 47+12
Armor Rtng: 0
Remarks:
Ex-civilian merchant ships. Possible 3rd unit. Can mount six 5 or 6 in guns, actual armament unknown.
Damage and Speed Breakdown:

Dam Pts:	0	49	98	147	177	197
Surf Speed:	21	16	11	5	0	Sinks

Portland — CA

Displacement: 9800 std
Size Class: B
Propulsion: Steam
Weapons:
In class: 2
In Service: 1932
Crew: 1382
Armor Rtng: 7/5

2F/A(3)3 Mk14 8 in/55	**C**
P/S(1)8 Mk23 5 in/25	**C**
2 Midships catapult	**-**
4 O3U Corsair	**B**
Area AA: (1)8 Mk23 5 in/25	**(1.7)**
Light AA: 8 .50 cal	**(.6)**

Remarks:
Portland, Indianapolis. Also *Indianapolis* class. 8 inch gunhouses lightly armored, treat as deck armor at all ranges for critical hit penetration.
• 1936: SOC Seagull replaced O3U Corsair.
• 1941: *Portland* fitted with (4)1 1.1 in (Lt AA = 0.9).
• Apr-May '42: *Indianapolis* refitted, .50 cal removed, (1)8 20mm and (4)4 1.1 in added (Lt AA = 3.3)
• Dec '42: *Indianapolis* refitted, 20mm rearranged, (4)2 1.1 in, secondary director, fire control radar added. (Lt AA = 4.5)
• Apr - May '43: *Indianapolis* refitted, Quad 1.1 in replaced by (4)4 40mm, (2)2 40mm (Lt AA = 6.9)
• Oct '44: *Indianapolis* refitted, (2)2 40mm on fantail replaced by (4)2 40mm, new fire control radar added. (Lt AA = 8.4)
• Late 44: *Portland* had (4)4 and (2)4 40mm, 12 20mm (Lt AA = 8.9)
• May - Jun '45: Kamikaze damage repaired, starboard catapult removed, SOC-3 Seagull replaced by SC-1 Seahawk. (1)4 20mm removed and replaced by (2)2 20mm, (1)2 20mm removed, rest (6) replaced by twin 20mm (Lt AA = 9.9)
• 30 Jul 45: *Indianapolis* sunk by *I-58*.
• At war's end *Portland* carried 24 40mm, 32 20mm (Lt AA = 13.9).
Damage and Speed Breakdown:

Dam Pts:	0	68	136	204	245	272
Surf Speed:	32	24	16	8	0	Sinks

Gridley — DD

Displacement: 1590 std
Size Class: C
Propulsion: Steam
Weapons:
In class: 4
In Service: 1937
Crew: 158
Armor Rtng: 0

F/A(1)4 Mk24 5 in/38	**C**
P/S(4)4 Mk12 533mm TT	**E**
2 Mk3 DC rail w/6 Mk7 or 8 Mk6/9 DC	**D**
Area AA: (1)4 Mk24 5 in/38	**(1.1)**
Light AA: (1)4 .50 cal	**(.3)**

Sensors:
QC series sonar
Remarks:
Also 'Craven' class. Stability problems prevented fitting 40mm.
• Late 41: 4 Mk6 K-gun w/4 Mk6/9 DC added, 1(6) Mk10 20mm replaced 4 .50 cal. Total of 23 Mk7 & 16 Mk6 or 41 Mk6/9 DC carried.
• Mid-42: SC radar fitted to Craven
• Mid-43: Another 20mm added, another a little later.
• Nov 43: SC2 fitted to Craven, Mk4 (FD) radar fitted by Dec 43
• 1945: 2 TT mounts removed when ships transferred to the Atlantic.
Damage and Speed Breakdown:

Dam Pts:	0	16	31	46	56	62
Surf Speed:	38	28	19	10	0	Sinks