

Oops, I'm at Sea (1st Edition AD&D)

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Overview

I'm not sure there's a single area in the Dungeons & Dragons rules genre with more variation than ships and the sea (with the possible exception of unarmed combat). Ship names, size, hull points, movement, cargo, combat abilities, weather effects—all vary wildly across editions and expansions. Most systems start from scratch with complicated systems, creating another game within the game, instead of sticking to the core simplicity of 1st Edition. At the same time core 1st Edition is lacking too many specifics. I want something simple: What happens to a ship in inclement weather? How long until ships engage? When will a ship sink?

Starting with ship-based combat, I surveyed many D&D resources and board games and, finding nothing I wanted, started to build my own detailed system. Then I realized something. Much like BattleSystem, creating a detailed nautical combat system creates a new game. Perhaps a game that includes D&D characters, but still, a separate game. Not AD&D. For the players to learn sea combat, they would have to learn an entirely new game, instead of playing AD&D. I just needed dice to answer a few simple questions:

- Can the players encounter/escape a naval foe
- What happens when a naval foe is at range
- How long does it take a naval foe to close
- What happens while two ships close with each other
- What factors might affect those questions (when I wanted to use them)

Borrowing from the resources available, I hew closely to core AD&D rules. Rules scattered far and wide are consolidated and organized, filling in gaps. Proficiencies allow player agency. For critical life-or-death moments, tables provide granularity, but the generalities are treated, well, more generally.

In a sea-based campaign, talk will turn to shipping and trade. As 1e has little information on trade, I borrow from other resources (primarily Gaz 9—the most detailed resource for nautical trade). BECMI/RC uses different standards for ships, now converted and simplified for 1e. Instead of a detailed, world-based goods system, generic goods permit trade without complexity. The PCs need only to acquire (or hire) a ship, hire a crew, load a cargo, and sail to parts known (and unknown) for adventure and profit.

Ships

Used vessels are available for 20%-70% the cost of a new one, with additional costs of 20%–70% of a new ship's cost to refit the vessel.

Quality

Ships have four quality classifications (DRMG 107):

Unseaworthy: If rats scurry in droves down the ship's gangplank prior to departure, it's probably unseaworthy. In high winds, unseaworthy ships take hull damage in addition to the usual chances for a catastrophe: 1-2 points of hull damage in a strong gale, 1-3 points in a storm, and 1-6 points in a hurricane. Unseaworthy ships are capable of only 75% normal speed, and cost 10% to 30% below normal ship price.

Average: The normal quality of seagoing ships. They have approximately normal speed, costs, and capsizing chances.

Good: These ships are built with time and care. Good quality ships often serve as the flagship of a small nation's fleet or command vessels of a larger nation's fleet. They have -10% to any capsize and wind damage results percentages. These ships cost twice the normal price and will rarely be available for sale.

Excellent: The best ships are of excellent quality, designed by experts. built by masters, and are never available for sale, although they make a great prize in a naval battle. An excellent vessel serves as the flagship of a large seafaring nation's navy. They have only a 5% chance to capsize in a storm (a 15% chance in a hurricane) and take -30% to their wind damage percentage. They also speed through the water at +10%.

Ship Types

Ship speeds are expressed as: Normal Sail (Maximum Sail)/ Normal Oar (Maximum Oar), Normal Daily Movement Sailed/ Normal Daily Movement Rowed. Maximum Sail is based on a Strong Breeze. Maximum Oar is only possible for periods of 30 minutes.

*Note that sailing ships on the open ocean sail day and night, moving twice their normal movement.

Raft: A simple craft constructed from logs lashed together to form an awkward floating platform. Maximum size is 30' × 40'. Capacity: 10,000 cn / 100 ft². Hull value: 5. Crew: 1 / 100 ft². Characters can build their own raft if wood is available- this takes d3 days / 100 ft² with a capacity: 5,000 cn / 100 ft². 30% Seaworthy. Move: 3"/3", 12 miles. Cost: 10' × 10', 50 gp.

Rowboat (canoe, skiff): Length 8'-20', width 2'-4'. Capacity: 2,000-4,000 cn. Hull value: 1-4. This vessel can have a crew of 2-10 people, depending on size. Rowboats do not function well in breezes above 19 mph. Seaworthiness: 35%. Move: 6"(9")/3"(6"), 18/9 miles. Cost: 75 gp.

Lifeboat: The ship's lifeboat is designed for survival and has a collapsible mast. The length is 20', beam is 4'-5', and draft of 1'-2'. Capacity: 15,000 cn. Hull value: 1-4. Stored on-board typically is one week's iron rations for 10 people. Small ships usually carry one or two lifeboats. Large ships carry three or four. A lifeboat carried onboard has an capacity of 5,000 cn cargo in addition to crew. It takes a turn to launch or load a lifeboat. Seaworthiness: 55%. Move: 6"(9")/3"(6"), 18/9 miles. Cost: 150 gp.

Galleys are long, slim oared ships, generally used for travel along the coast. Galleys beach at night, since supplies and sleeping accommodations are very limited. Stepping/Unstepping masts is done only on galleys and longships. 10 crew accomplish the task in 3 turns.

Galley, Small (hemiolia): Built for coastal and lake use. The length is 60'-100', beam is 10'-15', and draft is 2'-3'. Capacity: 20,000 cn. Hull value: 2d6. Standard crew: 60 rowers, 10 sailors, 20 marines, 1 captain. This ship can have a ram (hull damage d4+2 × 3) and two light catapults. 40% Seaworthy. Move: 18"(27")/15"/(24"), 50/30 miles. Cost: 10,000 gp.

Galley, Large (dromond): Designed for oceans and large lakes. The length is 120'-150', beam is 15'-20', and draft is 3'. Capacity: 40,000 cn. Hull Value: 4d4. Standard crew: 180 rowers, 20 sailors, 50 marines, 1 captain. It has a single mast with a square sail. Although it boasts one or two masts and triangular sails, the main power comes from the 100 oars, 50 to a side. These oars are divided into an upper and lower bank, with one man per oar on the lower bank and three men on the upper bank. It can have a ram (damage d6+3 × 3) and two light catapults. 45% Seaworthy. Move: 12"(21")/12"(24"), 50*/30 miles. Cost: 25,000 gp.

Galley, War (cataphract): This large, two-masted galley is designed for combat. The length is 120'-150', the beam is 20'-30', and draft is 4'-6'. Capacity: 60,000 cn. Hull Value: 4d4+8. Standard crew: 300 rowers, 30 sailors, 75 marines, 1 captain. This ship always has a ram (damage d6+4 × 3), and the deck above the rowers has two towers (providing a +3 AC bonus), each 10'-20' square, height 15'-20', and can have up to three light catapults. 45% Seaworthy. Move: 12"/6", 36*/12 miles. Cost: 50,000 gp.

Longship (drakkar): This ship, a square-sailed, oared galley having a single mast that can be unstepped, is designed for river, ocean, or coastal use. It is fairly seaworthy and can sail across the open sea. The length is 60'-80', beam is 10'-15', and the draft is 2'-3'. Capacity: 40,000 cn. Hull Value: 2-16. Standard crew: 75 sailors (acting as rowers and marines), 1 captain. 50 rowers are needed for full speed. No ram. 60% seaworthy. Move: 15"/9"(18"), 45*/18 miles. Cost: 15,000 gp.

Sailing Boat (fishing): A small single-masted craft, designed for lake or coastal use. The length is 15'-45', beam is 5'-15', and the draft is 3'-8'. Capacity: 20,000 cn. Hull Value: 3-24. Minimum crew: 1 sailor; additional crew and captain may be hired. 70% Seaworthy. Move: 15"(21")/2"(3"), 60*/10 miles. Cost: 2,000 gp.

Sailing ship, Small (knarr, coaster): The small sailing ship has but a single mast and a square sail. There is at best only a small stern castle. In times of poor wind, a few oars at the bow and stern can provide more power. Its flat bottom makes it useful for sailing up rivers and estuaries, and it can be beached easily. The length is 60'-80', beam is 20'-30, and draft is 5'-8'. Capacity: 100,000 cn. Hull Value: 6-36. Standard crew: 10 sailors, 1 captain. It can support one ballista. 65% Seaworthy. Move: 15"(21")/2"(3"), 50*/20 miles. Cost: 5,000 gp.

Sailing Ship, Large (cog): This is a 2-3 masted ship with one or more decks. There is normally one deck and fore- and sterncastle. The length is 100'-150', beam is 25'-30', and the draft is 10'-12'. Capacity: 300,000 cn. Hull Value: 12-48. Standard crew: 20 sailors, 1 captain. The bow and stern are raised "castles" for better field of fire. It can support up to two artillery (ballistae or light catapults). 65%-70% Seaworthy. Move: 9"(15")/1"(2"), 35*/15 miles. Cost: 15,000 gp.

Sailing Ship, Troop Transport: Identical in size to the large sailing ship, this ship is designed to carry people. The capacity is double that of a large sailing ship. This vessel often has special modifications such as a hatch cut into the side for loading horses and other animals. Capacity: 600,000 cn. Hull Value: 16-56. Standard crew: 20 sailors, 1 captain, 100 marines. Seaworthy: 60%. Move: 12"(15")/0", 50*/0 miles. Cost: 22,500 gp.

Sailing Ship, warship (nao, carrack): Very similar to a large sailing ship, these vessels tend to be fast, but less seaworthy. The warship has three masts, the length is 70'-100', beam is 15'-25', and the draft is 12'. Capacity: 100,000 cn. Hull Value: 7-42. It can support up to four artillery (max. 2 catapults). The crew of a warship tends to be 2 or 3 men to work each ballista, 3 or 4 men to handle the catapult, and the rest to main the sails. It is possible to have 100 or more men on board, but because of the shortage of space for food and fresh water, the number is usually considerably less. 60% Seaworthy. Move: 12"(18")/2"(3"), 50*/20 miles. Cost: 20,000 gp.

Crew

Crewmen must be of the sort needed for the waters (fresh vs. salt) and the type of vessel:

- Small boats: river boat, sailing boat, canoe, ship's lifeboat, raft
- Galleys: small galley, large galley, war galley, longship
- Sailing vessels: Large sailing ship, small sailing ship, troop transport
- Flying vessels: aerial boat, aerial ship.

Trained sailors cost 2 gp per month. They never wear armor but will use almost any sort of weapon furnished. When not slaves, oarsmen are considered to be primarily sailor-soldiers; they cost 5 gp per month, wear any sort of armor furnished, and use shields and all sorts of weapons. Marines are simply soldiers aboard ship; they cost 3 gp per month and otherwise have armor and weapons of heavy foot as furnished, with one sergeant per ten marines for 30 gp per month. More experienced crew earn 50% more for each additional level of skill/experience.

For every 20 crewmen there must be one lieutenant and two mates. Mates conform to specifications of sergeants. A lieutenant can command as many decades as he or she has levels. A captain can command as many lieutenants, and as many scores of sailors as he or she has levels. Captains and lieutenants cost 100 gp per month / level.

The bulk of a crew's pay on a merchant ship is in shares of the ship's profits as well as a share of any prize or treasure taken at sea. ~50% is the traditional share of the profits (and all of the losses) for ship owners, with the remainder paid out to the ship's crew. For any crew, the master captain gets a 25% share, each lieutenant gets 5%, each mate 1%, and the crew share 5% between them.

Crew normally expect three days of liberty (shore leave) each month, or become tired and argumentative, and lose morale. Employment of captain and crew is a matter of offer and acceptance (see Hirelings in the DMG). There is of course always the press gang option for gaining crew: 2–16 burly sailors or soldiers armed with swords but wielding clubs. Outnumbered or incapacitated citizens may be shanghaied onto the ship (with appropriate ramifications for skill and morale).

Supplies

Iron rations cost 25 gp per week per five crew, but include dried fruit.² Sea rations of salted meat and hard tack cost only 7 gp per week per five crew (4 sp per day per crew³). Every five crew require one barrel of water per week. A small sailing ship can carry one month's worth of sea rations and water, a large sailing ship 2–3 months. The space taken up by base crew provisions does not affect the ship's cargo space. Additional supplies can be taken on: two weeks of additional sea rations and water for five crew equals one "load" of cargo (discussed elsewhere) and costs 9 gp. Once the ship has additional water barrels, the future cost is reduced to 14 gp per week with a supply of fresh water.

A crew living on sea rations for more than a month becomes susceptible to scurvy (and other vitamin-related diseases). 10% of the crew will be affected by scurvy for each additional week the crew goes without fresh food. Those with scurvy lose one point of Constitution and Strength each week until either reaches zero, and they die. Those points are regained at a rate of three for each week with fresh food. Eating edible cargo reduces the cargo value by 10% per week that the cargo is eaten.

In dire straits the crew can fish, ceasing ship progress. On the sea lanes or high seas there is only a 10% chance per week to net enough fish to feed the crew, increasing to 50% within 100 miles of the coast.

Gear

Mariner's armor: The most skilled tanners and armorers construct this special leather armor. It is not magical, but acts as if it were for swimming and diving purposes (equal to no armor). It is waterproof, as is normal leather. Cost varies according to region and economic conditions, but it is at least 20 gp, four times the cost of ordinary leather armor. It must be tailored to fit the individual and requires 30 days to construct.

Swimming

The base surface swimming speed is 1/3 the normal movement rate, twice that if unencumbered. For a swimmer moving beneath the surface of the water, the rate is reduced to 2/3 the base amount (rounded up). The base rate may be modified by one or more of the following factors:

Strength 16 or 17	+1"
Strength 18	+2"
Strength 18/01+	+3"
Swimming in light current	±1" to ±3"
Swimming with strong current	±4" to ±6"

The base diving rate is 2", doubled for a character moderately encumbered characters and tripled for heavily encumbered characters. The base surfacing rate is also 2", doubled for unencumbered characters. Character floating to the surface rise at the rate of .5"/round.

Swimming will be impossible when encumbered with more than 20 pounds of equipment of any type (add or subtract 1 pound for each 100 gp worth of strength bonus or penalty), or in any type of metal armor, with the exception of magic armor. Any character wearing magic armor will be encumbered but can dog paddle at 1"/round. Although characters wearing heavier armors cannot swim, they can walk across the bottom at 1/3 their normal movement rate.

Endurance

A character's base swimming endurance in turns is equal to: `total experience levels + current Constitution score`. A character only treading water doubles their endurance. Endurance doubles for the unencumbered, and halves for the heavily encumbered. Each hour spent swimming causes a cumulative penalty of -1 to all attack rolls. A character regains three turns of endurance for every turn resting on shore.

A character may choose to swim at high speed on the surface if a successful Strength check is rolled (vs. half the character's normal Strength score), doubling their movement rate but reducing their endurance to 1/10 normal. After such an action (regardless of duration) the character must get out of the water to rest for as long as they spent swimming at high speed, regaining only one turn of endurance for every one turn of resting.

All this assumes calm water. If the waters are choppy, a Constitution check should be made every hour spent swimming, regardless of endurance. Rough seas can require more frequent checks; heavy seas or storms may require a check every round.

Drowning

DRMG 107: When a person swims in water for an extended length of time, there is a chance that the swimmer will not be able to maintain his buoyancy; then they will drown. Consult the chart below, treating the magical armors of ring mail, chain mail, and studded leather armor as non-magical leather, to determine at what interval a drowning check must be made.

*No armor / unencumbered	2 hours
*At least 50 gp enc.	1 hour
*At least 100 gp enc.	½ hour
*At least 150 gp enc.	1 turn
*At least 200 gp enc.	5 rounds
Choppy seas	1 hour

Storm	1 turn
Cold water	1 turn or less (see below)

* Treat leather armor as 50 gp encumbrance. Magical leather is equal to no armor at all.

The base 25% chance for drowning is modified as follows:

- **Every previous drowning check made: +10%**
- Wearing leather or padded armor: +5%
- Every 50 gp enc. on person: +2% (includes weapons, backpacks, and hard boots)
- Salt water: -10%
- Treading water (0" movement): -15%
- Calm water and/or weak current: -20%
- Choppy water or moderate current: -0%
- Rough water or strong current: +15%
- Every level of sea-deity worshiper: -1 %/level
- Buoying device: -5% to -50%
- Storm / Winds above 35 mph (check every turn): +50%

Hypothermia

Exposure to cold waters increases the chance of drowning. A *ring of warmth* or similar magic item or spell will prevent hypothermia. Adjust the drowning roll as follows:

- Water temperature below 60°F: + 10%, check as normal
- Water temperature below 50°F: + 30%, check every turn
- Water temperature below 40°F: + 60%, check every two rounds

Holding One's Breath

All characters are able to hold their breath for one round, regardless of circumstances. A character can hold their breath underwater a number of rounds equal to $\frac{1}{3}$ of their Constitution score. This assumes that the character has a chance to take a deep breath before submerging. If the character did not have a chance to fill their lungs with air before going under, the time is cut in half (rounded up). If they engage in strenuous activity (such as combat), the time is also cut in half. These penalties are cumulative with each other. Characters reduced to $\leq \frac{1}{3}$ of their normal movement due to encumbrance are always engaged in strenuous activity.

While attempting to hold their breath beyond this time, the character rolls a Constitution check each round. The first check has no modifiers, but each subsequent check suffers a -2 cumulative penalty. Once a check fails, the character runs out of air, and goes unconscious. If underwater and unconscious at the end of a round, the character's HPs reduce to a virtual -10 (if not worse already).

Underwater Vision

Characters can see objects and movement up to 50' away in fresh water and 100' away in salt water. The depth limit of vision is the same as the distance limit: characters can see until they go below 50' in fresh or 100' in salt water; below this depth vision will be obscured. Use of a *Light* spell allows vision up to 30' distance regardless of depth, or adds 10' of vision to any distance shorter than 60'.

Infravision and ultravision are useful underwater, and their distance limits are the same as in dungeon settings. There are some problems, however: infravision users may become confused due to shifting currents and layers of different-temperature water, as water exchanges heat more slowly than air and therefore is of a less even temperature. Distance of ultravision is halved at 100' depth and reduced to zero below 200' as ultraviolet "light" does not penetrate beyond that depth in sufficient quantities for sight.

Seaweed or sea grass will reduce vision to 10' or perhaps nil for those within it, depending on its density.

Ship Movement

On the open ocean, vessels sail all day and all night long, doubling their normal movement. 1 mph is roughly 3". To simulate the effects of currents and winds on long voyages, reduce the overall movement rate by d4 x 5%.

Ships manned by less than their full complement (a skeleton crew) cannot exceed 2/3 of their normal movement rate. A ship with less than half the required crew is crippled and mostly drifts with the winds and current, also suffering a -2 penalty on all checks.

Any ship wanting to turn must let her momentum carry her twice her length before such a procedure may begin. Galleys are able to pivot only if they are dead still in the water.

Ships can reduce speed by half each round.

(Optional): The movement rates for normal sail assume that the craft is being moved in the direction of the wind, and that the wind is blowing between 20 and 30 miles per hour. Subtract 1" (one mile per half-day or 10 feet per round) for each 10 miles per hour of wind speed less than 20, and add 2" for each 10 miles per hour greater than 30. A vessel cannot be successfully sailed if the wind is less than 5 miles per hour.

(Optional): The rate for maximum sail applies if a vessel is moving at right angles to the wind, with modifiers for wind speeds less than 20 or greater than 30 miles per hour. A vessel being sailed into the wind has its normal sail rate reduced by 3" for each 10 mph of wind speed, to a minimum of 1" (1 mile per eight hours or 1"/round) in any case.

Weighing Anchor

Accelerate from standing to normal speed	
Oared craft	1 round
Small craft	2 rounds
Barge, Small	2 rounds
Galley, Small	3 rounds
Galley, Large	6 rounds
Merchant ship, Small	5 rounds
Merchant ship, Large/Warship	1 turn
Other actions	
Heave to	2-8 rounds
Get under way	1-6 turns
Raise anchor	3-18 rounds
In irons (see Appendix)	5-30 rounds
Launch john boat	1 turn

Rowing

Exhaustion will occur after the crew has rowed at their normal speed for 8-10 hours or at maximum speed for 30 minutes.

Navigation

Ships which do not have the appropriate charts are at risk when they navigate, especially if the vessel travels out of sight of land. The chance to find the proper chart is 65% adjusted $\pm 30\%$ for the size of port, with a cost of 2d12 gp, also adjusted for port size (± 8). For every 500 miles distant, the chance of finding a chart is reduced by 10%, and the cost increased by 5%. A standard chart covers 1,000 miles (assuming 500 miles from point of purchase).

To determine the accuracy of a course, plot the route between point of departure and destination, checking weekly by rolling d20 minus the Navigator's proficiency score (or 0 if no one is proficient). When a Navigation result is greater than 0, a ship goes off course or becomes lost at sea. Multiply the result by 5%; that is the percentage the course is in error. Only one roll may be made for a vessel each day, using the best navigation roll aboard.

The navigation roll is subject to the following modifiers:

- Two or more navigators in consort: -3
- No appropriate charts +2
- Strong breeze +2
- Ship is old or worn (unseaworthy) +2
- Ship sailing against strong current +3
- Ship sailing against moderate current +1
- Strong gale +5
- Storm or greater force winds +10

The following technological modifiers can be used:

- Primitive: Out of sight of landmarks +6
- *Rudimentary with Light cloud cover +2
- *Rudimentary with Heavy cloud cover +5

*Rudimentary technology include compass, cross-staff, astrolabe

After a storm, a successful Navigation check pinpoints the ship's current location and heading. Any time the ship encounters fog or overcast skies, a failed Navigation check will cause the ship will drift to a new heading, turning one hex facing for each point the roll was failed, and delaying travel appropriately.

Hazards

Hazards include sailing near reefs or other waterborne obstacles. For every five miles of hazard movement a Piloting roll is required (identical to the Navigation roll), subject to the following modifiers):

- Two or more pilots in consort -3
- Lighthouse in area -5
- No appropriate charts +2

- Ship is unseaworthy +2
- Strong breeze +2
- Ship sailing against strong current +3
- Light fog +3
- Strong gale +5
- Heavy fog (¼ mile visibility) +6
- Storm or greater force winds +10

If the ship misses the Piloting roll, it takes damage according to the severity of the hazard and the amount by which the piloting roll was missed (refer to the effect on the **Hull Burn** table):

Hazard	Missed by	Damage	
Minor	1-4	1 hull damage	Light
	5-7	2-4 hull damage	Light to Moderate
	8-20	3-6 hull damage	Moderate
Major	1-2	1 hull damage	Light
	3-4	2-4 hull damage	Light to Moderate
	5-20	4-8 hull damage	Moderate to Heavy
Critical	1-2	2-4 hull damage	Light to Moderate
	3-4	3-6 hull damage	Moderate
	5-7	4-8 hull damage	Moderate to Heavy
	8-20	5-10 hull damage	Heavy

Damage

Hull Value

A ship's ability to remain afloat is represented by its hull value. As a general rule of thumb, a new ship from a good shipyard will have the maximum listed hull value. A new ship from a less-reliable shipyard, or a well-maintained older ship will have somewhat fewer. A scurvy river barge that's taking on water will have the lowest possible hull value.

Hull damage caused by the various artillery engines, as well as that caused by various monsters and spells, is determined by using the SIEGE ATTACK VALUES in the DMG (extended as an Appendix). Unless noted otherwise, giant sea creatures and appropriate magic attacks inflict 1 point of hull damage for every full 10 points of damage. Attacks that force a ship to make a saving throw (such as a *Disintegrate* spell cast on the ship) use the **Item Saving Throw Chart** (DMG, p. 39) for determining results, where most ships are Thick Wood. When relevant, a hole made in the ship has a diameter (in inches) equal to the damage caused by the attack. For example, a strike inflicting 6 points of hull damage would tear a 6-inch hole.

Each 10% of hull damage slows the ship by 10%. Each 10% loss of rowers reduces a ship's rowed speed by 10%. When a ship has suffered 75% of its hull value in damage, the ship is dead in the water; it cannot move under its own power until at least makeshift repairs are made. When a ship is damaged 90%, violent wave action can break the weakened structure, inflicting additional damage: squall/storm, 1 hull damage / day; hurricane, 1-2 hull damage / day.

A ship damaged to 90% or received a "Leaking" Critical Hit will begin to leak. A leaking ship will sink in 2d10 turns unless two crewmen are dedicated to bailing. If this critical is suffered again, the leaks become more severe. As the water flows

in faster, five more crewmen must be assigned to keeping the vessel afloat. With enough leaks it will eventually become impossible to keep the ship afloat.

If a ship's hull value is reduced to zero, repairs are no longer possible. The ship cannot use ship-mounted weapons and on 4 in 6 the ship weapons are destroyed. The ship will sink to the waterline in d10 rounds and d12 turns later sink beneath the sea (rowboats will sink in d10 rounds). When the ship sinks, every character aboard must make a Saving Throw vs. Death or be sucked down with the ship. For this reason, most characters will try to abandon ship, entering the water first to avoid being sucked into the undertow.

Repair

For damage less than half of a ship's hull value, temporary repairs can be made at sea; the remainder requires the ship put into port for repairs. Repairs are not possible during battles, storms, or gales.

While the ship is idle, a repair crew of ten can repair one point of hull damage for each hour of work.⁴ These repairs are makeshift however, and will fall apart in d6 days.

In most civilized areas, one point of hull damage can be permanently repaired at a cost of 100 gp / day by a crew of ten trained workers in port. Poor (or cheap) characters can repair ships themselves; a crew of five individuals, with the correct materials and in safe harbor, can repair one point of hull damage per week. Materials can be acquired (at an approximate cost of 50 gp of material per point of hull damage, and one load of cargo space) or just landing at a vacant stand of timber and taking what is needed. Such repairs are almost as good as the expensive ones provided that at least one member of the crew has the Shipwright proficiency. A successful proficiency check must be made for each such improvised repair to succeed.

Dry docks cost 5 gp per day per hull point¹ ($\pm 50\%$ based on port size), but reduces the time required for general maintenance or repairs by 20 to 80 percent.

Upkeep

Ships require port maintenance every six months, as well as careening at the end of every year.⁵ Maintenance can also be done by beaching the ship, taking twice the normal time with risk to ship and crew (hull damage and crew fatality for each point of proficiency failure). Failure to perform annual maintenance lowers the quality of the ship by one place, and one place further every six months thereafter.⁵ A vessel also loses 10% of its speed for each month sailed without required maintenance. Ship maintenance takes one day for every five of the ship's maximum hull points, and costs 1 gp / the ship's maximum hull value / day.¹

Capsizing

A small craft (i.e., large rowboat) is 25% likely to capsize in mild (< 15 mph winds) conditions, 35% likely to capsize in moderate (16-30 mph) conditions, increasing to 50% in Dangerous (21-50 mph) conditions, and 65% in Severe (> 50 mph) conditions, checked whenever a character enters or leaves the boat, or when deemed appropriate. If operated under sail, the chance of capsizing is 20% greater. A character with the Boating (or, where appropriate, Sailing) proficiency reduces the chance by 25%, and 20% more for each additional character with the Boating proficiency.

A capsized small craft will support a number of characters equal to twice its normal capacity; that is, up to eight characters can cluster around the sides of a large rowboat and use it to keep from going under themselves. If this weight

limit is exceeded, or if the weight is not evenly distributed, the craft will sink too far below the surface to be usable in this fashion.

If a ship capsizes, the ship sinks immediately and escape by boat is impossible. All crew must Save vs. Death or be trapped in the wreck and killed.

Sea monsters that attack by ramming also have a chance of capsizing a vessel, but only on their first successful ram,⁵ later successful rams cannot capsize the vessel. Very small boats suffer an additional 10% chance of being capsized, small vessels +5%, large vessels -5% and very large ships -10%.

Collision

A collision is not a gentle bump against the dock; what is meant here is a situation in which two vessels crash together at three-quarters to full speed. Unless a vessel is carrying a ram, this action isn't ramming, it's colliding. Each ship suffers 10%-60% of the hull value of the ship that collided with them and suffers a "Ship Shaken" Critical.

A ship that runs on rocks or reefs takes Heavy hull damage (See the effect on the **Hull Burn Table**) every turn. On sand bars, it takes Moderate damage once; on mud banks, it takes no damage.

Fire

Fire is a great danger on shipboard, whether as a result of a critical hit, flaming pitch, or spells such as *Fireball*:

Fire Risk Table		
Fire Risk	Hull Damage	Notes
10 flaming arrows	Check Hull Burn Table	
Pitch (via catapult)*	d6/turn	
≥5 HD fireball	Check Hull Burn Table	10 HD checks HB Table twice. < 5 HD does only ½*HD Hull Damage.
≥8 HD Lightning	Check Hull Burn Table	HB Table roll at -3 (< 8 HD does ½*HD Hull Damage).
Fire Spell Lvl 3+	Check Hull Burn Table	25% chance of creating a blaze; if so, HB Table roll at -3.

* Any flaming catapult missile landing on a ship should be immediately doused. Otherwise, it has a 75% chance of spreading out of control. 5 crew put out burning pitch in 3 turns, 10 crew in 2 turns, and 15 crew in 1 turn. Pitch will always burn for at least 1 turn. Pitch carries with it a 5% risk of catching the *attacker* on fire.

When a ship has a risk of fire, roll 3d6 to determine the ship damage:

Hull Burn (HB) Table (from Controlled Fires)				
3d6	Hull Damage	Combined Effect		
3-7	1	Light (L)		Almost no damage.
8-10	2-4	Light Moderate (LM)	= 3L	Minor damage. No immediate repair needed.
11-13	3-6	Moderate (M)	= 2L + 1LM OR 2 LM	Minor repairs required to get underway (d4 hours).
14-15	4-8	Moderate Heavy (MH)	= 2M	Major repairs to get underway (min. d3 days).
16-18	5-10	Heavy (H)	= 2MH	Extensive repairs to get underway (min. d6 days).

A fire can be extinguished by one person on the first round for each point of hull damage, requiring one additional person for every subsequent round the fire burns. Each point of damage is considered one round of burning (i.e., 4

points of fire damage would take 4 crewmen to put out the first round, 5 crewmen the next round). Fire inflicts hull damage on the first turn, doubling on every subsequent turn if not contained.

Fire Burn Damage that equals or surpasses the Hull Value is considered a fire no longer under control, and the ship burns uncontrollably to the water line. Any fires magically fed and not countered due to time, lack of men, or capable magic-user have a 75% chance per turn of spreading out of control.

Direct attempts to set a ship ablaze may be undertaken only while aboard. This requires at least two flasks of oil to two cubic feet of dry combustible materials such as sacking, cloth, wool or wood kindling and still has only a 60% chance of successfully creating a blaze. Additional flasks of oil and combustibles will increase the chances by 10% for each extra flask of oil plus a further cubic foot of combustibles. It will take a full turn before such a fire takes hold, during which period it may be extinguished with a 15% chance for every person helping in the attempt. On the second turn after ignition the chance of successfully extinguishing the fire goes down to 10% per person involved; on the third turn the fire will be out of control and will burn the ship down to the waterline in a further turn.

Scuttling

Six man-sized creatures can decrease the hull value of a ship by $d2/round$ (+1 round for each creature less than 6) if appropriately armed and damaging a specific point.

Attempts to hole a ship require the use of axes and/or similar implements. If hit point damage is inflicted to one location equal to the ship's hull points, the ship will begin to take on water and sink in $d12$ turns.

Combat

Visibility

On a clear day a 6' tall character can see 3 miles to the horizon line. A character in a 60' crow's nest can see 9 miles. Any obstruction (such as an island) will provide cover which may reduce this distance. Land can be seen at a distance of 24 miles on a clear day. Ships can be identified (type, firepower, low or high in the water) at 300 yards on a clear day (or as little as 40 yards in dense fog).

Maximum Visibility (Crow's Nest)	Miles
Clear	9
Cloudy	3
Gale	2
Hurricane	1
Fog	1 or less

Sighting

When two ships enter visual range of one another, each ship makes a $d20$ roll each turn until it sees the other.

Depending on heading, it is possible for one ship to see the other first and attempt to fade back into the horizon before being seen. This roll can also be used to indicate sighting land, large sea monsters (at the horizon), or other items of significance. Success is defined by the quality of the crew:

Ship Sighting Table (Crew Quality Roll required on $d20$)

Landlubber	20
Green	16
Average	13
Trained	10
Crack	8

Range

A ship will normally first be spotted at maximum range. Normal range can vary based on visibility.

Distance	Range	Duration	Possible Actions
Distant	> 300 yards (max 9 miles)	d6 hours	Approach/ Evade
Normal	300 - 50 yards:	d6 turns	Approach/ Maintain/Withdraw, Spells, ship-to-ship weapons, missile weapons
Short	50 yards - Contact	d6 rounds	Approach/Maintain/Withdraw, Spells, missile weapons, Grapple/Ungrapple, Prepare to Shear/Ram
Boarding	Contact	1 round	Withdraw, Spells, missile weapons, Grapple/Ungrapple, Shear, Ram Board/ (unless Grappled),

Range changes are possible only every interval defined by Duration. Range increase/decrease will be evenly spread across the Duration.

Evasion

A crew spotting a distant ship can choose to evade:

Base chance of evading pursuit outdoors (d10)	80%
Pursued is faster	+10%
Pursued is slower	-20%
Original Positional Advantage (optional)*	+25% to -25%
Piloting Skill Check	+10%
Open water	-50%
Marsh	+10%
Light, daylight	-30%
Light, twilight	-10%
Light, moonlight	0%
Light, starlight	+20%
Light, dark night	+50%
Weather, cloudy day	+10%
Weather, gale	+20%
Weather, storm	+30%
Weather, fog	+50%
Ship Damage	-%hull damage

*Original positional advantage is determined by where the pursuer is in relation to the wind.

If Evasion is successful, the attacker has lost sight of the pursuing vessel and cannot attempt again until the following day, otherwise the two ships close from 30" in d6 turns if pursuer is <= speed, or at rate of closure.

Once the pursuer closes to 30", they have the opportunity to review their target. At that time the pursuer might choose to disengage. This flight is automatically successful if not pursued, otherwise they need to succeed on an Evasion roll in

order to return to Distant range (taking 1 turn if the former target turns to pursue) and leading the now pursuer on a merry chase before potentially disappearing from sight in d6 hours if successfully evading a second time.

Ship-to-Ship

Crews can fire upon one another whenever they come within missile range. Hand missile weapons such as bows and crossbows can damage or kill crew but do no effective damage against the ship itself. No more archers can fire effectively than the ship's base maximum crew.

Artillery

Armament on galleys ranges from a ram to ballistae; some of the larger ones may even sport a catapult. Only longships, galleys, and sailed warships can mount catapults; ordinary sailing ships cannot. Typical armament for merchant ships includes at most a ballista.

A light catapult costs 150 gp. A ballista costs 75 gp. A catapult and 20 rounds of shot weigh 20,000 cn (1 load). A ballista and 20 bolts weigh 6,000 cn. A ballista bolt is 10 gp / bolt. Catapult stones are 20 gp, and are approximately 1' in diameter. Pitch costs 25 gp and takes 3 turns to prepare.

	Range (Min/Max) ^a	Damage (S/M, L, Hull)			Rate of Fire ^b	Crew	Arc	Siege Defensive value	AC	Critical Hit
Ballista	1"/ 32"	2d6	3d6	-	¼-½	2-4	45 ^{oc}	2	4	20
Catapult, Light	15"/30"	2d10	3d4	4	¼	4	30°	4	4	20
Catapult, Heavy	18"/36"	2d12	4d4	6	¼	6	15°	6	0	19,20

^aThe -5 modifier for long range does not affect catapults or ballista.

^aIncendiary ammo (pitch) reduces range by 1/3, affects a 10'×10' area and causes d6 / turn of hull damage in addition to damage to the crew. All creatures within three feet of the impact and breaking point of the container missile must save versus poison or be splashed with the contents of the shattered container. Extinguishing the associated fire takes 3/2/1 turns with 5/10/15 crew.

^bRate of Fire can only be achieved with the requisite crew. If less than the requisite crew is available, RoF drops to at best 50% of normal, and for each crew member missing, the weapon takes one additional round to fire.

^cIt takes three rounds for a crew of four to reposition a ballista.

Ranged attacks on characters inside the crow's nest are at -3 'to hit' in addition to any other penalties. This reflects the defensive bonus from the 3' high walls of the crow's nest.

Hit Determination

The level of the weapon crew chief determines base THACO. Default Lvl 4, THACO: 18 (potentially adjusted for crew rating). Artillery can be either aimed at the ship's crew, artillery, or the ship itself. Catapult targets are considered to be AC 0. Ballista targets are considered to be AC 10. *When any of the various siege machines (ballistae, catapults, etc.) fire missiles, target characters do not gain Dexterity bonus considerations to Armor Class.* Galleys are AC 5, other ships are generally AC 0. Adjust the base numbers to hit using the following table:

Target Movement	
Stationary	+3
Movement Rate 3"-12"	-3
Movement Rate > 12"	-5
Target Size	
Medium ship	+2
Large Ship	+4
Subsequent shots (if stationary)	+4
Subsequent shots (if moving, max +3)	+1
Weather	
Calm	+1
Light to moderate breeze	0
Strong Breeze/Gale	-2
Storm	-4
Direct Fire (subsequent shots at stationary target)	+4

Contact

Stopping a Ship

Aquatic attackers typically stop a vessel by snagging the hull with a large net (acting as a sea anchor), or by attaching two sea anchors—one to the rudder (ripping it out) and one to the side of the ship (making the ship turn in circles). The attackers may then attach more sea anchors at their leisure to stop the ship. Both of these methods work 50% of the time, and reduce speed by 50%.

Ram

Only oared ships can perform ramming maneuvers as sailing vessels do not possess sufficient maneuverability. Only galleys normally mount rams; Viking-type longships seldom carry them. A large or small galley may have a ram, a war galley always will. A ship may only attempt to ram once / turn. Before any battle in which ramming is intended, the mast must be previously unstopped and secured on deck; 10 crew accomplish this task in three turns.

Ramming must be done head-on at full speed, with the galley striking the target ship at a 60-90" angle.

When ramming, use the helmsman's THACO against AC 8 to determine if the ramming is successful. The rammed ship suffers from 10% to 60% damage, and there is a 25% chance that it is holed below the waterline and will sink in 3-18 turns unless patched. A vessel rammed in the side loses 20% of its crew (15% must be rowers if the ship is oared). Patching a hole below the waterline requires five turns of work by ten men, and there is a 25% chance the job will not hold, requiring another five turns to replace.

If the ramming ship misses its target or reduces the opposing ship to 0 hull value (so that the opposing ship begins to break up), the ramming ship may continue its movement. Ship crews may grapple in the same round as a ram if so desired. If the ship hits its target without destroying it or is locked or grappled with the target, its movement stops.

After successfully striking, the ramming ship must backwater immediately or risk either sinking with the ship it rammed or being boarded by her crew if the hole is above the water line. It may take d12 turns before the ship sinks (rowboats and small rafts are the only vessels that sink in less than a turn). Both ships automatically suffer a Shaken critical hit.

A ship without a ram may nonetheless drive itself into an enemy, inflicting collision damage on both the attacker and victim (it may still be useful for huge ships facing rowboats).

It is possible for some monsters to make ramming attempts. A successful Save vs. Breath Weapon will reduce the damage by half. Gargantuan creatures take 1d6 points of damage per 20,000 cn. capacity (or fraction thereof) of an attacking ship (up to a maximum of 6d6).

Shear

A shearing attack is a close pass against an opposing ship with the intention of snapping oars to slow the ship's speed. Shearing can only be attempted against oared craft. The attacking helmsman's THACO against AC8 is used to determine success. A successful shearing attack will cause a Shearing critical hit (kill 50% of the rowers on that side of the opposing ship, and cause it to be dead in the water for three turns, thereafter moving at one-half speed maximum). If it has its oars sheared again it will remain powerless to move by rowing. Shearing attacks inflict no damage on the target ship's hull, but if a 20 is rolled for the attack, an additional Critical Hit results applies.

Grapple

Grappling may be attempted each round the ships are adjacent (50' or less). There is a 100% chance of success if both crews desire that outcome, otherwise success is indicated by a 1-2 on a d6, while a 3-6 means the other crew successfully casts the grappling lines free. Once a ship is grappled, there is a 25% chance of freeing the ship each round (assuming the crew are not otherwise occupied). It requires only one man to grapple or cut a grapple. Grappled ships immediately lose all maneuvering, and have their Movement reduce to 0" in 5 rounds. Once grappled, vessels may be readily boarded.

In addition to the classic grappling hook, several devices were introduced to assist in boarding. The corvus was a bridge 36' long and 4' wide carried upright in the bow on a swivel mount. The far end had several spikes on the bottom. When an enemy galley was close enough, the lines holding it up were cut, allowing it to fall and spike itself to the enemy galley. The harpax was an iron-bound ballista missile with several lines attached to a winch at one end and a grappling iron at the other. The idea was to grapple and winch in an enemy. Pots of flaming oil were carried at the end of long poles that could be extended from the bow and sides of galleys.

When a burning ship grapples an ordinary one, there is a 10% chance per turn that the new ship will also suffer a fire attack (see **Hull Burn** Table).

Boarding

Boarding attackers attack and defend at -2 the round they board, but receive a +1 bonus to attack if boarding from a higher ship. One crew can attempt to board every round for every 10' of length.

A crew outnumbered by 3:1 will surrender. A captain can order their continued fighting; his crew will only obey 1 in 6.

Rigging (UK1)

Those with *Climb Walls* will move at their normal rate, for others their movement rate is reduced by 25%. Those with *Climb Walls* must roll their percentage score or less to succeed, and others must roll their Dexterity or less on 3d6 to succeed. Failure means a fall with a 50% chance of going either into the sea or onto the deck (rolling 1d6 per 10' fallen). Fighting when aloft will be as normal for those with *Climb Walls* ability. Others will have -2 on their 'to hit' die rolls and their AC will deteriorate by one, though not beyond AC 10. It will not be possible for any character to employ both shield and weapon (or any two-handed weapon) at the same time while aloft; nor will it be possible to cast spells other than

those with a verbal component only. Crossbows may not be reloaded in a ship's rigging; solid footing is required to re crank the weapon.

Critical Hits

If a ship received a Critical Hit, further damage is indicated:

d20	Result	
1	Roll twice on this table	
2-4	Deck Crew Casualty	One exposed crew member is struck and suffers the same damage as the ship.
5	Interior Crew Casualty	Same as Deck Crew Casualty, but everyone aboard is a potential target, including prisoners and the captain. This reflects not so much the effect of the missile itself, but shattered parts of the ship's interior bouncing around during combat.
6-8	Ship Shaken	All characters not sitting or otherwise firmly tied down must make a Dexterity Check to maintain their balance or fall to the deck, disallowing any attacks or spell use that round. Characters in the rigging could fall.
9-10	Large Weapon Damaged	One large weapon (chosen randomly) is inoperable until repaired. Its crew is unharmed.
11-12	Sheared	Ship movement is reduced 50%, and 25% of the rowers are killed.
13	Fire!	See Fire.
14-15	Loss of Movement	The base move of the ship drops by 1".
16	Leaking	The ship begins to leak as the timbers groan. Such a ship will sink in 2d10 + 10 rounds unless two crewmen are dedicated to bailing.
17-20	Hull Holed	The attack punches a hole in the ship where there was none before. A hole made in the ship has a diameter (in inches) equal to the damage caused by the attack. For example, a strike inflicting 60 points of damage would tear a five foot (60 inch) hole. The hole is below the waterline, and the ship will sink in d6*10 rounds.

Underwater Combat

Human-types will also be somewhat slowed underwater, so aquatic creatures will always get the first chance to hit, unless the human is armed with a significantly longer weapon than the opponent. All surface dwellers suffer -4 to attack rolls (for ranged and hand-to-hand combat) underwater.

Hand-to-Hand: Cutting, slashing, and smashing weapons are not all that useful under water. They suffer a -10 penalty to hit and do only half damage. Trusting and piercing weapons (spears, tridents, daggers, short swords, lances) function normally.

Missile Weapons: Most missile weapons do not work underwater. Only crossbows made by undersea dwellers (such as mermaids) will function, and sell at ten times the normal price. Effective underwater range of these will be one-half normal (dungeon) distances.

Spells: Characters cannot cast spells at all underwater unless they have already cast *Water Breathing* or *Create Air* or are using a magical item that permits them to breathe. Many material components will be altered by or will not work correctly underwater.

Encounters

Under sail, there is a base 10% chance per week (or fraction of a week) of encountering unusual weather phenomena (Gaz 9).

Salt water encounters occurs 1 in 20. Check dawn and noon in coastal and shallow waters. When in deep water check only once during daylight hours (usually noon) (DMG).

Wind

Wind doesn't vary wildly across trade routes, so routinely wind results can be ignored. When required, wind is normally checked each 24 hours, and (if a change is indicated) changes over d12 hours.

Wind can potentially providing a 0-2 mph modifier to movement, depending on direction:

Wind Direction (d8): DMG			
1	North	5	Northwest
2	South	6	Northeast
3	East	7	Southwest
4	West	8	Southeast

Wind Force (3d6): DMG		Miles per Hour
3	Calm	0-1
4-8	Light Breeze	2-7
9-12	Moderate Breeze	8-18
13-15	Strong Breeze	19-31
16	Strong Gale*	32-54
17	Storm *	55-72
18	Hurricane*	73-136

*Any wind of strong gale force or better will have a chance to damage the ship. There is also a chance for men to be blown overboard. Checks should be made every 6 hours or until winds subside:

DMG:	Strong Gale	Storm	Hurricane	
Capsizing	1%	20%	40%	Ship will sink in d10 turns
Broken Mast	5%	25%	45%	Mast snaps, halving ship movement
Broken Beams	10%	35%	50%	Ship leaking, will take 1 hull damage / turn
Torn Sail/Rigging	20%	45%	65%	6 points halves ship movement
Man Overboard	10%	50%	70%	

Sailing ships can run before a storm, moving twice their normal rate in a random direction. If no coastline is reached in one day, the ship is safe. If the ship reaches a coastline, there is a 75% chance that it will be broken up trying to beach, and a 25% chance it will find a safe harbor. Any vessel without a sail, including galleys, may not run before a storm, and has an 80% chance of being swamped by any gale. If a galley is in sight of the coast when the gale first hits, if there is clear coastal terrain the galley may beach, otherwise the galley will find a safe cove on 1-2 on d6.

Unusual Weather (Gaz 9)

d100	Unusual Weather
------	-----------------

01-04	Becalmed
04-29	Clouds
30-54	Fog
55-57	Frozen Precipitation
58-78	Squall
79-92	Storm
93-94	Hurricane
95-97	Waterspout
98-09	Whirlpool
100	Iceberg

Becalmed: Lasts for d100 hours. In summer equatorial waters, instead lasts for d12 days.

Clouds: Lasts d10 days. Shortens distance at which objects can be sighted by 50%. Penalizes Navigation checks by -2.

Fog: Lasts d4 days. Vision reduced 20-80%, reducing speed by 50%. When within 50 miles of the coast, there is a 2% chance of colliding with another vessel; within 1 mile of the coast, a 10% chance of hitting submerged rocks/reef.

Frozen Precipitation: Lasts d4 hours. Dexterity checks to maintain footing.

Squall: Lasts d100+10 minutes, Force d4. Arrives in d3 turns. A successful Ship Sailing check allows judging probable force and best heading. Force 4, 10% chance that ballast or cargo shifts. Shifted ballast reduces movement by 20% and Ship Sailing rolls by -4. Shifted cargo inflicts one point of hull damage per five loose loads¹, and requires one day to resolve. Lightning accompanies 20% of storms, with a 5% chance of hitting the ship (see *Lightning* spell). (RC)

Storm: Strikes in 2d6 turns after it is sighted on the horizon, with a 5% chance to outrun. Lasts one day, with a 20% chance of continuing the second day and a 10% chance of continuing each day thereafter. For each day a storm lasts, the ship is blown d10 × 10 miles off course. Lightning accompanies 20% of storms, with a 5% chance of hitting the ship (see *Lightning* spell). Determine the storm's force with d6. Force 5 or 6 storms require characters on deck to roll a Dexterity check each day; a second failure indicates the character is swept overboard. There is a 10% chance that ballast or cargo shifts, doing two hull damage per five loose loads¹, and requires one day to resolve. The captain must make a Ship Sailing roll for each day of the storm to avoid damage, modified by -1 for Force 5, -2 for Force 6, and -2 for every 1,000 miles the ship has sailed without maintenance. An average ship takes one hull damage for each day in a storm.

Hurricane: A hurricane brings four days of stormy weather. It cannot be outrun or avoided. It is preceded and followed by d2 days of storms. A hurricane doubles the ship's normal movement rate. As Storm, but the storm-related damage is doubled. Characters on deck must roll a Dexterity check each day with a -4 penalty if not lashed to a safety line. A second failure has them swept overboard.

Waterspout: Most last for d20 turns, but 10% last for d10 hours. There is a 5% chance to hit the ship. If a ship is struck by a waterspout it rolls four times for storm damage, and double the severity of the effects. Persons on deck suffer 3d6 damage and are flung d10 × 10 yards away.

Whirlpool: 90% are natural phenomena lasting d6 hours. Can be avoided with a successful Piloting roll. If not avoided successive rolls are at a cumulative -2 each hour. A ship still caught at the end of the duration takes 2d10 points of hull damage. 75% of whirlpools can drag down only small craft (50 feet or less), while 25% can drag any size ship to the bottom. Ships are dragged into the whirlpool at 1" per round, cumulative (1" the 1st round, 2" the 2nd, 3" the 3rd). A ship must exceed the speed of the flow to escape. Otherwise, it will be dragged to the bottom in 6 rounds.

Iceberg: Ships can encounter ice floes in freshwater and icebergs in salt, the latter ranging from single mountains of ice to fields of 10-20 small ice mountains that continually break against each other and anything that gets in their way. The chief danger to ships from ice is damage to the hull (10-16 feet in freshwater, 10-60 feet in salt). Ice does 1-6 points of hull damage for every round it is in contact with the ship. In addition, icebergs at sea have a 10% chance of putting a hole in the ship (treat as rammed; see "Ramming" in the DUNGEON MASTER'S GUIDE). MM2

Monsters

At sea. Some monsters, such as a Sea Snake or a Dragon Turtle, will also attempt to capsize a ship if they should choose to attack it.

Typical Sea Monster Movement

Dolphin 30", Dragon Turtle: 3"/9', Eye of the Deep 6", Locathah 12", Merman 18", Octopus 12", Sahuagin 12"/24", Sea Hag 15", Sea Lion 18", Sea Horse 21", Shark 24", Megalodon 18", Squid 18", Whale 18"-24"

See also MM2 Aquatic tables.

Surface Encounters, Shallow Waters, Coastal Waters, Small Inland Seas

Dice Score	Creature Encountered	Appearing	AC	Move	HD	THACO	Damage	Size	In Lair	Other
01-02	Crocodile, giant**	d2-2d12	4	6"/12"	7	13	3d6/2d10	L	Nil	Surprise
03-10	Dinosaur- see Dinosaur Subtable	-	-	-	-	-	-	-	-	-
11-17	Dolphin	2d10	5	30"	2+2	16	2d4	M	Nil	
18	Dragon turtle	1	0	3"/9"	12-14	9-8	2d6/2d6/4d8	L	5%	Breath Weapon. Capsize.
19-20	Elf, Aquatic	d20×10	5	12"	1+1	18	d10/w	M	10%	Leaders. Dolphins
21	Ixitxachitl	10d10	6	12"	1+1	18	3d4	M	60%	Cleric spells
22-23	Koalinth (hobgoblin)	d20×10	5	9"	1+1	18	d8	M	25%	Leaders
24	Kopoacinth (gargoyle)	2d8	5	9"/15"	4+4	15	d3/d3/d6/d4	M	20%	+1 or better
25	Lacedon (ghoul)	2d12	6	9"	2	16	d3/d3/d3	M		Paralyze, Undead
26	Locathah	d20×10	6	12"	2	16	d8/w		10%	Leaders, Giant Eels
27-35	Men, buccaneer (warship)	5d6×10	-	12"	1	-	W	M	20%	Leader
36-63	Men, merchant*	-	-	12"	1	-	W	M	20%	-
64-67	Men, pirate	-	-	12"	1	-	W	M	20%	-
68-70	Men, pirate (tribesman with small craft)	-	-	12"	1	-	W	M	20%	-
71-73	Merman	d20×10	7	1"/18"	1+1	18	d8/w	M	25	

									%	
74	Nymph	d4	9	12"	3	16	0	M	100%	50% MR, Druid spells
75	Octopus, giant	d3	7	3"/12"	8	12	d4x8	L	70%	25% pin arm
76-80	Sahuagin	d4x20	5	12"/24"	2+2	16	d2/d2/d4	M	25%	Leaders, Sharks
81-83	Shark, giant	d3	5	18"	10-15	9-7	4d4-6d6	L	Nil	Swallow
84-86	Snake, sea	d8	5	12"	8-10	12-10	d6/3d6	L	Nil	Poison, Constriction
87-89	Triton	d6x10	5	15"	3	16	d8/w	M	25%	Leaders. Mounted
90	Turtle, giant, sea	d3	2/5	1"/15"	15	8	4d3	L	Nil	Non-aggressive. Capsize
91-96	Whale, carnivorous, small	d8	4	24"	12	9	5d4-15d4	L	Nil	Swallow
97-00	Whale, small	d8	4	24"	12	9	d8-5d8	L	Nil	Swallow

Surface Encounters, Deep Waters

Dice Score	Creature Encountered	Appearing	AC	Move	HD	THACO	Damage	Size	In Lair	Other
01-05	Dinosaur- see Dinosaur Subtable	-	-	-	-	-	-	-	-	-
06-13	Dolphin	2d10	5	30"	2+2	16	2d4	M	Nil	
14	Dragon turtle	1	0	3"/9"	12-14	9-8	2d6/2d6/4d8	L	5%	Breath Weapon. Capsize.
15-16	Man, buccaneer (warship)	5d6x10	-	12"	1	-	W	M	20%	Leader
17-25	Man, merchant*	-	-	12"	1	-	W	M	20%	-
26-27	Man, pirate	-	-	12"	1	-	W	M	20%	-
28-35	Merman	d20x10	7	1"/18"	1+1	18	d8/w	M	25%	
36-40	Octopus, giant	d3	7	3"/12"	8	12	d4x8	L	70%	25% pin arm
41-45	Sahuagin	d4x20	5	12"/24"	2+2	16	d2/d2/d4	M	25%	Leaders, Sharks
46-50	Shark, giant	d3	5	18"	10-15	9-7	4d4-6d6	L	Nil	Swallow
51-53	Snake, sea	d8	5	12"	8-10	12-10	d6/3d6	L	Nil	Poison, Constriction
54-55	Squid, giant	1	7/3	3"/18"	12	9	d6x12/5d4	L	40%	Pin
56-65	Triton	d6x10	5	15"	3	16	d8/w	M	25%	Leaders. Mounted.
66-68	Turtle, giant, sea	d3	2/5	1"/15"	15	8	4d3	L	Nil	Non-aggressive. Capsize.
69-72	Whale, carnivorous, large	d8	4	18"	36	7	15d4	L	Nil	Swallow
73-78	Whale, carnivorous medium	d8	4	12"	24	7	10d4	L	Nil	Swallow
79-85	Whale, carnivorous, small	d8	4	24"	12	9	5d4	L	Nil	Swallow

86-90	Whale, large	d8	4	18"	36	7	5d8	L	Nil	
91-95	Whale, medium	d8	4	21"	24	7	3d8	L	Nil	
96-00	Whale, small	d8	4	24"	12	9	d8	L	Nil	

Dinosaur Subtable

Dice Score	Creature Encountered
01-15	Archelon ischyras
16-35	Dinictys"
36-55	Elasmosaurus**
56-75	Mosasaurus**
76-00	Plesiosaurus**

"Encountered only in deep water, otherwise roll again.

*80% of encountered trading vessels will be carrying d100% cargo.

**If encounter occurs in fresh water, it must be a warm climate or roll again.

Income and Expenses

Trade Summary

1. Arrive in port
2. Harbor master
 - a. Determine port entrance (d10 + 10 gp) fees and moorage fees (80% available, 1 gp/hull point/day or 5 gp anchor)
 - b. Pilots, towage, port of origin and next destination
3. Determine Customs timing, appraisal, and taxes (if offloading cargo)
4. Determine merchant interest in goods
 - a. Determine how many merchants are available each week
 - b. Determine sales price of goods
 - c. Determine time to offload cargo (depends on moorage)
5. Determine merchants with goods available
 - a. Determine how many merchants are available each week
 - b. Determine quantity, cost, purchase value of goods
 - c. Determine time to load cargo (depends on moorage)
6. Determine if merchant seeks cargo ship for hire to specific destination (5% + 25% if solicited)
7. If known destination, determine passengers seeking passage
8. Determine if passengers seek transportation for hire to specific destination (5%)
9. Depart to destination

The Cost of Doing Business

There are a number of fees associated with sea travel. Most ports charge a port entrance fee of 10-20 gp (depending on port size). It is possible to find a moorage berth 80 percent of the time. Ships that cannot find a berth may anchor in the harbor at a distance from the docks and quays. Moorage costs 1 gp per day for each hull point, or a flat 5 gp per day to anchor in harbor.

Representatives of the harbor master visit newly arrived vessels to assess docking and other service fees. The representatives have the authority to quarantine or turn away undesirable ships. They can also require or provide pilots, required to navigate in and out of difficult harbors for a 10-60 gp flat fee. They can also provide towage at a cost of 1 gp per hull point, required for large ships through congested harbors. When inspecting an arriving vessel, the harbor master also asks its port of origin and the next destination. This information is posted at the port authority office.

Port entrance fee	10-20 gp
Moorage	1 gp / hull point
At Anchor	5 gp / day
Piloting	10-60 gp
Towage	1 gp / hull point

Cargo

Port agents can be used as middlemen to ease process of the buying and selling of cargo. They have Appraisal and Bargaining skills of 10 + d8 + a d6-1 bonus. They make 2d10 + 5% of the sale profits or purchase, but remove the requirement for an available merchant at the cost of one level of demand.

Cargo Capacity

Measuring a ship's cargo capacity as "tonnage" derives from ships carrying barrels holding 250 gallons of wine. Cargo capacity is determined on the basis of the number of available "loads" of goods, defining one load as a half-ton of goods (10,000 cn). A 10-ton ship can therefore carry 20 loads of goods. Considering the load capacity for carts and wagons listed in WSG, one wagon can carry one load. A cart can carry one-half load, a large wagon with many horses can carry 1.5 loads.

A horse or cow consumes fodder weighing 200 cn / day; this feed takes up additional cargo space. The encumbrance of one crate equals 200 cns.

Cargo for Hire

There is a 5% chance per port that a merchant will offer to hire a vessel for d12 cargo loads of goods to another destination (Type determined per Available Goods below). This chance increases by 25% if the crew actively solicits such work. A shipper is typically charged 40 gp per ton (two loads) of cargo space per 500 miles, with a minimum fee of 100 gp, with no requirement to fill the hold. Normally half the payment is made in advance, and the remainder paid by the shipper's agent upon arrival. Bonuses for early delivery and hazardous travel conditions are negotiable.

Buying Cargo on Speculation

While there could be a complicated listing of specific cargos available and demanded at each port (wine, cotton, fish, etc.), a simpler system defines generic cargo as the associated components: value, distance, demand. These basic components can be used to determine profit for any shipping venture.

Merchants in port will buy and sell cargo. There will be d6 (± 2 depending on port size) merchants interested in transacting with the PCs (modified by the PCs Charisma Reaction Adjustment). One half of the merchants are available the first week in port, one quarter the 2nd week, and any remainder at 1 per week.

To determine the **Base Price of Available Goods** on 3d6:

- Per load³: (1-3: 50 gp), (4-8: 100 gp), (9-11: 150 gp), (12-16: 200 gp), Precious (17-18: 500 - 1,000 gp^{1,2})

¹The suggested value for monsters is 100 gp / HD, times 10 for each special or exceptional ability.

²10% of all Precious cargos will be worth 1,000-10,000 gp.

³25% of all cargos will be perishable. 25% of the cargo will perish if the ship is delayed for each unit of travel (a trip measured in days, weeks, or months).

Note: An Appraisal check can modify the amount paid by 1% times the difference.

Each merchant can deliver a varying amount of goods. To calculate the number of loads available from any particular merchant roll 3d8, subtract the previous roll for the Base Price, and modify based on the port size (± 2).

Selling Cargo on Speculation

Merchant interest at the destination is calculated similarly to the port of origin. The Sale Price at the destination is determined using the **Base Sale Adjustment Table**. Roll 3d6, modified by:

- Distance: Short (1-2, < 50 miles, -2), Medium (3-4, ≤ 500 miles, 0), Long (6, > 500 miles, +2)
- Demand (modified by the Trade proficiency): Low (1-2, -2), Average (3-5, 0), High (6, +2)
- Port Size: ± 1
- Bargaining Proficiency: ± 1
- Precious goods: -2

3	30 percent
4	40 percent
...	...
16	160 percent
17	180 percent
18	200 percent
19	300 percent
20	400 percent

The Loading and Unloading of Cargo

Cargo cannot be unloaded until inspected by Customs. Customs inspectors normally board within d6 hours. In a busy harbor or a place with lazy customs officials this could be as long as d20 hours. Customs officials generally have an Appraisal skill of 10 + d8. If a failure is on an odd number, the evaluation is low. The appraisal is off by 5% times the amount of failure.

After evaluating a cargo the customs inspector assess a tax which can range from 1% to 100% of the goods' determined value, with an average customs fee of 2d10 percent.

At a dock, five crew can unload one load of cargo (10,000 cns) per hour during daylight with reasonable weather conditions (provided the cargo is not particularly awkward). Adverse conditions can double or triple that time. Loading the ship takes 50% longer as the cargo must be carefully stowed and secured. If dock workers are available they can be hired for 2 sp per hour.³

Moving cargo to the shore in smaller boats increases loading and unloading time. At anchorage, it takes 75% longer to offload to a dock (one long boat required per five crew), and 150% longer if unloading to a beach. Rowing a loaded jolly boat through the surf additionally requires a Boating proficiency check for each round trip.

Passengers

There are typically 2d4 - d4 passengers seeking passage at any port, ± 2 depending on port size at both port of origin and destination. Passengers are usually charged 20 gp per 500 miles traveled. There is also a 5% chance per port visited that one or more passengers travelling together want to hire a ship to go to a destination of their choice. If this occurs, they desire to sail to the most remote port within $2d20 \times 100$ miles. If passengers hire a ship to go to the destination of their choice, they pay as if they shipped enough to fill the cargo hold at 40 gp per ton (two loads) of cargo space for each 500 miles, with a minimum fee is 100 gp. A round-trip fee can be charged if there is no possibility of cargo at the destination. As a general rule, a ship can substitute one passenger for every load reduction. A ship can accommodate passengers equal to 20% of the standard crew complement.

High Seas

Governments issue letters of marque to harass an enemy's shipping in war time and in peacetime to suppress piracy and smuggling. Once a privateer has captured a prize, it must bring or send the captured ship to a port in the country issuing the letter. There, a Prize Court determines if the prize was covered by the letter; if it was, the ship and its cargo are then auctioned. The government has the right to buy the ship for itself before auction. The privateer keeps 75% of the price and the remainder goes to the government.

Merchant Guilds

In a merchant sailor's guild, roughly 50% of the cargo carried is transported for hire. A variable amount is charged, based on volume, weight, and value of goods. 40% of those shipping fees go to the ship's crew as shares (the remainder goes to the Guild). About 20% of guild shipping is carrying goods on consignment, with 10-40% of the profit to the ship's crew. About 30% of guild shipping is speculative cargo bought and sold by the captains themselves, with 80% of the profit going to the ship's crew as shares.

Proficiencies

Appraisal: The skill of Appraisal is the ability to figure out what something is worth, used to evaluate the worth of a cargo. The evaluation is low on an odd-numbered failure, and off by 5% times the amount of failure. Merchants typically sell for 10-40% more than appraised value, and buy at 10-40% below appraised value.

Artillerist: Proficiency in siege artillery (catapult, ballista). Required for use of catapult. Permits the operation of artillery OR supervision of artillery construction. To both operate and construct artillery, this proficiency must be selected twice. Any supervised person with appropriate material can construct $\frac{1}{2}$ HP of equipment /day (maximum workers = $\frac{1}{2}$ the HP of the finished product). An artillerist is a hireling (150 gp / month) trained in the operation of siege artillery. Intelligence, -2 penalty.

Bargaining: The skill of Bargaining is the ability to get the best possible price for goods, services, or information. If Bargaining between two characters with the Bargaining proficiency, determine the difference between the two skills. Multiply the difference by 5%. The result is the price adjustment. The superior bargainer improves the price or decreases the cost by the indicated price adjustment. Charisma, -2 penalty.

Boating: Permits normal usage of small craft. Characters with boating proficiency is needed to guide a small boat (small boat, canoe or kayak.) In addition, a character with boating proficiency can insure that a boat is propelled at its maximum speed. In a small craft containing no proficient characters, or one in which at least one non-proficient character is doing some of the work of rowing or sailing, the following penalties apply: the movement rates of small craft

are reduced to 2/3 of normal; the chance of capsizing is increased by 25% in any situation where the chance is normally greater than 0%, to a maximum of 100%. The chance of capsizing is reduced by 20% for each proficient character after the first. Wisdom, +1 bonus.

Boatwright: Allows constructing all sorts of watercraft up to a maximum size of 40 feet long. The time period required to build a boat depends on its size. As a general guide, a boat requires one week of construction time per foot of length. Two characters with Boatwright proficiency cut this time in half; three reduce it to one third, etc. A maximum of one Boatwright per five-foot length of the boat can work on the vessel simultaneously.

The basic boat includes the hull, masts, deck, and benches as required. Additional features such as a cabin or sealed hold add about a week apiece to the construction time. Characters without Boatwright proficiency can aid the Boatwright in construction, but it takes two such characters to equal the time savings that one additional skilled Boatwright would provide. Intelligence, -2 penalty.

Shipwright (DRMG 107): See Boatwright. Character knows the arts of ship construction and can determine its quality with minimal inspection. The character is knowledgeable regarding techniques for ship construction and repair. He can design and build ships of all types, with a proficiency check only being required for an unusual feature. The character can perform routine maintenance on sailing vessels or galleys, including repairing sails and caulking the hull, without a proficiency check. A shipwright need not have other workmen to finish small vessels, but vessels of any size require large crews of shipwrights and other laborers to build or repair. 2 slots, Intelligence, -2 penalty.

Navigation (DRMG 107): The character has learned the arts of navigating by the stars, studying currents, and watching for telltale signs of land, reefs, and hidden danger. This is not particularly useful on land. At sea, a successful proficiency check by the navigator reduces the chance of getting lost by 20 percent. A character with the Ship Sailing proficiency can attempt to Navigate with a -10 penalty. Intelligence, -2 penalty.

Piloting (DRMG 107): Piloting is the science of directing a ship through a hazardous area (e.g., an icefield, lake with jutting rocks at irregular intervals, a reef, or a strong current which pulls ships into danger), and is specific to ship type:

- Small boats: river boat, sailing boat, canoe, ship's lifeboat, raft
- Galleys: small galley, large galley, war galley, longship
- Water vessels: Large sailing ship, small sailing ship, troop transport

A character with the Piloting skill also decreases the chance of capsizing by 10% and increases shearing attempts by +2. Wisdom, +1 bonus.

Sea Lore (Gaz 9, DRMG 107): This skill is similar to a bard's legend lore, but deals with knowledge of nautical legends, such as recognizing the names of sunken ships and remembering their history, recognizing uncharted islands from rumors and reports of landmarks, identifying sea monsters and ghost ships, etc. Intelligence, -2.

Seamanship: The character is familiar with boats and ships. He is qualified to work as a crewman, although he cannot actually sail or navigate. Crews of trained seamen are necessary to manage any ship, and they improve the movement rates of inland boats by 50 percent. Those with seamanship will not be required to roll for success when aloft in the rigging under normal conditions, and can fight as normal. Dexterity, +1 bonus.

Ship Sailing: Character knows how to sail a ship. This skill does not give the ability to navigate. Intelligence, +1 bonus.

Ship Carpentry: Character can make common shipyard repairs, including to masts, and can build boxes, barrels, and other containers. Intelligence, 0.

Signaling: Those proficient know a common flag code and a common conch-horn code, and may pick up new codes.

Trade: A character with the Trade proficiency is more likely to have goods to sell that are demanded at the destination, and will modify the Demand ± 1 with a Trade proficiency check.

Vessel Identification (Gaz 9): Upon seeing a vessel, the character can judge things about it by her lines, rigging, and flags (if any). Use of this skill gives a good idea of the ship's country of origin, its type, armament, speed, and crew compliment. Intelligence, 0.

End Notes (see also Bibliography)

¹ Number scaled from Expert and Gaz 9 to AD&D based on a 5:1 difference in hull points.

² Based off of 1e AD&D numbers.

³ Doubled due to the 20:1 ratio for silver in AD&D.

Appendix A: Siege Attack Values (Against Ships)

Source of Damage	Hull Damage
Bigby's Clenched Fist	1/round
Catapult, Light	4
Catapult, Heavy	6
Disintegrate	2
Fireball & Delayed Blast Fireball	½ per HD (if <5 HD) + Fire (if >= 5 HD)
Flame Strike	4 + Fire
Gust of Wind (hostile)	(10% chance / level of putting sailing vessel in irons)*
Horn of Blasting	18
Incendiary Cloud	½ per 6 hp damage done, Fire
Lightning Bolt	½ per HD (if < 8 HD) + Fire (if >= 8HD)
Meteor Swarm (2' sphere)	3 each
Meteor Swarm (1' sphere)	1½ each
Wall of Fire	2 + Fire
Wall of Force	As per collision
Warp Wood	1 (Level 5-9), 2 (Level 10+)
Sea Monsters	1 hull damage for each 10 hp inflicted unless otherwise indicated

* A vessel in irons (as noted above) is temporarily out of control. How long the vessel stays in irons depends on how quickly the cause is remedied. For the loss of a mast or a poorly executed maneuver, the vessel is in irons for 5-30 rounds. Once in irons, a vessel has no control over its course, cannot fire its artillery, and does a fair job of imitating a sitting duck.

Appendix B: Potential Modifiers (Optional)

The following modifiers can apply to dice rolls when evaluating ship-to-ship movement and combat:

	-2	-1	0	+1	+2	Special
Crew Quality	Green	Average	Trained	Crack	Old Salts	[Wounded]
Crew Quantity	None	Skeleton/Crowded	Normal	Enhanced	Peak	
Crew Morale	Afraid	Nervous	Normal	Confident	Fervent	
Wind	Calm	Light Breeze	Moderate	Strong	Gale	[Favorable]
Range	Distant	Long	Medium	Short	Contact	
Ship Size	T (< 8')	S (8'-19')	M (20'-59')	L (60'-100')	VL (100'+)	
Ship Status	Crippled	Leaking	Normal	Good	Advanced	[Fire], [Sinking]
Movement	Slow	Slower	Same	Faster	Fast	[Sailed]

Visibility	Foggy	Hurricane	Rain/Storm	Cloudy/Twilight	Clear	[Darkness]
Maneuverability	E	D	C	B	A	[Rowed]

Crew Experience

Training: 6 months landlubber, then 1 year as green/scurvy rats. 50% will then advance to Average (Mates) in 6 months. Trained requires many long voyages at sea, typically on different craft, and experienced in combat. Crack crews are very specialized, for a specific crew, ship, and captain.

Appendix D: Random Notes on Seaworthiness (unused)

Of Ships & Sea, Fallen Stars

Damage: Light, Moderate, Heavy affects seaworthiness?

Seaworthiness rates the vessel's ability to remain afloat in dangerous situations, notably storms, hidden shoals, extended voyages, huge monster attacks, and rams. Whenever a ship is rammed, struck by catapult stones, pierced by a ballista shaft, or partially disintegrated, there is a chance the damage caused will be serious enough to cripple or sink the vessel. This is determined through seaworthiness checks and critical hits.

Any time there is a chance of sinking, he rolls percentile dice. If the roll is equal to or less than the seaworthiness rating of the ship, it remains afloat, though bailing or repairs may be necessary. If the roll is higher than the seaworthiness rating, the ship suffers critical damage.

Ports and anchorages give a seaworthiness bonus of +50%. Thus, vessels at anchor are in little or no danger from a normal storm.

Hits reduce seaworthiness by 5%. Failure causes a critical hit.

In most civilized areas, 5 percentage points of seaworthiness can be replaced or repaired at a cost of 2,000 gp in 1d6 days by a crew of ten trained workers. Poor (or cheap) characters can repair ships themselves. A crew of five individuals, with the correct materials, can repair five percentage points in a month at sea.

Such repairs are just as good as the expensive ones, provided that at least one member of the crew has Shipwright proficiency. A successful proficiency check must be made for such improvised repairs to succeed.

S&S: A storm (worse than a gale) imposes a 15% penalty to Seaworthiness checks. Make one Seaworthiness check each day a storm or gale lasts. A ship that fails a seaworthiness check sinks in d10 hours. A roll of 20 (96%-100%) means the ship has capsized; the ship sinks immediately and escape by boat is impossible. All crew must save vs. death or be trapped in the wreck and killed.

Grounding happens when a ship enters coastal waters in fog, storm, or game. A failed seaworthiness check indicates the ship has run aground. The ship can be repaired and refloated after d6 days of work, but all future Seaworthiness checks suffer a 15% penalty until properly repaired. Ships that ground on a rocky coastline sink in d3 hours. A natural 20 indicates the ship splinters and sinks immediately in the jagged rocks of the coastline.

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