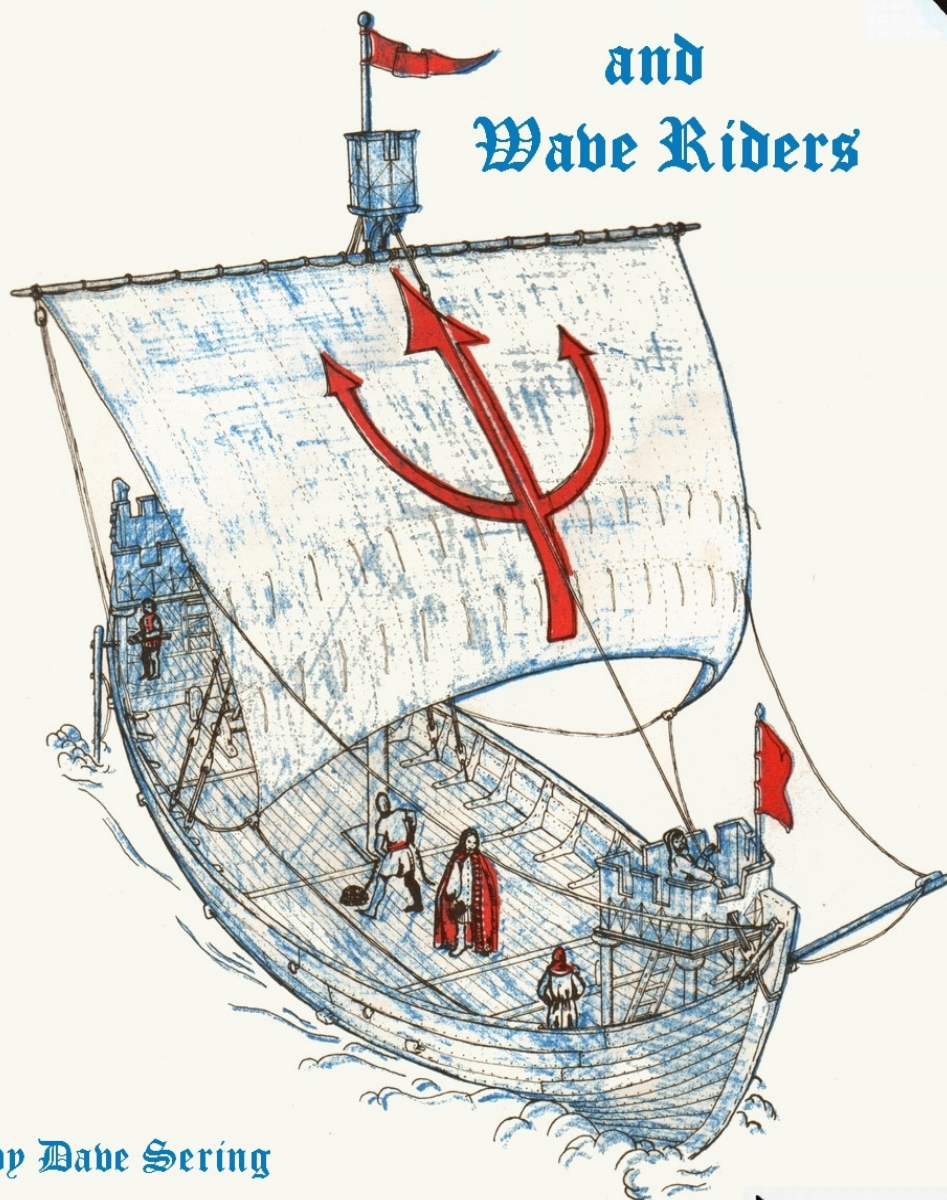


# Judges Guild



## Sea - Steeds and Wave Riders



by Dave Sering

Ebook Revision



A Judges Guild  
**UNIVERSAL**  
FANTASY SUPPLEMENT

JG 1310





# SEA-STEEDS AND WAVE RIDERS

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**JG-1310**

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## Introduction

From the days of man's early history, up until the invention of the railroad and the development of an efficient road system, the only practical means of moving large quantities of goods or heavy items was by water. Since the relative levels of technology in your fantastic universe are similar to those of Earth in the middle ages, we must assume this holds true here also. Thus, any item too bulky to fit into an ox cart, or items which require more than a couple of mules to carry them, are more cheaply moved by water transport. True, some of you very high-level magic-users could summon up a dragon or two for fast "air freight" service, but at what it's going to cost you, I don't expect you are going to do it very often. It's much less expensive to ship by boat, and as for travel, it draws far less attention.

Water transport effectively divides into two categories; that of inland waterways, such as rivers, lakes, and canals; and that of the seas and oceans. The principles of operation are the same in each category, though the hazards encountered are different in degree of severity. Weather hazards are much more important at sea, although large lakes can have as severe storms as any ocean. Depending upon the type of vessel, and her seaworthiness; rough weather and high seas could lead to your character suddenly visiting mermaids unannounced.

Vessels may be classified by size or use. There is no hard or fast dividing line, but for our purposes, we will consider all vessels of 40 feet or less to be small craft. Small craft tend to be multipurpose. Though the methods of construction are quite similar, due to the modifications to obtain designs efficient for special purposes, appearances differ radically. A ship is basically a box made of wood. It has a framework of thick sticks (frames) to maintain the shape and a thin skin of planks (hull) to keep the water out. This "box" is moved about from place to place by the wind, the currents, and muscle-power. Those ships which are built for the purpose of causing harm to other ships and men are quite logically called "warships." Those ships which are built to carry goods from one place to another are called "cargo ships" or "merchant vessels." Some ships have characteristics of both types: Viking Long Ships not being used to fight other ships, but to carry a bunch of fighting men to someplace where they may loot, plunder, or stage other fun-type activities.

The requirements to build any ship are construction materials, tools, a place to build, and some water to float the thing when finished. For small craft, all these requirements are easily met. As the vessel increases in size, the requirements quickly grow more difficult to fulfill. Construction materials are primarily wood, with minor fittings of metal work, and a great deal of ropes and cloth for propulsion systems. Some of the small craft can be hacked into shape with a sharp rock; however, the larger vessels need an increasing number of sophisticated metal tools, as the size and complexity of the ship grows. Wood for the smaller vessels can be grabbed out of any local brush patch. The larger the vessel, the larger the pieces of wood it requires, the longer it takes to find a tree the correct size and shape, and the harder it is to cut it down and move it to the construction site. Any thumb-fingered individual can lash together a usable raft, but it takes a number of highly skilled and experienced workers to make a large ship out of wood. Ships are limited in size by many factors; the intended function, the extent of water to float them, the availability of construction materials, and the number and skill-level of the crew members who must operate them.

In a campaign context, as our characters wander about the land, they will encounter the occasional lake, river, or stream, and the need to travel across or along this body of water. For the most part, any local inhabitants of this region will also have had this need, and they will have already built some sort of watercraft to serve them. All our intrepid adventurers need do is find, rent, buy or steal the appropriate small craft. Where there are no local inhabitants, our characters must build their own vessel. Most Judges have already easily solved what few problems arise in this line. This product provides a few general guidelines in this area, and a number of suitable drawings for use as visual aids. The specific features of each small craft are listed also. All

of these small craft can be easily built by local artisans, using no more tools and resources than are available in any typical village with a supply of wood.

Larger vessels are much more restricted in where they can be built. Shipyards are best located near a city on a large river or seacoast. There must be an adequate number of skilled shipwrights. The larger and more complex a vessel, the greater the number of skilled shipwrights and the greater the number of skilled craftsmen necessary to build it. For example; the lumber must be brought from the forest to the shipyard. It requires a skilled lumberman to pick the correct tree and to fell it. The lumberman must cut it so that he does not waste any timber, so that when it falls, it does not split or break; and so that once the excess branches are trimmed off, a peasant with an ox team can move it away. Oxen can pull a great load, but they travel quite slowly, moving at best but five miles per day. In such circumstances, it was often more efficient to drag the logs to the nearest stream. If the water-level was insufficient to float the logs, it would be necessary to raise the stream's level with a dam, or to wait for the Spring floods. The rivermen who handled such log drives were a separate skilled trade. It takes a great deal of skill and experience to move scores of logs down a narrow, twisting stream in the chilly leaping waters of a Spring flood, where the slightest misstep will jam the timbers in an immovable mess, or could smash a timberman to pulp. Once the logs reach the river, they are collected together in large rafts for the journey down to the shipyard. Here again, great skill is needed for a few men to guide thousands of logs down the river in the face of storms, shifting currents, and altering shoals, sandbanks, and snags.

Once these logs reach their destination, they must be sorted as to size and type, and hauled from the water to season. Wood, as freshly cut from a tree, has a great deal of fluids in it. As these fluids dry out, the timber may shrink, crack, split, or warp. Because of this factor, vessels built of green timber seldom last long. They pull apart at the joints, split their seams, and develop cracks and structural weaknesses. Under any strain at all, they tend to leak badly and sink; thus, the timber that the shipwright is now using arrived at his shipyard from one to five years ago. Judges should keep this green-wood factor in mind, should characters slap a ship together too hastily, and try to venture far in it.

The seasoned logs must next be prepared for use in the ship-building by having any remaining bark peeled off. Yet another skilled tradesman then comes into play; the sawyer. Teams of men using oxen, levers, and block-and-tackles, move the logs to the vicinity of the shipyard. They are placed in a holding frame which extends over a "sawpit." This apparatus permits a team of two or more sawyers to trim the logs into shape and to cut them into square timbers and rectangular planks. Suitable logs are also hewn and smoothed into the long, tapering shapes required for the masts and spars necessary to fit the ship for sailing.

Finally, the shipwright now commences his work. A long area, at right angles to the water, is cleared and made to slope smoothly and gently into the water. Blocks are set up in a precise straight line upon which the keel is laid. The keel is a large piece of wood which runs the length of the ship. It serves as a backbone of the vessel, giving it the stiffness required to keep its length straight. It also serves, in some ships, as the reinforcement which supports the bottom of the ship and takes the strain and wear of the vessel, when the ship is pulled up onto land. Once the keel is laid, the shipwrights can begin to fit together the planking to form the "skin" of the ship. Medieval ship-builders worked from the outside inward; first laying the thick skin of planking which formed the overall shape of the ship, then installing the interior framework of strong timbers which serve as the "skeleton." During construction, an exterior scaffolding of scrap lumber held the planks in position and permitted access of the workmen to all areas on the surface of the hull. On Earth, the planks were fastened together in two different ways. The Northern Europeans overlapped the edges of the planks. This permitted a stronger, more flexible hull, which required little internal framework to make it seaworthy. It was somewhat wasteful of hull-planking material, but permitted economies in the use of large internal timbers. This method of construction is called "Clinker-built," and the Viking Long Ship is an example of its use. The Southern Europeans set the planks edge-to-edge (end-to-end). This required less work in the shaping of the hull skin, but

meant that a stronger, more closely set interior framework of heavy timbers was required to hold the ship together. Here economies were made in the hull-planking material, at the expense of more large timbers for the internal frame. This method of construction is called "Caravel-built," and the Roman and Greek vessels are examples of its use.

"Clinker-built" vessels are more difficult to build and repair than "Caravel-built," but have advantages in increased seaworthiness in the hazardous Northern Seas. "Caravel-built" vessels could easily be built larger than their "Clinker-built" counterparts, and also had the advantage of being much easier and cheaper to "sheathe." "Sheathing" was a practice of covering a ship's hull below waterline with thin sheets of lead or copper, to protect the planking from a number of small marine "critters" which consider the wood to be a tasty meal.

All during the collection and preparation of the materials and construction so far, the blacksmith and skilled metal-worker have been busy making, sharpening, and repairing tools. Now the metal-workers are needed to make the metal fittings for the ship: hinges for the rudder, latches for doors and windows, reinforcement straps for all weak points, blocks and pulleys for the ropes, gears and ratchets for the winches, and an assortment of other items. Specialists might have to be engaged to make major castings, such as lead stocks for the anchors, or a bronze ram beak for a warship. These tradesmen all require a number of supporting manpower. Someone has to mine and refine the metal ores, cast them into ingots, and transport the metal to the blacksmith. Someone has to make the charcoal used as fuel in the forges. All these trades, and numerous others unmentioned, contribute to the manufacture of the metal parts of the ship.

At this point, other types of craftsmen are needed. Rope-makers have to make up the hundreds of feet of rope, in various lengths and thicknesses; to hold and move the sails, handle and secure cargo and anchors, and many other nautical functions. Sail-makers have busied themselves collection especially strong canvas-cloth from weavers. This is cut and sewn together into the required shapes and sizes to make the sails fitting. Other cloth items are also made; such as awnings, hatch-covers, rain-collectors, and spray shields. Potters must provide the jars and containers for holding food-stuffs, and substances such as oils, glues, and tar. They also provide tiles for the cabin roof, and bricks to make the hearth for the cook's fireplace. Coopers provide barrels to hold drinking water. Carvers and painters provide the decorations, figureheads, and colorful coatings which protect wood and sail from weathering, identifies the vessel, or makes the ship handsome enough to attract business. Scribes meticulously hand-copy the charts, any maps, and lists of sailing directions necessary for "long-distance" navigation. "Long-distance" being anywhere that requires more than 24 hours to get there. Instrument-makers supply the compass and special navigators tools required to hold a true course while at sea.

Now that the ship is almost finished, it is necessary to get it into the water, but before that can happen, the ship must be "caulked;" that is, the cracks and spaces between planks must be sealed with a waterproof substance such as tar or pitch (tree sap). The braces and props are carefully removed, as grease is poured onto the blocks the keel rests on. Eventually, all but the last prop is eliminated, leaving it alone to hold the ship in place. The final step is the knocking out of this last block, whereupon the ship will slide, under its own weight, down the gentle slope into the water. This final job was so dangerous that it was common practice to give the job to a slave or prisoner, granting them a life of freedom should they survive! If someone goofed, and the ship did not move by itself, a laborious job of setting up winches, pulleys, and levers had to be undertaken, to drag the ship into the water. Our medieval ship-builders could not simply ask the local sorcerer to summon an elemental to bring the water-level up to the ship and pull it to the sea!

There she is, floating gently on the water. But now we see that she took all of the skilled craftsman of a small city to produce her. It is simply not economically possible to get all these people, materials, and equipment together to make just one ship and quit. A ship-yard is always working on several ships,

maintaining and servicing others, and building a new vessel as soon as one is launched and materials permit. Although these shipyards work in a somewhat production-line fashion, each ship is individual, unique, and its own work of art. Medieval ship-builders did not work from detailed plans. At most, they would decide on how long one of the major dimensions would be, and then, according to custom and experience, by eyeball and feel, they would adjust every item to fit, in a traditional rule-of-thumb. They made every step, just as their forefathers did, because tradition, trial, and costly errors had proven that way was what was guaranteed to work.

Nevertheless, like many skilled artists, they did not fear to ply their creativity in the form of small "adjustments," changing items in small ways to make their work individualized, or to gain some advantage over a previous make. If such changes proved advantageous, they were copied and applied, until a better design came along. Shipwrights became specialists in building things, but only a certain way. If someone asked them to build a ship of a type they have never known before, they would hesitate and very likely scoff. "Quite Impossible! It has never been done before! We have no custom to guide us," they would retort, "It would take twice as long to build, and cost you twice as much!" Judges will have to watch for players asking craftsman to make things that are unfamiliar to the local norm, and charge accordingly.

Ships are generally not built on a whim. Someone, somewhere, has to pay for the ship, and ships do not come cheap. They are built to fulfill certain needs. Ships also require continual maintenance to keep them in efficient condition, otherwise they will soon deteriorate and become dangerous or completely useless. Therefore, unless a ship is earning its keep, it will soon be abandoned. Cargo ships earn their keep by moving goods from a place of low-demand to a place of high-demand, or by moving passengers to various destinations. With goods, the trade-rule is "buy low, move elsewhere, and sell high" as a means of making good profits. With passengers; the farther or more dangerous the voyage, the higher the fare. Warships earn their keep by protecting cargo ships, ports, or harbors. They also provide employment for otherwise idle warriors, put slaves and prisoners to use, and enhance a realm's social and financial stability (while often destroying someone else's peace-of-mind and fat purse)!

Thus, under normal circumstances, cargo ships are playing back-and-forth between ports, carrying merchandise and passengers from one city to another. This may be on a regularly scheduled basis with a fixed route, or may be at the whim of the ship's owner or captain, who moves to wherever he smells a profit. Fishing boats are continually out, weather permitting, trying to pull a living from the sea. Warships are patrolling trade routes, guarding harbors against surprise attacks, hunting pirate vessels or the ships of rival nations, or chancing raids of their own.

Small Coasters (plate 4) could be built with the resources of a small fishing village. The building of smaller Long Ships (plate 2) could be financed by a rich Viking chieftain. Larger ships would require the resources of a powerful noble. Where larger vessels were built, or in numbers, it was only with the authority of a strong king or emperor. A prosperous town could easily finance the building of several Merchant Ships; however, it would take the resources of a small city-state to set up the shipyards necessary to build and maintain such specialized vessels as a Round Ship (plate 6) or a War Galley (plate 3). Once such a yard was established, it would also become relatively easy for private enterprises, political groups, or commercial interests to finance the building of a vessel in it; so long as the undertaking was permitted by the ruling power.

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## Sailors



Now that we have our vessels built, where do the crews come from? On sheltered inland waters, anyone with reasonable coordination and patience can learn to handle almost any small craft tolerably well. It takes skill and experience to handle a small craft on even the calmest of open waters. Though, a short time doing so, gleans experience and skill, which is a small step toward handling a Small Coaster. The next step up requires an additional skill; the ability to coordinate the efforts of several other individuals, sometimes with only verbal instruction or hand-signals. Navigational skill is also vital; the ability to plot where you are at all times under all conditions. For the captain of a cargo ship, a business-sense is important; the ability to juggle profits and losses, cost margins, and expenses. A warship commander must have the skill and courage to handle his ship in combat. The training of a merchant-crew is not very difficult. One or two skilled men can easily direct the brute-force efforts of six to eight unskilled helpers. They do not have to know why they are to perform a certain action, only when to perform it under command. A warship crew has much tougher standards; they must perform correctly under the stress, noise, and confusion of combat, when it may become impossible the even hear a shouted order. In the ancient Triremes, even one oarsman who missed a stroke could throw the whole crew of oarsmen into confusion.

In any small fishing village enough experienced sailors could always be found to crew a Small Coaster for a trip of several days duration. In a fair-sized town, in addition to Coasters, about every 10 - 14 days, a moderate-sized Merchant Ship would call. 90% of the time, such a ship would have room for 2 - 12 passengers seeking transport to another port-of-call. Such ships normally travel between towns of the same size, and larger port-cities. These port-cities would likely have ships connecting to all reachable nearby towns and cities at least once a week. Coasters would leave daily for nearby town, some even stopping at small villages by arrangement. These statements are suitable to set general campaign guidelines, unless war or blockades in the area exist. See Craft-Encounter Tables (page 11) for suggested area ship-type frequencies.

The men who crew the ship must be considered. They too are skilled tradesmen, requiring years of practice at their craft to become proficient. The basic recruit must have an above average constitution, strength, dexterity, and intelligence. The sailor must learn his ship so well that he can tell the position and condition of each and every piece of the equipment, even in the dark and driving rain of a storm. He must also be able to repair broken items in the midst of such a storm. This is not just convenient, his very life depends upon it. He must never lose his footing whether in the rigging, on ropes, or on the wet and slippery deck; regardless of how violently the ship may pitch and toss. He must remain in excellent health, since his total strength may be suddenly called upon to move cargo, hoist or lower sail and anchor, or row a vessel out of danger. He must also know the sea, the locations and configurations of all dangers (reefs, shoals, rocks, currents, rip-tides) as well as all havens (harbors, coves, ports, river mouths) of his realm. He must always have an eye on the weather, for sudden drops or shifts in the wind may eventually wreck his ship.

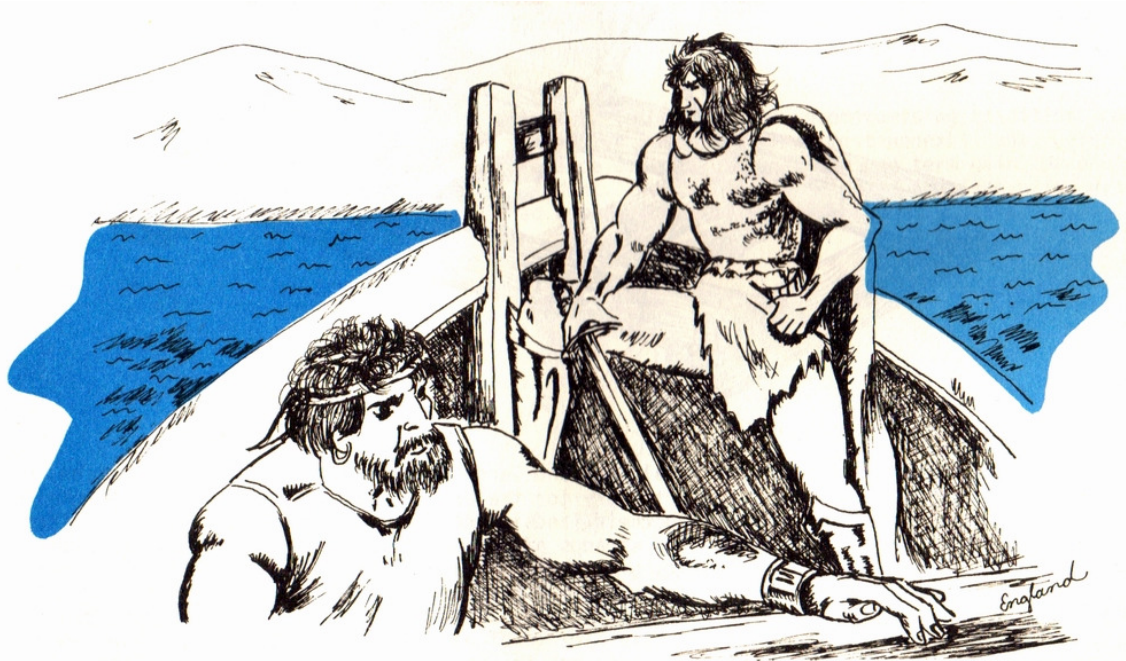
As a sailor gains in experience, he is given additional responsibility and additional pay. Senior Sailors are given charge of special tasks, such as repair of a ship's gear, sails, and structure. Senior Sailors handle and arrange cargo in the hold for balance. This task is far more important than it might seem. Slight changes in the attitude of a vessel have a great effect upon the ease with which a ship steers and sails. If the cargo shifts or breaks free in stormy weather, it may turn the ship over on its side or smash open holes in the hull.

Greater experience results in promotion to the position of Mate. Mates are essentially ship's officers, sharing in the tasks of steering and navigation. They are the ones who oversee the actual day-to-day routine of running the ship. They assign individual tasks to sailors, inspect the conditions of the ship's equipment and cargo, and order the conduct of any passengers. They require some slight skill in simple mathematics, enough for them to accurately apportion food and water, or estimate distances sailed. Mates have actual charge of a ship in the absence of her Captain. Mates must also be skilled in the use of weapons, and small-unit tactics, as they must bear the brunt of any fights against pirates, toll-collectors, and other such riffraff.

The Captain of a ship, though, is someone special. He must have the charisma and strength to compel respect and obedience from crew and passengers alike. He must have high intelligence and wisdom. He must know, and be able to influence, all of the people connected with his ship and trade. The Captain must deal with the tough laborers and thieves of the wharves, the pushy merchants and businessmen of the markets in port-towns, and the rich, demanding nobles and officials of the Court or local province. He must be able to speak several languages, be skilled in mathematics, and have a working-knowledge of the customs of the people he comes into contact with. He must be diplomatic; skilled at persuasion, haggling, and the delicate business of bribery. Business-deals and profit-margins are important to his success. A ship's Captain must be adept at navigation, able to read charts, use instruments, and predict sea and weather conditions. He must be a warrior, able to lead his crew and passengers in defending their lives and property. No ship's Captain was above the temptation to gain a little more property or money, if the opportunity was offered, and most maintained a reputation for holding their own business deals. Captains frequently owned their own ships; sometimes in a partnership with other businessmen, and sometimes in profit-shares with the crew. In those instances, where a Captain was more-or-less hired by the owners of the ship, it was common practice to give the Captain and Senior members of the crew, larger shares in the profits.

Up to this point, we have covered only the various men in connection with the sea travel. However, on the sea, skill and knowledge are often of more importance than brute strength. Women too, frequently served aboard-ship along-side their men. Sometimes, it was the Captain's wife who ran the ship in his off-watch (often in his presence too)! She was sometimes the one who drove the business deals and kept track of the money, and on few occasions, a warrior-like woman commanded as a Captain of her own Warship, having earned the respect of the Ruler's Fleet.





## Suggested Craft-Encounter Tables for Inland, Coastal, and High-Seas Areas

**Inland Waterways** dc20 - 1-3 Canoe, 4-6 Skiff, 7 Umiak, 8-9 Small Raft, 10-11 Large Raft, 12 Barge, 13 Dugout, 14-15 Fishing Boat, 16 Ceremonial Barge, 17 Coaster, 18-19 Coracle, 20 Southern Trader.

**Coastal Waters** dc20 - 1-2 Outrigger-Canoe, 3-5 Fishing Boat, 6 Longboat, 7 Umiak, 8-10 Coaster, 11 Merchant Ship, 12 Canoe, 13-14 Southern Trader, 15 Skiff, 16-17 Long Ship, 18-20 Harbor Galley.

**High-Seas Areas** dc20 - 1-4 Coaster, 5-6 Long Ship, 7-10 Harbor Galley, 11-15 Fishing Boat, 16 Small Raft, 17 Outrigger-canoe, 18-20 Merchant Ship.

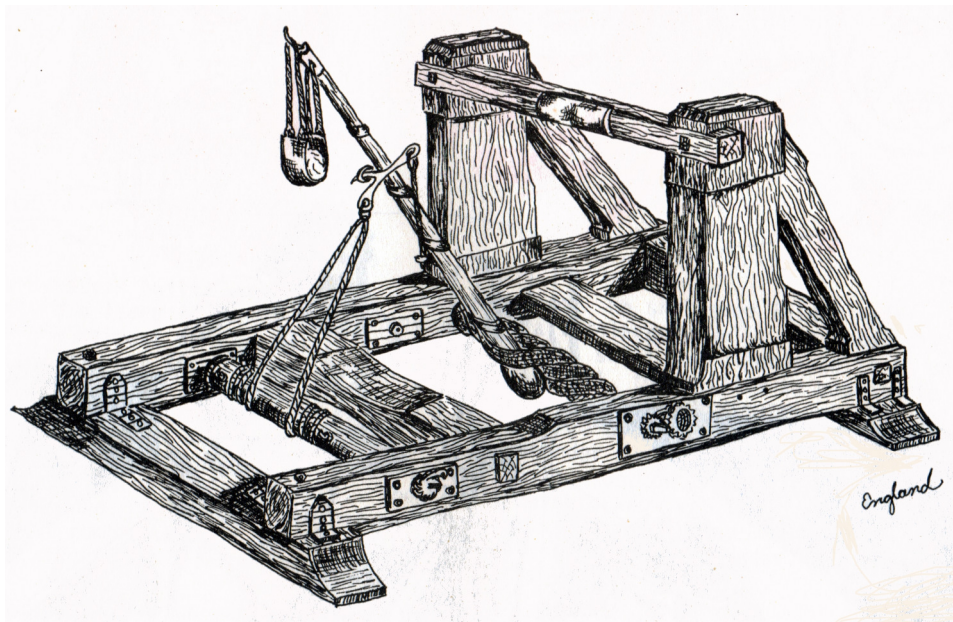
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## Naval Combat

At this level of technology, naval combat was pretty much an affair of individuals. Signals were very primitive. A Fleet Admiral or Squadron Commodore was limited to saying "Follow Me!" or "Everybody Fight!" or "Everybody Run!" Ship building was still an art, each vessel being a unique creation. Nowhere was this more apparent than in trying to maneuver fleets under sail. Not only did each vessel respond differently to the same wind, but if the fleet was spread out, many vessels received different winds. Thus, controlled fleet maneuvers were possible only under oars. Here, too, there were limiting factors; primarily, the distance at which the

signals and the maneuvers of the flagship could be accurately determined. Therefore, the upper limit of the number of ships directly under the command of a single officer worked out to be around twenty. Combat maneuvering under oars required constant practice. Most fleets, when not engaged in battle, will spend days exercising the oarsmen and practicing squadron formations. It took, at least, several weeks to train raw recruits to be effective oarsmen. Several more months would be required to turn this green crew into an effectively trained crew. An entire season would be necessary to have a trained crew become an experienced crew. However, a week or two of inactivity would be sufficient to take the fine edge off their expertise. One day's exercise per week is necessary to maintain a crew's level of stamina and coordination. Otherwise, such a crew would maneuver under a slight penalty their first day out. Subsequent days would see them regain their previous level of skill. In a week, they would be actually surpassing previous skill levels. Whenever a fleet is organized after a slack season, the first week or two must be spent on shakedown maneuvers before any Admiral would want to face combat.

Whether sailed or oared vessels predominate; any navy worth the name must have a large and complex arsenal or base. In order to prolong it's life, any ship which does not have her bottom sheathed in lead, must be pulled up out of the water, or dry-docked, when not in use. The more advanced societies have special slips in buildings specifically constructed for this purpose. The Vikings simply smeared an extra coat of pitch on the hull, and built a temporary roof on the hull itself, using logs and thatch. After a season of use, even without combat damage, the lightly constructed warships required an overhaul. Repair usually cost about half as much as the original building cost of the ship. Part of this expense was due to needing to fabricate new oars and sails. A Warship would have a normal attrition rate of 150% of the oars she carried; every oarsman wearing out one oar per season on average. A set of sails would generally last only one season. Many ropes and fitting would also need replaced. Water casks and provision barrels would need to be removed and their interiors purged and scoured. The entire expanse of the hull-planks, and every inch of the frame timbers, must be checked for splits, cracks, and rot. Suspect items must be removed, and replacement parts be fabricated and installed. Thus the arsenal or base is busy year-round; if not with new construction, then with maintenance.



(plate 16)

Because of their expertise in precision metal-work and large-scale complex timber construction, naval shipyards or arsenals built the siege-machines and artillery for both the army and navy. As a rule, catapults and ballistae on shipboard are somewhat smaller than their landside counterparts. A ballista is a dart-thrower, resembling a large crossbow, which utilizes the energy stored in twisted strands of horsehair rope to throw large arrows or darts to a maximum range of 500 yards. The catapult (plate 16) is a rock or ball thrower, generally using only one large strand of horsehair rope. It was most effectively used to throw large rocks on a flat trajectory against castle walls or the side of a ship's hull. With slight modifications, a sling could be attached, which would reduce the range of the catapult somewhat, but would allow the missile to be lobbed at a higher angle. Like the ballista, the catapult had a maximum effective range of about 500 yards. Though formidable in appearance, these artillery machines were not deadly enough to sink any moderately sized enemy vessel by themselves. Their main purpose was anti-personnel in nature; to attack the crews of the enemy vessels. Long range bombardment might still kill oarsmen or at least ruin the rhythm of their stroke, hindering the enemy ship's maneuverability. Hits on the mast, sails, or navigating helmsman could temporarily destroy the opponent's ability to move at all. The Romans, with their usual superiority in trained soldiers, invented a new use for ballistae. They fired special grappling-hooks with lines attached, so as to catch an enemy ship, pulling her close enough to board.

Until the invention of Greek Fire by the Byzantines, only two effective modes of attack existed. The first mode was Ramming, punching a hole in the side of the enemy ship, and sinking it. The second mode was Boarding, coming along-side the enemy ship and gaining control with one's own warriors. In Ramming, the ship itself was the primary weapon, its sharp bow being specially constructed to withstand the shock of ramming another vessel. Ramming tactics required maneuverable ships and needed crews and officers with a high degree of seamanship. The attacking ship need not impact the target hull solidly, or at a right-angle to be deadly. A good oar-raking pass, could cripple the target vessel just as thoroughly as a hole in its hull. Terrible damage to the enemy ship can be caused in such a maneuver. Oars broken and splintered and flailing oar-handles would cause injury or death to the crew, if they could not pull their oars inside quick enough. In fleet actions, such a crippled vessel could then be left for the less-well trained ships of the supporting second-line "mopping-up crews" to finish off.

Those navies which preferred boarding tactics tended to build larger vessels than those who preferred to ram. Ramming required some speed, and a stream-line vessel, where boarding forces of soldiers required troop transport. The larger vessels were built sturdier, hoping to withstand any ramming. A slight increase in size permitted a much greater number of marines to be carried. These larger ships were also able to mount heavier artillery engines. Then, too, their crews had the advantage of their height above the water-line, their siege-towers and bulwarks (ship-sides) over-topped and dominated the decks of the lower-lying smaller vessels.

As more efficient sea-going sailing ships were developed, tactics had to change. In any sort of breeze at all, the Long Ship could simply sail away from threat of the oared Galley. The Long Ship, with its keel and more efficient sail, could travel much closer to the wind. Also, merchant vessels, with their taller masts and longer yards, were making more effective use of an old weapon. This was the Dolphin, a heavy sharp-pointed weight hung out at the end of a yard or boom. When released, this Dolphin would plunge down through the lightly constructed galley and punch a hole in the enemy ship's bottom. A device such as this would make a Galley captain exceedingly wary about coming along-side a sailing vessel.

In Northern waters, normal weather and sea conditions are such that a rowing Galley was frequently not operable, even during the best part of the sailing season. Maneuver and ramming thus became less important in combat between sailing vessels in the North. The fight became a mobile siege, as two travelling castles tried to storm each other. The ship's sides, built higher to enhance seaworthiness, were made even higher. Miniature castles were built upon the bow and stern, complete with parapets and battlements. Small

fortified posts were built at the tops of the masts. Fire became an important weapon; clay pots of incendiary material would be lobbed or dropped onto an enemy's deck. Chemical warfare was used also; Quicklime was hurled to blind enemy crewmen. Oil and soap were dumped on enemy decks to make footing slippery and hamper crew movement. Missiles of all sorts were flung or fired at enemy crews; stones, spears, arrows, bolts, darts, javelins, etc. Attempts were made to cut the enemy's rigging with axes and blades on long poles. Finally, when one side or the other achieved the advantage, its warriors stormed across to conquer the enemy in hand-to-hand combat. Defensive measures were, to some extent, possible. Bulwarks could be hastily reinforced with deck planking removed from nonstrategic spots. Sand from the ballast was brought onto the deck to smother fires, improve deck footing, or be thrown at the enemy in attempts to blind them. If possible, fishing nets were attached to the tops of bulwarks and stretched upwards; doing so gave some protection from certain types of missiles, and made it more difficult for the enemy to get aboard. While enemy warriors were trying to cut their way through these nets, spearmen could easily pick them off.

A third mode of combat was developed by the Byzantines in the 7th Century A.D. This was the use of Greek Fire, an incendiary mixture. The secret weapon of the Eastern Roman Empire, it was sprayed from tubes, like a modern flame-thrower. It could also be flung in fragile clay pots, like hand-grenades. Its most frightening property was that it ignited upon contact with water. Although it likely contained a mixture of magnesium and sulfur, the exact composition of this petroleum-based substance is still uncertain. In its day, the ship armed with Greek Fire wielded the ultimate weapon.

In medieval societies, warfare was a curious blend of advancing technology and uncompromising tradition. Actual weapons utilized every type of innovation, but tactics changed ever so slowly. Strategy was almost nonexistent; personal considerations for honor, glory, and profit took precedence over any thought of long-term gain for one's self or society. In naval matters, this incongruity was also evident. New methods of rigging and innovative weapons were placed on hulls whose shape and method of construction had remained unchanged for a thousand years.





## **Ships**

This section contains detailed descriptions and drawings of several early vessel types. The vessels depicted here were chosen as the types most likely to be used by the judge or gamer in the course of medieval or fantasy campaigns. Details of these various ships may be altered by the judge to enhance or to more accurately reflect the situation being gamed in his or her campaign. Statistics of the ships may also be altered somewhat, but the basic mechanics and relative proportions should be retained in most cases, to prevent incongruities in play. Further, excessive use of magic to influence the navigation of ships in fantasy campaigns, on the whole, should be somewhat guarded-against by the judge, so that the skies do not become filled with ships acting as flying carpets.

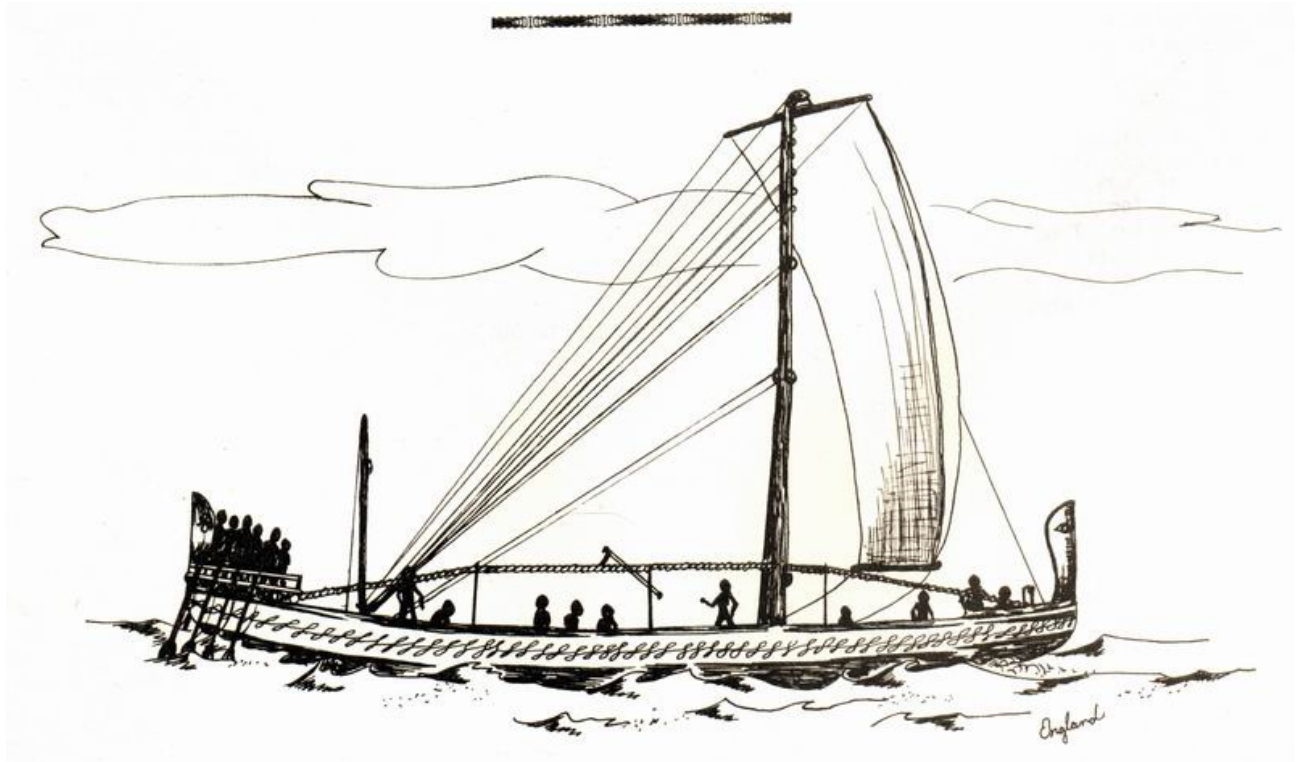
Regarding the prices given, or cost, for construction at a shipyard or building site that has the required raw materials, tools, and workmen: If starting from scratch to make built-up vessels, a shipyard and associated workshops must be established. To reflect the cost of building the shipyard, triple the cost of the first ship to be built, and then double the length of time needed to build it. Small craft and cruder vessels would only require unskilled laborers. Larger vessels require one skilled artisan for every two laborers. Costs work out at about one week's labor per one ton of ship. Rafts may be lashed together cheaply, needing only unskilled labor and taking about one day of labor per ton.

In the Judges Guild Fantasy Universe, or the Wilderlands, a day's labor is 15 hours; each workweek having 6 days. An unskilled laborer generally receives 3cp (copper pieces) in wages per day. A skilled artisan receives at least 12cp per day. If a warship is to be built, because of special construction features, the cost is 150% that of a normal commercial vessel of similar tonnage. Any new type of vessel constructed at the site requires the special supervision of a Naval Architect (or drafting engineer), which doubles the cost.

# Plans



1. MERCHANT SHIP
2. SOUTHERN TRADER
3. LONG SHIP
4. HARBOR GALLEY
5. COASTER
6. CEREMONIAL BARGE
7. BARGE or FERRY
8. LARGE RAFT
9. SMALL RAFT
10. CORACLE
11. UMIAK
12. SKIFF
13. LONGBOAT
14. FISHING BOAT
15. DUGOUT
16. OUTRIGGER CANOE



(plate 6)



## Merchant Ship (front cover)

Length: 92.5 feet

Beam: 22 feet

Draught: 3 feet (empty) - 5 feet (loaded)

Cargo Capacity: 40 tons with 10 passengers to 10 tons with 50 passengers.

Crew: 8 to 10 men

Cost : 4,800 gp; 20 men takes 10 weeks to build.

This is the vessel depicted on the front cover; the most common type in northern medieval European waters. This craft is a multi-purpose type developed from the Long Ship (plate 2). It's lines are much fatter and the sides are much higher. The primary mode of propulsion is sailing. Though it has but the one mast and sail, it is efficiently handled by a crew much smaller than that of a Long Ship. The mast remains permanently fixed in place, and has the aid of a winch built into the sides to accommodate eight sweeps. With 6 to 8 men rowing, the ship could move at 1 to 2 knots. With 16 men rowing, a speed of 5 to 6 knots could be possible. This is sufficient to maneuver the ship in most restricted waters. The Merchant Ship has a heavy keel and a relatively shallow draft. Though "clinker-built," she has much thicker planks and stiffer ribs than the Long Ship. This vessel is a practical compromise between a large heavy ship able to carry a lot of cargo and a small light ship able to be easily beached on most any shore. Heavy beams extend from side to side, supporting the deck and allowing quite heavy cargos to be carried upon the deck. Also, the planks comprising the deck could be removed and cargo stowed on top of a layer of wet sand which lined the bottom of the ship. This sand served as ballast, keeping the center of the ship's gravity low enough that she would not capsize when tilted by the wind. Wine or drinking bottles were often chilled in this bottom-sand on hot days by crew and passengers alike.

This ship was constructed with several improvements in sailing rig over the Long Ship. The sail had reef points; small paired pieces of rope, which permitted the lower edge of sail to be rolled up and tied in place. Thus, where the Vikings found it necessary to carry sails of different sizes to fit the different wind conditions, this new type of sail was adjustable in area. Furthermore, a new system of lines permitted the attitude of the sail to be maintained or changed without the use of a lot of muscle-power.

A ship's boat was also carried on deck or towed astern on a rope. This boat was a light open Skiff (plate 11), used to run errands in harbor and to help move cargo. Often, this small boat was sent ahead into shallow waters to gage the depth, taking soundings, to find a safe passage for the larger vessel. It was also common practice, in maneuvering through restricted waters, to use the ship's boat to pull on a rope attached to the bow or stern. With crewmen rowing the ship's boat, it was possible to turn the larger vessel around in place, not risking stranding by moving close to reefs or shoals in shallow waters. This flexibility of maneuver allowed the Merchant Ship to carry cargos directly to and from many towns located quite far up the course of relatively small rivers. The Southern Trader (plate 1) type of vessel, while it could carry much more cargo, could only visit ports with deep water.

There was also another type of flexibility associated with this type of vessel; though built for trade, it was easily adaptable to warfare. In fact, many medieval rulers gave their commercial port-towns certain tax advantages. In return, these towns agreed to place specific numbers of their ships at the disposal of the ruler in times of war. The Merchant Ship was easily converted to a warship by the building of temporary structures in the bow and stern. These structures actually served as miniature castles. They were high platforms of wood, mounted on stout pillars and edged with sturdy wooden walls pierced with battlements. In addition, a small pillbox, or basket, was mounted at the top of the mast. This was called a "top" or "top-castle." It served as a lookout and also as a secure place from which to hurl or fire missiles down upon an enemy's decks. The "forecastle" and "stern-castle" were strong-points, being fortresses that protected the men-at-arms and crew from enemy missiles. These served also as prime vantage-points for archers or bowmen.

Quite often the castles on these ships were brightly decorated. Along with brilliant sail insignia and flags; the colors and patterns served to identify the ship's allegiance to friend and foe. Some insignia designs, being of a striking or imposing appearance, were intended to forebode or frighten-off would-be attackers. As not all ships were outfitted with both bow and stern castles, judges may add one or both castles to a ship, as they wish. The cover art shows the ship as converted for war and sailing into battle. In this illustration, most of the warriors that would have been onboard have been omitted to show the ship's constructed details.

Other modifications to the ship might be made for special war missions. To participate in sieges of coastal fortifications, artillery could be added. Field ballista could be mounted along the sides. A vessel of this size could carry 4 such dart-throwers on her deck; if not under sail, by positioning 2 aft of the mast, and 2 forward of it. If sailing, only the forward pair would be usable. As an alternative armament, by reinforcing the deck, a single catapult could be mounted forward of the mast. This stone-thrower would require the removal of any forecastle and would be aimed by turning the entire ship; adjustments made easier by utilizing the ship's boat. It was not unknown for a single tall tower to be constructed in the middle of a Warship, in place of the mast; sometimes making her dangerously top-heavy, hard to handle, and requiring much heavy ballast in the holds to keep her from capsizing. Such a ship would be restricted to oar-movement in sheltered waters, being completely unsuited for braving open seas. From these taller central towers, archers might fire down onto defenders of sea-walls, or a storming-bridge might be lowered to permit an assault party to attack the top of a wall.

Battles at sea with these ships mostly consisted of bringing the vessel alongside the enemy and exchanging missile-fire; arrows, sling-stones, javelins, firepots and suchlike. When one side felt they finally had gained an advantage in numbers, they would risk an assault, attempting to board the enemy ship to finish off her crew in close combat. Sometimes, if enough casualties were inflicted early-on, an enemy ship might strike her colors and surrender quickly. Since most men-at-arms would be wearing metal armor, falling overboard meant almost-certain drowning. Exceptions to this; a man freeing himself from his armor and making it to the surface, would be extremely rare.

The main features of the Merchant Ship are (from the bow): the cutwater, foredeck, bits, main deck, mast, capstan, after deck, and sternpost. The foredeck is raised slightly above the level of the main deck. At the rear edge of the foredeck are two stout posts, called bits, which serve to control the anchor rope. The anchor rope is stored under the foredeck. Just after the bits, on either side of the front-end of the main deck, are located the forward pair of sweep ports. These large heavy oars were worked from a standing position. In the center of the deck is the mast, with a rope ladder or cleats to permit climbing to the top. Next aft comes another pair sweep ports, and then the capstan. The capstan is essentially a horizontal winch; pry-bars are inserted into the edge of a large hardwood drum, providing leverage to easily wind-up or let down sails or beams by ropes. Finally, the stern of the ship has an after-deck, where the helmsman stands to control the large steering oar. The oar is controlled by use of a right-angled extension at the top, known as the tiller. When carried; the forecastle and stern-castle were entered by means of a ladder under their center, passing through a trap-door in the floor.

Cargo was carried on the main deck; lashed down with ropes, and covered with oil-cloth or leather to protect it from the weather, when necessary. If passengers were being carried, rather than cargo, tent-like shelters of leather or heavy canvas would be set-up on the deck. As many as 50 passengers could be carried for short trips. Half that number would be more likely, on longer voyages. All, except the high-born passengers, would be expected to help, in small ways, with the workings of the ship, rowing, or raising the anchor. This vessel would normally work its way along the coast, stopping at each friendly harbor. Less often; once it had a complete cargo for a specific destination, or if a cargo was very perishable, it would sail direct. As many as 3 - 5 days might be spent continually at sea, although it was common to anchor for the night in a sheltered spot just offshore, if between ports.

Sailing with the wind, the Merchant Ship could make 8 knots or 150 miles (30 hexes) in a 16-hour day. Reaching across the wind; 6 knots or 110 miles (22 hexes) in a 16-hour day could be travelled. Sailing Close-hauled against the wind, only 4 knots or 75 miles (15 hexes) would be possible. (see plate 17)



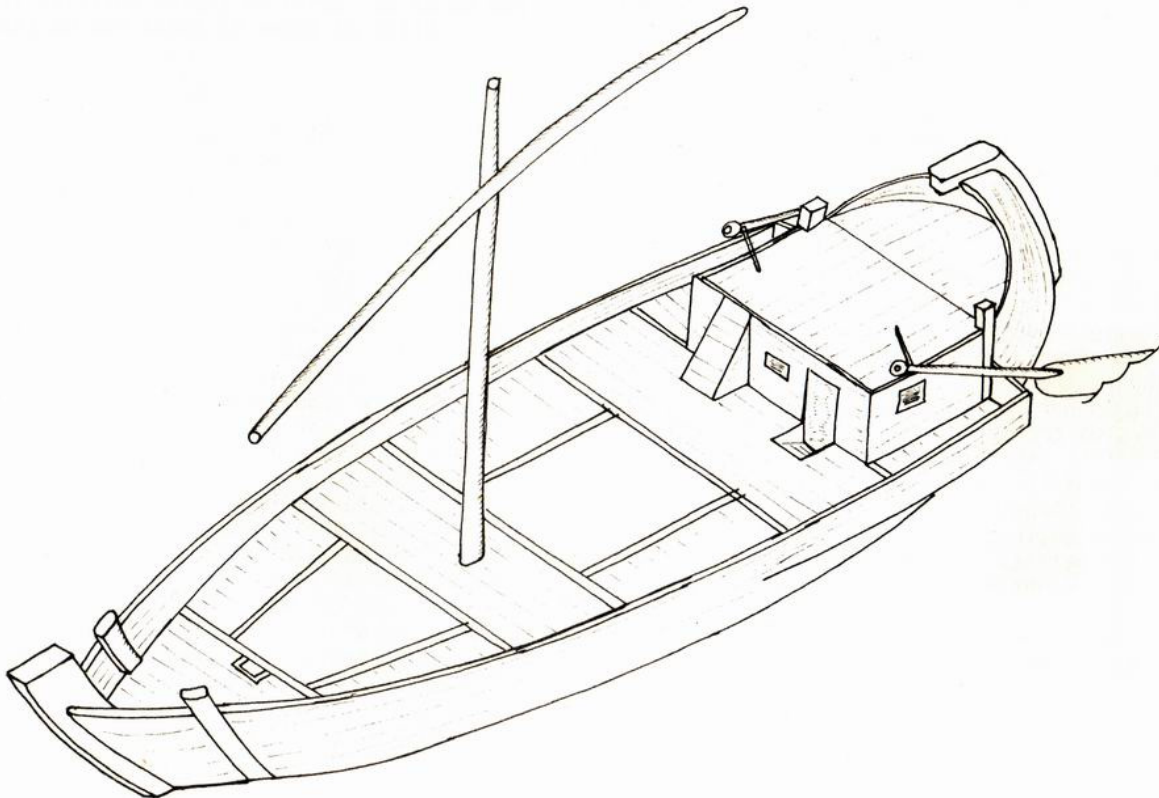
### Southern Trader (plates 1a and 1b)

Length: 80 feet                  Beam: 25 feet                  Draught: 8 feet (empty) - 12 feet (loaded)

Cargo Capacity: 100 tons (5,400 cubic feet)                  Crew: 9 to 12 men

Passenger Capacity: (with cargo) up to 10; (without cargo) up to 60

Speed: 5 knots                  Cost : 7,200 gp; 20 men takes 15 weeks to build.

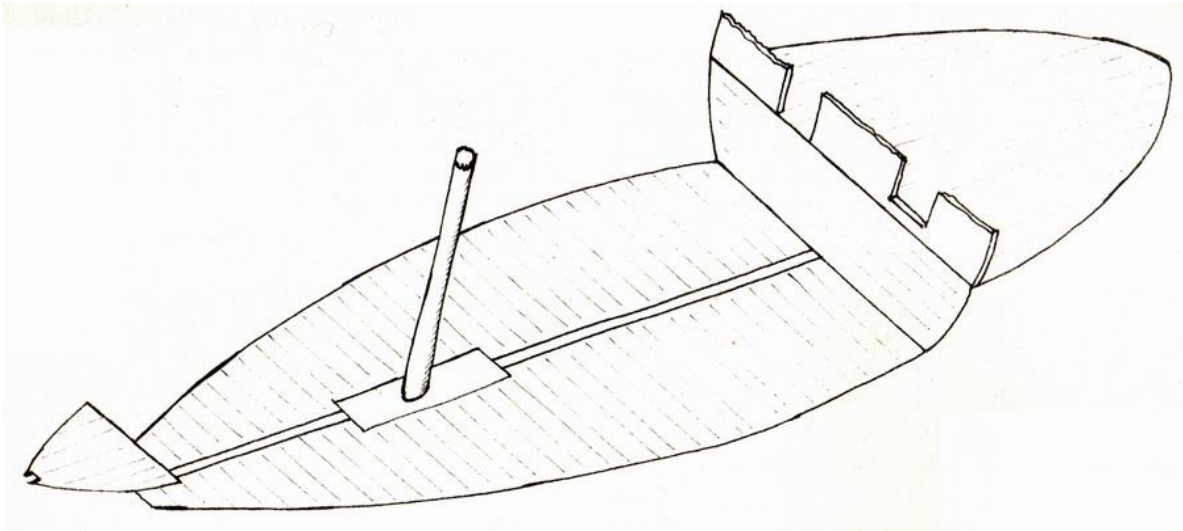


(plate 1a)

This Southern Trader is similar to the bulk of the moderate-sized trading vessels which plied the waters of the Black and Mediterranean Seas during the height of the Byzantine Empire. It is appropriate for the period from 600 A.D. to 1400 A.D. She is most often encountered in the lesser sea areas, where her ability to maneuver under sail is an asset in the hazards of shoals, rocks, and foul waters. Her lanteen-rigged sail permits the vessel to tack quickly, with only a couple of crewmen handling the sail. Though she does carry several large oars, called "sweeps," this ship was not made to be moved by rowing. Without wind, the most a crew could do would be to turn the ship in the open sea or shift from one berth to another in a calm harbor.

Owing to the deep draft necessary to obtain cargo-carrying capacity, this vessel cannot be pulled up on shore. If it ran aground in an area subject to tides, because of its rounded bottom shape, the ship would tend to roll over on its side, shifting any cargo not fastened firmly into place. Thus, this ship would tend to frequent ports where it could be tied up next to a dock or wharf for loading and unloading of cargo. If the items carried were relatively small, it would be possible to anchor the ship offshore, and transfer the cargo into small boats for the transit ashore. Another possible method would be the use of a Harbor Barge or Ferry (plate 7). Depending upon the amount of deck cargo carried, the ship's boat, or Skiff (plate 11), would be lashed down on top of the main hatch opening or towed astern on a line.

Observing the drawing (plate 1a), the main features of this vessel are as follows. The pointed end is the front and the more-rounded end (with the shelves on either side carrying large oars for steering) is the rear. Going from bow to stern, are the cutwater (a vertical extension of the keel), the hawsehole (through which the anchor ropes pass), the bits (a pair of sturdy posts), the forward cargo hatch, the mast, the main cargo hatch, and the cabin. Two sets of steps on the forward side of the cabin lead up to the roof, and down into the interior of the cabin. The floor of the cabin is set below the level of the main deck. The roof of the cabin would often have a rail around the edge. The ends of the steering oars would extend up to the level of the railing, and right-angle projections on their ends (called tillers) permit a person standing on the roof to control the course of the ship.



(plate 1b)

Going down, the next deck (plate 1b), is called the cargo hold. At the very front is an area raised three feet and partially walled-off from the rest of the cargo hold. This area is for the storage of the anchor ropes, which lead up through a hole (the hawsehole) in the main deck. The major section of this lower deck is the cargo hold. It is 8 feet from the floor of the cargo hold to the underside of the main deck above. A large round timber (the mast), projects vertically from the keel of the ship, through the cargo hold, and continues up past the main deck, to support a long horizontal pole which carries the sail. Two large rectangular holes in the main deck above are known as cargo hatches, through which the materials carried by the ship are loaded and unloaded to and from the cargo hold. Normally, these large openings are securely covered and made watertight with canvas covers, to prevent the ship taking on excess water from weather or rough seas. At the rear of the cargo hold is a wall which separates the cargo hold from the cabin. There is usually a small door in this wall, leading into the cabin. The floor is raised 4 feet from the level of the cargo hold floor, with steps or ladder leading up four feet to the door, and another four feet beyond, opening to the main deck. The floorboards of the cabin are removable, so that certain valuable items of cargo may be stored beneath. The

rear wall of the cabin is formed by the rear-portion of the ship's hull. There are a pair of niches on the right and left sides of the cabin, which are formed by the platform supporting the steering oars on the main deck above. The cabin is lit by several small glass windows set into the front and side walls. Each window has a stout wooden shutter hinged into it; allowing it to be securely shut tight. A stout wooden door may also be fitted to close the opening to the main deck.

The crew and high-paying passengers sleep in bunks built into the sides and rear of the cabin. A small brick hearth is located against the front wall of the cabin, where the cook prepares meals. Those passengers paying minimum fare, or working for their food and board, sleep on the main deck when weather permits, or on top of the cargo in the hold. The crew would consist of a Captain, a Mate, a Helmsman, and from six to nine men; the exact number depending upon the number of passengers working their way. Working passengers are required to help load and unload cargo, bail out water from the bilges, and assist in keeping the ship's maintenance.

The vessel would mostly be employed in taking cargo and passengers from one port to another, on a somewhat regular basis. Seldom would she be at sea for more than five consecutive days. Her voyages would follow the coastline, frequently anchoring each night. Only in the most favorable conditions, would she continue under sail at night, or cut directly across open-sea areas. Her speed under sail would average 5 to 6 nautical miles (knots) per hour, when running before the wind. When reaching, or sailing at angel to the wind, 4 to 5 knots would be the average. Tacking, or sailing against the wind; she would at best make 2 to 3 knots. In campaign-terms, this translates to 110 miles (22 hexes), 74 miles (15 hexes), or 37 miles (7 hexes) of distance covered in one 16-hour day of sailing in a brisk wind.



### Long Ship (plate 2)

Length: 96.5 feet                      Beam: 22 feet                      Draught: 2.5 feet (empty) - 4 feet (loaded)

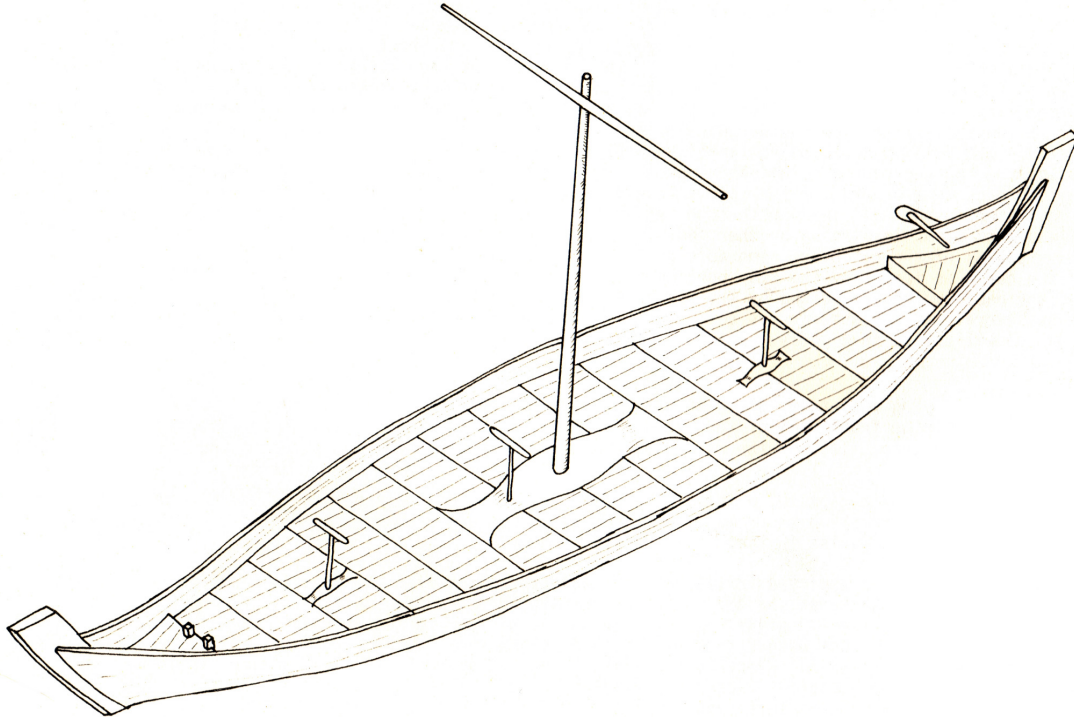
Cargo Capacity: 20 tons (with 40 oarsmen), 5 tons (with 80 oarsmen)                      Crew: 50 to 90 warriors

Speed: 10 knots max. by oars, 12 knots max. by sail                      Cost : 5,000 gp; 20 men takes 10 weeks to build

This vessel is exactly the same type as the Drakkar, the sea-going warship of the Scandinavian Vikings. With 20 pairs of oars and one square sail; this size of Long Ship was the smallest suitable for ocean voyages. With one man to each oar, the center of the single deck was clear to carry a moderate amount of cargo. Putting two men to each oar eliminated the cargo area, but doubled the number warriors carried. The Long Ship was designed primarily as a raider. She was built to carry the maximum number of warriors quickly, in the smallest design that would prove to be extremely sea-worthy. The type was remarkably successful in Earth's Nautical History; the Vikings using it to raid the entire coastline of Europe for over 400 years. It is the type most-often used, by the Azurerain River Pirate Brotherhood, for patrolling the waters near the City-State of Tarantis.

The smooth, streamlined shape permitted high speeds under both sail and oar. Viking ships are known to have maintained sailing speeds in excess of 12 knots for hours. With one man per oar, this Long Ship can average a speed of 8 knots; with two men per oar, her speed increases to 10 knots. Maximum speeds can only be maintained for intervals less than two hours, before the crew tires. A fast cruising speed of 6 to 7 knots may be maintained for about three hours. A slow cruising speed of 3 to 4 knots, allowing some of the crew to rest at all times, could be maintained all day.

Like the Vikings, the seafolk who use these Long Ships are excellent mariners. They do not hesitate to spend 6 to 10 continuous days at sea; though perhaps reducing the sail area at evening, the crews continue the voyage, keeping under way both day and night. When raiding, they are sufficiently confident of their navigation to strike out directly across the open sea. Thus, with no rumor of their presence spreading along the coast ahead of them; raiders usually hit their targets from the sea without warning of their approach.



(plate 2)

The hull-construction permits the ship to be run up on any gently-sloping shore. The raiders would run the bow onto the beach and jump over the sides forward, confident that the water would, at most, be just above waist level. After the raid, a quick push by the crew, and the ship was afloat again. The shallow draft, and light weight, made it easy to row her up river mouths. If they wished to pass shallows or sandbars in the river, the crew could cut wooden rollers from nearby woods, and roll the ship across. Long Ships could be rolled in this fashion through woods, overland; by-passing rapids, falls, or other hazards on land. By this means, the Vikings were able to strike far inland, crossing Russia from the Baltic to the Black Sea.

The hull is built around a heavy keel, usually a one-piece timber, which runs fully from bow to stern. The planks are overlapped and fastened together with rivets in the Northern Clinker fashion. Made watertight with moss and tree pitch in the cracks, this construction was lashed to a light framework of ribs. Therefore, the ship was flexible; giving with strains, and riding over waves that would break a more rigid ship. The mast was removable and could easily be raised or lowered by 5 or 6 men underway. A set of three T-shaped supports on the centerline of the ship, gave a place to store the mast, yard, and sail, when not in use. In this position, the yard also served as the ridge-pole of a tent, which could be used to shelter the crew in harbor or stormy weather.

Plate 2 shows the deck plan of the Long Ship. At the very bow is a carved figure-head. This wooden image was made removable, so it could be removed, and thus not offend the spirits of the land, when not on a mission of war. Next comes the forward platform, which is raised 6 to 8 inches above the main deck and has two sturdy wooden posts, set vertically at her rear. The space under the forward platform is used to store the

anchor rope. The anchor is lashed down between these posts while at sea, and the posts serve as the fastening-place for the line when at anchor. The main deck occupies all of the rest of the ship, except for the extreme stern. The main deck is flat, consisting of short planks set between ribs. These planks are held in place by removable wooden pegs. Cargo and supplies are stowed beneath, to give better balance to the ship, and to clear the deck for rowing or warfare. No rowing benches are provided, the oarsmen sitting upon the tops of their own personal sea-chest of belongings. The oars project through holes in the sides of the ship. These holes have small wooden shutters which close tight, keeping water out while proceeding under sail. The rails of the ship have small wooden cleats, to these, shields were fastened, and hung over the sides of the ship. This was done only in calm water and usually for ceremonial purposes. Waves of any real strength could easily wash these shields into the sea. It was far more common for oarsmen to sling their shields over their backs, where they would afford some protection, and be ready for combat. The Viking crews learned to keep their equipment and sea-chest belongings wrapped up in water-proof sealskin bags. They also used these bags to sleep in, during times of cold weather. At the center of the main deck is a large wooden block, which has a post-hole in the center to anchor the mast. The mast is inserted here, and held in place by a removable wedge. At the rear-end of the main deck is another small raised deck; the after-platform. This is the station of the Helmsman. The single steering oar is controlled by a handle-projection from the upper-end that is gripped by the Helmsman.

For all her size and seaworthiness, the Long Ship is rather lightly constructed. It is not designed to withstand damage from (nor deal out damage to) another ship. Her main weapon is her crew of warriors. Usually, the Long Ship only serves as troop-transport, taking the warriors to or from land battles. On the occasional instances where Long Ships fought at sea, they were brought alongside the enemy vessel as quickly as possible, whereupon the warriors would attempt to capture the vessel by boarding and combating the enemy crew. When Viking fought Viking, it was common practice for the defending side to chain it's ships together, the way cowboys of the American West might circle their wagons for defense. The assemblage of ships served as a floating fort, which made it difficult for attackers to be effective, especially if they had fewer warriors. Meanwhile, the defenders could concentrate and position all their best fighting men to the point of contact. The Vikings did build special ships, called "Knarr Bards" or "Iron Beards," that had reinforced bows for ramming-tactics. These special vessels were limited to coastal waters, since they were far less seaworthy. The sea-going Long Ships ranged in size up to 40 pairs of oars, being limited in length by the maximum size which a single suitable piece of keel timber could be obtained. Much larger warships were built by the later Viking Kings, able to carry as many as 600 men, but because of their weaker construction, they were limited to calm coastal waters.

Long Ships do not normally mount artillery. Their construction is too light to withstand the weight, stress, and shock of firing heavy catapults. They can mount small field ballistae, but owing to the space required on the single deck, there would be no room for oarsmen to work on either side of them; greatly crippling ship's movement.

The average Long Ship, with one man per oar, would be able to carry food and water reserves for up to 12 days, without impairing her maneuverability or fighting efficiency. With two men per oar, she would only be able to carry 4 days supplies. Long Ships, as any other ships, can be overloaded, but seaworthiness will suffer. Still, in happier times, the crew might gamble against the chance of battle or rough seas before the excess supplies are used up. Alternately; excess supplies might be thrown overboard before closing for battle, or when the weather becomes a substantial threat.

With their smooth streamlined form and efficient keels, Long Ships could sustain a speed of 10 to 12 knots when running before the wind or when "reaching" (travelling at an angle of up to 60 degrees from the wind). When "close-hauled" (moving at 120 degrees to the wind direction) they could make 6 to 8 knots. Travelling in open waters, the Long Ship could move a maximum of 300 miles (60 hexes) with the wind, in a 24-hour period. Sailing against the wind, a maximum of 200 miles (40 hexes) could be made.



### Harbor Galley (plate 3)

Length: 75.5 feet

Hull Beam: 10 feet

Outrigger Beam: 15 feet

Draught: 1.5 feet (empty) - 2.25 feet (loaded)

Cargo Capacity: 2 tons

Crew: Captain, 4 sailors, 8 marines, 48 oarsmen (slaves)

Speed: 3 knots (cruising) - 10 knots (max.)

Cost : 6,000 gp; 20 men takes 10 weeks to build

This small warship type is utilized by the City-State of the Invincible Overlord. It's primary mission is that of harbor patrol and customs duty. The small size and shallow draught also make it ideal for river patrol. As a byproduct, these vessels also serve to keep slaves and prisoners occupied. The construction is very light, and the freeboard very low; thus, these ships do not travel on the open sea. Not having any sails or masts, the Harbor Galley is propelled by oars only.

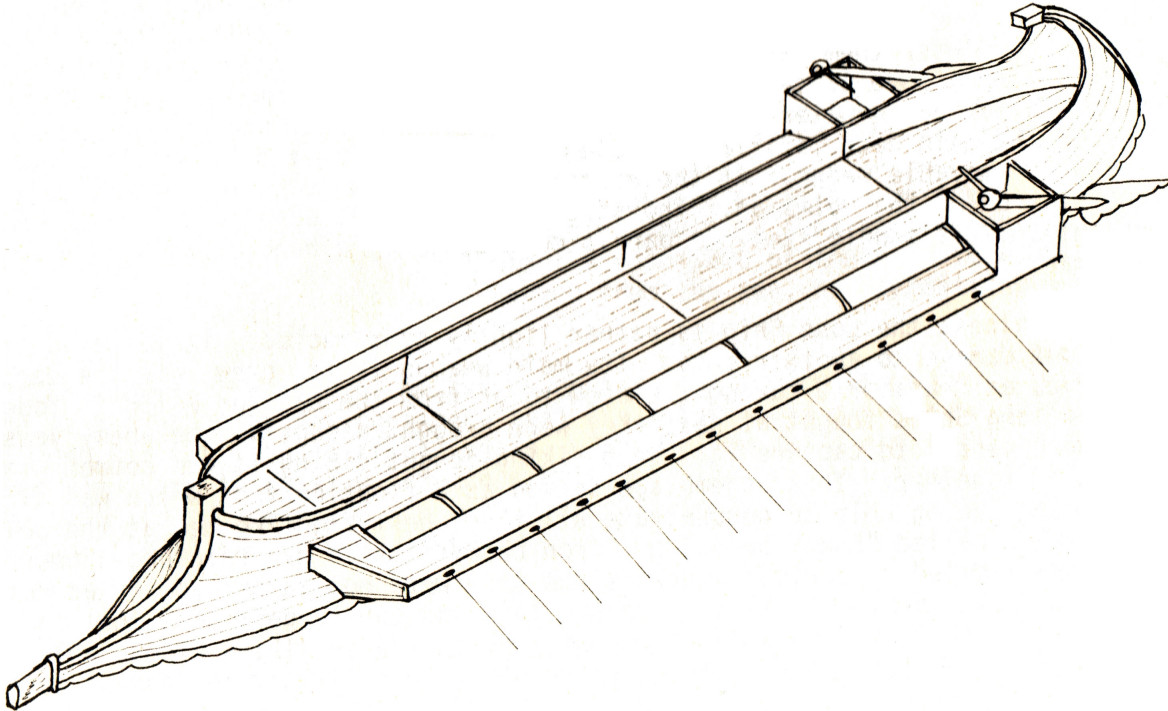
The City-State maintains 6 to 8 of these ships in constant service. There are 12 oars per side with two men pulling each oar. The oarsmen are generally slaves, criminals or indentured servants, and are chained to the ship's rowing benches. A total of 48 oarsmen is preferred. To supervise this unwilling power source, a slave-master is required, who usually carries appropriate (and motivating) instruments of pain and punishment. Also, to coordinate the oarsmen, a drummer provides a timing beat on his musical instrument. Two Helmsmen for the twin steering oars, and the Captain complete the crew. The marines carried have varied purposes, depending on the ship's current mission. For customs collection and control of merchant shipping in the harbor; one Customs Officer, two assistants, and four guardsmen are generally the detail. For river patrol the marines might comprise of one corporal, and seven guardsmen (four of whom would be archers). As an alternative; one field ballista and two crewmen, may be substituted for four marines.

Such small warcraft as these are never far from a naval base. They might, at most, carry food and water enough for two days. Their primary task is to keep an eye on things. Though they could do serious damage to a large warship in battle, they are mostly used for scouting and carrying messages. Several of these small galleys might combine forces against a larger war vessel, and cripple her, by breaking her oars. This would leave the enemy vessel easy prey for other large warships to be "called in for the kill." A Harbor Patrol Galley could ram an enemy warship, but unless it was very lucky, could never hope to sink it; however, she would be deadly against a ship her own size, any merchant, or transport vessel.

The Harbor Patrol Galley is built as lightly as is possible, so that she may obtain optimum speed and maneuverability. She has almost no wasted space. Two small areas below, at the bow and at the stern, may be used for storage of supplies. Owing to her light construction, she frequently leaks, and often has a spare slave, or two, who does nothing but bail out the incoming water from below the deck. Plate 3 gives the main features of this ship's construction. At the very bow is the ram, tipped with a metal beak cast of bronze. Heavy timbers reinforce the bow. A small hatch leads from the upper deck (or fighting deck) down into the main rowing deck. Under this hatch is a small storage space, immediately ahead of the oarsmen. The major portion of the rowing deck is occupied by the 12 pairs of rowing benches. Each pair of oarsmen sit facing astern, pulling on the weighted inboard end of a 12-foot-long oar. In order to give ample room for the oarsmen, and to place the pivot-point of the oar far enough outboard for sufficient leverage, a shallow rectangular box (called the outrigger) is attached to the side of the hull. The bottom of the outrigger is closed and leather sleeves seal the openings around the projecting oars. This outrigger adds to the effective freeboard of the ship, and adds



stability when the ship heels or leans over on her side. The space between the upper and inner edge of the outrigger and the fighting deck is left open for ventilation. This space may be closed off, when needed, by large flaps of heavy leather. This would usually keep out water in heavy weather, and offer some protection from enemy missiles when in battle. At the after end of the rowing benches is another small storage space. Here is where the drummer would usually sit.



(plate 3)

The fighting deck begins a short distance from the bow and ram. The rounded front-edge of the deck is reinforced by a vertical extension of one of the heavy bow timbers. A semi-circular railing is built out of thin planks covered with leather at the front-edge. This provides a shield against enemy fire, and makes it hard for warriors from a rammed vessel to board the Harbor Galley. This railing extends all the way, along both sides of the fighting deck, to the stern; though most of the length is only open wooden frame covered with leather. At the aftermost ends of the outrigger, there are platforms constructed, on either side, for the two helmsmen. The Captain's station is between the two helmsmen on the fighting deck. Situated immediately below the Captain, on the rowing deck, is the drummer. Thus, control of ship's direction and speed are within easy voice command of the Captain.

The Harbor Galley can sustain her top speed of 10 knots for only a half-hour before the oarsmen become exhausted. A fast cruising speed of from 6 to 7 knots could be maintained for about three hours. A slow-cruise of 3 knots could be maintained for about 12 hours, for a daily movement of 40 miles (8 hexes).



#### Coaster (plate 4)

Length: 45 feet (hull) 53 feet (overall)

Beam: 15 feet

Draught: 4 feet (loaded)

Cargo Capacity: 5 tons or 20 passengers

Crew: 3 men

Speed: 8 knots max. by sail

Cost : 500 gp; 5 men takes 4 weeks to build

The Coaster (plate 4) is essentially a large fishing boat. It is used for fishing, shipping cargo, and carrying passengers. This vessel may be built by one or two skilled shipwrights and a couple of laborers, with only the resources of a typical fishing village, so long as wood is available. Coasters, being small and easily maintained, are the work-horses of the coastal trade. They serve to carry most of the freight and passengers between the port towns and smaller coastal villages. No part is so complex that a village blacksmith cannot replace it in a day or two. All wooden parts can be produced using only basic carpenter's hand-tools.



(plate 4)

While the Coaster may load or unload cargo at the town or wharf when in port, at the villages it is easiest to simply run the ship up on the shore, and have cargo carried through the shallows. Though the Coaster may tow a Skiff along astern by a rope, there are few places that the ship cannot go directly. As the name indicates, the Coaster seldom ventures far from the shoreline. She is sufficiently seaworthy for long voyages, but most of her travel is along a sea-coast, from town to village and back again; often running routine courses in areas of denser populations (of both people and fish). A Coaster, being common to the fish-trade, might accompany 4 or 5 smaller Fishing Boats (plate 13) to a distant fishing-ground. It would often collect the catch of the group each day, and sail it back to the port-town for preservation or marketing. Thus, the Fishing Boats would be free to attend to the catching, while the Coaster did the shipping. Further, on such duties, the Coaster may carry spare lines, bait, or other resources and equipment for the fishing vessels. Certain types of fishing require heavy nets, and these may be too large for the common Fishing Boat to handle alone, necessitating the use of the bigger Coaster.

The Coaster is structurally a large open boat (plate 4). At the bow, a long pole projects forward several feet. This is the bowsprit and the ropes attached to it help handle the sail. A short section of the bow is enclosed, serving mainly for the storage of equipment. Several support-beams extend over the hull of the boat. These beams strengthen the ship's structure, hold the mast in place, and serve as fastening-points for ropes of the rigging or fishing tackle. The bottom of the hull has a number of flat planks fitted into it, providing a place to stand or to set cargo. Then comes another enclosed section, extending to the stern. This serves as a storage area for food and water, provides a space for the Helmsman to operate the single centerline rudder, and has a small windlass or capstan mounted at the front edge to raise or lower the sail, haul the nets or fishing-lines, or raise the anchor.

At any port-town, a number of Coasters will be found serving travelers bound for various destinations. They may be cheaply hired for a quick trip of a few days duration in any direction. Longer voyages, of course, would require more pay. Coasters, in this manner, can often serve as the "quick horse out of town," for those characters needing to suddenly be elsewhere. It is normal for the Coaster to travel during daylight hours only, beaching or anchoring each night. Owing to her shallow hull, the Coaster handles and sails much better when carrying at-least a partial-load for ballast. Running before the wind the Coaster can make 8 knots, which in 16 hours means a distance of 150 miles (30 hexes). Reaching before the wind, it makes 6 knots or 110 miles (22 hexes) per day. Travelling close-hauled against the wind, she can make 4 knots, a distance of 75 miles (15 hexes) in the same 16-hour day.



### **Ceremonial Barge (plate 5)**

Length: 50 feet

Beam: 26 feet

Draught: 3 feet (loaded)

Cargo Capacity: 3 tons

Crew: Varies

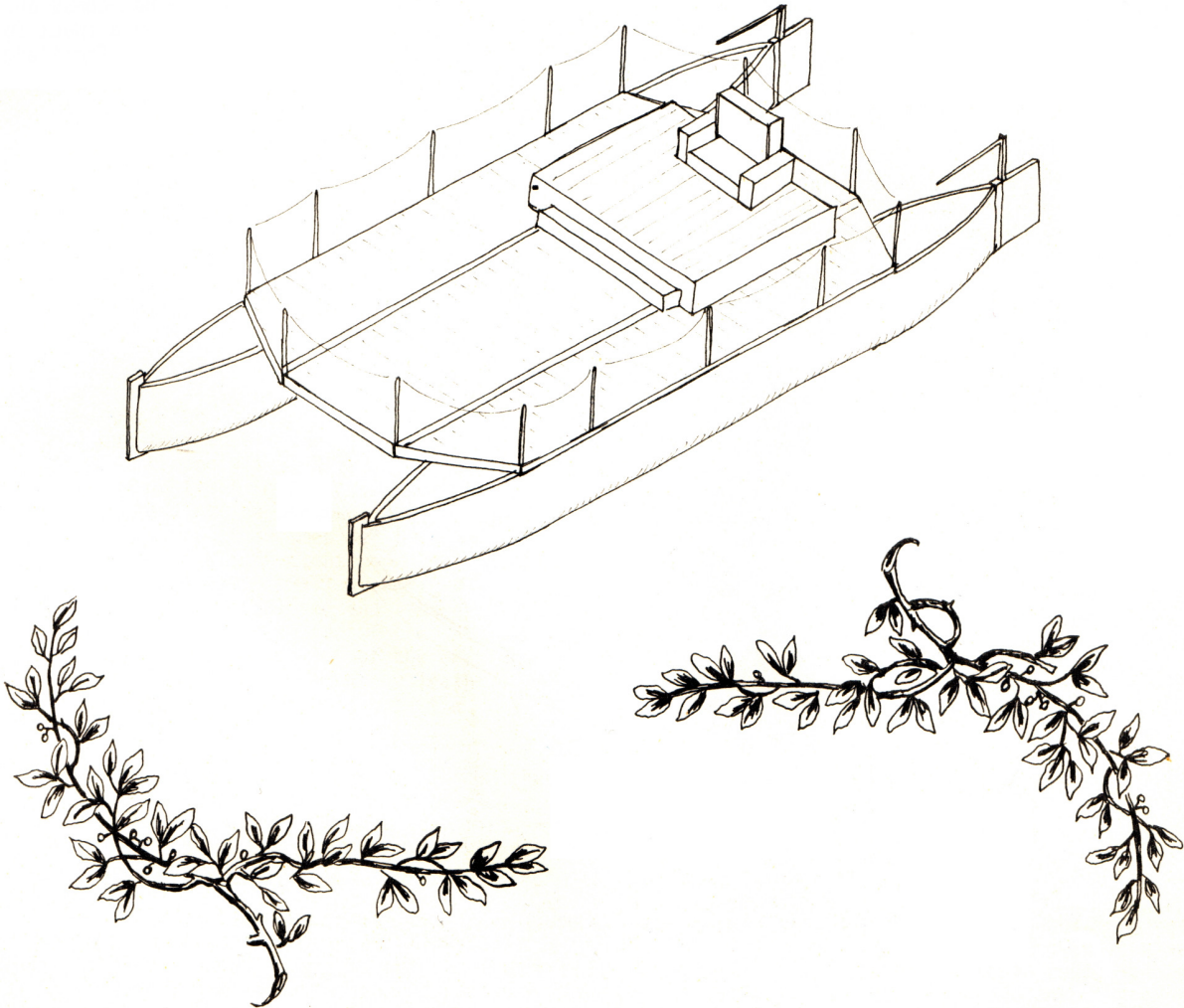
Speed: 2-3 knots max.

Cost : 10,000 gp; 5 men takes 12 months to build

This vessel is used for ceremonies only, and therefore has no workaday function. It provides an impressive vehicle from which an important person may pride himself before the commoner. Because of her ornate and delicate construction, she is suitable for travel only in sheltered waters. Ceremonial Barges may be paddled, poled, or towed for her short journeys on lake, river, or canal. The number of crewmen required varies on the mode chosen. One Helmsman is required, controlling both tillers by means of attached lines. Two attendants usually stand at the bows, with ceremonial boathooks. To pole or paddle, 6 to 8 men would fit along each side. Voyages in this craft would seldom last more than a few hours.

The Ceremonial Barge (plate 5) is of a catamaran configuration. She has two equal-sized hulls joined together by a flat platform. She takes more funds and longer to build because of the extensive amount of fine gildings, carvings, and paintings employed to beautify her. The most expensive woods are used for her frame. Often, her fittings are made from precious metals, and studded with gems. Thus, the Ceremonial Barge can make a gaudy and impressive setting for meetings of the wealthy and powerful.

In the Wilderlands, high-level magic-users are fond of using such vessels for travel. It makes a very high-toned statement to arrive in a Ceremonial Barge towed by a Dragon Turtle!



(plate 5)

**Barge / Ferry (plate 7)**

Length: 42 feet

Beam: 22 feet

Draught: 3 feet (loaded) 1 foot (empty)

Cargo Capacity: up to 20 tons

Crew: No set number

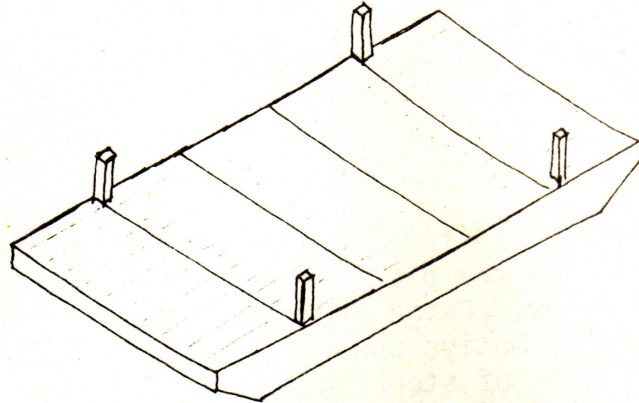
Speed: 1-3 knots max.

Cost : 10 gp; 5 men takes 1 week to build

This vessel is a simple flat-bottomed rectangular wooden box. It is useful only upon calm or sheltered waters. In harbors, cargo is piled upon her flat top and fastened down with ropes. Once loaded, the Barge is pushed with poles, rowed, or towed to her destination, where the cargo is transferred. In the harbor, the Barge may also serve as a mobile wharf or work-platform.

This vessel is especially a common site on rivers, and it often serves there as a Ferry. In addition to the previously mentioned modes of movement, the Ferry may be moved across a river by passengers or crew

pulling ropes, which have been stretched between the two banks. She may also be pulled along the banks of a river or canal by means of a tow line and a pair of oxen, timid trolls, or other draught animals.



(plate 7)

Barges do have uses in war and siege. Protective bulwarks may be build up around their edges. Ballistae and Catapults may easily be mounted on them. Two, or more, barges could be joined together, and a siege-tower be built upon the superstructure. In principle, a Barge is a floating platform, useful for many purposes, but only stable in calm waters.



### Large Raft

Length: 45 feet

Width: 30 feet

Draught: 2 feet

Cargo Capacity: 10 tons

Cost : 2 gp; 5 men takes 5 days to build

This craft is lashed together out of large tree-trunks or thick timbers. The primary factor in constructing this conveyance is the distance the logs have to be transported from the place of felling to the waterside. Rope and natural lashings of some sort are then used to bind the Raft together. Cargo arrangement is not very important, as the Raft will generally support anything which does not submerge or over-turn it. For motive power, a sail mast could be rigged, but owing to the difficulty of steering such an ungainly object, it could only move down-wind. Normally, the Raft is only used to float something, travelling with the current of a river. Sweeps are used to steer her, and long poles are employed. With the constant and strenuous efforts of a dozen paddlers, a Raft could be propelled for short distances, or pushed upstream against the gentlest of currents. Rafts like this are often found in use as a river Ferry, being pulled back-and-forth across the current by a heavy rope stretched between the banks. Sometimes Large Rafts are fitted with railings along the sides, or a small central cabin, where one can get out of the rain or cook a meal.



### Small Raft (plate 8)

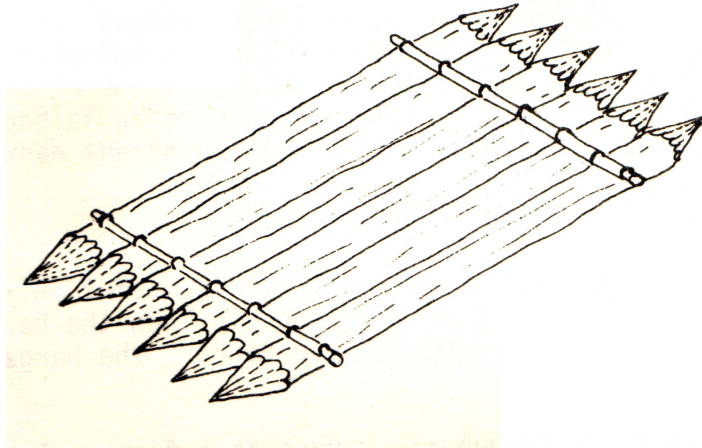
Length: 31 feet

Width: 5 feet

Draught: 1 foot

Cargo Capacity: 4 tons

Cost : 6 cp; 1 man takes 2 days to build



(plate 8)

The only difference between this craft and the Large Raft is the size of the logs comprising it. The Small Raft is composed of logs small-enough that a single man could move them into position unaided. The Raft is the simplest type of all water-craft to build, requiring absolutely no learned skill for her construction.



### Coracle (plate 9)

Length: 12 feet

Beam: 5 feet

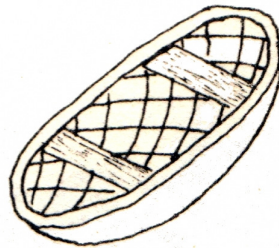
Draught: 1 foot

Cargo Capacity: 1,000 lbs. max.

Crew: 2-4 paddlers

Speed: 2-3 knots

Cost : 9 cp; 1 man takes 3 days to build



(plate 9)

The Coracle, while one of the earliest known types of boats, is also one of the most efficient. It is constructed by tying together a hemispherical frame of flexible branches. To this frame is laced a cover of animal skins; the edges of which are sewn together, and the seams are then water-proofed with tar or pitch. Lastly, seats are tied into place, and the boat is finished. The drawing depicts a fairly large version, but even a 14-foot boat of this make is so light that it can easily be carried by one man. The size may range from a one-man boat of 5-foot by 3-foot, up to a 30-foot by 12-foot size. This vessel must be paddled, although the larger versions, having stronger frames, can be fitted with oarlocks. This type of boat is known to many peoples who

live far from major bodies of water, and is often used by nomadic tribesmen to navigate inland waterways, rivers, and lakes.

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### Umiak (plate 10)

Length: 32.5 feet

Beam: 5.5 feet

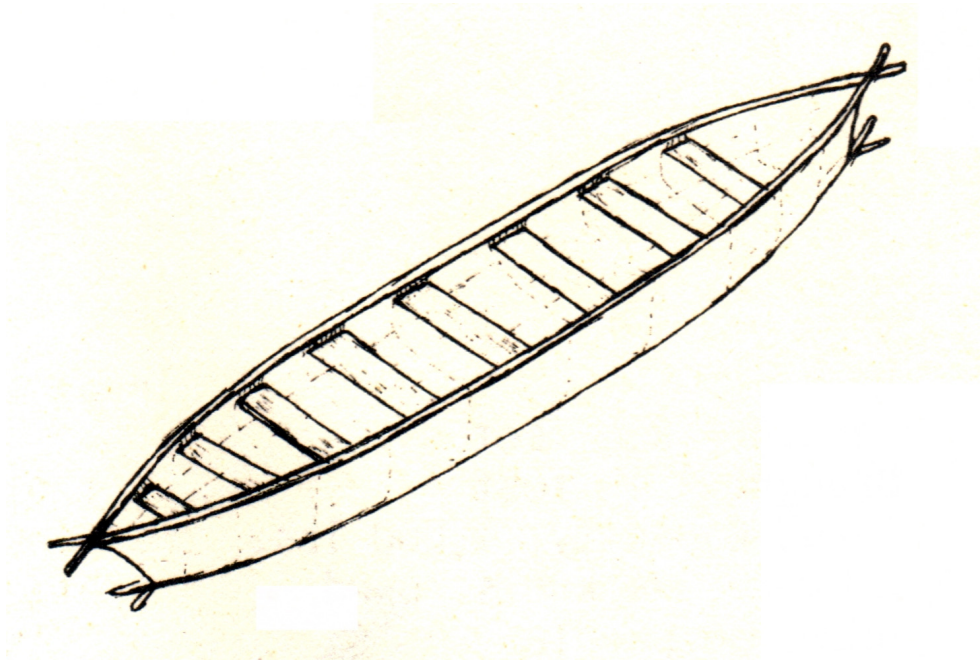
Draught: 1.25 feet

Cargo Capacity: 2,500 lbs. max.

Crew: 8 to 12 people

Speed: 4-5 knots paddled, 6-7 knots sailed

Cost : 48 cp; 4 men takes 4 days to build



(plate 10)

This vessel is similar in construction to the Coracle. Usually it is built in areas that have very little timber. Therefore, the frame is skillfully pieced together out of small branches, often reinforced at stress-points with bone. The more slender lines of the Umiak, make for faster speeds at sea. In her larger forms, which may reach 40-feet in length, she is very seaworthy. The Irish Curragh, which is of this type, has been sailed across the Atlantic Ocean. Most often, island tribesmen use vessels like this to make speedy raids on their neighbors. Generally, insufficient wood is available to strengthen the sides enough to permit oarlocks, but this is not the case in more wooded areas. Still, the Umiak is more-often paddled than rowed. With the addition of flat stones in the bottom for ballast, these craft handle and sail quite well. On ocean voyages, covers of leather are fastened over the open top, to keep out spray. Though she is quite sturdy, the crew must take care to avoid puncturing the sides with sharp objects. The bottom is reinforced with a wooden runner, permitting the Umiak to be drawn up on a beach or soft bank without damage. As light as this vessel is, only 6 or 8 people are needed to carry it overland on long portages. Some skill is required to build this type of boat, but once finished, any reasonably competent person can repair and maintain the Umiak.



### Skiff (plate 11)

Length: 16 feet

Beam: 5 feet

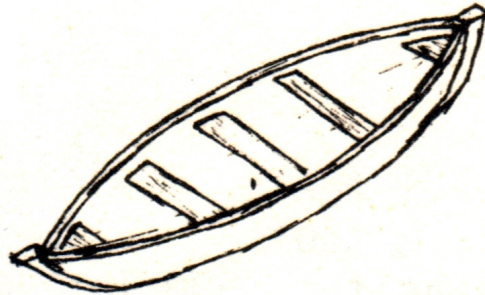
Draught: 1.25 foot

Cargo Capacity: 500 lbs. max.

Crew: 3-5

Speed: 3-6 knots paddled, 7-8 knots sailed

Cost : 6 gp; 4 men takes 6 days to build



(plate 11)

Skiffs vary in size somewhat, but all are intended to be work-boats, handled by one or two crewmen. Though used primarily in harbors and in sheltered waters, they may be put out to sea, when crewed by men with a high-level of seamanship. Endurance is limited to no more than one or two days with a full crew of 4 men. Her broad beam adds to her stability, but prohibits high speed. The Skiff is most often rowed by 2 to 4 crewmen. It is fitted with a collapsible mast, and may carry any one of a number of different sailing rigs. Though most often used to transport people, small items of cargo may be carried. The Skiff is often used to fish inland and sheltered waters, rivers and lakes; utilizing mostly hook-and-line or small netting techniques.

Larger ships often carry or tow a Skiff as an auxiliary. It is used to scout-out and explore unknown anchorages, or to move cargo and personnel through waters too-shallow for the big ship to navigate. The Skiff is the most common type of water-craft, and is encountered nearly everywhere, except inland towns or villages where no body of water exists.



### Longboat (plate 12)

Length: 29 feet

Beam: 7 feet

Draught: 1.5 feet

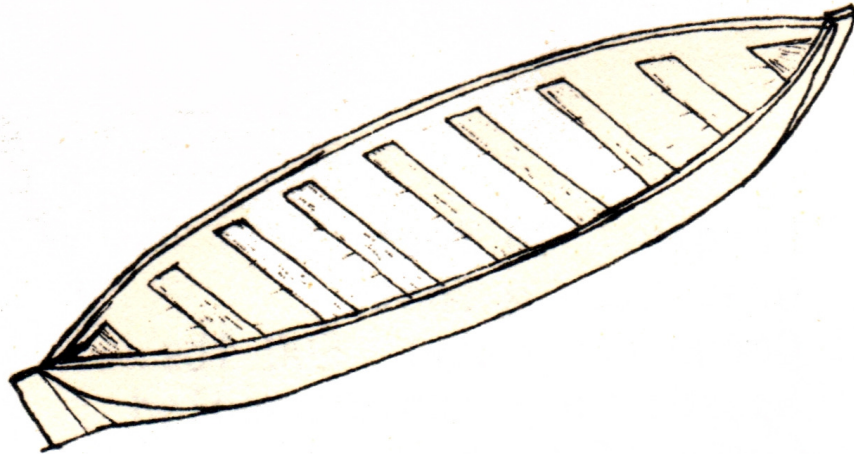
Cargo Capacity: 750 lbs.

Crew: 8 to 12 people

Speed: 7 knots rowed, 10 knots sailed

Cost : 15 gp; 6 men takes 10 days to build





(plate 12)

The Longboat is constructed in the same fashion as the Skiff. It is specialized for transport of people. The Longboat is most often used by the military. In harbor areas, she is used to move crewmen and passengers between the ships and the shore. Seldom are long journeys undertaken in such a craft, as it is primarily rowed, and necessary supplies for the large crew would be limited by the room onboard. In time of war, Longboats are used to land assault parties or raiding forces, where heavier warships cannot land directly. Also, in sea-battles, Longboats are used to pick up survivors, or carry messages between fleet units. In some accounts, Longboats have successfully made a sneak-attack on an engaged vessel, by slipping unnoticed around to the unengaged side of the enemy ship. Though equipped with a collapsible mast, the Longboat is not often sailed.



### Fishing Boat (plate 13)

Length: 29.5 feet

Beam: 6 feet

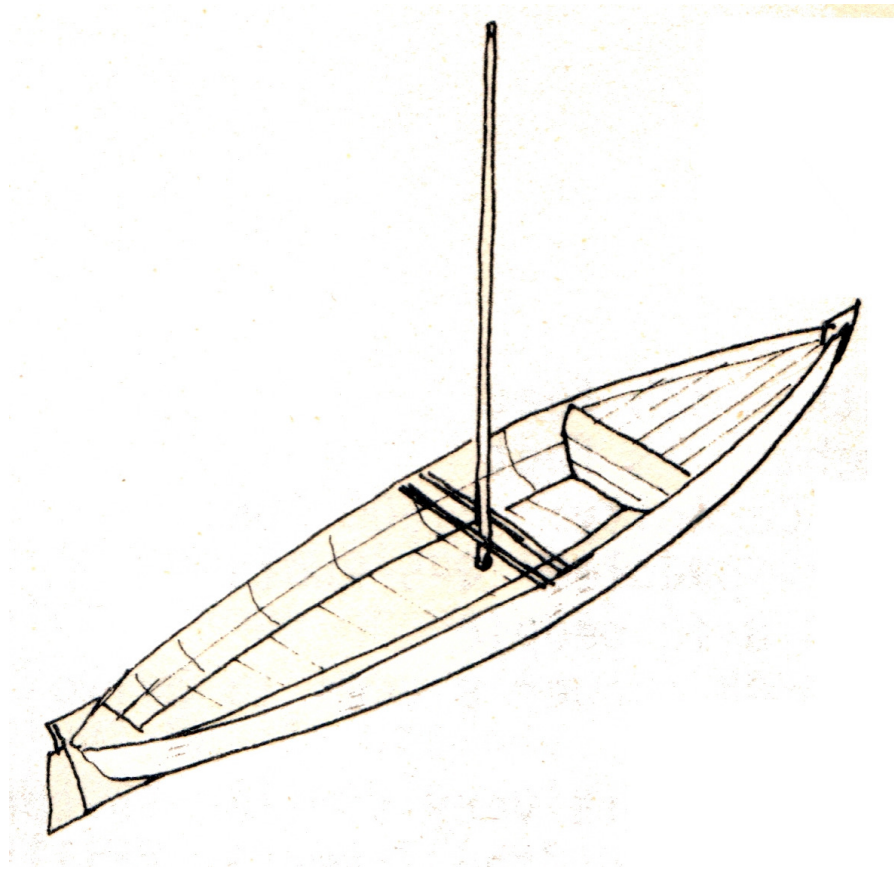
Draught: 1.5 feet

Cargo Capacity: 1,000 lbs.

Crew: 6 people

Speed: 3-4 knots rowed, 8-10 knots sailed

Cost : 12 gp; 6 men takes 8 days to build



(plate 13)

The Fishing Boat is encountered on any coast where there are people and fish to catch, and sometimes days from land, far out at sea. It is much the same size and construction as the Longboat, but carries a smaller crew and is specialized for sailing. Seaworthy-enough for long voyages, it has a covered area in the bow for storage or for shelter in rough weather. The open center-portion of the boat provides working space for the fishing crew and the catch. The boat is useful for general-purpose tasks, in most waters. Any size port or harbor will have several Fishing Boats available for hire to make short trips. Cargo can be carried in the center open section, and landed on any beach or shore with a gentle slope. Though it does require a skilled craftsman to build, any fisherman may make emergency repairs to his boat, provided the damage is not extensive. Any fishing village with wood will have at least one carpenter capable of making complete repairs, so long as the damaged Fishing Boat can make the journey.



### **Dugout (plate 14)**

Length: 31 feet

Beam: 5 feet

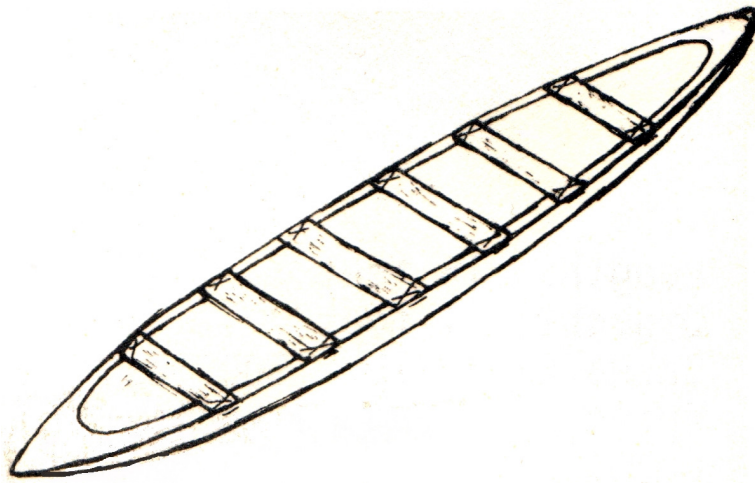
Draught: .75 feet

Cargo Capacity: 600 lbs.

Crew: 6 people

Speed: 5-6 knots paddled

Cost : 12 cp; 2 men takes 2 days to build



(plate 14)

The Dugout is one of the simplest vessels to build because it is not much more than a hollowed-out log. It may be made by peoples of low-technology using only stone tools and fire. The vessel depicted is of moderate size, but they can range in size from 6-feet for one person to over 80-feet, accommodating more than 100 people. The primary consideration, when figuring build-size, being the straight lengths of available tree-trunks in the area. The Dugout must be paddled only. It requires dexterity and balance to use, since it is unstable and capsizes easily. Dugouts are not often found in open waters, because of their poor handling in rough weather. Dugouts can carry some cargo, but they are very limited in their capacity. The primary advantages of these vessels are that they are cheap to make and require almost no maintenance.



### **Outrigger Canoe (plate 15)**

Length: 30 feet

Beam: 16 feet

Draught: .75 feet

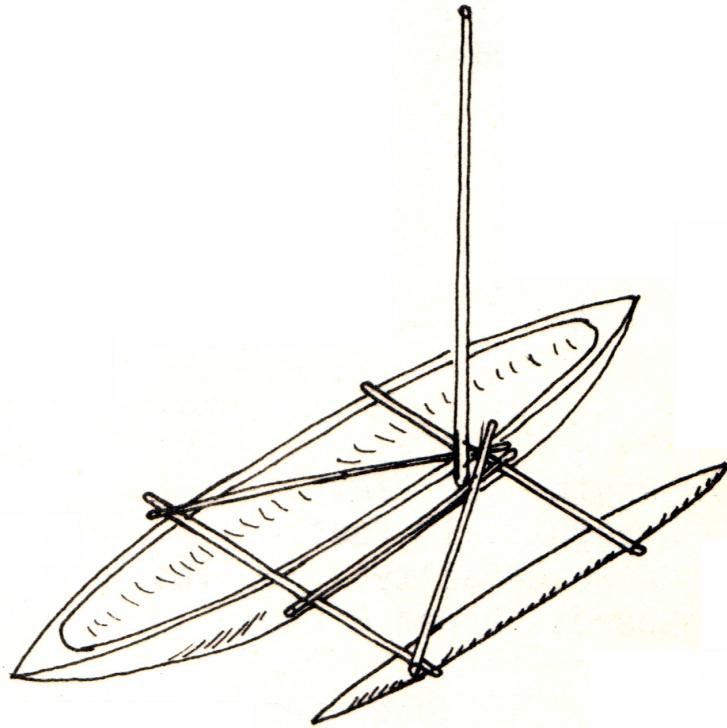
Cargo Capacity: 500 lbs.

Crew: 6 people

Speed: 5-6 knots paddled, 8 knots sailed

Cost : 18 cp; 2 men takes 3 days to build

This vessel is a simple modification of the Dugout. In order to prevent capsizing, a streamlined float has been attached parallel to the hull. The stability has thusly been increased to a level which permits the use of a sail. The Outrigger is sufficiently seaworthy to make ocean voyages. Various styles of Outrigger exist, of which, this variety is the simplest. One variety has a second float on the opposite side, increasing the stability, but thereby increasing drag. Another type consists of two Dugout hulls connected together with a rectangular platform, and yet others, known as Trimarans, consisted of fixing three such hulls together. These multi-hulled vessels could reach lengths in excess of 80 feet, and easily make transoceanic voyages.



(plate 15)



## Nautical Terms

Aft - the rearward direction or portion of the ship

Ballast - weight carried in the bottom of a ship to improve stability.

Beam - the greatest width of a ship

Bow - the front of a ship

Bowsprit - a long pole sticking out from the bow of a ship

Capstan - a mechanical winch for handling ropes or chains

Draught - (also Draft) the depth of water necessary to float the ship

Flagship - that ship carrying the commander of a squadron or fleet

Fleet - an organized group of several squadrons

Freeboard - the height of a ship's side above the water

Hauling - sailing at less than an angle of 60 degrees to the wind (plate 17)

Heel - tilting over on a side

Keel - the long timber forming the backbone of a ship

Knots - nautical miles per hour

Lanteen Sail - a triangular sail suspended from a single yard

Mast - the large vertical pole which supports the sail yard

Nautical Mile - 6,080 feet

Reaching - sailing at an angle between 60 and 120 degrees to the wind (plate 17)

Rigging - the ropes which support and work the sail

Rudder - the movable flat surface used to steer the ship

Running - sailing with the wind (plate 17)

Squadron - two or more ships which operate together under a single commander

Square Sail - a rectangular sail suspended from a single yard

Stern - the rear of a ship

Sweeps - large oars worked by more than one man

Tacking - zig-zagging from side-to-side to move against the wind (plate 17)

Wharf - a platform built over the water to load or unload a ship

Windlass - a horizontal cylinder turned by a crank or with pegs

Yard - the horizontal pole from which the sail is suspended



## Designer's Notes

This book was prepared as an aid to individual encounter gaming. Each vessel has a technical description which gives enough basic data about the ship to permit inclusion into any set of miniatures rules.

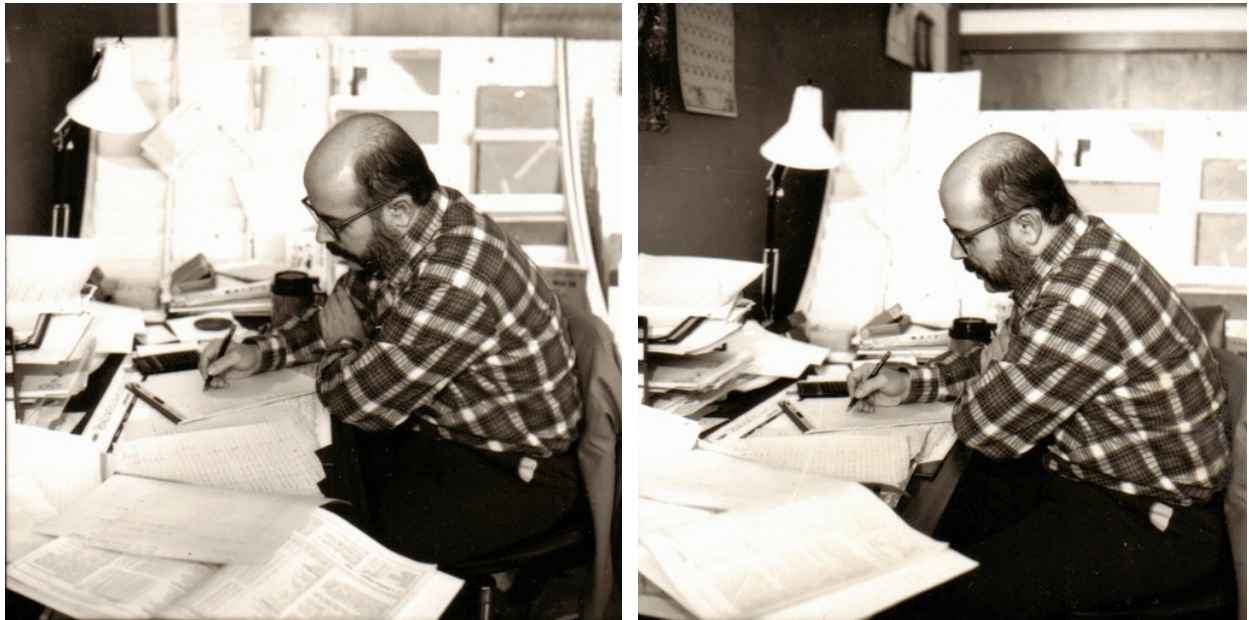
A lot of research time was spent determining the precise appearance of various vessels. Naval historians have had much new material to work on, as a result of recent archeological finds. The wide-spread use of underwater equipment has resulted in the uncovering of many wrecked ships of various eras. The new techniques of chemical, atomic, and statistical analysis have yielded fresh insights as to construction techniques and common-use practices.

These drawings were provoked by several medieval and fantasy campaigns where local gamers needed the "right" kind of ship. Since none were available, the author was forced to turn to reference books and the drafting board. It is hoped that this product will fulfill the gamers' need for nautical material. It is also intended to bring out additional fleets of ships.

Happy Gaming !

Dave Sering

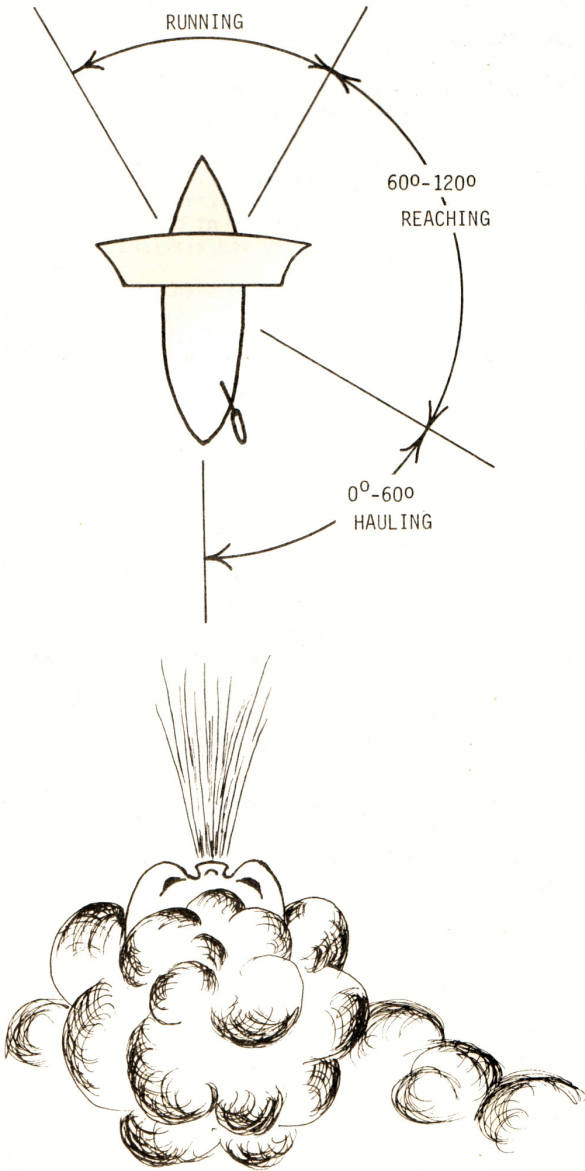
### Judges Guild



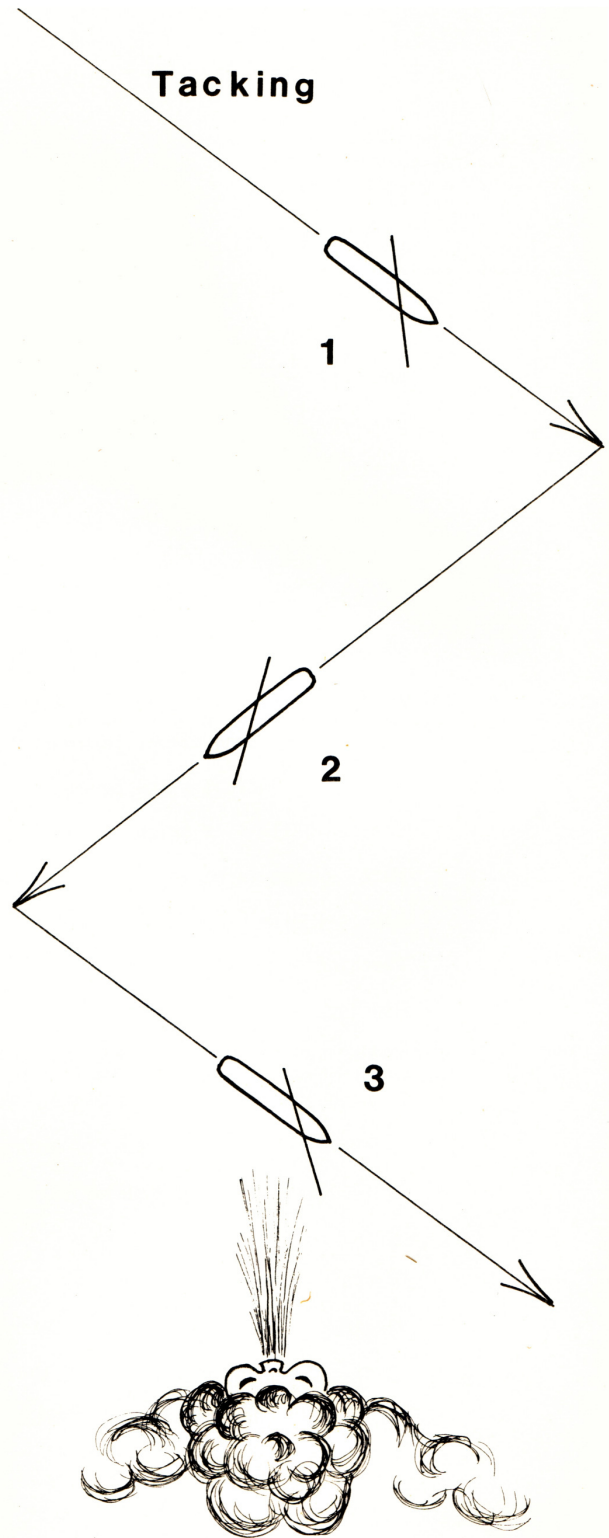
The author and designer, Dave Sering, at work in the Judges Guild design department - 1981.



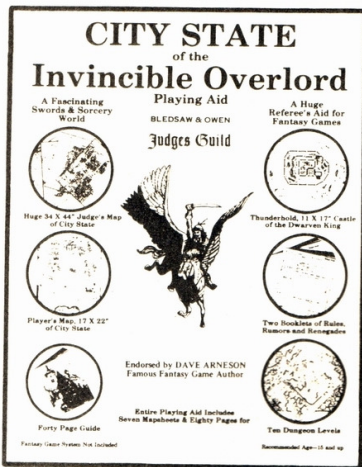
# Sailing



# Tacking



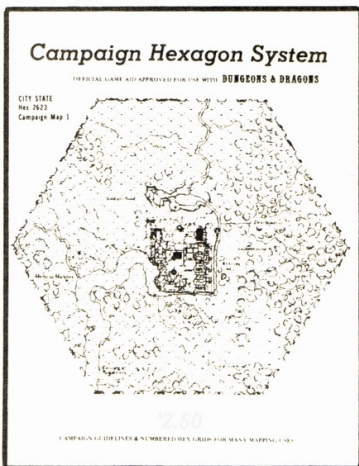
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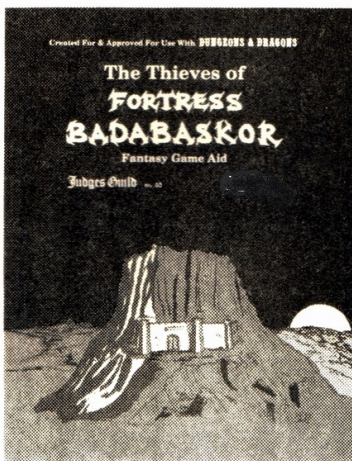
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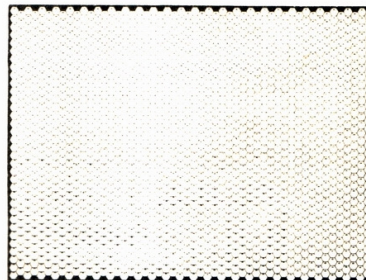
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