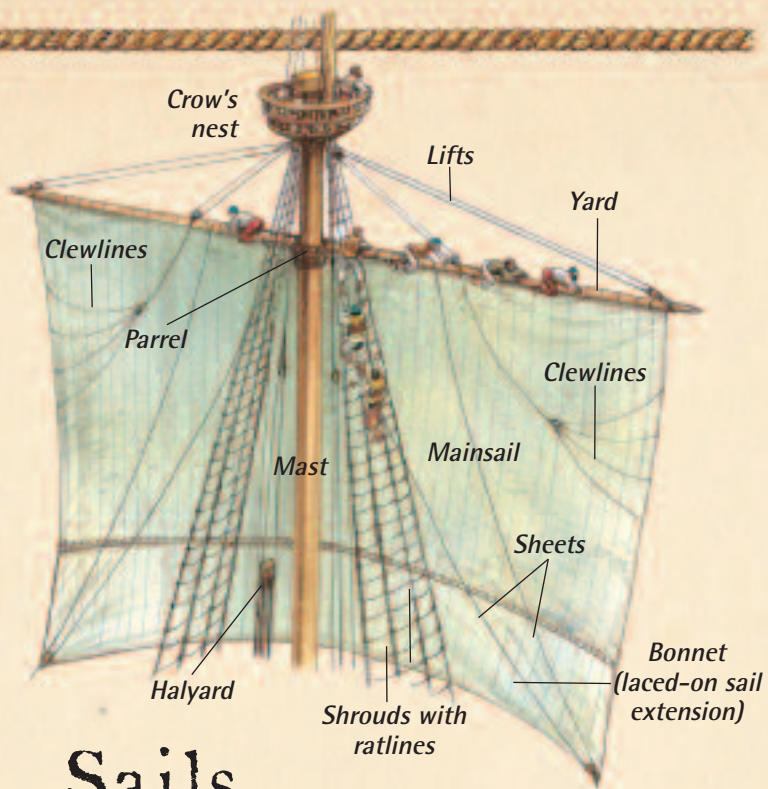


The standing rigging holds the masts securely in position. They consist of ropes called shrouds, which attach the masts to the ship's sides, and stays, which run between the masts. Running rigging takes its name from the blocks and pulleys through which the ropes run. They include the halyards, which hoist the yard up the mast, sheets, which keep the sails taut, and braces, which swing the yard left or right. Clewlines bunch the sail up against the yard when it is furled.



Sails

The ship's sails, together with the ropes used to adjust them, are called the rigging. A sail is attached to the mast on a horizontal yard, held in place by ties and lifts. It is hoisted into place by halyards. Men climb up and down the rigging on rope ladders, called ratlines. The galleon has three masts. From the bow they are: the foremast, mainmast and mizzen mast.



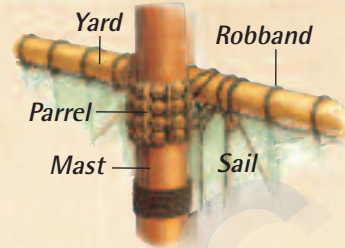
This sequence shows a ship making a turn to the left in a constant wind. At first, the sails are braced at right angles to the wind (1). Swinging the yards to the right and unfurling the lateen (2, 3) starts to turn the ship. Angling the rudder to the right assists in the turn. Eventually the sails are almost parallel to the wind (4).



The foremast and mainmast each carry three square sails, the mizzen mast one square sail and a triangular, or lateen, sail. To change direction when the wind is constant, or to maintain a steady course when the wind

itself changes direction, the position of the sails are adjusted. Braces, ropes attached to the ends of the yards, are used to swing them around. Keeping the sails braced at right angles to the wind will enable the ship to travel in the same direction as the wind. By bracing sails parallel to the direction of the wind, the ship can be slowed down.

To alter course, the angle of the square sails is adjusted to the right (starboard) to turn right or to the left (port) to turn left. Unfurling the lateen sail will help to catch the wind so the ship swings round smoothly. Adjusting the sails to a sharper angle causes the ship to make a tighter turn. Furling, or shortening, the sails helps to slow the ship down by reducing the area of sail open to the wind.



The sails are fastened to the yards by loops of rope called robbands. The yards themselves are mounted on the masts using a swivel device called a parrel. This allows the yards, and so the attached sails, to be adjusted to the position required.



The ship is steered by adjusting both sails and rudder. The rudder is controlled by the helmsman (top left). He holds a long handle, called a whipstaff, linked to the rudder by rods. He stands below deck, out of sight from enemy snipers.



With the wind blowing in the direction of these arrows (above), the larger warship is lying to windward of the smaller pirate ship. The warship can bear down on the pirate ship easily, whereas the pirate ship, in her leeward position, must tack from side to side to approach the enemy.

Defence

The Spanish Treasure Fleet is a tempting target for every privateer, buccaneer, filibuster or pirate sailing in the Caribbean Sea, Gulf of Mexico and Atlantic Ocean. For protection against these predators, the treasure ships always sail in convoy, accompanied by an escort of men-of-war: warships.

In a large convoy the admiral usually sails at its head, the vice-admiral at the rear and other men-of-war to windward. Keeping to windward gives the warships the "weather gauge" (see *Encounter at Sea*): they can quickly chase pirates approaching from leeward. But sometimes the winds veer or calms hit the convoy unexpectedly – a time of maximum opportunity for pirates.



To seek out and attack pirates off the Spanish Main.

the Spanish have also authorized the setting up of *armadillas*, squadrons of armed vessels. Smaller types of ships, including sloops and *barque longues* (right), together with oared boats such as the canoe-like *piraguas*, form the defence of ports along the Spanish Main. But

these craft often have difficulty finding their targets, or come under attack in the battles that follow. Some of their crews have even been known to turn to piracy themselves!

"A sail! A sail!" The first line of defence is the lookout on the masthead. A ship on the horizon can be spotted, in ideal conditions, up to about 40 km away (left).



With its precious cargo aboard, the Treasure Fleet convoy sets sail from Havana, Cuba, bound for Spain. Some convoys may be as strong as 15 men-of-war and 80 cargo ships

Vice-admiral's ship

Cargo ships

Cargo ships

Admiral's ship

Man-of-war

Man-of-war

Man-of-war