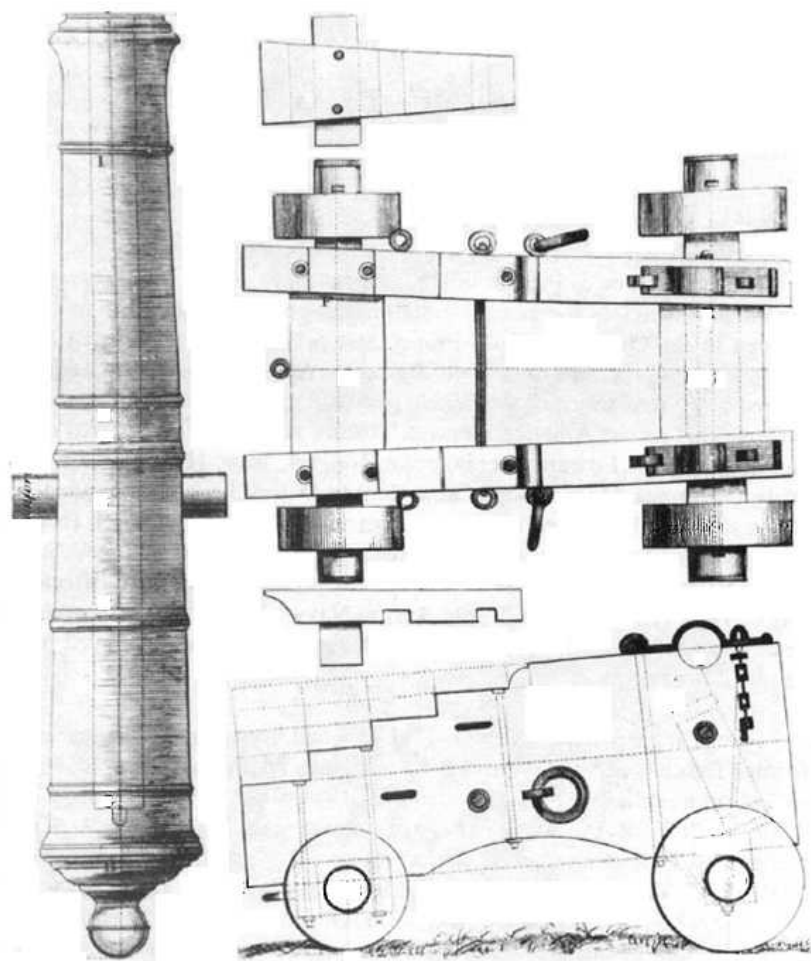


This section discusses the use of muzzle-loading artillery at sea. Artillery was used at sea for hundreds of years, and the cannons and tactics changed frequently over time and between the navies of the world. This section is not designed to be an exhaustive discussion on naval artillery, but to provide general information on the subject.

Naval Gun Overview

Guns on the USS Constitution in the War of 1812



An eighteenth century drawing of a typical naval gun and its truck carriage. Weapons of this type were a mainstay of naval warfare from the introduction of gunpowder until well into the nineteenth century.

The *USS Constitution* had a total of thirty cast-iron 24-pounder guns installed on her gun deck, 15 to each side. These were organized into five-gun divisions, each commanded by a lieutenant

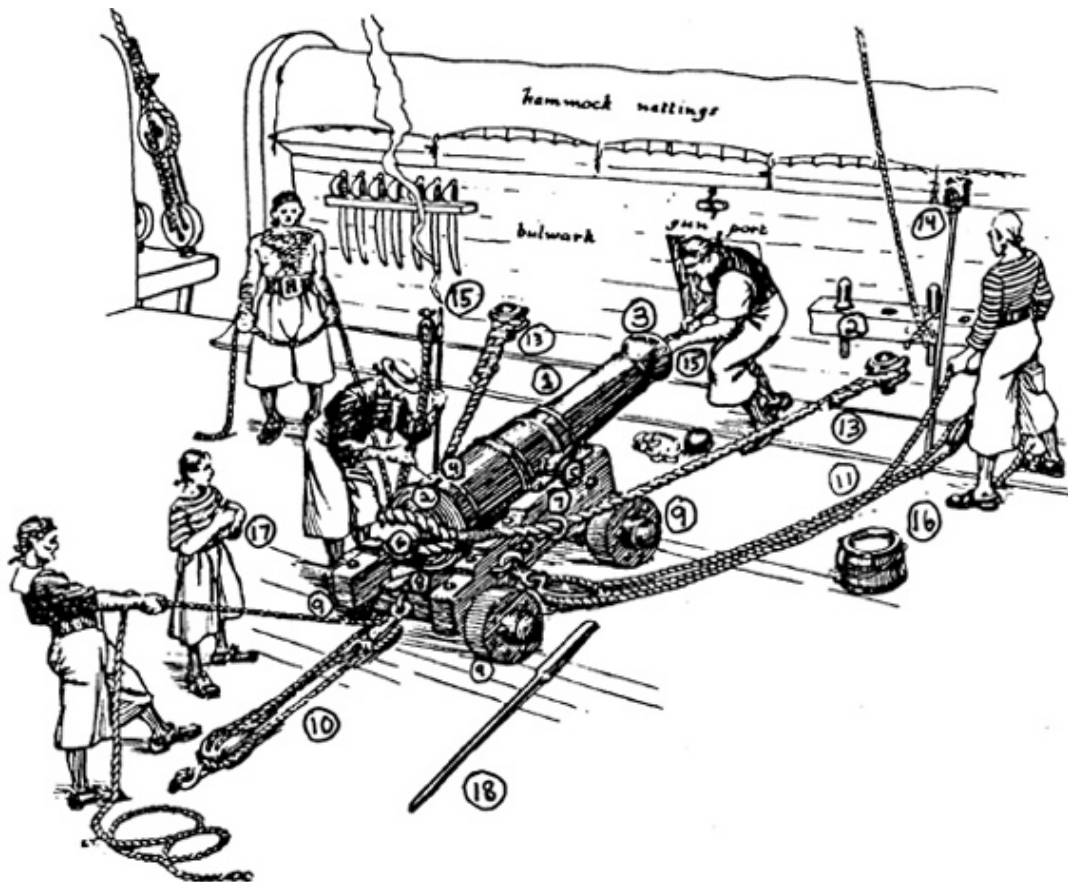
The 24-pounder was a powerful weapon. The cannon measured nine and one-half feet long from breech to muzzle, with a 5.8-inch bore. With its carriage it weighed nearly three tons. Like all the artillery pieces of its day, it was a black-powder smoothbore firing a round iron shot.

Dismantling shot, a generic term for different types of special shot used to tear up an opponent's sails and rigging, included bar shot—two ball halves connected by an iron bar—and chain shot, an iron ring to which several lengths of chain were fastened. Chain shot was sometimes called star shot from the way the sections of chain opened up, star-fashion, in flight. Another form of chain shot consisted of two round shot connected by a short chain. Grape and canister, containers of large and small "scatter shot," were used at close range against an enemy's crew.

Gun Crews on the USS Constitution in the War of 1812

During the War of 1812, a midshipman commanded fourteen of her fifteen gun-deck 24-pounders with a typical gun crew of twelve men and a powder boy (Royal Navy typically had 14 men and a Powder Boy). The 1st Captain primed and aimed the gun while the 2nd Captain tended the firing lock and slowmatch and fired. 1st, 2nd, and 3rd Spongers and Rammers relieved one another at those strenuous tasks to keep up the rate of fire. One man brought shot from the racks; another tended the train tackle to hold the gun in place while loading. If needed, some men were designated to take stations as boarders to man the pumps, or to fight fire. Guns were normally manned on the engaged side only; if a ship engaged two opponents, gun crews had to be divided.

The gun was mounted on a simple wooden carriage which was controlled by an arrangement of lines and tackle. The tools used to load and fire the gun were stowed on the bulwarks.

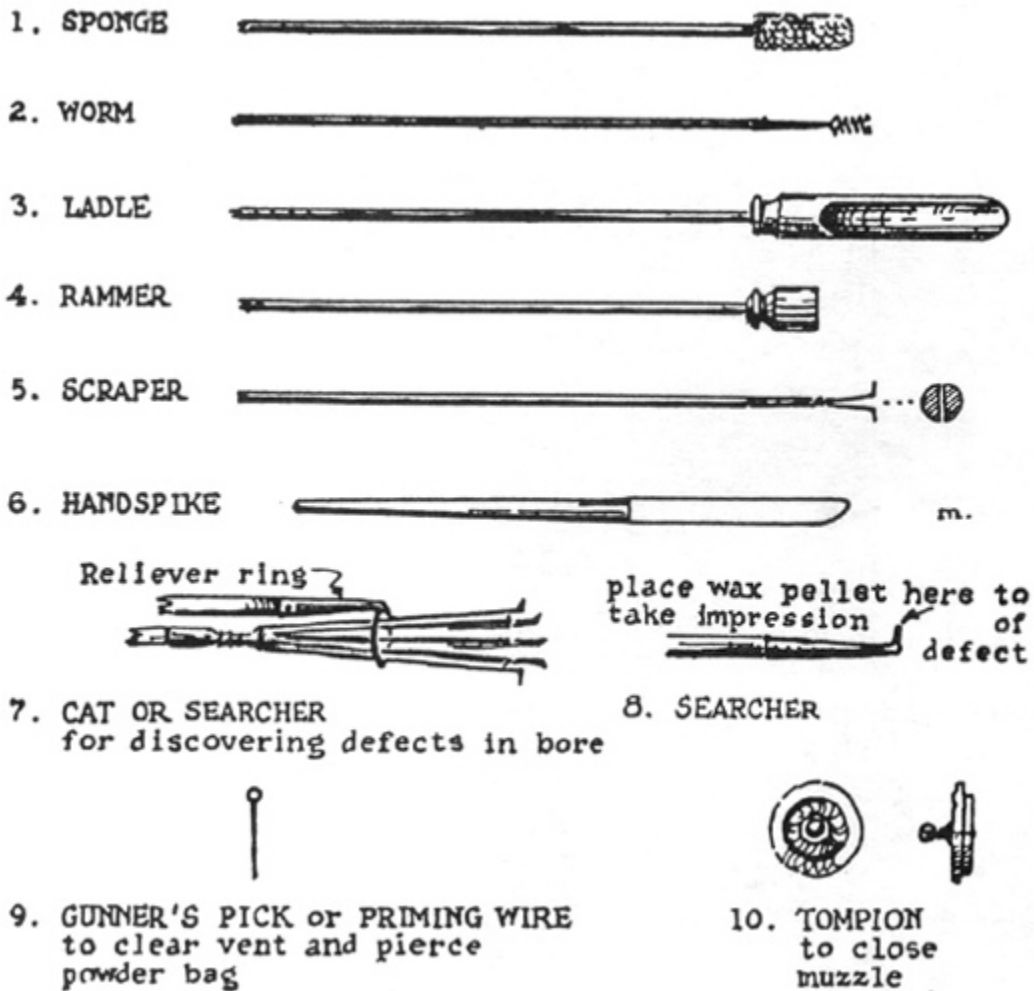


- | | | |
|----------|------------|----------------------------|
| 1 Barrel | 7 Carriage | 13 Rammer |
| 2 Breech | 8 Quoin | 14 Sponge |
| 3 Muzzle | 9 Truck | 15 Linstock with Slowmatch |

- | | | |
|-----------------|-----------------|-----------------|
| 4 Vent | 10 Train Tackle | 16 Water Bucket |
| 5 Trunnion | 11 Side Tackle | 17 Powder Box |
| 6 Cascabel Knob | 12 Breeching | 18 Handspike |

In the drawing above, the gun is in its recoil position for loading, and the man to the left is keeping a strain on the train tackle to hold the cannon in place while the man at the muzzle rams the load home. The man at the breech is piercing the powder cartridge with a priming wire before inserting the priming tube: in his left hand is a Linstock, a wooden staff holding a piece of burning slowmatch (see the Linstock section in this manual). When the gun is ready to fire, the two side tackles will be used to “run it out” (bring the gun forward into the firing position).

Naval Cannon Implements.



- The sponge, moistened with water, extinguished sparks in the bore after firing.
- The worm cleaned unburned fragments of cloth powder bags from the bore. Ladles were originally used to load powder; after cartridge bags came into use, they were used to extract loads from muzzle-loaders without firing.
- The rammer sealed cartridge and ball in place; the scraper and searchers were used to clean the gun and to find damaged spots in the bore.

- The handspike helped to move the gun carriage and to raise the gun breech so the wedge-shaped quoin could be moved to adjust the gun's elevation.
- The priming wire pierced the powder bag to make sure that the flame of the primer would ignite the powder charge, while the tompion kept the bore dry while the gun was not in use.

Nearby shot racks held the iron cannon balls.

Loading and Firing Naval Cannons

When an enemy was in sight, the crew was called to battle stations with the order to BEAT TO QUARTERS. The ship's marine drummer provided a cadence (drum beat) to call the men to their stations. The order CLEAR FOR ACTION was given and everything not needed for battle was stored below decks. The galley fire was put out; furniture in the captain's and commodore's cabins was moved below decks to make room for the gun crews. On the gun deck, the artilleryists would get the cannons ready for use. A gun-deck 24-pounder had a crew of up to 14 men.

The gun crew first unfastened the lashings which held the gun secure at sea. This had to be done with care. Gun carriages were not fixed to the deck; if one should break loose in a seaway, the consequences could be dangerous to the ship and fatal to the men who had to bring the cannon under control.

The crew then removed the covers that kept dampness out of the bore, and took various implements from their racks. Guns of this period were equipped with firing locks, but lengths of lighted slow match-cord were put in safe places along the gun deck for use in case a lock should fail. Down below the frigate's waterline, the gunner and his assistants opened the forward and aft magazines and began to break out flannel powder cartridges for the guns and carronades. Other men took stations along the lower decks to pass cartridges up to the gun crews.

When the ship was within shooting range of the enemy (usually no more than a few hundred yards) the gun-port lids, which kept wind and spray out while cruising, were opened. At the command RUN OUT, the artilleryists pulled on the side tackles to roll their guns forward until the muzzles extended through the ports. One of the gun crew inserted a wire pick through the vent to pierce the cloth powder bag, inserted a priming tube (a length of quill, packed with fine powder) into the vent, and then primed the pan of the firing lock (like the locks used in flintlock muskets) with fine powder from a flask or horn. The lock was cocked, and the gun captain (the senior enlisted man of the gun crew) took the end of the firing lanyard and stood, knees flexed, behind the gun and sighted along the barrel.

The captain's order to commence firing was passed to the division officers, who then directed their guns. A ship's guns might open fire together in a single broadside, or each division might be ordered to FIRE AS SHE BEARS. As the target came into view through his gun port, the gun captain waited for the proper moment in the ship's roll, depending on whether the object was the enemy's hull or his masts and rigging. At the right moment, the gun captain pulled the lanyard to trip the firing lock. This struck flint against steel, sending a spark into the pan. The ignited powder in the pan sent a flame through the priming tube to set off the powder charge in the gun to fire the 24-pound iron shot at the enemy.

Sir Isaac Newton stated that “for every action there is an equal and opposite reaction.” The force needed to send a cannon shot on its way at many hundreds of feet per second also made the gun

recoil on its carriage with great force. In a crowded space like the deck of a ship, this had to be controlled with ropes and pulleys to bring it safely to a stop.

After the gun fired and came to a stop, the bore was wiped out with a sponge moistened with water to put out any burning embers of powder that might still be inside the gun. The powder passer, who shuttled between the gun and the lower-deck hatch to pick up powder charges from the gunner's assistants, brought a flannel cartridge to the gun and handed it to the loader who pushed it into the muzzle. The cartridge was pushed firmly home with the rammer, and a wad of scrap fibers was rammed down after it. A shot man brought the iron ball from a nearby shot rack; the loader inserted the shot in the muzzle; then followed with another wad and rammed the load into place. The gun was now ready to run out, prime, and fire.

In the earlier stages of an engagement, loading and firing might be done in an ordered fashion, with the ship discharging whole broadsides or firing by division. When two ships finally came to close quarters, they usually began to fire at will, each gun loading and firing as rapidly as possible under the direction of its own midshipman and gun captain. At the close ranges of that day, effective shooting depended not upon pinpoint accuracy, but upon rapidity. When the target was looming only a few yards away there was no question of aiming, but simply of getting off as much shot as possible to overwhelm the enemy. While some captains drilled their men in firing at longer ranges and taught accuracy and coordination of fire, many officers considered short-range rapid fire the principal test of a well-trained gun crew.

Cannon Shot in the War of 1812

The principal object of naval battle in 1812 was not to sink an enemy, but to batter him into surrendering. It was difficult to destroy a wooden warship with solid shot. Relatively few wooden sailing warships were sunk in combat.

The iron solid shot was the principal ammunition.

In the early stages of an engagement, while two ships were maneuvering for the best position, a captain might try to use dismantling shot to disable the maze of sails and rigging. Chain shot was issued in a variety of forms:

- A bag containing an iron ring to which were fastened five 3 to 4 foot lengths of chain, This was usually known as "star shot."
- A split ball the two halves linked together by two heavy links of chain. Usually known as "split shot."
- Two cannon balls linked together with as short length of chain, usually known as chain shot.
- "Split chain shot" and "spider shot" were variations of chain rounds.

As the ships drew close to one another, some of their guns might load with grape or canister to sweep the enemy's decks. Grape was a round with 9 small iron balls on a wooden form wrapped in canvas (This resembled a cluster of grapes). When fired the canvas disintegrated and the balls were like a shotgun charge. This is very different from canister, which has many more small iron balls packed in a cloth, leather or tin container with sawdust and is used against personnel.

"Hot shot" were simply iron round shot, heated red in the galley stove for use against an inflammable target. The sizzling ball, embedded in the wood of a building or a ship's hull, could ignite a fire if not quickly extinguished.

All of these rounds including grape were used to shred rigging. The solid shot was used to dismount enemy guns, and penetrate the enemy hull.

Shell was a hollow cast iron sphere filled with gunpowder and separately fused. It was tricky to use since the shell fuse was ignited by the fire wash around the shell when fired. If the shell was "short-fused" or the fuse was faulty, and the round exploded in the barrel, it usually damaged the gun severely and often the crew as well.

Types of Naval Guns

Broadside Carriage Guns

These guns like the others smooth bore cannons are designated by the weight of the solid ball ammunition used. For example: if the ball weighs six pounds, the gun is designated as a 6 Pounder. Broadside Carriage guns include 6 Pounders, 9 Pounders, 12 Pounders, 18 Pounders, 24 Pounders, and 32 Pounders. There was also a 36 Pounder used in the French naval service. The largest guns of this period were the 42 pounders found in coastal fortifications and in some major warships. The 6 to 24 pound gun was in common use depending upon the size of the vessel.

The broadside guns were manufactured in three lengths; short, medium, and long; the long guns being the most accurate and long ranging. Long guns were sought out and used primarily for warships, while the short and medium guns were used for privateers and merchant vessels that routinely ventured into pirate waters like the British East and West Indiamen. These ships carried extremely valuable cargoes and needed significant armament to pass safely through the Eastern Seas. The Short and Medium barreled weapons were often referred to as "Cannonades" and had a tendency to "jump" upon firing when they were hot (after a few rounds had been fired).

These cannons were mounted on typical wheeled sea carriages whose design adapted the gun very well to the ship's structure. Aiming the gun as well as moving the entire gun and carriage had to be done by handspike.

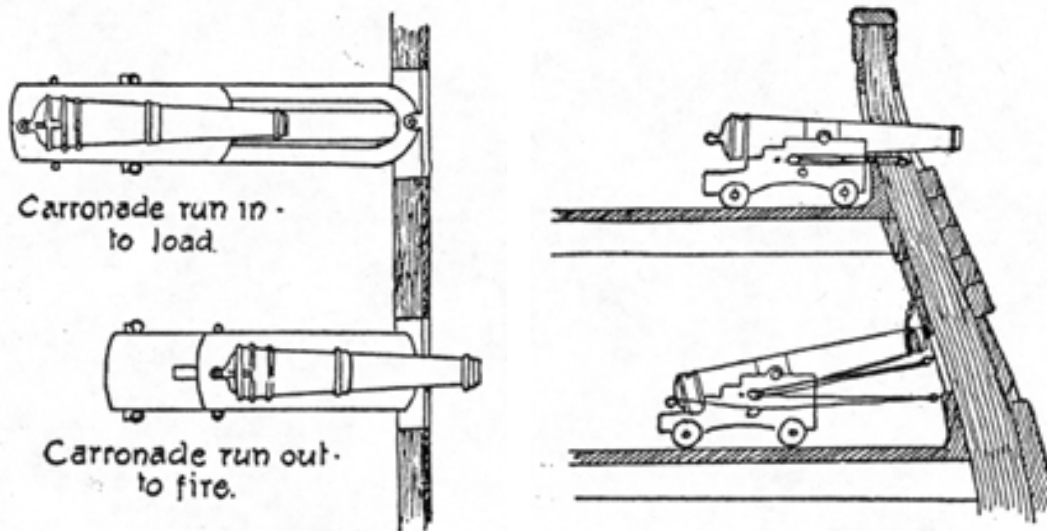
Chase Guns

These guns, as the name implies, were used in the chase of another vessel or when being chased. The best of these were either 9 Pounders on smaller vessels or 18 Pounders on larger warships. These weapons were usually precision bored, and were always "long" guns. They were as accurate a gun as was available in the period. They were mounted in the bows and the stern of a ship, and were mounted on sea carriages like the broadside guns.

Carronades

These guns were called "Smashers" and they were developed very late in the Revolutionary War period at a foundry in Carron Scotland. They were a short-range gun. However they could deliver a heavy ball for the weight of the barrel. The gun rested on a slide carriage and was mounted with a "mounting block" cast on the bottom of the gun instead of trunnions. The barrel was very light in comparison to a long gun and could do significant damage at short range. They were cast in 9 Pounder, 12 Pounder, 18 Pounder, and 32 Pounder. Virtually every warship in the Spanish, Dutch, British, French and American navies carried them. There was also a variation of

the Carronade called the "Gunade" which was a very similar gun except it was mounted on a sea carriage instead of a slide carriage and used trunnions instead of the mounting block. The "Gunade" was almost totally confined to merchant ships and privateers. Another advantage of the Carronade/Gunade was that it required a much smaller crew.



Other Guns

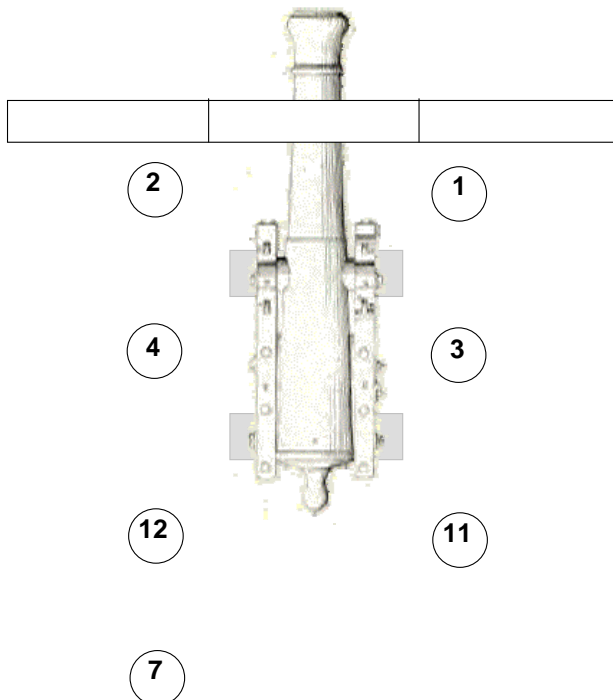
In addition to Broadside Guns, Chase Guns, and Carronades, there were a variety of additional guns in use aboard ships. These include, but are not limited to, swivel guns, 6-pound long guns, and mortars.

Naval Gun Posts and Duties

Naval Crew Numbers and Positions

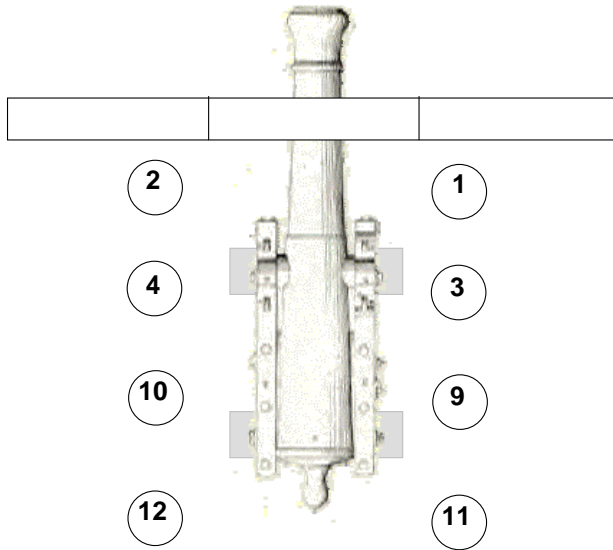
- | | |
|--|--|
| ① 1 st Sponger, Rammer, Side Tackle | ② 1 st Loader, Side Tackle |
| ③ 2 nd Sponger, Rammer, Side Tackle | ④ 2 nd Loader, Side Tackle |
| ⑤ 1 st Shot & Wad | ⑥ 2 nd Shot & Wad |
| ⑦ 1 st Train Tackle and Crowbar | ⑧ 2 nd Train Tackle and Crowbar |
| ⑨ 1 st Handspike & Train Tackle | ⑩ 2 nd Handspike & Train Tackle |
| ⑪ 1 st Captain | ⑫ 2 nd Captain |
| | Ⓑ Powder Boy |

6 Pounder Quarterdeck Crew



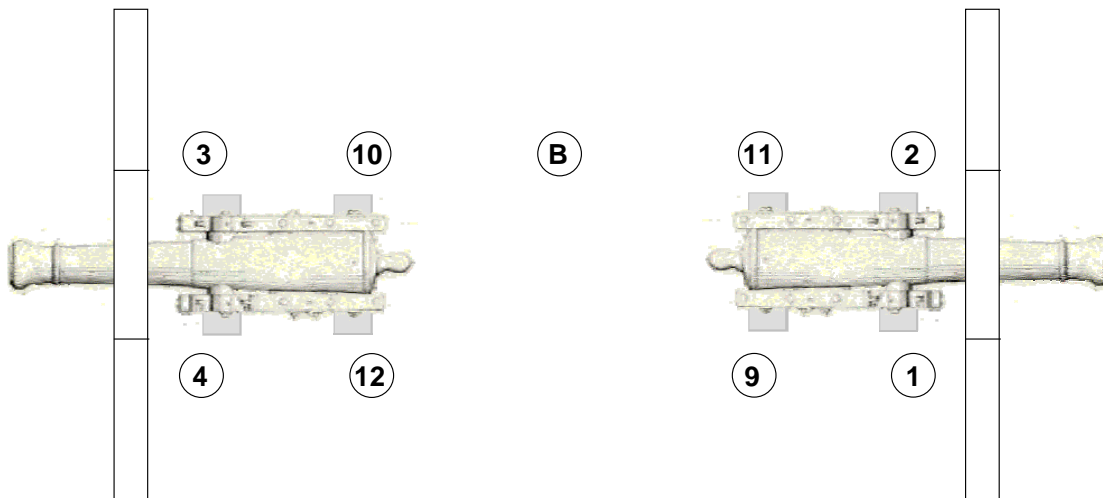
Single Gun Crew - Quarter Deck
6 Pounder

12 Pounder Gun Deck Crew



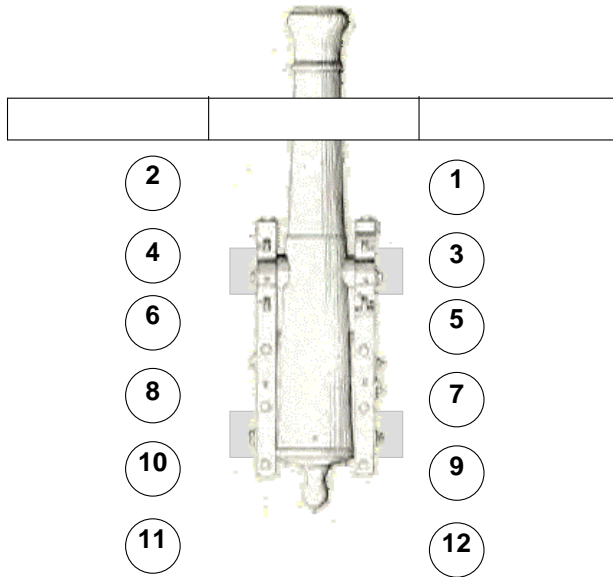
B

**Single Gun Crew - Gun Deck
12 Pounder**



**Gun Crew Position – Both Sides of Gun Deck
12 Pounders**

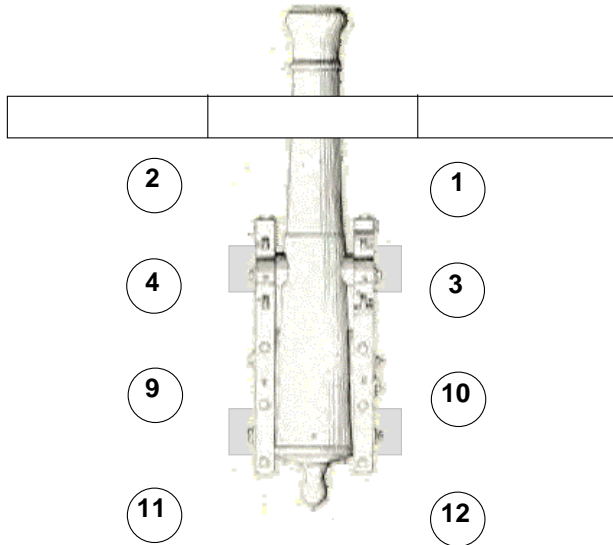
24 Pounder Gun Deck Crew



B

**Gun Crew
24 Pounder**

32 Carronade Crew



B

**Gun Crew
32 Pound Carronade**

Crew Positions for the 24 Pounder Broadside Long Gun and the 32 Pound Carronade

- **Number 1** (called **1st Sponger & Rammer & Side Tackle**) uses a sponge on a large staff to clean and cool the bore, a rammer on a large staff for ramming and seating the charge. Also helps position the cannon.
- **Number 2** (called **1st Loader & Side Tackle**) inserts the charge into the bore to be rammed. Also helps position the cannon.
- **Number 3** (called **2nd Sponger & Rammer & Side Tackle**) assists Number 1 with sponging and ramming. Also helps position the cannon.
- **Number 4** (called **2nd Loader & Side Tackle**) assists Number 2 with ramming. . Also helps position the cannon.
- **Number 5** (called **1st Shot & Wad** or “**Shellman**”) hands the shot and wadding to Number 2 to place into the bore.
- **Numbers 6** (called **2nd Shot & Wad** or “**Shellman**”) assists Number 5 in handing the shot and wadding to Number 2.
- **Numbers 7** (called **1st Train Tackle and Crowbar**), helps position the cannon.
- **Number 8** (called **2nd Train Tackle and Crowbar**) helps position the cannon.
- **Numbers 9** (called **1st Handspike & Train Tackle** or “**Handspikeman**”), helps position the cannon.
- **Numbers 10** (called **2nd Handspike & Train Tackle** or “**Handspikeman**”), helps positions the cannon.
- **Numbers 11** (called **1st Captain**), serves as the gunner for the cannon.
- **Numbers 12** (called **2nd Captain**), assists Number 11 as needed.
- The **Powder Boy** carries the powder to Number 2.

A 12-pound gun would not have this number of men. A long 12 Pounder's crew would have consisted of eight men and a boy, and a long 6 Pounder, six men and a boy.

When the guns (12 Pounders) on both side of the ship were manned simultaneously, the First Captain, Loader, Sponger and Handspikeman man the Starboard guns, and the Second Captain, Loader, Sponger and Handspikeman the port guns, four men to a gun. When only one side is in use, all eight men man the gun.

Naval Gun Battery Command Structure

The Gun Captains were experienced seamen but were for the most part not petty officers. For each "battery" of four guns there was usually a Midshipman, or if not a Midshipman, a Gunner's Mate who was in charge of the battery. His responsibility was to see that all the equipment for the gun was in it's place and well cared for, and his battle station was behind his guns for which he was responsible. He passed the word from the captain as to what rounds to load, where the target was, and other information vital to the Gun Captains.

The Second Lieutenant commanded the main gun deck, and on larger ships the Third Lieutenant the upper deck where the smaller guns were located. These officers took their orders from the Captain and/or the First Lieutenant and relayed these orders to the Midshipman commanding the batteries. The Captain and the First Lieutenant were on the Quarterdeck.

In the Royal Navy, the Gunner was a Senior Warrant Officer, and with his Mates, was responsible for making up charges, stowing ammunition, and looking after the gun carriages and the guns and all their related equipment. He was also responsible for any activity relating to the guns or gunpowder.

Naval Gun Deck Drill

This drill begins after the commands BEAT TO QUARTERS and CLEAR FOR ACTION have been given, and the cannoneers are on the Gun Deck (or other deck where their cannon or division is based).

SILENCE - MAN THE STARBOARD (OR PORT) GUNS

Number 11 – Faces the gun muzzle. Strict silence is observed while waiting for orders.

Numbers 1, 3, 5, 7, 9 – Turns Left to face the cannon with head turned toward Number 11. Strict silence is observed while waiting for orders.

Numbers 2, 4, 6, 8, 10, 12 – Turns Right to face the cannon with head turned toward Number 11. Strict silence is observed while waiting for orders.

Powder Boy – Stands behind Number 11. Strict silence is observed while waiting for orders.

CAST LOOSE AND PROVIDE

Number 11 – Takes off the lock cover, hands it to Number 7, who places it amidships; buckles on his waist belt (with cartridges and percussion caps and a box containing fifty primers), provides himself with a priming wire (vent prick), puts on and secures his thumb stall.

Number 12 – Assists in casting loose; takes off and places amidships sight covers, selvage straps, and toggles; handles quoin; provides thumb-stalls, priming wires, and boring bit (vent auger), linstock (properly armed with slow match and lit) and equips himself with the first two; clears the lock string, and lays it in a loose coil round the lock, and buckles on his waist belt (contains the same as the First Captain's). If the gun has an elevating screw, elevates the gun.

Number 1 – Aided by Number 2, opens the gun port. Takes off the muzzle lashings; takes out the tompion and passes it to Number 3, who hangs it amidships; places chocking quoin on the right side of the gun near the ship's side. The Spongers take down the sponges and rammers, take off the sponge cap and hang it out of the way; place sponges and rammers together on the right side of the gun; heads toward the breach in the brackets overhead on covered decks, other wise on deck.

Number 2 – Aided by Number 1, opens the gun port. Places handswabs and chocking-quoin near the ship's sides on the left side of the gun, aids Number 1 in taking the tompion out of the muzzle of the gun.

Number 3 – Assists in casting loose, hooks outer blocks of sidetackle to side training bolt on the right side of the gun. The Spongers take down the sponges and rammers, take off the sponge cap and hang it out of the way; place sponges and rammers together on the right side of the gun; heads toward the breach in the brackets overhead on covered decks, other wise on deck.

Number 4 – Aids in casting loose; sees the wads in place, and for rifled cannon places a pot of grease at hand; hooks outer block of side tackle to side training bolt, on the left side of the gun.

Number 5 – Assists in casting loose, provides shot and wads, and proceeds to the hatchway, ready to pass loaded shell; if ordered.

Number 6 – Assists in casting loose, provides shot and wads, and proceeds to the hatchway, ready to pass loaded shell; if ordered.

Number 7 – Assists in casting loose; moistens the sponge, being certain that the end of the sponge which touches the bottom of the bore is thoroughly wet. Also leads out and hook train tackle.

Number 8 – Assists in casting loose; moistens the sponge, being certain that the end of the sponge which touches the bottom of the bore is thoroughly wet. Also leads out and hook train tackle.

Number 9 – Takes out the handspikes, and with gun carriages using a quoin, each standing between his handspike and the side of the ship, place the heel of their handspikes on the steps of the carriage and under the breech of the gun, and raise it so that the quoin may be eased and the lower half port be let down; or when housed the bed and quoin be adjusted. Then, each Handspikeman will lay his handspike on deck, on his own side of the gun, parallel with its axis, clear of the trucks and butt to the rear.

Number 10 – Takes out the handspikes, and with gun carriages using a quoin, each standing between his handspike and the side of the ship, place the heel of their handspikes on the steps of the carriage and under the breech of the gun, and raise it so that the quoin may be eased and the lower half port be let down; or when housed the bed and quoin be adjusted. Then, each Handspikeman will lay his handspike on deck, on his own side of the gun, parallel with its axis, clear of the trucks and butt to the rear.

Powder Boy – Goes to his proper scuttle for his passing box. Once received, he returns and stands a little to the left and in rear of the gun; keeping the passing box, under his left arm, and the cover closely pressed down with his right hand. In the passing box is the gunpowder cartridge.

SPONGE YOUR GUNS

Number 11 – Places his thumb over the touchhole of the gun, while Number 1 sponges, which creates a vacuum in the gun that will extinguish any sparks left in the gun from a previous shot.

Number 1 – Rams the wet sponge down the barrel to the breech wetting the barrel to extinguish any sparks left in the gun from a previous shot.

NOTE: In Loading the Gun, when it is run in as far as the breeching will permit, its muzzle is only eighteen inches inboard, so the Sponger has to lean out of the port to insert and manipulate the long handle of the Sponge.

LOAD CARTRIDGE

Powder Boy – Passes the powder charge from his passing box to Number 2.

Number 2 – Places the powder charge into the gun.

RAM CARTRIDGE

Number 1 – Rams the charge home to the Breech end of the cannon barrel.

LOAD ROUND (BALL OR SHELL)

Number 5 – Passes the selected round and wad to Number 2.

Number 2 – Places the round and wad in the gun barrel. The wad is placed between the cartridge and the round.

RAM ROUND

Number 1 – Rams the Round and Wad against the charge (cartridge).

Number 11 – Inserts the Priming Wire into the touchhole making a hole in the Cartridge Bag, then primes the gun by either inserting a friction primer into the touchhole or by filling the touch hole with Priming Powder from the Priming Horn at the gun.

RUN OUT

Numbers 1-4 – Run the guns up to the side of the ship.

Number 11 – Sights the gun, elevating or depressing the gun barrel by use of the quoin or an elevating screw.

Numbers 9-10 –In the case of the quoin, the Handspikemen eased (lift) the Breech of the gun to allow proper placement of the Quoin. Training tackles and handspike were also used to train the gun from side to side.

FIRE AS YOUR GUNS BEAR

Number 11 – Warns his crew to CLEAR THE GUN meaning that they should stand clear. Then, fires the gun either by touching the smoldering linstock to the fine priming gun powder in the touchhole, igniting the friction primer by jerking the lanyard attached to it, or by activating the firing lock (similar to a flintlock) attached to the gun barrel.

NOTE: Generally, lock firing did not do well until the gun was hot, and the linstock and powder train was used at first.

Once the gun has fired, the crew immediately services the piece to prepare it for the next round. Once the engagement is ended, the piece is secured, the implements are secured, and the gun ports closed.