
Scout Brigade of Fort George Artillery Crew Reference & Procedures Manual

Based on
British 9-Pounder Smooth-Bore
Muzzle-Loading Gun

December 2007



Table of Contents:

Responsibilities of Scouting Youth 3

British 9lb'r Parts Illustration 4

 Shell & equipment 6

Roles and Responsibilities within SBFG Artillery Regiment 9

SBFG Artillery Commands 10

SBFG Artillery Marching Commands 12

SBFG Artillery Regiment Parade Review Formation 15

SBFG Artillery Regiment Rules of Engagement 16

 Range Flags 17

Reference material taken from:

 British Napoleonic Artillery 1793-1814 (1)

 Field Artillery

 Chris Henry, illustrated by Brian Delf

 New Vanguard Series

 Osprey Publishing

 Drill 18

 Tactics 19

 Battlefield Effectiveness 21

Appendix:

 Fort York Artillery Binder Material 23

Responsibilities Scouting Youth of a SBFG Artillery Crew

To be a member of an Artillery Crew:

- you must be 14 years of age at the time of the Campaign as well as a member in good standing of Scouts Canada or Boy Scouts of America (BSA)
- you must have served at least one year in the Infantry element of the SBFG
- you must make the commitment to attend organizational meetings and practices
- you must learn the following pages, 3 to 17, of reference material to the best of your ability (priority is given to parts of the artillery piece and the operational procedures all other knowledge is bonus)
- you must remember that this Crew is a Senior youth group within Scouts Canada or Boys Scouts of America, who will be setting an example at the annual International Scout Brigade of Fort George "Living History" camp. There will many more younger Scouting youth present. Fun, yet serious commitment must be made by all Artillery Crew members!

American Artillery Officers of this time period, for the most part, were originally trained in British Artillery technics. For the present time, Artillery evolution within the Brigade all Artillery participants will follow this reference manual. Hopefully, our American Scouting brothers can provide some historical reference material that can be incorporated in this manual in the future.

Returning members of the Artillery Crew will form the Executive and take input from all Crew members and make decisions regarding Crew Roles. It will be the Executives responsibility to train new members as they are accepted.

The Brigade has determined Gun Crew size to be 8 members in total. If a Scout Group cannot raise 8 members, the existing number will be joined with another Scout Group to form an 9 man Crew.

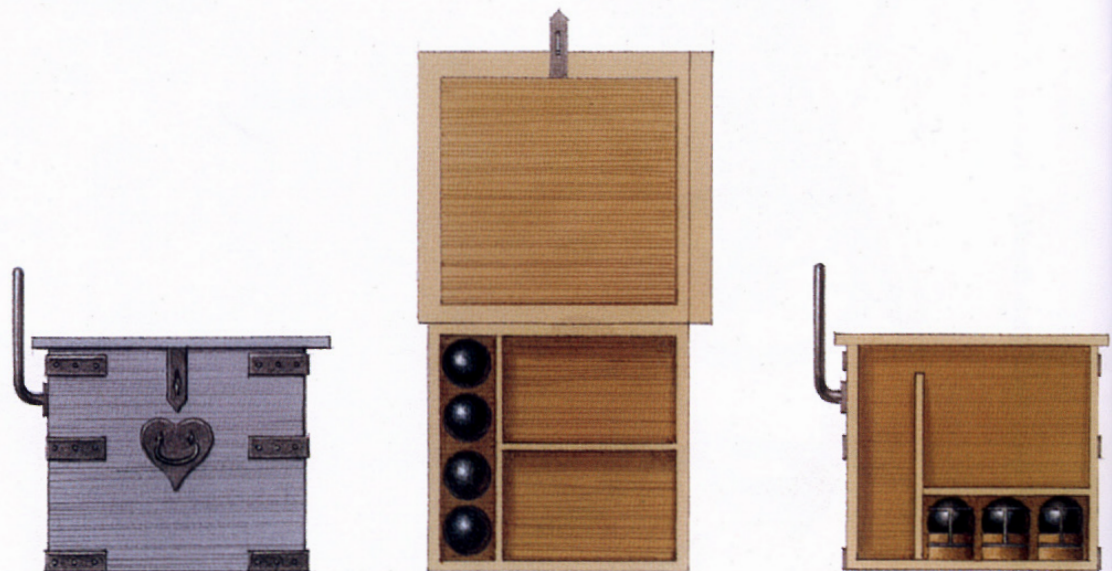
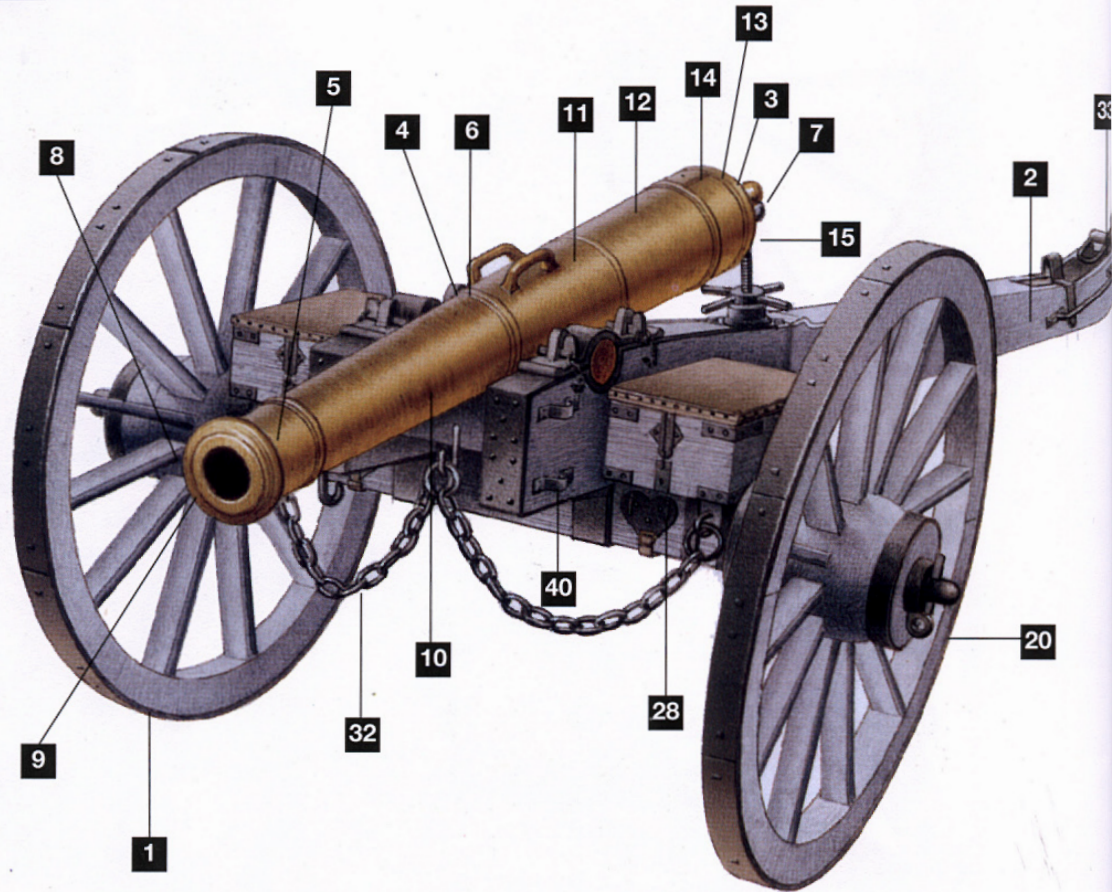
Not withstanding, the Executive, the Venturer/Scout Advisors, or the Fort George Contact for the Scout Group can override any of the above stated conditions, regarding participants and activities of the Artillery Crew in the best interest of the "Living Hirstory" Camp event.

All current and future Artillery pieces must have the Artillery Staff's approval for participation in the annual event. Any Group wanting to construct a new cannon, must seek contact with the Artillery Brigade officer to establish mentorship strategies for development of their new piece. The Brigade Artillery Officer will work with the Artillery Staff to ensure that the Scout Group has the Staff's experience and assistance during their construction process.

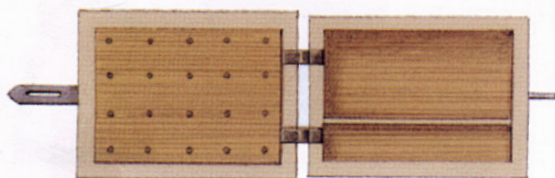
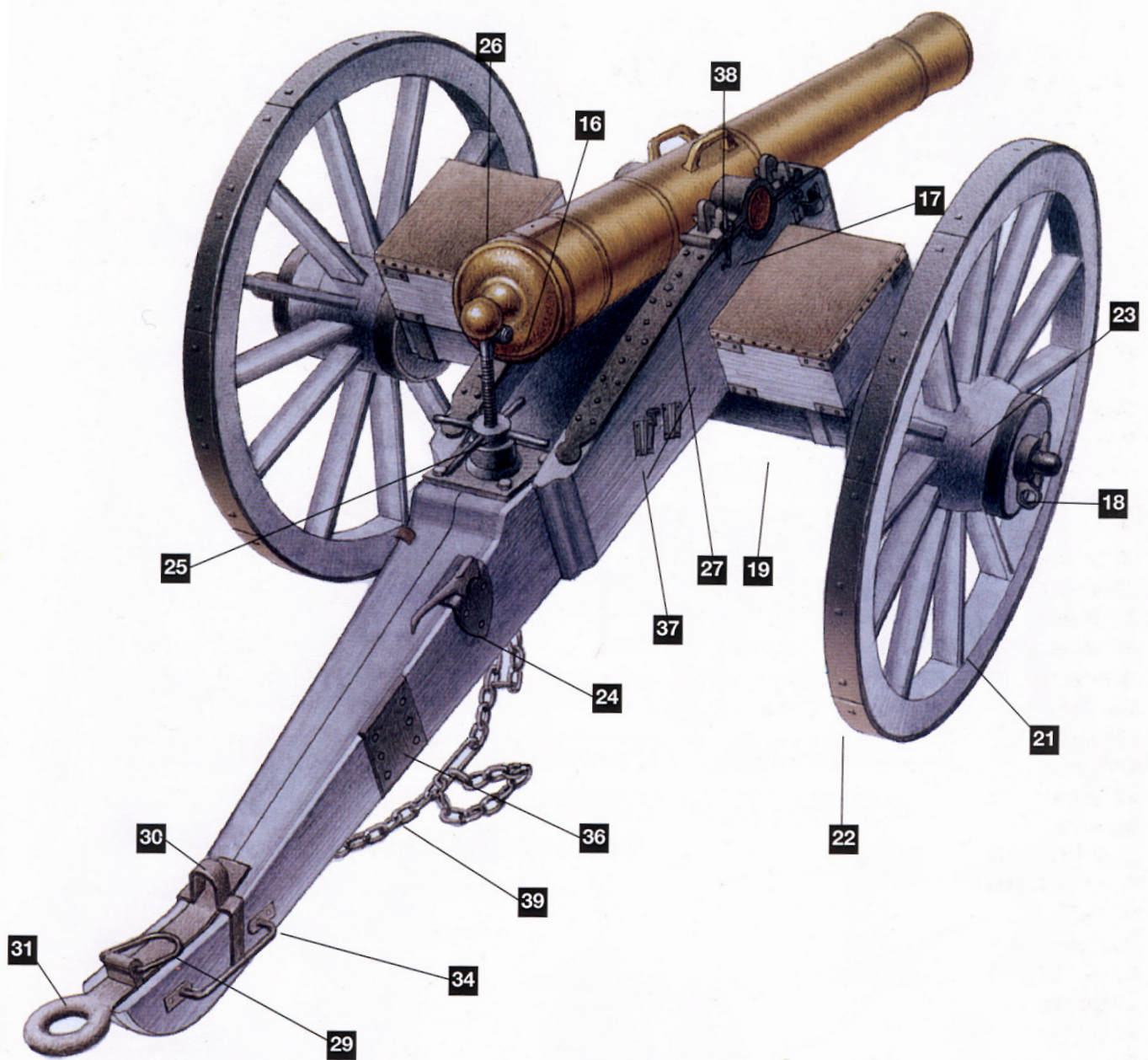
D: 9-POUNDER SMOOTH-BORE MUZZLE-LOADING GUN

KEY

- 1 Wheel
- 2 Block trail
- 3 Cascable
- 4 Astraga
- 5 Fillet
- 6 Ogee
- 7 Cascable button
- 8 Muzzle
- 9 Muzzle face
- 10 Chase
- 11 2nd reinforce
- 12 1st reinforce
- 13 Vent
- 14 Vent field
- 15 Base ring
- 16 Quarter sight scale
- 17 Trunnion
- 18 Axletree
- 19 Axletree bed
- 20 Wheel drag washer
- 21 Felloe
- 22 Strake/tyre
- 23 Nave
- 24 Portfire cutter
- 25 Elevating screw
- 26 Ammunition boxes
- 27 Trunnion plate
- 28 Kettle hooks
- 29 Trail spike eye
- 30 Trail spike stay
- 31 Trail eye
- 32 Breast chains
- 33 Handspike loop
- 34 Lifting handles
- 35 Yoke hoop
- 36 Locking plate
- 37 Portfire holder
- 38 Cap square
- 39 Skid chain
- 40 Hammer brackets



Timber boxes

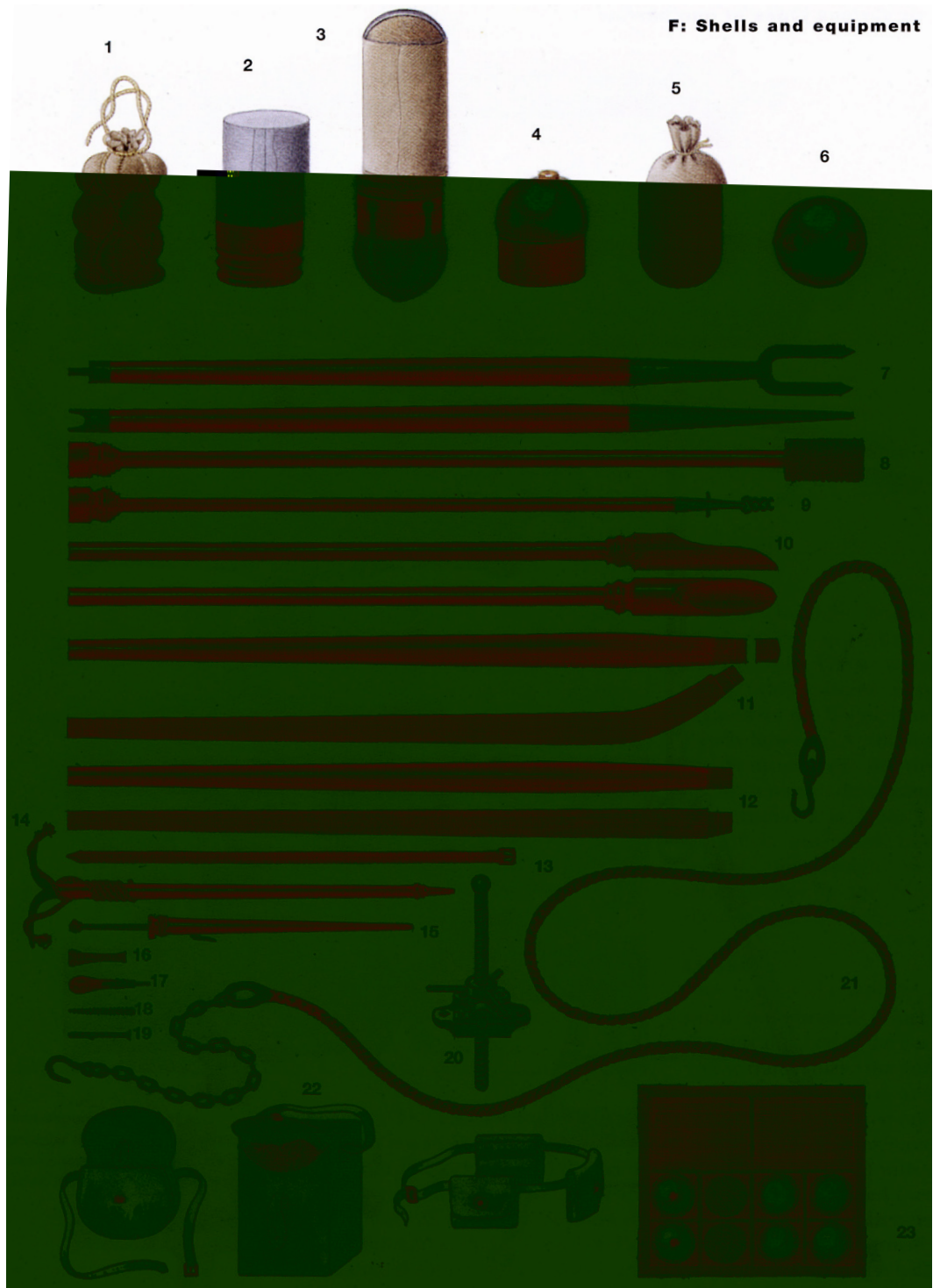


Carriage ammunition box

F: SHELLS & EQUIPMENT

Tools and ammunition from the Napoleonic period.

This image represents the tools, or side arms as they were known, for the gunner in the period 1792-1815. The ammunition at the top of the page is double scale. The side arms were attached to the carriage via leather straps and small brackets on the gun carriage whilst travelling and laid out by the gun in action.



- 1 Grape shot
- 2 Case shot
- 3 Fixed round with sabot and charge bag
- 4 Common shell with sabot
- 5 Separate powder charge
- 6 Spherical carcass
- 7 Fork lever
- 8 Sponge
- 9 Wad hook

- 10 Ladle
- 11 Crooked handspike
- 12 Straight handspike
- 13 Leather straps for sidearms
- 14 Linstock
- 15 Portfire holder
- 16 Fuze gauge
- 17 Auger
- 18 Vent spike
- 19 Sprung vent spike

- 20 Elevating screw
- 21 Drag rope
- 22 Cartouches and pouches for powder charges and ignition devices (Indian service)
- 23 Common shell ammunition box (Indian service)

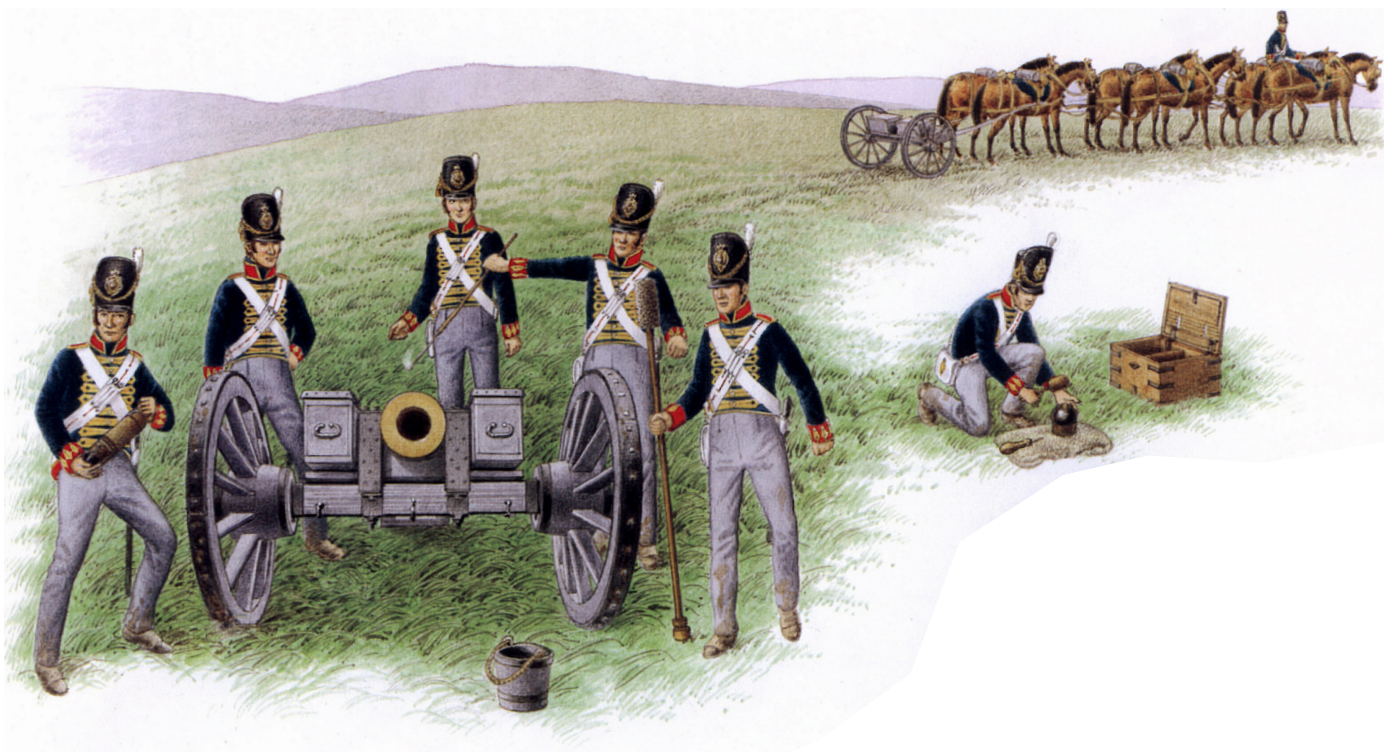
A: 6-POUNDER FIELD GUN, LIMBER AND HORSE TEAM, WITH A LAYOUT OF THE DETACHMENT (CREW), ROYAL HORSE ARTILLERY

A Royal Horse Artillery battery with 6-pounder gun on Congreve block trail carriage. The image shows the positions of the drivers and the horses. All of the crew would be mounted and the horses were normally held in a position behind the gun. The overhead view of the gun shows the positions of the principal gunners on the gun. (See page 6 of this manual)

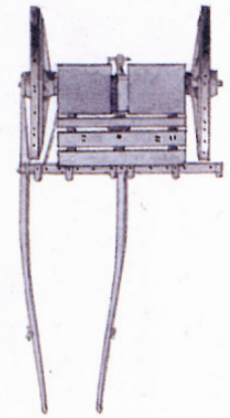
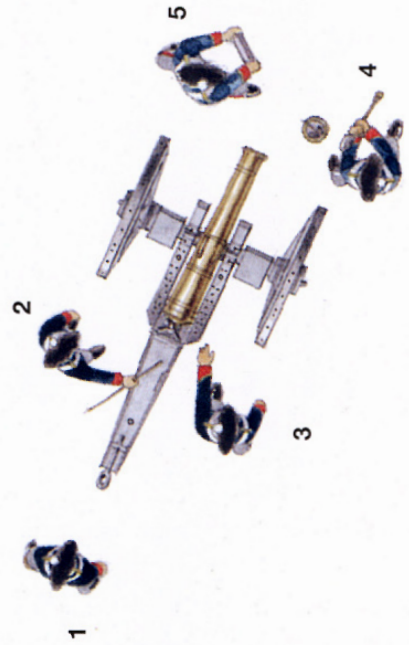
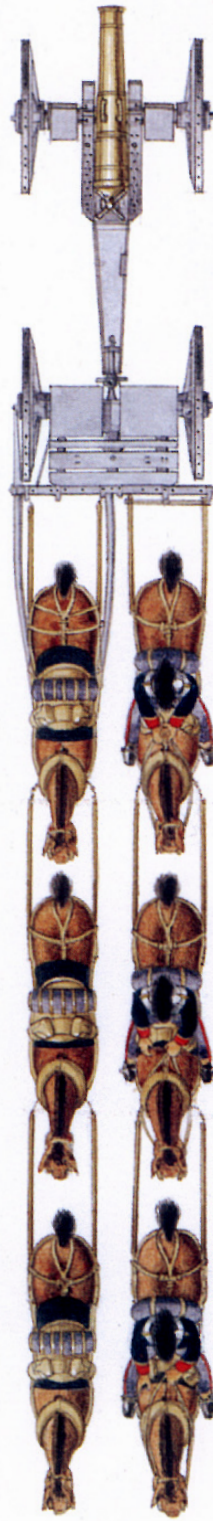
- 1 NCO who lays the gun and gives the orders.
- 2 From the rear of the gun the man at the right wheel serves the vent and primes the gun.
- 3 At the rear of the left wheel, this man fires the gun and cares for the portfire, and also traverses the gun when required.
- 4 At the front of the left wheel, this man rams the gun with the other gunner at the front of the gun and loads the ammunition.
- 5 This man worms the gun and sponges.

There were also a number of other gunners who were responsible for ancillary tasks such as bringing up ammunition from the limber, looking after the handspikes and horse holding.

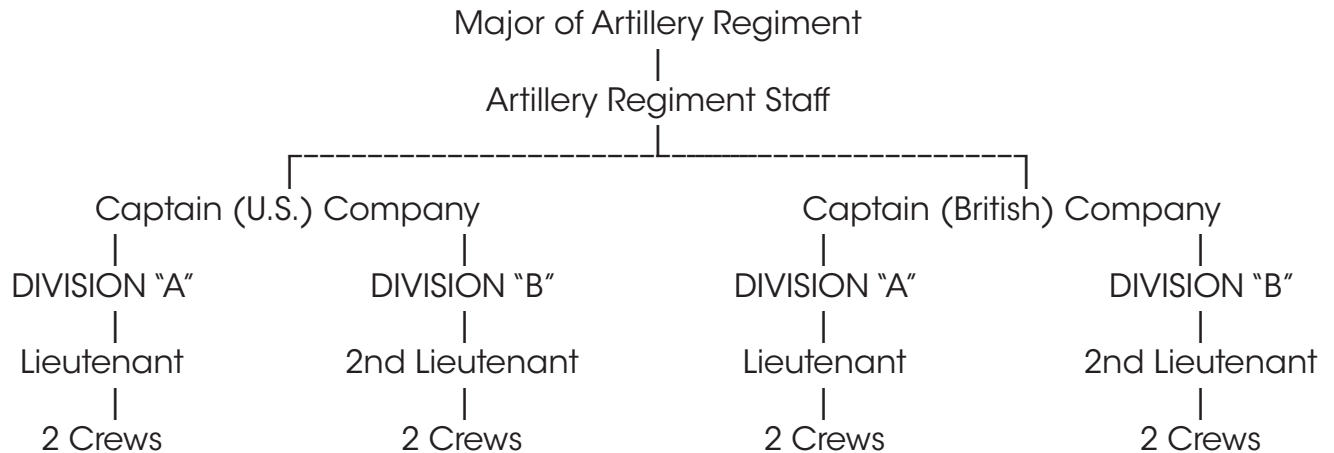
The overhead view shows the sub-division drivers and limber. It can be seen that the limber was equipped with shafts on one side only and that the method for attaching the horses consisted of a swingle tree on one side and a direct attachment through rings on the other. However, the limber was so designed that the shafts could be moved for double or even triple draught.



A: 6-pounder field gun, limber and horse team, with a layout of the detachment (crew), Royal Horse Artillery



Roles & Responsibilities within SBFG Artillery Regiment:



Min. 4 Crews, max. 8 crews per Company

Crew Ranks - 1 - Serjeant, 1 - Corporal, 2 - Bombardiers, 4 - Gunners

Major - The facilitator of the Artillery programme

Sub-Committee - Experienced Leaders with Artillery knowledge, who are enthusiastic to contribute to the evolution of Artillery within SBFG event. Artillery Staff members will be advisors/monitors of Artillery participants on the field of battle.

Captains - Selected senior Venturers or Rovers/Scouts (16-17 yrs of age) with Artillery knowledge and several years game experience will play the roles of Artillery Company Captains.

1st Lieutenants - Selected senior youth will play 2nd Lieutenants in charge of an Artillery Division.

2nd Lieutenants - Selected senior youth will play 2nd Lieutenants in charge of an Artillery Division.

Serjeant - Returning Senior youth who have participated in Artillery will be assigned to lead a Gun Crew.

Corporal - Returning youth who have participated in Artillery will be assigned to lead a Gun Crew.

Bombardiers - First, second year youth who are participating in Artillery for the first time will be assigned as Bombardiers to a Gun Crew.

Gunners - First, second year youth who are participating in Artillery for the first time will be assigned as Gunners to a Gun Crew.

Artillery Commands

Search Piece - screw/ loader removes any obstructions with his screw

Advance Sponge - sponge moves up and wets the sponge

Tend Vent - primer/ vent man covers touchhole with his thumb

Sponge piece - sponge wipes down barrel and inside of gun to cool it down and extinguish embers

Advance Cartridge - powder monkey gives loader a pre-measured powder cartridge

Load- loader places cartridge inside gun mussel

Wad to Cartridge - loader stuffs wadding into the gun

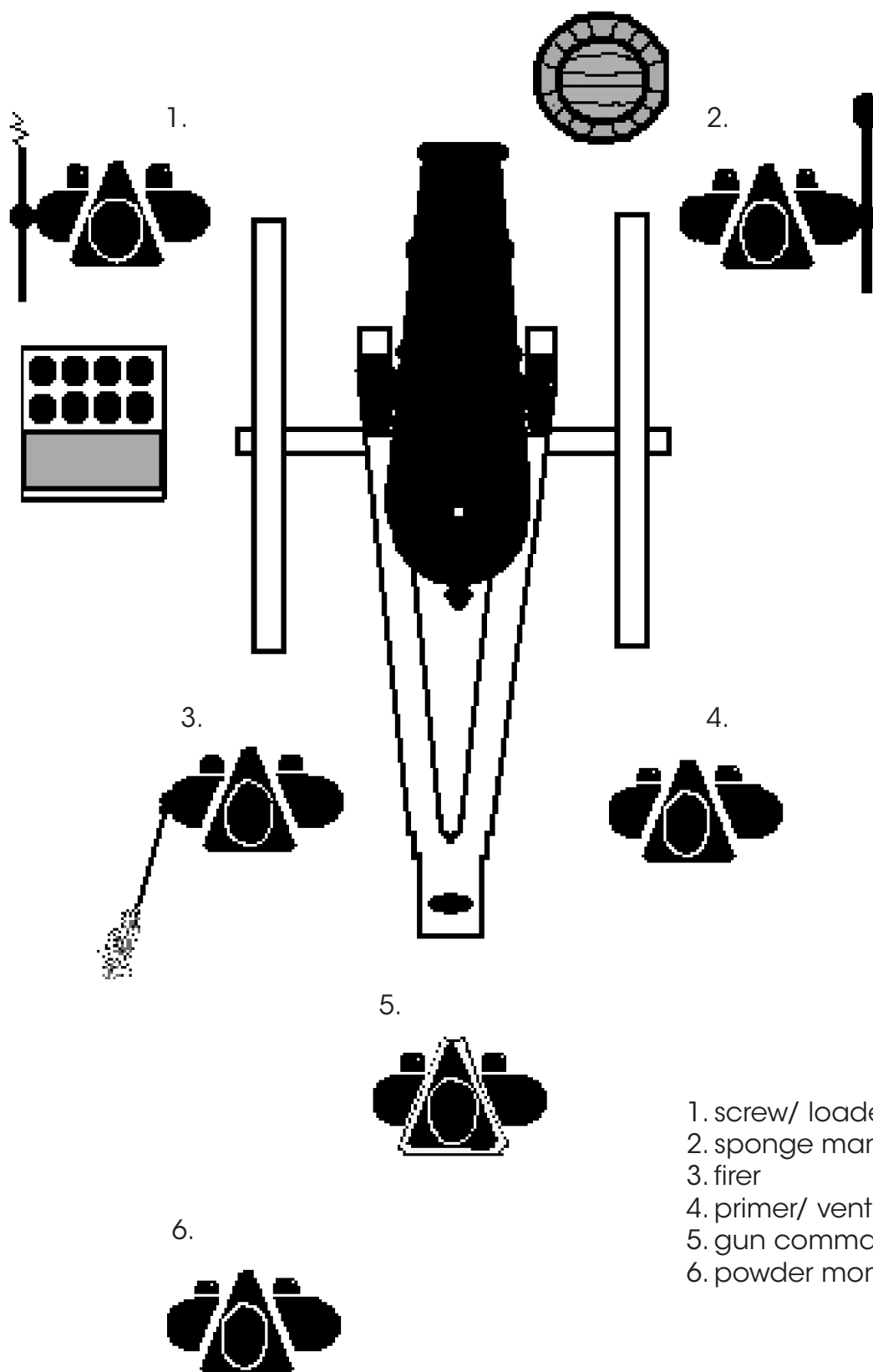
Shot your Piece - loader places shot (cannon ball, cartridge, grape shot) into gun

Wad to Shot and Ram Home - loader stuffs down more wadding and rams the whole package down

Prick and Prime - primer pricks a hole in cartridge and places primer cord through touchhole

Prepare to Elevate and Traverse - gun commander aims gun and adjusts elevation

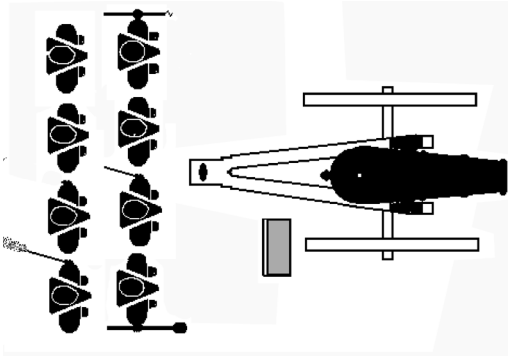
Fire! - battery captain or sergeant gives order for firer to ignite priming cord with port fire



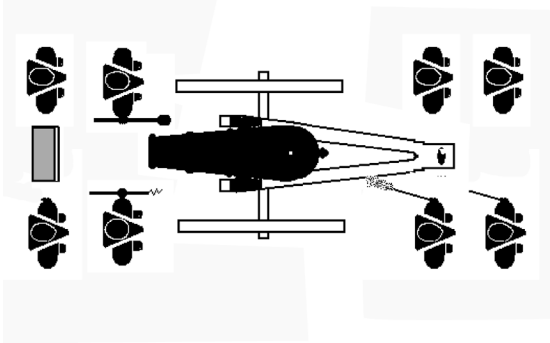
1. screw/ loader
2. sponge man
3. firer
4. primer/ vent man
5. gun commander
6. powder monkey

Artillery Marching Commands

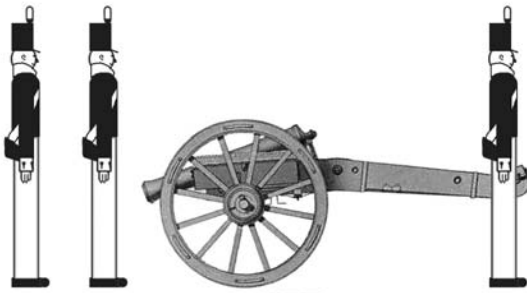
At your trail fail in - gunners line up in front of their trail at attention



Front - piece/crew faces (trail forward) officer



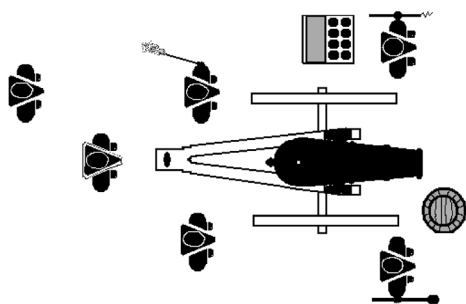
Up trail - gunners pick up trail ready to march (equiv: shoulder arms)



Down trail - gunners lower trail for halt (equiv: order arms)



Action Front/ - piece points muzzle in direction specified ready to engage enemy
Left/right



Right/left face - piece/crew turns to face right/left

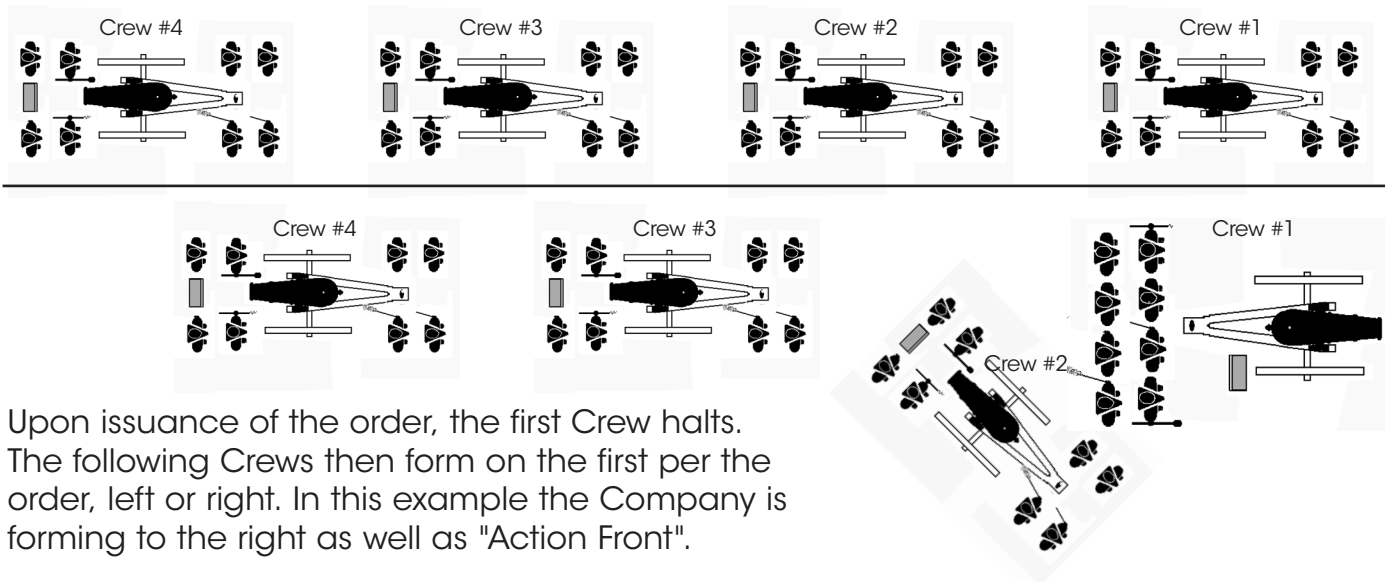
Right about face - piece/crew turns right around

In column of root fall in - pieces fall in into column. Muzzle faces backwards, so trail is facing the direction ordered or the route of march. See diagram on top of page 14.

On the left/right form battery - unit wheels from column of march into battery line on the right/left side of the lead piece. See page 14 for detailed diagram of manueur.

On the left/right form battery -

The Company/Division wheels from column of march into battery line on the right/left side of the lead piece. In this example to the right.

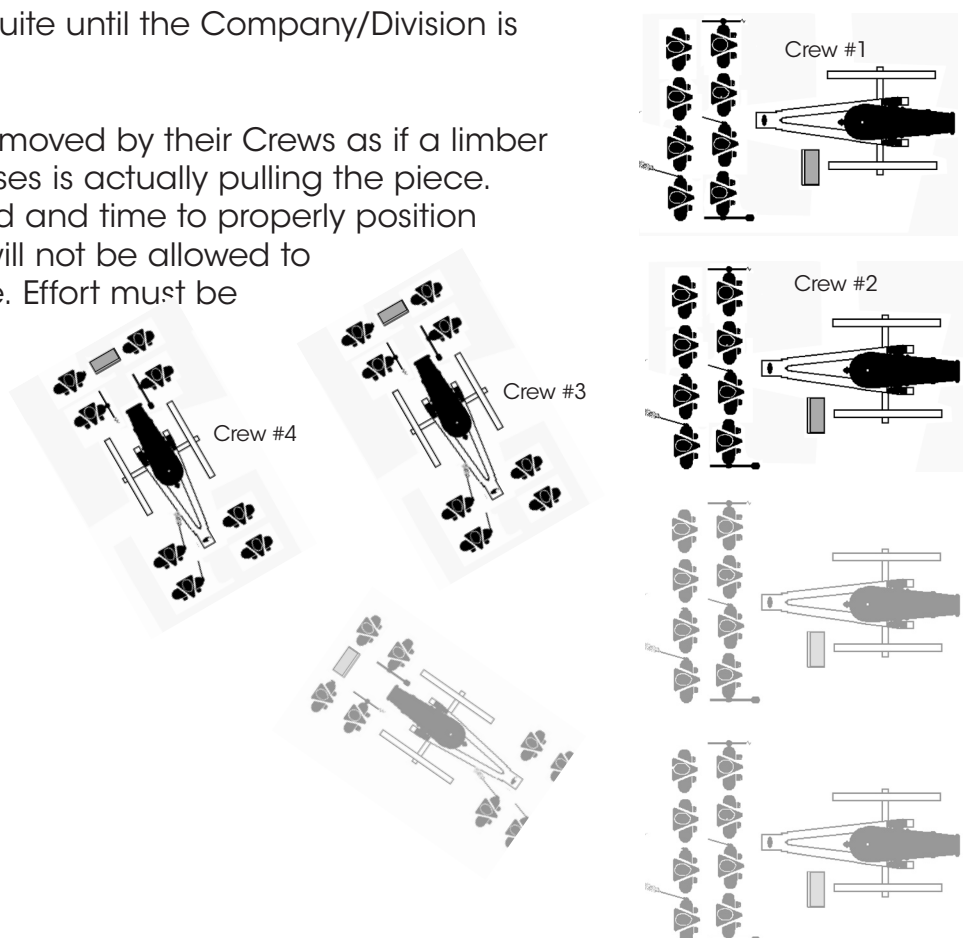
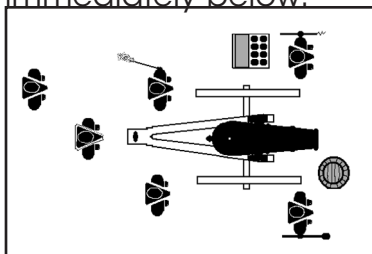


Upon issuance of the order, the first Crew halts. The following Crews then form on the first per the order, left or right. In this example the Company is forming to the right as well as "Action Front".

The remaining Crews follow suite until the Company/Division is formed as a Battery.

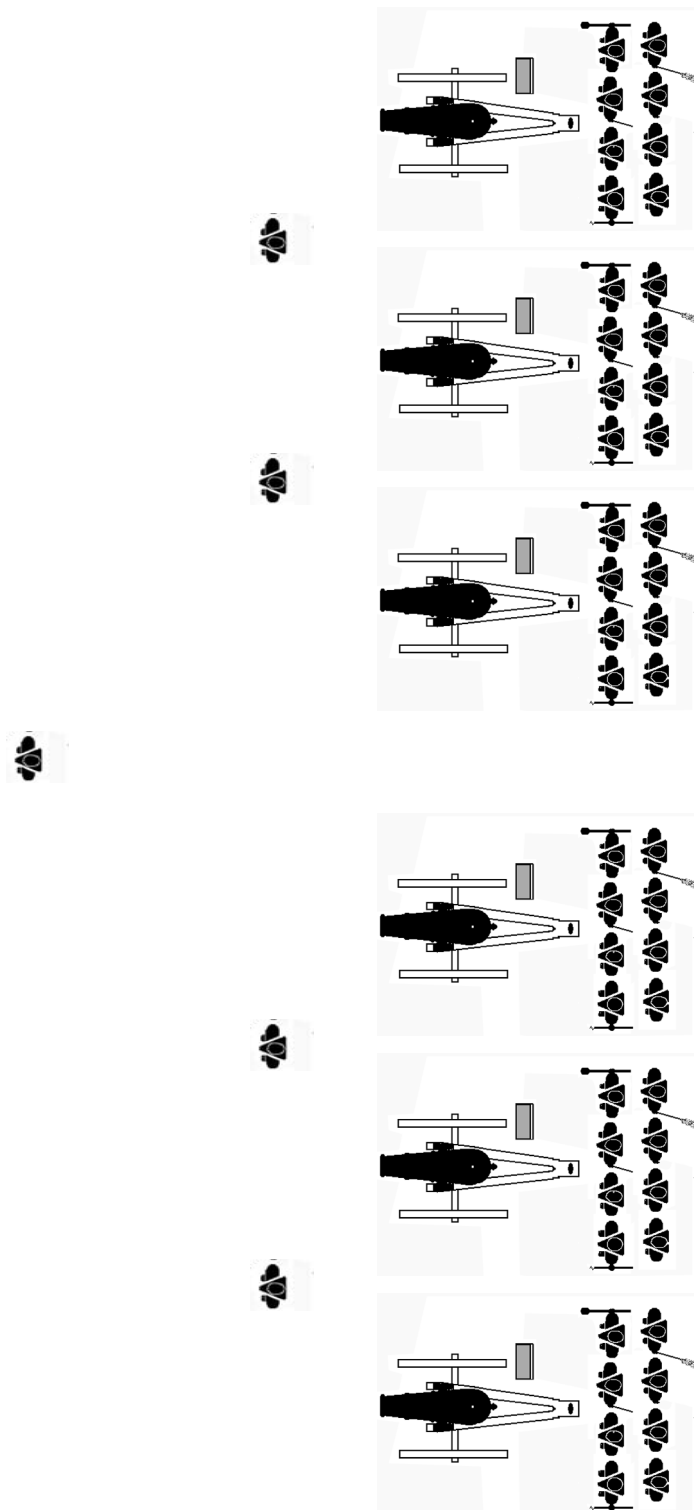
All Artillery pieces should be moved by their Crews as if a limber is attached and team of horses is actually pulling the piece. Large turn radius' are needed and time to properly position the piece(s). Artillery Crews will not be allowed to "spin on a dime" in the future. Effort must be made to manuevre as accurately as possible.

The Company Captain will relay orders to prepare for firing. The Crews would then form as per the diagram immediately below:



Artillery Parade Review Formation

SBFG Artillery Regiment is comprised of two Companies. The Companies will fall in for parade review as illustrated below. Officers in front of their Company, Gun Crews falling in at their trails, facing forward..



SBFG Artillery Regiment Rules of Engagement

All Artillery participants must be familiar with and follow the following rules of engagement. If the evolution of Artillery with the Scout Brigade of Fort George is to be taken seriously, all participants must “play by the rules”.

In 1812 an experienced Gun crew could fire 3 rounds in 5 minutes, so the same will apply for our game. All Artillery Crews will follow the correct procedures required to fire their piece, see pages ?? to ??. The role of Artillery within the game is one of precision, leading to a high degree of respect, just like the time period being represented.

The Artillery Captain will confer with the Commander of his assigned Army. The Captain will then place Artillery according to that strategic “game” plan.

Artillery participants will take the required time and effort to move their Artillery pieces into position. Artillery participants must play the role with historical accuracy in mind. Artillery was heavy it was not moved quickly. To be fair, participants must try to replicate this aspect. Any Artillery Crew found to be moving their “2 ton” artillery piece at a rapid rate will be retired to the rejuvenation flag at the required pace.

The Artillery Company will consist of two Divisions. Each Division will fire on one target together by the order of their Captain and/or Lieutenant(s).

Each Artillery piece within the Division must fire at least one “range finding” shot, signified by a white flag. A Gunner will be designated as signal corpsman. Each Gun Crew will be supplied with a red & white flag.

Again each shot taking an average of 2 minutes to prepare by correctly following the ordered loading/aiming procedures. If the target is stationary then the fourth round by a Division will have “hit” the target, signified by a Red flag, and successive damaging rounds will follow from that Division. If the target is moving then more range finding rounds will be necessary. If the target is stationary then Artillery fire should take out the target with great efficiency. Fairness in the game is the utmost priority. Artillery & Infantry participants will respect the Rules of Engagement.

Artillery, as senior youth participants, will take the high road and avoid un-Scouting like behaviour should any situations arise that are contentious. All participants must remember that this is a Scouting event that commands the same respect as any other Scouting event.

An averaged size Infantry Company will require 3 hits to be “retired”. Larger formations will take more. This is one of the points that will need to be assessed on the spot and reviewed in the debrief of the event. Artillery Staff are to be in position to help render a fair resolve.

Should an Artillery Division come under attack by an opposing Artillery Division, the same firing rate applies but 3 hits would eliminate a Gun Crew from the Division. This based on the physical area occupied by an Infantry Company and a Gun Crew. When an Artillery Division comes under attack, as with Infantry Companies, casualties are incurred during the battle before a decisive outcome is reached. Artillery participants will be free to add to the overall experience of their opposers by performing their best theatrical ability into a few gory death scenes. Again, senior youth have a responsibility to contribute to the younger sections experience.

Following the new guidelines for rejuvenation for Infantry companies, the same will apply to Artillery. This is a Scouting game, not a reenactment organization. Should an Artillery

Division be beaten by dynamic and tremendous strategic game play, that Division will properly pack up their gear and march back to the rejuvenation flag. Again with the proper drill and pacing to command respect due Artillery. Once arriving at the Rejuvenation flag they will be redeployed into the Battle by their Army's commanders and Artillery Company Commanders.

Currently Infantry companies are not plundered for their mukets, ammunition or wares. It therefore remains fair that the same will apply to Artillery.

Firing ranges & kill rates:

The Maximum range of the cannons will be 200 yards. This allows for a fair development of the game on the field. To allow more would effectively eliminate any Infantry movement. This objective is to allow fair development of the game for all participants.

Senior Artillery officers (Venturer advisors and Scout Leaders (U.S.)), otherwise known as Artillery Marshals, will be attached to a Gun Crew. In battle their position will be in the fire line of their assigned Crew. Artillery Marshals will be attached to a Gun Crew other than their own. The purpose to foster more the Venturer program, working with others and motivating Artillery participants to behave with the utmost Scouting principles.

Artillery Marshals will pace off an approximated 200 yards. Then stay opposite the Gun Crew to communicate to the "target". Artillery Marshals are to communicate goodwill and fair play to enhance the evolution of the game.

This will take the cooperation of the Brigade as a whole. Essentially, the Marshals and Infantry Officers (all Scout leaders essentially) on the field must remember this is a Scouting event (game). The goal is for all participants, especially the youth, to have a great experience. While Artillery participants are youth, they are senior section youth and have a responsibility to help deliver a great experience for the younger sections. This is the main goal for this initiative.

Firing of the Piece:

Proper firing procedures for all artillery pieces must be followed by the Gun Crews. Artillery Staff will be monitoring the Gun Crews to ensure that all Artillery participants comply. Appropriate speed and technique are vital for Artillery to be taken seriously by the rest of the Brigade.

Drill

It is thought that a good gun crew could fire as many as five rounds a minute and there is no doubt that improvements in the provision of ammunition, principally fixed rounds and vent tubes, contributed to increases in the rate of fire. But in reality it was the discipline and skill of the men that really told in battle. A gun crew might have to approach the enemy, unlimber, load and fire in a very short space of time. For the gunners, standing in front of a gun when an enemy cavalry unit was charging down on them must have been a nerve-wracking experience.

Drill was the key to good Fire discipline. In British gun crews, nine men were allocated to each gun, with each man allocated a specific number corresponding to his role, with a possible maximum of 15 if it was expected that the gun would have to be manhandled. Curiously some sources state that the men were numbered from seven to 15, although this is not always consistent.

The operations of the gun depended principally on five of the crew members. The remaining crew were 5 to 10 yards in the rear and brought up ammunition and tools. The duties of the main crewmen were as follows: No. 7 sponged, No. 8 loaded, No. 9 served the vent, No. 10 fired the gun, No. 11 was the gun commander. Other crew roles were: No. 12 carried the match and water bucket, No. 13 served No. 8 with ammunition from No. 14, who carried a cartouche bag (a waterproof canvas bag for holding gun charges) and a pair of drag ropes, and No. 15 held the limber horses and carried a cartouche bag.

When viewed from the rear, the positions were: No. 7 between the right wheel and the muzzle, No. 8 between the left wheel and muzzle, No. 9 clear of the right wheel and No. 10 clear of the left wheel, both in line with the vent. No. 11 at the rear of the gun "on the left of the handspike. The only difference with larger calibres was that Nos. 9 and 10 stood outside the wheels and Nos. 7 and 8 at the front assisted with ramming.

For howitzers the positions were the same but the duties were slightly different: No. 7 sponged, uncapped the fuse, and loaded the shell. No. 8 took the sheepskin out of the piece, laid it on the ground, loaded the cartridge, wiped the bottom of the shell and put the sheepskin in again. The sheepskin was used to stop the muzzle immediately after it was fired because there was a greater risk of accident with this type of weapon, due to the howitzer shells being filled with gunpowder and fused, whereas the round shot was inert. No. 9 served the vent, No. 10 fired the gun, No. 11 commanded and estimated range and fuse burning time, No. 12 carried the match and bucket, No. 13 served No. 8 with cartridges, No. 14 served No. 7 with shells from the limber, which he laid on the sheepskin, and No. 15 attended the limber. There was a system of sharing out the duties should a man be injured or killed and it was reckoned that a gun could still be kept firing with only three men in the detachment.

Horse artillery drill was essentially the same but all the gunners were mounted on horses so there had to be a horse holder. The horses and the horse holder were normally positioned behind the limber with five gun numbers manning the gun, with a sixth slightly behind them and one gunner controlling the limber team.

Tactics

During our period the use of artillery subtly changed within the British Army. At the beginning of the period guns were used in smaller groups and the use of the battalion gun meant that smaller calibres were spread amongst infantry battalions. The French were the great exponents of massed artillery and perfected the art of closing up with their guns in the shortest time possible. British artillery was handled in a different way.

At the beginning of the period, as we have seen, the guns were divided up into battalion guns, artillery of the park and horse artillery. The battalion guns were normally 3-pounders or light 6-pounders. Strict instructions on the positions of the guns relative to their parent units are not available but in review the battalion guns were placed to the right of the regiment with 10 yards between them and 10 yards between the left gun and the infantry, normally the battalion's grenadier company. It was said that the gun numbers 7 and 8 who stood at the rear of the trail but at a distance from it were to be in line with the front rank of the infantry. It is clear, though, that when guns were in action they would take any position that gave them advantageous locations from which to hit the enemy. A manual of 1802 gave the following advice:

With very few variations, the guns should attend in all movements of the battalion, that division of it to which they are particularly attached; and every attention should be paid in thus adapting the movements of the guns to those of the regiment.

At the start of the period artillery of the park could normally include 6-, 9- or 12-pounders. These guns were organised into brigades of six guns and the British used the heavier calibres, again normally 12-pounders, in a very specific way. The heavier guns were placed at weak points in the line and at places where they could do the most damage at the furthest range. The emphasis was placed on hidden positions and the creation of defensive works. Contemporary authors stress the use of ground and we can see that they were inclined to use guns in a similar way as a World War I tank in that the reverse of the slope was used for cover and the gun was run up to fire at the very last moment. The need to wait, hidden, until the very last moment to gain the element of surprise, was very important according to contemporary authors. There was also an optimum height at which the guns should be placed on a hill, a height of 30-40 yards at a range of 600 yards being thought most suitable.

It should be made clear that most Napoleonic combat took place at very short range compared with modern day values. Musket range was very short; anything in excess of 100 yards was out of the question and the normal effective range was really 50 yards or less. The guns then were extremely significant since they could range out to a maximum of 1,500 yards, giving the army an opportunity to destroy some enemy units long before they reached their destination.

Interestingly, in theory, guns were not to be used against other guns. Whilst this may well have been the generally accepted theorem it was clearly not the practice since there are many guns from the period with damage sustained from enemy guns. It is also interesting to note that one author suggests the masking of guns by another unit until they are needed. This suggests that their power and effect on the battlefield were very great indeed. As soon as a gun was in an advantageous position it was suggested that they were protected by some kind of defensive measure. The advice given in 1802 was:

By proper attention many situations may be found of which advantage may be taken for this purpose, such as banks, ditches. Everywhere to be met with.

Britain did not follow France's example and create grand batteries to destroy a particular part of the enemy line but during the wars the emphasis came to be placed on the need to concentrate fire on a particular target. French armies almost always had more guns than the British forces, for example during the Peninsular War Britain could rely on one gun per 1,000 men whereas the French often had four per 1,000 men.

The optimum effect would be produced by a cross-fire from the guns. This meant either choosing a target and attacking or choosing a prearranged point over which the enemy was likely to pass. The main thing was that the gunfire should hit an enemy unit at the head of the column and the weakest points of the front. The secret was to hit a unit at its greatest depth. For example infantry in line were ideally to be attacked by enfilade fire (to fire at an object along its greatest length from a perpendicularly placed gun). Columns were to be hit from the front. Emphasis was placed on the senior artillery officer knowing where and how his guns would produce the desired result, which was to be communicated to him by the senior commander. The only form of communication available was the messenger or word of mouth and so pre-arranged orders and changes in plan were difficult to carry out.

Horse artillery was another matter altogether since it was specifically formed to be light and mobile. A horse artillery unit was expected to be courageous and skilled, the gunners being good swordsmen as well as horsemen. They were expected to ride close to the enemy and unlimber to fire as soon as possible. A good example of how close this could be is demonstrated by the actions of Norman Ramsey's division at the Battle of Fuentes d'Onoro in Spain. As part of Bull's Troop Ramsey's two guns were firing on the retreat and were left out of the protective square of infantry within which they could have sheltered. They were attacked and completely enveloped by French cavalry and Major General Sir W.F.P. Napier describes what happened next:

Men and horses were seen to close with confusion and tumult towards one point, where a thick dust and loud cries, the sparking of blades, the flashing of pistols indicated some extraordinary occurrence. Suddenly, the multitude became violently agitated, an English shout pealed high and clear, the mass was rent asunder and Norman Ramsey burst forth sword in hand at the head of his battery [sic] his horses, breathing fire, stretched like greyhounds along the plain, the guns bounded behind them like things of no weight.

Napier's view may be fanciful but this incident has become something of a celebrated event in the Royal Artillery and it certainly demonstrated the high morale of the horse gunners.

Since Britain always had less artillery available than the French, as the wars proceeded British commanders began to experiment with and then carry out the practice of holding an artillery reserve. At the end of the wars this reserve usually formed a large percentage, up to half, of the overall artillery available. We should not think of the reserve as a number of units held in one place but as a central grouping from which units were drawn to support particular sectors of the battlefield when the need arose.

Battlefield effectiveness

Consider these words written by Cavalie Mercer after Waterloo about a French cavalry charge receiving the full fire of his brigade at 50 or 60 yards range:

The effect was terrible. Nearly the whole leading rank fell at once: and the round shot, penetrating the column carried confusion throughout its extent. The ground, already encumbered with victims of the first struggle became, almost impassable.

If the effect of artillery fire on cavalry was devastating it was possibly even worse when an artillery unit was attacked. Mercer's own troop was attacked by a French artillery brigade at a range of 400-500 yards:

Every shot almost took effect and certainly expected that we should all be annihilated. Our horses and limbers, being a little retired down the slope had hitherto been somewhat under cover from the direct fire in front; but this plunged right amongst them, knocking them down by pairs, and creating horrible confusion. The drivers could hardly extricate themselves from one dead horse ere another fell, or perhaps themselves. The saddle-bags, in many instances were torn from the horses' backs and their contents scattered over the field... In some instances the horses of a gun or ammunition wagon remained and all the drivers were killed.

Following the end of the Napoleonic Wars the Duke of Wellington became an immense public figure influencing almost every aspect of military life. This was in a way a backward step for gunnery development and as Britain entered the Crimean War the artillery equipment was virtually identical to that of 40 years before. Yet within ten years British armies were armed with breech-loading rifled weapons designed by William Armstrong, which were to point the way to the artillery of the future, and the age of the smoothbore gun was over.

Appendix

Generously donated by the

Staff at
Fort York

from their Artillery Procedures Binder.



Loading

The men of the British gun detachment were numbered consecutively, the NCO in command being usually, though not always, known as the "Number One". Four other men carried out the work on the gun itself. Two of these, the ventsman and the firer, stood on either side of the piece behind the wheels; two more, the spongeman and the loader, stood on either side in front of the wheels. Up to four other men, depending on the size of the equipment, prepared and supplied the loader with ammunition. The positions and actions of these men are shown in plates 28 and 29.

To reload the piece after a round had been fired the spongeman took his long spongestaff, wetted the sponge which was on one end of it with water from the bucket on the gun carriage, and thrust it down the bore. This was done to quench any smouldering fragments of powder which might have remained in the bore after the previous round had been fired. The loader then placed the new charge in the muzzle, and the spongeman reversed his spongestaff, and rammed the charge home. As he did this, the ventsman placed his thumb on the vent, an action known as "serving the vent". Its object was to prevent a rush of air through the vent, as this might have caused a premature explosion of the charge if any burning fragments remained in the bore in spite of sponging. So much did the safety of the spongeman depend on this precaution that, if the ventsman failed to serve the vent, the spongeman was traditionally entitled to hit him on the head with the spongestaff to spur him to his duty.

The charge having been rammed home, the ventsman thrust a sharp-pointed instrument, known as a "pricker", down the vent. This was done in order to pierce the fabric enclosing the charge so as to make ignition more certain. Meanwhile the loader had placed the projectile in the muzzle and the spongeman had rammed this in against the charge. The piece was then directed at its target, and, the ventsman having carried out the action of "priming" described below, all was ready for firing.

The process of loading could be speeded up by attaching the cartridge to the projectile so that both could be loaded together. This was done in the Artillery of the United States by 1840. The

charge and the projectile were kept separate in the British Service, except those of case shot, though it appears that both were often rammed together.

The charge of a muzzle-loading piece was exploded by causing a flash to pass down the vent in the breech. In the earliest days this was done simply by pouring loose powder into the vent and igniting it with a hot iron, as shown in plate 2.

Heating irons on the gun position was not a very convenient operation, and so, before the end of the 16th century, a pair of complementary devices were introduced which were to stay in service as a reliable means of firing guns for 250 years. These were called the linstock and the portfire.

The linstock (see plate 31) was a holder for a slow match which was kept burning continuously on the gun position, and could even be carried alight on the move. It was customary to light the slow match of the linstock when the order "Prepare for action" was given, as Captain Mercer describes in his "Waterloo Diary". The linstock was often of ornamental design, and had a spike at its lower end so that it could be planted in the ground. The slow match was made of three loosely woven strands of hemp boiled in lees of old wine, or in a solution of wood ash or saltpetre, the whole being bound together with an outer layer of hemp strands. It burned at a rate of one yard in eight or nine hours. Linstocks were usually provided on a scale of one for two guns, and were at one time carried by the officers.

The portfire was the means whereby a flame was transferred from the linstock to the vent. Each consisted of a stiff tube made of layers of paper 16½ in long, and contained a composition which burned at a rate of one inch in about a minute. When firing was imminent the firer ignited his portfire from the linstock, and stood by his gun while it was being loaded. When the order to fire was given, he applied the portfire to the vent. When it was necessary to extinguish the portfire, the firer cut off the burning end with the portfire cutter which was permanently mounted on the trail of the carriage.

EXERCISE of Artillery—with 9 men to a field gun.

When 15 men are attached to the service of a gun in the field, they are numbered from 1 to 15; but when the gun is not to be advanced by men, the first 5 numbers are left out, and the remaining 9 men are numbered from 7 to 15. The exercise of field guns of a heavy nature varies but little from the light ones. The different duties done by the men attached to the one, should, as nearly as possible, be kept up at the other: as thereby is prevented that confusion which must arise when men removed from a light gun to a heavy

EXE

121

heavy ones; change their numbers, though their duties at each be the same. The following will be the position of 9 men, for field ordnance of all natures, in the

1. *Line of March.*

Numbers 7, 9, 12, and 15, on the left of the gun; 8, 10, 13, 14, and 11, on the right; numbers 7 and 8 opposite the muzzle of the gun; 9 and 10 opposite the breech; 12 and 13 opposite the trail; 14 opposite the axle-tree of the limber; 11 opposite the shafts; 15 leads the limber horse; the driver leads the front.

2. *Position and Duties of 9 Men, when prepared for Action.*

Light Guns.—7 sponges, 8 loads, 9 serves the vent, 10 fires, 11 commands, 12 carries the watch and water bucket, 13 serves 8 with ammunition from 14, who carries a cartouch and a pair of drag-ropes; 15 has charge of the limber, and carries a cartouch.

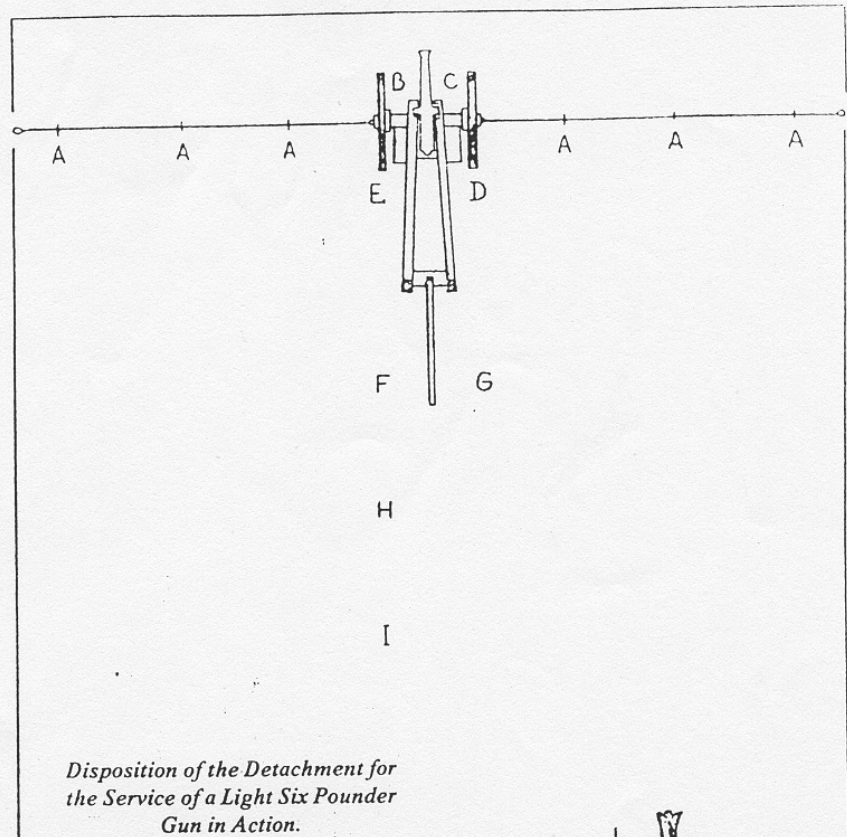
Position.—7 outside the right wheel; 8 outside the left wheel; 9 clear of the rear of the right wheel; 10 clear of the left wheel, both in a line with the vent; 11 on the left of the hand-spike; 12 on his right, clear of 9; 13 covers the left wheel, 5 yards in the rear; 14 covers the right wheel, 10 yards in the rear. The limber is 25 yards directly in the rear of the gun.

EXE

123

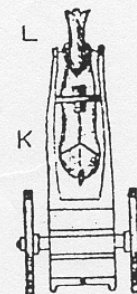
The following Method of Distributing the Duties amongst a smaller Number of Men, will be equally applicable to all Natures of Field Ordnance.

No. of Men.	Nature of Duty.	Numbers retained.	The vacancies how supplied.
9	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	complete.
8	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 1 being absent, No. 11 uses his duties.
7	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 14's pouch is laid on the ground; 12 carries it when moving. No. 3 serves limber; with cartouches.
6	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 9 serves the vent with his left hand, the cartouch and fires. Tube box on left side.
5	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 11 does all the duties of 9, as in the last example; his own duties, and those of 12.
4	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 8 fetches his own ammunition. No. 7 serves his own shells.
3	Gun How	7 8 9 10 11 12 13 14 15 7 8 9 10 11 12 13 14 15	No. 7 serves and loads all the ammunition.—No. 7 and 15 must change duties occasionally.



Disposition of the Detachment for the Service of a Light Six Pounder Gun in Action.

- A. Dragropemen.
- B. Puts the Cartridge in to the Gun.
- C. Loads.
- D. Serves the Vent.
- E. Fires.
- F. Steers and Points.
- G. Carries the Match.
- H. Carries the Ammunition from I to B.
- I. Carries a Cartouch full of Ammunition.



- K. Takes care of Ammunition upon the Limber.
- L. The Driver of the Limber when used as an Ammunition Cart.

The following is a composite gun drill taken from two notebooks written by Abraham Paul in 1801 and 1802. There appears to have been no standard loading procedure in the early decades of the 19th century, each company commander presumably being the final arbiter. The numbering of the gunners follows the pattern that Paul established for a field piece; numbers one through six are merely dragropemen who manhandled the gun back into position after every shot, and numbers seven through fifteen engage in the actual loading. The source of each motion is also noted in square brackets. All the words of command are in quotation marks and, excepting the last two commands, come from page 56 of the 1802 manual. The last two commands are arbitrary creations that come from page 114 of the 1801 manual.

Loading Procedure

1) "Prepare to Load"

- 7 - grabs rammer
[1802, pg. 56, step 1.]
- 13 - brings cartridge; stands ready to supply cartridge, shot, & wads (must have a supply nearby)
[1802, pg. 56, step 1.]
 - must keep cartidge on left side under coat until he gives it to # 8
[1801, pg. 114, rule 5.]
- 14 - brings up cartouches closed and keeps spare portfires in hand, not cartouche
[1801, pg. 114, rule 6.]

2) "Load"

- 13 - advances with cartridge, dresses to left and one pace in rear of # 8; once last wad is given to 8 return to supply and do not advance again until after the word "fire" is given
[1802, pg 62.]
- 8 - dresses just off front corner of left wheel. To receive cartridge, shot, & wad he takes one pace to the rear with left foot, and then advances one pace past right foot towards muzzle to insert object. Right foot remains stationary whole time.
[1802, pg. 62.]
 - take care not to advance with cartridge until sponge removed from tube
[1801, pg. 114, rule 2.]

3) "Prepare to elevate and traverse"

[1802, pg. 56, step 5.]

4) "Elevate" or "Traverse"

- 9 - if call is for an elevation adjustment the ventsman elevates or depresses as needed
[1801, pg. 103.]

5) "Prepare to Prime"

- 9 - prepares tube or powder horn
[1802, pg. 56, step 8.]

6) "Prime"

- 9 - advances to gun, inserts tube or pricks vent and pours powder; if powder is used pour from vent towards muzzle
[1802, pg. 56, step 9.]
- 11 - retires 8 feet for light 6 pdr to avoid being entangled upon recoil.
[1801, pg. 114, rule 8.]

7) "Prepare to Fire"

- 10 - lights match or puts himself in position to fire
[1802, pg. 56, step 10.]
- readies portfire under centre transom
[1801, pg. 114, rule 4.]

8) "Fire"

- 10 - applies match to powder in front of vent or points portfire down upon tube
[1802, pg. 56, step 11.]

9) "Dragropemen Retire"

- 1 to 6 - retire to gun, hook on dragropes, return gun to firing position, and unhook ropes
[1801, pg. 114, rule 7.]

10) "Sponge out Tube"

- 9 - advances and places thumbstall on vent, does not remove thumbstall until loading process is complete
[1801, pg. 114, rule 3.]
- 7 - grabs sponge and wets in bucket, advances after he sees that the vent is served, places sponge in tube and rams home to end of cylinder, turns sponge twice to ensure no fire hangs
[1801, pg. 114, rule 1.]

REMARKS ON ARTILLERY AND GUNNERY

The exercise of a 24 Pounder on
a standing Carriage with a Detachment
of 6 Men

The detachment being marched up in rear of the gun they are told off from the right of the rear rank who becomes no. 2 the no.s in the front rank being

6, 5, 3
and in the rear 1, 4, 2 -

In filing under cover of the Merlon No. 2 and 3 as soon as they come in line with the Breach open out the front rank to the right and the rear rank to the Left. No.s 4, 5, 6, 1 throwing their right and left shoulders forward No.s 2 and 3 halt on each side of the embrasure No. 1 halts two ** paces in rear of No. 5 the whole of the detachment face inwards and remain in that position untill further commands. At the word Load No. 4 steps out and serves the vent

standing clear of the axle-arm No. 3 takes one pace to the front and faces to the right draws his right foot back ready to go to the right about and remains in that position to receive the ammunition from No. 6. No. 6 takes the cylinder to the rear for the Cartridge and places himself opposite No. 3 with the cylinder between them No. 2 faces to the left and takes hold of the sponge by the centre and faces to the right about three [quarter?] steps up to the muzzle placing the sponge head against the greater sight and looks to see that the vent is served enters the sponge into the Muzzle draws his left hand up to the right and forces in the sponge up to his hands Both hands are then extended to the rammer Head and forces it down to the Bottom of the Bore sinks his Body and turns his wrists outwards then rising smartly tightens his knees and turns the ** sponge twice. He next withdraws the sponge gradually forcing it backwards and forwards and turning it from him After giving it two taps under the muzzle he takes a pace to the left to give room for turning it. After which he steps to the right and places the rammer head against the greater sight. No. 3 faces about with the Cartridge and introduces it into the bore seam downwards No. 2 bends over on his knee keeping his body back passes his left hand up to his right and presses the cartridge home he then rams it smartly down throwing his left arm towards the vent the knees are then straightened and the sponge sprung out he then bends over again and places the rammer head against the greater sight.

At the word Shot and Wad No. 3 faces to the right about and puts them into the gun He then advances his left foot in a position ready to assist No. 2 to ram home. No. 2 then introduces the rammer Head into the Bore and pushes it home. No. 3 takes hold of the sponge head ** and both No.s ram home together No. 3 then lets go the sponge and stands upright with his feet in the same position as before No. 2 springs the sponge and stands in the same manner holding the sponge upright they then both step back with the outward feet and No. 3 faces to his right with his back to the Parapet. No. 2 also faces to the right and lays the sponge against the Parapet and faces to the right about. No. 4 quits the vent and places himself on the Left of No. 2 in his proper place.

REMARKS ON ARTILLERY AND GUNNERY

At the word Run the Gun Up No.s 2 and 4 seize their handspikes with their left hands on the centre and the Left [sic] under the middle and 3 & 5 place their hands in the contrary way the points of their handspikes are then placed under the arms of the axle trees.

At the word Heave they all lift together and No. 1 places his handspikes under the rear axle tree to direct the gun to the middle ** of the embrasure. At the word Halt No. 2 and 3 withdraw their handspikes holding them across their bodies with the points resting on the platforms and standing clear of No.s 4 and 5 in line with the second step of the Brackets their backs backs [sic] towards the Parapet. No. 4 and 5 stand in the same position and 18 inches from the carriage with the point of their handspikes behind rear truck.

At the word Trail right No. 4 takes a [sweeping?] pace with his left foot and places the point of his handspike under the arm of the axle-tree No. 5 places his under the opposite Bracket

At the word Trail Left the operation are reversed.

At the word Elevate No. 4 and 5 stand wide while No. 2 and 3 place the point of their handspikes under the gun resting on the second step of the Bracket when by bearing down at the extremity they raise the Breach and afterwards gradually lower it till the coin [sic] is put in by No. 1 when he has the ** proper elevation the whole then hold their handspikes horizontally and lay them on the platform together all then retire under cover of the Merlon.

At the word Prime No. 4 jumps out and drops a tube into the vent No. 5 lights his portfire and places himself with a line with the vent.

At the word Fire No. 5 raises the Portfire and places it in front of the tube. No. 1 also steps on one side to see the effect of the shot

At the word Run the Gun Back No.s 2,3,4,5 run out and take up their handspikes facing to the rear No.s 2 and 3 place theirs in front of the arms of the arms of the axle tree. No. 4 & 5 in front of the rear arms. No. 1 & 6 double man 2 and 3 handspikes. **

REMARKS ON ARTILLERY AND GUNNERY

The exercise for a 24pr Gun on a Traversing Platform

Traversing on raised Platforms are usually placed at the salient angle of Barbette Batteries or in works where an extended command of fire is necessary. As soon as the Besieger has opened his Battery the Traversing Platforms are removed embrasures cut and the Gun placed on common Platforms. The men and Gun being too much exposed from being so much elevated. They consist of two side pieces 16 feet long connected by Transoms having a slope in front of about 1/2 an inch and a foot they are made of a [] to suit the Truck of the Gun Carriage. The whole of the platform is made to traverse bodily upon 4 Trucks and a pivot the latter is placed either in front centre ** or rear of the Platform according to the situation and direction which the Gun may be required to traverse. The Trucks are now so connected with the Platform that they may be changed either position of the pivot. The expense is very similar to that of a common Platform. The numbers stepping on the Platform to perform their duties. In serving the vent No. 4 stands in rear of the Gun with his foot on each bracket. In turning the sponge No. 2 extends his right arm upwards holding it by the centre and turns it horizontally over his head. In running up short levers shod with Iron are made use of [sic] the points are placed under the Trucks while the smaller end is pressed down this is termed finding [?]. In traversing 4 & 5 place their levers under the Truck of the Platform either in front or rear. On account of the height of the Platform it is necessary to have Locks [?] with Iron Platforms the hind Trucks should be taken off to prevent the Gun recoiling off the Platform. In running back ** it is usual to have Block and tackle on account of the slope of the Platform.

Exercise when firing with Hot Shot

Hot shot are very useful, when firing against Shipping, into Arsenals, Dockyards or where there is any thing that will easily take fire when firing against shipping that are not distant the shot must be made to lodge in the ships Hull. The charge must be reduced else it might otherwise pass through. The duties when the grate [?] is on the right of the Batteries are as follows: No. 1 Points and Commands. No. 2 Sponges Rams home, runs up, Traverses and Primes. No. 3 Loads runs up, Traverses Elevates and assists to put in Shot No. 4 Runs up serves the vent Assists to bring up the shot and put it in. No. 5 Runs up and assists to bring up the shot. No. 6 brings up ammunition from the rear and fires. The shot is not brought up till the word Prime is given when 4 & 5 bring it on a bearer to the right of the Gun. No. 5 then changes the bearer into his left hand for convenience of resting it on the Muzzle until ** No. 3 takes it in his right hand No. 3 & 5 then hold the bearer backhanded in front of the Muzzle with their feet nearest to it advanced a pace and roll the shot into the bore No. 3 then drops the handle of the bearer which No. 4 carries away. As soon as No. 1 ceases to hear it roll He gives the word fire. When the grate is on the left of the Battery 3 & 4 put in the shot and No. 3 primes. In loading a dry wad is put next to the powder and upon that a wad which has previously soaked in water and beaten on the Platform before put into the Gun. If firing at a depression so that the shot will not remain in the Bore a dry wad may be rammed before it.

Sighting

SIGHTING GEAR

A piece of ordnance is directed at its target by a combination of three movements. It is moved in azimuth—a process known in the British Army as traversing, and in the Royal Navy as training—and it is aligned on its target in the vertical plane to allow for any difference in height between them. A tangent elevation is then applied in the same plane to compensate for the vertical distance the projectile will fall during its time of flight as a result of the pull of gravity. The combination of these is known as laying.

Smooth-bore guns and howitzers were all laid by eye and it is surprising to find how accurately this could be done taking into consideration the very crude sights that were used. There is no doubt that considerable skill was exerted by the layers, who were always the most experienced men in the gun detachments—the Numbers One themselves.

The piece was originally laid simply by looking along the barrel and aligning it on the target. Traversing was invariably carried out by moving the trail of the equipment until the line was correct. But the line of sight over the top of the base ring and the top of the muzzle, which was called the

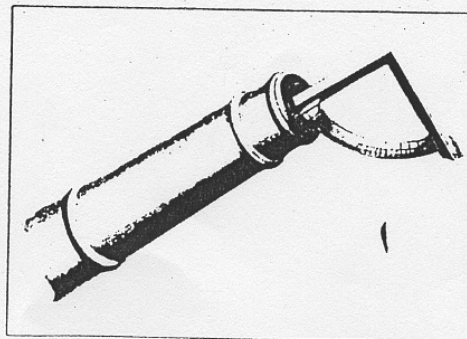
line of metal, was not parallel to the axis of the bore; and, if used for laying, would have given the piece a tangent elevation of one or one and a half degrees. The early gun layers had to allow for this in applying whatever tangent elevation was required by eye.

Gunners took their ballistics seriously from the earliest times, and the performance of the various pieces was carefully recorded during practice firings. Range tables were produced for each equipment as a result, and the correct tangent elevation for each range was known. The gunner's quadrant, an instrument for measuring the quadrant elevation of a piece by means of a quadrant and plumb bob applied to the muzzle, was used long before 1700, but in those early days the accurate measurement of elevation was practised mainly on the heavy siege guns and howitzers, firing at the longer ranges. On the lighter equipments, where both range and elevation were small, reliance was placed on the layer's visual estimate.

Hughes, Smooth Bore Artillery,
pg. 61.

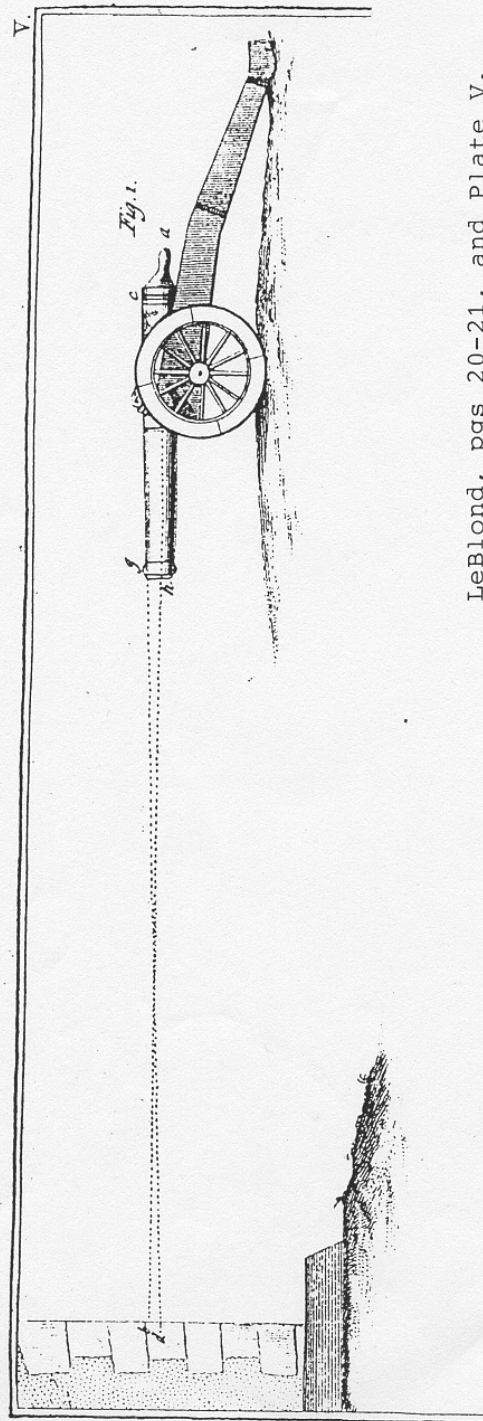
A seventeenth-century mortar quadrant, placed in the muzzle to determine the elevation and marked off in 'points'.

Hogg pg. 27.



Other most important pieces of the gunner's equipment were the quadrant and the tangent scale. The quadrant measured the tangent elevation by means of a setsquare, suitably calibrated, put into the muzzle of the piece. A plumb-line fixed to the apex then gave the reading. The tangent scale was fitted to a hole in the base ring of the piece and provided the angle of elevation of the target. Another table which helped the accurate laying of the guns was the quarter sights. These were engraved lines in the base ring of the piece. Mortars were laid by a plumb-line along the line of metal for direction, and if elevation was required a plumb-line was held over marks on the trunnions which provided the angle of elevation. Clinometers were also used to get an accurate reading of the angle of the carriage. Set tables were supplied giving various ranges of pieces at certain elevations.

In the Royal Navy, less equipment was needed, as the guns were fixed in position. On board ship each gun had beside it the rammers, sponges and wad hooks. There were also handspikes for elevating the guns. In the Navy a rope rammer was used, as it was easier to handle in confined spaces. In time of action, buckets, shot and cartridges were brought out.



LeBlond, pgs 20-21, and Plate V.

SECT. IX. Of the manner of pointing Cannon.

TO direct or point cannon towards the place you would strike with the bullet, the breech must be raised by means of a wedge; or coin *a*, which is placed under it on the *bed* of the carriage, and is called the *aiming wedge*.

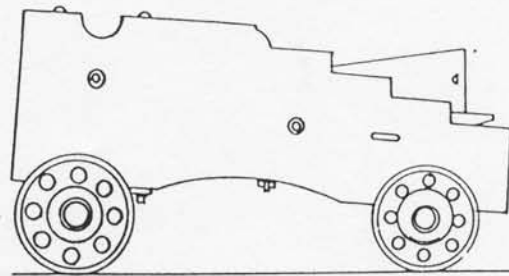
This wedge, by being driven under the breech, raises it up, and lowers the mouth, which is therefore to be done till the piece lies in the direction desired. When the piece is to be aimed from any considerable height to a place much beneath it, two or three of these wedges are made use of, laid one on another.

Cannon being heavier toward the breech than mouth, and making in shape a kind of frustum of a cone, a line supposed to pass from end to end thro' the middle of the bore, as *a b*, will not be parallel to the upper part of the piece *c g*; therefore if a piece be levelled by a continuation of the line *c g*, the bullet, instead of passing in that direction to *d*, will go to *b* the continuation of the line *a b*; that is, it will go higher than the point to which it was levelled. To remove this inconvenience, there must be placed on the chace, near

A R T I C L E K Y.

near the muzzle, a piece of wood *x*, concave on one side, that it may answer the convexity of the cannon, so as to lie firm, its top being just as high above the piece, as the metal is thicker at the breech than at the mouth. This is called the *fight-piece*, and serves, by guiding the eye, to discharge the bullet in the direction desired. By its help the line of sight becomes parallel to the line supposed to pass through the middle of the bore, that is, parallel to the line the bullet ought to describe, supposing it to move in a right line. So that levelling the upper part of the breech, and the upper part of the sight, with a given point, the bullet discharged in that direction will be carried towards that point, only lower just the semidiameter of the cannon at its breech. Therefore, if a piece be levelled to a point half the diameter of the breech higher, the bullet will strike precisely the point intended to be hit. But this must be understood exclusive of all the accidents that may, and that in practice actually do, vary the direction of the bullet.

Carriages & Movement



Carriages

Although there are thousands of gun barrels of the 18th and 19th century extant today, there are very few original carriages from the same period. Yet in 1846, there were more than 50 patterns of gun mounts. Even considering that changes in design were not frequent, the number of variations that were possible during the 150-odd year period covered by this paper are legion.

Of the guns existing today which are mounted on their original carriage, there are a large number from the mid 19th century. But earlier guns are extremely scarce with less than two dozen from the first decade of the century and probably less than ten from the 18th century that were used in North America.

Part of the reason for this can be attributed to the comparative impermanence of oak, but an even greater reason is that although the barrel could be used indefinitely, the obsolete carriage was replaced, and it is only the last used that has remained. For these reasons, it is necessary to piece together the developments of gun mounts and carriages from documentary sources and models made at the time the guns were in use.

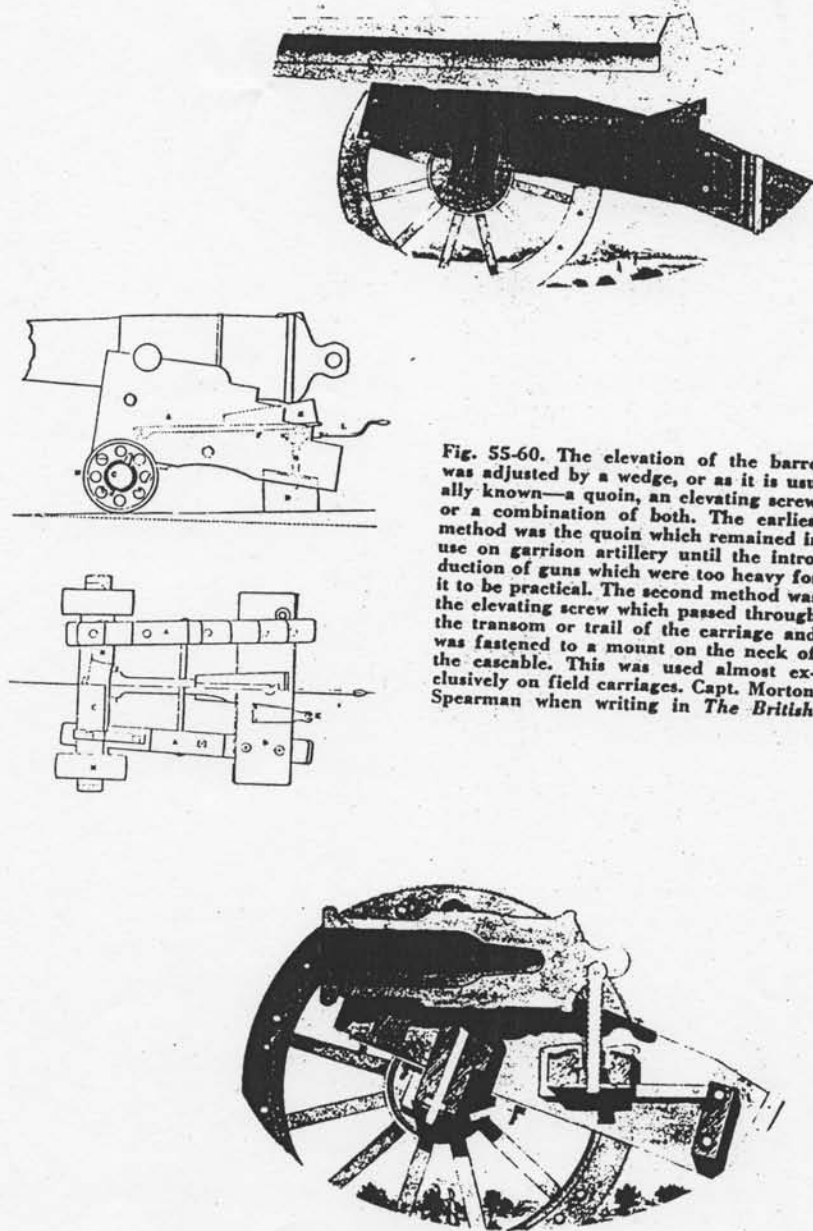
There were three jobs assigned to the artillery and for each function, a special class of piece was designed. It is possible, when looking at a gun, mounted on its correct carriage to determine fairly precisely what the designer of old was intending to use that gun for. The three classes were Garrison Artillery, Siege Artillery and Field Artillery.

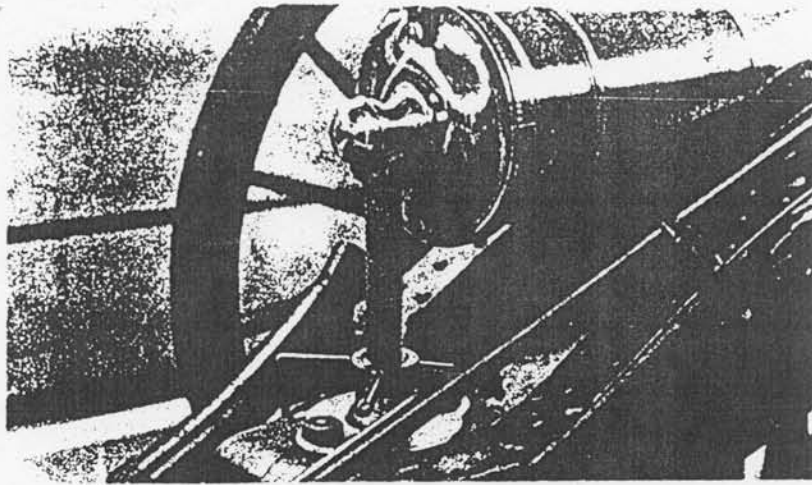
Garrison Artillery was designed for the defence of permanent fortifications. The carriages were designed for efficiency and weight was not a problem, for they would not be quickly moved under normal conditions. *Coastal artillery* was a development of garrison artillery that became a class of its own about the middle of the 19th century. By the time that it had been fully developed it was almost exclusively equipped with breech loading guns.

Siege Artillery could be considered similar to garrison. It had to be moved about, but once in place, there was little need for changing the location throughout the duration of the siege. Thus, in design, it was similar to garrison but with occasional modifications intended to speed movement from place to place. A battery during a siege would include larger quantities of some weapons than would normally be located in a garrison battery.

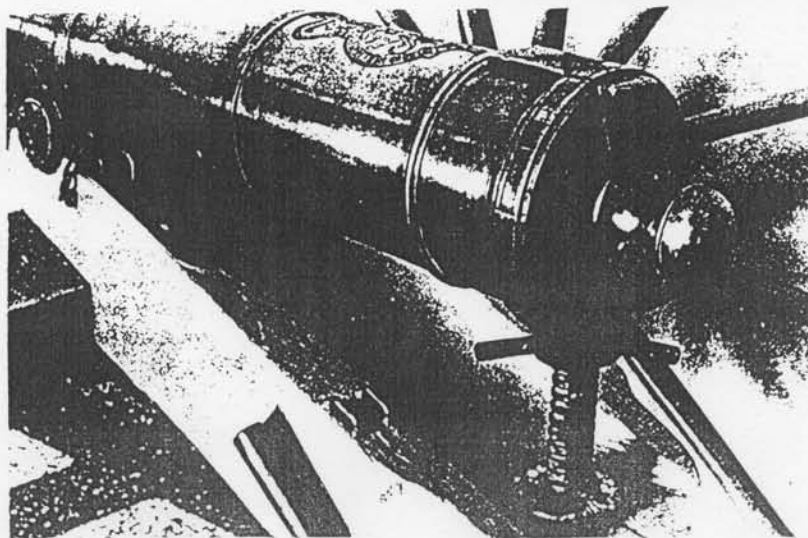
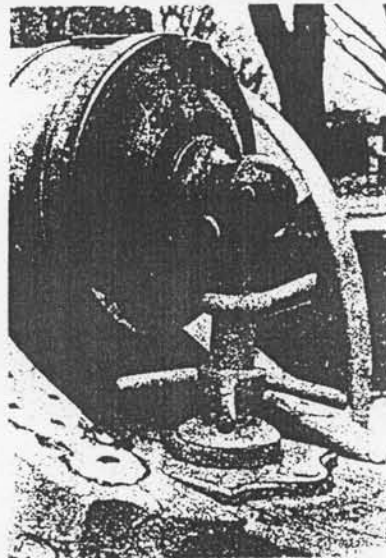
Field Artillery was, as the name suggests, designed for mobility. Cannons mounted on carriages with wheels that would allow them to be moved quickly.

limbers to carry ammunition and supplies, and special harness for the horses and men; each piece designed to be complete in itself. By this it is not meant that field artillery was always light in weight, for the artillerymen of the day, and the methods devised by them, made it possible to move great weights — barrels of two or three tons — with comparative ease and greater speed than can be imagined was possible.



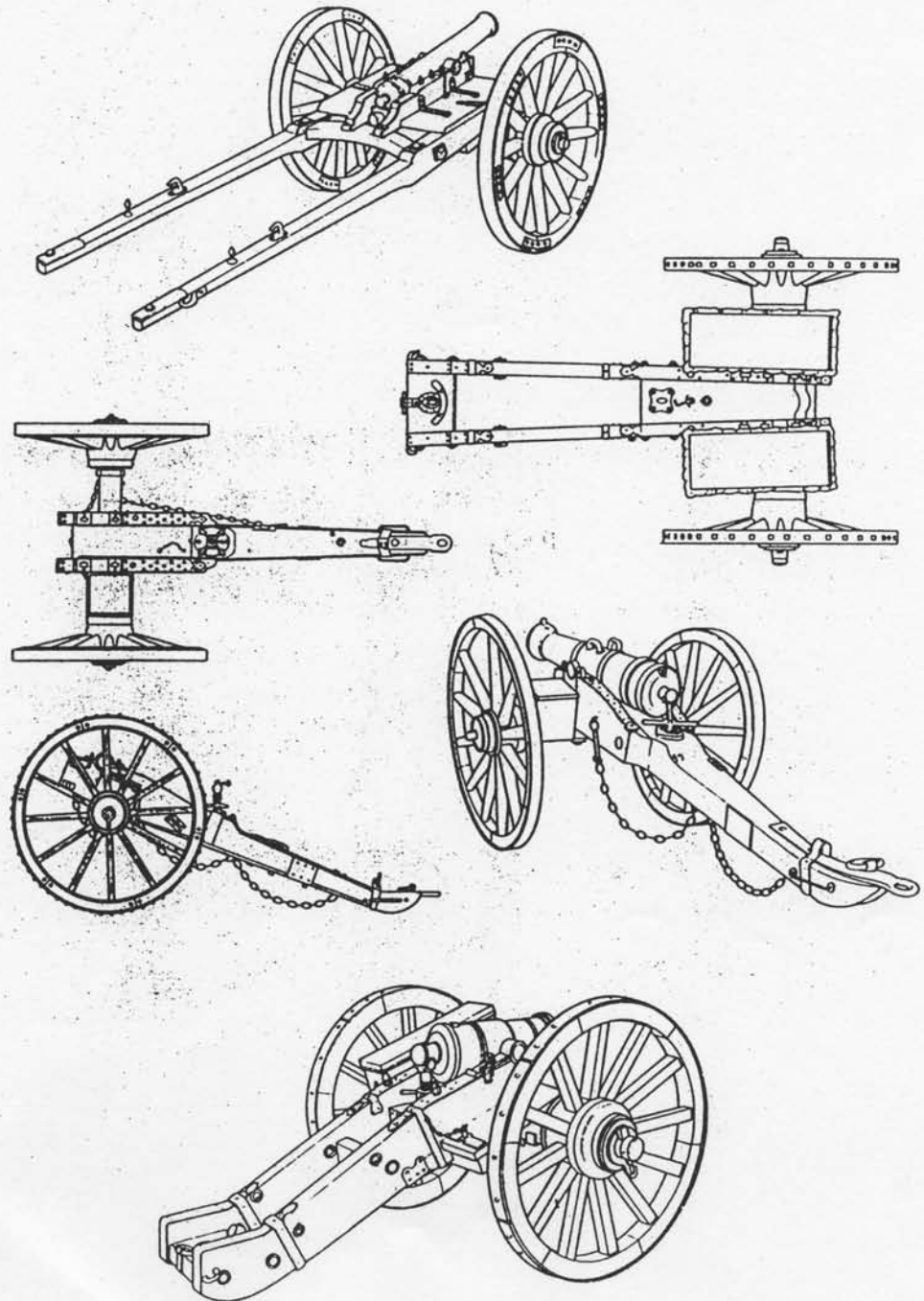


Gunner in 1828 noted that "a change in the construction of these screws has taken place of late years, by disengaging them from the cascade of the guns." On these, the screw mount on the cascade, or the base ring, merely rested on an enlarged 'button head' of the elevating screw. The change was not made to all classes of gun, for as late as 1870, there were guns with a direct connection between the screw and the barrel. A fourth method using the elevating screw operated by a ratchet-lever combined with a quoin was introduced in the second quarter of the 19th century.



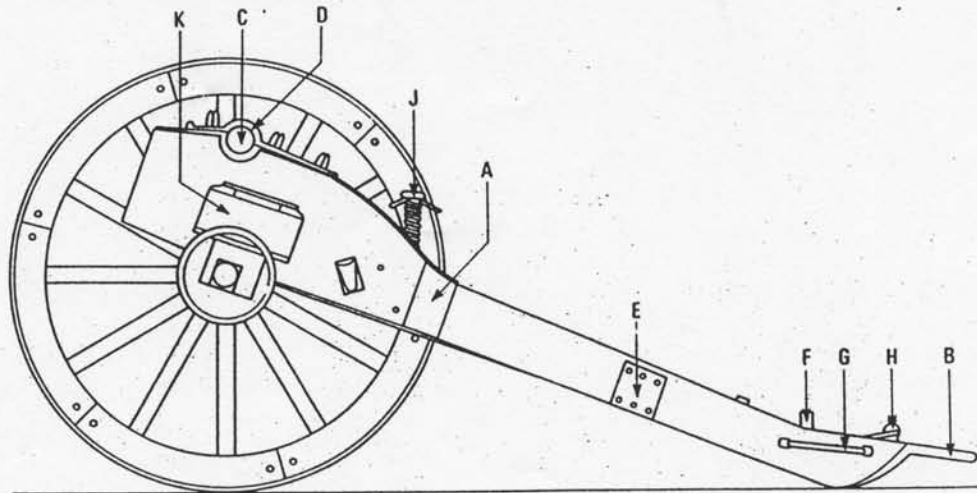
Haythornthwaite, pg. 68.

Top to Bottom: Galloper Gun, 1795; Plan of a Light 6-Pounder on a double bracket field carriage, 1793; Plan and elevation of a block trail field carriage for 6- and 9-Pounders; 9-Pounder gun on a field carriage; heavy $5\frac{1}{2}$ -Inch Howitzer, 1786-1819.



Haythornthwaite, pg.57.

Fig. 36. Parts of a British Field Carriage. A. Bracket; B. Trail-plate Eye; C. Trunnion-hole; D. Capsquares and Eye-bolts; E. Lockplate; F. Traversing Stay; G. Limbering-up Handle; H. Traversing Loop; J. Elevating Screw; K. Match or Shot-case.



57

Haythornthwaite pg: 69.

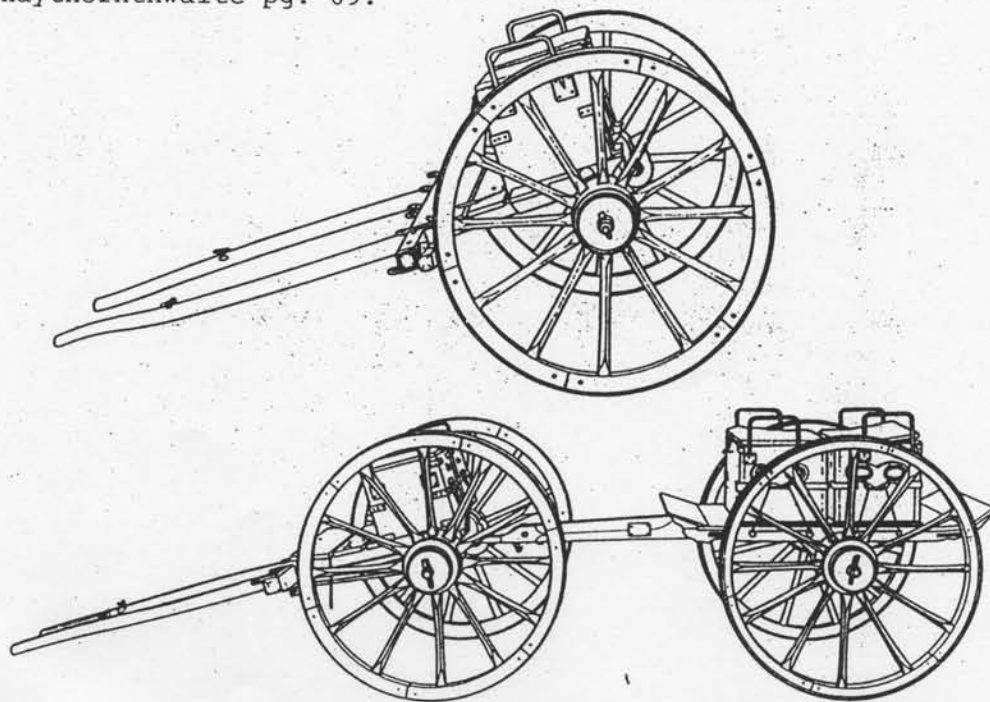


Fig. 43. Above: British Artillery Limbers. Top: 9-Pounder Limber. Below: Limber with attached ammunition waggon.

A great improvement in the design of the carriages of the light equipments took place in 1792 when General Congreve introduced the block trail into the British Service. This (see plate 50) was a pole-like structure of square section which replaced the two long brackets which had previously formed the trail. The trunnions of the piece were supported by two short brackets bolted to the front part of the trail, and provided with the usual capsquares.

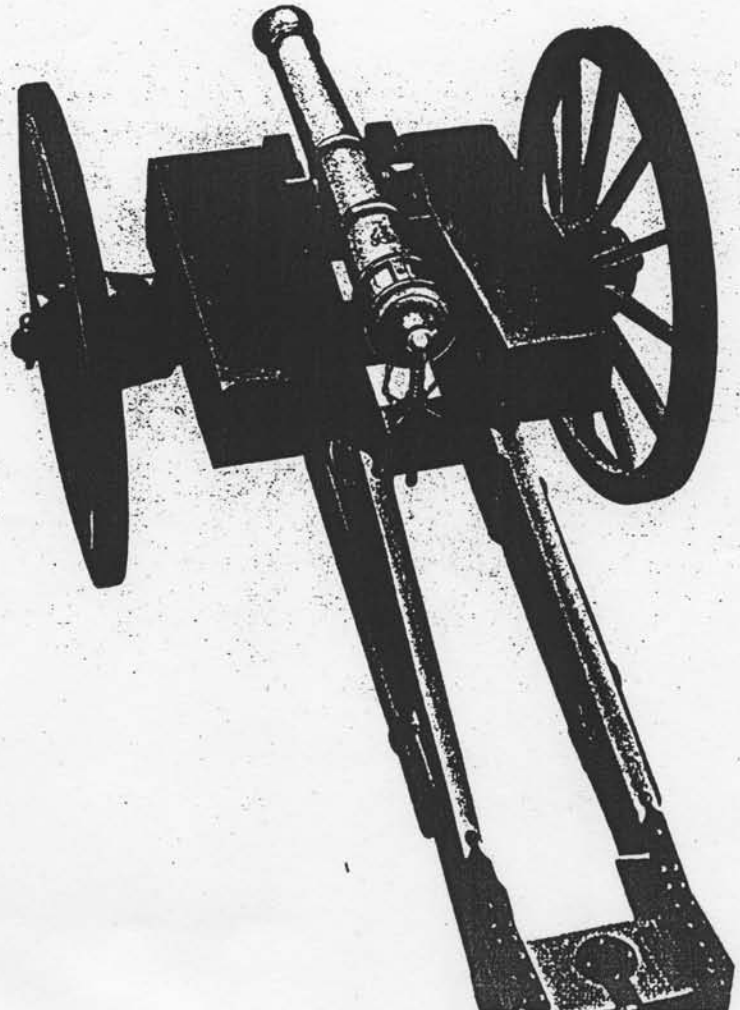
This design shifted the centre of gravity of the whole carriage further forward so that one man could lift the trail off the ground, using a single short handspike inserted into two iron loops on the end of the trail. Furthermore, that man could be the Number One himself, who could then lay the gun far more quickly and accurately than when he had been working through two intermediaries. Another advantage of the block trail lay in the bigger lock that could be given to the limber, as a result of which the whole carriage could be reversed almost on its own ground.

The block trail was in service with all British

6 and 9pr guns from the Peninsular War onwards. It does not seem to have been adopted for the 12pr guns until after they had ceased to be used as light equipments, and, although some were designed for the 51in howitzers, they do not seem to have been issued. But the 12 and 24pr howitzers had block trails from the start.

Hughes, Smooth Bore Artillery,
pg. 68.

Hogg pg. 35.



A British light 6-pounder,
of the type specially
prepared for service in
Canada with General Wolfe.
The axle was widened and
fitted with ammunition
boxes.

Disclaimer

This manual has been put together for the training only of Venturers, members of Scouts Canada and members of Boy Scouts of America, for the "Living History" Camp at Fort George, Niagara-on-the-Lake, Ontario, Canada. The Scout Brigade of Fort George event is held on the 3rd weekend of September, every year.

This manual was not created for, nor is it to be ever used for the purpose of profit. It is intended to condense resource materials for the preparation of the youth for the above mentioned event.

Donation

Fort York, Toronto, Ontario, Canada graciously contributed their artillery procedures for reference.

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