

BLACK POWDER GUNS

Supplement for GunMaster Gold By Bill Gant, February 2001



Black powder weapons were the earliest form of firearm. The projectile was forced out from a barrel by ignited black powder, a propellant comprising varying proportions of potassium nitrate (saltpeter), charcoal and sulphur (generally about 75%, 15% and 10% respectively). Unlike modern firearms, black powder weapons were muzzle-loaded, with the projectile, priming and propellant loaded separately instead of in a single casing.

GunMaster Gold recognises three major types of black powder ignition mechanisms (locks): Matchlock; Flintlock and Percussion cap. Their purpose is to send fire, when required, into a narrow vent leading to the powder charge in the barrel.

Matchlock - The earliest form of lock, the mechanism essentially consisted of a slow-burning cord (match) that was pressed into a pan containing the priming powder, thereby igniting the powder and subsequently the propellant in the barrel. The pan could be covered to prevent accidental discharge. Matchlock firearms were nearly always smoothbore longarms that fired spherical projectiles (or sometimes even metal arrows), and had very poor accuracy as a result. The requirement for a lit match made the weapon very unreliable and impractical in inclement weather.

Flintlock - An important innovation over the matchlock, a piece of flint would be scraped against steel, thereby sending a shower of sparks into the pan. They were considerably more reliable and practical than matchlocks, although damp weather could still prevent the primer charge in the pan from igniting. Also, the gun flint itself was only effective for about 20 shots, after which it required replacing. Early flintlock weapons were smoothbore like matchlocks, with about the same level of accuracy and power. Later, rifled bores allowed for greater accuracy and range, but it took longer to reload due to the need to engage the lead ball with the rifling.

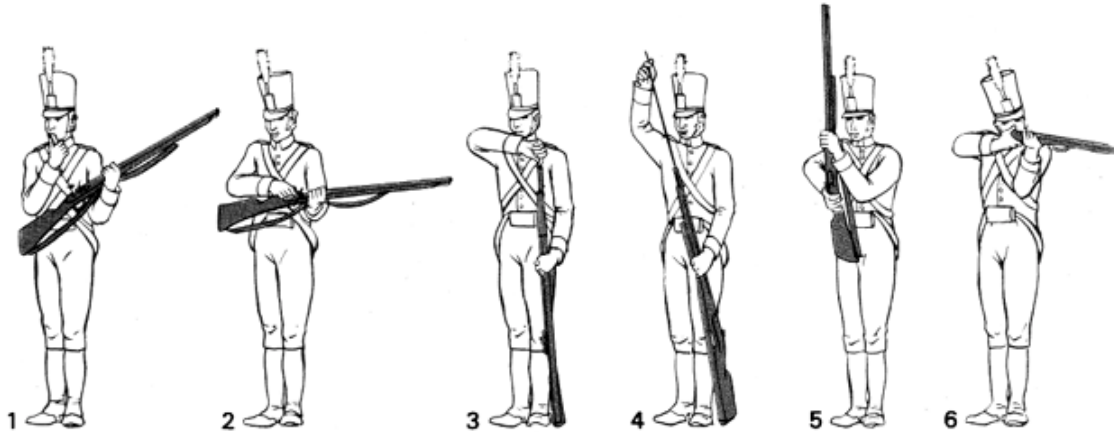
Percussion - A significant advancement in black powder technology, a detonating compound of fulminate of mercury was stored within a copper percussion cap, which would be placed over a nipple. When struck by a hammer, the compound would be crushed, sending a flash down the hollow nipple and into the main powder charge in the barrel - the cap would need replacing after each use. The simplicity of a percussion action meant that the weapon was more reliable than flintlocks. As with later flintlocks, percussion cap firearms tended to have rifled bores and therefore superior range and accuracy, but unfortunately with the same delays in reloading. Eventually, however, hollow-based elongated projectiles (e.g. Minié bullets), with diameters smaller than the bore, were developed that could be loaded quickly - the explosion from the charge when fired would force the hollow base to expand and engage the rifling, thereby causing the bullet to spiral through the barrel. It was not long before breech-loaded self-contained cartridges were introduced, thereby revolutionising firearms technology.

The skill required to fire a black powder small arm is the *Firearms* skill. Specialties include Handgun and Rifle. The blunderbuss (early shotgun) would use the Handgun specialty instead of the Shotgun specialty.

RELOADING

Muzzle-loaded firearms take considerably more time than breech-loaders to reload. This is because there are more steps involved - the following example is a standard drill for loading a flintlock musket:

1. Bite open the cartridge containing the correct amount of powder and the lead ball;
2. Prime the pan;
3. Pour the powder and ball into the muzzle;
4. Ram down the charge with a rammer or ramrod;
5. Set the lock to “full cock”;
6. Aim and fire.



A trained soldier could fire a shot from a smoothbore musket about every 20 seconds, but long-range accuracy was sacrificed. To overcome the disadvantage of the long loading times, the standard infantry tactic was to volley-fire - ranks of men fired disciplined volleys, one sub-unit firing while others were loading. Thus, a withering hail of bullets could be delivered at brief intervals. Alternatively, the whole unit could fire together to overwhelm the enemy before charging with bayonets.

Muzzle-loading a black powder firearm is a skill unto itself:

NAME	BASE ATTRIBUTES [Sunsign +]	OML
Muzzle-Loading	Dex Tch Tch [Fen +1]	SB 3

A Muzzle-Loading skill roll is made whenever a character attempts to load or reload a black powder firearm. The success level will determine the time interval between shots (see the table below). Roll for every round loaded.

LOCK	BORE	RATE OF FIRE (MUZZLE-LOADING ROLL)			
		CS	MS *	MF	CF **
Matchlock	Smooth	1 per 2 Rounds	1 per 3 Rounds	1 per 4 Rounds	1 per 6 Rounds
Flintlock	Smooth	1 per 2 Rounds	1 per 3 Rounds	1 per 4 Rounds	1 per 6 Rounds
Flintlock	Rifled	1 per 3 Rounds	1 per 4 Rounds	1 per 5 Rounds	1 per 8 Rounds
Percussion	Smooth	1 per 2 Rounds	1 per 3 Rounds	1 per 4 Rounds	1 per 6 Rounds
Percussion	Rifled	1 per 3 Rounds	1 per 4 Rounds	1 per 5 Rounds	1 per 8 Rounds

* Handguns generally take less time to reload than longarms. Treat any MS result as CS.

** A Malfunction roll is required whenever a Muzzle-Loading skill roll Critically Fails. If there is no malfunction (i.e. “Safe”), use the Rate of Fire given. See below for Firearm Malfunction.

Speed-loading: A gunner may elect to speed-load a *musket* or *rifle* (only) prior to making the Muzzle-Loading skill roll. Reduce the time required to reload by 1 Round (e.g. 1 per 3 Rounds becomes 1 per 2 Rounds), but *double* any EML range penalty if applicable. A Critical Success with the Muzzle-Loading skill roll indicates speed-loading has taken place, but without the range penalty.

FIREARM MALFUNCTION

Black powder firearms are less reliable than modern firearms. This is mainly due to inconsistencies in the amount of propellant used, the varying shape and diameter of the projectile, and the black powder's tendency to foul the firearm's mechanism. Whenever a *CF* result exceeds Firearms ML (before EML modifiers), roll 1d100 and consult the table below, to determine whether the weapon malfunctions:

LOCK	SAFE	DUD	FOULING	BREAKAGE
Matchlock	01-55	56-60	61-75	76-00
Flintlock	01-80	81-85	86-95	96-00
Percussion	01-90	91-95	96-00	--

Safe - The weapon fires normally. If this result occurred from a Critically Failed Muzzle-Loading roll, see the Reloading section to determine the number of rounds it will take to reload the weapon. For matchlocks and flintlocks only, if environmental conditions are poor (e.g. it is raining), treat any *Safe* result as *Dud*.

Dud - The weapon fails to fire. There are many reasons why this has happened, including: not enough priming in the pan (matchlocks and flintlocks); the pan cover or frizzen has blown away the primer charge as it opened (matchlocks and flintlocks); the match has extinguished (matchlocks); the flint has failed to cause sparks (flintlocks); the cap is defective (percussion caps); etc.

Marginal Dud: The fault must be fixed before it may be fired - this takes 1 Round.

Critical Dud: The weapon must be reloaded.

Fouling - The weapon has fired but something has happened to foul the mechanism of the firearm. Typically, this would be powder residue clogging the touchhole or vent leading to the barrel. No further shots may be fired until the firearm has been cleared.

Marginal Fouling: The fouling must be cleared before reloading the weapon - this takes 1 Round.

Critical Fouling: Same as Marginal Fouling, plus another roll must be made on the Firearm Malfunction table the next time the weapon is fired.

Breakage - Something has broken, preventing the weapon from firing. This could be as simple as a screw falling out, or as serious as permanent damage to the lock, requiring repair by a gunsmith. Until the fault has been fixed, no shots may be fired from the weapon. Note that unless the gunner has severely overloaded the weapon with powder, it is extremely unlikely that the weapon will explode.

Marginal Breakage: An important but easily repairable component has broken or fallen off - the fault must be fixed before the weapon can be fired. This could take a few minutes to a few hours, depending on the specific fault and the tools available.

Critical Breakage: Something serious has broken. The weapon must be repaired by a properly-equipped gunsmith before it can be fired.

BLUNDERBUSSES

The word blunderbuss came to describe a short carbine-like weapon with a wide barrel. Often loaded with buckshot, the blunderbuss was usually used at sea, or for the defence of homes and coaches, to scatter a spray of pellets at very close range at an enemy.

Although the actual number of pellets fired can vary greatly, for the sake of practical gameplay, assume a load of buckshot to contain 8 pellets. Use the *GunMaster Gold* shotgun rules, with the following table to determine the number of pellets that will strike:

RANGE	BLUNDERBUSS BUCKSHOT (RC 1)		
	Range Modifier	Strike Impact	Number of Strikes
1/Less	EML +0	(Base +2d6) ×0.5	[SCS] 8 / [CS] 7 / [SMS] 6 / [MS] 4 *
2/Less	EML +0	(Base +2d6) ×0.5	[SCS] 7 / [CS] 6 / [SMS] 4 / [MS] 2 *
4/Less	EML +0	(Base +2d6) ×0.5	[SCS] 6 / [CS] 4 / [SMS] 2 / [MS] 1
8/Less	EML +0	(Base -1 +2d6) ×0.5	[SCS] 4 / [CS] 2 / [SMS] 1 / [MS] 0
16/Less	EML +0	(Base -2 +2d6) ×0.5	[SCS] 2 / [CS] 1 / [MS] 0
32/Less	EML +0	(Base -4 +2d6) ×0.5	[SCS] 1 / [CS] 0 / [MS] 0

* All strikes are to a single location at 2 hexes range or less.

SAMPLE BLACK POWDER FIREARMS

The following are examples of muzzle-loaded firearms. The firearms are listed in rough chronological order.

Any ball with a calibre of less than 17.5mm is treated as a *Light Projectile*. A ball with a calibre of 17.5mm to 26.0mm is treated as a *Medium Projectile*.

Note on Prices: The prices listed assume that flintlock smoothbore weapons are the most common firearms available. Under this assumption, matchlocks are becoming obsolete, rifled bores are an emerging technology and percussion weapons are new and expensive. As GM, you may wish to adjust the prices to suit the technology level of your campaign.

Key: -M, Matchlock; -F, Flintlock, -P Percussion cap; s, Smoothbore; r, Rifled bore. These are indicated under Action.

BLACK POWDER PISTOLS & REVOLVERS

[Specialty Used: Handgun]

Name	Cal.	RC	Impact	Rec	IA	WT	PR	Clip	Action	ROF	LCW	WQ
Matchlock Pistol	15.0mm	1	4g	64	-5	3.0	112	1	SS-Ms	-	0.0	12
Fernandez Flintlock	15.9mm	1	5g	70	-5	3.1	129	1	SS-Fs	-	0.1	12
Cavalry Pistol	15.9mm	1	5g	70	-5	3.1	129	1	SS-Fs	-	0.1	12
Steel Pistol	14.1mm	1	4g	58	-5	1.4	124	1	SS-Fs	-	0.0	11
Sea Service Pistol	14.7mm	1	4g	62	-5	3.1	124	1	SS-Fs	-	0.0	12
Mortimer Duelling Pistol	15.7mm	1	5g	76	-5	2.3	134	1	SS-Fs	-	0.1	12
Naval Holster Pistol	15.7mm	1	5g	68	-5	2.0	129	1	SS-Fs	-	0.1	12
Blunderbuss	15.7mm	1	5g	68	-5	2.4	129	1	SS-Fs	-	0.1	12
Manton Duelling Pistol	12.7mm	1	4g	55	+0	2.5	136	1	SS-Fs	-	0.0	12
Collier Flintlock	12.0mm	1	4g	51	+0	2.2	360	5	RV-Fs	1	0.1	11
Manton Percussion	10.7mm	1	4g	46	+5	2.4	360	1	SS-Pr	-	0.0	12
Blanch 4-Barrelled Pistol	12.7mm	1	3g	50	-5	2.3	264	4	SS-Ps	½	0.1	11
Cooper Pepperbox	10.2mm	1	2g	36	-5	1.6	321	6	RV-Ps	1	0.1	11
Tower Cavalry Pistol	19.0mm	1	6g	91	-5	3.3	139	1	SS-Ps	-	0.1	12
Double Barrelled Pistol	17.8mm	1	5g	91	-5	2.3	247	2	SS-Ps	½	0.1	12
Model 1842 Pistol	13.7mm	1	4g	56	+0	2.8	372	1	SS-Pr	-	0.0	11
Colt Dragoon M1849	11.2mm	2	5g	71	+0	4.3	387	6	RV-Pr	1	0.0	11
Adams Dragoon	12.4mm	2	5g	68	+0	2.8	387	5	RV-Pr	1	0.0	11
Colt Navy Revolver	9.1mm	2	3g	42	+0	2.4	348	6	RV-Pr	1	0.0	11

BLACK POWDER MUSKETS & RIFLES

[Specialty Used: Rifle]

Name	Cal.	RC	Impact	Rec	IA	WT	PR	Clip	Action	ROF	LCW	WQ
Matchlock Caliver	12.0mm	2	6g	74	+0	7.0	73	1	SS-Ms	-	0.0	14
Matchlock Musket	14.5mm	2	7g	99	+0	9.0	83	1	SS-Ms	-	0.0	14
Dog-Lock Musket	18.5mm	2	9g	143	+0	15.0	103	1	SS-Fs	-	0.1	16
Brown Bess	19.0mm	2	9g	148	+0	12.0	108	1	SS-Fs	-	0.1	15
Model 1777 Musket	17.5mm	2	8g	131	+0	10.0	99	1	SS-Fs	-	0.1	15
Baker Rifle	15.8mm	2	9g	139	+5	9.1	323	1	SS-Fr	-	0.1	14
Brunswick Rifle	17.9mm	2	11g	168	+5	9.2	386	1	SS-Pr	-	0.1	14
Model 1839 Musket	19.0mm	2	9g	148	+0	9.3	108	1	SS-Ps	-	0.1	14
Morse Musket	18.0mm	2	11g	169	+0	9.5	194	1	SS-Ps	-	0.1	15
Model 1841 Rifle	13.7mm	2	8g	112	+5	9.8	282	1	SS-Pr	-	0.0	14
Model 1842 Musket	17.5mm	2	10g	162	+0	9.2	184	1	SS-Ps	-	0.1	15
Minié Rifle *	19.3mm	3	14g	236	+0	9.5	561	1	SS-Pr	-	0.2	15

* The Minié Rifle uses a specially-designed elongated bullet with a hollow base that flares out to engage the rifling when fired (treat as a 2:1 projectile, sg7 instead of 11). The loading time of a Minié is the same as for a smoothbore.

AMMUNITION

Most bullets are simply lead balls, which can be made by the firer using a bullet mold (0.5lbs, 18d). The cost of a bullet, therefore, is very cheap (about 5d per 10lbs ingot of lead). Black powder costs about 5d per pound - a powder flask (1.0lb, 10d) would generally hold enough powder for around 500 shots (2-5 pounds).

The formula for determining the mass in grams of a lead ball is $(46.07669 \times (d/20)^3)$, where d is the bullet's diameter in millimetres. To convert into ounces, multiply the mass by 0.0353.

Minié bullets are specialised ammunition and therefore very expensive. The price is approximately 3d per bullet for the Minié Rifle.

IMAGE REFERENCES

Page 1: Naval Holster Pistol from *Military Small Arms* (1994), edited by Graham Smith, published by Salamander Books, London.

Page 2: Flintlock musket loading drill from *Weapons* (1980), written by The Diagram Group, published by PAPERMAC, London.