

# Europa Barbarorum, *EBmodmod* edition, v.1.0

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## 1. Pre-introduction

I'm hoping to find a healthy balance between analyzing historical information, which I'll do in an academic writing style, and explaining how to actually play the game. I have no idea how well these styles of documents will mix, but i'm going to apply one of the cardinal rules of writing: write first, then edit. :)

## 2. Introduction

Rome: Total War (R:TW) is a critically acclaimed strategy game, created in 2004 by The Creative Assembly [[Creative Assembly, 2020](#)]. Ground breaking at the time of its release, R:TW's video game technology was used for visualisation and battle re-enactment in a number of historical documentation series, such as Time Commanders [[IMDB, 2003](#)] and Decisive Battles [[IMDB, 2004](#)].

Europa Barbarorum (EB) [[Europa Barbarorum, 2004](#)] is a modification (mod) of the original Rome: Total War. Set in the same time period as R:TW, EB aims to provide a historically accurate alternative to the original game, which in some instances sacrificed historical accuracy to provide a better player experience<sup>1</sup>.

*EBmodmod* is a mod of Europa Barbarorum. The name reflects its purpose: in this mod of a mod, I address some aspects which I believe further increase historical accuracy.

## 3. What changed versus Europa Barbarorum?

My main hypothesis is that a historically accurate reflection of the economics of armies during the time period can explain some differences between how factions fought, as well as differences between armies of the same faction within different periods.

The Romans, in particular, adopted a battle formation during the Republican period which has vexed historians and wargamers for decades. Under the unit cost system of R:TW, which the EB developers adopted, the Republican battle formation simply does not make

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<sup>1</sup>For example, Egypt during the time of R:TW was ruled by a Greek dynasty, and fought in the tradition of the Macedonian Successors. TCA gave Egypt a more “believable” unit roster, based on the way Egyptians fought during the period of Ramesses II, 1000 years earlier, relying on bow and chariot tactics which were outdated by the Roman period.

sense. During gameplay, all but the most stubborn historical players give up on it. Historians have tried to dismiss some of its more brutal implications, such as where three quarters of the army stays out of combat until one line of soldiers is dead, before the next line then engages, with reasonings along the lines of “life was brutal back then, modern people can’t understand”. The economics of warfare provides an alternative explanation, and simulated gameplay shows that together with a slightly different reading of the original sources, the Republican formation can be very effective.

Another example is how the “barbaric” Gauls, often fighting with no armor, compare to the heavily equipped Roman soldiers. Did the Gauls not care about the well-being of their sons fighting for their land and loved ones? Here, too, economics explains the difference.

## 4. Installation

*Note: this section will probably undergo significant changes, since I haven't done much installation testing. If you try this out and you experience problems, feel free to let me know.*

*EBmodmod* is built upon Europa Barbarorum version 1.2 (EB 1.2), which in turn is built on the original Rome: Total War game. Installing happens in three steps:

- Installing the original Rome: Total War game version 1.5
- Installing Europa Barbarorum version 1.2
- Replacing some EB files with the *EBmodmod* files

### 4.1 Installing the original Rome: Total War

You will need the 2004 Rome: Total War to install this mod<sup>1</sup>. There are various ways to obtain it. As of this writing, the *Rome: Total War™ - Collection* is available from Steam at 12,99€.

The original game needs to be updated to the 1.5 Official patch, which can be obtained from <https://www.moddb.com/games/rome-total-war/downloads/rome-total-war-v13-to-v15-patch>.

*Note: the 1.5 patch has to be installed on top of the 1.3 patch, which may or may not be the default version on Steam. I still have to try this out.*

### 4.2 Installing Europa Barbarorum

*EBmodmod* is a modification of the first edition of Europa Barbarorum (EB1)<sup>2</sup>, so we have to install that first. Installing EB1 happens in two steps: first the EB 1.1 full version needs to be installed, followed by the EB 1.2 patch. The installation files can be obtained via the following links:

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<sup>1</sup>In 2013, Creative Assembly released Rome: Total War II [Creative Assembly, 2013]; Europa Barbarorum is incompatible with the 2013 game.

<sup>2</sup>The Europa Barbarorum team has been working on a second version of the mod, which runs on the Medieval II: Total War engine.

- <https://www.moddb.com/mods/europa-barbarorum/downloads/europa-barbarorum-11>
- <https://www.moddb.com/mods/europa-barbarorum/downloads/europa-barbarorum-12-patch>

During the installation of Europa Barbarorum, it is important to direct the installer to the path called “Rome - Total War”, where the R:TW files such as RomeTW.exe are installed. After installing the EB files, there should be an additional folder called “EB”, containing the Europa Barbarorum files, inside the “Rome - Total War” folder. The files need to be in this exact location for the mod to work properly.

At this point, the original Europa Barbarorum mod should be playable (See Launching Europa Barbarorum, below).

#### **4.3 Installing *EBmodmod***

Modifications of Rome: Total War change the contents of some key files, which are loaded by the game on startup. Changing the contents of these files results in a different game experience.

To switch from Europa Barbarorum to *EBmodmod*, the following Europa Barbarorum files need to be replaced only once:

- Rome - Total War/EB/Data/export\_descr\_model\_battle.txt
- Rome - Total War/EB/Data/world/maps/campaign/imperial\_campaign/descr\_strat.txt
- Rome - Total War/EB/Data/export\_descr\_buildings.txt

The following files need to be replaced based on which faction the player wishes to play:

- Rome - Total War/EB/Data/world/maps/campaign/imperial\_campaign/DESCR\_MERCENARIES.txt
- Rome - Total War/EB/Data/export\_descr\_unit.txt

The *EBmodmod* files can be downloaded via the following link:

<https://github.com/KevinHoefman/EBmodmod/raw/work/EBmodmodFiles.rar>.

## 4.4 Launching Europa Barbarorum

Since *EBmodmod* works by replacing key Europa Barbarorum files, launching *EBmodmod* is the same as launching Europa Barbarorum.

The game can be launched by doubleclicking the “EB.bat” file inside the Rome - Total War folder, or, alternatively, the EB shortcut placed on your desktop by the installer.

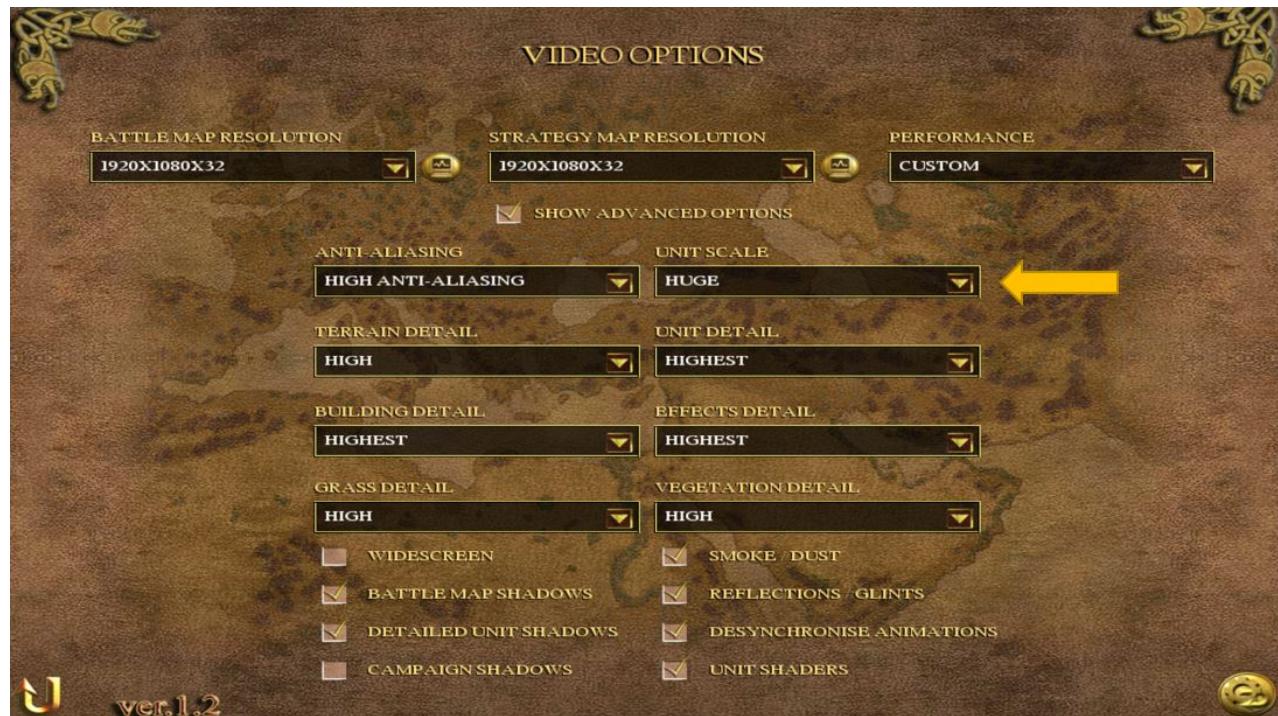
*Note: I have to verify this part. Let me know if some steps don't work.*

## 5. Your first Europa Barbarorum (*EBmodmod*) campaign

### 5.1 Video Settings

When Rome: Total War was first released, most home computers were unable to run it with full features. For the full experience, I would recommend setting the Video Options to high. Of all the options, setting Unit Scale to Huge will give the biggest benefit.

You can access the video options by picking Options -> Video Settings on the startup screen, and ticking the Show Advanced Options box.



## 5.2 Starting a New Campaign

To start a new campaign, launch Europa Barbarorum. From the startup screen, choose Single Player -> EB Main Campaign. This brings you to the EB Main Campaign window:



For a first *EBmodmod* playthrough, I would suggest the following settings:

- Campaign Difficulty: this value changes the amount of money AI factions receive at the start of every turn. I would suggest Medium or Hard Difficulty.
- Battle Difficulty: this value changes the attack and defense values of AI units in battle. I would suggest leaving it on Medium Difficulty.
- Faction: choosing the Romani faction will start the Roman campaign.

### 5.3 The Campaign Window

Europa Barbarorum introduces a few peculiarities compared to the original Rome: Total War. These are marked on the first game screen, below:



1. Each time the game starts, the Europa Barbarorum script, which controls the EB game experience, must be manually activated. You do this by clicking on the Advisor's image, then clicking on the "Show Me How" button below him, and clicking the Advisor's image again. When you start a new campaign, the Advisor will appear automatically for you to activate the script. When you load the game from a save file, you need to click on a city to activate the script. I always then click on a different city again, to verify if the script is activated - if it isn't, the Advisor will appear again. It is a bit tedious, and in the beginning you will forget to activate the script a number of times. But there was no other way for the Europa Barbarorum team to implement this.
2. Fleets are expensive, and you will not have a lot of funds at the start of a campaign, nor much use for a fleet. I tend to disband my fleet at the beginning of the campaign.
3. The diplomat and the spy are useful special units to talk to other factions, and spy on them, respectively.
4. Clicking on a city brings up the buildings in Town tab, shown at the bottom of the campaign window. Europa Barbarorum introduces new buildings to create a different game experience.

5. In Europa Barbarorum, the game progresses through different eras, which unlock different units. This indicator shows we are in the Camillan Era, which is where the Roman campaign starts.
6. In Europa Barbarorum, armies are separated into units that belong to the main faction of the campaign, and regional units which the player can hire to augment their army. Regional units vary from region to region, hence the name. The government building controls how far the factional and regional barracks<sup>1</sup> can be upgraded:
  - Type 1 government: level 5 factional barracks, level 2 regional barracks
  - Type 2 government: level 4 factional barracks, level 3 regional barracks
  - Type 3 government: level 3 factional barracks, level 4 regional barracks
  - Type 4 government: level 2 factional barracks, level 5 regional barracks

When conquering a city, you should remove any existing government buildings and barracks, then build your own. In the *EBmodmod* files, I provide an overview of which units can be trained in which city, by faction and type of barracks.

7. Arpi, the city selected in the campaign window above, has a level 2 factional barracks, shown here. It does not start with a regional barracks. There are rules, by faction, dictating where barracks can be built. For example, during the Camillan era, the Romans can build factional barracks only in their starting cities.

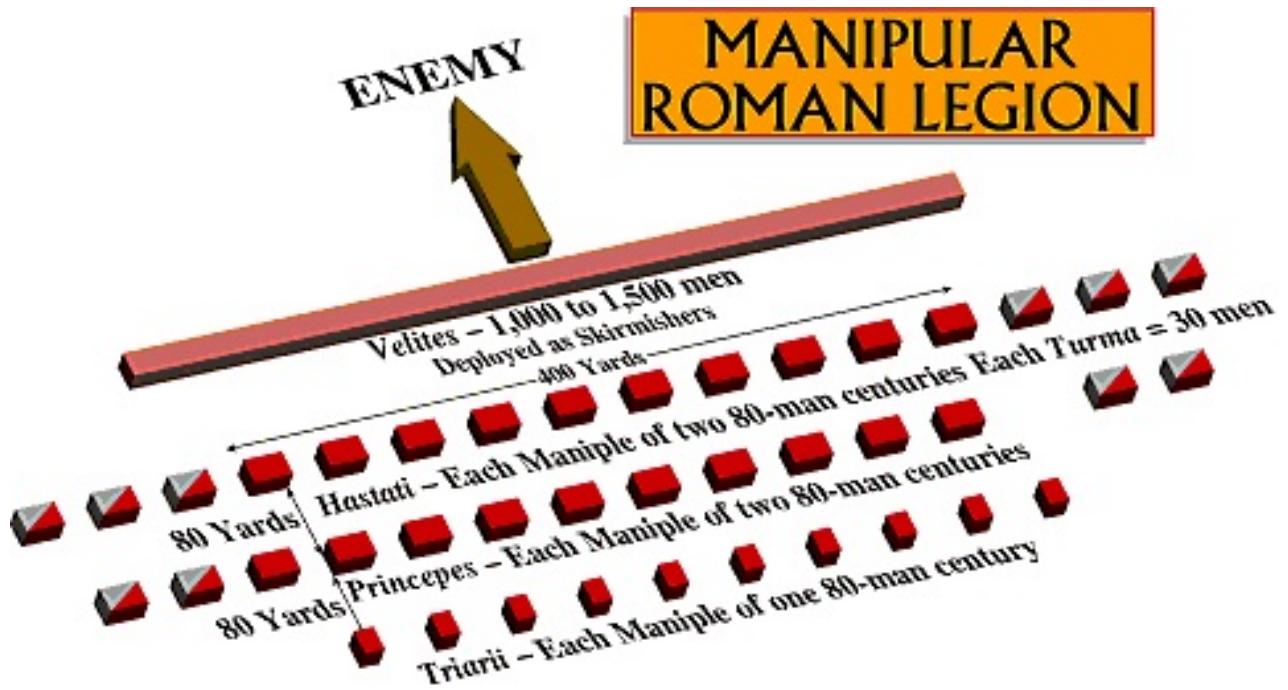
#### **5.4 The *EBmodmod* Roman Republican army progression system**

This is where the *EBmodmod* experience starts to diverge from EB1. In the Republican period, the Roman infantry, being the dominant part of the Roman army throughout the period covered by Europa Barbarorum, was separated into four categories of soldiers based on experience and equipment. The least experienced soldiers entered the army either as *Hastati*, the first line infantry soldiers, or as *Velites*, mobile javelin throwers who were not expected to hold a line in combat. After gaining some experience, soldiers would then progress to the category of *Principes*, the second line of infantry soldiers. Based on experience, equipment and (probably) social standing, some *Principes* progressed to the category of *Triarii*, a reserve third line of experienced, hardened, and heavily equipped soldiers:

- Novice soldiers, recently progressed to military age:
  - Velites: mobile javelin throwers
  - Hastati: first line infantry soldiers
- Principes: more experienced second line of infantry
- Triarii: a battle hardened, heavily equipped third line of infantry

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<sup>1</sup>These are called MICs, for Military Industrial Complex, in the Europa Barbarorum documentation



**Figure 1:** An overview of the Republican army lineup, with infantry in the center and cavalry on the flanks.

Unfortunately, the Rome: Total War engine does not provide a built-in system for unit progression. I've implemented the mechanisms in *EBmodmod*, but it's up to the player to play according to the unit progression rules, by following the unit disbanding requirements, described below:

1. All units except Principes and Triarii can be freely recruited.
2. When recruiting a unit of Principes, you must disband one of the following:
  - One unit of Hastati with at least 2 experience
  - Two units of Velites, Leves or Rorarii with at least 3 experience, or two units of Accensi with at least 4 experience
3. When recruiting a unit of Triarii, you must disband one of the following:
  - One unit of Principes with at least 2 experience
  - Two units of Pedites Extraordinarii with at least 2 experience
4. Units being disbanded for progression must have a unit strength of at least 90%

## 6. The Manipular Army

From around 315 BC to the Marian reforms in 107 BC, the Roman army was organized in a series of independently operating battle units, called *maniples*. The manipular system has famously been likened to "a phalanx with joints": where the Greek battle formation typically organized in a line, the manipular structure of independently commanded battle units allowed for greater tactical flexibility. Units could form in a line when needed, but were also capable of independent manoeuvre, when the tactical situation called for it.



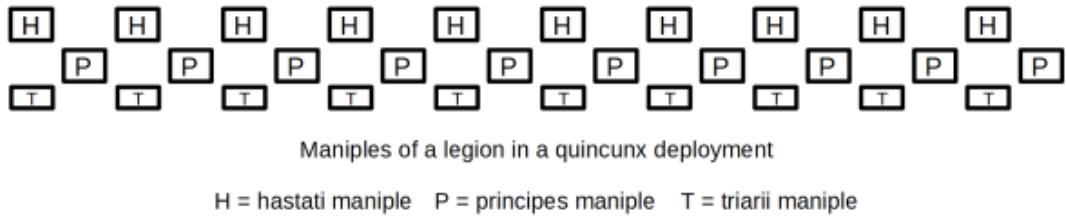
**Figure 2:** From left to right: medium armored Hastatus (pl. *Hastati*) armed with pilum and gladius, mobile Veles (pl. *Velites*) armed with javelins and gladius, heavily armored Triarius (pl. *Triarii*) armed with heavy spear, heavily armored Princeps (pl. *Principes*) armed with pilum and gladius.

Velites did not form their own units (Polybius 6.24), but were assigned to Hastati or Principes maniples at a ratio of one velite to two infantry soldiers. A legion's infantry contingent consisted of three types of maniples, typically 10 each, organized by line:

- Hastati maniples (first line): 120 hastati + 60 velites
- Principes maniples (second line): 120 principes + 60 velites
- Triarii maniples (third line): 60 triarii

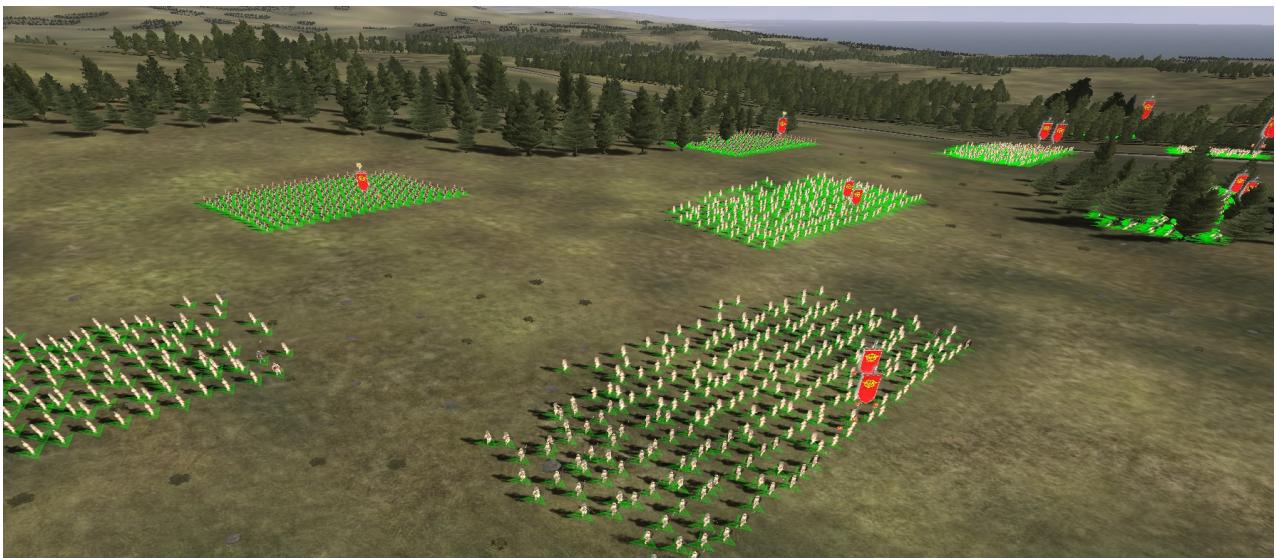
## 6.1 Battle Formation

According to Roman sources, maniples positioned on the battlefield with gaps between the units, a deployment known as the Quincunx.



Historians have struggled to make sense of this, assuming that open lines are dangerous because the enemy can easily penetrate the formation. Opinions diverge, but most historians assume the Roman line units closed formation in some way, to form a single line right before contact with the enemy.

There are good reasons to assume the above is historically inaccurate. There would be no good reason to assign commanders to each maniple individually, instituting independent command and control, if all the maniples did was close the line and slug it out with the opposing enemy.



**Figure 3:** Quincunx deployment in *EBmodmod*. The army is facing the enemy towards the bottom right of the screen. Individual soldiers are highlighted in green. The first and second line maniples are augmented with Velites.

Simulation reveals the tactical strength of the quincunx formation as a deployment in depth. The key is to realize that maniples were able to manoeuvre independently. Maniples could, of course, close the line when the tactical situation called for it. But maniple commanders also could, and we know they did, use manoeuvre to defeat the opponent. What maniples most likely did *not* do during battle was *stay* in a rigid quincunx formation. With the velites assigned to each maniple, Roman units were capable of fire and manoeuvre. It is difficult to believe that Roman commanders didn't make use of the tactical possibilities offered by the manipular formation.

## 6.2 Fire and Manoeuvre

The fact that velites were assigned to a maniple, rather than operating as a separate unit, creates tactical possibilities that are under-emphasised in the literature, which generally assumes the velites gathered at the front of the army exchanging javelin fire with the skirmishers of the other army, before retreating to the back. Velites could fill the role of skirmisher, when needed, but the fact that velites were assigned to a maniple, rather than operating as independent units, suggests a different intent. It is likely that Romans were the first to institutionalize combined-arms tactics at the unit level.

At a ratio of 2 infantry soldiers to 1 velite, a Roman maniple could occupy space, which the infantry soldiers could defend, creating a pocket from which the velites could attack with their javelins, from the protection offered by the proximity of their more heavily armored brethren. This combined action, where the infantry soldiers control the ground while the Velites attack at range, turns out to be very effective in simulation.



**Figure 4:** Hastati maniple, with velites highlighted in green taking shelter inside the formation.

### 6.3 EBmodmod Implementation

The Rome: Total War engine limits player army units to 20. The game also doesn't allow integrated units composed of infantry soldiers and javelineers operating together; Velites are implemented as separate units. This isn't a major restriction, but it does allow for ahistorical gameplay with Velites operating independently, which we know wasn't the case, as the Romans had no dedicated Velite commanders. For realistic gameplay, the player should assign a Velites unit to each of the Hastati en Principes maniples, and have these operating in close proximity to the maniple.



**Figure 5:** Theoretical manipular army composition. From topleft to bottom right: Commander (cavalry, right flank), Hastati x4, Principes x4, Campanian Cavalry (javelin cavalry, left flank), Velites x8, Triarii x2.

### 6.4 Hastati, Principes and Triarii

The classic Roman soldier was outfitted with a *pilum*, a type of heavy javelin, occasionally a second, lighter javelin, and a *gladius*, a type of short sword. How the Romans used this equipment in combat has been the subject of considerable debate. The Romans themselves claim that a unit would first throw their *pila* to soften up the enemy, draw their swords, and charge.

While probably this was indeed their *preferred* method of combat, as the tactic can be highly successful by breaking the opposing unit through force of shock, it is unlikely that this was the only battle tactic employed by the Romans. We know that a Roman battle could last for most of the day. With only one *pilum* per soldier, it is hard to imagine what the Romans were doing when they weren't throwing a *pilum* and charging, since during pitched combat, the average man will be exhausted in a few minutes at best. Most likely, the Romans reserved their *pila* for the critical moment, when there was an opening to deliver a shock attack to decide the battle. Until then, the *pilum* could also be used as a defensive melee weapon, as it offers a longer range than the short sword.

In *EBmodmod*, the Hastati do not throw their *pilum* at the enemy, but use it as a melee weapon for fending off enemy cavalry and/or infantry throughout the battle<sup>1</sup>. They will throw their light javelin. This is reflected by a lower damage value for the Hastati ranged attack, which is offset by a higher defense value against cavalry, as the *pilum* can be used

<sup>1</sup>Historically, these men would need to switch to their short sword eventually, as spears are prone to breaking. There is no way to implement this feature in *EBmodmod* since it isn't built into the Rome: Total War engine, but this isn't much of a problem, since it would not affect the outcome of a simulated battle too much.

as a spear. Overall, the Hastati unit reflects a defensive disposition, as would be expected from inexperienced recruits during their first few battles: their job is to hold their position, until the more experienced Principes can assist.



**Figure 6:** From left to right: Princeps with *gladius* in defensive stance, Hastatus throwing a *pilum*, Triarius with heavy *hasta* spear.

The Principes, being more experienced in combat and therefore more confident, do throw their *pilum* before charging into battle, in the classic Roman style. This is reflected in a high damage for the ranged attack. This means the Principes lack a defense bonus against cavalry, and their willingness to be more aggressive while attacking is reflected in a slightly

lower shield bonus. As such, Principes are better attack units than Hastati, while Hastati are better defense units than Principes. This arrangement fits the quincunx deployment well, as the Hastati form the first line of defense, with the Principes engaging to assist.

The Triarii form the ultimate reserve unit. Since they are few, keeping these men out of combat does not compromise the overall strength of the army. Because they are equipped with heavy *hasta* spears, Triarii have both defense and attack bonuses against cavalry. Their position on the third line gives them a range of options during combat, from plugging a gap in the formation caused by the front units manoeuvring out of position, to providing the decisive charge at the end of the battle against a worn down enemy, while having remained out of combat, and therefore fresh and rested, themselves. Due to their experience, the Triarii have the highest melee attack and defense values of all the Roman infantry, but this is offset by their heavy equipment: during prolonged combat, Triarii will wear out quickly.



**Figure 7:** Improvised manipular army composition. The more experienced Hastati fill in for the Principes, forming the second line in the quincunx.

## 7. Battle Tactics

Roman sources on battle tactics are scant on specifics. Part of the reason is the classic problem that people only explain what isn't common knowledge. Since all Romans were expected to go through military service, many aspects of Roman warfare that were obvious to the Romans weren't written down.

The infantry of the textbook manipular army consisted of 30 maniples, equally divided between Hastati, Principes and Triarii. Due to engine limitations<sup>1</sup>, *EBmodmod* is restricted to 4 units of Hastati and 4 units of Principes, each with accompanying Velites, and 2 units of Triarii.

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<sup>1</sup>This is actually a good thing, gameplay wise, as keeping track of 30 units is quite a challenge. It is interesting to note purely tactically speaking, the task of the player in managing all the units, is harder than the real-life situation, since in real life each maniple had its own set of commanders making decisions for the unit.

## 7.1 Single Unit Tactics

The tactical possibilities on the unit level mainly derive from the interaction between the infantry (Hastati or Principes) and the Velites. Co-operating with the infantry allows the Velites a range of tactical possibilities:

- Take shelter within the formation during archer or slinger fire.
- Take shelter *behind* the formation to avoid incoming javelin fire.
- Attack from range using javelins, while being protected from melee, by operating from behind or within the formation.

Because single maniples are self-sufficient in terms of command, they can be directed to take a position and hold it. This allows the commander to make use of the terrain in a much more flexible way than a rigidly structured army, forming fixed lines, would be able to do.

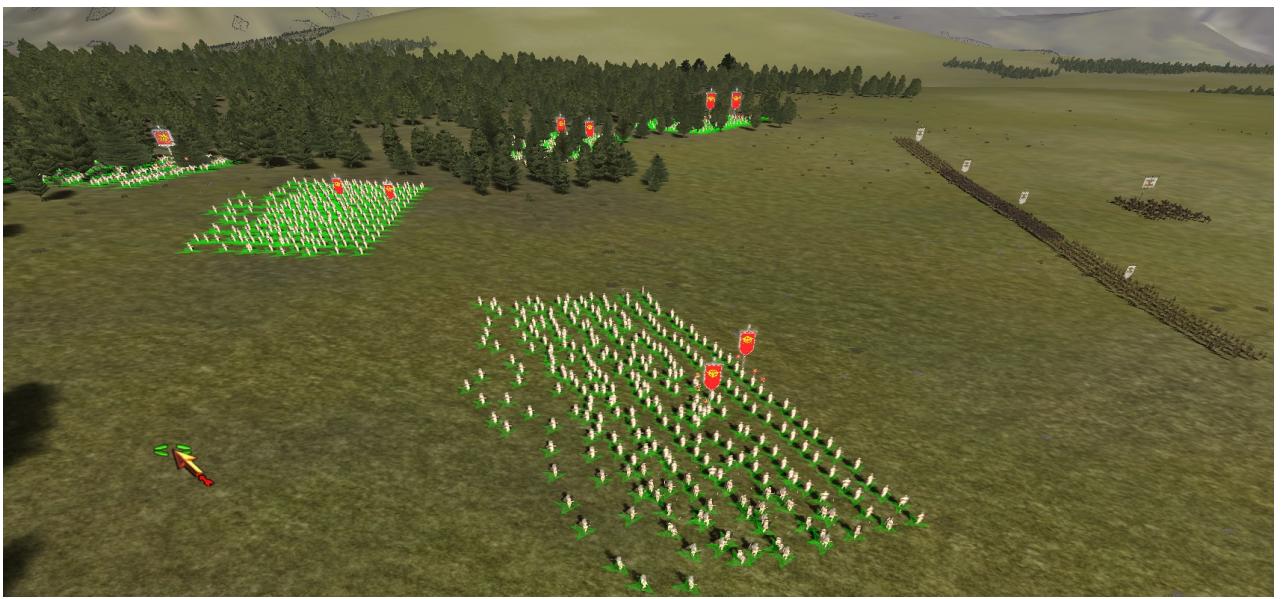
## 7.2 Army Tactics

When maniples work together, this is where the manipular formation really starts to shine. Figure 8 shows the ideal situation: a Hastati maniple has been engaged by the enemy, while a Principes maniple is moving in to assist, with a unit of Triarii in the background kept in reserve.



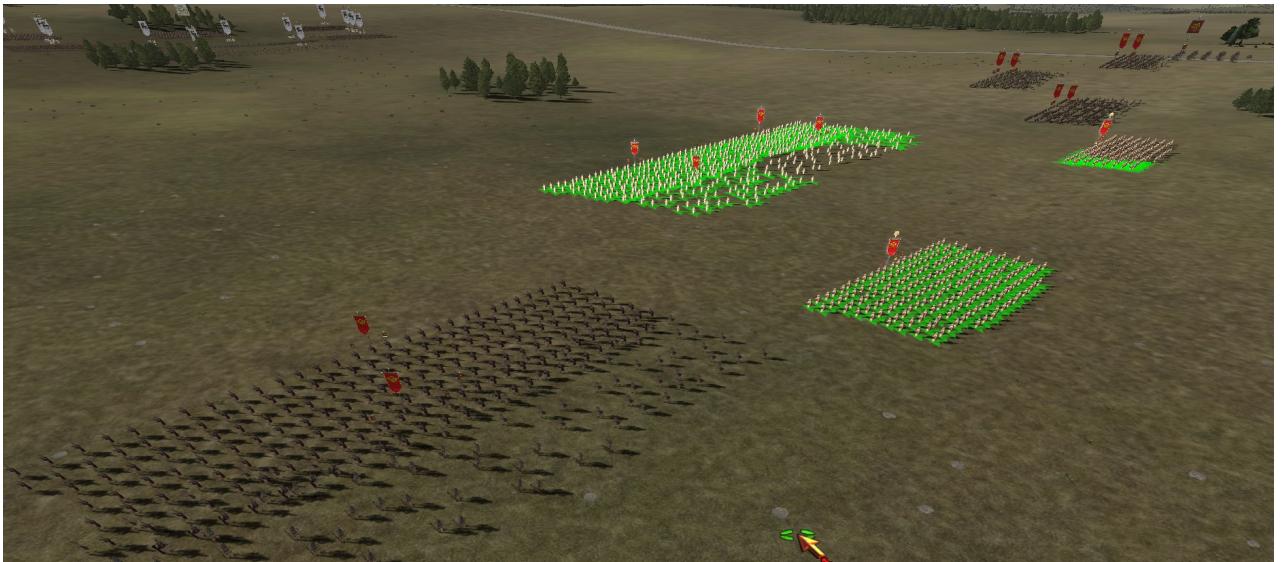
**Figure 8:** A Hastati unit, in the forefront, is being assisted by a flanking unit of Principes, at the top right of the screen. The Velites (highlighted in green) of the Principes unit are engaging the enemy in the back with javelins, while the Principes themselves are moving into position before engaging with a charge. In the back, a unit of Triarii stands by to assist

Figure 9 shows a small Roman army, deploying to make use of the available terrain. Two Hastati units occupy the edge of the forest at the top of the figure; another Hastati unit, on the first line, at the bottom of the image; and a Principes unit on the second line, at the left of the image. Despite the apparent gap in the center on the first line, the enemy cannot easily penetrate it, as the area is covered by javelin fire from the first line Hastati units and the second line Principes unit, as well as a charge from the Principes using their pila for shock effect. The fifth unit, in the back, is the commander directing the army, accompanied by his bodyguard of cavalry, waiting for an opportunity to intervene in a critical area, once the battle has begun.



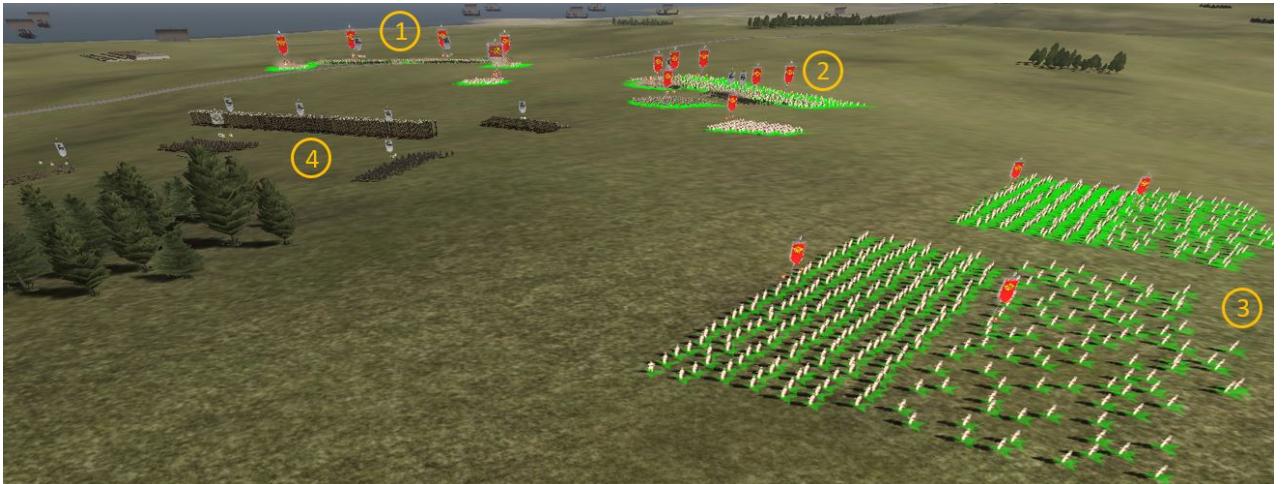
**Figure 9:** Roman manipular army, highlighted in green, facing an enemy army formed in a fixed line with closed ranks on the right.

In Figure 10, a larger Roman army faces off against a Carthaginian army at the top left of the image. The Roman commander has positioned two Hastati units side by side to form a strong center, supported by two Triarii units positioned on the third line. On each side, a unit of Hastati and two units of Principes, on the first and second row respectively, form the flanks of the army, accompanied by a unit of cavalry.



**Figure 10:** Large Roman manipular army, with center units on the first (Hastati) and third (Triarii) line highlighted in green, facing an army in the top left of the screen.

Finally, Figure 11 shows a manipular army organised in three distinct battle groups. The Roman right flank (1) and center (2) have been engaged by the Carthaginian vanguard, while the Roman left flank (3) has manoeuvred into the right flank of the enemy army, taking advantage of the position upon the hill. In this battle, the Carthaginian phalanx center (4) failed to assist the vanguard, leading to its defeat. This relatively open, mobile battle style is particularly difficult for phalanx armies to counter, consistent with the historical record: the Macedonian phalanx formations were soundly defeated by the flexible Roman battle formations on both occasions (the battles of Pydna and Cynoscephalae).



**Figure 11:** Roman army, highlighted in green, engaging a Carthaginian army. 1: Roman right flank, 2: Roman center, 3: Roman left flank, 4: Carthaginian center.

### **7.3 Open or Closed Ranks**

In modern textbooks, Roman soldiers are typically depicted in closed ranks, with shields locked together. Whether the Romans preferred to fight like this is a matter of debate. We know from original sources that soldiers were trained to form in both open and closed rank:

No part of drill is more essential in action than for soldiers to keep their ranks with the greatest exactness, without opening or closing too much. Troops too much crowded can never fight as they should, and only embarrass one another. If their order is too open and loose, they give the enemy an opportunity of penetrating. (Vegetius, *De Re Militari* I:26)

The trick seems to be to find the right balance between leaving enough space for the men to fight, but not so much space that men can't immediately assist one another. In simulation, I find Rome: Total War's open formation, which leaves enough room between the ranks for other men to pass through, vastly superior to the closed formation. The latter has its uses, typically in enclosed spaces, such as city combat. In battles on open ground, units in open formation cover more terrain, which results in more space for manoeuvring, in turn opening up tactical possibilities that would not be possible in closed file, closed line deployment.

### **7.4 What about Archers?**

Archers invariably played a minor role in both the Greek and Roman armies. Famously, the Greek infantry divisions defeated a larger Persian, archer based army at the battle of Marathon, by charging the Persian lines, at which point the archers lost their advantage against the well armored Greek hoplites.

In fact, during the Republican period, the Romans didn't use archers at all. Slingers (*accensi*) are attested, but similarly, their role during the battle was one of support, if any. One explanation could be the fact that most battles were fought on open ground, meaning heavier infantry and, especially, cavalry units could easily close the distance, negating the advantage of range, the only advantage archers enjoy. The classic "spear wall line with archers in the back" formation, which the Persians deployed at Marathon, does not work against the Roman formation on open ground, as it can simply manoeuvre around the shield wall on both flanks, and rout the archers.

This is not to say that archers aren't be useful, if they can be protected. But this is mostly reserved for enclosed positions, like protecting a bridge, or during siege warfare.

### **7.5 Roman Cavalry**

Cavalry played an important, if in the case of the Romans rarely decisive, role on the battlefield. While cavalry is usually depicted as heavy cavalry, delivering a decisive blow with a massive charge, Roman cavalry tended to be light and mobile. In Roman armies, the infantry did the heavy lifting, and the cavalry supported the infantry. In the supportive role, the mobility of the light Roman cavalry is a great asset, as it allows the cavalry to manoeuvre around the battlefield to assist where needed, as well as quickly closing with and routing an isolated ranged unit.



**Figure 12:** Two cavalry men in a scouting role, getting directions from a Veles.

## 8. The Economics of Roman Armies

In Rome: Total War, "better" units are more expensive to raise and maintain, with the maintenance cost for each turn set at 25% of the purchasing cost of a new unit. But we know from historical sources that Roman soldiers earned the same wages, regardless of whether they fought as "cheap" Velites or "expensive" Triarii. Higher wage categories (duplicarius and up) were reserved for officers, or rewards for individual bravery.

In *EBmodmod*, the cost of raising a new unit increases with the quality of the new unit's equipment, as in Rome: Total War. For example, on a soldier to soldier basis, training a new unit of Hastati costs more than training a new unit of Velites. The cost of maintaining a unit, however, only depends on the number of soldiers in the unit. Exceptions are made for elite units (+25% wage cost) and militia units (-33% wage cost), which is reflected in the morale of these units. Militia soldiers are paid lower wages, and therefore, are less likely to "die for their country".

Because the maintenance cost of each unit is the same, it makes economic sense to put the units that are more expensive to *replace* towards the rear of the army. This is reflected in both a monetary cost (a new unit of Triarii is more expensive than a new unit of Principes or Hastati), and a non-monetary cost: because Principes and Triarii can only be trained from experienced soldiers, there is a natural scarcity of these men, making these units extra valuable.

## 8.1 Barbarians and Mercenaries

We know that historically, Gauls would regularly offer their services as mercenaries to the highest bidder. Unfortunately, we have no historical data on wages for "Barbarian" factions, like the Gauls, Germans or Getai. But it is likely that here, the economics of mercenary "markets" dictated the price a Barbarian warlord would have to pay for the loyalty of his men.

To reflect this, *EBmodmod* uses the regular Rome: Total War unit cost system for Barbarian factional units, mercenary units, and units purchased from regional barracks. This means that under this model, better units are more expensive to hire and maintain. The difference in unit cost mechanics appears to explain the historically observed difference between "barbarian" and "civilized" factions: under the "Barbarian" cost system, it is economically rational to deploy lots of cheap units, and if an expensive unit is present in the army, it will typically be placed where the heat of the battle is most likely to occur, rather than held in the back as a reserve, like with Triarii.

## 8.2 Imperial Roman Armies

So far, I have talked about Roman armies during the Republican period. Starting with the reforms of Marius in 107 BC, the Roman army saw substantial transformation. By the time of Julius Caesar, for example, the Roman army had done away with Velites and Triarii. Instead, the Roman soldier's equipment and fighting style became very much standardized, and the army was organized into a first line and a second line of for all other purposes identical "legionnaires", structured in cohorts instead of maniples.

It is interesting to note that this transition happened as control over the armies shifted from the Roman senate, as in the Republican period, to individual Roman generals, like Julius Caesar, who paid their soldiers from their own pocket. It is reasonable to assume that, for this reason, economic forces shifted from "civic duties" where every soldier accepted the same wage regardless of their role in combat, to "market forces" of which general was willing to pay the highest wage. This would explain why, once Roman generals start to pay their soldiers from their own pocket, they also wanted the "best bang for the buck": meaning all soldiers were expected to fight as standardized, heavy infantry.

In *EBmodmod* during the Imperial period, I have edited the Antesignani unit to act as first line spearmen, similar to the Hastati. These men don't throw their pila, but keep them in hand for defensive melee action, giving them a defense bonus against cavalry. The "legionnaire" units, who form the second line of the Roman imperial legion, fight in the style of the Republican-era Principes: throwing their pila to soften up the enemy, drawing their short swords, and charging the enemy.

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