

FM 1-1

FORGOTTEN HOPE

FIELD MANUAL

SCOPED WEAPONS
AND RANGE ESTIMATION

December 1, 2023

FORGOTTEN HOPE
DEVELOPMENT DEPARTMENT,

Developer Bunker, 1 December, 2023

FM 1-1, Scoped Weapons and Range Estimation, is published for the information and guidance of all concerned.

By Order of Rad:

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DISTRIBUTION:

To all concerned.

BASIC FIELD MANUAL

SCOPED WEAPONS AND RANGE ESTIMATION

(The matter contained herein supersedes all previous Forgotten Hope 2 patches including 2.63, September 13, 2022)

CHAPTER 1

OVERVIEW

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SECTION I

UPDATE PURPOSE

1. OBJECT. - In Forgotten Hope Update 2.64 and beyond we have introduced a brand new scope ranging system! With this new system, every scoped weapon in the game will be able to be ranged properly. On most weapon platforms this means that using the scroll wheel will allow the player to select the distance to the target so that they can simply line up their crosshairs and pull the trigger. No holdover required!

2. REFRESHER. - Where can you find sniper rifles?

In Forgotten Hope 2 scoped rifles are typically only found in pickup kits. Sniper kits are placed throughout the maps in locations that you would typically find a sniper's equipment; whether that be behind the lines at the main base, or a church tower that a sniper has been using for observation. (See fig. 1.) These kits are placed differently on every map, and some maps might not have them at all. On certain maps, the unit being represented may have had enough scoped rifles to be found in a spawn kit. This is most typically found in the form of the German Karabiner 98k with a ZF41 scope.

3. REASONING. - Why do I need to range my scope?

In case you didn't already know, all bullets in Forgotten Hope are affected by gravity. This means that over a long distance, the bullet will drop a certain amount. (See fig. 2.)

At most typical engagement distances in FH2 this bullet drop does not matter, simply lining up your sights on a target and firing will be enough to score a hit anywhere from 0~100(ish) meters. But the longer the shot, the more the bullet drops and up until now, shooters would need to compensate for this drop by aiming above their target so that they score a hit (holdover).

While most engagement distances in FH2 are rarely out past 300m, this distance can cause the bullet to drop noticeably in-game. Therefore we found it useful to add this feature even if it will only be applicable in a handful of scenarios. Giving our scoped weapons a true long range advantage.



Figure 1. - U.S. rifle, caliber .30, M1903A4 located in church tower Ramelle Neuville, France.

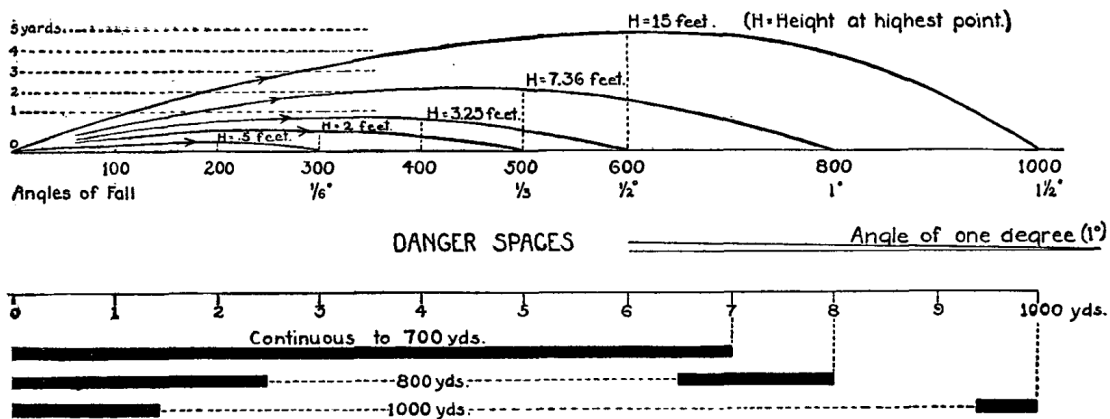


Figure 2. - Trajectory diagram for U.S. rifle, caliber .30, M1903A4 (vertical scale is 20 times horizontal scale).

SECTION II**IN DETAIL**

4. **CONTRIBUTORS.** - Binary hacks from Ekiso and model/ scope updates from McCloskey, Seth Soldier and Eat Uranium have all made this possible in the ancient refractor engine. All congratulations go to them.

5. **SCOPE SHADOW.** - In detail, a few new things have been added. A new shader that simulates scope shadow has been added to all scoped weapons in game. (See fig. 3.) Scope shadow is a phenomenon that happens when your eye isn't the proper distance from, or isn't centered on the scope. In game our super soldiers are very good at keeping the proper eye relief no matter which scope or gun they pick up, but when bolting and moving a scope shadow can be seen that will disrupt your shot. Keep careful to be as still as possible when pulling the trigger.



Figure 3. - Scope Shadow as seen on U.S. rifle, caliber .30, M1903A4 while bolting the action.

6. RANGING. - New code will allow the player to range their scope to a desired distance. (See fig. 4.) While sighted into the scope, the player can now use the scroll wheel to select from a set amount of ranges. Just like adjusting the dials of a real World War II scope, this will move the reticle inside the field of view to a new location, allowing the player to place the crosshairs on the target and shoot.



Figure 4. - Adjusting the range with the scroll wheel as seen on U.S. rifle, caliber .30, M1903A4.

7. RANGE ESTIMATION. - What's now more important than ever for a sniper in *Forgotten Hope 2* is *range estimation*. Intuitively knowing the distance to your target can make or break your shot. Here's a few tried and true methods for in-game range estimation from veteran FH2 developers;

- a) Markers - if you're a squad leader in FH2 you get access to markers by pressing and holding the 'T' key by default and issuing an order. This will allow you to place a marker on a target that will also show you the range. This is a quick and easy way of ranging targets out to ~300m when the markers start to fade.

- b) Practice, practice, practice - in Forgotten Hope 2 we offer a Firing Range that can be run locally to test all of the weapons and vehicles that we offer. One of the nice things about this is the small arms range with dummy soldiers and distance markers to practice your shooting. And now, you can practice your range estimation!
- c) Map knowledge - the more you play, the better you get. Learning the maps will help you learn the typical distances from one area to another. Knowing the distance from the church tower to the Farm Flag on Villers Bocage can now be a deadly bit of trivia!

8. BINOCULARS. - The newest and most important tool for range estimation is now binoculars. Every sniper kit is equipped with a set of binoculars to both spot enemies for their team and call in artillery (their primary role). Starting in 2.64 they have been calibrated so that they can be used to estimate the range to a target with relative accuracy.

Without getting into too much detail, most binoculars have markers on their reticle that are 5-10 milliradians (mils) in size. To calculate the range to a target, the formula is;

$$\text{(Target Height in Meters * 1000) / Height in Mils = Range in Meters}$$

The height of a standing playermodel in-game is 1.75m. This means that a soldier that covers 10 mils in the binoculars is 175m away. And a soldier covering 5 mils is 350m away. It's good practice to memorize the typical mils equivalents as a rule of thumb. Below are the mil equivalents showing the distance of a soldier in meters when they cover 2-15 milliradians in the binoculars. These are the most common and therefore the most helpful equivalencies to a soldier in Forgotten Hope 2;

15 mils = 117 meters
 10 mils = 175 meters
 5 mils = 350 meters
 2.5 mils = 700 meters
 2 mils = 850 meters

You can learn the most important mils markings on our most common binoculars in Figure 5.

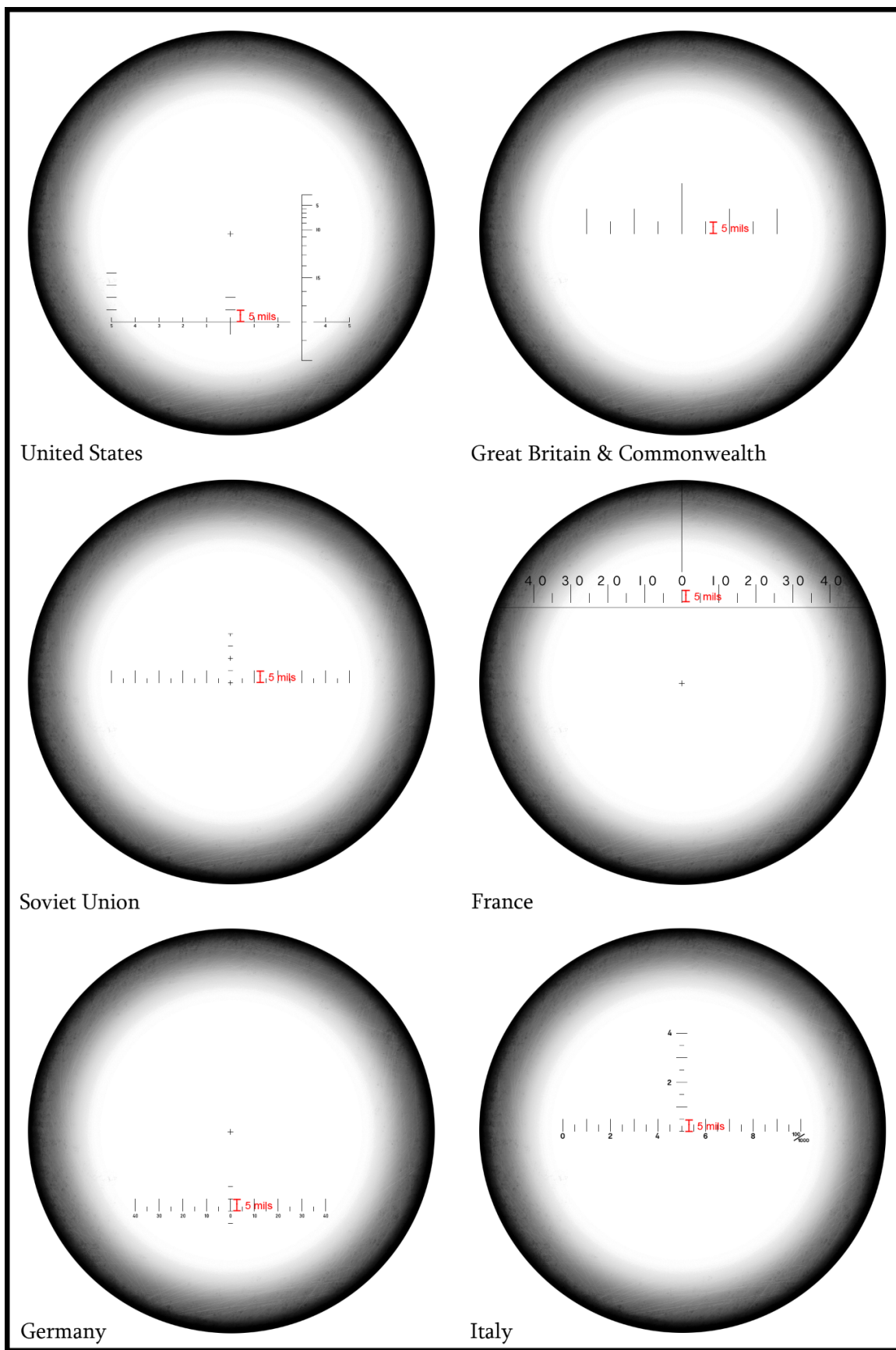


Figure 5. - Common Binocular Reticles of major combatants in Forgotten Hope 2 and their accompanying 5 mil notation.

9. ADS BOLTING. - Also new to 2.64 will be the ability to run the action of bolt-action rifles while staying Aimed Down Sights (ADS). This includes all bolt action sniper rifles and will make it easier for the player to track their targets. With this new feature the player no longer has to re-click the right mouse button by default to aim down the sights of the rifle after each shot. Also you are no longer locked into the bolting animation and can unzoom while it continues to play if you need to hightail it out of there immediately. These changes further improve the quality of life in FH2 and bring the mod one step closer to modern games. (See fig. 6.)



Figure 6. - Running the action of a German Karabiner 98k rifle while still Aiming Down Sights.