



Chocolate Warfare

Rifle Zero
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Introduction

Understanding rifle zeroing involves examining how to fine-tune your firearm for accuracy. In this context, a rifle refers to a semi-automatic, 5.56 caliber rifle with a barrel length ranging from 10 to 20 inches and capable of hitting from 0 to 500 yards.

The demonstrated principles can be derived for other calibers as well.

Rifle zeroing is essentially aligning your sights so that where you aim corresponds accurately with where your shots land at a specified distance. This process is crucial for achieving consistent and reliable shooting.

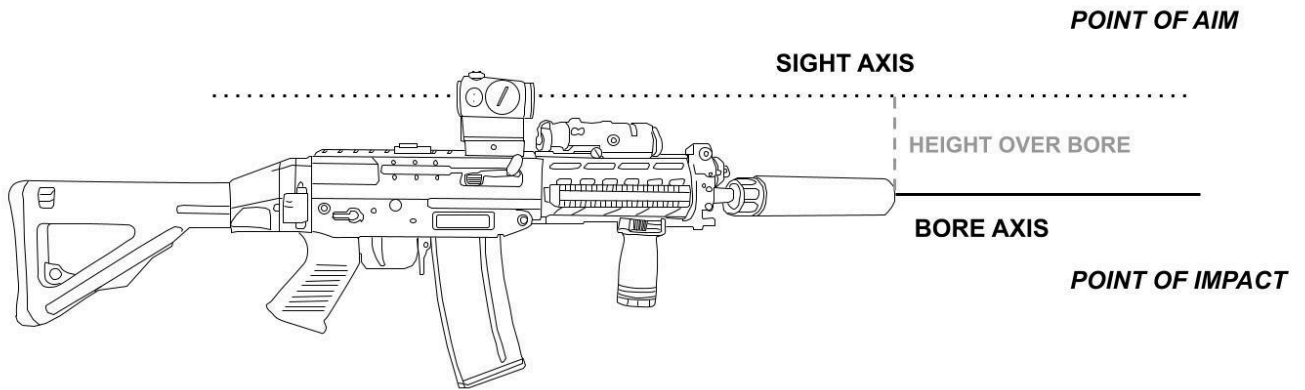
This document aims to present the factors influencing assault rifle zeroing in a factual manner. We'll delve into aspects such as the characteristics of the 5.56 round and the impact of different barrel lengths. The goal is to provide a methodical approach for individuals to select a zero that suits their specific rifle. Whether you're new to firearms or an experienced shooter, this document seeks to offer straightforward insights into the world of assault rifle zeroing without unnecessary embellishment.

Special thanks to youtuber DeltaThirtyFour¹ for his excellent content on rifle zeroing, height over bore and canted rifle shooting.

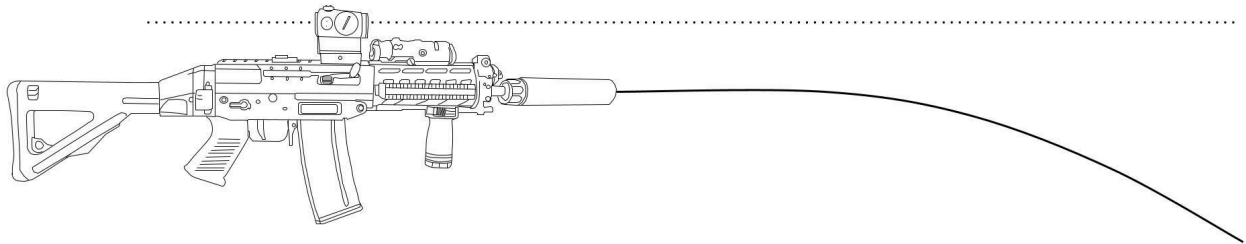
Note that selecting a zero distance is a subjective matter, tailored to the specific needs and preferences of the user.

¹ <https://www.youtube.com/@deltathirtyfour>

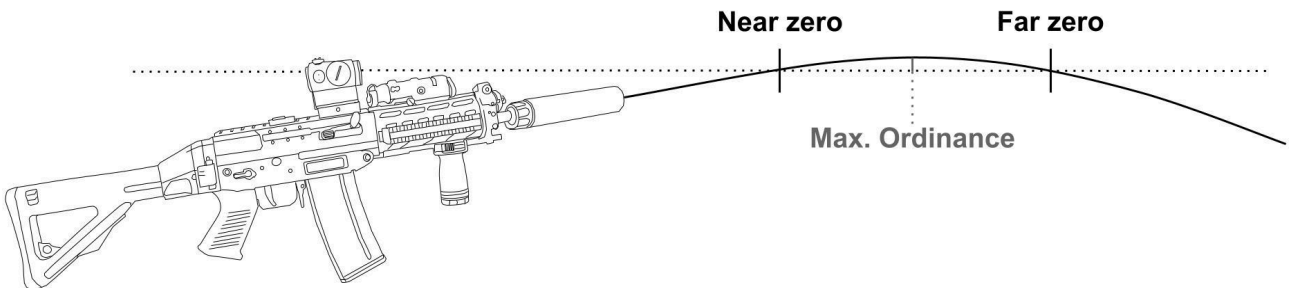
Basics



No Zero



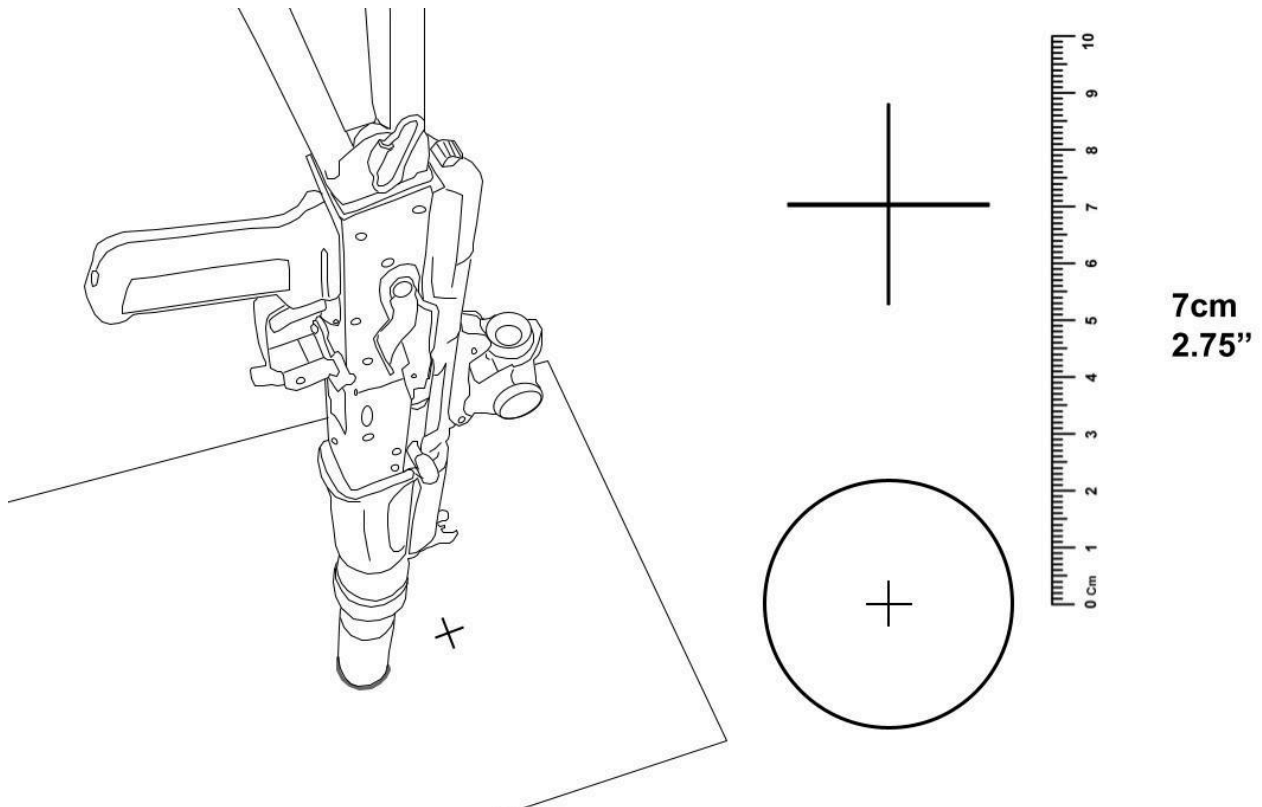
Zeroed rifle



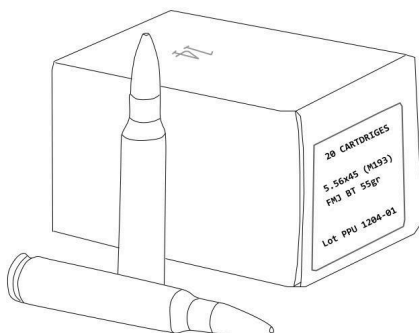
Build your data set

Height over bore

Generic method for measuring height over bore



Bullet specifications

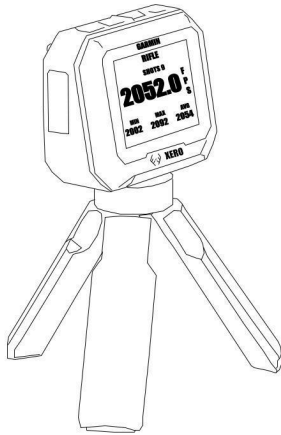


The ammunition box or the manufacturer website will inform you of the specifications of the ammunition you're using.

Most important for ballistic calculation is

- Drag coefficient (usually G1 or G7)
- Bullet weight

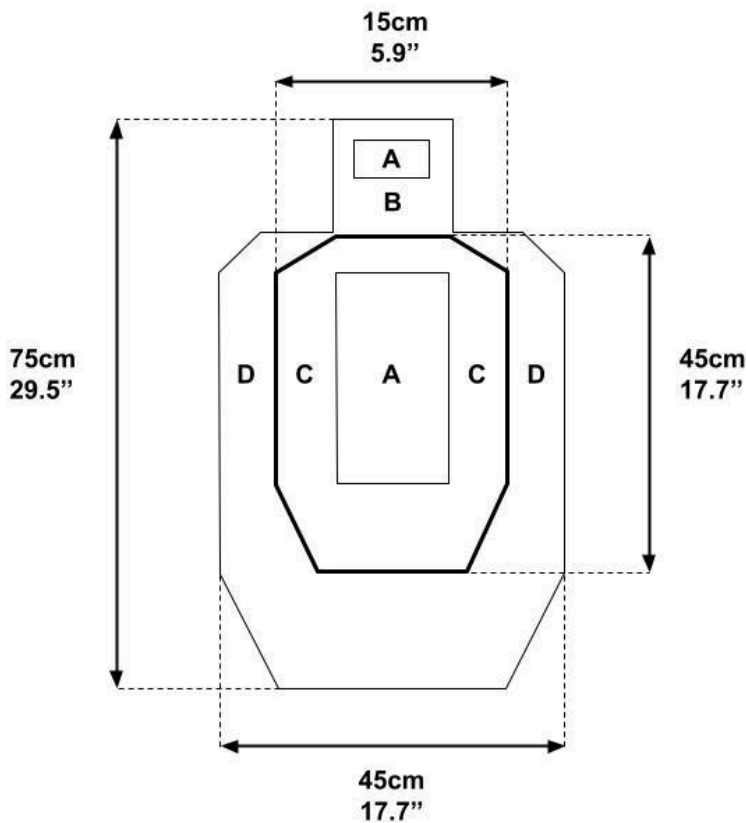
Velocity



Measure the velocity of your rounds with a minimum of 10 shots.

Note that many parameters affect velocity such as powder load, barrel length, barrel twist, temperature and more.

Point Blank Range



IPSC Target sizing

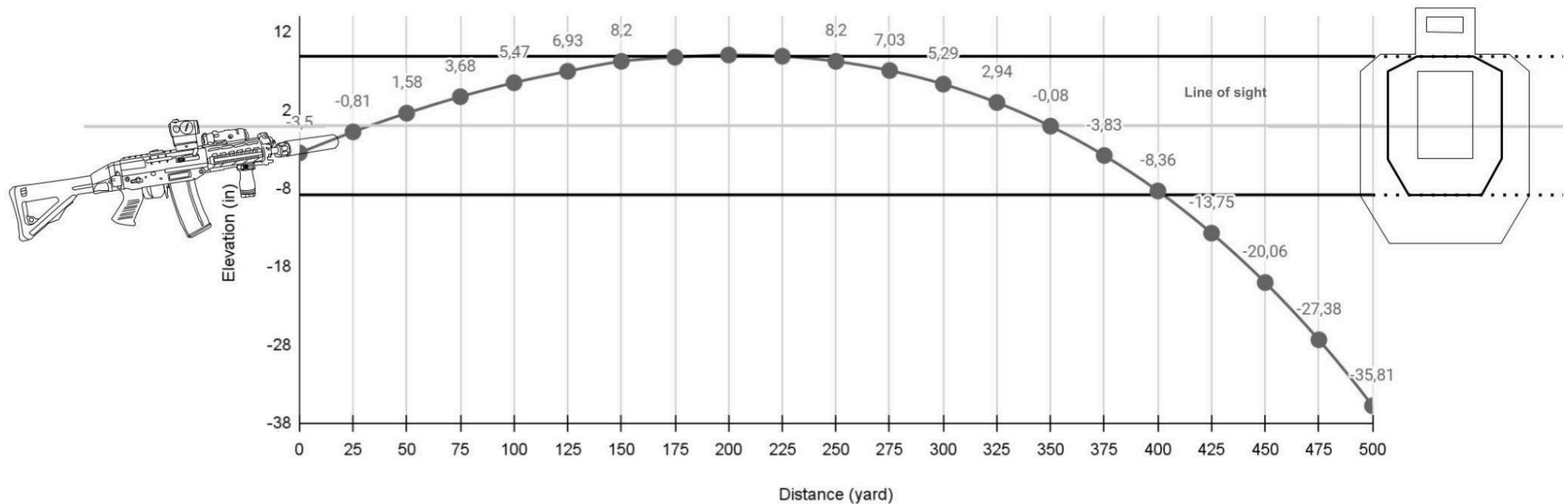
Point Blank Range (PBR) means how far you are able to shoot a firearm without adjusting where you aim for a defined target size.

Typically, we recommend using a target size of **20cm / 8"**

Using a ballistic calculator, you can use the ideal zero distance feature to maximize your point blank range.

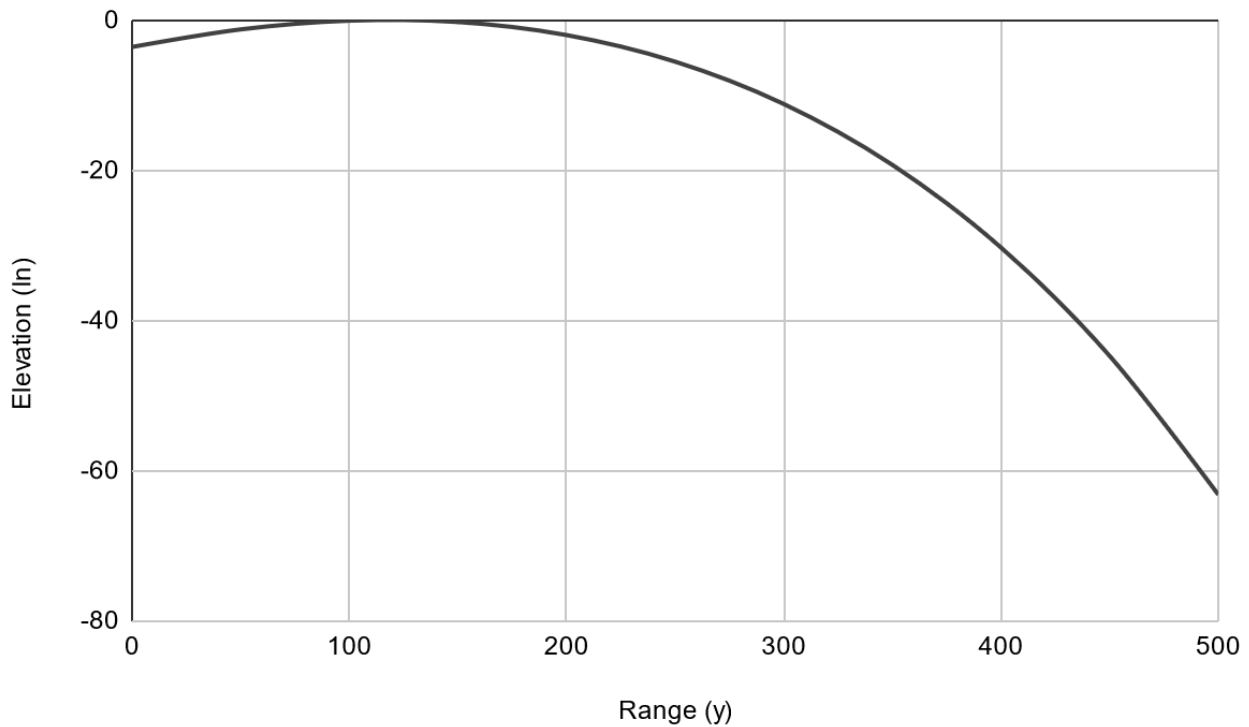
Example

Near Zero:	33 yards	Drag Function: G1	<u>International Standard Atmosphere</u> Altitude: Sea Level (0 ft) Barometric Pressure: 29.92 Hg Temperature: 59° F Relative Humidity: 50% Speed of Sound: 1116 fps
Far Zero:	346 yards	Ballistic Coefficient: 0.243	
Minimum PBR:	0 yards	Bullet weight: 55 gr	
Maximum PBR:	400 yards	Initial Velocity: 2920 fps	
Sight-in at 100yds:	5.37" high	Sight Height : 3.5 in	
		Target Size: 17.7 in (C-Zone IPSC)	



The 100y/100m zero

Indication of the ballistic curb for a 5.56 rifle



Simple & efficient from 0-200

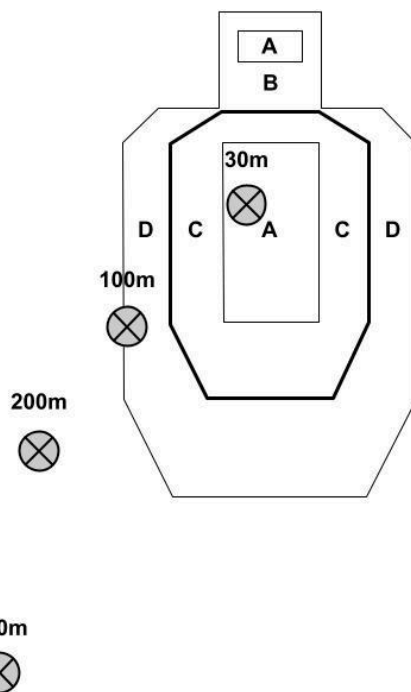
Max deviation from 0-200 is the optic height

Curb is tangent for most rifles, ideal for dialing scopes at longer distances

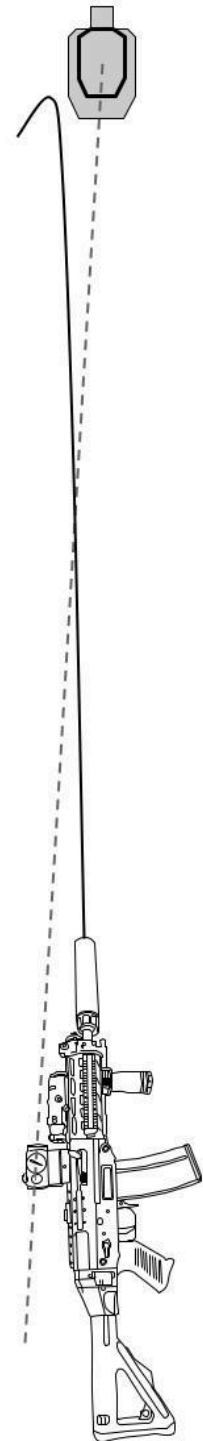
Off angle shooting at 90 degrees



What happens when your rifle is at 90 degrees ?



Points of impacts while keeping the reticle on target at various distances.



Contribution

This document is Open Source. If you desire to contribute or get access to the original document, feel free to contact us:

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