



# RIFLE MARKSMANSHIP



## M16A2/A4 BULLET PATH TABLE TRUE 300 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-0.33
50	1.56
75	3.13
100	4.37
125	5.27
150	5.8
175	5.94
200	5.68
225	4.98
250	3.82
275	2.17
<b>300</b>	<b>0</b>

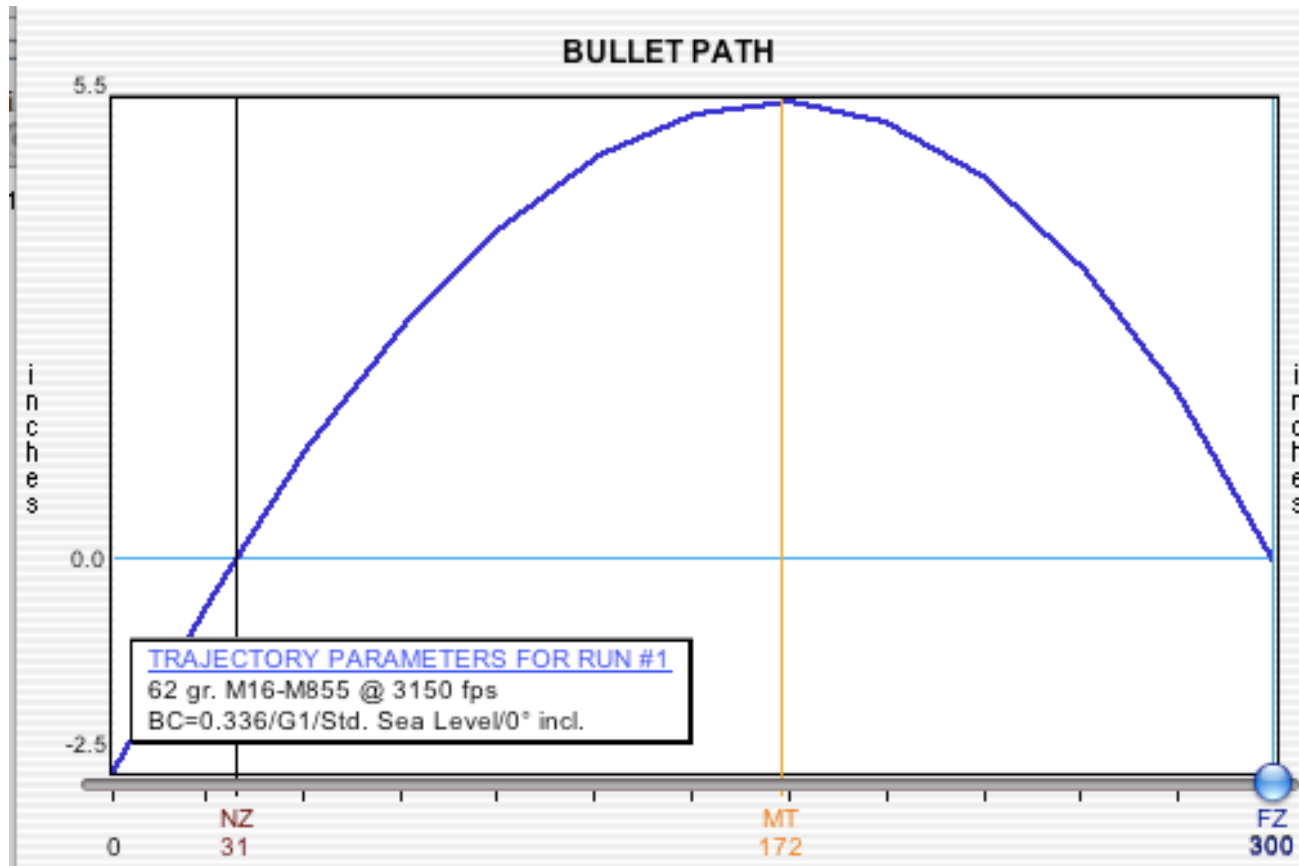
This slide shows the flight path of a bullet fired from an M16A2/A4 rifle with a true 300M zero. Current Army doctrine states that we must acquire a point of aim point of impact zero at 25M to achieve a point of aim point of impact zero at 00M where the bullet crosses the line of sight again. Note that the bullet impacts .33 inches low at 25M. This is why it is necessary to raise the BDC to 8/3 plus one click during the zeroing process, and then return the BDC to 8/3 for qualification or battle.



# RIFLE MARKSMANSHIP



## M16A2/A4 BULLET PATH DIAGRAM TRUE 300 METER ZERO



This is a graphic representation of the bullet's trajectory from the previous slide. You see that the first time the bullet crosses the line of sight is actually at 31M, not 25M. Also note that the maximum ordinate for the bullet fired from a rifle with a 300M zero is at 172M. NZ stands for near zero, MT stands for maximum trajectory, and FZ stands for far zero.



## RIFLE MARKSMANSHIP



# M4 BULLET PATH TABLE TRUE 300 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-0.03
50	2.11
75	3.89
100	5.29
125	6.3
150	6.89
175	7.03
200	6.7
225	5.86
250	4.49
275	2.55
<b>300</b>	<b>0</b>

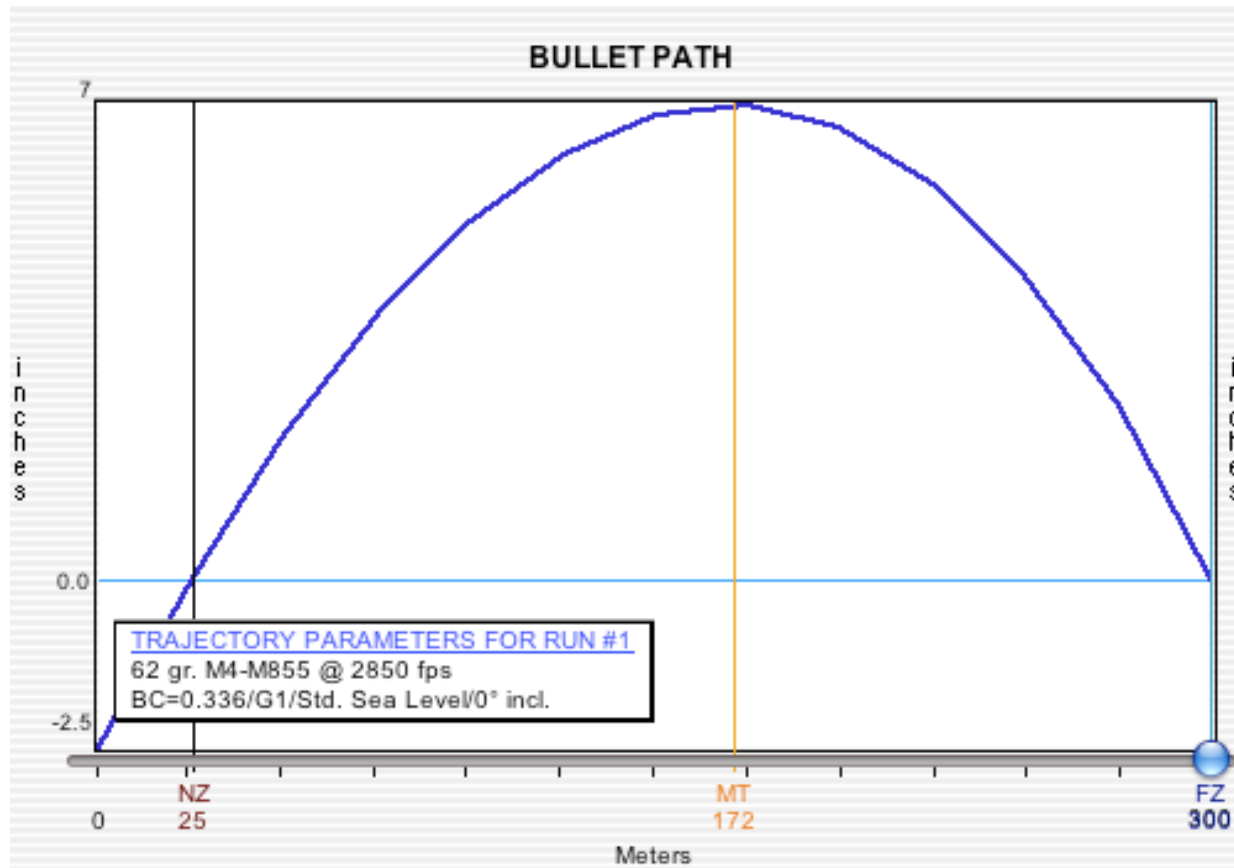
This slide shows the flight path of a bullet fired from an M4 rifle with a true 300M zero. Note that the bullet impacts .03 inches low at 25M. This amount is negligible, and also why it is not necessary to raise the BDC up one click as it is done on the A2 or A4. The M4 is kept at 6/3 both for zeroing and battle.



# RIFLE MARKSMANSHIP



## M4 BULLET PATH DIAGRAM TRUE 300 METER ZERO



This is a graphic representation of the bullets trajectory from the previous slide.



U.S. ARMY

## RIFLE MARKSMANSHIP



# M16A2/A4 BULLET PATH TABLE TRUE 200 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-1.11
50	0.01
75	0.83
100	1.35
125	1.54
150	1.4
175	0.89
200	0
225	-1.29
250	-3.01
275	-5.18
300	-7.83

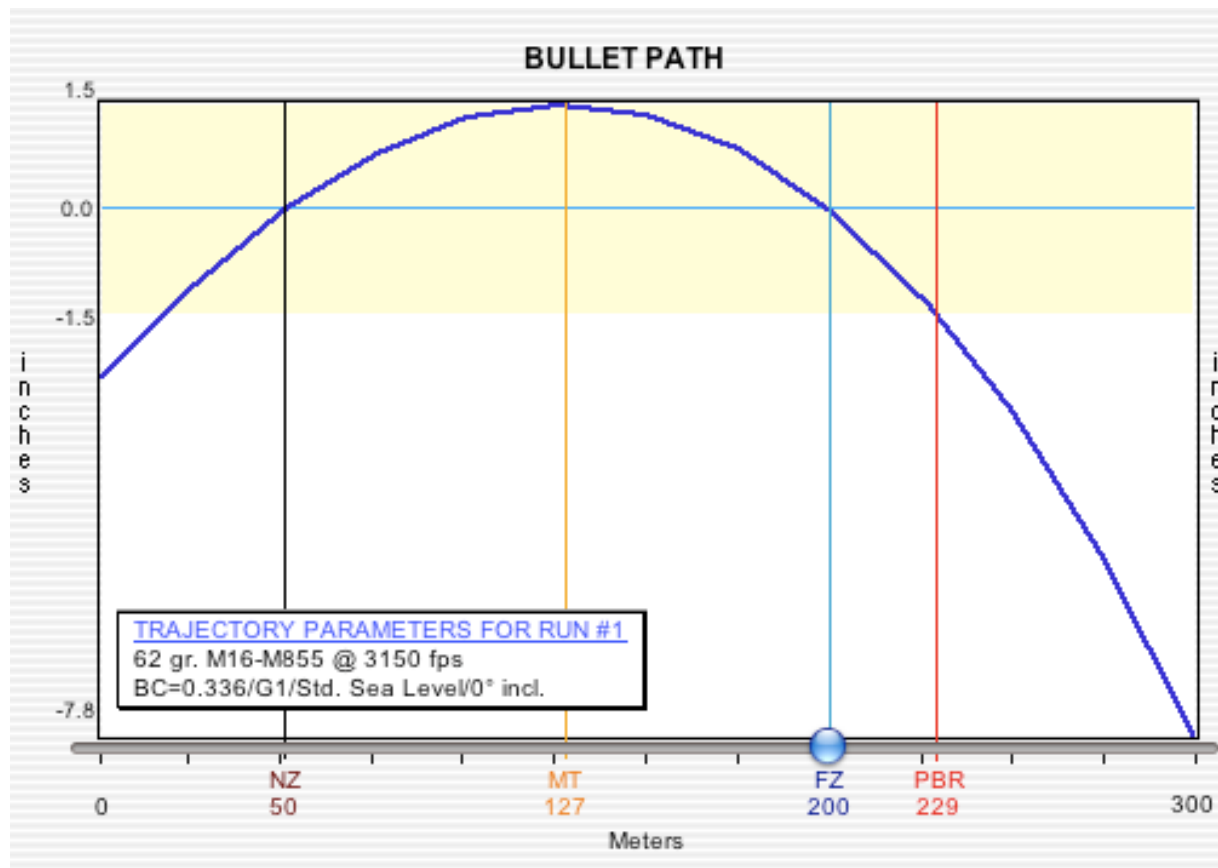
This slide depicts bullet flight path from an M16A2 or A4 with a true 200M zero. You see that the first time the bullet crosses the line of sight is at 50M. These numbers were achieved through two separate ballistic calculators and both came up with the same calculations. This is contradictory to much of the information that is circulating about how to achieve a 200M zero. Many units are zeroing at 37M and believe that they are achieving a 200M zero, when they are in fact achieving a 255M zero by doing it this way. This will be demonstrated later in this brief. Another question that this slide poses is the use of the BDC during zeroing. Are units zeroing from 8/3 plus one, plus two, or just 8/3. However it is being done, it probably isn't being done the same way from unit to unit.



# RIFLE MARKSMANSHIP



## M16A2/A4 BULLET PATH DIAGRAM TRUE 200 METER ZERO



Graphic representation of bullet trajectory of the previous slide.



# RIFLE MARKSMANSHIP



## M4 BULLET PATH TABLE TRUE 200 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-0.87
50	0.43
75	1.37
100	1.94
125	2.11
150	1.86
175	1.17
<b>200</b>	<b>0</b>
225	-1.67
250	-3.88
275	-6.66
300	-10.05

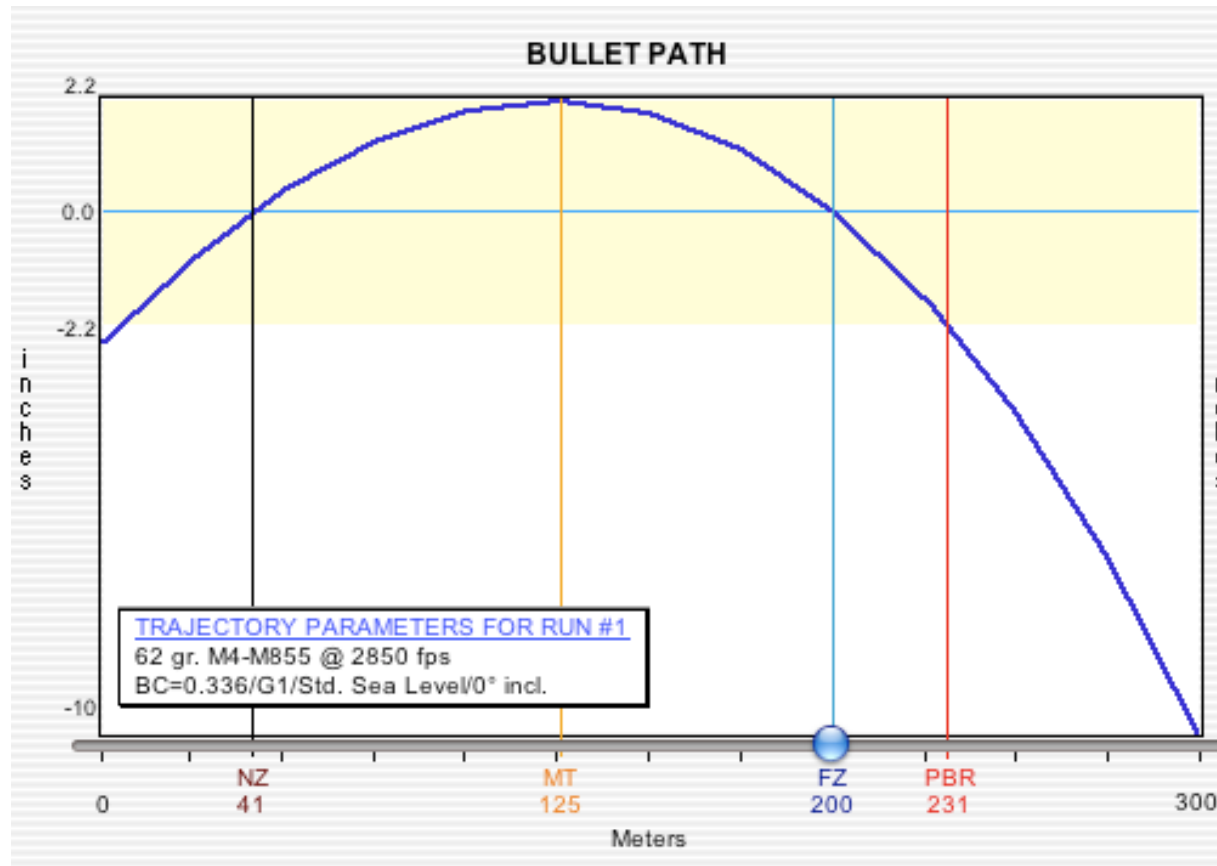
This depicts ballistic information for the M4 with a true 200M zero.



# RIFLE MARKSMANSHIP



## M4 BULLET PATH DIAGRAM TRUE 200 METER ZERO



This depicts the flight path as described on the previous slide. Note that the flight of the bullet does not cross the line of sight at 37M for this weapon system either. To achieve a true 200M zero, one would have to zero at 41M.





# RIFLE MARKSMANSHIP



## M16A2/A4 BULLET PATH TABLE TRUE 255 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-0.77
50	0.67
75	1.83
100	2.68
125	3.21
150	3.4
175	3.23
200	2.67
225	1.71
250	0.33
275	-1.51
300	-3.82

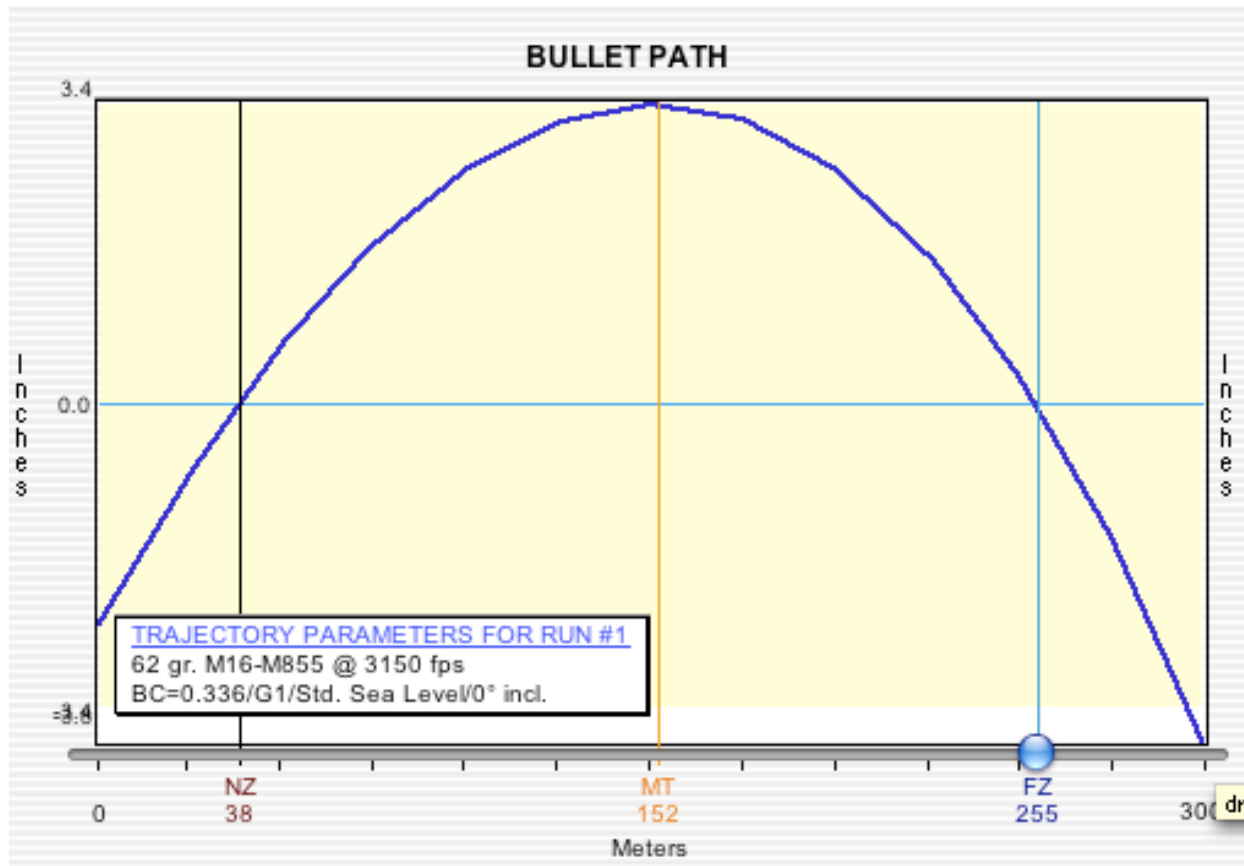
This slide represents a true 255M zero as taught by the USAMU. A 255M zero allows for the use of the 25M zero ranges that are organic to the Army already. Additionally, a Soldier is never more that about 3 1/2 inches high or low using a center mass hold all the way out to 300M. Also the max ordinate of the round is only 3.4 inches at 150M. This not only negates the necessity for adjusted aiming points, but the BDC will also remain calibrated. Should a Soldier need to engage targets beyond 300M, he still has the ability to place accurate fire on far targets.



# RIFLE MARKSMANSHIP



## M16A2/A4 BULLET PATH DIAGRAM TRUE 255 METER ZERO



Graphic representation of the previous slide. Note that while a 25M zero range can still be utilized, the first time the bullet crosses the line of sight is at 38M. This goes back to what was said earlier in the brief, unit are achieving a 255M zero by zeroing at 37M.



## RIFLE MARKSMANSHIP



# M4 BULLET PATH TABLE TRUE 255 METER ZERO

METERS	PATH INCHES:
0	-2.5
25	-0.43
50	1.3
75	2.67
100	3.67
125	4.27
150	4.45
175	4.18
200	3.44
225	2.19
250	0.42
275	-1.92
300	-4.86

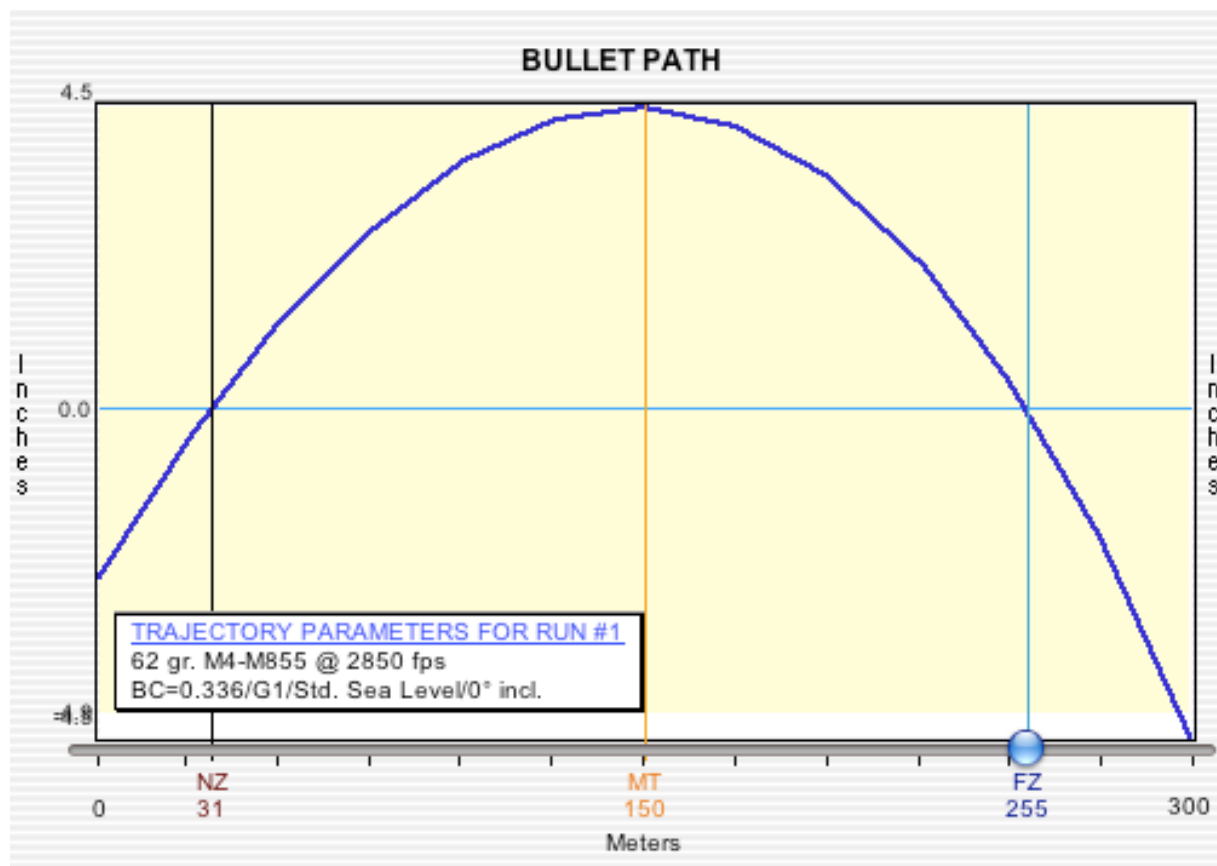
This slide depicts flight path of bullet from an M4 with a 25M zero. You will see on the next slide that on would really need to zero at 31M to achieve these results. The USAMU has developed 2 new 25M zero targets that they plan to unveil during the rewrite of the new marksmanship manual. These targets will allow units to continue to zero on the available 25M zero ranges, but achieve a 255M zero that will be effective in all battlefield engagements, both near and far.



# RIFLE MARKSMANSHIP



## M4 BULLET PATH DIAGRAM TRUE 255 METER ZERO



Graphic representation of previous slide.

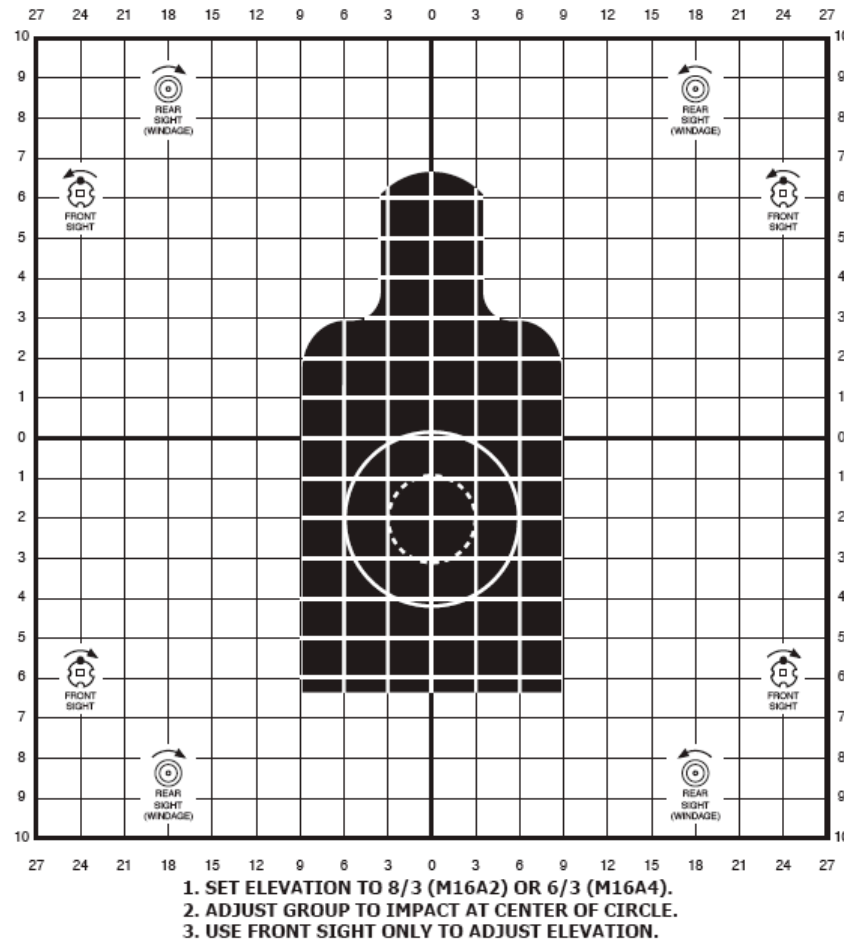


# RIFLE MARKSMANSHIP



## PROPOSED M16A2/A4 255M ZERO TARGET

M16A2/M16A4  
25 METER ZERO TARGET



This is the new zero target for an M16A2 or A4. Unlike the current target, which is a graphic representation of a 300M target that has been cut to scale. This target is a 200M target drawn to scale. This target will give Soldiers a more definitive aiming point to acquire during the zeroing process. As you see, the circles where the rounds need to impact are slightly lower than center mass on the target. A Soldier aims center mass, and the strike of the round is simply adjusted to slightly below the point of aim. Additionally, the sight correction squares have been modified for more accurate sight adjustments. The current target is slightly off and causes soldiers to over correct and move their sights to far during the zeroing process. Another benefit of this target is that it is no longer necessary to ad the click during the zeroing process, and then return to 8/3 or 6/3 after zeroing is complete.



# RIFLE MARKSMANSHIP



## PROPOSED M4 255M ZERO TARGET

M4 25 METER ZERO TARGET



1. SET ELEVATION TO 6/3.
2. ADJUST GROUP TO IMPACT AT CENTER OF CIRCLE.
3. USE FRONT SIGHT ONLY TO ADJUST ELEVATION.

The proposed M4 zeroing target.