



VIKING ARMORY SHOOTERS LOG BOOK



Draft Copy - Viking-Armory.com



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We recommend using colored pens or markers for most record keeping. Colored pens will allow the shooter to clarify and emphasize important information, while retaining permanence. In contrast, we recommend using a pencil for the zero summary and moving target charts, because the shooter may find that this data will change as the shooter obtains more data.

The shooter using the loose-leaf version of the data book should elect to leave completed data pages at home in a separate notebook to protect these pages.

Section 1: Zero Summary Chart

Purpose:

To allow the shooter to track elevation deviations because of changes in temperature.

Description:

The zero summary chart lists target ranges in the left column and temperature variations across the top of the sheet in either Fahrenheit or Celsius.

Procedure:

1. Check either the "Yard" or the "Meter" box to indicate system being used.
2. Indicate ammunition type in the space provided. For maximum efficiency use one sheet for each weapon/ammunition combination. 4 sheets are provided.
3. Once the shooter has obtained the point of aim/point of impact at a given distance, note the elevation setting in the boxes corresponding to temperature and distance. (Use a pencil, to correct data as necessary.)
4. The shooter can extrapolate data for unfired temperature/distance conditions that have not been fired by noticing trends in your chart.



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5. The shooter either should mark cold bore zeroes with a red pencil or should designate a separate zero summary chart for cold bore zeroes.

Section 2: Cold Bore Data and Remarks

Purpose:

To allow the shooter to track deviations in zero when firing cold bore shots. This page is not for zeroing! The shooter should use these pages only after he has zeroed his rifle and he has started developing cold bore data.

Description:

This section consists of two facing pages: the Cold Bore Data sheet with Deviation Summary, and the Remarks page. The columns marked 1-5 on the deviation the Data sheet are for 5 different cold bore shots and correspond to the rows marked 1-5 on the Remarks page.

Procedure:

The shooter's first shot of the day should be his cold bore shot, and should be fired through the rifle as it would be deployed. For example, if the shooter deploys the rifle clean, without fouling, rifle.

The following procedure is for one cold bore shot:

1. Complete the data in the first column on the Cold Bore Data sheet.
2. Fire your shot and indicate where you saw the crosshair (or, where you think the shot went) in the "call" box at the bottom of the column.
3. Place a number "1" on the impact grid where the shot actually impacted on the target.



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4. Record any remarks in the corresponding remarks space on the Remarks page.
5. By tracking this information, you will be able to predict where your cold bore shots will impact in relation to your point of aim.

Section 3: Zero Data

Purpose:

To allow the shooter to develop a base "zero" for his weapon. Preferably, the shooter should do all zeroing from the same distance (we recommend either 100 yards or meters). The shooter should use the other data pages (e.g., Bullseye, Stationary, and Unknown Distance Data pages) for developing true zeros for distances other than the zero range.

Description:

This page consists of three major data areas:

1. The "shooting conditions" area (top of sheet), used to record the place, date, time, etc., along with the ambient environmental conditions.
2. The "call" box (lower left), used to record where you saw the crosshair (or, where you think the shot went).
3. The "plot" area (lower right), used to note individual shot and shot group placement.

Procedure:

Fill in the shooting conditions. To plot light conditions lay the book on the ground facing downrange. Place the point of a pencil in the middle of the circle on the dot provided and keeping the pencil vertical note the direction of the shadow. Draw an arrow in the direction of the shadow. Note mirage and humidity as "L", "M", or "H" for light or low, medium, or heavy or high. Note barometric pressure if available.



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Note the size of the target in the box in the lower left-hand corner of the plot area.

Note the elevation and windage settings in the boxes provided for the first shot.

Fire the shot and place a dot in the call box for that shot.

Write a number "1" on the larger plot target where the shot impacted the target. If the shot is outside of the limits of the plot target note the location in the remarks box. For example, "Shot #1 - 7 inches out at 5 o'clock."

Continue the process for the remaining shots in the group. Indicate windage and elevation changes as necessary.

When you have placed 5 consecutive shots in the aiming area of the target, you may consider the rifle zeroed for that distance and conditions.

If your scope has the ability to "slip scales" the windage should be slipped to reflect the wind conditions present (if there is 2 minutes of wind blowing from the right, then the windage should read 2 moa right). The elevation should reflect the distance fired when using a scope with a "bullet drop compensator" such as the Leupold Mk. IV M3 or slipped to "0" if using target type turrets. Consult your scope owners' manual for specific instructions.

Section 4: Bullseye and Stationary Target Data

Purpose:

To allow the shooter to develop known distance zeros for distances other than the base zero for his weapon. Normally, these pages are used when firing at targets on a known distance NRA-style range to ensure positive distances to targets. These "KD" zeroes should be obtained prior to shooting at targets on a field firing or unknown distance range. Description: This page consists of three major data areas:



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1. The "shooting conditions" area (top of sheet) used to record the place, date, time, etc., along with the ambient environmental conditions.
2. The "call" box (lower left), used to record where you saw the crosshair (or, where you think the shot went).
3. The "plot" area (lower right), used to note individual shot and shot group placement.

Procedure:

1. Fill in the shooting conditions. To plot light conditions lay the book on the ground facing downrange. Place the point of a pencil in the middle of the circle on the dot provided and keeping the pencil vertical note the direction of the shadow. Draw an arrow in the direction of the shadow. Note mirage and humidity as "L", "M", or "H" for light or low, medium, or heavy or high. Note barometric pressure if available.
2. Note the size of the target in the box in the lower left-hand corner of the plot area.
3. Note the elevation and windage settings in the boxes provided for the first shot.
4. Fire the shot and place a dot in the call box for that shot.
5. Write a number "1" on the larger plot target where the shot impacted the target. If the shot is outside of the limits of the plot target note the location in the remarks box. For example, "Shot #1 - 7 inches out at 5 o'clock."
6. Continue the process for the remaining shots in the group. Indicate windage and elevation changes as necessary.
7. When you have placed 5 consecutive shots in the aiming area of the target, you may consider the rifle zeroed for that distance and conditions.



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8. Note the sight setting on the Zero Summary chart at the corresponding distance and temperature.

Appendix A: Mission Sheets

Description:

This section of the book contains the following pages:

1. Field Sketch
2. Range Card
3. Barrel Log
4. Movers Log
5. Shot Log

For information on the use of the tactical range cards, observation logs and field sketch sheets consult the US Army FM 23-10, Sniper Training, TC 31-32, Special Operations Sniper Training and Employment or the USMC FMFM 1-3B, Sniping.

Appendix B: Formula Sheets

1. GAP Reticle
2. Army
3. Gen2
4. USMC
5. Leupold TMR

☐ Yards ☐ Meters

[illegible]

☐ Yards ☐ Meters

[illegible]

☐ Yards ☐ Meters

[illegible]☐ Yards ☐ Meters[illegible]

Geo-Shooting Data

Date	Time	USGS Map / Location		Rifle/Scope	Ammunition	Distance												
Altitude	Humidity	Baro. Press.	Temp	Mirage	Light	Wind												
Coordinates				☐ Bright ☐ Hazy ☐ Overcast ☐ Changing														
UTM - Lon / Lat				☐ Light (3) ☐ Med (7) ☐ Heavy (15)														
Shooter		Target																
/		/		<table border="1"> <tr> <th>Points</th> <th></th> </tr> <tr> <td>A - Zone</td> <td>0</td> </tr> <tr> <td>B - Zone</td> <td>-1</td> </tr> <tr> <td>C - Zone</td> <td>-3</td> </tr> <tr> <td>D - Zone</td> <td>-4</td> </tr> <tr> <td>Mike</td> <td>-10</td> </tr> </table>			Points		A - Zone	0	B - Zone	-1	C - Zone	-3	D - Zone	-4	Mike	-10
Points																		
A - Zone	0																	
B - Zone	-1																	
C - Zone	-3																	
D - Zone	-4																	
Mike	-10																	
Bearing	____ Deg. Mag / True		Shooting Angle	____ Deg. U														
Datum	☐ NAD27 CONUS		☐ Other _____															
Ranging Method		Used	Pts.	Shot Out -20 pts. ea. after CB														
Scope	☐	0	#	CB	2	3												
Map	☐	-5	Elev.															
Laser	☐	-10	Wind															
Observerd Stalk		☐ Pass / Fail	Call	☐	☐	☐												
Scoring: Possible -10 pts for using a laser range finder. Every shot after coldbore is a -20 pts for a possible -80pts. Possible -10 pts for nothing on target. One rifle scope ranged cold bore shot in the A-zone = ZERO DOWN Possible 100 pts DOWN for 5 shots, no hits w/ laser ranging.				Range: _____ Shots: _____ Target: _____ Total: _____														

Geo-Shooting Data

Date	Time	USGS Map / Location		Rifle/Scope	Ammunition	Distance												
Altitude	Humidity	Baro. Press.	Temp	Mirage	Light	Wind												
Coordinates				☐ Bright ☐ Hazy ☐ Overcast ☐ Changing														
UTM - Lon / Lat				☐ Light (3) ☐ Med (7) ☐ Heavy (15)														
Shooter		Target																
/		/		<table border="1"> <tr> <th>Points</th> <th></th> </tr> <tr> <td>A - Zone</td> <td>0</td> </tr> <tr> <td>B - Zone</td> <td>-1</td> </tr> <tr> <td>C - Zone</td> <td>-3</td> </tr> <tr> <td>D - Zone</td> <td>-4</td> </tr> <tr> <td>Mike</td> <td>-10</td> </tr> </table>			Points		A - Zone	0	B - Zone	-1	C - Zone	-3	D - Zone	-4	Mike	-10
Points																		
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Bearing	____ Deg. Mag / True		Shooting Angle	____ Deg. U														
Datum	☐ NAD27 CONUS		☐ Other _____															
Ranging Method		Used	Pts.	Shot Out -20 pts. ea. after CB														
Scope	☐	0	#	CB	2	3												
Map	☐	-5	Elev.															
Laser	☐	-10	Wind															
Observerd Stalk		☐ Pass / Fail	Call	☐	☐	☐												
Scoring: Possible -10 pts for using a laser range finder. Every shot after coldbore is a -20 pts for a possible -80pts. Possible -10 pts for nothing on target. One rifle scope ranged cold bore shot in the A-zone = ZERO DOWN Possible 100 pts DOWN for 5 shots, no hits w/ laser ranging.				Range: _____ Shots: _____ Target: _____ Total: _____														

Steel Zero Data

Date	Time	Location										Rifle/Scope	Ammunition	Distance
Altitude	Humidity	Baro. Press.					Temp					Mirage	Light	Wind
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____
Shot #	1	2	3	4	5	6	7	8	9	10				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Shot #	11	12	13	14	15	16	17	18	19	20				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Notes:														

Steel Zero Data

Date	Time	Location										Rifle/Scope	Ammunition	Distance
Altitude	Humidity	Baro. Press.					Temp					Mirage	Light	Wind
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____
Shot #	1	2	3	4	5	6	7	8	9	10				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Shot #	11	12	13	14	15	16	17	18	19	20				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Notes:														

IPSC Zero Data

Date	Time	Location										Rifle/Scope	Ammunition	Distance	
Altitude	Humidity	Baro. Press.										Temp	Mirage	Light	Wind
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10					
Elev.															
Wind															
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐					
Shot #	11	12	13	14	15	16	17	18	19	20					
Elev.															
Wind															
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐					
Notes: Eyebow = 2x4" A-Zone = 11x4"															

The diagram shows an IPSC target with the following dimensions: a top section that is 6 inches wide and 6 inches high, and a main body that is 18 inches wide and 24 inches high. The total height of the target is 30 inches. The target is divided into zones: A (center), B (top), C (inner ring), and D (outer ring).

IPSC Zero Data

Date	Time	Location										Rifle/Scope	Ammunition	Distance	
Altitude	Humidity	Baro. Press.										Temp	Mirage	Light	Wind
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10					
Elev.															
Wind															
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐					
Shot #	11	12	13	14	15	16	17	18	19	20					
Elev.															
Wind															
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐					
Notes: Eyebow = 2x4" A-Zone = 11x4"															

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Zero Data

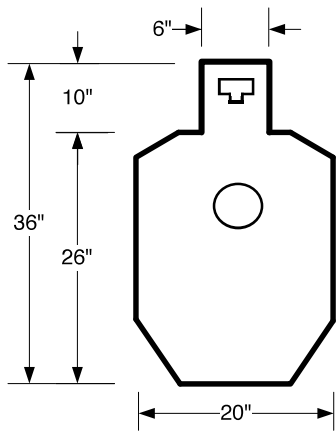
Date	Time	Location										Rifle/Scope	Ammunition	Distance		
Altitude	Humidity	Baro. Press.										Temp	Mirage	Light	Wind	
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10						
Elev.																
Wind																
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐						
Shot #	11	12	13	14	15	16	17	18	19	20						
Elev.																
Wind																
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐						
Notes:																
Target Size =																

Zero Data

Date	Time	Location										Rifle/Scope	Ammunition	Distance		
Altitude	Humidity	Baro. Press.										Temp	Mirage	Light	Wind	
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10						
Elev.																
Wind																
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐						
Shot #	11	12	13	14	15	16	17	18	19	20						
Elev.																
Wind																
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐						
Notes:																
Target Size =																

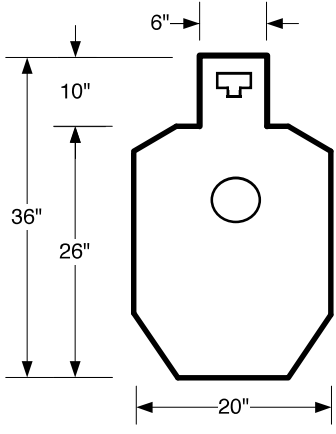
Steel Zero Data MGM

Date	Time	Location										Rifle/Scope	Ammunition	Distance
Altitude	Humidity	Baro. Press.					Temp	Mirage	Light		Wind			
									☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____			
Shot #	1	2	3	4	5	6	7	8	9	10				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Shot #	11	12	13	14	15	16	17	18	19	20				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Notes: MGM Precision Rifle Target The head shot overall area is 3.5" wide x 1.75" tall, with the "eye" area 1" x 3.5" ~ 5.0" to close Chest is a 5" diameter circle and ~ 2.5" wide to close.														



Steel Zero Data MGM

Date	Time	Location										Rifle/Scope	Ammunition	Distance
Altitude	Humidity	Baro. Press.					Temp	Mirage	Light		Wind			
									☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____			
Shot #	1	2	3	4	5	6	7	8	9	10				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Shot #	11	12	13	14	15	16	17	18	19	20				
Elev.														
Wind														
Call	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				
Notes: MGM Precision Rifle Target The head shot overall area is 3.5" wide x 1.75" tall, with the "eye" area 1" x 3.5" ~ 5.0" to close Chest is a 5" diameter circle and ~ 2.5" wide to close.														



Simple Bullseye Target

Date	Time	Location										Rifle/Scope	Ammunition	Distance	
Altitude	Humidity	Baro. Press.					Temp					Mirage	Light	Wind	
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10					
Elev.															
Wind															
Call															
Shot #	11	12	13	14	15	16	17	18	19	20					
Elev.															
Wind															
Call															
Notes:															

Simple Bullseye Target

Date	Time	Location										Rifle/Scope	Ammunition	Distance	
Altitude	Humidity	Baro. Press.					Temp					Mirage	Light	Wind	
													☐ Bright ☐ Hazy ☐ Overcast ☐ Changing	☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____	
Shot #	1	2	3	4	5	6	7	8	9	10					
Elev.															
Wind															
Call															
Shot #	11	12	13	14	15	16	17	18	19	20					
Elev.															
Wind															
Call															
Notes:															

Grid Bullseye Target

Date	Time	Location		Rifle/Scope		Ammunition		Distance		
Altitude	Humidity	Baro. Press.		Temp	Mirage	Light		Wind		
						☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____		
Shot #	1	2	3	4	5	6	7	8	9	10
Elev.										
Wind										
Call										
Shot #	11	12	13	14	15	16	17	18	19	20
Elev.										
Wind										
Call										
Notes:										

Grid Bullseye Target

Date	Time	Location		Rifle/Scope		Ammunition		Distance		
Altitude	Humidity	Baro. Press.		Temp	Mirage	Light		Wind		
						☐ Bright ☐ Hazy ☐ Overcast ☐ Changing		☐ Light (3) ☐ Med (7) ☐ Heavy (15) ☐ _____		
Shot #	1	2	3	4	5	6	7	8	9	10
Elev.										
Wind										
Call										
Shot #	11	12	13	14	15	16	17	18	19	20
Elev.										
Wind										
Call										
Notes:										

Date:	Method:	Field Sketch Card
Location:	↑	
	Yd / M	
		Notes:



Date:	Method:	Field Sketch Card
Location:	↑	
	Yd / M	
		Notes:



FRONT



Date:	Method:
Location:	↑
	Yd / M

Field Sketch Card

Notes:



Date:	Method:
Location:	↑
	Yd / M

Field Sketch Card

Notes:

Barrel Log

Date	Ammunition	Lot	# Fired	Total	Date	Ammunition	Lot	# Fired	Total
Notes:							This Page		
							Previous Page		
							Total		

Barrel Log

Date	Ammunition	Lot	# Fired	Total	Date	Ammunition	Lot	# Fired	Total
Notes:							This Page		
							Previous Page		
							Total		

FRONT

Movers

Snapshot		< 500	600	700	800	900	1000
Mil Leads	2 mph	1.25	1.25	1.50	1.50	1.50	1.75
7.62mm, 175gr @ 2650 fps	3 mph	1.75	2.00	2.00	2.25	2.25	2.50
	4 mph	2.50	2.75	2.75	3.00	3.00	3.25
	6 mph	3.75	4.00	4.25	4.50	4.50	4.75

TOF Estimates (7.62mm, 175gr @ 2650 fps)

100 yds = .12 sec	600 yds = .84 sec
200 yds = .24 sec	700 yds = 1.02 sec
300 yds = .38 sec	800 yds = 1.22 sec
400 yds = .52 sec	900 yds = 1.43 sec
500 yds = .68 sec	1000 yds = 1.66 sec

MPH Estimates

Slow Patrol ~ 1 mph
Slow Walk ~ 2 mph
Normal Walk ~ 3 mph
Fast Walk ~ 4 mph
Bicycle ~ 6 mph

1.467 fps = 1mph/fps = 0.682 mph

.308 Snap Lead in Mil < 500 yards = (target speed (mph) * 0.6)

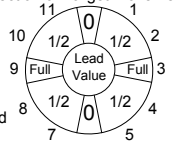
MIL Lead = (TOF(sec) * Target Speed (mph) * 489) / Range in Yards
MOA Lead = (TOF(sec) * Target Speed (mph) * 1682) / Range in Yards

Example: Man walking 3 mph @ 400 yds

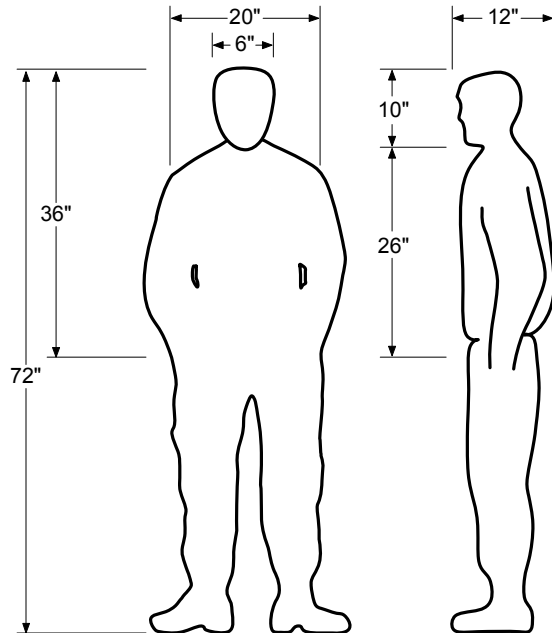
Direction of Target Movement

(0.6 * ~3 mph) = 1.8 MIL Snap Lead

(.52 sec * 3 mph * 489) / 400 yds = 1.9 MIL Lead
(.52 sec * 3 mph * 1682) / 400 yds = 6.56 MOA Lead



Human Target



Movers

Snapshot		< 500	600	700	800	900	1000
Mil Leads	2 mph	1.25	1.25	1.50	1.50	1.50	1.75
7.62mm, 175gr @ 2650 fps	3 mph	1.75	2.00	2.00	2.25	2.25	2.50
	4 mph	2.50	2.75	2.75	3.00	3.00	3.25
	6 mph	3.75	4.00	4.25	4.50	4.50	4.75

TOF Estimates (7.62mm, 175gr @ 2650 fps)

100 yds = .12 sec	600 yds = .84 sec
200 yds = .24 sec	700 yds = 1.02 sec
300 yds = .38 sec	800 yds = 1.22 sec
400 yds = .52 sec	900 yds = 1.43 sec
500 yds = .68 sec	1000 yds = 1.66 sec

MPH Estimates

Slow Patrol ~ 1 mph
Slow Walk ~ 2 mph
Normal Walk ~ 3 mph
Fast Walk ~ 4 mph
Bicycle ~ 6 mph

1.467 fps = 1mph/fps = 0.682 mph

.308 Snap Lead in Mil < 500 yards = (target speed (mph) * 0.6)

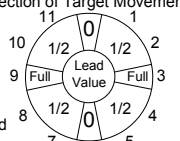
MIL Lead = (TOF(sec) * Target Speed (mph) * 489) / Range in Yards
MOA Lead = (TOF(sec) * Target Speed (mph) * 1682) / Range in Yards

Example: Man walking 3 mph @ 400 yds

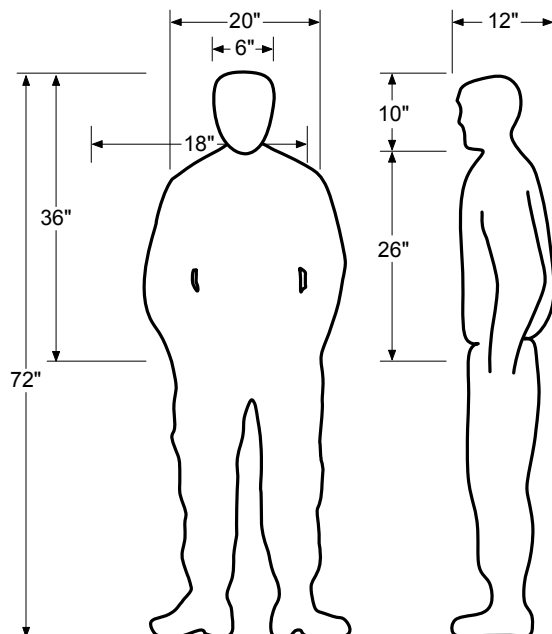
Direction of Target Movement

(0.6 * ~3 mph) = 1.8 MIL Snap Lead

(.52 sec * 3 mph * 489) / 400 yds = 1.9 MIL Lead
(.52 sec * 3 mph * 1682) / 400 yds = 6.56 MOA Lead



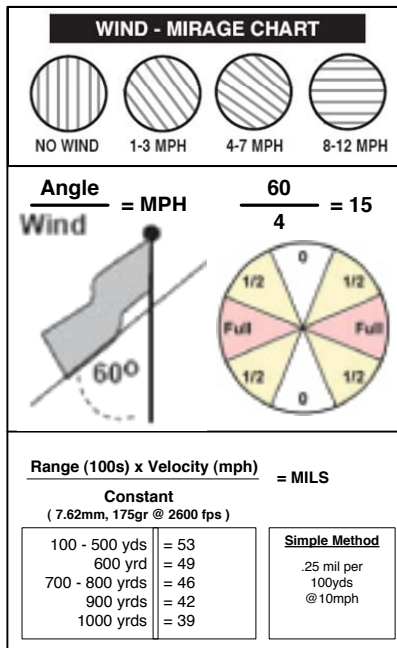
Human Target



Shot Log
System: _

[illegible]

Formulas



Wind Effects

0-3 Hardly felt on face
3-5 Lightly felt on face
5-8 Tree leaves in motion
8-12 Raises dust and paper
12-15 Small trees sway
15-20 Larger trees sway

Yards	M/Yd	Meters
1.0936	1	0.9144

MIL	MIL/MOA	MOA
1.00	1	3.438

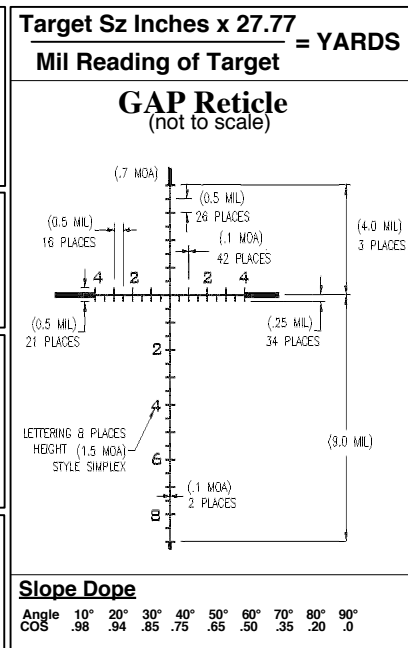
Humidity Effects

Humidity up = impact down
Humidity down = impact up

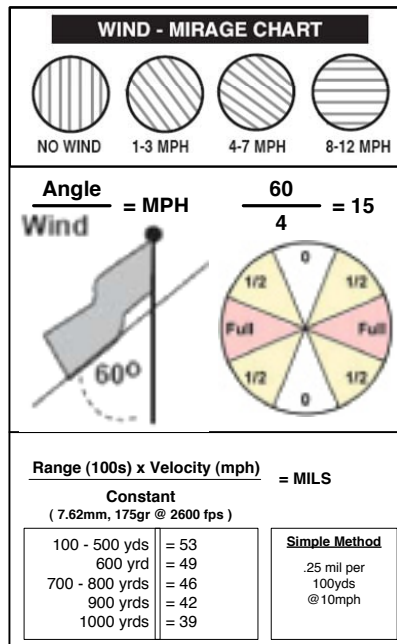
Rule of Thumb:
20% = ~1moa affect on POI

Common Measurements

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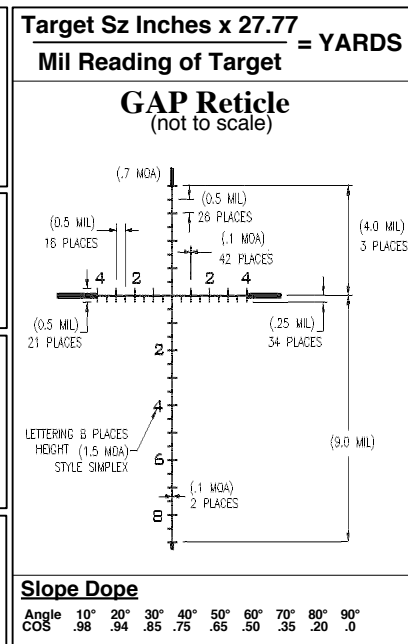
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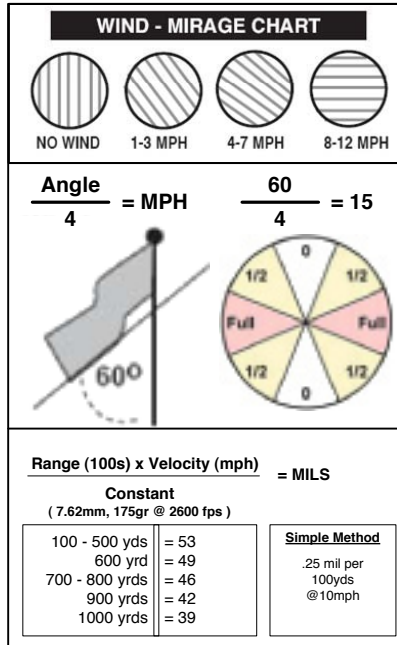
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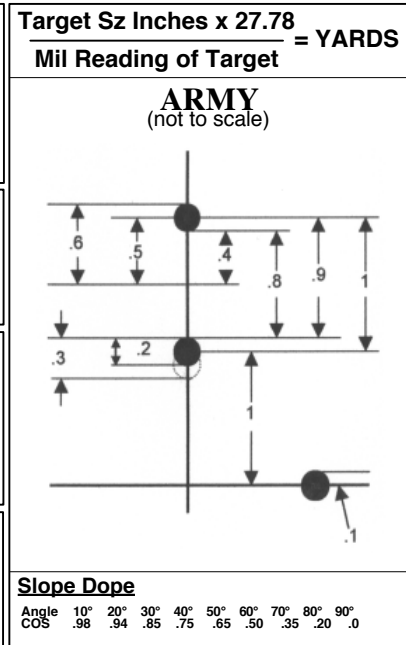
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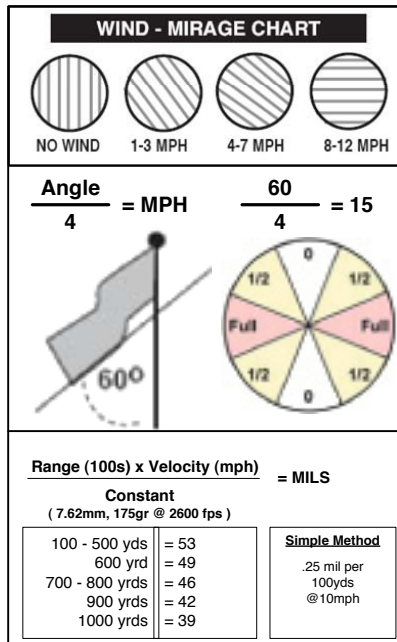
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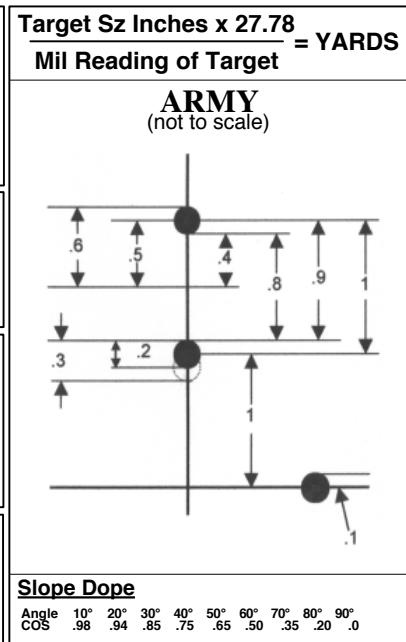
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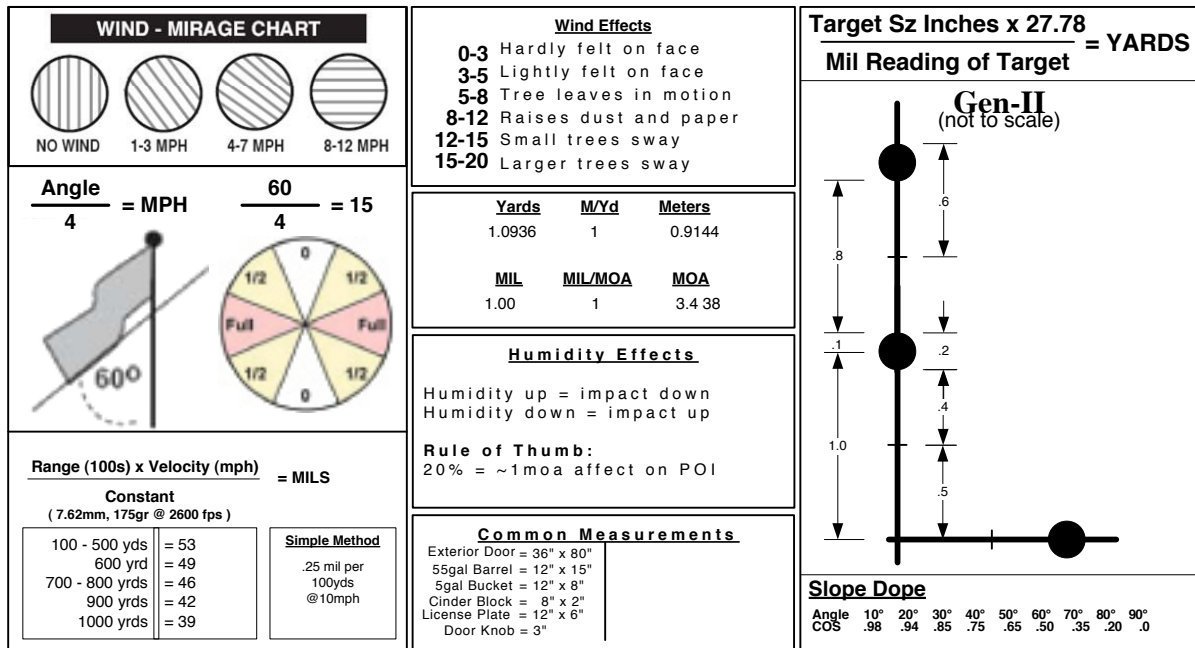
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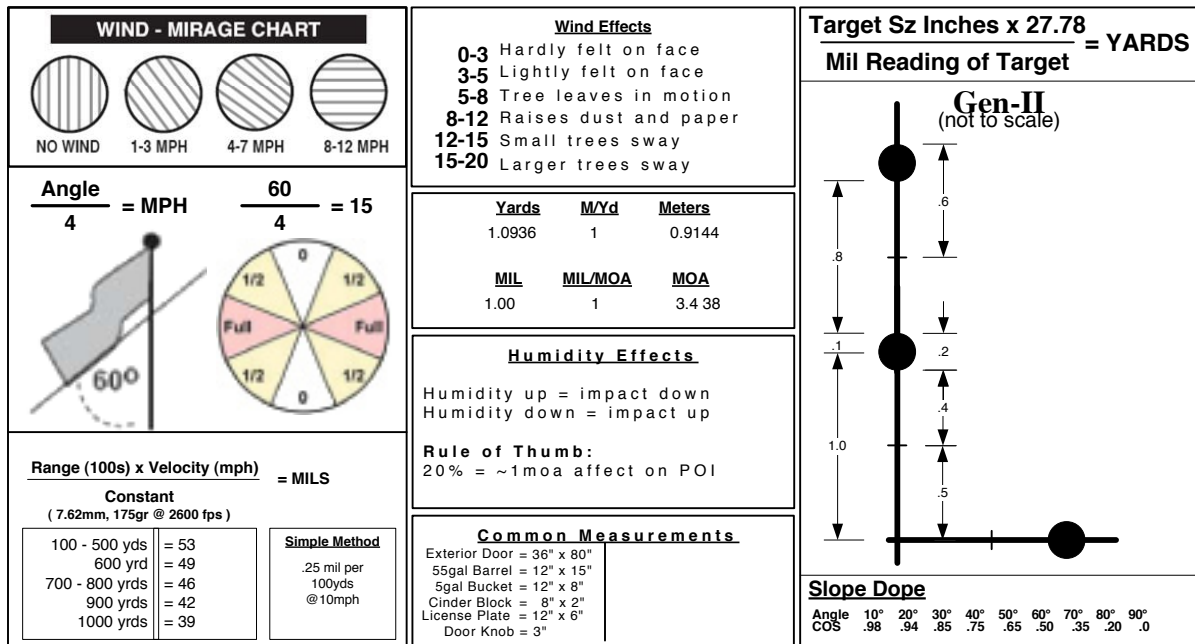
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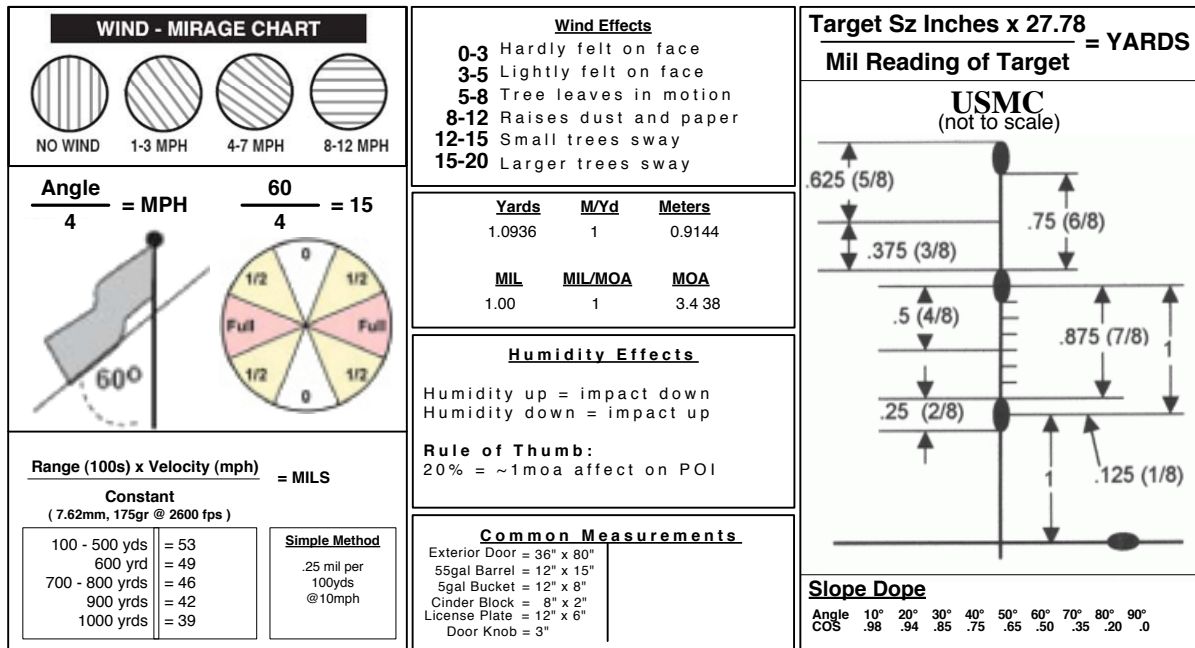
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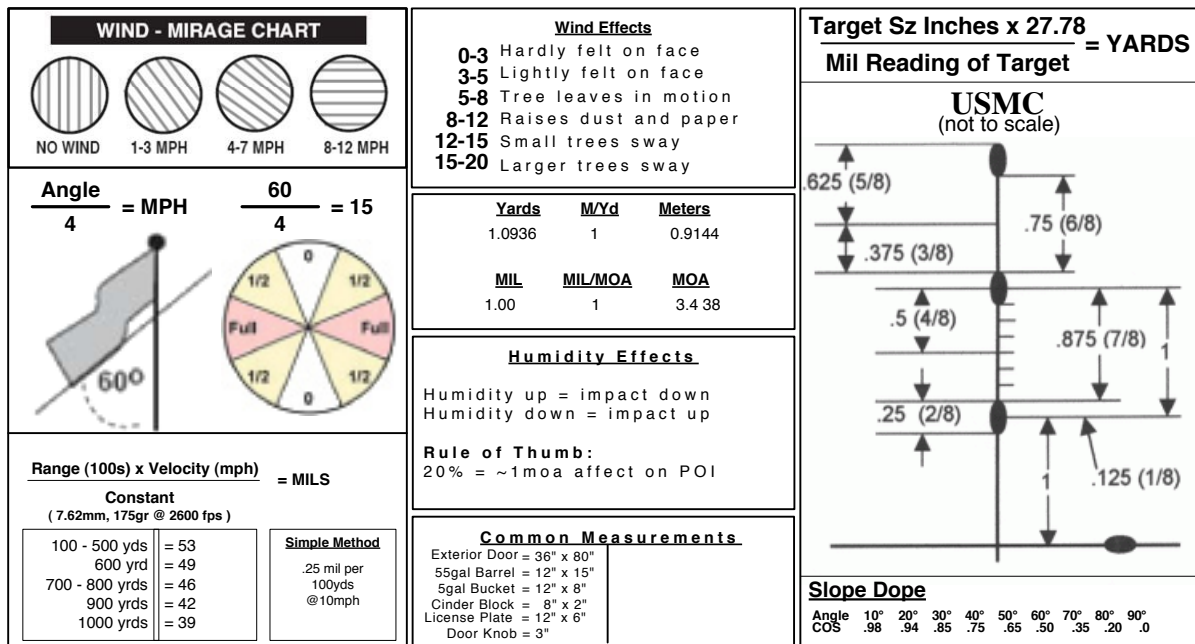
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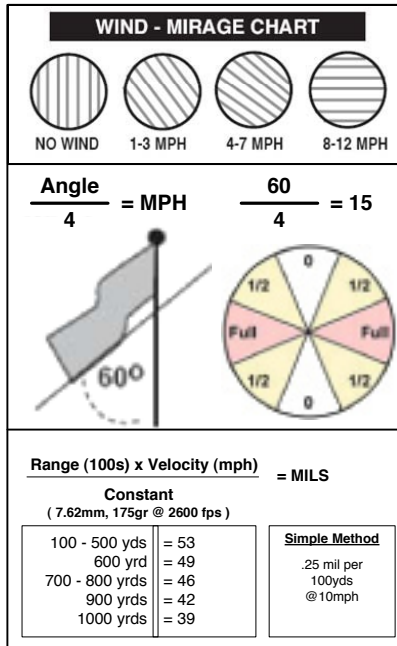
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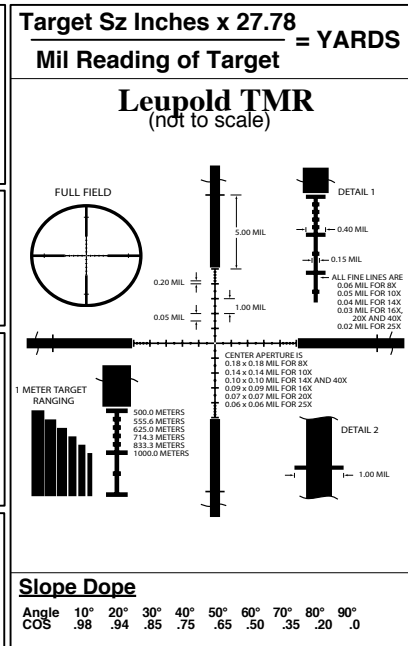
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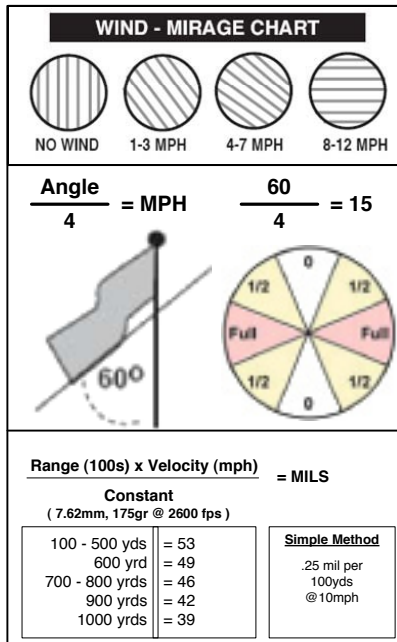
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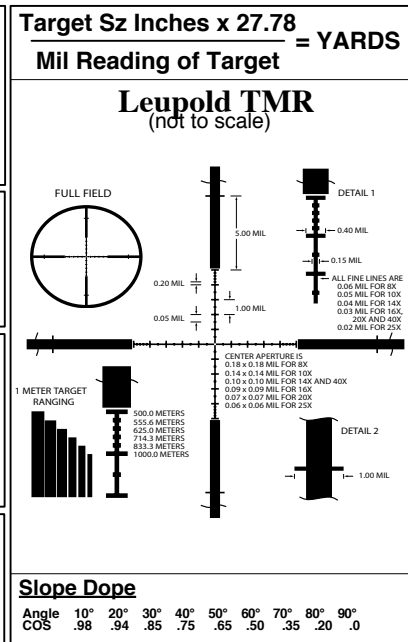
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12



Over Gassed

3

Perfect
Gas Setting

Under
Gassed

4:30

6