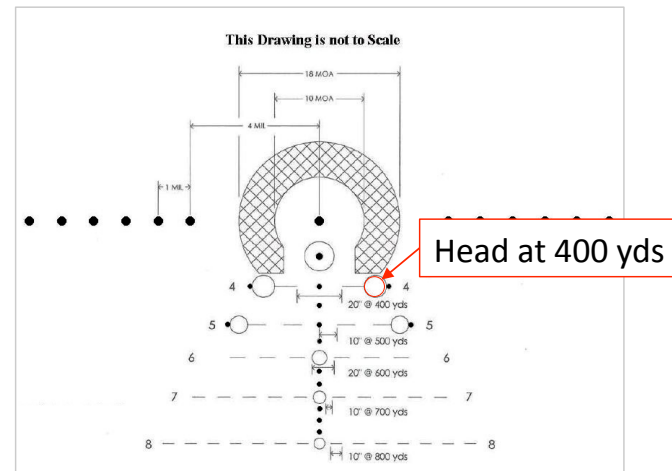
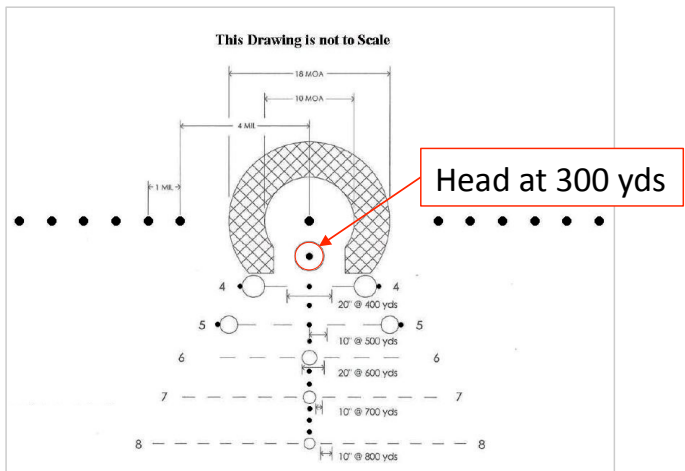
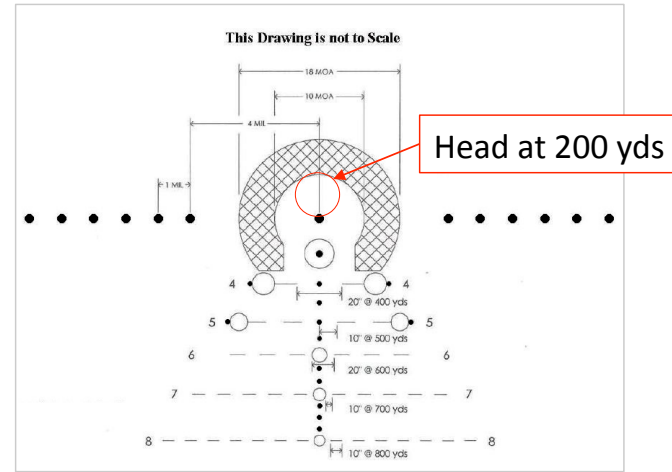
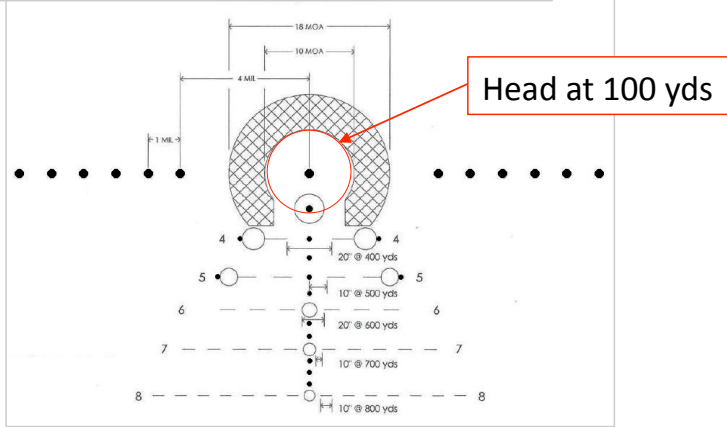


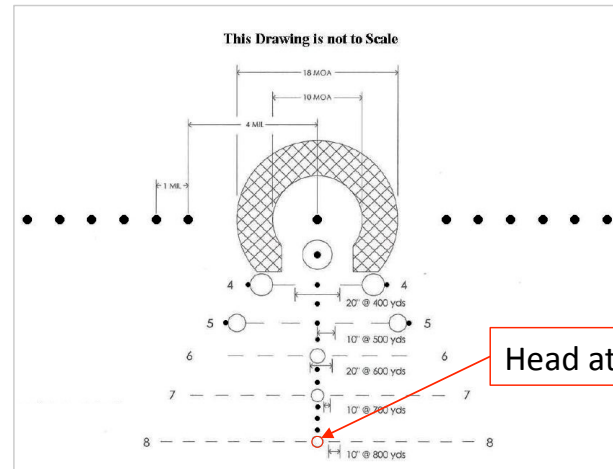
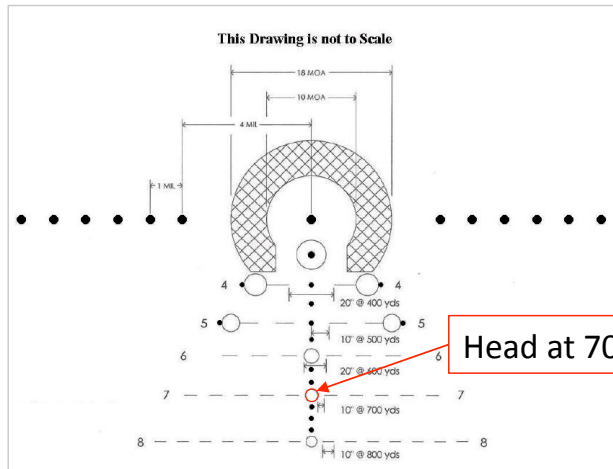
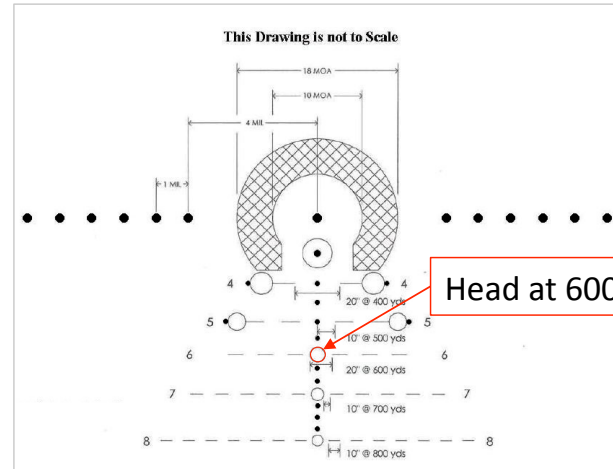
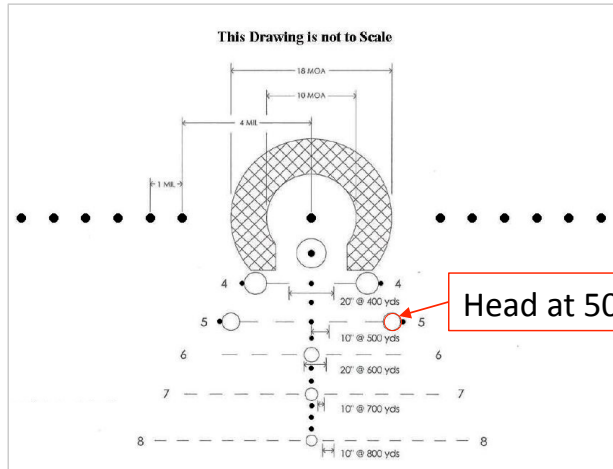
The following slides explain how to use the GRSC reticle for range estimation using:

- The approximate head size of a male adult (about 10 inches from the chin to the top of the head)
- The approximate shoulder width of a male adult (about 20 inches side to side)

How to estimate range using head size
(approximately 10 inches from chin to top)

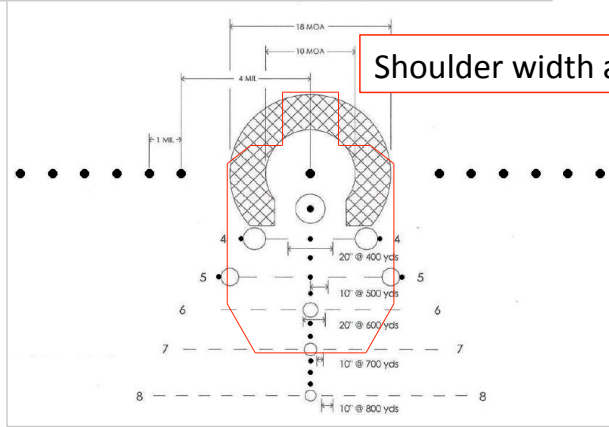
Prepared by Hector Arvizu



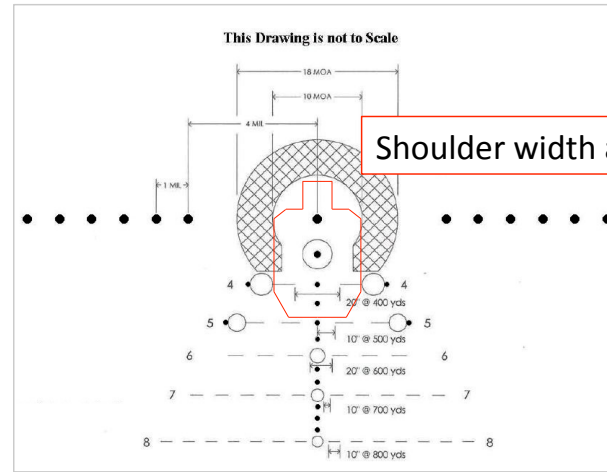


How to estimate range using shoulder width (approximately 20 inches)

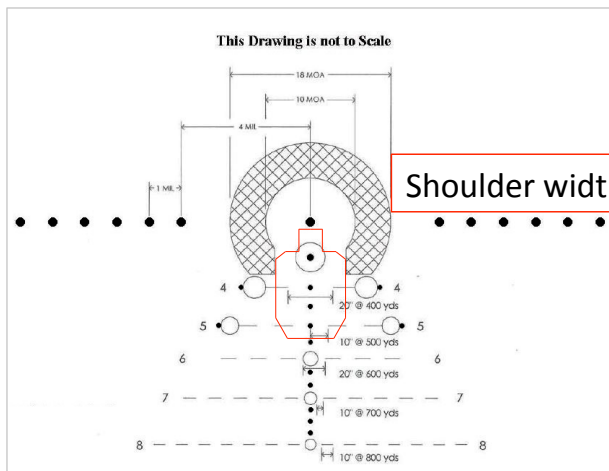
Prepared by Hector Arvizu



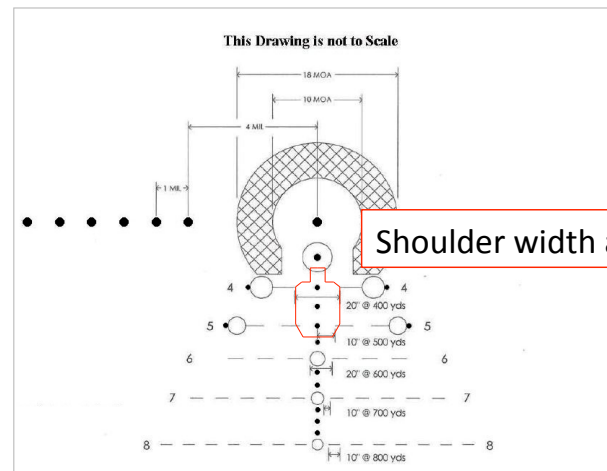
Shoulder width at 100 yds



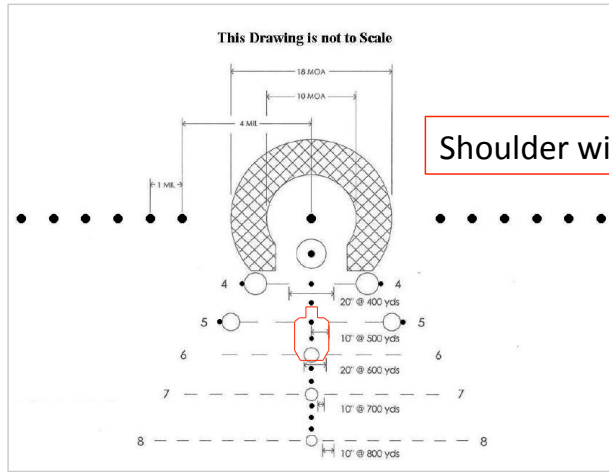
Shoulder width at 200 yds



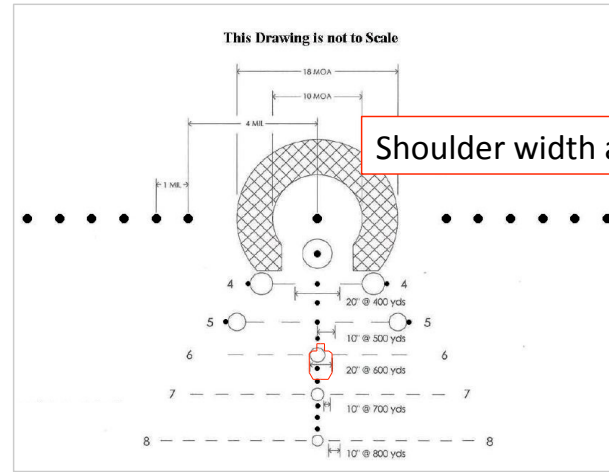
Shoulder width at 300 yds



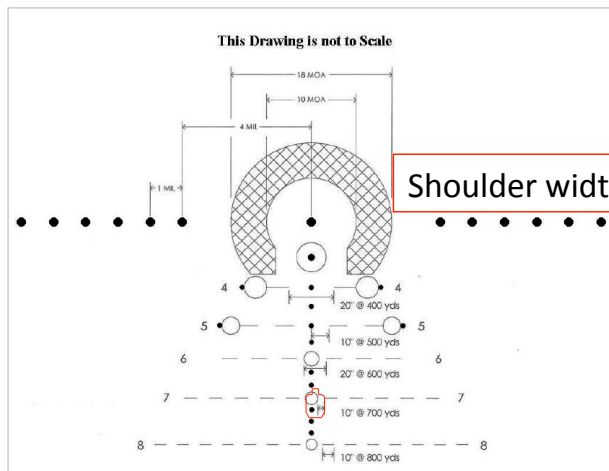
Shoulder width at 400 yds



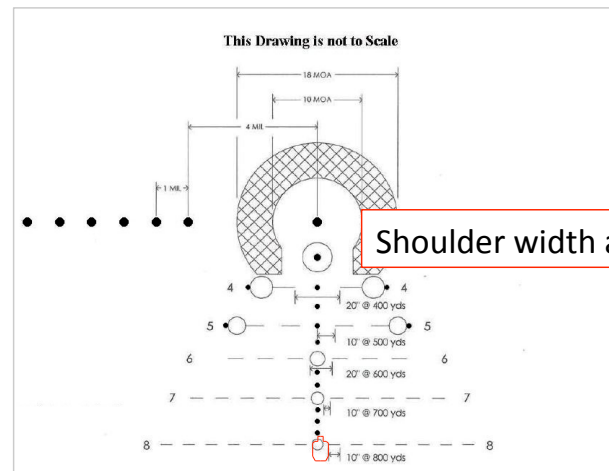
Shoulder width at 500 yds



Shoulder width at 600 yds



Shoulder width at 700 yds



Shoulder width at 800 yds

The following slides explain:

- The correlation of the GRSC reticle dimensions to wind drift data for M855/M4
- What Points of Aim (POA's) to use for the graduated distances with zero wind and with full value 15 mph wind.

Ballistic and Muzzle Velocity data from Wikipedia for M855 projectile
(http://en.wikipedia.org/wiki/5.56x45mm_NATO)

Prepared by Hector Arvizu

The US Army's Ballistic Research Laboratory measured a ballistic coefficient (G7 BC) of 0.151 and form factor (G7 *i*) of 1.172 for the SS109/M855 ball projectile.^[23]

The Swedish military has measured the bullet velocities of SS109/M855 military cartridges at 4 m (13.1 ft) from the muzzle fired from differing barrel lengths:^[24]

Barrel length	SS109/M855 V ₄ bullet velocity	V ₄ velocity loss
210 mm (8.3 in)	723 m/s (2,372 ft/s)	41 m/s (135 ft/s)
240 mm (9.4 in)	764 m/s (2,507 ft/s)	32 m/s (105 ft/s)
270 mm (10.6 in)	796 m/s (2,612 ft/s)	29 m/s (95 ft/s)
300 mm (11.8 in)	825 m/s (2,707 ft/s)	18 m/s (59 ft/s)
330 mm (13.0 in)	843 m/s (2,766 ft/s)	23 m/s (75 ft/s)
360 mm (14.2 in)	866 m/s (2,841 ft/s)	12 m/s (39 ft/s)
390 mm (15.4 in)	878 m/s (2,881 ft/s)	14 m/s (46 ft/s)
420 mm (16.5 in)	892 m/s (2,927 ft/s)	14 m/s (46 ft/s)
450 mm (17.7 in)	906 m/s (2,972 ft/s)	9 m/s (30 ft/s)
480 mm (18.9 in)	915 m/s (3,002 ft/s)	7 m/s (23 ft/s)
508 mm (20.0 in)	922 m/s (3,025 ft/s)	-

Data was entered into
shooterscalculator.com

Prepared by Hector Arvizu

SHOOTERSCALCULATOR.COM



BALLISTIC TRAJECTORY | BULLET KINETIC ENERGY | POINT BLANK RANGE | RECOIL

BALLISTIC TRAJECTORY CALCULATOR

Use this ballistic calculator in order to calculate the flight path of a bullet given the shooting parameters that meet your conditions. This calculator will produce a ballistic trajectory chart that shows the bullet drop, bullet energy, windage, and velocity. It will produce a line graph showing the bullet drop and flight path of the bullet. By adding trajectories to the panel on the right you may produce charts and graphs that show the different trajectories side by side. This can be useful in comparing cartridges or loads.

Note: calculations were repeated with multiple on-line ballistic calculators with very similar results.

SINGLE TRAJECTORY GRAPH & CHART [?]

M885 M885

Drag Function: [?]

Ballistic Coefficient:[?]

Bullet Weight: [?] (gr)

Initial Velocity: [?] (fps)

Zero Range: [?] (yd)

Sight Height: [?] (in)

Shooting Angle: [?] (deg)

Wind Speed: [?] (mph)

Wind Angle: [?] (deg)

Correct for Atmosphere: [?]

Altitude: [?] (ft)

Temperature: [?] (F)

Barometric Pressure:[?] (hg)

Relative Humidity: [?] (%)

Show Sound Barrier: [?]

Chart Range: [?] (yd)

Chart Step Size: [?] (yd)

MULTIPLE TRAJECTORY GRAPH [?]

M885

Trajectories

Width: (px)

Height: (px)

Range: (yd)

Chart Step Size: (yd)

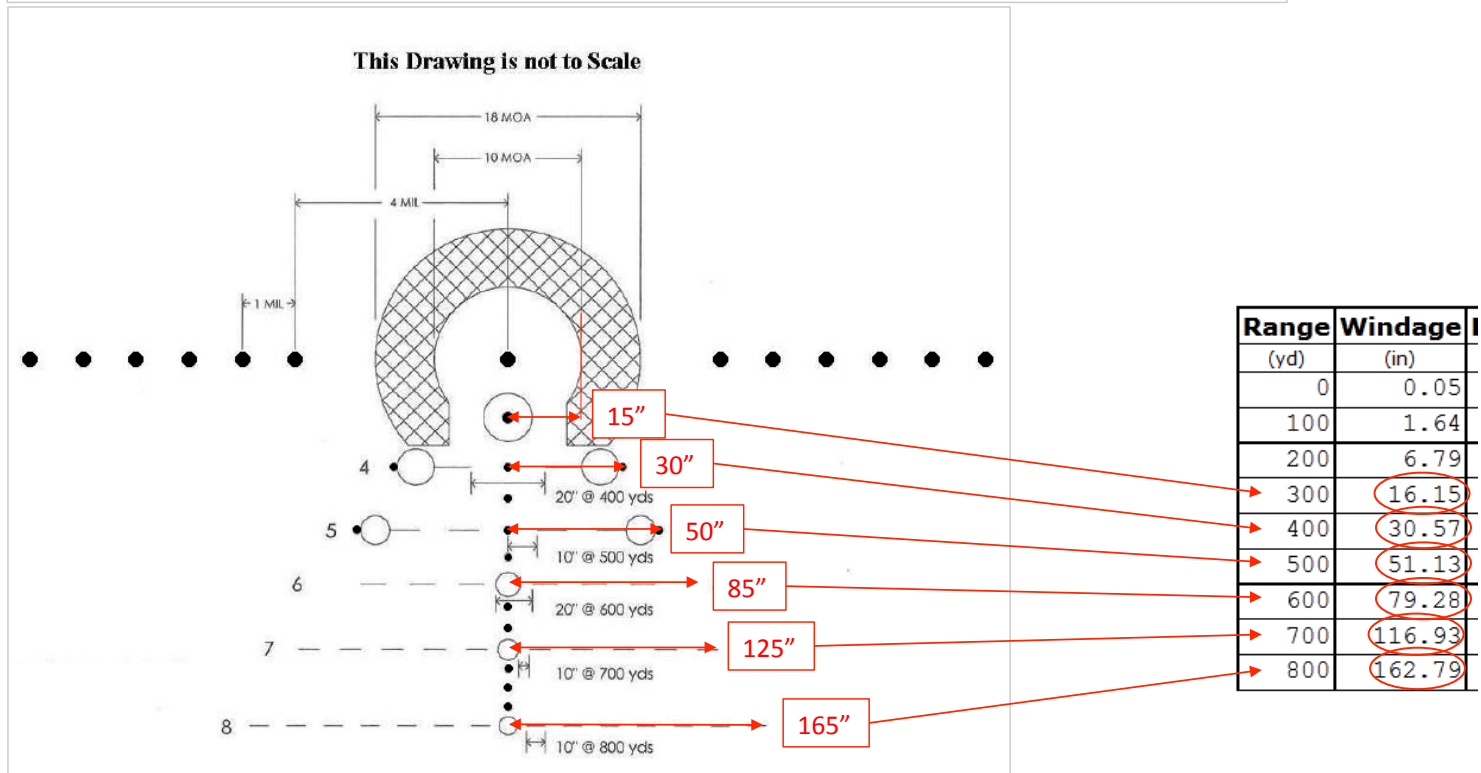
Label:

The table below is the product of the calculation. Highlighted are the wind drift values (note: calculation was performed for a full value wind of 15 mph).

Range	Windage	Elevation	Elevation	Elevation	Windage	Windage	Time	Energy	Vel[x+y]
(yd)	(in)	(in)	(MOA)	(MIL)	(MOA)	(MIL)	(s)	(ft.lbf)	(ft/s)
0	0.05	-3.00	0.00	0.00	0.00	0.00	0.00	1111	2841
100	1.64	0.00	0.00	0.00	1.57	0.46	0.11	890	2543
200	6.79	-2.41	1.15	0.33	3.24	0.94	0.24	705	2263
300	16.15	-11.65	3.71	1.08	5.14	1.49	0.38	551	2000
400	30.57	-29.64	7.07	2.06	7.30	2.12	0.54	424	1754
500	51.13	-59.02	11.27	3.28	9.76	2.84	0.72	320	1525
600	79.28	-103.48	16.47	4.79	12.62	3.67	0.93	237	1311
700	116.93	-168.38	22.97	6.68	15.95	4.64	1.18	173	1122
800	162.79	-260.50	31.09	9.04	19.43	5.65	1.46	148	1037

Note: M855 out of a 14.5" bbl will become transonic between 600 and 700 yds (at standard atmospheric conditions). Past 600 yards, the GRSC reticle will easily allow the M855/M4 to still provide effective harassing fire but accuracy will decline.

On the left are the equivalent dimensions of the GRSC reticle (at the indicated distances). On the right, are the windage values in inches from the ballistic calculation. Wind drift values are very close to GRSC equivalent horizontal dimensions; the horizontal ends of the reticle can be used for a full value 15 mph wind.



POA's at the different distances

