USSOCOM / DARPA Comparative Sniper Rifle
Test Data - First Look 04/18/07

Scope. This document provides an overview of the test data collected during firing tests performed in accordance with SOW/COA of 02/12/07. Funding was provided by DARPA on document number 07W438. These tests were performed on XM-3, MK 13 MOD 5, and MK 11 rifles at ranges from 400 to 1200 yards. While the original scope of testing was intended to include all 3 of each weapon type firing 3 groups suppressed and 3 groups unsuppressed at each range, this plan proved overly optimistic for the range time available. Subsequently, testing was reduced to what is detailed in this overview. Weather delays were also an issue. A Joint SOF Safety Release is in process for the XM-3 rifle with projected approval by 21 May.

Physical Characteristics Data. Weapons were weighed, measured, and photographed to document configuration. Physical characteristics were recorded. While accessories are not of particular interest for this evaluation, it should be noted that each XM-3 System does include a Universal Night Sight Type clip-on device and associated mounting capability to support night operations. The other 2 rifle types also support use of this type device. All three weapon types include a Harris brand bipod and Nightforce Brand Day Optic.

Physical Characteristics Comparison Data

XM-3		MK 13 MOD 5	MK 11 MOD 0
 Remington 700SA based bolt action rifle assembled by Iron Brigade Armory		 Without Suppressor Remington 700LA based bolt action rifle assembled by NSWC Crane Code 408	 Knight's Armament Co. (semi-automatic)
System Weight (no sling)	w/ supp 15.06 lbs wo/ supp 13.88 lbs	w/ supp 19.08 lbs wo/ supp 17.25 lbs (w/ empty mag.)	w/ supp 16.18 lbs wo/ supp 14.34 lbs (w/ empty mag.)
Length	w/ supp 26.25 inches wo/ supp 40.25 inches	w/ supp 53.0 inches wo/ supp 47.0 inches	w/ supp 45.5 inches wo/ supp 39.5 inches
Magazine	5 round internal box	5 round detachable box	20 round detach.box
Barrel	18 inch 1:10" twist Hart Stainless (416R) Muzzle Vel: 2560 fps M118LR 7.62mm NATO	26.5 inch 1:10" twist Lilja Stainless (416R) Muzzle Vel: 2900 fps .300 Win. Mag.	20 inch 1:11.2" twist Obermeyer CM (4150) Muzzle Vel: 2590 fps M118LR 7.62mm NATO
Suppression	SureFire Flash suppressor and 7.62SS QD Sound Suppressor	KAC MK 11 Sound Suppressor (no flash suppressor)	KAC MK 11 Sound Suppressor (no flash suppressor)
Accessories	Hardigg Case Harris Bipod NXS 3.5-15X Scope Mil Std 1913 Rails for Scope and NVD	Hardigg Case Harris Bipod NXS 5.5-22X Scope Mil Std 1913 Rail for Scope and NVD	Pelican Case Harris Bipod NXS 3.5-15X Scope Mil Std 1913 Rails for Scope and NVD

Equipment Used.

9 total weapon systems which include removable sound suppressors and ammunition.
3 Accuracy Fixtures - Each tailored for mounting of a specific rifle type.
Target Frames – Plywood and 2X4 construction with paper based targets.
Electonic Target – "T-bar" acoustical targeting system.
6 Weather Stations - Davis Instruments Vantage Pro 2 (wireless w/data loggers).
Laptop Computer – Dell Latitude with WeatherLink 5.7 Software.
Digital Camera – Nikon Coolpix 950.
Video Camera - Sony Digital Handycam.
Velocity Screens/Chronograph – Oehler Ballistic Research components.
"Pull" Targets – Camp Atterbury rising target frames with paper 6X6 foot targets.
110Volt Generators – Camp Atterbury support of Velocity Screens/Chronograph.

Data Collection Process. A shot sensing "T-bar" was located in front of all target positions at Crane to determine shot sequence (accuracy data was also generated but not useful due to the aim points being spread beyond its optimal impact zone). While a video recorder was set up in the hopes of capturing shot sequence for the 7.62mm rifles, which do not register on the T-bar at 1000 yards, the image quality will not reliably allow for shot sequence determination for the 7.62mm rifles. The MK 13 shots did record on the "T-bar" as at other distances. The target frames at Camp Atterbury are designed to be raised and lowered and have plastic backers. Standard paper competition targets were used (6 foot square). The weather stations were used to gather wind data at the time of firing. This was accomplished through use of a "Data Logger" memory device which was set to store the instantaneous wind speed and direction at the top of each minute (all 6 station clocks were synchronized). At the end of each firing day the data was downloaded to a laptop computer. The fire command was called at the top of each minute and the time and muzzle velocities (at 15 feet) were recorded. Generally 10 shots were then fired in 10 minutes when there were no delaying issues. After each 10 shot group the targets were marked to indicate shot locations for that particular firing sequence. Ammunition Lots used for all firing were .300 Win Mag A191 WCC01G006-001 and 7.62mm NATO M118LR LC-06E272-086 (sublot E). The .300 Win Mag is loaded with 190 grain Sierra Match King (SMK) projectiles, while the M118LR is loaded with 175 grain Sierra Match King projectiles. Rifles were initially zeroed while fired from the shoulder and then ballistic tables were used to align the rifle optic for initial fixture firing. Fixture zero was adjusted as necessary if there was significant shift between suppressed and unsuppressed point of impact.

Range Firing Tests. This testing consisted of firing the XM3, MK11, and MK13 MOD5 from accuracy fixtures bolted to a concrete pad starting at 600 yards followed by 800 and 1000 yards and then one set of rifles at 400 yards. The 3 weapon types were all fired simultaneously (to within 1 second of each other) at each range. Atmospheric conditions with focus on wind direction and velocity were monitored and recorded within approximately 3 seconds of shot firing time every 200 yards beginning at the firing line. Initial (muzzle) velocity was recorded for every shot fired (as possible). The weapons were fired for not less than 1 group of 10 shots each unsuppressed and 3 groups of 10 shots each suppressed at each yard line. While all 3 weapon sets were fired at 600 yards only 2 sets were fired at 800 and 1000 yards with a single set being fired at 400 yards. Paper target data was recorded through a combination of the actual paper target and use of an electronic targeting system to verify shot sequence for correlation to proper wind data. Shot locations are recorded with reference to the furthest right shot being at "zero" on the X axis and the lowest shot being "zero" on the Y axis. Data

collected will allow for statistical data to be extracted (Extreme Spread, Mean Radius, Mean Point of Impact). This testing was performed March 23-25, 2007.

The same accuracy fixtures used for firing at the Code 408 Outdoor Range were mounted to a concrete pad and fired at 1200 yards at Camp Atterbury Range 6 according to the same process as detailed above. Muzzle Velocities were recorded as possible (use of a gasoline powered generator did not work well for the velocity screens used and limited this data). Personnel were stationed in the "Butts", a protected position near the target to determine shot sequence. The actual targets were kept for measuring shot locations. Testing was performed on 3 and 4 April 2007. Wind conditions (10 to 20 mph average) combined with the 6 foot square targets limited the number of shot locations able to be documented.

Conclusions: This testing was for collection of data only. Conclusions may be drawn by the reader, but with the understanding that the view of the data is limited at this time. DARPA has interest in how the wind at time of firing correlates to shot impact locations. While determining / extracting wind effects can be a very complex process, the weapon accuracy data may be compared since all weapons were fired under the same prevailing weather conditions.

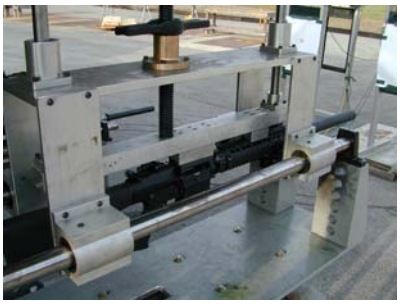
Weapons Tested and Ammunition Expended (for record)

Test Range	Weapons	Rounds A191 190 grain SMK projectile	Rounds 118LR (AA11) 175 grain SMK proj.
Lot Numbers		WCC01G006-001	LC-06E272-086 (sublot E)
Accuracy, POI & Velocity @ 400 yrds.	XM3 – 824 MK13 – 888 MK 11-077	40	40 40
Accuracy, POI & Velocity @ 600 yrds.	XM3 – 263, 824, 254 MK13 – 888, 008, 032 MK 11- 058, 077, 923	150	150 150
Accuracy, POI & Velocity @ 800 yrds.	XM3 – 824, 263 MK13 – 888, 008 MK 11-077, 032	90	90 90
Accuracy, POI & Velocity @ 1000 yrds.	XM3 – 824, 263 MK13 – 888, 008 MK 11-077, 032	80	80 80
Accuracy, POI & Velocity @1200 yrds.	XM3 – 263 MK13 – 008 MK 11-077	80	80 40
Total	**9 total rifles (3 of each)**	**440**	**840**

Accuracy Fixtures

XM-3

MK 13 MOD 5



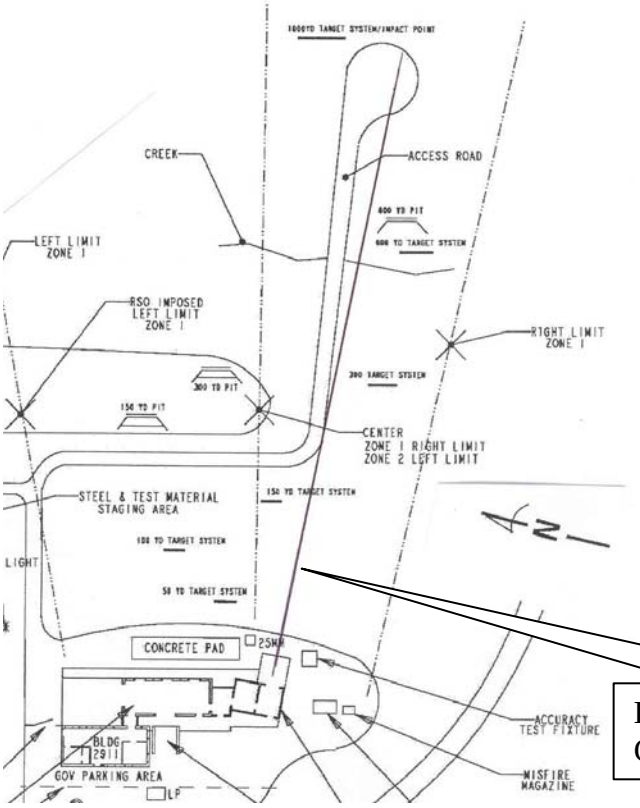
MK 11 MOD 0

Code 408 Range Test Set-ups	
	
Davis Vantage Pro 2 Weather Station	All Three Accuracy Fixtures (408 Range)
	
Oehler Velocity Screens	Oehler Chronographs and Davis VP2 Console
	
400 yard Target Set Up (T-Bar in front)	600 yard Target Set-Up (T-Bar below)

Crane Code 408 Outdoor Firing Range Results Summary
all rifles in same row fired within the same second of time
Averages shown are for all groups fired at that range from that rifle type

10 Shot Extreme Spread Data									
	DARPA M40XM-3			**SOCOM MK 13 MOD 5**			**SOCOM MK 11 MOD 0**		
	XM-3	**inches**	**MOA**	**MK13**	**inches**	**MOA**	**MK11**	**inches**	**MOA**
400 yards 1 MOA = 4.2 in.	824	12.75	3.03	888	7.00	1.67	077	9.50	2.26
	824supp	10.25	2.44	888supp	12.50	2.98	077supp	8.00	1.90
	824supp	9.75	2.32	888supp	3.90	0.93	077supp	15.60	3.71
	824supp	7.80	1.86	888supp	6.20	1.48	077supp	13.10	3.12
AVERAGE	**ES 400**	**10.15**	**2.41**	**ES 400**	**7.40**	**1.76**	**ES 400**	**11.55**	**2.75**
600 yards 1 MOA = 6.3 in.	263	11.55	1.83	888	15.75	2.5	058	13.00	2.06
	263	10.90	1.73	888	6.20	0.98	058	13.80	2.19
	263	9.90	1.57	888	10.60	1.68	058	11.40	1.81
	263supp	8.40	1.33	888supp	9.70	1.54	058supp	15.30	2.43
	263supp	9.60	1.52	888supp	4.25	0.67	058supp	14.80	2.35
	263supp	12.60	2.00	888supp	9.90	1.57	058supp	15.00	2.38
	263supp	12.90	2.05	888supp	6.90	1.10	058supp	9.00	1.43
	824	13.30	2.11	008	7.45	1.18	077	10.70	1.70
	824supp	9.95	1.58	008supp	11.20	1.78	077supp	15.70	2.49
	824supp	12.75	2.02	008supp	8.55	1.36	077supp	19.55	3.10
	824supp	26.25	2.58	008supp	19.05	3.02	077supp	29.55	4.69
	254	7.70	1.22	923	8.00	1.27	032	8.90	1.41
	254supp	10.60	1.68	923supp	7.00	1.11	032supp	10.10	1.60
	254supp	13.40	2.13	923supp	7.00	1.11	032supp	13.10	2.08
	254supp	12.00	1.90	923supp	9.50	1.51	032supp	13.20	2.10
AVERAGE	**ES 600**	**12.12”**	**1.92**	**ES 600**	**9.40”**	**1.49**	**ES 600**	**14.21”**	**2.26**
800 yards 1 MOA = 8.4 in.	824	9 hits	-----	888	12.90	1.54	077	15.0	1.79
	824	18.75	2.19	888	8.40	1.00	077	16.75	1.99
	824supp	19.60	1.81	888supp	17.40	2.07	077supp	missed	-----
	824supp	14.20	2.43	888supp	16.25	1.93	077supp	27.5	3.27
	824supp	13.00	2.35	888supp	16.75	1.99	077supp	25.4	3.02
	263	17.50	2.38	008	17.60	2.10	032	17.0	2.02
	263supp	16.45	1.43	008supp	23.75	2.83	032supp	21.9	2.61
	263supp	17.60	1.70	008supp	9.60	1.14	032supp	27.1	3.23
	263supp	16.50	2.49	008supp	15.10	1.80	032supp	28.5	3.39
AVERAGE	**ES 800**	**16.7”**	**1.99**	**ES 800**	**15.31”**	**1.82**	**ES 800**	**22.39”**	**2.67**
1000 yards 1 MOA = 10.5 in.	263supp	26.1	2.49	008supp	24.0	2.29	032supp	25.1	2.39
	263supp	20.9	1.99	008supp	13.9	1.32	032supp	33.4	3.18
	263supp	21.1	2.01	008supp	13.5	1.29	032supp	32.4	3.09
	263	27.9	2.66	008	33.2	3.16	032	14.0	1.33
	824supp	missed	-----	888supp	20.0	1.90	077supp	37.5	3.57
	824supp	25.9	2.47	888supp	11.25	1.07	077supp	37.6	3.58
	824supp	18.0	1.71	888supp	17.9	1.70	077supp	42.25	4.02
	824supp	14.75	1.40	make-up group - bad zero			--------	--------	------
	824	35.4	3.37	888	38.0	3.62	077	7 hits	-----
AVERAGE	**ES 1000**	**23.76”**	**2.26**	**ES 1000**	**21.47”**	**2.04**	**ES 1000**	**31.75”**	**3.02**

Code 408 and Camp Atterbury Range Layouts



Line represents direction of fire at Code 408 Range (East)

Camp Atterbury Range 06 Firing Direction is South alongside Airfield

Location of Target Area "Butts"

Weather Station Data Camp Atterbury 06	
Direction	**Angle (deg)**
N	**0 or 360**
NNE	**22.5**
NE	**45**
ENE	**67.5**
E	**90**
SES	**112.5**
SE	**135**
SSE	**157.5**
S	**180**
SSW	**202.5**
SW	**225**
WSW	**247.5**
W	**270**
WNW	**292.5**
NW	**315**
NNW	**337.5**

Camp Atterbury Range 6 Test Set-ups for 1200 yard Firing

Concrete Pad Fixture Mounting

Chronographs and 4 Davis Consoles

View of lowered Target in "Butts"

Rear View of "Butts" Target Position

1200 yard Camp Atterbury Firing Results Summary
(1 MOA equals 12.6 inches at 1200 yards)

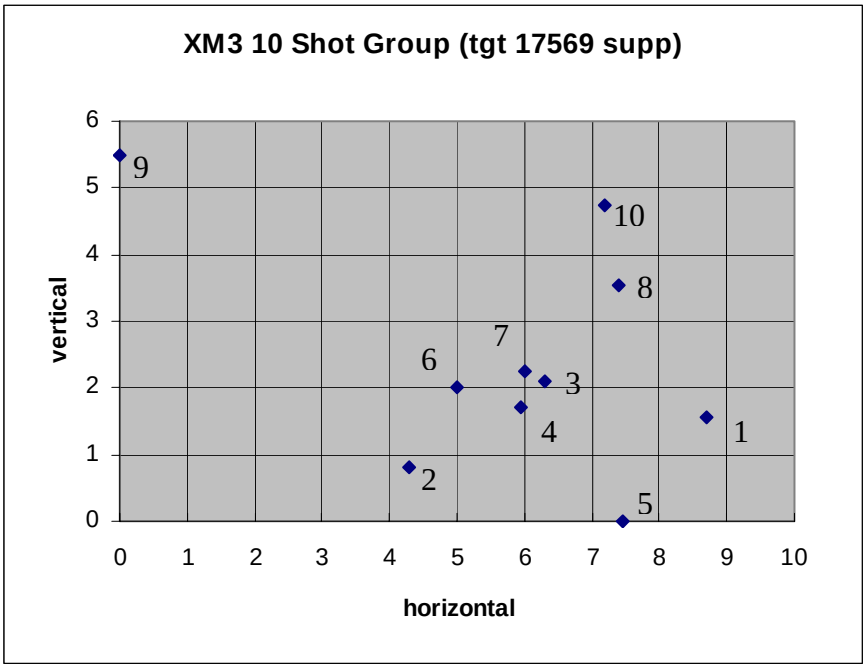
Note: Windy conditions (10 to 20 mph) did not allow for capture of all shots in group at 1200 except for 2 complete 10 shot groups			
1200 yards	**XM-3 (263)**	**MK 13 (008)**	**MK 11 (077)**
Unsuppressed (4/3/07)	**ES= 58.25 inches (all 10)** **ES= 4.62 MOA**	ES= 32.9 inches (8 shots) Lost shots 9 & 10	All shots missed target
	ES= 49.25 inches (8 shot) Lost shots 3 & 8	ES= 30.75 inches (7 shot) Lost shots 1, 3, & 4	ES= 41.1 inches (4 shots) Only 3, 4, 6 & 7 hit
	Only had 3 hits	Only had 3 hits	ES= 41.75 inches (5 shots) Only shots 5, 6, 7, 8 & 9
Suppressed (4/3/07)	ES= 56.25 inches (6 shot) 4, 7 & 8 hit plus three	ES= 55.9 inches (5 shot) Only 1, 2, 3, 4, & 10	ES= 42.25 inches (4 shot) Only shots 3, 5, 6, &10
(4/4/07)	ES= 59.25 inches (8 shot) Shots 6 & 9 missed	ES= 29.1 inches (4 shot) Only shots 1, 2, 3, & 4	Could not get zeroed (wind issues)
(4/4/07)	ES= 26.6 inches (7 shot) Lost shots 7, 8 & 10	ES= 15.75 inches (5) Includes shots 1 – 5	----------
(4/4/07)	Only 9 & 10 hit target	**ES= 55.6 inches (all 10)** **ES = 4.41 MOA** ES= 21.5 in. for 1st 5 shts	----------

Complete Test Data Set for 2 Firing Cycles at 600 Yards

North is to the negative X direction (North wind blows to positive X) East Wind blows opposite direction of firing (from East)
The Lettered Wind Direction Indicators can be translated into an angular measure (22.5 degree segments of 360 deg circle)
This will allow for calculated application of vectored wind influence on the projectile (full value for 90 deg cross wind, half value for 45 degree, etc.)
Any wind components toward or away from the direction of fire can raise or lower projectile impact accordingly (as will muzzle velocity changes)

3/23/2007	Firing Line		200 yards		400 yards		600 yards											
	Wind	Wind	Wind	Wind	Wind	Wind	Wind	Wind	Shot	Muz			Muz			Muz		
Time	Speed	Dir	Speed	Dir	Speed	Dir	Speed	Dir	Number	Vel	XM 3		Vel	MK13		Vel	MK11	
Tgt 17569											X	Y		X	Y		X	Y
8:41 AM	3	W	4	W	5	W	3	WNW	1	2510	8.70	1.55	2879	3.70	1.40	2570	4.25	3.45
8:44 AM	5	WSW	1	W	7	W	3	W	2	2546	4.30	0.80	2906	2.55	2.30	2581	6.80	0.00
8:45 AM	8	WSW	6	W	5	WSW	5	WSW	3	2557	6.30	2.10	2884	1.95	1.90	2601	4.95	4.45
8:46 AM	3	W	6	SSW	2	WSW	3	WNW	4	2561	5.95	1.70	2887	0.20	0.00	2608	6.90	9.75
8:47 AM	6	W	1	SSW	4	W	3	NW	5	2557	7.45	0.00	2881	3.40	1.25	2579	3.90	7.20
8:48 AM	5	SW	4	WSW	2	SW	3	SW	6	2604	5.00	2.00	2887	2.80	1.75	2595	4.90	5.75
8:49 AM	6	SW	3	SW	2	WNW	3	W	7	2564	6.00	2.25	2904	0.00	3.40	2588	9.40	13.90
8:51 AM	3	WSW	5	W	2	WSW	2	W	8	2546	7.40	3.55	2901	1.75	2.25	2590	7.80	11.55
8:52 AM	2	SSW	3	W	1	W	4	W	9	2586	0.00	5.50	2909	0.30	3.10	2595	3.90	4.25
8:53 AM	2	SW	1	WNW	2	W	3	W	10	2546	7.20	4.75	2909	0.05	0.70	2583	0.00	2.30
										ES	9.55 in.		ES	4.2 in.		ES	14.93 in.	
										MR	2.18 in.		MR	1.53 in.		MR	4.10 in.	
									Shot	Muz			Muz			Muz		
									Number	Vel	XM 3		Vel	MK13		Vel	MK11	
Tgt 17570											X	Y		X	Y		X	Y
9:13 AM	6	SW	4	WSW	5	W	5	SW	1	2568	2.50	4.30	2904	1.60	3.55	2608	0.00	10.90
9:15 AM	3	W	4	WSW	3	S	5	W	2	2570	7.10	7.40	2904	7.00	0.00	2599	10.45	0.00
9:16 AM	4	WSW	3	SW	3	NNW	3	W	3	2564	2.50	4.90	2904	4.60	3.40	2610	5.25	9.70
9:17 AM	4	W	2	W	4	W	2	W	4	2564	11.75	0.00	2890	7.05	1.75	2588	6.80	8.45
9:18 AM	5	WSW	2	W	3	W	4	WNW	5	2553	5.40	2.25	2923	6.05	7.10	2608	6.90	6.75
9:19 AM	3	W	4	W	6	W	3	W	6	2583	9.05	6.00	2909	4.00	3.80	2599	5.75	7.90
9:20 AM	4	WSW	4	W	4	WNW	4	WSW	7	2572	5.25	6.40	2946	6.50	6.45	2599	8.00	6.25
9:21 AM	1	SW	3	WSW	5	W	4	W	8	2575	0.00	4.75	2964	0.00	6.90	2592	4.25	4.60
9:22 AM	5	SW	1	WSW	3	WSW	1	WNW	9	2579	6.45	8.75	2915	3.00	4.40	2601	1.55	5.30
9:23 AM	3	SW	1	S	2	W	4	WSW	10	2579	5.40	8.90	2904	4.50	0.60	2604	6.10	6.60
										ES	12.67 in.		ES	9.83 in.		ES	15.1 in.	
										MR	3.74 in.		MR	2.88 in.		MR	3.29 in.	

Example Target Plot

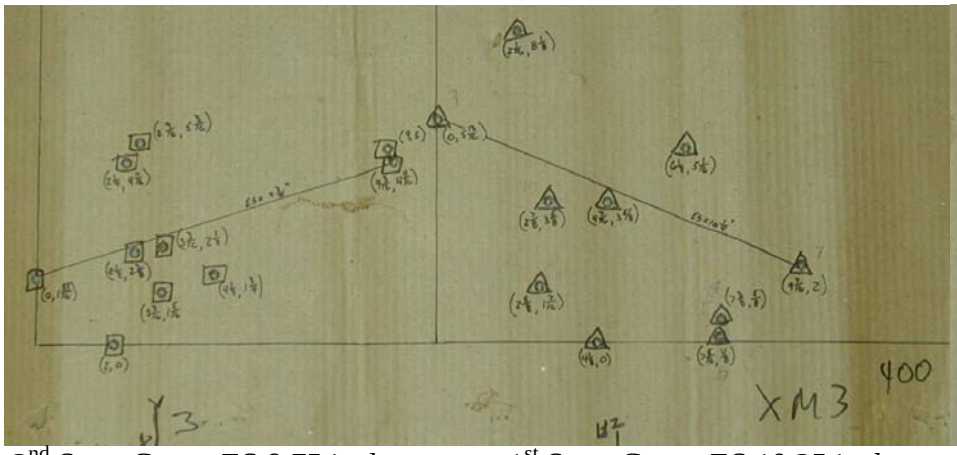


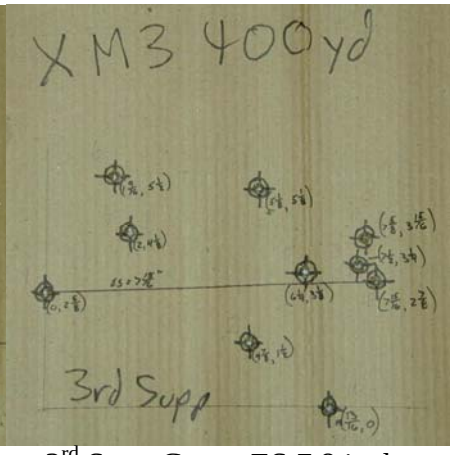
Shot Location Data and Mean POI and Mean Radius Calculations (inches)

Shot	Muzzle	XM 3				
#	Velocity	X	Y	Xdiff	Ydiff	Rad
1	2510	8.70	1.55	2.87	-0.87	3.00
2	2546	4.30	0.80	-1.53	-1.62	2.23
3	2557	6.30	2.10	0.47	-0.32	0.57
4	2561	5.95	1.70	0.12	-0.72	0.73
5	2557	7.45	0.00	1.62	-2.42	2.91
6	2604	5.00	2.00	-0.83	-0.42	0.93
7	2564	6.00	2.25	0.17	-0.17	0.24
8	2546	7.40	3.55	1.57	1.13	1.93
9	2586	0.00	5.50	-5.83	3.08	6.59
10	2546	7.20	4.75	1.37	2.33	2.70
	Avg	**5.83**	**2.42**	**1.64**	**1.31**	**2.18**
				Xdifavg	**Ydifavg**	**MR**

The average of all the X and Y coordinates gives the location of the Mean Point of Impact (MPI = Center of Group). Xdiff and Ydiff above are the distances from the Average X and Y values. Xdifavg and Ydifavg are the averages of the absolute values of those "diff " #'s. "Rad" is the radial distance from each shot location as measured from the MPI. The MR is the average of all these "Rads". It is a more meaningful number than the Extreme Spread (ES) which only compares the two farthest apart shots. As can be seen in the XM-3 example plot shot 9 approx. doubles the group size. The # 9 shot influence on MR is less significant. If # 9 is completely removed from the group the MR would drop to 1.69 inches and the MPI would change to X= 6.48" and Y=2.08" (Avg diffs drop to X 1.08" and Y 0.96") .

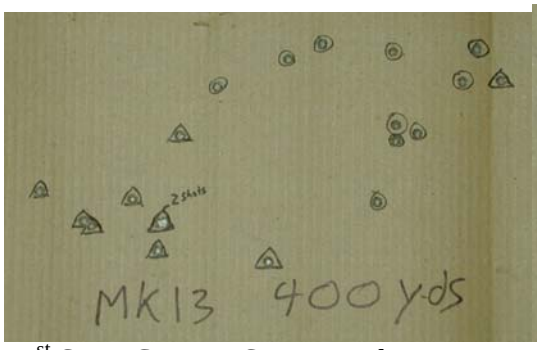
400 yard Targets

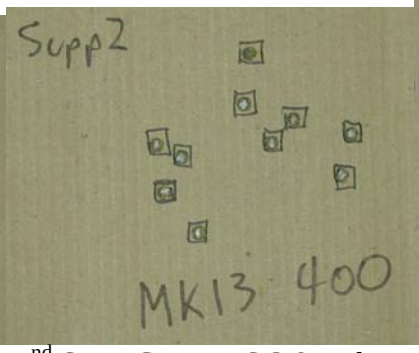


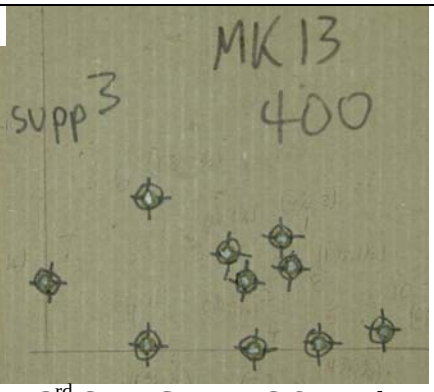


2nd Supp Group ES 9.75 inches 1st Supp Group ES 10.25 inches 3rd Supp Group ES 7.8 inches

XM3 SN 824 Targets Above - Unsuppressed not shown is ES 12.75 inches

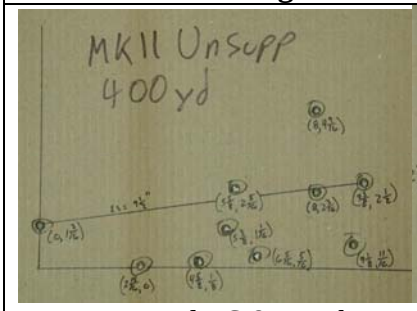


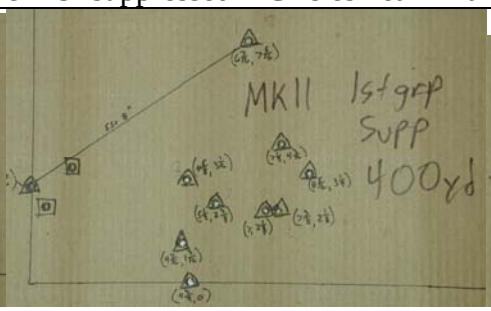


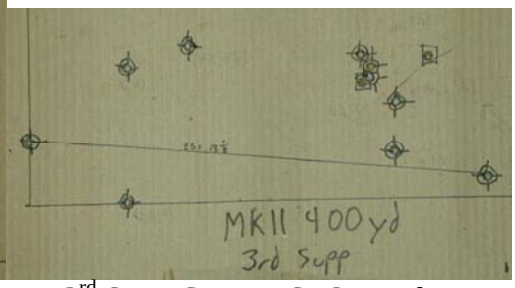


1st Supp Group ES 12.5 inches 2nd Supp Group ES 3.9 inches 3rd Supp Group ES 6.2 inches

MK 13 SN 888 Targets Above – Unsuppressed = Circles near Triangles ES 7.0 inches



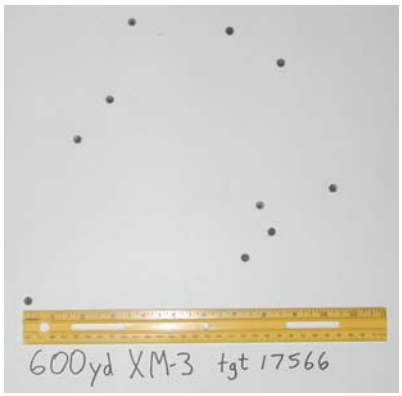
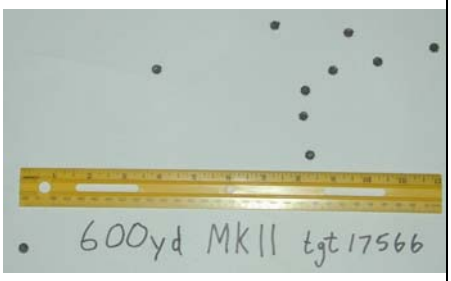
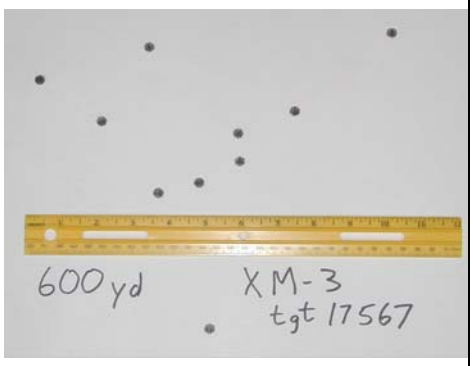
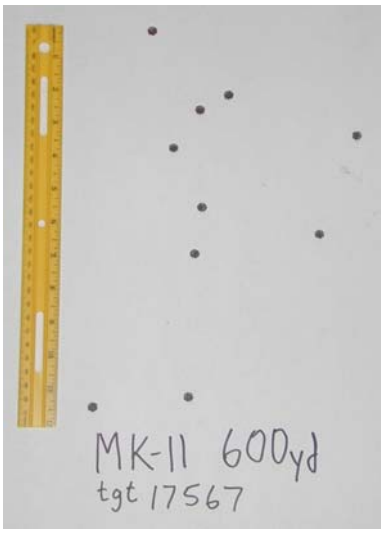
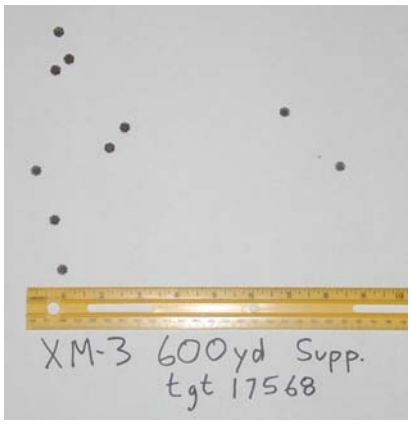




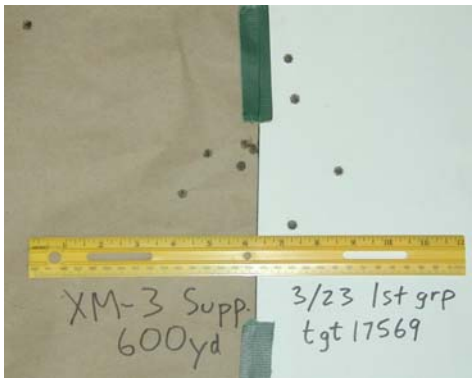
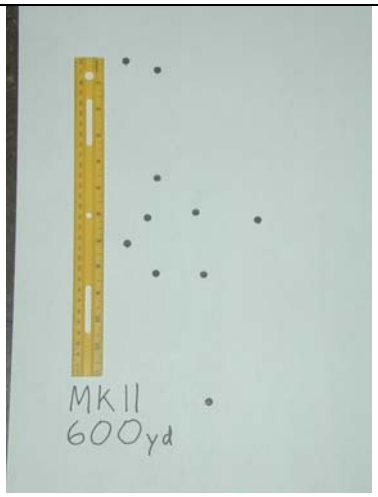
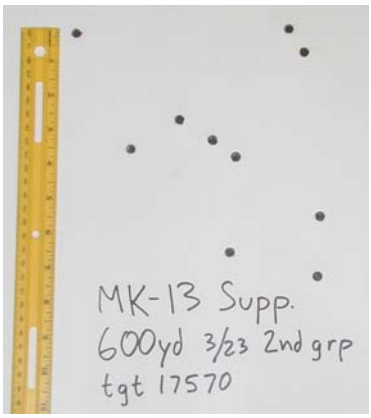
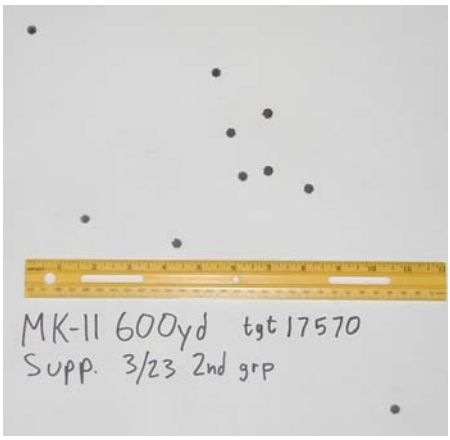
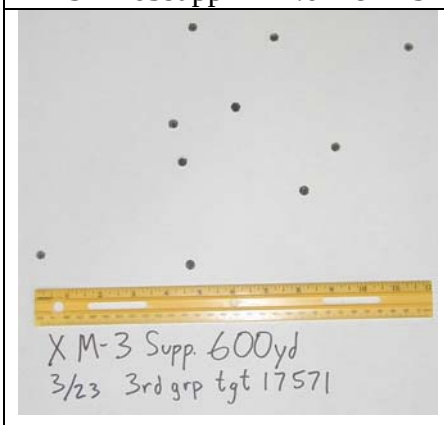
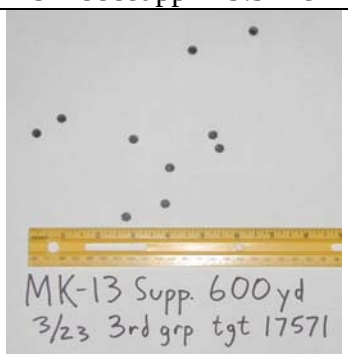
Unsuppressed ES 9.5 inches 1st Supp Group ES 8.0 inches 3rd Supp Group ES 13.1 inches

MK 11 SN 824 Targets Above - 2nd Group Suppressed not shown ES 15.6 inches

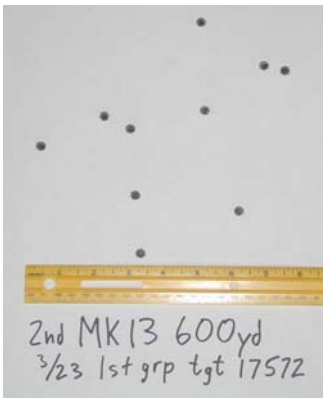
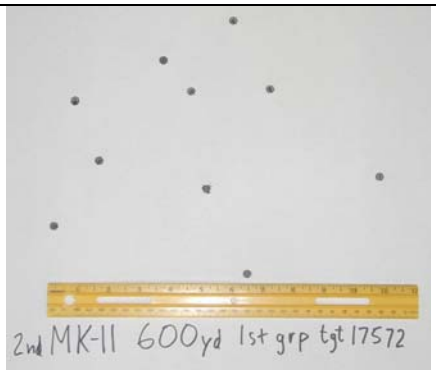
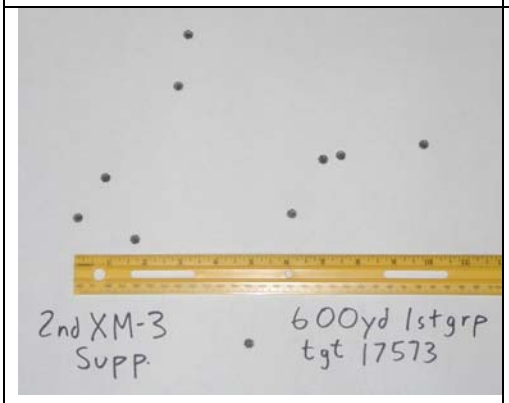
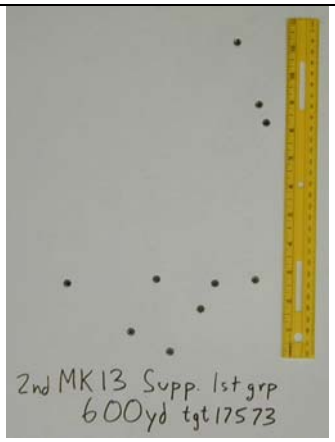
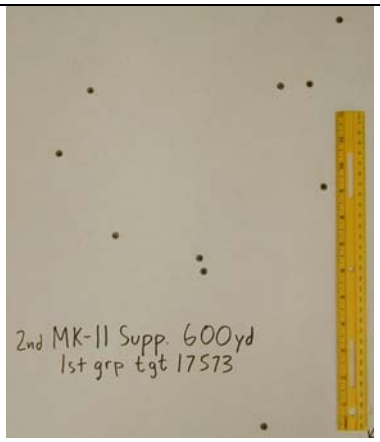
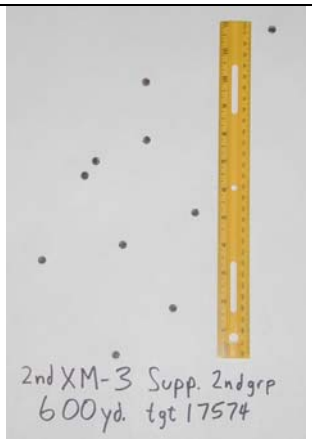
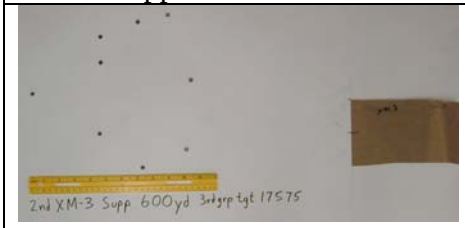
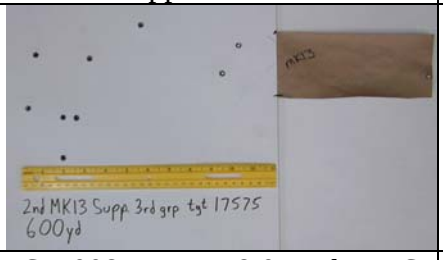
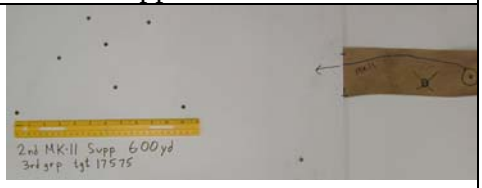
600 Yard Targets (1st set of rifles)

		
SN 263 - 11.55 inch ES	SN 888 - 15.75 inch ES	SN 058 - 3.0 inch ES
		
SN 263 - 9.9 inch ES	SN 888 - 10.6 inch ES	SN 058 - 11.4 inch ES
		
SN 263supp – 8.40 inch ES	SN 888supp – 9.70 inch ES	SN 058supp – 15.3 inch ES

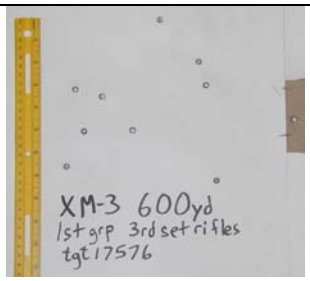
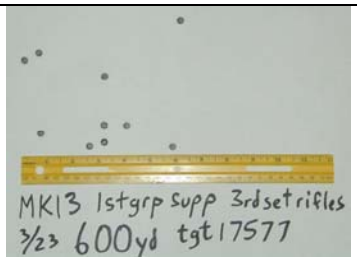
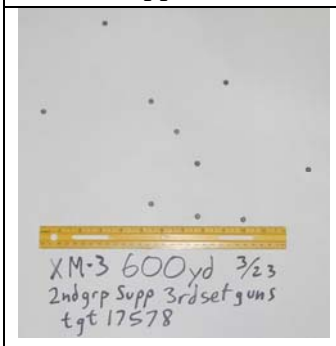
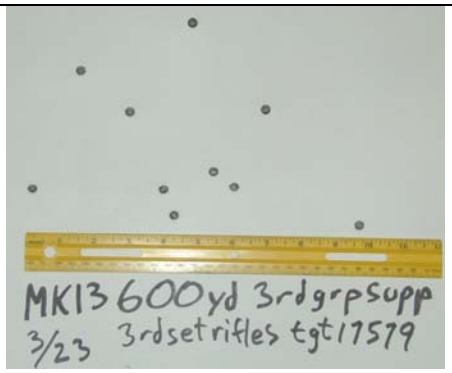
600 Yard Targets (1st set of rifles)

		
SN 263supp – 9.6 inch ES	SN 888supp – 4.25 inch ES	SN 058supp – 14.8 inch ES
		
SN 263supp – 12.6 inch ES	SN 888supp – 9.9 inch ES	SN 058supp – 15.0 inch ES
		
SN 263supp – 12.9 inch ES	SN 888supp – 6.9 inch ES	SN 058supp – inch ES

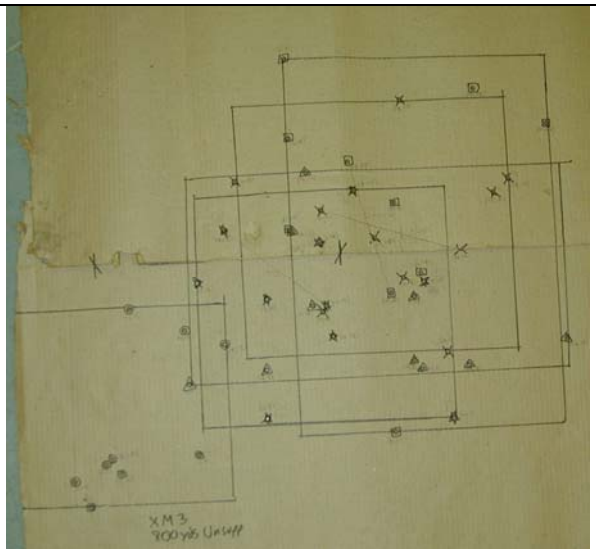
600 Yard Targets (2nd set of rifles)

		
SN 824 - 13.3 inches ES	SN 008 – 7.45 inches ES	SN 077 – 10.7 inches ES
		
SN 824supp - 9.95 inches ES	SN 008supp – 11.2 inches ES	SN 077supp – 15.7 inches ES
		
SN 824supp - 12.75 inches ES	SN 008supp – 8.55 inches ES	SN 077supp – 19.55 inches ES
		
SN 824supp - 26.25 inches ES	SN 008supp – 19.05inches ES	SN 077supp – 29.55 inches ES

600 Yard Targets (3rd set of rifles)

		
SN 254 – 7.7 inches ES	SN 923 – 8.0 inches ES	SN 032 – 8.9 inches ES
		
SN 254supp – 10.6 inches ES	SN 923supp – 7.0 inches ES	SN 032supp – 10.1 inches ES
		
SN 254supp – 13.4 inches ES	SN 923supp – 7.0 inches ES	SN 032supp – 13.1 inches ES
		
SN 254supp – 12.0 inches ES	SN 923supp – 9.5 inches ES	SN 032supp – 13.2 inches ES

800 Yard Targets (1st set of rifles)



XM3- SN 824

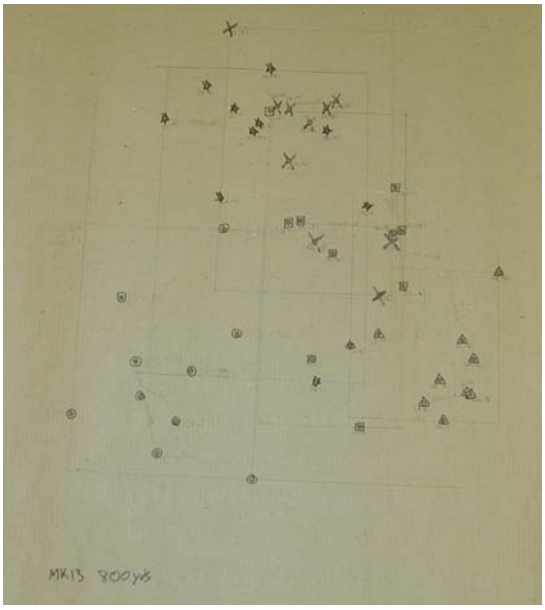
Circles = 1st Unsupp ES 10.1”
(Only contains 9 shots – lost 1)

Triangles = 2nd Unsupp ES 18.75”

Squares = 1st Supp ES 19.6”

Stars = 2nd Supp ES 14.2”

X = 3rd Supp ES 13.0”



MK13- SN 888

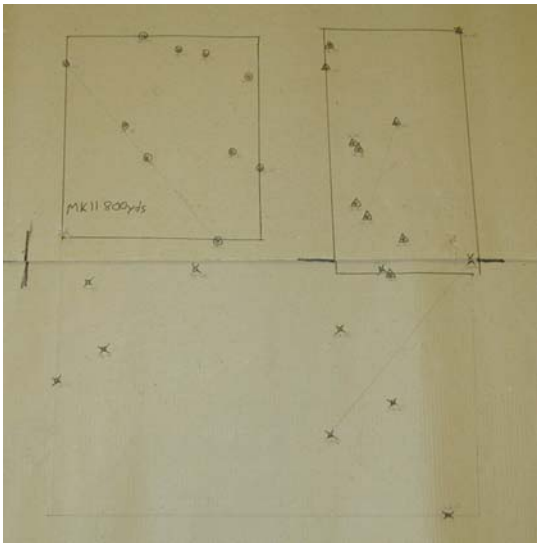
Circles = 1st Unsupp ES 12.9”

Triangles = 2nd Unsupp ES 8.4”

Squares = 1st Supp ES 17.4”

Stars = 2nd Supp ES 16.25”

X = 3rd Supp ES 16.75”



MK 11 – SN 077

Circles = 1st Unsupp ES 15.0”

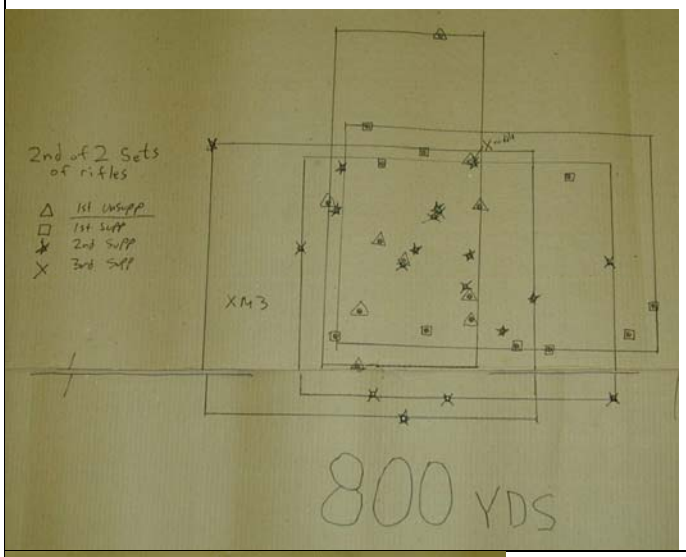
Triangles = 2nd Unsupp ES 16.75”

Squares = 1st Supp missed target/NA

Stars = 2nd Supp ES 27.5”

X = 3rd Supp 25.4”

800 Yard Targets (2nd set of rifles)



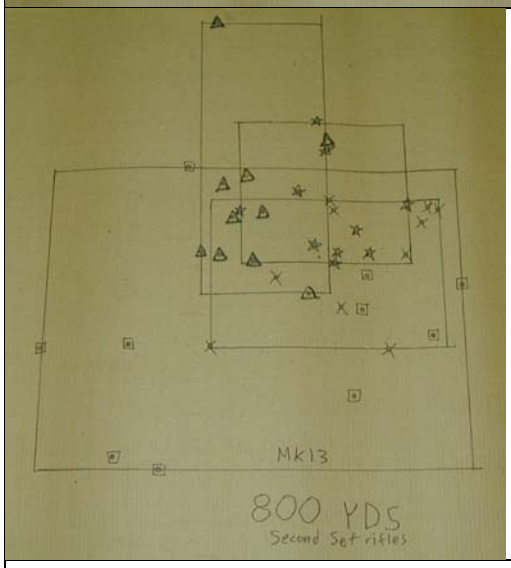
XM 3 SN263

Triangles = Unsuppressed ES 17.5”

Squares = 1st Supp ES 16.45”

Stars = 2nd Supp ES 17.6”

X = 3rd Supp ES 16.5”



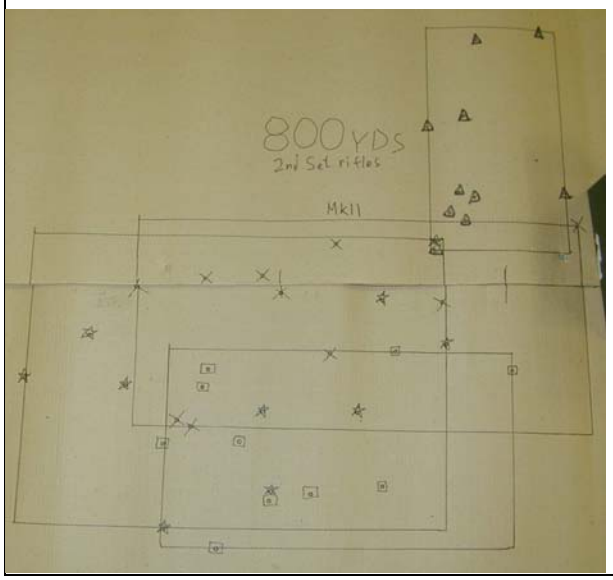
MK 13 SN 008

Triangles = Unsuppressed ES 17.6”

Squares = 1st Supp ES 23.75”

Stars = 2nd Supp ES 9.6”

X = 3rd Supp ES 15.1 ”



MK 11 SN 032

Triangles = Unsuppressed ES 17.0”

Squares = 1st Supp ES 21.9”

Stars = 2nd Supp ES 27.1”

X = 3rd Supp ES 28.5”

1000 XM 3 targets (1st set of rifles)

XM 3 SN263

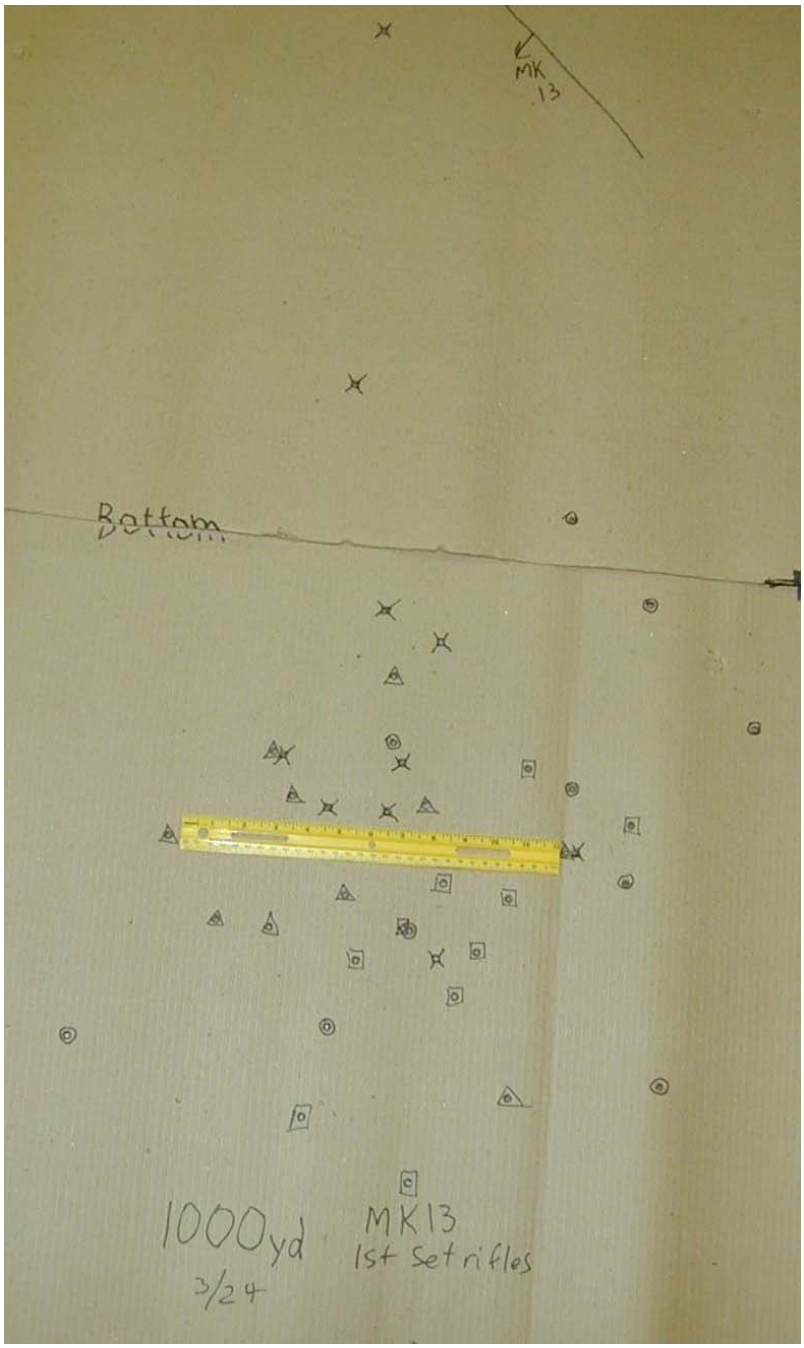
Circles= 1st Supp ES 26.1”

Triangles = 2nd Supp ES 20.9”

Squares = 3rd Supp ES 21.1”

X= Unsupp ES 27.9”

1000 yard MK 13 Targets (1st set of rifles)



MK13 SN 008

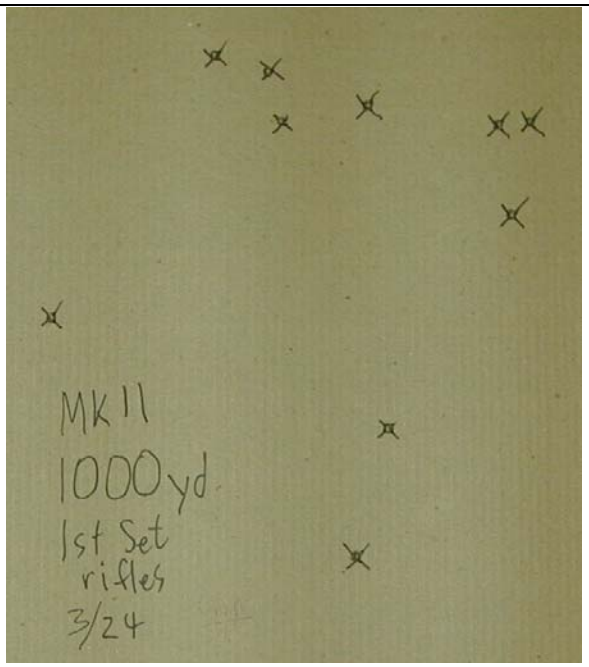
Circles= 1st Supp ES 24.0”

Triangles = 2nd Supp ES 13.9”

Squares = 3rd Supp ES 13.5”

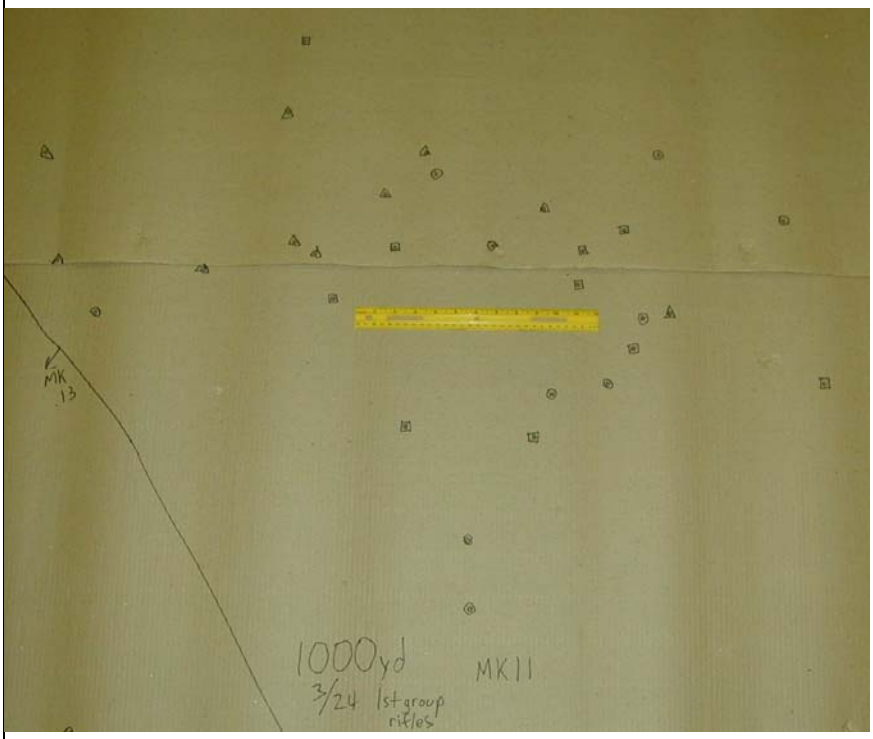
X= Unsupp ES 33.2”

1000 yard MK 11 Targets (1st set of rifles)



<u>MK 11 SN 032</u>

Unsuppressed ES 14.0”



Circles= 1st Supp ES 25.1”

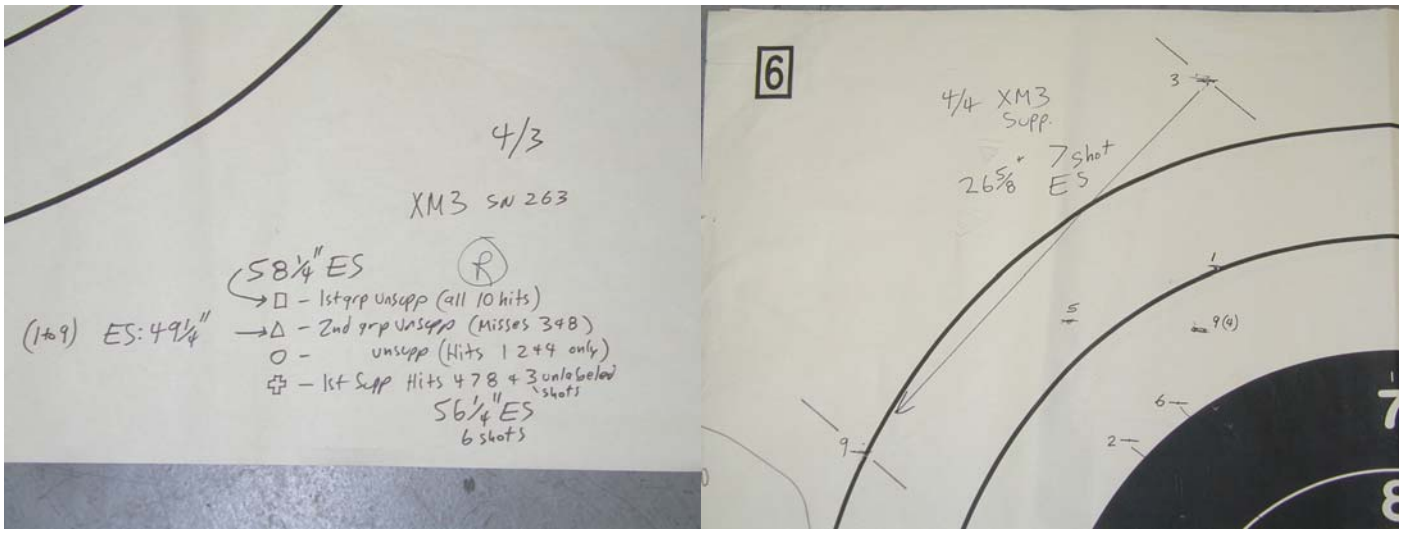
Triangles = 2nd Supp ES 33.4”

Squares = 3rd Supp ES 32.4”

MK 13 Targets from 1200 yard Firing

As seen above the best 5 consecutive shots fired were from the MK 13 (ES: 15.75 inches)

XM3 Targets from 1200 yard Firing



MK 11 Target from 1200 yard Firing