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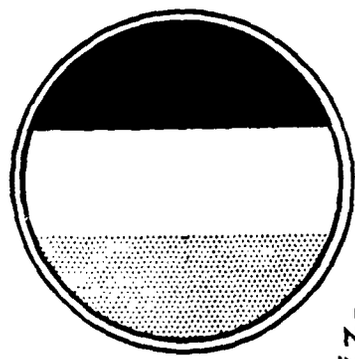
UNITED STATES ARMY INFANTRY BOARD

FORT BENNING, GEORGIA

REPORT OF PROJECT



PROJECT NR 2787 (Winchester) DATE 14 July 1958

EVALUATION OF SMALL CALIBER HIGH VELOCITY RIFLES - WINCHESTER

(DA PROJECT 502-08-006)

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UNITED STATES ARMY INFANTRY BOARD
Fort Benning, Georgia

UNCLASSIFIED

REPORT OF PROJECT NR 2787
EVALUATION OF SMALL CALIBER HIGH VELOCITY RIFLES - WINCHESTER
(DA PROJECT 502-08-006) (U)

14 July 1958

1. (UNCLASSIFIED) AUTHORITY.

a. Directive.--Ltr, ATDEV-3 474/4 (24 Feb 58), USCONARC, 24 Feb 58, subject: "Evaluation of Small Caliber High Velocity Rifles."

b. Purpose.--To determine the potential of the Winchester Small Caliber High Velocity Rifle to replace the M-14 and M-15 rifles.

c. Scope.--The temperate phase tests of this project were conducted by the United States Army Infantry Board. The United States Army Arctic Test Board will conduct arctic phase tests. Separate reports of project will be submitted to United States Continental Army Command by each test agency.

2. REFERENCES.

a. (CONFIDENTIAL) Report of Project Nr 2709, Board Nr 3, CONARC, 28 Nov 55, Evaluation of M2 Carbine Modified to Fire High Velocity Caliber .22 Cartridge (C).

b. (UNCLASSIFIED) Report of Project Nr 2726, Board Nr 3, CONARC, 29 May 56, Evaluation of Light Weight Rifles.

c. (UNCLASSIFIED) Report of Project Nr 2743, US Army Inf Bd, 26 Jul 57 (Subject classified SECRET).

d. (UNCLASSIFIED) Paragraph 237a(1), Combat Development Objective Guide, USCONARC, 1957.

e. (UNCLASSIFIED) FM 23-7, Jan 52, subject: "Carbine Caliber .30 M1, M1A1, M2 and M3."

3. (UNCLASSIFIED) DESCRIPTION OF MATERIEL.

a. Control Rifle.--The M-14 rifle, hereinafter referred to as the control rifle or M-14, is a production model weapon of United States

[redacted]

e. 65 ... 65 [redacted]

[redacted]

[redacted]

fabrication. It is a new weapon and essentially the same as [redacted] in reference 2b.

[redacted]

b. Test Rifle.

(1) The Winchester rifle, hereinafter referred to as the test rifle, is a prototype weapon developed by the Winchester-Western Division of Olin Mathieson Chemical Corporation, New Haven, Connecticut. It fires, selectively semiautomatic-automatic, a caliber .224 lead cored round.

(2) The test rifle functions essentially the same as the Carbine, Caliber .30, M2 (see ref 2e), the only exception being that the safety, which is located at the rear of the receiver, functions by withdrawing the hammer from the sear.

c. Control Ammunition.--Cartridge, Ball, 7.62mm, M59, Lot Nr LC 12011, hereinafter referred to as the control round or M59, is a standard item currently issued for use with United States standard 7.62mm weapons.

d. Test Ammunition.--Cartridge, Ball, Cal .224, Winchester, E2, hereinafter referred to as the test ammunition or the Winchester Cal .224, is a lead cored round developed by Winchester-Western Division of Olin Mathieson Chemical Corporation. This cartridge fires a 53 grain projectile at a muzzle velocity of 3300 ft/sec.

4. BACKGROUND.

a. (CONFIDENTIAL) In 1952, Ordnance began investigating high velocity small caliber cartridges for use in rifles and carbines. In 1955, this Board conducted an evaluation of an M-2 carbine modified to fire a high velocity caliber .22 cartridge (ref 2a). The resulting report of project recommended that investigation of the high velocity, small caliber principle be given a high priority and that a lightweight rifle using this principle be developed. On 26 July 1957, this Board forwarded to USCONARC draft military characteristics for rifles of small caliber firing high velocity ammunition.

b. (UNCLASSIFIED) The test rifle is not proposed for Tripartite Standardization.

5. (CONFIDENTIAL) SUMMARY OF TESTS.--The Winchester rifle was tested to determine its characteristics and compare them with those of the standard M-14 rifle.

a. The test and control rifles are comparable in these respects:

(1) Ease of Assembly and Disassembly.

[redacted]

[redacted]

(2) Organizational Maintenance.

(3) Accuracy - Semiautomatic (Bench Rest).

(4) Accuracy - Automatic.

(5) Transition Firing.

(6) Reliability under Simulated Combat Conditions.

(7) Adverse Conditions.

b. The test rifle is superior to the control rifle in:

(1) Lightness of weight.

(2) Ease of Handling.

c. The test rifle-ammunition combination is inferior to the control rifle-ammunition combination in these respects:

(1) Penetration.

(2) Sights.

(3) Position Disclosing Effects.

6. (CONFIDENTIAL) DISCUSSION.

a. Initially, the malfunction rate of the test weapon was very high when compared to that of the control weapon. Modifications performed by a representative of the Winchester Corporation reduced the malfunction rate to that comparable to the control rifle.

b. The test round meets the requirement for penetration stated in the United States Army Infantry Board's Draft Military Characteristics for a Rifle of High Velocity and Small Caliber (ref 2c).

c. An analysis of Test Nr 9 (app I) shows:

(1) A significantly less capability of the test round to penetrate various mediums, as compared to the control round.

(2) That the projectile of the test round is considerably deflected when fired through brush, however, this is considered a minor deficiency.

(3) That the projectile of the test round has a tendency to disintegrate when fired into brush, sand, etc.

[redacted]

[redacted]

d. It is the opinion of this Board that the penetrating capability of the test round would be greatly enhanced if a steel core was substituted for the currently used lead core and/or if the bullet jacket was increased in thickness.

e. Firing at ranges over 500 yards with the test round, conducted in addition to that reported in Appendix I, indicates that the test rifle, if using ammunition of improved penetrating capability and equipped with an optical sight, would fill sniper requirements.

f. Equipping the test rifle with an integral flash suppressor should result in reduction of muzzle flash comparable to that obtained with the control rifle with its integral flash suppressor.

g. The results of Test Nr 6, Transition Firing, indicate that a marked increase in the number of hits per unit of time is possible with the test rifle.

7. (CONFIDENTIAL) CONCLUSIONS.--The United States Army Infantry Board concludes that:

a. The Winchester rifle is a potential replacement for the M-14 rifle.

b. The Winchester rifle equipped with a bipod and hinged butt plate should be a potential replacement for the M-15 rifle.

c. The penetrating capability of the test round is significantly less than that of the control round and should be improved.

8. (CONFIDENTIAL) RECOMMENDATIONS.--The United States Army Infantry Board recommends that:

a. The Winchester rifle be considered a potential replacement for the M-14 and M-15 rifles.

b. Development be expedited to provide a round for the Winchester rifle that has greater resistance to bullet disintegration and better penetrating characteristics.

c. The following items be furnished for service test:

(1) Eight Winchester rifles modified to correct the deficiencies reported in Appendix II (three of these rifles to be equipped with hinged butt plate and bipod).

[redacted]

[redacted]

(2) Sufficient quantities of improved ammunition for use with the Winchester rifles.

Henry B. Kunzig

HENRY B. KUNZIG
Colonel, Infantry
President

Appendixes:

I Details of Test
II Deficiencies and Suggested Modifications
III Photographs

[redacted]

[redacted]

Report of Project Nr 2787 - Winchester

Test Nr 1, PHYSICAL CHARACTERISTICS.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the physical characteristics and the operation of the test and control rifles.

2. (UNCLASSIFIED) METHOD.

a. Test and control rifles were weighed and measured, and the resulting data was recorded. Photographs are attached as Appendix III.

b. Operation of the control rifle was determined by analysis of descriptive material furnished by the Chief of Ordnance. Operation of the test rifle was determined by physical inspection and explanation and demonstration conducted by a representative of the developer.

3. RESULTS.

a. (CONFIDENTIAL) Weights (lb):

	M-14	Winchester
Rifles (less sling, magazines and accessories)	8.34	5.19
Magazine (empty)	(0.54)	(0.19)
Magazine (loaded - 20 rds)	1.61	0.68
Sling (M-1)	0.31	None furnished
Accessories	None	None
Totals: w/20 rd mag	10.26	5.87

RELATIVE BATTLE LOAD (LBS):

	M-14	Winchester
Rifle w/100 rds in five 20 rd magazines plus 120 rds (Total - 220 rds)	22.39	
Rifle w/100 rds in five 20 rd magazines plus 120 rds (Total - 220 rds)		12.07
Rifle w/100 rds in five 20 rd magazines plus 552 rds (Total - 654 rds)		22.39

Note: Weight of bandoleers, clips, etc, are not included in the above comparison.

[redacted]

[redacted]

CARTRIDGE:

	M-59	Winchester Cal .224
Case	184 gr	94 gr
Propellant	45 gr	25 gr
Projectile	147 gr	53 gr

b. (UNCLASSIFIED) Dimensions (inches):

	M-14	Winchester
Overall length	44.19	37.63
Barrel length	22.00	20.00
Overall height	7.63	7.00
Sight radius	26.75	23.13

c. (UNCLASSIFIED) Operation.

(1) Control Rifle.--Functioning and operation of the control rifle was determined to be the same as similar rifles previously tested and reported by this Board (ref 2b).

(2) Test Rifle.--Functioning and operation of the test rifle was determined to be similar to that of the M2 carbine (ref 2e).

4. (CONFIDENTIAL) SPECIAL OBSERVATIONS RELATING TO THE TEST WEAPON.

a. The weapon cannot be put on safe when the bolt is open.

b. The weapon cannot be loaded or unloaded when on safe.

c. The safety is awkward to handle and makes an audible noise when moved.

d. The safety projects from the weapon in such a manner as to catch on brush, wire, etc.

e. The safety when on "safe" closes an opening in the receiver and thus helps to keep out dirt and dust.

[redacted]

[redacted]

Test Nr 2, EASE OF DISASSEMBLY AND ASSEMBLY

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the ease of disassembly and assembly, and difficulties of training therein for test and control rifles.

2. (UNCLASSIFIED) METHOD.

a. Using appropriate Ordnance publications and advice furnished by the developer as guides, test personnel were instructed in procedures to be followed in disassembling and assembling the test and control weapons.*

b. Twelve test personnel were given four hours of preliminary training and familiarization with each type rifle. After familiarization, each individual performed three field stripping and assembly operations with each type rifle. Each operation was timed and average times computed.

c. Test and control rifles were thoroughly cleaned and properly lubricated prior to conducting time trials in this test.

d. Throughout all test firing, difficulties encountered in disassembly and assembly of test weapons were recorded.

3. RESULTS.

a. (UNCLASSIFIED) Number of parts handled by the soldier in field stripping:

M-14 - 11.
Winchester - 11.

b. (UNCLASSIFIED) Time Required (seconds):

	M-14	Winchester
(1) Disassembly	35.4	28.3
(2) Assembly	92.7	84.8

c. (CONFIDENTIAL) Special Observations Relating to the Test Weapon:

(1) The rocker drops out of the weapon during disassembly and is easily lost. (Making the rocker an integral part of the receiver should eliminate this problem.)

*NOTE: No combination tool was furnished for either type weapon. A wrench is required to disassemble and assemble the control rifle. (Loosen or tighten the gas plug.) No aids are required for disassembling or assembling the test rifle.

[redacted]

[redacted]

(2) Reversibility of Parts:

(a) The weapon can be assembled with the rocker improperly positioned (causes the weapon to fire automatic on the semiautomatic setting).

(b) The magazine spring can be incorrectly assembled (causes failures to feed). Since completion of the test the springs have been clamped to the follower thus eliminating this problem.

Test Nr 3, ORGANIZATIONAL MAINTENANCE.

1. (UNCLASSIFIED) PURPOSE.--To determine whether organizational maintenance of the test rifle can be readily accomplished, to review the maintenance package, to accumulate parts usage data, and to compare the data with that of the control rifle.

2. (UNCLASSIFIED) METHOD.--Throughout all tests, data was recorded which pertained to the ease of care, cleaning, and maintenance of the test and control rifles.

3. (UNCLASSIFIED) RESULTS.

a. No cleaning or maintenance package (cleaning rods, chamber cleaning tools, combination tools, etc) was received for the test or control rifles. Necessary spare parts accompanied each shipment.

b. A combination tool, chamber brush, and cleaning rod will be required for proper maintenance of the test and control rifles. No special tools are required for organizational maintenance.

c. Time required to clean the test and control rifles using improvised maintenance equipment was comparable.

d. Parts Breakage:

(1) M-14 - 1 hand guard, 1 retainer spring for roller on the bolt.

(2) Winchester - 4 trigger housings, 1 hand guard, and 1 gas cylinder.

e. Special Observations Pertaining to the Test Rifle:

(1) The developer recommended a special lubricant known as "Molykote" be used on the slide tracks on the barrel.

(2) The finish on the rifles and magazine follower is inadequate to prevent rust and corrosion (Test Nr 8).

[redacted]

[redacted]

(3) The cracked gas cylinder (see app III-5) was discovered after the completion of all tests. When the crack occurred and what caused it is unknown.

4. (UNCLASSIFIED) ANALYSIS.--Organizational maintenance can be readily accomplished for the test and control rifles. However, the test rifles require additional maintenance due to inadequate finish and requirement for special lubricant.

Test Nr 4, ACCURACY - SEMIAUTOMATIC.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the accuracy of the test and control rifles in semiautomatic fire.

2. (UNCLASSIFIED) METHOD.

a. Using a bench rest, each of four experienced riflemen fired the following with two of each type rifles:

(1) After zeroing, three 10-round groups at 300 yards ("A" target).

(2) After zeroing, three 10-round groups at 500 yards ("B" target).

b. Center of impact, maximum spread, and mean radius were computed and recorded for each shot group. The average of these measurements for each type rifle was determined.

3. (CONFIDENTIAL) RESULTS.--Average mean radius and maximum spread (inches):

	300 Yds		500 Yds	
	MR	MS	MR	MS
M-14	5.64	18.60	8.88	29.16
Winchester	4.44	13.92	7.44	23.70

4. (CONFIDENTIAL) ANALYSIS.--The test and control rifles are comparable in semiautomatic fire.

Test 5, ACCURACY - AUTOMATIC FIRE.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the accuracy of the test and control rifles in automatic fire.

[redacted]

2. (UNCLASSIFIED) [redacted] METHOD.

a. After zeroing, four experienced riflemen each fired one 100 round group (two to three round bursts) with each type rifle from a standing position at an "A" target at a range of 50 yards.

b. After zeroing, four experienced riflemen each fired one 100 round group (two to three round bursts) with each type rifle from a prone position at an "A" target at a range of 100 yards.

c. The number of hits falling within a 12 inch circle, 24 inch circle, and 36 inch circle were recorded.

d. After zeroing, four experienced riflemen each fired three 100 round groups (two to three round bursts) with each type rifle at three "E" type silhouette targets, placed side by side, at a range of 300 yards. The number of hits striking the silhouette targets were recorded. (The above exercise was conducted from a prone position with and without sandbag rest.)

3. (CONFIDENTIAL) RESULTS.--The average number of hits falling within a 12 inch circle, 24 inch circle, and 36 inch circle, or on other type targets are shown below:

a. Standing (50 yards):

	DIAMETER OF CIRCLE (INCHES)			
Weapon	12	24	36	TOTAL
M-14	21	25	7	53
Winchester	40	15	3	58

b. Prone (100 yards):

	DIAMETER OF CIRCLE (INCHES)			
Weapon	12	24	36	TOTAL
M-14	15	17	11	43
Winchester	45	15	8	68

c. Prone without sandbag (300 yards):

Weapon	Nr of Hits on Three "E" Type Silhouettes
M-14	37
Winchester	44

[redacted]

[redacted]

d. Prone with sandbag (300 yards):

Weapon	Nr of Hits on Three "E" Type Silhouettes
M-14	53
Winchester	58

4. (CONFIDENTIAL) SPECIAL OBSERVATIONS PERTAINING TO THE TEST RIFLE.--The trigger produces excessive trigger slap when firing automatic fire.

5. (CONFIDENTIAL) ANALYSIS.--The test and control rifles are comparable in automatic fire accuracy.

Test Nr 6, TRANSITION FIRING.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the performance of the test and control rifles under transition range firing conditions.

2. (UNCLASSIFIED) METHOD.

a. Semiautomatic.--After zeroing their rifles at a range of 300 yards, twelve average riflemen each fired one practice and three record runs of a modified transition course with each type rifle.

b. Automatic.--After zeroing their rifles at a range of 300 yards, twelve average riflemen each fired one practice and one record run of a modified transition course with each type rifle.

c. The modified transition range consisted of 10 targets located at ranges of 50 to 350 yards within a 25° to 40° fan. Each rifleman was allotted 1 round per target for semiautomatic fire and two rounds per target for automatic fire. All targets were exposed when the order was given to commence firing. Unhit targets were lowered 40 seconds after firing commenced.

d. The percentage of target hits in relation to number of rounds fired by each type weapon was recorded

3. (CONFIDENTIAL) RESULTS.--Percentage of target hits in relation to rounds fired:

Rifle	Semiautomatic	Automatic
M-14	74%	35%
Winchester	65%	30%

[redacted]

[redacted]

4. (CONFIDENTIAL) SPECIAL OBSERVATIONS PERTAINING TO THE TEST WEAPON.

a. In nearly all instances, the riflemen required the full 40 seconds to engage the ten targets with the M-14 rifle. Approximately 25-30 seconds were required to engage the ten targets with the Winchester.

b. There was a loss of hitting ability with the test rifle at ranges greater than 250 yards because the sights could not be adjusted to obtain a correct zero.

5. (CONFIDENTIAL) ANALYSIS.--The test and control rifles are comparable in unknown distance (transition) accuracy. The test rifle, due to its lighter weight and shorter length, is easier to point and aline on subsequent targets.

Test Nr 7, SIMULATED COMBAT CONDITIONS.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the performance of the test and control rifles under simulated combat conditions.

2. (UNCLASSIFIED) METHOD.

a. A course consisting of six lanes was constructed. Obstacles of various types (barbed wire fences, ditches, shell holes, etc) were constructed in each lane so that the lanes became progressively more difficult, lane 1 being the least difficult and lane 6 being the most difficult. No minimum acceptability criterion was established since the purpose of the course was to establish relative performance and not absolute performance. Each weapon entered the course at lane 1 and proceeded through the firing points (five firing points in each lane) until 8 out of 10 rounds resulted in malfunctions (four malfunctions of 5 rounds fired at each of two successive firing points). The weapon was then removed from the course, field stripped and cleaned. In the event of breakage or stoppages that could not be corrected by the soldier negotiating the course, the weapon was removed from the course, cause of breakage or stoppage determined, and the weapon disassembled and cleaned prior to restarting in lane 1. Each weapon entered the course at lane 1 four times (three semiautomatic fire runs and one automatic fire run).

b. Malfunctions by type and number of firing points completed were determined and recorded for each type rifle.

[redacted]

[redacted]

3. (CONFIDENTIAL) RESULTS.

a. Semiautomatic Fire.

Rifle Nr	Rds Fired	*MALFUNCTIONS									% Malfunctions Per 100 Rounds Fired	Avg Nr Firing Points Completed
		EJ	X	F	NFH	SR	CE	LS	RO	TS		
Winchester 5	276	0	0	1	3	0	18	0	3	21	16.7	15.3
12	311	0	4	15	4	0	37	0	7	3	22.5	19.7
14	419	0	0	2	1	0	9	0	0	44	13.4	23.7
15	314	4	1	9	0	0	12	0	3	33	19.7	18.0
TOTAL		4	5	27	8	0	76	0	13	101		

Total Malfunctions: 234
Average Malfunctions/100 rds fired: 17.7
Average firing points completed per start: 19.2

Rifle Nr	Rds Fired	*MALFUNCTIONS									% Malfunctions Per 100 Rounds Fired	Avg Nr Firing Points Completed
		EJ	X	F	NFH	SR	CE	LS	RO	TS		
M-14 1072	393	2	13	12	54	0	4	0	0	1	22.6	22.3
1216	255	0	4	3	42	0	1	0	0	0	19.6	14.7
1256	240	0	4	16	33	0	0	0	0	0	22.5	13.7
1380	506	1	8	16	28	0	1	0	0	0	10.7	28.7
TOTAL		3	29	47	157	0	6	0	0	1		

Total Malfunctions: 247 (including 4 instances of the hammer following the bolt home, not included above, Rifle Nr 1072)

Average Malfunctions/100 rds fired: 17.7

Average Nr firing points completed per start: 19.8

Breakages: M14-retaining spring for roller on bolt - Rifle Nr 1256 after 2279 rounds.

*NOTE: See Annex A to App I for definition of malfunction abbreviations.

[redacted]

[redacted]

b. Automatic Fire.

Rifle Nr	Rds Fired	*MALFUNCTIONS EJ	X	F	NFH	SR	CE	LS	RO	TS	% Malfunctions Per 100 Rounds Fired	Nr Firing Points Completed
Winchester 5	210	2	2	15	3	0	24	1	4	0	24.3	35
12	70	0	2	0	12	0	0	0	0	0	20.0	12
14	28	0	6	0	5	0	0	0	0	0	39.3	5
15	70	1	4	4	18	0	2	0	1	0	42.9	12
TOTAL		3	14	19	38	0	26	1	5	0		

Total Malfunctions: 106
Average Malfunctions/100 rds fired: 28.0
Average firing points completed per start: 16

Rifle Nr	Rds Fired	*MALFUNCTIONS EJ	X	F	NFH	SR	CE	LS	RO	TS	% Malfunctions Per 100 Rounds Fired	Firing Points Completed
M-14 1072	28	0	2	0	7	0	0	0	0	0	32.1	5
1216	22	0	3	1	4	0	0	0	0	0	36.4	5
1256	68	0	3	0	6	0	0	0	0	0	13.2	12
1380	100	0	6	4	17	0	0	1	0	3	28.0	17
TOTAL		0	14	5	34	0	0	1	0	3		

Total Malfunctions: 57
Average Malfunctions/100 rds fired: 26.1
Average firing points completed per start: 9.8

c. Special Observations Pertaining to the Test Weapon:

(1) The trigger sticks to the rear when particles of dirt, dust, etc., get into the trigger mechanism. Weapon ceases to fire on both automatic and semiautomatic settings. This was alleviated to a large extent by modifying the trigger so as to allow more clearance between the trigger and the trigger housing.

*NOTE: See Annex A to App I for definition of malfunction abbreviations.

[redacted]

[redacted]

(2) The magazine spring was strong enough to feed the last few rounds from the magazine after it became dirty. There were numerous failures to feed on the last round because the magazine spring is required to push up the bolt stop as well as feed the last round. A heavier magazine spring appears to have eliminated this trouble.

(3) The weapon fires semiautomatically on the automatic setting when the trigger mechanism gets dirty.

4. (CONFIDENTIAL) ANALYSIS.--The test rifle is comparable to the control rifle in reliability under simulated combat conditions. The test rifle had an excessive number of sticky triggers but this appears to have been corrected. The control rifle experienced an excessive number of bolts failing to go home which may be attributable to insufficient gas (gas ports measured .076 inches).

Test Nr 8, ADVERSE CONDITIONS.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the performance of the test and control weapons under adverse conditions.

2. (UNCLASSIFIED) METHOD.

a. Clean and properly lubricated test and control rifles (two of each type) were fired, at the rate indicated below for 5 days without further care and cleaning.

1st day - 40 rd per minute for 5 minutes.
2d day - 15 rd per minute for 30 minutes.
3-5th day - 8 rd per minute for 15 minutes.

b. Prior to each exposure to the conditions discussed below, the test and control rifles (two of each type) were thoroughly cleaned, properly lubricated, and fully loaded, including one round in the chamber. Spare magazines (loaded) in ammunition pouches were exposed to the same adverse conditions.

(1) The rifles were submerged in muddy water for 5 minutes then drained and fired. The rifles were then cleaned and again submerged in muddy water for 5 minutes, drained, left to dry for 24 hours and fired. (Muddy water approximated that found in shell holes, etc, on the battlefield.)

(2) The rifles were fired while exposed to an artifically generated 25-mph wind laded with dust and sand. This exercise was repeated to allow rotation of weapons and change in wind direction (left-right sides).

(3) The rifles were fired in a light downpour of artificial rain (100 rounds).

[redacted]

[redacted]

c. Clean and properly lubricated test and control rifles (two of each type) were stored, with loaded magazines and a round in the chamber, in a cold room at -25°F for 72 hours, then transported in insulated containers to the testing range and fired (100 rounds).

d. Clean and properly lubricated test and control rifles (two of each type) were stored with loaded magazines and a round in the chamber, in a hot room at 125°F for 72 hours, then transported in insulated containers to the testing range and fired (100 rounds).

e. Clean and properly lubricated rifles (two of each type) were fired (100 rounds), stored with loaded magazine and a round in the chamber, in a cold room at -25°F for 24 hours, then transported in insulated containers to the testing range and fired (50 rounds).

3. (CONFIDENTIAL) RESULTS.

a. After 5 days without care and cleaning:

Weapon		*MALFUNCTIONS								Total Malfunctions	Total Rds Fired
		EJ	X	F	NFH	SR	CE	LS	RO		
M-14	1216									0	1010
	1380									0	1010
Winchester	14	6	2	2						10	1010
	15			3					1	4	1010

Breakages: M-14 - Hand Guard, Rifle Nr 1380.

Winchester - 2 trigger housings (Rifle Nr 14 after 2790 rounds and Rifle Nr 15 after 3314 rounds).

Per Cent Malfunctions/100 rounds Fired: M-14 - 0.

Winchester - 0.7

*NOTE: See Annex A to App I for definition of malfunction abbreviations.

[redacted]

[redacted]

b. After submersion in muddy water:

Weapon		*MALFUNCTIONS								Total Malfunctions	Total Rds Fired
		EJ	X	F	NFH	SR	CE	LS	RO		
M-14	1072		3	1	13		1			18	22
	1256	1	13		21			1		36	97
Winchester	5			17	2		9	1	3	32	144
	12		1	24	3		4			32	133

Breakages: M-14 - None
Winchester - None.

Per Cent Malfunctions/100 rds Fired: M-14 - 45
Winchester - 23

c. While being exposed to artificially generated sand and dust:

Weapon		*MALFUNCTIONS								Total Malfunctions	Total Rds Fired
		EJ	X	F	NFH	SR	CE	LS	RO		
M-14	1072		8	3	1		1			13	13
	1256		8	1	1					10	10
Winchester	5		7				3			10	10
	12	1	4							5	5

Breakages: None.

Per Cent Malfunctions/100 rds Fired: M-14 - 100 per cent
Winchester - 100 per cent.

*NOTE: See Annex A to App I for definition of malfunction abbreviations.

[redacted]

[redacted]

d. Fired while being exposed to artificial rain:

Weapon		*MALFUNCTIONS							Total Malfunctions	Total Rds Fired
		EJ	X	F	NFH	SR	CE	LS	RO		
M-14	1072									0	100
	1256									0	100
Winchester	5			2						2	100
	12			1						1	100

Breakages: M-14 - None.
Winchester - None.

Per Cent Malfunctions/100 rds Fired: M-14 - 0
Winchester - 1.5

e. After exposure to -25°F for 72 hours:

Weapon		*MALFUNCTIONS							Total Malfunctions	Total Rds Fired
		EJ	X	F	NFH	SR	CE	LS	RO		
M-14	1072									0	100
	1256									0	100
Winchester	12									0	100
	15			10			2		1	13	100

Breakages: M-14 - None.
Winchester - Trigger housing cracked - Rifle Nr 12 after 2946 rounds.

Per Cent Malfunctions/100 rds Fired: M-14 - 0
Winchester - 6.5

*NOTE: See Annex A to App I for definition of malfunction abbreviations.

[redacted]

f. After exposure to 125°F for 72 hours:

Weapon		EJ	*MALFUNCTIONS X	F	NFH	SR	CE	LS	RO	Total Malfunctions	Total Rds Fired
M-14	1216			6	2					8	100
	1380			**8			**11			19	100
Winchester	5	1			1					2	100
	14			1			**19			20	100

Breakages: M-14 - None.

Winchester - Trigger housing cracked Rifle Nr 5 after 2898 rounds

Per Cent Malfunctions/100 rds Fired: M-14 - 13.5

Winchester - 11.0

g. Fired 100 rounds, exposed to -25°F for 24 hours then refired. This test was not completed due to a failure of refrigeration equipment.

h. Special Observations Relating to the Test Weapon:

(1) The finish on the weapon and the follower of the magazine is inadequate for prevention of rust and pitting under adverse conditions.

(2) The hand guard is not strong enough for normal handling.

(3) The trigger housing is not strong enough for the normal life of the weapon (see app III-4).

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* See Annex A to App I for definition of malfunction abbreviations.

**The follower in one magazine for Rifle Nr 1380 and one magazine for Rifle Nr 14 stuck at the bottom. Each weapon was fired eight times with continuous malfunctions at which time it was assumed that the rest of the magazine would result in continuous malfunctions. The magazines were removed and firing continued with other magazines.

[redacted]

4. (CONFIDENTIAL) ANALYSIS.

a. The test and control rifles are comparable in performance when:

(1) Fired for five days without care or cleaning.

(2) Exposed to rain.

(3) Exposed to temperatures of -25°F.

(4) Exposed to temperatures of 125°F.

b. The test rifle is superior in performance to the control rifle when exposed to muddy water.

c. The test and control rifles did not function satisfactorily when exposed to sand and dust.

Test Nr 9, PENETRATION.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the relative penetration effects of the ammunition used with test and control rifles.

2. (UNCLASSIFIED) METHOD.

a. Five rounds of each type ammunition were fired into 10 gauge mild steel plate (SAE 1020, Rockwell hardness C-14) at ranges of 25, 100, 300, and 500 yards. Layers of 1 inch commercially dressed pine boards (actual measurement 3/4 inch), spaced at 1 inch intervals, were placed behind the steel plate. Ranges at which the steel plate and pine board were perforated were determined and recorded.

b. Ten rounds of each type ammunition were fired into layers of 1 inch commercially dressed pine boards (actual measurement 3/4 inch) spaced at 1 inch intervals, at ranges of 300, 500, 600, 700 and 800 yards. The number of boards perforated by each type ammunition at each range was recorded.

c. Each type ammunition was fired against standard US steel helmets (with liners) at ranges of 500, 600 and 700 yards and against body armor at 500 yards. Firing was conducted until 10 fair hits (strikes more than 1 inch from the periphery of the profile of the helmet) were obtained with each type ammunition. Number of hits and perforations obtained with each type ammunition was recorded.

d. Ten rounds of each type ammunition were fired into a box constructed of 3/8 inch plywood, containing 6 inches of sand, at ranges of 20, 40, 100 and 300 yards. A witness plate, constructed of 1 inch

[redacted]

[redacted]

commercially dressed pine boards, was placed 1 foot in rear of the target. Penetration effects were recorded for each range. Performance characteristics of the test and control ammunition projectiles, such as tumbling, yawing, etc, as evidenced from the witness plate, were recorded.

e. One hundred rounds of each type ammunition were fired, in ten round groups, into a fixture containing approximately 12 inches of green, freshly cut, lightly packed, brush (limbs varied from very small to approximately 3/4 inch) at ranges of 100, 300 and 500 yards. Mean radius was determined for each 10-round shot group before the projectile entered the brush. The change in mean radius and the performance characteristics of the projectiles, such as tumbling, yawing, etc, as evidenced from a witness plate placed 10 feet in rear of the brush, were recorded.

3. (CONFIDENTIAL) RESULTS.

a. Ranges at which each type ammunition perforated the steel plate and the average number of pine boards perforated are shown below:

Range (Yards)	Type Ammunition	Steel Plate Perforated	Average Nr of Pine Boards Perforated
25	M-59	Yes	8.8
	Winchester Cal .224	Yes	3.7
100	M-59	Yes	9.2
	Winchester Cal .224	Yes	3.0
300	M-59	Yes	9.8
	Winchester Cal .224	Yes	1.8
*450	Winchester Cal .224	Yes	0
*475	Winchester Cal .224	No	0
500	M-59	Yes	8.6
	Winchester Cal .224	No	0

*Note: Firing was conducted at 450 and 475 yards after it was determined that the test ammunition would not perforate the steel plate at 500 yards. The projectiles of the test ammunition were deformed, and in some instances, partially broken up after perforating the steel plate.

[redacted]

[redacted]

b. Number of pine boards perforated by each type ammunition is shown below:

Range (Yards)	Type Ammunition	Average Nr of Pine Boards Perforated
300	M-59	15.9 (+)
	Winchester	7.5
500	M-59	13.2
	Winchester Cal .224	7.3
700	M-59	10.8
	Winchester Cal .224	6.7
800	M-59	11.7
	Winchester Cal .224	5.3

c. Ranges at which each type ammunition perforated body armor and steel helmets are shown below:

Range (Yards)	Type Ammunition	Perforation of Body Armor	Perforation of Steel Helmets w/Liner
475	M-59	Not tested	Both sides
	Winchester Cal .224	Not tested	Both sides
500	M-59	Yes	Both sides
	Winchester Cal .224	Yes	One side
600	M-59	Not tested	Both sides
	Winchester Cal .224	Not tested	None
700	M-59	Not tested	Both sides
	Winchester Cal .224	Not tested	None

d. Number of rounds of each type ammunition that perforated 6 inches of sand within a box constructed of 3/8 inch plywood.*

Range (Yards)	Type Ammunition	Number of Perforations
20	M-59	10
	Winchester Cal .224	0
40	M-59	10
	Winchester Cal .224	0
100	M-59	7
	Winchester Cal .224	0
300	M-59	10
	Winchester Cal .224	1

*Note: The projectiles of the test ammunition disintegrated in the sand.

[redacted]

e. Comparison of mean radius prior to and after projectiles passed through brush:

Range (Yards)	Type Ammunition	MEAN RADIUS (INCHES) Prior to Entering Brush	After Passing Through Brush*	(Inches)	% Change
100	M-59	1.4	4.6	+3.2	+218
	Winchester Cal .224	1.9	14.5	+12.6	+663
300	M-59	4.8	7.8	+3.0	+63
	Winchester Cal .224	5.8	18.1	+12.3	+212
500	M-59	7.8	15.1	+7.3	+94
	Winchester Cal .224	9.4	18.1	+8.7	+93

*Note: The projectiles of the test ammunition tumbled more than the projectiles of the control ammunition after passing through brush.

The projectiles of the test ammunition showed evidence of breaking up when deflected by heavy brush at 100 yards.

4. (CONFIDENTIAL) ANALYSIS.

a. The capability of the test round to penetrate various mediums is significantly less than that of the control round.

b. The projectiles of the test round are excessively deflected when fired through brush.

c. The projectiles of the test rounds have a tendency to disintegrate.

Test Nr 10, SIGHTS.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare the suitability of the sight systems and the related performance of the test and control rifles.

2. (UNCLASSIFIED) METHOD.--In all tests, incidents reflecting upon the suitability of the sights were recorded as they occurred.

3. (CONFIDENTIAL) RESULTS.

a. The test rifle is equipped with an "L" type rear sight. The short side of the "L" is used when targets are at 300 yards or less. The long side of the "L" is used when targets are over 300 yards from the firer. The rear sight is not adjustable for windage. The front sight is a fixed post similar to the M-1 rifle.

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b. The M-14 rifle is equipped with sights similar to those found on the M-1 rifle.

c. No difficulty was experienced in adjustment of the M-14 rifle sight system. However, with the test weapon, the rifle cannot be zeroed since there are no fine adjustments for elevation and none for windage.

d. Special Observations Pertaining to the Test Weapon.--As a result of not being able to properly zero their weapons, the firers had to use "hold off". The loss in hitting ability was apparent at ranges greater than 250 yards.

4. (CONFIDENTIAL) ANALYSIS.--The test sights are inferior to the control sights due to the inability of the firer to make adjustments for zero.

Test Nr 11, POSITION DISCLOSING EFFECTS.

1. (UNCLASSIFIED) PURPOSE.--To determine and compare for test and control rifles the visibility of muzzle flash during darkness and smoke during daylight.

2. (UNCLASSIFIED) METHOD.

a. Test and control rifles were fired from unconcealed non-tactical positions. Firing was conducted during daylight and repeated during darkness. Flash hiders are integral parts on the control rifles. The test rifles were not equipped with a flash hider.

b. Observers approached the weapons positions from the front at an angle of 45°. Ranges at which the smoke and flash could be detected and the weapons position identified with the unaided eye and with 6 x 30 binoculars were recorded.

3. (CONFIDENTIAL) RESULTS.--Ranges at which the smoke and flash could be detected are shown below (four rounds were fired semiautomatically and three 4-5 round bursts were fired automatically at each range).

a. Daylight.--Smoke could be observed at ranges of 400 yards from the control rifle position and at 400 yards from the test rifle position with both the unaided eye and 6 x 30 binoculars.

b. Darkness.

(1) Control Rifle.

(a) Semiautomatic Fire.--The control rifle could not be detected with the unaided eye when the observer was at a range of 50 yards or with 6 x 30 binoculars when the observer was at a range of 150 yards.

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[redacted]

(b) Auto[redacted]und Bursts).--The control rifle could not be detected with the unaided eye when the observer was at a range of 100 yards, or with 6 x 30 binoculars when the observer was at a range of 200 yards.

(2) Test Rifle.--When firing, semiautomatic and automatic, flash could be observed at a range of 400 yards with the unaided eye (400 yards was the maximum distance from the firing position that observers could be stationed due to limitations of terrain facilities available to this Board).

4. (CONFIDENTIAL) ANALYSIS.--Test and control rifle-ammunition combination produces excessive smoke. The test rifle produces excessive flash (see photographs attached as app III).

Test Nr 12, COMPARISON WITH MILITARY CHARACTERISTICS.

1. (UNCLASSIFIED) PURPOSE.--To determine to what extent the test items meet current draft military characteristics.

2. (UNCLASSIFIED) METHOD.--Upon completion of testing, test data was analyzed and compared with draft military characteristics contained in Project 2743 (ref 2c).

3. (CONFIDENTIAL) RESULTS AND ANALYSIS.

* * * * E X T R A C T * * * *

Military Characteristics	Characteristics of Test Weapon
a. Configuration.--The weapon shall:	
(1) Be of a size and shape usable by all personnel meeting physical requirements of the Department of the Army with the capability of being fired from the right or left shoulder in all normal firing positions.	Meets this requirement.
(2) Be capable of accepting a carrying sling in a conventional manner.	Meets this requirement.
(3) Be equipped with an easily identifiable, conveniently located, positive safety. It is desirable that the operation of the safety be inaudible.	Meets this requirement except that the safety is not inaudible (see Test Nr 1, app I).

[redacted]

[redacted]

(4) Have operating [redacted] easily located and identified by touch and capable of being operated by the firer under extremes of weather.	[redacted] this requirement.
(5) Be relatively comfortable to carry and fire and have no projections which can readily entangle in brush, grass, or battlefield obstacles.	Meets this requirement in part. The safety catches on brush, grass, etc (see Test Nr 1, app I).
(6) Be incapable of reversed assembly to the detriment of its functioning.	Meets this requirement to an acceptable degree. The rocker can be improperly positioned (see Test Nr 2, app I).
(7) Be of the minimum weight commensurate with performance requirements. It is desirable that the weapon weigh not more than 6 pounds complete w/sling and loaded with 20 rounds of ammunition. This characteristic, however, should not limit ammunition capacity to 20 rounds.	Meets this requirement. Weapon and ammunition weigh 5.87 pounds (sling not furnished) (see Test Nr 1, app I).
(8) Be of minimum length commensurate with performance requirements. It is desirable that the weapon be no longer than the current standard carbine (35.5 inches).	Meets this requirement to an acceptable degree. Weapon is 37.6 inches long. However, it will require a flash suppressor which will add to its length (see Test Nr 11, app I).
(9) Have simple and durable integral sights. After zeroing, it is desirable that the sight shall not require more than two range settings or indexes for firing from 0 to 500 yards with maximum mismatch not to exceed 4 inches in each range span. Fixed focus, nonadjustable optical sights should be considered.	Meets this requirement except for the ability to zero (see Test Nr 10, app I). Mismatch was not determined. Optical sights were not furnished.
(10) Have an ammunition capacity of not less than 20 rounds.	Meets this requirement.
(11) Be capable of being readily loaded to maximum capacity in one operation and of being recharged to maximum capacity with one or more rounds from a multi-round charging device.	Meets this requirement in part. A recharging device was not furnished.

[redacted]

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b. Performance [redacted]

(1) The weapon shall:	
(a) Be provided with such integral safeties as are necessary to prevent accidental firing.	Meets this requirement.
(b) Be capable of selective semiautomatic-automatic fire by an easily accessible, positive, manually controlled change lever. The automatic fire feature should be capable of being rendered inoperative to the firer without impairing the semiautomatic functioning of the weapon.	Meets this requirement.
(c) Fire from a closed bolt. Bolt shall remain open after the last round is fired. No preliminary action, other than release of the safety and single pull of the trigger, shall be necessary to put the weapon in action when fully loaded bolt closed.	Meets this requirement.
(2) The weapon and ammunition combination shall:	
(a) Have adequate stopping and wounding power to a range of 500 yards without bullet disintegration or undue deflection by light objects, such as grass, twigs, or brush.	Stopping and wounding power appears adequate based on results of penetration tests. Projectiles disintegrate when fired into sand and deflect when fired into brush (see Test Nr 9, app I).
(b) Be capable of inflicting a fatal wound at ranges up to 500 yards on personnel protected by standard body armor and standard helmets.	Meets this requirement (see Test Nr 9, app I).
(c) When fired semiautomatically from a benoh rest have horizontal and vertical errors of not more than ¼ mil at all ranges up to 500 yards. (At 300 yards 90 per cent of rounds should strike within an area 15.6" x 15.6".)	Meets this requirement. Horizontal error at 300 yards is .22 mil and vertical error is .23 mil.

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[redacted]

(d) Wh[redacted] matically in 2 to 3 round bursts from the prone position insure a hit probability of 80 per cent distributed on three "E" type silhouette targets placed side by side at a range of 300 yards.	[redacted] not meet this requirement (see Test N_r 5, app I).
(e) Be capable of firing at a steady rate of 15 rounds a minute for an indefinite period and 40 rounds a minute for 5 minutes without danger to weapon or firer. These rates apply to both semiautomatic and automatic fire.	Meets this requirement.
(f) Have the minimum of recoil and blast. It is desirable that the effects of recoil and blast be reduced by at least 25 per cent as compared to the M-1 and/or M-14 rifle and its ammunition.	Not fully tested (observations indicate a reduction in recoil and blast.)
(g) Not produce smoke or flash discernible beyond 50 yards. A flash suppressor, if necessary, is acceptable.	Does not meet this requirement. Smoke and flash can be seen with the naked eye at 400 yards (test weapon not equipped with flash suppressor) (see Test Nr 11, app I).
(3) The ammunition shall be of the smallest caliber, lowest velocity, and minimum cartridge weight to achieve required hit probability and casualty producing effects to a range of 500 yards.	Meets this requirement to an acceptable degree.
c. Durability and Reliability. --The weapon shall:	
(1) Have a minimum barrel life of 5000 rounds.	Not fully tested.
(2) Have a bore and working parts which are resistant to wear, rust, and corrosion to the maximum practicable extent.	Does not meet this requirement. Certain working parts are too susceptible to rust (see Test Nr 8, app I). (Weapon is equipped with an all-steel barrel.)

[redacted]

[redacted]

(3) Function[redacted]	not meet this requirement factorily than the curr[redacted]t for muddy water (see under all adverse conditions to [redacted]r 8, app I). rain, snow, dust, mud, after submersion and at temperature extremes from -40°F to +125°F.
(4) Be sufficiently rugged to withstand normal usage encountered in training and combat.	Does not meet this requirement (see Test Nr 8, app I).
(5) Be easy to maintain under combat conditions. It is desirable that no tools be necessary for maintenance, disassembly or assembly.	Meets this requirement.
d. Transportability.--The weapon shall be capable of being jumped on a parachutist without disassembly or special container.	Not tested.
e. Associated Equipment.--The weapon shall have:	
(1) A light sling for carrying which is adjustable and detachable.	No sling was furnished, however, weapon is equipped with sling swivels.
(2) A cleaning, maintenance and spare parts kit.	Not tested, equipment not furnished.
(3) A small simple multiround loading and recharging device.	Not tested, equipment not furnished.
(4) A blank firing attachment or special cartridge which will provide the weapon with a blank firing capability at its semiautomatic and automatic rates of fire. (However, the fulfillment of the requirement for this item should not impede the development of the rifle itself.)	Not tested, attachments not furnished.
f. Environmental and Terrain Requirements.--The weapon shall be so designed that all operations necessary to firing may be performed by an individual wearing standard arctic handwear. In order to meet this requirement, a special kit is acceptable.	Not tested.

[redacted]

[redacted]

g. **CBR and Atomic Requirements.** --Not applicable.

h. **Kit Requirement.**--See paragraphs e and f.

i. **Maintenance and Interchangeability Requirement.**--The weapon shall:

(1) Require a minimum of maintenance and shall be capable of firing for long periods without cleaning or lubrications.

Meets this requirement in part - finish is inadequate. Special lubricant is required (see Test Nr 8, app I).

(2) Be capable of being readily modified as follows to provide a suitable replacement for the current standard small arms:

(a) To replace the submachine gun, substitute a stock group which is capable of folding or sliding forward to minimize length. Provide a compensator, if necessary.

Not tested, however, due to its similarity to the carbine, the test weapon should be capable of accepting a stock similar to that of the M1A1 carbine.

(b) To replace the BAR and M-1? rifle, substitute a hinged butt plate. Provide a bipod and compensator, if necessary.

Not tested (hinged butt plate or bipod not furnished).

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ANNEX A TO APPENDIX I - DEFINITION OF ABBREVIATIONS

Report of Project Nr 2787 - Winchester

(UNCLASSIFIED) Listed below are definitions of abbreviations used in Appendix I to designate malfunctions:

EJ - Failure to eject - case still in receiver but not in chamber.

X - Failure to extract - case still in or partly in chamber.

F - Failure to feed but not CE, NFH, or SR.

NFH - Bolt not fully home. Round has started in chamber.

SR - Stubbed round. No part of round has entered chamber but round has started forward. May be stubbed in magazine.

CE - Chamber empty, bolt closed, round in magazine.

LS - Light strike on primer cap. Hammer down - primer cap shows firing pin dent but round did not fire.

BO - Bolt fails to remain open after last round in magazine is fired.

TS - Trigger stuck to the rear - weapon is cocked but will not fire.

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APPENDIX II - DEFICIENCIES AND SUGGESTED MODIFICATIONS

Report of Project Nr 2787 - Winchester

(CONFIDENTIAL) The deficiencies listed herein are those that remain uncorrected at the completion of this project. They are listed in two categories: major deficiencies and minor deficiencies. The former are those deficiencies which must be corrected to make the item suitable for Army use. The latter are those, the correction or elimination of which will increase the efficiency or desirability of the item, but need not be corrected to make the item suitable for Army use.

	Major Deficiencies	Results	Suggested Modifications
1.	Trigger housing is too weak (Test Nr 8, app I).	Trigger housing cracks or breaks after approximately 2800 rounds.	Correct by strengthening trigger housing or by removing the breakage force.
2.	Projectiles disintegrate when fired into sand (Test Nr 9, app I).	Reduced penetration.	Correct (thicken projectile jacket and/or provide steel cored projectile).
3.	Rifle-ammunition combination produces flash (Test Nr 11, app I).	Reveals position of firer in combat.	Provide integral flash suppressor.
4.	Sights cannot be adjusted for windage or elevation (zero)(Test Nr 10, app I).	Weapon cannot be properly zeroed.	Correct.
	Minor Deficiencies	**Results**	**Suggested Modifications**
1.	The safety is awkward to handle (Test Nr 1, app I).	Safety is poorly located and when dirty requires considerable force to operate.	Correct.
2.	The safety is not inaudible (Test Nr 1, app I).	Reveals position of firer in combat.	Correct.
3.	The safety projects too far from the weapon (Test Nr 1, app I).	Catches on brush, wire, etc.	Correct.

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[redacted]

	Minor Deficiencies	Results	Suggested Modifications
4.	The weapon cannot be put on safe when the bolt is open (Test Nr 1, app I).	Creates safety hazard.	Correct.
5.	The weapon cannot be loaded or unloaded when on safe (Test Nr 1, app I).	Creates safety hazard.	Correct.
6.	The rocker drops out of the weapon during disassembly (Test Nr 2, app I).	Rocker is easy to lose.	Make rocker an integral part of the receiver.
7.	Rocker can be improperly positioned (Test Nr 2, app I).	Causes weapon to fire automatically on semi-automatic setting.	Make rocker an integral part of the receiver.
8.	Gas Cylinder is not strong enough (Test Nr 3, app I).	Gas cylinder cracked.	Correct.
9.	Trigger produces excessive trigger slap when firing automatic fire (Test Nr 5, app I).	Produces firer fatigue.	Correct.
10.	Requires special lubricant (Molykote) (Test Nr 3, app I).	Additional item in supply chain.	Correct.
11.	Trigger sticks to the rear when particles of dirt, dust, etc., get into the trigger mechanism (Test Nr 7, app I).	Trigger does not return to firing position.	Correct.
12.	Magazine spring is not strong enough (Test Nr 7, app I).	Causes failures to feed.	Correct (substitution of a stronger magazine spring appears to have corrected this deficiency.)
13.	Weapon fires semi-automatically on automatic setting when trigger mechanism gets dirty (Test Nr 7, app I).	Reduced automatic fire capability.	Correct.

[redacted]

[redacted]

	Minor Deficiencies	Results	Suggested Modifications
14.	Undue sensitivity to sand and dust (Test Nr 8, app I).	Weapon fails to function properly.	Correct.
15.	Projectiles deflect considerably when fired through brush (Test Nr 9, app I).	Reduces hit probability.	Correct.
16.	Rifle-ammunition combination produces smoke (Test Nr 11, app I).	Reveals position of firer in combat.	Correct.
17.	Rifles not sufficiently accurate in automatic fire role when fired from the prone position (Test Nr 12, app I).	Fails to meet requirement imposed by military characteristics.	Correct.
18.	Rifle and magazine follower too susceptible to rust (Tests Nr 8 and 12, app I).	Shortens the life of the weapon and follower.	Correct.

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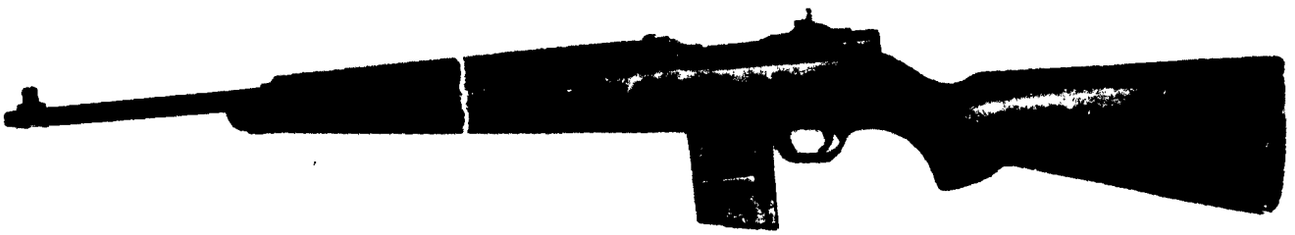
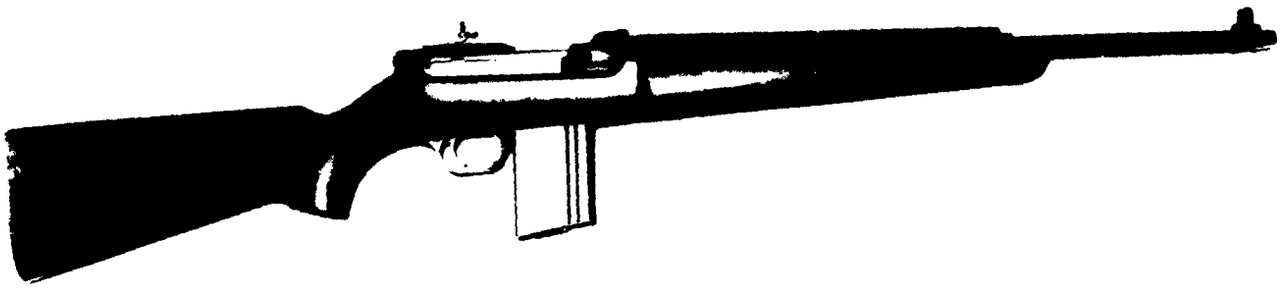


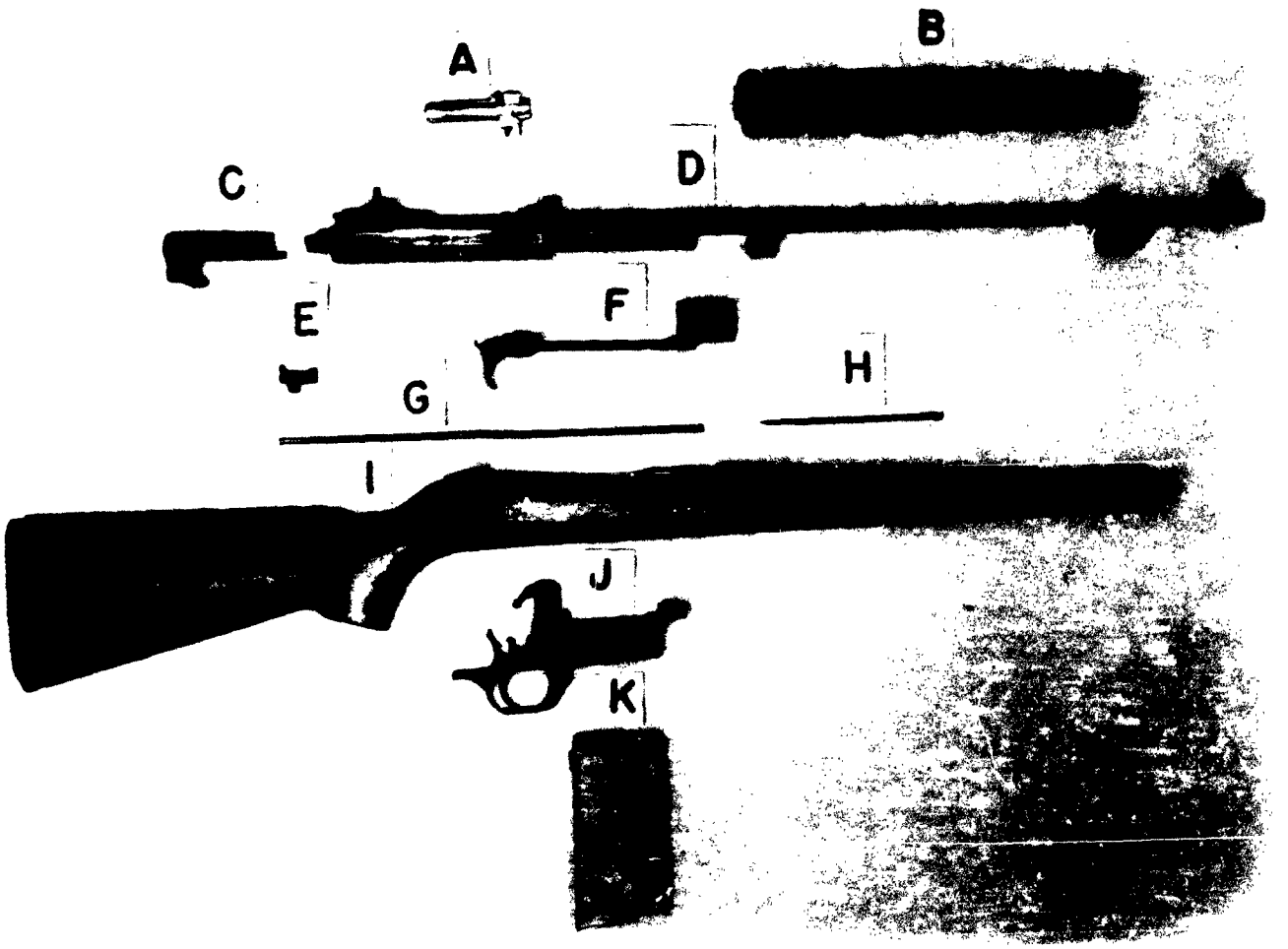


UNITED STATES ARMY INFANTRY BOARD
FORT BENNING, GEORGIA

PROJECT NR	DATE	NEGATIVE NR
2767	19 May 1958	09-166-516/AJ-58

EVALUATION OF HIGH VELOCITY SMALL CALIBER RIFLES - WINCHESTER

Top Winchester, Left Side View
Bottom Winchester, Right Side View



UNITED STATES ARMY INFANTRY BOARD

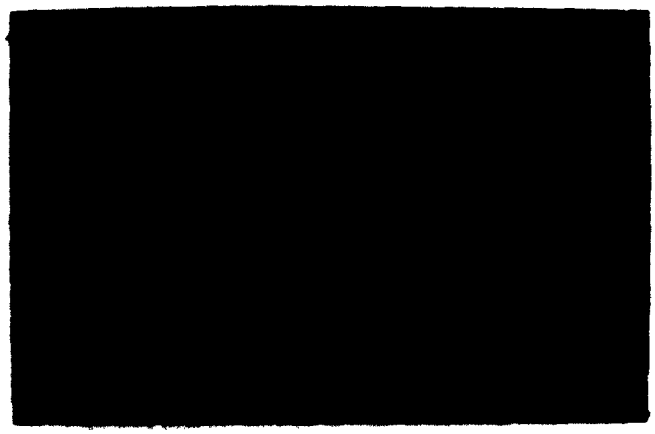
FORT BENNING, GEORGIA

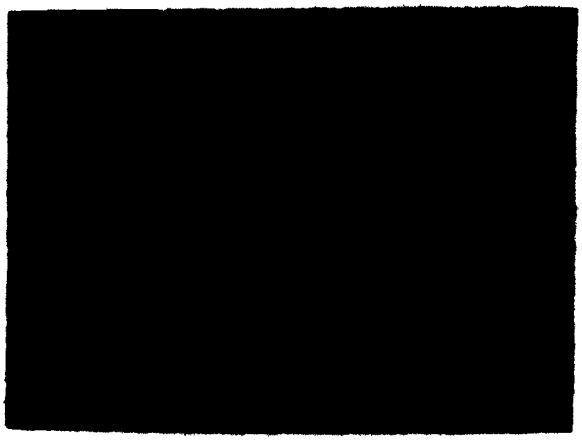
PROJECT NR	DATE	NEGATIVE NR
2787	19 May 1958	09-166-517/AJ-58

EVALUATION OF HIGH VELOCITY SMALL CALIBER RIFLES - WINCHESTER

Winchester Disassembled (Field Strip)

a. Bolt
b. Hand Guard
c. Safety Sleeve
d. Barrel and Receiver Assembly
e. Rocker
f. Operating Slide
g. Operating Slide Spring
h. Operating Slide Spring Guide
i. Stock
j. Trigger Guard Assembly
k. Magazine





UNITED STATES ARMY INFANTRY BOARD

FORT BENNING, GEORGIA

PROJECT NR	DATE	NEGATIVE NR
2787	23 Jun 58	09-166-650/AJ-58

Evaluation of High Velocity Small Caliber Rifles - Winchester

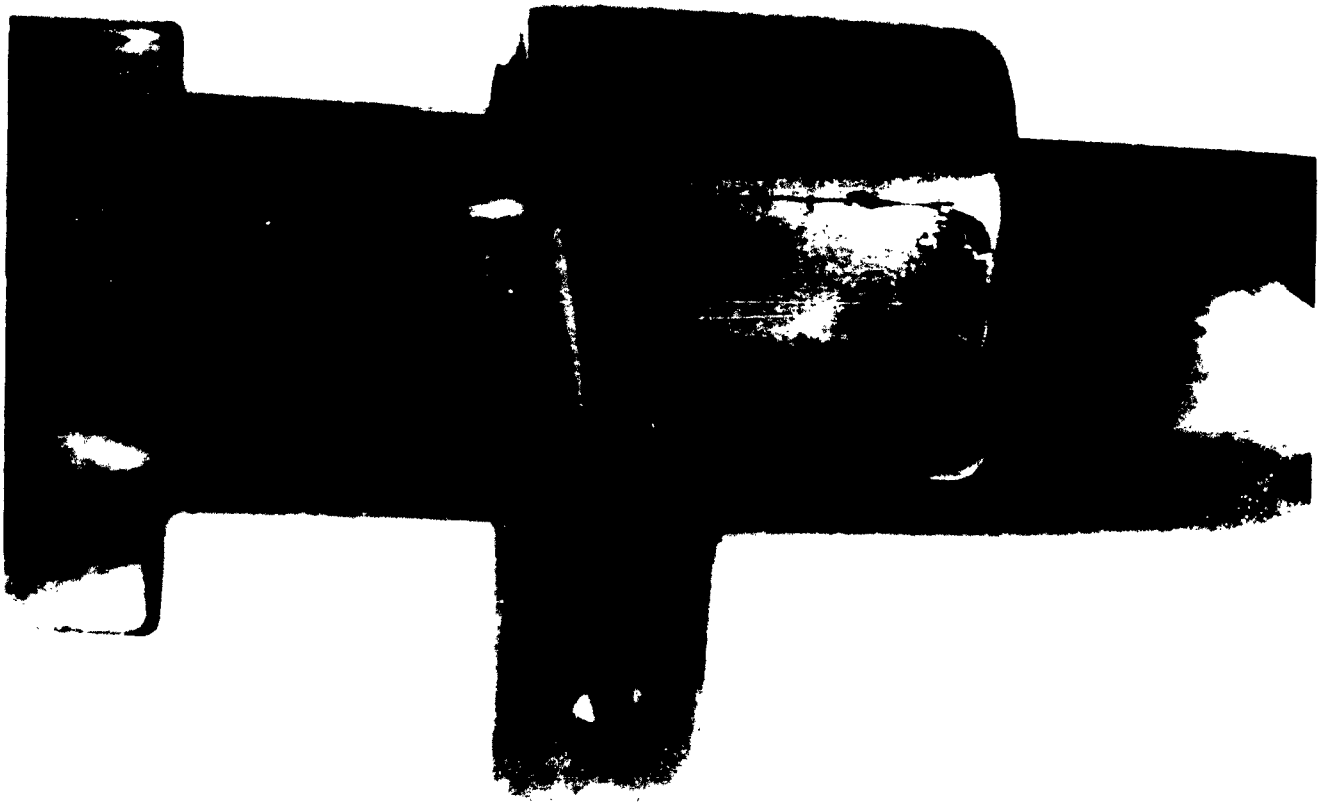
Top: Flash - Winchester firing a 5-round burst.
Bottom Left: Flash - Winchester Semiautomatic fire.
Bottom Right: Flash - Winchester firing a 3-round burst.

UNITED STATES ARMY INFANTRY BOARD
FORT BENNING, GEORGIA

PROJECT NR	DATE	NEGATIVE NR
2787	20 Jun 58	09-166-651/AJ-58

Evaluation of High Velocity Small Caliber Rifles - Winchester

Top: Broken Trigger Housing (parts in correct relationship)
Bottom: Broken Trigger Housing (parts arranged to show break)



UNITED STATES ARMY INFANTRY BOARD
FORT BENNING, GEORGIA

PROJECT NR	DATE	NEGATIVE NR
2787	2 July 58	09-166-756/AJ-58

Evaluation of High Velocity Small Caliber Rifles-Winchester

Cracked Gas Cylinder

This Project Executed

by

SMALL ARMS DEPARTMENT
UNITED STATES ARMY INFANTRY BOARD

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