ABERDEEN PROVING GROUND
MARYLAND

REPORT

FIRST REPORT ON TESTS OF THE LIGHT MACHINE GUN, CAL. .30, T24

AND

THREE HUNDRED AND FIRST REPORT ON FUNCTIONING AND MECHANICAL TESTS OF MACHINE GUNS AND MACHINE GUN ACCESSORIES

ORDNANCE PROGRAM NO. 5082

ORDNANCE RESEARCH CENTER

PROJECT NO. 788

C.B. Reg. No.
06-58-TA-OC

ATTENTION:
SPOTS

WSA/mwh
ORDNANCE RESEARCH CENTER
ABERDEEN PROVING GROUND, MD.
23 MARCH 1944

FIRST REPORT ON TESTS OF THE LIGHT MACHINE GUN, CAL. .30, T24

AND

THREE HUNDRED AND FIRST REPORT ON FUNCTIONING AND MECHANICAL TESTS OF MACHINE GUNS AND MACHINE GUN ACCESSORIES

ORDNANCE PROGRAM NO. 5082

DATES OF TEST: 24 January - 14 February 1944

INDEX

APPENDIX

by

Wm. S. Aumen Jr.,
Assistant Engineer.

I. AUTHORITY FOR TEST:

A. The test of the Light Machine Gun, Cal. .30, T24, was conducted by authority contained in Teletype AO V WAO 833 0822402, February 1944, SPOTS, Balleisen. A copy of the teletype is included as Appendix A.

B. Firings were suspended by verbal authorization of Major C. Balleisen, O.C.O., when it became evident that the weapon required further development before being submitted to the rigorous standard Light Machine Gun test.

II. INTRODUCTION:

A. Discussion:

1. The construction of captured German Machine Guns, M.G. 42, caused a great deal of interest regarding the ease of manufacture and the possibility of adapting a weapon of this type for use by our Armed Forces.

2. A contract was accordingly let to the Saginaw Steering Gear Division of General Motors Corporation for the construction of two guns, following in general along the lines of the German weapon, but incorporating certain modifications to adapt the gun to our requirements. These weapons were designated Light Machine Gun, Cal. .30, T24. The two guns were received at the Ordnance Research Center, 6 January 1944, for test.

B. Object of Test:

1. Firings were scheduled to ascertain gun performance under the diversified conditions of the standard light machine gun test.

III. CONCLUSIONS:

A. That the functioning of the Cal. .30 Machine Gun, T24, was unsatisfactory.

IV. RECOMMENDATIONS:

A. That further development work be undertaken before this weapon be subjected to the lengthy and severe standard light machine gun test.

V. DESCRIPTION OF MATERIAL:

A. Material undergoing test.

1. 1 - Light Machine Gun, Cal. .30, T24.

a. The weapon under test was very similar in appearance and construction to the German M.G. 42, 7.92 mm. The gun was chambered for the standard U.S. Cartridge, Cal. .30, M2, and used the German open link belt. A complete description of the construction and functioning of Gun, Machine, M.G. 42, 7.92 mm., German, is given in the 18th Partial Report on O.P. No. 5826.

b. The bolt was increased in weight in an effort to reduce the cyclic rate consistent with U.S. requirements.

c. A conventional B.A.R. bipod was installed in lieu of the type bipod used on the M.G. 42.

d. As received, the weapon was without sights, but a B.A.R. rear sight and temporary front sight were installed at the Research Center in order to conduct the accuracy tests.

e. The butt stock was made of formed metal in place of the plastic butt stock used on the German gun.

f. Further descriptive data are given under Tests I and II, which are covered in Firing Record S-36300, Appendix C. Photographs, included as Appendix D, clearly illustrate the weapon.

B. Other material exclusive of the usual range facilities.

4 - High Pressure Proof Rounds, Cal. .30, 60,000 - 70,000 p.s.i.
50 - Ctg., Cal. .30, Ball, M2, loaded to 55,000 p.s.i.
50 - Ctg., Tracer, Cal. .30, M1, Lot F.A. 1055-C, loaded for 38,000 p.s.i.
2797 - Ctg., Ball, Cal. .30, M2, Lot F.A. 3929

VI. DETAILS OF TEST:

A. Observers:

1. Throughout test.

Mr. H. Boedinger, representative of Saginaw Steering Gear Division of General Motors Corporation.

B. Procedure:

1. Tests were initiated in accordance with the procedure outlined in the standard light machine gun test, copy of which is included as Appendix B.

2. Unsatisfactory gun functioning led to substitution and changes of various component parts in an effort to place the weapon in a condition to continue the test, but all attempts failed. Firings were discontinued by authorization of Major C. Balleisen, O.C.O.

C. Results of Test:

Refer to Firing Record S-36300, Appendix C, for complete detailed data.

1. The average instrumental velocity obtained with the weapon was 2629.2 f/s with a maximum velocity of 2670 f/s and a minimum velocity of 2561 f/s.

2. Complete accuracy data could not be obtained due to inability to obtain uninterrupted automatic gun functioning. The results obtained are listed below:

a. Short automatic bursts - (2 - 3 rds.) bipod.

Target Number	Number of Hits	E.V.D.	E.H.D.	E.S.
1	11	30.80"	39.70"	44.50"
2	13	22.18	28.82	32.00
3	11	40.00	51.30	61.05
4	18	39.72	40.20	40.78
5	19	45.10	51.49	53.76
Ave.	(Total) 72	35.56	42.76	46.42

b. Continuous 20-round burst - bipod.

Target Number	Number of Hits	E.V.D.	E.H.D.	E.S.
8	18	52.82	61.48	76.35

c. Single shot - individual rounds placed in feedway.

Target Number	M.R.	M.V.D.	M.H.D.	E.V.D.	E.H.D.	E.S.
S-1	12.20"	6.75"	9.10"	30.10"	39.50"	39.75"
S-2	11.65	8.60	6.88	39.62	25.15	43.88
S-3	14.05	7.44	9.43	34.69	38.92	42.10
Ave.	12.63	7.60	8.47	34.80	34.52	41.91

d. Continuous 20-round burst - tripod - firmly sand-bagged.

Target Number	Number of Hits	E.V.D.	E.H.D.	E.S.
1-TA	17	29.22	49.75	49.75
2-TA	20	30.30	51.60	52.90
Ave.	(Total) 37	29.76	50.68	51.33

3. One hundred rounds were fired without incident in short 2 and 3-round bursts. Single shots could not be obtained as the weapon was not provided with a control for this type of fire. At the full automatic rate, 14 short recoils and one failure to feed were recorded. Three hundred rounds were then fired in intermittent short and long bursts. Two failures to feed, two short recoils and 1 ruptured case were experienced during this firing.

4. Three failures to eject (short recoil) occurred during the firing of 50 rounds of low pressure ammunition (38,000 p.s.i.). Gun operation was satisfactory during 50 rounds fired with high pressure ammunition (55,000 p.s.i.).

5. The endurance test was started, but excessive failures to eject occurred. Various adjustments and substitution of parts were tried, but to no avail. In all, 1583 rounds were fired, with a total of 51 malfunctions being recorded. The average cyclic rate of the weapon was 614 r.p.m. Belt lift tests showed that the gun would lift a belt of 60 loaded rounds.

APPROVED:

Leslie E. Simon,
Col., Ord. Dept.,
Acting Director.

BY:

John W. Cave,
Lt. Col., Ord. Dept.,
Chief, Arms & Ammn. Div.

Wm. S. Aumen Jr.
Wm. S. Aumen Jr.,
Assistant Engineer.

APPENDIX A

Teletype of Authority.

C O P Y

T15

AO V WAO B 33 WD

FROM STUDLER C OF ORD ASF WASHINGTON DC 082240 Z FEB 44

ORDNANCE RESEARCH CENTER ABER P G ABERDEEN MD

GR NC

REQUEST ONE CAL. .30 MACHINE GUN T24 BE GIVEN COMPLETE LIGHT MACHINE GUN TEST STARTING 10 FEB 1944 IF POSSIBLE. END CITE SPOTS BALLIESEN

090140 Z

APPENDIX B

Standard Light Machine Gun Test Program.

TEST I

a. The items undergoing test shall be disassembled and an examination and photographs made of all working parts.

b. The number and names of all parts and the types of springs will be recorded.

c. The weights and major dimensions will be recorded.

d. Comment will be made on the simplicity of design and ease of manufacture.

TEST II

The time, also the number and kinds of tools, required for each of the following operations will be recorded:

a. Disassembly.

b. Assembly.

c. Adequate cleaning.

TEST III

Two rounds Cartridge, Caliber .30, High Pressure Test, will be fired singly. The gun mechanism will be examined and the headspace measured before and after this test.

TEST IV

Ten targets of 20 rounds each will be made at 300 yards. Five of these targets will be fired semi-automatically and five automatically, the gun being mounted on the tripod submitted or otherwise as may be necessary.

TEST V

There shall be fired 30 rounds for the determination of instrumental velocity.

TEST VI

a. The gun will be fired 100 rounds semi-automatically to observe general behavior and functioning.

b. The gun will be fired 300 rounds automatically to observe general behavior and functioning.

c. The gun will be fired 300 rounds, both semi-automatically and automatically, the mechanism being changed from one type of operation to the other at least 10 times during this firing.

TEST VII

To test the action of the mechanism with increased and reduced powder pressure, 25 consecutive shots will be fired with the cartridges loaded to give a powder pressure of 55,000 lb/in^2 and 25 loaded to give a powder pressure of 38,000 lb/in^2. This test will be conducted at both the automatic and semi-automatic settings.

TEST VIII

The gun will be fired 10,000 rounds automatic for endurance at the rate of 100 rounds per minute. The barrel may be cooled and parts oiled without disassembling after each 500 rounds. The entire mechanism may be disassembled, cleaned, oiled, etc., after each 2000 rounds. All malfunctions, breakages, and replacing of components, together with the total firing time, the time for replacing or correction of parts, etc., will be recorded. The cyclic rate of fire will be taken at the beginning of each 500 rounds. The general working of the gun will then be examined. The headspace will be measured after each 2000 rounds of this test. Before the endurance test, measurements will be taken of the length of the bolt and all shoulders which sustain powder pressure. These measurements will be repeated after the endurance test. The reserve power will be tested at the beginning of each thousand rounds by weighing the belt pull which will stop the gun.

TEST IX

a. Barrel shall have sufficient endurance to maintain without keyholding or excessive dispersion, five minutes of fire at full automatic rate, one 125-round burst in each minute. This test shall be performed three times in all, using the same barrel, with adequate cooling between each five minutes (625 rounds) of fire.

b. When the light machine gun is provided with a spare barrel, the following schedule on firings should be used:

Barrel Number 1	125 Rounds
Barrel Number 2	125 Rounds
Barrel Number 1	125 Rounds
Barrel Number 2	125 Rounds
Barrel Number 1	125 Rounds

Following the above, firing should be conducted as follows:

Barrel Number 1	200 Rounds
Barrel Number 2	200 Rounds
Barrel Number 1	225 Rounds

Each of the above firings should be conducted as nearly as possible at a rate of 125 rounds per minute and the entire 625 rounds are to be fired within five (5) minutes. Accuracy should be measured at the beginning and end of each series of firings using Barrel Number 1.

TEST X

With the mechanism closed and both ends of barrel tightly corked, the gun will be exposed in the box prepared for that purpose to a blast of sand for 2 minutes and then removed. The surplus sand may be removed by blowing thereon, jarring, or wiping with the bare hand only. There will then be fired 500 rounds automatic fire.

TEST XI

Photographic Stability Test.

*TEST XII

Standard Mud Test.

*TEST XIII

Standard Rain Test.

*TEST XIV

Standard Cold Test.

TEST XV

Such additional tests as may be considered desirable, including tests by the Infantry and Cavalry.

* O.O. 400.112/5053
A.P.G. 472.5/1335

19 January 1944

APPENDIX C

Firing Record No. S-36300

FORM APG 5

C.B. Reg. No.
06-84-Tm-06

ABERDEEN PROVING GROUND, MARYLAND

FIRING RECORD

788-SMI-064

OBJECT OF FIRING: To subject the Light Machine Gun, Caliber 30, T24, to the standard light machine gun test.

DATE OF FIRING 24 Jan.-14 Feb. 1944
PROVING CENTER F. R. No. S-36300
SHEET 1 OF 12
T. S. T. P.
O. C. M. ITEM
O. P. No. 5082
O. O. FILE T15 A0 VWA0A B33 WD 44
A. P. G. FILE Studler 082240Z Feb.
W. O. No. 320-1 SPOTS BALLEISEN

DEVELOPMENT - SPOTS

		Prev. Rds.
FIRED FROM	Light Machine Gun, Caliber 30, T 24, No. 1	unknown
	Light Machine Gun, Caliber 30, T 24, No. 2	unknown

AMMUNITION

Cartridge, High Pressure, Cal. .30, M1 (60,000-70,000 p.s.i.)

Cartridge, Ball, M2, Cal. .30, Lot F.A. 3929

Cartridge, Tracer, Cal. .30, Lot F.A. 1055-C

Cartridge, Ball, M2, Cal. .30 (55,000 p.s.i.)

TEST I

(a) The photographs attached as an inclosure, illustrate the weapons. The following nomenclature derived from drawings supplied by the manufacturer, apply to the various photographs. (See Appendix D)

Photograph No. 99257
1 - Bolt assembly
2 - Barrel assembly
3 - Receiver assembly
4 - Stock and buffer assemblies
5 - Actuating spring

Photograph No. 99258
1 - Ejector pin
2 - Bolt roller wedge
3 - Firing pin
4 - Bolt body
5 - Ejector plunger
6 - 8 - Bolt rollers
7 - Cross head
9 - Extractor spring
10 - Extractor lock
11 - Extractor

Photo No. 99259

1 - Pistol grips and retaining screws
2 - Pistol grip pin & lock pin
3 - Trigger mechanism catch pin
4 - Trigger mechanism catch
5 - Trigger spring
6 - Trigger spring pin & spacer
7 - Pistol grip assembly
8 - Safety assembly
9 - Trigger pins
10 - Trigger sub assembly

Photo No. 99260

1 - Butt plate & screws
2 - Buffer screw nut & cotter pin
3 - Stock assembly
4 - Buffer spring screw
5 - Buffer spring
6 - Recoil buffer
7 - Buffer spring spacer
8 - Buffer screw washer
9 - Buffer spring tube

Photo No. 99261

1 - Barrel nozzle
2 - Booster
3 - Flash hider

Photo No. 99367

1 - Feed mechanism cover sub assembly
2 - Feed fingers sub assembly
3 - Cam bar and feed fingers connecter
4 - Cam bar sub assembly
5 - Bullet ramp positioning pin
6 - Bullet ramp positioning spring
7 - Bullet ramp spring
8 - Bullet ramp sub assembly

NOTE: Above nomenclature secured from prints supplied by the manufacturer.

The number of parts listed below are an estimation as many assemblies were staked or riveted together and could not be disassembled for a complete count.

Total number of parts - 227
Number of springs - 17

NOTE: Sights, tripod adapters or bipod are not included.

Weight and dimensional data are listed below. For comparative purposes related data on the M.G. 42 is included.

	T24	MG42
Overall length	46-7/8"	48-1/8"
Length of Barrel	20-13/16"	20-13/16"
Weight of Bipod	2 lbs. 10.7 ozs.	2 lbs. 7.4 ozs.
Weight of Barrel	3 lbs. 13 ozs.	3 lbs. 13.74 ozs.
Weight of Bolt	2 lbs. 15 ozs.	1 lb. 1.78 ozs.
Command Height	No traverse Low 11-1/2" High 16-7/8"	Universal Low 11-1/8" High 13-1/8"
Weight of Adapter for M2 Tripod	3 lbs. 8.72 ozs.	
Weight of Stock & Buffer Assembly	2 lbs. 11 ozs.	2 lbs. 8.1 ozs.
Trigger Pull	13-1/2 lbs.	19-1/2 lbs.
Distance from Cover Latch to Rear of Butt Plate	7-1/2"	9"
Weight w/o Bipod or Adapters	24 lbs. 6 ozs.	23 lbs. 10 ozs.

TEST II

Four minutes and eight seconds were required to disassemble the weapon. Eight minutes and fifty-seven seconds were required to reassemble the gun. A medium sized screw driver and a round of ammunition were required for both operations.

The gun could be field-stripped in one minute and reassembled from this condition in two minutes and fifteen seconds. A round of ammunition was required for these operations.

Adequate cleaning required approximately five minutes.

ABERDEEN PROVING GROUND, MARYLAND
FIRING RECORD

PROVING CENTER F. R. No. S-36300
SHEET 4 OF 12
DATE 24 Jan. - 14 Feb. 1944

Cartridge, Ball M2, Caliber 30, Lot D.M. 20335
Light Machine Gun, Caliber 30, T24

24 January 1944

ROUNDS	NO.	FUNCTION	CYCLIC RATE r.p.m.	REMARKS
Preliminary firing to select best weapon for Standard test.				
				Note: Single strand recoil spring received in weapon used in test. Woven spring shown in Photo. No. 99257 would not fit.
		Gun No. 1		
1-2		satisfactory		Hi-Pressure rounds. No damage to gun.
1-50	1	failed to eject	615 620	
		B.A.R. rear sight installed		
		Temporary front sight installed		
		Gun No. 2		
1-2		satisfactory		Hi-Pressure rounds No damage to gun
1-57		failed to eject on practically every round.		

All efforts to make gun function failed. Examinations showed improperly formed right guide rib where bolt rides. Track in which bolt retracting handle rides was badly galled. Cover latch must be hammered to securely lock. Subsequent gauging showed that headspace on this weapon was too great to measure, being over 1.955".

ABERDEEN PROVING GROUND, MARYLAND
FIRING RECORD

Ord. Research
CENTER F. R No. S-36300
SHEET 5 OF 12
DATE 24 Jan. - 14 Feb. 1944

TEST V
VELOCITY

Caliber 30 F.A. 3929 Ball, M2
Machine Gun No. 1 (T24)

8 February 1944

TIME	ROUNDS	VELOCITY f/s	REMARKS
2:15	1	2607	Barrel No. 3
	2	2670	Room Temp. 72°
	3	2665	Range Temp. 47°
	4	2587	Den 1,097
	5	2651	
	6	2607	
	7	2561	2 Conditoners
	8	2604	6 lost rounds
	9	2596	38 total rounds fired
	10	2610	
	11	2651	
	12	2610	Means 2629.2 f/s
	13	2601	Maximum 2670 f/s
	14	2646	Minimum 2561 f/s
	15	2670	E.V. 109 f/s
	16	2653	M.V. 23.5 f/s
	17	2618	
	18	2644	
	19	2595	
	20	2629	
	21	2646	
	22	2644	
	23	2653	
	24	2660	
	25	2627	
	26	2623	
	27	2616	
	28	2653	
	29	2655	
	30	2623	

TEST IV
ACCURACY

Ball, M2, Caliber 30, Lot F.A. 3929
Light Machine Gun Caliber 30, T24

9 Feb. 1944

TIME	ROUNDS	NO.	FUNCTION	TARGET	REMARKS
	Range 300 yds.				5 Conditioning Rds.
	Fired in bursts of 2 and 3 shots. Single aimed shot cannot be obtained when belt is used.				
10:15	1-100	2	failed to eject	1-5	
	Noted that butt stock is very uncomfortable for gunner. The stock is short, bringing face close to cover latch. Line of sight entirely too low with B.A.R. sight mounted on cover. Gunner's cheekbone lies on sharp ridge on butt stock, face in direct contact with metal stock. Cold and uncomfortable. Very hard to retract bolt while in the prone position.				
	Range 300 yds.				
	Full automatic rate - from bipod				
11:00	1-20	4	failed to eject	out	
	21-40	2	failed to eject	out	
	41-60	2	failed to eject	out	
	61-80		satisfactory	8	
	81-100	4	failed to eject	out	
		1	failed to fire		cause unknown
	101-120	4	failed to eject	out	Extractor lip chipped. Extractor replaced with one from Gun #2.
	Range 300 yds.				
	Targets fired by placing single rounds in feedway.				
1:00	1-60		satisfactory	S1 to S3	

TIME	ROUNDS	NO.	FUNCTION	TARGET	REMARKS
			Range 300 yds.		
			Full Automatic rate - From tripod, sandbagged down firmly		
					Cond. Rds. -22
	1-20		satisfactory	1-TA	
	21-40		satisfactory	2-TA	
	41-60	2	failures to feed		Rds. hit left front side of feedway slot.
	61-89		satisfactory		

On 10th round of this burst, there was a puff of smoke from the receiver. Inspection showed that the rear half of one ruptured case was in the receiver, the front end of this case was left in the chamber. The primer of this case had been hit by the firing pin. There was a second ruptured case in the receiver, whose primer had been detonated but not by the firing pin. The projectile from the second ruptured case was stuck in the bore at the origin of the rifling. There was a large quantity of unburned powder in the receiver. The neck and seating shoulder of the second case was greatly expanded. It is evident that the first round ruptured cleanly, leaving the front half in chamber. The second round tried to chamber but could not go in very far. The primer was hit by some object, perhaps the rear end of the first ruptured case, which was forced against the primer by the closing bolt.

ACCURACY RESULTS

Short automatic bursts - (2-3 rds) - bipod

TARGET NO.	NO. OF HITS	E.V.D.	E.H.D.	E.S.
1	11	30.80"	39.70"	44.50"
2	13	22.18"	28.82"	32.00"
3	11	40.00"	51.30"	61.05"
4	18	39.72"	40.20"	40.78"
5	19	45.10"	51.49"	53.76"
Ave.	(total) 72	35.56"	42.76"	46.42"

Continuous 20-round burst - bipod

8	18	52.82"	61.48"	76.35"

TARGET NO.	M.R.	M.V.D.	M.H.D.	E.V.D.	E.H.D.	E.S.
Single shot - individual rounds placed in feedway.						
S-1	12.20"	6.75"	9.10"	30.10"	39.50"	39.75"
S-2	11.65"	8.60"	6.88"	39.62"	25.15"	43.88"
S-3	14.05"	7.44"	9.43"	34.69"	38.92"	42.10"
Ave.	12.63"	7.60"	8.47"	34.80"	34.52"	41.91"

Continuous 20 round burst - tripod - firmly sand-bagged

TARGET NO.	NO. OF HITS	E.V.D.	E.H.D.	E.S.
1-TA	17	29.22"	49.75"	49.75"
2-TA	20	30.30"	51.60"	52.90"
Ave.	(total) 37	29.76"	50.68"	51.33"

TEST VI

Ball, M2, Caliber 30, F.A. 3929
T24, Caliber 30 No. 1

10 Feb. 1944

TIME	ROUNDS	NO.	FUNCTION	REMARKS
	Short bursts - 2 to 3 rounds each			Barrel #3
11:00	1-100		satisfactory	
	Full Auto. Rate			
11:15	1-50	11	short recoil	
	51-100	1	short recoil	
	101-150	1	short recoil	
	151-200	1	short recoil	Spring from #2 -.085" wire. Sp. #1 - 2 coils removed.
	201-250	1	failed to feed*	* End Tab of belt caught in feedway slot.
	251-300		OK	
	Intermittent Short and long bursts			
1:20	1-50	1	failed to feed*	*Link caught in feed slot
	51-100	1	Ruptured case	Headspace - 1.948"
11 Feb. 1944	101-150		satisfactory	Headspace changed to 1.941" at Machine Shop Barrel No. 3
	151-200		satisfactory	
	201-250		satisfactory	
	251-300	2	short recoil	
		1	failed to feed	Belt link caught in feedway

TEST VII
High and Low Pressure Test

L.M.G. Caliber 30, T24, No. 1 Barrel No. 3

11 Feb. 1944

ROUNDS	NO.	FUNCTION	REMARKS
Cartridge, Tracer, Caliber 30, Lot F.A. 1055-C (38,000 p.s.i.)			
Short Bursts - 2 to 3 rounds each.			
1-25	2	failed to eject*	* Short recoil
Full Automatic rate			
1-25	1	failed to eject*	
Cartridge, Ball M2, loaded to 55,000 p.s.i.			
Short bursts - 2 to 3 rounds each			
1-25		satisfactory	
Full automatic rate			
1-25		satisfactory	

TEST VIII
Endurance

F.A. 3929

Gun No. 1

11 Feb. 1944

Gun thoroughly cleaned and oiled. Headspace of barrel No. 3 1.942". Barrel water cooled every 100 rounds during firing. Firing conducted from M2 tripod.

1-200	8	failed to eject*	*Short recoil

Reserve power was tested at start of firing and it was found that the gun would lift a belt of 60 loaded rounds. Inasmuch as the functioning was unsatisfactory, the following firing was conducted in an effort to get the weapon in proper operating shape.

FORM A.P.G. 8

ABERDEEN PROVING GROUND, MARYLAND
FIRING RECORD

Ord. Research CENTER R. No. S-36300
SHEET 10 OF 12
DATE 24 Jan. - 14 Feb. 1944

ROUNDS	NO.	FUNCTION	CYCLIC RATE spm	REMARKS
Placed in rigid mount - oiled - Booster with .600" opening.				
201-300	6	failed to eject		short recoil
Booster from M.G. 42 installed - .425" orifice.				
301-365		satisfactory	725	
366-415	1	failure to feed		
	1	failure to eject	725	cause unknown
416-465		satisfactory	725	
Butt group and buffer assembly from Gun #2 installed - Booster with .460" opening.				
466-495	2	failures to eject		Empty cases caught between retracting handle and face of bolt.
Booster with .600" opening installed.				
496-525	1	failure to eject		Short recoil
526-575		satisfactory	610 610 615	
576-625	3	failures to eject		
	1	ruptured case		
	1	failure to feed		Round shortened
626-675	1	failure to feed		Short recoil
	3	failures to eject		Head of round caught between bolt face and front of ejection port
Buffer advanced to within 1/32" of bolt when bolt is in cocked position.				
676-725	1	failure to eject		
	1	ruptured case		
12 Feb. 1944				
Bolt from gun #2 installed				
726-733	5	failures to eject		

ROUNDS	NO.	FUNCTION	CYCLIC RATE rpm	REMARKS
	Original bolt replaced - Installed barrel No. 5 from No. 2 gun. Headspace 1.941". Had been reduced from 1.955" at machine shop.			
734-783		Satisfactory		
784-833	2	Failure to eject		
	Indications of retracting handle being hit by barrel recoiling. End relieved to provide clearance.			
834-883		Satisfactory		
884-933	1	Failure to feed		Stubbed on bottom of barrel face
	Bullet ramp bent. Replaced with ramp from No. 2 gun.			
934-983	1	Failure to feed		Stubbed on bottom of barrel face
984-1033	1	Failure to eject		
	2	Failures to feed		Round was not pushed from belt.
1034-1083	1	Failure to feed		Round hit below face of barrel
1084-1133	1	Failure to feed		Round was not pushed from belt.
	1	Failure to feed		Stubbed on bottom of barrel face.
	1	Failure to eject		Empty between front of retracting handle and bolt face.
1134-1283	1	Failure to eject		
	2	Failures to feed		Stubbed on top of barrel face
	Cut down M.G. 42 buffer spring installed			
1284-1333	2	Failures to feed		Stubbed on top of barrel face
	Bullet ramp broke when an attempt was made to bend it to correct feed failures. Ramp from M.G. 42 installed.			

FORM A.P.G. 4

ABERDEEN PROVING GROUND, MARYLAND
FIRING RECORD

Ord. Research CENTER F. R. No. S-36300.
SHEET 12 OF 12
DATE 24 Jan. - 14 Feb. 1944

ROUNDS	NO.	FUNCTION	CYCLIC RATE rpm	REMARKS
1334-1383		satisfactory		
1384-1433	1	failure to eject		
		Retracting handle removed from weapon		
1434-1483		satisfactory		
1484-1533	1	failure to eject		
1534-1583		satisfactory		

Firing suspended at this point by authority of Major Balleisin, O.C.O.

SUMMARY:

Average cyclic rate - 614 R.P.M.
Average instrumental velocity at 78' - 2629.2 f/s
Complete accuracy data could not be secured due to unreliable gun function.
Limited firing indicated that the accuracy of the weapon was fair.
A total of 1583 rounds were fired in Test VIII and in an effort to improve operation. Fifty-one malfunctions occurred during this firing, the majority being failures to eject.

This firing record is Appendix C in the First Report on Tests of the Light Machine Gun, Cal. .30, T24 and Three hundred and First Report on Functioning and Mechanical Tests of Machine Guns and Machine Gun Accessories, Ordnance Program No. 5082.

APPROVED:

LESLIE E. SIMON,
Col. Ord. Dept.,
Acting Director.
Ord. Research Center

JOHN W. CAVE,
Lt. Col. Ord. Dept.,
Chief, Arms & Ammun. Div.

Wm. S. Aumen Jr.
Wm. S. AUMEN Jr.
Asst. Engineer

APPENDIX D

Photographs Nos.

99250	99257
99251	99258
99252	99259
99253	99260
99254	99261
99255	99262
99256	99367