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PRODUCTION ENGINEERING TEST OF LAUNCHER, ROCKET,
3.5 INCH, M20A1B1, AND DEVELOPMENT TESTS OF
LAUNCHER, ROCKET, 3.5 INCH, M20
EQUIPPED WITH LATCH MECHANISM, T-1.
TWENTY-SECOND REPORT ON ORDNANCE PROJECT 764-409.
DEVELOPMENT AND PROOF SERVICES
ABERDEEN PROVING GROUND, MARYLAND

Authority: ORDTS
Priority: IA

PRODUCTION ENGINEERING TEST OF LAUNCHER, ROCKET.

3.5 INCH, M20A1EL AND DEVELOPMENT TESTS OF
LAUNCHER, ROCKET, 3.5 INCH, M20
EQUIPPED WITH LATCH MECHANISM, T-1

TWENTY-SECOND REPORT ON ORDNANCE PROJECT 784-4619

DATES OF TEST: JUNE - JULY 1953

OBJECT

To determine the suitability for field use, functional reliability, and performance of 3.5 Inch Rocket Launcher, M20A1EL and the performance of the 3.5 Inch Rocket Launcher, M20, with Latch Mechanism, T-1.

SUMMARY

Four 3.5 Inch Rocket Launchers, M20A1EL, Serial Nos. 207931, 207932, 207935, and 207936, were received at this Proving Ground for Production Engineering testing. The launchers were subjected to a cycling test with inerted ammunition and were fired in connection with general functioning, environmental and aimed rapid fire and accuracy tests.

The 3.5 Inch Rocket Launcher, M20 with Latch Mechanism, T1, was used in the firing of the the development tests of the 3.5 Inch Rockets, T205EL and T206EL.

CONCLUSIONS

It is concluded that the general design and functioning of the Production Launchers, and the M20 Launcher with the T1 Latch Mechanism, with minor exceptions, are satisfactory.

RECOMMENDATIONS

It is recommended that the minor deficiencies of the four Production 3.5 Inch Rocket Launchers, M20A1EL, and the 3.5 Inch Rocket Launcher, M20, with Latch Mechanism, T1, tested and noted in the report, be corrected and that the corrections be applied to all production launchers.
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I. INTRODUCTION

A. DISCUSSION

1. The 3.5 Inch Rocket Launcher, M20A1B1, was designed and fabricated to provide the Army Field Forces with a shoulder type launcher which would:

   a. Have a higher rate of fire than the standard type rocket launcher.
   
   b. Be safer to operate than the standard type rocket launcher.

   c. Eliminate the necessity for the long contact lead (blue) wires of the 3.5 Inch Rockets.

2. The exigency for such a weapon was recognized because:

   a. The rate of fire of the standard M20 and M20A1 Launchers was low and it was necessary for the loader to:

      (1) Pull the long contact lead (blue) wire from the rocket expansion cone and remove the insulation from the free end of the wire.

      (2) Insert the rocket into the launcher tube and ascertain if the rocket was properly indexed in the launcher as the contactor latch blade of the launcher had to engage the unpainted groove in the shroud ring of the radial fins of the rocket.

      (3) Connect the long contact lead (blue) wire to a contact spring on the launcher.

   b. Also, a safety hazard existed in loading the standard M20 and M20A1 Launchers if an incorrect loading sequence were used, i.e. if the loader connected the blue lead wire to the contact spring before the loader had completely positioned the rocket in the launcher tube. If the gunner then pulled the trigger of the firing mechanism while the loader was still attempting to position the rocket, the rocket could be ignited. If this occurred, the loader would most probably be burned by the back blast of the rocket. Also, the rocket fin assembly could possibly become wedged into the launcher tube by the contactor latch resulting in a runaway launcher.

   c. A danger existed that the long contact lead (blue) wire, at the instant of the rocket firing, could be whipped about the contact spring with a force great enough to cut or penetrate clothing causing injury or discomfort to either the loader or the gunner. In addition, with the knowledge that this could occur the gunner may flinch at the time of firing thereby decreasing the accuracy of the weapon.

3. A Latch Contactor Mechanism was suggested by Aberdeen Proving Ground Personnel and was further developed by the Harvey Machine Company. This mechanism, later designated as the Latch Contactor Mechanism, T1, performed the following functions:
a. Provided a leader's safety. When the arming lever was in the lead position, the firing circuit was broken and the rocket could not be fired until the arming lever was pushed into the fire position.

b. Indexed the rocket in the launcher tube when it was loaded. This was accomplished by means of stops which protruded into the launcher tube and stopped the forward motion of the rocket in the proper position for firing.

c. Provided a hot contact finger which rested on a hot contact band on the rocket fin shroud assembly. All standard 3.5 Inch Rockets are equipped with a hot contact band. This in conjunction with the holding detent completed the firing circuit to the rocket to be fired. Therefore, there is no need for the long contact lead (blue) wire in rockets fired by a Launcher equipped with this Latch Contact Mechanism.

4. A 3.5 Inch Rocket Launcher, M20, equipped with a development Latch Contactor Mechanism, T1, was development tested at this Proving Ground. The launcher and Latch Contactor Mechanism were, in general, found to be satisfactory. The results of these tests were reported in the Sixteenth Report on Project T84-4019.

5. A 3.5 Inch Rocket Launcher, M20, No. 153679, equipped with a further improved model of the development type Latch Contactor Mechanism, T1, was received for testing at this Proving Ground. This Launcher and Latch Contactor Mechanism were similar to the ones which were sent to Army Field Forces for evaluation. The Launcher and Latch Contactor Mechanism were tested and the results of the tests were recorded in this report.

6. Also four each 3.5 Inch Rocket Launcher, M20A1E1, Nos. 207931, 207932, 207933, and 207961 were taken from production at Birtman Electric Company and forwarded to this Proving Ground for Production Engineering Testing.

7. The results of the tests of these production launchers and the launcher with the Latch Contactor Mechanism, T1, form the basis of this report.

B. REFERENCES

1. Authority for Test - copy inclosed in Appendix A.

2. Related APG Reports.
   a. Twentieth Report on Project T84-4019 entitled "Contactor Latch Mechanism for 3.5" Rocket Launcher, M20".

   b. First Report on Project T22-1015A entitled "Development Tests of Rocket, HEAT, 3.5 Inch, T205E1, and Rocket, Practice, 3.5 Inch, T226 and T206E1".

-5-

II. DESCRIPTION OF MATERIAL

A. 3.5 INCH ROCKET LAUNCHER, M20A1B1, (PRODUCTION).

1. The 3.5 Inch Rocket Launcher, M20A1B1, is a two-piece cast aluminum smoothbore weapon of the open tube type and is fired by means of a double-action magnetic type electric firing mechanism housed in the trigger grips. It fires fin stabilized 3.5 Inch Rockets utilizing a Latch Contactor Mechanism which positions the rockets in the launcher and provides electric contacts to the rocket from the firing mechanism. The launcher is exhibited in APG Photographs A92115, A92116, A92117, A92118, and A92119, Appendix C.

2. The physical characteristics of this launcher follow:
   a. Weight of launcher (with sling and shoulder stock) 13.4 Pounds
   b. Overall length 60.5 Inches
   c. Overall height (with shoulder stock) 12.5 Inches
   d. Overall width (sight extended) 10.0 Inches
   e. Weight of front barrel assembly 4.1 Pounds
   f. Length of front barrel assembly 30.2 Inches
   g. Weight of rear barrel assembly 9.3 Pounds
   h. Length of rear barrel assembly 31.4 Inches
   i. Type of firing mechanism Electric
   j. Metal of tube section Cast Aluminum
   k. Weight of sling 0.24 Pounds

3. This launcher consists of a front barrel assembly and a rear barrel assembly.
   a. The front barrel assembly consists of a tube with a front barrel hook and a barrel latch strike both cast with the tube.
   b. The rear barrel assembly consists of a tube, a rear barrel eye, and a barrel latch (both cast integral with the tube), an electric firing mechanism with a trigger guard, a latch contactor mechanism, a barrel coupling lock lever, a shoulder stock, and a sling assembly, reference APG Photographs Nos. A92117, A92118, Appendix C.
   c. Latch Contactor Mechanism.
      (1) The mechanism as shown is APG Photograph Nos. A92115, A92116, and A92119, Appendix C, consists of two stops, a hot contact finger, a holding detent, an arming lever, a knife type safety switch, a shorting strip, and a blast vane.
(2) Functioning

(a) The arming lever operates all the moving parts of the latch mechanism and also operates the knife switch which acts as a loader's safety.

1) When the arming lever is up, the launcher is "armed", the stops are retracted from the launcher tube and the blast vane is in the firing position.

2) When the arming lever is forward, the mechanism is "safe", the stops are in position in the launcher tube and the blast vane is out of the launcher tube.

3) The knife switch forms a part of the electrical firing circuit of the launcher so that when the switch is open the launcher is "safe" and when the switch is closed the launcher is "armed".

(3) Loading

(a) M29A2, M29A2, T205E1 or T206E1 series rocket are pushed into the breech of the launcher without regard to the position of the arming lever. If the mechanism is in the "fire" position, the rocket head will bear and return the mechanism to the "safe" position as the rocket is loaded in the launcher. As the rocket head enters the launcher tube, the spring loaded stops of the latch mechanism are cammed up out of the tube by the rocket head thereby allowing the rocket to enter the tube. When the rocket head passes the spring loaded stops, they are forced back down in place in the launcher tube to contact the leading edge of the shroud ring of the fin assembly and stop the rocket in the firing position. When the forward motion of the rocket is stopped by the stops, the holding detent engages the groove of the shroud ring of the fin assembly (ground contact) and the hot contact finger rests on the hot contact band of the rocket. The rocket is now in the firing position and the firing circuit is complete except that the knife switch is open.

(4) Firing

(a) The launcher is armed by pulling the arming lever up into the "fire" position. This retracts the stops, closes the knife switch and completes the firing circuit. To fire, the trigger of the firing mechanism is squeezed, this sends an electric current to the rocket motor which ignites the rocket.
(b) When the rocket is fired, the rocket must move forward 5/8 inch before the blast strikes the blast vane and trips the mechanism into the safe position making the launcher ready to receive the next round. This delay was incorporated in the design of the launcher to prevent the mechanism from being tripped too early and lowering the stops before the rocket had moved. If this happened the stops when tripped would have held the rocket in the launcher resulting in a runaway launcher.

(5) Unloading.

To unload in case of a misfire the launcher is made "safe" by pulling the arming lever downward and forward. This opens the knife switch thereby breaking the electrical circuit to the rocket and making the launcher "safe". The rocket can then be removed by depressing the holding detent of the latch contactor mechanism and pulling the rocket from the rear of launcher tube.

B. The 3.5 Inch Rocket Launcher, M20, with Latch Mechanism, T1, is the standard M20 Launcher which has been slightly altered by replacing the standard Contactor Latch with the T1 Latch Contactor Mechanism. This T1 Latch Contactor Mechanism is the same design and functions the same as the mechanism described in Paragraph II, A, 3, e above.

III. DETAILS OF TEST

A. PROCEDURE

1. 3.5" Rocket Launcher, M20A1B1, (Production)

a. Preparation for test

(1) All four of the cast aluminum launchers, when received, were inspected for damage incurred during shipment.

(2) The electric firing circuit of each launcher was tested by means of a firing mechanism output tester (hot contact finger to cold contact finger) to determine the power output.

b. Cycling test

(1) Ten 3.5 Inch Practice Rockets, M29A2, were inerted by removing the igniter and propellant from the rocket motors. These inerted rockets were cycled through 3.5 Inch Rocket Launcher, M20A1B1, No. 207932, until one thousand rounds had been cycled through the launcher.

(2) Each rocket cycled through the launcher was observed to determine if the rocket was positioned satisfactorily by the stops of the latch mechanism. At different stages of the cycling the latch mechanism was examined for damage and excessive wear.
c. Functioning test.

(1) Twenty 3.5 Inch Practice Rockets, M29A2, were fired through each of 3.5 Inch Rocket Launchers, M20A1B1, Nos. 207932 and 207935.

(2) Five 3.5 Inch Practice Rockets, M29A2, were fired through each of 3.5 Inch Rocket Launchers, M20A1B1, Nos. 207931 and 207931.

d. Environmental tests.

(1) Hot test

(a) Launcher, M20A1B1, Nos. 207932 and 207935 were temperature conditioned for six hours at plus 120°F.

(b) Five 3.5 Inch Practice Rockets, M29A2, were fired through each launcher for launcher functioning.

(2) Cold test

(a) Launchers, M20A1B1, Nos. 207932 and 207935, were temperature conditioned for six hours at minus twenty degrees Fahrenheit.

(b) Five 3.5 Inch Practice Rockets, M29A2, were fired through each launcher for launcher functioning.

(3) Dust test

(a) Launchers, M20A1B1, Nos. 207932 and 207935 were exposed to a continuous dust blast for a period of two minutes as described in paragraph 17 of OPM 21-10, except that the muzzle and breech ends of the launchers were not closed.

(b) Five 3.5 Inch Practice Rockets, M29A2, were fired through each launcher for functioning.

(4) Rain test

(a) Launchers, M20A1B1, Nos. 207932 and 207935, were exposed to a water spray for a period of one hour with both the breech and muzzle ends of the tube open.

(b) Five 3.5 Inch Practice Rockets, M29A2, were fired through each launcher for functioning.

(5) Mud test

(a) Launchers, M20A1B1, Nos. 207932 and 207935, were immersed in a mud bath consisting of ten parts red clay and two parts clean river sand mixed with water for a period of twenty seconds. After immersion, the gunner used his bare hands
to remove excess mud from the latch mechanism and the bore of the launcher.

(b) Five 3.5 Inch Practice Rockets, M29A2, were fired through each launcher for functioning.

e. Aimed Rapid Fire Test.

(1) Launcher, M20A1E1, No. 207932, mounted on a lightweight Tripod-Mount, T113E2, with Cradle Assembly, T20, was used for this test.

(2) Two men, who were acquainted with the launcher fired twenty-five 3.5 Inch Practice Rockets, M29A2, at a seven feet wide by four feet high vertical target at a range of one-hundred yards for an aimed rapid fire test of the launcher. One man loaded the rounds, and the second man aimed and fired the launcher.

f. A M20A1E1 Launcher (Production) was used as a proof facility to fire fifteen 3.5 Inch Practice Rockets T206E1, five at minus 40°F temperature, five at plus 70°F temperature, and five at plus 125°F temperature for a launcher recoil test, reference APG Firing Record No. R-3036 inclosed as part of the First Report on Ordnance Project No. T22-L05.

2. 3.5 Inch Rocket Launcher, M20, No. 153679, with Latch Contactor Mechanism, T1 (Development).

a. The launcher, when received, was inspected for damage incurred during shipment.

b. The electric firing circuit of the Launcher was tested by means of a firing mechanism output tester (hot contactor finger to cold contact finger) to determine the power output.

c. No specific firing tests were conducted on this Launcher. However, it was used as a proof facility for the development engineering testing of the 3.5 Inch HEAT Rocket, T205E1, and 3.5 Inch Practice Rocket, T206 and T206E1. During these tests the following rockets were fired from this launcher.

(1) 184 each 3.5 Inch Practice Rocket, T206.

(2) 200 each 3.5 Inch Practice Rocket, M29A2.

(3) 200 each 3.5 Inch Practice Rocket, T206E1.

(4) 175 each 3.5 Inch HEAT Rocket, T205E1.
B. RESULTS

1. 3.5 Inch Rocket Launcher, M20A1B1, (Production).

a. During preparation for test.

(1) No damage to the launchers was discovered when they were inspected upon arrival at this Proving Ground. All moving parts of the launchers functioned satisfactorily.

(2) The electrical firing circuit of each launcher was complete and functioned satisfactorily. The electrical output of the launcher firing mechanism follows:

<table>
<thead>
<tr>
<th>Launcher No.</th>
<th>Output</th>
<th>Launcher No.</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>207931</td>
<td>44</td>
<td>207935</td>
<td>40</td>
</tr>
<tr>
<td>207932</td>
<td>43</td>
<td>207931</td>
<td>45</td>
</tr>
</tbody>
</table>

(3) The weights and other characteristics of the launchers are recorded in paragraph II, A, of this report.

(4) The Latch Contactor Mechanism functioned satisfactorily both mechanically and electrically.

b. Cycling test

(1) The Latch Contactor Mechanism correctly positioned all but three of the one-thousand inserted rockets cycled through the Launcher. These three rockets over-rod the stops of the Latch Contactor Mechanism and passed too far into the Launcher to be fired. The cause of these three malfunctions was not ascertained.

(2) The Latch Contactor Mechanism was in good working order after this cycling test. No damage or excessive wear was observed in any of the parts of the mechanism.

c. Functioning test.

(1) The Latch Contactor Mechanism of all four launchers correctly positioned and fired all of the rounds satisfactorily.

(2) No misfires or launcher malfunctions were experienced during this test.

d. Environmental Tests.

(1) A summary of the results of the environmental tests follows:
<table>
<thead>
<tr>
<th>Test</th>
<th>Launcher Serial No.</th>
<th>No. of Rounds Fired</th>
<th>Launcher Functioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot</td>
<td>207932</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>207935</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Cold</td>
<td>207932</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>207935</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Dust</td>
<td>207932</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>207935</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Rain</td>
<td>207932</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>207935</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Mud</td>
<td>207932</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>207935</td>
<td>5</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

(e. Aimed Rapid Fire Test.

(1) The latch contactor mechanism of the launcher positioned and fired all of the rockets satisfactorily.

(2) No misfires or launcher malfunctions were experienced during this test.

(3) The total elapsed time for firing twenty-five rounds was one minute and fifty seconds. This is an average rate of fire of fourteen rounds per minute.

(4) Twenty-two of the twenty-five rounds impacted the four-foot by seven-foot target at a range of 100 yards in a 45 inch by 68 inch area. The three rounds which were misses passed to the right of the target.

(5) The Launcher and Latch Contactor Mechanism (Production) correctly positioned and fired all the T20661 Rockets satisfactorily and was not damaged by any of the firings, reference First Report on Ordnance Project No. TU2-10052.

2. 3.5 Inch Rocket Launcher, M20, No. 153679, with Latch Contactor Mechanism, T1, (Development).

a. The Launcher assembly, when received, was free from damage.

b. The electrical firing circuit of the Launcher was complete and the electrical output of the firing mechanism was 48 milliwatts.

c. The Latch Contactor Mechanism correctly positioned all rockets loaded into the launcher during the firing tests.

d. After one-hundred and eighty-four T206 Rockets, two-hundred M29A2 Rockets and fifty-five T20651 Rockets had been fired through this Launcher, the shorting strip was blown off of the T1 Latch Contactor Mechanism, reference APU Photographs A88992, Appendix G, and the edges of the latch cover were forced out of place.

e. During the firing tests launcher misfires were experienced. These misfires were caused by the loss of the insulation between the launcher contact spring...
clamp and the contact lead wire conduit of the T1 Latch Contactor Mechanism. This allowed the firing circuit to become shorted thus causing the launcher to misfire. The insulation was replaced and firing was resumed.

f. No other Latch Contactor Mechanism malfunctions were experienced.

g. Details of the firings are recorded in the First Report on Ordnance Project No. TU2-1015A.

C. OBSERVATIONS

1. It was observed that the insulation on the contact lead wire of the M20A1E6 Launcher (Production) was partially worn away at the point where this wire is squeezed between the cover and the bearing holder of the Latch Contactor Mechanism. If this insulation is broken, the launcher firing circuit will be "shorted out" causing the launcher to misfire. Although this never occurred during any testing at this Proving Ground, it is believed that there is a good possibility of this occurring thereby causing launcher misfires. This condition would be especially aggravated during combat operation when the cover of the Latch Contactor Mechanism must be removed and replaced during cleaning and/or servicing of this Mechanism.

2. When a section of the leading edge of the shroud ring of the rocket fin assembly is depressed or dented one-sixteenth of one inch or more, the steps of the Latch Contactor Mechanism of the M20A1E6 Launcher (Production) will ride over the damaged shroud section, thereby allowing the rocket to pass too far into the Launcher tube to be fired.

3. The production model Latch Contactor Mechanism stops were thinner in web section and offered a more curved leading edge to position the rockets than did the stops of development model Latch Contactor Mechanism.

IV. CONCLUSIONS

It is concluded that:

A. The M20A1E6 Launchers functioned satisfactorily on functioning and environmental tests except for the wearing of the insulation of the hot lead wire near the point where it attaches onto the knife switch post of the Latch Contactor Mechanism, reference paragraph III, C, 1.

B. The rate of fire of the M20A1E6 Launcher is higher than that of the M20 or M20E1 Launcher, reference paragraph III, B, 1, e, (3).

C. The shorting strip of the T1 Latch Contactor Mechanism on the 3.5" Rocket Launcher, M20 was not strong enough to withstand the shock of firing the 3.5 Inch HEAT Rocket, T205E1, (Practice Rocket T206E1), reference paragraph III, B, 2, d.
V. RECOMMENDATIONS

It is recommended that

A. The contact lead wire of the Latch Contactor Mechanism be run through a grommet in the bearing holder at the point where it now passes over said bearing holder of the Latch Contactor Mechanism.

B. The shorting strip of the Latch Contactor Mechanism be strengthened so as to be satisfactory for firing 3.5 Inch HEAT Rockets, T205E1 (Practice Rocket T206E1).

C. The M20A1 BL Launcher be considered acceptable for Army Field Forces Evaluation Tests.

B. McCLINTON
Pfc., Ord Corps
Project Engineer

APPROVED:

for T.F. COLEMAN
Director, Development and Proof Services.

P. J. STADTMAN
B.S. GOSWIG
Acting Chief
Arms & Amm., Div.
APPENDICES

APPENDIX A - Correspondence
APPENDIX B - APG Firing Record
APPENDIX C - APG Photographs
APPENDIX A

Correspondence
ET062
ECA043 X
HR UETCH
MI021
HR UCHC ZVA
HR UKEAO UETCH 222

DE UCHC 021
R 091.9121

FM GD ROOKE ISLAND ARSENAL ILL
TO UKEAO/CQFOED WASHDC
INFO UETCH/CO AMHERST FVG CO MD

DA CQFOED

FROM CQFOED WILHELM TT 17743 FOR ORDIN R PALLER AND ORDIN SMITH C FIELD
FOUR LAUNCHERS ROCKET 3.5" M20101 WITH LATEST IMPROVED CONTACTOR LATCH
SHIPPED APO 5 JUNE 53 BY AIR FREIGHT ON READING WY 2244847

MNF 17743 3.5" M20101 5 53 2244847

G 09/1413%
EG 16132%

***

09/14/53

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WAR DEPARTMENT
OFFICE OF THE CHIEF OF ORDNANCE
WASHINGTON, D.C.

00 471.9/168
APG 471.94/44

9 February 1953

S U B J E C T: Test of Launcher, Rocket, 3.5" M201E1
(Ord R&D Project TS-4019; DA Priority 1A)

TO: Commanding General
Aberdeen Proving Ground, Maryland

1. Shortly there will be shipped to your station four each
Launchers, Rocket, 3.5", M201E1 which have been taken from current pro-
duction by the Birtman Electric Company.

2. It is requested that these launchers be tested to determine
their suitability for field use, functional reliability and performance,
and that results of tests be furnished this office by letter prior to
preparation of the formal report.

BY COMMAND OF MAJOR GENERAL FORD:

/s/ Edward B. Grossman
EDWARD B. GROSSMAN
Lt Col, Ord Corps
Assistant
APPENDIX B

Firing Record
No. B-3068

DATES OF TEST: 17-19 June 1953

FIRING RECORD NO. R-3068

SHEET 1 OF 6

AUTHORITY: 00 471.9/168

APG 471.94/44

W.O. NO. 964-16-00-3

DEVELOPMENT: ORDTS

Project No. TS4-4019

Related Firing Record Nos. R-3036, R-3056

MATERIAL

3.5 Inch Rocket Launcher, M204A1B1, Nos. 207931, 207932, 207935 and 207981 (See Round-by-Round Data).

AMMUNITION

117 Each 3.5 Inch Practice Rocket, M29A2, Lot NO. NOP-1-12.

FACILITIES

Heavy Machine Gun Mount, M917A2, with modified cradle to receive the 3.5 Inch Rocket Launchers.

Cradle Assembly, T20.

Tripod Mount Assembly, T11382.
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S = Denotes satisfactory  
Rockets C/R - Data not taken.

II-ENVIRONMENTAL TEST PHASES  
27-19 June 1953

A. TEMPERATURE TESTS

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17 June 1953

19 June 1953

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Target 4 feet high by 7 feet wide.

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Rocket C/R - Data not taken  
Elevation - Data could not be determined  
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S = Satisfactory
Rocket C/R - Data not taken.
1. Before any firing was done inerted 3.5 Inch Practice Rockets, MC942, were cycled through launcher numbered 207932 one thousand times. The latch mechanism positioned the rockets satisfactorily in all cases except cycles numbers 863, 944 and 946.

2. Except for the rockets fired during the rapid fire test which were fired manually, all the rockets were fired remotely. A lanyard arrangement was used to pull the launchers firing mechanisms.

3. All the rockets were loaded into the launcher tubes without difficulty.

4. In every case except the cycling test mentioned above the latch mechanism positioned all of the rockets satisfactorily.

5. No misfires were experienced during any of the firings.

6. Mr. Ralph Flanagan and Mr. R.P. Palese from OCO and Mr. T. Kyle from the Birtman Electric Company witnessed tests conducted on 19 June 1953.

7. This firing record forms a part of the Twenty-First Report on Project TS4-4019.

APPROVED:

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MORRIS D. KAPLAN
Chief, Artillery & Rocket Branch

BRUCE McCLOTHLIN
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Project Engineer
APPENDIX C

APG PHOTOGRAPHS
A88392    A92117
A92119    A92118
A92116    A92119
Project No. T34-4019. Rocket Launcher, 3.5", M20A1Bl, No. 153679, W/T1 Latch.

Shorting strip blew off T1 latch mechanism after the following rockets were fired through the launcher: 184, T-206; 200, M29A2; and 55, T-206E1.
Project No. T54-4019. Rocket Launcher, 3.5", M2019RL.

Latch mechanism with cover removed. TOP: Latch mechanism in fire position. BOTTOM: Latch mechanism in safe position.
Project No. TS4-4019. Rocket Launcher, 3.5" M20A1B1.
Breech end. TOP: Rear view of launcher with cocking lever of latch mechanism in safe position. BOTTOM: Left side view of launcher with cocking lever of latch mechanism in safe position.
Project No. TS4-4019. Rocket Launcher, 3.5", M2OAlBl.
Reflecting sight assembly (ladder type reticle pattern) in folded position and firing mechanism (double action).
Project No. TS4-4019. Rocket launcher, 3.5", "204131. Equipped with shoulder stock.

TOP: Breech end of launcher with cocking lever of latch mechanism in fire position. BOTTOM: Left side of launcher with cocking lever of latch mechanism in fire position.