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# SPRINGFIELD ARMORY

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Report: SA-TR20-9103

Date: 28 February 1964

**Report Title:** Bibliography of Springfield Armory Technical  
Reports and Notes on Matériel  
(1 January 1963 - 31 December 1963)

Approved

  
STANLEY C. SWEIBER  
Lt Col, Ordnance Corps  
Chief, Res and Eng Div

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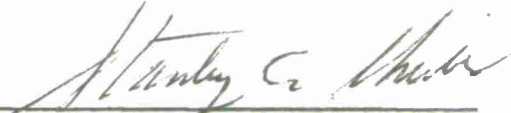


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Preparing Agency: Springfield Armory, Springfield, Mass.

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ABSTRACT

This bibliography is a compilation of Technical Reports and Notes on Materiel prepared and published by Springfield Armory Research and Engineering Division. This bibliography covers the period from 1 January 1963 to 31 December 1963. Abstracts of Technical Reports are included in this bibliography.

FOREWORD

This bibliography contains Springfield Armory Technical Reports, Notes on Materiel, and a Brochure published from 1 January 1963 to 31 December 1963.

Initial distribution of these reports has been made by Springfield Armory.

Reports published from 1 January 1961 to 31 December 1962 are listed in SA-TR20-9102 dated 31 January 1963.

Reports published from 1 July 1959 to 31 December 1960 are listed in SA-TR20-9101 dated 16 February 1961.

Reports published from 1 January 1948 to 30 June 1959 are listed in SA-TR20-9100 dated 30 September 1959.

REPORT  
SA-TR20-9103

ANNOTATION

Symbol

Identification

NM

Notes on Matériel

TR

Technical Reports

<u>NUMBER</u>	<u>TYPE</u>	<u>TITLE</u>
1-7021	TR	PRELIMINARY STUDY OF A METHOD OF STRETCH-STRAIGHTENING GUN BARRELS FOR SMALL ARMS, J. R. Eves, 7 Jun 63. Unclassified report. Nonlimited distribution.  ABSTRACT: The feasibility of straightening barrels for small arms by axially stretching these barrels was investigated. A standard tensile testing machine was used to apply the axial loading. This method of stretch-straightening is useful for all small arms barrels with particular emphasis on barrels having a length-to-bore ratio larger than 100 to 1. Test procedure is described, and results are discussed.
7-1717	TR	FUNCTION OF THE M3 (T15) GUN FEEDER, FOR THE 20MM AUTOMATIC GUN M61, IN A SIMULATED MD7 INSTALLATION, R. L. Rogers, 19 Oct 62. Unclassified Report. Limited Distribution. (For Official Use Only.)  ABSTRACT: An investigation was made to determine the cause of malfunctions when using the ammunition box and the T14 or the M3 (T15) feeder with the M61 automatic gun in the MD7 installation. The M61 gun was set up with the ammunition box and associated military equipment to simulate the installation in the MD7 aircraft. Firing was conducted at C rate, and the complete installation was checked at frequent intervals by high-speed motion pictures, oscillographs, and still photographs. Severe internal vibration of the rails, conflicting movements, bolt operations, and reversal of ammunition belt after firing was disclosed by the high-speed pictures. Live ammunition was used during one phase of the test. Ammunition did not flow evenly from ammunition box even at C rate of firing. It was recommended that features be incorporated in the ammunition box to reduce the turbulent flow of ammunition. Test procedure is described, and results discussed.
7-1719	TR	FUNCTIONAL REPORT OF THE INTEGRAL POWDER - GAS DRIVE FOR GUN, AUTOMATIC, 20MM, M61, R. L. Rogers, 7 Dec 62. Unclassified report. Nonlimited distribution.

NUMBER

TYPE

TITLE

ABSTRACT: The results of a functional test of the integral powder-gas drive for the 20mm M61 Automatic Gun are discussed. The rate of acceleration of the M61 gun with the powder-gas drive compares favorably with the rate of acceleration with the electric and hydraulic drives after the first round is fired. The rate of fire in 100-round burst is not adversely affected by the heat added to the gun by the powder-gas drive. Additional testing to determine the relative reliability of the new design of the bolt and modification of the drive cylinder to eliminate mutilation were recommended.

11-2629

TR

EXPERIMENTAL HEAT RESISTANCE TESTS ON FIBER GLASS REINFORCED PLASTIC HANDGUARDS FOR THE M14 RIFLE, K. A. Jorczak, 6 Nov 61. Unclassified report. Nonlimited distribution.

ABSTRACT: An investigation was made to obtain data concerning the heat resistance of the M14 fiber glass reinforced plastic handguards. These handguards had various modifications of the inner surface. Test procedure is described, and results discussed. Handguards with fiber glass reinforced plastic polyester construction are superior to wood with regard to heat resistance. No difference was shown in the heat resistance of the various polyester type fiber glass reinforced plastic constructions tested. It was recommended that further investigation be made to improve the heat resistance of the M14 fiber glass reinforced plastic handguard.

11-2633

TR

REPAIR OF FIBER GLASS REINFORCED PLASTIC STOCKS FOR THE M14 RIFLE, J. Szanto, 7 Jan 63. Unclassified report. Limited distribution. (For Official Use Only.)

ABSTRACT: A kit was developed for the repair of damaged fiber glass reinforced plastic stocks for the M14 rifle. The reparability, the materials, the equipment, and the procedure are given for various types of damage. The adhesive kit can be used in the repair of plastics with the exception of fluorocarbons and polyethylenes. This kit can also be used for plastic-metal and for metal-metal joining. The aerosol spray kit can be used for spraying or for atomizing fluids as required.



<u>NUMBER</u>	<u>TYPE</u>	<u>TITLE</u>
11-2634	TR	<p>A COMPARISON OF POLYTETHYLENE GLYCOL TREATED BLACK WALNUT M14 GUNSTOCKS AND STANDARD BLACK WALNUT M14 GUNSTOCKS, M. S. Spivak, 5 Oct 62. Unclassified report. Nonlimited distribution.</p> <p>ABSTRACT: Polyethylene Glycol E600 impregnated M14 gunstocks were compared with standard M14 gunstocks for ease of machinability, effect on corrosion of steel in contact with polyglycol, weight differences, dimensional stability, durability under sustained fire, and firing accuracy under varied conditions. The treated gunstocks (1) exhibited better dimensional stability toward moisture than the standard M14 gunstocks, (2) could be cut just as easily in machining, but were heavier and more costly to sand, (3) gained more weight in humid conditions, and (4) did not appear to stand up as well under sustained fire. These treated stocks were not statistically superior in firing tests. Procedure is given and results discussed.</p>
11-2637	TR	<p>ONE-YEAR TROPICAL EXPOSURE TEST OF WOOD STOCKS AND PLASTIC STOCKS FOR THE M14, 7.62MM, RIFLE, J. Szanto, 27 May 63. Unclassified report. Nonlimited distribution.</p> <p>ABSTRACT: Fiber glass reinforced plastic stocks were compared with wood stocks for weatherability. Five walnut and five birch stocks were tested at the NRL Tropical Exposure Site, Canal Zone, together with five plastic stocks of the latest design. The effect of heat, humidity, and mildew under tropical wet conditions was determined from these tests. The damaging effect caused by chewing or biting or boring insects, vermin, rodents, and other forms of life indigenous to the area was also determined from these tests. Fiber glass reinforced plastic stocks successfully withstood the one-year exposure to tropical environment. Procedure is described and results discussed.</p>
11-2716	NM	<p>NOTES ON DEVELOPMENT TYPE MATERIEL FOR RIFLE, 15MM, SPOTTING, XM90E1, I. H. Atwood, Jr., 15 Oct 62. Unclassified report. Nonlimited distribution.</p>

REPORT  
SA-TR20-9102

<u>NUMBER</u>	<u>TYPE</u>	<u>TITLE</u>
18-1082	TR	PRODUCTION HARD-CHROMIUM-PLATING OF THE M14 RIFLE, R. J. Girard and E. F. Koetsch, Jr., 7 Jan 63. Unclassified report. Nonlimited distribution.  ABSTRACT: This report describes in detail the procedure used in production hard-chromium-plating of the 7.62mm rifle, M14, barrel. Tool marks, torn lands, and other irregularities not consistent with good machining practices result in an unsatisfactory chromium plate. Results of this procedure are given.
19-1213	TR	SUMMARY REPORT ON INVESTIGATIONS OF THE USE OF POWDERED METAL COMPONENTS FOR SMALL ARMS WEAPONS, J. F. Panda, 15 Mar 61. Unclassified report. Limited distribution. (For Official Use Only.)  ABSTRACT: This report summarizes results of investigations made to determine the feasibility of using powdered metal fabrication processes in the manufacture of components for small arms weapons. Inconsistent length of service life of components indicated the need of nondestructive testing procedures for quality control of powdered metal parts. (These procedures are being investigated.) Excellent physical properties were obtained with hot-coining techniques. Mechanical properties determined on a test bar heat-treated to Rockwell C36 were: Tensile strength, 207,300 p.s.i.; yield strength, 200,000 p.s.i.; elongation in 1 inch, 7.8 per cent; reduction of area, 29.2 per cent; density, 99.5 per cent of maximum. Procedure is given, and results discussed.
20-2313	TR	INVESTIGATION OF PACKAGING METHODS AND SUBMETHODS WITH VOLATILE-CORROSION-INHIBITOR TREATED MATERIALS, G. Pributsky, 1 Aug 62. Unclassified report. Nonlimited distribution.  ABSTRACT: An investigation was made to evaluate the suitability of using various submethods with volatile-corrosion-inhibitor-treated materials in the packaging of small arms components. Packages were stored under two conditions: (1) in an outdoor shed to simulate minimum warehouse storage and

<u>NUMBER</u>	<u>TYPE</u>	<u>TITLE</u>
		(2) in a static humidity cabinet to simulate tropic storage. Heat-sealable polyester film with volatile-corrosion-inhibitor innerwrap provided satisfactory protection in the humidity cabinet for one year. Results of this investigation indicate that packaging submethods other than those specified in MIL-I-8574 can be satisfactorily used with VCI preservatives. Test procedures are described and results given.
20-9211	TR	H13H HELICOPTER ARMAMENT SUBSYSTEM, 7.62MM, MACHINE GUN, XM2, M60C, B. H. Prescott, 10 Dec 62. Unclassified report. Nonlimited distribution.  ABSTRACT: Feasibility studies were made of the XM2 armament subsystem when this subsystem was used on the H-13H helicopter. The results of this study along with the performance characteristics of the XM2 armament subsystem are presented. The weapon control system is satisfactory for in-flight safetying and charging. The armament subsystem will function satisfactorily at -50°F. Recommendations are given. Procedure for the feasibility study is described and performance results discussed.
20-9102	TR	BIBLIOGRAPHY OF SPRINGFIELD ARMORY TECHNICAL REPORTS AND NOTES ON MATERIEL (1 January 1961 - 31 December 1962), Res and Eng Div, 31 Jan 63. Unclassified report. Nonlimited distribution.  ABSTRACT: This bibliography is a compilation of Technical Reports and Notes on Materiel prepared and published by Springfield Armory Research and Engineering Division. This bibliography covers the period from 1 January 1961 to 31 December 1962. Abstracts of Technical Reports are included in this bibliography.
20-9210	TR	PARAMETRIC STUDY OF 20MM WEAPON SYSTEMS FOR AIRCRAFT AREA FIRE MISSION, E. A. Humphrey, 1 Oct 62. Classified report. Limited distribution.

NUMBER

TYPE

TITLE

ABSTRACT: A study was made to determine the effect of the 20mm weapon system on the HU-1B helicopter. Four 20mm weapons were evaluated from various aspects to determine the most suitable weapon from the point of view of function, safety, and availability. Fixed (elevation only) systems and flexible (elevation and azimuth) systems located at several positions on the helicopter were investigated. Comparisons were made between the 20mm weapons and the 40mm XM75 weapon from the standpoint of aircraft control to show the difference between a lightweight, low-impulse system (40mm XM75) and a heavy, high-impulse system (20mm). The effect of pitch, yaw, roll, and rearward and sideward propulsion was established by calculations. Results show that the M39 is the most suitable of the 20mm weapons evaluated. A lightweight, low-impulse 40mm weapon which meets the terminal ballistics requirements would be the most feasible weapon system for the full flex in-board-mounted or the fixed outboard-mounted installations.

None

Brochure

ENGINEERING DEVELOPMENT AND OPERATIONAL CHARACTERISTICS OF RIFLE, 7.62MM, M14E2, P. R. Landry, 18 Dec 63. Unclassified report. Nonlimited distribution

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