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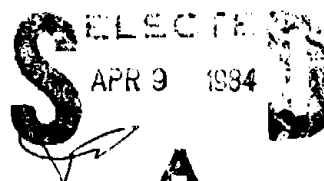
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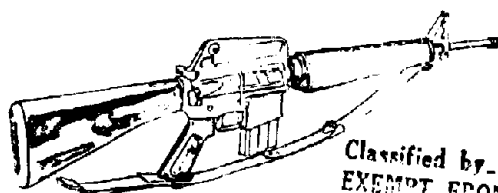
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REPORT OF THE M16 RIFLE REVIEW PANEL



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1 JUNE 1968

M16 SURVEYS IN THE REPUBLIC OF VIETNAM

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DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF
FOR RESEARCH, DEVELOPMENT, AND ACQUISITION
WASHINGTON, DC 20310

REPLY TO
ATTENTION OF

DAMA-WSW


1 FEB 1991

MEMORANDUM FOR THE RECORD

SUBJECT: Declassification Action - Report of the M16 Rifle Review Panel (C)
dated 1 June 1968. ~~CONFIDENTIAL~~

1. The Report on the M16 Rifle Review Panel dated 1 June 1968 was prepared for the Office of the Chief of Staff of the Army, by the Office of the Director of Weapons System Analysis. The Ground Combat Systems Division, Office of the Director of Weapons Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition, is the successor to the originator of the report.
2. This office has completed a review of subject report and appendices 1 through 11 and has determined classification of Confidential is no longer needed. The report is now Unclassified. Selected extracts of the report are at Enclosure 1.
3. Notification of this declassification will be forwarded to all distribution addressees and a declassified copy will be forwarded to the Defense Technical Information Center, Cameron Station, for file.

1 Encl
as


WILLIAM O. COOMER
Colonel, GS
Chief, Ground Combat Systems
Division



Appendix 7

M16 SURVEYS IN THE REPUBLIC OF VIETNAM

1 June 1968

Appendix 7

M16 Surveys in the Republic of Vietnam

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Letter to file

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Appendix 7

M16 SURVEYS IN THE REPUBLIC OF VIETNAM

A. Introduction

An urgent need for increased firepower in Vietnam was recognized by the Commander, U.S. Military Assistance Command, Vietnam, when he asked for 170,000 M16 rifles in December 1965.^{1/} The request was immediately approved and large numbers of M16's were introduced rapidly into Vietnam in early 1966.

No serious problems with the M16 were reported for several months, but in the fall of 1966 excessive stoppages and malfunctions began to be reported by units in U.S. Army, Vietnam (USARV). A preliminary investigation made by the Customer Assistance Office of the U.S. Army Materiel Command (USAMC), and technicians from the 1st Logistical Command and USARV determined that a lack of proper training and maintenance was the probable cause of the trouble.^{2/} USARV then took steps to improve the quality of M16 maintenance. Among these, USARV requested in early October 1966 that U.S. Army Weapons Command (USAWECOM) furnish technical training teams.

As reliability problems with the M16 continued to be reported, military concern increased and both public and Congressional interest was aroused. This concern and interest brought about a series of field surveys by various agencies and commands.

¹ Hq MACV Msg 42787, 060148Z Dec 65.

² Hq MACV Msg MACJ42-MS 46816, 230911Z Oct 66.
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B. U.S. Army Weapons Command Surveys

On 11 October 1966 USARV requested technical assistance in support of the M16 from U.S. Army Weapons Command,^{3/} and three surveys were made: one from October 1965 to December 1966, another in January - February 1967, and the third in April - May 1967.

October - December 1966

The first USAWECOM survey team stayed in Vietnam from 21 October 1965 until 2 December 1966.^{4/} While the primary purpose of the team^{5/} was to provide maintenance instruction to a nucleus of officers and men from each brigade, who would then teach their own units, direct support organizations were also instructed.

The team taught maintenance in every major USARV unit except the 1st Air Cavalry Division.^{6/} Students brought their own weapons, magazines, ammunition, cleaning materials, and accessories to class. A detailed inspection of each student's equipment revealed that with the exception of the weapons of the 1st Brigade, 101st Airborne Division, the 173d Airborne Brigade, and the 5th Special Forces, all

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Hq USARV Msg AVHGD-MD 29518, 110206Z, Oct 66.

4 Ltr, PM-RS, USAMC, 15 Dec 66, Subj: Liaison Vis't to SEA in Reference to the XM16E1 Rifle. All information about this USAWECOM survey is from this 15 Dec 66 report unless otherwise indicated.

5 The team, headed by Lieutenant Colonel Herbert P. Underwood of the Office of Project Manager, Rifles, had seven other members, four from USAWECOM and three from Colt's Firearms Division of Colt Industries.

6 The 1st Air Cavalry Division had stated that it was having no trouble with the rifle, and asked that instruction be given only to the small arms shop of its maintenance battalion.

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the weapons were poorly maintained. The most common faults observed were:

- Excessive oil on the weapon;
- Carbon buildup in the chamber, bolt, and bolt carrier group;
- Overloading of magazines with 21 rounds of ammunition;
- Oil and grit inside magazines (frequently accompanied by lubricated ammunition); and
- Failure to replace worn or broken extractors and extractor springs.

Other deficiencies noted frequently were shortages of technical manuals, cleaning equipment, and repair parts, and a general lack of knowledge of the M16 rifle among officers and noncommissioned officers.

The 1st Brigade, 101st Airborne Division, the 173d Airborne Brigade, and the 5th Special Forces were the only units surveyed that had received training with the M16 for a significant period of time prior to deployment to Vietnam. Men in other units had been given training in marksmanship but little or no instruction in care and cleaning of the rifle.

The survey team verified the existence of a malfunction problem and supported the findings of the preliminary investigation by concluding that the malfunctions were primarily due to inadequate cleaning, improper lubrication, and the continued use of worn parts. The team believed, further, that poor rifle maintenance was itself

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the result of insufficient maintenance training; a shortage of technical manuals, repair parts, and cleaning equipment; and a lack of knowledgeable officers and noncommissioned officers. As a result of the technical team's visit the following actions were taken within USARV:

Instruction material on the care and cleaning of the M16 was published and distributed at company or rifleman level.^{7/}

Emphasis was placed on the need for adequate command supervision of maintenance programs.^{8/}

New troops were required to receive a minimum of two hours M16 maintenance training during their first week in Vietnam.

Immediate USARV inspection and repair of all M16's on hand by divisional direct support maintenance teams and elements of the 1st Logistical Command was directed.

Follow-up inspections by teams from the 1st Logistical Command were directed to check on the effectiveness of maintenance training within USARV.

⁷ USAWECOM Ltr, 25 Oct 66, User Care of the M16; USARV Combat Lessons Learned, 28 Oct 66, M16 Care and Cleaning; USARV Training Circular 5, 20 Nov 66; USARV Pamphlet 750-5, 14 Dec 66; and extracts from several PS Magazines.

⁸ COMUSMACV Msg, MACJ42-MS 46816, 230911Z Oct 66; USARV Msg AVHGD-MD 30677, 181215Z Oct 66.

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January - February 1967

A follow-up of the first survey and instruction visit was made by USAWECOM from 17 January through 20 February 1967.^{9/} No trip report, after action report, or other memoranda exist, and therefore no comment on this survey can be made.

April - May 1967

On 17 April 1967, Headquarters, USARV, requested technical assistance with the XM148 grenade launcher.^{10/} A technical team was sent in response to this request.^{11/} The primary purpose of the survey was to evaluate and correct problems with the XM148 grenade launcher, but the team also examined large numbers of M16 rifles in the hands of troops to determine the status of maintenance, the availability of cleaning materials, and the condition of rifle barrels and chambers.^{12/} The team was in Vietnam

⁹ The team had five members: its team chief, Major Emanuel Podurgal, who was from the Office of the Project Manager, Rifles, two representatives from USAWECOM, one from U.S. Continental Army Command (USCONARC), and one from Colt's Firearms Division.

¹⁰ Ltr, PM-RS, USAMC, 25 May 67, p.1.

¹¹ This team consisted of its chief, Major Podurgal, from the Office of the Project Manager, Rifles, Mr. Wesley B. Eastis from USAWECOM, and Mr. Kanamitsu Ito, Colt's Firearms Division

¹² Ltr, PM-RS, USAMC, 25 May 67, Subj: After Action Report - AMCPM-RS Team Visit to Vietnam, All information regarding this survey is from this report.

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from 27 April through 18 May 1967, and during this time visited the two Marine divisions and every Army division and separate brigade (with the exception of Task Force Orgeon),^{13/} observing rifles, checking maintenance shops, and conducting interviews.

M16 rifles were inspected by the survey team in troop units and maintenance repair shops throughout Vietnam. The findings of this survey were:

No major difficulties were being experienced with the M16. There was still a problem with the extractor, but the frequency of malfunction had been reduced through improved care and cleaning.

Men expressed satisfaction with the M16 and agreed that it was superior to the M14 in the Vietnam environment.

About 50 percent of the M16's inspected in maintenance shops showed signs of chamber deterioration due to pitting.^{14/}

Accumulation of thick deposits of copper fouling in rifle bores was often observed. This condition was worse in units which habitually fired a large amount of tracer ammunition.

¹³ Why Task Force Oregon was not visited is unknown.

¹⁴ These weapons, which had been turned in for repair, however, may not be generally representative of those in the hands of troops.

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The survey team concluded that the major problem was deterioration of rifle barrels caused by chamber pitting and the accumulation of copper fouling. It estimated that approximately 10 percent of the M16's in Vietnam would require a barrel replacement every three months. To reduce the rate of barrel deterioration, the team recommended speeding up deliveries of the recently adopted improved lubricant (MIL-L-46000A) LSA and chrome plating the rifle chambers.

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C. Congressional Survey

On 3 May 1967, the House Committee on Armed Services appointed a special subcommittee to inquire into the M16 rifle program, naming Congressman Richard H. Ichord chairman and Congressmen Speedy O. Long and William G. Bray members. During their investigation the members of the subcommittee, accompanied by three special assistants and one military escort, visited Vietnam from 3 to 10 June 1967. After briefings at both Headquarters, MACV, and Headquarters, USARV, they visited the two Marine divisions and elements of five Army divisions. While in the field, they interviewed commanders, logistic support and training personnel, and soldiers and marines who had used the M16 in combat. Although some documents pertinent to the rifle program were collected, most of the information obtained by this survey came from personal interviews with men in combat units who were armed with the M16. Each of the three congressmen and three special assistants participated, and while no accurate count of the actual number of men interviewed is available, one of the special assistants, Colonel Edward B. Crossman (Ret.), estimated that he personally talked to more than 300 men.

No official report on this survey was published; the findings which follow are based upon observations by Colonel Crossman and the team escort, Colonel Paul B. Henley.^{15/}

- ¹⁵ Ltr, Col Crossman (Ret) to Mr Ichord, 16 Jun 67, Subj: Report of Investigations of the M16A1 Rifle in Combat.
Memo, USARV for CINCUSARPAC and DA, 15 Jun 67, Report of Congressional Visit (RCS SAOSA-9)

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At least 50 percent of the men interviewed had encountered serious malfunctions with M16, most of them failures to extract.

The bolt closure device was used frequently enough to justify the Army's insistence upon this product improvement.

Extractors and extractor springs required replacement fairly often.

While there was no general shortage of cleaning and preserving equipment, many individuals were short of the critical cleaning rod and chamber brush.

Approximately 50 percent of the men preferred the M14. Most of the men who wanted the M14 felt that it was a more reliable rifle and were concerned about the M16's possible malfunctions in combat.

The M16's light weight, full-automatic fire capability, handiness, ease of firing, and light ammunition weight were all factors mentioned in its favor.

A large percentage of the men appeared to be shooting their rifles in combat, in marked contrast to experience in Korea.

Many cases of a stuck or jammed selector lever were reported.

It was not possible to correlate kind of lubricant or method of lubrication with malfunctions, nor was such correlation possible

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with ammunition of a particular type or make.

Colonel Crossman recommended in his letter to Mr Ichord that an immediate investigation be conducted of ammunition design and manufacture, rifle design and manufacture, and maintenance in the field to determine the cause and cure for failures to extract. He also recommended modification of the selector lever and related parts to eliminate any tendency to stick.

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D. Office of the Assistant Secretary of Defense Survey

The Directorate for Inspection Services (DINS), Office of the Assistant Secretary of Defense (Administration), conducted a field survey in Vietnam from 22 August to 6 September 1967 to examine the performance of the M16 rifle.^{16/} Findings were to be compared with a technical evaluation of the M16 already completed by the Director of Defense Research and Engineering, who would then submit to the Deputy Secretary of Defense a final report stating whether any major deficiencies existed in the weapons and recommending corrective action accordingly.

Emphasis was placed on identifying corrective actions taken or required to improve the basic weapon and its accessories, the maintenance and logistic support thereof, and individual M16 rifle training (CONUS and SVN). The effectiveness of supervision of the chain of command was examined with respect to implementing corrective actions down to the individual rifleman. The performance and acceptability of the M16 was examined under a variety of combat conditions, terrain and weather. Special interest examinations were made with respect to additional field testing of the weapon in SVN, reporting procedures for performance data, and the effects of varying operating tactics (modes of fire) on reliability. Finally, suggestions for additional improvements to the rifle and accessories were solicited.^{17/}

The survey team questionnaire was completed by 1,585 men armed with the M16. The following is a summary of responses to the questionnaire:^{18/}

¹⁶ This team of six officers was headed by Major General Robert W. Strong, USAF.

¹⁷ Directorate for Inspection Services, OASD (Administration), 30 Sep 67, M16 Rifle Survey in South Vietnam, p.1.

¹⁸ Directorate for Inspection Services, OASD (Administration), undated, M16 Rifle Survey in South Vietnam, pp 17-18. (DINS, OASD (Administration) published two reports, the first undated and the subsequent one dated 30 Sep 67).

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	<u>Yes</u>	<u>No</u>	<u>UNKNOWN N/A</u>
1. Have you used the M16 rifle in combat operations?	83%	17%	
2. Has the M16 rifle performed well for you in Vietnam?	85%	13%	2%
3. Do you like the M16 as an individual weapon?	87%	12%	1%
4. Do you clean your M16 daily?	71%	28%	1%
5. Did you receive training on firing the M16 rifle after arrival in Vietnam?	82%	17%	1%
6. Did you zero your individual weapon in Vietnam?	77%	20%	3%
7. Have you had stoppage(s) with your rifle during firing? ^{19/}			
8. Were you able to clear the stoppage and continue to fire?	72%	8%	20%
9. Do you carry a cleaning kit for your M16 rifle?	69%	29%	2%
10. Are you able to get cleaning material for your rifle in your unit?	82%	16%	2%
11. Have you received special training in the maintenance of the M16 rifle under field conditions?	65%	32%	3%
12. Does your unit have a daily weapons inspection by the chain of command?	44%	53%	3%

^{19/} None, 17 percent; few, 70 percent; many (more than ten), 10 percent; and no answer, 3 percent.

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	<u>Yes</u>	<u>No</u>	<u>UNKNOWN</u> <u>N/A</u>
13. Have you received the new lubricant for the M16 rifle?	54%	44%	2%
14. Has the new lubricant improved the performance of your M16? (If you have used it)	66%		34%
15. Have you been told to keep your ammunition clean?	96%	4%	
16. Do you clean your ammunition and magazines daily?	29%	69%	2%
17. Would it help to have all magazines preloaded in disposable sealed magazines?	86%	11%	3%
18. Do you usually load 20 rounds in your magazines?	16%	83%	1%
19. If you usually load less than 20 rounds, how many do you load? <u>20/</u>			
20. Have you used the BOLT ASSIST to reduce stoppage?	44%	42%	14%
21. In combat have you usually fired the M16 fully automatic?	38%	51%	11%

The following OSD field survey findings were based upon a synthesis of the data collected from the questionnaire and from more than 600 personal interviews with commanders, maintenance personnel, and riflemen: 21/

20/ 20 rounds, 16 percent; 19 rounds, 10 percent; 18 rounds, 67 percent; 17 rounds, 6 percent; and 15 rounds, 1 percent.

21 Directorate for Inspection Services, OASD (Administration), 30 Sep 67, M16 Rifle Field Survey Vietnam, pp. 13-15.

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Training

1. In general, adequate training policy, guidance, and directives have been published by the separate services and their subordinate commands in CONUS to remedy the reported deficiencies contributing to M16 malfunctions in South Vietnam.

2. Training in CONUS could be improved by additional emphasis on familiarization firing, use of improved cleaning techniques, rifle disassembly and assembly, and application of procedures to reduce stoppages (immediate action).

3. The functions of rifle inspection and maintenance thereof in the field would be improved by increased CONUS training of company grade officers and noncommissioned officers in the nomenclature, functioning, care, and cleaning of the M16.

4. Adequate policy, guidance, and directives have been published by MACV and major subordinate headquarters prescribing specific training in the familiarization, care, cleaning, maintenance, and zero firing of the M16 rifle. These directives are available at all echelons of command in South Vietnam as a basis for effective training programs for individual combat riflemen.

5. The interview of individual riflemen in South Vietnam disclosed that compliance with MACV training directives had not been achieved to the desired degree. This was caused by some failure to communicate to the operating units, down to the individual rifleman, the training directives issued by MACV and major subordinate commands. There was also some failure in the chain of command to follow up the implementation of the directives in order to achieve compliance.

Support

6. CONUS support of the M16 rifle was found to be adequate in every respect and improving. Adequate quantities of repair parts, cleaning materials, and equipment were available or in supply channels to meet all requirements.

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7. MACV has directed appropriate action to insure the availability to operational units of adequate supplies, repair parts, and cleaning equipment. However, the individual rifleman has not consistently received these items on a routine basis even though available at direct support echelons.

8. The principal direct cause of the stoppages of the M16 rifle in South Vietnam has been the failure to extract the spent case. In turn this is caused by dirty or corroded cartridges, and improperly maintained chambers.

9. Adequate regularly conducted inspections of the M16 rifle were not being accomplished in many units. In the majority of units the inspection of magazines and ammunition on a regular basis was rarely accomplished.

10. Almost one hundred percent issue of the new LSA lubricant had just been completed to combat units at the time of the field survey. More than one half of those surveyed had used it in the field, and these reported improvement over previous lubricants. Noteworthy is the report of its rust and water repellant characteristics when used by units deployed in wet and muddy terrain.

11. Out of millions of rounds of 5.56mm ammunition expended, very few ammunition malfunctions were reported. Where rifles were given proper care, individual riflemen were unable to discern any difference in performance or carbon build-up between ammunition loaded with either ball or IMR propellant from different manufacturers.

12. The new buffer for the M16 had been issued to all maneuver elements. Action had been taken to accomplish retrofit and had been completed in the majority of these elements. Issue to all other units had been programmed and was in progress with scheduled completion during December 1967. In those units in which retrofit had been completed, riflemen surveyed reported that it had improved overall performance of their weapon.

13. No determination could be made of the effect or the impact on the performance of the M16 rifle by the

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substitution of the chrome chambered barrel due to the small number of rifles in Vietnam so modified. Soonest determination could be made of the effect of this modification if it is issued on a priority basis to all U.S. maneuver units in South Vietnam.

Current Problems

14. There are no major problems being experienced in the field with the M16 rifle at this time that have not been identified and for which corrective action had not been instituted. There are minor problems remaining which are within the purview of the product improvement program for the weapon.

Performance and Acceptability

15. The over-all performance of the M16 rifle in Vietnam has had the revolutionary impact of dramatic improvement of the combat capability of U.S. ground maneuver units in all types of operations. This is in spite of reliability problems caused by its accelerated issue and employment on a large scale, and the less than adequate preparation, training and discipline of U.S. forces for its support and maintenance.

16. The general performance of the M16 rifle has been satisfactory in Vietnam. Since June 1967, it has improved steadily as a result of increased training and discipline of the rifleman in the care, cleaning and maintenance of the weapon.

17. The great preponderance of riflemen, their commanders and support personnel accept the M16 as the proper infantry rifle for use throughout Vietnam and like it as an individual weapon. Only thirty-eight individuals out of the more than 2,100 surveyed stated they would exchange their M16 rifle for another weapon. Of this group, thirty-five wanted the shorter, lighter version of the M16--the CAR-15 (XM177).

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E. Office of the Chief of Staff Survey

Early in November of 1967, the Chief of Staff directed a review of the entire M16 rifle program.^{22/} On 8 November the M16 Rifle Review Panel was convened within the Office of the Assistant Vice Chief of Staff and instructed to prepare a comprehensive history and evaluation of the M16 program, recommending further action as required. This panel then conducted a field survey of men armed with the M16 in Vietnam during the period 24 January through 5 February 1968 to collect data on the reliability, status of training, status of maintenance, and general overall effectiveness of the M16-M16A1 rifle system.^{23/} Specific objectives of the field survey were to:

1. Determine the extent of corrective action previously taken to improve the reliability of the M16 rifle system.
2. Identify current problems experienced with the M16 in the field.
3. Evaluate the general performance and acceptability of the system under combat conditions.

All major Army units and one Marine division were surveyed. The survey team used two means of collecting data: personal interviews and a questionnaire. The interviews were with men whose

²² CSM 67-436, 8 Nov 67, Subj: The M16 Rifle Program.

²³ This team of six was headed by Mr John A. Locherd from the Weapon Systems Analysis Directorate of the Office of the Chief of Staff, Army.

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primary duties involved either rifle training or the logistical support of the rifle system, and with members of the chain of command within tactical units. The questionnaire was completed by 2,021 men armed with the M16.

The findings of the survey are summarized below. (For detailed discussion see Inclosure 7-1.)

Training.

1. A total of 23 percent of all men questioned who came direct from the continental United States indicated that they had received no formal M16 training prior to their arrival in Vietnam. Of the men from all other theaters, 73 percent stated they had not received such training before arrival.

2. Although 24 percent of the men indicated they had not received any M16 rifle training before arrival in Vietnam, there is good reason to believe that this problem will be reduced significantly in the near future. Analysis of survey data reveals a pronounced trend toward reduction of the numbers of men slipping through without M16 training. Only 4 percent of the men deploying during October 1967 - January 1968, indicated they were untrained.

3. Adequate training policies, guidance, and directives have been published by Headquarters, MACV, and Headquarters, USARV. These directives were not consistently available among units conducting replacement training at the time of the survey.

4. M16 training observed at divisional replacement centers did not always comply with MACV or USARV training directives.

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5. USARV M16 training policies and procedures did not distinguish among replacements by theater source or by the amount of rifle training men had received before their arrival in Vietnam.

6. 28 percent of the men surveyed said they had not received formal M16 rifle training in Vietnam. The number of men who had received M16 training in Vietnam varied appreciably from one major unit to another.

7. Many unit armorers lacked formal training and adequate knowledge of M16 rifle maintenance. As a result of this failing, rifles that properly should have been repaired by the unit armorer (those with a broken extractor, for example) had to be turned in by the riflemen and repaired at a higher echelon. Other unit armorer duties, such as periodic lubrication of detent springs, were often neglected.

Maintenance and Supply

8. Adequate quantities of repair parts and cleaning materials and equipment were found to be generally available in Vietnam. However, unbalanced distribution among depots occasionally resulted in temporary shortages which did affect using units.

9. Cleaning materials such as the cleaning rod, lubricant, brushes, and patches, were generally available to the rifleman and he usually carried most items with him in the field. Pipe cleaners and bore cleaners, however, were often not available.

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10. Men tended to clean their rifles two to three times more frequently than they cleaned their magazines and ammunition. This tendency was encouraged by unit maintenance inspections, which stressed care of the rifle and failed to emphasize the importance of properly maintained magazines and ammunition.

11. Unit armorers frequently did not accompany units into the field, and as a consequence field repair of weapons was neglected.

12. The buffer retrofit program was not complete at the time of the survey, although units within USARV had reported 100 percent completion of this program during November 1967. 84 percent of those surveyed indicated they had new buffers.

Reliability and Acceptability

13. Failures to extract still occurred with enough frequency to reduce confidence in the M16. Among the men surveyed, 35 percent had experienced at least one such failure within the previous four months. The average number of reported failures to extract was 4.8 per man reporting this type malfunction.

14. Attempts to establish a statistically significant correlation between failures to extract and such possible causes as poor cleaning habits, overlubrication, and the user's lack of mechanical training were unsuccessful. Inability to statistically isolate the causative factors from field survey data suggests that failures to extract are not caused exclusively by user abuse.

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15. Among those surveyed, 42 percent indicated that they had experienced at least one failure to lock. Of those reporting this type failure, the average number of failures was 5.3.

16. Half of the men reported having used the bolt assist and 69 percent indicated that use of the bolt assist had cleared the malfunction.

17. When asked what weapon they would prefer to carry in combat, 85 percent of the men wanted either the M16 or its sub-machine gun version, the XM177.

18. In general, men armed with the M16 in Vietnam rated this rifle's performance high. Most frequently lauded were its light weight and its firepower. However, many men entertained some misgivings about the M16's reliability (33 percent made adverse comments on either the rifle's sensitivity or its reliability).

Product Improvements

19. Although the chrome plated chamber has not been fielded long enough to permit adequate evaluation, many men who had recently received an M16 with a chrome chamber found the rifle significantly more reliable than earlier models they had used.

20. The desire for magazines of greater capacity than 20 rounds was frequently expressed.

21. On-weapon storage capacity for cleaning materials is required. At the time of the survey, there was no means satisfactory to the rifleman for carrying these materials.

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General Usage

22. 83 percent of all men surveyed indicated they did test fire. The manner and frequency of test firing varied appreciably among units. A greater percentage of leaders, from fire team to platoon level, test fired than men within the rifle squads.

23. Within the theater, 10 percent of the men armed with the M16 had never zeroed their rifles. About one-fourth of the men zeroed when their weapons were issued at the beginning of their tours and never thereafter, while about half zeroed quarterly. USARV quarterly training requirements included zeroing of rifles.

24. Ammunition loads carried by the men were generally excessive, although the loads varied greatly. Individual loads ranged from 7 to over 40 magazines. In terms of actual useage, the average individual ammunition load carried was from 39 to 41 normal consumption days of ammunition.

25. Most men loaded 18 rounds in their magazines; the theater average was 18.3 rounds.

26. The theater consumption ratio of ball to tracer ammunition for men armed with the M16 was 4:1. This ratio varied appreciably among units (unit averages were a product of even wider differences among individuals, with many men firing 100 percent tracer).

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27. Men estimated that they used the automatic mode of fire about 34 percent of the time and that about 60 percent of their automatic fire was expended in short bursts.

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F. Analysis and Conclusions

In response to General William C. Westmoreland's request of December 1965, the M16 was fielded in Vietnam as rapidly as the rifles became available. The transition from the M14 to the M16 was accomplished so swiftly that most of the Army's combat forces were equipped with the M16 after they arrived in Vietnam, or so shortly before they left the United States that formal M16 training prior to departure was limited. This accelerated introduction of the M16 into Vietnam, along with shortages of cleaning materials and repair parts, and generally inadequate knowledge of the weapon on the part of the chain of command led to poor maintenance in the early stages of the rifle's use in Vietnam.

In the fall of 1966 excessive malfunctions^{24/} were reported. The first surveys concluded that insufficient training of men in the care and maintenance of the M16 was the basic cause of the high malfunction rate, and a training program designed to increase care and cleaning proficiency was immediately begun. Subsequent surveys found M16 maintenance significantly improved and the malfunction problem reduced.

Despite improved care, malfunctions continued to occur with enough frequency to warrant concern. The Congressional survey in June 1967 found user acceptability relatively low. At that time

²⁴ Primarily failure to extract the spent cartridge.

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about one-half of the riflemen wished to exchange their M16's for M14's, chiefly because they had misgivings about the M16's reliability. This attitude toward the M16 was not entirely the product of a bad press, or rumors, since many men indicated that they had personally experienced one or more failures to extract while they were using the rifle in combat.

In the fall of 1967 the Office of the Secretary of Defense field survey found acceptability unusually high. ^{25/} "The M16 has achieved wide acceptance throughout Vietnam. Only 38 individuals of all those surveyed (2,100) would like to exchange their M16 for another weapon. Of this group 35 wanted the shorter, lighter version of the M16 -- the CAR15." (XM177) This acceptability figure is misleading since the OSD survey questionnaire did not ask the men which weapon they preferred. ^{26/} A better picture can be gained from responses to the OSD question: Do you like the M16? 12 percent of the men answered, "No."

Findings of the 1968 survey conducted by the Office of the Chief of Staff are basically consistent with the other surveys. These earlier surveys stressed the urgent need for improved care of the M16 by the rifleman. Emphasis upon maintenance has reduced the number of M16 malfunctions but has not eliminated the reliability

²⁵ Directorate of Inspection Services, OASD(A), 30 Sep 67, M16 Rifle Field Survey in South Vietnam, p.15.

²⁶ Men could write in comments on weapon preference but were not required to do so.

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problem. It is clear that emphasis should be shifted to an examination of the entire rifle and ammunition system.

The following detailed conclusions are based upon the most recent Vietnam survey, the January-February 1968 visit of the M16 Rifle Review Panel.

Policies and directives throughout Vietnam which govern M16 training, supply, maintenance, and user care and cleaning were found generally adequate in January-February 1968. Continued command supervision is required to improve compliance with these directives.

With the exception of Vietnam-oriented advanced individual training for infantrymen, all M16 training given to men before their deployment to Vietnam should be improved. Many leaders have been hampered in meeting their supervisory responsibilities by insufficient knowledge of the M16. Frequently, riflemen receive either poor M16 training or none before they arrive in Vietnam. ^{27/} In order to improve predeployment rifle training the following measure should be taken:

1. Accelerate introduction of M16 rifles and M16 training for all men in basic combat training at the earliest possible date.
2. Increase the amount of M16 instruction for supervisors in all schools producing junior leaders, for example, NCO refresher courses, officer candidate schools, and basic branch courses.

²⁷ Recently improved clearance procedures within the continental United States have reduced the numbers of men who deploy without rifle training.

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3. Establish procedures to insure receipt of M16 training for men on intertheater transfer to Vietnam.

USARV requires all replacements to complete the same M16 training program. Since many untrained replacements have arrived in Vietnam, it is appropriate that two training programs be operated: the present one for most men and another and more intensive one for the totally untrained.

Unit armorers often lacked formal training and adequate knowledge of M16 rifle maintenance. Provision should therefore be made for additional training for armorers, perhaps through divisional schools or mobile training teams from the 1st Logistical Command.

Men tend to clean their rifles two to three times more frequently than they clean their magazines, yet corroded or dirty ammunition and defective magazines seriously reduce rifle effectiveness. Unit maintenance inspections should emphasize care of the entire rifle system.

Adequate quantities of repair parts and cleaning materials and equipment were found to be generally available in Vietnam. However, unbalanced distribution among depots has occasionally resulted in temporary shortages which have affected rifle maintenance. The causes for this maldistribution should be identified and then procedures to achieve optimum distribution instituted.

Although individuals usually test fired their rifles, the nature and frequency of such firing varies widely among and within units. Test firing, when properly performed, will increase weapon reliability, and significant improvement in rifle effectiveness will be achieved by:

1. Isolation of defective rifles and magazines through periodic test firing by individuals in a combat zone. The Project Manager, Rifles, should develop a standard test firing procedure for this purpose.

2. Continued command emphasis upon the importance of frequent and properly conducted test firing.

Greater zeroing effort is required, particularly within maneuver battalions. The average frequency of zeroing was every 4.96 months and 10 percent of the men had never zeroed their rifles. Zeroing increases both hit probability and user confidence in the rifle. It also stimulates the appropriate use of aimed fire. Verification of zero should be integrated with test firing, since any object that can visibly register hits may serve as a target.

Current performance and acceptability data indicate:

1. The M16's high rate of lethal fire and light weight are qualities particularly suitable for the war in Vietnam.

2. Failures to extract still occur with enough frequency to reduce confidence in the M16, and these failures have several

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causes. Besides inadequate maintenance, such failures may result from pitted chambers, from defective parts, or from faulty control of ammunition case hardness. Consequently, both continued product improvement and user effort are necessary elements within any program to reduce the M16 reliability problem.

3. Introduction of the chromed chamber appears to have reduced the number of failures to extract, but this improvement has not been fielded long enough to permit adequate evaluation.

4. Most men armed with the M16 in Vietnam rated this rifle's performance high; however, many men entertained some misgivings about the M16's reliability. When asked which weapon they preferred to carry in combat, 85 percent of the men indicated that they wanted either the M16 or its submachine gun version, the XM177.^{28/}

5. A field malfunction reporting system should be established throughout USARV. While such a system does not produce reliability data with laboratory precision, it does permit analysis of malfunction trends and would contribute to further improvement in the reliability of the M16.

²⁸ The M14 was preferred by 15 percent, while less than one percent wished to carry either the Stoner rifle, the AK-47, the carbine, or a pistol.

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two attachments.

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**M16 RIFLE SURVEY
IN THE
REPUBLIC OF VIETNAM**

24 JANUARY - 5 FEBRUARY 1968

3 MAY 1968

**PREPARED BY:
OFFICE CHIEF OF STAFF
OFFICE DIRECTOR OF WEAPON SYSTEMS ANALYSIS
WASHINGTON, D. C. 20310**

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M16 RIFLE SURVEY IN THE REPUBLIC OF VIETNAM

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M16 Rifle Survey in the Republic of Vietnam

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I. Abstract

A field survey of men armed with the M16 rifle was conducted in Vietnam from 28 January through 5 February 1968 as a part of a review of the M16 program presently under preparation within the Office of the Chief of Staff. This report is an extract from that review.

The purpose of the survey was to evaluate measures already taken to improve M16 reliability, to identify current rifle problems, and to determine the general performance and acceptability of the system under combat conditions. All major Army units in USARV and one marine division were included in the survey sample. Two means were used to collect data: personal interviews and a questionnaire.

The survey indicated that the M16 rifle system was suitable for the war in Vietnam. Particularly desirable qualities were its high rate of lethal fire and light weight. However, failures to extract were still occurring with enough frequency to undermine confidence in the M16. Although men generally preferred to carry this weapon in combat, some misgivings were entertained about its reliability. Introduction of the chromed chamber appeared to reduce the number of failures to extract, but this improvement had not been fielded long enough to permit adequate evaluation. Many factors cause failures to extract, and continued product improvement and user effort are required to improve reliability.

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II. Purpose and Scope

Early in November of 1967, the Chief of Staff directed an intensive review of the entire M16 rifle program. On 8 November 1967 the M16 Rifle Review Panel was convened within the Office of the Assistant Vice Chief of Staff and instructed to prepare a comprehensive history and evaluation of the M16 program, recommending further action as required. This panel then conducted a field survey of men armed with the M16 in Vietnam during the period 24 January through 5 February 1968 to collect data on the reliability, status of training, status of maintenance, and general overall effectiveness of the M16-M16A1 rifle system. The information gathered has permitted comparative evaluation with results obtained in earlier field surveys, and whatever insight has been gained from the comparison, as well as the facts collected during the survey itself, have been added to the overall history and review of the M16 rifle program.

Specific objectives of the field survey were to

1. Determine the extent of corrective action previously taken to improve the reliability of the M16 rifle system.
2. Identify current problems experienced with the M16 in the field.
3. Evaluate the general performance and acceptability of the system under combat conditions.

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III. Survey Procedures

The panel used two means of collecting data: personal interviews and a questionnaire.

The interviews were with men whose primary duties involved either rifle training or the logistical support of the rifle system, and with members of the chain of command within tactical units.

The questionnaire (Section IV) was designed to provide insight as to the reliability of the rifle system, the training of the men who used it, and the manner in which the system has been employed and supported. It was completed only by men armed with the M16. In an attempt to avoid bias or inhibition, no one was asked to place his name on the questionnaire and each individual was urged to base his responses only upon his own experience with the rifle. The questionnaire was administered by members of the survey team and by the 22d and 90th Replacement Battalions. The answers to many of the questions have permitted direct comparison with results of the field survey conducted by the Office of the Secretary of Defense from 24 August through 5 September 1967.

The survey data is based upon responses from 2,021 men. Since the primary user of the rifle in combat is found within the infantry battalion, these units are heavily represented in the sample. One half (51 percent) of all men surveyed were from

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infantry battalions and 681 (38 percent) had an 11E military occupational specialty (light weapons infantryman).

To assure a fair representation of experience under the variety of environmental conditions found within Vietnam all major units were included in the survey. (For the location of units, see Section V.) The distribution of responses by major unit was:

<u>Major Unit</u>	<u>Number of Questionnaires</u>
1st Infantry Division	109
1st Air Cavalry Division	143
4th Infantry Division	51
9th Infantry Division	419
25th Infantry Division	80
Americal Division	285
101st Airborne Division	63
Separate Brigades (173d and 199th)	54
Other USARV Units	693
1st Marine Division	<u>124</u>
Total	2,021

Survey team members selected were those men on the Department of Army Staff who were most intimately involved with and knowledgeable of the M16 rifle system, its training program, logistical support, product improvements, and reliability problems. The team composition is listed in Section VI.

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The survey team intended to contact each major unit in Vietnam. The Communist TET offensive created a turbulent military situation and shortages of aircraft which reduced the number of units that could be directly contacted during the survey. A broadened survey sample was achieved by administering questionnaires at replacement battalions to individuals who were returning to the United States, having just completed their Vietnam tours.

Information of immediate command interest derived from data collected by the team was provided to the commanders concerned during exit interviews. In those instances when corrective action was appropriate, measures to relieve the situation were immediately initiated by the chain of command.

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IV. Questionnaire

M16A1 Rifle Field Survey, Republic of Vietnam
January - February 1968

What is your unit? (Division or Separate Brigade) _____.

Grade _____

How many months in Vietnam _____.

Where from if not CONUS _____ MOS _____ Duty Position _____.
(Sgd Ldr, Rifleman, etc.)

1. Which of the following weapons have you used in combat?

a. M14 _____; b. M16 w/o new buffer or chrome chamber _____;

c. M16 w/new buffer only _____; d. M16 w/new buffer and chrome
chamber _____.

2. Delete

3. Did you receive formal M16 training before arriving in RVN?

Yes ____; No _____. Since arriving in RVN? Yes ____; No _____.

4. If you received formal M16 training, how many hours did you
receive:

	Before Coming to RVN	In RVN
a. Mechanical training	_____	_____
b. Range firing	_____	_____
c. Tactical live fire exercises	_____	_____

5. Do you have the following cleaning materials or are they
available in the unit?

	Yes	No		Yes	No
a. Cleaning rod	_____	_____	e. Patches	_____	_____
b. LSA lubricant	_____	_____	f. Pipe cleaners	_____	_____
c. Chamber brush	_____	_____	g. Bore cleaner	_____	_____
d. Bore brush	_____	_____			

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6. Do you normally carry any of the following with you on combat operations?

	Yes	No		Yes	No
a. Cleaning Rod	___	___	e. Patches	___	___
b. LSA lubricant	___	___	f. Pipe cleaners	___	___
c. Chamber brush	___	___	g. Bore cleander	___	___
d. Bore brush	___	___			

If so, how do you usually carry them? _____

7. Is your rifle equipped with: a. New buffer? Yes ___; No ___.
(How long ___ wks); b. Chrome plated chamber? Yes ___; No ___.
(How long? ___ wks).

8. When was the last time you zeroed your M16? ___ wks ago.

9. How many rounds of 5.56 ammo do you normally carry on operations?
ball ___; tracer ___.

10. Do you lubricate your ammo? Yes ___; No ___.

11. When was the last time you received instruction on the care
and cleaning of: a. The M16 _____ (day, month, year);
b. Its ammunition _____ (day, month, year);
c. Its magazine _____ (day, month, year)?

12. Have you ever experienced a failure of the bolt to lock on
the M16? Yes ___; No ___. If so, how many times? _____.

13. Have you ever used the BOLT ASSIST? Yes ___; No ___. If
yes, what percent of the time did it clear the problem? ____%.

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14. How many magazines do you normally carry on operations? ____.
15. In combat, what percentage of the time do you use the full automatic mode of fire ____%; semiautomatic mode of fire ____%.
16. When using the full automatic mode, what percentage of time do you fire in short bursts (2-3 rounds) ____%; in long bursts (10-20 rounds) ____%.
17. What is largest number of rounds you have fired in any one day of combat? ____ rounds.
18. Have you been issued a card with care and cleaning instructions for the M16? Yes ____; No _____. If so, do you still have it? Yes ____; No ____.
19. Does your unit test fire individual weapons? Yes ____; No ____.
20. If the answer to 19 is yes, is a regular schedule prescribed? Yes ____; No _____. If yes, please explain the schedule _____.
21. To the best of your recollection, how often have you cleaned your M16? _____.
22. How many rounds do you usually load in a magazine? ____ rounds.
23. Approximately how many rounds have you fired with the M16 during the past four months? 0-500 ____, 500-1000 ____, 1000-1500 ____, 1500-2000 ____, more than 2000 ____.
24. During the past four months, did you experience a failure to extract? Yes ____; No _____. If yes, how many times? ____ times.

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25. Have you, during the last four months, had problems with a round sticking in the chamber when it was left for periods of:
0-8 hours Yes ___, No ___; 9-16 hours Yes ___, No ___; 17-24 hours Yes ___, No ___.

26. Does your unit have weapons inspection? Yes ___; No ___.
If yes, how many times a week? _____. Who inspects the weapons?
Fire team ldr, Sqd ldr, Plat sgt, Plat ldr, CO? (Circle one).
Does your unit inspect magazines and ammo? Yes ___; No ___.

27. Approximately what percentage of the ammo that you fire in combat is tracer? ____%.

28. Give to the best of your recollection, how often you cleaned your magazines and ammo. _____.

29. Which of the following do you prefer as your individual weapon? M16 ___; M14 ___; M16 Commando (XM177E1 SMG) ___; Other ___ (specify).

30. What do you like about the M16? _____

31. What do you dislike about the M16? _____

32. Additional comments _____

1st Air Cn Div

1st Marine Div

THAILAND

1st Air Div

4th Inf Div

173d Sep Bde

CAMBODIA

1st Inf Div

25th Inf Div

101st Abn Div

9th Inf Div

199th Sep Bde

SOUTH VIETNAM

Legend:

- International Boundary
- National Boundary
- Provincial Boundary
- District Boundary
- Commune Boundary
- Road
- Railway
- Canal
- River
- Stream
- Lake
- Swamp
- Mountain
- Hill
- Plateau
- Plain
- Coastal Area
- Island
- Bay
- Strait
- Sound
- Harbor
- Port
- Airport
- Airfield
- Base
- Camp
- Barracks
- Warehouse
- Hospital
- School
- Church
- Mosque
- Temple
- Shrine
- Monument
- Statue
- Obelisk
- Tower
- Lighthouse
- Beacon
- Radar Station
- Communication Station
- Power Station
- Water Treatment Plant
- Sewage Treatment Plant
- Landfill
- Quarry
- Mine
- Tunnel
- Bridge
- Dam
- Lock
- Weir
- Pier
- Wharf
- Dock
- Quay
- Jetty
- Breakwater
- Pierhead
- Lighter
- Barge
- Boat
- Ship
- Aircraft
- Helicopter
- Tank
- Truck
- Car
- Motorcycle
- Bicycle
- Pedestrian
- Horse
- Elephant
- Buffalo
- Cow
- Pig
- Chicken
- Duck
- Fish
- Crab
- Shrimp
- Squid
- Octopus
- Jellyfish
- Starfish
- Sea Urchin
- Mollusk
- Insect
- Reptile
- Amphibian
- Mammal
- Bird
- Fish
- Invertebrate
- Plant
- Fungus
- Bacteria
- Virus
- Parasite
- Pathogen
- Antigen
- Antibody
- Enzyme
- Hormone
- Vitamin
- Mineral
- Nutrient
- Food
- Drink
- Medicine
- Drug
- Vaccine
- Antibiotic
- Anticancer
- Antiviral
- Antifungal
- Antiparasitic
- Immunomodulator
- Biopharmaceutical
- Gene Therapy
- Stem Cell Therapy
- Organ Transplant
- Tissue Engineering
- Regenerative Medicine
- Personalized Medicine
- Precision Medicine
- Digital Health
- Telemedicine
- E-health
- Health Informatics
- Biomedical Engineering
- Nanotechnology
- Robotics
- Artificial Intelligence
- Machine Learning
- Deep Learning
- Neural Networks
- Support Vector Machines
- Decision Trees
- Random Forests
- Gradient Boosting
- Reinforcement Learning
- Evolutionary Algorithms
- Genetic Algorithms
- Particle Swarm Optimization
- Ant Colony Optimization
- Simulated Annealing
- Tabu Search
- Hill Climbing
- Genetic Programming
- Evolutionary Programming
- Differential Evolution
- Particle Swarm
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- Hill Climbing
- Genetic Programming
- Evolutionary Programming
- Differential Evolution
-

SOUTH VIETNAM

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VI. Survey Team Composition

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COL J. T. Price
M16 Project Officer
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Deputy Chief of Staff for Personnel
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Deputy Chief of Staff for Logistics
Headquarters, Department of the Army

LTC John D. A. Hogan, Jr.
Directorate of Doctrine and Systems
Assistant Chief of Staff for Force Development
Headquarters, Department of the Army

LTC George H. Gardes
Directorate of Plans and Programs
Office, Chief of Research and Development
Headquarters, Department of the Army

LTC David P. Thoreson
Weapon Systems Analysis Directorate
Office Chief of Staff, Army
Headquarters, Department of the Army

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VII. Itinerary Within Vietnam (24 January - 5 February 1968)

Headquarters USARV	24 January
Headquarters USARV 1st Logistical Command	25 January
9th Infantry Division	26 January
9th Infantry Division	27 January
1st Logistical Command 90th Replacement Battalion	28 January
Headquarters MACV 90th Replacement Battalion	29 January
22d Replacement Battalion Americal Division	30 January
Americal Division	31 January
Headquarters III Marine Amphibious Force	1 February
1st Marine Division 3d Marine Division	2 February
1st Marine Division 3d Marine Division	3 February
Headquarters USARV 90th Replacement Battalion	4 February
Headquarters USARV Headquarters MACV	5 February

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VIII. Analysis of Survey Data

General

All findings are based upon the results of personal interviews and data collected from questionnaires.

Display and analysis of questionnaire data were simplified through the use of a SUMX computer program. (Frequency distributions of each questionnaire item are contained in Section X.) The SUMX program was also used to produce a series of matrixes which relate responses to one item with those of another. (Items examined through this technique are listed in Section XI.)

Major Unit Comparisons

Cleaning frequency and unit maintenance inspection data shown in Table 1 reflect that:

1. Men tended to clean their rifles two to three times more frequently than they cleaned their magazines and ammunition. This tendency was encouraged through unit maintenance inspections, which also emphasized the rifle rather than the entire rifle system.
2. Frequency of cleaning was generally greater among units that conducted more maintenance inspections. However, other factors also influenced cleaning frequency, for example, how often the rifle was fired and the user's anticipated need for a reliably functioning rifle. Nontactical USARV units, for example, cleaned less frequently than the theater average, despite a higher than theater average

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unit maintenance inspection level. The opposite behavior was observed in the Americal Division where cleaning frequency was relatively high and unit inspections infrequent.

Review of information regarding lubrication of ammunition, test firing, and the buffer retrofit program (Table 2) indicates:

1. One quarter of all men armed with the M16 lubricated their ammunition - a practice contrary to all published directives.

(During the survey over-use of LSA lubricant on the rifle and ammunition appeared to decrease as the survey team traveled northward from the Delta to the demilitarized zone. The general climate was dryer in the north.)

2. Most individuals test fired their rifles. The lowest incidence of test firing was among nondivisional USARV units and separate brigades.

3. The buffer retrofit program was not complete (84 percent of those surveyed indicated they had new buffers) at the time of the survey, although units within USARV had reported 100 percent completion of this program during November 1967.

The following conclusions have been drawn from ammunition consumption data and M16 training information:

1. The theater ratio of ball to tracer ammunition for men armed with the M16 was 4:1. This ratio varied appreciably among units (unit averages were a product of even wider differences among individuals, with many men firing 100 percent tracer).

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2. All men armed with the M16 had not received formal rifle training in-country (28 percent of the men surveyed indicated that they had not received this training). Percentages of men receiving training varied appreciably among major units. The low percentage (61 percent) in the Americal Division was partially due to responses from members of its 11th brigade, which had been in-country two months and was not required to process personnel through the divisional replacement training center upon arrival in Vietnam.

Major unit statistical data regarding zeroing (Table 4) and failures to extract (Table 5) indicate that:

1. Zeroing of rifles varied appreciably among units (the percentage of men who have not zeroed in the 25th Infantry Division was three times greater than that of the 101st Airborne Division). Differences among units with respect to personnel turbulence and rate of weapon exchange also contributed to differences in zeroing history.

2. Failures to extract have occurred with enough frequency to reduce confidence in the M16. The 1st Marine Division had the highest incidence of this failure (an average of 7.0 failures per man reporting failures within the last four months). Close comparison of failures to extract among units could not be made without more accurate information about unit 5.56mm ammunition consumption rates than the survey produced.

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TABLE 1. CLEANING FREQUENCY & UNIT INSPECTIONS BY UNIT

UNIT	CLEANING FREQUENCY (Number of Times Per Month)		UNIT MAINTENANCE INSPECTIONS (% Indicating Inspections are Conducted)	
	RIFLES	MAGAZINES & AMMUNITION	RIFLES	MAGAZINES & AMMUNITION
1st Inf Div	21.0 (109)	8.7 (109)	91% (100)	78% (93)
1st Air Cav Div	18.3 (143)	5.1 (143)	64% (120)	47% (95)
4th Inf Div	22.5 (37)	4.8 (41)	68% (37)	53% (34)
9th Inf Div	21.6 (419)	8.4 (419)	79% (406)	64% (175)
25th Inf Div	19.5 (79)	6.3 (80)	87% (77)	53% (59)
Americal Div	21.9 (284)	9.0 (285)	66% (273)	39% (214)
101st Abn Div	26.1 (63)	11.1 (63)	82% (58)	71% (45)
Sep Brigades (173d & 199th)	23.1 (54)	9.9 (54)	80% (50)	71% (41)
Other USARV Units	16.8 (692)	6.9 (693)	81% (628)	64% (480)
1st Marine Div	24.9 (124)	10.8 (124)	100% (119)	78% (105)
THEATER AVERAGE	20.4 (2004)	8.1 (2011)	79% (1868)	61% (1341)

1. Numbers contained within parenthesis are total men responding to the question.

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TABLE 2. LUBRICATION OF AMMUNITION, TEST FIRING & BUFFER RETROFIT BY UNIT/

UNIT	ACTIVITY					
	LUBRICATION OF AMMUNITION (% Indicating Ammunition is NOT Lubricated)		TEST FIRING (% Indicating They DO Test Fire Rifles)		BUFFER RETROFIT (% Indicating They HAVE New Buffer Installed)	
1st Inf Div	81%	(103)	96%	(107)	93%	(109)
1st Air Cav Div	79%	(140)	84%	(128)	87%	(142)
4th Inf Div	76%	(51)	79%	(43)	69%	(51)
9th Inf Div	65%	(390)	85%	(407)	85%	(419)
25th Inf Div	78%	(76)	84%	(77)	89%	(80)
Americal Div	74%	(271)	87%	(281)	93%	(283)
101st Abn Div	66%	(62)	95%	(61)	78%	(63)
Sep Brigades (173d & 199th)	64%	(53)	73%	(52)	93%	(54)
Other USARV Units	82%	(660)	74%	(631)	78%	(693)
1st Marine Div	94%	(116)	92%	(124)	93%	(124)
THEATER AVERAGE	77%	(1922)	82%	(1911)	84%	(2018)

1. Numbers contained within parenthesis are total men responding to the question.

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TABLE 3. AMMUNITION CONSUMPTION & M16 TRAINING IN VIETNAM BY UNIT^{1/}

UNIT	ACTIVITY				
	AMMUNITION CONSUMPTION (Consumption Ratio by Type Ammunition)			FORMAL M16 TRAINING IN VIETNAM (% Indicating Training WAS Received in Vietnam)	
	BALL	TRACER	BALL TO TRACER RATIO		
1st Inf Div	79%	21%	3.8 : 1 (109)	78%	(107)
1st Air Cav Div	79%	21%	3.8 : 1 (143)	74%	(128)
4th Inf Div	91%	9%	10.1 : 1 (51)	76%	(45)
9th Inf Div	73%	27%	2.7 : 1 (419)	85%	(377)
25th Inf Div	85%	15%	5.7 : 1 (80)	68%	(78)
Americal Div	73%	27%	2.7 : 1 (285)	61%	(241)
101st Abn Div	72%	28%	2.6 : 1 (63)	77%	(53)
Sep Brigades (173d & 199th)	83%	17%	4.9 : 1 (54)	69%	(49)
Other USARV Units	85%	15%	5.7 : 1 (693)	63%	(597)
1st Marine Div	93%	7%	13.3 : 1 (124)	89%	(123)
THEATER AVERAGE	80%	20%	4.0 : 1 (2021)	72%	(1798)

1. Numbers contained within parenthesis are total men responding to the question.

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TABLE 4. ZEROING HISTORY BY UNIT

UNIT	ZEROING HISTORY				Total Men Responding to Question
	Never Zeroed	Zeroed W/in Last 3 Months ¹	Zeroed Over 3 Months Ago ¹		
1st Inf Div	8% (8)	60% (61)	32% (32)		100% (101)
1st Air Cav Div	8% (11)	41% (54)	50% (66)		100% (131)
4th Inf Div	10% (5)	69% (33)	21% (10)		100% (48)
9th Inf Div	16% (62)	65% (251)	19% (73)		100% (386)
25th Inf Div	25% (19)	19% (14)	56% (42)		100% (75)
Americal Div	11% (30)	64% (174)	24% (66)		100% (270)
101st Abn Div	7% (4)	73% (43)	20% (12)		100% (59)
Sep Brigades (173d & 199th)	14% (6)	55% (24)	32% (14)		100% (44)
Other USARV Units	5% (28)	50% (300)	46% (275)		100% (603)
1st Marine Div	6% (7)	87% (104)	7% (8)		100% (119)
THEATER AVERAGE	10% (180)	58% (1058)	33% (598)		100% (1836)

1. Direct comparison among units is misleading since the average length of time in country varies among units.

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TABLE 5. FAILURE TO EXTRACT BY UNIT

UNIT	FAILURE TO EXTRACT ^{1/}			
	% Indicating No Failures	% Indicating One or More Failures	Average No. of Failures (Per Man Reporting Failures)	Total Men Responding to Question
1st Inf Div	68% (64)	32% (30)	5.2	100% (94)
1st Air Cav Div	55% (63)	45% (52)	4.9	100% (115)
4th Inf Div	68% (25)	32% (12)	3.2	100% (37)
9th Inf Div	56% (135)	44% (104)	4.5	100% (239)
25th Inf Div	73% (54)	27% (20)	5.0	100% (74)
Americal Div	55% (64)	45% (52)	4.4	100% (116)
101st Abn Div	44% (23)	56% (29)	6.3	100% (52)
Sep Brigades (173d & 199th)	57% (28)	43% (21)	5.6	100% (49)
Other USARV Units	76% (432)	24% (136)	3.9	100% (568)
1st Marine Div	52% (37)	48% (34)	7.0	100% (71)
THEATER AVERAGE	65% (925)	35% (490)	4.8	100% (1415)

1. Occurring w/in last four months

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M16 Training

Training before Vietnam.

A total of 23 percent of all men questioned who came direct from the Continental United States indicated that they had received no formal M16 training prior to arrival in Vietnam (Table 6). Of those men from all other theaters, 73 percent stated they had not received such training before arrival (Table 6). The pronounced tendency for non-CONUS replacements to be untrained was to be expected since M16's were not generally available for training outside of the CONUS training base (84 percent of all men indicating they were non-CONUS replacements were from units in Germany).

How serious the lack of M16 training for men prior to their arrival in Vietnam depends upon how these men are employed after their arrival. Of those men who indicated they had not received any formal M16 training prior to arrival in Vietnam examination by MOS (Table 7), duty position (Table 8), and grade (Table 9) suggests that:

1. Many of the men untrained on the M16 before their arrival in Vietnam were assigned to infantry battalions (35 percent of untrained men noted in the sample had MOS's common to infantry battalions).

2. A significant number of men in this group were in grades and duty positions that required them to have detailed knowledge

of the rifle to meet their supervisory responsibilities (16 percent of this untrained group were either fire team leaders, squad leaders, or platoon sergeants and 80 percent of them were in grades E-4 through E-6).

3. The tendency of men in this M16 untrained-before-Vietnam group to be leaders was even more pronounced among non-CONUS replacements (22 percent of non-CONUS M16 untrained men were either fire team leaders, squad leaders or platoon sergeants and 75 percent were in grades E-4 through E-6).

Although a high percentage of men indicated they had not received any M16 rifle training before arrival in Vietnam (24 percent), there is good reason to believe that this problem will be reduced significantly in the near future. Examination of the untrained-before-Vietnam group by deployment month (Table 10) reveals a pronounced trend toward reduction of the numbers of men slipping through without M16 training (only 4 percent of the men deploying during October 1967 - January 1968 indicated they were untrained).

Training in Vietnam.

All men armed with the M16 had not received formal rifle training in-country (28 percent of the men surveyed said they had not received this training). Percentages of men receiving M16 training varied appreciably among major units (Table 3).

USARV M16 training policies and procedures did not distinguish among replacements by theater source or by the amount of rifle training men have received before their arrival in Vietnam. The number of untrained replacements which have arrived in Vietnam suggests consideration of two training programs, the present one for most men and another more intensive one for the untrained. If two programs are not established, then, as a minimal measure, a system should be used which guarantees that the untrained replacements will have a higher probability of receiving in-country training than those with previous training.

Adequate training policies, guidance, and directives have been published by Headquarters, MACV, and Headquarters, USARV. These directives were not consistently available among units conducting replacement training at the time of the survey.

M16 training observed at divisional replacement centers did not always comply with MACV or USARV training directives.

Unit Armorers

Many unit armorers lacked formal training and adequate knowledge of M16 rifle maintenance. As a result of this failing, many rifles that properly should have been repaired by the unit armorer (a rifle with a broken extractor, for example) were turned in by the rifleman and repaired at a higher echelon. Other unit armorer duties, such as periodic lubrication of detent springs, were often neglected.

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TABLE 6. M16 TRAINING "BEFORE" VIETNAM BY THEATER SOURCE

M16 TRAINING BEFORE VIETNAM	THEATER SOURCE		TOTALS
	CONUS	NON-CONUS	
YES	77% (1506)	27% (12)	76% (1518)
NO	23% (445)	73% (32)	24% (477)
TOTALS	100% (1951)	100% (44)	100% (1995)

1. Percentages apply only to responses of YES or NO.
There were 26 non-responses - all by men from CONUS.

TABLE 7. THEATER SOURCE BY MOS FOR THOSE MEN WHO INDICATED
THEY HAD NOT RECEIVED ANY FORMAL M16 TRAINING
PRIOR TO ARRIVAL IN VIETNAM

MOS	THEATER SOURCE		TOTALS
	CONUS	NON-CONUS	
11B (Light Wpn Infantryman)	13% (58)	28% (9)	14% (67)
11C (Inf Indirect Fire Crewman)	4% (18)	3% (1)	4% (19)
11D (Armor Intel Specialist)	2% (8)	6% (2)	2% (10)
11G (Inf Senior Sergeant)	- (0)	- (0)	- (0)
11H (Inf Direct Fire Crewman)	1% (4)	- (0)	1% (4)
31B & F (Radio Mach & Com- munication Chief)	3% (13)	- (0)	3% (13)
36A (Wireman)	1% (3)	3% (1)	1% (4)
64A, B & C (Drivers)	3% (15)	6% (2)	4% (17)
71A & B (Clerk & Clerk Typist)	2% (9)	3% (1)	2% (10)
76K (Gen Supply Specialist)	- (0)	- (0)	- (0)
94A & B (Cooks)	3% (15)	6% (2)	4% (17)
All Other Enl	67% (300)	44% (14)	65% (314)
1542 (Inf Off)	< 1% (2)	- (0)	< 1% (2)
TOTALS	100% (445)	100% (32)	100% (477)

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TABLE 8. THEATER SOURCE BY DUTY POSITION FOR THOSE MEN WHO INDICATED THEY HAD NOT RECEIVED ANY FORMAL M16 TRAINING PRIOR TO ARRIVAL IN VIETNAM

DUTY POSITION	THEATER SOURCE		TOTALS
	CONUS	NON-CONUS	
Other or No Response	73% (323)	53% (17)	71% (340)
Rifleman	7% (33)	16% (5)	8% (38)
Grenadier	< 1% (1)	- (0)	< 1% (1)
Auto Rifleman	1% (4)	- (0)	1% (4)
Fire Team Ldr	2% (1)	3% (1)	3% (12)
Squad Ldr	10% (46)	16% (5)	11% (51)
Platoon Sgt	2% (8)	3% (1)	2% (9)
Plat Ldr/CO	1% (4)	- (0)	1% (4)
RTO/Wireman	3% (15)	6% (2)	4% (17)
Armorer	- (0)	3% (1)	< 1% (1)
TOTALS	100% (445)	100% (32)	100% (477)

TABLE 9. THEATER SOURCE BY GRADE FOR THOSE MEN WHO INDICATED THEY HAD NOT RECEIVED ANY FORMAL M16 TRAINING PRIOR TO ARRIVAL IN VIETNAM

GRADE	THEATER SOURCE		TOTALS
	CONUS	NON-CONUS	
Other or No Response	2% (8)	- (0)	2% (8)
E-1 thru E-3	16% (69)	25% (8)	16% (77)
E-4	47% (208)	41% (13)	46% (221)
E-5	27% (122)	22% (7)	27% (129)
E-6	7% (29)	12% (4)	7% (33)
E-7 thru E-9	1% (5)	- (0)	1% (5)
O-1 thru O-4	1% (4)	- (0)	1% (4)
TOTALS	100% (445)	100% (32)	100% (477)

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TABLE 10. RECEIPT OF FORMAL M16 TRAINING BEFORE ARRIVAL IN VIETNAM
BY DEPLOYMENT MONTH

MONTH OF DEPLOYMENT	RECEIPT OF FORMAL M16 TRAINING BEFORE VN				
	YES		NO		TOTALS
Jan 68	96%	(153)	4%	(6)	100% 159
Dec 67	98%	(123)	2%	(2)	100% 125
Nov 67	93%	(89)	7%	(7)	100% 96
Oct 67	96%	(107)	4%	(5)	100% 112
Sep 67	87%	(61)	13%	(9)	100% 70
Aug 67	83%	(95)	17%	(19)	100% 114
Jul 67	92%	(56)	8%	(5)	100% 61
Jun 67	80%	(74)	20%	(18)	100% 92
May 67	85%	(89)	15%	(16)	100% 105
Apr 67	83%	(86)	17%	(18)	100% 104
Mar 67	80%	(139)	20%	(35)	100% 174
Feb 67	58%	(359)	42%	(260)	100% 619
Jan 67	65%	(37)	31%	(17)	100% 54
Dec 66	62%	(8)	38%	(5)	100% 13
Nov 66	18%	(2)	82%	(9)	100% 11
Oct 66	43%	(3)	57%	(4)	100% 7
Sep 66	40%	(2)	60%	(3)	100% 5
Aug 66	31%	(11)	69%	(24)	100% 35
Jul 66	50%	(7)	50%	(7)	100% 14
Jun 66	80%	(4)	20%	(1)	100% 5
TOTALS	75%	(1505)	24%	(470)	100% 1975

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Maintenance and Supply

Adequate quantities of repair parts, cleaning materials and equipment were generally available in Vietnam. However, unbalanced distribution among depots occasionally resulted in temporary shortages which affected using units. For example, some units reported shortages of bore brushes with due-ins over two months old, while the theater had not been totally out of stock since November 1967.

Cleaning materials such as the cleaning rod, lubricant, brushes, and patches, were generally available to the rifleman and he usually carried most items with him in the field (see questions 5 and 6, Section X). Pipe cleaners and bore cleaner, however, were often not available.

Unit armorers frequently did not accompany units into the field and as a consequence, field repair of weapons was neglected. Greater use of contact teams would reduce this problem and would also compensate for lack of skill among unit armorers.

The quality of maintenance by the rifleman was directly influenced by the degree of supervisory emphasis placed on care and cleaning within the unit. Men tended to clean their rifles two to three times more frequently than they cleaned their magazines and ammunition (Table 1). This trend was encouraged through unit maintenance

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inspections which also emphasized the rifle rather than the entire rifle system. Additional information regarding cleaning frequency and unit inspections is displayed in questions 21, 26, and 28 of Section X.

Survey data supports two product improvements presently under development.

1. The desire for magazines of greater capacity than 20 rounds was frequently expressed.

2. On-weapon storage capacity for cleaning materials is required. This was demonstrated by the data contained in question 6h of Section X, which indicates that there was no means generally satisfactory to the rifleman for carrying these materials.

Reliability and Acceptability.

Failures to extract still occurred with enough frequency to reduce confidence in the M16. (Table 5) Among those men surveyed, 35 percent had experienced at least one such failure within the previous four months (the average number of reported failures was 4.8). Attempts to establish a statistically significant correlation between failures and such possible causes as cleaning habits, overlubrication, and the extent and recency of the user's mechanical training were unsuccessful. The fact that it has been impossible to statistically isolate the causative factors from field survey data

suggests that failures to extract were caused by more than one variable. That is, the problem was not with maintenance, ammunition, or defective parts alone but was rather a combination of several variables. Consequently, system reliability can be improved only by continued product improvement and user effort.

A total of 42 percent of those surveyed indicated they had experienced at least one failure to lock. (Of those reporting this failure, the average number of failures was 5.3; see question 12, Section X.)

Half of the men reported having used the bolt assist and most of these (69 percent) indicated that use of the bolt assist had cleared the malfunction. (See question 13, Section X.)

Data relating to weapon performance and acceptability are shown in the answers to questions 29, 30, and 31 of Section X. In general, men armed with the M16 in Vietnam rated this rifle's performance high. Most frequently lauded were its light weight and its firepower. However, many men entertained some misgivings about the M16's reliability (33 percent of the men surveyed made adverse comments on either the rifle's sensitivity or its reliability). When asked what weapon they would prefer to carry in combat, 85 percent indicated that they wanted either the M16 or its submachine gun version, the XM177E1-2. The Office Secretary of Defense field survey conducted five months earlier reported: "Less than one half of one percent of

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of all personnel interviewed stated that they would exchange their M16 for another rifle." This difference in acceptance figures may reflect differences in data collection techniques. The Office Secretary of Defense survey derived its 99.5 percent acceptance figure from personal interviews, primarily of leaders, rather than from anonymous questionnaires completed by everyone armed with the weapon. While the 85 percent acceptance figure obtained by this survey does not show a particularly high level of confidence in the M16, continued introduction of the chrome chambered model, with its expected lower incidence of failures to extract, should improve user confidence. Many men who had recently received an M16 with a chrome chamber indicated that the rifle was significantly more reliable than earlier models they had used.

General Usage.

Test firing data displayed in Tables 2, 11, and 12 indicates:

1. Extent of test firing varied appreciably among units (this is an activity strongly influenced by unit standard operating procedures and command emphasis).
2. A greater percentage of leaders, from fire team to platoon level, test fired than men within the rifle squads. (This fact suggests that leaders know what should be done but do not always insist upon performance from their men.)

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3. Maneuver battalions test fired more than other units - 87 percent of personnel in maneuver battalions indicated that they test fired as compared to 77 percent in other units.

Zeroing information contained in Tables 4, 13, 14, and 15 reflect:

1. Within the theater, 10 percent of the men armed with the M16 had never zeroed their rifles. An additional 33 percent had not confirmed their zero within three months. (USARV quarterly training requirements include zeroing of rifles.)

2. There was no significant difference in zeroing trends by duty position.

3. The need for zeroing was particularly pronounced within maneuver battalions. Despite the fact that zeroing was done more frequently in maneuver battalions (see question 8 in Section X), 12 percent of the men in these battalions had never zeroed as compared to 8 percent in other units. A rapid turnover in men and more frequent exchanges of weapons probably contributed to the greater need for zeroing within maneuver battalions than in other units.

4. The zeroing history of men who have completed their 12 month tours in Vietnam is shown in Table 15. This table permits a more accurate evaluation of zeroing frequency, since the total

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sample contains men with various lengths of time in Vietnam. Table 15 indicates that 10 percent of all men never zeroed, about half zeroed quarterly (according to USARV directives), and about one-fourth zeroed when their weapon was issued at the beginning of their tour and never thereafter.

The average ammunition load carried was from 39 to 41 normal consumption days of ammunition. Variance in the amount of ammunition carried was quite pronounced (loads varied from seven to over 40 magazines). Although user estimates of ammunition consumption tend to be inflated, the survey data displayed in Table 16 support the judgment that men carry more ammunition than they need.

Most men loaded 18 rounds in their magazines (the theater average is 18.3 rounds).

The consumption ratio of ball to tracer ammunition varied appreciably among units (Table 3) and unit averages were a product of even wider differences among individuals, with many men firing 100 percent tracer.

Men estimated that they used the automatic mode of fire about 34 percent of the time and that about 60 percent of their automatic fire was expended in short bursts.

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TABLE 11. TEST FIRING BY DUTY POSITION

DUTY POSITION	TEST FIRING ^{1/}	
	(% Indicating They <u>DO</u> Test Fire Rifles)	
Other or No Response	78%	(1013)
Rifleman	86%	(361)
Grenadier	100%	(9)
Auto Rifleman	79%	(29)
Fire Team Ldr	90%	(103)
Squad Ldr	90%	(232)
Platoon Sgt	97%	(38)
Plat Ldr/CO	95%	(21)
RTO/Wireman	83%	(102)
Armorer	100%	(3)
THEATER AVERAGE	82%	(1911)

1. Numbers contained in parenthesis are total men responding to the question.

TABLE 12. TEST FIRING BY TYPE UNIT

TYPE UNIT	TEST FIRING ^{1/}	
	(% Indicating They <u>DO</u> Test Fire Rifles)	
Maneuver Battalion	87%	(984)
Other	77%	(926)
THEATER AVERAGE	82%	(1910)

1. Numbers contained in parenthesis are total men responding to the question.

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TABLE 13. ZEROING HISTORY BY DUTY POSITION

DUTY POSITION	ZEROING HISTORY							
	Never Zeroed		Zeroed W/in Last 3 Months		Zeroed Over 3 Months Ago		Total Men Responding to Question	
Other or No Response	10%	(95)	52%	(501)	38%	(310)	100%	906
Rifleman	12%	(4)	61%	(256)	21%	(75)	100%	365
Grenadier	-	(0)	50%	(2)	50%	(2)	100%	4
Auto Rifleman	4%	(1)	81%	(25)	7%	(2)	100%	28
Fire Team Ldr	12%	(12)	68%	(63)	20%	(27)	100%	102
Squad Ldr	8%	(17)	59%	(128)	33%	(72)	100%	217
Platoon Sgt	-	(0)	39%	(18)	41%	(14)	100%	32
Plat Ldr/CO	5%	(1)	55%	(11)	40%	(8)	100%	20
RTO/Wireman	10%	(10)	62%	(61)	28%	(28)	100%	99
Armorer	-	(0)	100%	(3)	-	(0)	100%	3
THEATER AVERAGE	10%	(180)	58%	(1054)	33%	(598)	100%	1836

TABLE 14. ZEROING HISTORY BY TYPE UNIT

TYPE UNIT	ZEROING HISTORY				Total Men Responding to Question	
	Never Zeroed	Zeroed W/in Last 3 Months	Zeroed Over 3 Months Ago			
Maneuver Battalion	12% (112)	60% (573)	28% (267)	100%	952	
Other	8% (65)	55% (435)	37% (334)	100%	852	
THEATER AVERAGE	10% (180)	58% (1054)	33% (598)	100%	1836	

TABLE 15. ZEROING HISTORY BY MONTH FOR ONLY THOSE HAVING
TWELVE MONTHS IN VIETNAM

TIME SINCE ZEROING (In Months)	ZEROING HISTORY		
	By Month	By Quarter	By 3 Months or Less and Over 3 Months
Never Zeroed	10% (51)	10% (51)	10% (51)
1	20% (109)		
2	18% (96)	48% (261)	48% (261)
3	10% (56)		
4	4% (24)		
5	5% (26)	11% (61)	
6	2% (11)		
7	3% (15)		
8	4% (21)	8% (44)	42% (227)
9	1% (8)		
10	1% (8)		
11	3% (15)	23% (122)	
12	18% (99)		
TOTALS	100% 539	100% 539	100% 539

✕ (Average Time Since Zeroing) = 4.96 months

☑ (Standard Deviation) = 4.39 months

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TABLE 16. AMMUNITION LOAD BY TYPE UNIT

ITEM	UNIT		
	Maneuver Bn	All Other	Theater
a. Total Rounds Carried	338 rounds	258 rounds	300 rounds
b. Total Magazines Carried	16.6 magazines	11.3 magazines	14.0 magazines
c. Largest consumption ever experienced in a single day of combat	293 rounds/day	327 rounds/day	308 rounds/day
d. Total consumption (within last 4 months)	1040 rounds	750 rounds	878 rounds
e. Average Daily consumption($d \div 120$)	8.67 rounds/day	6.25 rounds/day	7.32 rounds/day
f. Ammunition Load: Ave Consumption Days ($a \div e$)	39 days	41 days	41 days
Max Consumption days ($a \div c$)	1.15 days	0.79 days	0.97 days

1. This figure appears to be an inflated estimate made by men who are less experienced than those in maneuver battalions (it should be smaller than the battalion figure of 293 rounds.)

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IX. Conclusions and Recommendations

Policies and directives throughout Vietnam which govern M16 training, supply, maintenance, and user care and cleaning were generally adequate. Continued command supervision is necessary to improve compliance with these directives.

With the exception of Vietnam-oriented advanced individual training for infantrymen, all M16 training given to men prior to deployment should be improved. Many leaders were hampered in meeting their supervisory responsibilities by insufficient knowledge of the M16. Frequently, riflemen received either poor M16 training or none before they arrived in Vietnam. (Recently improved clearance procedures within the continental United States have reduced the numbers of men who deploy without rifle training.) In order to improve predeployment rifle training the following measures should be taken:

1. Accelerate introduction of M16 rifles and M16 training for all men in basic combat training at the earliest possible date.
2. Increase M16 instruction for supervisors in all schools producing junior leaders: for example, NCO refresher courses, officer candidate schools, and basic branch courses.
3. Establish procedures to insure receipt of M16 training for men on intertheater transfer to Vietnam.

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USARV required all replacements to complete the same M16 training program. The large number of untrained replacements that have arrived in Vietnam suggest use of two training programs, the present one for most men and another and more intensive one for the totally untrained.

Unit armorers frequently lacked formal training and adequate knowledge of M16 rifle maintenance. Provision for additional training, perhaps through divisional schools or mobile training teams from the 1st Logistical Command, should be made.

Men tended to clean their rifles two to three times more frequently than their magazines. Corroded or dirty ammunition and defective magazines seriously reduce rifle effectiveness. Unit maintenance inspections should emphasize care of the entire rifle system.

Adequate quantities of repair parts and cleaning materials and equipment were generally available in Vietnam. However, unbalanced distribution among depots occasionally resulted in temporary shortages which affected rifle maintenance. Procedures to achieve optimum distribution should be instituted.

Although individuals usually test fired their rifles, the nature and frequency of such firing varied widely among and within units. Test firing, when properly performed, will increase weapon reliability. Significant improvement in rifle effectiveness will

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be achieved by:

1. Isolation of defective rifles and magazines through periodic test firing by individuals in a combat zone. Design of a standard test firing procedure to accomplish this purpose should be developed by the Project Manager Rifles.

2. Continued command emphasis upon the importance of frequent and properly conducted test firing.

Greater zeroing effort is required, particularly within maneuver battalions. The average frequency of zeroing was every 4.96 months and 10 percent of the men had never zeroed their rifles. Zeroing increases both hit probability and user confidence in his rifle. It also stimulates the appropriate use of aimed fire. Verification of zero should be integrated with test firing, since any object that can visibly register hits may serve as a target.

Performance and acceptability data collected during the survey indicate:

1. The M16's high rate of lethal fire and light weight are qualities particularly suitable for the war in Vietnam.

2. Failures to extract still occurred with enough frequency to reduce confidence in the M16. These failures apparently result from a variety of causes. Factors which could contribute are inadequate maintenance, care and cleaning, and control of ammunition case hardness, or from pitted chambers, or defective parts.

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Consequently, both continued product improvement and user effort are necessary.

3. Introduction of the chromed chamber appeared to reduce the number of failures to extract. However, this improvement has not been fielded long enough to permit adequate evaluation.

4. Most men armed with the M16 in Vietnam rated this rifle's performance high, however, many men entertained some misgivings about the M16's reliability. When asked what weapon they preferred to carry in combat, 85 percent indicated that they wanted either the M16 or its submachine gun version, the XM177E1-2. (The M14 was preferred by 15 percent, while less than one percent wished to carry either the Stoner rifle, the AK-47, the carbine or a pistol.)

5. A field malfunction reporting system should be established throughout USARV. While such a system does not produce reliability data with laboratory precision, it does permit analysis of malfunction trends and would contribute to further improvement in the reliability of the M16.

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X. Frequency Distributions of Responses to Questionnaire

A series of frequency distributions displaying all responses to each item of the questionnaire were prepared to support the analysis. Each distribution is included in this section except where consolidation permitted an omission. Additional information is superimposed upon each of the inclosed distributions to assist in interpretation. (Instructions to assist interpretation of these distributions are contained on the initial distribution, page 44.)

A listing of each frequency distribution prepared follows:

Questionnaire Heading

Where from (theater source)

Major unit

Grade

Months in Vietnam

MOS

Duty position

Questions

1. Type and model of weapon used.
- 3.a. Was formal M16 training received before Vietnam?
- b. Was formal M16 training received in Vietnam?
- 4.a. Hours mechanical training received before Vietnam
- b. Hours of mechanical training received in Vietnam
- c. Total hours of mechanical training received before and in Vietnam.

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5.a. to g. Do you have cleaning materials (cleaning rod, LSA, chamber brush, bore brush, patches, pipe cleaners and bore cleaner)?

6.a. to g. Do you carry cleaning materials (a. to g.)?

h. Where are cleaning materials carried?

7.a. Receipt of new buffer

b. Receipt of chrome chamber

8.a. to c. Zeroing history (maneuver battalions, all other, and theater)

9.a. Total ball ammunition carried

b. Total tracer ammunition carried

c. Total ammunition carried (ball and tracer)

10. Lubrication of ammunition

11.a. to c. Weeks since instruction on care and cleaning of M16, ammunition, and magazines

12. Number of failures to lock

13.a. Use of bolt assist

b. Percentage of time use of bolt assist cleared problem

14.a. to c. Number of magazines carried (maneuver battalions, all others, and theater)

15. Percentage of fire in fully automatic mode

16. Percentage of automatic fire expended in short bursts

17.a. to c. Largest number of rounds expended in a single day of combat (maneuver battalions, all others, and theater)

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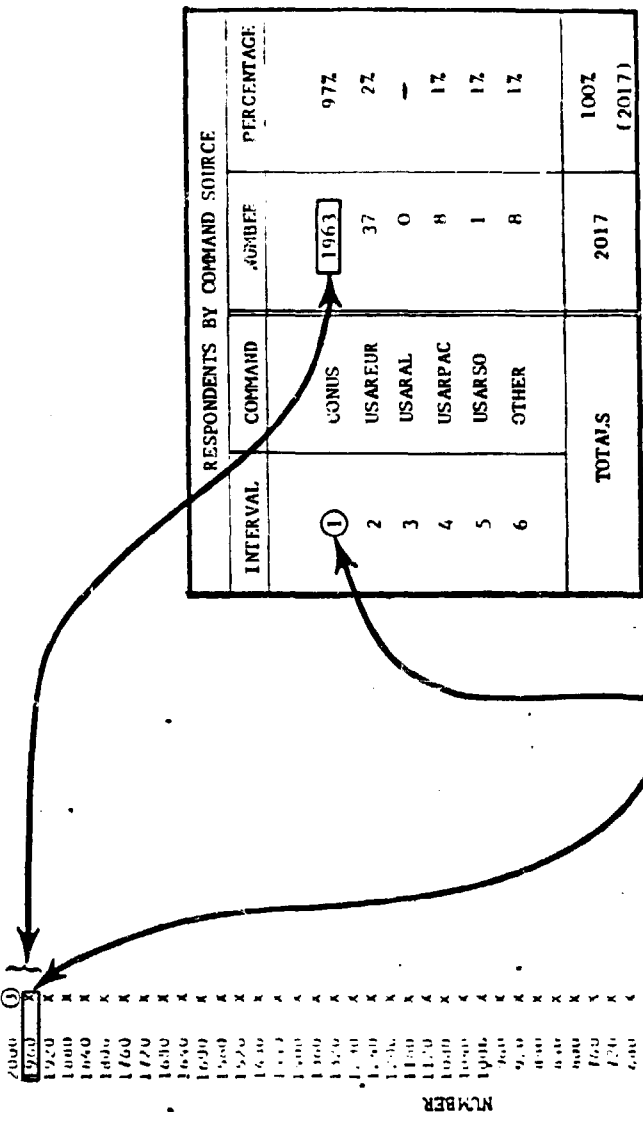
- 18.a. Was care and cleaning card received?
 - b. If issued, is card still in possession?
- 19. Test firing of individual weapons
- 20. Test firing schedule
- 21. M16 rifle cleaning trends
- 22. Number of rounds loaded in magazines
- 23.a. to c. Total rounds fired within last four months
(maneuver battalions, all others, and theater)
- 24.a. to c. Failures to extract (maneuver battalions, all
others, and theater)
- 25.a. to c. Do rounds stick in chamber when left for periods
of 0-8 hours, 9-16 hours, or 17-24 hours?
- 26.a. Frequency of unit rifle inspections
 - b. Who conducts unit rifle inspections?
 - c. Are unit magazine and ammunition inspections conducted?
- 27. Amount of tracer ammunition fired
- 28. Magazine and ammunition cleaning frequency
- 29. Weapon performance
- 30.a. to e. What do you like about the M16 system?
- 31.a. to e. What do you dislike about the M16 system?
- 32.a. to c. Additional comments

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SUMMARY OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY REPORTS AS OF 28 FEB 68

STANDARD HULLID: M16 1 HISTOGRAM OF LOCATION OF SOLDIER LOCATED IN WORDS 45, 0.
WITH ASSOCIATED WEIGHING FACTORS LOCATED IN WORDS, 0.



An "x" indicates that the number of responses filled up to that level (1960) and a digit (3) was the overflow, i.e. the total number of responses for interval #1 was 1960 + 3 or 1963.

Heading: Where from

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STATISTICAL SUMMARY OF DIVISIONS CONCERNED LOCATED IN WORDS 1,
WITH ASSOCIATED REIGHTING FACTORS LOCATED IN WORDS 0,

INTERVAL 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

RESPONDENTS BY MAJOR UNIT			
INTERVAL	UNIT	NUMBER	PERCENTAGE
1	1st Inf Div	109	5%
2	1st Air Cav Div	143	7%
3	4th Inf Div	51	3%
4	9th Inf Div	419	21%
5	25th Inf Div	80	4%
6	Americal Div	285	14%
7	101st Abn Div	63	3%
8	173d & 199th Bde	54	3%
9	Other USARV	693	34%
10	1st Marine Div	124	6%
TOTALS		2021	100%

Heading: Major Unit

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FORMER - - - - -

STANDARD# BLOCIO. NT# 1 HISTOGRAM OF MCS *SEE REFERENCE* LOCATED IN WORDS
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0. .

RESPONDENTS BY MOS			
INTERVAL	MOS	NUMBER	PERCENTAGE
1	All Others	984	49%
6	11B	681	34%
11	11C	137	7%
16	11D	46	2%
21	11G	3	< 1%
31	1542	15	1%
36	31B	19	1%
37	31F	2	< 1%
41	36A	13	1%
46	64A	19	1%
47	64B	24	1%
48	64C	0	—
51	71A	0	—
52	71B	17	1%
56	76K	5	< 1%
61	94A	0	—
62	94B	35	2%
TOTALS			2020 100%

Heading: Primary MOS

INTERVAL. 12) 3 4 5 6 / 8 9 C 12) 3 4 5 6 / 8 9 C 12) 3 4 5 6 / 8 9 C 12) 3 4 5 6 / 8 9 C

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARIES AS OF 28FEB68

STANDARD: BLOCIO. M16 1 HISTOGRAM OF DUTY POSITION
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS, O.

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154
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110
88
66
44
22
INTERVAL 1/3056189C 10

NUMBER

RESPONDENTS BY DUTY POSITION			
INTERVAL	DUTY POSITION	NUMBER	PERCENTAGE
1	Others - or No Response	1077	-
2	Rifleman	384	41%
3	Grenadier	10	1%
4	Auto Rifleman	29	3%
5	Fire Team Ldr	109	12%
6	Squad Ldr	239	25%
7	Plat Sgt	39	4%
8	Plat Ldr, Co Comdr	21	2%
9	Ammo Bearer, RTO, Wireman	110	12%
10	Armorer	3	< 1%
TOTALS		2021	100% (944)

Heading: Duty Position

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DATA OUTPUT -- VERSION: M4
NO STATISTICS: SUMMARIES AS OF 28FEB86

STANDARD BLOCK: M4 1 HISTOGRAM OF WEAPONS USED
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS, 0.

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INTERVAL 121-001094
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WEAPONS PRESENTLY IN POSSESSION		
INTERVAL	WEAPON	PERCENTAGE
1	No Answer	15
2	M14	15
3	M16 - w/o New Buffer	298
4	M16 - w/New Buffer	1063
5	M16 - w/New Buffer & Chrome	629
TOTALS		2020
		100% (2005)

Question 1: Type and Model Weapon Used

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M16 SUMA OUTPUT -- VERSION 44
M16 STATISTICAL SUMMARIES AS OF 28FEB88

STANDARDX 8LOC10. M16 1 HISTOGRAM OF TRAINING BEFORE R.V. LOCATED IN WORDS
ITEM ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0.

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CONFIDENTIAL

SUMMARY OUTPUT --- VERSION M5
M16 STATISTICAL SUMMARY AS OF 11/1/68

STANDARD DEVIATION: 11.0 HOURS OF MECH. TRAIN. BEFORE VN LOCATED IN WORDS 11.
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NUMBER

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88

80

HOURS MECHANICAL TRAINING RECEIVED - BEFORE VIETNAM			
INTERVAL	HOURS	NUMBER	PERCENTAGE
1	None	584	32%
2	1	133	7%
3	2	223	12%
4	3	75	4%
5	4	191	10%
6	5	85	5%
7	6	58	3%
8	7	4	< 1%
9	8	164	9%
10	9	1	< 1%
11	10	90	5%
12-31	11-30	157	9%
32-81	31-80	66	4%
88-100	No Response	190	-
TOTALS		2021	100% (1831)

\bar{X} (ave) = 5.2 hours mechanic
 σ (std dev) = 8.2 hours

Question 4A: Hours mechanical training received BEFORE Vietnam

INTERVAL 10 20 30 40 50 60 70 80 90 100 110
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1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 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1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 20

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SUMMARY OF THE -- VOLUME 10
 STATISTICAL SUMMARY AS OF 1960

ESTABLISHED BELOW, NTP 1 HISTOGRAM OF MECH. TRA'N. IN VN LOCATED IN WORDS 12, WHEN CALCULATED WEIGHTING FACTORS LOCATED IN WORDS 10,

HOURS MECHANICAL TRAINING RECEIVED IN VIETNAM			
INTERVAL	HOURS	NUMBER	PERCENTAGE
1	None	690	44%
2	1	318	20%
3	2	241	15%
4	3	56	4%
5	4	81	5%
6	5	31	2%
7	6	18	1%
8	7	3	< 1%
9	8	53	3%
10	9	0	-
11	10	27	1%
12-21	11-20	38	2%
22-88	21-89	24	2%
89-96	No Response	441	-
TOTALS		2021	100% (1580)

$$\bar{X} = 2.1 \text{ hours}$$

$$s = 4.0 \text{ hours}$$

Question 4a: Hours Mechanical Training in VN

[illegible]

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

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MI6 SPATIAL STATISTICAL SUMMARIES AS OF 2010000

STANDARD NO. 1000
 WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 17.
 WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 17.

NOTE: This table is a consolidation of all seven histograms on Question 5.

ITEM	DO YOU HAVE CLEANING MATERIALS?			TOTAL MEN RESPONDING
	INTERVAL 1 (NO RESPONSE)	INTERVAL 2 (YES)	INTERVAL 3 (NO)	
Cleaning Rod	103	97%	32 (54)	100% 1916
LSA Lubricant	103	91%	9% (179)	100% 1918
Chamber Brush	103	93%	7% (134)	100% 1918
Bore Brush	103	94%	6% (116)	100% 1913
Pipe Cleaners	104	69%	31% (589)	100% 1917
Patches	104	91%	9% (163)	100% 1917
Bore Cleaner	144	63%	37% (686)	100% 1877

Question 5a: Have cleaning rod (histograms for 5b-g available on request)

INTERVAL 171456789C
 10

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARIES AS OF 28FEB68

STANDARDX MUC10, M16 1. HISTOGRAM OF CLEANING ROD CARRIED LOCATED IN WORDS
ALIN ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS, C.

NOTE: This table is a consolidation of all seven histograms on question 6a through 8.

ITEM	DO YOU CARRY CLEANING MATERIALS ON OPERATIONS?				TOTAL MEN RESPONDING
	INTERVAL 1 (NO RESPONSE)	INTERVAL 2 (YES)	INTERVAL 3 (NO)		
Cleaning Rod	126	85%	15%	(281)	100% 1895
LSA Lubricant	126	75%	25%	(479)	100% 1895
Chamber Brush	126	70%	30%	(563)	100% 1895
Bore Brush	126	70%	30%	(561)	100% 1895
Pipe Cleaners	127	36%	64%	(1205)	100% 1894
Patches	126	71%	29%	(546)	100% 1894
Bore Cleaner	161	34%	64%	(1209)	100% 1860

Question 6a: Carry Cleaning Rod (histograms for 6b-g available on request)

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M16 SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARIES AS OF 28FEB68

ASTAQUARDUC BLUCLIO, M16 1 HISTOGRAM OF C.P.C. EQUIPPED LOCATED IN WORDS 32,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NUMBER

IS YOUR M16 EQUIPPED WITH A CHROMED CHAMBER?			
INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	No	1385	69%
2-99	Yes	636	31%
TOTALS		2021	100%

Question 7b: Presence of chromed chamber, and
number of weeks in possession.

INTERVAL 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY MS OF 20FEB86R

STANDARDUC 9LOCIO, N1# 3 HISTOGRAM OF TIME SINCE ZERO *2 LOCATED IN WORDS 33,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0,

ZEROING HISTORY				
INTERVAL	RESPONSE	MANEUVER BNS	ALL OTHERS	THEATER
1	No. Response	84	97	101
2-13	3 Months	60% (573)	55% (485)	58% (1058)
14-99	3 Months	28% (267)	38% (334)	33% (601)
100	Never	12% (112)	8% (68)	10% (180)
TOTALS	Responding Questioned	100% (952)	100% (887)	100% (1839)
		1036	984	2020

NUMBER

	13.9 weeks	16.3 weeks	17.9 weeks	16.0 weeks
\bar{X} (ave time since zeroing):	11.6 weeks	16.3 weeks	17.9 weeks	16.0 weeks
σ (std dev)	13.7 weeks	17.9 weeks	17.9 weeks	16.0 weeks

Question 8: Zeroing history--maneuver bns (histograms for all others and theater available on request)

[illegible]

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARIES AS OF 20FEB68

STANDARD OF ULCIO, WITH HISTOGRAM OF TRACER ANNO CARRIED LOCATED IN WORDS 35,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0,

NOTE: This table is a consolidation of all three histograms on quest1

ROUNDS OF AMMUNITION CARRIED ON OPERATIONS			
CHARACTERISTICS	BALL	TRACER	TOTAL
\bar{X} (Ave. Number)	224.3	65.1	289.8
σ (Std Dev)	145.2	87.0	180.7

NUMBER

Question 9: Total rounds tracer carried (histograms for ball and total rounds available on request.)

[illegible]

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SUMMARY OUTPUT -- VERSION 44
M16 STATISTICAL SUMMARY AS OF 28 FEB 68

STANDARD C BLOC 10, N16 1. HISTOGRAM OF LUBRICATION OF AMMO LOCATED IN WORDS 36,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 6,

NUMBER
1500
1470
1450
1410
1380
1350
1320
1290
1260
1230
1200
1170
1150
1110
1080
1050
1020
990
960
930
900
870
850
810
790
750
720
690
660
630
600
570
540
510
480
450
420
390
360
330
300
270
240
210
180
150
120
90
60
30
INTERVAL 1/1550/1092
10

DO YOU LUBRICATE AMMUNITION?			
INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	No Response	98	—
2	Yes	450	23%
3	No	1472	77%
TOTALS		2020	100% (1922)

Question 10: Lubrication of Ammunition

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SUMA OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY AS OF 28 FEB 68

STANDARD: BLUC10, M16 1. HISTOGRAM OF LUBRICATION OF AMMO LOCATED IN WORDS 36,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0,

1500
1470
1440
1410
1380
1350
1320
1290
1260
1230
1200
1170
1140
1110
1080
1050
1020
990
960
930
900
870
840
810
780
750
720
690
660
630
600
570
540
510
480
450
420
390
360
330
300
270
240
210
180
150
120
90
60
30
INTERVAL 1/3450/896
10

DO YOU LUBRICATE AMMUNITION?			
INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	No Response	98	-
2	Yes	450	23%
3	No	1472	77%
TOTALS		2020	100% (1922)

Question 10: Lubrication of Ammunition

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SOME OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY AS OF 21FEB68

STANDARD BLOCIO, M16 1 HISTOGRAM OF MAG. CLEAN. INST. LOCATED IN WORDS 39,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NOTE: This table is a consolidation of all three histograms in question 11.

INTERVAL	HAS INSTRUCTION ON CARE & CLEANING BEEN RECEIVED?			MAGAZINE
	RESPONSE	M16	AMMUNITION	
1	No	6% (97)	11% (171)	10% (157)
2-99	Yes	94% (1580)	89% (1414)	90% (1439)
100	No Response	— 344	— 436	— 425
TOTALS:	Responding	100% (1677)	100% (1585)	100% (1596)
	Questioned	2021	2021	2021
\bar{X} (Ave Time Since Inst.)		16.5 Weeks	15.8 Weeks	15.9 Weeks
σ (Std Dev)		16.1 Weeks	16.2 Weeks	16.1 Weeks

Question 11c: Weeks since receipt of magazine cleaning instruction
(histograms for M16 and ammunition cleaning available
on request)

INTERVAL	1	10	20	30	40	50	60	70	80	90	100	110
1	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
10	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
20	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
30	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
40	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
50	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
60	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
70	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
80	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
90	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
100	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
110	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

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SUNA OUTPUT -- VERSION M4
MIG STATISTICAL SUMMARIES AS OF 28FEU68

STANDARD LOCUS	MTN	HISTOGRAM OF FAILURE TO LOCK	LOCATED IN WORDS
WITH ASSOCIATED WEIGHING FACTORS	LOCATED IN WORDS	0	40

NUMBER OF FAILURES TO LOCK			
INTERVAL	NUMBER OF FAILURES	NUMBER	PERCENTAGE
1	None	1142	58%
2-6	1-5	519	26%
7-11	6-10	125	6%
12-88	Over 10	56	3%
89	No Response	44	-
90-100	Some - No Number Given	135	07%
TOTAL		2021	100% (1977)

\bar{X}	(average) = 5.3 failures/men reporting failures	\bar{X}_2	(ave) = 2.0 failures/all men
σ	(std dev) = 6.3 failures	σ_2	(std dev) = 4.6 failures

Question 12: Number of failures to lock.

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SUMX OUTPUT -- VERSION M4
 MINO STATISTICAL SUMMARY AS OF 20FEB68

STANDARD< BLOCK, NT# 1 HISTOGRAM OF BOLT ASSIST
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0,
LOCATED IN WORDS 41,

HAVE YOU USED BOLT ASSIST?			
INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	No Response	93	—
2	Yes	922	48%
3	No	1000	52%
TOTALS		2015	100% (1922)

Question 13: Use of bolt assist.

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INTERVAL 1:1456789C
10

11

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SUMX OUTPUT -- VFRSTIN M4
M16 STATISTICAL SUMMARY AS OF 28FEB68

STANDARD	NO	HISTOGRAM OF BOLT ASSIST WORKED WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS	LOCATED IN WORDS
42.	0	0	0

T ASSIST CLEAR PROBLEM?			
INTER	AL. ONSE	NUMBER	PERCENTAGE
1	Never	106	11%
2-88,90-99	Sometimes	401	43%
100	Always	434	46%
89	No Response	1080	-
TOTALS		2021	100% (941)

\bar{X} (average) = 68.9% of time it cleared problem
(std dev) = 39.1%

Question 13: Percentage of the time that use of bolt assist cleared problem.

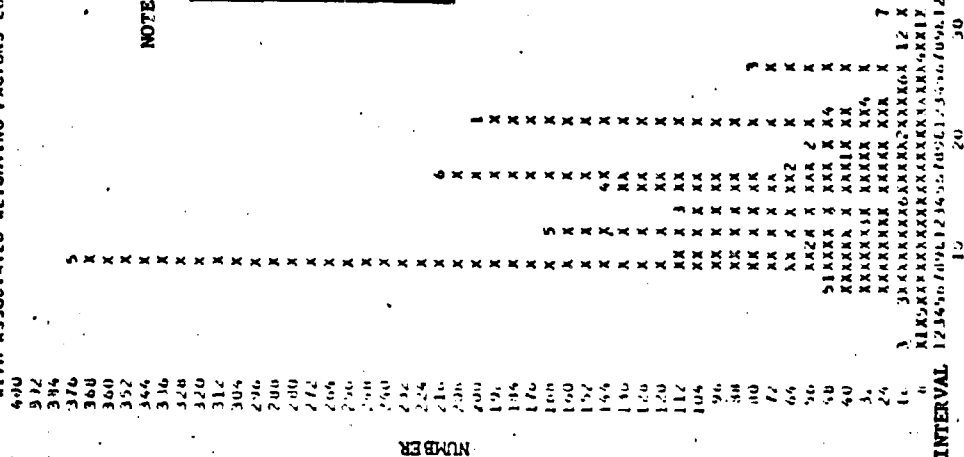
[illegible]

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARIES AS OF 28FEB68

STANDARD BLUCIO, M16 1 HISTOGRAM OF MAGAZINES CARRIED LOCATED IN WORDS 43.
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0,



NOTE: This table is a consolidation of all three histograms on question 14.

NUMBER OF MAGAZINES CARRIED ON OPERATIONS			
CENTRAL TENDENCY	MANEUVER BNS	ALL OTHERS	THEATER
\bar{X} (Average No. Carried)	16.6	11.3	14.0
σ (Standard Deviation of Distribution)	7.5	8.2	7.8

Question 14: Number of magazines carried--theater (histograms for maneuver bns & all others available on request)

INTERVAL 10 11 12 13 14 15 16 17 18 19 20

NUMBER 0 100 200 300 400

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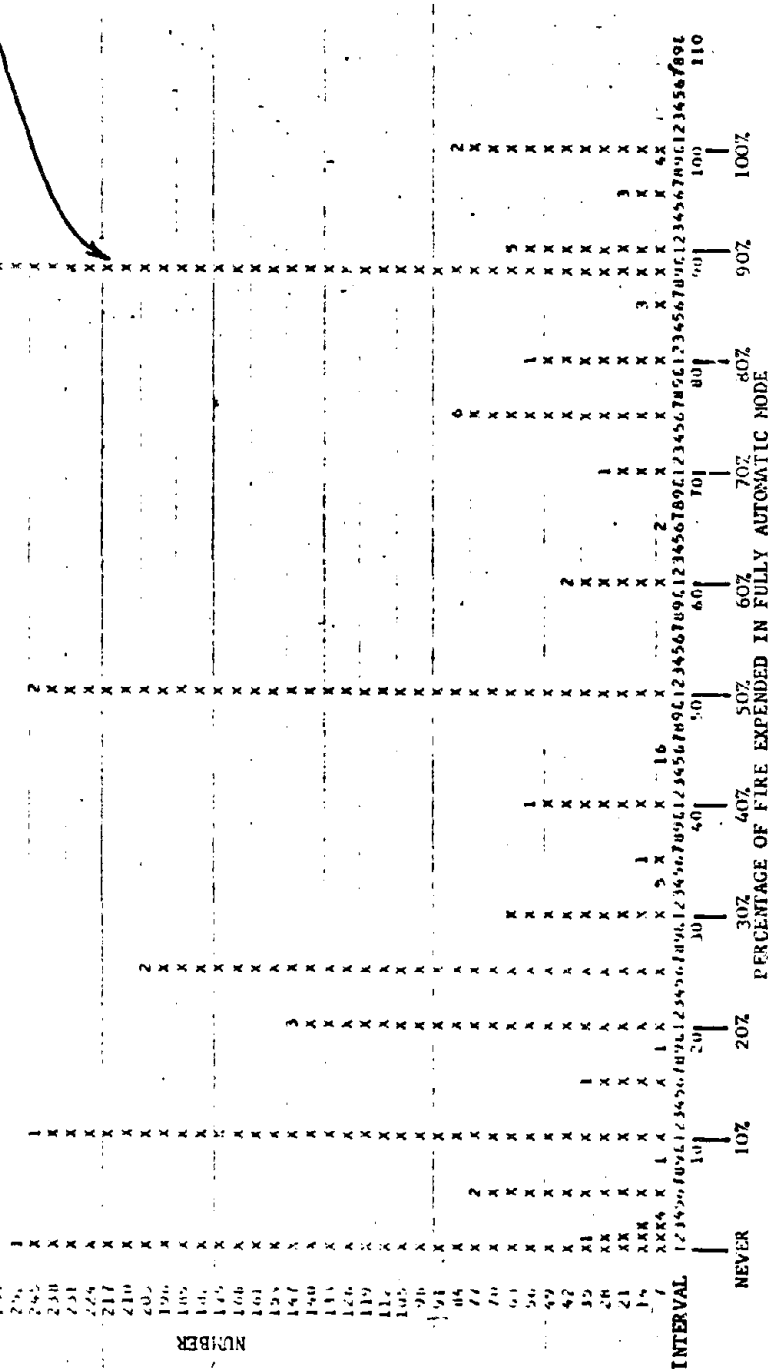
SOME OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY AS OF 2HFE608

4514100000 BLUCIO: N17 1 HISTOGRAM OF FULLY AUTOMATIC FIRE LOCATED IN WORDS 48.
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

Question 15: Percentage of Fire Expended in Fully Automatic Mode

\bar{X} (ave) = 33.9%
 σ (std dev) = 30.4%

No Response



WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0,
 LOCATED IN WORDS 51,

NOTE: This table is a consolidation of two histograms on question 18.

M16 CARE & CLEANING INSTRUCTION CARD			
INTERVAL	RESPONSE	WAS CARD ISSUED?	IF ISSUED, DO YOU STILL HAVE IT?
1	No Response	-	-
2	Yes	58% (1112)	51% (547)
3	No	42% (797)	49% (535)
TOTALS:	Responding	100% (1909)	100% (1082)
	Questioned		2018

Question 18a: Was instruction card issued? (histogram for presence of card available on request)

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY AS OF 28FEB68

STANDARD BLUCIO. NT# 1 HISTOGRAM OF TEST SCHEDULE LOCATED IN WORDS 54,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

1250

1225

1200

1175

1150

1125

1100

1075

1050

1025

1000

975

950

925

900

875

850

825

800

775

750

725

700

675

650

625

600

575

550

525

500

475

450

425

400

375

350

325

300

275

250

225

200

175

150

125

100

75

50

25

0

INTERVAL

10

IF TEST FIRING IS CONDUCTED, IS THERE A SCHEDULE?			
INSTR.	SCHEDULE	NUMBER	PERCENTAGE
1	None	1236	73%
2	At First Light	13	1%
3	Before Moving Out	70	4%
4	Daily	73	4%
5	Every Second Day	14	1%
6	Weekly	67	4%
7	Other	215	13%
10	No Response	333	-
TOTALS		2021	100% (1688)

Question 20: If you test fire, what is the test firing schedule?

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STANDARD DEVIATION: M16 1 HISTOGRAM OF CLEANING OF M16 LOCATED IN WORDS 55, 2
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NUMBER	INTERVAL
800	5
794	X
788	X
782	X
776	X
770	X
764	X
758	X
752	X
746	X
740	X
734	X
728	X
722	X
716	X
710	X
704	X
698	X
692	X
686	X
680	X
674	X
668	X
662	X
656	X
650	X
644	X
638	X
632	X
626	X
620	X
614	X
608	X
602	X
596	X
590	X
584	X
578	X
572	X
566	X
560	X
554	X
548	X
542	X
536	X
530	X
524	X
518	X
512	X
506	X
500	X
494	X
488	X
482	X
476	X
470	X
464	X
458	X
452	X
446	X
440	X
434	X
428	X
422	X
416	X
410	X
404	X
398	X
392	X
386	X
380	X
374	X
368	X
362	X
356	X
350	X
344	X
338	X
332	X
326	X
320	X
314	X
308	X
302	X
296	X
290	X
284	X
278	X
272	X
266	X
260	X
254	X
248	X
242	X
236	X
230	X
224	X
218	X
212	X
206	X
200	X
194	X
188	X
182	X
176	X
170	X
164	X
158	X
152	X
146	X
140	X
134	X
128	X
122	X
116	X
110	X
104	X
98	X
92	X
86	X
80	X
74	X
68	X
62	X
56	X
50	X
44	X
38	X
32	X
26	X
20	X
14	X
8	X
2	X

M16 RIFLE CLEANING FREQUENCY			
INTERVAL	FREQUENCY	NUMBER	PERCENTAGE
1	Never	13	1%
2	Daily	789	54%
3	Every 2d Day	224	15%
4	Every 3d Day	174	12%
5	Weekly	204	14%
6	Every 2 Weeks	76	5%
7	No Response	551	-
TOTALS		2004	100% (1453)

\bar{X} (ave) = 20.4 times per month
 σ (std dev) = 11.1 times per month

Question 21: Rifle cleaning frequency.

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STATISTICAL SUMMARY -- VERSION M4
M10 STATISTICAL SUMMARY AS OF 29FEB88

ESTIMATED BLUIC10, WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS, 56,
LOCATED IN WORDS, 56,
LOCATED IN WORDS, 56,

INTERVAL	NUMBER	PERCENTAGE
1250	1	-
1225	18	12
1200	10	12
1175	69	47
1150	1241	66%
1125	316	17%
1100	220	12%
1075		
1050		
1025		
1000		
975		
950		
925		
900		
875		
850		
825		
800		
775		
750		
725		
700		
675		
650		
625		
600		
575		
550		
525		
500		
475		
450		
425		
400		
375		
350		
325		
300		
275		
250		
225		
200		
175		
150		
125		
100		
75		
50		
25		
0		
INTERVAL	1250	1250

Question 22: Number of rounds loaded into magazines.

INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	No Response	136	-
16	15	18	12
17	16	10	12
18	17	69	47
19	18	1241	66%
20	19	316	17%
21	20	220	12%
TOTALS		2010	100% (1874)

\bar{X} (ave) = 18.3 rounds
 σ (std dev) = 0.82 rounds

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SUMX OUTPUT -- VERSION M4
M16 STATISTICAL SUMMARY AS OF 28FEB68

STANDARD: BLOCIO, NTR 2 HISTOGRAM OF ROUNDS FIRED/4MO #1 LOCATED IN NORDS 58.
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WINDS, 0.

NOTE: This table is a consolidation of all three histograms on question 21.

INTERVAL	TOTAL ROUNDS FIRED W/IN LAST FOUR MONTHS 1/			
	ROUNDS	ALL OTHERS	MANEUVER BNS	THEATER
1	No Response	-	20	-
2	0-500	51% (407)	30% (100)	4% (597)
3	500-1000	21% (169)	24% (150)	22% (319)
4	1000-1500	11% (86)	16% (100)	13% (186)
5	1500-2000	5% (38)	10% (63)	7% (101)
6	Over 2000	12% (99)	21% (133)	16% (231)
10	No Response	-	84	-
TOTALS:	Responding	100% (798)	100% (636)	100% (1434)
	Questioned	902	735	1637

\bar{X} (ave) : 750.0 rds 1039.7 rds 878.0 rds

σ (std dev): 628.1 rds 675.7 rds 665.0 rds

1/ All men with less than four months in-country were excluded.

Question 23: Total number of rounds fired within the last four months--all others
(histograms for maneuver bns and theater available on request)

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INTERVAL 1/1650/89C
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STANDARD NO. 10, M16 5 HISTOGRAM OF FAILURE TO EXTRACT LOCATED IN WORDS 59,
41TH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NOTE: This table is a consolidation of all three histograms on question 24.

FAILURES TO EXTRACT*			
INTERVAL	NO. OF FAILURES	MANEUVER BNS.	ALL OTHERS
1	None	56% (359)	73% (565)
2	1	8% (50)	7% (53)
3	2	9% (58)	5% (42)
4	3	6% (36)	2% (19)
5	4	4% (27)	3% (23)
6	5	5% (31)	2% (16)
7	6	2% (10)	2% (13)
8-99	Over 6	11% (73)	6% (44)
100	No Response	- 91	- 127
TOTALS	Respondents	100% (644)	100% (775)
	Questioned	735	902
	(ave # failures, of those having failures, (std dev)	5.6 & 6.9	5.0 & 6.5
	(ave # failures, of all men, (std dev)	2.5 & 5.3	1.4 & 4.0
			1637
			5.4 & 6.7
			1.9 & 4.7

* All men with less than four months in Vietnam were excluded.

Question 24: Failures to extract--maneuver bns (histograms for all others & theater available on request)

INTERVAL 10 20 30 40 50 60 70 80 90 100 110

CONFIDENTIAL

DATA OUTPUT -- VERSION M6
M16 STATISTICAL SUMMARIES AS OF 28FEB68

STANDARD DEVIATION: 1. HISTOGRAM OF STICKING IN CHAMBER LOCATED IN WORDS 66,
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0,

NOTE: This table is a consolidation of all three histograms on question 25.

INTERVAL	DID ROUNDS STICK IN CHAMBER WHEN CHAMBERED FOR:			
	RESPONSE	0-8 HOURS	9-16 HOURS	17-24 HOURS
1	No Response	-	438	-
2	Yes	13% (206)	8% (88)	12% (141)
3	No	87% (1376)	92% (1068)	88% (1029)
TOTALS:	Respondents	100% (1582)	100% (1156)	100% (1170)
	Questioned	2020	2021	2019

Question 25a: Do rounds stick in the chamber when left for: 0-8 hours?
(histograms for 9-16 hours and 17-24 hours available on request)

INTERVAL 123-56789
10

CONFIDENTIAL

DATA OUTPUT -- MINIMUM 44
N16 STATISTICAL SUMMARIES AS OF 2-1-80

STANDARD M10C10. HT# 1 HISTOGRAM OF NO. INSPECTIONS/MO. LOCATED IN WORDS 63.
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

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INTERVAL

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UNIT RIFLE INSPECTION FREQUENCY (INSPECTIONS/MONTH)		
INTERVAL	RESPONSE	PERCENTAGE
1	No Inspections Conducted	21%
2	1/Month (Monthly)	15%
3-4	2 or 3/Month	5%
5	4/Month (Weekly)	21%
6-8	5-7/Month	6%
9	8/Month (Twice Weekly)	5%
10-28	9-27/Month	6%
32-99	31-98/Month	1%
89	No Response	-
100	Yes--No Number Indicated	13%
TOTALS		100% (1874)
		2021

\bar{X} (ave freq. of insps)=5.5 inspections per month
 σ (std dev) =8.0 inspections

Question 26a: Frequency of unit rifle inspections.

INTERVAL 10 20 30 40 50 60 70 80 90 100

CONFIDENTIAL

STANDARD OUTPUT -- VERSION 114
M16 STATISTICAL SUMMARIES AS OF 28FEB68

STANDARD OUTPUT, N16 1 HISTOGRAM OF WHO INSPECTS, LOCATED IN WORDS 64, 5
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0, 0,

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CONFIDENTIAL

STANDARD M16: M16 1. HISTOGRAM OF CLEANING MAG. - AMMO LOCATED IN WORDS 66,
M16 STATISTICAL SUMMARIES AS OF 28FEB68
WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS , 0,

NUMBER
833
816
799
782
765
748
731
714
697
680
663
646
629
612
595
578
561
544
527
510
493
476
459
442
425
408
391
374
357
340
323
306
289
272
255
238
221
204
187
170
153
136
119
102
85
68
51
34
17
INTERVAL 1214561896
10

MAGAZINE & AMMUNITION CLEANING FREQUENCY			
INTERVAL	RESPONSE	NUMBER	PERCENTAGE
1	Never	109	9%
2	Daily	189	16%
3	Every 2d Day	61	5%
4	Every 3d Day	92	8%
5	Weekly	345	29%
6	Every 2 Weeks	144	12%
7	Monthly	238	20%
8	No Response	833	-
TOTALS:		2011	100% (1178)

\bar{X} (ave frequency)=8.0 times per month
 σ (std dev) =10.3 times per month

Question 28: Magazine & ammunition cleaning frequency

M16 STATISTICAL SUMMARIES AS OF 28 FEB 68

STANDARD DEVIATION: 67.1 HISTOGRAM OF PREFERENCE OF WEAPON LOCATED IN WORDS 67. WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

NUMBER

1300 4
1275 X
1250 X
1225 X
1200 X
1175 X
1150 X
1125 X
1100 X
1075 X
1050 X
1025 X
1000 X
975 X
950 X
925 X
900 X
875 X
850 X
825 X
800 X
775 X
750 X
725 X
700 X
675 X
650 X
625 X
600 X
575 X
550 X
525 X
500 X
475 X
450 X
425 X
400 X
375 X
350 X
325 X
300 X
275 X
250 X
225 X
200 X
175 X
150 X
125 X
100 X
75 X
50 X
25 X
0

WEAPON PREFERENCE			
INTERVAL	WEAPON	NUMBER	PERCENTAGE
1	No Response	203	-
2	M16	1252	69%
3	M14	258	14%
4	XMI77E1	291	16%
5	Other	16	< 1%
TOTALS		1817	100% (1817)

WEAPON PREFERENCE		
WEAPON	NUMBER	PERCENTAGE
M16 & XMI77E1	1543	85%
M14	258	14%
Other	16	< 1%
TOTALS	1817	100%

Question 29: What weapon do you prefer?

INTERVAL 1.5625/1.75

STATISTICAL SUMMARY OF M167 1/ 2/

LOCATED IN WORDS 68.

LOCATED IN WORDS 0.

1/

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INTERVAL	RESPONSE	NUMBER BY COLUMN					TOTAL NUMBER	PERCENTAGE
		1	2	3	4	5		
1	No Response	497	1095	1748	1982	2007	497	-
2	Light Weight	1340	12	5	0	0	1357	49%
3	Heavy Firepower	110	497	17	1	0	625	23%
4	Ease of Cleaning/Maintenance	19	115	82	6	0	222	8%
5	Ease of Handling	29	217	85	20	1	352	13%
6	Lethality	8	14	15	5	11	53	2%
7	Accuracy	9	52	49	4	2	116	4%
8	Reliability	8	18	20	3	0	49	2%
TOTALS							3271	100% (2774)

1/ "Likes" were recorded from each questionnaire in a 5 column field to assure the recording of all responses (an individual frequently listed several "likes"). A histogram was printed for each column, and then responses totaled in this table.

2/ "Maverick" or unusual "Likes" were recorded separately.

INTERVAL 12/19/66/000

Question 30: What do you "like" about the M16? (Column 1)

STANDARD BLOCK, NO 1 HISTOGRAM OF DISKES 1
WITH ASSOCIATED WEIGHING FACTORS LOCATED IN WORDS, 0.

WHAT DO YOU DISLIKE ABOUT THE M16? 1/ 2/								
INTERVAL	RESPONSE	NUMBER BY COLUMN					TOTAL NUMBER	PERCENTAGE
		1	2	3	4	5		
1	No Response	1064	1924	2009	2017	2018	1064	-
2	Sensitive to Dirt or Abuse	175	11	0	1	0	187	24%
3	I Dislike Nothing	303	2	0	0	0	305	-
4	Difficult to Clean	170	16	3	0	0	189	25%
5	Inadequate Range	8	1	3	1	0	13	2%
6	Poor Lethality	9	2	0	1	1	13	2%
7	Inaccurate	29	5	1	0	2	37	5%
8	Poor Reliability	242	52	5	1	0	300	39%
9	Poor Penetration	1	2	0	0	0	3	< 1%
10	Maintenance	20	6	0	0	0	26	3%
TOTALS							2137	100% (768)

1/ "Dislikes" were recorded from each questionnaire in a 5 column field to assure the recording of all responses (an individual frequently listed several "dislikes"). A histogram was printed for each column and then responses totaled in this table.

2/ "Maverick" or unusual "Dislikes" were recorded separately.

Question 31: What do you "dislike" about the M16? (Column 1)

INTERVAL 17 NOV. 1956

STANDARD MUCLO, NTH 1 HISTOGRAM OF COMMENTS 1 LOCATED IN WORDS 78,
 WITH ASSOCIATED WEIGHTING FACTORS LOCATED IN WORDS 0.

1930
 1911
 1871
 1831
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 1351
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 1231
 1191
 1151
 1111
 1071
 1031
 991
 951
 911
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 831
 791
 751
 711
 671
 631
 591
 551
 511
 471
 431
 391
 351
 311
 271
 231
 191
 151
 111
 71
 31
 0

ADDITIONAL COMMENTS		
INTERVAL	RESPONSE	TOTAL NUMBER
1	Other or No Response ^{1/}	1933
2	Need 30 Round Magazine	75
3	Need On Wpn Storage for Cleaning Materials	4
4	Needs to be Belt Fed	8
TOTALS		2020
		100% (87)

^{1/} "Maverick" or unusual "comments" were recorded separately.

Question 32: Additional comments--column 1 (histograms for columns 2 & 3 available on request)

KI. Matrix Plots

A series of matrix plots which permitted correlation of responses to two or more questionnaire items were prepared to support the analysis. Tables 1 through 16 (Section VIII) were developed from these plots. A list of each matrix print-out prepared follows by subject area.

Reliability

1. Lubrication of ammunition vs failures to extract
2. Percent tracer vs failures to lock
- 3.a. Hours mechanical training (before Vietnam) vs failures to lock and extract
- b. Hours mechanical training (in Vietnam) vs failures to lock and extract
- c. Total hours mechanical training vs failures to lock and extract
4. Time since last trained on M16 vs failures to lock and extract
5. M16 cleaning trends vs failures to lock and extract
6. Magazine and ammunition cleaning trends vs failures to lock and extract
7. Number of rounds expended within 4 months vs failures to extract

Supervision

1. M16 cleaning trends vs unit inspections of M16
2. Magazines and ammunition cleaning trends vs unit inspections of magazines and ammunition

Training

1. Training received before arrival in Vietnam vs MOS
2. Training received before arrival in Vietnam vs months
in Vietnam
3. Of those not receiving training before arrival in Vietnam
("No" answer on question 3A)
 - a. Theater source vs duty position
 - b. Theater source vs MOS
 - c. Theater source vs grade
4. Of those receiving training before arrival in Vietnam
("Yes" answer on question 3A)
 - a. Duty position vs hours mechanical training before
Vietnam
 - b. MOS vs hours mechanical training before Vietnam
 - c. Duty position vs hours range firing before Vietnam
 - d. MOS vs hours range firing before Vietnam
 - e. Duty position vs hours tactical training before
Vietnam
 - f. MOS vs hours tactical training before Vietnam
5. Of those receiving training in Vietnam
 - a. Duty position vs hours mechanical training in
Vietnam

- b. MOS vs hours mechanical training in Vietnam
- c. Duty position vs hours range firing in Vietnam
- d. MOS vs hours range firing in Vietnam
- e. Duty position vs hours tactical training in Vietnam
- f. MOS vs hours tactical training in Vietnam

6. Of those not receiving training either before arrival in Vietnam or in Vietnam

Major unit vs Duty Position

Cleaning Materials

Of those having cleaning materials ("Yes" answer on question 5a to g)

- 1. to 7. Men who carry materials (a-g) vs MOS

Zeroing

- 1. Zeroing history vs MOS
- 2. Zeroing history vs duty position
- 3. Zeroing history vs time in Vietnam
- 4. Zeroing history vs type of unit (maneuver battalion and other)

Ammunition Load

- 1. MOS vs ball ammunition load
- 2. MOS vs tracer ammunition load
- 3. MOS vs number of magazines carried
- 4. Type of unit (maneuver battalions and other) vs total ammunition load

General Usage

1. MOS vs percent of fire expended in fully automatic mode
2. MOS vs percent of automatic fire expended in short bursts
3. MOS vs largest number of rounds fired within 1 day of combat
4. MOS vs percent tracer used
5. Duty position vs percent tracer used
6. Weapon preference vs MOS
7. Test firing vs duty position
8. Test firing vs type of unit (maneuver battalion and other)

Major unit

1. Major unit vs presence of new buffer
2. Major unit vs zeroing history
3. Major unit vs lubrication of ammunition
4. Major unit vs test firing
5. Major unit vs M16 cleaning trends
6. Major unit vs unit inspections of M16
7. Major unit vs magazine and ammunition cleaning trends
8. Major unit vs unit inspection of magazines and ammunition
9. Major unit vs percent tracer
10. Major unit vs failures to lock and extract
11. Major unit vs training received in Vietnam

