



PB2004-101628



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ARMY CONCEPT TEAM IN VIETNAM
APO SAN FRANCISCO 96384

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SNIPER OPERATIONS AND EQUIPMENT (U)

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DEPARTMENT OF THE ARMY
ARMY CONCEPT TEAM IN VIETNAM
APO San Francisco 96384

PB2004-101628



AVIB-CO

23 February 1968

SUBJECT: Final Report - Sniper Operations and Equipment (ACG-87/67I)

TO: Commanding General
United States Army Vietnam
ATTN: AVHGC-DST
APO 96375

Unclassified


1. Reference: Letter, AVHGC-DH, Headquarters, US Army Vietnam, 23 February 1967, subject: Letter of Instruction.

2. In accordance with the provisions of the foregoing reference, the attached final report is forwarded for review and transmittal to Department of the Army.

3. Request a copy of the USARV and CINCUSARPAC forwarding in-dorsements be furnished the Commanding Officer, Army Concept Team in Vietnam (ACTIV).

FOR THE COMMANDER:

1 Incl
as


F. A. KLEIN
CPT, AGC
Adjutant

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AVHGC-DST (23 Feb 68)

1st Ind (U)

SUBJECT: ACTIV Final Report - Sniper Operations and Equipment (U)

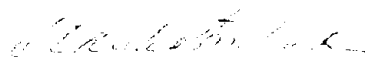
HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,
APO 96558

✓ Commanding Officer, Army Concept Team in Vietnam, APO 96384

1. The attached Final Report of Evaluation on Sniper Operations and Equipment is forwarded for your information.
2. This headquarters concurs with the conclusions and recommendations contained in the final report.
3. Request that DA:
 - a. Develop doctrine, to be included in appropriate field manuals, for employment of snipers.
 - b. Provide a POI for a sniper training program, to include lesson outlines.

FOR THE COMMANDER:



1 Incl
nc

C.S. NAKATSUKASA
Captain, AGC
Assistant Adjutant General

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DEPARTMENT OF THE ARMY
ARMY CONCEPT TEAM IN VIETNAM
APO San Francisco 96384

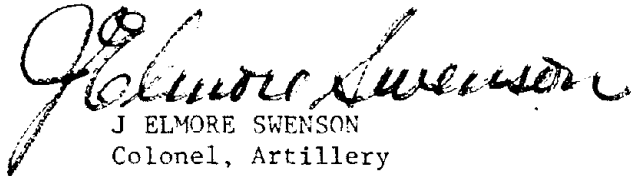
FINAL REPORT

**SNIPER OPERATIONS
AND EQUIPMENT (U)**

ACTIV Project No. ACG-87/67I

23 February 1968

Approved:



J ELMORE SWENSON
Colonel, Artillery
Commanding

DOWNGRADED AT 3 YEAR INTERVALS:
DECLASSIFIED AFTER 12 YEARS
DOD DIR 520C.10

AUTHORITY

Letter, AGAM-P, DA, 22 Jan 68, Subject: Army Combat Developments and Materiel Evaluation (CD&ME) Program, Vietnam. Message, AVHGC-DM, Hq USARV, 19 April 1967, Subject: Sniper Operations and Equipment

ACKNOWLEDGMENTS

The Army Concept Team In Vietnam is indebted to the U.S. Army units which participated in the evaluation. The Army Concept Team is particularly indebted to the U.S. Army Marksmanship Training Unit, Fort Benning, Georgia, for testing equipment as well as furnishing advice and reference material.

PROJECT OFFICER

LTC David S. Moore, MI

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Army Concept Team In Vietnam APO San Francisco 96384		2a. REPORT SECURITY CLASSIFICATION CONFIDENTIAL	
		2b. GROUP 4	
3. REPORT TITLE Sniper Operations and Equipment (U)			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Final Report 19 April - 31 October 1967			
5. AUTHOR(S) (First name, middle initial, last name) David S. Moore, LTC MI			
6. REPORT DATE 23 February 1968		7a. TOTAL NO. OF PAGES 32	7b. NO. OF REFS NONE
8a. CONTRACT OR GRANT NO.		8b. ORIGINATOR'S REPORT NUMBER(S) ACTIV Project No ACG-87/67I	
b. PROJECT NO.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
c. NONE		NONE	
d.			
10. DISTRIBUTION STATEMENT Distribution of This Document is Unlimited.			
11. SUPPLEMENTARY NOTES NONE		12. SPONSORING MILITARY ACTIVITY US ARMY VIETNAM APO San Francisco 96375	
13. ABSTRACT This report covers an evaluation conducted by the Army Concept Team in Vietnam of Sniper Operations and Equipment used by US Army units. The report concludes that sniper operations in Vietnam are desirable and that suitable equipment and doctrine are required. (U)			

DD FORM 1473

REPLACES DS FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

UNCLASSIFIED

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Rifle, M14, accurized M84, Realist, and Redfield telescope Sniper training.						

CONTENTS

	<u>Page</u>
SUMMARY	iv
I. INTRODUCTION	
A. Purpose	1
B. Background.	1
C. Description of Materiel	1
D. Objectives.	2
E. Evaluation Design	2
II. DISCUSSION	
A. Employment.	4
B. Organization and Doctrine	8
C. Equipment	12
D. Training.	18
III. CONCLUSIONS AND RECOMMENDATIONS	
A. Conclusions	22
B. Recommendations	23
ANNEXES	
A. Test Results.	A-1
B. Distribution.	B-1

SUMMARY

(U) This evaluation was conducted at the request of DCG, USARV.

(U) The purpose of the evaluation was to determine the organizational, doctrinal, and materiel requirements for sniper operations by U.S. Army units in the Republic of Vietnam (RVN).

(U) Major combat units throughout Vietnam participated in the evaluation. Data was collected through reports, questionnaires, and interviews. Data on assignment level, employment, range of targets, effective range of equipment, user acceptance, and training were collected and analyzed.

It was found that within limitations most units can use snipers, that the accurized M14 was a suitable sniper rifle for Vietnam, that none of the telescopes evaluated had all the desirable characteristics, that training and publications were inadequate and that training can be effectively conducted in Vietnam.

Recommendations are that: (1) Divisions and separate command brigades be authorized sniper equipment in addition to TOE weapons; (2) organization for sniper operations be tailored by divisions and brigades in accordance with their requirements; (3) the accurized M14 be designated as the standard sniper rifle for Vietnam; (4) a standard sniper telescope be designated; (5) a sniper training program be provided for units in Vietnam; and (6) expanded doctrine for employment of snipers be developed and included in appropriate field manuals.

INTRODUCTION

A. (U) PURPOSE

The purpose of the evaluation was to determine the organizational, doctrinal, and materiel requirements for sniper operations by U.S. Army units in the Republic of Vietnam (RVN).

B. BACKGROUND

In a message dated 19 April 1967, USARV announced plans for the conduct of an evaluation of sniper operations and equipment in Vietnam. Prior to that time several U.S. Army units had limited quantities of sniper equipment and had conducted sniper operations on a limited scale. Data was not available, however, to determine materiel and organizational requirements. To determine these requirements USARV requested specific sniper rifles and telescopes from CONUS and developed plans to issue the equipment to all divisions and separate brigades in Vietnam on an equitable basis. Units participating in the evaluation were directed by USARV to develop their own training programs, organization, and concepts of employment.

C. (U) DESCRIPTION OF MATERIEL

1. Rifle, M14, accurized, w/M84 telescope (Hereafter referred to as M14 w/M84). This rifle is of the same basic design as the standard M14 rifle, except as modified to eliminate the automatic firing capability and accurized by use of specially selected and fitted parts. The M84 is a two and one-half power telescope that was formerly mounted on the M1D sniper rifle.

2. Rifle, M14, National Match, w/LWL adjustable range telescope (Hereafter referred to as M14 w/ART). This rifle is a National Match specification M14 modified to permit mounting of a modified commercial Redfield telescope. The telescope incorporates a camming principle in conjunction with the range finding capability inherent in the Redfield three to nine variable power "accorange" telescope. This feature automatically zeroes the telescope as the firer adjusts the range finder.

3. Rifle, M16, w/Realist telescope (Hereafter referred to as M16 w/Realist). This is the standard M16 rifle with a three power Realist commercial telescope. No modification of the rifle is required to mount the telescope.

4. Rifle, Winchester Model 70 This is a commercial sporting rifle chambered to fire 30-06 ammunition.

D. (U) OBJECTIVES

1. Objective 1 - Employment

Evaluate current employment of sniper personnel and equipment in Vietnam.

2. Objective 2 - Organization and Doctrine

Determine sniper organizational and doctrinal concepts for U.S. Army sniper operations in Vietnam.

3. Objective 3 - Equipment and Maintenance

Determine which of the sniper equipment evaluated is most suitable for combat operations in Vietnam, what other equipment may be required, and what maintenance support is required for sniper equipment.

4. Objective 4 - Training

Determine sniper training requirements for combat operations in RVN, and what training support may be required by units in the field.

E. (C) EVALUATION DESIGN

1. Setting of the project

a. Environment: The evaluation was conducted in the highlands, the lowlands, the coastal plain, and the delta region of the Republic of Vietnam (RVN). Terrain in the evaluation area included mountains, plateaus, jungle, marshes, and cultivated plains. The climate of the areas ranges from semi-tropical in the highlands to tropical in the delta. Data collection took place during the summer monsoon, which blows generally from the southwest bringing heavy rains, high humidity, and tropical temperatures to the delta and southern RVN.

b. Military units. The 1st, 4th, 9th, and 25th Infantry Divisions; the 1st Cavalry Division; the 1st Brigade, 101st Airborne Division; and the 196th and 199th Light Infantry Brigades participated in the evaluation. The 173d Airborne Brigade was issued sniper equipment but did not train nor employ snipers during the data collection period.

2. Methodology

a. Data collection methods: Data to accomplish the objectives of the evaluation was collected by each participating division and separate

brigade. Data was collected by means of reports from subordinate units and by questionnaires distributed by each division and separate brigade to commanders and snipers. Summaries of sniper operations were collected each month and questionnaires were completed during the final month of data collection. One hundred and seventeen commanders completed questionnaires as follows: 12 brigade commanders, 14 battalion commanders, 48 company commanders, and 43 platoon leaders. Eighty seven snipers completed questionnaires.

b. Analysis methods: Collected data was reduced and analyzed using quantitative and qualitative methods. Data reduced from questionnaires was compared and related to actual combat results reported by the units.

3. Limitations and Variables

a. During the evaluation period, the participating units were engaged in combat operations; and controlled tests of weapons, techniques, and concepts were not possible.

b. There were only ten M14 w/ART sniper rifles and eight Winchester 70 rifles used in Vietnam during the evaluation.

c. The ACTIV evaluation plan called for five data collectors to be TDY to ACTIV for the period of the evaluation. Data collectors, however, were not approved and data was collected by each division and separate brigade.

4. Support Requirements

The equipment for the evaluation was obtained by USARV through ENSURE procedures. The materiel issued for the evaluation will be retained by the units to which it was issued.

5. Time Schedule

a. Equipment arrived in Vietnam in April 1967, with the exception of the M14 w/ART, which arrived in June.

b. Training of snipers took place during June and July 1967.

c. Data collection took place during the period July through October 1967.

II. (U) DISCUSSION

A. (U) OBJECTIVE 1, EMPLOYMENT

1. Distribution of Equipment

Figure 1 presents a breakdown of the equipment obtained for the evaluation:

<u>UNIT</u>	<u>M14 w/M84</u>	<u>M14 w/ART</u>	<u>M16 w/Realist</u>	<u>Winchester 70</u>
1st Inf Div	21	3	60	0
4th Inf Div	21	0	54	0
9th Inf Div	25	5	54	0
25th Inf Div	21	0	54	0
1st Cav Div	0	2	54	0
1st Bde, 101st Abn Div	7	0	18	8*
173d Abn Bde	7	0	18	0
196th Lt Inf Bde	7	0	18	0
199th Lt Inf Bde	7	0	18	0

(U) Figure 1. Distribution of equipment.

(*These weapons were already in the possession of the 1st Bde, 101st Abn Div.)

2. Number of Snipers Employed

a. Each of the units listed in Figure 1, with the exception of the 173d Airborne Brigade, conducted sniper training during May and June 1967, and began actual employment of snipers by July. In a message to CG, USARV in August 1967, the CG, 173d Airborne Brigade stated that operational commitments, personnel turnover, and the nature of the area of operations precluded training and employment of snipers during the evaluation period. Figure 2 presents the number of snipers trained and employed by each unit during the evaluation period.

<u>UNIT</u>	<u>M14 w/M84</u>	<u>M14 w/LWL ART</u>	<u>M16 w/Realist</u>	<u>Win 70</u>	<u>Total</u>
1st Inf Div	14	3	60	0	77
4th Inf Div	14	0	15	0	29
9th Inf Div	25	5	28	0	58
25th Inf Div	21	0	0	0	21
1st Cav Div	0	2	11	0	13
1st Bde, 101st Abn Div	6	0	0	8	14
196th Lt Inf Bde	15	0	7	0	22
199th Lt Inf Bde	<u>7</u>	<u>0</u>	<u>18</u>	<u>0</u>	<u>25</u>
TOTAL	102	10	139	8	259

Figure 2. Number of snipers trained and employed.

b. The differences between total equipment issued and equipment actually employed occurred for several reasons. As described in paragraph 2a, one brigade did not train or employ snipers. Two units, the 25th Infantry Division and 1st Brigade, 101st Airborne Division, did not consider the M16 w/Realist an adequate sniper rifle and consequently did not employ it as extensively. (See paragraph C, Equipment.)

3. Results of Sniper Employment (Figure 3)

a. KIA numbers are according to the reporting procedure of the unit concerned and are in all cases, by body count. Sniper man-days are days in actual combat operations.

<u>UNIT</u>	<u>MAN DAYS</u>	<u>NUMBER OF TARGETS ENGAGED</u>	<u>NUMBER KIA - WIA</u>	
1st Inf Div	1943	4	0	0
4th Inf Div	1848	28	21	3
9th Inf Div	864	21	3	4
25th Inf Div	320	20	1	1
1st Cav Div	852	12	10	0
1st Bde, 101st Abn Div	293	21	10	1

<u>UNIT</u>	<u>MAN DAYS</u>	<u>NUMBER OF TARGETS ENGAGED</u>	<u>NUMBER KIA - WIA</u>	
196th Lt Inf Bde	519	16	0	0
199th Lt Inf Bde	<u>873</u>	<u>2</u>	<u>1</u>	<u>0</u>
TOTAL	7512	124	46	9

(B) Figure 3. Results of Sniper Employment.

b. The highest KIA to man-days ratio occurred in units that were operating primarily in the central highlands, coastal plain, and southern portion of the northern highlands of RVN. The lowest ratio of KIA to man-days occurred in units employed primarily in the lowlands area north of Saigon and south of the central highlands. The latter area is characterized by flat terrain and dense vegetation. At the conclusion of the evaluation, the 1st Infantry Division, which operated in this area, decided that it would not be profitable to continue sniper training and employment.

c. The range at which targets were engaged varied considerably between units. Units operating in the lowlands area north of Saigon reported the shortest ranges at which targets were engaged, while those operating primarily in the highlands, coastal, and delta areas reported longer ranges. Figure 4 presents ranges at which targets were detected and engaged.

<u>UNIT</u>	<u>MAXIMUM RANGE (METERS)</u>	<u>AVERAGE RANGE (METERS)</u>
1st Inf Div	250	200
4th Inf Div	450	250
9th Inf Div	550	400
25th Inf Div	350	250
1st Cav Div	600	350
1st Bde, 101st Abn Div	1300	900
196th Lt Inf Bde	900	550
199th Lt Inf Bde	550	450

(C) Figure 4. Ranges of Combat Targets.

4. Types of Operations in Which Snipers Were Employed

Twelve brigades reported employment of snipers in combat operations. Snipers were employed in the following types of combat operations. Type operations are arranged by order of frequency:

- (1) ambushes.
- (2) combat patrols.
- (3) offensive operations of company or larger size.
- (4) tactical perimeter defense.
- (5) base camp defense.

5. Limitations on Sniper Effectiveness

Two significant limitations were identified that restricted sniper effectiveness. These were vegetation and rules of engagement.

a. Vegetation. Questionnaires completed by 91 company officers throughout Vietnam contained data on limitations imposed by vegetation. Vegetation was considered as the most significant limitation by 92% of those officers. Company officers in units located in the lowlands north of Saigon reported vegetation to be a greater limitation than did those in units located in other areas of Vietnam. Vegetation presents the least limitation in the coastal plains and highly cultivated delta areas.

b. Rules of Engagement. The rules of engagement were considered a significant limitation by 44 percent of the company officers who completed questionnaires. The restrictions were generally the same in all units. Approximately 70 percent of these officers stated that the sniper must either see the suspected enemy firing at friendly troops or have approval from his squad or platoon leader before firing.

6. Findings

a. Of the nine major units which were issued sniper equipment, all but one trained and employed snipers during the evaluation period.

b. The effectiveness of snipers in detecting and engaging targets varies considerably from one area to another, and is based primarily upon conditions of vegetation.

c. The average range at which targets were engaged by all units in Vietnam was approximately 400 meters.

d. The average maximum range at which targets were engaged by all units was about 600 meters.

e. Within the framework of platoon operations, snipers were employed in a variety of combat situations.

f. Vegetation is the greatest limitation on effectiveness of snipers in Vietnam. Rules of engagement are also a limitation.

B. (C) OBJECTIVE 2. ORGANIZATION AND DOCTRINE

1. General

As directed by USARV, each division and separate brigade participating in the evaluation developed its own organization and doctrine of employment. Assistance was furnished by ACTIV in the form of the following publications:

- a. FM 23-71, Rifle Marksmanship, December 1966.
- b. Army Subject Schedule 23-16 Sniper training, November 1962 (Rescinded).
- c. Army Training Program 7-18-1.
- d. U.S. Army Marksmanship Training Unit's "Service Rifle Instructors and Coaches Guide", 1967 edition.

2. Concepts of Organization

a. ATP 7-18-1 requires the training of a minimum of three snipers per rifle platoon, although current TOE's make no provisions for snipers or sniper equipment. FM 23-71, Rifle Marksmanship, December 1966, reiterates this requirement and states that the number of snipers should be one per rifle squad. Current field manuals on the rifle platoon and the rifle company contain no reference to sniper organization.

b. During the evaluation period, the majority of snipers were designated riflemen in rifle platoons, although a few units did designate some snipers in units other than rifle platoons. No unit participating in the evaluation organized a specific sniper unit such as a platoon or squad of snipers at battalion or brigade level; consequently, it was not possible to evaluate different concepts of organization. Figure 5 shows distribution of snipers in the 12 brigades that actually employed them.

<u>ORGANIZATION LEVEL</u>	<u>NUMBER OF BRIGADES</u>
Assigned to rifle platoons	12
Assigned to company level	(2)
Assigned to battalion RECON platoon	(1)
Assigned to brigade LRRP	(1)
Total	<u>12</u>

(U) Figure 5. Assignment of Snipers

c. Opinions of commanders. One hundred and seventeen commanders, ranging from platoon leaders to brigade commanders from all units that participated in the evaluation, completed questionnaires related to organizational concepts. Figure 6 contains tabulated data from these questionnaires.

<u>ITEM</u>	<u>RESPONSE</u>	
	<u>COMPANY OFFICERS</u>	<u>BN AND BDE CO's</u>
Stated a need for snipers:	79%	76%
Desired to convert TOE positions to snipers:	47%	20%
Average number of snipers desired (not necessarily TOE positions) per company:	4	3
Level at which snipers should be assigned:		
(a) Platoon	64%	54%
(b) Company	33%	32%
(c) Battalion	3%	14%
(d) Brigade	0	0

(U) Figure 6. Commanders Opinions on Organization

3. Doctrine of Employment

a. U.S. Army doctrine concerning the employment of snipers is very scanty. The current Field Manuals on the Rifle Platoon, Rifle Company, Infantry Battalion, and Infantry Brigade contain no guidance or doctrine for the employment of snipers. FM 23-17, Rifle Marksmanship, December 1966, contains a chapter on advanced marksmanship (sniping). This chapter is directed principally toward the individual sniper although it does contain a limited discussion of the employment of snipers. A search of the current index to Army publications revealed no other publications containing doctrine on employment of snipers.

b. The concept of employment implemented by all units participating in the evaluation was almost entirely that of the squad or platoon sniper. The squad or platoon sniper is a selected rifleman who is given special training and is equipped with a sniper rifle. He remains under the control of his unit leader and engages targets of opportunity within the framework of his unit's operations. The mission of the sniper in this role is to extend the effective rifle firing range of his unit. There was insufficient use of snipers under other concepts to permit a comparative analysis of results.

c. At the end of the evaluation period commanders were requested to comment upon doctrine of employment based upon combat experience in Vietnam. The following comments are representative of the concepts of sniper use during the evaluation period.

(1) Airborne Brigade: "The number of targets detected and successfully engaged in combat operations justified a minimum of one sniper per platoon. The nature of reconnaissance unit missions allows reconnaissance units greater flexibility in employment of snipers. In these units snipers can operate as teams using spotting scopes to detect and assist in engaging targets. In rifle elements of the brigade, the sniper gives the platoon leader the capability of engaging targets beyond the range of his other weapons."

(2) Infantry Division: "Sniper operations and equipment have been monitored and evaluated in this command since May 1966. As a result of this evaluation, I have arrived at certain conclusions concerning sniper employment and equipment in our area of operation. Within the division (area of operation), I feel that one sniper per platoon can be profitably employed on targets of opportunity and designated targets in both offensive and defensive operations. Additionally, snipers are required for long range reconnaissance patrols (LRRP) and sniper/hawkeye teams (the sniper/hawkeye team consists of a sniper and an observer equipped with an observation telescope). Employment is frequently limited by dense jungle vegetation, terrain, weather, and rules of engagement."

(3) Infantry Brigade: "Selected individuals are trained as snipers and perform this mission as an additional duty. Most tactical operations have been conducted in heavily wooded areas that reduce the effectiveness of the sniper equipment."

(4) Infantry Brigade: "This headquarters is of the opinion that snipers could not be effectively employed in the brigade TAOR (Tactical Area of Operation) with regard to vegetation, terrain, and frequent movement of the units. The concept that this headquarters entertains is that snipers be used only when the sniper is familiar with trails and probable target areas, and when the sniper is familiar with avenues of approach and escape around his position."

(5) Infantry Brigade: "Snipers are controlled at platoon level and are employed both as individual snipers firing at targets of opportunity and as members of teams to detect and engage long range targets. Sniper-observer teams are generally controlled at company level, while individual snipers remain under the platoon leader's control. In isolated cases, snipers have been used to conduct reconnaissance by fire of suspected enemy locations. Snipers could have been more effectively employed during the brigade's initial deployment to this area when targets were often sighted at ranges of 1000 meters; however, the enemy has since fragmented into small groups who seldom present a lucrative target for snipers."

(6) The comments quoted above were selected from units operating in the different geographic areas of RVN encompassed in the evaluation. The most favorable comments concerning the overall value of sniper operations came from units operating in the highlands, coastal plains, and delta areas of RVN. The least favorable comments came from units operating in the heavily wooded lowlands north of Saigon.

d. Although not a part of this evaluation, the experience of the 1st Marine Division in Vietnam is of interest. In April 1967, an interview was conducted with the Assistant G3 for Research and Development of the division. This officer had assisted in the establishment of the sniper program in the division.

(1) The 1st Marine Division has organized and trained a platoon of snipers for each regiment in the division. The platoon has a platoon leader, platoon sergeant, and three sniper squads with five two-man sniper teams each. Snipers are employed either in squads or teams, as the tactical situation dictates, and in the area that is most favorable to sniper operations. Training of snipers was initially conducted by a team of personnel with advanced marksmanship experience.

(2) Results on hand in the 1st Marine Division indicated that the employment of snipers as described above was effective in their area of operations. In March 1967, the Division reported 80 KIA at an average range of 800 meters. During that period the division was operating in the coastal plain and highlands area of RVN.

4. Findings

- a. Most units in Vietnam stated some need for snipers.
- b. Most commanders in Vietnam do not desire to convert TOE positions to sniper positions, even where a need for snipers exists.
- c. The average requirement for snipers in Vietnam was four per rifle company in those units desiring snipers.
- d. Most snipers in Vietnam were designated as either squad or platoon snipers. Most commanders interviewed believed that snipers should be controlled at platoon level.
- e. There was no employment of a centralized sniper unit during the evaluation period. Results reported by the 1st Marine Division, nevertheless, indicated that centralized organization and control was an effective concept in their area of operation.
- f. Little current U.S. Army doctrine was available on the employment of snipers.

C. OBJECTIVE 3. EQUIPMENT

1. Accuracy Requirement

a. The requirement for accuracy at given ranges was determined by analysis of ranges at which targets were engaged during the evaluation period. During this period there were 123 reported targets engaged. Figure 8 presents data on these targets.

Number of targets engaged	- 123
Average range	- 400 meters
Maximum range	- 1300 meters
Targets at 300 meters or less	- 22 percent
Targets at 300 to 600 meters	- 73 percent
Targets more than 600 meters	- 5 percent

Figure 8. Range of Targets.

b. The above data indicates that a rifle with an effective range of 600 meters would have been capable of effectively engaging 95% of the targets during the evaluation period. To increase this to 98 percent would require a rifle effective to 1000 meters.

2. Rifle and Telescope Capability

a. It is emphasized that the evaluation in Vietnam took place under combat conditions, and consequently, controlled tests of the equipment could not be conducted by ACTIV. To obtain data on the effectiveness of the rifles and telescopes concerned, CO, ACTIV wrote to the CO, U.S. Army Marksmanship Training Unit, Fort Benning, Georgia and requested effectiveness tests. CO, U.S. Army Marksmanship Training Unit tested the rifles and telescopes as requested by CO, ACTIV and also furnished test results of other telescopes and included many valuable comments.

b. Rifle test results. Figure 9 presents a summary of the rifle tests conducted by U.S. Army Marksmanship Training Unit. Complete results are contained in Annex A.

RIFLE	AMMUNITION	EFFECTIVE RANGE (100% HITS)	EFFECTIVE RANGE (90% HITS)
M14			
Accurized	Match	600 meters	700 meters
M16			
	Ball (No match ammo made)	300 meters	350 meters
Winchester			
70	Match	600 meters	700 meters

(Note: Effective range is first round hit on man size target.)

(U) Figure 9. Rifle test results.

c. Telescope test results. Figure 10 presents a summary of the telescope tests conducted by U.S. Army Marksmanship Training Unit. Complete results are contained in Annex A. Telescope effectiveness was based upon the ability to precisely aim at a man size target in the open.

<u>TELESCOPE</u>	<u>EFFECTIVE RANGE BRIGHT LIGHT</u> (Light meter: 17)	<u>EFFECTIVE RANGE REDUCED VISIBILITY</u> (Light meter: 6.5)	<u>COMMENTS</u>
M84	600 meters	400 meters	Excellent adjustment
REALIST	700 meters	500 meters	No difficulty zeroing or adjusting
REDFIELD 3-9 POWER (LWL ART)	1000 meters	600 meters	Excellent internal adjustments.

(U) Figure 10. Telescope Tests Results

3. Equipment Problems

a. The most significant equipment problem during the evaluation in Vietnam was moisture seepage into telescopes. At the end of the evaluation period, 84 snipers completed questionnaires related to their equipment. Forty-four of the snipers reported that their telescopes developed internal moisture or fog during the evaluation period. In approximately 90 percent of the cases, the internal moisture could be removed by placing the telescope in direct sunlight for a few hours. Figure 11 depicts the number of cases of internal moisture by type telescope.

<u>TYPE TELESCOPE</u>	<u>NUMBER OF TELESCOPES</u>	<u>NUMBER OF TELESCOPES WITH MOISTURE</u>	<u>PERCENT OF TELESCOPES WITH MOISTURE</u>
M84	35	19	54%
REALIST	35	22	62%
LWL ART	8	3	41%

(C) Figure 11. Telescopes with Internal Moisture

b. Other equipment problems. The one unit that used the Winchester hunting rifle reported maintenance problems. It was difficult to maintain the rifle under field conditions because spare parts were not normally stocked and armorers had no training with this weapon. This unit was also the only unit to use the Weaver and Bushell commercial telescopes. These telescopes were found not to be as rugged as the M84 by that unit.

c. The ART. In addition to developing internal moisture, one other maintenance problem was noted with this telescope. After approximately 90 days field use, three of the eight telescopes had broken mounting rings. The ring appears to be made of a cast alloy.

4. User Acceptance

a. At the end of the data collection period, 84 snipers who had been in combat operations for 60 or more days completed questionnaires concerning the sniper equipment used. Figure 12 reflects the sniper's opinion of the adequacy of his rifle/telescope combination for combat operations in Vietnam.

<u>RIFLE/TELESCOPE</u>	<u>NUMBER</u>	<u>CONSIDER SATISFACTORY</u>	<u>CONSIDER UNSATISFACTORY</u>
M14 w/M84	35	74%	26%
M16 w/REALIST	35	48%	52%
M14 w/ART	8	100%	
WINCHESTER Model 70	6	18%	82%

(C) Figure 12. User Opinion of Equipment.

b. The reasons given by snipers for considering their rifle or telescope unsatisfactory were:

(1) M14 w/M84. Eight snipers considered the power of the M84 telescope inadequate. Two said that moisture collection in the telescope was frequent and persistent.

(2) M16 w/Realist. Ten snipers stated that the M16 was not accurate enough at ranges beyond 300 meters. Eight stated that moisture collected in the telescope. Comments were also made on the inverted reticle of the Realist telescope, which firers found more difficult to sight with than the standard post reticle or crosshair. Two major units, the 25th Infantry Division and 1st Brigade, 101st Airborne Division, decided not to employ the M16 as a sniper rifle due to the limited long range capability of the weapon, to the difficulty with adjustments on the Realist telescope, and to dissatisfaction with the inverted reticle.

(3) Winchester Model 70. Five of the six snipers who completed questionnaires on this rifle/telescope did not consider it satisfactory for employment in Vietnam. Three stated that the six round clip and bolt action made the weapon unsuitable for a close range fire-fight. Two stated that the power of the Weaver telescope (3x) was not sufficient.

5. Commanders' Preference

a. At the end of the evaluation period, commanders who had both the M14 and M16 as sniper rifles in their unit were asked their preference. Figure 13 depicts their answers.

	<u>PREFER M14</u>	<u>PREFER M16</u>
PLAT LDR	21	3
COMPANY CO	19	10
BATTALION CO	10	5
BRIGADE CO	<u>11</u>	<u>1</u>
TOTAL	61 (75%)	19 (25%)

(C) Figure 13. Commanders' Preference.

b. The major reason for preference of the M14 was greater range and accuracy. The limited number of commanders who had experience with the M14 w/ART preferred it to the M14 w/M84 because of the power and the range finding feature of the telescope.

6. The M14 w/ART

As described in paragraph I, Introduction, this is a modified Redfield 3 to 9 variable power telescope incorporating a range finding feature. Ten of these telescopes were brought to Vietnam, mounted on M14 rifles, and accurized to National Match specifications. The accurizing was completed by the U.S. Army Marksmanship Training Unit, Fort Benning, Georgia. The following observations are based upon limited numbers of items and limited combat experience.

a. Training in use of the telescope. With two hours instruction in use of the telescope and about 40 rounds of practice firing, 10 soldiers were able to achieve 87% hits on a 15 inch silhouette target at 300 meters. These individuals had no previous advanced marksmanship training or experience and had never used a telescope sight prior to this training. Interviews conducted with six men who used the telescope in combat operations indicated that they understood and used the range finding feature.

b. Other user comments. All personnel who used the telescope considered it superior to other telescopes the unit had. The following recommendations were noted:

- (1) All users found the power adjusting ring difficult to turn.
- (2) Three of the users experienced moisture seepage.
- (3) Three of the telescopes sustained broken barrel mounting rings.
- (4) All users recommended a light carrying case for field use.

(The metal container furnished with the telescope is good for storage of the item).

7. Telescope moisture problem

The high incident rate of moisture collection inside telescopes was brought to the attention of local maintenance personnel as well as to the U.S. Army Marksmanship Training Unit. In addition to more careful sealing of telescopes, the CO, US Marksmanship Training Unit suggested that a nitrogen ampule could be used to inject nitrogen under low pressure to clear up fogging. The field expedient method used by some units in the field was to place the telescope in direct sunlight for a few hours.

8. Findings

a. A sniper rifle with an effective range of 600 meters effectively engaged approximately 95 percent of the targets reported during the evaluation.

b. The accurized M14 and the Winchester Model 70 rifles, using match ammunition, were capable of 100 percent first round hits to 600 meters. The M16 was capable of 100 percent first round hits to 300 meters.

c. More than 50 percent of all the telescopes used in Vietnam by snipers during the evaluation period experienced internal moisture. The Realist telescope had the highest incident rate of internal moisture.

d. The M84, Realist, and the Weaver telescopes were not effective under reduced visibility for precise aim at 600 meters. The variable power Redfield (3 to 9) was not as effective under reduced visibility as fixed power telescopes of 4 to 6 power tested at Fort Benning. (See Annex A.)

e. The range finding feature of the ART (3 to 9 power Redfield) was effective and simple enough in operation for use by a rifleman without extensive training or telescope experience.

f. The ART mounting rings were subject to breaking under field conditions and the power adjusting ring was difficult to turn while aiming.

g. The reticle design in the Realist telescope was not compatible with the common sighting and aiming techniques taught in the U.S. Army.

D. (C) OBJECTIVE 4. TRAINING

1. Training Programs and Publications

a. Current U.S. Army Publications. The following publications were obtained for each major unit participating in the evaluation:

- (1) FM 23-71, Rifle Marksmanship, December 1966.
- (2) Army Subject Schedule 23-16, Sniper Training, November 1962 (Rescinded).
- (3) Service Rifle Instructors and Coaches Guide, USA Marksmanship Training Unit, 1967 edition.
- (4) Army training program 7-18-1.

b. Although publication (2) above has been rescinded, it provides an adequate basis for a sniper training program with the exception of current equipment, particularly telescopes. Publication (3) above provides material on telescopes in general, but does not specifically cover the telescopes used in Vietnam. A lesson plan used in 1956 by the U.S. Army Infantry School on the M84 telescope was provided by the CO, U.S. Army Marksmanship Training Unit. The Realist telescope came with an instruction sheet prepared by the manufacturer, and the U.S. Army Limited War Laboratory provided instructional material for the M14 w/ART combination.

2. Unit Training Programs in Vietnam

a. Each major unit participating in the evaluation developed and conducted its own training program. Figure 14 contains data relative to these training programs.

Number of major units (division or separate brigade) - - - 8

Number conducting a centralized training program - - - 6

Average length of training course	- - - 46hrs
Number having instructors with advanced marksmanship or sniper experience	- - - 6
Average maximum range for practice fire	- - - 500 meters
Number of units having training ranges less than 500 meters	- - - 3
Average hours of practice firing	- - - 16

(U) Figure 14. Unit Training Factors.

b. All of the unit training programs covered the general subject areas outlined in Army Subject Schedule 23-16 which prescribes a 48 hour program. Most of the unit training programs did not provide for as many hours of practice fire as called for in that publication. All of the eight major units, with the exception of one brigade, stated that their unit could adequately conduct its own training of snipers. In all units except one, the training was conducted by the division or separate brigade school.

3. Sniper's Opinion of Training

At the end of the evaluation period, 80 snipers completed questionnaires that included questions on the sniper training they received in Vietnam. Figure 15 contains opinions of these snipers as to the sufficiency of the training they received in selected subject areas.

<u>SUBJECT AREA</u>	<u>SUFFICIENT (PERCENT)</u>		<u>INSUFFICIENT (PERCENT)</u>	
Functioning, care of rifle	73	(91.3%)	7	(8.7%)
Use and care of telescopes	47	(59%)	33	(41%)
Range estimation	65	(82%)	15	(18%)
Target detection	60	(75%)	20	(25%)
Zeroing	62	(78%)	18	(22%)
Effects of wind	55	(69%)	25	(31%)
Practice firing	55	(69%)	25	(31%)

(C) Figure 15. Snipers Opinion of Training.

4. Sniper Selection Criteria

a. FM 23-71 states that the following criteria should be considered in selecting personnel for sniper training:

- (1) High power competitive rifle experience.
- (2) Small bore competitive experience.
- (3) Pistol competitive experience.
- (4) High score on known distance range.
- (5) High score on trainfire range.
- (6) A desire to learn to shoot.

b. The USMC Advanced Marksmanship Training Program, MTU LP#24, states some additional sniper prerequisites to be considered, including:

- (1) Good physical condition, particularly, uncorrected good vision.
- (2) Emotional stability.
- (3) High degree of proficiency in basic military subjects.

c. Figure 16 presents some background factors concerning 87 snipers selected at random from all units in Vietnam.

<u>FACTOR</u>	<u>DATA</u>
(1) Average length of service.	21 months
(2) Prior advanced marksmanship experience:	
(a) Military rifle team.	8 percent
(b) Civilian rifle team.	20 percent
(c) Prior sniper training or experience.	12 percent
(d) None.	60 percent

<u>FACTOR</u>	<u>DATA</u>
(3) Most recent qualification:	
(a) Expert.	57 percent
(b) Sharpshooter.	36 percent
(c) Marksman.	7 percent
(4) Volunteered for sniper training	60 percent

(C) Figure 16. Sniper Background Data.

5. Findings

a. Sniper training guidance, as provided in current DA publications, was not adequate.

b. Most training programs developed by the major units participating in the evaluation contained the subjects specified in Army Subject Schedule 23-16, although some training programs did not meet the minimum number of hours of practice firing prescribed therein.

c. Approximately one-third or more of the snipers completing questionnaires considered their training inadequate in some subject areas.

d. Forty-three percent of the snipers completing questionnaires had not qualified as experts in their most recent range firing.

e. All major units participating in the evaluation, with the exception of one brigade, considered their unit capable of conducting its own sniper training.

f. All units did not have training areas with a maximum range of 600 meters or more.

g. All units did not have instructors with advanced marksmanship training or experience.

III

CONCLUSIONS AND RECOMMENDATIONS

A. (C) CONCLUSIONS

It is concluded that:

1. Within the limitations imposed by the area of operations and rules of engagement, most units in Vietnam can profitably employ snipers.
2. Although the principle use of the sniper in Vietnam was with the rifle platoon, in some areas of Vietnam a sniper unit under brigade or battalion control would be effective.
3. The accurized M14 is a suitable sniper rifle for Vietnam.
4. A sniper telescope for Vietnam should incorporate the following features:
 - a. Permit precise aim at ranges up to 600 meters under less than bright light conditions.
 - b. Sealed to prevent or materially reduce entrance of moisture and a rapid method of eliminating any moisture that does enter the telescope.
 - c. A reticle design compatible with sighting and aiming techniques used in the U.S. Army.
 - d. Rugged enough to withstand handling under field conditions.
 - e. A range finding feature similar to the ART (desirable).
5. None of the telescopes used in the evaluation in Vietnam possessed all the characteristics listed in paragraph III A4 above.
6. An adequate U.S. Army sniper training program does not exist.
7. Divisions and separate brigades in Vietnam can conduct adequate sniper training provided that they have a 600 meter range, instructors with advanced marksmanship experience, and are furnished an adequate training program.
8. Sniper selection criteria should include the factors listed in paragraph II D4 above.

9. There is a lack of definitive doctrine on employment of snipers.

B. (C) RECOMMENDATIONS

It is recommended that:

1. Divisions and separate brigades in Vietnam be authorized sniper equipment in addition to TOE weapons, without recourse to TOE changes.

2. The organization for sniper organizations be tailored by divisions and separate brigades in accordance with their requirements.

3. The accurized M14 be designated as the standard sniper rifle for Vietnam.

4. A standard sniper telescope be designated that incorporates the features in paragraph III A4 above.

5. A sniper training program, with lesson plans, be provided for units in Vietnam.

6. Expanded doctrine for employment of snipers be developed and included in appropriate field manuals.

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(U) ANNEX A

RESULTS OF TEST BY USA MARKSMANSHIP TRAINING UNIT

1. Reference your letter, AVIB-GCD, subject: Sniper Operations. The test data on the rifles and telescopes listed in the reference letter follows:

a. Rifles and Calibers

(1) In your recommendations on rifles and calibers we are basing our findings on actual firing in the competitive marksmanship field. The weapons/ammunition combinations that will enable the expert sniper to make 100% First Round Hits at the ranges indicated is the basis on which we have made our comments on each weapon evaluated. If 90% hits on the first round is considered to be acceptable, we feel then that the maximum ranges of each weapon mentioned below can be extended about 20%.

(2) First, we will discuss the current Service rifles and Match ammunition capability. The M-14 and M-1 rifles when accurized to National Match standards have very close to the same potential. Both of these weapons have an effective sniper range of 600 meters (100% first round hits).

(3) The M-16 rifle was tested with telescopic sight and the best ammunition available. It should be stated here that the ammunition was very poor in accuracy.* Even in a test barrel, normal grouping gave an extreme spread of five (5) inches at 100 meters. The limitation on this rifle is 300 meters. (*There is no Match ammo for the M-16)

(4) We have shot and tested several cartridges in the 30 caliber field, to include the most powerful magnums, and there is no rifle/cartridge combination that will give 100% hits on the first shot at 1000 meters. We are presently using the 30/338 magnum for our Long Range (1000 yards) Teams. This cartridge is the 338 magnum case necked down to 30 caliber. With the many thousands of rounds fired by the very best riflemen in the Army, we have placed only 90% of all shots in the 20 inch "V" ring, which would represent a man-sized target. We feel that the very best rifle of this type would give first round hits to a range of 800 meters.

(5) The Model 70 Winchester or Remington 700 rifles have very close to the same potential as the National Match Service rifles when used in calibers 7.62 and 30-06, which would not warrant their purchase of these calibers.

(6) The increase of 200 meters in killing range, with the use of a magnum caliber versus service caliber, might warrant the purchase of the Winchester or Remington rifles in a magnum caliber. However, this would complicate the supply problem, with the requirements for the special ammunition used, and may not be justified.

b. Telescope Sights

a. Rather than limit our recommendations to the specific four telescopes mentioned, an evaluation was made of several telescopes covering both internally and externally adjusted and from 2.2 to 25 magnifications. The enclosed chart will show the magnification, reticle type, area covered by the reticle in minutes of angle, the light level of that time of day as taken with a Gossen Lunasix Light Meter, the ability to discern a man-sized target in the open, and the ability to precisely aim at that object. In addition, the preciseness of the adjustment will be commented upon. One telescope mentioned by you, the Colt Realist 3X, was not available for test. However, telescopes of comparable optics are included. Please note also, the feeling that the 3X is not considered of sufficient power to provide precise identification and aiming at the ranges desired.

c. In this evaluation, several factors will have to be taken into consideration.

(1) Reticle dimensions will vary slightly in appearance with different personnel.

(2) The observer in this test has 20-15 vision and has been using telescopes for over 30 years.

(3) The sky was overcast and sighting was done in an easterly direction. With the sky darker in the target area, the light of the western sky was reflected off of the eyepiece for a period of time (2000-2100) which interfered with observation.

(4) The terrain used for observation was Hook Range, Fort Benning, Georgia, which may be familiar to some of your personnel. The targets from the immediate foreground to 900 meters were red painted "E" targets; it should be noted, however, that in late evening they did not appear to be this color, but did stand out against the background of grass and foliage. Target at 1200 meters was a pile of scrap metal and lumber approximately ten feet across. Target at 1300 meters was an armored personnel carrier. Targets at 1800 and 1900 meters were 155mm guns. At those ranges beyond 900 meters, no man-sized targets were used; however, an attempt was made to identify a part of the target which would be man-sized. It is interesting to note

also that, even with the 25 power scope, no discernable difference could be detected between two 155mm guns which were in fact over 100 meters different in range. This indicates a need for a flat trajectory cartridge to be used if any attempts were made to hit man-sized targets at this extreme range.

(5) Only one scope of each type was tested.

d. The following is a brief description of each telescope, discussing the characteristics, usable ranges, reticle type, adjustment for windage and elevation. Please note that we are talking about a man-sized target in the open.

(1) M-84: Under bright light it can be used to 600 meters and with unfavorable conditions to 100 meters. The reticle was type "B" and limited precise aim at longer ranges, but allowed shooting late in the evening. The adjustments were excellent and with no backlash.

(2) M-73 B1: This is the telescope of WWII used on the 1903A4 Rifle. Under bright light it can be used to 600 meters. See Chart for unfavorable usage. The reticle was type "A". The adjustments were very poor with windage affecting elevation and vice versa.

(3) Weaver K-3: Under bright light it can be used to 700 meters. See chart for unfavorable usage. The reticle is Type "A". The adjustments were excellent with no backlash.

(4) Bushnell Scopechief 4 Power: This was an old model much of the same construction as the present Redfield Scope. Note that a man could be identified at extreme range under bright conditions but only aimed at up to 800 meters. See chart for unfavorable usage. This scope had reticle Type "C". The adjustments had about one-quarter minute of backlash.

(5) Kohler 4 Power: This was used due to its reticle style (F) which was designed for unfavorable light conditions. Please note from chart that due to the fine point on the center post that precise aim could be taken at full range, but it became ineffective more quickly than a more blunt or flat surfaced post. There is no need to comment on the adjustments.

(6) ZEISS 4 Power: This was used due to its reticle style (E) which was designed for unfavorable light conditions. Please note from chart that it could be aimed as far as could be seen under unfavorable light conditions. There is not a need to comment on the adjustments.

(7) REDFIELD 6 Power: An excellent glass. However, the reticle type (C) limited its use under favorable conditions. The adjustments were excellent with no backlash; with the proper reticle this would be the most desirable power American made scope.

(8) HENSOLDT 8 Power: This scope is the one most desired by the German hunters. It is no longer made, but is really outstanding. The reticle type (C) was not suitable for unfavorable conditions. But note the 300 meter range even at the end of the test. The original reticle was type (E) but did not allow precise aiming at crows and woodchucks at 500 meters so was changed to the present one. The adjustments need not be discussed.

(9) LYMAN TARGETSPOT 10 Power: This telescope has external target type adjustments which are excellent with no backlash. Though excellent for long range aiming under good light conditions, please note it became useless rather quickly with fading light.

(10) LYMAN SUPER TARGETSPOT 25 Power: A telescope of this type with a magnification of 15-20 power would be excellent for extreme long range sniping with a rifle shooting a cartridge of the 50 caliber machine-gun type. Please note that it was ineffective very early in the evening due to the lack of light coming through this high magnification scope. The adjustments are external target type and excellent.

(11) REDFIELD 3-9 Power: This scope is used with the "Leatherwood" self ranging mount. Reticle Type (D) is used a ranging device. Due to their size, the crosswires in the center allowed aiming only to 1000 meters. Smaller crosswires in the center area only would provide a means of aiming at a smaller target or greater distance. The internal adjustments are excellent with no backlash.

(12) ATLAS 3-7 Power: This is a cheap, variable scope made in Japan, but was used simply to show the effect of finer crosswires and the aiming which could be done even with an inexpensive glass.

(13) BUSHNELL CHIEF II, 3-9 Power: Although this model was not available for test, a member of the unit had one of these scopes a few months back. His personal feelings were that it would not quite come into focus and that the adjustments were poor. His statement is to the effect that, when a correction was taken, part of that correction "took" now, and it settled into the full correction after several shots.

e. Conclusions:

(1) Telescopes of three power or less should not be considered with the quality of scopes that are available in the higher powers.

(2) The Redfield 3-9 Power is considered the best of the variable power scopes for sniping use whether it be on standard mount or the "Leatherwood" self ranging mount. (LWL ART)

(3) The Redfield 6 Power is the most suitable fixed power with internal adjustments.

(4) A target-type scope with external adjustments of 10 power would be the best for ranges beyond 800 meters when used with conventional calibers.

(5) The reticle should have a means of precise aim at long ranges and also have a means of aiming in other than favorable lighting conditions at close ranges.

2. The foot candle scale to match the light meter readings taken in conjunction with the scope test on Hook Range is presented below:

SCALE	FOOT CANDLES
1	.014
2	.028
3	.055
4	.11
5	.22
6	.44
7	.88
8	1.75
9	3.50
10	7.00
11	14.00
12	28.00
13	55.00
14	110.00
15	220.00
16	440.00
17	880.00
18	1750.00
19	3500.00
20	7000.00
21	14000.00

3. Recommendations:

a. That the M-14, accurized to National Match specifications, be used as the basic sniping rifle.

- b. That National Match ammunition be used in caliber 7.62 NATO.
- c. That a reticle similar to Type "E" be used on telescopic sights of fixed power.
- d. That the Redfield six power "Leatherwood" system telescope be used by snipers above basic unit level.
- e. That the Redfield four power (not mentioned previously) be utilized by the sniper at squad level.
- f. That serious consideration be given to the development of a long range sniping rifle using the 50 caliber machine gun cartridge and target-type telescope.

(NOTE: It is our opinion that the Redfield telescope sights are the finest of American made telescopes.)

1 Incl
Sighting and Aiming Chart

SIGHTING AND AIMING CHART

TIME			1345	1900	1945	2000	2030	2045	2050	2100	2100	2107	2107	2115	2115	2120	2130	
LIGHT METER READING			17	16.5	15	14.5	11.5	9.5	8.5	6.5	6.5	4	1	1	1	0	0	
TELESCOPE	POWER	RETICLE TYPE	IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS		IDENTIFY/METERS	
			AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	AIM/METERS	
M-84	2.2	B	1000	600	1000	500	1000	500	600	400	500	300	300	200	300	200	150	100
M73B1	2.5	A	1000	600	1000	600	1000	500	600	400	500	250	300	200	200	-	-	-
WEAVER	3	A	1200	700	1200	600	1000	600	700	500	400	300	400	300	250	-	-	-
BUSHNELL	4	C	1900	800	1500	800	1200	700	1000	700	1000	600	600	400	300	-	-	-
KOHLER	4	F	1900	1900	1700	1500	1200	1000	600	400	500	250	300	250	250	100	-	-
ZEISS	4	E	1900	1900	1900	1700	1500	1500	1000	700	500	400	300	250	200	200	200	200
REDFIELD	6	C	1900	1900	1900	1900	1900	1900	1200	1200	800	600	400	-	300	-	200	-
HENSOLDT	8	C	1900	1900	1900	1900	1900	1900	1500	1500	100	700	500	-	400	-	300	-
LYMAN	10	C	1900	1900	1900	1900	1500	1500	1000	1000	300	-	300	-	-	-	-	-
LYMAN	25	C	1900	1900	1900	1900	1900	1900	-	-	-	-	-	-	-	-	-	-
REDFIELD	3	D	1500	700	1500	700	1000	600	1000	500	600	400	350	-	200	200	200	-
	9		1900	1000	1900	1000	1500	700	1200	600	600	400	400	-	300	300	-	-
ATLAS	3	A	1200	900	1200	900	900	500	600	400	-	-	-	-	-	-	-	-
	7		1900	1200	1600	1200	1200	700	700	500	400	-	250	-	100	-	-	-

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(U) ADDENDA TO ANNEX A

TEST OF REALIST TELESCOPE BY USA MARKSMANSHIP TRAINING UNIT

1. The evaluation data on the Colt Realist Telescope Sight is presented below. Please add the data to the chart included with test results, which displays the identifying and aiming characteristics of the scopes tested previously:

<u>Light Meter</u>	<u>Identify</u>	<u>Aim</u>
17-16.5	1000	700
16-14.5	1000	600
11.5-9.5	1000	600
8.5-6.5	600	500
6.5-4	500	400
4-1	400	300
1-0	150	100
0	100	100

2. The Colt Realist Telescope Sight was tested on the M-16 rifle. Dismounting and remounting the scope between each ten-shot group caused no change in the center of impact. The center of impact was consistent with any range setting, either on a change from a greater range to a lesser range, or vice versa.

3. It is our opinion that the reticle is completely wrong. All conventional military metallic sights are designed in the form of a vertical post arising from the bottom. The sights on the M-1, M-14, M-1911A1, and Carbine (M-84 reticle) are flat-topped blades with parallel sides, and, as a result, there is a natural tendency to initially place the sight under the target and raise it up to the point of aim. The upside down sight has been subjected to trial by many shooters in the past, including our Ordnance Officer, *who is a shooter of National renown, with very poor results. If all sights were manufactured in this configuration, perhaps one would eventually get used to it. As it now stands, we feel that this sight is a detriment. It is our opinion that the post, or any front sight for that matter, should have parallel rather than tapered sides as there is a natural tendency on the part of the shooter to try to place the sight in a vertical position. This is easy with a parallel-sided

* Conducted a years trial

aiming device, but a problem is presented with the contrasting angles on the tapered sight where the light conditions or background would cause the shooter to want to use one side as vertical in one situation, and the opposite side in another, with a subsequent canting of the piece.

4. The telescope sight is something new to most soldiers and, in our opinion, should be as near to the conventional as possible. The interjection of unorthodox items like the upside down sight can cause the individual soldier to completely reject the idea of using the telescope, while a properly mounted, designed, and adjusted telescope sight will increase the soldier's confidence in his weapon and his ability to hit the targets at ranges far beyond that which anyone not familiar with telescopes can imagine.

5. You mentioned that several of the scopes have developed internal fog. We do not, of course, experience here at Fort Benning what one encounters in Vietnam. No moisture tests were conducted. As mentioned in previous correspondence, the idea of designing a nitrogen ampule that could be used to inject nitrogen under low pressure into the telescope to clear up fogging should be considered. We experienced no difficulty in zeroing the weapon because of any idiosyncrasy on the part of the adjusting mechanism as mentioned in your referenced letter.

6. In summation, the capabilities of the telescope, in general, exceed those of the M-16 rifle with the present ammunition.

(U) ANNEX B

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Commanding General, US Army Materiel Command, ATTN: Dir of Research & Development (AMC RD)	5
Commanding General, US Army Materiel Command, ATTN: Proj Manager, Special Warfare (AMCPM-SW)	2
Commanding General, US Army Weapons Command	5
Commanding General, US Continental Army Command	4
Commanding General, US Army Ordnance Cen & Sch	3
Commandant, US Army Armor Sch	2
Commandant, US Army Arty & Msl Sch	2
Commandant, US Army Avn Sch	2
Commandant, US Army Engr Sch	2
Commandant, US Army Inf Sch	5
Commandant, US Army Intel Sch	2
Commandant, US Army MP Sch	2
Commandant, US Army Special Warfare Sch	2
Commandant, Armed Forces Staff College	1
Commandant, Command & General Staff College	2
Commandant, US Army War College	1
Commanding General, US Army Combat Developments Command, ATTN: CDCRE-T	70
Commanding General, US Army Combat Developments Command/Experimentation Command	3
Commanding Officer, US Army LWL	2
President, US Army Armor Board	1
President, US Army Inf Board	1
Commanding General, John F. Kennedy Cen for Special Warfare (ABN)	1
Commanding General, US Army Test and & Eval Command	5
Commanding General, 7th US Army, ATTN: G-3	2
Commander-in-Chief, USARPAC	5
Commanding General, 8th US Army, ATTN: G-3	2
Commanding General, USARV, ATTN: AVHGC-DST	10
Commanding General, 1st Log Command	1
Commanding General, I FFORCEV	2
Commanding General, II FFORCEV	2
Commanding General, 1st Inf Div	2
Commanding General, 4th Inf Div	2
Commanding General, 9th Inf Div	2
Commanding General, 25th Inf Div	2
Commanding General, Americal Div	3
Commanding General, 1st Cav Div (Airmobile)	2
Commanding General, 101st Abn Div	2
Commanding General, 173d Abn Bde	1
Commanding General, 196th Lt Inf Bde	1
Commanding General, 11th Armd Cav Regiment	1
Commanding Officer, 1st SFG	1
Commanding Officer, 5th SFG	1
Commanding Officer, US Army Marksmanship Training Unit, Fort Benning, Georgia	2

United States Navy

Chief, NRDUV	2
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United States Marine Corps

Commanding General, III MAF, ATTN: ACofS, G3 5

United States Air Force

Commander, 1st Air Commando Wing 1

Air University Library, ATTN: AUL3T-65-207 1

Special Warfare Div, ATTN: Dir of Plans for
Policy (DCS/P&O) 1

ACTIV Project Officer, ATTN: GCD 5

ACTIV Library 10

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