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

FINAL REPORT

TUNNEL WEAPON

ACTIV Project No. ACG-25/69I

November 1969

Approved:

C. B. McCoid

C. B. McCOID
Colonel, IN
Commanding

AVHGC-DST (12 Jan 70) 1st Ind
SUBJECT: Final Report - Tunnel Weapon

HEADQUARTERS, UNITED STATES ARMY, VIETNAM, ATTN: AVHGC-DST, APO San Francisco 96375 27 JAN 1970

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

1. This headquarters concurs in the conclusions and recommendations contained in the attached report with the understanding that the recommendation in paragraph 30f is conditional to development of an improved ammunition.

2. This headquarters further recommends that the development of an ammunition with acceptable reliability and lethality be pursued vigorously, and that evaluation quantities of an improved ammunition be provided this command for evaluation prior to a decision on procurement of operational quantities of the weapon or ammunition.

FOR THE COMMANDER:

1 Incl
nc

C. E. MICHELS
MAJ, AGC
Assistant Adjutant General

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

AVIB-CO 12 January 1970

SUBJECT: Final Report - Tunnel Weapon

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

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 one copy of the USARV and CINCUSARPAC forwarding indorsement be furnished the Commanding Officer, Army Concept Team in Vietnam (ACTIV).

FOR THE COMMANDER:

JOSEPH W. STRAUB
CPT, AGC
Adjutant

AUTHORITY

Message, EFTC 6728, AVHGC-DST, Headquarters US Army, Vietnam, 16 June 1969, subject: Tunnel Weapon LWL Task No. 02-F-68.

ACKNOWLEDGEMENTS

Appreciation is expressed to the officers and men of the Americal Division, 1st Infantry Division, and 25th Infantry Division whose professionalism and cooperation were fundamental to the conduct of this evaluation.

ACTIV PROJECT OFFICER

LTC David H. Weddington, Infantry

ABSTRACT

The Army Concept Team in Vietnam (ACTIV) evaluated the Tunnel Weapon to determine its suitability for tactical use by US Army units in the Republic of Vietnam (RVN). The Tunnel Weapon was designed to provide tunnel exploration personnel with a silent handgun capable of engaging fleeting targets without aimed fire. In July 1969, ten Tunnel Weapons were sent to RVN and distributed to the 1st and 25th Infantry Divisions for a 90-day evaluation. During August 1969, the five weapons assigned to the 1st Infantry Division were transferred to the Americal Division.

This report recommends that:

1. The reliability of Tunnel Weapon ammunition be improved to meet Department of the Army standards for use in combat.

2. A ring be placed on the base of the Tunnel Weapon grip.

3. Additional holes be provided on the strap of the holster assembly.

4. A slug and improved multipellet cartridge be adopted for use with the Tunnel Weapon that will be lethal at 25 feet, when fired into a vital part of the body.

5. The Tunnel Weapon be adopted for use in RVN, if the ammunition problems are corrected, lethality is improved, and the suggested modifications to the weapon and holster assembly are accomplished.

6. The Tunnel Weapon be issued to units on the basis of four per infantry company and ten per Ranger company.

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SECTION I

INTRODUCTION

1. REFERENCES

a. Letter, -9C, Headquarters, US Army Limited War Laboratory, 1 April 1969, subject: Shipment of USALWL Developed Equipment, Tunnel Weapon, LWL Task No. 02-F-68.

b. Disposition Form, AVHGC-DST, Headquarters, US Army, Vietnam, 16 June 1969, subject: Tunnel Weapon, LWL Task No. 02-F-68.

c. Message, EFTO 67288, AVHGC-DST, Headquarters, US Army, Vietnam, 16 June 1969, subject: Tunnel Weapon LWL Task No. 02-F-68.

d. Message, APG 3397, CRDLWL-9C SGD MCEVOY, Headquarters, US Army Limited War Laboratory, 24 June 1969, subject: Shipment of USALWL Developed Equipment, Tunnel Weapon LWL Task No. 02-F-68.

2. PURPOSE

The purpose of this project was to evaluate the suitability and acceptability of the Tunnel Weapon for use in tunnel operations in the Republic of Vietnam (RVN).

3. OBJECTIVES

a. Objective 1

To determine training requirements for the Tunnel Weapon.

b. Objective 2

To describe and evaluate tactical employment and operational characteristics of the Tunnel Weapon.

c. Objective 3

To determine maintenance and storage requirements for the Tunnel Weapon.

d. Objective 4

To determine a recommended basis of issue for the Tunnel Weapon.

4. BACKGROUND

In December 1967 the Military Assistance Command, Vietnam identified a need for a low-noise, multiprojectile weapon and ammunition to be used by tunnel exploration personnel in RVN. To satisfy this requirement the US Army Limited War Laboratory developed the Tunnel Weapon.

5. DESCRIPTION

a. General

The Tunnel Weapon (see Figure I-1) is a balanced, compact, six-shot, cylinder loaded, exposed hammer, selective double-action, modified Smith and Wesson .44 Magnum revolver. The weapon has a loaded weight of 38 ounces. It fires a special 15-pellet round (see Figure I-2) at a sound level of 120 decibels at 1 meter from the muzzle, which is comparable to the silenced .22 caliber pistol. The weapon has the capability to engage fleeting targets at ranges up to 25 feet when time does not permit aimed fire. The multipellet cartridge also improves the effectiveness of inexperienced pistol shooters, since the shot pattern is similar to that of a shotgun. Smoke and flash have been practically eliminated by the design of the multipellet cartridge. When the revolver is fired, only low intensity sparks are produced.

b. Holster and Cartridge Carrier

A shoulder holster and two seven-round cartridge carriers are provided for each weapon (see Figure I-3). The shoulder holster has a flap and secures the weapon under spring tension by a spring retainer. The spring retainer feature permits a quick snap-draw from the side of the holster without opening the holster flap. The flap must be opened to holster the weapon. The two cartridge carriers are attached to the shoulder holster's strap and can be positioned across the chest or under the arm.

6. APPROACH

a. Ten Tunnel Weapons and 992 rounds of ammunition arrived in RVN during July 1969 for a 90-day evaluation. On 15 July 5 weapons and 496 multipellet cartridges were distributed to the 1st and 25th Infantry Divisions. On 22 August 5 Tunnel Weapons and 125 rounds of ammunition were transferred from the 1st Infantry Division to the Americal Division.

b. Personnel using the weapons were given training in the operation and maintenance of the Tunnel Weapon by the ACTIV project officer. The weapons were employed on operational missions from 17 July to 13 October 1969.

FIGURE I-1. Tunnel Weapon.

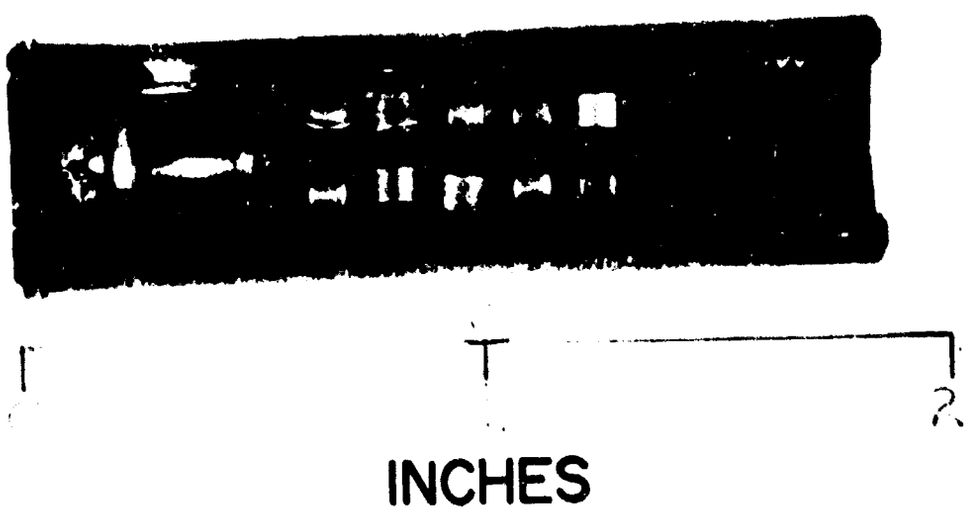

FIGURE I-2. 15-Pellet Round.

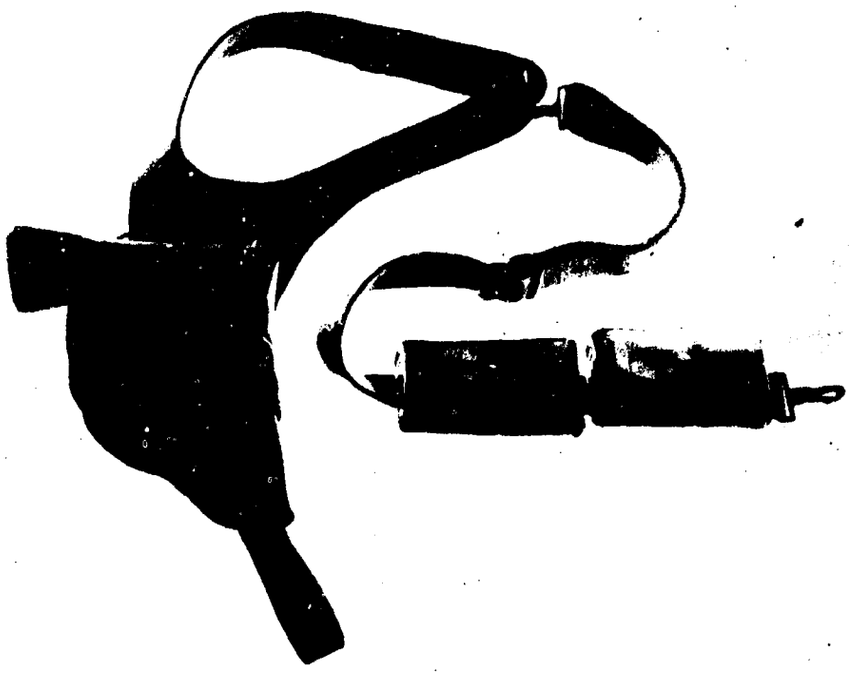

FIGURE I-3. Shoulder Holster and Two Seven-Round Cartridge Carriers.

7. ENVIRONMENT

The areas of operation for the three evaluating units were as follows:

1st Infantry Division	-	Mekong Terrace
25th Infantry Division	-	Mekong Terrace
Americal Division	-	Northeastern Coastlands
		Northern Highlands

During the evaluation period all three regions experienced heavy rainfall (14.17 to 25.12 inches). Temperatures ranged from 73° to 99° in the Mekong Terrace, and from 70° to 98° in the Northeastern Coastlands and Northern Highlands.

8. DATA COLLECTION AND ANALYSIS

Information was obtained from responses to questionnaires and interviews with personnel who had used the Tunnel Weapons on combat operations.

Questionnaires were obtained from 19 respondents as follows:

1st Infantry Division	5
25th Infantry Division	7
Americal Division	7

The term respondent refers to only those personnel who carried and employed the weapon on combat operations and who completed the questionnaires. Persons responsible for employment of the Tunnel Weapon were also interviewed, and their subjective comments, where appropriate, were used in preparing this report.

SECTION II

OBJECTIVE 1: TO DETERMINE TRAINING REQUIREMENTS FOR TUNNEL WEAPON.

9. TRAINING REQUIREMENTS

a. Initial Training

(1) The ACTIV project officer programmed a four-hour block of instruction for personnel of the 1st and 25th Infantry Divisions. However, due to the high level of experience encountered this instruction was reduced to two hours.

(2) It was anticipated that the Tunnel Weapon's low noise level would give the students an impression that the weapon was not very powerful. To dispel this idea, an initial demonstration shot was fired into a 3/4-inch sheet of plywood at a distance of 15 feet. The plywood, which had been penetrated, was shown to the students, and each entry and exit hole of the cartridge's 15 steel pellets was identified. The students were then required to fire at least 5 rounds (at 15 feet) from their assigned weapons into sheets of stacked plywood, and to note that all pellets would pass through the plywood a minimum 3/4-inch distance. After each demonstration and practice firing session the students showed enthusiasm for the "silent" capabilities of the weapon, but a few individuals in each group still appeared to be skeptical of its killing power.

(3) In the Americal Division similar instruction was given to the unit's project officer and cadre who later conducted training at company level.

b. Unit Training

Due to rotation, casualties, and administrative actions, some of the Tunnel Weapons changed hands. Because of the weapon's simplicity, new personnel rapidly adapted to its use. The training received by replacements normally consisted of a briefing by a trained individual in the unit and familiarization firing. In one instance, however, a respondent who had killed two enemy soldiers with the weapon reported he had received no instruction in its use. At the conclusion of the evaluation, 37 percent of the personnel armed with the Tunnel Weapon had been trained by the ACTIV project officer, and 63 percent had received unit and on-the-job training.

c. Loading and Unloading Procedures

Respondents were asked how long they estimated it took them to become proficient in loading and unloading procedures. Their answers varied from 2 minutes to 3 hours, but the majority (79 percent) indicated 1 hour or less to be the time required.

d. Quick-Draw Techniques

The time respondents estimated it took them to become proficient in quick-draw techniques varied from one minute to six hours. The majority (74 percent) said that this skill could be acquired in 2 hours or less.

e. Fixed Targets

The time and number of rounds respondents estimated they needed to achieve proficiency in engagement of fixed targets varied from 2 seconds and 1 round to 6 hours and 100 rounds. Forty-two percent of them (the largest single grouping) said 30 minutes and 15 rounds satisfied this requirement.

f. Moving Targets

The time and number of rounds respondents estimated they required to become proficient in engaging moving targets varied from 5 seconds and 2 rounds to 6 hours and 100 rounds. The respondent who said he required the former demonstrated he could kill a flying sparrow at a distance of approximately 20 meters with a single shot. His shooting skill was unusual and not acquired as the result of Tunnel Weapon training. The majority (53 percent) said 1 hour or less, and 30 or fewer rounds were all they needed to acquire this skill.

g. Recommended Training

Almost every respondent stressed the need for practice loading and firing training. Quick-draw techniques and the engagement of fixed and moving targets from the prone and kneeling positions were most frequently mentioned. Respondents believed such training should be conducted in tunnels, and that targets should not be engaged at distances greater than 30 feet. Some typical responses to the question, "What training procedures and techniques do you recommend?" were:

(1) "Loading and unloading procedures, quickdraws, snapshooting at still and moving targets."

(2) "Close range firing should be stressed."

(3) "Give instructions on how to fight in tunnels, put grenade in tunnels, shoot around corners in tunnels."

10. FINDINGS

a. Initial Training

(1) The "silent" quality of the Tunnel Weapon gave students the impression that it was not a lethal weapon.

(2) After seeing all 15 pellets from a single cartridge penetrate a 3/4-inch sheet of plywood, some students still appeared to be skeptical of the weapon's lethality potential.

(3) All students were enthusiastic about the Tunnel Weapon's "silent" quality.

b. Unit Training

(1) Due to personnel turbulence, 63 percent of the respondents at the close of the evaluation period were either trained on the job or by their unit.

(2) Since the Tunnel Weapon was simple to use, new personnel rapidly adapted to its employment.

(3) It was possible for an individual to employ the weapon successfully without prior training in its use.

c. Loading and Unloading Procedures

Seventy-nine percent of the respondents said they needed one hour or less to become proficient in loading and unloading procedures.

d. Quick-Draw Techniques

Seventy-four percent of the respondents reported they became proficient in quick-draw techniques in two hours or less.

e. Fixed Targets

Forty-two percent of the respondents said they needed 30 minutes and 15 rounds to become proficient in engaging fixed targets.

f. Moving Targets

Fifty-three percent of the respondents reported they required 1 hour or less and 30 or fewer rounds to become proficient in engaging moving targets.

g. Recommended Training

Training in quick-draw techniques, and engagement of fixed and moving targets from the prone and kneeling position were recommended. Respondents believed such training should be conducted in tunnels, and that targets should not be engaged at distances greater than 30 feet.

SECTION III

OBJECTIVE 2. TO DESCRIBE AND EVALUATE TACTICAL EMPLOYMENT AND OPERATIONAL CHARACTERISTICS OF THE TUNNEL WEAPON.

11. PERSONNEL RECEIVING TUNNEL WEAPONS

Tunnel Weapons were used by respondents as shown in Figure III-1.

Personnel	1st Infantry Division	25th Infantry Division	Americal Division
Company Commander	1	0	0
Platoon Leader/Team Leader	0	2	1
Platoon Sergeant/Team Sergeant	1	1	1
Rifleman/Tunnel Rat	3	4	3
Grenadier	0	0	2

FIGURE III-1. Personnel Armed With Tunnel Weapon.

Issue of the weapons was controlled by the commander of evaluating units. Use of the weapons varied among units. In the 1st Infantry Division they were employed by the unit's Tunnel Rat Team. The 25th Infantry Division issued the weapons to members of one of its combined reconnaissance and intelligence platoons, Ranger company, and infantry companies. The Americal Division employed the revolvers with its Ranger company and infantry companies.

12. MISSION OF UNITS

Although the Tunnel Weapon was designed to be used primarily in tunnels, its unique properties were recognized as being adaptable to other missions, and evaluating units were encouraged by the ACTIV project officer to employ the weapon in a variety of roles. As a result, respondents reported several types of mission on which the Tunnel Weapon was used. These were tunnel search, reconnaissance, ambush, clearing, snatch, and search and destroy.

13. TUNNELS

Employment of the weapon in tunnels varied somewhat among units. In the 1st Infantry Division, members of its Tunnel Rat Team fired three rounds into the entrance and around each turn in a tunnel, and a like number into trap doors, false walls, or similar objects encountered underground. This volume of fire was seldom used in tunnels by exploration personnel of the other two infantry divisions. These units normally detonated fragmentation grenades, smoke grenades, claymore mines, and other explosive devices or chemical munitions in the entrance of tunnels to destroy, neutralize, and discourage the enemy from firing on exploration personnel. Therefore, as a result of the techniques used by all units, only one respondent armed with the Tunnel Weapon encountered the enemy face-to-face during the evaluation. A sergeant in the 25th Infantry Division quietly entered a tunnel complex, and when he crawled around a corner an NVA soldier was met. He said, "The NVA was sitting and just as surprised as me, but I was able to fire the Tunnel Weapon...before he could use his rifle. I drug him outside but he was dead."

14. AMBUSHES

The Tunnel Weapon was found to be ideally suited for ambushes. For example, during one night ambush operation two members of the Americal Division's Ranger Company, using a single Tunnel Weapon, killed one NVA officer and two NVA soldiers. In the first instance, the officer was shot at a distance of approximately ten feet. The respondent reported the first round struck a large leather pocketbook, filled with papers, that was being carried across the officer's chest. The second round struck his stomach, knocked him over, but failed to kill him. After this encounter, the Tunnel Weapon was given to another member of the team who subsequently shot and killed two NVA soldiers as they were walking along the same trail. They too were engaged at a distance of approximately ten feet. Three rounds fired in quick succession knocked them down. In an ambush made by an infantry company of the Americal Division. a respondent successfully fired two rounds at a Vietnamese guerrilla on a trail and killed him. There were several instances, however, in which the Tunnel Weapon failed to incapacitate an enemy soldier after he was hit.

15. SEARCH AND DESTROY OPERATIONS

Respondents particularly liked to use the Tunnel Weapon when bunkers, houses, and spider holes were encountered on search and destroy operations. Its small size enabled them to reach quickly around corners and fire without exposing more than a hand and arm. This capability had a beneficial psychological effect on respondents, and they reported it was possible to clear such areas much more rapidly with a Tunnel Weapon than with a rifle. For example, on one search and destroy operation in the 25th Infantry Division, a sergeant armed with a Tunnel Weapon killed a VC. He said, "I shot him coming out of a bunker. He was running, and he was about 20 to 25 feet away."

16. REVOLVER DESIGN

The design of the Tunnel Weapon was considered adequate. During the evaluation period there were two reported instances in which the weapon failed to function as a result of "parts" failure. In the first, a respondent reported the extractor rod came loose and was lost while he was crawling in a tunnel. The second occurred when the small pin on the hand broke off. Both "failures" were suspect. In the first, the extractor rod was probably loosened inadvertently because it is impossible for the extractor rod to unscrew itself during normal handling. In the second instance, the weapon experiencing the part breakage had been disassembled at least twice by an inexperienced individual. Several respondents wanted a ring put on the base of the grip, so a lanyard or cord could be attached to it and the lanyard or cord hung around the neck. There were many reported cases in which the respondent had to use both hands unexpectedly. The ability to drop the weapon and immediately retrieve it was desired by the majority of respondents.

17. CARTRIDGE

Seventy-four percent of the respondents experienced misfires. Some typical comments of the majority were:

a. "Four rounds out of twenty-two failed to fire the first time round."

b. "One round misfired twice, went off third time."

c. "Primer was recessed in some and would not fire."

d. "Many of rounds failed to fire."

e. "One round of three misfired twice, went off third time."

f. "One of six rounds actually fired."

g. "One round had to be struck seven to eight times before it fired."

During training the misfire problem was recognized after the first 100 rounds had been fired. In an effort to determine the cause, a new hammer nose was made in RVN from harder steel than the original. This was done because the original hammer nose would "mushroom" after approximately 25 rounds had been fired. The new hammer nose did not eliminate the misfires, so all the cartridges were examined to find a cause for the failure. In some 25-round boxes there were as many as 12 cartridges with recessed primers. The ACTIV project officer, during one demonstration, showed that five out of six such cartridges would fail to fire the first time. However, this was not the only reason the rounds misfired. There were a few cartridges whose primers were recessed that did fire, and some whose primers

were not recessed that failed to fire. A thorough inspection of the cartridges prior to their shipment to RVN would have revealed the recessed primers. The fact that the ammunition was unreliable caused some commanders to refuse to employ the Tunnel Weapon. These commanders were also skeptical of the weapon's killing power. They preferred to have one slug, rather than 15 steel pellets.

18. HOLSTER ASSEMBLY

All respondents liked the quick-draw feature and found the holster assembly easy to put on and adjust, but a few wanted more holes in the strap. Seventy-two percent of the respondents said the holster assembly was comfortable to wear. Three of them mentioned that, when they wore a rucksack and web gear over the holster assembly, the strap, buckle, and holster were uncomfortable. One respondent solved this problem by tying the holster to the rucksack. There were two complaints about the cartridge carriers sliding back and forth on the strap, and catching on things in tunnels. The flaps of the carriers also curled up along the edges and allowed the cartridges to fall out. Normally, the holster assembly was not worn when a respondent entered a tunnel, because it hindered movement and was not needed. The weapon was carried in the hand, and spare cartridges were carried in the pockets of the shirt and trousers.

19. RESPONDENT COMMENTS

a. Listed below are comments of respondents who killed enemy personnel with the Tunnel Weapon.

(1) "If we had five such pistols we could stay out for a week at a time...without giving our position away."

(2) "That pistol is the most magnificent weapon I ever seen in action. I could use three of these in my platoon. The pistol doesn't make any noise louder than a cap pistol. It hits the target just by using the pointing method. I never aimed with the weapon. This weapon is far by being better than a .38 caliber pistol we had. It's more accurate, it's very quiet, and it handles better than any other pistol I have handled."

(3) "For our use it works real good. We have to avoid contact and the weapon doesn't compromise our position. For our platoon we could use five or six of these weapons."

b. Several comments were made that the Tunnel Weapon would be ideally suited as a survival weapon for aircrews and Special Forces personnel.

20. FINDINGS

a. Personnel Receiving Tunnel Weapons

Issue of Tunnel Weapons was controlled by the evaluating units. The 1st Infantry Division employed the weapons exclusively in its Tunnel Rat Team, while the Americal Division used them in its Ranger and infantry companies. The 25th Infantry Division employed them with its Ranger company, infantry companies, and one of its combined reconnaissance and intelligence platoons.

b. Mission of Units

The Tunnel Weapon was used on a number of different missions, such as tunnel exploration, ambushes (both day and night), and a variety of search and destroy operations where bunkers, spider holes, wells and dwellings were encountered.

c. Tunnels

Tunnel clearing and exploration techniques varied among units. The Tunnel Rat Team in the 1st Infantry Division used reconnaissance by fire with the Tunnel Weapon and no other destructive devices in tunnels. The other two infantry divisions, generally speaking, did the opposite.

d. Ambushes

The silent, multipellet, weapon concept is well suited to special applications such as ambushes. Members on long range patrol operations, who had the mission of capturing or destroying enemy personnel, preferred it to other "silent kill" weapons.

e. Search and Destroy Operations

In bunkers, houses, wells, and other situations where maneuver space is critical, the Tunnel Weapon was preferred over the rifle. The Tunnel Weapon demonstrated it was capable of stopping an enemy at a distance of 20 to 25 feet.

f. Revolver Design

The design of the Tunnel Weapon is adequate. However, to improve it, a ring on the base of the grip is desired.

g. Cartridge

Seventy-four percent of the respondents experienced misfires. Cartridges were not adequately inspected prior to shipment to RVN. As a result of the ammunition being unreliable, some commanders refused to employ the weapon. A slug round was desired for the cartridge of the Tunnel Weapon.

h. Holster Assembly

Cartridge carriers were not always used because the edges of the flap curled up and allowed ammunition to fall out, and because the carriers frequently caught on obstructions encountered in tunnels. The holster assembly was easy to put on and adjust, but respondents wanted more holes put in the strap.

i. Respondent Comments

Respondents who had successfully employed the Tunnel Weapon were enthusiastic in their praise of the weapon.

SECTION IV

OBJECTIVE 3 - TO DETERMINE MAINTENANCE AND STORAGE REQUIREMENTS FOR THE TUNNEL WEAPON.

21. IDENTIFICATION OF ITEMS PRONE TO RUST AND WEAR

a. Tunnel Weapon

(1) After approximately three days use in the field, rust sometimes formed on the following parts:

(a) Barrel

(b) Cylinder

(c) Extractor Rod

(d) Frame

(e) Hammer

(f) Stock screw

(g) Thumb piece

(h) Trigger

(2) The only parts that appeared to wear during the evaluation period were the hammer nose and cylinder. After approximately 25 firings the tip of the hammer nose "mushroomed." Bluing on the outside of the cylinder wore off as a result of rubbing against the rough interior surface of the holster.

b. Cartridge

(1) Rust formed on cartridges that were left in the weapon or in the cartridge carriers. Cartridges initially packed in the 25-compartment cardboard box seldom experienced rust. However, cartridges placed in the cardboard box that had been on combat operations did rust, particularly those rounds that had not been wiped clean prior to storage.

(2) Three cartridges that had been submerged in water and dried in the sun had the red rubber seal at the base of the cartridge break loose.

(3) Prolonged exposure to moisture caused the white plastic-like substance sealing the end of the cartridge to discolor and become soft.

c. Holster Assembly

(1) Rust formed on the buckle, rings, brads, and snaps of the holster assembly.

(2) On four occasions, when the leather became wet, the snap on the cartridge carrier pulled loose from the leather.

d. Ammunition Box

The reinforced steel ammunition box issued with the Tunnel Weapon was satisfactory for storage of ammunition. However, when a weapon was placed inside it tended to rust rapidly. No other significant storage problems were noted.

22. PRESCRIBED MAINTENANCE

a. Tunnel Weapon

There was no evidence of a weapon malfunctioning as a result of failure to perform prescribed maintenance. Daily maintenance should have consisted of:

(1) Cleaning and light lubrication of the interior of the barrel and cylinder.

(2) Cleaning and light lubrication of the exterior of the frame, barrel, and cylinder.

(3) Cleaning of the holster assembly.

b. Holster Assembly

There was no reported attempt by respondents to clean or preserve the leather of the holster assembly during the evaluation period. However, five holster assemblies were cleaned with a commercial type saddle soap (Fiebring's Saddle Soap) prior to being transferred to the Americal Division. After approximately ten minutes of cleaning, the holster assembly appeared to be like new. This indicated that following a month's use under field conditions, the "original" appearance of the holster assembly could be quickly restored.

c. Cleaning Equipment

A glue brush (FSN 792-240-7175), LSA lubrication oil, (FSN 9150-889-3522), and patches (FSN 1005-288-3565) were the standard issue items most frequently used to clean the Tunnel Weapon. The most frequently employed non-issue item was a toothbrush.

23. NECESSARY TOOLS

No special tools were required to maintain the Tunnel Weapon and holster assembly at user level.

24. FINDINGS

a. Identification of Items Prone to Rust and Wear

(1) Tunnel Weapon parts listed in paragraph 21a(1) were prone to rust.

(2) Rust did not affect the operation of the Tunnel Weapon during the evaluation period.

(3) Rust formed on cartridges that were used during combat operations.

(4) Rust formed on the buckle, rings, brads, and snaps of the holster assembly.

(5) The cylinder and hammer nose of the Tunnel Weapon showed signs of wear.

(6) After being submerged in water and dried in the sun, the red rubber seal at the base of the cartridge would break loose.

(7) Prolonged exposure to moisture caused the sealing compound at the end of the cartridge to become soft and discolor.

(8) The snap on some cartridge carriers pulled out of the leather when the latter became wet.

b. Prescribed Maintenance

(1) Prescribed maintenance was not always performed.

(2) There were no weapon malfunctions that could be positively traced to a failure to perform prescribed maintenance.

(3) A tooth brush, glue brush, LSA lubricating oil, and patches were the items most frequently used to clean the Tunnel Weapon.

(4) After field use, cleaning with saddle soap improved the appearance of the holster assembly.

c. Necessary Tools

No special tools were needed by respondents to maintain the Tunnel Weapon.

SECTION V

OBJECTIVE 4 - TO DETERMINE A RECOMMENDED BASIS OF ISSUE FOR THE TUNNEL WEAPON.

25. TUNNEL WEAPON DISTRIBUTION

In the 1st Infantry Division all five weapons were given to members of its Tunnel Rat Team. The 25th Infantry Division assigned weapons to its infantry companies, Ranger company, and one combined reconnaissance and intelligence platoon. The Americal Division initially employed the weapons with infantry companies, but later shifted all five weapons to its Ranger company. Normally no more than one Tunnel Weapon was used in an infantry company, while the Ranger companies in the 25th Infantry and Americal Divisions operated with two and five weapons, respectively. The combined reconnaissance and intelligence platoon used one weapon. Every respondent questioned wanted his unit to be equipped with more weapons than were allocated to it for the evaluation.

26. WEAPON REPLACEMENT

Company commanders, platoon leaders, team leaders, and respondents stated the Tunnel Weapon should not replace a weapon already in their TOE, but should be issued as an additional weapon.

27. ASSIGNMENT OF TUNNEL WEAPON

a. Infantry Company

Respondents said that there should be one Tunnel Weapon assigned to each platoon. Staff members, company commanders, and platoon leaders varied in their opinion as to how many Tunnel Weapons should be in a company. Generally, the higher the rank of an officer, the greater was his tendency to reduce the requirement. The majority, however, favored one Tunnel Weapon per platoon.

b. Ranger Company

The Ranger company in the Americal Division wanted each of its committed teams to be armed with two Tunnel Weapons. The team sergeant and his second in command would normally carry and employ the weapons. This unit had a total requirement for 16 weapons. The Ranger company in the 25th Infantry Division had a requirement for five weapons. During an operation the team sergeant would carry one of these weapons.

c. Tunnel Rat Team

The Tunnel Rat Team in the 1st Infantry Division wanted six Tunnel Weapons for its tunnel exploration personnel.

d. Combined Reconnaissance and Intelligence Platoon

One of the 25th Infantry Division's combined reconnaissance and intelligence platoons desired to be equipped with four Tunnel Weapons.

28. FINDINGS

a. Infantry Company

Four Tunnel Weapons per infantry company was the preferred number.

b. Ranger Company

The Ranger company in the 25th Infantry and Americal Divisions requested to be armed with 5 and 16 Tunnel Weapons, respectively.

c. Tunnel Rat Team

The Tunnel Rat Team in the 1st Infantry Division requested six Tunnel Weapons for its personnel.

d. Combined Reconnaissance and Intelligence Platoon

One of the combined reconnaissance and intelligence platoons of the 25th Infantry Division desired to be equipped with four Tunnel Weapons.

SECTION VI

CONCLUSIONS AND RECOMMENDATIONS

29. CONCLUSIONS

a. The Tunnel Weapon was suitable for the following tactical employments: tunnel, bunker, well, and spider hole exploration; ambush; and search and destroy operations.

b. The ammunition for the Tunnel Weapon is not suitable for US Army use in RVN because of its high misfire rate and unreliable lethality.

c. The Tunnel Weapon is simple to operate and personnel can readily adapt to its use.

d. A ring needs to be placed on the base of the grip for attachment of a lanyard or cord.

e. The cartridge carriers should not be used on the holster assembly, and additional holes need to be provided on the strap.

f. The Tunnel Weapon should not replace any other weapon in current TOEs.

g. A slug should be developed for the Tunnel Weapon cartridge.

h. If the ammunition problem can be corrected, the weapon would be suitable for further use by the US Army in RVN.

30. RECOMMENDATIONS

It is recommended that:

a. The reliability of Tunnel Weapon ammunition be improved to meet Department of the Army standards for use in combat.

b. A ring be placed on the base of the Tunnel Weapon grip.

c. Additional holes be provided on the strap of the holster assembly.

d. A slug and improved multipellet cartridge be adopted for use with the Tunnel Weapon that will be lethal at 25 feet, when fired into a vital part of the body.

e. The Tunnel Weapon be adopted for use in RVN by the US Army, if the ammunition problems are corrected, lethality is improved, and the suggested modifications to the weapon and holster assembly are accomplished.

f. The Tunnel Weapon be issued to units in RVN as an additional weapon on the basis of four per infantry company and ten per ranger company.

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13. ABSTRACT

The Army Concept Team in Vietnam (ACTIV) evaluated the Tunnel Weapon to determine its suitability for tactical use by US Army units in the Republic of Vietnam (RVN). The Tunnel Weapon was designed to provide tunnel exploration personnel with a silent handgun capable of engaging fleeting targets without aimed fire. In July 1969, ten Tunnel Weapons were sent to RVN and distributed to the 1st and 25th Infantry Divisions for a 90-day evaluation. During August 1969, the five weapons assigned to the 1st Infantry Division were transferred to the Americal Division.

This report recommends that:

1. The reliability of Tunnel Weapon ammunition be improved to meet Department of the Army standards for use in combat.
2. A ring be placed on the base of the Tunnel Weapon grip.
3. Additional holes be provided on the strap of the holster assembly.
4. A slug and improved multipellet cartridge be adopted for use with the Tunnel Weapon cartridge that will be lethal at 25 feet, when fired into a vital part of the body.
5. The Tunnel Weapon be adopted for use in RVN, if the ammunition problems are corrected, lethality is improved, and the suggested modifications to the weapon and holster assembly are accomplished.
6. The Tunnel Weapon be issued to units on the basis of four per infantry company and ten per Ranger company.

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