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AVIB-GCD

27 March 1970

SUBJECT: Interim Letter Report - XM191 Multishot Portable Flame Weapon - ENSURE 263 (ACG-24/69I)

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

1. REFERENCES

a. Letter, AVDE-GT-T, HQ 9th Inf Div, 28 August 1968, subject: Request for Flame Weapon to Neutralize Bunker Positions (U), Confidential.

b. Message, AVHGC-DST, HQ USARV 74375, 14 October 1968, subject: Long Range Flame Weapon (ENSURE (U), Confidential.

c. Message, DA 887885, 20 November 1968, subject: Long Range Flame Weapon (ENSURE 263).

d. DF, AVHGC-DST, HQ USARV, 16 May 1969, subject: Evaluation of the XM191 Multishot Portable Flame Weapon (MPFW) System (U), Confidential.

e. Message, AVHGC-DST, HQ USARV, 63293, 23 May 1969, subject: XM191 Multishot Portable Flame Weapon (MPFW) (U), Confidential.

f. Message, AVHGC-DST, HQ USARV, 83148, 21 September 1969, subject: XM191 Multishot Portable Flame Weapon (ENSURE 263) (U), Confidential.

2. PURPOSE

The report describes field evaluation

To determine the effectiveness and suitability of the XM191 Multishot Portable Flame Weapon (MPFW) in the combat environment of the Republic of Vietnam (RVN).

3. OBJECTIVES

a. Objective 1. To evaluate the operational performance of the XM191 MPFW.

b. Objective 2. To document tactical employment doctrine developed from field use of the XM191 MPFW.

c. Objective 3. To determine the user acceptability and suitability of the XM191 MPFW.

d. Objective 4. To determine the adequacy of technical documentation and training guidance for the operation of the XM191 MPFW.

4. BACKGROUND

The general requirement for a weapon capable of firing an encapsulated flame round at targets to ranges of 100 meters or greater was stated by the US Marine Corps in October 1966. A specific requirement for a flame weapon to neutralize bunker positions when fired from standoff ranges of 200 meters or more was stated by the 9th Infantry Division in August 1968, resulting in approval of ENSURE 263. The weapon developed combines a warhead containing a pyrophoric (spontaneously igniting) compound with the rocket motor and other components of the M72 Light Antitank Weapon (LAW) system. This item has been designated the XM191 Multishot Portable Flame Weapon (MPFW). A joint Army/Marine team demonstrated the weapon in RVN during February - March 1969. All organizations attending the demonstrations indicated a high level of interest.

5. DESCRIPTION

The XM191 MPFW system consists of the lightweight, shoulder-fired, four-tube, semi-automatic, 66mm, XM202 rocket launcher (Figures 1a & b) and the factory-loaded, four-round XM74 rocket clip (Figure 2). The system, as it appears when it is assembled and ready to fire, is shown in Figure 3. The rocket, which is propelled by the M54 LAW motor, has a warhead containing 1.3 pounds of thickened triethylaluminum (TPA). A complete description, including tabulated data, is contained in an annex to this report.

6. METHOD OF EVALUATION

a. Approach

The evaluation of the XM191 MPFW system was conducted in two phases. The first phase, completed in January 1970, consisted of familiarization and training for US Army divisions and separate brigade-size units. Concurrently, four units--the 4th, 23rd (Americal), and 25th Infantry Divisions and the 1st Cavalry Division (AM)--, upon completion of training, participated in an interim 90-day evaluation. A second, or full-scale, evaluation was conducted by the above units and the following additional organizations: 1st Infantry Division; 101st Airborne Division (AM); 173d Airborne Brigade; 11th Armored Cavalry Regiment; 199th Light Infantry Brigade; 1st Brigade, 5th Infantry Division (Mech); and 3d Brigade, 9th Infantry Division. A staggered schedule, dictated by the times that launchers and ammunition were received

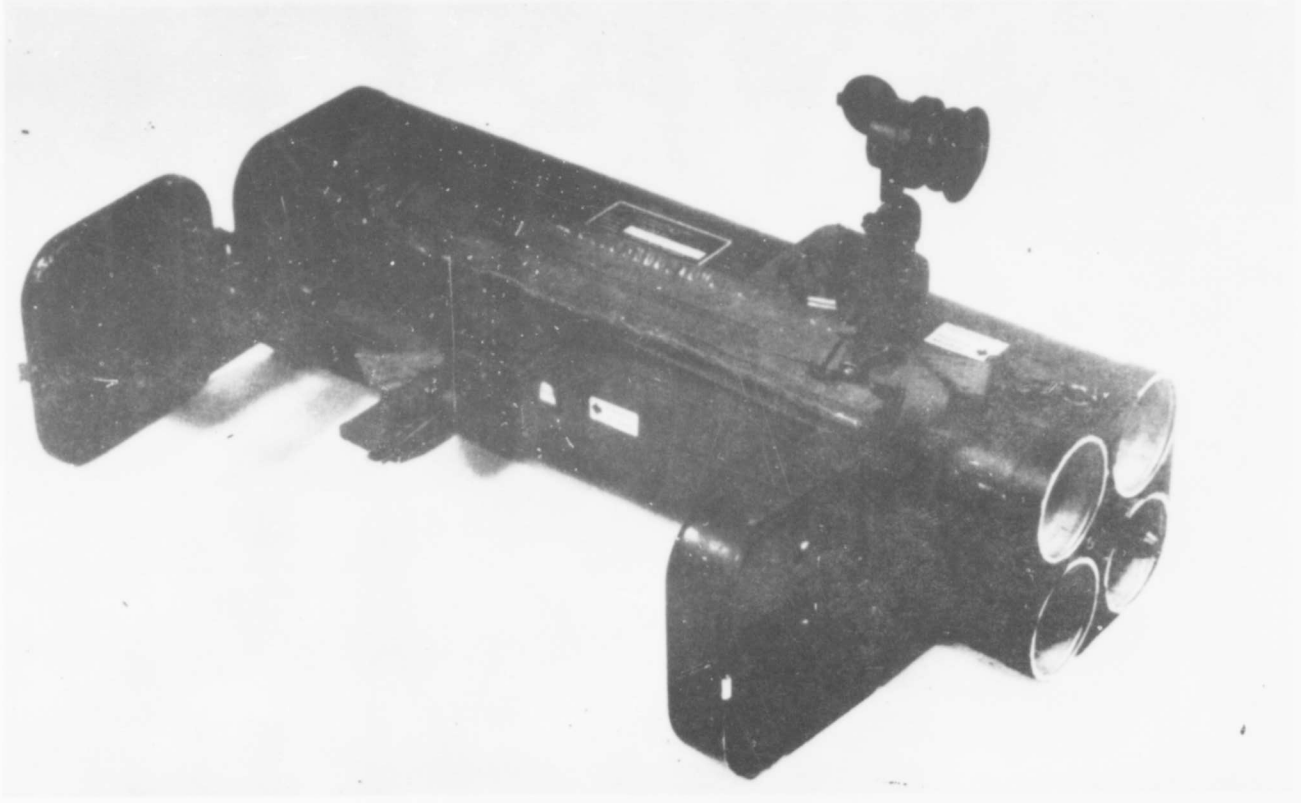

FIGURE 1a

LAUNCHER, ROCKET: TPA, 4-TUBE, XM202 (Open)

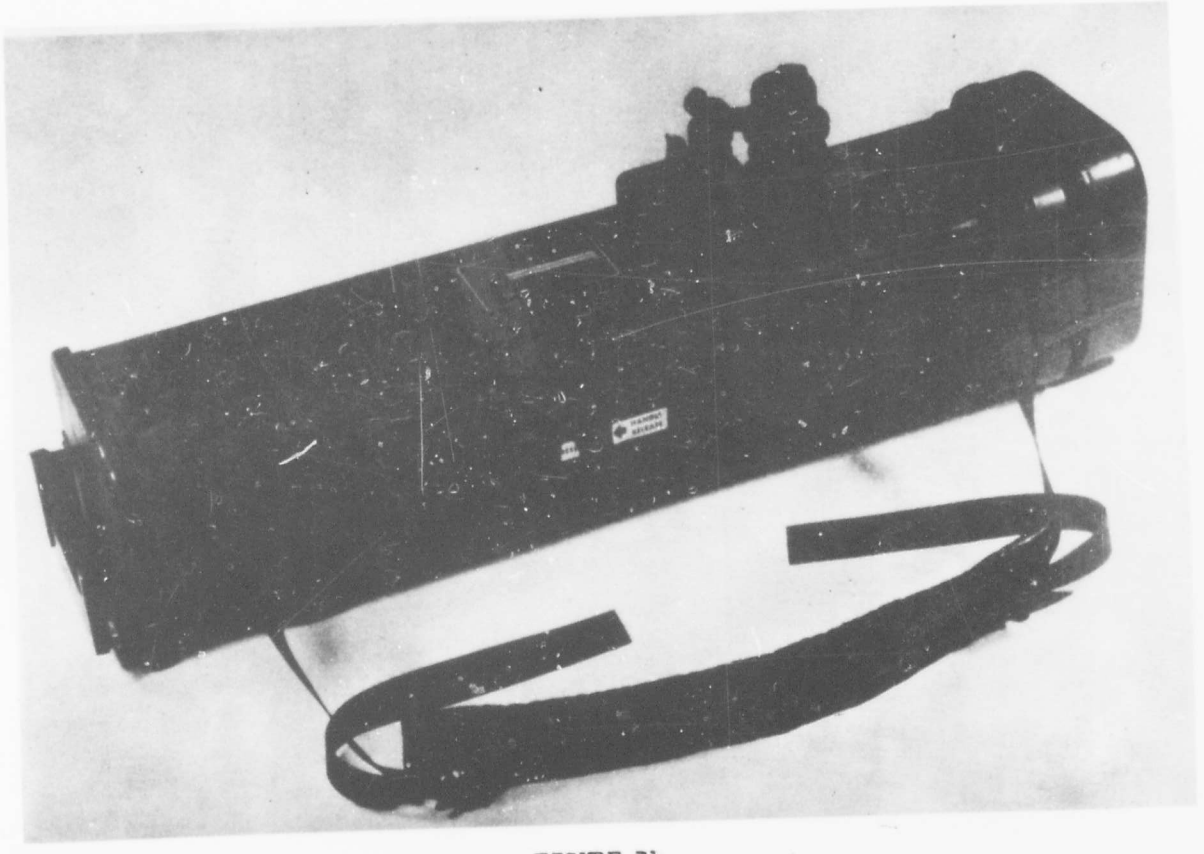

FIGURE 1b

LAUNCHER, ROCKET: TPA, 4-TUBE, XM202 (Closed)

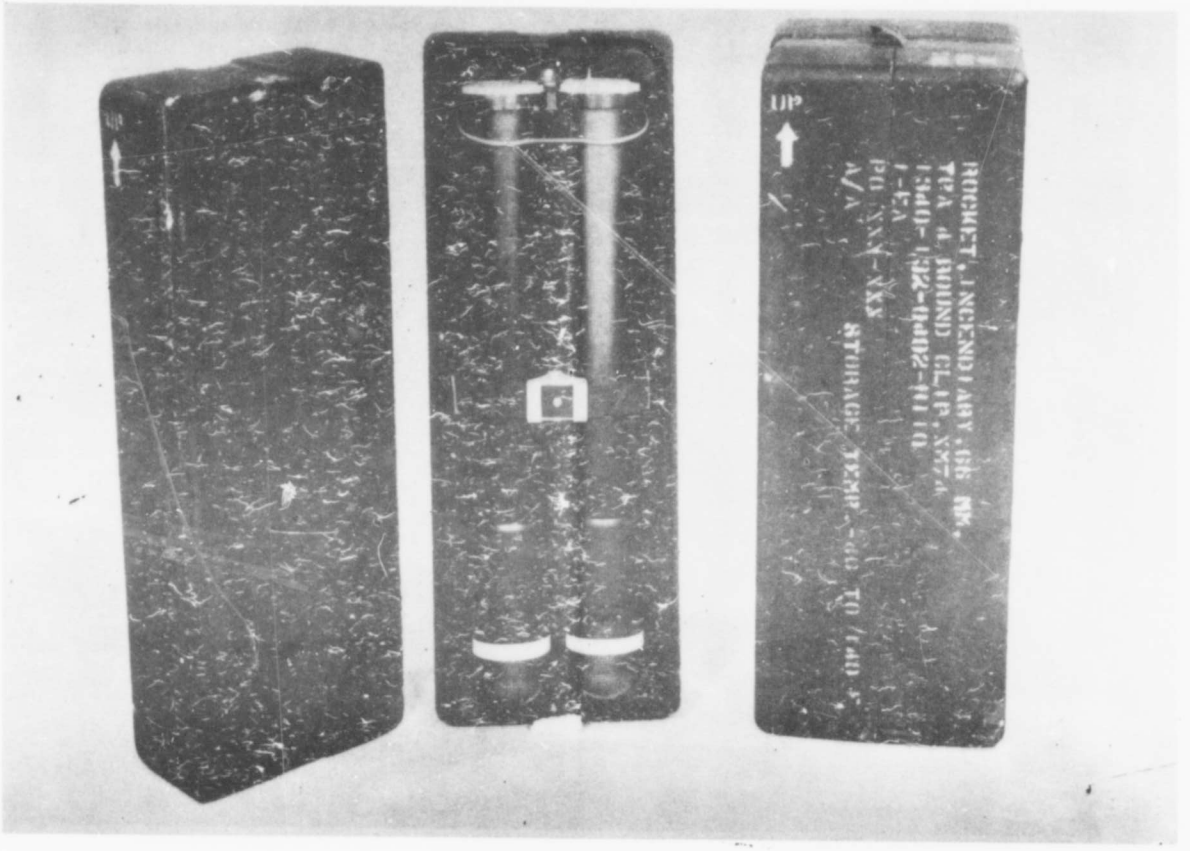

FIGURE 2

ROCKET, INCENDIARY: 66mm, TPA, 4-ROUND CLIP, XM74

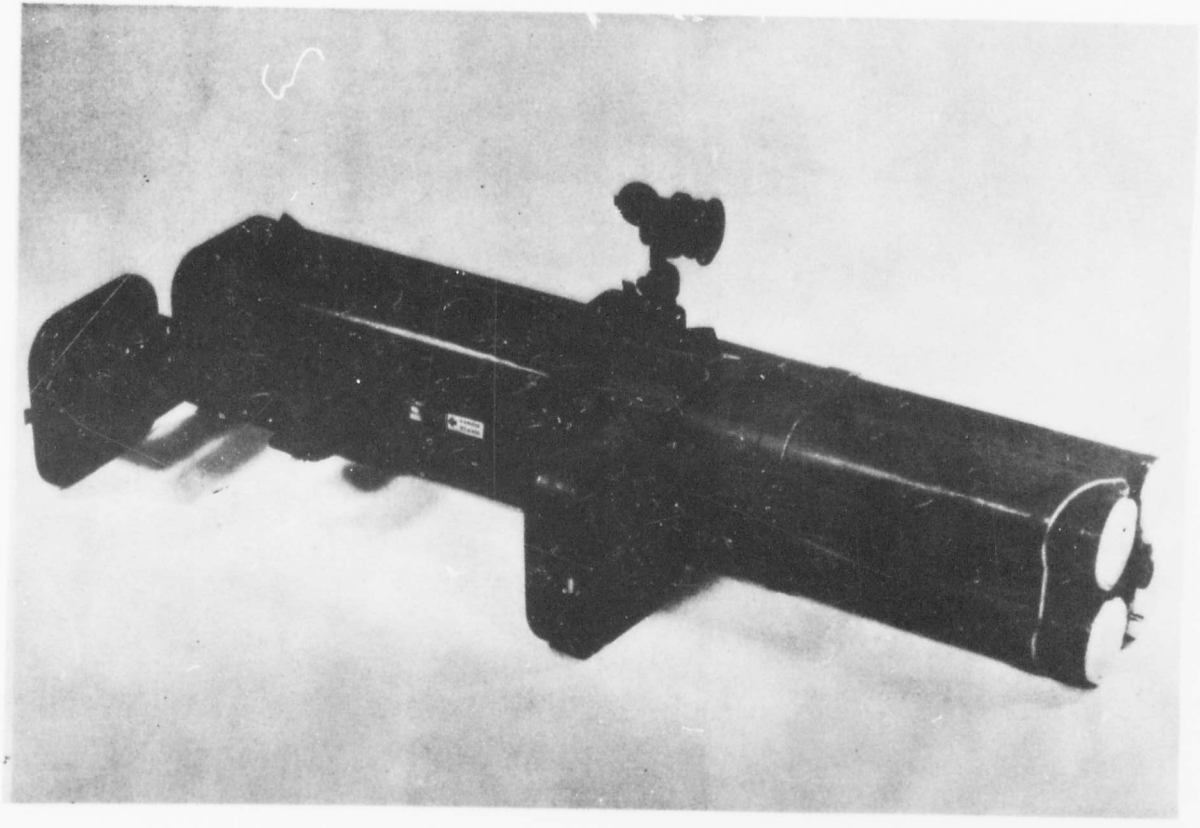

FIGURE 3

XM191 SYSTEM

in-country and the ability of the US Army Edgewood Arsenal New Equipment Training Team (NETT) to provide the required support, was followed.

b. Data Collection

The principal data collection agencies within the participating organizations were the divisional or brigade chemical sections augmented by a noncommissioned officer evaluator. Normally, the chemical sections became the unit action offices, and directed the activities of the evaluator. As soon as possible following a reported employment of the weapon, the evaluator interviewed the firer and, if possible, the firer's immediate superior. A questionnaire was employed to record the details of the action, performance of the weapon and ammunition, and associated human factors. As weapons utilization warranted, small unit leaders and commanders up to battalion level were interviewed periodically by chemical officers and the ACTIV project officer. These planned interviews were designed to determine the views of responsible officers and NCOs at these echelons regarding acceptability and adequacy of the XM191 system, and to assist in the development of employment doctrine.

c. Environment

The evaluation was conducted in all the major geomorphic regions of RVN, including the Northern and Central Coastlands, the Northern Highlands, the Western Plateau, and the Mekong Terrace. The last named region has many of the characteristics of the Mekong Delta. All types of terrain, from rice fields through elephant grass savannas to dense triple canopy rain forest, were encountered in the evaluation, as well as areas where the rocky and broken nature of the topography provided severe tests of durability and portability. The northeast monsoon predominated during most of the evaluation, causing heavy rainfall and difficult trafficability on the Northern and Central Coastlands and Northern Highlands. The Western Plateau and Mekong Terrace were generally dry, and provided some opportunities for secondary fires.

7. OBJECTIVE 1. TO EVALUATE THE OPERATIONAL PERFORMANCE OF THE XM191 MPFW

a. Range and Accuracy

The preponderance of targets engaged were classified as area targets from which enemy fire was received or which were suspected to conceal enemy troops. These targets were engaged at ranges varying from 75 meters to approximately 700 meters, with the average being about 260 meters. With respect to accuracy of fire against area targets, gunners claimed 22 first-round hits (a round impacting within 5 meters of the target was defined as a hit) out of 34 fired, for a percentage of 65 percent. Few valid conclusions can be drawn, however, as one-fifth of these targets were engaged at night; also, the target center of an area target, such as a hedgerow, was largely a matter of the firer's opinion. While the number of engagements

of legitimate point targets, i.e. weapons positions, caves, and bunkers, was limited, the ranges varied from 100 meters to 450 meters, with the average being 270 meters. More than 70 percent of the rounds fired against point targets were at ranges of 100 to 200 meters. Using the criteria defined above, 75 percent of the gunners achieved first-round hits on point targets.

b. Target Effect

(1) The burst radius was approximately 20 meters, except when confined by vegetation or terrain. Rounds observed to impact in soft or marshy terrain had reduced effectiveness in this respect.

(2) Two confirmed fatalities can be directly attributed to the effects of the weapon at the time this report was prepared. Additionally, on several occasions, enemy soldiers were observed fleeing from their positions with their clothing burning, and pieces of individual equipment were found burning at the scene of the action. In several engagements, enemy troops were killed or wounded by other weapons after they were forced from concealment or cover by the flame rounds. The psychological impact of the weapon appeared to be considerable, as enemy activity invariably ceased after employment of the flame rounds. After a multiple round firing, users made statements such as "The entire interior of the cave was one wall of flames" and "The entire hedgerow was set afire and the NVA came out and we engaged them with other weapons." In general, during the dry season in the Mekong Terrace region, secondary fires were easily started, which materially enhanced the effectiveness of the weapon in the reconnaissance-by-fire role. The same applied to bamboo and grass structures when they were attacked.

c. Reliability

In the course of the interim evaluation, there were no incidents of launcher malfunction during combat firing or during the training provided by the Edgewood Arsenal NETT team. Out of a total of 254 fielded to date, 3 launchers have been evacuated to CONUS for repair and return for defects discovered during initial inspection upon receipt. All three launchers had defective trigger mechanisms. The trigger either failed to return properly, or required excessive pressure to function. In addition, during unit training conducted in the 1st Cavalry Division (AM), the detent pin on the clip lock assembly of one launcher failed, rendering the launcher unserviceable. This was the only field failure since the weapon system was deployed in late October 1969. Experience with the XM74 rocket clips and rounds was better than that realized with the launcher. No duds were reported in 238 rounds fired in combat, and only 7 duds were recorded among 640 rounds fired in the training activities of the NETT. The overall dud rate based on documented firings is 0.8 percent. In addition three misfires, in which the rocket motor failed, have been reported.

8. OBJECTIVE 2. TO DOCUMENT TACTICAL EMPLOYMENT DOCTRINE DEVELOPED FROM FIELD USE OF THE XM191 MPFW

a. Types of Units

Organizations participating in the interim evaluation distributed the available weapons (24 to 30 within each division) among a variety of subordinate units, including:

(1) Infantry and mechanized infantry companies.

(2) Divisional cavalry troops.

(3) Aero-rifle platoons of air cavalry.

(4) Miscellaneous headquarters-controlled elements, i.e., anti-tank platoons, 4.2 inch mortar sections, chemical sections, etc.

b. Types of Operations

The operations of smaller units were primarily tactical sweeps or interdiction and ambush missions. Although bunker complexes and similar positions were encountered with some frequency, the standoff tactics used during the evaluation emphasized the employment of heavy support weapons to accomplish the neutralization mission. Consequently, the number of conventional assault-type operations, in which MPFW would be most useful, was drastically reduced. Furthermore, the nature of normal operations of dismounted infantry units in the Vietnam combat environment was not conducive to carrying the weapons in the manner of an organic, crew-served weapon [see Paragraphs 8e and 9b(1)]. However, on a trial basis, some units carried the MPFW on short-range patrols. Mounted units, i.e. mechanized infantry or cavalry units, carried the weapon as a part of the normal combat load and employed it frequently; most MPFW usage was by these units.

c. Command and Control

As a result of the low density and novelty of the weapon, tactical control was frequently exercised at a higher echelon than normal. Company commanders, rather than platoon or squad leaders, often selected targets or positioned the weapon. As additional numbers of weapons are fielded, it is likely that employment will be decentralized to platoon or squad level.

d. Tactics and Techniques

(1) General

Although combat employment of the XM191 MPFW system during the interim evaluation period was limited, it provided some indication

of the ultimate missions and employment techniques for the weapon. The primary role of the weapon, and the one for which it was designed, is the neutralization and/or destruction of bunkers and other manned fighting positions. However, the current nature and level of combat operations in RVN modified the expected patterns of usage and tactics. Missions to date have included:

(a) Attack of bunkers, caves, and weapons positions, i.e. point targets.

(b) Attack of covered and/or concealed area targets.

(c) Reconnaissance by fire.

(d) Fire base defense.

(e) Other operations.

(2) Point Targets

Although infrequently engaged, compared to other targets, point targets, such as caves on the mountain Nui Ba Den in Tay Ninh Province and in the rocky hills surrounding the Bong Son Plain in Binh Dinh Province, were attacked using the MPFW system. In these instances, the weapon was conventionally employed in support of rifle squads searching for enemy hiding places or to suppress sniper fire from enemy positions. On one occasion enemy supporting weapons, including a light mortar and a recoilless rifle, were engaged and silenced.

(3) Area Targets

Wooded areas, hedgerows, and areas of high grass concealing enemy troops were effectively attacked several times. The tactic used in these instances was to place flame over a wide area and force the enemy to abandon his position, thereby subjecting himself to fire from other weapons.

(4) Reconnaissance-by-fire

Reconnaissance-by-fire of possible enemy hiding places by means of the flame round was the most frequent mode of employment. On one occasion, troops were reluctant to enter a dense bamboo and brush hedgerow, ever after it had been swept with small arms and automatic weapons fire; however, after eight flame rounds had been fired along the length of the hedgerow, troops entered the position with confidence. In the cited instance, an enemy weapons and supply cache was located.

(5) Fire Base Defense

Commanders visualized using the XM191 MPFW in this role for its psychological effect, as well as capitalizing on the fact that

the low explosive power of the rocket warhead would minimize the damage to wire entanglements while disabling and/or repelling infiltrators. Employment in this manner was not reported; however, enemy attacks by fire from ranges out to 700 meters were effectively countered.

(6) Other Operations

One instance was reported in which the XM191 MPFW was used on a night ambush position. The weapon was fired at suspected enemy movement, but no results were determined. Several firings were made at night based on radar sightings from night defensive positions. In all cases movement ceased after employment of the weapon. Commanders also attempted to capitalize on the added psychological effect of the flame rocket at night by firing on likely approach routes of enemy reconnaissance elements.

e. Effects of Environment

The physical environment of RVN had a significant effect on tactical employment of the XM191 MPFW. The conspicuous lack of firing data on reduction of bunkers was a partial result of the frequent enemy practice of selecting the most densely forested areas in which to construct his permanent fighting positions. Frequently, bunker complexes were not located until friendly troops were virtually on top of or among the bunkers. In close terrain of this nature, the minimum range restriction, intervening vegetation, and back blast clearance requirements drastically reduced the utility of the weapon. At the interim stage of the evaluation no pattern of deleterious effects on components of the launcher attributable to the effects of the environment were discerned.

f. Basis of Issue

Although the current evaluation basis of issue is one per company-size unit, nearly all commanders recommended a basis of issue of one per platoon. No direct field comparisons were made with the standard portable flame throwers, but, at this point in the evaluation, two divisions recommend replacement of these items with the XM202 rocket launcher on at least a one-for-one basis. A basis of issue will be recommended upon completion of the full evaluation.

9. OBJECTIVE 3. TO DETERMINE THE USER ACCEPTABILITY AND SUITABILITY OF THE XM191 MPFW

a. Requirement

(1) Utilization

The number of combat employments of the MPFW during the interim evaluation period was low, consistent with the general level of combat activity in recent months. Four divisions have participated during at least a portion of the interim evaluation period. These organizations, with an intial aggregate of 145 weapons, reported a total

of 38 engagements of known or suspected enemy targets. The combat expenditure rate per division averaged 18.7 rounds or 4.7 clips per month (0.017 rounds/launcher/day). Ammunition expended in training or demonstrations was not included in the above figures. Only 26 percent of the targets engaged could be considered as point targets, the majority of firings were against area targets such as hedgerows, wood-lines, and similar known or likely hiding places of the enemy. The predominant utilization during the interim period was reconnaissance by fire on suspected enemy locations; generally these were later found to be unoccupied. Point targets engaged were, for the greater part, caves or positions located in rocky crevices in hilly terrain from which fire was received or where enemy activity was reported. Approximately 20 percent of the combat usage occurred at night. These fires were largely defensive in nature and were based on visual or ground radar sightings.

(2) User Opinion

From the inception of the evaluation, commanders were generally enthusiastic about the possibilities for combat employment of the XM191 MPFW. Interviews and unit reports indicated that all organizations currently employing the weapon, and those in the process of receiving it, recognized a definite need for a flame capability in a weapon of long range and which was simple to support logistically.

b. Design Features

(1) Weight and Configuration

The weight and configuration of the predominantly fiberglass and aluminum XM191 MPFW provided improved portability over most crew-served or support type weapons. However, in the physical environment of Vietnam most dismounted infantry soldiers thought the weapon was too heavy and bulky to carry as an integral squad or platoon weapon. Foot soldiers, already burdened with 40 to 60 pounds of equipment, were understandably reluctant to carry an additional 26-pound load; most commanders concurred in this view.

(2) Ease of Operation

Initial impressions gained during training were that the operating sequences of preparing the weapon to fire, reloading, and returning it to carrying configuration were awkward to perform. Repetitive performance of these steps in training by soldiers resulted in greatly improved speed. The first and second times through, the prepare-to-fire sequence usually took about one minute. With five or six repetitions, times dropped to 20 or 30 seconds for the average gunner. As expected, opening the front cover, rotating the handle, and engaging the latch that releases the trigger handle assembly, was the most awkward and time-consuming step in the sequence, particularly for men with short arms.

(3) Sight

The single design feature most commented upon was the reflecting sight, originally designed for the 3.5-inch rocket launcher. If the available light was poor, it was extremely difficult for the firer to distinguish the sight reticle. The sight developed for future production models should not have this drawback. Night firings served to emphasize the fact that the existing sight was virtually useless after dark; consequently, night firings were conducted by estimation. If this usage pattern continues, development of a reticle illumination system will be indicated.

(4) Durability

Damage to the launcher and ammunition resulting from field activities was minimal during the interim evaluation. Two launchers were rendered unserviceable during an operation because they were dropped approximately 5 meters from a helicopter onto rocky terrain. The damage in both instances consisted of cracks in the fiberglass tubes.

(5) Trigger Mechanism

Although no reports of malfunction have been received from the field, three launchers were found to have faulty trigger mechanisms upon initial inspection by the NETT. The trigger and trigger linkage proved to be components of the system readily subject to malfunction, e.g., sticking, excess play, or failure to return properly. This is an area that should be considered in product improvement efforts.

c. Safety

(1) Desirable Features

The triply redundant features of the safety button, front cover interlock system, and safety guide tube provided adequate protection against inadvertent firing of the launcher prior to the completion of the prepare-to-fire sequence. The simple clip latch and spring-actuated retraction of the firing pin mechanism provided a simple and positive means of rendering the launcher safe for extraction of the ammunition clip in the event of malfunction. The location of the rocket primers, recessed within the clip manifold, provided a high assurance against accidental ignition of a rocket motor by means other than the firing pin.

(2) Undesirable Features

Two aspects of the trigger safety button were commented upon by users. It was noted that the direction of movement between the "Safe" and "Fire" positions was opposite to that of most weapons, with forward being "Safe" and rearward "Fire." This could result in a failure to safe the weapon after firing, and thus produce a hazardous condition

on a subsequent preparation-for-firing sequence. The second problem area involved two reported incidents of the safety button vibrating off the "Safe" position after the weapons were transported for a period of time in tracked vehicles. The frequency with which the weapon is likely to be transported in this manner warrants correction of this potential safety hazard.

(3) Accidents

During the evaluation one serious accident was investigated. A launcher fired while attempts were being made to retract the clip into the launcher. The launcher was destroyed due to the tactical situation, so the exact mechanical cause of the accident, if any, could not be determined. Two operating personnel were injured because, contrary to safety instructions, portions of their bodies were in the rocket motor backblast area of the weapon. Increased safety consciousness was stressed during the remainder of the training program.

d. Logistics

A major factor contributing to the acceptability of the XM191 MPFW was the simplification of the logistics that were associated with flame operations in the past. Freedom from fuel mixing and pressurization requirements was a clear advantage from the inception of the evaluation. Transportation and storage of the XM74 incendiary rocket clips through normal in-country ammunition channels proved to be trouble-free. Care and cleaning requirements proved simple and considerably less demanding than with other weapons systems.

10. OBJECTIVE 4. TO DETERMINE THE ADEQUACY OF TRAINING GUIDANCE AND TECHNICAL DOCUMENTATION FOR THE OPERATION OF THE XM191 MPFW

a. Training

(1) Formal Program

Initial instruction on the XM191 MPFW was presented to the divisions participating in the evaluation by the Edgewood Arsenal NETT. Instruction was based upon the Program of Instruction (POI) published by the New Equipment Training Section of the Weapons Development and Engineering Laboratories of Edgewood Arsenal. This program consisted of 12 hours of instruction, broken into 5 hours of lecture and demonstration and 7 hours of practical exercises, including dry and live firing of the system. This POI was tailored for a class of about 12 students, and employed two instructors/demonstrators. Two launchers and inert XM74 rocket clips were the primary training aids. While this program represented an ideal plan, it had to be modified considerably at times to accommodate varying class sizes, training time available, and operational considerations. Normally, the composition of the classes consisted of three-fourths enlisted operators in grades E2 to E4, the balance of the class being commissioned and

non-commissioned officers. The latter group received the instruction in preparation for future training at the unit level, and to apprise themselves of the capabilities of the system.

(2) Observations

It became apparent that there were two key aspects of a training program for the XM191 MPFW: (1) The amount of practical exercise, including dry firing, and (2) the number of practice rounds a gunner should fire to be considered qualified with the weapon. As discussed in Paragraph 9b(2), considerable drill was required before a gunner acquired the proper dexterity in the loading, firing, and unloading sequences of the system. Observations indicated that from one to two hours of repetitive practice were necessary to develop the requisite skills. Despite the commonality of many components of the XM202 launcher with the M72 LAW system, the two were sufficiently dissimilar in operating procedures to require distinct training programs. The XM191 MPFW training program reflected the increased complexity of the weapon. The formal POI employed by the NETT required each gunner to fire two rounds for qualification. Gunners that subsequently fired the weapon in combat stated that they felt qualified after firing from one to eight rockets, with the average being three. No attempt was made to correlate the number of first-round hits achieved in combat with the number of rockets fired in training because of the many variables involved in the combat environment. Observations of firings during training indicated that the average gunner could score acceptable hits on targets at ranges from 100 to 200 meters with the second round fired. With increased availability of ammunition, it would probably be desirable for each gunner to fire an entire clip (four rounds) in training; the first few rounds overcomes the normal, initial apprehension; subsequent rounds build the gunner's confidence in the weapon and in his own ability to fire it accurately.

b. Training Ammunition

Early in the training activities, it was apparent that a requirement existed for inert training ammunition. The nature of the launcher mechanism and functioning cycles required a rocket clip or facsimile that would retain the firing pin mechanism assembly in the rearward position and permit the normal firing cycle to occur. Likewise, the sequences of preparation-for-firing, unloading, and the hangfire-misfire-mechanical delay procedures, all required an inert clip for realistic practice. A spent (fired) rocket clip could be employed for this purpose, but there was a considerable risk of damage to the launcher tubes. The sharp edges of the aluminum rocket tubes were likely to scratch the interior of the fiberglass launcher tubes, particularly following repetitive use. This practice could render the launcher unserviceable. Inert clips provided to units by the NETT sufficed for the interim evaluation period; however, a basis of issue remains to be determined.

c. Technical Documentation

The technical manual, TM 3-1055-218-12, both in draft form and as a formal DA publication, were judged to be adequate during the period of the interim evaluation. All respondents have indicated satisfaction with the format and content of these documents.

11. INTERIM CONCLUSIONS AND RECOMMENDATIONS

a. Conclusions

Tentative conclusions based on the 90-day interim evaluation are:

(1) The XM191 MPFW possesses adequate range, accuracy, and target effect to engage and neutralize a variety of targets.

(2) The XM202 rocket launcher and XM74 rocket are reliable under field conditions.

(3) The weapon system is capable of performing a much wider variety of tactical missions than standard portable flame weapons.

(4) The utility of the XM191 MPFW is limited in dense jungle terrain by minimum range restrictions.

(5) Commanders generally agree on the need for a weapon of this type.

(6) Dismounted infantry consider the weapon too bulky and heavy to carry regularly on extended operations.

(7) Logistical support and maintenance of the XM191 MPFW are simple.

(8) The XM191 MPFW is considerably more complex than the M72 LAW system, and consequently requires a more extensive training program.

(9) A requirement exists for inert training ammunition.

b. Recommendations

Based on the limited conclusions, it is recommended that:

(1) The evaluation be continued as scheduled.

(2) Procurement of the XM191 MPFW be continued.

(3) Product improvement efforts toward simplification of weapons system operation be continued.

(4) Preliminary procurement plans be formulated to provide inert training ammunition on a basis to be determined.

C. B. McCoid

2 Inclosures
1. Annex A
2. Annex B

C. B. McCoid
Colonel, IN
Commanding

ANNEX A

XM191 MULTISHOT PORTABLE FLAME WEAPON SYSTEM (MPFW)

1. DESCRIPTION

a. General

The major components of the XM191 MPFW are the Launcher, Rocket: 66mm, Multishot, XM202, referred to as the XM202 rocket launcher, and the Rocket, Incendiary: 66mm, TPA, 4-Round Clip, XM74, referred to as the XM74 incendiary rocket clip.

b. XM202 Rocket Launcher

The launcher component of the XM191 system consists of 4-66mm fiberglass tubes arranged two-by-two and secured by bulkheads at both ends (see Figure 1a).[1] The firing pin mechanism is located in the center of the tube cluster. The trigger - handle assembly is attached to the forward end of the launcher. In its carrying configuration, front and rear covers seal the launcher against dirt and moisture (see Figure 1b). The front cover also serves to unlatch and permit extraction of the trigger - handle assembly from the body of the launcher where it retracts in the carrying configuration. The rear cover protects the firing pin mechanism assembly. A reflecting-type sight and carrying sling are mounted on the left side of the launcher (see Figure 3).

c. XM74 Incendiary Rocket Clip

The rocket clip consists of four aluminum tubes bound together by a star-shaped manifold (see Figure 2). Each tube is preloaded with a 66mm rocket. The tubes are grouped in the same two-by-two pattern as the XM202 rocket launcher and slip-fit into the launcher tubes. Each rocket consists of a warhead which contains 1.3 pounds of thickened triethylaluminum (TPA), and an M54 rocket motor. The thickened triethylaluminum ignites spontaneously when exposed to air. The rocket fuze is a base-detonating, non-delay-action type. It arms after the rocket has traveled a minimum of 5.5 meters and a maximum of 13 meters.

d. Operation

The rocket launcher is fired from the right shoulder using any of the standard firing positions. It is used to neutralize both point and area targets. It is semi-automatic, and capable of firing from one to four incendiary rockets at a rate of more than one round per second. It can be reloaded with a new rocket clip in approximately 30 seconds. After arming, deceleration on impact activates the rocket fuze, initiating the detonator and the primacord burster in turn. On open terrain the incendiary TPA is disseminated in burning droplets over a 20-meter radius.

1. Figure references indicate the appropriate figures given at Section 5, Description.

2. TABULATED DATA

Weight of XM202 launcher	11.5 pounds
Weight of XM74 clip with rockets	15.1 pounds
Weight of XM191 MPFW	26.6 pounds
Length, closed	27.0 inches
Length, extended with clip	34.75 inches
Muzzle velocity	350 feet per second
Range, maximum	730 meters
Range, effective for point targets	200 meters
Operating temperature limits	32° - 140° F