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Consulting Report

Training Implications, Extended Field Test,
Infantry Rifle Unit Study, IRUS - 75 (IRUS IIBX)

by

Nelson I. Fooks

Joseph S. Ward

November 1968

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PREFACE

This Consulting Report was prepared, as Technical Advisory Service, at the request of the Commanding General, U.S. Army Combat Development Command Experimental Command (CDCEC), Fort Ord, California.* The report concerns CDCEC Extended Duration Field Test, Infantry Rifle Unit Study, (IRUS-IIBX), and gives the views of HumRRO Division No. 3 on training implications associated with the Army's possible adoption of new basic organizational configurations equipped with new radios and weapons.

HumRRO research is conducted under Contract DA 44-188-ARO-2 and Project 2J024701A712 01, Training Motivation and Leadership Research.

Howard H. McFann
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(Recruit Training)

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TRAINING IMPLICATIONS, EXTENDED FIELD TEST,
INFANTRY RIFLE UNIT STUDY, IRUS - 75 (IRUS IIBX)

1. CDCEC Request This report was prepared at the request of The Commanding General, U.S. Army Combat Development Command Experimental Command, Ft. Ord, California, in connection with Extended Duration Field Test, Infantry Rifle Unit Study, (IRUS IIBX). It gives the views of HumRRO Division No. 3 on "the training implications associated with the Army's possible adoption of new basic organizational configurations equipped with new radios and weapons." As requested, training implications are expressed in terms of revision(s) to Army Training Programs (BCT/AIT) required to train infantry soldiers in:

- a. The universal light machine gun (ULMG).
- b. The squad radio, AN/PRT-4 and AN/PRR-9.
- c. The rifle/grenade dual purpose weapon (SPIW).

2. Scope Although the report addresses itself primarily to the training implications as they affect individual training, closely related implications for tactical training in BCT/AIT, for Basic Unit Training (BUT) and for range facilities have been included.

3. Assumptions For the purposes of the study the following assumptions have been made:

- a. Hours currently devoted to instruction are adequate.
- b. Current BCT/AIT content of program is appropriate.
- c. In the time span under consideration, there may be advances in instructional methods affecting the program which cannot be anticipated at this time.

- d. The hardware and organizations under consideration extend present capabilities and do not introduce any revolutionary concepts.

4. Analysis

a. Universal Light Machine Gun (ULMG)

Comparison of the HumRRO-developed Skills, Knowledges, and Performances (SK&Ps) required of the soldier armed with the Universal Light Machine Gun (See Incl 1) with those required of the M-60 machine gunner (FM 23-67, par 8p, A Subj Scd 7-11B10, and Annex I-G, HumRRO Research Memorandum (RM), No 23, "Critical Combat SK&Ps Required of the 1962 Light Weapons Infantryman," projected to present date) indicates that training with the Universal Light Machine Gun will result in only minor changes in the training program. The changes anticipated are set forth below under four contingencies.

(1) 1st Contingency

If the M-60 machine gun is retained in the system (a given possibility), presumably trainees will get their fundamental training on the M-60 machine gun and will require further training in the features wherein the ULMG differs from the M-60, or vice-versa; e.g., fundamental training could be given on the ULMG. The training in the differences of the two weapons and their usage would consist mostly of functioning, assembly and disassembly,

and use of sights; at most, an estimated 5 hours* of instruction. (See Figure 1, Contingency 1).

(2) 2nd Contingency.

If the M-60 machine gun is not retained in the system (also a given possibility) and no tripod-mounted machine gun is included in the system, all of the time currently devoted to M-60 Machine Gun Technical Training in BCT/AIT, 40 hours, could be devoted to ULMG training. In this contingency, however, approximately eight (8) hours* of 40 hours of training time currently devoted to training in the tripod role of the M-60 machine gun would not be needed for training in the ULMG (See Figure 1, Contingency 2).

(3) 3rd Contingency.

If a tripod-mounted member of a family of weapons (of which an ULMG is a member) were to be used in lieu of the M-60 MG (not necessarily in the BIE) the training time currently allocated to the M-60 MG would suffice for both the ULMG training and medium MG training (See Figure 1, Contingency 3).

(4) 4th Contingency.

If the M-60 machine gun is not retained in the system and the ULMG supplants the automatic rifle, the

* Estimate is based on amount of time devoted to functioning, assembly, and disassembly in par 8p Machine Gun M-60, A Subj Scd 7-11B10.

Contingency	Training Implications (Time)
1. If the ULMG is included in the BIE, and the M-60 MG is retained in the system.	5 hrs training in functioning assembly and disassembly and use of sights of ULMG must be <u>added</u> .
2. If the ULMG is included in the BIE, the M-60 MG is eliminated, and no tripod-mounted MG is included in the system.	8 hrs training time will be <u>surplus</u> to needs.
3. If the ULMG is included in the BIE, the M-60 MG is eliminated and a tripod-mounted member of a family of weapons (of which the ULMG is a member) is used in lieu of the M-60 MG. (Not necessarily in the BIE).	None.
4. If the ULMG is included in the BIE, the M-60 MG is eliminated and ULMG supplants the automatic rifle.	24 hrs currently used for AR Training would be <u>available</u> for further ULMG or other training.

Figure 1. Training Implications for BCT/AIT if an ULMG is included in the BIE (4 contingencies).

entire 24-hour block of time currently devoted to automatic rifle training would be available for ULMG or other training. (See Figure 1, Contingency 4)

b. The Squad Radio. AN/PRT-4 and AN/PRR-9

Comparison of the HumRRO-developed Skills, Knowledges, and Performances (SK&Ps) required of the soldier equipped with the squad radios AN/PRT-4 and AN/PRR-9 (Incl 2) with those required of the soldier equipped with the AN/PRC-25 (FM 24-18, par 8n, A Subj Scds 7-11B10, 7-11C10, 7-11H10, and Annex II-A, HumRRO RM No. 23, "Critical Combat SK&Ps Required of the 1962 LWI," projected to present date, including AN/PRC-25) indicates that training with the AN/PRT-4 and AN/PRR-9 radios will introduce no SK&Ps other than those that are currently taught for the AN/PRC-25 radio. (See Figure 2.)

There are minor differences in equipment which should not take more than an hour of explanation and practical application for trainees trained on the AN/PRC-25 radio to learn.

Introduction of the squad radio into the BIE will not supplant the requirement for training in current means of intra-squad communication, such as arm and hand signals and voice. Not only will there be situations where communication means other than radio will be more suitable to the situation; but radios can be expected to fail to communicate, sometimes at the most inopportune moments.

Condition	Training Implications (Time)
If AN/PRT-4 and AN/PRR-9 Radios (or descendants) are included in the BIE.	1 hr added training will be required to cover differences in radios introduced and the AN/PRT-25 radio.

Figure 2. Training Implications for BCT/AIT if Squad Radios AN/PRT-4 and AN/PRR-9, or descendants, are included in the BIE.

c. Rifle/Grenade Launcher Dual Purpose Weapon (SPIW)

Comparison of the HumRRO-developed SK&Ps required of the soldier armed with rifle/grenade launcher (Incls 3 and 4) with those required of a soldier armed with M-16 Rifle and a soldier armed with a 40mm grenade launcher (FMs 23-31 and 23-71, A Subj Scd 23-31 and par 8d, A Subj Scds 7-11B10, 7-11C10 and 7-11H10, and Annex I-F and I-O, HumRRO RM No. 23, "Critical Combat SK&Ps Required of the 1962 LWI," projected to present date) indicates that training with the SPIW will introduce only a small number of easily learned skills and knowledges. (See Figure 3.)

The S&Ks introduced are those incident to operating two triggers, and those concerned with the decisions the firer has to make; that is, when to use the grenade launcher capability and when to use the rifle capability. The S&Ks that are added by virtue of the dual purpose feature of the weapon are set forth in par 3 Incl 3. The instructional material that would be added because of the added S&Ks could easily be taught in one (1) hour. The application of these S&Ks should be integrated with Technique of Fire, Tactical Training, and Patrolling with no additional hours required for the application.

Condition	Training Implications (Time)
If the SPIW (or a descendant) is included in the BIE.	1 hr must be <u>added</u> in trigger manipulation and decision as to which capability of the weapon to use.

Figure 3. Training Implications for BCT/AIT if an SPIW (or descendant) is included in the BIE.

d. Effect Upon Individual Weapons Training, Technique of Fire, Tactics, Patrolling, and Related Instruction of Inclusion of ULMG, Squad Radios and SPIW in the BIE.

Although the basic letter requesting this study did not ask for training implications in Individual Weapons Training, Technique of Fire, Tactics and Patrolling, etc., it has been necessary in preparation of a reply, to give some thought to the training implications for BCT/AIT in these areas. For what they are worth our views are set forth below.

Our study indicates that no additional time will be required in Individual Weapons Training, Technique of Fire, Tactics, Patrolling, etc. if the ULMG, Squad Radios and SPIW are included in the BIE. It is apparent from the foregoing without further study that none of the hardware under consideration introduces a new or unfamiliar technique. Rather, the few techniques changed are in each instance only minor variations of techniques currently being taught. Even the decision making requirement introduced by virtue of the dual purpose characteristic of the SPIW is related to an already-familiar process required currently, namely that used when a soldier has to decide when to stop firing his rifle and throw a hand grenade, and vice-versa.

Although we can expect increased fire power per man in contact with the enemy and more breadth of leader control (due to the radios) resultant increases in frontage per man should entail only extensions of current techniques.

Accordingly, it is inconceivable that the introduction of the hardware under consideration could have far reaching effects on BCT/AIT training in Technique of Fire, Tactics, Patrolling, etc. True, ATPs, A Subj Scds and FMs will have to be revised and certain established techniques like Technique of Fire will be in for minor adjustment. But fire will still be distributed and applied to the target in a manner similar to current procedures; orders will still be given for application and control of fire and for control of the BIE. None of the hardware will have greater effect than that of adjusting existing processes; or in case of the radios, making these same processes easier and more responsive.

e. Effect on Basic Unit Training.

Again, the basic letter did not ask for study in this area. But, since some thought has been given to BUT our views are offered. BUT is essentially an extension of BCT/AIT. No new techniques are introduced in BUT, in the area under consideration. Interactions - Yes. But the interactions required in BUT are but a refinement of those learned in BCT/AIT; and are not changed fundamentally by introduction of the hardware. It is our considered opinion, therefore, that the introduction of the hardware under consideration will have no effect on the amount of time required for BUT.

[REDACTED]

f. Effect Upon Range Facilities

Confirming informal discussions with members of the CDCEC staff during preparation of this study, we are including some thoughts on the effect upon range facilities of inclusion of the weapons and radios under consideration in the BIE. So far as individual training in weapons and radios is concerned, we are of the opinion that training areas, training methods, range space allocations, danger areas, etc. acceptable for on-going training would be wholly acceptable for individual training in the new weapons types and radios.

Likewise, space allocations for patrolling should offer no problem. However, in team training (BIE or NEATBIE) in technique of fire and tactical firing exercises, firing line and firing lane breadth may be affected by the number of men in a BIE or NEATBIE and tactical application of the new hardware. For instance, if a 7-man BIE option (Option 1 and 2) is accepted, it may be necessary to convert an existing tactics range or a technique of fire range now accommodating three 10-man squads to one accommodating four 7-man BIEs. Because each BIE may need to fire at the same target configuration that a squad previously fired at, accommodation of the four BIEs might entail the purchase and installation of an additional set of targets for one lane and the lateral extension of the range accordingly. At the same time, range space scheduling may make the reduction to 21 men per order (in this instance) as compared to 30 undesirable.

On the other hand, provided tactical application of the new hardware would not dictate otherwise, it might be possible to fit Options 3, 4, 5, 6, and 7 on existing ranges, with possible minor range adjustments for Options 5 and 7.

Because of many factors involved such as ammunition requirements per man to achieve greater sustained fire power with new weapons, which BIE configuration will be adopted, realism to be required on future ranges, breadth of range per individual, target configurations, target requirements, etc., we prefer not to hazard a guess as to the extent of range and equipment increases which may result. We would prefer to indicate only that some adjustments in range facilities may be required.

g. Summary

In summary, our analysis indicates that inclusion of the weapons and radios under consideration in the BIE in any of the Optional Organizations given would have very little effect upon hours or nature of training required in BCT/AIT, individual weapons training, technique of fire, tactics and patrolling, or upon BUT; but that there is a possibility that inclusion of the weapons and radios under consideration, in some of the options under consideration, might entail range alterations, and possible acquisition of some additional range space (laterally) and equipment.

PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED
OF THE LIGHT WEAPONS INFANTRYMAN ARMED WITH A
UNIVERSAL LIGHT MACHINEGUN (ULMG)

General Considerations

Introduction

The Universal Light Machinegun (ULMG) is one of the primary weapons that the LWI in the BIE and/or NEABIE will fire in combat. The ULMG can be fired from bipod, the shoulder, or the hip. Because of its light weight (approximately 12 lbs), it can be used as an automatic weapon of considerable lethality to augment the fires of the flat trajectory, small caliber, shoulder weapons in the BIE or the NEABIE.

Scope

Performances are given setting forth the technical proficiency required of the LWI with an ULMG under all conditions of visibility. Closely related material is Observation, Combat Intelligence, and Reporting; Technique of Fire; Formations, Battle Drill (Plays), Communications: Individual-to-Individual by Radio, Visual, Auditory Touch and Pyrotechnic Signals; and Elementary Fire and Maneuver; Cover; Employments, Shelters, Obstacles, and Fields of Fire; Movement by Vehicle; Maintenance of Clothing and Equipment; Physical Conditioning; and Operating with Armor.

Materiel

ULMG, belted ammunition (100-round, disintegrating, metallic belt in plastic case) carried attached to the weapon ready to fire.

Stimuli

Orders or signals from leaders.

Moving, stationary, fleeting, multiple, seen or heard personnel targets, including airborne, irregularly spaced at ranges from 0 to 1100 meters.

Suspected personnel positions.

Unarmored and lightly armored surface and air vehicles.

Universal Light Machinegun (cont)

Performances, Knowledges, and Skills

1. AT RANGES FROM 0 TO APPROXIMATELY 35 METERS, THE LWI, UNDER EXTREME TIME PRESSURE, WILL ENGAGE SUDDENLY APPEARING CLOSE-IN TARGETS, SUCH AS STATIONARY, MOVING (SOME FLEETING), MULTIPLE-LOCATED PERSONNEL ON THE GROUND OR IN THE AIR, AND SUSPECTED ENEMY POSITIONS, AND WILL TAKE PART IN ASSAULT FIRE. HE WILL COMMENCE AND TERMINATE FIRE AS DEMANDED BY THE SITUATION OR ON ORDER.

He will :

- : fire in the standing (crouched) or kneeling position, moving or stationary.
- : fire from gun emplacement or not.
- : fire with the gun at hip.
- : fire using the bipod.
- : fire while pointing the gun at the base of seen or assumed target, without the use of sights.
- : fire and adjust his fire by observing the strike of ball or tracer ammunition.
- : fire long or short bursts, reloading as necessary.

Universal Light Machinegun (cont)

2. AT RANGES FROM 0 TO 1100 METERS, THE LWI, UNDER TIME PRESSURE VARYING FROM GREAT TO NONE, WILL ENGAGE TARGETS, SUCH AS STATIONARY, MOVING (SOME FLEETING), MULTIPLE-LOCATED PERSONNEL ON THE GROUND OR IN THE AIR, AIRCRAFT, VEHICLES, AND AREAS CONTAINING ENEMY OR SUSPECTED ENEMY POSITIONS. HE WILL COMMENCE AND TERMINATE FIRE AS DEMANDED BY THE SITUATION OR ON ORDER.

- a. Time Pressure: Great to medium.
Target Distance: 0 to 400 meters.
He will: fire from a standing (crouched), sitting (kneeling), or prone position, or from the standing foxhole.
- : fire from a gun emplacement or not.
 - : fire with the gun at the hip or shoulder (0-150 M)
 - : fire with the gun on bipod, or not using bipod.
 - : fire with either a coarse or deliberate aim.
 - : fire while aiming at the base of seen or assumed mass (leading low and slow flying aerial targets).
 - : fire using the sight, properly positioned and properly zeroed.
 - : fire long or short bursts, reloading as necessary.
 - : adjust his fire off mount by observing the strike of ball or tracer bursts in the target area (adjusting leads at aerial targets).
 - : adjust his fire on bipod by looking through his sights, observing strikes and applying hold-off (to adjust) on the ground targets.
- b. Time Pressure: Medium to none.
Target Distance: 400 to 1100 meters.
He will: fire from a kneeling or prone position, or from a standing foxhole.
- : fire from a gun emplacement or not.
 - : fire with the gun on bipod (w/o bipod for aerial targets).
 - : fire with a deliberate aim (coarse aim, applying leads as necessary for aerial targets).
 - : fire while aiming at the base of seen or assumed mass (leading aerial targets).
 - : fire using the sight, properly positioned and properly zeroed.
 - : fire by observing the strike and adjusting aim or sights accordingly and applying hold-off to bring the bursts on ground target (adjusting leads to aerial targets).
 - : fire long or short bursts, reloading as necessary.

Universal Light Machinegun (cont)

2. Continued

- c. On order or in accordance with an SOP,
 He will: fire from ground transport in conjunction with other occupants of the vehicle at located enemy personnel.
 : fire from air transport in conjunction with other occupants of the transport at located enemy personnel on the ground.

3. THE LWI WILL ENGAGE PREDETERMINED ASSIGNED TARGET AREAS AND APPLY FINAL PROTECTIVE LINE FIRING UNDER ALL CONDITIONS OF VISIBILITY. HE WILL COMMENCE AND TERMINATE FIRE ON ORDER.

- He will: fire from a prone or standing foxhole position with the machinegun on bipod.
 : use a deliberate aim on the target on the initial burst and adjust thereafter by hold-off on bullet-tracer strike or on order from leader.
 : fire a succession of short or long bursts and reload when necessary
 : use field expedients to obtain accuracy when firing under poor visibility and darkness.
 : use base stakes to define sector limits.
 : use stake and notched stick for direction to several targets and to the FPL.
 : use white taped or illuminated front sight.

4. THE LWI WILL MAINTAIN HIS MACHINEGUN IN AN OPERATIVE CONDITION AND, CONSISTENT WITH SAFETY, WILL KEEP IT READY FOR INSTANT USE.

- He will: keep the machinegun properly zeroed.
 : keep ammunition clean and dry.
 : keep machinegun fully loaded with safety on safe.
 : keep the bore, chamber, and operating group, and feedplate clean and dry (as prescribed), and remove any foreign matter from those parts before firing.
 : keep moving parts clean and lubricated.
 : disassemble the machinegun sufficiently for cleaning and lubricating, and reassemble it.
 : apply immediate action when necessary.
 : change barrels as prescribed.

PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF
THE LIGHT WEAPONS INFANTRYMAN EQUIPPED WITH THE
RECEIVER SET AN/PRR-9 AND TRANSMITTER SET AN/PRT-4

General Considerations

Introduction

Communication is essential to command control and the dissemination of information in combat. In moving situations, such as attack and patrol, radio communication is the planned principal means of contact between leaders, and for leaders of BIE to members of their BIE. Radio communication frequently will be used between elements of patrols, and from patrols, outposts, listening posts, roadblocks, etc., to the leader of the parent unit. As a member of one of these elements, the BIE will be required to use the transmitter set AN/PRT-4 as well as the receiver set AN/PRR-9.

Scope

Performances are given outlining the technical proficiency required of the LWI to perform user maintenance, site, operate, wear or secure, and transport the radios organic to the BIE, (AN/PRT-4 and AN/PRR-9). Transmission security, including authentication, use of simple coding systems, and use of the phonetic alphabet, numerals, and the military time system required to operate communications equipment are set forth under operation. Destruction of communications equipment is listed as an operator responsibility. Closely related material is Wire Communication; Messenger Communication; Communications: Individual-to-Individual by Radio, Visual, Auditory, Touch, and Pyrotechnic Signals; Cover; Concealment and Camouflage; Observation, Combat Intelligence, and Reporting; Protection Against Mines, Booby-traps, and Warning and Illuminating Devices; Maintenance of Equipment, and Counterintelligence.

Materiel

Radio Set AN/PRT-4
1 ea BIE Leader
Radio Set AN/PRR-9
1 ea BIE Member

Sets AN/PRR-9 and AN/PRT-4 (cont)

Stimuli

Orders and instructions from leaders.

Radio signals from other units.

Possession of information of value to others when a radio is available to the LWI and the requirement for speed of transmission is greater than the security of the message.

Recognized need for information, ammunition, supplies, fire support, casualty evacuation, etc., when a radio is available to the LWI and the requirement for speed of transmission is greater than the security of the message.

Drop in signal strength while operating, or failure of set to operate.

Disruption of communications by jamming.

Performances, Knowledges, and Skills¹

1. THE LWI WILL MAINTAIN THE RADIO IN SERVICEABLE CONDITJON AT ALL TIMES.

He will: identify the set and components by sight or touch (in darkness), check for operational serviceability, and replace unserviceable or missing components.

- : obtain additional batteries if the nature of the mission so indicates.
- : change batteries in darkness without artificial light when drop in signal strength indicates weak batteries.
- : keep the radio, components (when applicable), and extra batteries in his personal possession when serving as radio operator.
- : within the limits imposed by the situation, protect radio equipment from dirt, moisture, and breakage.

¹ Each performance is pertinent to each type of radio listed under Materiel or obviously applies to but one set

Sets AN/PRR-9 and AN/PRT-4 (cont)

2. THE LWI WILL TRANSMIT AND RECEIVE RADIO MESSAGES UNDER ALL CONDITIONS.

- He will:
- : site the radio set and adjust the controls for maximum transmission range and reception volume.
 - : know that line-of-sight between his set and the other sets in the net is essential for most effective operation.
 - : within the limits imposed by the combat situation, transmit or receive from positions judged to offer line-of-sight to other stations in his net.
 - : keep antenna vertical and free of foliage, particularly during wet weather.
 - : seek a better site when drop in signal strength due to location threatens to disrupt communications or when a new site may decrease the effect of jamming signals; and use other normal anti-jamming processes.
 - : maintain transmission security when operating communications equipment.
 - : know that properly maintained transmission security decreases the enemy's opportunity to intercept messages, gain information from volume of traffic, or locate friendly troops with radio direction finders.
 - : maintain transmission security by using abbreviated radio-telephone procedure.
 - : use the phonetic alphabet, numerals, and the military time system.
 - : initiate and terminate radio transmissions, make corrections, properly receipt for messages received, and request repetitions.
 - : maintain radio silence as directed.
 - : authenticate as directed.
 - : transmit in the clear only when specifically authorized.
 - : transmit identification of units or individuals only in code.
 - : initiate only essential information.
 - : memorize or record call signs, authentication systems, and coding systems, for reference prior to entering a radio net.
 - : know that authentication prevents the enemy from entering friendly radio nets.
 - : know that authentication systems and coding systems change frequently and that he must have current information to operate.
 - : use coding systems and authentication procedures as prescribed by SOI when operating communications equipment.

Sets AN/PRR-9 and AN/PRT-4 (cont)

3. THE LWI WILL DESTROY FRIENDLY COMMUNICATIONS EQUIPMENT WHEN CAPTURE IS IMMINENT.

He will: know that capture of operative communications equipment by the enemy facilitates interception of friendly messages and possible entry by the enemy into friendly nets.
: fire into, demolish with grenades, smash, or burn communications equipment to render it useless to the enemy.

PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF
THE LIGHT WEAPONS INFANTRYMAN ARMED WITH AN M-16
RIFLE, SEPARATE OR AS PART OF THE M-16/XM148

General Considerations

Introduction

The M-16 rifle is a primary element of the M-16/XM148 (SPIW) shoulder weapon that the LWI in the BIE will carry and fire in combat. The M-16 rifle independent of the XM148 is also a weapon of the BIE. All entries in this paper apply to the M-16 rifle as part of the SPIW, as well as separate.

Scope

These performances set forth the technical proficiency with which the LWI should handle the M-16 rifle, firing semiautomatically and automatically under all conditions of visibility. Closely related material is Observation, Combat Intelligence, and Reporting; Formations, Battle Drill (Plays), and Elementary Fire and Maneuver; Technique of Fire; Hand Grenades; Movement by Vehicle; Maintenance of Clothing and Equipment; Physical Conditioning Operating with Armor; Communication; Individual-to-Individual, by Radio, Voice, Visual, Touch, and Pyrotechnic Signals.

Materiel

M-16 rifle as part of the M-16/XM148: 20-round capacity magazine, magazine charger (five-round clip), magazine filler, and bandoleers.

M-16 rifle: Same.

Stimuli

Orders or signals from leaders.

Moving (some fleeting), and stationary, single- and multiple-located personnel targets, including airborne, irregularly spaced at ranges from 0 to 350 meters.

Suspected personnel positions.

Unarmored and lightly armored surface and air vehicles.

Rifle, M-16 separate and as part of the M-16/XM148(cont)

Performances, Knowledges, and Skills

1. AT RANGES FROM 0 TO APPROXIMATELY 35 METERS, THE LWI, UNDER EXTREME TIME PRESSURE, WILL ENGAGE SUDDENLY APPEARING CLOSE-IN TARGETS, SUCH AS STATIONARY, MOVING (SOME FLEETING), SINGLE- AND MULTIPLE-LOCATED PERSONNEL ON THE GROUND, AND SUSPECTED ENEMY POSITIONS, AND WILL TAKE PART IN ASSAULT FIRE. HE WILL COMMENCE AND TERMINATE FIRE AS DEMANDED BY THE SITUATION OR ON ORDER.

He will: fire while moving or stationary.
: fire from either the shoulder or underarm position.
: fire in a standing (crouched) position.
: sight or point at the center of seen or assumed mass.
: fire a rapid succession of single shots, or fire short bursts of automatic fire.
: reload quickly.

2. AT RANGES FROM 0 TO APPROXIMATELY 350 METERS, THE LWI, UNDER TIME PRESSURE VARYING FROM GREAT TO NONE, WILL ENGAGE TARGETS SUCH AS STATIONARY, MOVING (SOME FLEETING), SINGLE- AND MULTIPLE-LOCATED PERSONNEL ON THE GROUND OR IN THE AIR, AIR-CRAFT, AND VEHICLES, AND SUSPECTED ENEMY POSITIONS. HE WILL COMMENCE AND TERMINATE FIRE AS DEMANDED BY THE SITUATION OR ON ORDER.

- a. Time Pressure: Great to medium.
He will: fire while stationary in any position, or moving.
: fire supported or unsupported.
: fire with rifle at the shoulder or hip.
: use a pointing aim at close range; use sights at greater ranges.
: engage targets quickly.
: hold at the center of seen or assumed mass.
: fire single shots, or a rapid succession of single shots, or fire short bursts of automatic fire.
: reload quickly.
: adjust fire by watching bullet strikes or tracers
- b. Time Pressure: Medium to none.
He will: fire while stationary in any position.
: fire supported or unsupported.
: fire with rifle at the shoulder.
: use a deliberate aim.
: hold at the lowest point at which he can get a clear aiming point on the target,

Rifle, M-16 separate and as part of the M-16/XM148 (cont)

2. b. Continued.

- : aim at the center ^{except} of the torso, at a clearly visible target.
 - : fire single shots, a rapid succession of shots, or short bursts if automatic fire.
 - : reload quickly.
 - : adjust fire by watching bullet strikes or tracers.
- c. When enemy proximity, awareness, and exposure time permit, He will: assume a firing position (prone, squatting, kneeling, standing, or modifications thereof) that will maximize steady support for his weapon consistent with delivery of effective fire on selected targets.
- d. On order or in accordance with an SOP, He will: fire from ground transport in conjunction with other occupants of the vehicle at located enemy personnel.
- : fire from air transport in conjunction with other occupants of the transport at located enemy personnel on the ground.

3. DURING LOW VISIBILITY, AT RANGES FROM ZERO TO THE LIMITS OF VISIBILITY, THE LWI, UNDER TIME PRESSURE VARYING FROM GREAT TO NONE, WILL ENGAGE TARGETS SUCH AS STATIONARY, MOVING, SINGLE-OR MULTIPLE-LOCATED, OR SUSPECTED ENEMY PERSONNEL ON THE GROUND. HE WILL COMMENCE AND TERMINATE FIRE AS DEMANDED BY THE SITUATION OR ON ORDER.

- He will:
- : fire while stationary in any position, or moving.
 - : fire supported or unsupported.
 - : fire with rifle at the shoulder or underarm.
 - : use a pointing aim.
 - : hold on center or seen or assumed mass.
 - : fire single shots, or a rapid succession of single shots or short bursts of automatic fire.
 - : reload quickly.
 - : reload by feel during high and low visibility.
 - : when enemy proximity, awareness, and exposure time permit, assume a firing position (prone, squatting, kneeling, standing, or modifications thereof) that will maximize steady support for his weapon consistent with delivery of effective fire on selected targets.

Rifle, M-16 separate and as part of the M-16/XM148 (cont)

4. THE LWI WILL MAINTAIN HIS RIFLE IN AN OPERATIVE CONDITION, AND, CONSISTENT WITH SAFETY, WILL ALWAYS KEEP IT READY FOR INSTANT USE.

He will: know how to zero his rifle and keep it zeroed (battle sight).
: keep his ammunition and magazine clean and dry.
: keep his rifle in his possession and keep it fully loaded and locked when not firing (when in a combat situation).
: keep the bore and chamber clean and dry, and remove any foreign matter before firing.
: keep moving parts clean and lubricated correctly.
: disassemble the rifle for cleaning and lubrication, and reassemble it.
: apply immediate action when necessary.

5. FOR PERFORMANCE, SKILLS, AND KNOWLEDGES REQUIRED IN CONJUNCTION WITH THE GRENADE LAUNCHER, CHARACTERISTIC OF THE M-16/XM148. SEE PAR 3, INCL 4: PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE LWI ARMED WITH THE GRENADE LAUNCHER AS PART OF THE M-16/XM148.

PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED
OF THE LIGHT WEAPONS INFANTRYMAN ARMED WITH
THE GRENADE LAUNCHER AS PART OF THE M16/XM148

General Considerations

Introduction

The grenade launcher of the M-16/XM148 overlaps (for the "shotgun" round only) and extends the hand grenade capability of the BIE to approximately 375 meters. The grenade launcher will be used against enemy personnel and materiel, both offensively and defensively, as a direct fire weapon. It provides the BIE with a suppression fire weapon to take over after the artillery has lifted.

Scope

This paper outlines the technical proficiency demanded of the Light Weapons Infantryman (LWI) to load, aim and fire, and maintain the grenade launcher in the field. Closely related are Cover; Concealment and Camouflage; Observation, Combat Intelligence, and Reporting; Formations, Battle Drill (Plays), and Elementary Fire and Maneuver; Communications: Individual-to-Individual by Radio, Visual, Auditory, Touch, and Pyrotechnic Signals; Technique of Fire; Emplacements, Shelters, Obstacles, and Fields of Fire; Maintenance of Equipment; Physical Conditioning; Hand Grenades; Rifles, M-16; Pistol, Automatic Cal. 45; and Operating with Armor.

Materiel

Grenade launcher, XM148 (attached to the M-16 rifle).

HE fragmentation grenades, 40 mm; and "shotgun" round.

Bandoleers of ammunition.

Stimuli

Orders or signals from leaders.

Located single or multiple enemy personnel, stationary or moving within range, including personnel in defilade or partial cover.

Located open weapons and personnel emplacements.

Openings in fortifications (bunkers), trenches, and buildings.

Open, unarmored vehicles and vulnerable materiel.

Grenade Launcher as part of the M16/XM148 (cont)

Performances, Knowledges, and Skills

1. AT RANGES FROM APPROXIMATELY 0 TO 375 METERS, THE LWI WILL ENGAGE LOCATED ENEMY TARGETS SUCH AS SINGLE OR MULTIPLE PERSONNEL IN THE OPEN OR IN DEFILADE; OPENINGS IN DUGOUTS, BUNKERS, AND BUILDINGS; UNARMED VEHICLES; AND VULNERABLE MATERIEL. HE WILL FIRE ON ORDER OR AS DEMANDED BY THE SITUATION.

- He will:
- : know the effective bursting area of the HE grenade, and killing range and cone of "shotgun" round.
 - : know the arming distance of the HE grenade.
 - : estimate range accurately to within the effective bursting area of the HE grenade at ranges from 0 to 375 meters; and to killing range of the "shotgun" round.
 - : use the "shotgun" round when enemy proximity will result in injury to the LWI from his own HE grenade fragments or within arming distance of the HE round.
 - : use the sights to engage targets at estimated ranges from 30 meters to at least 375 meters for the HE round; use pointing aim at close range and/or under extreme time pressure for the "shotgun" round, from 0 to effective range.
 - : aim at center of seen or assumed mass.
 - : zero the grenade launcher.
 - : use brush, walls, terrain irregularities, etc., to obtain detonation within lethal proximity of located enemy who are partially covered or in defilade.
 - : know his own capabilities and limitations with respect to the firing techniques he must use to deliver effective fire at various ranges with varying degrees of enemy exposure, movement, awareness and reaction to the LWI's fire.
 - : prior to firing, select a position so that no objects will mask his fire and cause premature detonation.
 - : fire from positions ranging from prone through standing, using support within the limits of availability and time pressure.
 - : sense each burst and determine the required adjustment for range and deflection.
 - : adjust the range on the basis of sensed burst when large errors exist.
 - : use field expedients or a modified sight for delivery of prearranged fire during limited visibility.

Grenade Launcher as part of the M16/XM148 (cont)

1. Continued

- : reload quickly by feel, while maintaining visual search for or marking located targets or bursts.
- : not fire the grenade launcher and rifle at the same time.

2. THE LWI WILL MAINTAIN HIS GRENADE LAUNCHER IN AN OPERATIVE CONDITION, AND, CONSISTENT WITH SAFETY, WILL ALWAYS KEEP IT READY FOR INSTANT USE.

- He will:
- keep the sight slide in the battle-sight position until ready to engage targets at ranges beyond battle-sight limitations.
 - keep the launcher on SAFE (when loaded and unloaded) until ready to fire.
 - keep the inside and outside of the barrel and receiver cleaned and oiled as prescribed.
 - keep the ammunition clean and protect it from physical damage, such as crushing, soaking, and exposure to excessive heat.
 - perform immediate action to keep both the grenade launcher and rifle in action.

3. ON HIS OWN INITIATIVE (IF NOT DIRECTED BY HIS LEADER) THE LWI ARMED WITH THE M16/XM148 WILL DECIDE FOR EACH ENEMY TARGET WHETHER TO ENGAGE IT WITH HIS RIFLE OR HIS GRENADE LAUNCHER, MAKING SUCCESSIVE DECISIONS AS THE CHARACTERISTICS, ENVIRONMENT AND PROXIMITY OF THE TARGET CHANGE.

- He will:
- weigh the quantity and characteristics of all types of ammunition available to him, choosing the appropriate type for the target presented.
 - generally engage multiple personnel in the open or in defilade; openings in dugouts, bunkers and buildings; unarmored vehicles and vulnerable materiel with the HE grenade.
 - generally use the "shotgun round" on close in multiple personnel.
 - generally engage single enemy targets, suspected single enemy targets, and all targets NOT suitable for the grenade launcher with the rifle.
 - in border-line decisions he will favor use of the rifle, in order to conserve his limited supply of 40mm ammunition.

4. SEE ALSO INCL. 3