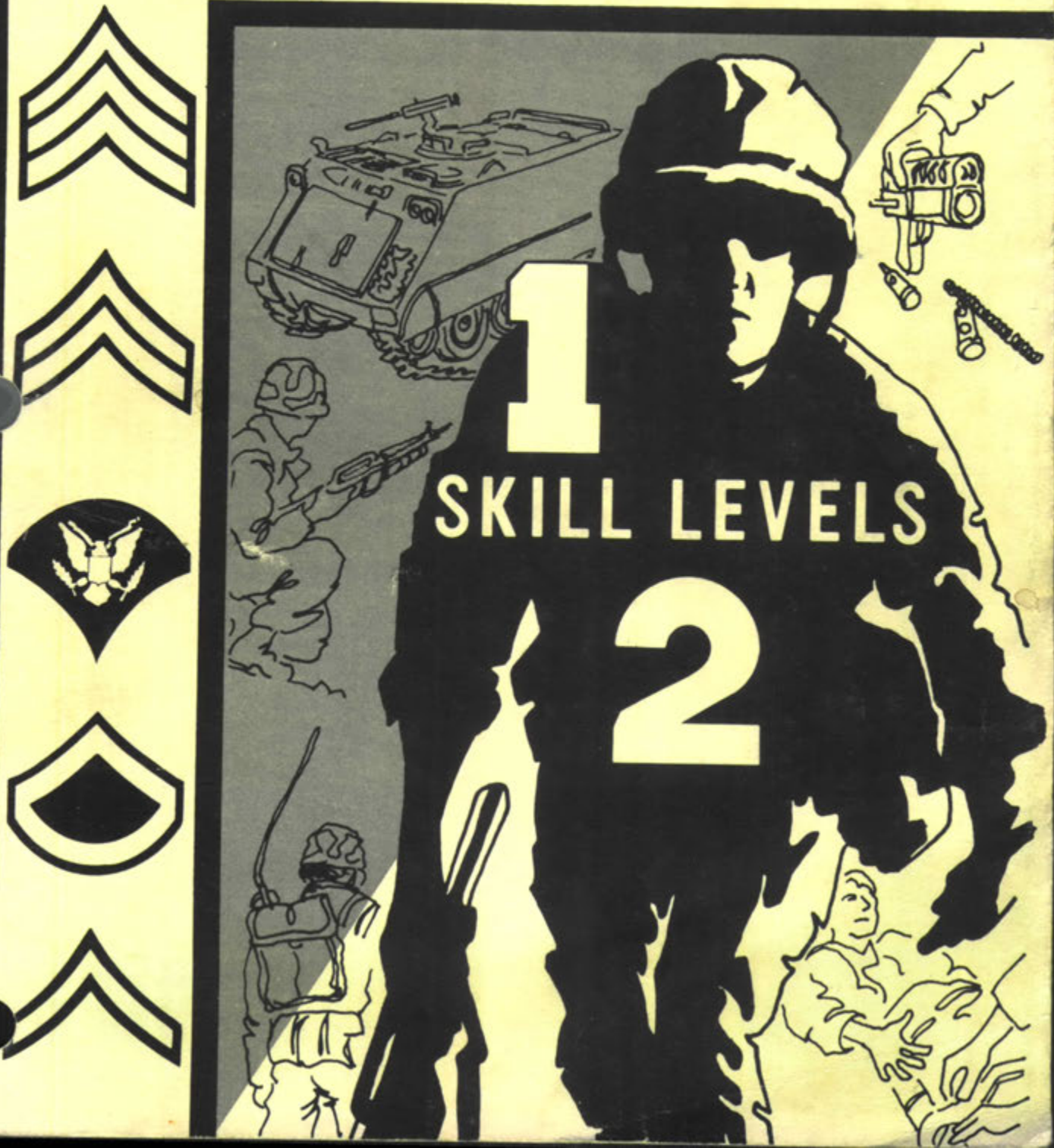
HEADQUARTERS
DEPARTMENT OF THE ARMY

FM 7-11B1/2

obsolete

SOLDIER'S MANUAL

11B10 - INFANTRYMAN - 11B20



COMMANDER'S ATTENTION

Distribute this manual to each soldier in MOS 11B Skill Levels 1-5.

This Soldier's Manual is designed to tell the soldier what tasks he must be proficient in to be MOS qualified. If the soldier follows the road map it provides, he should progress readily to positions of responsibility commensurate with his aptitude and motivation.

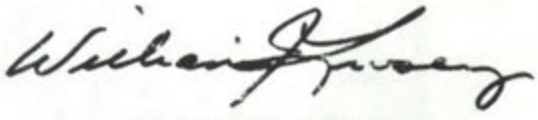
Initial distribution of Soldier's Manuals will be "pushed" down to the unit level, based upon assigned strength in the particular MOS and skill level. If additional manuals are needed by the unit for MOS study, libraries, or other training needs, requests for publications may be sent directly to the US Army Publications Center, 2800 Eastern Boulevard, Baltimore, Maryland 21220.

Soldier's Manuals are designed on the modular system. Each skill level manual builds upon another. As an example, a skill level 3 soldier needs manuals 1 through 4. Levels 1 through 3 tell the level 3 soldier what he needs to know for proficiency at his present skill level. The skill level 4 manual tells him what he must be able to do at the next skill level. The point is - he needs all four manuals to know all he needs to know.

The individual soldier is responsible for retaining and maintaining his manual. Upon promotion to grades E5, E6, E7, or E8, the soldier must order his next higher level manual directly from the preparing agency.

To comply with guidance of the Assistant Secretary of Defense (Manpower and Reserve Affairs), this Soldier's Manual has been reviewed for the use of neuter language. Unless otherwise noted, the third person singular "he" stands for both masculine and feminine genders.

This Soldier's Manual was prepared by the US Army Infantry School.



WILLIAM J. LIVSEY
Major General, USA
Commandant

RESERVE COMPONENT COMMANDER

ARMY NATIONAL GUARD ARMY RESERVE

The information on this page is for you, the Reserve/Guard component commander. Although this manual lists the critical tasks to be performed by the Active Army soldiers in their MOS on equipment available in the Active Army inventory, most tasks in this manual are applicable to reservists/guardsmen without changes. However, some tasks may require modification because of differences in equipment, facilities, and training time available. Because of these differences, you, as a Reserve/Guard component commander, will need to be innovative and seek ways to enable your soldiers to accomplish their critical tasks.

This manual has not undergone the review process necessary to make it completely applicable to Reserve/Guard components. However, some Reserve/Guard component tasks have been identified. In the meantime, Reserve/Guard components will be using the manual prepared for their Active Army counterpart. As necessary, change sheets will be published and distributed to your unit.

Many tasks learned in basic combat training and advanced individual training are in this manual. There are other critical tasks that your reservists/guardsmen must learn on their own. Study materials have been prepared and can be ordered from the proponent agency. Your job is to make sure that the necessary study materials are available in your unit training center.

NOTICE TO RESERVE COMPONENTS

This manual will not be effective for the Army National Guard and the Army Reserve until **after** the 1979 SQT. **Do not** (repeat **do not**) destroy FM 7-11B1, dated 14 May 1976 and FM 7-11B2, dated 14 May 1976. Your SQT in 1979 will be based on FM 7-11B1, dated 14 May 1976 and FM 7-11B2, dated 14 May 1976.

Field Manual
No. 7-11B1/2

*FM 7-11B1/2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 7 July 1978

SOLDIER'S MANUAL 11B
INFANTRYMAN SKILL LEVEL 1/2

Contents

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*This Field Manual supersedes FM 7-11B1 and FM 7-11B2, dated 14 May 1978.

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WEAPONS

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HAND GRENADES, MINES, AND DEMOLITIONS

SECTION V

TACTICAL VEHICLES

SECTION VI

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CHAPTER 1

LIGHT WEAPONS INFANTRYMAN

SECTION I
SKILL LEVEL ONE INTRODUCTION AND ROAD MAP

WHAT IS A SOLDIER'S MANUAL?

PERFORMANCE COUNTS

IN COMBAT, PERFORMANCE COUNTS. The job of an Infantryman in combat isn't easy. In fact, it's one of the hardest jobs you'll ever learn. You must have confidence, ability, and conditioning to be an Infantryman - a professional in the combat arms!

DO YOU KNOW YOUR JOB? Everyone likes to think he knows how to do his job. But those who think they know and those who really know are not always the same. First, you have to know what **TASKS** you are expected to do as an Infantryman in combat. Then you need to know the battlefield **CONDITIONS** under which you are going to do those tasks and how well (**STANDARDS**) you must be able to do them. This manual tells you that. You can use it to find out if you **really** know your job.

BEING A PROFESSIONAL. The Soldier's Manual tells you those tasks you **must** be able to do to be a winner and stay alive in combat. They are called **COMBAT TASKS** - the most important part of an Infantryman's job. In combat, lives will depend on your ability to do them, so learn them well! You should already be able to do many of the tasks in this manual. Some were taught in basic or advanced individual training; others may have been recently taught in unit training. It really doesn't matter when or where you first learned a task. The important thing is:

CAN YOU DO IT NOW?

HOW TO USE THE SOLDIER'S MANUAL

1. To understand how to use your Soldier's Manual, it is first necessary to know a few terms used in your Soldier's Manual. These terms are listed below:

a. **Common Skill Level Task.** A task performed by every soldier in a specified skill level of a specified MOS.

b. **Critical Task.** A task needed to accomplish a mission or do a job and survive on the battlefield.

c. **Duty Position.** The same as job, a major subdivision of skill level. It is further divided into (or composed of) tasks. Thus, MOS 11B may be divided into five skill levels. The five skill levels may be further divided into 27 duty positions (jobs), each of which consists of many tasks.

d. **Duty Position Task.** A task identified with, and related to, a particular duty position (job) at a given skill level within a specified MOS.

e. **GO/NO GO.** This is a pass-fail measure whereby the soldier (student) cannot be partially correct. He either meets the standard or he does not meet the standard.

f. **Job.** The tasks performed by a soldier constitute his job. If identical tasks are performed by several soldiers, they all hold the same job. Job is the same as duty position. An MOS is composed of skill levels, and skill levels are composed of jobs, also called duty positions. Thus, an MOS **11B soldier** is called an **Infantryman** but his job may be **machinegunner** or **radiotelephone operator.**

g. **Military Occupational Specialty (MOS).** A term used to identify a grouping of duty positions having such close relationship that they are interchangeable among soldiers so classified at any skill level.

HOW TO USE THE SOLDIER'S MANUAL

h. **Performance Measure.** Those steps or behavior that the student or scorer observes to determine if the task is being or has been performed correctly.

i. **Task.** An act or series of acts by an individual to produce a product or achieve a certain result. It is the lowest level of behavior in a job that describes the performance of a meaningful function in a job. A task has an intermediate action that can be specifically stated in terms of behaviorable activities. Tasks vary in complexity. The definition is imprecise and what appears to be a very simple task may be treated more meaningfully as part of a larger task. Conversely, what appears to be a complex task may be meaningfully broken into two or more component tasks. A group of tasks go together to form a job or duty position.

j. **Qualification Training.** Introductory training, usually entry level training, given an untrained soldier that results in the soldier performing a specified task to Soldier's Manual standards.

k. **Additional Training.** Refresher or advanced training given to a previously trained soldier that results in the soldier regaining or improving Soldier's Manual task standard proficiency.

l. **Page Color.** The pages in the manual that are used by the skill level 1 soldier are printed on white paper; skill level 2 on yellow; skill level 3 on green; skill level 4 on salmon; and skill level 5 on blue.

HOW TO USE THE SOLDIER'S MANUAL

COMMON SKILL LEVEL 1 TASKS

2. The Soldier's Manual for Skill Level 1 soldiers (grades E1-E4) contains common combat tasks that **all** 11B10 Infantrymen must be able to perform. These tasks are listed on the Road Map for Skill Level 1 in chapter 1, under "COMMON TASKS FOR ALL SKILL LEVEL 1 INFANTRYMEN." The Road Map will tell you the page on which each task can be found.

DUTY POSITION TASKS

3. Your duty position may require you to be able to do some add-on tasks. The table below lists the duty positions which require add-on tasks and the number of add-on tasks required. A list of tasks for each duty position and the page on which each task can be found is listed on the Road Map for Skill Level 1 under "DUTY POSITION TASKS."

DUTY POSITION	NUMBER OF TASKS
HAW Crewman (TOW)	10
(RC) HAW Crewman (106-mm RCLR)	12
Squad Gunner	7
Scout	19
Wheeled-Vehicle Driver	8
Tracked-Vehicle Driver	9
(RC) MAW Crewman (90-mm RCLR)	6
MAW Crewman (Dragon)	8
Radiotelephone Operator	17
M60 Machinegunner	10
M203 Grenadier	5

TASK SUMMARY

4. For each task in this manual, there is a **task summary** which has two parts: **a training objective and training guidance.**

a. Training Objective. The training objective is written in three parts: TASK, CONDITIONS, and STANDARDS.

(1) The **TASK** states **what** you must be able to do.

TASK

ENGAGE ENEMY TARGETS WITH YOUR M16.

(2) The **CONDITIONS** state the **situation** in which you must be able to do it. All the TASKS in the Soldier's Manual are to be performed in combat uniform, wearing your load-bearing equipment and protective mask, and carrying your assigned weapon, unless the conditions note otherwise.

CONDITIONS

FROM THIS FIGHTING POSITION.

(3) The **STANDARD** states **how well** you must be able to do it.

STANDARDS

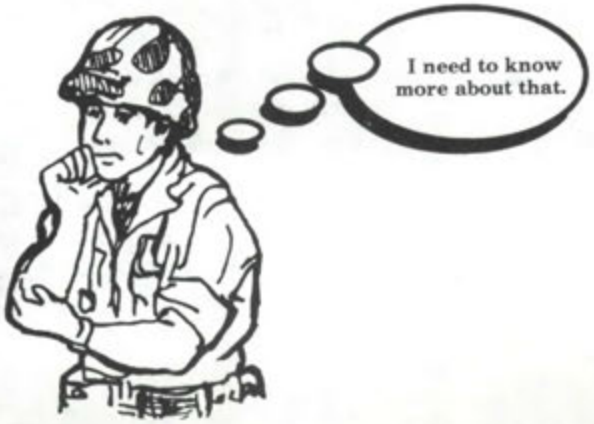
AND DON'T LET ANYONE COME UP THAT TRAIL.

b. Training Guidance. Training guidance may have three parts: a step-by-step explanation (performance measures), training tips, and/or training references.

(1) The **performance measures** provide a good **(not always the only)** method of performing the task.

(2) The **training tips** provide guidance on how to train to perform the task.

(3) The **training references** direct you to the publications or training extension course (TEC) lessons which cover the subject in detail. These references may be updated from time to time. Your supervisor will provide you with the latest changes so you can keep your manual straight.



EPMS

1. Enlisted personnel have a complete career development system called the **Enlisted Personnel Management System (EPMS).** It will affect the training, evaluation, classification, assignment, and promotion of every enlisted soldier in the Army. The system is designed to provide career incentive, progression, and professionalism, while at the same time providing the right number of qualified people to carry out the Army's missions. There are five skill levels that correspond to a soldier's progression in grade. A Soldier's Manual has been developed for each of the skill levels identified below that contains those critical combat tasks that the soldier must be able to perform:

Grade	Skill Level	
E-1, 2, 3, & 4	Skill Level 1	Combined
E5	Skill Level 2	
E-6	Skill Level 3	
E-7	Skill Level 4	
E-8 & 9	Skill Level 5	

2. Under EPMS, the soldier will be evaluated, then classified, and finally promoted to the next higher grade. This is a significant change from the past when a soldier was first promoted, then classified into a higher skill level, and then evaluated. The Army, in adopting EPMS, assures soldiers better opportunity for attaining and maintaining proficiency through improved training programs -- plus providing usable products -- Soldier's Manuals, Commander's Manuals, and Job Books -- to be used to train and evaluate soldier job performance.

CAREER PROGRESSION UNDER EPMS

HOW TO MAKE SERGEANT E5

The Army will only promote men who have proved that they can do the job. In other words, you must show that you can do the tasks required of a sergeant before you can be considered for promotion to that grade. Here's how the system works:

1. LEARN THE TASKS IN THIS MANUAL that apply to you. As soon as you have done that, BEGIN LEARNING THE COMMON TASKS FOR SKILL LEVEL 2 in the manual. There will not be as many as you might think since many of the skills that you learned for Skill Level 1 will also be in the Skill Level 2 manual. Use the Skill Level 2 Road Map to determine which common tasks you need to learn.

2. A Skill Qualification Test (SQT) has been developed to replace each MOS test.

a. The goal of each SQT is to provide an equitable, reliable, and relevant means of determining the job proficiency of enlisted soldiers. It covers both the present and the next higher skill levels of the soldiers and is numbered to show the next higher skill level. For example, soldiers holding skill level (SL) 1 take SQT 2, which includes critical tasks from SL1 as well as critical tasks from SL2. Under the old "MOS Test" the soldier was likely to be tested on the entire MOS. In the SQT, the soldier is tested only on critical tasks listed in the Soldier's Manual. The SQT sets Army-wide standards for all soldiers in **MOS 11B.**

b. The basic feature of the SQT is that it is task-oriented. The SQT is based upon a thorough job and task analysis which identifies and rigorously defines the critical tasks of an MOS. The SQT samples this domain of critical tasks. All questions and problems in the SQT must bear directly on an individual's ability to perform the specified tasks. For example, an item on the SQT could require soldiers to show that they know how to achieve a correct sight picture for a weapon because that knowledge is required to fire the weapon effectively. **Knowledge of chamber pressure or muzzle velocity is not essential in firing the weapon effectively and will not be tested on the SQT.**

3. As an E4, you will TAKE AN SQT. The SQT will test your ability to do the tasks in the Soldier's Manual. If you make a high enough score on the test, you will be given the Skill Level 2 rating which you must have before you are promoted to E5. Since the SQT will use the same conditions and standards used in the Soldier's Manual, you will be able to prepare in advance for the SQT.

4. The SQT has three parts: written, hands-on, and performance certification. Sixty to ninety days before the SQT is given, an SQT notice will be sent to each unit. It will tell which tasks will be tested in each part of the SQT. It will also tell how the task will be tested. There are three different ways to test a task. First, you may be asked to answer a **written question** about how a task is performed. You will pick the correct answer from a list of answers and mark the correct answer on a machine-scoreable answer sheet. Second, you may be asked to actually do the task. For example, you may be given an M72A2 LAW and be asked to prepare it for firing. This is called a **hands-on test** which means you are actually required to do the task as you would on the job. Third, your unit commander may observe your performance of a task and report your ability to perform it as part of your SQT score. Your performance on all three parts of the test will be reported to you sometime soon after you complete the SQT. You will be told on which tasks you did not perform well. You can use your Soldier's Manual to improve your performance in those areas.

5. Also while you are an E4, you will ATTEND THE PRIMARY NONCOMMISSIONED OFFICER'S COURSE (**PNCOC**). In this course, you will build on the skills you developed during unit training and gain leadership experience to help you perform more effectively.

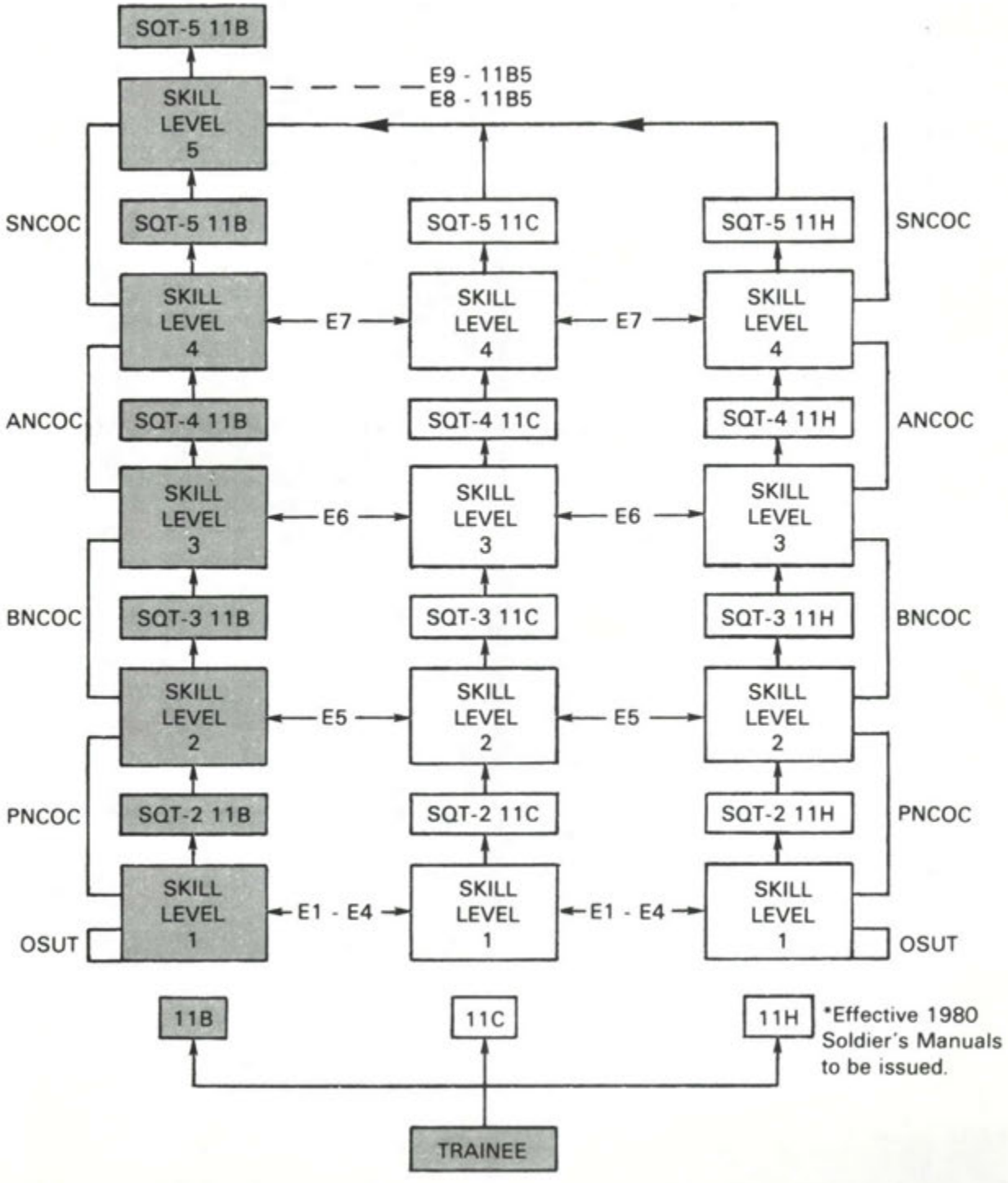
6. In addition to the SQT, you will RECEIVE AN ENLISTED EFFICIENCY REPORT (**EER**). In the EER, your supervisor will give his opinion of your performance on the job. Both the SQT and the EER will be used to determine your final evaluation score.

7. If you don't understand any parts of the manual or want to know more about advancement opportunities, see your squad leader. Take advantage of his knowledge and experience.

8. At the top of your enlisted chain of command is your sergeant major. He is an expert in helping younger soldiers learn about training, evaluation, and the system for getting ahead in the Army. As such, he is responsible for insuring that your NCOs either provide the assistance you need or refer you to him for his guidance and help.

9. The Army wants and needs well-trained soldiers who desire to advance through the ranks. This manual and the willing assistance of senior NCOs are the tools you can use to your advantage and the Army's.

THE INFANTRYMAN'S CAREER PROGRESSION UNDER EPMS



A NOTE TO TRAINERS

Skills not practiced are soon lost. Football teams have pre-season practice each year to retrain players who have lost skills during the off-season. A football coach plans and conducts practice depending on how well his players can perform basic skills such as blocking, running, and tackling. The same method is used by unit trainers. Your unit training program should be based on how well your soldiers can perform the combat tasks contained in Soldier's Manuals. After you determine the proficiency level of your soldiers, train them in the areas of poor performance first. As a leader and trainer you must be able to perform all tasks required of soldiers in skill levels lower than your own. Using your knowledge and the process described in chapter 3 of **FM 21-6, How to Prepare and Conduct Military Training,** you have to get your team trained to win in combat. Every other year, the soldiers in your unit will be required to take an SQT to evaluate their ability to perform in combat. The evaluation score that the soldier receives on the test will in part determine his eligibility for promotion, reenlistment, schools, and future assignments. Indirectly, this test also measures your success as a trainer in preparing your soldiers for combat.

ROAD MAP
FOR
LIGHT WEAPONS INFANTRYMAN SKILL LEVEL 1

COMMON TASKS FOR ALL SKILL LEVEL 1 INFANTRYMEN

BATTLEFIELD SURVIVAL

NUCLEAR, BIOLOGICAL, AND CHEMICAL

ALL TASKS MARKED WITH (RC) APPLY ONLY TO THE US ARMY RESERVE AND NATIONAL GUARD.

(NUCLEAR, BIOLOGICAL, AND CHEMICAL, CONTINUED)

HAND GRENADES, MINES, AND DEMOLITIONS

HAND GRENADES

MINES

DUTY POSITION TASKS - SKILL LEVEL 1

TOW CREWMAN (HAW)

(SCOUT - LIGHT INFANTRY ONLY, CONTINUED)

M203 GRENADIER

(RADIOTELEPHONE OPERATOR, CONTINUED)

(WHEELED VEHICLE DRIVER, CONTINUED)

CHAPTER 1

LIGHT WEAPONS INFANTRYMAN

SECTION II
SKILL LEVEL TWO
INTRODUCTION AND ROAD MAP

HOW TO USE THE SOLDIER'S MANUAL FOR SKILL LEVEL 2

Refer to the introduction to Skill Level 1, pages 1-I-A-1 thru 1-I-A-5, for an explanation of what is a Soldier's Manual. Refer to pages 1-I-A-7 thru 1-I-A-9 for an explanation of a task summary.

COMMON SKILL LEVEL 2 TASKS

The Soldier's Manual for Skill Level 2 soldiers (grade E5) contains basic combat tasks that all 11B20 Infantrymen must be able to perform. These tasks are listed on the Road Map for Skill Level 2 in chapter 1, under "COMMON SKILL LEVEL 2 TASKS." The Road Map will tell you the page on which each task can be found.

DUTY POSITION TASKS

Your duty position may require you to be able to do some add-on tasks. The table below lists the duty positions which require add-on tasks and the number of add-on tasks required. A list of tasks for each duty position and the page on which each task can be found are listed on the Road Map for Skill Level 2 under "DUTY POSITION TASKS."

DUTY POSITION	NUMBER OF TASKS
HAW Squad Leader (TOW)	9
HAW Squad Leader (106-mm RCLR)	10
Fire Team Leader (Mechanized units only)	7
Fire Team Leader (Mechanized and Light Infantry) or Assistant Scout Squad Leader (Light Infantry)	23

HOW TO MAKE SERGEANT E6

The Army will only promote men who have proved that they can do the job. In other words, you must show that you can do the tasks required of a staff sergeant before you can be considered for promotion to that grade. Here is how the system works:

1. LEARN THE TASKS IN THIS MANUAL that apply to you. As soon as you have done that, ask for a copy of the 11B30 Soldier's Manual **(for Skill Level 3).**

2. Then LEARN THE COMMON TASKS IN THE SKILL LEVEL 3 MANUAL. There will not be as many as you might think since many of the skills that you learned for Skill Level 2 will also be in the Skill Level 3 manual.

3. As an E5, you will TAKE A SKILL QUALIFICATION TEST (SQT). The SQT will test your ability to do the tasks in the Soldier's Manual. If you pass the test, you will be given the Skill Level 3 rating which you must have before you are promoted to E6. Since the SQT will use the same conditions and standards used in the Soldier's Manual, you will be able to prepare in advance for the SQT.

4. The SQT has three parts: written, hands-on, and performance certification. Sixty to ninety days before the SQT is given, an SQT notice will be sent to each unit. It will tell which tasks will be tested in each part of the SQT. It will also tell how the task will be tested. There are three different ways to test a task. First, you may be asked to answer a **written question** about how a task is performed. You will pick the correct answer from a list of answers and mark the correct answer on a machine-scoreable answer sheet. Second, you may be asked to actually do the task. For example, you may be given an M72A2 LAW and be asked to prepare it for firing. This is called a **hands-on test** which means you are actually required to do the task as you would on the job. Third, your unit commander may observe your performance of a task and report your ability to perform it as part of your SQT score. Your performance on all three parts of the test will be reported to you sometime after you complete the SQT. You will be told which tasks you did not perform well. You can use your Soldier's Manual to improve your performance in those areas.

5. Also while you are an E5, you will ATTEND THE BASIC NONCOMMISSIONED OFFICER'S COURSE (**BNCOC**). In this course, you will build on the skills you developed during unit training and gain leadership experience to help you perform more effectively.

6. In addition to the SQT, you will RECEIVE AN ENLISTED EFFICIENCY REPORT (**EER**). In the EER, your supervisor will give his opinion of your performance on the job. Both the SQT and the EER will be used to determine your final evaluation score.

7. If you don't understand any parts of the manual or want to know more about advancement opportunities, see your squad leader. Take advantage of his knowledge and experience.

8. At the top of your enlisted chain of command is your sergeant major. He is an expert in helping younger soldiers learn about training, evaluation, and the system for getting ahead in the Army. As such, he is responsible for insuring that your NCOs either provide the assistance you need or refer you to him for his guidance and help.

9. The Army wants and needs well-trained soldiers who desire to advance through the ranks. This manual and the willing assistance of senior NCOs are the tools you can use to your advantage and the Army's.

ROAD MAP
FOR
LIGHT WEAPONS INFANTRY SKILL LEVEL 2

COMMON TASKS FOR ALL SKILL LEVEL 2 INFANTRYMEN

NOTE:

1. TASKS MARKED (SL 1) WERE SKILL LEVEL 1 SOLDIERS' TASKS AND ARE NOW YOUR RESPONSIBILITY.

2. ▒▒▒▒ TASKS MARKED IN THIS MANNER ARE YOUR NEW SKILL LEVEL 2 TASKS.

BATTLEFIELD SURVIVAL

FIRST AID

TASK NUMBER		SL	PAGE
	Introduction to first aid.	1	2-I-A-1.1
081-831-1004	Perform mouth-to-mouth resuscitation and external heart massage.	1	2-I-A-2.1
081-831-1005	Stop bleeding (arm or leg).	1	2-I-A-3.1
081-831-1006	Identify signs of and treat for shock.	1	2-I-A-4.1
081-831-1007	Splint a fracture.	1	2-I-A-5.1
081-831-1008	Apply first aid measures for burns.	1	2-I-A-6.1
081-831-1010	Apply first aid for sun or heat injuries.	1	2-I-A-7.1
081-831-1011	Apply first aid for wet or cold injuries.	1	2-I-A-8.1

NUCLEAR, BIOLOGICAL, AND CHEMICAL

092-503-1001	Perform operator's maintenance on an M17 series protective mask.	1	2-I-B-1.1
092-503-1010	Exchange filters on an M17 series protective mask.	1	2-I-B-2.1
092-503-1002	Put on and wear a protective mask.	1	2-I-B-3.1
092-503-1015	Put on and wear protective clothing.	1	2-I-B-4.1
092-503-1007	Decontaminate self.	1	2-I-B-5.1
092-503-1008	Decontaminate individual equipment.	1	2-I-B-6.1

ALL TASKS MARKED WITH (RC) APPLY ONLY TO THE US ARMY RESERVE AND NATIONAL GUARD.

(NUCLEAR, BIOLOGICAL, AND CHEMICAL, CONTINUED)

(BASIC INDIVIDUAL TECHNIQUES, CONTINUED)

(LAND NAVIGATION, CONTINUED)

TASK NUMBER		SL	PAGE
071-329-1004	Determine the elevation of a point on the ground using a map.	2	2-II-E-10.1
071-329-1011	Orient a map using a compass.	2	2-II-E-11.1
071-329-1005	Determine a location on the ground by terrain association.	2	2-II-E-12.1
071-329-1012	Orient a map to the ground by map-terrain association.	2	2-II-E-13.1

NIGHT VISION DEVICES

071-315-2301	Perform operator maintenance on an AN/PVS-2.	1	2-II-F-1.1
071-315-2302	Conduct surveillance using an AN/PVS-2.	1	2-II-F-2.1

WEAPONS

M16A1 RIFLE

	Introduction -- M16A1 Rifle.		2-III-A.1
071-311-2001	Perform operator maintenance on an M16A1 rifle, magazine, and ammunition.	1	2-III-A-1.1
071-311-2003	Load, reduce a stoppage, and clear an M16A1 rifle.	1	2-III-A-2.1
071-311-2004	Battlesight zero an M16A1 rifle.	1	2-III-A-3.1
071-311-2007	Qualify with the M16A1 rifle.	1	2-III-A-4.1
071-311-2006	Use limited visibility firing techniques with the M16A1 rifle.	1	2-III-A-5.1
071-311-2303	Mount/dismount AN/PVS-2 on M16A1 rifle.	1	2-III-A-6.1
071-311-2304	Zero AN/PVS-2 when mounted on M16A1 rifle.	1	2-III-A-7.1
071-311-2305	Engage a target with a rifle using AN/PVS-2.	1	2-III-A-8.1

M203 GRENADE LAUNCHER

071-311-2101	Perform operator maintenance on M203 grenade launcher and ammunition.	1	2-III-B-1.1
071-311-2102	Load, unload, and clear the M203 grenade launcher.	1	2-III-B-2.1
071-311-2103	Zero an M203 grenade launcher.	1	2-III-B-3.1

(M203 GRENADE LAUNCHER, CONTINUED)

TASK NUMBER		SL	PAGE
071-311-2104	Engage targets with an M203 grenade launcher and apply immediate action to reduce a stoppage.	1	2-III-B-4.1
071-311-2105	Use limited visibility firing technique with the M203 grenade launcher.	1	2-III-B-5.1

LIGHT ANTITANK WEAPON (LAW)

071-318-2201	Prepare an M72A2 LAW for firing; restore M72A2 LAW to carrying configuration.	1	2-III-C-1.1
071-318-2202	Engage targets with an M72A2 LAW.	1	2-III-C-2.1
071-318-2203	Apply immediate action to correct a malfunction on an M72A2 LAW.	1	2-III-C-3.1

CALIBER .45 PISTOL

191-376-0105	Maintain a caliber .45 pistol.	1	2-III-D-1.1
191-376-0104	Engage targets with a caliber .45 pistol.	1	2-III-D-2.1

M60 MACHINEGUN

071-312-3001	Operate an M60 machinegun.	1	2-III-E-2.1
071-312-3002	Fire the M60 machinegun for familiarization.	1	2-III-E-3.1
071-312-3004	Construct an M60 machinegun position.	1	2-III-E-4.1
071-312-3003	Lay M60 machinegun using field expedients.	1	2-III-E-5.1

90-MM RECOILLESS RIFLE (RC)

071-319-3151 (RC)	Perform operator maintenance on a 90-mm RCLR.	1	2-III-G-1.1
071-319-3152 (RC)	Boresight the 90-mm RCLR.	1	2-III-G-2.1
071-319-3153 (RC)	Load, unload, and clear 90-mm RCLR.	1	2-III-G-3.1
071-317-0000	Prepare an antiarmor range card (90-mm RCLR).	1	2-III-H-5.1
071-319-3155 (RC)	Engage targets with 90-mm RCLR.	1	2-III-G-4.1
071-317-3307	Construct a fighting position (Dragon/90-mm RCLR).	1	2-III-H-7.1

HAND GRENADES, MINES, AND DEMOLITIONS

HAND GRENADES

MINES

TASK NUMBER	(MINES, CONTINUED)	SL	PAGE
051-192-2026	Direct a minefield marking party.	2	2-IV-B-12

TACTICAL VEHICLES

WHEELED VEHICLE

071-333-6001	Drive a wheeled vehicle cross-country.	1	2-V-A-1.1
071-333-6002	Drive a wheeled vehicle on roads, in vehicle parks, and in built-up areas.	1	2-V-A-2.1
071-333-6003	Drive a wheeled vehicle using blackout drive.	1	2-V-A-3.1
071-333-6004	Start a wheeled-vehicle engine using auxiliary power (M151, M715, and M561).	1	2-V-A-4.1
071-333-6005	Perform an ESC (equipment serviceability criteria) inspection on a wheeled vehicle (M151, M715, and M561).	1	2-V-A-5.1
071-333-6006	Maintain required TAMMS records on a wheeled vehicle (M151, M715, and M561).	1	2-V-A-6.1
071-333-6007	Perform operator maintenance on a wheeled vehicle.	1	2-V-A-7.1
071-333-6008	Recover a wheeled vehicle.	1	2-V-A-8.1

TRACKED VEHICLES (MECHANIZED UNITS ONLY)

071-333-6501	Drive an APC cross-country.	1	2-V-B-1.1
071-333-6502	Drive an APC on roads, in vehicle parks, and in built-up areas.	1	2-V-B-2.1
071-333-6503	Drive an APC with night vision devices, infrared equipment, and blackout drive.	1	2-V-B-3.1
071-333-6504	Operate an APC in water.	1	2-V-B-4.1
071-333-6505	Start the APC engine using auxiliary power.	1	2-V-B-5.1
071-333-6506	Perform a tracked-vehicle ESC (equipment serviceability criteria) inspection.	1	2-V-B-6.1
071-333-6507	Maintain required TAMMS records on a tracked vehicle.	1	2-V-B-7.1
071-333-6508	Perform operator maintenance on an APC.	1	2-V-B-8.1
071-333-6509	Recover a tracked vehicle using field expedients.	1	2-V-B-9.1

LEADERSHIP AND TRAINING

TASK NUMBER	LEADERSHIP	SL	PAGE
071-328-5301	Inspect personnel/equipment.	2	2-VI-A-1.1
071-328-5302	Supervise maintenance on individual and TOE equipment.	2	2-VI-A-2.1
071-328-5304	Enforce preventive medicine program (includes personal hygiene).	2	2-VI-A-3.1
121-030-2501	Prepare the rater's section of an Enlisted Evaluation Report (EER).	2	2-VI-A-4.1
	TRAINING		
874-896-2001	Conduct a performance-oriented training session.	2	2-VI-B-1.1

TASKS FOR SELECTED DUTY POSITIONS - SKILL LEVEL 2

TOW SQUAD LEADER (HAW)

071-316-2500	Assemble the TOW launcher.	1	2-III-J-1.1
071-316-2501	Perform operator maintenance on TOW weapons system.	1	2-III-J-2.1
071-316-2502	Conduct a system self-test and preoperational inspection.	1	2-III-J-3.1
071-316-2503	Load, arm, and unload an encased missile.	1	2-III-J-4.1
071-316-2504	Perform immediate action procedures for a misfire.	1	2-III-J-5.1
071-316-2505	Determine if a target can be engaged.	1	2-III-J-6.1
071-316-2506	Camouflage/conceal TOW position.	1	2-III-J-7.1
071-317-0000	Prepare an antiarmor range card (TOW).	1	2-III-H-5.1
071-316-2551	Supervise preparation of a TOW fighting position.	2	2-III-J-8.1
071-316-2552	Control TOW squad fires.	2	2-III-J-9.1

106-MM RCLR SQUAD LEADER (HAW) (RC)

071-319-3601 (RC)	Perform operator maintenance on a caliber .50 spotting rifle, M8C.	1	2-III-I-1.1
071-319-3602 (RC)	Load, reduce a stoppage, unload, and clear the caliber .50 spotting rifle, M8C.	1	2-III-I-2.1

(106-MM RCLR SQUAD LEADER (HAW) (RC), CONTINUED)

TASK NUMBER		SL	PAGE
071-319-3603 (RC)	Perform operator maintenance on a 106-mm RCLR.	1	2-III-I-3.1
071-319-3604 (RC)	Load, reduce a stoppage, unload, and clear 106-mm RCLR.	1	2-III-I-4.1
071-319-3605 (RC)	Engage targets with the 106-mm RCLR.	1	2-III-I-5.1
071-319-3606 (RC)	Conduct 106-mm RCLR weapon system alinement.	1	2-III-I-6.1
071-317-0000	Prepare an antiarmor range card (106-mm RCLR).	1	2-III-H-5.1
071-319-3608 (RC)	Construct 106-mm RCLR position (mounted).	1	2-III-I-7.1
071-319-3609 (RC)	Construct 106-mm RCLR position (dismounted).	1	2-III-I-8.1
071-319-3610 (RC)	Camouflage/conceal 106-mm RCLR position.	1	2-III-I-9.1
071-319-3611 (RC)	Control 106-mm RCLR squad fires.	2	2-III-I-10.1

FIRE TEAM LEADER (MECHANIZED UNITS ONLY)

071-313-3451	Perform operator maintenance on a caliber .50 M2 HB machinegun and ammunition.	1	2-III-F-1.1
071-313-3452	Target/zero a caliber .50 machinegun.	1	2-III-F-2.1
071-313-3453	Load, reduce a stoppage, unload, and clear a caliber .50 machinegun.	1	2-III-F-3.1
071-313-3454	Engage targets with a caliber .50 machinegun.	1	2-III-F-4.1
071-313-3455	Set headspace and timing on a caliber .50 machinegun.	1	2-III-F-5.1
071-313-2314	Mount/dismount AN/TVS-2 sight on caliber .50 machinegun.	1	2-III-F-6.1
071-313-2315	Boresight AN/TVS-2 to caliber .50 machinegun.	1	2-III-F-7.1

FIRE TEAM LEADER (MECHANIZED AND INFANTRY)
OR ASSISTANT SCOUT SQUAD LEADER
(INFANTRY)

071-312-3005	Perform operator maintenance on an M60 machinegun and ammunition.	1	2-III-E-1.1

(FIRE TEAM LEADER (MECHANIZED AND INFANTRY) OR ASSISTANT SCOUT SQUAD LEADER (INFANTRY), CONTINUED)

TASK NUMBER		SL	PAGE
071-312-3006	Field zero an M60 machinegun.	1	2-III-E-6.1
071-312-3007	Prepare a range card for an M60 machinegun.	1	2-III-E-7.1
071-312-2310	Mount/dismount an AN/PVS-2 on an M60 machinegun.	1	2-III-E-10.1
071-312-2311	Zero an AN/PVS-2 to an M60 machinegun.	1	2-III-E-11.1
113-587-2002	Prepare radio set AN/VRC-64 for operation.	1	2-II-D-5.1
113-587-3004	Perform operator maintenance on radio set AN/VRC-46 or AN/VRC-47.	1	2-II-D-6.1
113-587-2020	Prepare tactical FM radios (AN/VRC-46 or AN/VRC-47) for operation.	1	2-II-D-7.1
113-609-1001	Install and operate communications security equipment TSEC/KY-8 using RT-524/VRC.	1	2-II-D-14.1
113-609-1002	Install and operate speech security equipment TSEC/KY-38 using RT-841/PRC-77.	1	2-II-D-15.1
113-622-1002	Install radio set control group AN/GRA-39.	1	2-II-D-16.1
113-622-2002	Operate radio set control group AN/GRA-39.	1	2-II-D-17.1
071-326-5501	Control rate and distribution of fire.	2	2-VII-A-1.1
071-326-5605	Control fire team movement.	2	2-VII-C-1.1
071-326-5606	Select fire team (scout vehicle) overwatch position.	2	2-VII-C-2.1
051-193-1503	Construct a nonelectric (initiation) detonating assembly.	2	2-IV-C-1.1
051-193-1003	Prime a demolition block nonelectrically.	2	2-IV-C-2.1
051-193-1004	Construct an electric (initiation) detonating assembly.	2	2-IV-C-3.1
051-193-1005	Prime demolition block electrically.	2	2-IV-C-4.1
051-193-1006	Connect electrical firing circuits.	2	2-IV-C-5.1
051-193-1010	Install firing devices on standard military explosives.	2	2-IV-C-6.1

(FIRE TEAM LEADER (MECHANIZED AND INFANTRY) OR ASSISTANT SCOUT SQUAD LEADER (INFANTRY), CONTINUED)

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION I
BATTLEFIELD SURVIVAL

TASK SUMMARIES

INTRODUCTION TO FIRST AID

Since a medic cannot be with every soldier, your life and the lives of other soldiers may depend upon how much you know about first aid.

First aid is the emergency or lifesaving care given to a sick, injured, or wounded person when a medically trained person is not immediately available. Without this emergency care, a sick, injured, or wounded person may not live until he can receive medical treatment. It is important that everyone know how to apply lifesaving first aid measures, especially the soldier on the training field or battlefield.

This material is designed to be a handy guide when an emergency arises. For this reason, it contains only essential information about real emergencies which you may face and should be able to handle. To learn how to apply all first aid measures, you should read FM 21-11.

1. Lifesaving Measures:

a. **Open airway and restore breathing and heartbeat.** Lack of oxygen intake (through breathing and heartbeat) leads to death in a very few minutes.

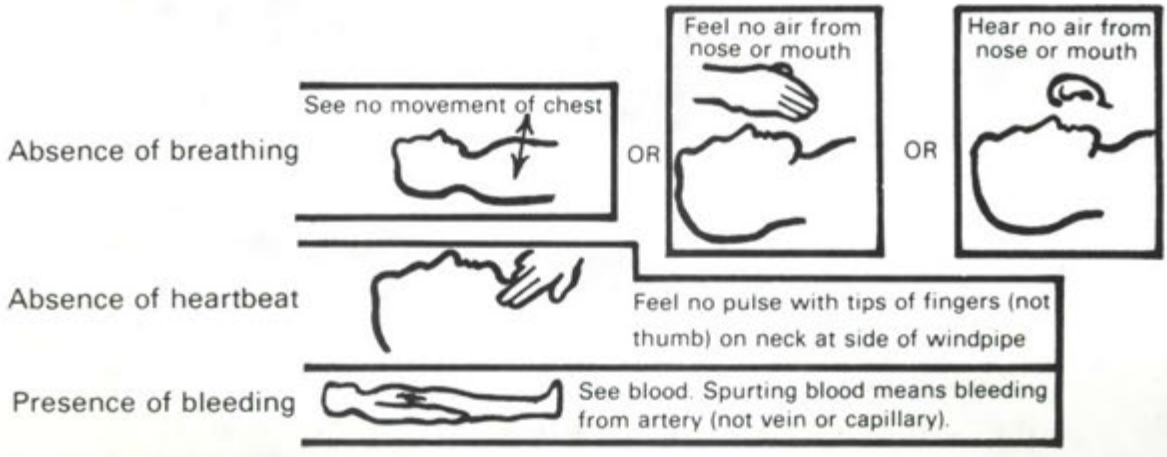
b. **Stop bleeding.** Life cannot continue without adequate volume of blood to carry oxygen to tissues.

c. **Prevent shock.** Unless shock is prevented or corrected, death may result even though injury would not otherwise be fatal.

d. **Dress and bandage wounds to avoid infection.** Healing of wound and recovery depend to great extent upon how well the wound was protected from contamination initially.

2. Basic Guides:

a. **Examine promptly and calmly for:**



b. **Apply lifesaving measures a and b instantly.**

If no sign of breathing ..... Open airway (a).
If still no sign of breathing ..... Start artificial respiration (a).*
If no pulse or only very weak, irregular pulse ..... Start closed-chest heart massage with artificial respiration (a).*
If bleeding ..... Apply pressure (b).

*Continue until the person regains consciousness, until you are relieved by medically trained person, or for at least 45 minutes in the absence of all life signs.

c. **Re-examine immediately head-to-toe and front-to-back for:**

(1) Other injuries -- Fractures, injuries without associated wounds, etc.

(2) Signs of shock -- Early signs: Restlessness, thirst, pale skin, rapid heartbeat. May be excited or appear calm and very tired; may be sweating although skin is cool and clammy. Signs when shock becomes worse: Fast breaths or gasps; staring into space; blotchy or bluish skin, especially around mouth.

d. **Apply lifesaving measures c and d promptly.** Apply shock prevention and control measures (c). Dress and bandage wounds to avoid infection (d).

e. **Arrange evacuation to nearest medical treatment facility.**

3. Do Nots: (To act incorrectly can be just as serious or fatal to a wounded soldier as the failure to administer a lifesaving measure.)

a. **Do not let soldier remain on his back if he is unconscious or has face or neck wound.**

b. **Do not pull or tear clothing from injured soldier.**

c. **Do not touch or try to clean dirty wounds, including burns.**

d. **Do not remove dressings and bandages once they have been placed over wound.**

e. **Do not loosen tourniquet once it has been applied.**

f. **Do not move soldier with fracture until it has been properly splinted unless necessary to save his life.**

g. **Do not give fluids to soldier who is unconscious, nauseated, or vomiting or has abdominal or neck wound.**

h. **Do not permit head to be lower than body when soldier has head injury.**

i. **Do not try to push protruding intestines or brain tissue back into wound.**

j. **Do not put any medication on burns.**

k. **Do not try to give first aid measures which are unnecessary or beyond your capabilities.**

l. **Do not fail to resupply your first aid case with items used from it.**

TASK NUMBER: 081-831-1004

PERFORM MOUTH-TO-MOUTH RESUSCITATION AND EXTERNAL HEART MASSAGE

CONDITIONS:

Situation 1--Given an unconscious casualty who has stopped breathing but still has a heartbeat.

Siutation 2--Given an unconscious casualty who has stopped breathing and has no heartbeat, and one soldier to assist.

STANDARDS:

Situation 1--Properly apply mouth-to-mouth resuscitation until the casualty resumes breathing or until relieved, IAW performance measures below.

Situation 2--Properly apply mouth-to-mouth resuscitation and external heart massage using the ONE RESCUER method without assistance. Then shift to the TWO RESCUER method as assistance becomes available, and continue until the heartbeat and breathing are restored or until relieved, IAW performance measures below.

PERFORMANCE MEASURES:

1. Apply mouth-to-mouth resuscitation.

a. Upon finding an unconscious person, the rescuer must determine if the victim is breathing.

b. The victim will be placed on his back with the rescuer kneeling alongside the victim's head. First clear the airway by inserting the fingers into the victim's mouth and removing any obstruction, then place one hand (hand nearest victim's feet) under the victim's neck and the other hand on the victim's forehead. By lifting with the hand under the neck and pushing down on the forehead, the neck is extended, the tongue is lifted away from the back of the throat, and the airway is opened (figure 1).

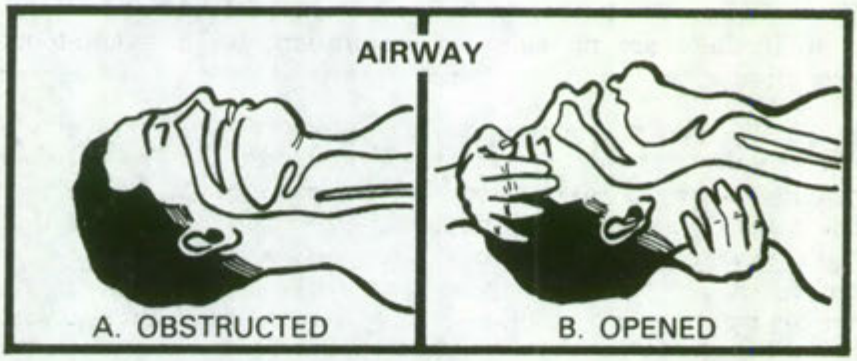


Figure 1.

c. After opening the airway, LOOK, LISTEN, and FEEL to determine if the victim is breathing. To do this, place the ear close to the victim's mouth and nose (figure 2).

Figure 2.

Hold this position for 5 seconds since it could be 5 seconds between the victim's breaths.

(1) LOOK to see if the victim's chest is rising and falling as he exhales.

(2) LISTEN and FEEL for exhaling of air on the ear and cheek.

d. If there are no signs of respiration, begin mouth-to-mouth resuscitation.

(1) To perform mouth-to-mouth resuscitation, the rescuer will use the hand under the victim's neck to maintain the head in a position of maximum backward tilt and continue to press down on the victim's forehead with the other hand (figure 3), and rotate this hand so that the victim's nostrils can be pinched together between the thumb and index finger (figure 4). The rescuer opens his mouth wide, takes a deep breath, places his mouth over the victim's mouth, makes an airtight seal with his lips, and blows into the victim's mouth (figure 5).

Figure 3.

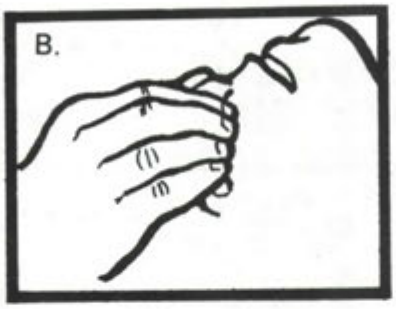


Figure 4.

Figure 5.

(2) The rescuer will then remove his mouth, turn his head, and again LOOK, LISTEN, and FEEL for the exhaled air (figure 6).

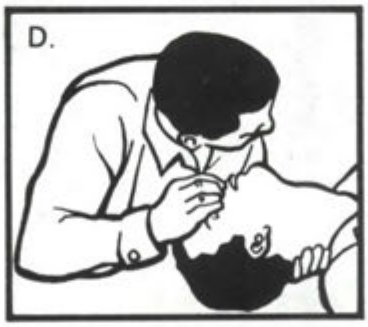


Figure 6.

(3) This procedure will be repeated once every 5 seconds for as long as needed.

NOTE: When starting artificial respiration, the first time the rescuer blows in the victim's mouth, he will give four quick but full breaths to make sure the victim's lungs are fully inflated.

e. If, when starting the procedure, strong resistance is felt when the rescuer blows into the victim's mouth, quickly reposition the victim's head and try again. If airway is still not clear, roll the victim onto his side; using heel of hand, deliver sharp blows between his shoulder blades to dislodge foreign objects. If abdomen bulges (air going into stomach), apply gentle pressure on abdomen with hand to force air out of stomach. If this procedure causes the victim to vomit, quickly turn him onto his side, clean out his mouth, and resume the cycle.

NOTE: The procedures for opening the airway and performing artificial respiration for children are essentially the same as those for adults, but there are some differences. For infants and small children, the rescuer covers both the mouth and nose of the child with his mouth and uses small breaths with less volume to inflate the lungs once every 3 seconds. The neck of an infant is so pliable that forceful backward tilting of the head may obstruct the breathing passages. Therefore, the tilted position should not be exaggerated. For an infant or small child, the head tilt may be assisted by the rescuer's placing one hand beneath the victim's shoulders.

2. Apply mouth-to-mouth resuscitation and external heart massage.

a. Upon finding an unconscious casualty, in addition to checking to see if he is breathing, the rescuer should also determine if he has a heartbeat.

b. First clear the airway by inserting the fingers into the victim's mouth and removing any obstruction, then open the airway and LOOK, LISTEN, and FEEL for breathing. At the same time, FEEL for a heartbeat. To do this, keeping the head in the tilted back position, remove the hand under the neck (hand closest to the victim's feet) and place the fingers on the victim's throat. Feel for the ADAM'S APPLE, and slide the fingers down from the ADAM'S APPLE to the side of the throat (figure 7). This will place the fingertips over the carotid artery where the carotid pulse can be felt. If a pulse cannot be felt, CARDIOPULMONARY RESUSCITATION (CPR) must be started immediately.

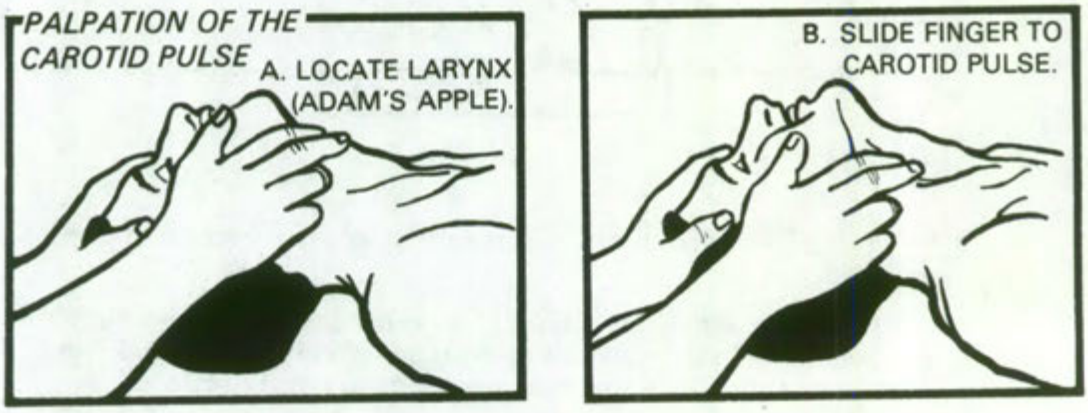


Figure 7.

c. It is important that CPR be started quickly as permanent brain damage may occur if deprived of oxygenated blood.

0-4 Min	4-6 Min	6-10 Min	Over 10 Min
BRAIN DAMAGE NOT LIKELY	BRAIN DAMAGE PROBABLE	BRAIN DAMAGE VERY LIKELY	BRAIN DAMAGE ALMOST CERTAIN

d. External heart massage is effective in providing artificial circulation because the heart lies between the breastbone and the backbone. When the chest is compressed, the heart will be squeezed, forcing blood through the lungs, brain, and body.

e. To perform the ONE RESCUER procedure of mouth-to-mouth resuscitation and heart massage, the rescuer will kneel at the victim's side.

(1) He will apply four quick, but full breaths to the victim to fill the lungs with oxygen (head must be tilted and airway open).

(2) He will apply 15 compressions of the chest at a rate of 80 counts per minute. To do this, the rescuer must locate the correct position for the hands. (If the hands are too high or too low on the chest, the heart will not be compressed.) To locate the correct position for the hand, first locate the tip of the breastbone and measure two finger-widths up from this tip. Place the heel of the other hand alongside the fingers (figure 8).

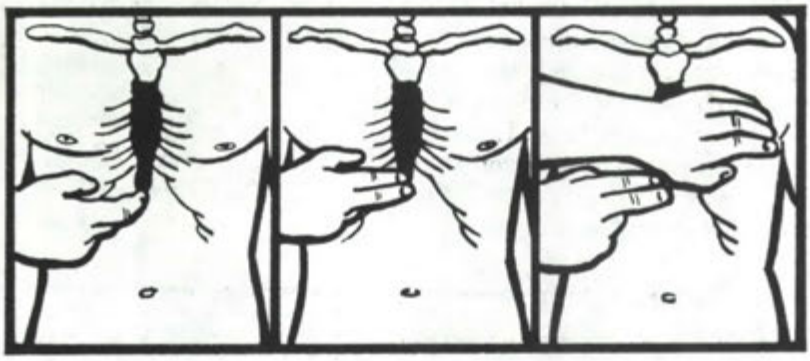


Figure 8.

NOTE: The tip of the breastbone can be felt through the victim's clothing.

(3) After placing the one hand in the correct position, place the other hand on top of the first hand and interlace the fingers (figure 9).

(4) When the upper part of the body is brought forward, the arms will become vertical and the elbows will be kept locked as the weight of the upper body is applied to the chest. The chest of the victim will be compressed 1½ to 2 inches (figure 10).

Figure 9.

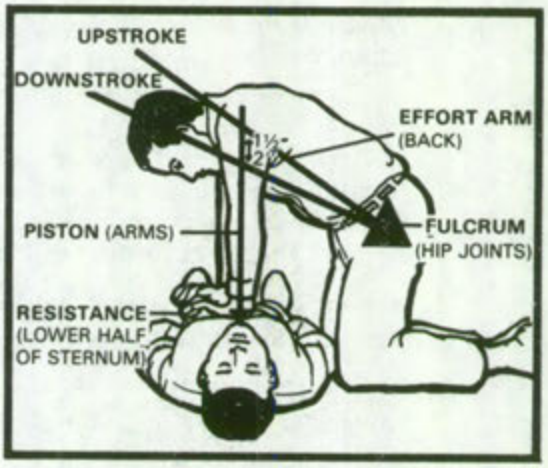


Figure 10.

(5) The chest will be compressed 15 times at a count of 80 compressions per minute. Then shift position slightly and apply two quick, but full breaths (tilt head, open airway). Continue this cycle--15 compressions to two breaths--until relieved (figure 11).

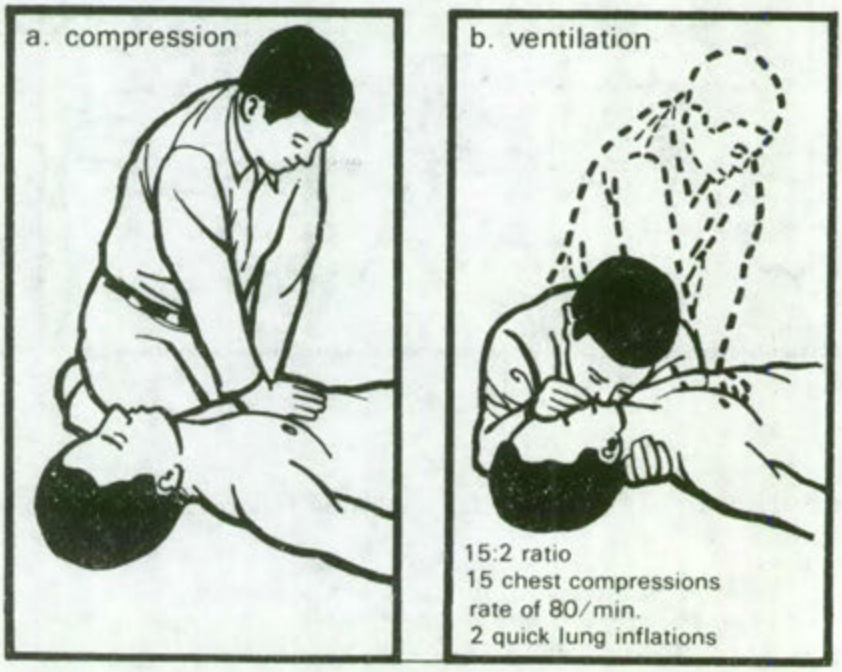


Figure 11.

f. If someone arrives to help, start the TWO RESCUER method. In this method, one rescuer does the compressions and one does the breathing for the victim.

(1) To do this, the assistant will get on the opposite side of the victim and take over the breathing. When this happens the cycle will change to five compressions to two breaths (figure 12).

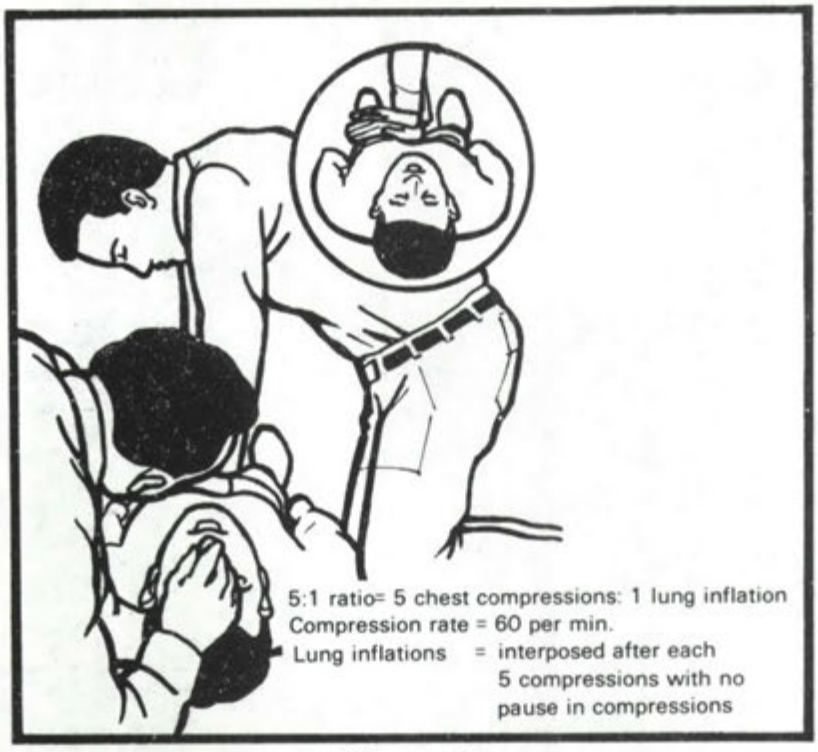


Figure 12.

(2) As the one giving the compressions tires, the two rescuers will change positions. The cycle should not be broken during this exchange of positions. The one giving the compressions will control the change using some signal. Since he will be counting aloud as he does the compressions, counting ONE to FIVE, he can say, "CHANGE ON THREE NEXT TIME." By using the five-word phrase, he will not lose count of the compressions. This lets the one giving the breaths know that they will change the next time he hears "THREE".

NOTE: In the TWO RESCUER method, the lung inflations must be given on count FIVE as the one giving the compressions releases pressure from the chest.

REFERENCE:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 3, pages 11-28)
TC 21-11, Pocket Medic, Mar 75 (part I, pages 12-13 and 16-19)

TASK NUMBER: 081-831-1005

STOP BLEEDING (ARM OR LEG)

CONDITIONS:

Given a casualty with a bleeding arm or leg wound and requiring no other first aid; field first-aid dressings or any available cloth; material to apply a tourniquet if required; and the absence of qualified medical personnel.

STANDARDS:

Perform the lifesaving measure of stopping the bleeding IAW with the performance measures below.

PERFORMANCE MEASURES:

1. Check for more than one wound.

A missile usually makes smaller wound where it enters than where it exits.

2. Cut and lift clothing from wound.

Tearing clothing results in rough handling of injured part.

3. Prevent further contamination of wound. Don't touch wound.

Any attempt to clean wound only contaminates it more. If found dirty, leave dirty.

4. Cover wound and apply pressure.

(a) After you cut and lift clothing from wound, remove wrapped dressing (with attached bandages) from plastic envelope; then twist to break paper wrapper.

(b) Grasp folded bandages with hands, being careful not to touch side of dressing which goes next to wound.

(c) Place dressing on wound without allowing it to touch anything else.

(d) Wrap bandages around the part and tie ends securely with square knot.

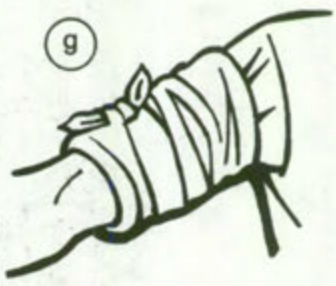
NOTE: The bandages attached to field first aid dressing are split 4-6 inches from the loose ends. They may be split farther to make four tails long enough for securing bandages around the head.

(e)

If bleeding continues, press wound with hand for 5-10 minutes.

(f)

(g)



Additional pressure can be applied to wound with thick pad (rag) firmly secured with a strip of material.

NOTE: If no first aid dressing is available, use any available cloth. Once dressing is applied, don't remove.

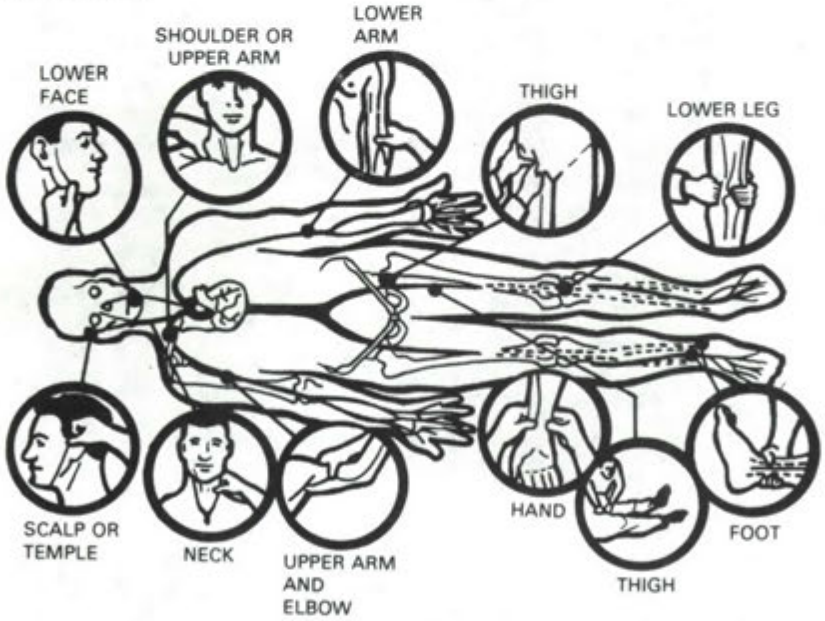
Elevation of Wounded Limb

Raising injured part above level of heart lessens bleeding. If there is a broken bone in limb, do not raise it until it has been properly splinted.

Digital Pressure

(Pressure with fingers, thumbs, or hands)

If blood is spurting from wound (artery), press at the point or site where main artery supplying the wounded area lies near skin surface or over bone as shown below. This pressure shuts off or slows down the flow of blood from the heart to the wound until a pressure dressing can be unwrapped and applied. You will know you have located the artery when you feel a pulse.



Tourniquet

Use tourniquet as last resort. Apply it between the wound and where the limb is attached to the body. Place it 2 to 4 inches above the injury, not over wound or fracture. Never loosen or remove a tourniquet once you have applied it. If possible, mark a T on soldier's forehead and time you applied tourniquet. Get him to medical treatment facility as soon as possible.

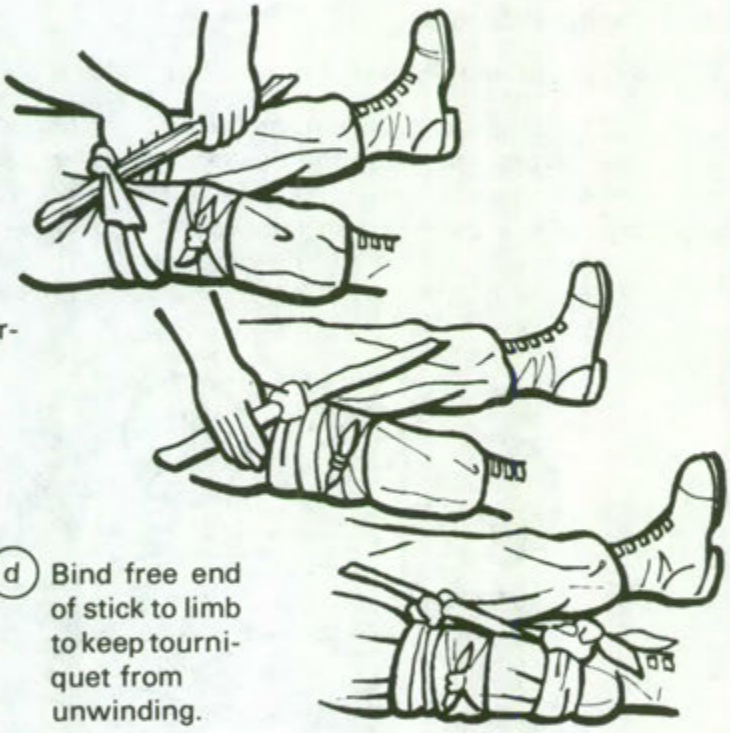
(a) Make a loop around the limb with any flexible material; tie with square knot.

SQUARE KNOT

(b) Pass a stick, scabbard, or bayonet under the loop.

(c) Tighten tourniquet just enough to stop arterial bleeding.

(d) Bind free end of stick to limb to keep tourniquet from unwinding.



REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 4, pages 29-35)
TC 21-11, Pocket Medic, Mar 75 (pages 20-27)
TEC Lesson 911-441-0028-F, Basic First Aid Measures; Stopping the Bleeding, Part 1
TEC Lesson 911-441-0029-F, Basic First Aid Measures; Stopping the Bleeding, Part 2
TEC Lesson 911-441-0031-F, Dressings and Bandages, Part 1
TEC Lesson 911-441-0032-F, Dressings and Bandages, Part 2

TASK NUMBER: 081-831-1006

IDENTIFY SIGNS OF AND TREAT FOR SHOCK

CONDITIONS:

Given the absence of qualified medical personnel and a casualty who shows signs of any of the following: restlessness, thirst, paleness of skin or rapid heartbeat.

STANDARDS:

Apply lifesaving measures to treat for shock IAW the performance measures below.

PERFORMANCE MEASURES:

NOTE: Shock may result from any injury but is more likely to develop in severe injuries.

Warning signs:	May be:	Signs as shock gets worse:
Restlessness	Excited or appear calm and tired	Small fast breaths or gasps
Thirst		Staring vacantly into space
Paleness of skin	Sweating when skin feels cool and clammy	Blotchy or bluish skin, especially around mouth
Rapid heartbeat		

1. **Maintain adequate respiration and heartbeat.** This may entail only clearing soldier's upper airway, positioning him to insure drainage of any fluid blocking airway, and observing him to insure airway remains clear. However, you may need to give him artificial respiration and closed-chest heart massage (TC 21-11, pages 12-19).

2. **Stop bleeding.** See task: **Stop Bleeding.**

3. Loosen clothing at neck, waist, and other places where it tends to bind. Loosen, but do not remove shoes.

4. **Reassure soldier.**

Take charge. Show by your calm self-confidence and gentle yet firm actions that you know what you are doing and that you expect him to feel better because you are helping him. If he asks questions about the seriousness of his injury, explain that a physician will have to examine him to determine the extent of injury. Ill-timed or incorrect information can increase a person's anxiety.

5. **Splint fractures.** See task: **Splint a Fracture.**

6. **Position soldier.**

(Splint any fracture first)

If conscious--On back with feet raised 6" to 8"

If unconscious--On side or abdomen with head turned to side.

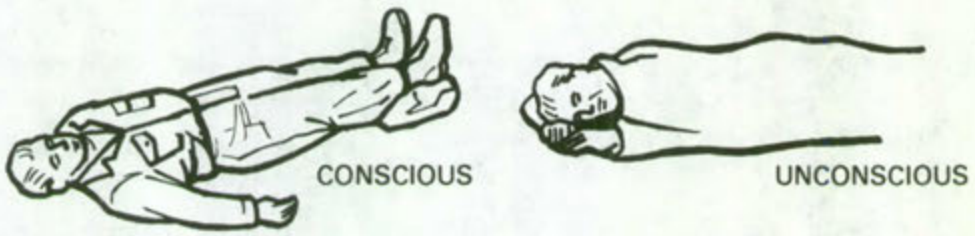
Vary position for:

Head injury--Head also raised higher than body.

Face and neck wound--Sit, lean forward with head down or in unconscious position.

Sucking wound of chest--Sit or lie on injured side.

Abdominal wound--On back with head turned to side.



7. **Keep soldier comfortably warm.**

Place suitable material (poncho, blanket, etc.) under him as well as over him if weather makes necessary. If weather permits, remove any wet clothing except boots.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 5, pages 36-39)
TC 21-11, Pocket Medic, Mar 75 (part 1, pages 28-29)
TEC Lesson 911-441-0029-F, Basic First Aid Measures: Controlling for Shock

TASK NUMBER 081-831-1007

SPLINT A FRACTURE

CONDITIONS:

Given a casualty who has a fracture (closed or open) and material for field expedient splints. The necessary lifesaving measures have already been performed and no qualified medical personnel are available.

STANDARDS:

Splints are applied to the fracture (open or closed) IAW performance measures below.

FRACTURES

Closed fracture: Break in bone without break in overlying skin.

Open fractures: Break in bone as well as overlying skin.

Fractures must be splinted (immobilized) to prevent razor-sharp edges of bone from moving and cutting tissue, muscle, blood vessels, and nerves; to reduce pain and help control shock; and to prevent closed fractures from becoming open fractures.

First Aid:

1. "Splint them where they lie" - Splint (immobilize) fractured part without changing position of part and before moving injured person. If bone is in unnatural position, do not straighten it. If person must be moved to save his life, such as from enemy fire or a burning building, tie fractured part, grasp him under arm pits and pull him in straight line.

2. Apply splint so joint above fracture and joint below fracture are immobilized.

3. Use padding between injured part and splint.

4. Secure splint to part with bandages at several points above and below fracture (NOT across fracture); tie bandages against splint with square knot.

5. Use sling to support splinted arm bent at elbow and fractured elbow which is bent.

PERFORMANCE MEASURES:

1. Cover any wound or bone sticking through the skin with a clean dressing as you would any other wound. Stop any bleeding.

2. Apply padding if available between injured part and splint. If no padding is available, splint anyway.

NOTE: Do not cover the fracture with the padding material.

3. Apply the splint. Splint should extend past the joints above and below the fracture.

NOTE: Do not move the individual and do not attempt to change the position of the fractured part.

4. Bind the splint.

   a. All knots must be against the splint.

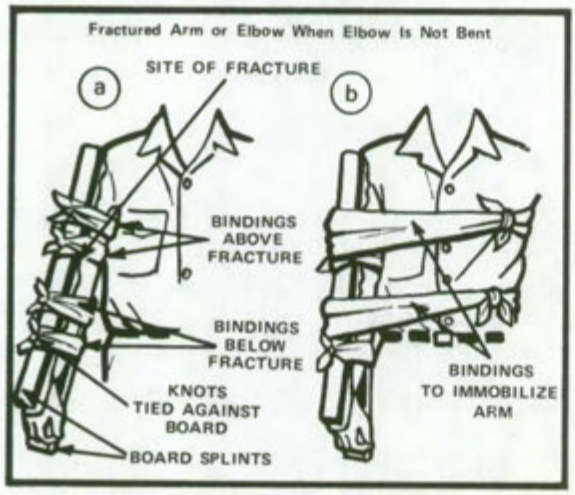
   b. Bindings must be placed both above and below the fracture.

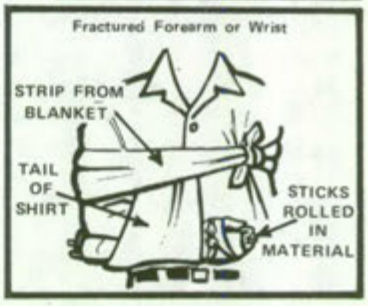
NOTE: Blood circulation must not be impaired by splint, padding, or bindings.

NOTE: Do NOT place bindings across the fracture.

5. Collect splinting materials. Splints may be improvised from such items as boards, poles, sticks, tree limbs, unloaded rifles, etc. Padding may be improvised from such items as a jacket, poncho, shelter half or leafy vegetation.

FRACTURED ARM, ELBOW, OR WRIST





REFERENCES:

FM 21-11, First Aid for Soldiers, 30 Jun 76 (Chap 8, pages 66-67)

TC 21-11, Pocket Medic, 14 Mar 75 (Part 2, pages 44-48)

TEC Lesson 911-441-0030-F, Fractures and Splinting

TASK NUMBER: 081-831-1008

APPLY FIRST-AID MEASURES FOR BURNS

CONDITIONS:

During daylight in a field location, given a casualty or dummy with a burn, sodium chloride-sodium bicarbonate mixture (salt packet), two sterile dressings, and a canteen of cold water. The casualty is conscious, is not vomiting, and has no other wounds. His clothing may or may not be stuck to the burn.

STANDARDS:

Within 5 minutes, administer first aid for burns IAW the performance measures below.

PERFORMANCE MEASURES:

1. Protect the burn against further contamination as follows to lessen the possibility of infection:

a. If clothing covers the burn, cut and lift it gently away without touching the burn.

(1) Do not try to remove pieces of cloth which have stuck to the burn or to clean the burn in any way.

(2) Do not pull clothes over the burned area.

(3) Do not break blisters.

(4) Do not put ointment or any medication whatsoever on the burn.

b. Place a sterile dressing over the burned area and secure it in place with bandages.

2. Prevent shock by applying the measures discussed in the task: **Identify signs of and treat for shock.**

a. If size of burn is less than 1 square foot, have the casualty drink the water from his canteen. If size of burn is over 1 square foot and the casualty is conscious, is not vomiting, and has no abdominal or neck wound, give him the sodium chloride-sodium bicarbonate mixture included in the first-aid kit. Dissolve one envelope (4.5 grams) of the mixture in one canteenful or quart of cool or cold water. Never use warm water, as this often causes vomiting.

b. Give the solution to the casualty slowly, having him consume the entire amount over a 1-hour period. Should the casualty become nauseated, stop giving him the solution.

c. Get the casualty to a medical treatment facility as soon as possible.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 7, pages 61-62)
TC 21-11, Pocket Medic, Mar 75 (part 2, page 43)
TEC Lesson 911-441-0033-F, Burns and Eye Injuries

TASK NUMBER: 081-831-1010

APPLY FIRST AID FOR SUN OR HEAT INJURIES

CONDITIONS:

Given a casualty suffering from a heat injury (heat cramps, heat exhaustion, heat stroke), a canteen of water, and a field first aid pouch containing two envelopes sodium chloride-sodium bicarbonate mixture (burn packet).

STANDARDS:

Casualty's signs and symptoms are identified in accordance with the performance measures and initial care is begun immediately to reduce the seriousness of the injury.

PERFORMANCE MEASURES:

Identify type of injury.

1. **Heat cramps.**

a. Signs/symptoms - Muscle cramps of abdomen, legs, or arms.

b. First aid.

(1) Move casualty to shade and loosen clothing.

(2) Give him large amounts of cool salt water slowly. Prepare salt water by dissolving the contents of one burn packet in one canteen of cool water.

2. **Heat exhaustion.**

a. Signs/symptoms - Headache, excessive sweating, weakness, dizziness, nausea, muscle cramps. Pale, cool, moist clammy skin.

b. First aid.

(1) Lay casualty in cool shaded area and loosen his clothing.

(2) Give him large amounts of cool salt water slowly. Prepare salt water by dissolving the contents of one burn packet in one canteen of cool water.

(3) Get the casualty to a medical treatment facility as soon as possible.

NOTE: For units isolated and not able to evacuate casualty: if he is conscious, have him drink 3 to 5 canteenfuls of cool salt water during a period of 12 hours.

3. **Heat stroke (sunstroke).**

a. Signs/symptoms-Stoppage of sweating (hot, dry skin). Collapse and unconsciousness may come suddenly or may be preceded by headache, dizziness, fast pulse, nausea, vomiting, and mental confusion.

b. First aid.

(1) Promptly immerse person in coldest water available. Add ice, if available, to water. If you cannot immerse him, get him into shade, remove his clothing, keep his entire body wet by pouring water over him, and fan his wet body continuously.

(2) Transport him to nearest medical facility at once, cooling his body on the way.

(3) If he becomes conscious, give him cool salt water prepared as described for "heat cramps".

NOTE: If casualty becomes nauseated, stop giving him the solution but keep it available for him to drink later.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 9, pages 84, 88-90)
TC 21-11, Pocket Medic, Mar 75 (part 3, pages 59-60)
TEC Lesson 911-444-0034-F, Snake Bites and Hot Weather Hazards

TASK NUMBER: 081-831-1011

APPLY FIRST AID FOR WET OR COLD INJURIES

CONDITIONS:

Given a casualty suffering from a wet or cold injury (frostbite, immersion foot, trench foot, snow blindness).

STANDARDS:

Casualty's signs and symptoms are identified in accordance with the performance measures and initial care is begun immediately to reduce the seriousness of the injury.

PERFORMANCE MEASURES:

Identify type of injury.

1. **Frostbite.**

a. Signs/symptoms - Skin is white, stiff, and numb.

b. First aid —

(1) Cover frostbitten part of face with warm hands until pain returns.

(2) Place frostbitten bare hands next to skin in opposite armpits.

(3) If feet are frostbitten, seek sheltered area and place bare feet under clothing and against abdomen of another person.

(4) If deep frostbite is suspected, protect part from additional injury and get to medical treatment facility by fastest means possible. **DO NOT** attempt to thaw deep frostbite. There is less danger of walking on feet while frozen than after thawed.

2. **Immersion foot.**

a. Signs/symptoms - Soles of feet are wrinkled. Standing or walking is extremely painful.

b. First aid —

(1) Dry feet thoroughly and get to medical treatment facility by fastest means possible.

(2) Avoid walking if possible.

Figure 1. Immersion foot.

3. **Trench foot.**

a. Signs/symptoms - Numbness. May be tingling or aching sensation, cramping pain, and swelling.

b. First aid —

(1) Dry feet thoroughly and get to medical treatment facility by fastest means possible.

(2) Avoid walking if possible.

Figure 2. Trench foot.

4. **Snow blindness.**

a. Signs/symptoms - Scratchy feeling in eyes.

b. First aid —

(1) Cover eyes with dark cloth.

(2) Transport casualty to medical treatment facility at once.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 9, pages 90-91)
TC 21-11, Pocket Medic, Mar 75 (part 3, page 61)
TEC Lesson 911-441-0035-F, Cold Weather Hazards

TASK NUMBER 092-503-1001

PERFORM OPERATOR'S MAINTENANCE ON AN M17 SERIES PROTECTIVE MASK

CONDITIONS:

Given an M17 series protective mask, carrier, accessories authorized to be stored in the carrier (per unit SOP), TM 3-4240-279-10, a pail of soapy water, a pail of clear rinse water, rags, and a small brush.

STANDARDS:

1. All components and accessories authorized by unit SOP are present; any which are missing are reported to your supervisor.

2. All deficiencies not requiring higher echelon support have been corrected. Those which do require such support are reported to your supervisor.

3. Mask and carrier are free of dirt, sand, and grit.

PERFORMANCE MEASURES:

1. **To inspect mask and carrier.**

a. Remove the mask from the carrier and check to insure that all components are present (figure 1). Insure that accessories authorized by your unit SOP are present (figure 2). Inform your supervisor if any components or accessories are missing.

b. Check the carrier for dirt, mildew, rips, torn straps, and missing hardware.

c. Check the facepiece for holes, tears, splits, and signs of deterioration of rubber parts.

d. Check the filter elements to make sure that they are serviceable and properly installed.

e. Check outserts for scratches, discoloration, or distortion that could affect vision.

f. Check the head harness for dirt and mildew; worn, frayed, or broken straps; and missing clinch tips.

g. Check the hood (if present) for holes, rips, tears, or excessive wear. The hood is unserviceable if it has more than two pinholes in any one panel.

h. Correct deficiencies which you are authorized to correct at your level (see TM 3-4240-279-10, sec III, page 3-5 through 3-12).

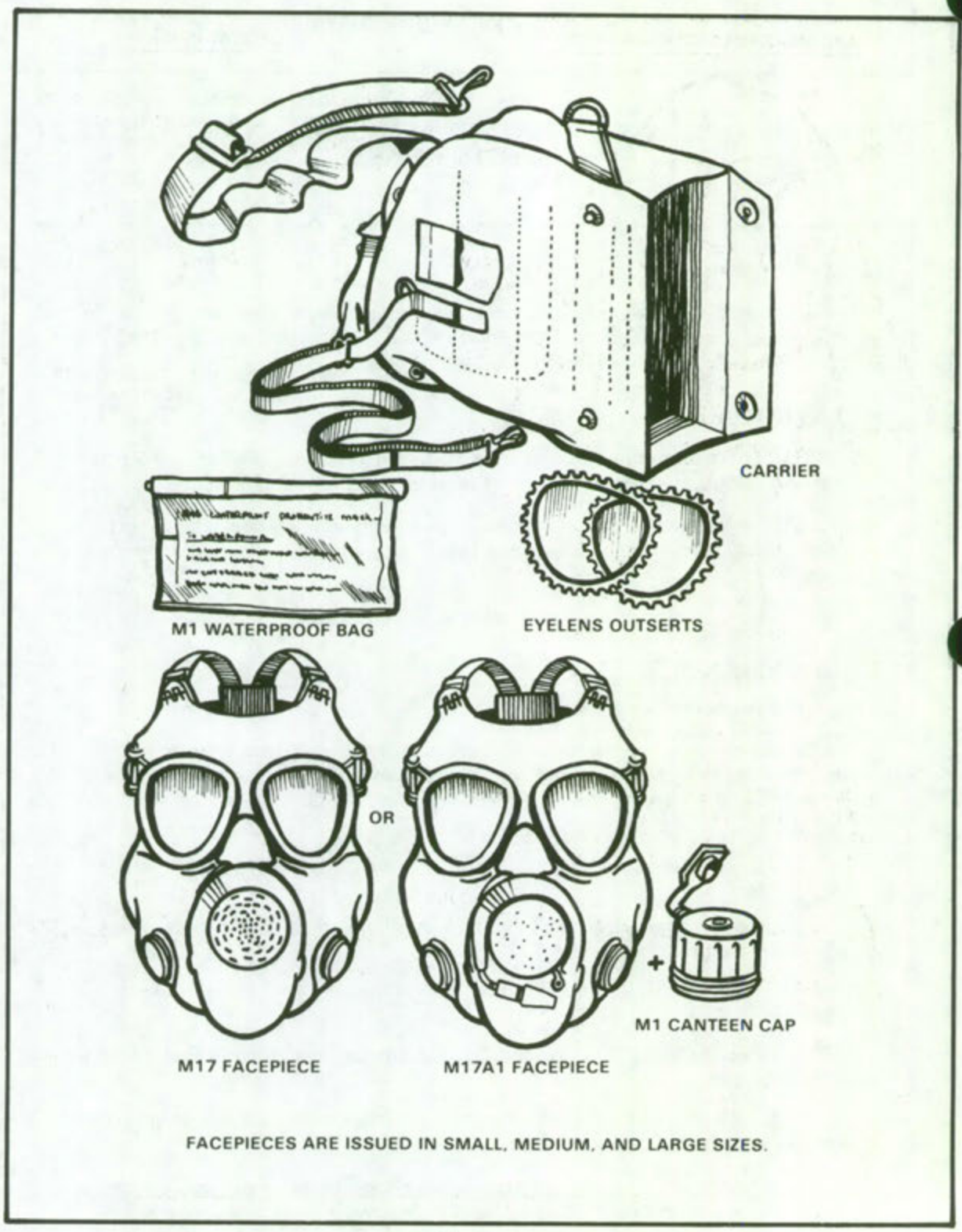
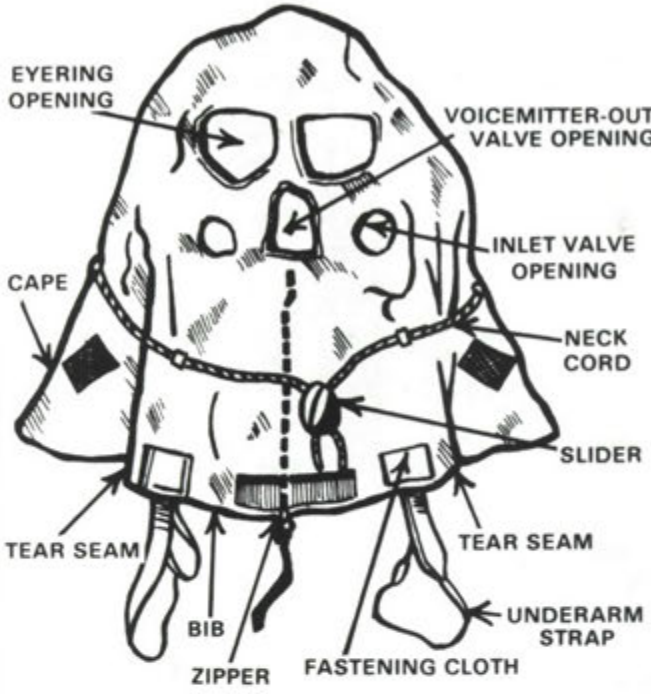

CARRIER
M1 WATERPROOF BAG
EYELENS OUTSERTS
OR
+
M1 CANTEEN CAP
M17 FACEPIECE
M17A1 FACEPIECE
FACEPIECES ARE ISSUED IN SMALL, MEDIUM, AND LARGE SIZES.

Figure 1.

ABC-M6A2-FIELD CB MASK HOOD



PROTECTS AREAS OF YOUR HEAD AND NECK, NOT COVERED BY YOUR MASK, AGAINST CB AGENT VAPORS, AEROSOLS, AND DROPLETS

OPTICAL INSERTS

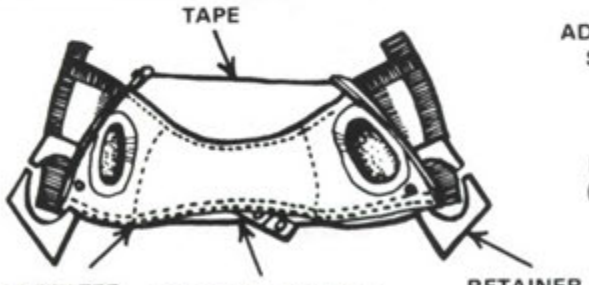
AVAILABLE BY MEDICAL PRESCRIPTION. IF YOU MUST WEAR GLASSES, ASK YOUR SUPERVISOR TO LET YOU SEE TM 3-4240-270-20&P

THIS STYLE IS DESIGNED FOR ABC-M17 MASKS AND WILL ALSO FIT M17A1 MASKS.

THIS STYLE WILL FIT M17A1 MASKS ONLY.

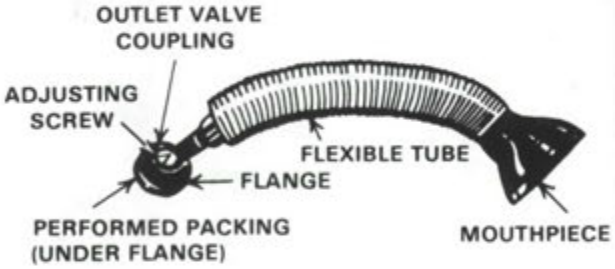
ABC-M4 FIELD CB MASK WINTERIZATION KIT

SPECIAL INLET VALVE DISKS & NOSECUP VALVE DISKS (STORED IN PREFILTER POCKET) WILL WITHSTAND EFFECTS OF EXTREME COLD



PREVENTS FROST ACCUMULATIONS ON INLET VALVES DURING SUBZERO WEATHER.

M1 RESUSCITATION TUBE FOR M17A1 ONLY



CONVERTS YOUR MASK INTO A LIFE-SAVING RESUSCITATION SYSTEM.

Figure 2.

NOTE: Depending upon your unit SOP, you will be authorized any or all of the accessories above.

i. Notify your supervisor of any deficiencies which must be corrected at a higher level.

2. **To clean the mask (without removing filter elements).**

a. Do not remove the hood if it is attached to the mask.

b. Remove the voicemitter-outlet cover, inlet valve caps, and eyelens outserts.

c. Clean the mask inside and out with a cloth dipped in warm, soapy water (wrung almost dry) or a brush with soft bristles, being careful not to wet the filter elements.

d. Rinse with a cloth dipped in warm, clear water (wrung almost dry).

e. Wipe the facepiece with a clean, lint-free cloth or air-dry.

f. If the nosecup valve disks become detached while the mask is being cleaned, reinstall them.

g. Reassemble the mask.

3. **To clean the carrier.**

a. Empty the carrier pockets.

b. Brush the carrier both inside and outside to remove sand or grit.

c. If the carrier is soiled, clean it with a brush dipped in clear, cold water.

d. Put components and authorized accessories back in the carrier.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, May 71 (chap 4, sec I, pages 4-4 to 4-6)
TM 3-4240-279-10, Mask Chemical-Biological Field, ABC-M17A1, M17 and Accessories, Aug 75 (chap 3, pages 3-1 to 3-14)
TEC Lesson 931-061-0065A, NBC: Maintenance of the M17 Series Mask

TASK NUMBER: 092-503-1010

EXCHANGE FILTERS ON AN M17 SERIES PROTECTIVE MASK

CONDITIONS:

Given an M17 series protective mask with filters that have been exposed to chemical agents, immersed in water, or damaged, and a pair of M13 series replacement filters.

STANDARDS:

Exchange the spare set of M13 series filters with those in the mask and perform a function check IAW the performance measures below.

PERFORMANCE MEASURES:

1. The M17 series mask has two M13 series filter elements installed in the left and right cheek pouches. These filter elements provide protection to the wearer from all known toxic chemical agents. But when exposed to agents for long periods of time, or repeatedly, they break down and must be replaced. In any future conflict, the individual soldier must be able to exchange the filter elements himself.

2. To remove the filter elements in the M17 series mask, follow the steps outlined in figure 1.

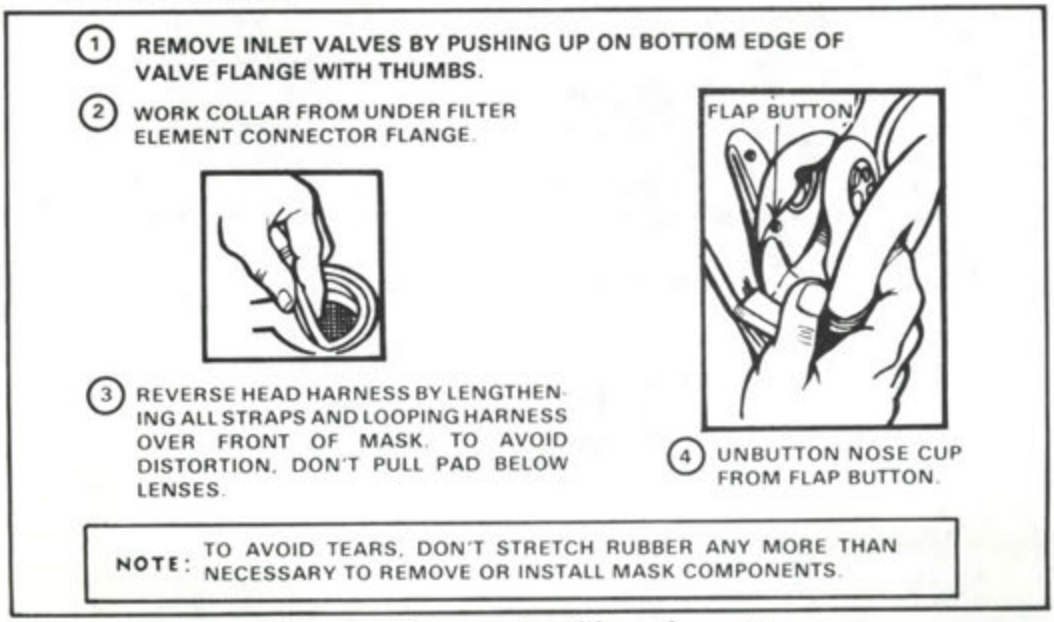


Figure 1. Removing filter elements.

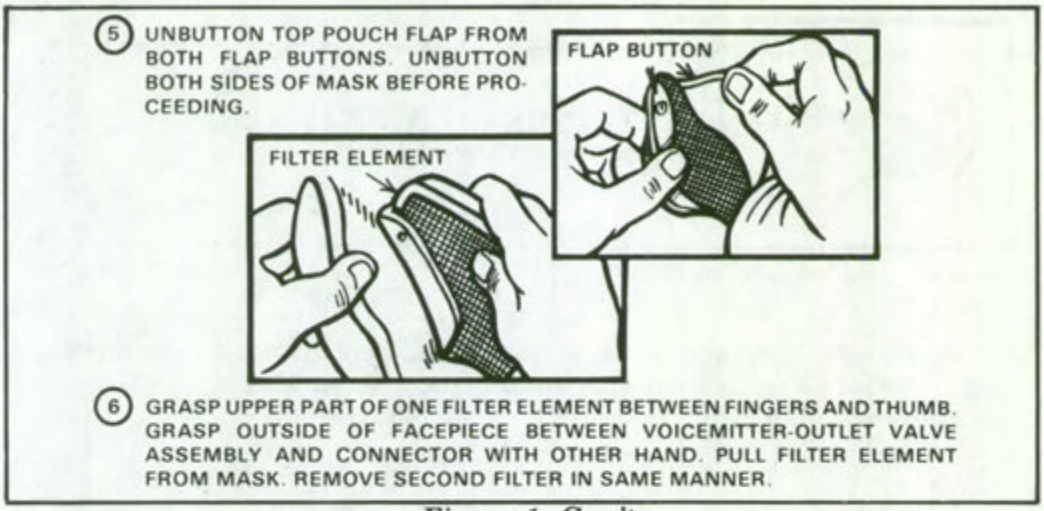


Figure 1. Con't.

3. **To replace the filter elements, follow the steps outlined in figure 2.**

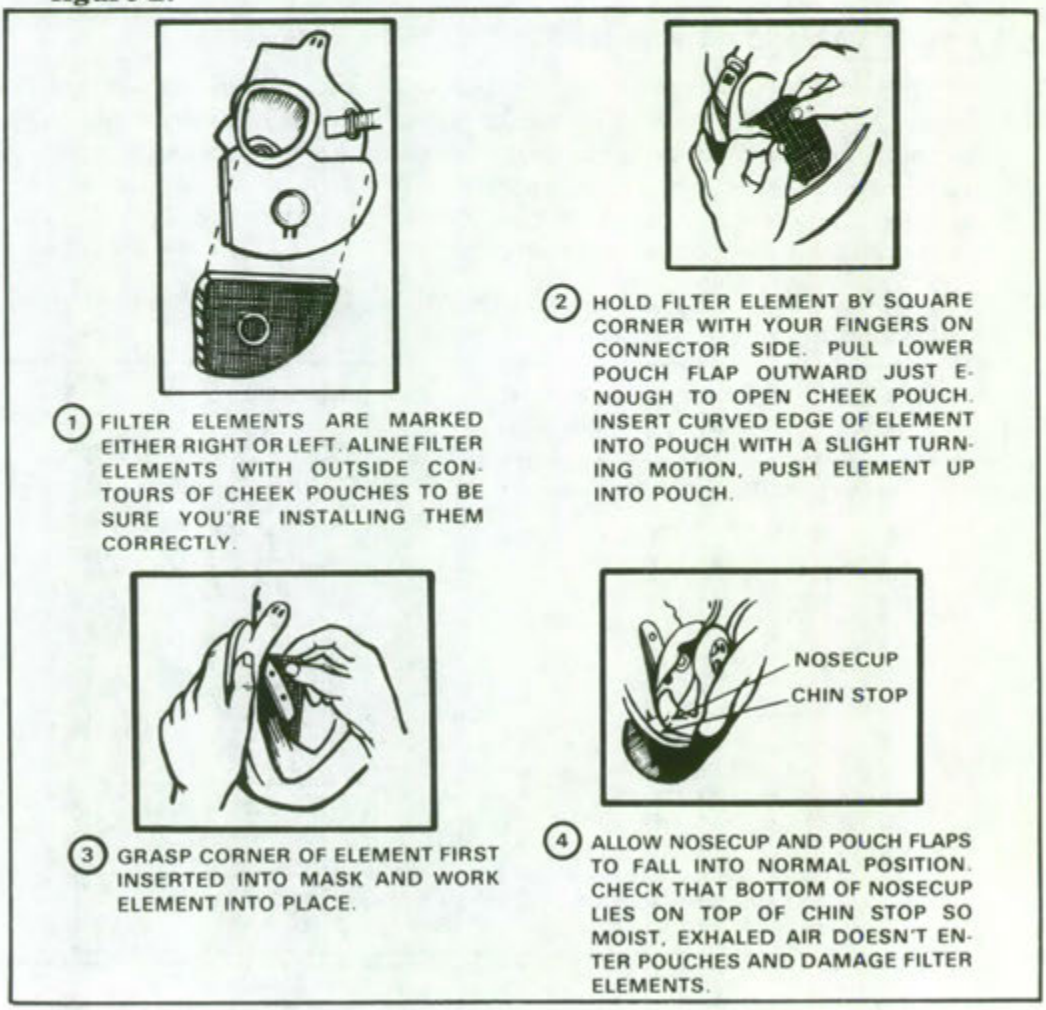
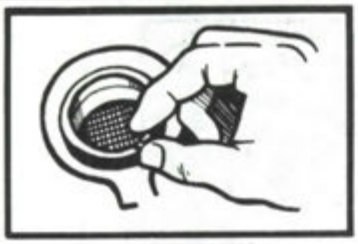


Figure 2. Installing filter elements.



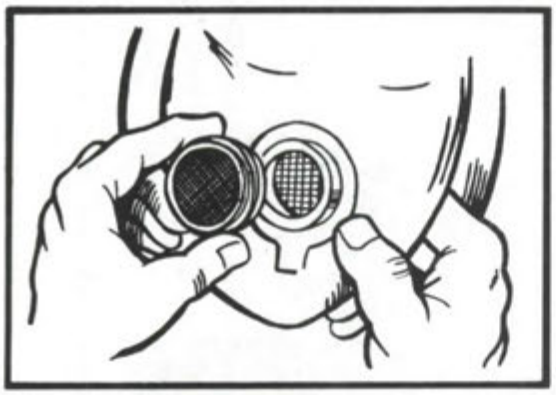
(5) WORK COLLAR UNDER CONNECTOR FLANGE AND RECHECK FILTER ELEMENT POSITION. ADJUST IF NECESSARY.

(6) AFTER BOTH ELEMENTS ARE INSTALLED, BUTTON POUCH FLAPS AND NOSECUP. PLACE ONE FINGER UNDER SHORT (OUTER) BUTTON AND SLIP CORRESPONDING HOLE IN FLAP OVER THAT BUTTON. REPEAT WITH LONG (INNER) BUTTON.

(7) SLIP HOLE IN NOSECUP OVER INNER BUTTON.

(8) BUTTON BOTH SIDES IN LIKE MANNER.

(9) RETURN HEAD HARNESS TO NORMAL POSITION AND ADJUST STRAPS AS REQUIRED.



(10) INSTALL INLET VALVES.

Figure 2. Con't.

4. To perform a function test, follow these steps:

a. Put on the mask.

b. Clear the mask.

c. Check the seal.

d. If you cannot obtain a seal or cannot breathe, check to see if the mask has been reassembled properly.

e. If the difficulty still exists, notify your supervisor.

REFERENCE:

TM 3-4240-279-10, Operator's Manual Mask, Chemical-Biological: Field ABC M17/M17A1 and Accessories, C1, Aug 75 (chap 3, sec III, page 3-6, 8)

TASK NUMBER: 092-503-1002

PUT ON AND WEAR A PROTECTIVE MASK

CONDITIONS:

In a field or garrison situation, wearing standard individual combat gear, to include a protective mask carrier worn in an authorized carrying position, containing a prefitted M17 series protective mask and given a standard alarm for an NBC attack or exposed to CS gas without warning.

STANDARDS:

1. Within 9 seconds, put on, seat, and clear the protective mask.

2. Within an additional 6 seconds, secure the hood (if present) in accordance with the performance measures below.

3. Secure underarm straps to the hood (if present) before continuing the mission.

NOTE: If exposed to CS gas without warning, remain masked for an additional 2 minutes.

PERFORMANCE MEASURES:

1. Upon becoming aware of a chemical-biological attack, stop breathing, remove headgear, and open the carrier with the left hand. (Headgear may be placed between the legs or on the muzzle of a rifle held between the legs. This is important in a contaminated area and should be practiced in training. If dropped, however, continue to mask and decontaminate the equipment afterward.)

2. Hold the carrier open with the left hand and with the other grasp the mask just below the eyepieces and remove the mask.

3. Grasp the facepiece with both hands, sliding the thumbs up inside, so that the facepiece is open to the fullest extent.

4. Place chin in the chin pocket, then pull the head harness over the head, making sure that all head straps are straight and the head pad is centered (figure 1).

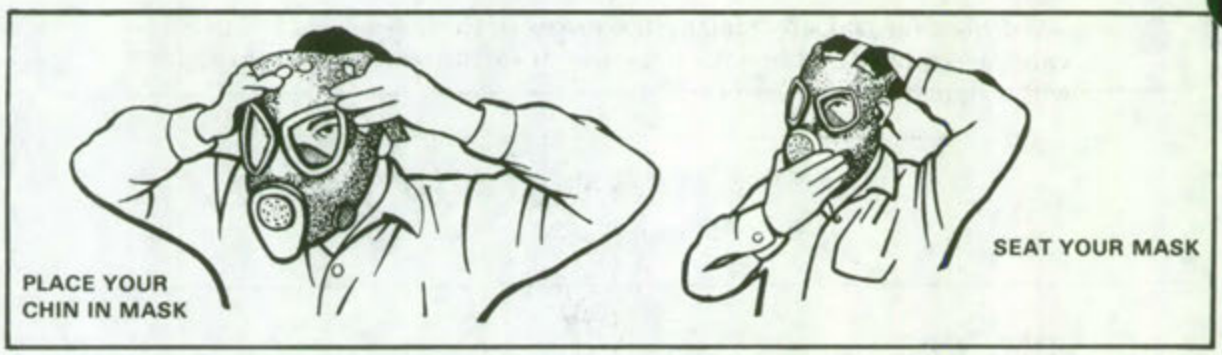


Figure 1.

5. Smooth the edges of the facepiece on the face with an upward and backward motion of the hands, pressing out all bulges to get an airtight seal (figure 2).

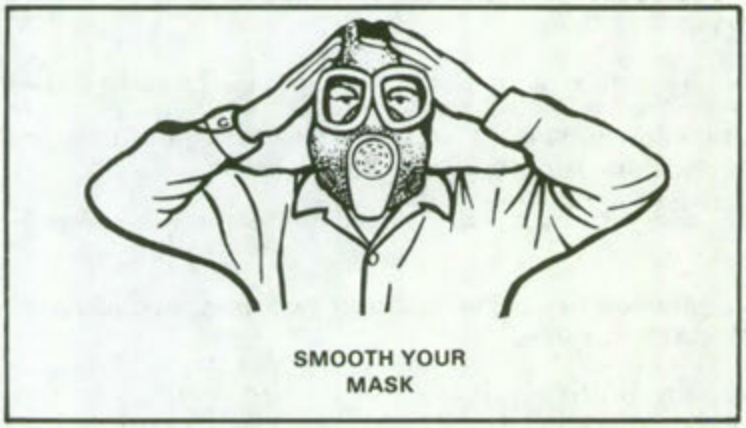


Figure 2.

6. Clear the mask (M17) by placing the palm of one hand over the bottom of the outlet valve cover and blowing hard to clear any agent inside the mask. Clearing the M17A1 also requires covering the voicemitter assembly with the other hand (figure 3).

Figure 3.

7. Check for leaks by placing the palms of the hands over the two inlet valve assemblies and breathe in slowly. If there are no leaks, the facepiece will collapse against the face (figure 4).

Figure 4.

8. Secure the protective hood (if present) by pulling the hood over the shoulders, zipping it, and adjusting the drawstrings. Before continuing the mission, pull the straps forward, under the arms, and attach the ends to the velcro patches on the front of the hood.

9. Replace the headgear.

10. Sound the appropriate alarm, and continue the mission.

NOTE TO TRAINERS: This task is designed to familiarize the soldier with the difficulty involved in performing his normal duties while masked. Time should be allowed for the soldier to remain in the mask initially for 1 hour and work up to at least 6 consecutive hours.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, May 17 (app B, sec I, page B-1)
FM 21-41, Individual NBC Defense, Oct 77 (pages 25 thru 27)
TEC Lesson 931-061-0060-F, NBC: The Mask
TEC Lesson 931-061-0061-F, NBC: Masking and When To Do It

TASK NUMBER: 092-503-1015

PUT ON AND WEAR PROTECTIVE CLOTHING

CONDITIONS:

In a simulated NBC environment, given either the chemical protective overgarment or chemical protective liner ensemble, gloves and socks (boot socks and field gloves may be used), and a requirement to dress in protective clothing.

STANDARDS:

Complete dressing steps in 3 minutes IAW performance measures below.

NOTE TO TRAINERS: this task is designed to familiarize the soldier with the difficulty involved in performing his normal duties while wearing either protective garment. Time should be allowed for the soldier to remain in the protective clothing for a minimum of 6 hours.

PERFORMANCE MEASURES:

1. **Procedure for putting on overgarment.**

   a. Remove boots.

   b. Replace boot socks with impregnated socks.

   c. Put on boots and tuck trouser cuff in boot; lace tightly.

   d. Put on overgarment trousers, zip legs, and tie firm blouse over boots.

   e. Put on overgarment shirt; zip up and fasten closures.

   f. Put on protective gloves and pull the cuff of the overgarment over the gloves.

2. **Procedure for putting on liner ensemble.**

   a. Put on trouser liner.

   b. Put on outer trousers and attach liner waist tie tapes through belt loops of the outer trousers.

   c. Button inside gas flap button of trouser liner into right buttonhole, then button left outside of trouser liner to the same button.

   d. Put on protective socks and pull over top of the knitted cuff of the trouser liner.

e. Put on boots and lace snugly. The upper portion of the boot must cover the top of the knitted cuff of the trouser liner and top of the sock. The cuff of the outer trousers is bloused over the top of the boot.

f. Put on shirt liner. Button inside gas flap button into right buttonhole, then button left outside of liner to the same button.

g. Tuck the shirttail of the liner inside the trouser liner.

h. Put on the outer shirt. Button, and leave shirttail outside.

i. Put on protective gloves. Pull upper portion of glove over knitted cuff of shirt liner. Sleeves of outer shirt fit over the upper portion of the gloves.

3. **Perform primary duties wearing the protective clothing.**

NOTE: To remove either the overgarment or undergarment, follow steps in para 1 and 2 in reverse order. However, if your overgarment or field uniform and undergarment are contaminated, remove them according to paragraph 4.

4. **When garments are contaminated:**

a. Use the cloth bag from the M13 kit to detect/decontaminate liquid contamination.

b. Loosen the hood and remove the shirt.

c. Remove the trousers.

d. Dust the boots with the cloth bag and wash off with water.

e. Dispose of the contaminated clothing in a container or designated area.

f. Remove the mask and hood (if required, decontamination is done by an assistant prior to removal).

g. Remove the gloves.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71, (chap 4, para 4-2, 4-5, 4-24)

TM 10-277, Protective Clothing Chemical Operations, Jul 67, C1-3, (chap 12, sec III, para 12)

TASK NUMBER: 092-503-1007

DECONTAMINATE SELF

CONDITIONS:

Given all standard NBC protective equipment, the M13 and M258 decontamination kits or the M58 training skin decontamination kit, and an unknown liquid contaminant on the skin. (Contamination normally would result from exposure to a direct chemical attack or passage through a chemically contaminated area.)

STANDARDS:

Remove all contamination from the skin IAW the performance measures below.

PERFORMANCE MEASURES:

1. If you are not already masked, mask according to task: **Put on and wear a protective mask.**

2. For contamination on your face:

   a. Extract the M13 kit (figure 1) from your protective mask carrier.

   b. Take the fuller's earth pad (skin pad) from the M13 kit.

   c. Grasp the chin portion of your mask and pull the mask away from your face far enough to allow you to touch the fuller's earth pad to your nose.

   d. Make two quick wipes from your nose to each ear and one wipe across the chin.

   e. Replace the mask on your face.

   f. Clear your mask.

   g. Check your mask.

   h. Dispose of the pad.

   i. Put on all protective clothing not already on.

3. For contamination on skin other than the face:

   a. Extract your M258 kit (figure 2) from your protective mask carrier.

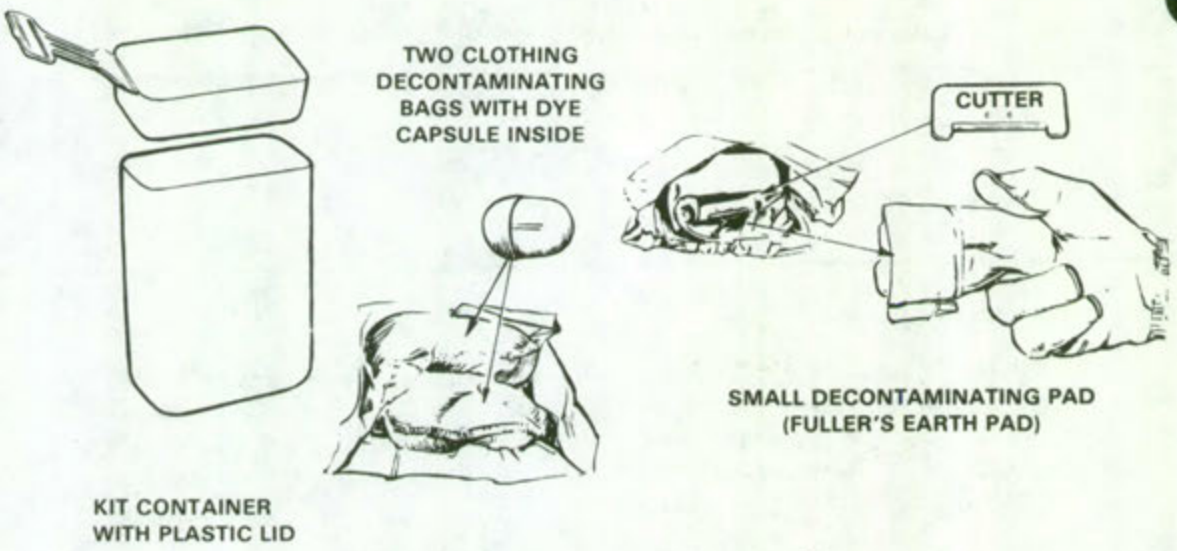


Figure 1. M13 decontamination kit.

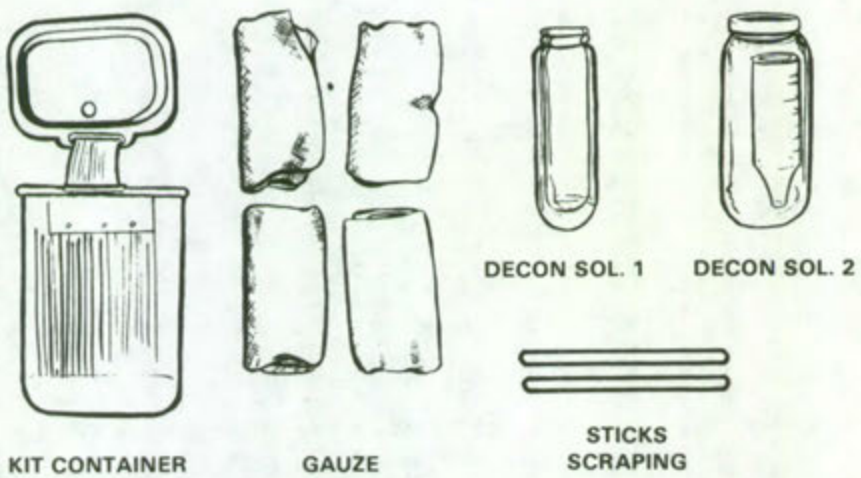


Figure 2. M258 decontamination kit.

b. Open the kit (figure 3) and push the T-handle of the cover through the web strap so that you don't lose it.

Figure 3.

c. Take out a piece of gauze and soak up any liquid on your skin. DO NOT WIPE. If the liquid is thick and won't soak into the gauze, use one of the scraping sticks like a spoon to remove it.

d. Take out Capsule 1 and punch a hole in the side near the top of the capsule with the spike attached to the cover of the kit.

e. Wet a gauze pad (figure 4) with the solution from the capsule and blot (figure 5) the contaminated skin.

Figure 4.

Figure 5.

f. Dispose of the pad.

g. Take out Capsule 2 and break the glass vial inside the capsule (figure 6). (Use the heel of your boot, the butt of your rifle, or a rock.)

Figure 6.

h. Shake the capsule hard at least 12 times so that everything is well mixed.

i. Puncture Capsule 2 the same way you did Capsule 1.

j. Wet a gauze pad with the solution from the capsule and blot the contaminated area with the solution; make sure you cover the entire contaminated area.

k. Dispose of the pad.

l. Put on all protective clothing not already on.

SQT ADMINISTRATIVE INSTRUCTIONS: The M58 training kit will be used in all training situations. The M258 kit will be used only for actual chemical agents.

REFERENCES:

FM 21-41, Individual NBC Defense, Oct 77 (page 58 thru 64)

TASK NUMBER: 092-503-1008

DECONTAMINATE INDIVIDUAL EQUIPMENT

CONDITIONS:

After being exposed to a chemical-agent attack, passing through an area contaminated with an agent, or operating in an area contaminated with a chemical agent, wearing all chemical protective clothing and given an M13 individual decontaminating and reimpregnating kit.

STANDARDS:

Perform decontamination IAW performance measures below.

PERFORMANCE MEASURES:

1. Extract the M13 kit (figure 1) from the protective mask carrier.

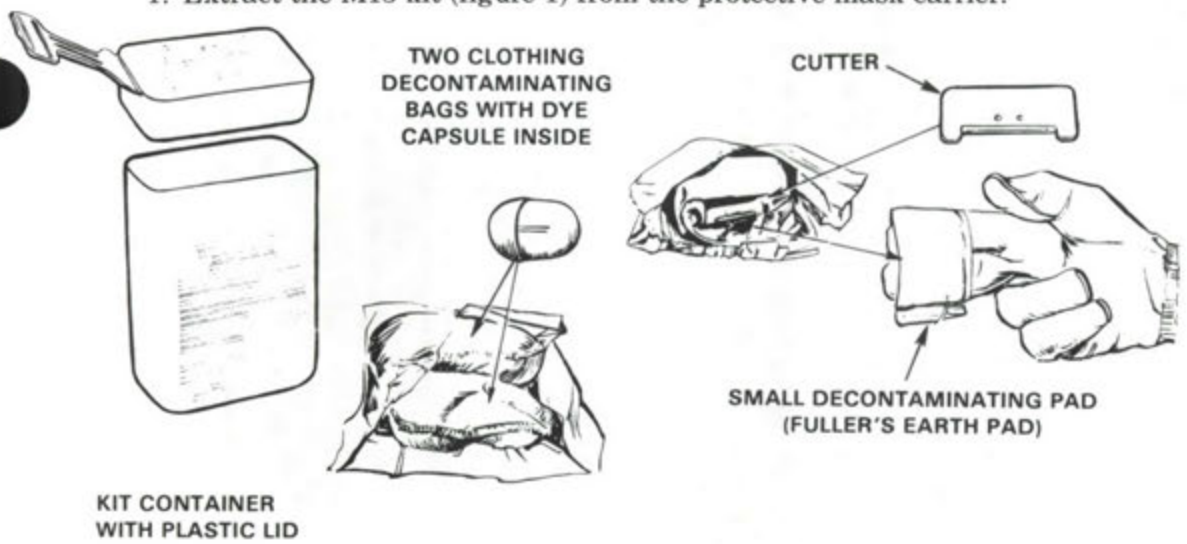


Figure 1. M13 decontamination kit.

2. Remove the fuller's earth pad and, if required, decontaminate the interior surface of your protective mask:

   a. Blot the contamination with one side of the pad.

   b. Turn the pad over.

   c. Slap the pad against the mask to spread the powder.

   d. Rub the powder in using the pad.

3. Remove the cloth bag and use it to decontaminate the exterior of the mask, clothing, and individual equipment:

a. Crush dye capsule and mix thoroughly inside the bag. **NOTE: DO NOT CRUSH THE DYE CAPSULE UNLESS ACTUAL CONTAMINATION IS PRESENT.**

b. Dust the contaminated area.

c. Inspect for red or brown color on clothing.

d. If red or brown color is present, use the cutter to remove spots larger than one-eighth inch. **NOTE: This does not apply to the overgarment which has an inner liner of charcoal to neutralize the contamination.**

e. On equipment, rub the powder in using the bag.

f. Clean and oil metal equipment.

SQT ADMINISTRATIVE INSTRUCTIONS: That portion of the procedure which requires crushing of the dye capsule will be simulated. Only in the event of an actual chemical contamination will the capsule be crushed.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 4, para 4-2, 4-5, 4-24)
FM 21-41, Individual NBC Defense, Oct 77 (page 65, 66)

TASK NUMBER: 092-503-1014

IDENTIFY A CHEMICAL AGENT USING ABC-M8 DETECTOR PAPER

CONDITIONS:

In a field or garrison environment, masked and wearing all individual combat equipment, given an unknown liquid chemical agent simulant and sufficient ABC-M8 detector paper.

NOTE TO TRAINER: Contact the NBC NCO at battalion level for suitable agent simulants.

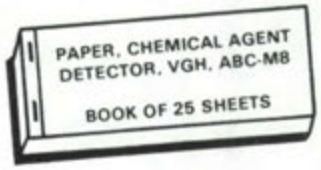
STANDARDS:

Within 1 minute, determine if the chemical agent is nerve (V or G) or blister (H).

PERFORMANCE MEASURES:

1. M8 detector paper gives the individual soldier the means for determining the presence of nerve or blister (H-type only) agents. M8 detector paper alone does not allow the soldier to determine if he can unmask. It will only detect nerve and blister agents in liquid form and must physically come in contact with them. M8 detector paper is normally found in the protective mask carrier.

M8 DETECTOR PAPER



2. To use M8 paper:

a. Remove the book of detector paper from the wrapping.

b. Tear out one sheet of paper.

c. Touch the paper to the suspected agent.

d. Try to match the color reaction on the paper to the color chart on the inside cover of the book.

3. Inform your supervisor of your findings. Continue to wear your mask even if you don't get a match as this is no indication that the substance is necessarily safe.

REFERENCE:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 8, page 8-12, para 8-17a)

TASK NUMBER: 092-503-1006

DEMONSTRATE VISUAL, VOCAL, AND SOUND ALARMS FOR AN NBC ATTACK

CONDITIONS:

In a field environment, masked and wearing all individual combat equipment, given a requirement to give the alarm for a surprise NBC attack.

STANDARDS:

Demonstrate the correct arm-and-hand signal, vocal signal, and sound alarm in accordance with performance measures below.

PERFORMANCE MEASURES:

1. **Visual Signal** (figure 1). Extend both arms horizontally sideways with fists doubled facing up, and rapidly move the fists to the head and back to the horizontal position. Repeat at least three times.

Figure 1.

2. **Vocal Signal.** Yell "Spray!" for a chemical or biological spray attack and "Gas!" for an attack by any other means.

3. **Sound Alarm.**

a. Rapidly strike metal on metal to produce a loud clanging noise.

b. Soldiers should become familiar with the sound alarm given off by the automatic chemical agent alarm. This sound is very similar to a police siren.

NOTE TO TRAINERS: It is recommended that this task be trained in conjunction with unit NBC training on field exercises.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 4, sec II, para 4-9; app G)
FM 21-60, Visual Signals, Dec 74 (chap 2, page 2-1)

TASK NUMBER: 092-503-1009

SATISFY PERSONAL NEEDS IN A CHEMICAL ENVIRONMENT

CONDITIONS:

In an area contaminated with an unknown chemical agent (simulated), masked and wearing standard chemical protective clothing (or acceptable substitute) and all individual combat equipment, given the need to drink water, use the latrine, and sleep.*

***NOTE: Other personal needs such as eating, shaving, bathing, and changing clothes in a chemical environment require equipment and efforts beyond the capabilities of an individual. Your unit will tell you how to deal with these problems.**

STANDARDS:

1. Drink water from your canteen IAW performance measures below.
2. Explain correct procedure for defecating, urinating, and sleeping.

PERFORMANCE MEASURES:

1. Drinking with mask other than the M17A1.

a. Remove the canteen from the carrier, remove the canteen cap and, if necessary, decontaminate exposed threads with water or the skin pad from the M13 decontaminating kit.

b. Take a few breaths and hold the last one.

c. Close the eyes, pull the protective hood up, grasp facepiece behind the outlet valve assembly of the protective mask with the free hand, and pull the facepiece out and up far enough to provide access to the mouth.

d. Place the neck of the canteen to the closed lips and cant it, tilting the head back until the water reaches the lips, and then fill the mouth with water.

e. Replace the facepiece, swallow the water, and then clear the mask.

f. Rest and then repeat as necessary.

2. Drinking when wearing the M17A1 mask (figure 1).

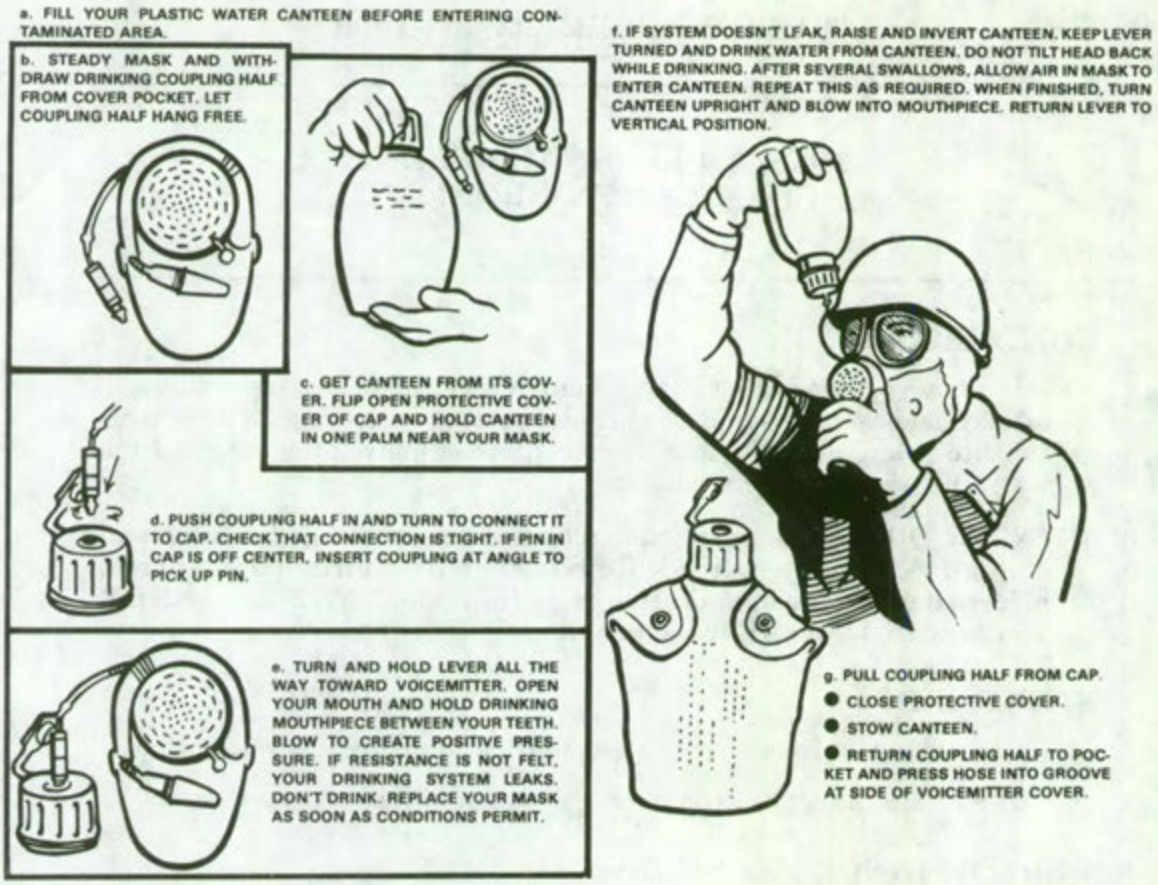


Figure 1.

3. Defecating and urinating. During the removal, opening, and closing of contaminated outergarments or while squatting over the latrine in a contaminated environment, the possibility of transferring contamination to the underclothing or exposed skin requires special precautions. For this reason, individuals dust with the cloth pad of the M13 decontamination kit the parts of the contaminated outergarments that might come in contact with the skin when the contaminated clothing is partially removed or opened. After the contaminated outergarments have been opened or partially removed, individuals remove the protective gloves before handling undergarments or the bare skin.

4. Sleeping.

a. Wear all protective clothing, mask, and hood.

b. Use the "buddy" system to periodically check to insure the clothing, mask, and hood do not become dislodged while sleeping.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 4, page 4-16 thru 4-17, para 4-26 thru 4-30)

TM 3-4240-279-10, Operator's Manual, ABC M17/M17A1, C1, Aug 75 (chap 2, pages 2-13 thru 2-14)

TASK NUMBER: 092-503-1005

PROTECT SELF AGAINST A NUCLEAR HAZARD

CONDITIONS:

In a field or garrison location, wearing all individual combat gear, given a sudden nuclear explosion (simulated) without warning.

STANDARDS:

Protect yourself IAW performance measures listed below.

PERFORMANCE MEASURES:

1. When subjected to an unexpected nuclear attack:

a. Close your eyes and fall face down to the ground immediately, your head in the direction opposite the blast.

b. As you hit the ground, cover all exposed skin. Place your hands under your body, keep your face down in the dirt, and hunch your shoulders forward to try to cover the back of your neck. Be sure to keep your helmet on.

c. Remain down until the blast wave passes over you, first in one direction and then in the opposite direction, and until debris stops falling.

d. Stay calm, check for injury, check weapons and equipment damage, and prepare to continue the mission.

2. The important thing to remember in an unexpected nuclear attack is to take cover immediately. That means if you have a choice between falling directly on the ground or taking two steps and jumping into a ditch, you must fall directly on the ground. In the time it takes to go those two extra steps, you can sustain serious injury.

3. When warned of an imminent nuclear attack, place yourself in the best protective position possible (figure 1).

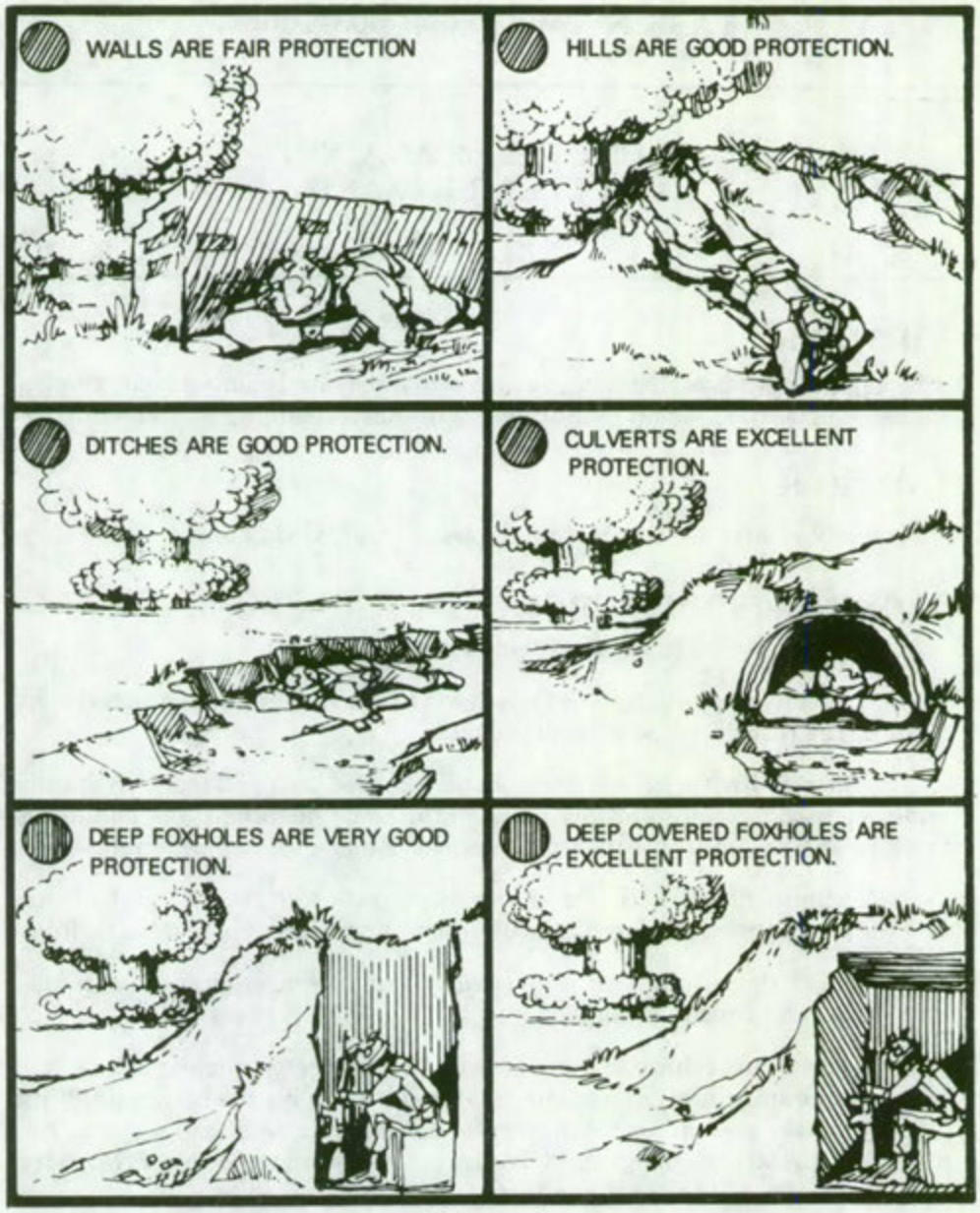


Figure 1.

NOTE: An armored vehicle is excellent protection.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 6, page 6-1, para 6-1 thru 6-5; app F, page F-1)
TEC Lesson 931-061-0064-F, Individual Protection and Decontamination

TASK NUMBER: 081-831-1012

ADMINISTER ANTIDOTE TO A NERVE-AGENT CASUALTY

CONDITIONS:

While wearing a protective mask, given a training automatic injector and a casualty with nerve-agent symptoms (described or simulated) (casualty may be tested soldier).

STANDARDS:

Within 10 seconds, recognize nerve-agent symptoms, inject casualty (self) with antidote (simulated), and massage injection area.

PERFORMANCE MEASURES:

1. Recognize symptoms of nerve-agent poisoning: flushed skin with local sweating and tremors, or tightness of chest and pin-pointing of pupils of the eye (tested soldier would recognize this as dimness of vision).

2. Mask the casualty if not already masked.

3. Remove yellow or gray safety cap from the Combo Pin injector.

4. Place green or black end of injector against casualty's thigh (or other large muscle), push until injector functions, and hold firm for a full 10 seconds.

5. Massage the injection area.

6. Attach expended injector to casualty's shirt collar by bending needle through material.

7. Repeat **steps 3, 4, 5,** and **6** after a 5 minute interval if necessary.

NOTE: Administer no more than two Combo Pin injections. This applies to the new antidote as opposed to atropine.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 11, page 129)
FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, May 71 (chap 4, sec III, pages 4 thru 13)
FM 21-41, Individual NBC Defense, Oct 77 (page 32)

TASK NUMBER: 081-831-1017

ADMINISTER ANTIDOTE TO BLOOD-AGENT CASUALTY

CONDITIONS:

In a simulated NBC environment, wearing all individual equipment, gloves, and mask, given at least two simulated amyl nitrite capsules and a casulaty showing symptoms of blood-agent poisoning.

STANDARDS:

Within 30 seconds, recognize blood-agent symptoms, and administer antidote IAW performance measures below.

PERFORMANCE MEASURES:

1. How to recognize blood-agent poisoning: marked increase or decrease in breathing rate (labored), convulsions or coma.

2. Mask the casualty.

3. Insert a crushed amyl nitrite capsule (simulated) inside protective mask.

4. Repeat **step 3** every 4 minutes until normal breathing returns, or a total of eight amyl nitrite capsules is used.

5. Administer artificial respiration, as necessary.

6. Prepare to continue mission.

NOTE: If casualty cannot be masked for some reason, hold amyl nitrite capsule directly under casualty's nose. Be sure to use the casualty's amyl nitrite capsule and not your own.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 11, page 135)
FM 21-41, Individual NBC Defense, Oct 77 (page 35)
TEC Lesson 931-061-0062-F, NBC: First Aid, Part 1

TASK NUMBER: 081-831-1009

APPLY ARTIFICIAL RESPIRATION TO A CHEMICAL-AGENT CASUALTY

CONDITIONS:

During daylight or darkness, in a contaminated area, wearing a field protective mask with M1 resuscitation tube, given an unconscious chemical-agent casualty (a dummy may be used for training).

STANDARDS:

1. Clear the casualty's upper air passage.

2. Apply artificial respiration until the casualty begins to resist resuscitation.

3. Mask the casualty.

PERFORMANCE MEASURES:

Use of M1 resuscitation tube.

1. Place the casualty on his back. Stretch the front of the neck by lifting up on his chin with one hand; push the back of his head down as far as it will go with the other hand.

2. While holding the casualty's chin up, open his mouth and remove loose dentures (if any). Insert a finger and clean out any foreign matter or mucus that may be in his mouth.

3. Insert the resuscitation mouthpiece between the casualty's lips and teeth. Completely surround the edge of the mouthpiece with his lips.

4. Hold the mouthpiece in place by putting your thumb and index finger over the outside of the casualty's lips and hooking remaining fingers under his chin (figure 1).

5. Pinch the casualty's nostrils closed. Take a deep breath and blow into the breathing tube mouthpiece until the casualty's chest appears to rise. Relax the pressure on the casualty's nostrils and allow him to exhale. Repeat this procedure at a rate of approximately 12 times a minute until the casualty is able to breathe for himself.

Figure 1.

NOTE: When a casualty begins to breathe for himself, he will automatically resist resuscitation efforts.

6. When the casualty can breathe normally, have him hold his breath for masking.

7. Remove the resuscitation mouthpiece from the casualty's mouth and put a mask on his face.

8. Remove the resuscitation tube from your mask. Wipe the resuscitation mouthpiece as clean as possible and wash it as soon as conditions permit.

REFERENCES:

FM 21-11, First Aid for Soldiers, Jun 76 (chap 11, pages 130-134)
TM 3-4240-279-10, Mask, Chemical-Biological Field, M17A1 and M17 and Accessories, Aug 75 (chap 2, pages 2-18 to 2-21)
TEC Lesson 931-061-0063-F, NBC: First Aid, Part 2

TASK NUMBER: 092-503-1004

RECOGNIZE AND PROTECT SELF AGAINST A CHEMICAL/BIOLOGICAL (CB) HAZARD

CONDITIONS:

In a field environment during the conduct of a tactical mission against (simulated) enemy forces which have a CB offensive capability, given your assigned weapon, TOE equipment, and protective mask with all accesories.

STANDARDS:

Respond to source or indicator of NBC attack by masking, sounding the alarm, and continuing the mission.

PERFORMANCE MEASURES:

1. Current analysis of threat doctrine indicates that threat forces have a powerful CB offensive capability and are prepared to use it. Its important, then, for the individual soldier to know what the possible sources and indicators of a CB attack are. He must learn to mask immediately when these sources or indicators become apparent to him, if he is to survive on the battlefield.

2. If an attack is reported to be imminent or if chemical agents have been used already by enemy forces, individuals not already masked will mask when:

a. Any artillery, mortar, rocket, or aircraft attack occurs on or near their position.

b. Any smoke, mist, vapor, or droplets of an unknown source occur in the area.

c. There is any reason for suspecting a chemical attack.

d. Any of the following symptoms appear:

(1) Running nose.

(2) Choking and/or tightness in the chest and throat.

(3) Dimming of vision or difficulty in focusing.

(4) Irritation of the eyes.

(5) Increase in breathing rate, or difficulty in breathing.

e. Entering an area known or suspected to be contaminated.

3. In some cases, you will encounter a contaminated area which has been marked. You should mask immediately. Standard NATO CB markers are pictured in figure 1.

a. The chemical marker has the word GAS in red against a yellow background.

b. The biological marker has the word BIO in red against a blue background.

c. The chemical minefield marker has the words GAS MINES and a horizontal strip in yellow on a red background.

NOTE: The front surface of the marker is facing away from the contaminated area and all information concerning the minefield is placed on the front surface of the marker, not the back.

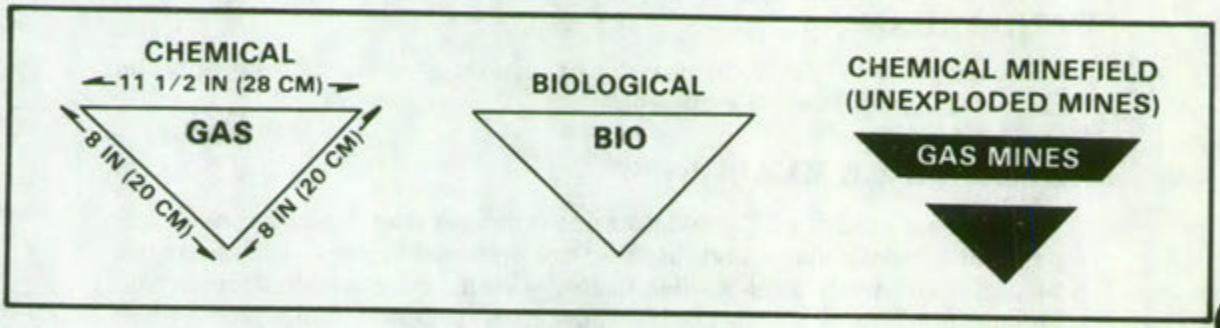


Figure 1.

SQT Administrative Instruction: An on-target chemical agent attack can be simulated using the Simulator Projectile Airburst Liquid (SPAL) M9 or a spray of water combined with the detonation of artillery simulators.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 2, para 2-14/21/22/27; chap 4, para 4-10; app F, page F-1)
FM 21-41, Individual NBC Defense, Oct 77 (page 7, 8, 13 thru 17)

TASK NUMBER: 092-503-2002

DECONTAMINATE EQUIPMENT USING ABC-M11 DECONTAMINATION APPARATUS

CONDITIONS:

In a simulated NBC environment, while masked and wearing all individual combat equipment and gloves, given a prefilled ABC-M11 decontamination apparatus and a contaminated (simulated) weapon.

STANDARDS:

Place the M11 decontamination apparatus into operation and decontaminate the weapon.

PERFORMANCE MEASURES:

NOTE TO TRAINERS: Fill the M11 with water instead of DS2 for training purposes. When task is complete, thoroughly dry the M11 to prevent rusting, and heavily oil the weapon to prevent it from rusting.

1. The M11 decontamination apparatus (figure 1) has a 1½-quart capacity and normally holds 1-1/3 quarts of DS2 decontamination solution. It is normally mounted in wheeled and tracked vehicles, to be used to decontaminate surfaces which must be handled to operate the vehicle or allow it to perform its mission (e.g., laterals, steering wheel, driver's seat, combat door, hatches, etc.).

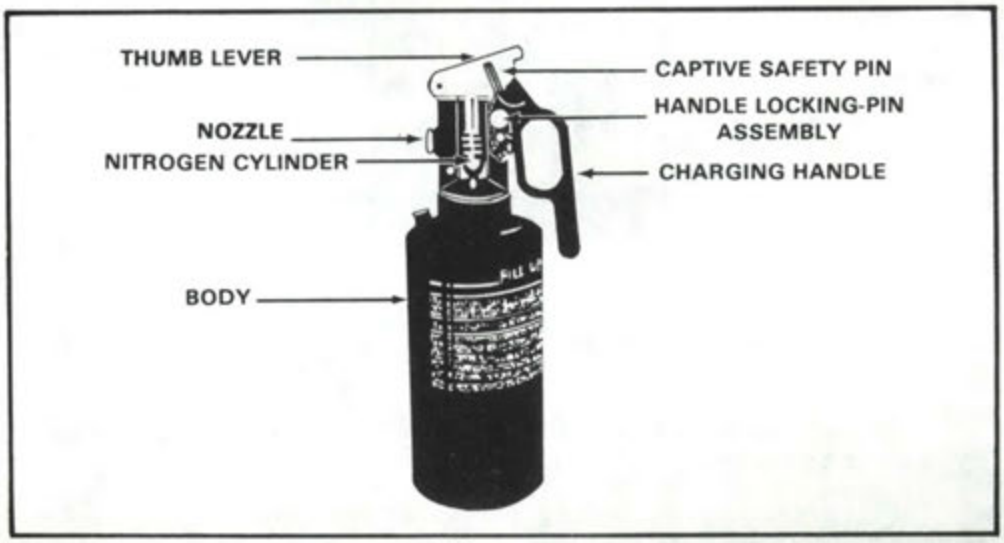


Figure 1.

2. To operate a filled M11:

a. Remove the captive safety pin.

b. Grasp the M11 in one hand (figure 2) and lift up on the charging handle with the other. You should hear a hissing noise which indicates the compressed gas from the nitrogen cylinder has entered and charged the M11.

Figure 2.

c. Pull up on the charging handle, point the apparatus at the object to be decontaminated, hold it 6 to 8 inches away, and depress the thumb lever (figure 3).

Figure 3.

d. The charged M11 will last about 30 seconds, so care should be taken to prevent wasting the DS2.

e. Having sprayed the object to be decontaminated, interrupt the flow by removing your thumb from the thumb lever.

f. Depress the handle locking pin, lower the charging handle, and replace the captive safety pin.

WARNING: DS2 is highly corrosive. DO NOT SPRAY ON PERSONNEL and avoid spraying fabric.

3. To decontaminate a contaminated weapon.

NOTE: For training, the M11 can be filled with water. Care should be taken to dry it out thoroughly when finished to avoid rusting.

a. Holding the charged and filled M11 6 to 8 inches from the weapon, depress the thumb lever and cover the weapon completely with the spray from the apparatus. Avoid getting spray on any surfaces that are not metal.

b. Wait 30 minutes (simulate).

c. Flush surfaces of weapon with water, taking care to avoid contact with the runoff.

d. Dry, clean, and lubricate weapon.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71 (chap 4, para 4-25)
TM 3-4230-204-13, Decontaminating Apparatus, Portable, DS2, 1½ Quart ABC-M11, Oct 69 (chap 2, para 2-3 thru 2-4)

TASK NUMBER: 092-503-2007

IGNITE SMOKE POTS

CONDITIONS:

In a (simulated) combat environment given an M1 or M5 smoke pot and a requirement to conceal your position.

STANDARDS:

Ignite the M1 or M5 smoke pot.

PERFORMANCE MEASURES:

1. To ignite the M1 pot (figure 1).

   a. Strip off the adhesive tape and clamp.

   b. Remove outer cover to expose match head.

   c. Remove scratcher block from envelope.

   d. While looking away from the pot, draw the scratcher block rapidly across the match head.

   e. Move away from the smoke pot.

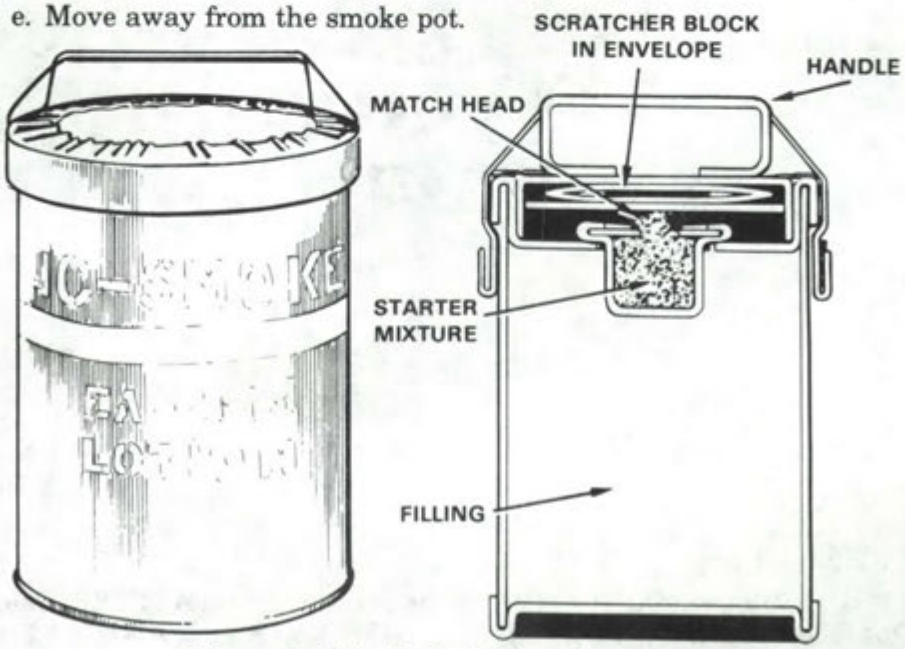


Figure 1. M1 10-lb. HC smoke pot.

2. To ignite the M5 pot (figure 2).

a. Expose the match head by pulling the tear strip handle upward and off.

b. Remove scratcher block from envelope.

c. While looking away from the pot, draw the scratcher block rapidly across the match head.

d. Move away from the smoke pot.

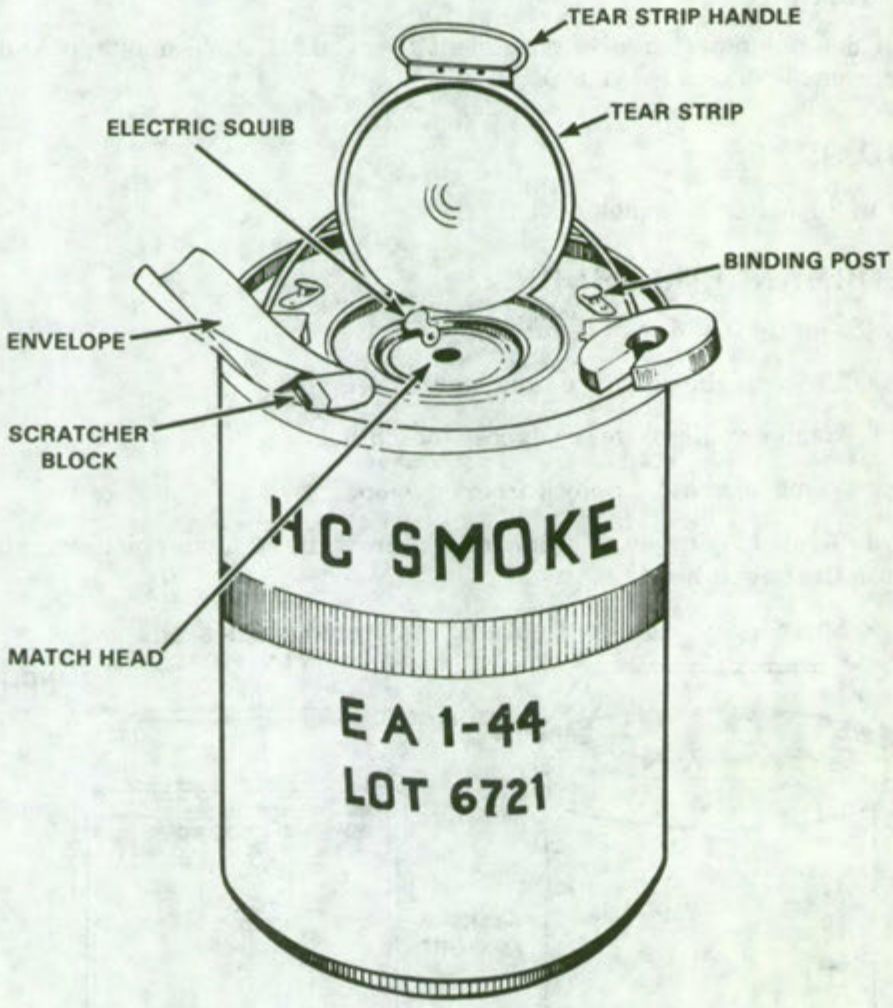


Figure 2. ABC-M5 smoke pot prepared for manual ignition.

REFERENCE:

TB CML 100, Smoke Pot, HC, 10-lb, M1 and 30-lb, ABC-M5; Smoke Pot, Floating, HC, M4A2; SGF2, AN-M7 and SGF2, AN-M7A1, C1, Apr 64 (para 8-b(1); 9b(1))

TASK NUMBER: 092-503-2001

READ AND REPORT RADIATION DOSAGES

CONDITIONS:

In a nuclear environment (simulated) while masked and wearing all individual combat equipment, given an IM93/UD series pocket dosimeter with a preset radiation dosage.

STANDARDS:

Read and report the correct radiation dosage within 20 rads.

PERFORMANCE MEASURES:

1. The IM93/UD and IM93A/UD are total-dose pocket dosimeters capable of indicating total exposure to radiation on a scale of 0-600 rads (figure 1). The IM93/UD series dosimeter is designed to be carried like a ballpoint pen, and will allow the soldier to determine the total amount of radiation he has been exposed to over a given period of time. It is normally distributed to a representative number of squad or platoon members, to allow the commander to determine the average radiation exposure within the entire unit.

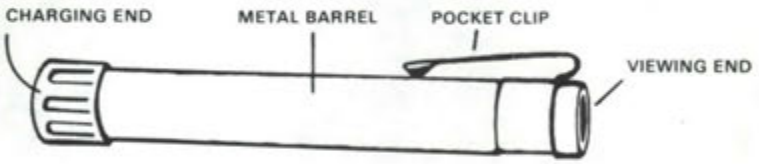


Figure 1.

2. To read the IM93/UD series pocket dosimeter:

a. Remove the rubber cap from the charging end of the dosimeter.

b. Point the dosimeter at a light source and hold the viewing end of the dosimeter to the eye.

c. Read the value on the scale covered by the hairline (figure 2).

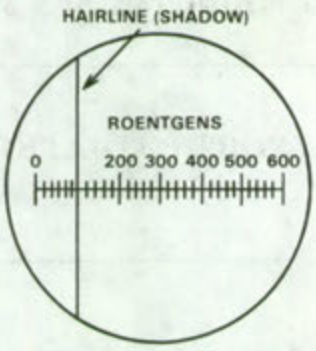


Figure 2.

d. Report the total number of rads indicated to your supervisor.

REFERENCES:

FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense, C1, May 71, (chap 11, pages 11-3 thru 11-5, para 11-6)

TM 11-6665-214-10, Operator's Manual: Radiacmeters IM93/PD, IM93/UD, IM93a/UD, and IM-147/PD, C1-3, Nov 62 (chap 4, page 20)

TASK NUMBER: 071-327-0201

MAINTAIN AN APPROPRIATE LEVEL OF PHYSICAL FITNESS (MALE ONLY)

CONDITIONS:

You will be tested to measure your physical fitness. If you are assigned to a combat or combat support unit, you will be given the Advanced Physical Fitness Test. If you are assigned to a combat service support unit or a TDA organization, you will be given the Staff and Specialist Physical Fitness Test. This test will be in daylight at a site established for the physical fitness test appropriate to your unit.

STANDARDS:

You must demonstrate, once every 6 months, that you can meet or exceed the minimum level of physical fitness required of each member of your unit in accordance with the standards contained in AR 600-9 by:

1. Exceeding the minimum standard score of 60 points on each test event with a total score of 300 or more points on the Advanced Physical Fitness Test if you are under the age of 40 and are assigned to a combat or combat support unit.

2. Exceeding the minimum standard total score of 300 or more points on the Staff and Specialist Physical Fitness Test if you are under the age of 40 and are assigned to a combat service support or TDA unit.

PERFORMANCE MEASURES:

1. Complete the five events of the Advanced Physical Fitness Test (APFT) listed below, as outlined in FM 21-20.

a. Inverted crawl.

b. Run, dodge, and jump.

c. Horizontal ladder.

d. Bent-leg situps.

e. Two-mile run.

2. Personnel over the age of 40 may elect not to take the APFT. If they elect to take it, they must complete the test once they have begun the first event or else they will receive a NO GO for the entire test.

3. Complete the five events of the Staff and Specialist Physical Fitness Test listed below, as outlined in FM 21-20.

a. Pushups.

b. Run, dodge, and jump.

c. Horizontal ladder.

d. Bent-leg situps.

e. One-mile run.

SQT REQUIREMENTS:

1. Failure to meet the standards for either test will result in an evaluation of NO GO. Personnel with profiles, who cannot complete all five events of either test, will be scored as nonobserved on the performance certification portion of the SQT.

2. SQT credit will be awarded as follows:

EVALUATION	SQT POINTS
NO GO	0
GO	1
NONOBSERVED	Neither counts for nor against total SQT score

REFERENCES:

AR 600-9, Army Physical Fitness Program and Weight Control Program, Nov 76 (chap 2, pages 2-1 thru 2-2, para 2-1 thru 2-6)
FM 21-20, Physical Readiness Training, C3, Mar 73 (chap 24-26, pages 211-253, para 386-424)

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION II
COMBAT TECHNIQUES

TASK SUMMARIES

TASK NUMBER: 071-326-0501

MOVE AS A MEMBER OF A FIRE TEAM

CONDITIONS:

In a designated position (other than team leader) in a moving fire team wedge formation, in any climatic or terrain condition.

STANDARDS:

1. Maintain the same position within the wedge.

2. React immediately to fire team leader example by performing the same actions taken by him.

PERFORMANCE MEASURES:

All training in fire team movement should be conducted by the squad leader employing both fire teams, using the techniques of movement, (traveling, traveling overwatch, and bounding overwatch). Team members and the team leader must come to know the individual traits and mannerisms of all team members. More importantly, the team members must become familiar with the team leader's style and leadership methods. The following points of correct team member movement should be stressed.

1. Maintain the same relative position within the wedge.

2. Maintain visual contact.

3. Perform the same actions as the team leader while maintaining the same relative position.

4. The interval between you and the man next to you is determined by your ability to see him and follow directions from your team leader.

a. The normal interval in daylight is about 10 meters (figure 1).

b. The interval is increased in open terrain.

c. The interval is decreased when visibility is limited due to dense underbrush, terrain, darkness, smoke, or dense fog.

d. The normal interval is resumed as soon as conditions permit.

5. The sides of the wedge may move farther apart in open, unrestricted terrain or may close together in almost a single file when moving up a narrow mountain path, through a minefield, around large obstacles, or

when visibility is severely limited. These adjustments are made automatically and without command whenever necessary (figure 2).

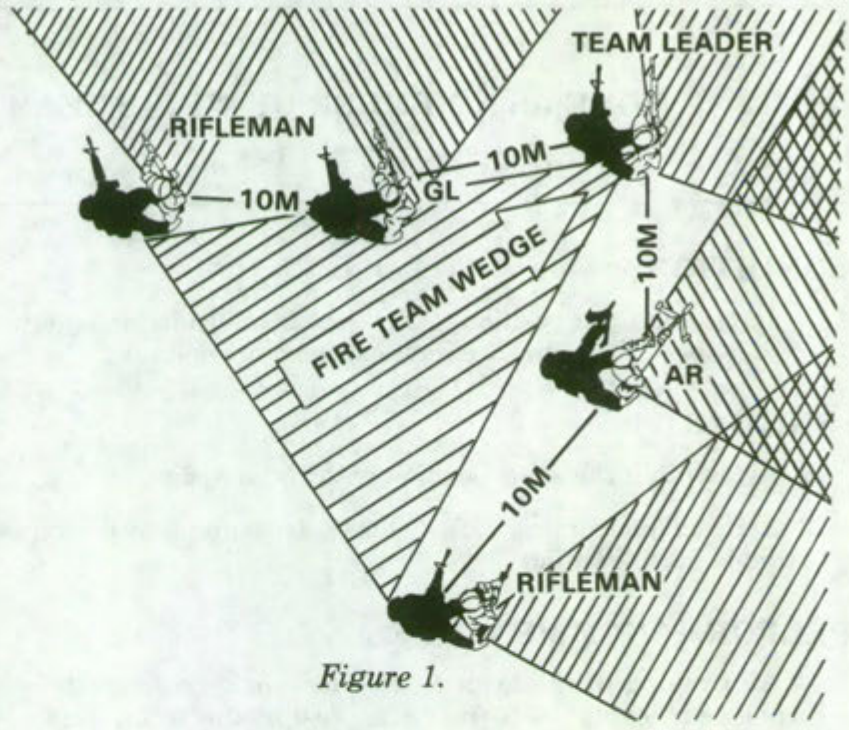


Figure 1.

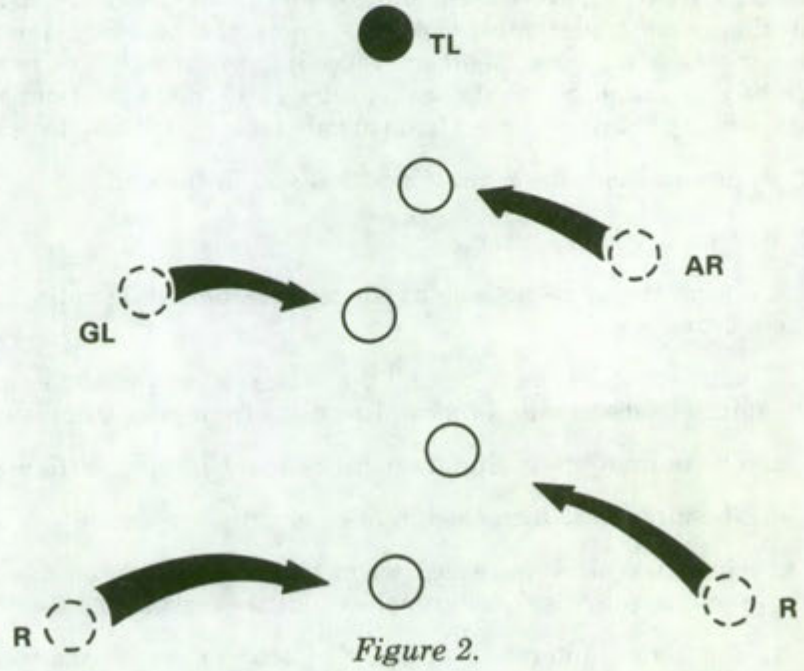


Figure 2.

REFERENCES:

FM 7-8, The Infantry Platoon and Squad (Revised edition, TBP)
TEC Lesson 020-071-1043-F, Moving as a Member of a Fire Team

TASK NUMBER: 071-326-0502

MOVE UNDER DIRECT FIRE

CONDITIONS:

During daylight, at a field location containing varied terrain and vegetation, armed with an M16A1 rifle or M203 grenade launcher, wearing web gear, seasonal camouflage uniform (if available), and SCOPES target numbers. You will be opposed by an enemy sniper in a concealed position at least 200 meters away armed with an M16A1 rifle with a 6X rifle telescope (SCOPES equipment) and blank ammunition. You will move as a member of a two-man buddy team over a route which maximizes use of available cover/concealment.

STANDARDS:

Within 15 minutes, move to within 100 meters of the enemy position without being hit (scoped).

PERFORMANCE MEASURES:

1. **How to Select Individual Movement Route (within your team/squad route or axis of advance)** (figure 1).

a. Search the terrain to your front for:

(1) A gully, ravine, ditch, wall, etc., which is at a slight angle to your direction of movement. (These features provide cover and concealment when the low or high crawl is used.)

(2) Hedgerows or a line of thick vegetation. (These provide only concealment when the low or high crawl is used.)

(3) Large trees, rocks, stumps, fallen timber, rubble, vehicle hulks, folds or creases in the ground, etc. (These provide cover and concealment for use as temporary positions. Use the rush if the area between them has no concealment.)

(4) High grass, weeds, etc. (Provides only partial concealment since use of high or low crawl could reveal your location by the movement of vegetation. You might have to use the rush.)

b. Select your next position (and route to it), which:

(1) Exposes you the least to enemy fire.

(2) Does not require you to cross in front of other members of your element and mask their fires.

Figure 1.

2. **Determining the Correct Individual Movement Technique:**

a. Use the high crawl when:

(1) The route you have selected provides cover and concealment.

(2) Poor visibility reduces enemy observation.

(3) The terrain/vegetation are suitable only for the low crawl but speed is required.

b. Use the low crawl when:

(1) The route you have selected provides cover or concealment less than 1 foot high.

(2) Visibility provides good enemy observation.

(3) Speed is not required.

c. Use the rush when:

(1) You must cross open areas.

(2) Time is critical.

3. **To High Crawl** (figure 2).

a. Keep your body free of the ground and rest your weight on your forearms and knees. Cradle the rifle in your arms, keeping its muzzle off the ground.

b. Move forward by alternately advancing your right elbow and left knee; left elbow and right knee, etc.

Figure 2.

4. **To Low Crawl** (figure 3):

a. Keep your body as flat as possible to the ground and grasp the rifle sling at the upper sling swivel, letting the balance of the rifle rest on your forearm and the butt of the rifle drag on the ground.

b. To move forward, pull with your arms and push with your right or left leg, changing legs frequently to avoid fatigue.

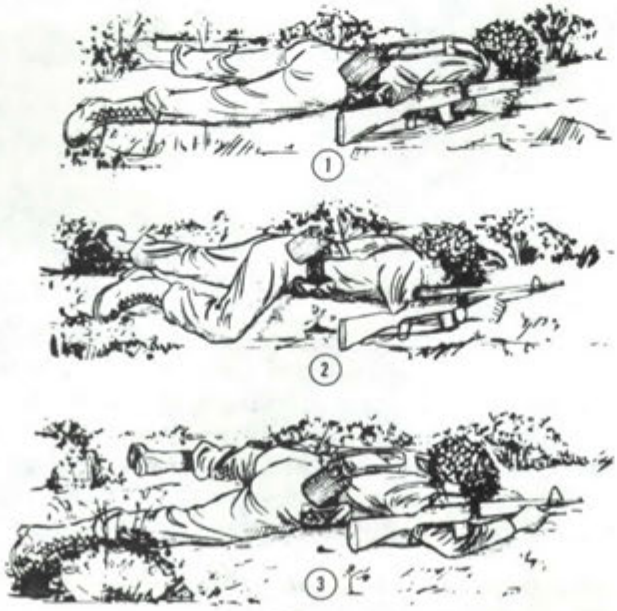


Figure 3.

5. **To Rush** (figure 4):

a. Start from the prone position by slowly raising your head and selecting your next position.

b. Lower your head, draw your arms in to your body, keep your elbows down, and pull your right (left) leg forward.

c. With one movement, raise your body by straightening your arms, spring to your feet, and step off with either foot.

d. Run to the next position and, just before hitting the ground, plant both feet.

e. Fall forward, breaking your fall with the butt of the rifle.

f. Shift the weight of your body to your left (right) side, place the butt of the rifle in the hollow of your shoulder, and then roll into a firing position.

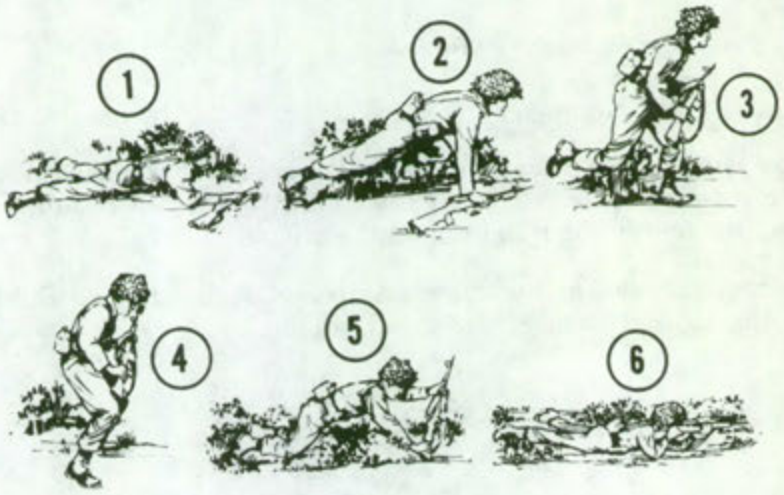


Figure 4.

TRAINING NOTES

1. Short rushes from covered position to covered position may be used when enemy fire allows brief exposure. Maneuver teams, buddy teams, or individuals may advance by short rushes to avoid accurate enemy fire. Try not to stay up any longer than 3 to 5 seconds so that you don't give the enemy time to track you with his automatic fire. The rule is to rush from cover to cover. Don't hit the ground in the open just because you have been up for 5 seconds.

2. Don't rush from a position from which you've been firing; roll right/left or crawl before springing to your feet.

3. When you complete a rush to a position providing concealment but no cover (weeds, bushes, etc.), roll or crawl to a new position before firing.

4. When you move as a member of a buddy team, you must communicate (talk to, watch and signal, etc.) with each other. Insure that one man covers by fire any movement by the other man. When moving as a member of a fire team, watch and listen to your team leader; he will lead you along the best route (covered and concealed) available and insure that covering fire is provided when you move. STAY WITH HIM AND FOLLOW HIS EXAMPLE.

REFERENCES:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (chap 3, page 3-24)
FM 7-8, The Infantry Platoon and Squad (TBP)
FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
TEC Lesson 020-071-1042-F, React to Indirect Fire

TASK NUMBER: 071-326-0510

REACT TO INDIRECT FIRE

CONDITIONS:

You are a member of a squad/section other than team leader or squad leader.

Situation 1: You are not moving (i.e., in day or night defensive position or during a break in a tactical movement). You hear either the sound of incoming rounds or someone shouting "Incoming!"

Situation 2: Your squad/section is making a foot movement. You hear either the sound of incoming rounds or someone shouting "Incoming!"

STANDARDS:

React to each situation IAW performance measures below.

PERFORMANCE MEASURES:

1. **If you are subjected to an indirect fire attack,** there is a good chance you will have some warning before the first shell explodes in your area. This warning may be either of the following:

a. The sound of incoming shells.

b. A shouted warning of "Incoming" from someone who hears the shells coming before you do.

c. The sound of shells passing overhead or exploding nearby, but not yet zeroed in on your location.

2. **The first thing you should do is shout or repeat "Incoming,"** when you hear any of the above warnings. This is standard procedure for incoming indirect fire and will alert others who might not have heard the warning. Indirect fire will normally be from artillery, mortars, rockets, or similar weapons.

3. **Look to your fire team/squad leader before taking any other actions.**

4. **Actions to take if not moving:**

a. When you hear any of the warnings in paragraph 1a, b, or c, shout "Incoming!"

b. Remain in your defensive position, taking advantage of any available cover. If your defensive position has not been dug yet, then look for some type of cover that will protect you from indirect fire.

c. Any movement away from your position could let the enemy know exactly where you are.

d. Incoming indirect fire (zeroed in on your position) may be an indicator of a coming attack by ground forces.

5. **Actions to take if moving:**

a. When you hear any of the warnings in paragraph 1a, b, or c, shout "Incoming!"

b. Follow your team leader's actions.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition - TBP)
TEC Lesson 010-071-1042-F, Reacting to Indirect Fire

TASK NUMBER: 071-326-0511

REACT TO FLARES

CONDITIONS:

At night, upon hearing a flare rising or when suddenly illuminated by a ground or overhead flare.

STANDARDS:

React as specified for each situation listed in the performance measures.

PERFORMANCE MEASURES:

React as follows for each situation:

1. **Ground flares:** move out of the illuminated area, and:

a. When alone, reorient yourself and continue mission.

b. As a member of a combat element, regroup (by SOP or as instructed) and continue mission.

2. **Overhead flare with warning** (sound of rising flare): assume a prone position (behind concealment when available) before the flare bursts.

3. **Overhead flare without warning:**

a. Get into the prone position, making maximum use of nearby cover, concealment, and shadows until the flare burns out. Close one eye to protect your night vision; observe with the other. (See figure 1.)

b. When crossing wire obstacles where the prone position is not possible, crouch low until flare burns out.

4. **Ground or overhead flare while under direct enemy fire or followed by direct enemy fire:** use fire and maneuver (select temporary position, rush, low crawl, etc., as specified in applicable tasks) as you would during daylight.

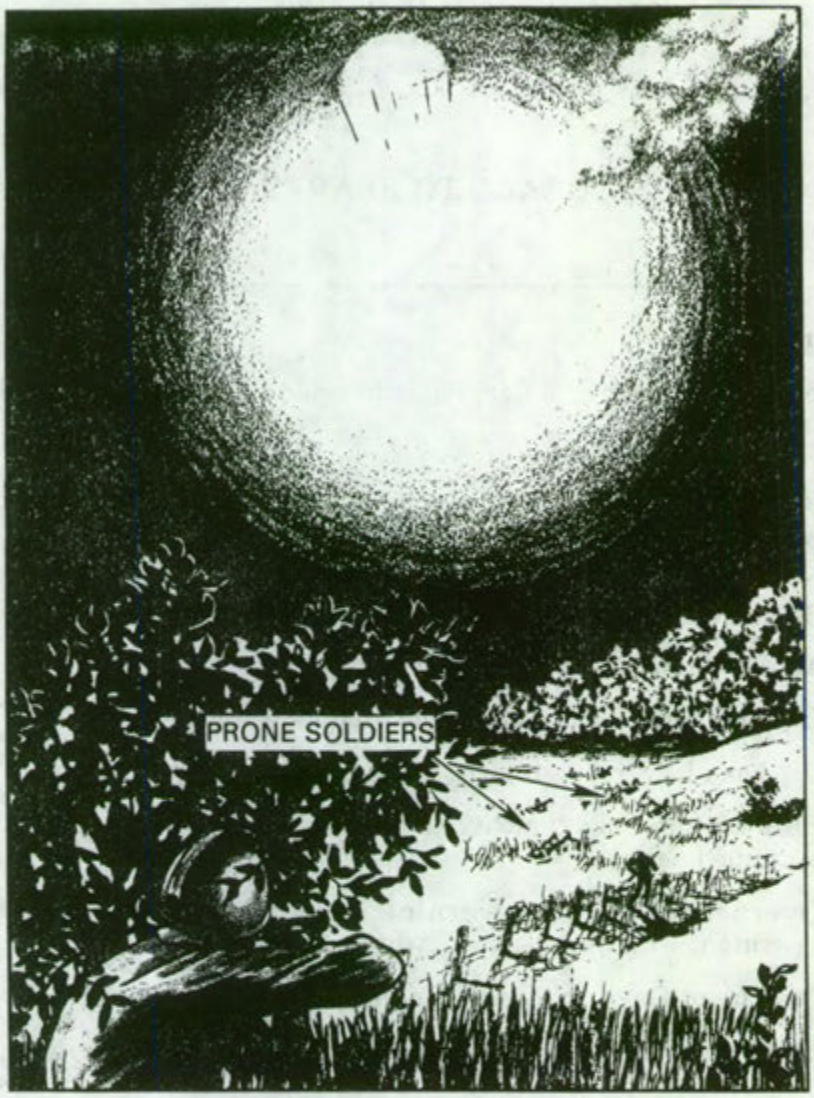


Figure 1.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
TEC Lesson 020-071-1049-F, Reacting to Flares

TASK NUMBER: 071-326-0503

MOVE OVER, THROUGH, OR AROUND OBSTACLES

CONDITIONS:

During daylight, at a field location moving over a route with manmade obstacles (two walls and two barbed-wire entanglements), given one smoke grenade, wood or grass mat, or chicken wire, and a grappling hook. You will be opposed by an OPFOR in a concealed position armed with an M16A1 rifle with 6X telescope (SCOPES equipment), located at least 200 meters away.

STANDARDS:

Within 20 minutes, move along the predesignated route to within 100 meters of the OPFOR without being hit (scoped).

PERFORMANCE MEASURES:

1. Use smoke as an effective method of concealment to cover your advance while crossing the obstacle.

2. Barbed wire obstacles:

WARNING:

1. First, check it for boobytraps or early warning devices. It is threat doctrine to attach trip wire-activated mines to barbed wire. A grappling hook with a length of rope attached should be used first to pull the wire. Before pulling wire, check for early warning devices attached to the wire.

2. If no such devices are found, then cross the barbed wire, using one of the methods listed in paragraph 2.

a. To cross over the barbed wire, you may put a wood or grass mat, or chicken wire netting, over it. Cross carefully because such a mat or net forms an unstable path (figure 1).

b. To cross under the wire, slide headfirst under the bottom strands on your back. Push yourself forward with your shoulders and heels. Carry your weapon lengthwise on your body. Let the wire slide on the weapon to keep the wire from catching on clothing and equipment. Inch your way along, holding the wires with one hand (figure 1).

c. If it is necessary to cut your way through wire, cut only the lower strands. Leave the top wire in place to make it less likely that the enemy will discover the gap. Wrap cloth, such as rifle patches, around the wire between

your hands and cut partly through the wire. Quietly bend the wire back and forth until it separates.

Figure 1a.

Figure 1b.

REMEMBER

Obstacles are always covered by either fire or observation.

Figure 2.

3. To negotiate minefields or boobytraps, see TASKS: **Locate mines by visual means,** and **Neutralize enemy mines.**

4. To cross roads, trails, or small streams, select a point at or near a bend in the road or stream—if possible, a bend that has concealment and cover on both sides. This will offer less chance of being seen by the enemy when crossing. Crawl up to the edge of the open area and observe the other side carefully before crossing. Cross rapidly but quietly. Get down on the other side; check the area around you (figure 3).

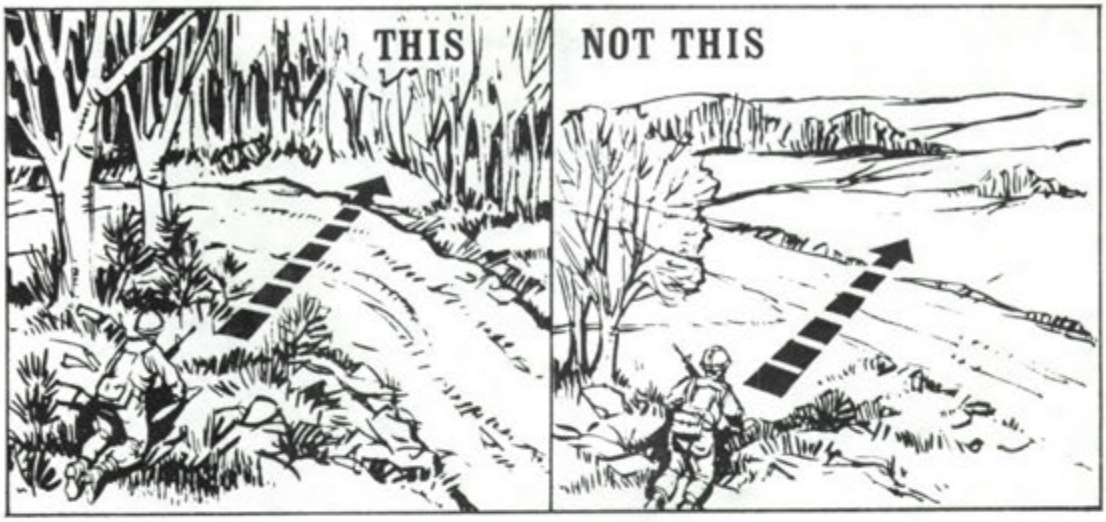


Figure 3.

5. To go over a wall, roll quickly over the top to avoid going over upright (figure 4). When crossing an obstacle such as a wall, use the buddy system: one man covers while one crosses.

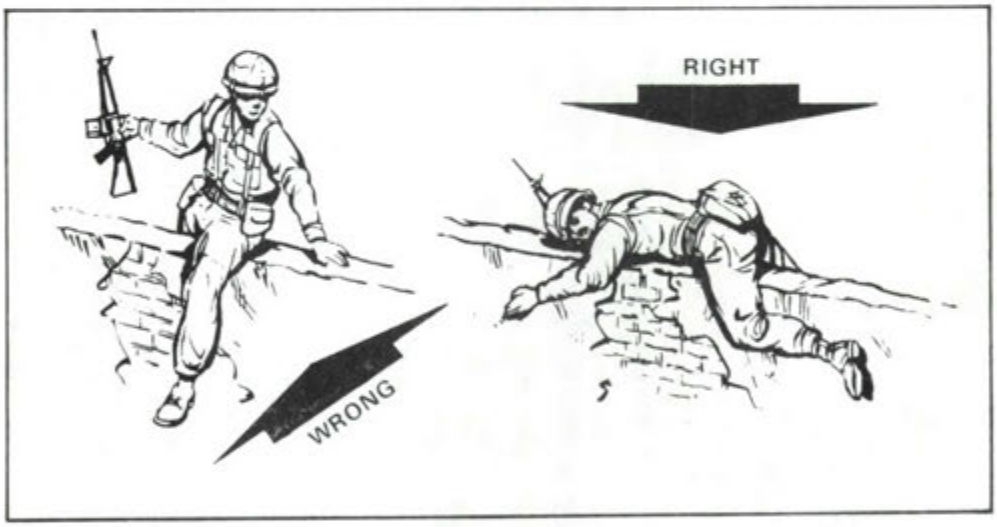


Figure 4.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
TEC Lesson 947-071-0071-F, Breaching Artificial Obstacles

TASK NUMBER: 071-326-0512

ESTIMATE RANGE

CONDITIONS:

Given personnel, equipment, silhouettes, and/or vehicles, all stationary and either partially or fully exposed, at ranges from 50 meters to 3,000 meters, during daylight in weather conditions where all objects are visible.

STANDARDS:

State the distance to each object with no more than a 20% error in the actual distance.

PERFORMANCE MEASURES:

1. **Appearance-of-Objects Method.** You must learn the appearance of various objects (personnel, vehicles, equipment, silhouettes) at known ranges in various light and weather conditions, noting in particular which details become unrecognizable as the range increases, and the apparent size of the objects at various ranges.

2. **Unit-of-Measure Method.** Become familiar with the appearance of 100-meter intervals on the ground.

a. For ranges up to 500 meters - estimate the number of 100-meter intervals between you and the target (NOTE: During training, pace off the actual distance in order to confirm range sensing).

b. For ranges between 500 and 1,000 meters - pick a point halfway between you and the target and determine the distance to the halfway point as described above. Double the estimate to find range to target.

c. Learn the effect of terrain (slopes and dead space) on the appearance of objects at 100-meter intervals.

3. **Flash-and-Sound Method** (figures 1 and 2). When you see the flash or smoke of a weapon or the dust it raises, immediately start counting at a rate of three counts per second. Stop when you hear the report of the weapon. The number you are counting when you stop is the approximate distance to the weapon in hundreds of meters. For example, if you stop on the number three, the distance is about 300 meters. Practice counting at three counts per second. This can be done with blank ammunition fired at known distances, or by having someone time you while you count. When counting at the correct rate, you should count to 30 in 10 seconds. Practice until your timing is correct.

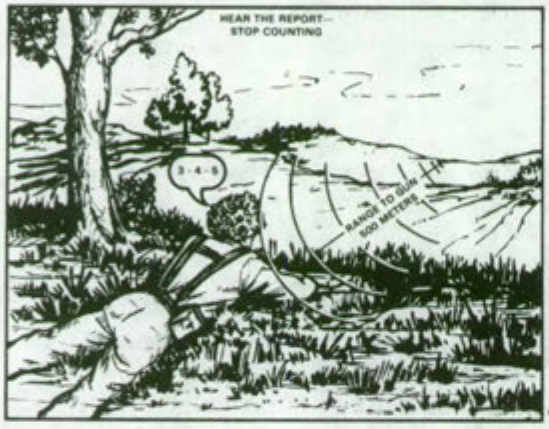


Figure 1.

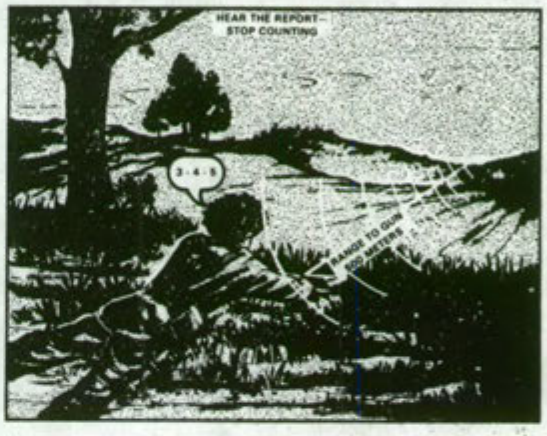


Figure 2.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
TEC Lesson 020-171-1611-F, Target Range Determination

TASK NUMBER: 071-326-0513

SELECT TEMPORARY BATTLEFIELD POSITIONS

CONDITIONS:

During daylight or darkness; at an overwatch position; after initial movement into tentative defensive positions; at a halt during movement; or upon receiving direct fire.

STANDARDS:

1. Select and occupy a firing position which allows good observation, fields of fire, and provides (in order of priority):

a. Cover and concealment, or

b. cover only, or

c. Concealment only.

2. Remain as low as possible (prone where possible) and look (aim) around rather then over objects.

PERFORMANCE MEASURES:

Select temporary firing or observation positions which take advantage of available cover and concealment (figure 1).

1. Observe and fire around the side of an object. This conceals most of your head and body.

2. Stay low to observe and fire whenever possible. You can aim better and take advantage of concealing vegetation to present the smallest possible target to enemy observation and fires.

3. Select a good background before observing. A good background does not silhouette the individual.

4. Follow team leader's directions after your initial selection of temporary battlefield position; he might reposition you to gain better team coverage of the area.

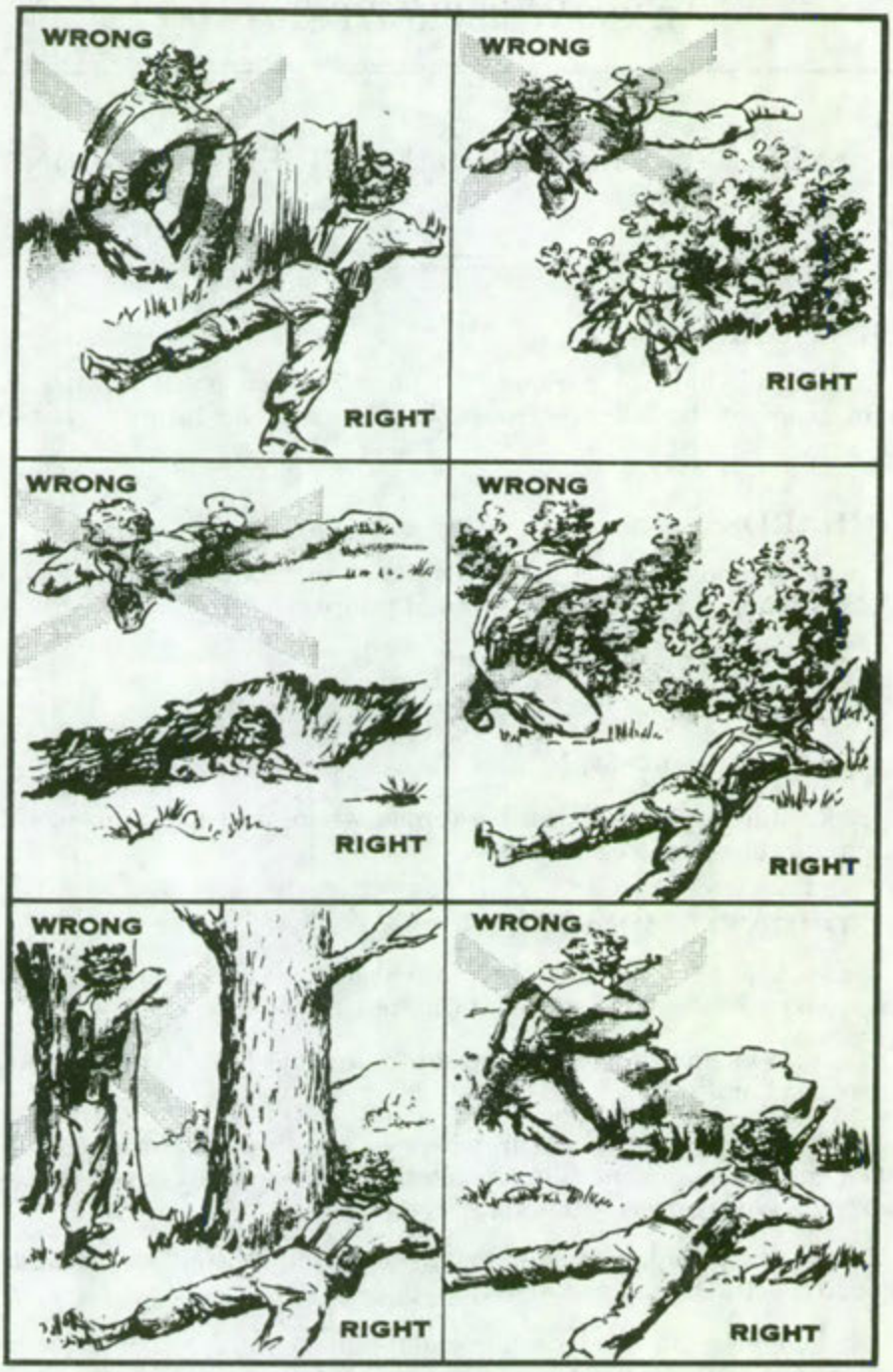


Figure 1.

REFERENCE:

FM 21-75, Combat Skills of the Soldier, (TBP)

TASK NUMBER: 071-326-5703

CONSTRUCT INDIVIDUAL FIGHTING POSITION

CONDITIONS:

As a member of a two-man team, in daylight, given load-bearing equipment with bayonet, scabbard, entrenching tool, poncho, and M16A1 rifle; the specific location and sector of fire of the position to be constructed (NOTE: Position should afford natural cover such as mounds or earth, stumps, trees, rocks, etc., and observation and fields of fire); logs to construct overhead cover; and 4 hours to complete construction.

STANDARDS:

Within time specified, completed position must meet the following specifications:

NOTE: Time may be adjusted when soil and weather conditions make construction of positions particularly difficult.

1. **Cover** - Affords protection from direct frontal small-arms fire (by means of a natural or manmade frontal parapet high and thick enough to protect your head completely while manning your weapon) and from effects of indirect fire (shrapnel) (normally requires at least 18 inches of dirt/log overhead protection).

2. **Concealment** - Position cannot be easily detected from front (e.g., blends with surroundings well enough that an approaching soldier approximately 35 meters to front (hand-grenade range) cannot detect it).

3. **Fields of Fire** - Limiting stakes are emplaced and correctly define sector of fire. Soldier can observe anyone moving through his sector. Fields of fire have been selectively cleared so that anyone moving into the sector will not recognize it as being a cleared area.

4. **Size and Shape** - As a minimum, position should be shoulder wide, armpit deep, and provide enough room for the soldier to engage targets in his sector using the normal foxhole firing position.

5. **Optional** (dependent on available time) - Position includes grenade sump, sloping floor with shallow trench to facilitate drainage, elbow holes to stabilize firing position and to lower silhouette when firing, range card, and night firing stakes.

PERFORMANCE MEASURES:

1. **Hasty Fighting Positions.** When you first move into a battle position, you may have very little or no time to prepare the position from which you must fight. If that is the situation, then occupy a hasty fighting position. A hasty fighting position is behind some natural object on the terrain that affords you frontal protection from direct fire but also allows you to fire forward.

Note that the term **hasty position** does not mean that you can't dig. Even if you only have a few minutes, you can dig or scrape out a prone shelter that will give you increased protection.

2. **Improved Fighting Positions.** As time and conditions permit, the position can be improved, but the natural cover that was initially used in the hasty position will still be the basis for constructing your fighting position.

3. **Basic Position.** The basic improved fighting position is a two-man hole. It should be as small as possible to provide the greatest amount of protection against the fragmentation effects of explosives, and to make it easy to camouflage. However, it must be large enough for two men and their weapons, equipment, and ammunition. Construction of a fighting position should generally follow this sequence:

a. Obtain position location and sector of fire from your squad leader. Put in sector-of-fire stakes.

b. Partially clear fields of fire within your sector and dig a hasty hole for minimum protection. Be careful not to destroy natural camouflage around your position. Save grass clumps, etc., for camouflage later. At this point, you should be able to fight effectively in the event of a surprise attack.

c. Next, dig in. Make hole armpit deep (figure 1a). If you have a natural frontal parapet, carry away and camouflage dirt from hole; if not, make frontal parapet with hole dirt as shown in figure 1b.

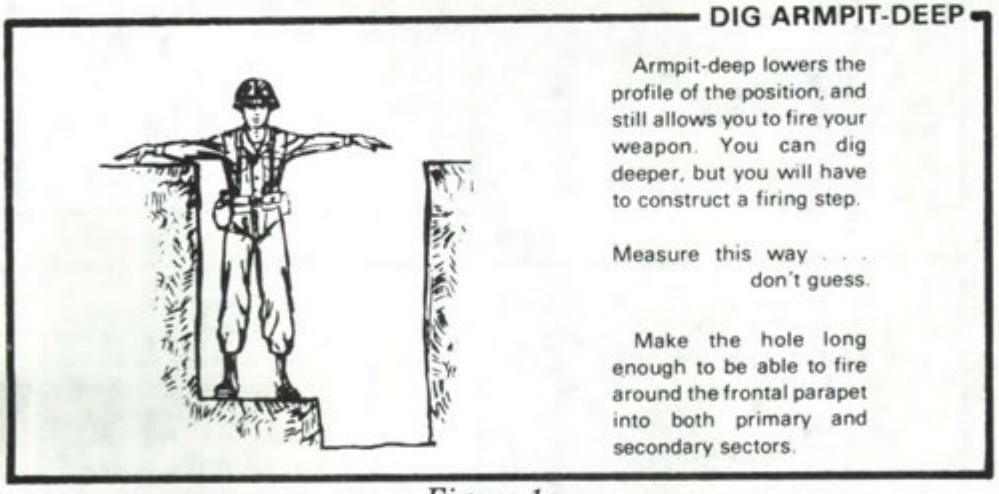
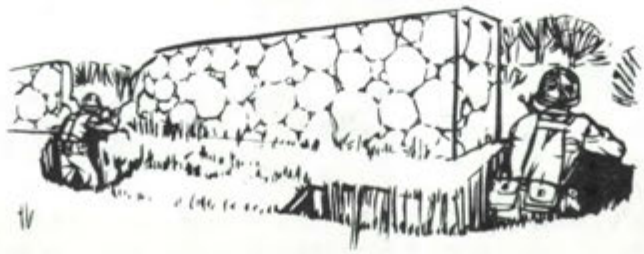


Figure 1a.

(1) Use the dirt from your hole to build the frontal parapet or save it for use as flank, overhead, and rear cover later. Carry away and camouflage excess dirt.

(2) Shape the hole to fit the natural cover available. Depending on the size and shape of the frontal cover that you are using, you may not be able to dig a rectangular hole. It may look like this --



(3) Frontal cover. Ideally, a natural parapet such as a tree, mound, rock, or stump that will blend with the surrounding terrain will be available. Otherwise, you must build your own parapet using dirt from the hole. At least the equivalent of 18 inches of earth should be between you and the enemy. Frontal cover is important so you can shoot without exposing your head to enemy fire.

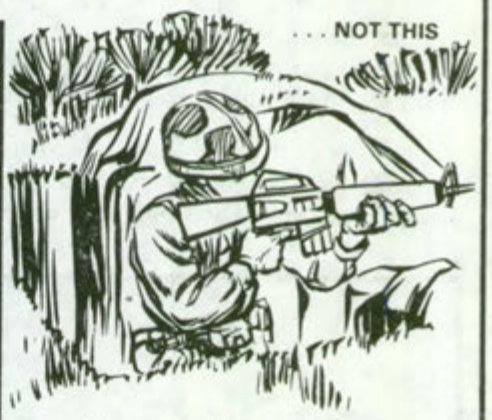
PROVIDE SUPPORT FOR THE FIRER

The space between the hole and the frontal protection should be wide enough to allow the soldier to fire from a supported position (one with elbows on the ground).

THIS . . .

Supported fire to the front.

. . . NOT THIS



Unsupported fire to the front.

Figure 1b.

ROCKS ARE OK FOR LIMITING STAKES

Place AIMING STAKES toward especially dangerous approaches so you can lay your weapon on these approaches even at night.

Place LIMITING STAKES right and left, to define your sector of fire; they will also prevent accidental firing into adjacent positions.

NOTE:

Care must be taken not to destroy the concealment of the position with limiting stakes.

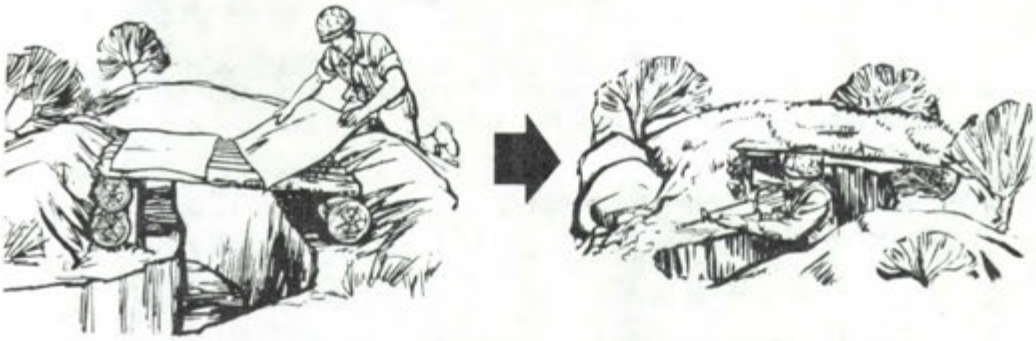
d. Complete clearing fields of fire. Clear only what is absolutely necessary. Get in firing position and check observation and fields of fire. Save any cut foliage, dirt, grass clumps, etc., for camouflage of position.

NOTE: Task Number 071-331-0852, Clear fields of fire, will give you more detailed information on this performance measure.

e. Construct fighting overhead cover.

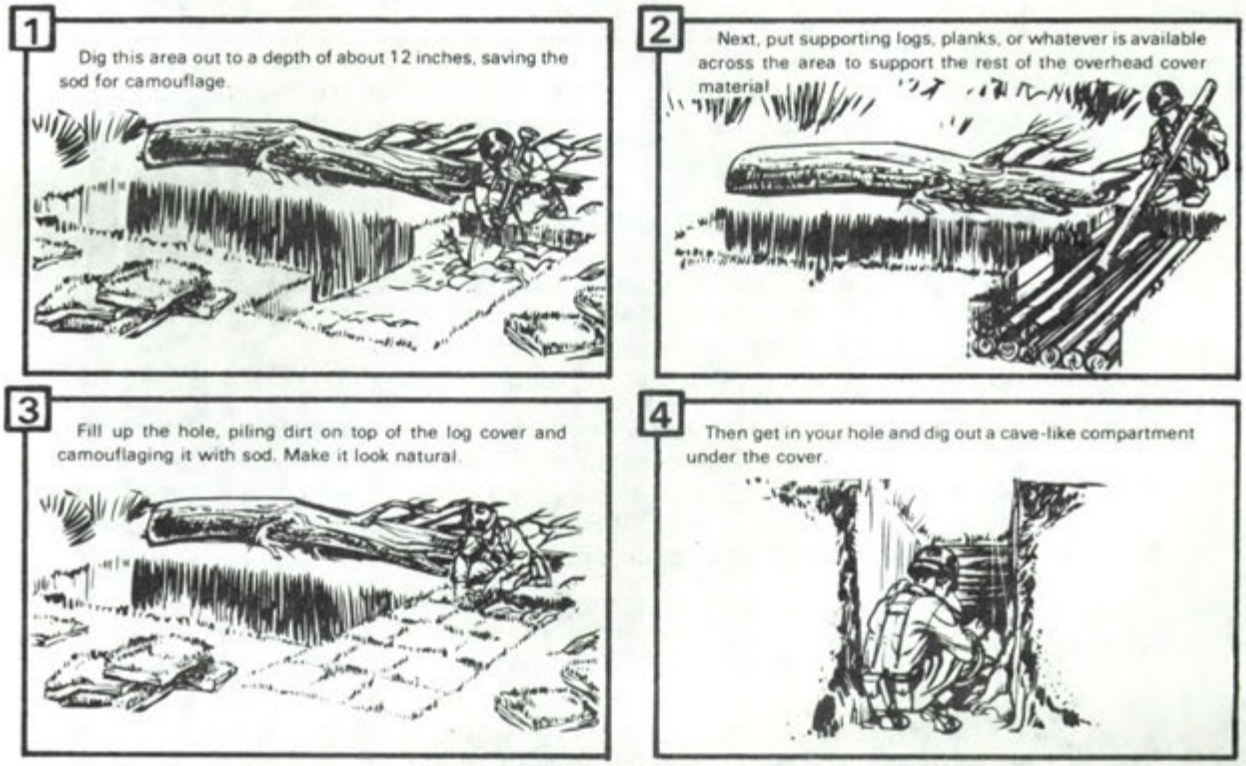
(1) Cover should provide best possible protection from airbursts and allow you to fight from underneath it.

(2) Logs/dirt should be 18 inches thick. Check your protection by standing on the overhead cover. If it feels solid under your weight, it will probably protect you from airburst shrapnel.

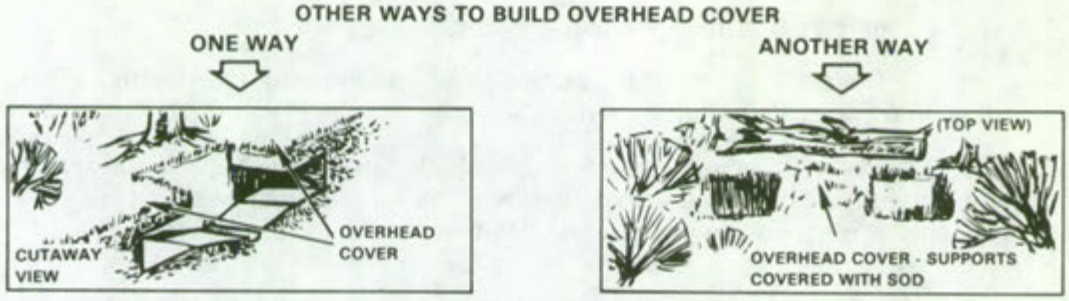


CONSTRUCTION OF FIGHTING OVERHEAD COVER

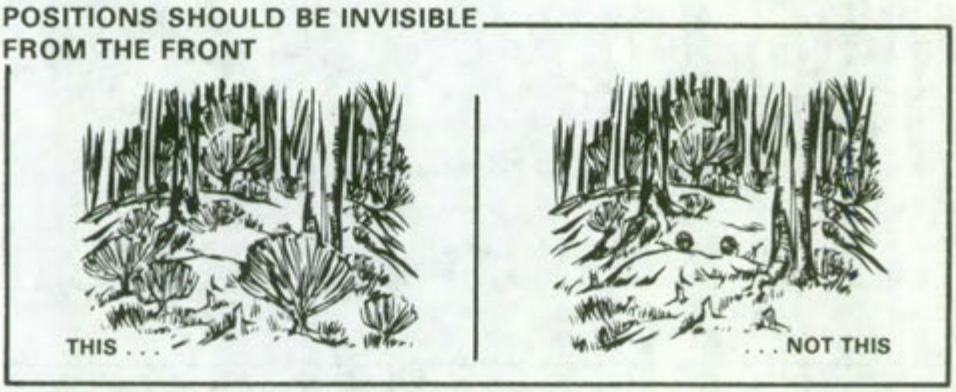
f. Construct flank overhead cover when fighting overhead cover would significantly increase the silhouette of the position, making it vulnerable to detection. Construct as follows:



Use the excavated dirt to add to and strengthen your parapet or your overhead cover. Excess dirt should be carefully carried away and hidden.



g. Camouflage position using available materials (grass clumps, foliage, etc.). Make your position blend into surroundings. Check camouflage by moving 35 meters to the front; if you can spot it easily, you need more work on camouflage.



NOTE: Task Number 051-202-1003, Camouflage/conceal defensive positions, will give you more detailed information on this performance measure.

h. Improve your position as time permits:

(1) To insure complete protection for fighting positions, flank and rear cover is necessary. It protects against the effects of indirect fire that bursts to the flanks/rear of the positions and against the effects of friendly supporting weapons located in the rear.

(2) Dig grenade sump at 45-degree angle and at least 2 feet deep. Slope floor of foxhole and dig shallow trench to allow for drainage. Put in night firing stakes and make a range card. Improve camouflage. Construct alternate and secondary positions as directed by your squad leader. Replace dead foliage as needed to maintain camouflage.

REMEMBER,

you can always improve your position.

4. **Variations of the Basic Fighting Position.** The terrain will sometimes force you to modify the basic construction of your position in order to fight effectively. Some variations are:

a. One-man fighting position.

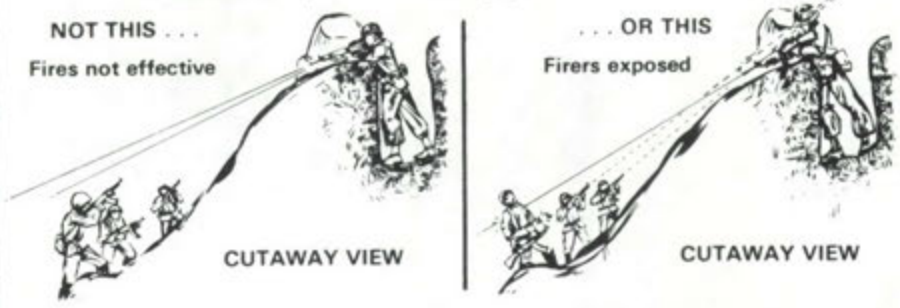
b. Modified two-man position.

c. Positions on steep terrain.

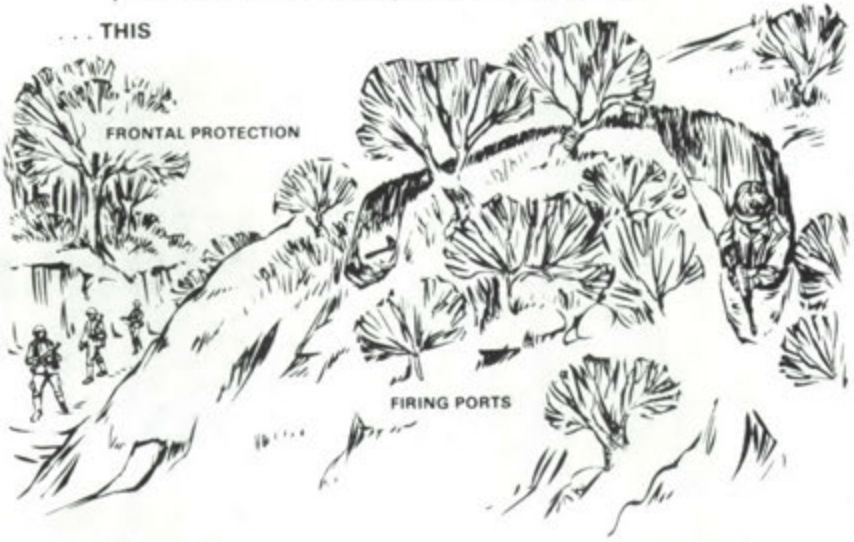
NOTE: Appendix C, FM 7-7, The Mechanized Infantry Platoon and Squad, provides specific information on construction techniques for these types of fighting positions.

POSITIONS ON STEEP TERRAIN

When building positions on steep terrain, you cannot simply dig a hole behind frontal protection because you would not be able to fire at the enemy without standing up.



To overcome this problem, dig your hole and then cut firing ports forward from each end of the hole. The ground between the firing ports then serves as frontal protection for the position.



REFERENCES:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (app C, pages C-1 thru C-18)
FM 7-8, The Infantry Platoon and Squad (TBP)

TASK NUMBER: 071-326-0600

USE VISUAL SIGNALS TO CONTROL MOVEMENT (DISMOUNTED)

CONDITIONS:

Given a combat or field training situation with necessary flags or flashlights, and you are moving dismounted. Radio communications may or may not be available, and radio silence may or may not be imposed.

STANDARDS:

1. Skill Level 1: Demonstrate the correct procedure for each signal in the performance measures below.

2. Skill Level 2: Train each member of your squad to recognize each signal and require them to take appropriate actions.

PERFORMANCE MEASURES:

1. Visual communication is a means available to all units. Visual signals are transmitted by flags, lights, pyrotechnics, panels, arm-and-hand signals, and other prearranged methods. They are suitable for transmitting prearranged messages rapidly over short distances as well as for recognition and identification of friendly forces.

2. Visual signals also facilitate ease in controlling the action(s) or movement(s) of the follower and conversely visual signals can influence the action(s) or movement(s) of the leader.

3. It is important that you familiarize yourself with all the visual signals used on the battlefield. However, it is more important that you know those signals which can assist you in performing your specific job effectively in the event alternate means of communication are not available.

4. Signals for combat formations and battle drill.

a. These signals may be used, as appropriate, by either mounted or dismounted troops. They give the soldier a means of communication between himself and other persons or units. They must be practiced until their use becomes second nature. Signals must be given correctly and distinctly.

b. When a movement or action is to be executed by less than the total unit, the signaler will point, if necessary, toward the person(s) or element(s) of a unit as a warning that a signal will follow. However, when a movement or action is to be executed by the entire unit, the proper signal should be preceded by the signal ATTENTION. Most signals may be given from the ground or from a vehicle. Unless otherwise indicated in the illustrations, the

signaler will face the person(s) or element(s) for which the signal is intended.

5. Listed below are selected visual signals. You should know these standard arm-and-hand signals.

SPECIAL EMERGENCY AND WARNING SIGNALS

AIR ATTACK. Rapidly cross and uncross arms fully extended above the head.

NUCLEAR WARNING. Cover both eyes with the right hand to warn exposed troops to take cover before the detonation of nuclear weapon.

NUCLEAR, BIOLOGICAL, CHEMICAL (NBC) HAZARD. After donning the field protective mask, extend both arms horizontally sideways with fists doubled facing up; rapidly move fists to the head and back to the horizontal; repeat.

SIGNALS FOR COMBAT FORMATIONS AND BATTLE DRILL

I AM READY or ARE YOU READY? Extend the arm toward the person being signaled; then raise arm slightly above horizontal, palm facing outward.

ATTENTION. Extend the arm sideways, slightly above horizontal, palm to the front; wave arm to and away from the head several times.

I DO NOT UNDERSTAND. Raise both arms sideward to the horizontal; bend both arms at elbows and place both hands across the face, palms to front.

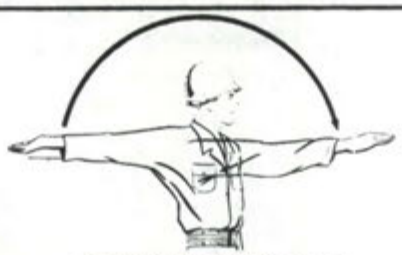
DISREGARD PREVIOUS COMMAND or AS YOU WERE. Raise both arms and cross them over the head, palms to the front.

DISPERSE. Extend either arm vertically overhead; wave the hand and arm to the front, left, right, and rear, with the palm toward the direction of each movement.

ASSEMBLE or RALLY. Raise the arm vertically overhead, palm to the front, and wave in large horizontal circles.

NOTE: Signal is normally followed by the signaler pointing to the assembly or rally site.

JOIN ME, FOLLOW ME, COME FORWARD, or MOVE VEHICLE FORWARD. Point toward person(s), vehicle(s), or unit(s); beckon by holding the arm horizontally to the front, palm up, and motioning toward the body.



ADVANCE or MOVE OUT. Face the desired direction of movement; hold the arm extended to the rear; then swing it overhead and forward in the direction of desired movement until it is horizontal, palm down.

FIX BAYONETS. Simulate the movement of the right hand in removing the bayonet from the scabbard and fixing it on the rifle.

HALT or STOP. Raise the hand upward to the full extent of the arm, palm to the front. Hold that position until the signal is understood.

INCREASE SPEED, DOUBLE TIME, or RUSH. Raise the hand to the shoulder, fist closed; thrust the fist upward to the full extent of the arm and back to the shoulder rapidly several times.

DECREASE SPEED (vehicle), QUICK TIME (dismounted troops). Extend the arm horizontally sideward, palm to the front, and wave arm slightly downward several times, keeping the arm straight. Do not move arm above horizontal.

ECHELON RIGHT (LEFT). Extend one arm 45° above and the other 45° below the horizontal, palms to the front. The lower arm indicates the direction of echelon.

WEDGE FORMATION. Extend both arms downward and to the sides at an angle of 45° below the horizontal, palms to the front.

COLUMN FORMATION (or FILE). Raise either arm to the vertical position. Drop the arm to the rear, describing complete circles in a vertical plane parallel to the body. The signal may be used for a column of dismounted troops or a vehicular column.

ENEMY IN SIGHT. Hold rifle above the head with one arm, fully extended, with the rifle parallel to the ground and pointing in the direction of the enemy.

LINE FORMATION. Raise both arms to the side until horizontal, arms and hands extended, palms down.

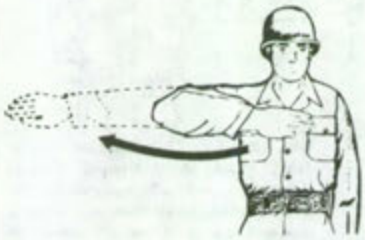
ACTION FRONT (RIGHT, LEFT, or REAR), FIGHT ON FOOT, or ASSAULT FIRE. Raise fist to shoulder level and thrust it several times in the desired direction of action.

SIGNALS FOR FIRE CONTROL AND POSITIONING OF CREW-SERVED WEAPONS AND INFANTRY FIRE TEAMS

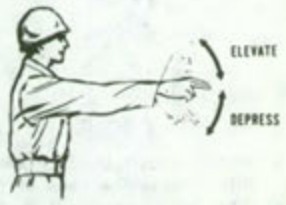
PREPARE FOR ACTION. Raise the fist to the waist and rotate forearm several times in horizontal, clockwise circles.

OUT OF ACTION. Strike the closed fist of one hand several times in rapid succession against the open palm of the other hand.

CEASE FIRING. Raise the hand in front of the forehead, palm to the front, and swing the hand and forearm up and down several times in front of the face.



MOVE OVER or SHIFT FIRE. Raise the hand that is on the side toward the new direction across the body to the opposite shoulder, palm to the front; then swing the arm in a horizontal arc, extending arm and hand to point to the new direction. For slight changes in direction, wave hand from final position (described above) to the desired direction of movement.



TRAVERSE RIGHT (LEFT) or ELEVATE (DEPRESS). Extend one arm in direction of gunner concerned. Move the hand in a vigorous movement in the direction of desired correction (elevate, depress, right, or left). Flex arm at wrist and expose one finger for each mil (or for each 100 meters of range) of desired correction. For machineguns, the extended fingers indicate 1 mil for tripod guns and 1 meter for bipod guns.

COMMENCE FIRING. Extend arm in front of the body, palm down, and move it through a wide horizontal arc several times. For machineguns: giving the signal again, moving the arm faster means "change to the next higher rate of fire." To slow the rate of fire, move the arm slower. (Used primarily for direct fire weapons.)

REFERENCES:

FM 21-60, Visual Signals, Dec 74 (chap 2, page 2-1 thru 2-10)

TASK NUMBER: 071-329-1021

DETERMINE AN ENEMY TARGET LOCATION USING GRID COORDINATES

CONDITIONS:

Acting as a forward observer at a known location, given binoculars (if available), a standard 1:50,000 scale military map, compass, coordinate scale and protractor, pencil, paper, and a target requiring indirect fire.

STANDARDS:

Determine the six-digit grid coordinates of the target (grid coordinates must be within 250 meters of actual target location) within 90 seconds after identification.

PERFORMANCE MEASURES:

1. **To orient a map using a compass:**

a. With the map in a horizontal position, place the compass with the straightedge along one of the north-south grid lines and the cover of the compass pointing toward the top of the map.

b. Rotate the map and compass until the north-seeking arrow is alined with the compass index line.

c. This procedure will orient the map close enough to the terrain features to allow location of the target.

NOTE: Do not move the map, once you have it oriented, until you have performed step 3.

2. **To orient the map by terrain association:**

a. Knowing one of the four cardinal directions or a very identifiable natural or manmade terrain feature will increase the speed and accuracy in orienting the map.

b. Rotate the map until the terrain features to the front (hills, valleys, roads, or streams) are alined with the same terrain features on the map.

NOTE: Do not move the map, once you have it oriented, until you have performed step 3.

3. **To locate the target:** Identify it with one of the terrain features on the ground. Locate this terrain feature on the map and plot the target on the map in the same relation to it as it is on the ground.

4. **To determine the six-digit grid coordinates of the point plotted on the map:** See task: **Determine the grid coordinates of a point on a military map using the military grid reference system.**

NOTE: To call fire on the target you have just located: See task: Call for/adjust indirect fire.

REFERENCES:

None

TASK NUMBER: 061-283-6002

LOCATE A TARGET BY SHIFT FROM A KNOWN POINT

CONDITIONS:

You will be given binoculars (if available), a compass, a pencil, and a 1:50,000 scale military map of the target area. You have identified a suspected target near a point known by you to include direction and plotted in the fire direction center (FDC). Your own location is plotted on your map.

STANDARDS:

Locate the target within 250 meters of the actual location. Announce target location within 90 seconds after identification. Express direction to the nearest 10 mils and within 100 mils of actual direction. Express right or left corrections to the nearest 10 meters. Express range corrections to the nearest 100 meters.

PERFORMANCE MEASURES:

Definitions:

1. **Deviation** - The distance in mils or meters a target is right or left of a known point or the distance in mils or meters around bursts right or left of the target.

2. **Lateral shift** - The correction in meters the FO sends to the FDC to bring the mortar or artillery rounds onto the observer target (OT) line.

3. **Range correction** - The correction in meters the FO sends to the FDC to hit, bracket, or creep the mortar or artillery round onto the target for range.

4. **OT factor** - The known or estimated distance to a target or known point expressed in thousands (2500 meters would be expressed as 2.5) and used to convert the mils between two points to meters (lateral shift).

1. Determine observer-target (OT) direction.

a. Measuring deviation from a known point to the target.

(1) By binoculars: In looking through binoculars you will find a mil scale which is used to measure horizontal distance (figure 1). This scale is divided into 10-mil increments, with 100 mils across the scale. Let's say Hill

905 in figure 2 is your known point. You measure the deviation from Hill 905 to the target. The deviation is three 10-mil increments, or 30 mils right of Hill 905.

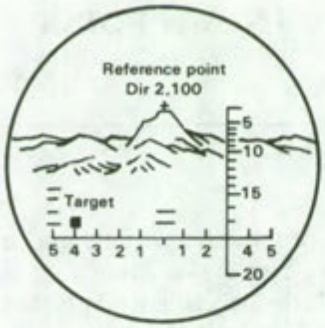


Figure 1.

Figure 2.

(2) By the hand-and-finger method:

(a) If you do not have binoculars, you can use your hand and fingers to measure how many mils right or left of the known point the target is. One finger is about 30 mils; two fingers, 70 mils; and three fingers, 100 mils. See figure 3 for approximate hand and finger values. To use this method, with your arm fully extended, count the number of fingers it takes to cover the distance from the known point to the target. Then again referring to figure 3 you have a good approximation of the deviation. Using the same known point, Hill 905, and the same target, let's use fingers to measure the deviation (see figure 4). Extending the arm fully, you find the target one finger to the right of Hill 905. Recall that one finger is about 30 mils.

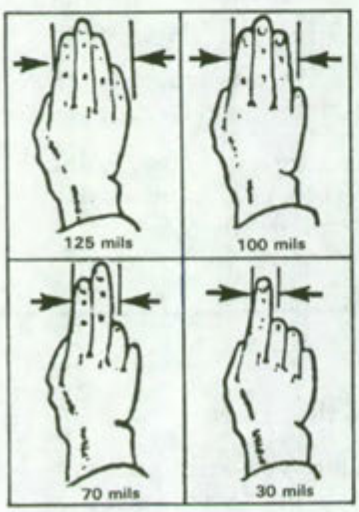


Figure 3.

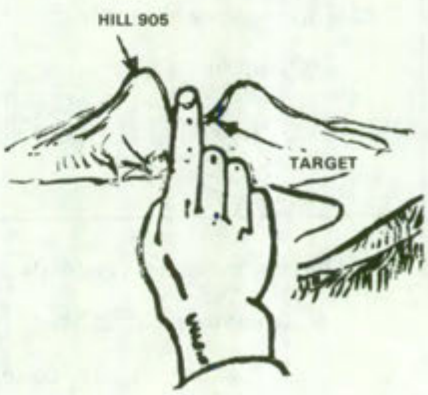


Figure 4.

(b) If degrees are being used, remember: 17.8 mils equals 1 degree. As a general guideline, you can equate mils and degrees by using the relationship 35 mils equals 2 degrees. The field artillery and mortars, however, would prefer measurement in mils. If it becomes necessary to use degrees, be sure you tell the FDC. Remember, your compass will measure mils as well as degrees.

b. Applying deviation. Apply the measured deviation to the known direction (if the target is right of the known point, add deviation; if the target is left of the known point, subtract the deviation).

NOTE: An easy way to remember this is the RALS rule: right-ADD-left-SUBTRACT.

(1) Right Deviations - Add. In figure 2, we know the direction to Hill 905 to be 3200 mils. With the binoculars, we measure the deviation to be 30 mils. Since the target is right of the known point we add the deviation (30 mils) to the known direction (3200 mils). The sum is the direction to the target (3230 mils).

3200 (direction to known point)
+30 (right deviation - add)
3230 (direction to the target)

(2) Left Deviations - Subtract. In figure 1, we know the direction to the reference point (2100 mils). With the binoculars, we measure the deviation to be 40 mils. Since the target is left of the known point, we subtract the deviation (40 mils) from the known direction (2100 mils). The answer (2060 mils) is the direction to the target.

2100 (direction to known point)
- 40 (left deviation - subtract)
2060 (direction to the target)

2. Determine the lateral shift from a known point to the target (see figure 5) using the mil relation formula.

a. The formula is expressed as $\frac{W}{R\not{m}} = 1$, where $\not{m}$ is the angular measurement in mils between the two points, R is the distance in thousands of meters (expressed to the nearest 100) to the known points from which angle $\not{m}$ was measured (figure 5), and W is the lateral distance in meters.

b. A convenient way of using the mil relation formula is to cover the value desired and perform the calculation indicated. For example, to find the lateral shift in meters, the lateral distance (W) would be covered leaving the range (R) to be multiplied by the mils ($\not{m}$).

(1) For our purposes, the mil relation formula is used in conjunction with the distance to the known point expressed in thousands to the nearest 100 to determine lateral shift. The lateral shift in meters (W) is equal to the distance to the known point (R) times the angular deviation in mils (m).

(2) The distance to the known point is the distance from the observer to the known point (to the nearest 100 meters) divided by 1000. For example, if the distance to the known point (church in figure 5) is estimated to be 3,200 meters, the distance to the known point is 3.2.

$$\frac{3200}{1000} = 3.2$$

(3) Now we are ready to determine the lateral shift. We multiply the distance to the known point (3.2) by the angular deviation (30 mils); the product is the lateral shift (96 meters).

$$\begin{array}{l} 3.2\ (R) \\ \times\ 30\ (m) \\ \hline 96\ (\text{Lateral shift})\ \underline{R\ 100}\ (W) \end{array}$$

Since the deviation is to the right, expressed to the nearest 10 meters, we shift Right 100.

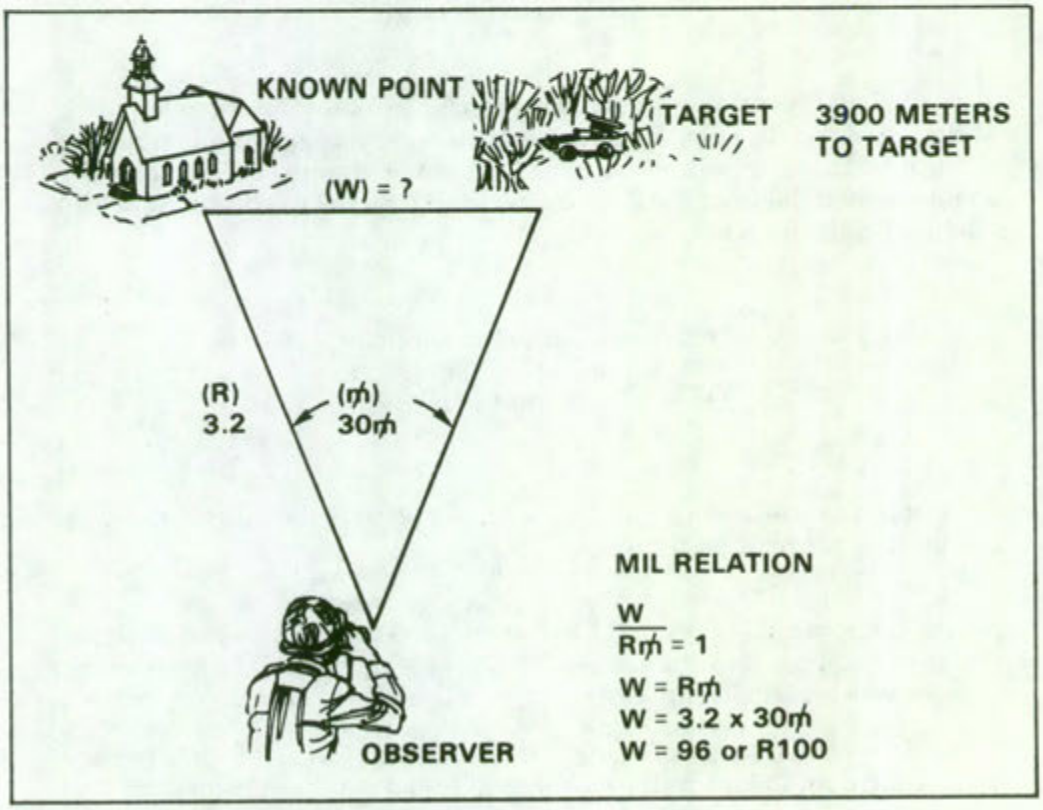


Figure 5.

3. Determine range change from the known point to the target (see figure 5).

a. The range change is estimated to the nearest 100 meters. If the target is beyond the known point, we add the range difference. If the target is closer than the known point, we drop the difference.

b. For example, if the distance to the known point is 3200 meters and the estimated distance to the target is 3900 meters, the range change is 700 meters (3900 - 3200 = 700). Since the target is beyond the known point, we add 700. If the target distance is estimated at 2800 meters, the range change is 400 meters (3200 - 2800 = 400). Since the target is closer than the known point, we drop 400.

NOTE: Task 071-329-1010, Determine an azimuth, must be mastered as a prerequisite to this task.

REFERENCES:

TC 6-40-4, Fire for Effect, Mar 77 (part 1, page 8, 10-17)
TEC Lesson 949-061-0001F, Determination of Direction
TEC Lesson 949-061-0003F, Locate a Target by Shift From a Known Point

TASK NUMBER: 061-283-6003

CALL FOR/ADJUST INDIRECT FIRE

CONDITIONS:

You will be given binoculars (if available), a radio, callsigns for fire direction center (FDC), a compass, a coordinate scale, a pencil, and a 1:50,000 scale military map of the target area (targets may vary in range up to 4,000 meters).

STANDARDS:

The initial request for fire must be made within 3 minutes after the target has been designated. Adjustments must be transmitted within 30 seconds after round impacts. Observer must achieve effect on the target within five adjustments. **(NOTE: Round must impact within 50 meters of the target to achieve effect on the target.)**

PERFORMANCE MEASURES:

1. Formulate and transmit the initial call for fire.

a. Locate the target by grid coordinate, shift from a known point, or polar plot.

b. Determine the direction from your position to the target.

c. Transmit the call for fire to the FDC on the FDC net. Include the following elements in sequence:

(1) Observer identification. (Your callsign)

(2) Warning order. (Adjust fire)

(3) Location of target. (Grid or shift data)

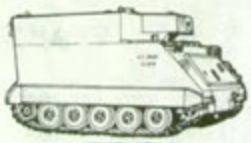
(4) Description of target. (What is the target? Platoon in the open . . .)

(5) Method of engagement (may be omitted if area fire is desired). **(NOTE: If target is within 600 meters of friendly troops, announce "Danger close.")**

(6) Method of fire and control.

The initial fire request for a mission using shift from a known point would be somewhat like example 1. The request for a grid mission would approximate example 2.

FO



FDC

INITIAL FIRE REQUEST

"H66, THIS IS H44, ADJUST FIRE, SHIFT 732, OVER."

"DIRECTION 5210, LEFT 380, ADD 400, OVER."

"COMBAT OP IN OPEN, VT, OVER."

"CHARLIE, ONE ROUND, OUT."

"THIS IS H66, ADJUST FIRE, SHIFT 732, OUT."

"DIRECTION 5210, LEFT 380, ADD 400, OUT."

"COMBAT OP IN OPEN, VT, OUT."

Message to Observer

"CHARLIE, ONE ROUND, OVER."

Example 1.

YOU | **FDC**

INITIAL FIRE REQUEST

"A4Z57, THIS IS G3H71, ADJUST FIRE, OVER."

"G3H71, THIS IS A4Z57, ADJUST FIRE, OUT."

"GRID 180513, OVER."

"GRID 180513, OUT."

"INFANTRY PLATOON IN THE OPEN, VT IN EFFECT, OVER."

"INFANTRY PLATOON IN THE OPEN, VT IN EFFECT, OVER."

MESSAGE TO OBSERVER

"BRAVO, TWO ROUNDS, OVER."

"BRAVO, TWO ROUNDS, OUT."

DIRECTION (MUST BE SENT BEFORE OR WITH YOUR FIRST CORRECTION)

"DIRECTION 1650, OVER."

"DIRECTION 1650, OUT."

Example 2.

2. Adjust fire onto the target using the bracketing method of adjustment. (See figure 1.)

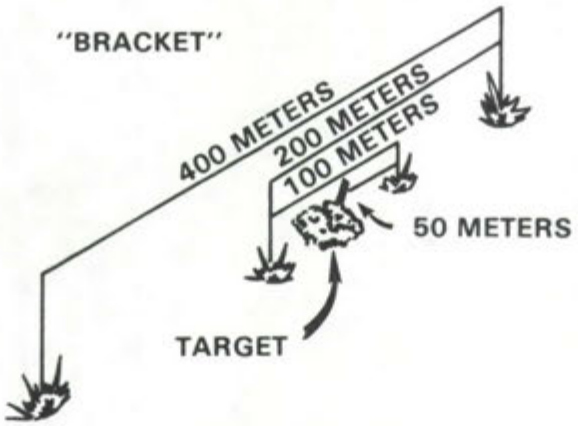


Figure 1.

a. Spot each round when it impacts as over or short, right or left of your target.

(1) When the first range spotting is observed, make a range correction that would result in a range spotting in the opposite direction; e.g., if the first round is short, add enough to get an over on the next round.

(2) Use the following guide to establish a bracket.

Round impact from target	Add or drop
Over 400 meters	+ or - 800 meters
200-400 meters	+ or - 400 meters
100-200 meters	+ or - 200 meters
less than 100 meters	- or - 100 meters

(3) Deviation.

(a) Measure the horizontal angle in mils, using either fingers or the reticle pattern in the binoculars (see figures 2 and 3). Estimate the range to the target and divide by 1000. This is the OT factor. If the OT distance is 1000 meters or greater, the OT factor is expressed to the nearest whole number. If the OT distance is less than 1000 meters, the OT factor is expressed to nearest 1/10th, e.g., 800 = .8. Multiplying the OT factor by the deviation measured in mils produces deviation in meters.

(b) For example, in figure 2 we measure the round 100 mils right of the target. Estimating the range to be 2,200 meters, the OT factor is 2.2. For adjustment purposes, we express the OT factor to the nearest whole number. Example: 1.1 would be 1; 1.8 would be 2; 2.5 would be 3. Multiplying the angle (100 mils) by the OT factor (2), we get the deviation in meters (200 meters right).

100 (deviation in mils)
× 2 (OT factor)
200 (deviation in meters)

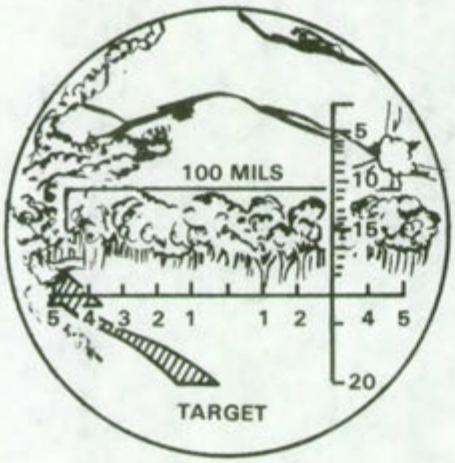


Figure 2.

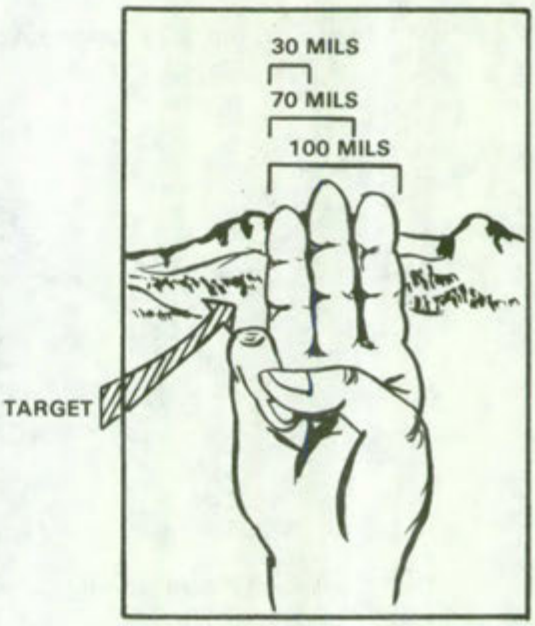
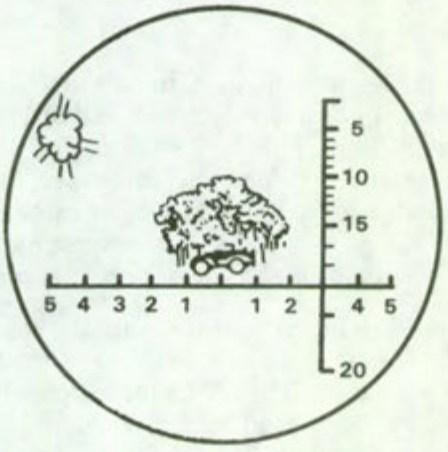


Figure 3.

b. Transmit corrections to the FDC in meters. The initial correction should bracket the target in range. Deviation corrections should be made to keep the rounds on line. Figure 4 shows the impact of your initial round. Since the round is beyond the target, you must drop. You estimate that the round is 250 meters beyond the target. Therefore, a 400-meter drop will give you a bracket.

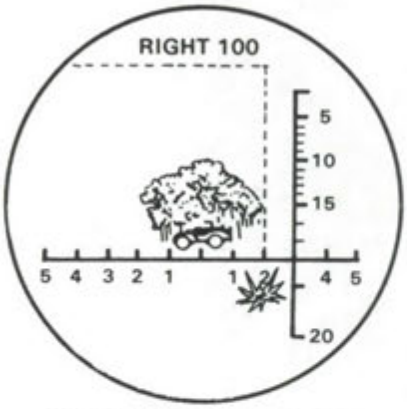
The round impacted 50 mils left of the target. With an OT factor of 2, the round impacted 100 meters left. Your correction to FDC is "Right 100, Drop 400, Over."



(MILS) X (OT) = (SHIFT)
50 X 2 = 100 METERS
"RIGHT 100, DROP 400, OVER"

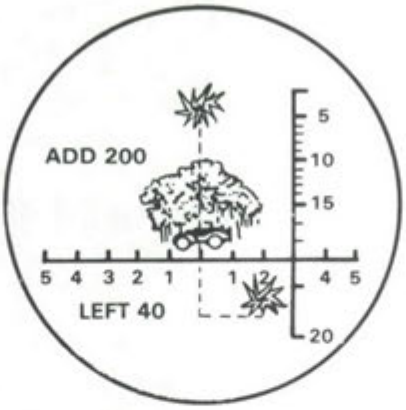
Figure 4.

c. Continue splitting the range bracket until a 100-meter bracket is split or a range correct sensing is observed, maintaining deviation on line. Figures 5, 6, and 7 show the next three adjustments. Note that each deviation correction is made to keep the impacting rounds on line. The range corrections split the bracket each time. The adjustment phase of a fire mission would resemble example 3.



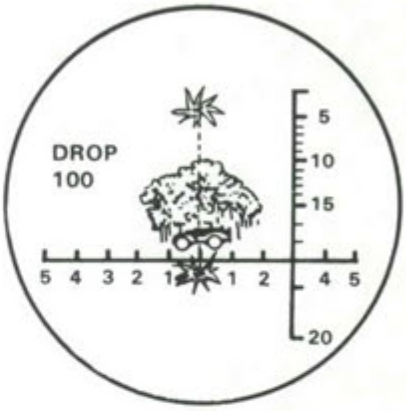
"LEFT 40, ADD 200, OVER"

Figure 5.



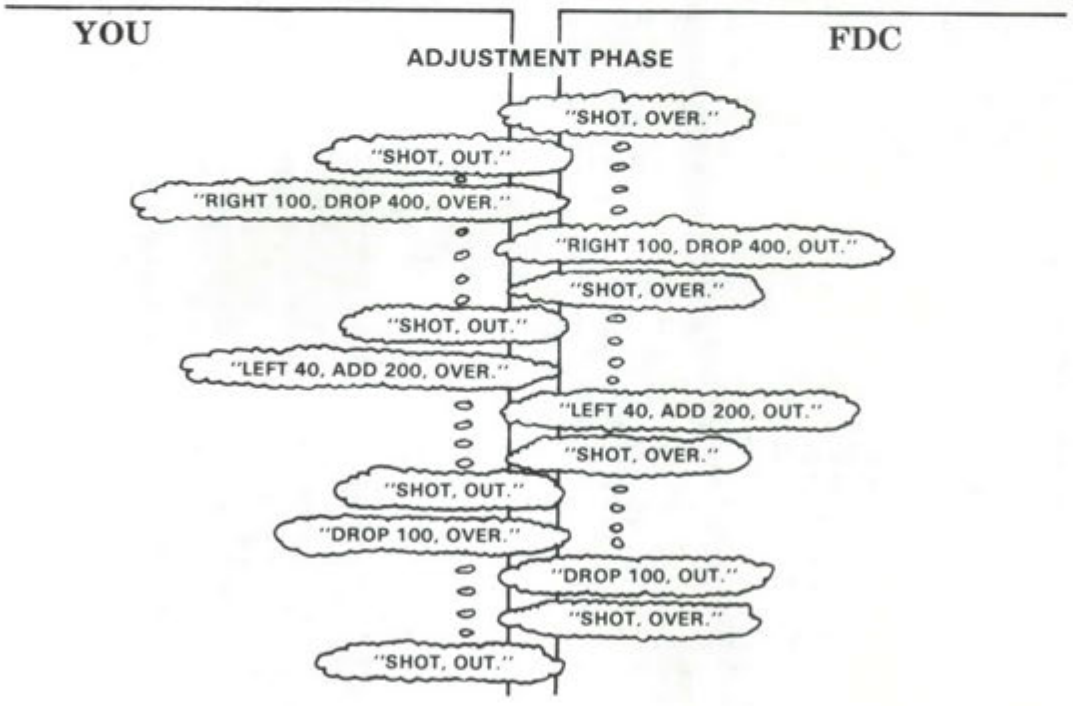
"DROP 100, OVER"

Figure 6.



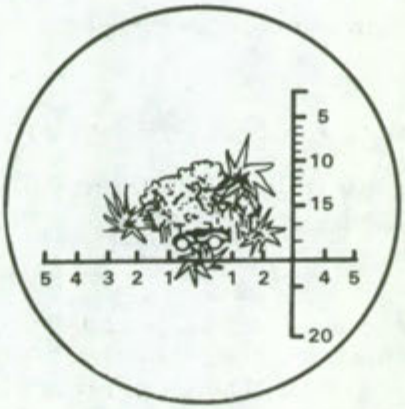
"ADD 50, FIRE FOR EFFECT, OVER"

Figure 7.



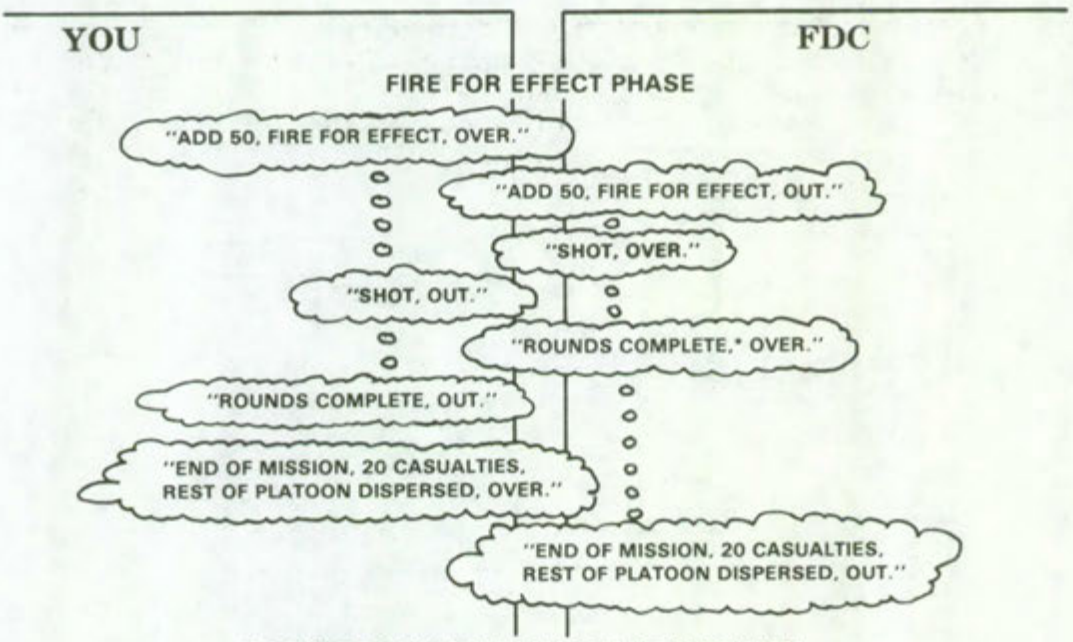
Example 3.

d. Initiate fire for effect. When a 100-meter bracket is split or a range correct spotting is made, the fire-for-effect phase is entered. Note that figure 7 shows the 100-meter bracket split and the call is **fire for effect.** Figure 8 shows a simulated pattern which might be observed in the fire-for-effect phase. (See example 4.)



"END OF MISSION"

Figure 8.



Example 4.

3. Observe the results of fire for effect and report the results. When the smoke clears, tell the FDC what the results are. Such things as the number of casualties, damaged equipment, stalled tracks, etc., are important. (See example 4.)

4. In the event that fire is required within 600 meters of friendly troops, the following guidelines apply.

a. Announce "danger close" to the FDC in the initial call for fire.

b. Initial target location is reported on the enemy side of the target.

c. Creeping procedures are used to adjust danger-close fire.

(1) Range corrections should not exceed 100 meters.

(2) Never bracket; it could cause friendly casualties.

NOTE: In a hostile environment, authentication may be required before fire is delivered.

REFERENCES:

TC 6-40-4, Fire for Effect, Mar 77 (part 1, page 2-8, 10-17; part 2, page 20-26; part 3, page 28-34; part 4, page 36-40)
TEC Lesson 949-061-0001F, Determination of Direction
TEC Lesson 949-061-0002F, Target Location: Polar Plot and Grid Coordinate Method
TEC Lesson 949-061-0003F, Locate a Target by Shift from a Known Point
TEC Lesson 949-061-0004F, The Call for Fire
TEC Lesson 949-061-0005F, Adjustment of Indirect Fire by the Bracketing and Creeping Methods, Part I
TEC Lesson 949-061-0006F, Adjustment of Indirect Fire by the Bracketing and Creeping Methods, Part II

TASK NUMBER: 071-326-5704

SUPERVISE/EVALUATE CONSTRUCTION OF A FIGHTING POSITION

CONDITIONS:

During daylight in a field or combat situation, given personnel, equipment, and a sector of responsibility.

STANDARDS:

Within specified time limits, the position is completed and meets the following minimum requirements.

1. **Cover** - Affords protection from direct frontal small arms fire (e.g., a natural or manmade frontal parapet high enough to protect head completely while manning weapon and from indirect fire (shrapnel) (normally requires at least 12 inches of dirt/log overhead protection).

2. **Concealment** - Position cannot be easily detected from the air or from 35 meters to the front (e.g., blends with surroundings well).

3. **Fields of Fire** - Limiting stakes correctly define sector of fire. Occupant in firing position has observation in sector and fields of fire which have been selectively cleared, but which have not destroyed natural camouflage.

4. **Size/Shape** - Position is armpit deep and at least shoulder wide (of occupant), provides a cave-like compartment with overhead cover big enough for occupant to get under.

5. **Optional** - If time permits, position includes grenade sump, sloping floor with shallow trench to facilitate drainage, elbow holes to stabilize firing position and to lower silhouette when firing, range card, and night firing stakes.

PERFORMANCE MEASURES:

Through supervision, evaluation, and on-the-spot corrections, insure that the construction of the individual fighting position generally follows the sequence below:

1. Assign position location and sector of fire. Individual should emplace sector-of-fire stakes.

2. Individual should partially clear fields of fire within his sector and dig a hasty hole for minimum protection, being careful not to destroy natural camouflage around his position; he should save grass clumps, etc., for camouflage later on.

3. Individual should next dig in, making hole armpit deep. If he has a natural frontal parapet, the dirt from hole should be carried away and camouflaged; if not, the dirt should be used to make a frontal parapet.

4. Individual can now complete clearing fields of fire; he should clear only what is absolutely necessary. Insure that individual gets in firing position and checks observation in fields of fire.

5. Individual should next camouflage his position using available materials (e.g., grass clumps, foliage, etc.), blending the position with the surroundings. The camouflage should be checked by moving approximately 35 meters to front and observing the position; if the position can be spotted easily, more work on camouflage is needed.

6. After all of the above have been accomplished satisfactorily, the individual should construct overhead cover. He should use logs, planks, etc., which will support at least 12 inches of dirt, and dig a cave-like area big enough to get under.

7. Upon completion of the overhead cover, the individual should begin to improve his position. Items to check for include grenade sump, drainage trench, elbow holes, night firing stakes, range card, and improvement of camouflage.

REFERENCE:

None

TASK NUMBER: 051-202-1001

CAMOUFLAGE/CONCEAL SELF AND INDIVIDUAL EQUIPMENT

CONDITIONS:

During daylight, given camouflage paint stick(s), individual weapon, load-bearing equipment (LBE), helmet complete with accessories, a snowsuit (white sheet or mattress cover) if appropriate, burlap garnishing strips or cloth strips, charcoal or burnt cloth residue, and mud (if appropriate to area).

STANDARDS:

Within 15 minutes, shade shiny areas of exposed skin with dark color and shadow areas with light color. Clothing, LBE, and weapon outlines will be altered and irregular patterns added to blend with the predominant color of the background in the area.

PERFORMANCE MEASURES:

1. **Guide for skin camouflage** (figure 1). Exposed skin reflects light and attracts the enemy's attention. Even very dark skin will reflect light because of its natural oil. Camouflage face paint sticks are issued in three standard two-tone sticks as follows:

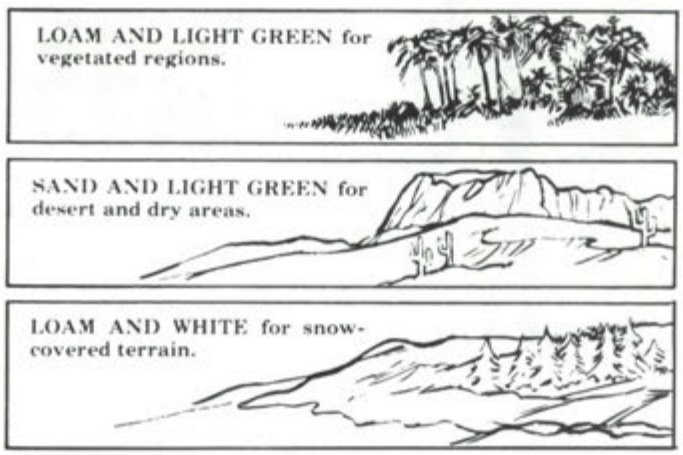


Figure 1.

2. **To camouflage exposed skin** (figure 2):

a. Paint the shiny areas (forehead, cheekbones, nose, and chin) with a dark color.

b. Paint the shadow areas (around the eyes, under the nose, and under the chin) with a light color.

c. Paint the exposed skin on the back of your neck and hands with irregular patterns.

d. When applying camouflage, use the buddy system – work with another man and check each other.

Figure 2.

(1) Slits in burlap allow insertion of natural material.

(2) Rubber bands, or expedient bands made from old inner tubes or burlap strips, secure natural materials. (Note position of band.)

(3) A disruptive paint pattern, with the pattern carried across the curved lines of the edges, especially those seen from the front.

Figure 3.

3. **To camouflage the helmet** (figure 3):

a. The outline of the helmet is one of the striking features of your equipment, and its curved shape can be easily identified by the enemy. You should attempt to break up the outline of your helmet. There are several ways of doing this. Figure 3 shows some examples.

b. Improvised helmet covers can be made of pieces of burlap, other cloth, or sandbags.

4. **To camouflage your weapon** (figure 4):

a. One of the easiest ways to change the outline of your weapon is by wrapping it with burlap strips or strips of cloth dyed to match the background.

b. Pattern painting the weapon is also good. Shiny parts can be covered by cloth, paint, or mud.

c. Care must be taken when camouflaging a weapon not to cause interference in the sighting and firing of the weapon.

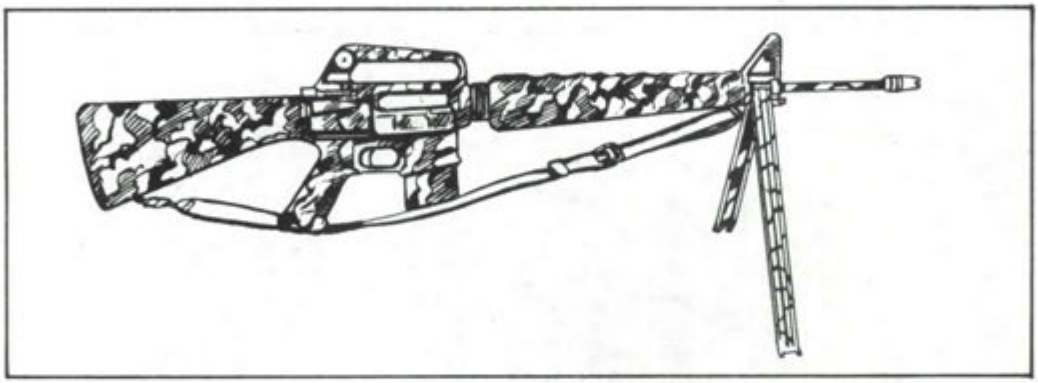


Figure 4.

5. **To camouflage your uniform:**

a. Combat uniforms can be stained and dyed with a little imagination.

(1) You can make a uniform blend with the terrain by dyeing it or by attaching bow ties of colored burlap.

(2) A mixture of mud and grease or crankcase oil may be used to stain your uniform.

(3) When operating in snow-covered terrain, you can make a snowsuit from a sheet, mattress cover, or other white cloth.

b. The important thing is to make the clothing look less like a uniform and more like the terrain in which it is to be worn.

6. **To blend with your surroundings** (figure 5):

Blending is the use of camouflage materials on, over, and around an object so that it appears to be part of the background. For example, a soldier can apply stick paint to exposed skin, and add burlap, paint, and live vegetation to his helmet, clothing, and LBE so that he will closely resemble or blend into the background.

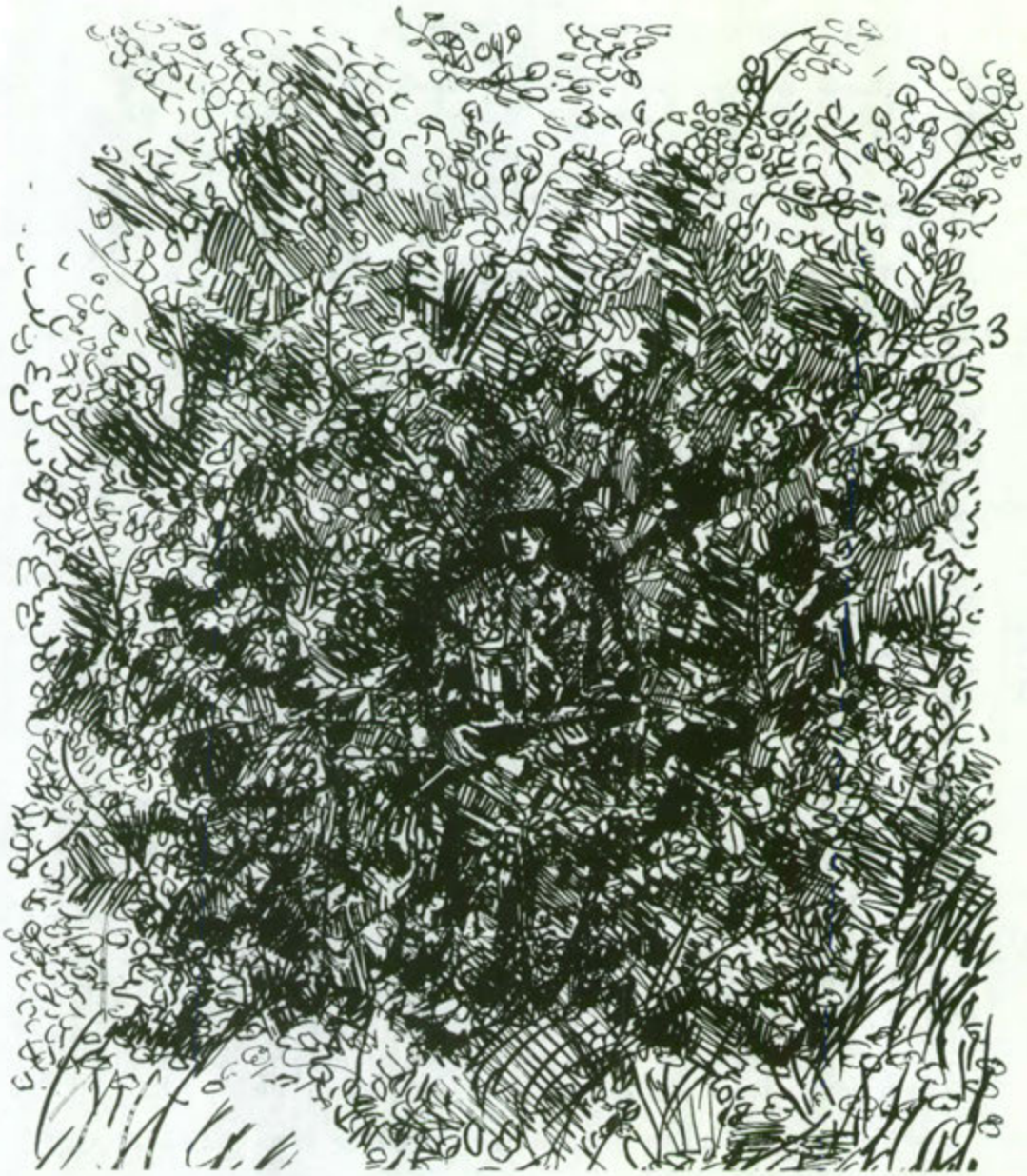


Figure 5.

REFERENCES:

FM 5-20, Camouflage, May 68 (chap 4, pages 26 thru 30, para 11 thru 17)
TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part I

TASK NUMBER: 051-202-1002

CAMOUFLAGE/CONCEAL EQUIPMENT

CONDITIONS:

During daylight, given an item(s) of military equipment in a field location, natural camouflage materials (foliage, grass, mud, snow, etc.) appropriate to area, camouflage net(s), and basic issue pioneer equipment.

STANDARDS:

Conceal shiny parts and cover remaining areas of the equipment in irregular patterns, and alter outlines to blend with the predominant terrain background pattern in the area.

PERFORMANCE MEASURES:

To camouflage and conceal equipment, follow these examples:

1. Use pattern paint, mud, etc., to cover shiny areas of equipment in irregular patterns so the item will blend with the color of natural surroundings (figure 1).

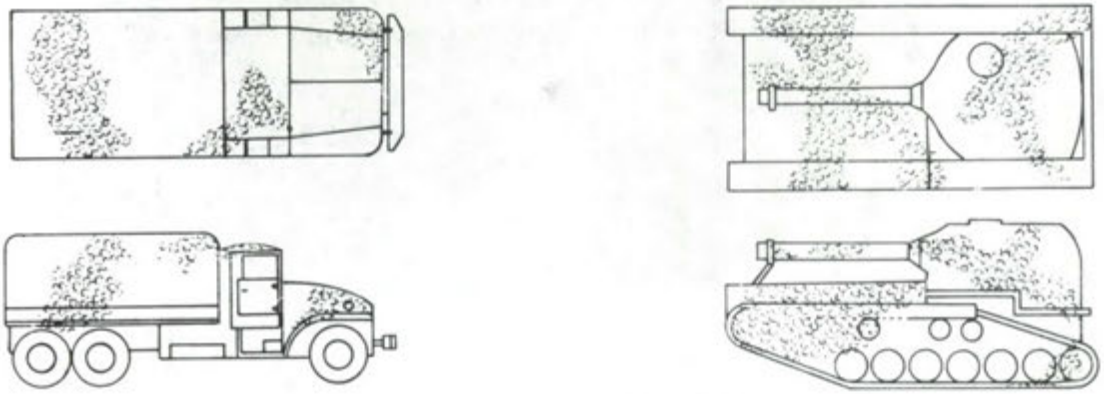


Figure 1.

2. Use natural materials (foliage, grass, mud, etc.) and manmade materials to alter the shape and size of the equipment (figure 2).

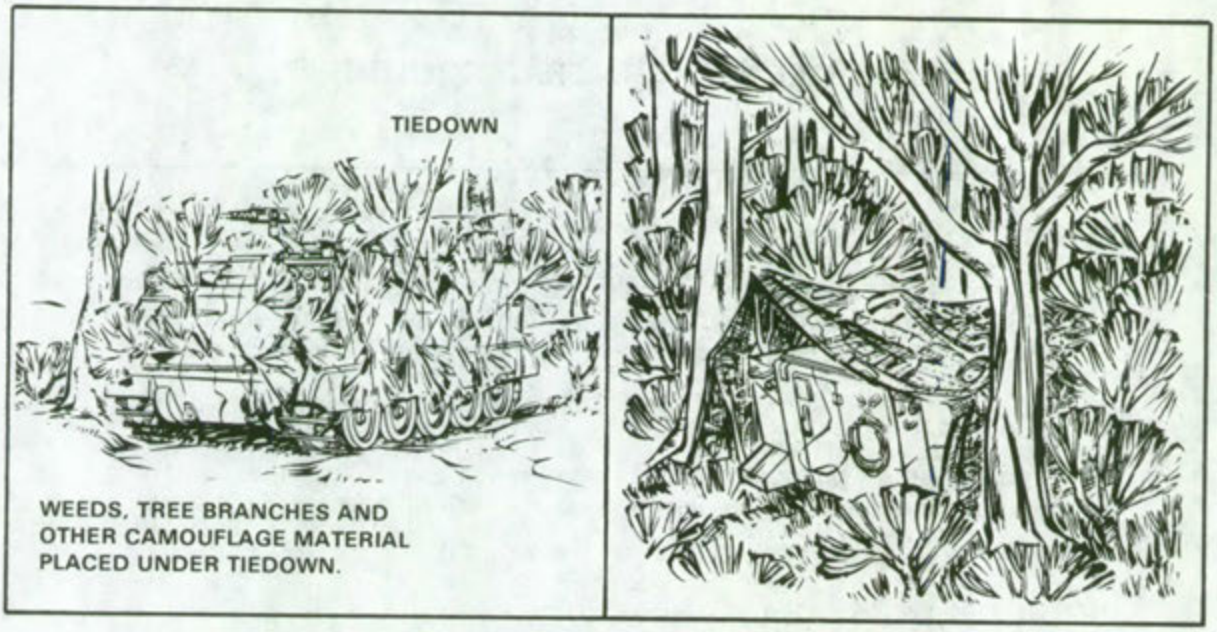


Figure 2.

REFERENCES:

FM 5-20, Camouflage, May 68 (pages 31 — 48)
FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (pages 9-1 — 9-12)
FM 7-8, The Infantry Platoon and Squad (TBP)
TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part I

TASK NUMBER: 051-202-1003

CAMOUFLAGE/CONCEAL DEFENSIVE POSITIONS

CONDITIONS:

In a field location during daylight or limited visibility, given a defensive position either being built or already constructed.

STANDARDS:

Completed position so blends with the terrain that an approaching soldier approximately 35 meters (handgrenade range) to the front cannot detect it.

PERFORMANCE MEASURES:

1. Before, during, and after construction of defensive position:

a. Approach the position only from the rear, insuring that a visible trail is not left. Circle the position when moving to the front so that a trail does not point out the position (figure 1).

b. Do not litter area, make noise, or, during hours of darkness, expose any light.

It is obvious here, to even the untrained observer, that some activity is taking place at both 1 and 2 and needs watching.

Figure 1.

c. Do not disturb vegetation not used in constructing or camouflaging the position. Be particularly careful with a vehicle, if you are a driver, to insure that the vehicle does not leave a trail pointing out the position (figure 2).

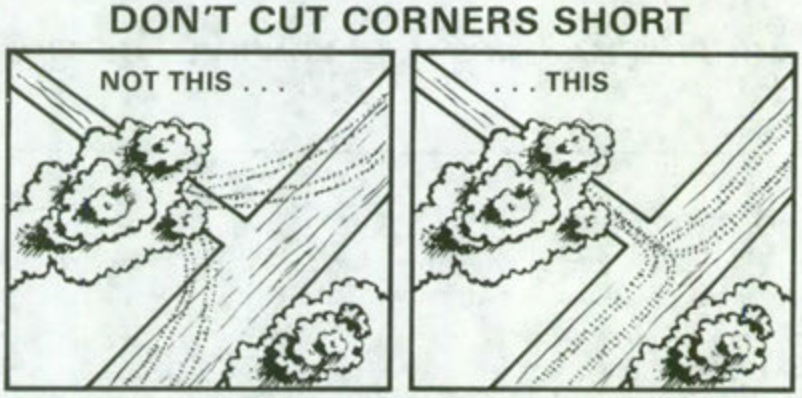


Figure 2.

2. During construction:

a. Place sod from the position in front of proposed parapet location.

b. Use soil removed from the position to build a parapet and then cover it with sod in such a manner that it looks natural and will have a good chance of growing. Conceal the dirt you dig from the foxhole by carrying it away and putting it under low bushes, on roads, or in streams and ponds (figure 3). The poncho is handy for carrying soil.

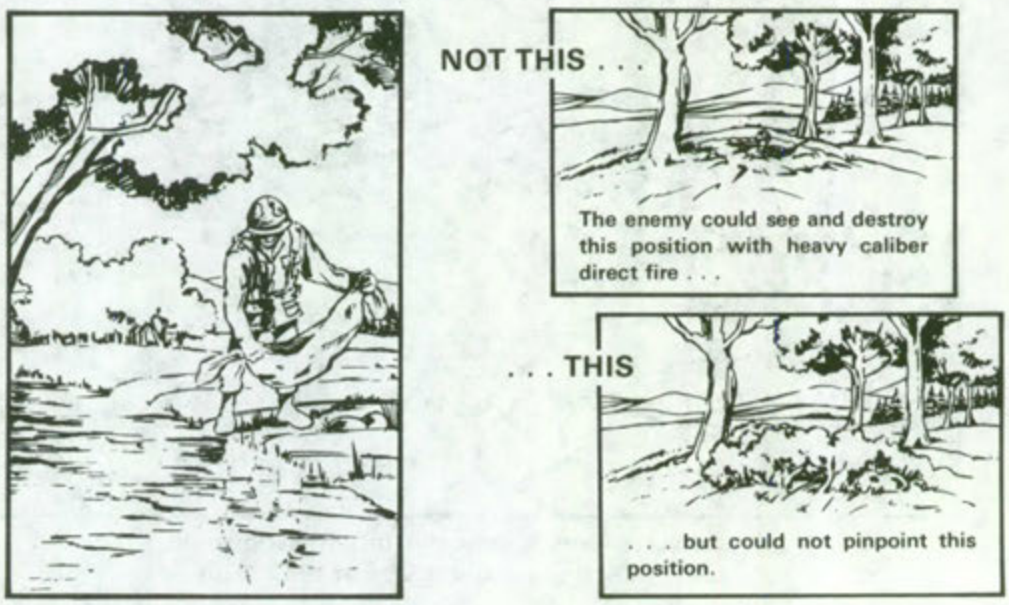


Figure 3.

c. If additional vegetation must be used to break up the outline of the parapet, obtain some (similar to that found near your position) from far to the rear of your position with root structure intact, if possible. Do not use so much vegetation that the position has more than the surrounding area. Camouflage the holes or cuts from which vegetation was removed.

3. After construction:

a. Replace dying foliage constantly. (Change cut foliage at least every 3 hours when the tactical situation permits.)

b. If the ground under the weapon's muzzle (when aimed within sector of fire from completed position) is dusty, keep it moist but not excessively wet.

c. Upon completion, your position should blend with the surrounding terrain to prevent detection from the front. You or your buddy should check the position from the front to insure sufficient concealment (figure 4).

Figure 4.

REFERENCES:

FM 5-15, Field Fortification, Jun 72 (chap 2, sec II, page 2-2)
FM 5-34, Engineer Field Data, Sep 76 (chap 16, page 361)

TASK NUMBER: 071-331-0852

CLEAR FIELDS OF FIRE

CONDITIONS:

Given a partially completed fighting position with an assigned sector of fire, containing thick underbrush and small to medium trees, an intrenching tool, an axe, a specified depth or sector of fire to be cleared, and a designated amount of time in which to clear the field of fire.

STANDARDS:

Within designated time, clear your sector of fire out to the specified distance so that:

1. Anyone moving through your sector of fire can be seen from your position.

2. Anyone moving into your sector of fire will not recognize it as a cleared area.

PERFORMANCE MEASURES:

1. **Clearing fields of fire.**

a. In preparing defensive positions for expected contact with the enemy, clear suitable fields of fire within the assigned sectors of fire for each position.

b. Before clearing the fields of fire, you should make a careful estimate as to how much clearing can be done in the time available. This estimate often determines the nature and extent of the clearing to be undertaken, since a field of fire improperly cleared may afford the enemy better concealment and cover than if you left the area in its natural state.

2. **The following principles must be observed:**

a. Do not disclose your position by excessive or careless clearing (figure 1).

b. In areas organized for close defense, start clearing near your position and work forward.

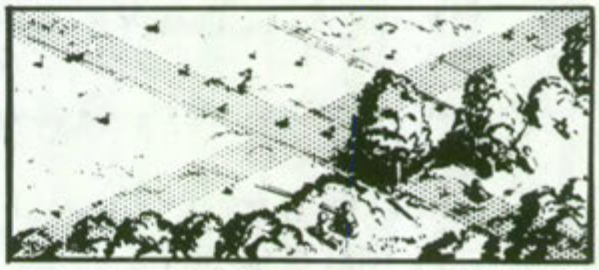
c. In all cases, leave a thin natural screen of vegetation to hide defensive positions.

d. In sparsely wooded areas, remove lower branches of large scattered trees.

Figure 1.

ORIGINAL TERRAIN

WRONG -- TOO MUCH CLEARING. DEBRIS NOT REMOVED. ENEMY WILL AVOID.



WRONG -- AFTER IMPROPER CLEARING

RIGHT -- ONLY UNDERBRUSH AND TREES DIRECTLY IN LINE OF FIRE REMOVED. ENEMY SURPRISED.

RIGHT -- AFTER PROPER CLEARING

e. In heavy woods, complete clearing of the field of fire may not be possible or desirable within the time available. Restrict work to thinning undergrowth and removing lower branches of large trees. Clear narrow lanes of fire for automatic weapons, making sure that you clear in an irregular pattern that will not reveal the weapons' positions.

f. Remove or thin dense brush. It is never a suitable obstacle and it obstructs the field of fire.

g. Cut weeds only where they obstruct your view.

h. Drag away cut brush, limbs, and weeds to points where they will not be detected by the enemy or furnish him with concealment.

i. Cover cuts on trees and bushes forward of the position with mud, dirt, or snow.

j. Insure that no trails are made in your sector of fire as lanes are cleared.

REFERENCES:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (chap 5, page 5-33)
FM 7-8, The Infantry Platoon and Squad (TBP)

TASK NUMBER: 071-331-0801

USE CHALLENGE AND PASSWORD

CONDITIONS:

Given current challenge and password and a defensive position with designated sector of fire. Soldier will be told that enemy and friendly personnel may enter his sector and that he is to allow friendly personnel to pass only if they respond with correct password and to detain (capture) other personnel as he is able.

STANDARDS:

Soldier will:

1. Detect and halt personnel in his sector.

2. Challenge them using correct challenge.

   a. If given correct password, allow personnel to pass.

   b. If not given correct password, attempt to detain (capture) personnel as he is able.

PERFORMANCE MEASURES:

IF ONE MAN DESIRES TO PASS:

1. Seeing or hearing someone approach your position, before that person gets close enough to pose a threat, command the person to "Halt!" Use a clear voice, just loud enough to be heard.

2. Seeing the stranger halt, keep the stranger covered and without exposing your position, ask "Who is there?" Again, use a clear voice but just loud enough to be heard so the enemy won't overhear if he's nearby.

3. When the stranger identifies himself, such as "Private Willard, Messenger," you order him to "Advance to be recognized."

4. Maintain your concealed position and keep the stranger covered with your weapon. When the stranger gets within two or three meters of you, again order him to "Halt!"

5. Issue the challenge in a soft voice and wait for the stranger to reply with the correct password. Hearing the correct password, give permission to pass if you have no other reason for doubt. If doubt still exists, demand further identification or ask a question only a friendly person would be able to answer.

IF A GROUP DESIRES TO PASS:

6. The procedure and precautions for a group are almost the same as for one man. Seeing or hearing a group approach, before they are close enough to pose a threat, order them to "Halt!"

7. The leader of the group should identify the group, such as "Friendly Patrol." Since you don't want the whole group to advance on you at once, order "Advance **one man** to be recognized."

8. When the leader has come forward to be recognized give him the challenge and get the password in reply.

9. Once you're satisfied that the leader is friendly, have the rest of the patrol advance one by one and let the leader identify each man.

10. Person(s) not able to give the proper password or identify himself to your satisfaction is disarmed and detained. Then notify your immediate superior.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
FM 22-6, Guard Duty, C1, Sep 71 (chap 9, pages 9-1 and 9-2; app F, pages F-1 to F-4)
TEC Lesson 935-071-1029-F, Counterintelligence

TASK NUMBER: 071-331-0802

PROCESS KNOWN OR SUSPECTED ENEMY PERSONNEL

CONDITIONS:

Given an area with friendly civilians and other friendly elements, two surrendering enemy personnel with weapons (rifles, bayonets, pistols, etc.) and military documents, a designated prisoner of war (PW) collection point 200 meters to the rear, and PW tags.

STANDARDS:

Within 15 minutes, without letting the prisoners talk to each other, and without letting anyone harm them, remove all weapons and documents except individual ID papers; tag prisoners and their equipment with your complete unit ID, date, time, and circumstances of capture; and turn the prisoners' weapons and documents over to the collection point.

PERFORMANCE MEASURES:

Suspected or known enemy personnel must be handled under the following rules:

1. **SEARCH prisoners** (figure 1) for weapons and documents as soon as you capture them. Take weapons to prevent resistance and take documents, except individual identification papers, to prevent the prisoners from destroying them. Prisoners from whom personal property is taken, including personal documents, should be given a written receipt for the property. Tag documents and personal property taken so you know which prisoner had them. Allow prisoners to keep items needed for their general welfare or safety such as a protective mask.

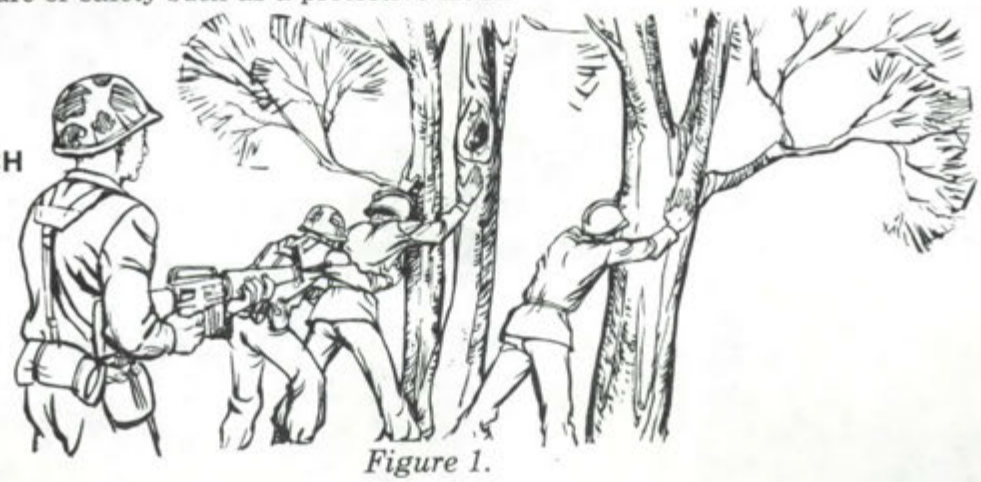


Figure 1.

2. **SEGREGATE** them into groups (figure 2): officers, noncommissioned officers, privates, deserters, civilians, females, and political indoctrination personnel. This prevents the leaders from organizing for a mass escape and from making the rest of the prisoners security-minded.

Figure 2.

3. **SILENCE** (figure 3) is essential. Do not allow prisoners to talk to each other. This helps to prevent plans of escape.

Figure 3.

4. **SPEED** (figure 4) prisoners to the rear. The information they have does no good until obtained by an interrogator and processed.

Figure 4.

5. **SAFEGUARD** the prisoners (figure 5) as you take them to the rear. Do not allow anyone to abuse them, but do not allow anyone to give them cigarettes, food, or water.

Figure 5.

6. **TAGGING.** A PW tag should include the capturing unit (a complete unit identification), date and time of capture, place of capture (grid coordinates or reference from a known point), and circumstances of capture (how PW was captured). The same format is used for documents and equipment except that circumstances identify where documents of equipment came from (i.e., from PW Ivan Schmidt, "found on dead enemy soldier", etc.) (figure 6).

NOTE: Tags may be printed before combat or made out of materials at hand on the battlefield.

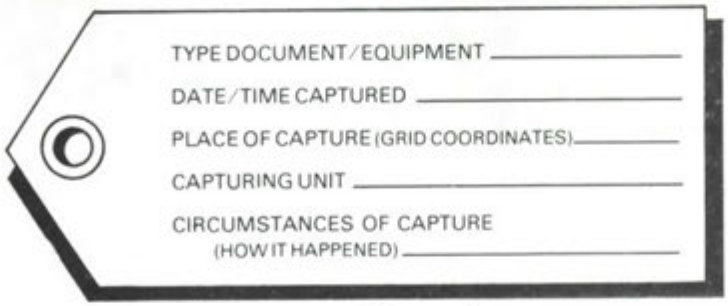


Figure 6.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition TBP)
TEC Lesson 935-071-1028-F, Processing Captured Personnel, Equipment, and Documents

TASK NUMBER: 071-331-0803

COLLECT/REPORT INFORMATION - SALUTE

CONDITIONS:

Given a tactical situation which includes any number of enemy soldiers, engaged in any type of activity, who can be seen either with the naked eye or with binoculars.

STANDARDS:

Give an oral report to your leader which describes each point of interest expressed by the letters of the key word SALUTE. (Location may be descriptive; need not be grid coordinates.)

PERFORMANCE MEASURES:

1. Report all information quickly, completely, and accurately. The example report below shows how much detail is included in a complete report.

"Seven men in civilian clothes, one carrying rifle and bandoleer, six carrying farm tools, entered the village of Friedberg (BN 223227) by SW gate at 211300 August. Same seven men, all with rifles and bandoleers, left Friedberg by NE gate 211300 August, walking NE on road to Ogau (BN 214230)."

2. A good way to remember how and what to report about the enemy is to use the letters of the word SALUTE.

a. **S - IZE** - The number of personnel seen or size of object.

. **A - CTIVITY** - What the enemy was doing.

c. **L - OCATION** - Grid coordinates or reference from a known point including distance and direction (or azimuth) from the known point.

d. **U - NIT** - Describe any patches or clothing, distinctive signs or symbols, or ID numbers on vehicles.

e. **T - IME** - The time the activity was observed.

f. **E - QUIPMENT** - Describe or identify all equipment associated with the activity.

3. Both oral and written reports may be accompanied by maps, photos, overlays, sketches, captured documents, enemy materiel, or anything else which may help convey the full meaning of the information you are reporting.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)
TEC Lesson 935-071-1026-F, Collecting and Recording Information

TASK NUMBER: 071-331-0804

CONDUCT DAY AND NIGHT SURVEILLANCE WITHOUT THE AID OF ELECTRONIC DEVICES

CONDITIONS:

1. **Situation 1:** During daylight, with good visibility to 500 meters or beyond, given an unspecified number of:

a. Improperly camouflaged OPFOR soldiers in fighting positions and temporary battlefield positions at ranges from 30 to 460 meters.

b. Stationary, properly camouflaged vehicles at ranges from 150 to 500 meters.

2. **Situation 2:** At night, with good visibility to 500 meters or beyond, given an unspecified number of:

a. Moving and stationary OPFOR soldiers skylined at not more than 300 meters.

b. Moving and stationary OPFOR soldiers in open and semi-open areas, not on the skyline, at ranges less than 100 meters.

c. Sounds of wheeled and tracked vehicle movement.

d. Sounds of friendly and enemy weapons fire.

STANDARDS:

1. **Situation 1:** Locate 75 percent of all soldiers (positions) and 50 percent of all vehicles.

2. **Situation 2:** Locate 75 percent of soldiers on skyline, locate 50 percent of all soldiers not skylined, differentiate between tracked and wheeled vehicle sounds, and identify all weapons fire as:

a. Heavy machinegun fire.

b. Light machinegun/assault rifle fire.

c. Indirect fire.

d. Rocket/recoilless rifle fire.

PERFORMANCE MEASURES:

1. To conduct a visual search in daylight:

a. Make a quick overall search of the entire area by quickly raising your eyes from just in front of your position to the maximum range you wish to observe (figure 1). (For a wide area, subdivide and repeat procedure.)

b. Observe overlapping, 50-meter-deep strips of terrain in detail, alternately searching left to right, right to left, etc. (figure 2).

c. Search suspicious spots thoroughly.

2. To identify improperly camouflaged personnel, equipment, and positions, look for:

a. Camouflage/foliage that doesn't match.

b. Failure to replace dead foliage.

c. Failure to obscure outlines.

d. Failure to subdue bright colors/reflections.

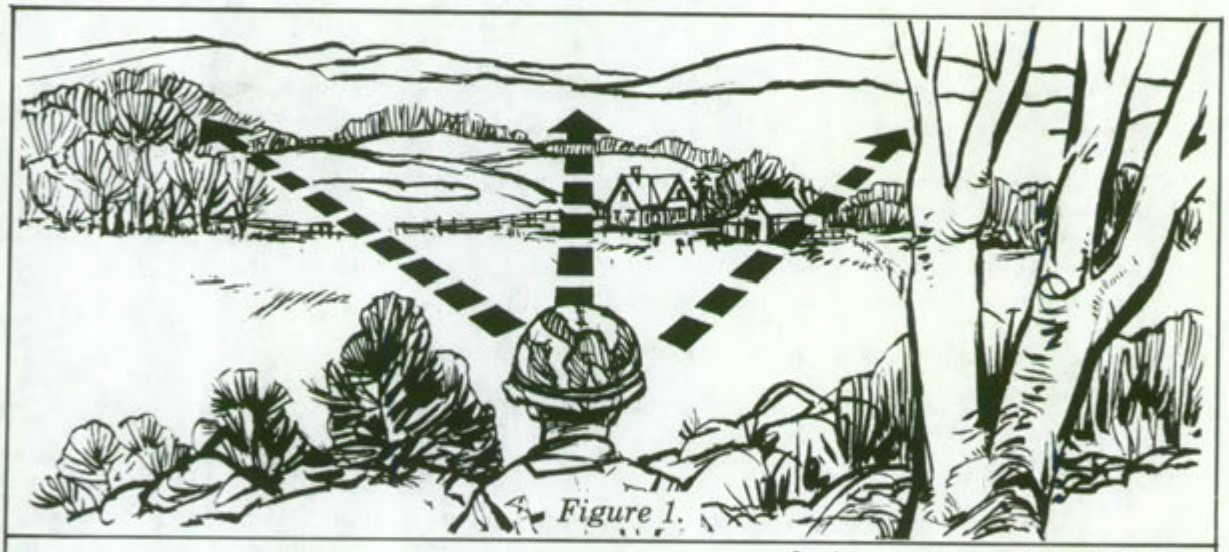


Figure 1.

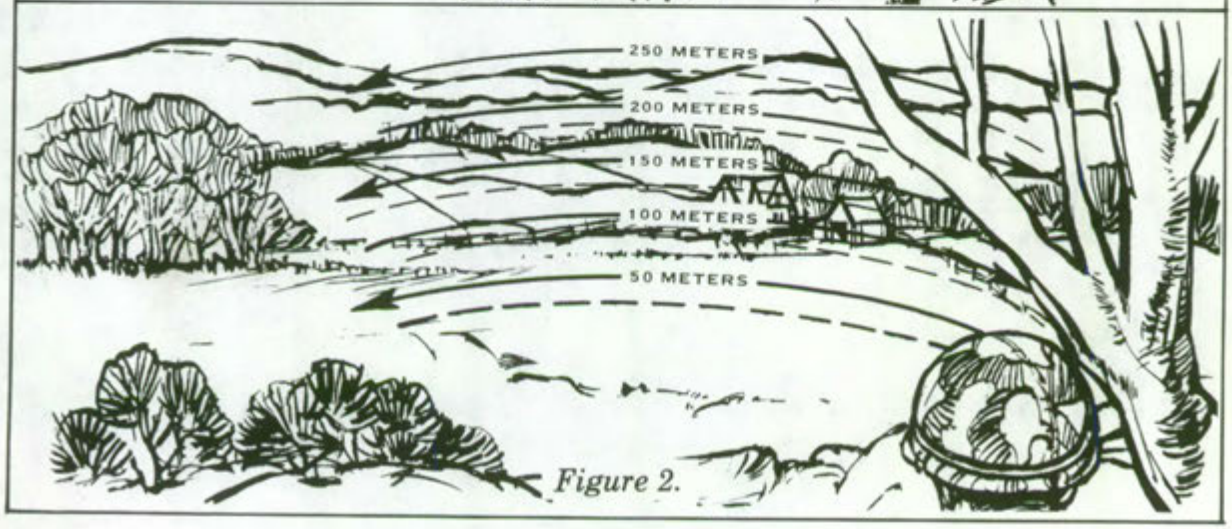


Figure 2.

e. Piles of dirt and litter, tracks, and footpaths.

f. Failure to observe selective clearing procedures.

3. To conduct surveillance at night:

a. Dark adaptation. Accustom eyes to low levels of illumination prior to night operations by either:

(1) Staying in a secure darkened area for 30 minutes (assembly area at night, initial rally point (IRP), etc.).

(2) Staying in a red-lighted area for 20 minutes followed by 10 minutes in darkness.

(3) Wearing red goggles for 20 minutes followed by 10 minutes in darkness.

b. Scanning. To visually search areas at night, move your eyes in short, quick, irregular movements (figure 3).

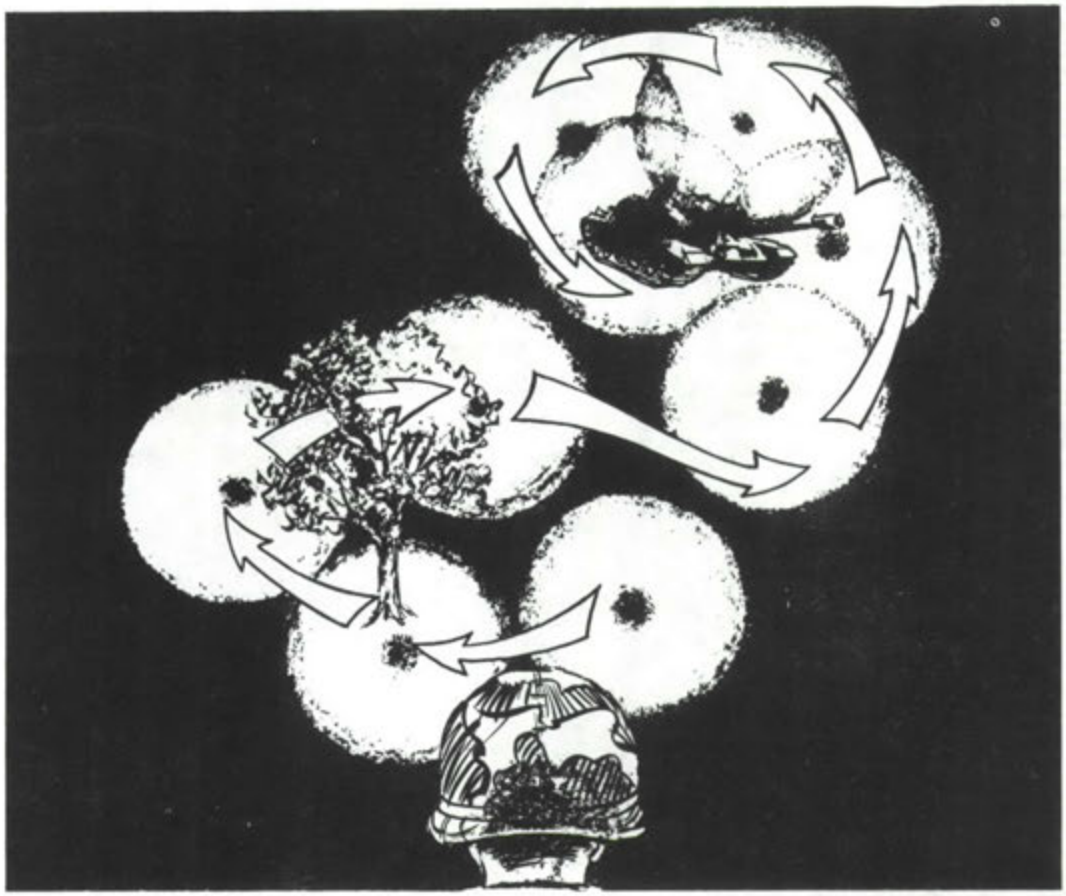


Figure 3.

c. Off-center vision. To observe specific objects, look slightly to the left, right, above, or below them, by about 6 to 10 degrees (figure 4).

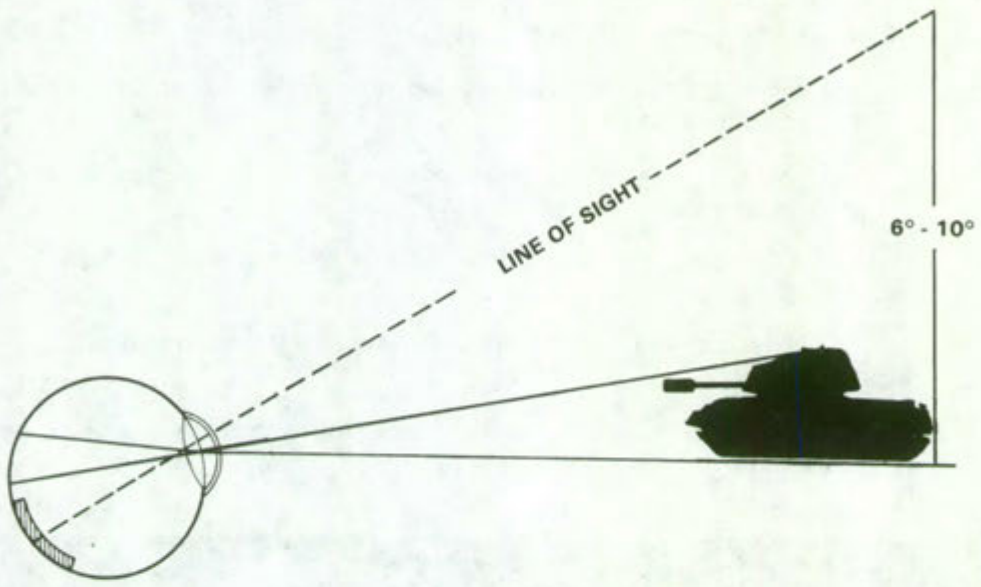


Figure 4.

d. Preserving night vision. When exposed to bright lights, close both eyes. If surveillance must be maintained, close one eye only and observe with the other.

TRAINING TIPS: Since it is hard to tell if the above techniques are being used, frequent training is the only way to insure mastery of this skill. The nature of this task makes it easy to integrate with other tactical training. Maintaining surveillance is one of the basic and critical combat skills. In addition to the training given above, frequent familiarization with the sounds of vehicles and weapons fire, and with various common smells such as gasoline, campfires, deodorants, etc., in a field environment is recommended.

REFERENCE:

FM 21-75, Combat Skills of the Soldier (Revised Edition, TBP)

TASK NUMBER: 071-331-0805

ENGAGE ENEMY ARMOR WEAK POINTS

CONDITIONS:

Given one of the following weapons: M16A1 rifle, M203 grenade launcher, or M60 machinegun; and a situation in which an enemy tank or APC (without dismounted troops) enters your assigned sector of fire or area of responsibility.

STANDARDS:

Engage the armor threat, causing the armor crew to button up and operate with increased visual deadspace.

PERFORMANCE MEASURES:

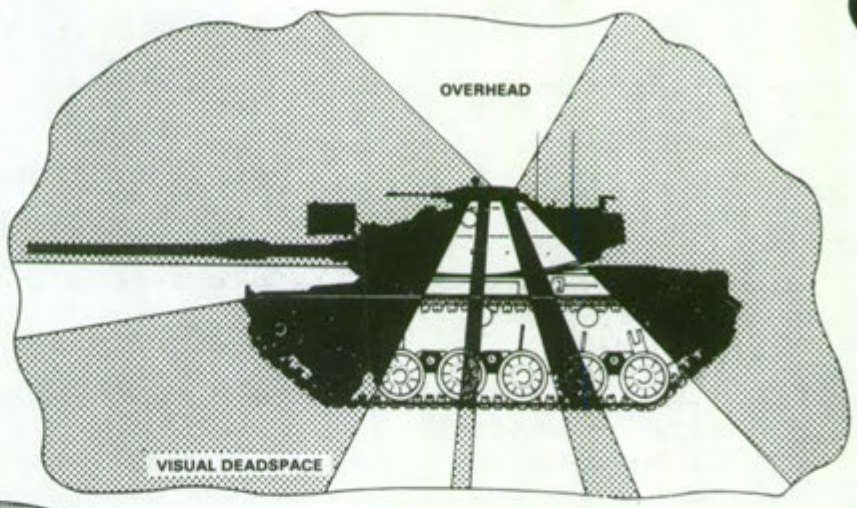
1. **Tank Weak Points.** Tank and APC features vary with the different models, particularly in weapons and armor protection, but there are weaknesses common to all armored vehicles.

a. Although tank crewmen are more likely to be injured when exposed, they prefer to keep hatches open and remain exposed until they come under fire because, when buttoned up, the crew must operate with increased visual deadspace. By taking advantage of this visual deadspace, dismounted elements can approach and destroy a tank using numerous antitank devices. A representative diagram illustrating visual deadspace is shown in figure 1.

b. Threat tanks also have external fuel tanks mounted flush with the top of the rear deck. If these have not been dropped, subjecting them to artillery or direct fire hits may cause them to burn.

2. **APC Weak Points.** The same considerations that apply to tanks are applicable; however, an enemy APC can be stopped by engaging it from the sides with either the M60 machinegun or the M203 grenade launcher using the HEDP round. Furthermore, you may engage the rear of the enemy APC and rupture the fuel cells, igniting the fuel and destroying the carrier.

3. **Suppressive Fires.** Suppressive fires are fires, direct and indirect, brought to bear on known or likely enemy locations to degrade the enemy's ability to place effective fire on maneuver elements. Suppressive fires are immediate or planned. Some examples of the use of suppressive fires would be to employ artillery and automatic weapons to force enemy tank crews to button up. The tank is much less effective when it is buttoned up, and the ability of its crew to acquire targets or maneuver the tank is reduced.



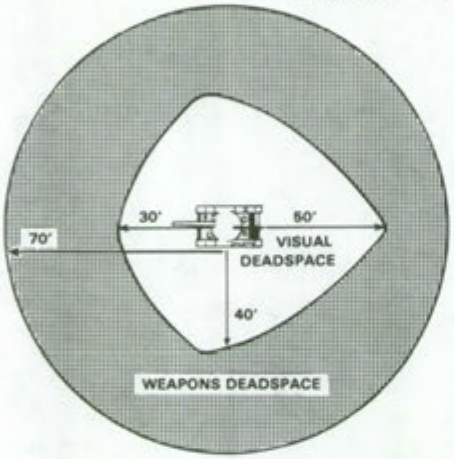
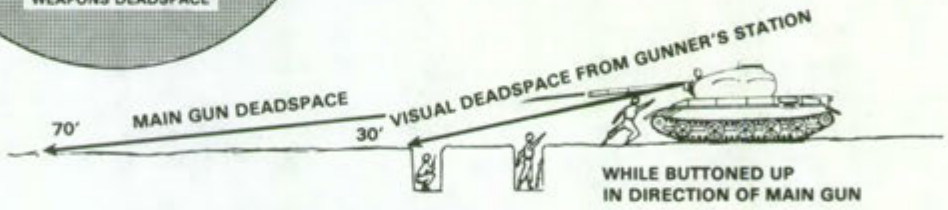


Figure 1.



"When buttoned up, a tank is at least 50 percent less effective."

4. **Suggestions.** To reduce the odds and minimize threat weapon effectiveness:

a. Use terrain to best advantage when moving.

b. Suppress likely enemy positions using a variety of means; tank, APC, artillery, mortar, and aircraft fires.

c. Cover your position with smoke or the threat vehicle's vision by using white phosphorous (WP) or smoke fired by mortars or artillery.

d. Fire at any of the weak points identified in paragraph 1 and 2, above.

REFERENCES:

None

TASK NUMBER: 071-331-0806

IDENTIFY OPPOSING FORCE (OPFOR) ARMORED VEHICLES

CONDITIONS:

During a field training exercise or in a classroom or suitable area in garrison, given a mockup, model, or photograph of opposing force (OPFOR) vehicles.

STANDARDS:

1. **ALL SOLDIERS.** Identify each vehicle observed as being either friendly or opposing forces.

2. **11B SCOUT OR NCO.** Identify each vehicle observed by NATO nomenclature and state primary combat role of each.

PERFORMANCE MEASURES:

Tank Characteristics.

1. Identification. Tank identification is designed around four areas common to all tanks:

a. Track and suspension system.

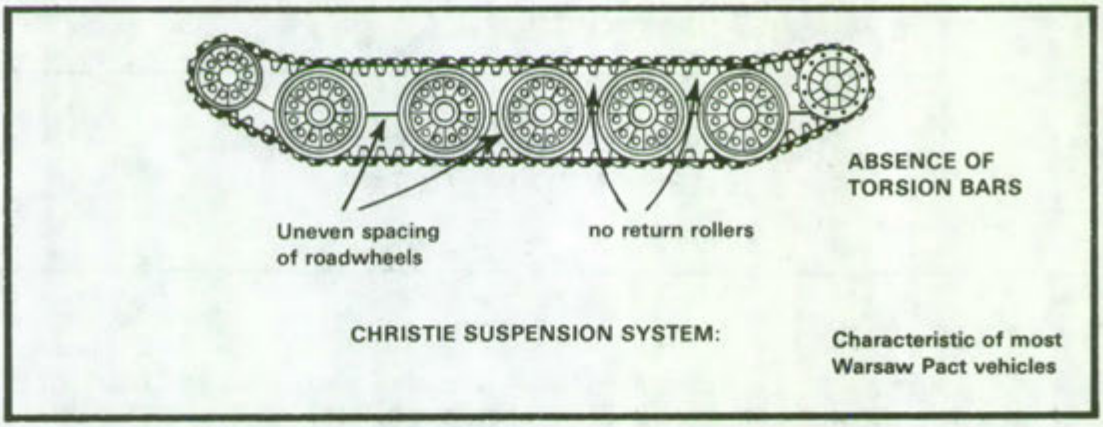
b. Turret.

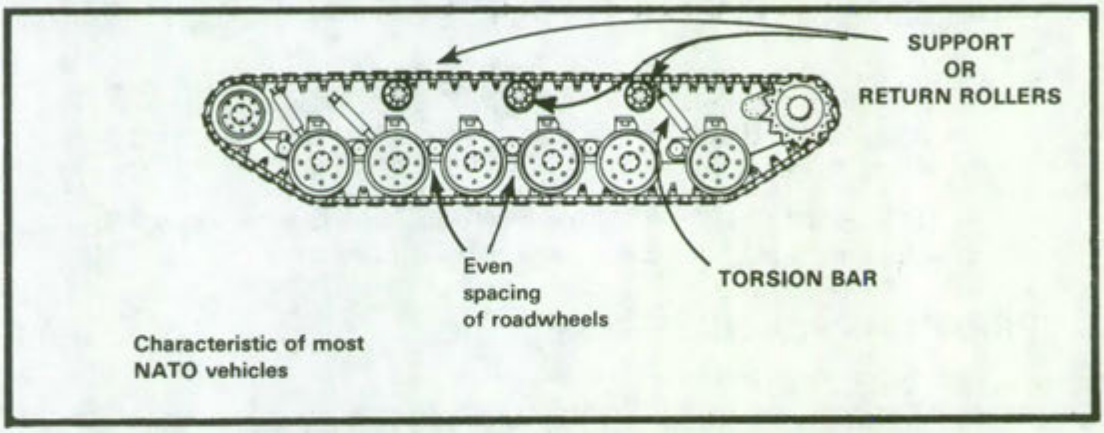
c. Main gun.

d. Cupola.

2. Track and Suspension System. Many tanks may be recognized by their track and suspension systems. However, recognition by this feature alone is often difficult as the tracks will often be obscured by grass or other objects. To identify the track and suspension system, check to see if it has support or return rollers. Except for the T-10, M-1970, and T-72 tanks, most Warsaw Pact vehicles do not have these rollers.

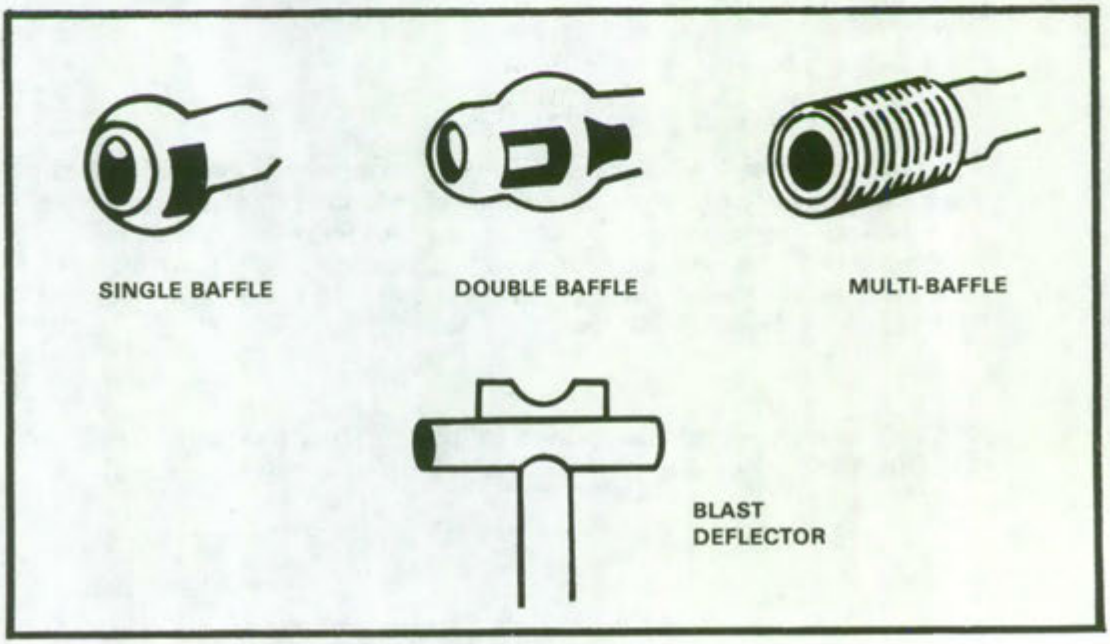
NOTE: When using this method to help identify tanks, keep in mind that the M551, Sheridan in the US Army also has no return rollers.



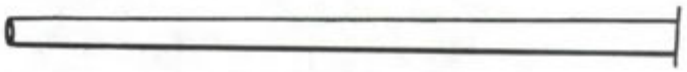


3. Main Gun. Armament varies from machineguns to large cannons. In turreted vehicles, the heaviest armament is normally in the turret. Look for:

a. Muzzle brakes.



b. Main gun bore evacuator and its location.

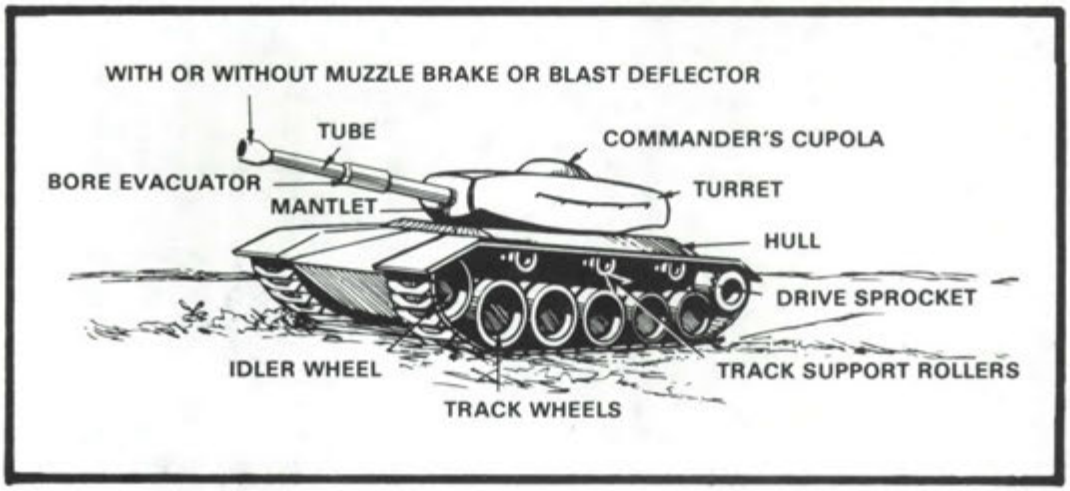


MAIN GUN WITHOUT BORE EVACUATOR

MAIN GUN WITH BORE EVACUATOR

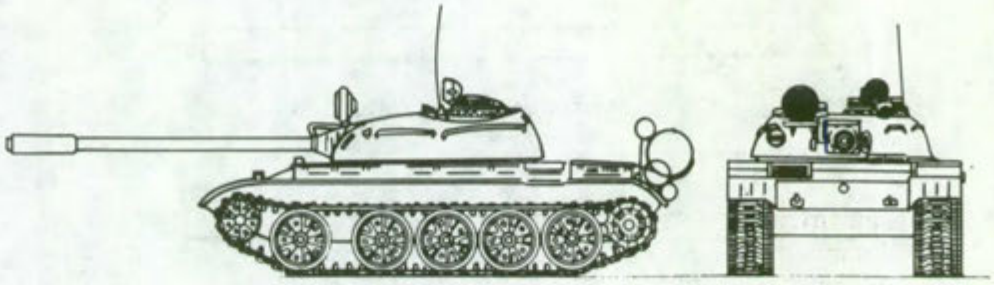
MAIN GUN WITH BORE EVACUATOR AND
MUZZLE BRAKE/BLAST DEFLECTOR

Note these common identification characteristics of both friendly and threat tanks:



Tanks. Threat main battle tanks are smaller than the US main battle tank. They have a cruising range of about 300 miles without auxiliary fuel and can attain speeds of about 30 mph. Threat tank fire control is relatively simple compared to that of US tanks. Currently, they mount no rangefinder similar to those on US tanks. Most Threat main battle tanks are equipped with active infrared (IR) night viewing devices, and have a superior underwater snorkeling capability.

NATO Nomenclature: T-55 Tank



Recognition features: Fully tracked; five-roadwheeled; space between first and second roadwheels; low-silhouetted, sloped hull; dome-shaped turret mounted over third roadwheel; bore evacuator at muzzle; infrared headlights; infrared searchlight for gun; seven variations of this model exist.*

Main gun range: 1,500 meters

Speed: 50 km/hr

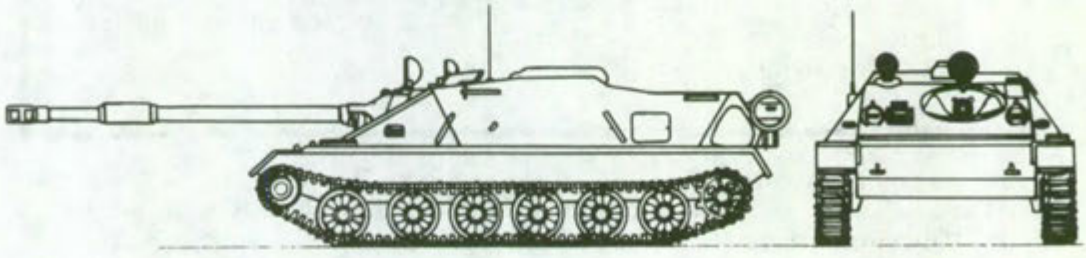
Range: 500 km

Users: India, Israel (with 105mm gun), People's Republic of China, United Arab Republic, USSR, Warsaw Pact

Employment: Medium battle tank in armored formations.

*T-55 and T-55A may mount 12.7mm AA machinegun.

NATO Nomenclature: ASU-85



The ASU-85 airborne assault gun provides armored striking power to airborne forces. Although not amphibious, the ASU-85 chassis is based on that of the PT-76 tank. Its armament is an 85-mm main gun and a 7.62-mm coaxial machinegun. The ASU-85 mounts a large gunner's infrared searchlight above the mantlet and carries a small commander's light.

NATO Nomenclature: T-62 Tank

Recognition features: Fully tracked; five-roadwheeled; flat, low-silhouetted hull; dish-shaped turret over third roadwheel; no muzzle brake; bore evacuator three-fourths to muzzle.

Armament: 1 - 115mm main gun
1 - 7.62mm machinegun (coaxial)
1 - 12.7mm AA machinegun

Main gun range: 2,000 meters

Speed: 50 km/hr

Range: 500 km

Users: United Arab Republic, USSR, Warsaw Pact

Employment: Main battle tank (medium) in armored formations.

NATO Nomenclature: T-72 Medium Tank

Recognition features: Live track, complete with support rollers, centerguides, end connectors, and probable torsion bar suspension. Glacis plate is gently sloping and has a "V" shaped splash guard directly in front of driver's position; external fuel cells down both sides of tank; three equal size storage boxes on lefthand side of the turret, and two unequal size storage boxes on the righthand side of the turret. Main gun has bore evacuator about one-third down the gun tube from the muzzle end.

Armament: 1 - 115mm main gun
1 - 12.7mm AA machinegun (turret roof-mounted)
1 - 7.62mm machinegun (coaxial)

Main gun range: 2,000 meters (approximately)

Speed: 55 km/hr

Range: 500 km (approximately)

Users: USSR

Employment: Main battle tank in armored formations.

NATO Nomenclature: M-1970 Medium Tank

Recognition features: Six evenly spaced roadwheels; well-sloped glacis plate; infrared unit on left of gun; driver's hatch center-front of hull; commander's hatch right of turret; bore evacuator first third of turret near muzzle.

Armament (probable):
1 - 115mm gun (smoothbore)
1 - 7.62mm machinegun (coaxial)
1 - 12.7mm AA machinegun

Speed: 60 km/hr (approximately)

Range: 500 km (approximately)

Users: USSR

Main gun range: 2,000 meters

Employment: Armored formations; possible replacement for T-62.

NATO Nomenclature: PT-76 Amphibious Tank

Recognition features: Fully tracked; six-roadwheeled; rectangular-shaped hull with a boat-like front; dish-type turret mounted over second roadwheel; chassis similar to BTR-50P; muzzle brake on main gun; bore evacuator close to muzzle.

Armament: 1 - 76mm main gun
1 - 7.62mm machinegun (coaxial)
1 - 12.7mm machinegun (AA) (on some versions)

Speed: 45 km/hr - land
10 km/hr - water

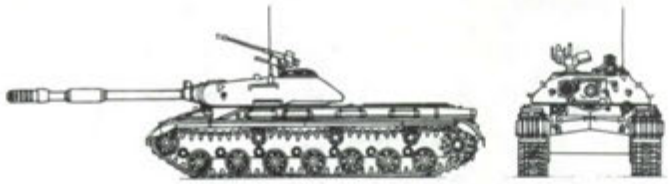
Range: 250 km

Main gun range: 1,000 meters

Users: People's Republic of China, United Arab Republic, USSR, Warsaw Pact

Employment: Amphibious reconnaissance tank; personnel movement (up to six plus crew) in maneuver divisions and regiments.

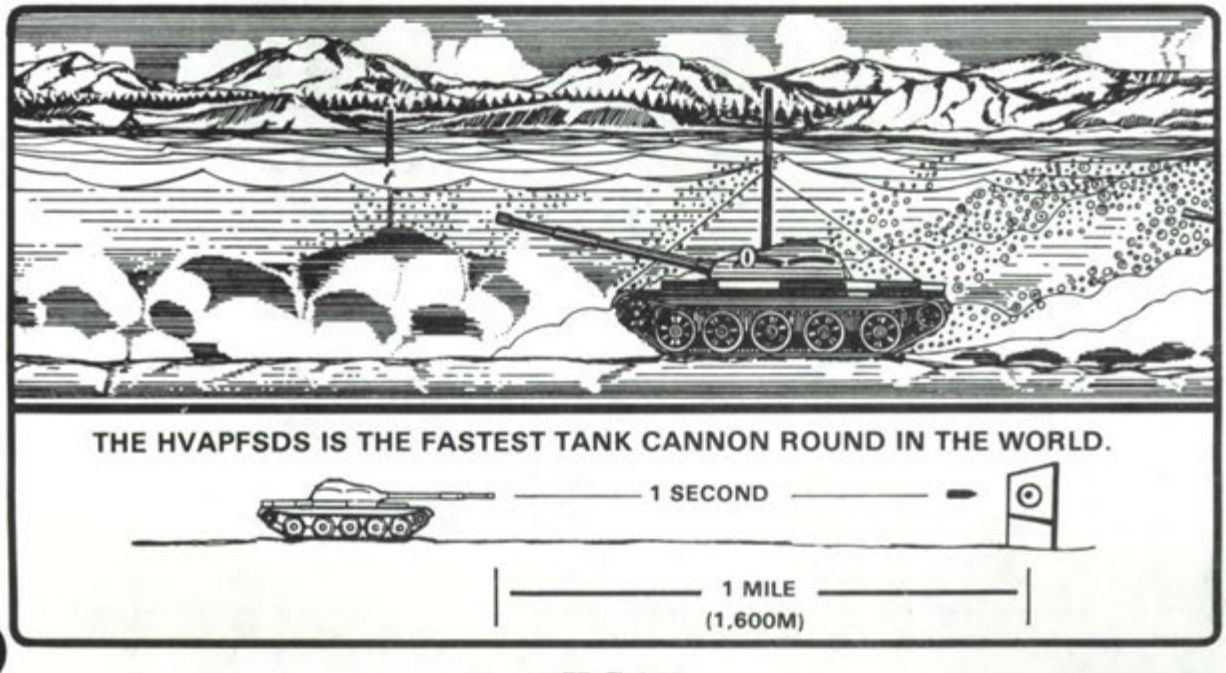
NATO Nomenclature: T-10



TheT-10 heavy tank is rarely seen in Threat forward areas. This tank stays in the rear and is used in counterattacks or with tank killer units. It is equipped with infrared sights or devices for all crew members, and has seven pairs of roadwheels. Its primary weapon is a 122-mm stabilized gun firing kinetic energy armor-piercing cap and chemical energy high explosive antitank ammunition. It has two 12.7-mm machineguns, one for antiaircraft and another mounted coaxially with the main gun.

Strengths. The strengths of Threat main battle tanks are:

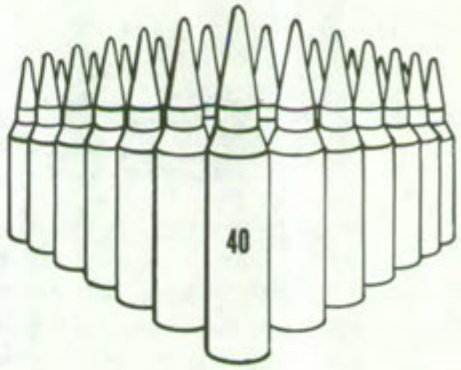
- Low silhouette, which makes them harder to hit.
- Simple fire control, which makes them easier to operate and maintain.
- Infrared night vision devices, which increase effectiveness at night.
- Underwater snorkeling, which permits them to cross water barriers quickly.
- The high-velocity 115-mm APFSDS tank-defeating round, which travels a mile every second. The accuracy of this round gives T-62 tank crews a 50% chance of hitting a stationary target in the open with the first round at ranges to 1,500m, or a moving target traveling at a constant speed in the open at ranges to 1,000m.



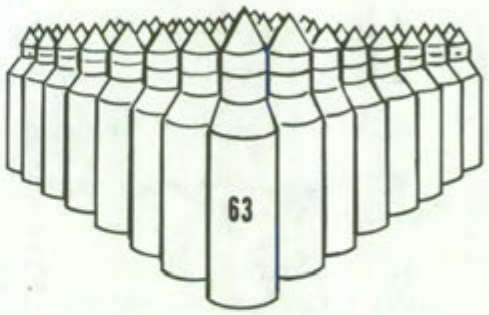
Weaknesses. The weaknesses of Threat main battle tanks are:

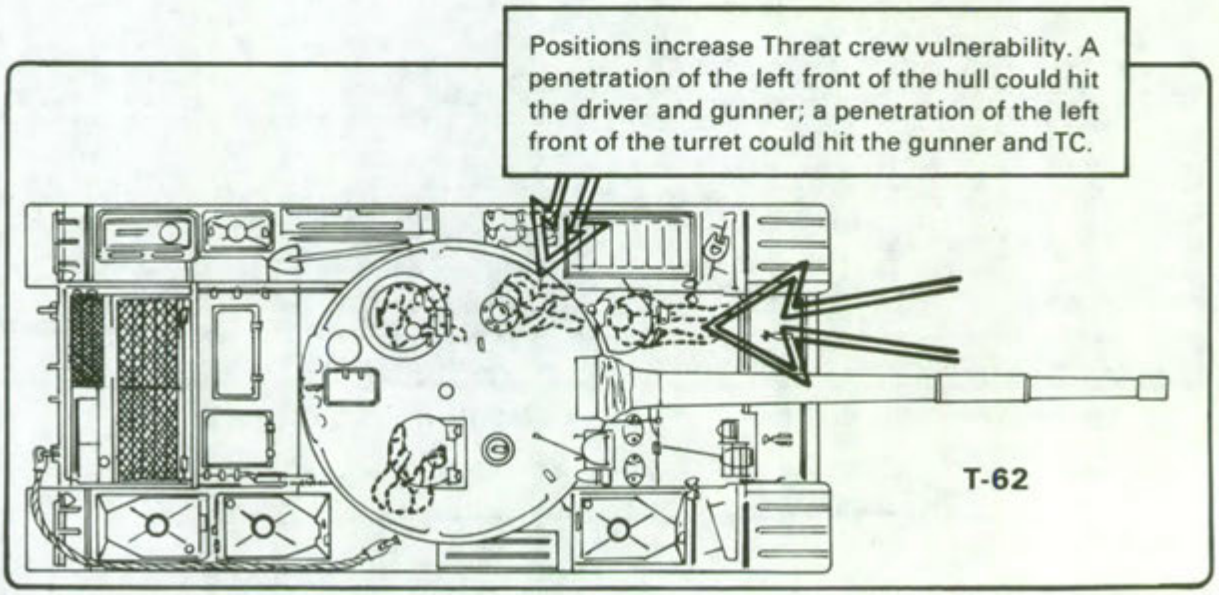
- Threat tank fighting compartments are considerably smaller than those in US tanks. The crew is cramped and freedom to move is restricted. Crew fatigue can therefore be a bigger factor in Threat tanks.
- Smaller turret interior and larger (115-mm) main gun ammunition means that Threat tanks have a slower rate of fire than US tanks.
- Because of its small fighting compartment, the T-62 tank has 23 fewer rounds of main gun ammunition than the M60A1. Therefore, in tank duels Threat tanks may run out of ammunition sooner than US tanks.
- Some main gun ammunition is strapped along the turret walls, and hits above the turret ring may cause secondary ammunition explosions.

T-62



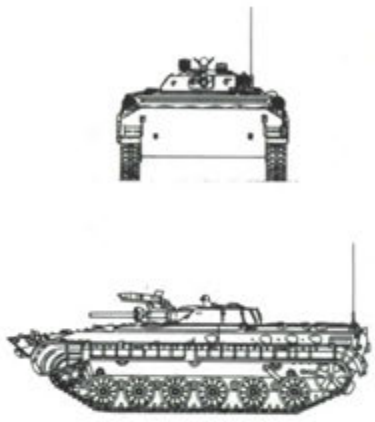
M60A1





INFANTRY COMBAT VEHICLES

NATO Nomenclature: BMP



The amphibious BMP is used as both a reconnaissance and an armored fighting vehicle. The armored infantry version of the BMP has a crew of three—gunner, driver, and vehicle commander and has a rear compartment troop capacity of eight. There are four periscopes and firing ports on each side allowing the infantry to fire from inside the vehicle while on the move. Its main armament is a 73-mm smoothbore gun with a Sagger missile rail mounted over the gun. A 7.62-mm PKT coaxial machinegun is mounted on the turret. Each BMP has racks for two Sagger missiles.

Recognition features: Six-roadwheeled, tracked, amphibious, ICV; engine in front; two doors in rear; four hatches in top of crew compartment; low silhouette with flat revolving turret. (May have Sagger mounted above gun.)

Employment: Motorized rifle units.

NATO Nomenclature: BMD

The airborne amphibious combat vehicle, BMD, resembles the BMP. It has five evenly spaced roadwheels on each side and is 5m long. It is air droppable, carries six troops, and has a turret similar to the BMP with a 73-mm gun and a Sagger missile launch rail. The BMD is amphibious and has a water propulsion system similar to the PT-76.

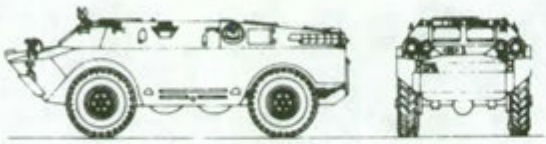
Recognition features: Five evenly spaced roadwheels; turret mounts the same as on the BMP; rear crew compartment, amphibious.

Employment: Motorized rifle units.

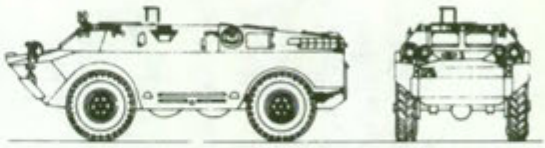
SCOUT VEHICLES

NATO Nomenclature: BRDM-2

The BRDM-2 is a four-wheel-drive amphibious scout car adaptable for many uses on the battlefield. It can be used as a command vehicle, an NBC test vehicle, an antiarmor vehicle, or an ADA vehicle. Cross-country mobility is improved by a centralized tire pressure regulation system, and by four retractable auxiliary drive wheels located under the center of the vehicle which can be lowered to aid flotation and help in crossing gaps. The rear mounted power plant is improved over that of the first BRDM's. Its armament is a turret-mounted 14.7-mm machinegun. Its armament in the basic reconnaissance car is two machineguns mounted on the turret.

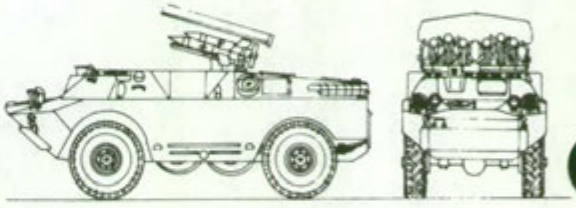


BRDM-2

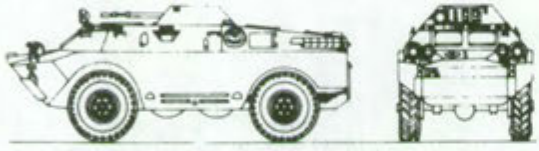


CHEMICAL RECONNAISSANCE VEHICLE

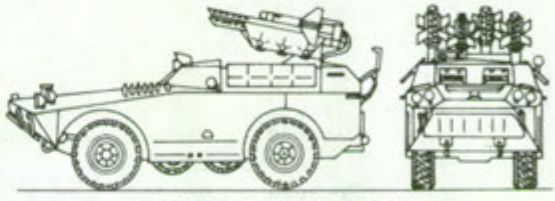
COMMAND VEHICLE



ATGM LAUNCHER



RECONNAISSANCE CAR



ANTIAIRCRAFT MISSILE LAUNCHER

Recognition features: Four-wheeled, amphibious, armored reconnaissance vehicle; has full armored cover; has four small, rough terrain belly wheels that may be raised or lowered when needed.

Employment: As scout car in different variants; can mount Snapper, Swatter, or Sagger At missiles. Two versions: basic BRDM has a 7.62mm machinegun; BRDM-2 has a 14.5mm machinegun.

REFERENCES:

FM 71-1, The Tank and Mechanized Infantry Company Team, Jun 77 (chap 2, pages 2-1 thru 2-12)
TC 30-3, Soviet Equipment Recognition Guide, Apr 75 (pages 25 thru 44)

TASK NUMBER: 071-331-0808

IDENTIFY OPPOSING FORCE (OPFOR) WEAPONS AND EQUIPMENT

CONDITIONS:

Given a mockup, model, or photograph of OPFOR and NATO weapons and equipment.

STANDARDS:

Identify each weapon and piece of equipment by NATO nomenclature and as being friendly or Threat.

PERFORMANCE MEASURES:

1. Threat small arms are characterized by their heavy weight and high reliability. Emphasis is placed on simplicity of design for easy training, handling, and maintenance. Their automatic weapons are generally shorter than U.S. models for use from inside APCs.

2. The standard Threat side arm is the 9-mm Makarov Semi-Automatic Pistol (pm), which uses an eight-round magazine (figure 1).

Characteristics:

Length: 106 mm
Weight: 0.81 kg
Effective Range: 50 m
Magazine Capacity: 8 rounds

Identifying features: Star on butt; weapon has a double-action trigger.

Figure 1.

THREAT RIFLES AND MACHINEGUNS

1. **Rifles:**

a. AKM - 7.62-mm assault rifle
NATO Nomenclature: AK (Knashnikov)

Identifying features: Gas cylinder above the barrel.

b. AKMs - This new version has a folding stock:

NOTE: Characteristics and identifying features same as AKM except for folding stock.

2. PK Series 7.62 General Purpose Machinegun:

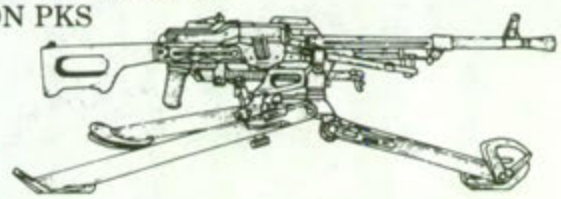
NOTE: This machinegun appears in two versions.

a. The bipod-mounted PK used at the squad or company level.

OPEN STOCK

NATO Nomenclature:
PK general purpose machinegun

GAS CYLINDER
BELOW BARREL
ON PKS



b. The tripod-mounted PKS used as an AA weapon.

NATO Nomenclature: RPK 7.62-mm Light Machinegun

ANTITANK WEAPONS

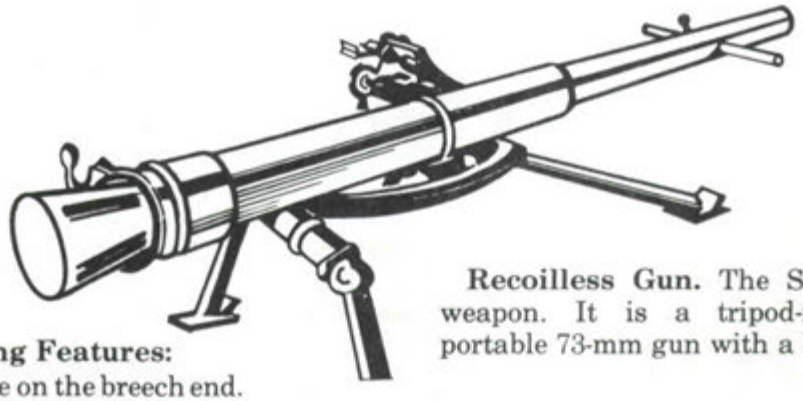
In addition to large numbers of armored vehicles, Threat forces can be expected to saturate the battlefield with rocket-propelled grenades (RPGs), recoilless guns, and antitank guided missiles (ATGMs).

NATO Nomenclature: RPG-7

Identifying Features:
Two handgrips, large optical sight and a flared cone on the end.

Rocket-Propelled Grenades. RPGs are shoulder-fired infantry antitank weapons; current models are effective to 500 meters.

NATO Nomenclature: SP-G-9 73-mm Antitank Recoilless Gun



Identifying Features:
Cone shape on the breech end.

Recoilless Gun. The SP-G-9 is a new weapon. It is a tripod-mounted, man-portable 73-mm gun with a locked breech.

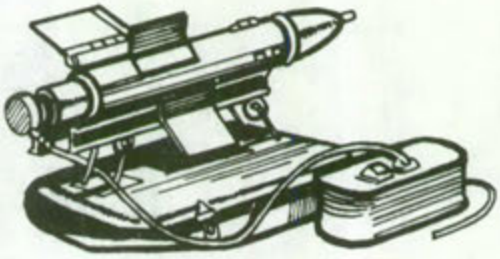
Antitank Guided Missiles. Threat forces have deployed two types of ATGMs in large numbers: the Sagger is wire-guided and thus invulnerable to electronic countermeasures (ECM); the Swatter is radio-guided and vulnerable to ECM.

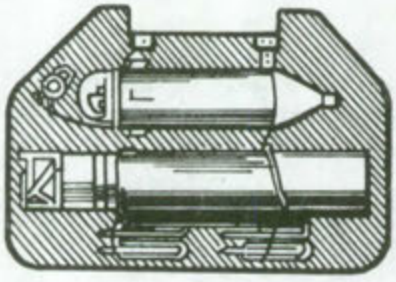
ATGMs are highly accurate to 3,000 meters. They are highly mobile and can defeat all known armor.

Missiles can be mounted on BMPs, BMDs, BRDM-2s, and helicopters.

"Suitcase" Saggers can be man-packed and ground-mounted. In this version, the Sagger is easily carried by its crew. Its light weight and small size make it easy to transport, set up, and camouflage.

NATO Nomenclature: Sagger





The Sagger is a wire-guided antitank missile with an effective range of 3,000 meters. A three-man team carries the portable launcher, the fire control equipment, and two complete missiles. Gunner normally displaces 15 meters from the missile during firing. In flight identification: look for smoke and flare trail.

Strengths. The main strengths of Threat ATGMs are:

Long-range accuracy and lethality, which permit them to hit and defeat all known armor up to 3,000 meters away.

Versatility of employment, which enables ATGMs to be fired while crewmen are buttoned up and, in the case of the Sagger on a BRDM-2, at a remote position up to 80 meters from the vehicle. The "suitcase" Sagger may be remotely fired from a position up to 15 meters from the launching rail.

Weaknesses. In spite of their reliability, mobility, and long-range effectiveness, Threat ATGMs have weaknesses.

Gunners must have good visual contact with both target and missile during flight. Threat ATGMs are not effective at night. US cavalrymen who move behind cover, obscure themselves by smoke, or conceal themselves in vegetation reduce Threat missile and rocket hit probability. Bushes can break Sagger guidance wires, causing loss of missile control. Trees or heavy brush can detonate an ATGM warhead.

Gunners must be highly trained. Threat ATGM gunners must simultaneously track both target and missile with an optical viewer, while flying the missile with a "joystick" on a control box.

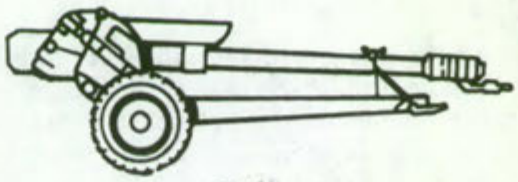
Missiles have a minimum range limitation. The missile has to fly about 500 meters after launch for the gunner to capture it in his viewer and accurately fly it to target. It is also slow moving when compared to the TOW.

ARTILLERY

Threat forces are equipped with a variety of excellent artillery weapons, from light and heavy mortars and conventional field guns and howitzers to multiple rocket launchers (MRLs) and missiles. MRLs can deliver saturation fire, while conventional artillery fires against targets of opportunity and preselected targets.

The most common field pieces are 122-mm and 152-mm towed howitzers. The maximum range of the 122-mm howitzer is 15,300 meters and its rate of fire is 7 to 8 rounds per minute.

NATO Nomenclature: 122-mm Howitzer, D-30

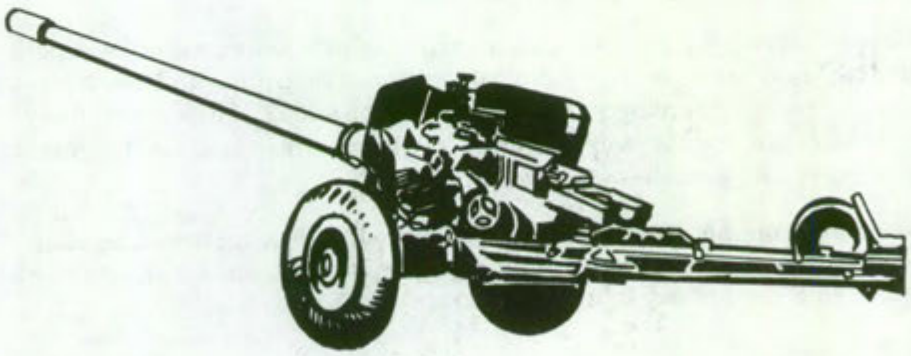


122-mm Howitzer, D-30

Recognition features: Three-trailed configuration; trails fold together and attach to tube for travel; towed by muzzle.

Employment: Direct support of maneuver company or battalion (regimental artillery battery and divisional artillery); weapon should appear 1 to 4 km behind the forward edge of the battle area in offense or 2 to 7 km in defense, depending on unit of assignment.

NATO Nomenclature: 100-mm AT Gun, T-12

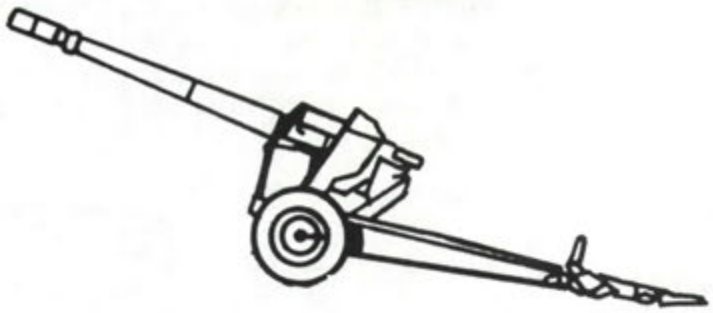


100-mm Antitank Gun, T-12/T-12A

Recognition features: Long tube with cylindrical "pepperpot" muzzle brake; single castor wheel near trail ends; winged shield angled to rear on either side, T-12A only; added cylinder to right and above breech.

Employment: Support of maneuver battalion; weapon should appear approximately 0.2 to 0.5 km behind forward edge of the battle area in offense and 0.2 to 2.0 km in defense.

NATO Nomenclature: 152-mm Gun Howitzer, D-20



152-mm Gun/Howitzer, D-20

Recognition features: Prominent baseplate connected to bottom forward cradle for travel (same carriage as D-74); castor wheels and jacks at each trail end; scalloped winged shield with traveling central portion; shorter, larger diameter tube than D-74 with similar double-baffle winged, muzzle brake.

Employment: Weapon should appear 3 to 5 km behind the forward edge of the battle area in offense or 4 to 8 km in defense; organic to artillery battalions and regiments.

NATO Nomenclature: 152-mm Howitzer, D-1

152-mm Howitzer, D-1

Recognition features: Essentially same appearance as the 122-mm howitzer, M-30 (M1938) except larger diameter tube and added double-baffle muzzle brake.

Employment: Weapon should appear 2 to 3 km behind the forward edge of the battle area in offense and 3 to 6 km in defense; organic to artillery units at combined arms army/division level.

Threat forces have recently been equipped with two new mobile artillery pieces: 122-mm and 152-mm self-propelled (SP) guns. The 122-mm SP gun is mounted on a tracked carriage which resembles the hull of the BMP personnel carrier and running gear of the PT-76 tank. The gun is mounted in a turret with compartments and hatches for both gunner and commander. Not much is known about the 152-mm SP.

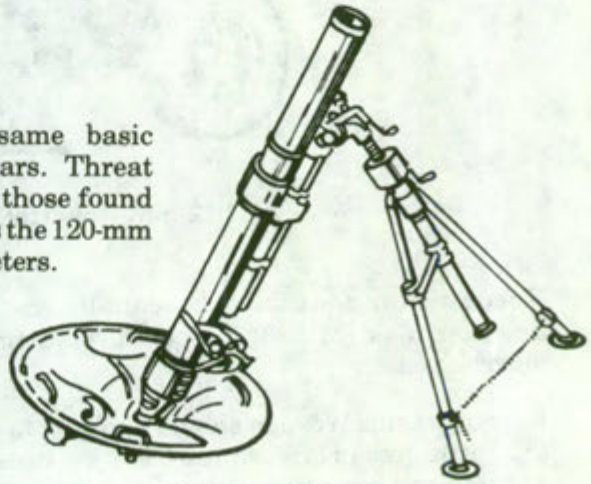
122-mm SP Gun

152-mm SP Gun

Threat forces usually use the multiple rocket launcher (MRL) for area coverage. These weapons are available in many sizes, but the most common is the 122-mm truck-mounted launcher, which can rapid fire up to 40 rounds at ranges out to 20,000 meters.

122-mm Rocket Launcher BM-21

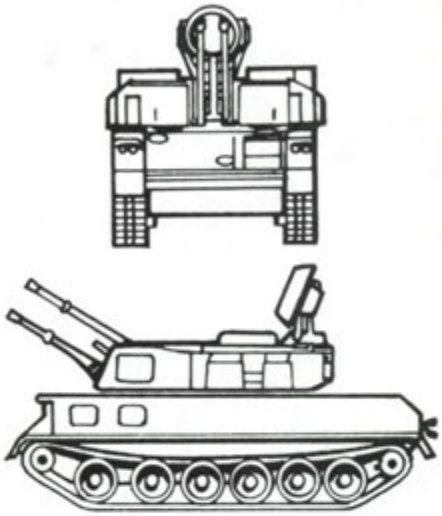
Threat mortars have the same basic support missions as US mortars. Threat mortars are almost the same as those found in US forces. One of the largest is the 120-mm mortar with a range of 5,700 meters.



120-mm Mortar

ANTIAIRCRAFT ARTILLERY AND MISSILES

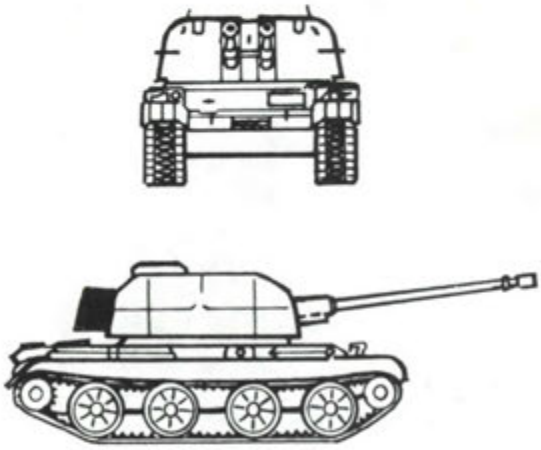
Antiaircraft Artillery. The Threat army has been reluctant to replace its conventional antiaircraft guns with more sophisticated surface-to-air missile (SAM) systems. Antiaircraft artillery weapons range in caliber from 12.7-mm to 130-mm. Present emphasis is on automatic, rapid-fire, highly mobile guns and missile systems designed to provide field armies with effective low-level air defense.



The ZSU-23-4 is a self-propelled system mounting four 23-mm guns with a completely integrated fire control system. The ZSU-23-4 is mounted on a light tracked chassis. Its onboard radar is used for both target acquisition and target tracking. Its four guns fire 800-1,000 rounds per minute, each with a tactical antiaircraft range of 3,000 meters and 2,000 meters without radar. It may be used against aircraft maneuvering to evade low- and medium-level surface-to-air missiles. The sustained rate of fire is 300 rounds per minute per barrel.

Recognition features: Full-tracked, six-roadwheeled vehicle; box-like hull with a rectangular turret centered over the third roadwheel; turret mounts four 23-mm automatic AA guns.

Employment: Located in AD gun battery of motorized rifle and tank regiments; organic to AA regiment of maneuver divisions.



The ZSU-57-2 is used by field air defense units in tank divisions. It consists of a modified T-54 tank chassis carrying a twin S-68 57-mm gun in a large, squarish, open top turret. The chassis has much less armor than the T-54 tank and the running gear uses only four roadwheels. It weighs 28.1 tons. The turret is also identifiable by the large basket on the rear where empty cartridge cases are stored. It can fire 105-120 rounds per minute per gun with a tactical antiaircraft range of 4,000 meters.

REFERENCES:

FM 71-1, The Tank and Mechanized Infantry Company Team, Jun 77 (chap 2, pages 2-13 thru 2-17)
TC 30-3, Soviet Equipment Recognition Guide, Apr 75 (pages 1 thru 18)

TASK NUMBER: 071-331-0807

ENFORCE NOISE, LIGHT, AND LITTER DISCIPLINE

CONDITIONS:

As the leader of a unit conducting any tactical mission (defense, offense, etc.) during daylight or the hours of darkness.

STANDARDS:

The leader will insure that:

1. Noise is kept at a minimum.
2. No light is visible to the enemy.
3. The area is free of litter and other evidence of the unit's presence.

PERFORMANCE MEASURES:

1. **Noise Discipline:**

a. Avoid unnecessary vehicular and foot movement.

b. Tape or otherwise secure metal parts (weapon slings, canteen cups, ID tags, etc.) to prevent them from making noise when contacting each other. Be careful that restricting moving parts of weapons does not prevent their operation.

c. Talk only when necessary to conduct or plan operations. Use radios only when necessary. Keep volume low so they can be heard only by the operator. Wire communications should be used whenever possible, especially in the defense.

2. **Light Discipline:**

a. Don't allow smoking except when concealed from possible enemy view. Discourage smoking at night; the enemy can see and smell it.

b. If flashlights or other lights are used, they must be filtered and concealed, such as underneath a poncho.

c. Cover anything that shines or glares (metal surfaces, vehicles, glass, etc).

d. Use all available natural concealment and camouflage vehicles, equipment, etc.

3. **Litter Discipline:**

a. When occupying fixed positions, establish collection points for disposal of empty food containers, empty ammo boxes, old camouflage, dirt from defensive positions, etc. During movement, carry litter until it can be disposed of without leaving any trace.

b. Conceal unused equipment from enemy view.

REFERENCES:

FM 21-75, Combat Skills of the Soldier (TBP)
TEC Lesson 935-071-1029-F, Counterintelligence

TASK NUMBER: 071-331-0809

EMPLACE AND RECOVER FIELD EXPEDIENT WARNING DEVICES

CONDITIONS:

In daylight, given:

1. Used C-ration cans, used ammunition boxes, or other discarded metal containers.
2. Used small arms ammunition, pebbles, or other small, hard objects.
3. A location for a defensive position.
4. Barrier wire, WD-1 communication wire, or similar wire.
5. A suspected route of enemy advance or well-defined avenue of approach.
6. Thirty minutes to complete emplacement.

STANDARDS:

Within time specified, the devices must meet the following specifications:

1. Security - Devices must be securely attached to either barrier wire or WD-1 communication wire, etc., along a known or suspected route of enemy advance.

2. Concealment - Devices must not be readily observable by an enemy approaching at night.

3. Forewarning - Devices must produce sufficient noise to warn personnel in defensive position of enemy advancing toward their position.

4. Simplicity - Devices that could be used by the enemy against you must be easily removable upon leaving defensive position.

PERFORMANCE MEASURES:

1. Components. Field expedient warning devices are limited only by your imagination. Four basic components are needed.

a. Container (C-ration can, metal ammunition box, or any other metal container without a bright, shiny finish).

b. Noise-maker (pebbles, stones, brass ammunition casings, or any other small, hard objects which, when put in the container, will make a noise when the container is shaken).

c. Tripwire (WD-1, barrier wire, or any similar wire).

d. Attachment device (a small piece of wire, string, cloth, etc., to tie container to tripwire).

2. Construction.

a. Cut holes in the side(s) and bottom of the container (to reduce wind resistance and allow water drainage). If container has a bright, shiny finish, paint it with a subdued color (OD, brown, flat black) or cover it with mud (if only mud is available, consider using a different container).

b. Attach container to tripwire. If a wire barrier is in place, use it; if not, string tripwire across likely avenue of approach at knee level or below. Attach container at a spot where natural vegetation will conceal it from enemy detection.

c. Place noise-making objects in container.

d. Take a position at a defensive listening post and have another squad member brush against the wire holding the cans, to make sure you can hear the noise produced.

3. Recovery. Before leaving defensive position, recover devices that could be used by the enemy against you.

REFERENCES:

TEC Lesson 952-061-0050-F, Expedient Early Warning Devices, Part 1
TEC Lesson 052-061-0051-F, Expedient Early Warning Devices, Part 2

TASK NUMBER: 071-331-0810

EMPLACE/RECOVER PYROTECHNIC EARLY WARNING DEVICES

CONDITIONS:

Situation 1: Given an M49A1 trip flare (either live or inert) and a designated area for employment of an early warning device.

Situation 2: Given WD-1/TT field wire or string, an M3 pull release training device (either live or inert), nonelectric blasting cap, crimpers, and a designated area for employment of an early warning device.

STANDARDS:

1. Installing Devices:

a. Install trip flare (M49A1) or M3 firing device so that the devices are firmly attached in place across designated area.

b. Arm devices so that anyone moving the trip wire/string will make the device go off.

2. Removing Devices:

a. Remove trip flare by first reinserting the safety pin and then reversing installation procedures.

b. The M3 (live) is dangerous to disarm. It should be blown in place. If the device must be disarmed, proceed as outlined in the performance measures below.

PERFORMANCE MEASURES:

1. **General.** Trip flares and M3 firing devices with trip wire are employed extending across any trail approaching from the direction of enemy main forces, allowing for maximum observation of trail from friendly positions. Typical employment sites may have the following characteristics:

a. A narrow trail approaches from the direction of enemy main forces; it is about 100 meters forward, and is near the adjacent friendly unit.

b. Two routes in open terrain approach your position directly; each route is about 10-15 meters wide.

c. A narrow wash approaches to within 10-15 meters of a listening post.

d. A narrow trail, approaching from the direction of bypassed enemy.

2. **To Emplace an M49A1 Trip Flare:**

a. The location chosen for installation of the flare and trip wire should be in the logical path of infiltrating troops and so positioned that the field toward the enemy will be illuminated and friendly defense positions will not be disclosed.

b. In most instances, it is easier to install the flare using the pullpin method, because the amount of slack in the trip wire is less critical. Also, the trip wire may be installed to the left or right of the flare.

c. To mount bracket by nailing, use two of the nails provided. The bracket must be as vertical as possible and at a height of 15 to 18 inches above the ground.

d. To mount flare, aline lever with trigger pivot.

e. Carefully slide flare downward into its bracket until bottom edge of lever is no more than 1/16 inch above — but not past — the bracket. In this position, note that the flare base is approximately 1/2 inch below the upper carriage bolt. The bottom end of lever is approximately 3/8 inch below the bracket prongs and is centered between these prongs (figure 1).

NOTE: If the flare is positioned below the slot, in the bracket, the lever will not be free to move for proper arming. If the lever is not alined with the trigger pivot and centered between the prongs, the lever will not be free to move for proper arming.

f. Clamp flare in its bracket by tightening upper wingnut with sufficient force to grip flare firmly.

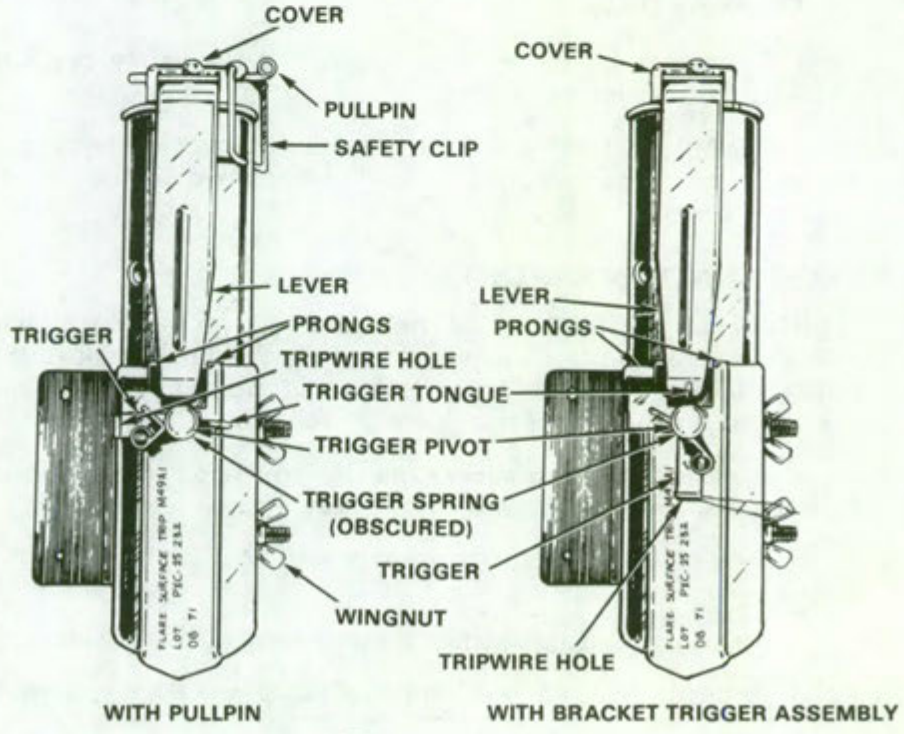


Figure 1.

3. **To Arm the M49A1 Trip Flare Using the Pullpin Method:**

a. Fasten one end of trip wire to a post, stake, or other rigid object, at the desired distance (usually 40 feet) from flare and to the right or left of flare when facing flare trigger.

WARNING: Do not release lever when pressing it down in 3b below, because release of lever will cause flare to function.

b. Press lever down with one hand and move safety clip assembly.

c. While still holding lever, insert pullpin, which is attached to safety clip, through two safety clip holes of cover loading assembly.

WARNING: Before releasing lever in 3d below, make certain pullpin will hold in safety clip holes.

d. Carefully release hold on lever. Make certain pullpin is retained in safety clip holes by lever.

e. Pull loose end of trip wire taut and fasten it to loop in pullpin.

f. Check to see that the trip is taut and tightened at both ends.

g. Flare is now prepared for firing. Sufficient pressure applied to trip wire will pull safety from flare.

4. **Misfire of the M49A1.** In case of failure to fire, the flare should not be approached for 5 minutes. After the waiting period, the flare should be removed carefully and forwarded to authorized personnel for disposal.

5. **Recover Flares Prepared for Use but Not Used.** Follow procedures below to disarm.

WARNING: Any flare having a loose cover loading assembly will be forwarded to authorized personnel for disposal. Make no attempt to reassemble or tighten cover loading assembly.

a. Disarming.

(1) Carefully depress lever against flare body.

(2) If pullpin was used as method of arming, remove pullpin.

WARNING: Use only the safety clip holes in cover loading assembly when reassembling safety clip. The other holes must not be used.

(3) Secure lever by inserting one end of safety clip through one of the safety clip holes of cover loading assembly; snap other end of safety clip into other safety clip hole.

(4) Detach wire from pullpin.

(5) Return flare to its original packing.

c. Inspection. Prior to returning flare to storage, perform an inspection.

6. **To Emplace a M3 Pull Ring Firing Device.**

a. Functioning.

(1) Pull method. A pull 6 to 10 pounds on taut trip wire will cause device to fire.

(2) Tension-release method. Release of tension (cutting of taut trip wire) will cause device to fire.

b. To Install the M3 Firing Device (figure 2).

(1) Remove protective cap.

(2) With crimpers, attach blasting cap to standard base. *Crimper jaws should be placed no farther than 1/4 in. from open end of blasting cap.*

(3) Attach firing device assembly to anchor (must be firm enough to withstand pull of at least 20 pounds).

(4) Secure one end of trip wire to anchor and place other end in hole in winch.

(5) With knurled knob, draw up trip wire until locking safety pin is pulled into wide portion of safety pin hole.

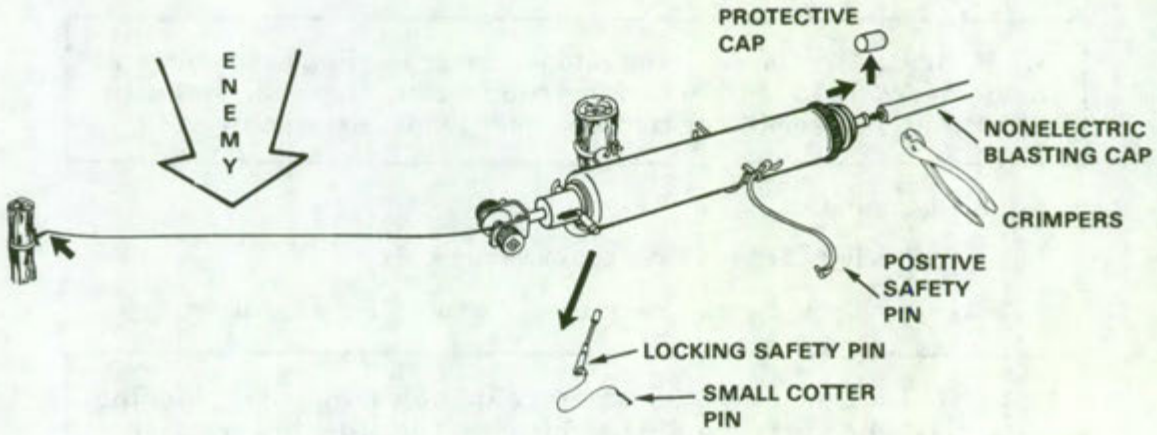


Figure 2.

c. Arming.

(1) With cord, remove small cotter pin from locking safety pin and withdraw locking safety pin. If it does not pull out easily, adjust winch winding.

(2) With cord, pull out positive safety pin. This should pull out easily. If not, disassemble and inspect.

d. Disarming.

(1) Insert length of wire, nail, or cotter pin in positive safety pin hole.

(2) Insert length of wire, nail, or safety pin in locking safety pin hole.

(3) Check both ends and cut trip wire.

(4) Separate firing device from charge and return firing device to its container.

NOTE: Insert positive safety pin first. Cut trip wire last.

REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 1, sec VI, pages 1-36 thru 1-37)
FM 5-34, Engineer Field Data, Sep 76 (chap 3, sec I, page 46b)
FM 20-32, Mine/Countermine Operations at Company Level, Nov 76 (app D, page 153)
TM 9-1345-200, Land Mines, C1, 3, 5, 6 and 7, Jun 64 (chap 5, page 107)

TASK NUMBER: 071-331-0811

EMPLACE/RECOVER ELECTRONIC ANTI-INTRUSION DEVICES

CONDITIONS:

Given a patrol seismic intrusion device (PSID) detector unit (in storage), an area for emplacement of the PSID, a detection range setting, and a PSID receiver and receiver operator in the area of emplacement.

STANDARDS:

1. Within 8 minutes, emplace the PSID IAW the performance measures for emplacement.

2. Within 5 minutes, recover the PSID and return to storage configuration IAW the performance measure for recovery.

PERFORMANCE MEASURES:

1. **Unpacking** (figure 1).

a. Remove the detector sets and receiver sets from the carrying cases and remove the clips which are over the end of each unit. Remove the geophone from the clip on the detector, and unwrap the geophone cables. Remove the headset and headband from the carrying case. Connect the headset cable to the receiver set.

b. Inspect each unit for damage (e.g., broken antenna, cracked case, damaged cable). If any damage exists, either repair or reject the unit.

c. Remove the batteries from their shipping carton. Place the ON/OFF sensitivity switch on the detector sets in the OFF position, and the ON/OFF switch on the receiver set in the OFF position. Install the batteries in the detector sets and the receiver set. Place 10 spare batteries in the alarm set carrying case.

d. Make sure that all detectors of the alarm set are marked with the same RF frequency as the receiver. All four pulse codes should be present. The units with the wrong frequency or pulse code will be taken from the alarm set and returned to supply.

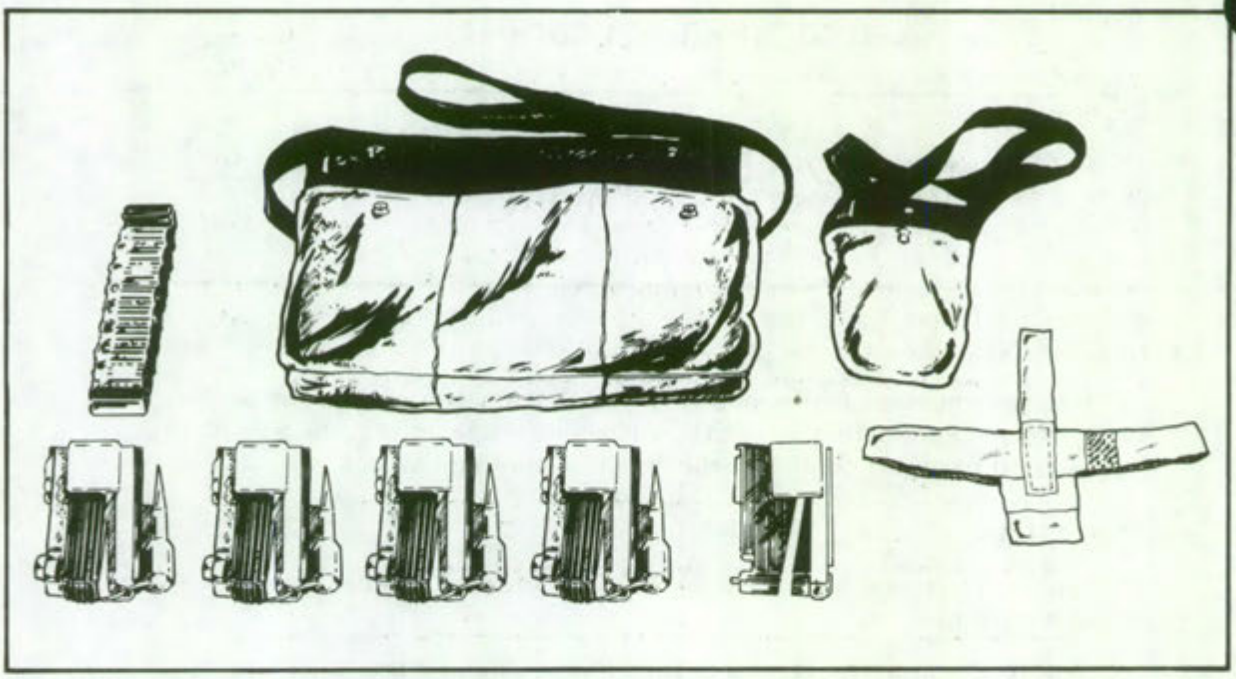


Figure 1. Alarm set, anti-intrusion (PSID).

2. **Preparation and Checkout.**

a. Select a suitable location for the checkout area. The conditions of this area should be similar to those of the actual use area.

b. Select one of the detector sets and notice the pulse code marked on the detector case. Emplace the detector set in the checkout area as shown in figure 2. The receiver operator should be 4 to 5 meters (13 to 16 feet) from the detector set.

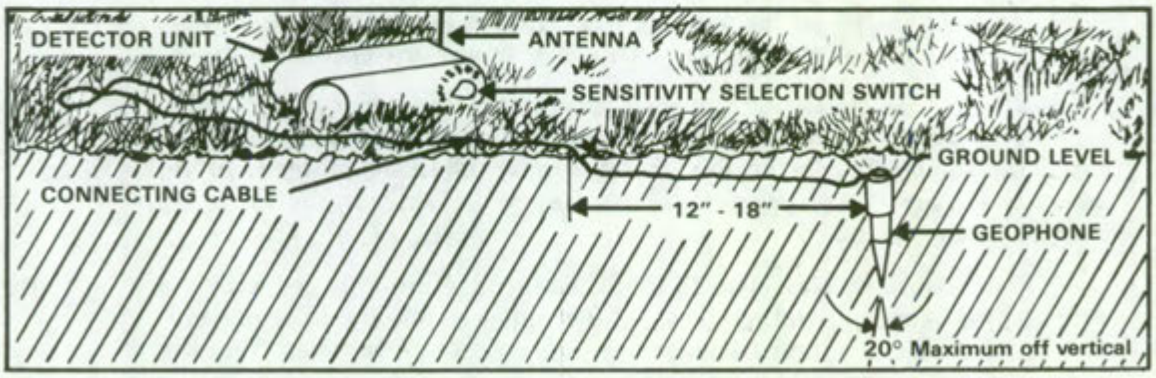


Figure 2. PSID emplacement.

c. Turn the detector ON/OFF sensitivity switch to position number one (1), and the receiver ON/OFF switch to the ON position. If the detector operator does not move, the receiver operator should not hear a signal. If the receiver operator does hear a signal, either there is excessive background noise in the checkout area or the detector set is defective.

d. When the detector operator moves within the radius of the detector range shown in figure 3, the receiver operator should hear a signal. **NOTE: He may or may not hear a signal for each movement.**

e. If the receiver operator hears a signal or signals which match the pulse code marked on the detector set, the position of the ON/OFF sensitivity switch and the distance between the detector set and receiver set should be noted for proper setup when the detector is deployed in the use area. Return the ON/OFF sensitivity switch to the OFF position. Remove the geophone from the ground. Wipe the case and geophone clean; then return the detector set to the carrying case for move to the use area.

ON/OFF SENSITIVITY SWITCH POSITIONS	PERSONNEL MOVEMENT RANGE
OFF	0 feet 0 meters
1	8 feet 2.6 meters
2	15 feet 4.9 meters
3	50 feet 16.5 meters
4	70 feet 23 meters
5	130 feet 43 meters

Figure 3. Detector sensitivity range.

f. If the receiver operator does not hear a signal, set the ON/OFF sensitivity switch to the next higher position and/or decrease the distance between the detector set and receiver set as necessary until the receiver operator hears a signal or signals matching the pulse code marked on the detector case, and repeat paragraph 2e.

g. In all cases, select the switch setting which allows no false signal when the detector operator is not moving, but which gives a signal when the detector operator moves within the detector sensitivity range. If both conditions cannot be met, select the nearest approximations or relocate the checkout area to a location with less background noise.

h. Repeat the preceding procedure for each of the detector sets.

3. **Emplace the Detector Sets.**

a. The detector sets will be emplaced as shown in figure 2. The deployment location should be one which has a low level of background noise (background noise is defined as any undesired vibration within the sensitivity range of the detector set, such as high winds, rain, low-flying aircraft, and similar sources of ground disturbances). Some areas which present high levels of background noise would be airfields, heavily traveled

roadways, heavily congested areas, and roadways with heavy vehicles traveling as much as a mile from the detector set. Background noise of a sufficient level could cause the detector set to transmit meaningless signals indicating movement in an area where there is none.

b. Remove the plastic storage clip from the PSID unit.

c. Unclip the geophone and unwind the connecting cable and antenna. Slide the plastic clip back over one end of the detector unit so it will not be mislaid.

d. Push the geophone straight down into the ground (no more than 20 degrees off vertical or it will not work). Do not drive the geophone into the ground by striking it with a hard object or stamping on it. Loosen the soil with an intrenching tool, stick, or other sharp object, if necessary.

e. Bury 12 to 18 inches of the connecting cable adjacent to the geophone. This cuts down on the possibility of cable movement activating the geophone. (See figure 2.)

f. Position the detector unit on the ground, being sure the antenna is not in contact with any wet foliage that might ground it.

g. Set the sensitivity selection switch for the detection range you have been given.

h. During daylight hours, camouflage the detector unit and connecting cable with dry twigs and weeds. This is not usually necessary at night.

4. **Geophone.** The geophone senses the movement of personnel and vehicles in the area of the detector. The detector in turn transmits a message until the movement is outside the detector's sensitivity range. If it is desirable to establish the direction of movement, the detectors can be arranged in such a manner where movement from one detector range into another detector range will indicate the direction of travel. Under ideal conditions, the transmitted signal from the detector set will be received a maximum of 1 mile (1852 meters).

5. **Receiver Set.**

a. The two acceptable configurations in which the receiver set may be utilized are shown in figure 4. In the configuration (a), the receiver may be placed on a table, the ground, or held in the hand. The antenna should be free of any obstruction. In configuration (b), the receiver may be placed in the shirt pocket. **CAUTION: The antenna should be on the side away from the body to avoid the possibility of malfunction or poor reception due to body perspiration.**

b. When the receiver picks up the transmitted signal, it converts it to a pulsed audio tone which is heard through the headset. An experienced receiver operator will be able to determine which detector is transmitting by the tone, as well as the number of pulses. In place of the headset, a small speaker of the proper impedance may be used, or an amplifier with the proper input impedance may be used in conjunction with the receiver set.

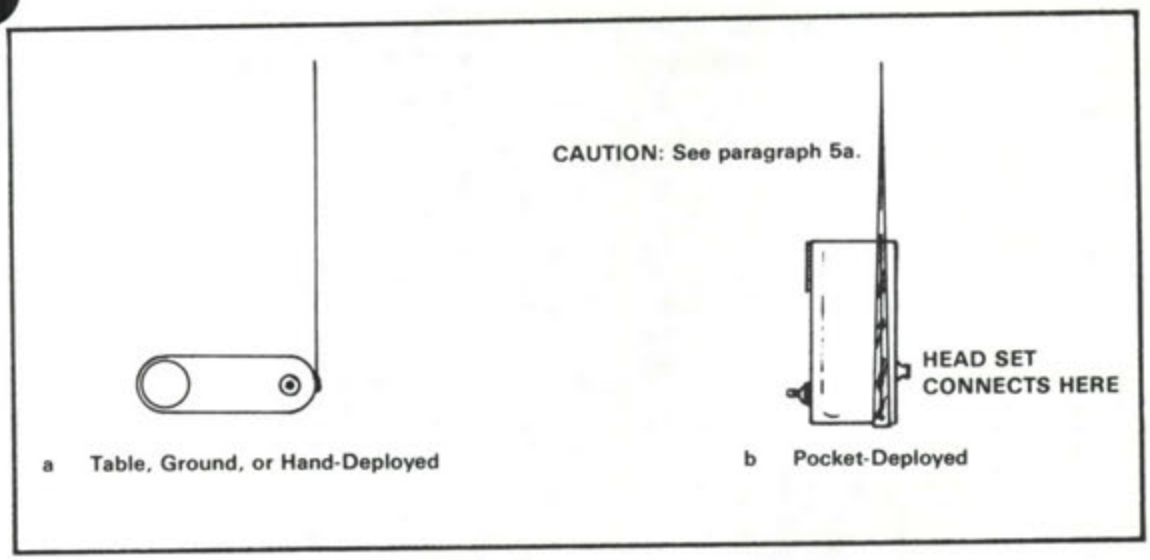


Figure 4. Receiver configuration while in use.

6. **Recovering the PSID.**

a. Locate the detector unit and turn the sensitivity switch to the OFF position.

b. Trace along the connecting cable and gently uncover the buried cable until you get to the geophone.

c. Dislodge the geophone by grasping it, not the connecting cable, and pulling it loose.

d. Remove the storage clip and brush all dirt and debris off the equipment.

e. Rewind the antenna around the detector unit, wrap the cable around the unit, clip the geophone into the holder, and fasten the plastic storage clip over the wire and antenna.

REFERENCES:

TM 5-6350-249-12, AN/GSO-151, Alarm Set, Anti-Intrusion Restricted Area (PSID), C1, Dec 69 (sec I, II, and III, pages 1-1 thru 3-3)
TEC Lesson 952-061-0054-F, Early Warning Devices: Electronic, Part 1
TEC Lesson 952-061-0055-F, Early Warning Devices: Electronic, Part 2

TASK NUMBER: 113-600-3001

PERFORM OPERATOR PREVENTIVE MAINTENANCE ON TELEPHONE SET (TA-312/PT OR TA-1/PT)

CONDITIONS:

You are in a field training exercise or performing required garrison maintenance. Given an installed operational TA-1 or TA-312 telephone set, blank DA Form 2404, (TL 13A if required), 3 feet of WD-1/TT wire, cleaning compound (FSN: 7930-395-8542), clean rags, a brush, TM 11-5805-201-12 or TM 11-5805-243-12, and TM 38-750.

STANDARDS:

1. Perform all prescribed operator maintenance steps as required by the appropriate TM.

2. Complete DA Form 2404 IAW TM 38-750, para 3-4.

PERFORMANCE MEASURES:

1. Perform all prescribed operator maintenance steps for the TA-312, IAW TM 11-5805-201-12, para 4-2, pages 4-4 thru 4-5.

2. Perform all prescribed operator maintenance steps for the TA-1, IAW TM 11-5805-243-12, para 21 thru 23, pages 11 thru 14.

3. Conduct, as a minimum, the following services on either telephone set.

a. Check for completeness.

b. Check for proper installation.

c. Check for cleanliness.

d. Check battery compartment for cleanliness and foreign matter (TA-312 only).

e. Check H-60/PT for proper seating in retaining cradle (TA-312 only).

f. Check binding post for tight connection.

g. Check to see that all controls, knobs, and switches operate properly without binding.

h. Check reception and transmission of telephone set.

4. Previously reported faults beyond the operator's capability to repair or those requiring parts are recorded on the Uncorrected Fault Record (DA Form 2408-14) in the logbook. This form is completed by organizational maintenance.

5. Faults which the operator cannot correct or which require a part are recorded on DA Form 2404 IAW procedures outlined in paragraph 3-4 of TM 38-750.

REFERENCES:

TM 11-5805-201-12, Telephone Set TA-312/PT, C1, Jun 67 (chap 4-2, pages 4-4 thru 4-5, para 4-3)
TM 11-5805-243-12, Telephone Set TA-1/PT, C3-5, Sep 59 (pages 11 thru 14)
TM 38-750, The Army Maintenance Management System (TAMMS), C1, Nov 72 (chap 3, pages 3-4 thru 3-7, para 3-4)
TEC Lesson 936-061-0125-F, Field Wire Installation; Equipment
TEC Lesson 936-061-0129-F, Field Wire Installation; Maintenance and Troubleshooting
TEC Lesson 936-061-0137-F, Local Battery Operation

TASK NUMBER: 113-600-1001

INSTALL TELEPHONE SET (TA-312/PT OR TA-1/PT)

CONDITIONS:

Situation 1: Given a working telephone set TA-1/PT, pliers TL-13A, an installed wire line WD-1/TT, and a telephone or switchboard with an operator at the far end of the wire line.

Situation 2: Given a working telephone set, TA-312/PT, two BA-30 batteries, pliers TL-13A, an installed wire line WD-1/TT, and a telephone or switchboard with an operator at the far end of the wire line.

STANDARDS:

Install either field telephone IAW the performance measures below.

PERFORMANCE MEASURES:

1. **Installing the telephone set TA-1/PT:**

a. Using pliers TL-13A, strip ½-inch of insulation from each strand of the wire line.

b. Refer to figure 1. Depress the spring-loaded line binding posts and insert one strand into each post.

c. Adjust signal volume control knob to LOUD.

d. Depress the generator lever several times to call the other operator and ask for a buzzer signal.

e. When the buzzer sounds, turn the buzzer volume control knob until desired volume is obtained, then look at the visual indicator to see if it shows four white luminous markings.

f. To talk, depress the push-to-talk switch; release it to receive.

g. As a field expedient, the receiver can be used for both transmitting and receiving.

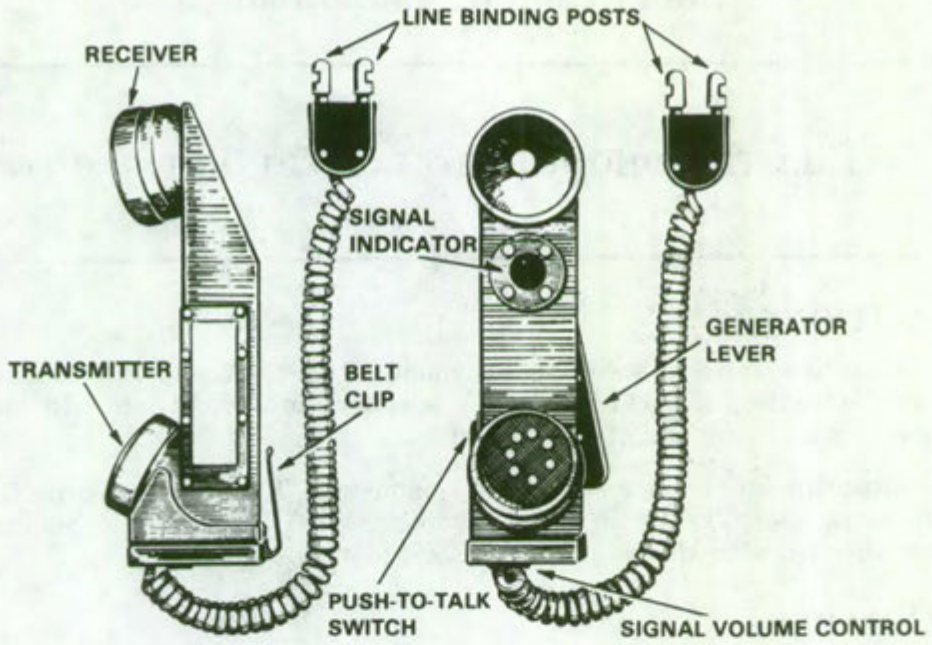


Figure 1.

2. **Installing the telephone set TA-312/PT:**

a. Using pliers TL-13A, strip ¼-inch of insulation from each strand of the wire line.

b. Refer to figure 2. Depress the spring-loaded line binding posts and insert one strand into each post.

c. Adjust buzzer volume control knob to LOUD.

d. Place the INT-EXT switch to INT.

e. Place the circuit selector switch to LB.

f. Insert the BA-30 batteries into the battery compartment, one up and one down.

g. Be sure the handset is seated firmly in the retaining cradle.

h. Turn the handcrank rapidly a few turns.

i. Remove the handset from the retaining cradle and wait for the operator to answer.

j. Depress the push-to-talk switch to talk, and release it to listen.

k. Request the other operator to give you a ring back.

l. When the buzzer rings, terminate the call and place the handset in the retaining cradle.

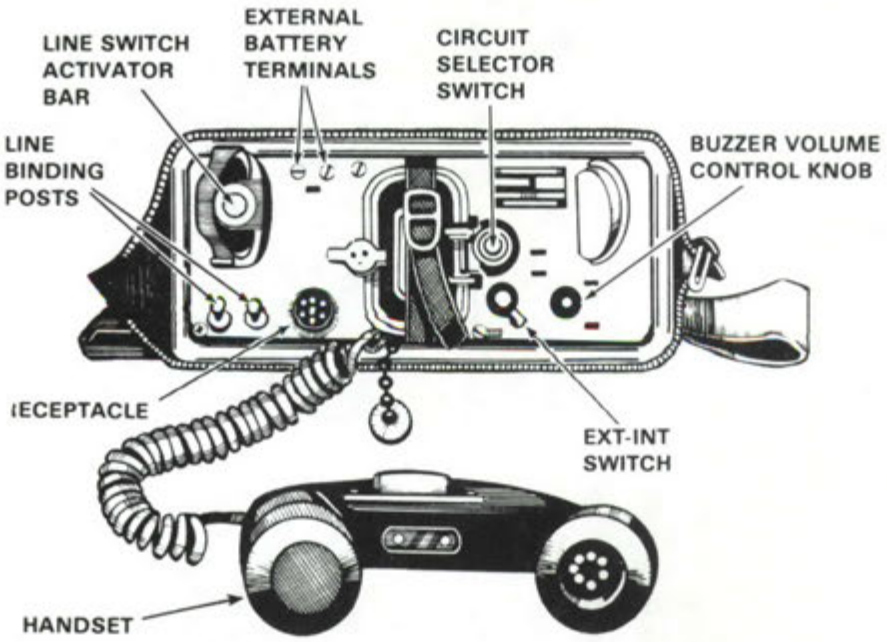


Figure 2.

REFERENCES:

TM 11-5805-201-12, Telephone Set TA-312/PT, C1, 2, Jan 67 (chap 2, page 2-1 thru 2-8, para 2-1 thru 2-5)
TM 11-5805-243-12, Telephone Set TA-1/PT, C3-5, Sep 59 (chap 2, page 6, para 9-12)
TEC Lesson 936-061-0137-F, Local Battery Operation

TASK NUMBER: 113-587-3005

PERFORM OPERATOR MAINTENANCE ON RADIO SETS; AN/PRC-77 OR AN/VRC-64

CONDITIONS:

You are participating in a field exercise or performing required garrison maintenance. Given either radio set (AN/PRC-77 or AN/VRC-64), prepared for operation, the appropriate TM, clean cloth, trichloroethylene, mild soapy water, flat tip screwdriver, a radio station within range, callsigns, a frequency, a blank DA Form 2404, and TM 38-750.

STANDARDS:

1. Perform all prescribed operator maintenance steps as required by the appropriate TM.

2. Complete DA Form 2404 IAW TM 38-750, para 3-4.

PERFORMANCE MEASURES:

1. Perform all prescribed operator maintenance steps for the AN/PRC-77 IAW TM 11-5820-667-12, chap 4, pages 4-1 thru 4-3, para 4-1 thru 4-8.

2. Perform all prescribed operator maintenance steps for the AN/VRC-64 IAW TM 11-5820-498-12, chap 4, pages 4-1 thru 4-12, para 4-1 thru 4-11.

3. Previously reported faults beyond the operator's capability to repair or those requiring parts are recorded on the Uncorrected Fault Record (DA Form 2408) in the logbook. This form is completed by organizational maintenance IAW procedures outlined in paragraph 4-13 of TM 38-750.

4. Faults which the operator cannot correct or which require a part are recorded on DA Form 2408 IAW procedures outlined in paragraph 3-4 of TM 38-750.

REFERENCES:

TM 38-750, Army Maintenance Management System (TAMMS), C1, Nov 72 (chap 3, page 3 thru 4, para 3-4)
TM 11-5820-498-12, Radio Sets AN/VRC-64 and AN/GRC-160, C5, May 67 (chap 4, pages 4-1 thru 4-12, para 4-1 thru 4-11)
TM 11-5820-667-12, Radio Set AN/PRC-77, C1 thru 4, Jun 67, (chap 4, pages 4-1 thru 4-3, para 4-1 thru 4-8)
TEC Lesson 201-113-4501-F, Preparation of Radio Set AN/PRC-77 for Operation Part 1: Installation

TASK NUMBER: 113-587-2001

OPERATE RADIO SET AN/PRC-77 OR AN/PRC-25

CONDITIONS:

Given a functional radio set (AN/PRC-77 or AN/PRC-25) with all parts, a frequency, callsigns, another station within range (can be another radio operator requiring training), knowledge of how to make a radio check, and battery BA-4386. Entering a radio net is not required in this task.

STANDARDS:

Within 2 minutes, assemble the AN/PRC-77 or AN/PRC-25 and make a communication check with the other station.

PERFORMANCE MEASURES:

1. **Assembly of radio set AN/PRC-77** (figure 1) (TM 11-5820-667-12, chap 1, pages 1-2 thru 1-5). Inspect radio set to insure that all components are present:

a. Electrical harness.
b. Antenna, AT-892/PRC-25.
c. Antenna, AT-271/A PRC.
d. Antenna support.
e. Handset.
f. Cotton-duck bag.
g. Receiver-transmitter, RT-841.
h. Battery BA-4386.

2. **Installation of battery** (figure 2) (TM 11-5820-667-12, chap 2, page 2-4, para 2-4).

a. Place radio on control guard, and remove battery box.

b. Do not install battery (BA-4386) until you are certain air vent in battery box works.

(1) Depress valve and blow from the outside; air should pass through the vent.

(2) Release the valve and blow; air should not flow.

c. Check pressure relief valve before installing battery.

d. Place battery in battery box as shown in figure 2.

CAUTION: Do not break floating connector.

e. Replace battery box and close both latches at the same time.

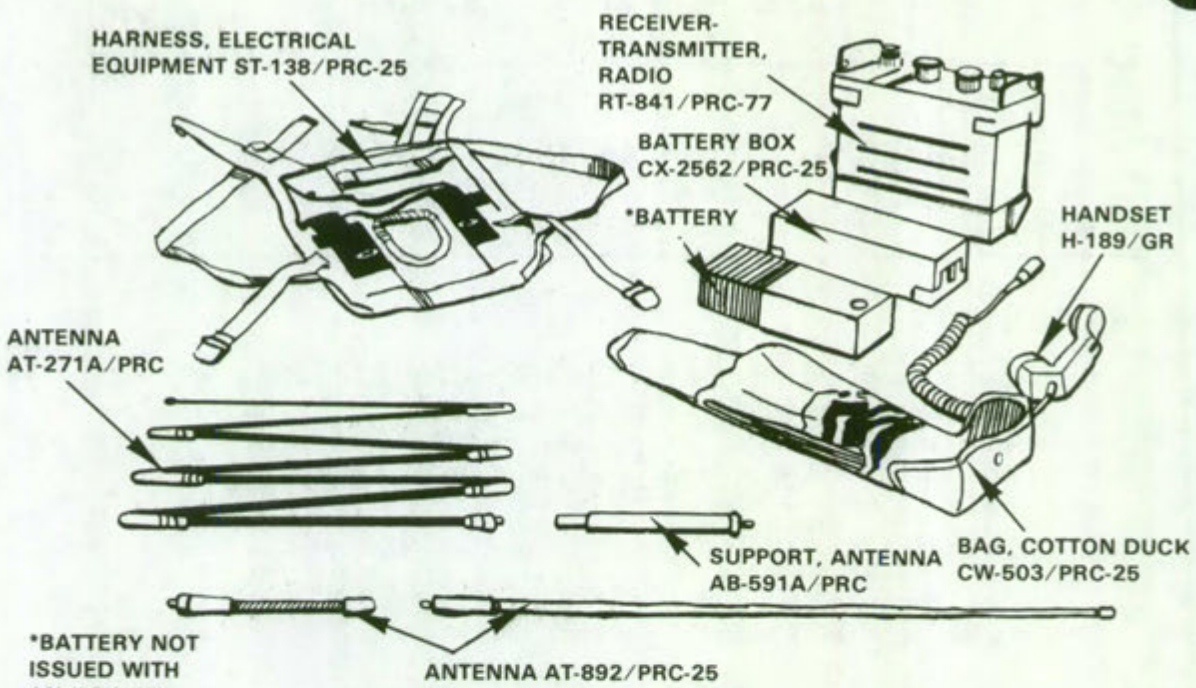


Figure 1. Components.

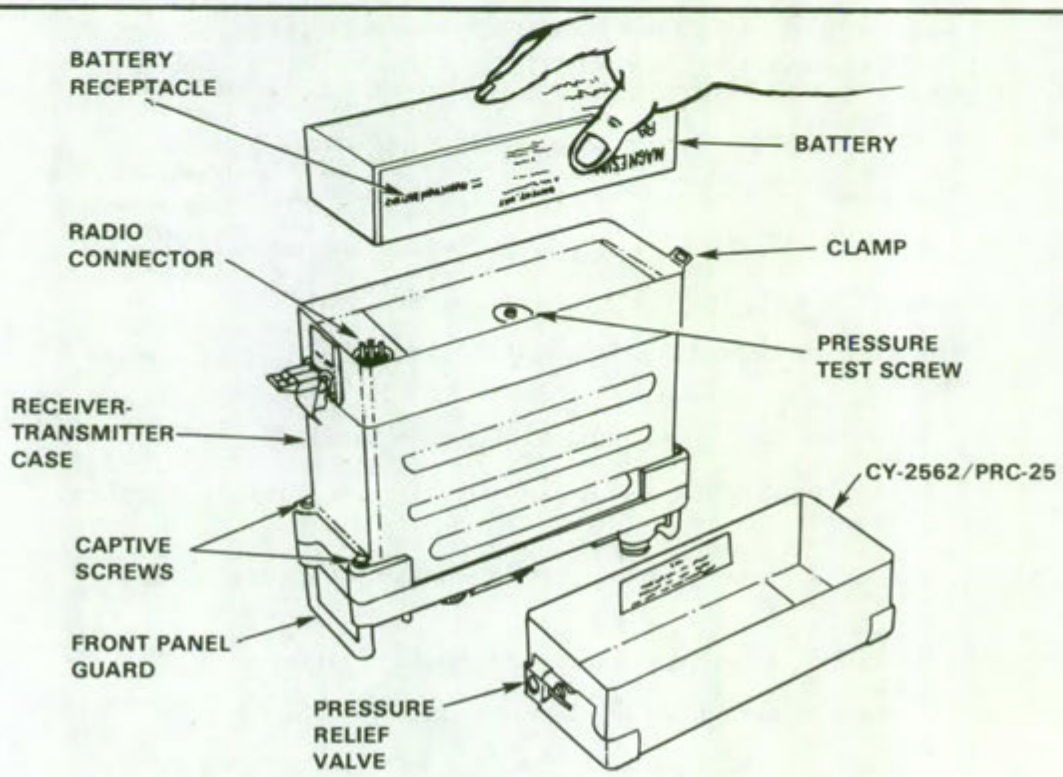


Figure 2. Installing battery in receiver-transmitter.

3. **To operate set** (figure 3) (TM 11-5820-667-12, chap 3, pages 3-1 thru 3-7).

a. The numbers of steps 1 through 6 below relate to the numbers in figure 3.

(1) Install the antenna required for the type of operation in the antenna mount.

(2) Attach handset H-189/GR to either audio connector.

(3) Turn the function switch to on.

(4) Turn the band switch to the desired operating frequency band.

(5) Turn the MC tuning and KC tuning control knobs until desired frequency appears in the channel dial (7).

(6) Turn the volume control to 4.

(7) Press the handset H-189/GR push-to-talk switch and speak into handset; release the push-to-talk switch to listen.

(8) Adjust the volume control (6) for a desirable sound level.

(9) To reduce the rushing noise when no signal is being received, turn switch (3) to squelch.

b. Make a radio check with other stations.

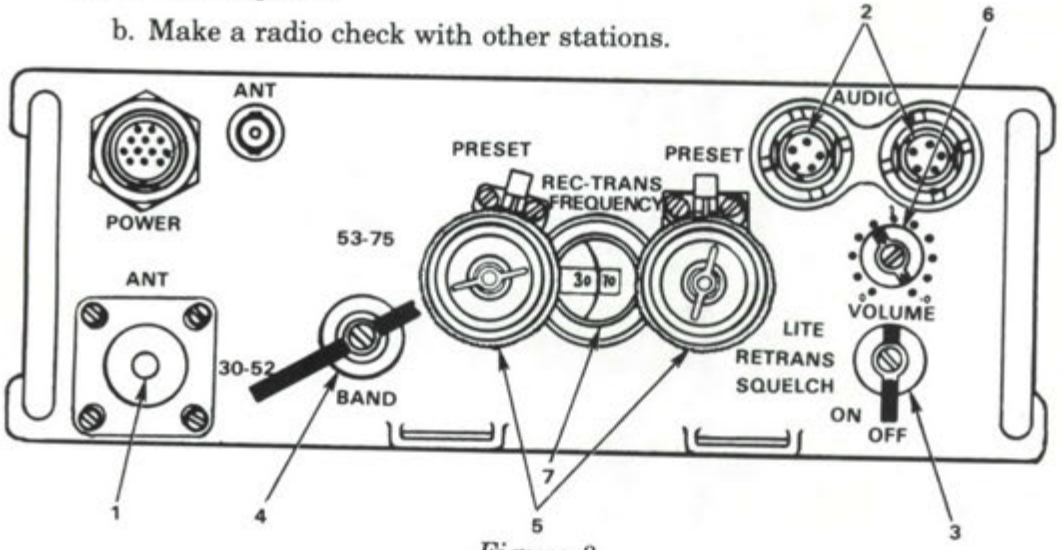


Figure 3.

c. To turn set off: Turn the function switch (3) to off.

REFERENCES:

TM 11-5820-667-12, Radio Set AN/PRC-77, Jun 67
TEC Lesson 201-113-4501-F, Preparation of Radio Set, AN/PRC 77 for OP PT 1, Install
TEC Lesson 201-113-4502-F, Preparation of Radio Set, AN/PRC-77 for OP PT 2, Operation Checks
TEC Lesson 201-113-4503-F, Preparation of Radio Set, AN/PRC-77 for OP PT 3, Pre-Sets

TASK NUMBER: 113-587-2002

PREPARE RADIO SET AN/VRC-64 FOR OPERATION

CONDITIONS:

Given the functional components for the AN/VRC-64 radio, a tactical vehicle with mount MT-1029/VRC and antenna matching unit base installed in operational condition, antenna AS-1729/VRC or antenna AT-912/VRC, a frequency, callsigns, a radio station within range (can be another radio operator performing the task), a knowledge of how to make a radio check, TM 11-5820-498-12, and radio cables necessary to install the radio set. Entering a radio net is not required to perform this task.

STANDARDS:

1. Within 15 minutes, install and assemble the radio.

2. Within 10 minutes, place the radio into operation and make a communication check.

PERFORMANCE MEASURES:

WARNING: operator must be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this task. Failure to follow requirements of TB SIG 291 could result in injury or DEATH.

1. **Installation of radio set AN/VRC-64** (figures 1 thru 4) (TM 11-5820-498-12, chap 2, pages 2-1 thru 2-7).

a. Inspect radio set to insure that all components are present:

(1) Amplifier-power supply OA-3633/GRC (figure 1).

(2) Mounting MT-1029/VRC (figure 2).

(3) Receiver-transmitter RT-871/PPC-77 (figure 3).

b. Observe the precaution on warning label, DA Label 132: **"WARNING: DO NOT START VEHICLE WHILE RADIO IS ON."** The label, positioned in attention-arresting location is required by SB11-624.

WARNING: Do not permit manpack or vehicular whip antennas to touch high powerlines or other sources of electricity; injury or death could result. Observe the requirements of TB SIG 291 which illustrates the danger of permitting an antenna to contact other sources of power.

CAUTIONS:

1. **Remove battery from battery box when the receiver- transmitter is installed in a vehicle.**

2. **DO NOT OPERATE the radio within 3 megacycles of the operating frequency of another radio that is less than 25 feet away. Mutual interference can occur.**

3. **DO NOT REVERSE the connections of the radio power cable leads at the vehicle battery. Damage to resistors and diodes may result if the leads are reversed at the battery terminals.**

4. **DO NOT KEY the receiver-transmitter (by operating the handset push-to-talk switch or holding the audio accessory switch at RADIO position) while changing channels or the BAND switch. Module damage may occur or the frequency of the new channel may be incorrect.**

5. **DO NOT START THE VEHICLE ENGINE, restart it, slave-start, or stop it with the radio turned on. The OA-3633/GRC PWR switch must be set to OFF and, if used, the AM-1780/VRC MAIN PWR switch must also be set to OFF.**

2. **Installation of Amplifier-Power Supply on Mounting MT-1029/VRC** (figures 1 thru 3).

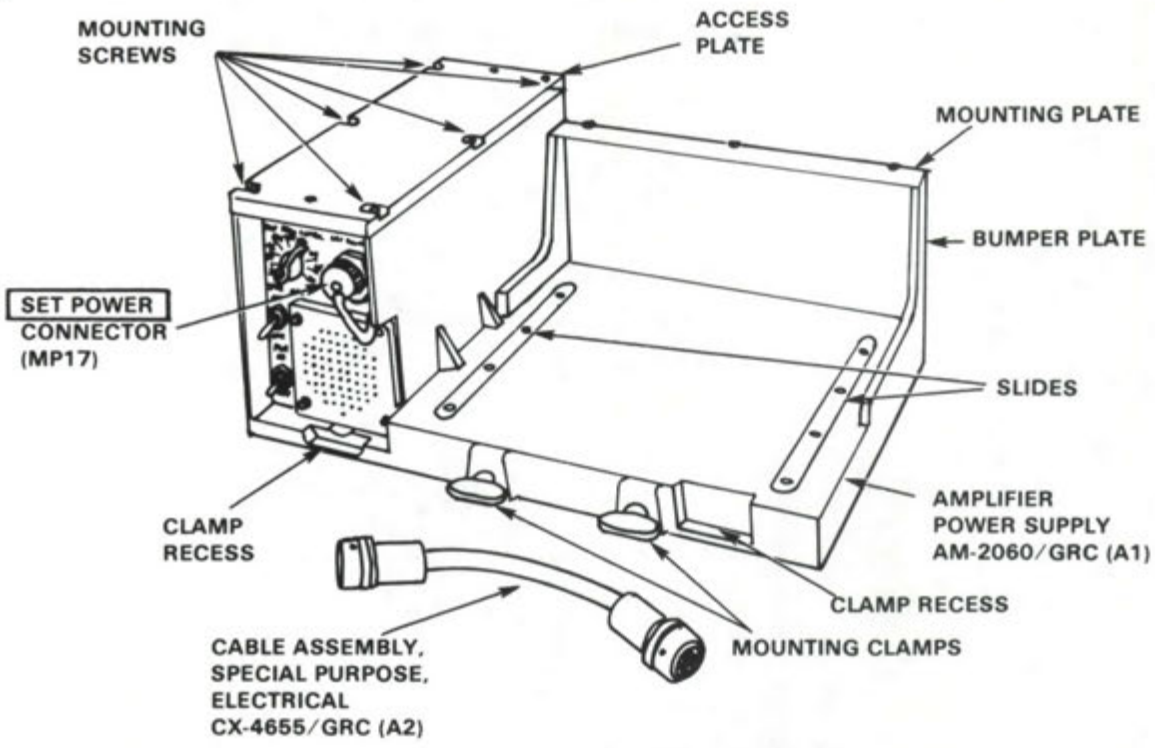
a. Loosen the clamps on the MT-1029/VRC.

b. Set the amplifier-power supply (AM-2060/GRC) on the MT-1029/VRC.

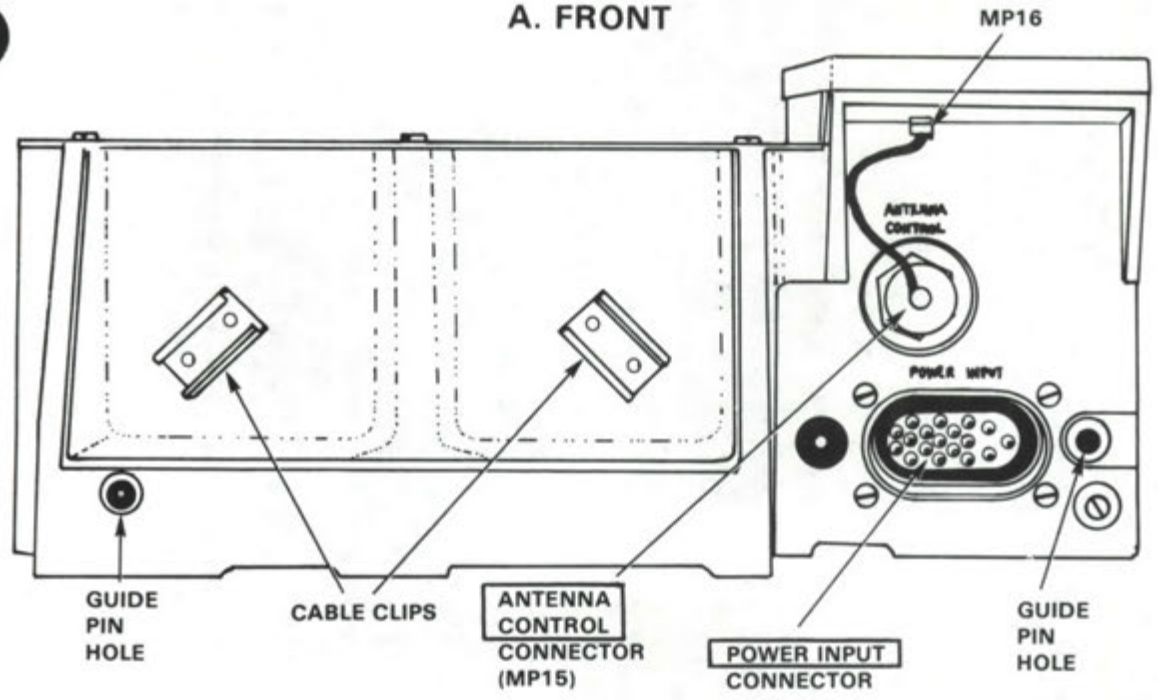
c. Mate the POWER INPUT connector at the rear of the amplifier-power supply with the connector on the MT-1029/VRC junction box. Be sure that the guide pins on the MT-1029/VRC are alined with the guide pinholes on the amplifier-power supply.

d. Push the amplifier-power supply back on the MT-1029/VRC.

e. Engage the clamps on the MT-1029/VRC with the clamp recess on the amplifier-power supply. Tighten the clamps securely.



A. FRONT



B. REAR

Figure 1. Amplifier-power supply OA-3633/GRC.

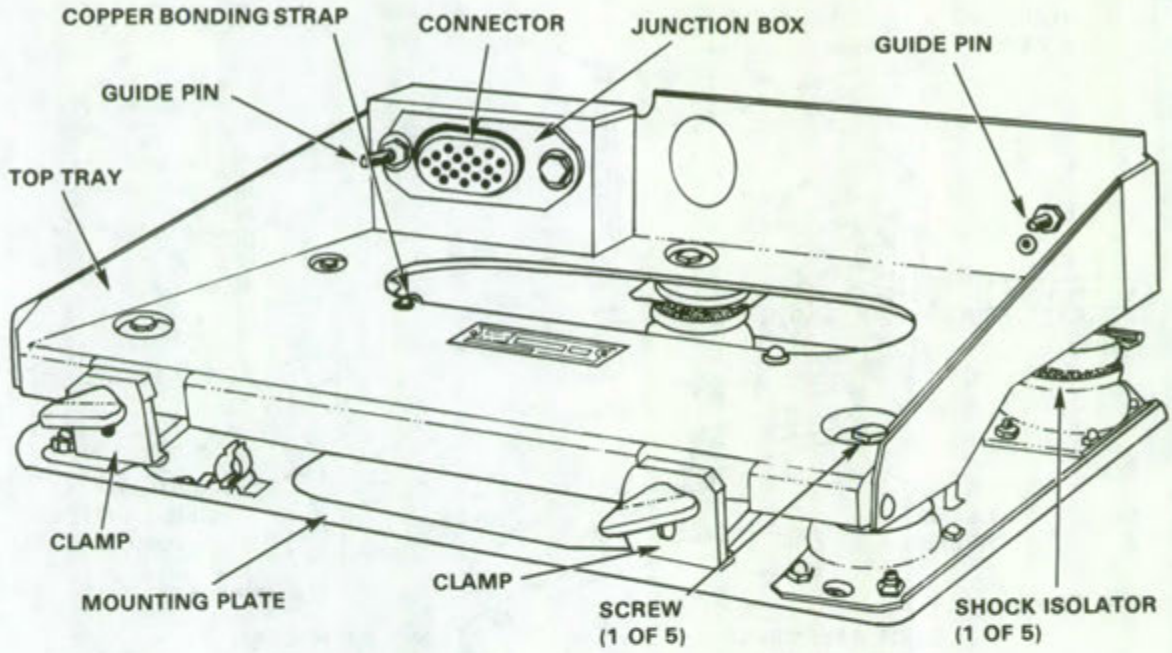


Figure 2. Mounting MT-1029/VRC.

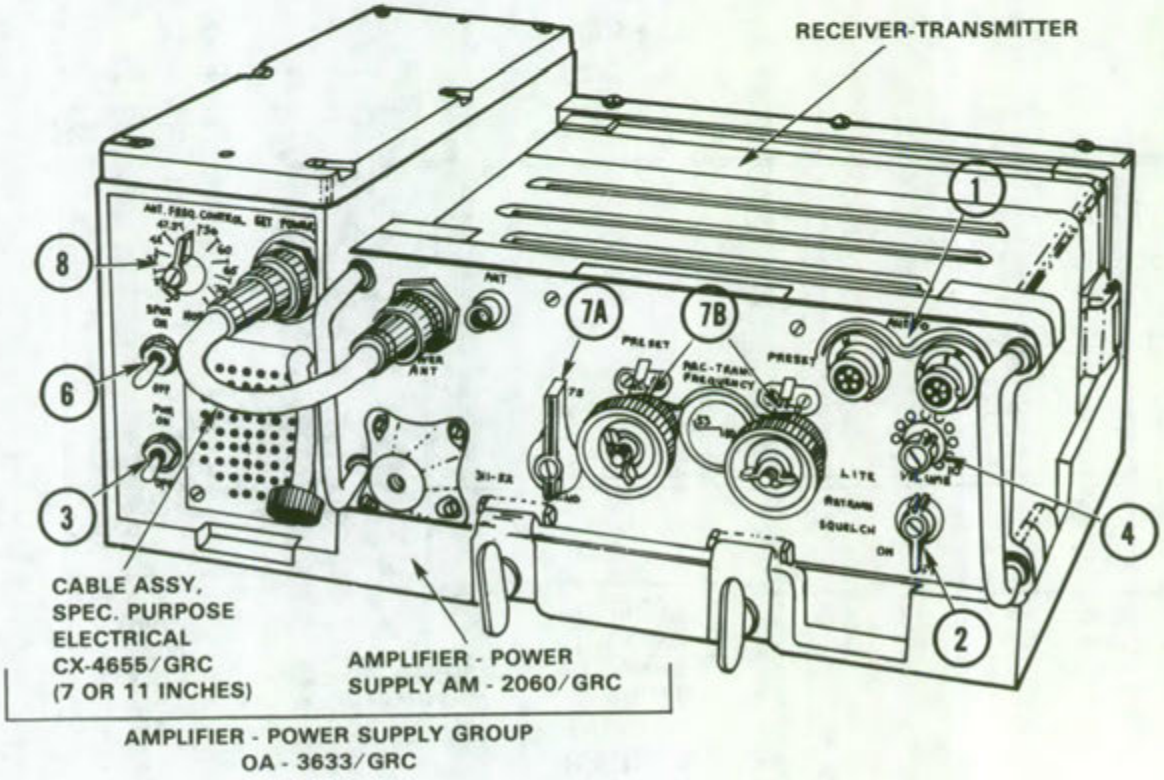


Figure 3. Amplifier-power supply group OA-3633/GRC or OA-3633A/GRC with receiver-transmitter installed.

f. Connect the cable assembly (Special Purpose, Electrical CX-4722/VRC) between the amplifier-power supply ANTENNA CONTROL connector and connector J552 on Antenna Matching Unit MX-2799/VRC, or connector J2 on Antenna Matching Unit MX-6707/VRC (figure 4).

NOTE: The ANTENNA CONTROL connector on the back of the amplifier-power supply (figure 1) is female, and the one on the AT-912/VRC or AS-1729/VRC has male pins. Connect the corresponding mating end of the CX-4722/VRC accordingly.

CAUTION: Be careful when connecting the CX-4722/VRC connectors to the mating connectors. Improper mating damages the pins of the cable connector, or pins in the antenna matching units. First, line up the key in the receptacle with the slot in the cable connector; then press in on the cable connector and turn the cable connector sleeve to lock the cable connector to the receptacle.

3. **Installation of receiver-transmitter on amplifier-power supply** (figures 1 and 3).

NOTE: Only if immediate man-pack operation is expected during the mission, install the battery in the receiver-transmitter before installing the receiver-transmitter on the amplifier-power supply.

a. Loosen the screw-type mounting clamps on the front of the amplifier-power supply; they will drop slightly.

b. Slide the receiver-transmitter into the amplifier-power supply until the bottom of the receiver-transmitter is flush with the bumper plate at the rear of the amplifier-power supply.

c. Raise the screw-type mounting clamps until they engage the lips on the panel of the receiver-transmitter; tighten the screw-type mounting clamps.

d. Remove the protective cap from the POWER connector on the panel of the receiver-transmitter.

e. Connect cable assembly (Special Purpose, Electrical CX-4655/GRC) between the amplifier-power supply SET POWER connector and the receiver-transmitter POWER connector (figure 3).

f. Connect cable assembly (Radio Frequency CG-1773/U) between the receiver-transmitter ANT connector and connector J551 and the MX-2799/VRC or connector J1 on the MX-6707/VRC (figure 4).

4. **Operation of set** (figure 3) (TM 11-5820-498-12, chap 3, page 31-2, para 3-14). (The numbers within steps below relate to the numbers in figure 3.)

WARNING: Dangerous voltage exists at the antenna. Be careful not to touch the antenna while the radio set is transmitting.

a. Connect the handset or microphone to either of the two receiver-transmitter (1) AUDIO connectors.

b. Turn the receiver-transmitter (2) FUNCTION switch to ON.

c. Turn the amplifier-power supply (3) PWR switch to ON.

d. Adjust the receiver-transmitter (4) VOLUME control until background noise is heard.

e. If squelch operation (2) is to be used, refer to TM 11-5820-498-12, paragraph 3-12a, b, and c, for squelch operation conditions and perform the procedures given in 12d to use the squelch feature.

f. If the amplifier-power supply loudspeaker is to be used, proceed as follows:

(1) Set the (6) SPKR switch to ON.

(2) Adjust the receiver-transmitter VOLUME control to a desired listening level.

g. Tune the receiver-transmitter as follows:

(1) Turn the (7A) BAND switch to 30-52 or 53-75, depending on the frequency band desired.

(2) Turn the MHz tuning and KHz tuning controls (7B) until the operating frequency appears on the channel dial.

h. Turn the OA-3633/GRC ANT (8) FREQ CONTROL to the position that includes the selected operating frequency.

CAUTION: If the H-138(*)/U is used (i below), do not speak into both microphone elements. The H-138(*)/U has two microphone elements for noise cancellation; speaking into both elements at the same time will cancel out your voice.

i. To transmit, press the handset push-to-talk switch and speak into one microphone element; to receive, release the switch.

j. To turn the radio set off:

(1) Set the OA-3633/GRC PWR switch to OFF.

(2) Turn the receiver-transmitter FUNCTION switch to OFF.

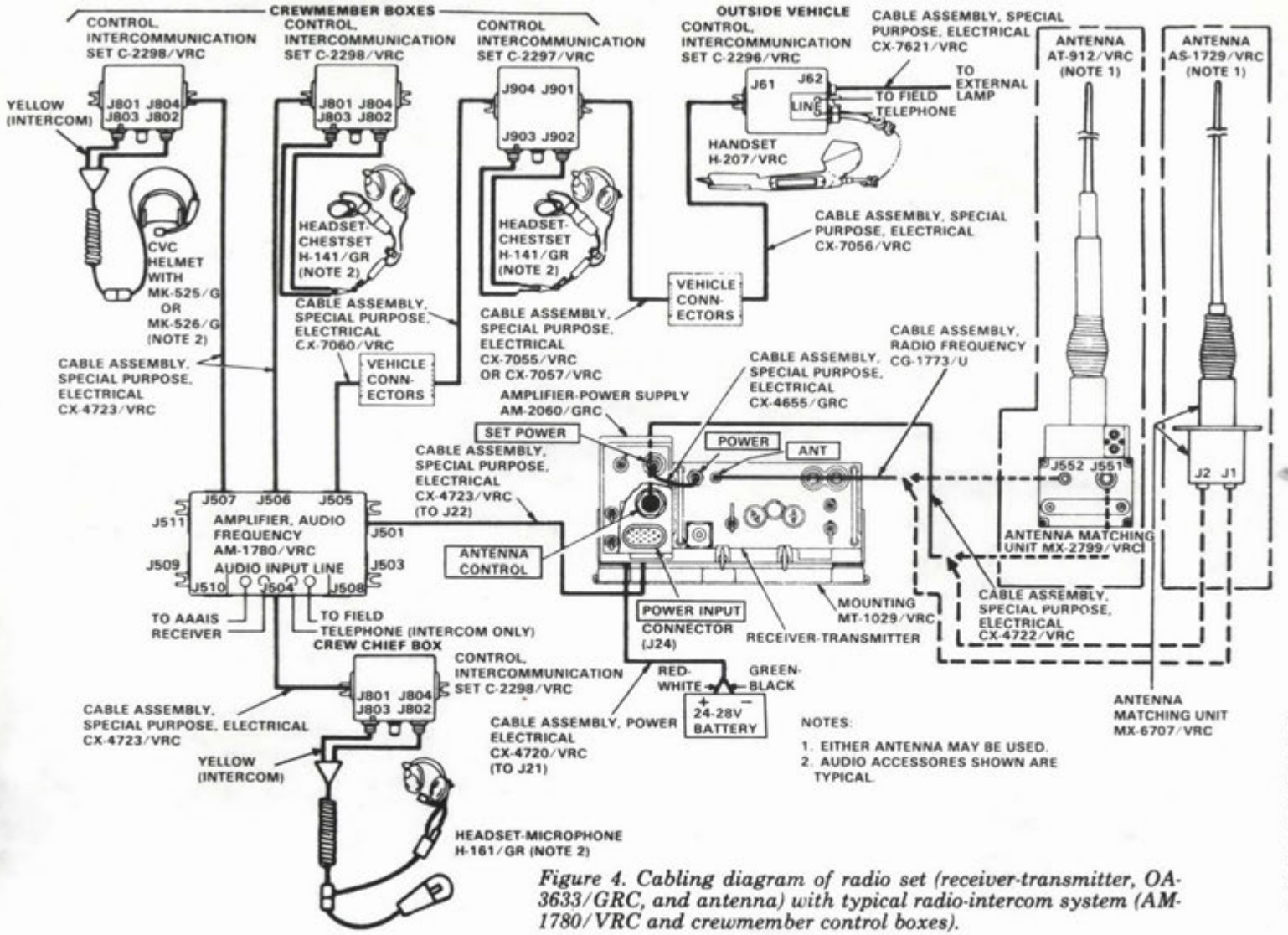


Figure 4. Cabling diagram of radio set (receiver-transmitter, OA-3633/GRC, and antenna) with typical radio-intercom system (AM-1780/VRC and crewmember control boxes).

REFERENCE:

TM 11-5820-498-12, C1 thru C5, May 67 (chap 2, pages 2-1 thru 2-7; chap 3, page 3-12 para 3-14)

TASK NUMBER: 113-587-3004

PERFORM OPERATOR MAINTENANCE ON RADIO SETS AN/VRC-46 OR AN/VRC-47

CONDITIONS:

You are participating in a field training exercise or performing required garrison maintenance. Given an installed operational FM radio (vehicular mounted) the appropriate TM, clean cloth, trichloroethylene, mild soapy water, flat tip screwdriver, a radio station within range, callsigns, a frequency, a blank DA Form 2404 and TM 38-750.

STANDARDS:

1. Perform all prescribed operator maintenance steps as required by the appropriate TM.

2. Complete DA Form 2404 IAW TM 38-750, paragraph 3-4.

PERFORMANCE MEASURES:

1. Perform all prescribed operator maintenance steps outlined in the preventive maintenance services section of TM 11-5820-401-12, chap 4, para 4-1 thru 4-3.

2. To correct deficiencies/shortcomings, refer to TM 11-5820-401-12, chap 4, para 4-4 thru 4-6.

3. Previously reported faults beyond the operator's capability to repair or those requiring parts are recorded on the Uncorrected Fault Record (DA Form 2408-14) in the logbook. This form is completed by organizational maintenance.

4. Faults which the operator cannot correct or which require a part are recorded on DA Form 2408 IAW procedures outlined in paragraph 3-4 of TM 38-750.

REFERENCES:

TM 38-750, Army Maintenance Management System (TAMMS), C1, Nov 72 (chap 3, page 3 thru 4, para 3-4)
TM 11-5820-401-12, Radio Sets AN/VRC-46 and AN/VRC-47, Sep 72 (chap 4, para 4-1 thru 4-3)
TEC Lesson 936-061-0117-F, Tactical FM Radio: RT524A and R442: Maintenance

TASK NUMBER: 113-587-2020

PREPARE TACTICAL FM RADIOS (AN/VRC-46 OR AN/VRC-47) FOR OPERATION

CONDITIONS:

Given the functional components for the AN/VRC-47 or AN/VRC-46 radio, a tactical vehicle with radio mounts, antenna matching unit, and cable assembly installed in operational condition, a frequency, callsigns, a radio station within range (can be another radio operator performing the task), a knowledge of how to make a radio check; and TM 11-5820-401-12. Entering a radio net is not required to perform this task.

STANDARDS:

1. Install, assemble, and disassemble radios IAW chapter 2, TM 11-5820-401-12.

2. Place the applicable radio (receiver-transmitter) into operation and make a communication check IAW performance measures below:

PERFORMANCE MEASURES:

1. **Radio set AN/VRC-46.**

a. Inspect radio set to insure that all components are present:

(1) Receiver - transmitter (figure 1).

(2) Antenna AT-912/VRC (figure 2).

(3) Mountings MT-1029/VRC and MT-1898/VRC (figure 3).

(4) Cables (figure 4).

(5) Antenna AS-1729 (figure 5).

b. Installing, assembling, disassembling, and handling radio equipment: Refer to TM 11-5820-401-12, chapter 2.

2. **To operate receiver-transmitter RT-524/VRC** (figure 1).

CAUTION: DO NOT turn radio on until vehicle is started or the set may be damaged.

a. Start the vehicle.

b. The numbers within the steps below are keyed to the numbers in figure 1.

(1) Set POWER switch (1) to LOW power position.

(2) Set LIGHT switch (2) to ON position.

(3) Set SQUELCH switch (3) to desired mode of operation (NEW - ON position).

(4) Set BAND switch (4) to position of given operating frequency (A-Band).

(5) Turn MHz control (5) to desired frequency.

(6) Turn KHz control (6) to desired frequency.

(7) Turn SPEAKER control (7) to ON.

(8) Turn VOLUME control (8) to desired listening level.

c. Make a radio check with the squelch switch (3) OFF.

d. Turn BAND switch (4) to B-Band.

e. Turn MHz and KHz controls (5 and 6) to desired frequency.

f. Make a radio check with the SQUELCH switch (3) ON.

g. Turn POWER switch to OFF before you stop vehicle motor.

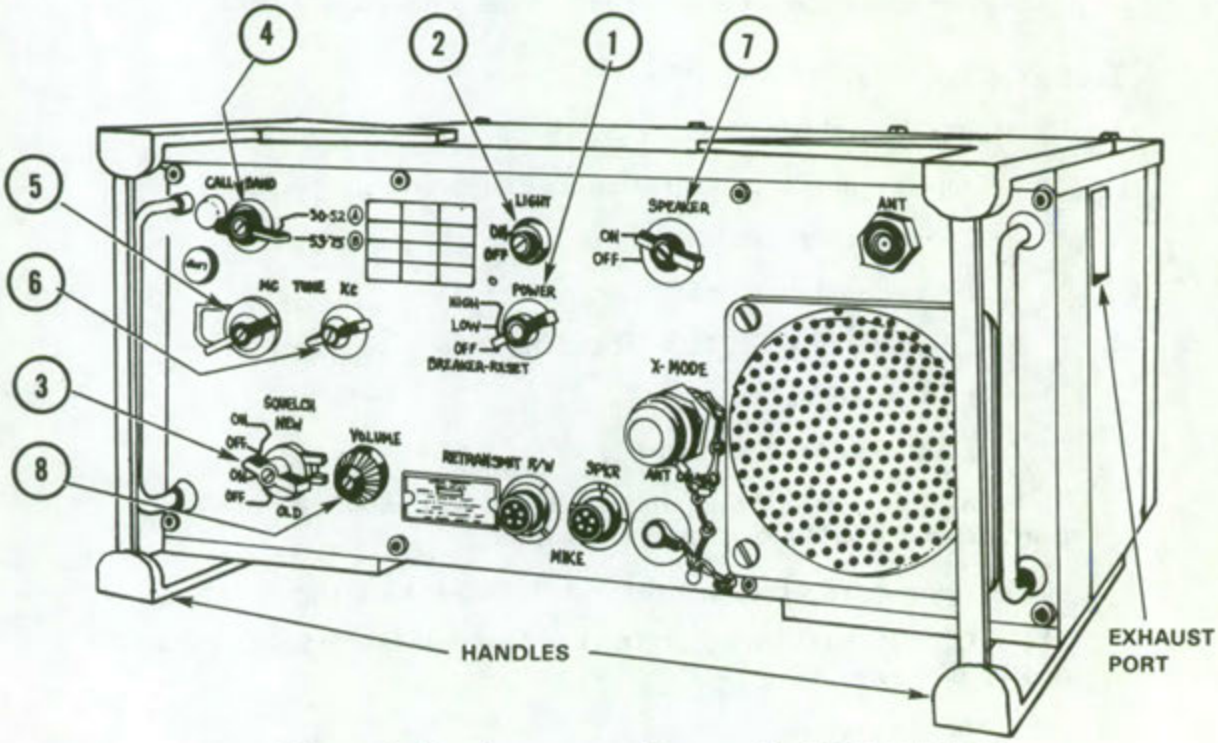


Figure 1. Receiver-transmitter, radio RT-524/VRC.

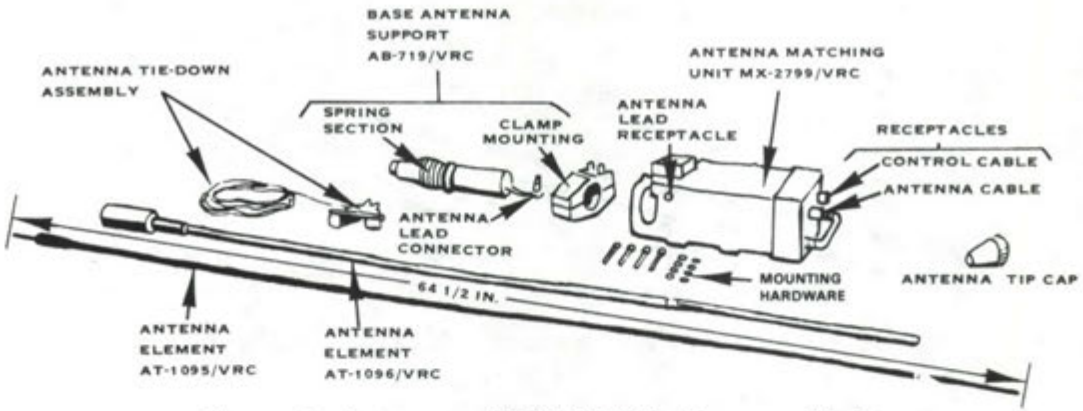
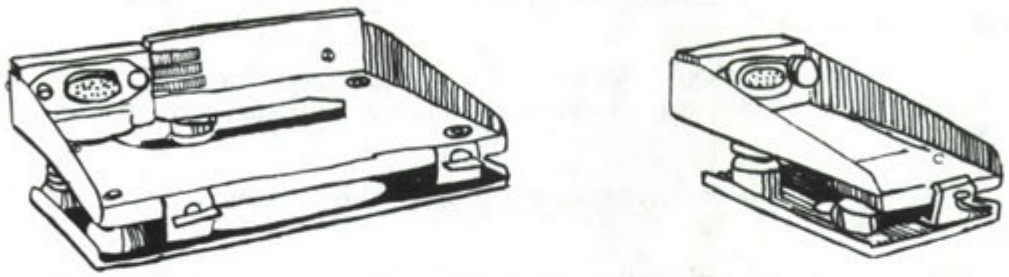


Figure 2. Antenna AT-912/VRC, disassembled.



A. MOUNTING MT–1029/VRC (FOR RECEIVER–TRANSMITTERS).

B. MOUNTING MT–1898/VRC (FOR R–442(•)/VRC.

Figure 3. Mountings MT-1029/VRC and MT-1898/VRC.

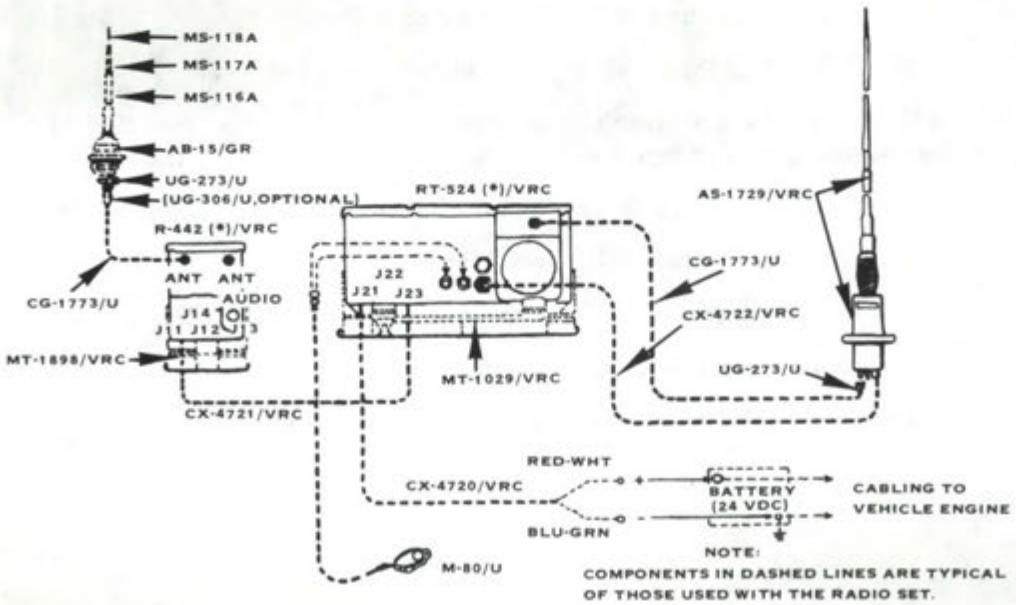


Figure 4. Typical cabling diagram for AN/VRC-47.

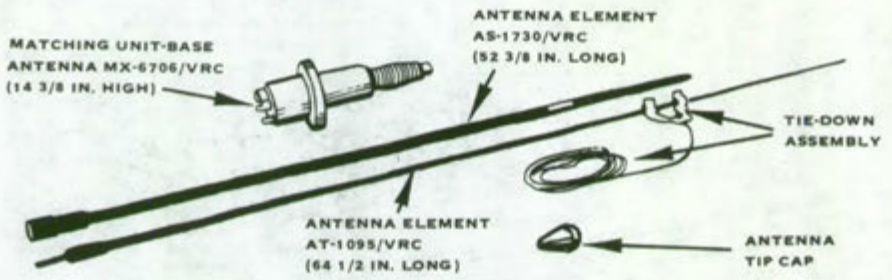


Figure 5. Antenna AS-1729/VRC, disassembled.

3. **To operate AN/VRC-47** (figures 1 thru 6).

CAUTION: DO NOT turn radio on until vehicle is started or the set may be damaged.

a. Operation of the RT-524 and R-442 together forms the AN/VRC-47. A check of the R-442 operation should be done in conjunction with checking the RT-524.

b. To operate the receiver-transmitter 524 (figure 1), refer to paragraphs 1 and 2 above.

c. The numbers within steps below are keyed to the numbers in figure 6.

(1) Turn POWER switch (1) to ON.

(2) Turn BAND switch (2) to A.

(3) Turn MHz control (3) to desired frequency.

(4) Turn KHz control (4) to desired frequency.

(5) Turn VOLUME switch (5) to desired listening level.

NOTE: There is no speaker control switch on the R-442. An external speaker is required (loudspeaker LS-454/U) (figure 7).

(6) Receive message from another station with SQUELCH (6) ON.

(7) Turn BAND switch (2) to B position.

(a) Turn MHz and KHz controls (3 and 4) to desired frequency.

(b) Receive message from another station.

(8) Turn POWER switch (1) to OFF before you stop vehicle motor.

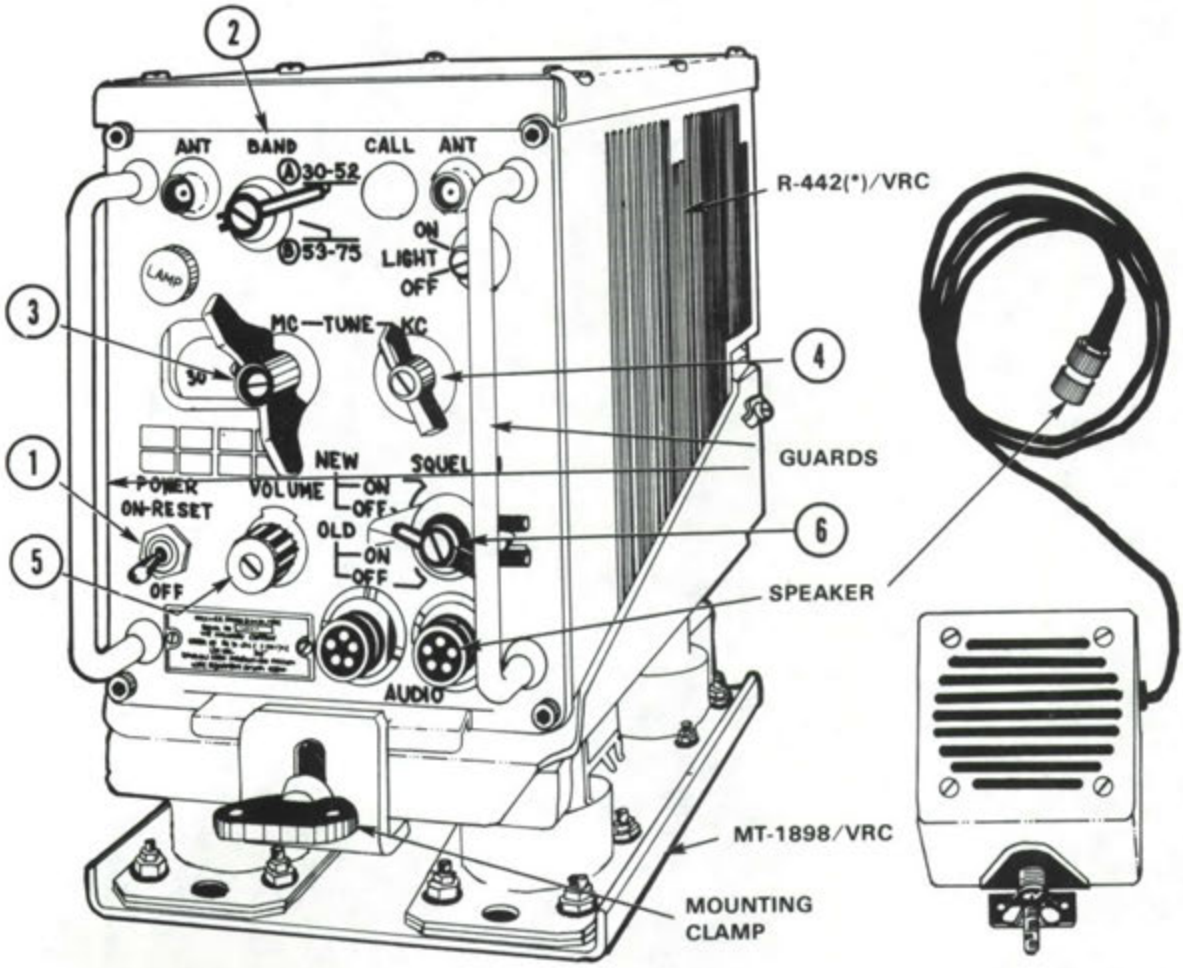


Figure 6. Receiver R-442(*)/VRC, installed on Mounting MT-1898/VRC.

Figure 7. Loudspeaker LS-454/U.

REFERENCES:

TM 11-5820-401-12, Radio Sets AN/VRC-46 and AN/VRC-47, C1, Aug 72 (pages 2-3 thru 2-20, para 2-5 thru 2-11; pages 3-1 thru 3-8, para 3-2 thru 3-7; pages 3-15 thru 3-24, para 3-14 thru 3-17; page 3-26, para 3-19)

TASK NUMBER: 113-573-8001

USE AN AUTOMATED CEOI

CONDITIONS:

Given an extract of the division Communications-Electronics Operating Instructions (CEOI) and directions to determine, for a specified time period, any or all of the following:

a. The frequency(s) of specified unit nets.

b. The callsign(s) of station(s) within a given net.

c. Your own item number identifier.

d. Another station's identity, given its item number identifier.

STANDARDS:

1. Within 2 minutes (for each station), determine the complete individual callsign (to include suffix) assigned by the CEOI to that station, for the time period specified, and state (or show) it to your supervisor.

2. Within 1 minute (for each net), determine the frequency assigned by the CEOI to that unit, for the time period specified, and state (or show) it to your supervisor.

3. Within 2 minutes, determine your own item number identifier as given in the CEOI for the time period specified.

4. Within 2 minutes, determine an unknown station's unit identity.

PERFORMANCE MEASURES:

1. **General:**

a. The CEOI contains specific instructions for the operation of communication systems under a division headquarters — and is the only authorized document from which subordinate elements will extract information to compile organization/unit CEOIs — for use during tactical training and contingency operations.

b. Callsigns, suffixes, and frequencies will be changed simultaneously during each time period throughout the division. Specific callsign and frequency assignments will not be transmitted in the clear over nonsecure means of communication. If such transmission is required, the callsign and frequency must be encoded using the current tactical unit operations code or

numeral/cipher authentication system. All information is listed according to time periods. When determining callsigns and frequencies, be sure you look under the correct time period. [Your supervisor can explain the local time period designation procedure that you should use.]

2. **To determine callsigns:** To find the callsigns for a given element (for example: 1/77 Inf, A Co, 1st Plt Ldr), turn to the index (figure 1a) of the CEOI. Follow the left-hand column of items until you find the parent unit (e.g., 1/77 INF BN). Next, look across from the parent unit to the right-hand column under the item number heading to find the correct item number (6A) and turn to that item number (figure 2a). Determine the correct time period (01) and look down the column headed by that time period to find the callsign for 1/77 Inf, A Co, 1st Plt (J1M). Then, go back to the index (figure 1a) and find the item number for suffixes (item no. 2). Turning to that item number (figure 3), find PLT LDR. Located to the left of PLT LDR is its two-digit suffix (13). Combining the callsign (J1M) with the suffix (13) gives you the complete five-character callsign for the Plt Ldr, 1st Plt, A Co, 1/77 Inf Bn (J1M13).

3. **To determine frequencies:** Frequencies are assigned to each unit according to command echelon. To find the frequency for a given net (for example: 1/77 Inf, A Co, 1st Plt), turn to the index (figure 1a) and find the parent organization item number, as in para 2 above. Turn to that item number (figure 2b) and look down the left-hand column until you find the unit you want to communicate with (A Co, 1st Plt). After finding the unit, look to the right under the correct time period (01) to find the right frequency (52.45).

4. **Item number identifiers.** Unknown station callsigns can be identified by the use of item number identifiers. Each station should know the two-letter identifier for its own net for each time period. To find your item number identifier, follow these steps:

Step 1 - Go to the index of your CEOI and find item numbers for both your unit and ITEM NUMBER IDENTIFIERS.

Step 2 - Turn to the correct item number for ITEM NUMBER IDENTIFIERS and read down the column under the appropriate time period until you find your unit's CEOI item number. Next, follow that line to the far left column to find your correct two-letter ITEM NUMBER IDENTIFIER. Use this number to identify yourself when entering a net in which you do not normally operate. This gives the other net your CEOI item number from which your station's identity can readily be determined.

Example:

You have just received a call from a unknown station. The individual identified himself using the callsign S9A17 and stated that his item number identifier is AB. The time period is 01, and the individual authenticated correctly when you challenged him. To identify the unknown station, follow this procedure:

Step 1 - Go to your index (figure 1b) and locate the item number for ITEM NUMBER IDENTIFIERS (20). Turn to item number 20 (figure 4),

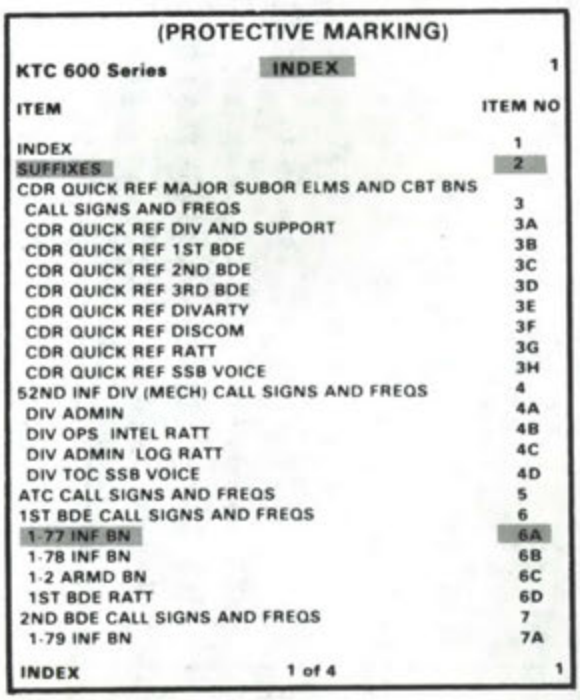
and look down the left-hand column until you find the two-letter identifier, AB. Next, follow this line across the page to the column of item numbers under the correct time period (01) and read the item number of the unknown station (6A).

Step 2 - Turn to the CEOI item number (6A) (figure 2a). Look under the correct time period (01) for the first three characters of the unknown callsign (S9A). Reading over to the left-hand column, you find this to be the 1/77 INF BN.

Step 3 - To identify the last two characters of the unknown station callsign (17), go to the CEOI item for suffixes (2) (figure 3). Look down the left-hand column until you find the number 17. Read to the right to identify the unknown station as an S2.

In this manner, you have completely identified the unknown station as the S2, 1/77 INF.

NOTE: The CEOI extract and the performance measures section under the task: USE KAL-61B, 1400 NUMERICAL CODE TO AUTHENTICATE TRANSMISSION AND ENCRYPT NUMBERS AND GRID ZONE LETTERS, may be cut out and used as a training CEOI.



(PROTECTIVE MARKING)

KTC 600 Series INDEX 1

ITEM	ITEM NO
INDEX	1
SUFFIXES	2
CDR QUICK REF MAJOR SUBOR ELMS AND CBT BNS CALL SIGNS AND FREQS	3
CDR QUICK REF DIV AND SUPPORT	3A
CDR QUICK REF 1ST BDE	3B
CDR QUICK REF 2ND BDE	3C
CDR QUICK REF 3RD BDE	3D
CDR QUICK REF DIVARTY	3E
CDR QUICK REF DISCOM	3F
CDR QUICK REF RATT	3G
CDR QUICK REF SSB VOICE	3H
52ND INF DIV (MECH) CALL SIGNS AND FREQS	4
DIV ADMIN	4A
DIV OPS INTEL RATT	4B
DIV ADMIN LOG RATT	4C
DIV TOC SSB VOICE	4D
ATC CALL SIGNS AND FREQS	5
1ST BDE CALL SIGNS AND FREQS	6
1-77 INF BN	6A
1-78 INF BN	6B
1-2 ARMD BN	6C
1ST BDE RATT	6D
2ND BDE CALL SIGNS AND FREQS	7
1-79 INF BN	7A

INDEX 1 of 4 1

Figure 1a.

(PROTECTIVE MARKING)

KTV 600 Series INDEX 1

ITEM	ITEM NO
1-441 ADA BN CALL SIGNS AND FREQS	12
FAAR PLT	12A
1-441 ADA BN SSB VOICE	12B
52ND ENGR BN CALL SIGNS AND FREQS	13
52ND ENGR ADM PLT SSB VOICE	13A
52ND MP CO CALL SIGNS AND FREQS	14
52ND MI CO CALL SIGNS AND FREQS	15
52ND SIG BN CALL SIGNS AND FREQS	16
52ND AVN BN CALL SIGNS AND FREQS	17
AHC 52ND AVN BN	17A
AHC PLT'S	17B
GEN SPT CO 52ND AVN BN	17C
52ND ASA CO CALL SIGNS AND FREQS	18
52ND ASA CO RATT	18A
SPARE CALL SIGNS AND FM FREQS	19
SPARE CALL SIGNS AND FM FREQS	19A
SPARE CALL SIGNS AND VHF FREQS	19B
SPARE CALL SIGNS AND UHF FREQS	19C
SPARE CALL SIGNS AND HF FREQS	19D
ITEM NUMBER IDENTIFIERS	20
PYROTECHNIC AND SMOKE SIGNALS	21
SIGNS AND COUNTERSIGNS	22

INDEX 3 of 4 1

Figure 1b.

(PROTECTIVE MARKING)

KTV 600B CALL SIGNS

1-77 INF BN 6A

	01	02	03	04	05
1-77 INF BN	S9A	I2L	P9T	Z1N	I3L
HHC	B7J	G8X	K4H	O3E	K4C
A Co	M1C	R4M	N3X	T1K	K7X
1ST PLT	J1M	K2J	V6N	G8L	F1G
2ND PLT	V7D	R8O	E0P	K2W	W2R
3RD PLT	D2H	W5K	K1J	G5M	D5P
MORTAR PLT	C4B	J2A	P7K	E5Y	F5W
B CO	Y6Y	P0Z	L0Q	K6R	C6J
1ST PLT	P0F	B6R	X1A	P1U	R2N
2ND PLT	S2X	H7H	V8I	Y7C	G2V
3RD PLT	L7T	L7Q	Q7V	S5A	I4Z
MORTAR PLT	R9V	B7W	D1S	P7D	B2B
C CO	G1Q	J6N	E6F	M4B	A0T
1ST PLT	N7O	P9U	B6B	N5V	P7U
2ND PLT	B9S	Y6D	K2R	R7O	I6Y
3RD PLT	H8P	P7I	Z6L	B4Q	T1I
MORTAR PLT	A5L	Q2C	A8E	Y8F	V6D
CSC	C0W	O4B	N7C	O6H	S4H
AT PLT	A2E	N9P	E4W	N2G	L6E
MORTAR PLT	J6Z	U2G	U6G	Q5Z	W0M
RECON PLT	E4G	B6F	R0Z	D0T	E8S
REDEYE SEC	J7I	Z0S	A6O	Q5J	U1K
GND SURVL SEC	G5U	L2Y	T8D	F1I	U4O
MEDEVAC	Q5J	A6I	V2S	W0P	O2O

1-77 INF BN 6A

Figure 2a.

(PROTECTIVE MARKING)

KTV 600 B FREQUENCIES 6A

1-77 INF BN	01	02	03	04	05
1-77 INF CMD	52.800	61.950	35.050	61.550	60.700
1-77 INF A L	49.300	64.200	31.500	39.250	41.200
A CO CMD	35.950	40.600	35.550	34.600	30.250
1ST PLT	52.450	52.550	47.900	53.150	51.700
2ND PLT	53.100	52.500	52.050	52.750	50.850
3RD PLT	47.500	53.450	52.350	52.550	52.150
MORTAR PLT	71.450	66.450	59.450	68.050	70.650
B CO CMD	44.850	56.750	71.850	55.200	56.250
1ST PLT	53.350	52.650	50.950	53.350	53.750
2ND PLT	50.150	48.800	53.100	52.350	52.450
3RD PLT	53.650	52.050	53.700	50.950	48.050
MORTAR PLT	49.150	49.050	40.950	71.200	62.550
C CO CMD	56.150	66.850	54.750	49.850	45.550
1ST PLT	50.450	53.100	51.200	52.650	53.250
2ND PLT	52.550	48.100	52.950	53.100	50.650
3RD PLT	51.600	48.700	53.350	53.500	52.100
MORTAR PLT	56.600	55.850	47.950	45.800	43.300
CSC CMD	57.800	34.900	34.250	35.850	61.450
AT PLT	54.850	65.650	35.350	49.300	65.250
MORTAR PLT	46.450	58.900	64.200	61.300	68.550
RECON PLT	71.850	55.900	72.900	39.500	72.550
REDEYE SEC	46.250	36.400	73.000	45.150	75.900
GND SURVL SEC	39.500	41.700	58.200	73.000	47.700
1-77 AJ ALT 1	53.000	33.350	73.150	56.750	59.800
1-77 AJ ALT 2	40.050	71.500	59.000	73.300	65.800
MEDEVAC P	35.200	43.800	48.500	69.000	73.150

1-77 INF BN 6A

Figure 2b.

(PROTECTIVE MARKING)

KTV 600 B 2

SUFFIXES TIME PERIOD 01

01	TARGET ACQ OFF	31	TM SQD SEC DET TK 7
02	AID DE CAMP	32	LN OFF 4
03	C E OFF	33	TM SQD SEC DET TK 8
04	MAINT OFF	34	ATSE
05	AIRCRAFT 12	35	FO RECON TACP 6
06	G3 S3 AIR	36	COMSEC OFF
07	MATERIEL OFF	37	TRANS MOTOR OFF
08	AVLB SEC	38	FSE
09	G1 S1	39	EW OFF
10	MET	40	CHIEF OF STAFF XO
11	ASA OFF	41	SURGEON MED OFF
12	FO RECON TACP 1	42	FO RECON TACP 5
13	PLT SEC TEAM LDR	43	ACE
14	AIRCRAFT 6	44	HQ COMDT
15	FO RECON TACP 3	45	FDC
16	FSCOORD	46	TM SQD SEC DET TK 1
17	G2 S2	47	AIRCRAFT 1
18	AG	48	AME
19	SURVEY OFF	49	RADAR
20	FLT OPS	50	AIRCRAFT 10
21	AIRCRAFT 8	51	AIR DEFENSE OFF
22	RECOVERY VEH	52	CHAPLAIN
23	G3 S3	53	AIRCRAFT 5
24	IG	54	SPARE 9
25	PLT SEC TEAM SGT	55	ENGR OFF
26	LN OFF 3	56	NCS
27	TOC CP	57	FO RECON TACP 2
28	SGM CSM	58	AIRCRAFT 7
29	G4 S4	59	SPARE 8
30	NAICO	60	SPARE 2

SUFFIXES 1 OF 20 2

Figure 3.

(PROTECTIVE MARKING)

KTV 600 B 20

ITEM NUMBER IDENTIFIERS

	01	02	03	04	05	06	07	08	09	10
AA	19A	3G	19A	13A	11A	7	9B	9F	13	15
AB	6A	10B	9B	9A	12	19B	8C	7A	4	8A
AC	3H	4C	19D	4D	6	3B	19B	14	9F	10D
AD	8	12A	3F	7B	19D	7B	3A	19A	4D	10E
AE	3A	4A	12A	3B	6C	10E	4D	10B	17B	3
AF	3C	10A	3E	10E	9E	8E	6D	16	10D	19D
AG	3E	4D	7	19D	11	16	3E	9C	11A	11
AH	9F	13	10C	19A	15	3D	9D	8E	17A	3E
AI	7	7C	8D	10C	10B	7D	4B	11B	7B	7A
AJ	6	10C	13	6D	13A	9	5	13	7A	8B
AK	18	3D	16	8A	17B	5	3B	3E	8C	6
AL	17	10E	3	5	9A	9A	13	8C	4C	6B
AM	10C	19C	10	9D	8C	8A	10C	7D	19C	11A
AN	12	12	3D	10A	9C	4B	8B	4D	9C	18A
AO	6B	19B	9A	10	12B	10D	10E	5	14	9F
AP	8D	19	19	3D	3D	17B	3H	10E	9	17C
AQ	9	8E	11A	9	9	14	11B	11	3E	19
AR	7D	15	12	6	17A	19C	19C	3F	3F	9B
AS	3G	9E	9	18A	5	11A	18A	18A	17C	3H
AT	7C	7A	17	8D	10D	4D	9F	17A	9A	18
AU	9B	3A	9F	6C	6A	3H	6A	9E	19A	12B
AV	3F	3B	18A	12	3H	4	8A	9D	3D	16
AW	19B	8C	8B	7A	7C	17A	7	15	6D	3C
AX	10A	18A	14	8	17	8C	3F	19D	13A	17A
AY	5	11A	7A	6A	8B	17	10	17	3	4A
AZ	16	17B	4D	12A	3G	3C	3G	17B	19D	7D

ITEM NUMBER IDENTIFIERS 1 OF 3 20

Figure 4.

REFERENCES:

Unit CEOI

TEC Lesson 936-061-0140-F, CEOI, Part 1: How to use the CEOI

TASK NUMBER: 113-571-2001

USE KAL-61B 1400 NUMERICAL CODE TO AUTHENTICATE TRANSMISSIONS AND ENCRYPT/DECRYPT NUMBERS AND GRID ZONE LETTERS

CONDITIONS:

Given dates and times, a KAL 61B with KTC 1400 tables, pencil, paper, and the following items which may be simulated for training only: operational FM radios, a frequency, callsigns, and a sending station.

Situation 1: A contacted station which might be an imposter.

Situation 2: A station requests you to authenticate two phonetic letters.

Situation 3: A requirement to encode specific grid coordinates and transmit them within an otherwise clear text (uncoded) message.

Situation 4: A station, while transmitting, says the words "I set" followed by 8, 10, or 12 phonetic letters.

STANDARDS:

Without error, select the right KTC 1400 for the time period given:

Situation 1: Within 15 seconds (not counting time taken by the other station), transmit, using proper radio procedure, a two-letter challenge, and from the reply determine whether or not the station responded correctly. (If station takes more than 5 seconds to respond, challenge again.)

Situation 2: Within 15 seconds, using the correct radio procedure, respond to the challenge with correct authentication. (If immediately challenged again, respond correctly within 5 seconds.)

Situation 3: Encode the specific grid coordinates without error and transmit them using correct radio procedures.

Situation 4: Decode the words after "I set" without error.

PERFORMANCE MEASURES:

NAO 3B

TO SET UP FOR ENCRYPTING

Step 1. Randomly select any two letters (except Z) for message "SET INDICATOR" (SI). EXAMPLE: CP.

Step 2. Find the first letter "C" of the SI in LINE INDICATOR COLUMN (1).

Step 3. Find the second letter "P" of SI in the line indicated by the first letter. Letter to the right of second SI letter is the SET LETTER.

NOTE: If the second SI letter is the last letter in the line, then the first letter in the same line will be the SET LETTER.

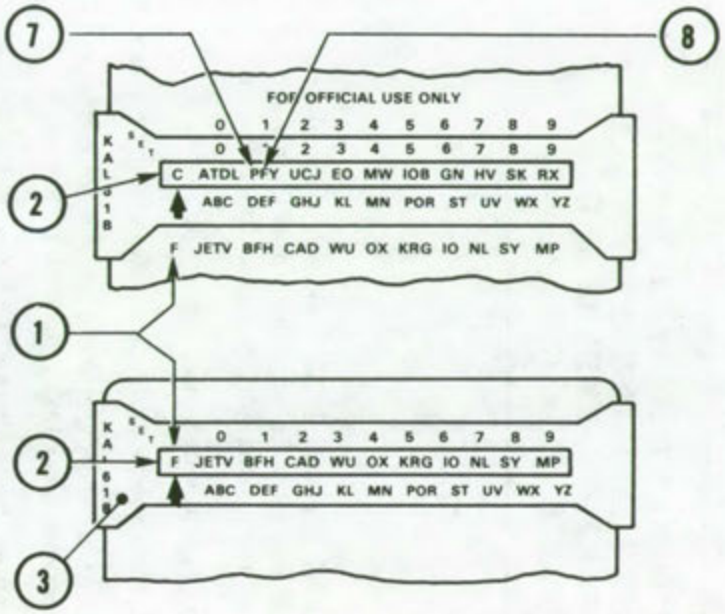
Step 4. Find SET LETTER "F" in LINE INDICATOR COLUMN.

Step 5. Position READER GUIDE over line indicated by SET LETTER "F". Device is now ready for encrypting.

1. TO SET UP FOR ENCRYPTING.

(PROTECTIVE MARKING)

NAO 3B



KAL 61 set up for encrypting.

1. Line Indicator Column
2. Set Letter/First Letter of Set Indicator
3. Reader Guide

7. Second Letter of Set Indicator
8. Set Letter

(PROTECTIVE MARKING)

NAO 3B

TO ENCRYPT NUMBERS

Set KAL 61 for encrypting as indicated in Section 1.

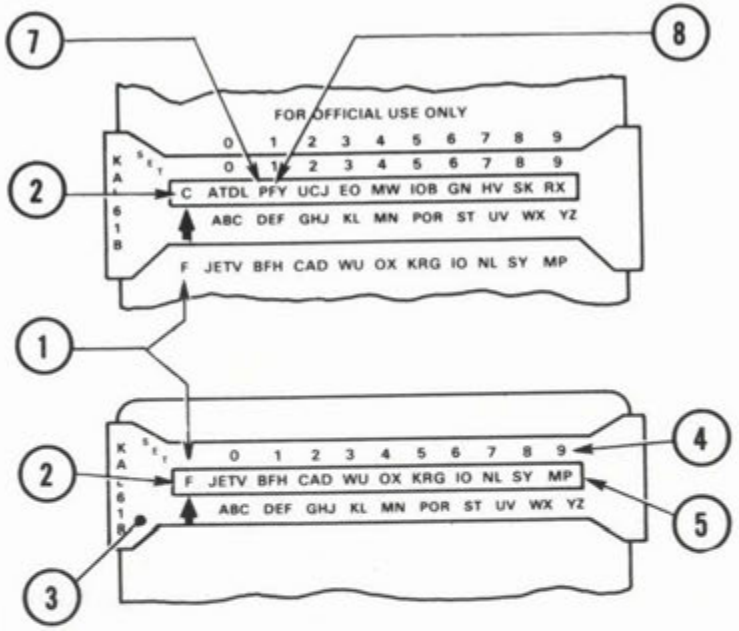
Step 1. Find number to be encrypted in PLAINTEXT NUMBERS (4) on READER GUIDE (3). EXAMPLE: 572938.

Step 2. Substitute for each number one of the CIPHER LETTERS (5) grouped in the set line immediately below the number to be encrypted. Continue to substitute letters from the same SET line until all numbers for that group are encrypted. EXAMPLE: RNAMUS is one possibility. By using variants, others are possible.

NOTE: Numbers will be encrypted one at a time in the same order they appear in the message. A different cipher letter will be used for repeated numbers. If there are more than 15 numbers to be encrypted in the same message, one SET INDICATOR will be used for the first 15 numbers and a different SET INCIATOR for each succeeding group of 1 to 15 numbers. This must be done because the encrypting of more than 15 numbers in the same SET INDICATOR can seriously weaken the security of the system.

2. TO ENCRYPT NUMBERS.

(PROTECTIVE MARKING)



3. Reader Guide
4. Plaintext Numbers
5. Cipher letters

(PROTECTIVE MARKING)

NAO 3B

TO ENCRYPT GRID ZONE LETTERS

Step 1. Find first grid zone letter to be encrypted in PLAINTEXT LETTERS (6). EXAMPLE: N.

Step 2. Substitute for that letter the cipher letter located in SET line directly above the letter to be encrypted. EXAMPLE: X.

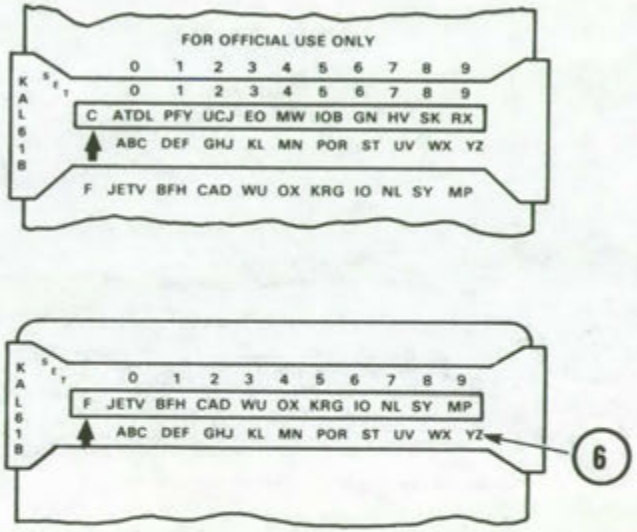
Step 3. Find the second grid zone letter to be encrypted in PLAINTEXT LETTERS (6). EXAMPLE: R.

Step 4. Substitute for second letter the cipher letter located in SET line directly above the letter to be encrypted. EXAMPLE: G. The same SET line will be used to encrypt both the grid zone letters and the coordinates.

NOTE: Grid Zone letters will be included in messages when they are necessary to the understanding of such messages. NO OTHER LETTERS WILL BE ENCRYPTED. If necessary to preclude misunderstanding, a statement may be made that grid zone letters are included in the message.

3.TO ENCRYPT GRID ZONE LETTERS.

(PROTECTIVE MARKING)



6. Plaintext letters for UTM Grid Zone Designators

(PROTECTIVE MARKING)

ARRANGEMENT AND TRANSMISSION OF MESSAGES

This system is designed to be used with plain text. Therefore, most messages using this system will include both encrypted portions and plaintext portions.
The encrypted portions of your message will be arranged as follows:

a. First two letters will be the SET INDICATOR letters. (NEVER TRANSMIT THE SET LETTER). EXAMPLE: CP. (This is transmitted as "I set CHARLIE PAPA".)

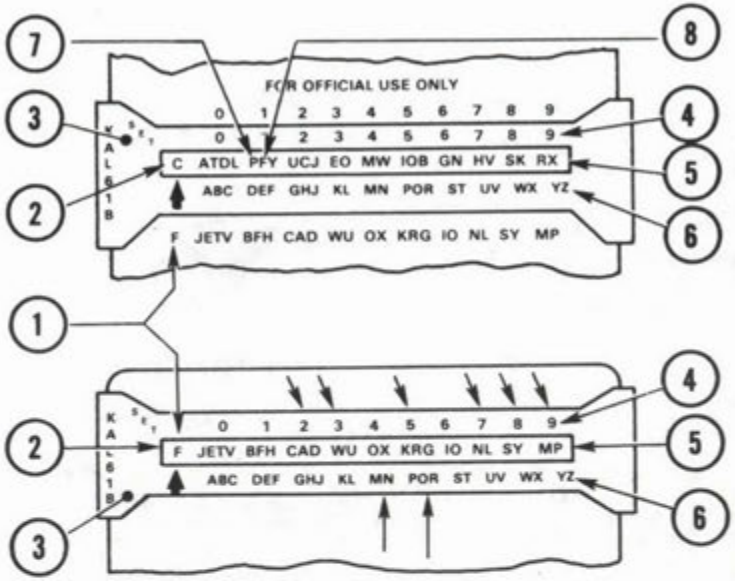
b. If grid zone letters are included, the third and fourth letters will be encrypted grid zone letters. EXAMPLE: XG. (This is transmitted as "X-RAY GOLF".)

c. Remaining letters (including third and fourth if grid zone letters are not included) will be encrypted numbers. EXAMPLE: RNAMUS. (This is transmitted "ROMEO NOVEMBER ALFA MIKE UNIFORM SIERRA".)

NOTE: An encrypted, six-digit location which includes grid zone letters will consist of ten letters, including the SI which is always the first two letters. The entire encrypted location would be transmitted as "I set CHARLIE PAPA, (pause), X-RAY GOLF ROMEO NOVEMBER ALFA MIKE UNIFORM SIERRA".

4. ARRANGEMENT AND TRANSMISSION OF MESSAGES

(PROTECTIVE MARKING)



1. Line Indicator Column
2. Set Letter/First Letter of Set Indicator
3. Reader Guide
4. Plaintext Numbers
5. Cipher Letters
6. Plaintext Letters for UTM Grid Zone Designators
7. Second Letter of Set Indicator
8. Set Letter

(PROTECTIVE MARKING)

NAO 3B

TO DECRYPT

Example encrypted location: CP XG RNAMUS. (Transmitted as, "I set CP (pause) XG RNAMUS".)

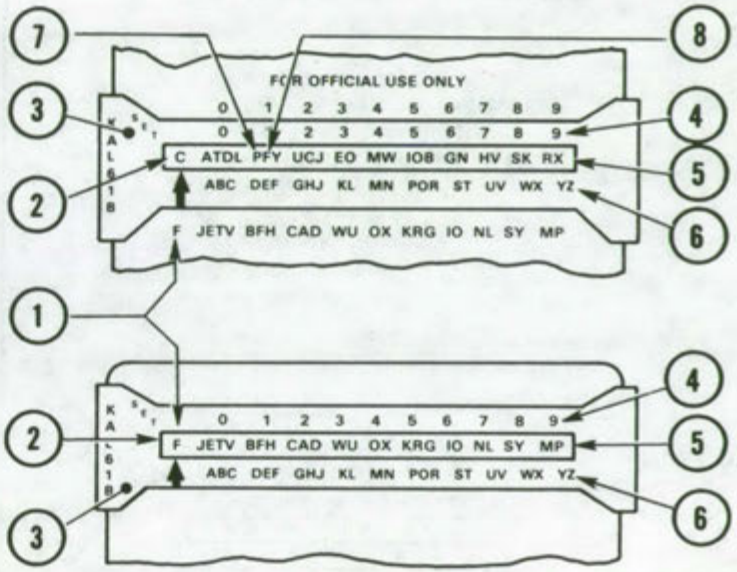
Step 1. Find SET LETTER "F" using the SI "CP" as described in "TO SET UP FOR ENCRYPTING" Steps 2 and 3.

Step 2. Decipher message beginning with the third letter "X" by substituting plaintext letters/numbers on the READER GUIDE (3) for the cipher letters.

5. TO DECRYPT

(PROTECTIVE MARKING)

NAO 3B



1. Line Indicator Column
2. Set Letter/First Letter of Set Indicator
3. Reader Guide
4. Plaintext Numbers
5. Cipher Letters
6. Plaintext Letters for UTM Grid Zone Designators
7. Second Letter of Set Indicator
8. Set Letter

(PROTECTIVE MARKING)

NOTE: AUTHENTICATION MAY BEST BE ACCOMPLISHED BY MOVING READER GUIDE COMPLETELY OUT OF THE WAY OR ELSE POSITIONING IT SO AS NOT TO OBSCURE REPLY LINE.

TO AUTHENTICATE

Challenge and Reply

Step 1. Select any two letters (except Z) at random for challenge. EXAMPLE: KV.

Step 2. Find first letter "K" of challenge in the LINE INDICATOR COLUMN.

Step 3. Find second letter "V" of challenge in line indicated by first letter. The correct reply (E) is the cipher letter directly under the second letter "V" of the challenge.

NOTE: If the first letter of the challenge is "Y" indicating the last line of the table, the reply should be taken from the "A" line and will be the letter in the same position as the second letter of the challenge in the "Y" line.
If challenged party does not reply within 5 seconds but does reply correctly, challenge that party again using a different challenge.

NOTE: The called party will make the first challenge. Both the person making the challenge and the person being challenged must find the correct reply. The party making the call may then counter-challenge the called party using a different challenge.

Transmission Authentication

One hundred Transmission Authentication digraphs have been provided in this system. They are to be used in cases where authentication is required and it is not possible or desirable that the receiving station reply. The Transmission Authentication table consists of ten numbered columns containing ten digraphs each. Columns have been numbered to make the assignment of Transmission Authentication digraphs easier. Numbered columns should be assigned by the Controlling Authority to selected communications nets within his cryptonet. **Authentication digraphs within the numbered columns should be used only once, and only within the Controlling Authority's net.** When it becomes necessary to use Transmission Authentication, the first or next unused digraph in the assigned column will be used.

6. TO AUTHENTICATE.

NAO 3B

	0	1	2	3	4	5	6	7	8	9
A	VDFJ	AUM	IHC	EL	XW	YNO	GT	QK	PS	RB
B	CIFN	WKV	BDQ	ES	RH	YOJ	XL	AT	UG	PM
C	QSXJ	CFY	OGD	RT	UA	VIN	KH	EM	WP	LB
D	IOBS	JKQ	FEG	DP	MN	XWL	CH	TA	VU	RY
E	KLPA	MJX	QDY	CH	CW	VFE	BT	RN	UI	OS
F	VUCI	EPA	NXY	TH	BQ	QGJ	LK	WR	FM	DS
G	NYAO	UFK	GJW	QI	DT	BLH	ES	VR	CX	PM
H	KHIV	GYC	RPS	FO	JX	QWA	TU	DB	EM	NL
I	BWOA	DPJ	UGY	NH	RE	VCI	TS	LM	FQ	KX
J	PCWX	RQF	JVM	OY	HS	EGD	BN	KT	UA	IL
K	CQPK	ASM	TDJ	WX	IH	NUR	GB	OL	YE	VF
L	BWRF	JPC	QON	AV	HG	IML	DU	SK	YX	ET
M	HQIA	XLC	FVB	SK	OJ	MUD	RW	YN	GE	TP
N	CWQF	KJS	XHP	AE	TN	UGY	VL	MD	RI	OB
O	NWFD	QBS	RJX	PH	YT	ICM	OG	AV	LU	KE
P	PAFT	NSC	DGR	QM	WX	HKI	OE	YJ	UB	LV
Q	SNGD	JTP	WYI	CR	BE	UOV	MX	FH	QK	LA
R	AMRH	NJG	QUY	SE	IO	KDL	PV	XC	WB	FT
S	YWGS	VXE	IDC	KQ	OA	TPH	BU	JR	ML	NF
T	BCDL	FOR	AUT	NV	GW	SXK	PI	ME	HQ	JY
U	RMQD	WVS	YJX	TG	UL	FEK	PB	OA	NH	IC
V	BOKA	HXG	SLC	PD	JT	EFQ	IV	WM	RN	UY
W	ASLW	YVD	TRO	BE	CI	PFX	HG	MN	JQ	KU
X	DLTV	NEQ	PAS	XB	OC	MHJ	KW	RF	IG	YU
Y	XSIC	YGP	NFW	HE	KL	JAR	VO	QD	TM	BU

DAY 17 KTC 1400 A

7. SAMPLE TABLE

(PROTECTIVE MARKING)

NAO 3B

SECURITY THOUGHTS

Following are common rules to achieve security:

a. Change message set after 15 numbers are encrypted.

b. Encrypt brevity values.

c. Never encrypt or decrypt a message and then repeat it in plain language.

d. Avoid the encrypting of information known to the enemy.

e. Make all transmissions as short as possible.

f. Remember that anyone can listen to your transmission.

INSTRUCTIONS FOR INSERTING CIPHER TABLE IN KAL 61

1. Unfasten flap at the bottom of device and bend back out of the way.

2. Slide the cipher table face up under the lips at the top and sides of the device.

3. Before refastening the flap, adjust cipher table so that the top register marks (+) at the bottom of the table will align precisely with the snaps when the flap is fastened.

TRANSMISSION AUTHENTICATION TABLE

01	02	03	04	05	06	07	08	09	10
HA	VX	YM	WT	MY	OE	JR	AY	RB	IP
DM	VB	ZF	MP	QV	XI	TX	TF	WE	VH
JP	YQ	QL	MA	SS	JZ	SG	XJ	EX	AO
SQ	VC	OR	IS	BM	HN	HB	VN	HW	ZK
NK	UD	FU	CM	YF	YN	HM	NF	VK	EG
OD	CC	WA	UF	QC	OQ	MW	GD	CD	XA
SW	MQ	QP	ES	YL	ZY	SV	IB	AR	ZL
RG	KM	RL	GO	OF	OK	BX	II	ND	EA
MM	OH	QK	RZ	NE	ZT	AN	FG	GB	PB
IF	DC	UV	SB	FA	VZ	MD	BD	XE	HR

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(PROTECTIVE MARKING)

NOTE: NEVER self-authenticate using challenge and reply authentication. If self-authentication is required, use one of the two letter digraphs found in the Transmission Authentication Table (KTC 1400) assigned to your unit.

REFERENCE:

TC 24-2, The Automated "CEOI", Dec 75 (all)

TASK NUMBER: 113-571-2002

ENCODE AND DECODE MESSAGES USING A KTC-600 TACTICAL OPERATIONS CODE

CONDITIONS:

Given dates and times, CEOI, tactical operations code KTC-600, and a message to be encoded or three-letter code groups to be decoded.

STANDARDS:

Encode or decode the message, without error, within 30 seconds per code group or word/phrase.

PERFORMANCE MEASURES:

1. **Use of code sets.** Each set of the KTC-600 tactical operations code is effective for a given time frame, not to exceed 48 hours. Time of change will be directed in the CEOI (could be days of the month or days of any given operation). Sets are used as follows:

EXAMPLE ONLY

SET	EFFECTIVE DAYS (of the month or operation as directed by the CEOI)
1	1 and 2
2	3 and 4
3	5 and 6
4	7 and 8

2. **To encode.**

a. After writing out your message in plain text, turn to the code set used on that day (see example above; on the 5th day of the month (or operation), you would use set 3).

b. The encoded portion of the operations code is made up of words and phrases commonly used in tactical operations which are arranged in alphabetical order as in a dictionary. To the left of each is a three-letter code group which is the code for that word or phrase.

c. Procedure to encode words or phrases:

(1) Find the word or phrase to be encoded.

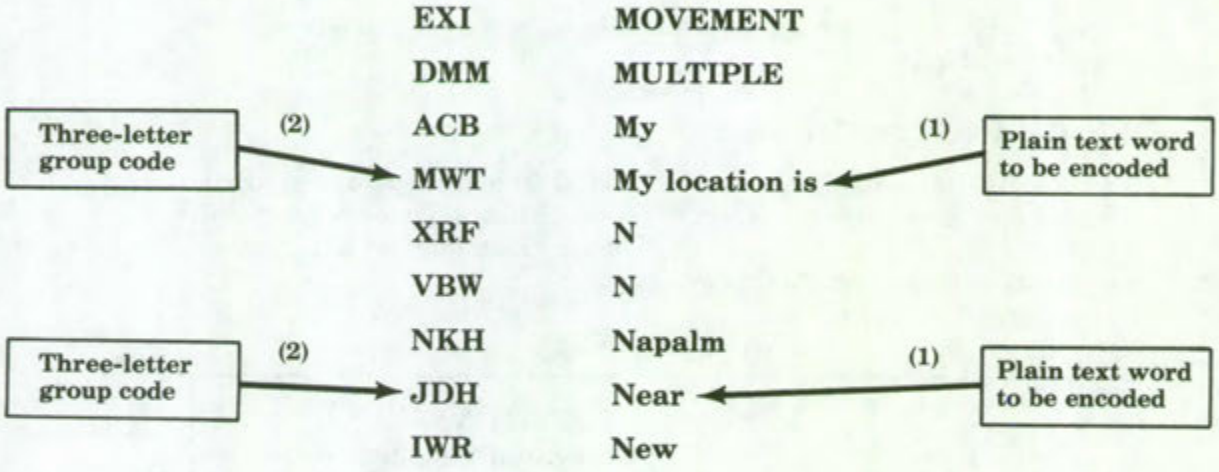
(2) Identify the three-letter code group located to the left of that word or phrase.

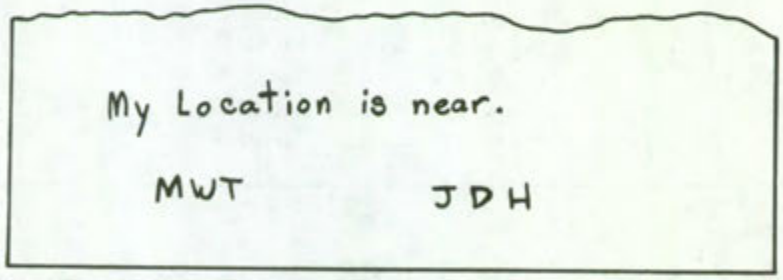
(3) Write that three-letter code group under the word or phrase where you have written out the message to be encoded.

(4) Repeat this procedure until the whole message is encoded.

(EXAMPLE ONLY)

Message: "My location is near."





NOTE: Two code groups are provided for spelling a word that contains double letters. Do not use identical code groups side by side when you are spelling a word that contains double letters.

3. **To decode.**

a. After receiving and writing down the encoded message, check the CEOI and turn to the code set in effect for that day.

b. The decode portion of the operations code is made up of a column of three-letter code groups in alphabetical order (AAO, ABL, ABY, etc.) with a word or phrase to the right of each group.

c. To decode a received message, find the code group and write the word/phrase next to it under that group in the encoded message which you copied.

(EXAMPLE ONLY)

Coded Message: "MWT JDH"

	J	
	JCW	**Here**
Three-letter group code →	**JDH**	**Near** ← **Plain text word decoded**
	NDU	**O**
	M	
	VMM	**Comma (,)**
	MWF	**Period (.)**
Three-letter group code →	**MWT**	**My location is** ← **Plain text word decoded**
	MWY	**Convoy (s)**
	MXB	**Effect-ed-ing**

MWT JDH

My Location is near.

NOTE: You can save some time when encoding or decoding by going in alphabetical order. When encoding, look up all words/phrases starting with A, then B, etc. When decoding, look up all code groups beginning with A, then B, etc.

4. **Radio procedure.**

a. After contact is established, the station sending the encoded message uses the following prowords/procedures.

(1) "Message". Lets the receiving station know that a message is going to be sent THAT REQUIRES RECEIVING STATION to copy.

(2) "Groups". The number of groups in the message is provided so that the receiving station can check his copy. The receiving station should write this number down.

(3) Groups are transmitted phonetically (that is, each letter is pronounced as a word, as given in the military phonetic alphabet). Transmission should be slow, with a pause between each group.

EXAMPLE: If station F07 is going to transmit the message, "Execute plan B" to station F26 and the encoded message is "BCA ONM ZYX," the transmission would be: (-- indicates a pause)

(sending station) "FOXTROT TOO SIX -- THIS IS FOXTROT ZERO SEVEN -- MESSAGE - OVER"

(receiving station) "FOXTROT TOO SIX -- OVER"

(sending station) "GROUPS THREE -- "

BRAH-VOH	CHAR-LEE	AL-FAH
-- OSS-CAH	NO-VEM-BER	MIKE
-- ZOO-LOO	YANG-KEY	ECKS-RAY
-- OVER		

b. After the message is received and copied, and before it is decoded, the following procedures and prowords may be used:

(1) "Interrogative groups". Used by the receiving station when his group count is not the same as the sending station told him it would be. The receiving station's group count follows the word "groups".

(2) "Correct, out". Used by the sending station when the receiving station's interrogative group count is correct.

(3) "Groups" followed by a series of phonetic letters. Used by the sending station when the interrogative group count is wrong. The right group count follows the word "groups" and the first letter of each group is sent again. The receiving station checks these letters against the message he copied and finds his mistake.

(4) "Say again." Used by the receiving station to ask the sending station to retransmit a group(s) not received. The number of the group missed is put in the blank (Example: "Say again five" means that the sending station should resend the fifth group in the message).

c. Once the message has been decoded and a word (or all of the message) does not make sense, the receiving station should:

(1) Check to see if he has used the right code set.

(2) If the right code set was used, the receiving station should recontact the sending station and have him check the code group (or message) by using the pro-word "verify." (Examples: "Verify ONM" if ONM when decoded does not make sense; or "Verify message" if the whole message does not make sense.) The sending station then encodes and sends that portion again.

NOTE: Each set in the operations code has "spares" assigned. These spares can be used if all stations are informed of their meaning in advance. A word not included in the code or an entire message may be assigned to a "spare" group, or be spelled out using the letters listed in the operations code for that set.

REFERENCES:

Unit CEOI (Communications-Electronic Operating Instructions) (Classification)
TEC Lesson 936-061-0109-F, RTP: Part 2, Writing down messages received by radio
TEC Lesson 936-061-0111-F, RTP: Part 4, Preparing messages to be sent
TEC Lesson 936-061-0112-F, RTP: Part 5, Sending & Receiving Messages

NOTE: This instruction is not classified insofar as explaining encoding and decoding messages.

TASK NUMBER: 113-571-1003

ESTABLISH AND ENTER OR LEAVE A RADIO NET

CONDITIONS:

1. **Situation 1:** Given an operational tactical FM radio set, the appropriate CEOI extracts, KAL 61 and KTC 1400, two or more stations, and a requirement to establish a radio net.

2. **Situation 2:** Given you are operating in an established radio net, appropriate CEOI extracts, KAL 61 and KTC 1400, and a requirement to enter a radio net in which you do not normally operate.

STANDARDS:

1. **Situation 1:** Open the net for traffic by transmitting the net callsign and the additional calls required to get a responding call to the net control station (NCS).

2. **Situation 2:** Using the appropriate CEOI extract, determine the frequency and callsigns for the net you are to enter and your item number identifier, then request permission to leave your net and enter that net.

PERFORMANCE MEASURES:

1. When establishing a radio net, the following actions must be accomplished:

a. Extract appropriate callsigns, suffixes, and frequency from the CEOI.

b. Prepare and operate the appropriate FM radio set.

c. Identify the net structure and determine the answering sequence, and make the appropriate response to the individual stations (figure 1).

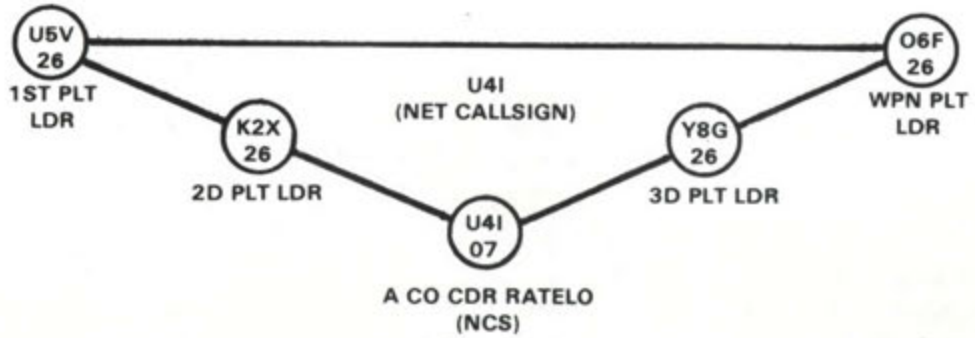


Figure 1.

(1) Establishing a net.

(a) Proper control by the NCS and adherence to operating rules by subordinate stations will enable a radio net to begin, maintain, and exchange messages with minimum delay. The use of procedure as prescribed herein must be followed when establishing a net.

EXAMPLE: When ready to establish the net, U4I07 transmits: U4I - THIS IS U4I07 - OVER.

(b) Each subordinate station then answers the call in alphabetical-numerical order according to callsigns.

U4I07 - THIS IS 06F26 - OVER

U4I07 - THIS IS Y8G26 - OVER

U4I07 - THIS IS U5V26 - OVER

U4I07 - THIS IS K2X26 - OVER

(c) The NCS now calls the net to inform all stations that their transmissions were received satisfactorily, and that he has no messages for them.

U4I - THIS IS U4I07 - ROGER - OUT

(2) Upon direction of the NCS, provided no confusion will result, callsigns other than the net callsign may be abbreviated by omitting their first two characters.

(3) All stations in the net should be prepared to authenticate when challenged.

(4) If any stations in the net do not answer the net callsign, the NCS will make individual calls to those stations in an attempt to establish communication.

(5) If any station in the net is unable to communicate with the NCS due to faulty equipment or unsuitable location, a report will be made to the NCS as soon as possible by means other than radio.

2. When entering a net in which you do not normally operate, the following procedure normally will be used:

Step 1. Request permission from your NCS to leave your assigned radio net.

Step 2. Go to the index of your CEOI and find the Item Number Identifier item number; turn to that item number and determine your two-letter identification using the correct time period.

Step 3. Using your CEOI index, locate the net for which you wish to enter, and turn to that item number; obtain the NCS callsign and the callsign of the station that you wish to send a message to.

Step 4. Determine the correct frequency using the CEOI for the net you are to enter.

Step 5. Call the NCS station for the net for which you wish to enter and request permission to enter the net.

NOTE: Before transmitting, monitor the frequency to insure you do not cut in on someone else's transmission.

Step 6. The NCS will require you to authenticate prior to giving you permission to enter the net. After permission is granted to enter the net, send your message.

Step 7. After sending your message, request permission to leave that net from the NCS. Upon receiving permission to leave the net, call your NCS and request permission to reenter the net.

EXAMPLE: "T3F07" wishes to enter a net which is controlled by "R7G28."

ROMEO SEVEN GOLF TOO AIT - THIS IS TANGO TREE FOXTROT ZERO SEVEN - REQUEST PERMISSION TO ENTER THE NET - OVER

TANGO TREE FOXTROT ZERO SEVEN - THIS IS ROMEO SEVEN GOLF TOO AIT - AUTHENTICATE ---- ---- OVER

ROMEO SEVEN GOLF TOO AIT - THIS IS TANGO TREE FOXTROT ZERO SEVEN - I AUTHENTICATE ---- ---- OVER

TANGO TREE FOXTROT ZERO SEVEN - THIS IS ROMEO SEVEN GOLF TOO AIT - ROGER - IDENTIFY YOUR STATION - OVER

ROMEO SEVEN GOLF TOO AIT - THIS IS TANGO TREE FOXTROT ZERO SEVEN - REFER TO ALPHA CHARLIE - OVER

TANGO TREE FOXTROT ZERO SEVEN - THIS IS ROMEO SEVEN GOLF TOO AIT - ROGER - PERMISSION GRANTED TO ENTER THE NET - OUT

3. Any station desiring to leave a net simply requests permission from the NCS.

REFERENCES:

FM 24-1, Combat Communications, Sep 76 (app N, pages N-1 thru N-3, N-9 thru N-14)
TC 24-2, Communications-Electronics Operation Instructions, Dec 75 (part 2, pages 10 thru 11; part 5, pages 23 thru 42)
ACP-125 (D), Communications Instructions -- Radio-Telephone Procedure, Jul 70 (chap 3, pages 3-1 and 3-3 thru 3-25, para 301 thru 321)
TEC Lesson 936-061-0113-F, RTP: Part 6, Entering and Leaving a Radio Net and Authenticating

TASK NUMBER: 113-571-1001

TRANSMIT AND RECEIVE A RADIO MESSAGE

CONDITIONS:

Situation 1: Given KAL 61 and KTC 1400, a correctly installed and operational FM radio (vehicular or portable) operating in a net on a designated frequency, and the requirement to transmit a written or oral message to a designated station using correct radio procedures.

Situation 2: Given KAL 61 and KTC 1400, a pencil, paper, a correctly installed and operational FM radio (vehicular or portable) operating in a net on a designated frequency, and the requirement to receive a radio transmission from another station that is either clear text, coded, or a combination of clear text and code.

STANDARDS:

1. Transmit and receive all messages using the correct prowords.

2. Transmit all numerals phonetically as shown in paragraph 2 of the performance measures.

3. Receive a radio transmission by correctly writing the message down and relaying to addressee, or relaying the message orally, word for word as received, to the addressee.

4. Transmit a message, using correct radio procedure and transmit the message as written or stated.

5. State the correct procedures to use if you are being jammed.

PERFORMANCE MEASURES:

1. Transmit PROWORDS where their intended meanings are appropriate as listed below:

PROWORDS LISTED ALPHABETICALLY

PROWORD	EXPLANATION
ALL AFTER	The portion of the message to which I have reference is all that which follows . . . .
ALL BEFORE	The portion of the message to which I have reference is all that which precedes . . . .
AUTHENTICATE	The station called is to reply to the challenge which follows . . . .

PROWORD	EXPLANATION
AUTHENTICATION IS	The transmission authentication of this message is . . . .
BREAK	I hereby indicate the separation of the text from other portions of the message.
CORRECTION	An error has been made in this transmission. Transmission will continue with the last word correctly transmitted.
GROUPS	This message contains the number of groups indicated by the numeral following . . . .
I AUTHENTICATE	The group that follows is the reply to your challenge to authenticate . . . .
I SAY AGAIN	I am repeating transmission or portion indicated.
I SPELL	I shall spell the next word phonetically.
MESSAGE	A message which requires recording is about to follow. (Transmitted immediately after the call. This proword is not used on nets primarily employed for conveying messages. It is intended for use when messages are passed on tactical or reporting net.)
MORE TO FOLLOW	Transmitting station has additional traffic for the receiving station.
OUT	This is the end of my transmission to you and no answer is required or expected.
OVER	This is the end of my transmission to you and a response is necessary. Go ahead; transmit.
RADIO CHECK	What is my signal strength and readability, i.e., how do you hear me.
ROGER	I have received your last transmission satisfactorily, loud and clear.
SAY AGAIN	Repeat all of your last transmission. Followed by identification data means "Repeat——(portion indicated)."
THIS IS	This transmission is from the station whose designator immediately follows.
TIME	That which immediately follows is the time or date-time group of the message.
WAIT	I must pause for a few seconds.

PROWORD	EXPLANATION
WAIT-OUT	I must pause longer than a few seconds.
WILCO	I have received your signal, understand it, and will comply. To be used only by the addressee. Since the meaning of ROGER is included in that of WILCO, the two prowords are never used together.
WORD AFTER	The word of the message to which I have reference is that which follows . . . .
WORD BEFORE	The word of the message to which I have reference is that which precedes . . . .

2. Transmit isolated letters and abbreviations; phonetically spell unusual or difficult words using the phonetic alphabet as listed below: (See sample message transmission for correct procedure.)

A ALFA (AL FAH)	B BRAVO (BRAH VOH)	C CHARLIE (CHAR LEE)	D DELTA (DELL TAH)
E ECHO (ECK OH)	F FOXTROT (FOKS TROT)	G GOLF (GOLF)	H HOTEL (HOH TELL)
I INDIA (IN DEE AH)	J JULIETT (JEW LEE ETT)	K KILO (KEY LOH)	L LIMA (LEE MAH)
M MIKE (MIKE)	N NOVEMBER (NO VEM BER)	O OSCAR (OSS CAH)	P PAPA (PAH PAH)
Q QUEBEC (KEH BECK)	R ROMEO (ROW ME OH)	S SIERRA (SEE AIR RAH)	T TANGO (TANG GO)
U UNIFORM (YOU NEE FORM)	V VICTOR (VIK TAH)	W WHISKEY (WISS KEY)	X XRAY (ECKS RAY)
Y YANKEE (YANG KEE)	Z ZULU (ZOO LOO)	1 WUN	2 TOO
3 TREE	4 FOW-er	5 FIFTH	6 SIX
7 SEV-en	8 AIT	9 NIN-er	0 ZE-RO

Accented syllables are underlined.

3. Numbers will be transmitted digit by digit except that exact multiples of thousands may be spoken as such. However, there are special cases, such as identifying a specific code group in a coded message, when the normal pronunciation of numerals is prescribed; for example, 17 would then be "seventeen."

NUMERAL	SPOKEN AS
44	FOW-ER FOW-ER
90	NIN-ER ZE-RO
136	WUN TREE SIX
500	FIFE ZE-RO ZE-RO
1200	WUN TOO ZE-RO ZE-RO
1478	WUN FOW-ER SEV-EN AIT
7000	SEV-EN TOU-SAND
16000	WUN SIX TOU-SAND
812681	AIT WUN TOO SIX AIT WUN

SAMPLE MESSAGE: ROAD TO TILLEPS WILL BE FLOODED BY 1800 HRS. INITIATE PLAN B.

TRANSMITTING STATION CALLSIGN: Z8C28

RECEIVING STATION CALLSIGN: U4I07

——— (SAMPLE TRANSMISSION) ———

(TRANSMITTING STATION):

INDIA ZERO SEVEN - THIS IS CHARLIE TOO
AIT - MESSAGE - OVER

(RECEIVING STATION):

INDIA ZERO SEVEN - OVER

(TRANSMITTING STATION):

ROAD TO TILLEPS - I SPELL - TANGO INDIA LIMA LIMA ECHO PAPA SIERRA - TILLEPS - WILL BE FLOODED BY WUN AIT ZERO ZERO HOTEL ROMEO SIERRA - PERIOD - INITIATE PLAN BRAVO - PERIOD - OVER

(RECEIVING STATION):

WILLCO - OUT

4. Jamming is intentional radio interference caused by the enemy. If the enemy has the capability to jam the frequencies used, each radio operator should:

a. Learn to recognize enemy jamming and report details to the supervisor of the radio station.

b. Learn to readjust the set to minimize the effects of enemy jamming.

c. Operate with minimum power until jammed – then increase the power.

d. Shift to alternate frequencies and callsigns as directed.

e. Authenticate all transmissions.

f. KEEP OFF THE AIR as much as possible. Transmit only when absolutely necessary.

g. Observe radio discipline at all times.

h. Keep transmissions as short as possible.

i. Keep calm, keep trying, and keep operating when the circuit is jammed.

j. Do not mention you are being jammed on the radio.

REFERENCES:

FM 24-1, Combat Communications, Sep 76 (app N, pages N-1 thru N-5, N-9 thru N-14)
ACP-125 (D), Communications Instructions -- Radio-Telephone Procedures, Jul 70 (chap 3, page 3-1, para 3-2; pages 3-8 thru 3-10, para 3-7 thru 3-9; page 3-22, para 3-18)

TEC Lesson 936-061-0108-F, RTP: Part 1, Initiating and Responding to Radio Call
TEC Lesson 936-061-0109-F, RTP: Part 2, Writing Down Messages Received by Radio
TEC Lesson 936-061-0110-F, RTP: Part 3, Responding to Messages
TEC Lesson 936-061-0111-F, RTP: Part 4, Preparing Messages to be Sent
TEC Lesson 036-061-0112-F, RTP: Part 5, Sending and Receiving Messages

TASK NUMBER: 113-594-2005

PREPARE/OPERATE SWITCHBOARD SB-993

CONDITIONS:

Given an SB-993, a radio/wire net CEOI, switchboard designators, and 3 personnel with equipment to act as receiving stations.

STANDARDS:

Place the SB-993 into operation and make communication check with receiving stations within 5 minutes.

PERFORMANCE MEASURES:

1. **General.** Manual telephone switchboards are designed for use in several types of operation, such as common battery (CB), local battery (LB), and common battery signaling (CBS). In a common-battery system, the source of electrical energy for speech and ringing signals is located at the switchboard telephone central. In a local-battery system, this source of electrical energy is supplied by the station (both the switchboard and the telephone set). In the other system (CBS, LB operation), the source of power for speech is part of the telephone set; the power for signaling the switchboard is located at the switchboard.

2. **Manual Telephone Switchboard SB-993 ()/GT.** Manual telephone switchboard SB-993/GT (figure 1) is a light, portable local battery switching center normally used in company-size units. It consists of a plug holder and seven two-pronged adapter connectors U-184 ()/GT in a case. A field telephone is required for the operator's use. The SB-993()/GT may be used as an emergency field replacement for any local battery switchboard. Manual telephone switchboard SB-993/GT weighs 2¼ pounds. It will handle an operator's line and six local battery wire circuits. Manual telephone switchboard SB-993/GT consists of --

a. A canvas carrying case to protect and carry the switchboard when not in use.

b. An adapter connector holder to hold the adapter connectors in position for operation.

c. Seven adapter connectors U-184/GT, six of which are used to attach the six incoming wire circuits to the switchboard. The seventh adapter connector is connected to a field telephone for the switchboard operator.

d. A 7-foot mounting strap to secure the adapter connector holder to a tree or table for support when in use.

3. **Adapter Connector U-184/GT.**

a. Each adapter connector U-184/GT consists of a neon glow lamp, two binding posts, two plugs, and two jacks, all molded together in a translucent plastic housing. The connectors serve as the thumbscrew ends of binding posts to which incoming lines are connected. The connectors may be inserted into the jacks of another adapter connector U-184/GT to connect two lines.

b. Several adapter connectors U-184/GT can be connected in tandem for conference connections (several separate parties conversing at the same time).

c. An incoming ringing signal lights the neon lamp in the switchboard plug connected to the line, for the duration of the signal. An audible signal is not heard when the neon lamp lights, unless the switchboard operator's telephone is connected to that line. Thus, the operator must be constantly watching for an incoming signal.

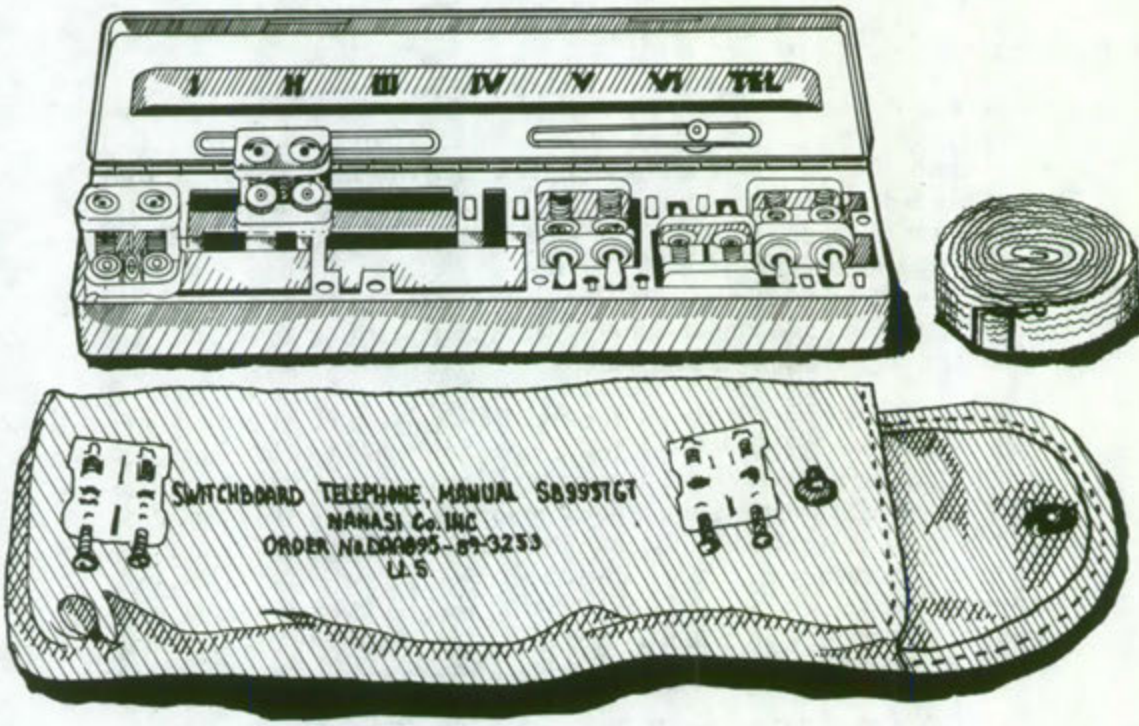


Figure 1.

REFERENCES:

FM 24-20, Field Wire and Cable Techniques, Feb 70 (chap 12, pages 244 thru 246, para 154 thru 156)
TM 11-5805-294-15, Switchboard, Telephone, Manual SB-992/GT, Oct 59, (chap 2, pages 6-7, para 7-11)

TASK NUMBER: 113-609-1001

INSTALL AND OPERATE COMMUNICATIONS SECURITY EQUIPMENT TSEC/KY-8 USING RT-524/VRC

CONDITIONS:

This task is performed under all weather conditions in a field or a garrison location. Given security equipment TSEC/KY-8, a tactical FM radio set, TM 11-580-300-12, and all cables necessary to install the TSEC/KY -8.

STANDARDS:

Within 10 minutes, install the security equipment TSEC/KY-8 IAW performance measures 1 and 2 below.

PERFORMANCE MEASURES:

1. **To install security equipment TSEC/KY-8 with remote control unit (RCU)** (Refer to TM 11-5810-300-12, para 2-20 and 2-30.):

a. Place TSEC/KY-8 in mount and secure locking levers.

b. Connect all cables.

c. Switch radio power OFF (when using RT-524/VRC).

d. Switch RCU power OFF.

e. Switch RCU to CIPHER.

f. Switch TSEC/KY-8 to REMOTE.

g. Key the TSEC/KY-8. (CLASSIFIED).

h. Switch RCU power ON.

i. Perform TSEC/KY-8 alarm test (pause at each position; RED light should blink on and beeps should be heard).

j. Perform these steps for KYK-5 only:

(1) Flip ZEROIZE switch.

(2) Make CIPHER transmission - BEEPS should be heard and PLAIN (RED) light should flash.

(3) Turn RCU OFF.

(4) Key KYK-5 again. (CLASSIFIED)

(5) Turn RCU power ON.

(6) Press PUSH-TO-TALK; single BEEP should be heard.

(7) Begin SECURE transmission.

k. For subsequent transmissions, only steps (5) and (6) above apply.

NOTE: If a constant series of BEEPS is heard or flashing RED light occurs during CIPHER transmissions, repeat entire first start. If problem reoccurs, switch to PLAIN voice and notify your supervisor or support maintenance facility.

l. In an **emergency**, eliminate key according to local ZEROIZE procedures.

2. **To install TSEC/KY-8 (without remote control unit)** (refer to TM 11-5810-300-12, para 2-20 and 2-31):

a. Place TSEC/KY-8 in mount and secure all locking levers.

b. Connect all cables.

c. Switch radio power OFF (when using RT-524/VRC).

d. Switch TSEC/KY-8 power OFF.

e. Switch TSEC/KY-8 to CIPHER.

f. Switch TSEC/KY-8 to LOCAL.

g. Key the TSEC/KY-8 (CLASSIFIED).

h. Turn TSEC-KY-8 power ON.

i. Perform TSEC/KY-8 alarm test. (Pause at each position; BEEPS should be heard and PLAIN (RED) light should flash.)

j. Perform these steps for KYK-5 only:

(1) Open KYK-5 door.

(2) Make CIPHER transmission; BEEPS should be heard and PLAIN (RED) light should flash.

(3) Turn TSEC/KY-8 OFF.

(4) Key equipment again (CLASSIFIED).

(5) Turn TSEC/KY-8 ON.

k. Press PUSH-TO—TALK; get single BEEP.

l. Begin secure transmission.

m. For subsequent transmission only, steps k and l above apply.

n. In an emergency, eliminate key according to local ZEROIZE procedures.

NOTE: If a constant series of BEEPS is heard or flashing RED light occurs during any CIPHER transmission, repeat entire first start. If problem reoccurs, switch to PLAIN voice and notify your supervisor or support maintenance facility.

REFERENCES:

TM 11-5810-300-12, Operator's and Organizational Maintenance Manual for NESTOR Communications Systems Using TSEC/KY-8 and TSEC/KY-38 with Radio Sets and Associated Equipment (FOUO), Sep 75 (chap 2, para 2-20, 2-30 & 2-31, page 2-20).

TASK NUMBER: 113-609-1002

INSTALL AND OPERATE SPEECH SECURITY EQUIPMENT TSEC/KY-38 USING RT-841/PRC-77

CONDITIONS:

This task will be performed under any weather conditions in a field or a garrison location. Given radio set AN/PRC-77, speech security equipment TSEC/KY-38, TM 11-5810-245-10 (CLASSIFIED), batteries, and all cables needed to install and operate the security equipment for manpack operation.

STANDARDS:

Within 10 minutes, install and operate the speech security equipment TSEC/KY-38 IAW performance measures 1 through 3 below.

PERFORMANCE MEASURES:

1. To install TSEC/KY-38 (first start). (Refer to figure 2-7 of (C) TM 11-5810-245-10.)

a. Connect cable from POWER connector on radio to RADIO connector on TSEC/KY-38.

CAUTION: Insure that batteries are properly installed in TSEC/KY-38 and radio set AN/PRC-77.

b. Connect handset cable to TSEC/KY-38 AUDIO plug.

c. Key the TSEC/KY-38 (classified).

2. Operate TSEC/KY-38. (Refer to para 2-32, (C) TM 11-5810-245-10.)

a. First start (daily).

(1) Turn radio set FUNCTION switch to ON.

(2) Switch TSEC/KY-38 to CIPHER.

(3) Switch TSEC/KY-38 DELAY to IN.

(4) Press handset PUSH-TO-TALK switch and wait for three rapid beeps then one lower-pitched beep.

(5) Begin SECURE transmission.

b. Subsequent transmissions.

(1) Switch DELAY to OUT (unless operating with a retransmission station using HYL-3/TSEC).

(2) Press handset PUSH-TO-TALK switch and wait for one beep.

(3) Begin SECURE transmissions.

NOTE: If a constant series of beeps is heard during any CIPHER transmission, repeat entire first start. To clear the equipment in an emergency, turn ZEROIZE switch clockwise (toward direction of arrow).

3. Follow these procedures to remedy minor problems. (Refer to para 3-12 of (C) TM 11-5810-245-10.)

SYMPTOMS	CORRECTIVE MEASURES
a. First indication of trouble.	Clean cable connections with pencil eraser and repeat first start procedure.
b. No beeps or no steady tone.	Rotate batteries and repeat first start procedure.
c. Dead handset.	Replace batteries and repeat first start procedure.
d. Steady tone.	Verify correct key setting, key equipment again, and repeat first start.
e. Constant series of beeps.	Release PUSH-TO-TALK switch and try again.
f. Still beeps.	Verify key setting, key equipment again, and repeat first start procedure.

NOTE: If problem cannot be solved by the above remedies, switch to PLAIN voice and notify your supervisor or support maintenance personnel.

REFERENCES:

TM 11-5810-245-10 (CLASSIFIED)

TASK NUMBER: 113-622-1002

INSTALL RADIO SET CONTROL GROUP AN/GRA-39

CONDITIONS:

This task is performed under all weather conditions in a field or a garrison location. Given Radio Set Control Group AN/GRA-39, TM 11-5820-477-12, an installed tactical FM radio set (using RT-524/VRC or RT-841/PRC-77), ¼-mile of field wire WD-1/TT on reel DR-8, 12 BA-30 batteries, and Tool Equipment TE-33.

STANDARDS:

Within 15 minutes, install the radio set control group IAW the performance measures below.

PERFORMANCE MEASURES:

1. **Preparing Local Control Unit C-2329/GRA-39 for Operation** (figure 1a).

a. Unsnap the two rear cover clamps and remove the rear cover.

b. Inspect the battery compartment, and if needed, clean compartment and battery contacts with a pencil eraser.

c. Install six BA-30 batteries according to the instructions on the rear of the case, and insure battery terminals are in contact with the battery contacts (figure 2).

(1) Insure batteries are held in place under tension.

(2) Insure that battery compartment case is not cracked.

(3) Replace the rear cover and clamp it.

(4) Insure all operating controls are free from internal or external binding.

2. **Preparing Remote Control Unit C-2328/GRA-39 for Operation** (figure 1b).

a. Follow the procedures in para 1, above.

b. Position the remote control unit as required (up to 2 miles from the local control unit).

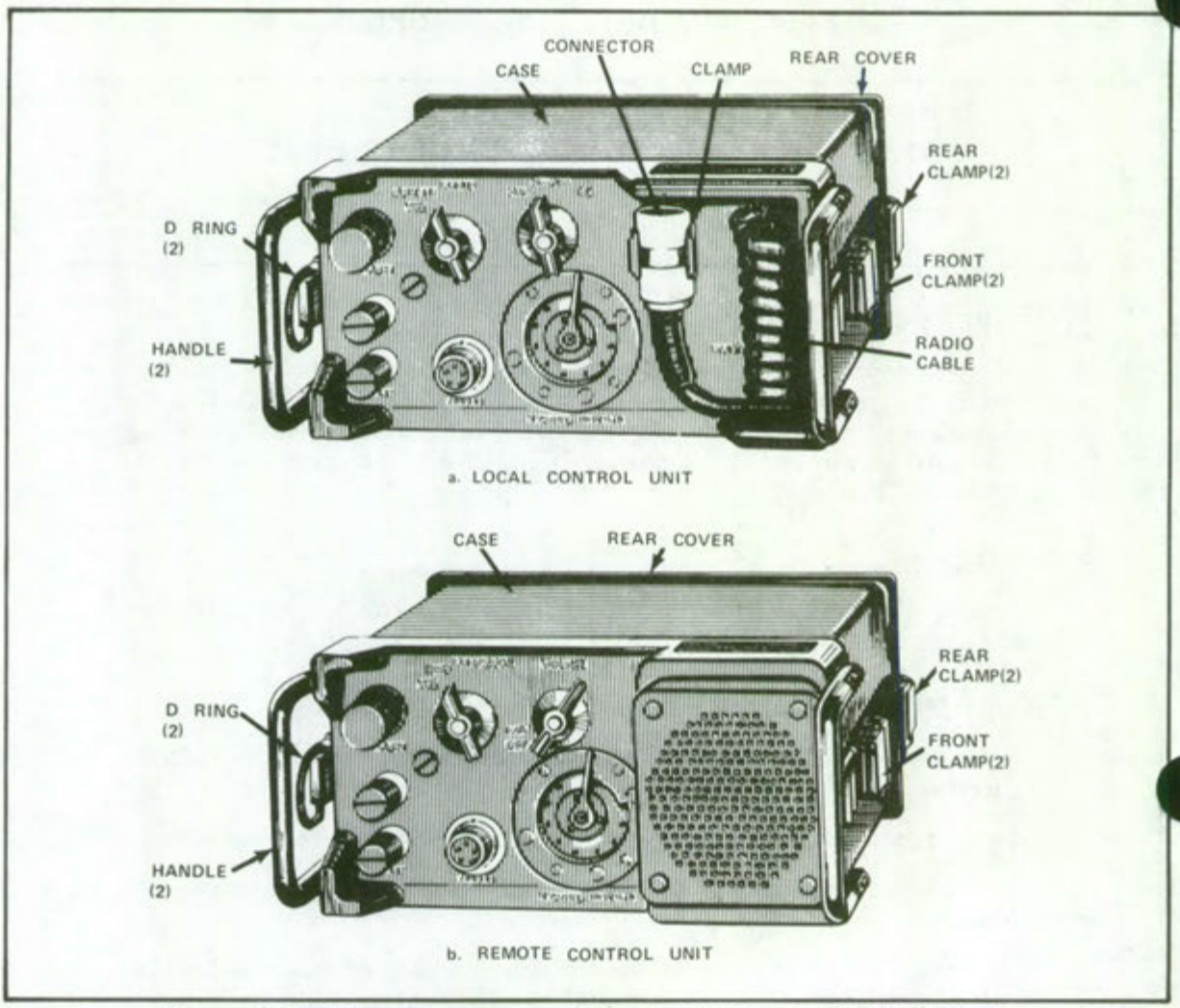


Figure 1. Major components of Radio Set Control AN/GRA-39.

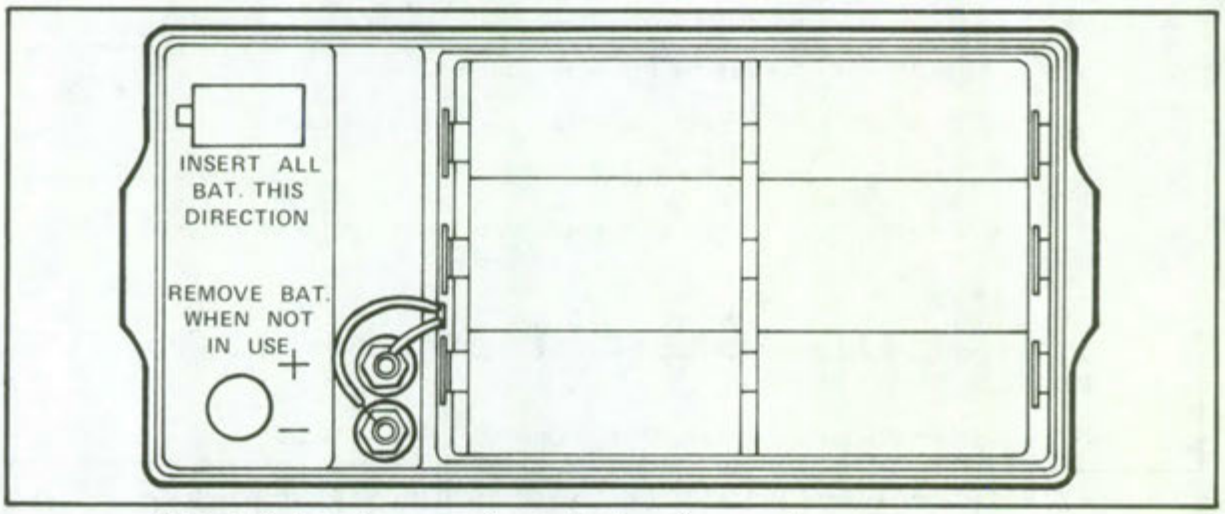


Figure 2. Local or remote control unit, rear view, cover removed.

3. **Connect Local Control Unit C-2329/GRA-39 to Radio Set** (figure 3).

a. Position local control unit next to radio and connect local control unit radio cable to RETRANSMIT R/W connector (RT-246/VRC or RT-524/VRC (figure 3)) or the audio connector (AN/PRC-77 (figure 4)).

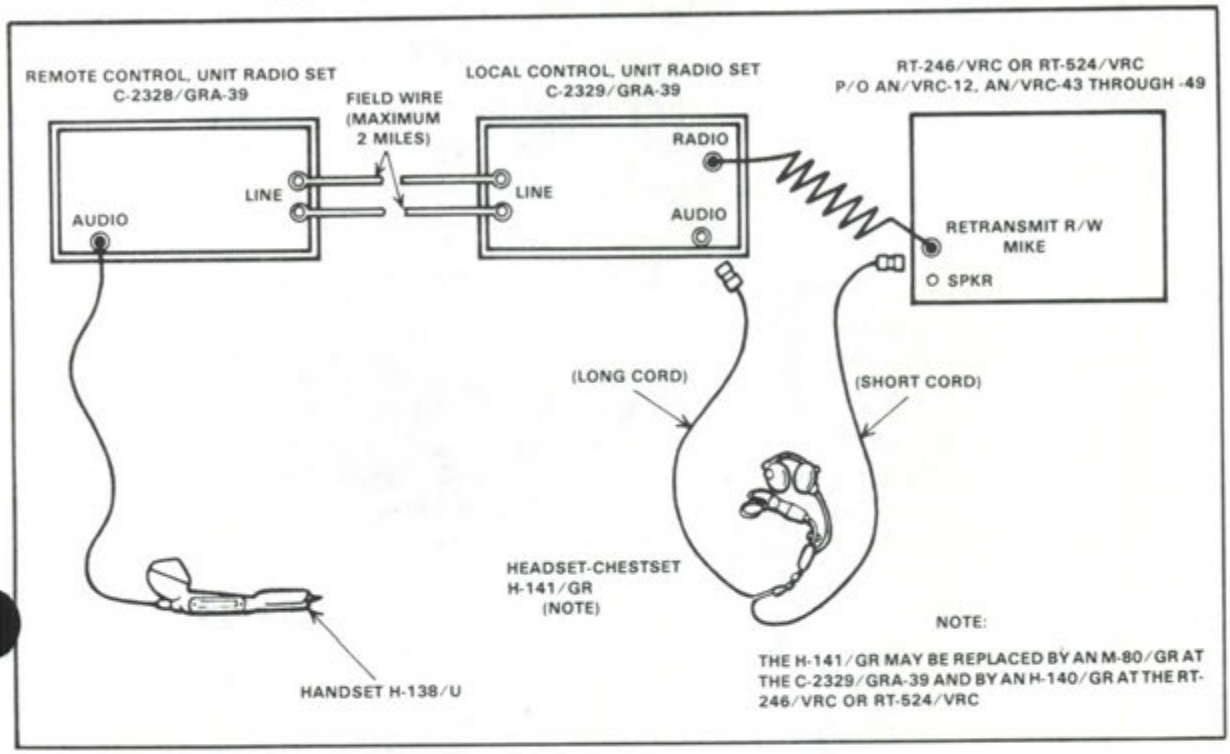


Figure 3. Radio Set Control Group AN/GRA-39 connected to Receiver-Transmitter RT-246/VRC or RT 524/VRC.

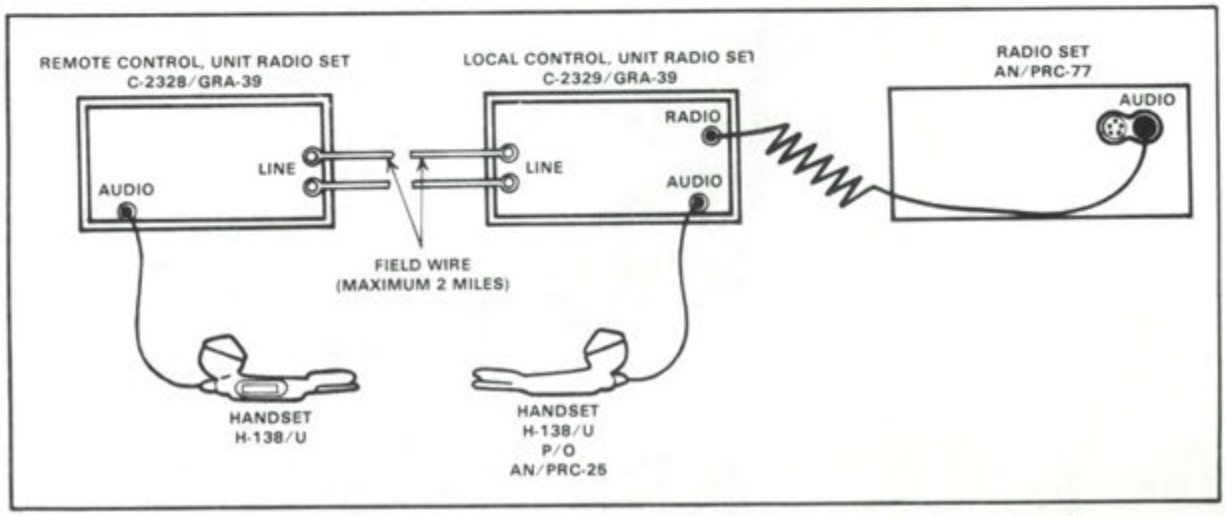


Figure 4. Radio Set Control Group AN/GRA-39 connected to Radio Set AN/PRC-25.

b. Attach field wire WD-1/TT to binding posts of local control unit.

NOTE: Tie field wire to a solid object prior to connecting to local control unit binding posts. This will prevent the local unit from being damaged should wire be pulled.

c. Lay field wire to remote control site.

4. **Connect Remote Control Unit C-2328/GRA-39** (figure 4).

WARNING: Do not press the RINGER button while connecting the field wire to the LINE binding posts.

a. Tie field wire off to solid object, leaving sufficient wire to connect to remote unit.

b. Connect field wire to binding posts of remote control unit.

c. A handset may be connected to the audio connector.

REFERENCES:

TM 11-5820-477-12, Operator and Organizational Maintenance Manual - Radio Set Control Group AN/GRA-39, C2 & 3, Oct 62 (chap 2, sec I, pages 11 thru 14, para 15 and 16)

TASK NUMBER: 113-622-2002

OPERATE RADIO SET CONTROL GROUP AN/GRA-39

CONDITIONS:

Given an installed tactical FM radio set, an installed Radio Set Control Group AN/GRA-39, TM 11-5820-477-12, another radio station with which to communicate, and an assistant operator for the local control unit.

STANDARDS:

Within 10 minutes, place the radio set control group into operation IAW the performance measures below.

PERFORMANCE MEASURES:

1. **Insure Radio Set Control Group AN/GRA-39 is properly installed.** (Refer to task: **Install Radio Set Control Group AN/GRA-39).**

2. **Start Local Control Unit C-2329/GRA-39** (figure 1a).

a. Turn POWER switch to ON.

b. Set BUZZER VOLUME control to approximately midrange.

3. **Start Remote Control Unit C-2328/GRA-39** (figure 1b).

a. Turn VOLUME control (ON/OFF switch) to approximately midrange.

b. Set BUZZER VOLUME control to approximately midrange.

4. **Conduct telephone communication check between local and remote control units.**

NOTE: During operation, adjust BUZZER VOLUME control for desired level.

a. Press **RINGER** button several times in quick succession to gain attention of other operator.

b. Set remote control unit TEL-RAD-RAD/SPKR switch to TEL.

c. Turn and hold local control unit TEL-REMOTE-RADIO switch to TEL.

d. Press handset PUSH-TO-TALK switch to talk to the other operator; release to listen.

5. **Conduct radio transmission and reception check from remote control unit.**

a. Have operator at local unit place TEL-REMOTE-RADIO switch of local control unit to REMOTE position.

b. Have local control unit operator adjust radio volume control for a comfortable listening level at local control unit handset to prevent excessive audio level (squeal) at remote unit.

c. Set TEL-RAD-RAD/SPKR switch of remote control unit to RAD or RAD/SPKR.

d. Adjust VOLUME control on remote unit to desired listening level for either handset or speaker operation of remote unit.

e. Press handset PUSH-TO-TALK switch to transmit; release to receive.

f. Use proper radio callsigns and procedures to conduct radio check with the other station.

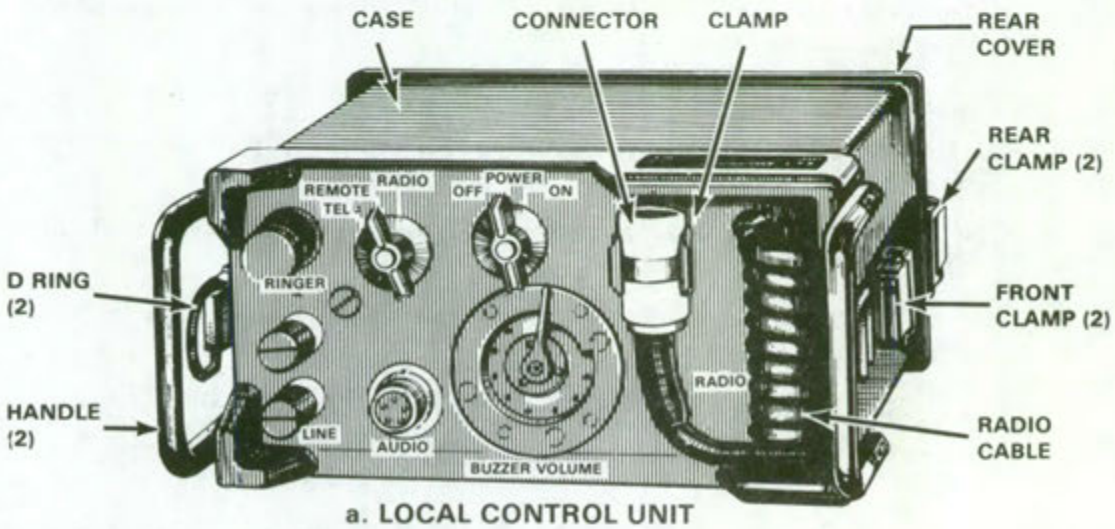
g. Transmit and receive one message with the other station.

6. **Conduct radio transmission and reception check from local control unit.**

a. Turn and hold TEL-REMOTE-RADIO switch of local control unit to RADIO.

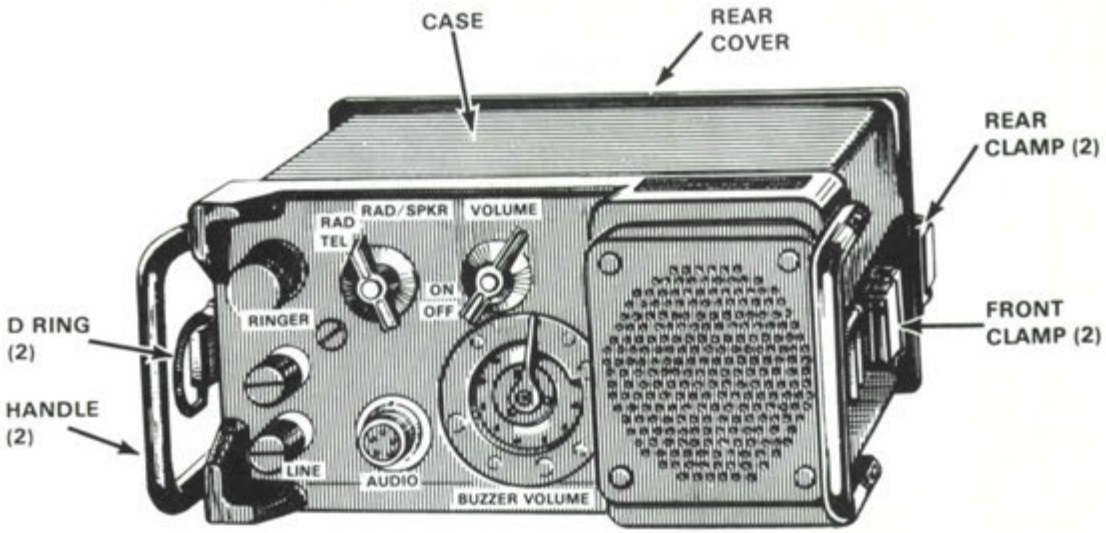
b. Press handset PUSH-TO-TALK switch to transmit; release to receive.

c. Use proper radio callsigns and procedures to conduct radio check with the other station.



a. LOCAL CONTROL UNIT

Figure 1. Major components of Radio Set Control AN/GRA-39.



b. REMOTE CONTROL UNIT

Figure 1. Con't.

7. **Stopping procedures** (figure 1).

a. Local control unit. Turn POWER switch to OFF.

b. Remote control unit. Turn the VOLUME control ON-OFF switch to OFF.

REFERENCE:

TM 11-5820-477-12, Operator and Organizational Maintenance Manual - Radio Set Control Group AN/GRA-39, C2, 3, Oct 62 (chap 2, sec II, pages 15 thru 18)

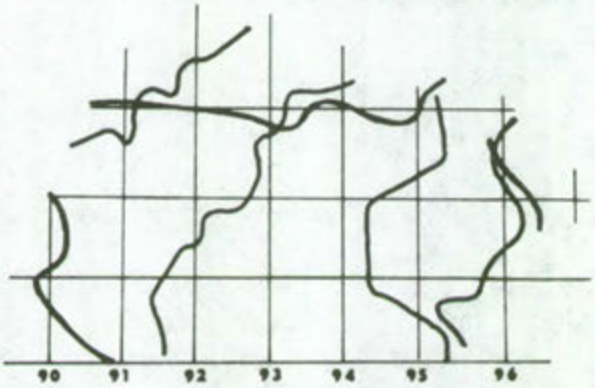
INTRODUCTION TO LAND NAVIGATION

If you get lost in combat, bad things can happen. You may run into some nasty people—the enemy. You may not get where you are supposed to go—fail your mission. You may have trouble getting back to your unit—miss your meals and worry the CO.

What can you do to keep from getting lost? Read a map correctly. Use a compass correctly. Use other ways to find directions. Keep cool. Use common sense.

The first thing you should know about a map is that it's nothing more than a drawing of a piece of the earth's surface. It's a drawing made of the earth as you would see it from an airplane

—looking straight down.



Prepared by the Army Map Service (LU), Corps of Engineers, U.S. Army, Washington, D.C. Compiled in 1966 from Alabama, 1:25,000, AMS, Sheets 3947 III NE, NW, SE, SW; field checked 1965. Horizontal and vertical control by USC&GS. AMS and CE. This map complies with the national standard map accuracy requirements. Map not field checked.

LEGEND

Tint indicates areas in which only landmark buildings are shown

ROAD DATA (1965)

In developed areas, only through roads are classified

Hard surface, heavy duty road, four or more lanes wide
Hard surface, heavy duty road; Two lanes wide; Three lanes wide
Hard surface, medium duty road, four or more lanes wide
Hard surface, medium duty road; Two lanes wide; Three lanes wide
Buildings
RAILROADS
Standard gauge (Single track, Multiple track)
Narrow gauge
In street
Cartline
BOUNDARIES
National
State (with monument)
County
County subdivision
Corporate limits
Military reservation
Other reservation

Improved light duty road, street
Unimproved dirt road
Trail
Route markers: Interstate, Federal, State
Barns, sheds, greenhouses, stadiums, etc.
Bench mark, monumented (BM ×795)
Bench mark, non monumented (×491)
Spot elevations in feet: Checked; Unchecked (768; 768)
Light, lighthouse; Windmill, wind pump; Water mill
Woods or brushwood
Vineyard; Orchard
Intermittent lake
Intermittent stream; Dam
Marsh or swamp
Rapids; Falls
Large rapids; Large falls

In order to make the map more useful to soldiers, the map shows much more than just terrain. It shows man-made objects as well as things like roads, buildings, and bridges, just to name a few. All of these man-made objects are represented by a symbol, and the symbols are explained in the lower left corner of every map in a section called the **legend.**

Besides giving symbols for man-made objects, the legend also gives the color code used on the map, and explains the meanings of other symbols which give you an even better idea of what the ground actually looks like. Look at the legend before you begin using the map.

TASK NUMBER: 071-329-1001

IDENTIFY TERRAIN FEATURES (NATURAL AND MANMADE) ON THE MAP

CONDITIONS:

Given a standard 1:50,000 scale military map which includes examples of one or more of each of the natural features identified in 1 through 5 below, and which has examples of the use of colors to identify classes of features as in 6 through 10 below:

1. Hilltop
2. Ridge
3. Valley
4. Saddle
5. Depression
6. Black
7. Blue
8. Green
9. Brown
10. Red

STANDARDS:

Within 3 minutes, identify one of each type terrain feature marked on the map given to you by your supervisor.

PERFORMANCE MEASURES:

Your military map shows something important that ordinary maps don't have. That is elevation (relief)—the slopes, hills, and valleys. You will learn later in this book about locating points, measuring distances, and finding the right direction. But you should also check hills and valleys along the direction you intend to travel before you start. **IT MIGHT SAVE YOU SOME TROUBLE.**

1. To identify terrain features, refer to figure 1.

2. Colors used to identify a class of features.

a. Black - The majority of cultural or manmade features.

b. Blue - Water features such as lakes, rivers, and swamps.

c. Green - Vegetation such as woods, orchards, and vineyards.

d. Brown - All relief features such as contour lines.

e. Red - Used to classify manmade features as to their type or use, e.g., main roads, built-up areas, and special features.

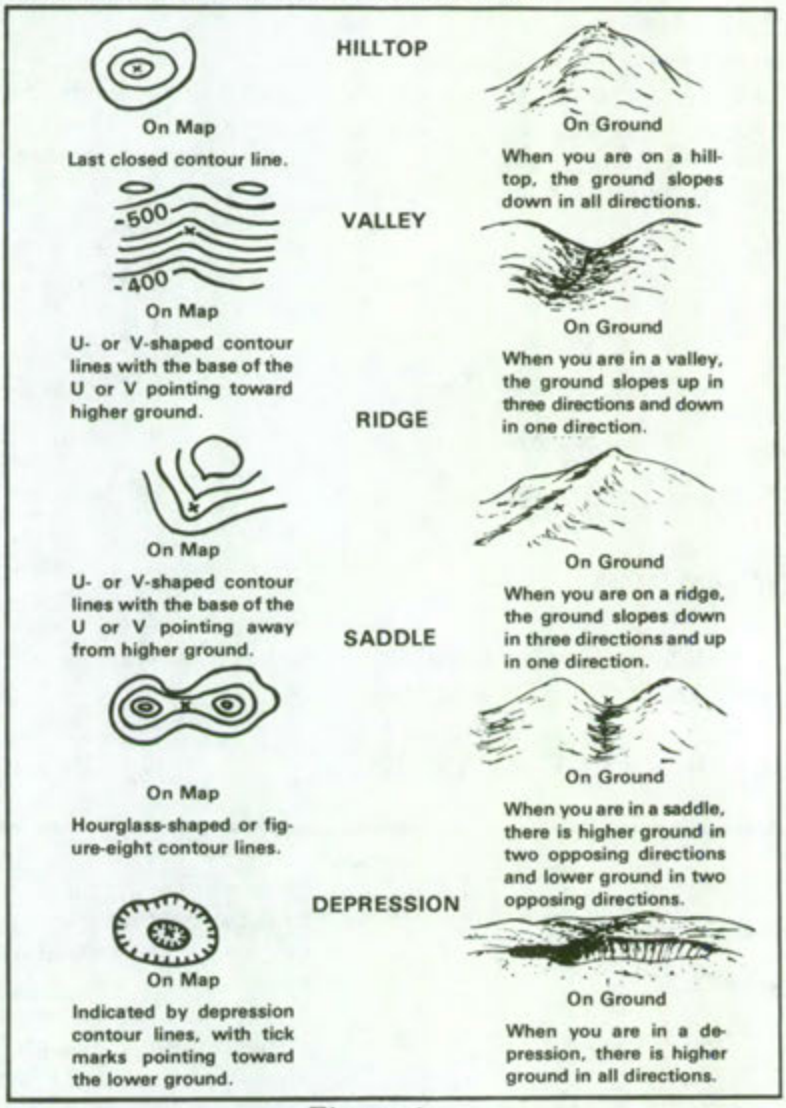
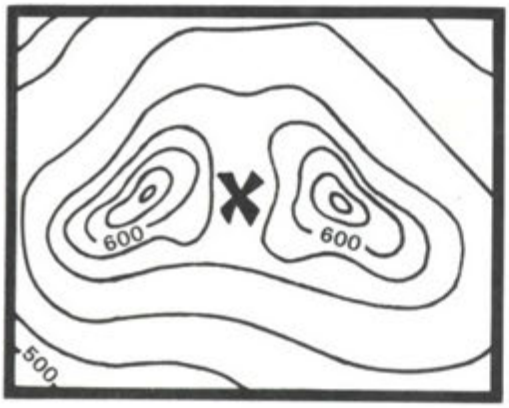


Figure 1.

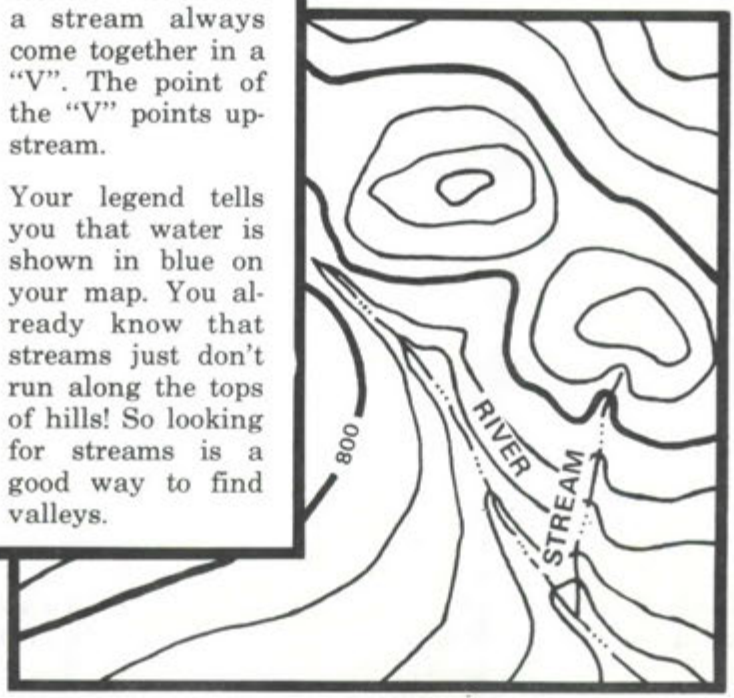
NOTE: Occasionally, other colors may be used to show special information. These will be indicated in the marginal information on the map.

Sometimes contour lines show two hilltops fairly close together. The lower terrain between the two hilltops is called a SADDLE. Going through a saddle is sometimes the easiest route to use to get beyond the two hills. Of course, you wouldn't go through a saddle if the enemy was on the hills.

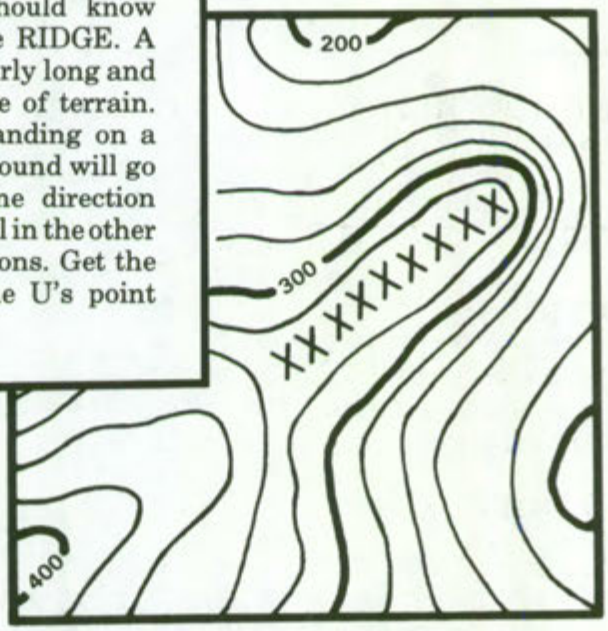


Contour lines across a stream always come together in a "V". The point of the "V" points upstream.

Your legend tells you that water is shown in blue on your map. You already know that streams just don't run along the tops of hills! So looking for streams is a good way to find valleys.



Another terrain feature that you should know about is the RIDGE. A ridge is a fairly long and narrow piece of terrain. If you're standing on a ridge, the ground will go uphill in one direction and downhill in the other three directions. Get the picture? (The U's point downhill.)



REFERENCES:

FM 21-26, Map Reading, C1, Jan 69
TC 21-26, Don't Get Lost, Oct 72 (pages 46 thru 49)
TEC Lesson 930-071-0013-F, Introduction to Land Navigation
TEC Lesson 930-071-0016-F, Terrain Features

TASK NUMBER: 071-329-1002

DETERMINE THE GRID COORDINATES OF A POINT ON A MILITARY MAP USING THE MILITARY GRID REFERENCE SYSTEM

CONDITIONS:

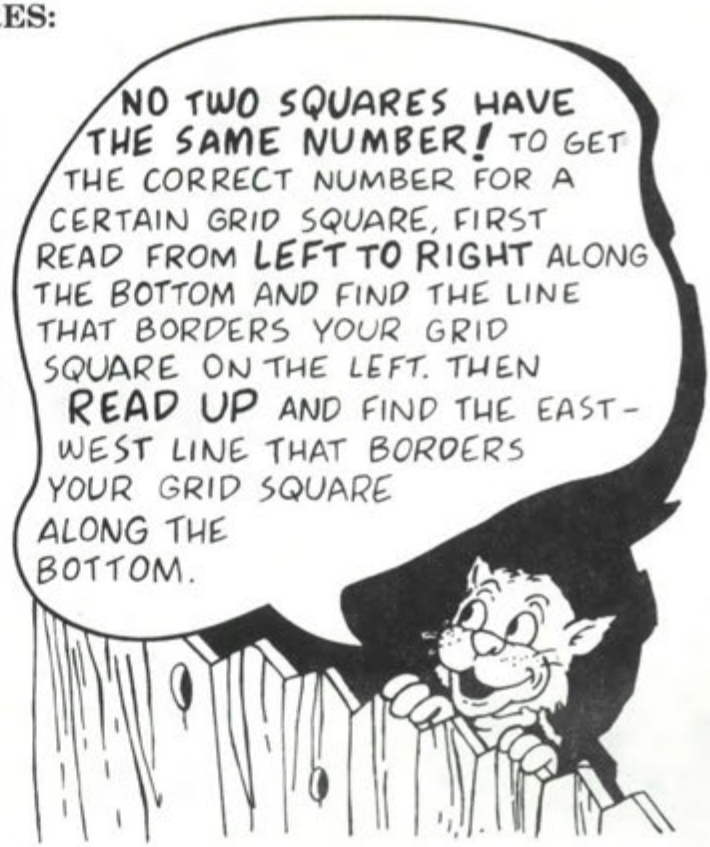
Given a standard, 1:50,000 scale military map, a 1:50,000 grid coordinate scale, a pencil and paper, and a point on the map which is labeled for identification (for example, Point A).

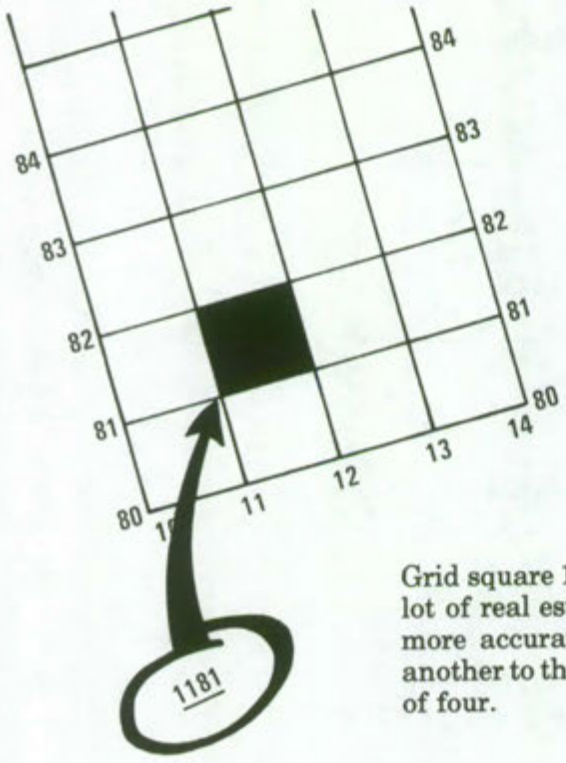
STANDARDS:

Within 2 minutes, determine the six-digit grid coordinates for a point to within 100 meters (grid coordinates must be preceded by the correct two-letter 100,000-meter-square identifier).

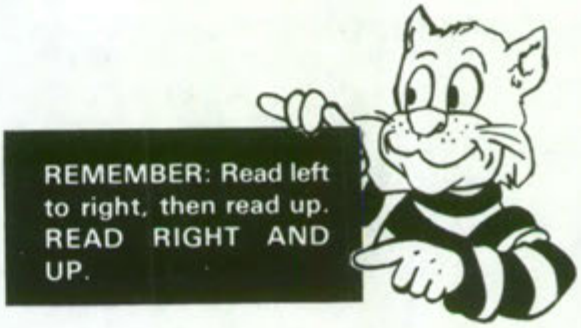
PERFORMANCE MEASURES:

To keep from getting lost in the boonies you have to know how to find your location or your address. There are no street addresses in a combat area, but the military map can spot your location accurately. It has black lines running up and down (north and south) and crosswise (east and west). They form small squares called grids. These lines are numbered along the outside edge of the map picture. Using these numbers you can name each square.





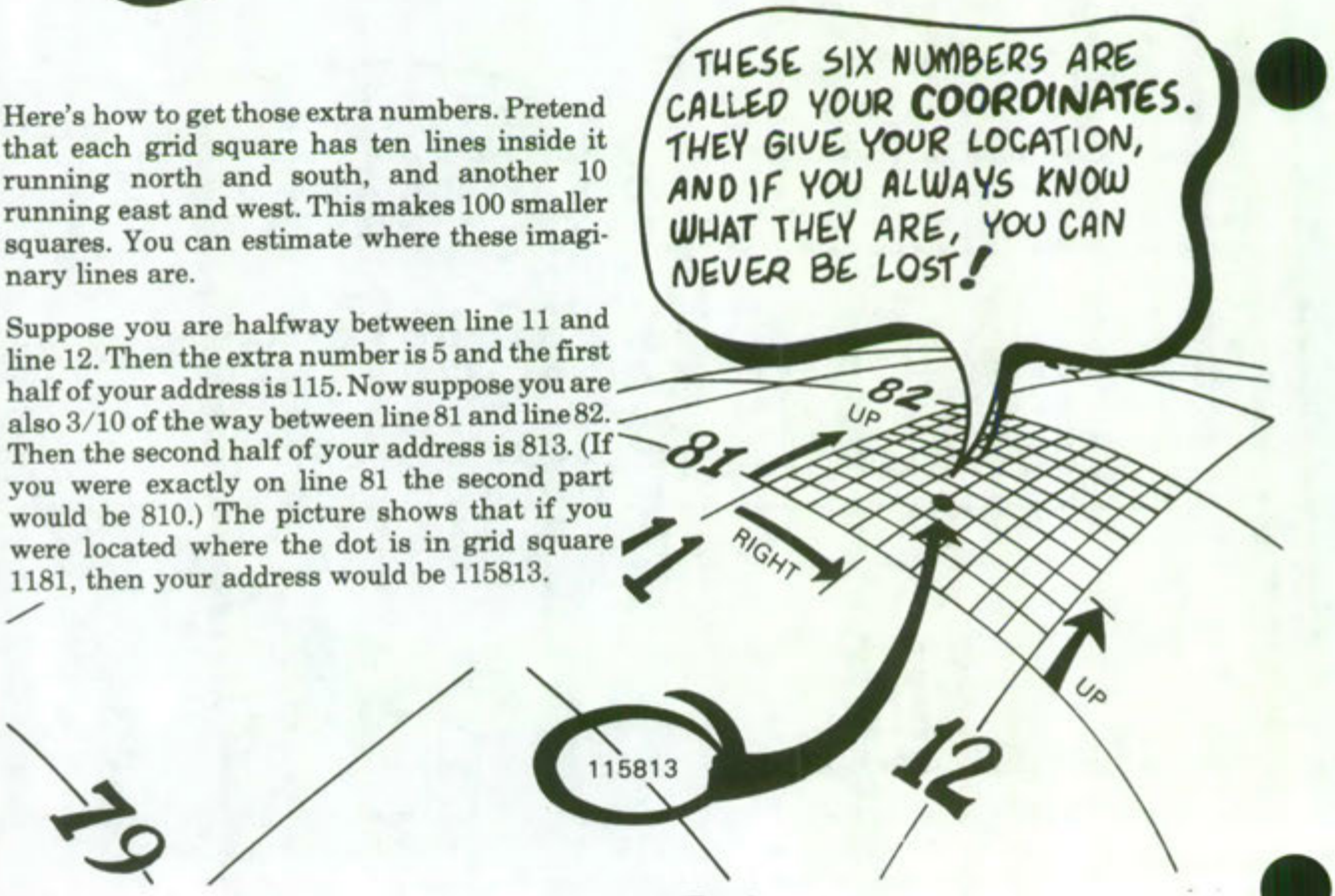
Look at the picture. Your address is grid square 1181. How do you know this? Start from the left and read RIGHT until you come to 11, the first half of your address. Then read UP to 81, the last half. Your address is somewhere in grid square 1181.



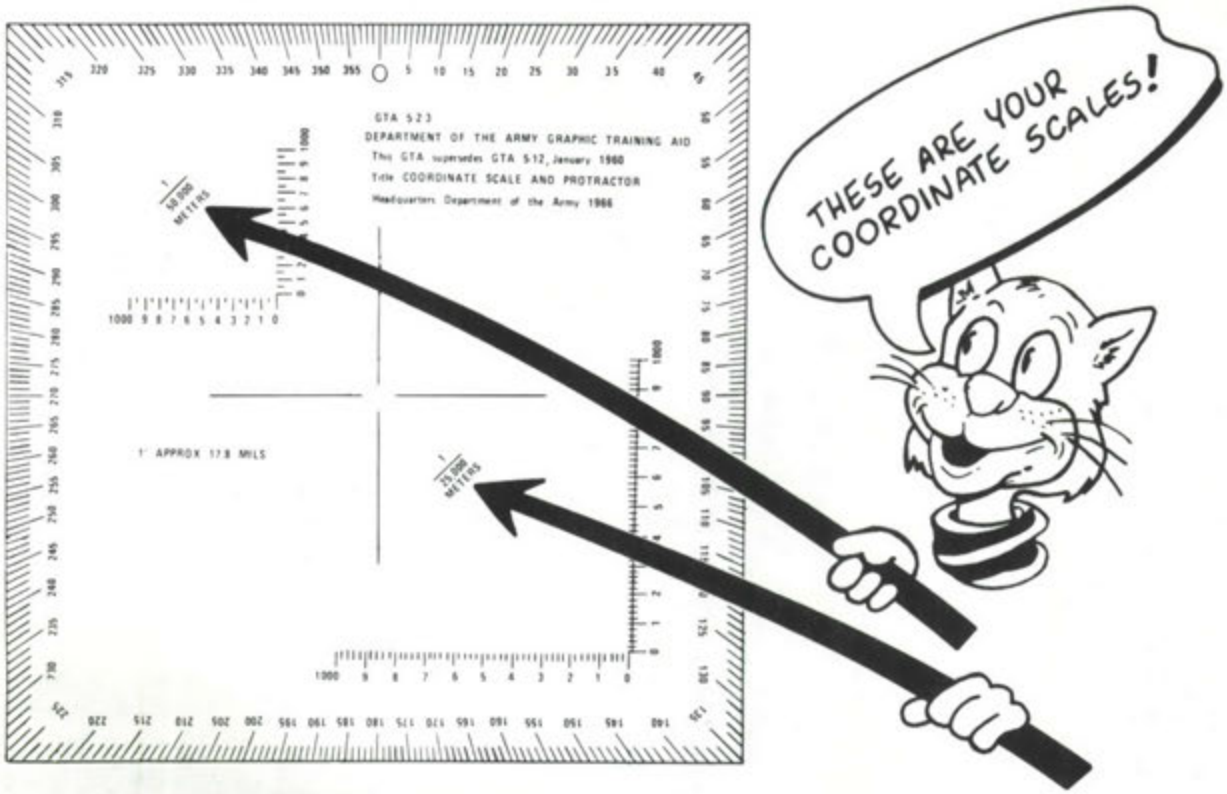
Grid square 1181 gives your general neighborhood, but there is a lot of real estate inside that grid square. To make your address more accurate just add another number to the first half and another to the last half—so your address has six numbers instead of four.

Here's how to get those extra numbers. Pretend that each grid square has ten lines inside it running north and south, and another 10 running east and west. This makes 100 smaller squares. You can estimate where these imaginary lines are.

Suppose you are halfway between line 11 and line 12. Then the extra number is 5 and the first half of your address is 115. Now suppose you are also 3/10 of the way between line 81 and line 82. Then the second half of your address is 813. (If you were exactly on line 81 the second part would be 810.) The picture shows that if you were located where the dot is in grid square 1181, then your address would be 115813.



If you have this little device, you don't have to worry about estimating exactly where you are inside a certain grid square. You don't have to use imaginary lines, because you can come up with your **exact** coordinates.



This is a coordinate scale and protractor. It helps you measure small distances inside grid squares. You can also measure angles with it. The coordinate scale and protractor is nothing more than a square piece of clear thin plastic. It is usually called just a "protractor" for short. Here's how to determine the six-digit grid coordinates of a point on a map using a protractor.

1. First locate the grid square in which the Point is located (the Point should already be plotted on the map). (See figure 1.)

2. The number of the vertical grid line on the left (west) side of the grid square is the **first** and **second** digits of the coordinate.

3. The number of the horizontal grid line on the bottom (south) side of the grid square is the **fourth** and **fifth** digits of the coordinate.

4. To determine the **third** and **sixth** digits of the coordinate, place the grid coordinate scale on the bottom grid line of the grid square in which Point A is located.

5. Check to see that the zeros of the coordinate scale are in the lower lefthand (southwest) corner of the grid square.

6. Slide the coordinate scale to the right keeping the bottom of the scale on the bottom grid line until Point A is located under the vertical (righthand) scale. (See figure 2.)

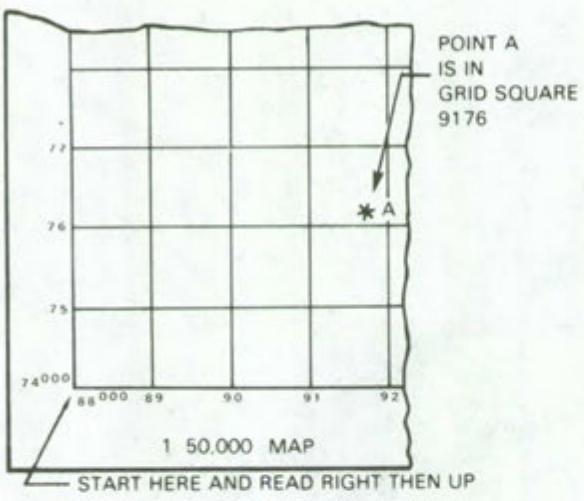


Figure 1.

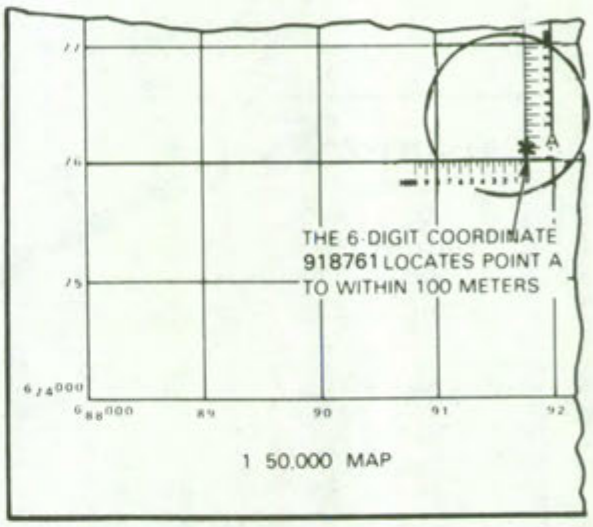


Figure 2.

7. The 100-meter mark on the bottom (horizontal) coordinate scale which is nearest the north-south gridline represented by the first and second digit of the coordinate to be determined is the third digit.

8. The 100-meter mark on the righthand (vertical) coordinate scale which is nearest Point A is the sixth digit.

9. Write the 6-digit coordinate on the paper provided.

10. Determine the correct two-letter 100,000-meter-square identifier by looking at the grid reference box in the margin of the map.

11. Place the 100,000-meter-square identifier in front of the 6-digit coordinate.

NOTE: As an alternate training method to improve map reading ability, start with a six-digit coordinate and plot the point on the map.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 3, pages 3-8 thru 3-20, para 3-4 thru 3-7)
TC 21-26, Don't Get Lost, Oct 72 (pages 5-9)
TEC Lesson 930-071-0013-F, Introduction to Land Navigation

TASK NUMBER: 071-329-1010

DETERMINE AZIMUTHS USING A COORDINATE SCALE AND PROTRACTOR

CONDITIONS:

Given a standard 1:50,000 scale military map, two known points plotted on the map, coordinate scale and protractor, a straightedge object, a pencil, and a requirement to determine the azimuth from your location (Point A) to another point (B) on the map.

STANDARDS:

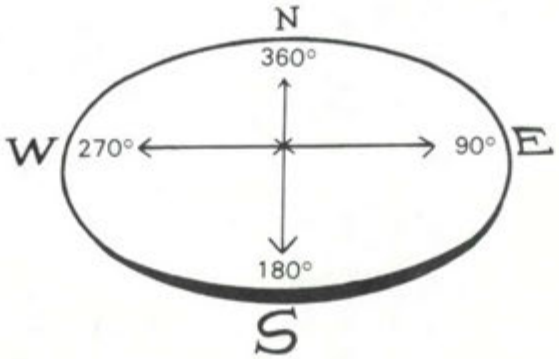
1. Determine the grid azimuth from your location (Point A) to Point B to within 1 degree in 3 minutes.

2. Determine the back azimuth of a given azimuth to the exact degree.

PERFORMANCE MEASURES:

1. The direction from one point to another point, either on the map or on the ground, has a military name --

2. Azimuths are given in degrees in a clockwise direction. Since there are 360 degrees in a circle, your azimuth can be any number up to 360. Due east is 90 degrees, due south is 180 degrees, due west is 270 degrees, and due north is 360 degrees.



3. To get the right azimuth from a map you have to use a protractor. **Here is how to use your protractor to determine an azimuth:**

a. Determine your location (Point A) and the location of the other point (B) on the map (see figure 1).

b. Draw a straight line from Point A to Point B.

c. Place the index of the protractor over center of mass of Point A with the 0° on the protractor at the top and 90° to the right.

d. Start at the 0° point on the protractor and read to the right in a clockwise manner until reaching the point where the straight line intersects the protractor scale.

e. Read the azimuth in degrees from the protractor - 210°.

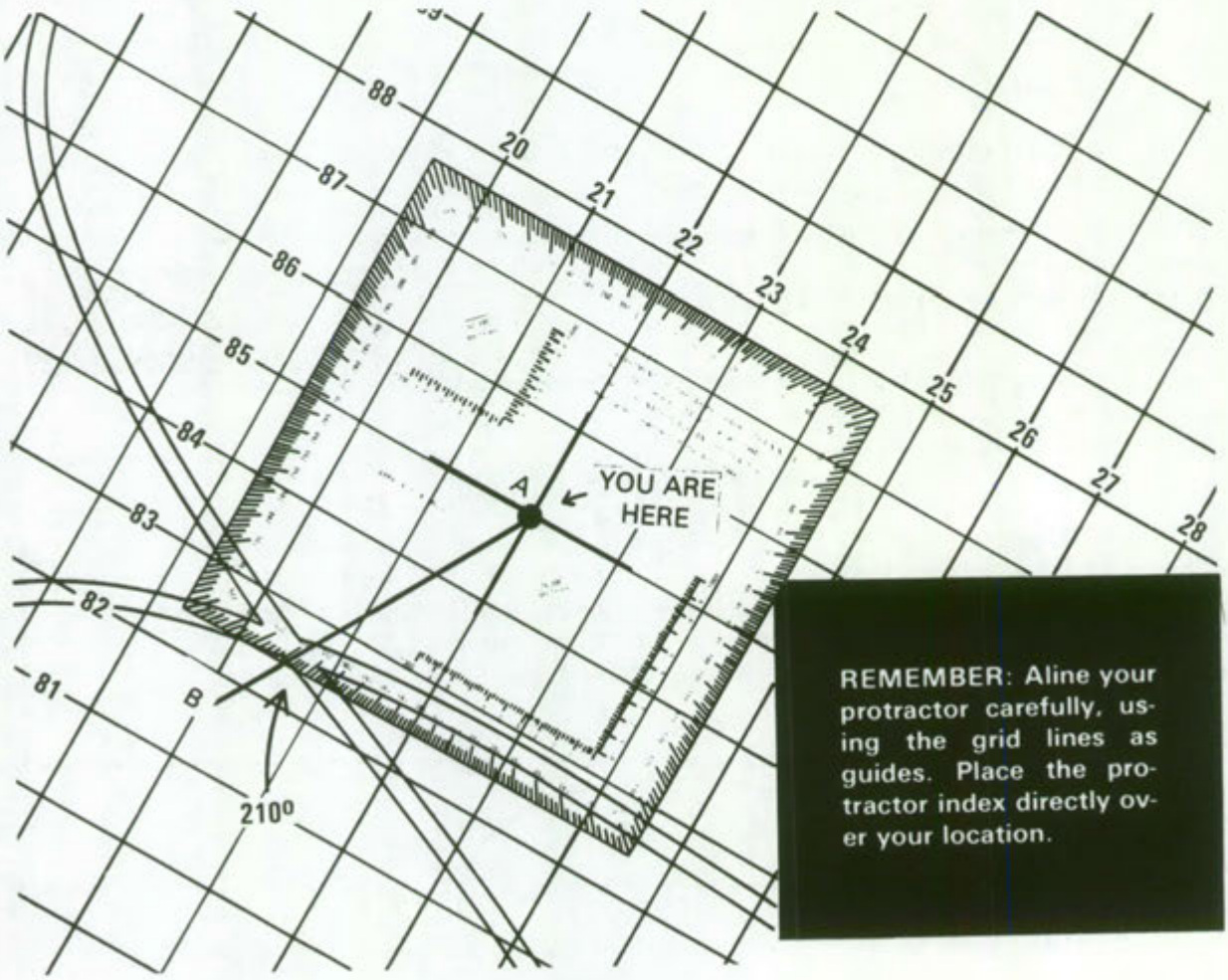
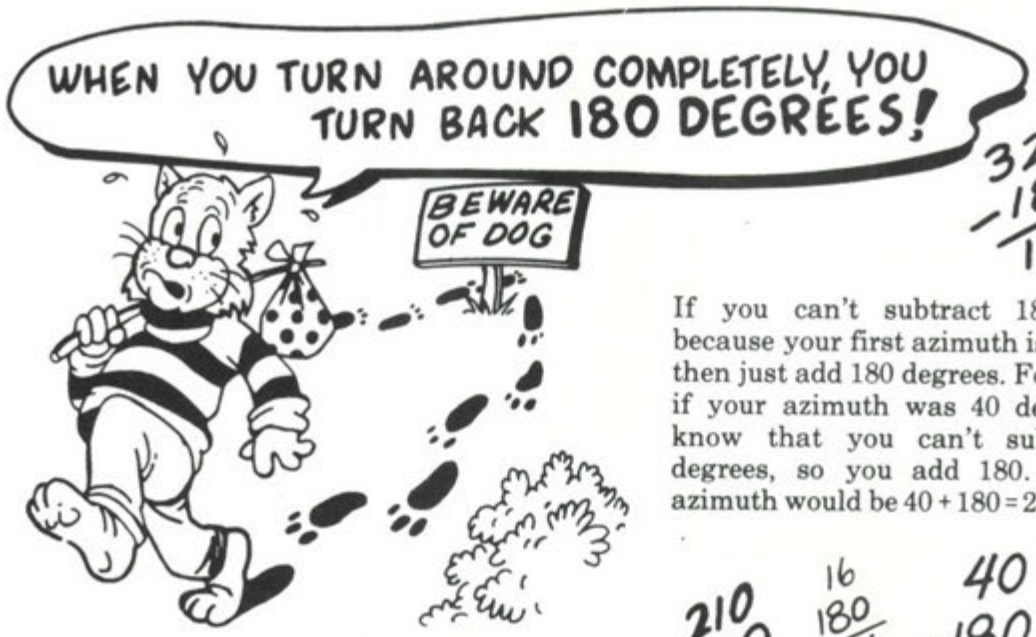


Figure 1.



320 − 180 = 140 60 + 180 = 240

If you can't subtract 180 degrees because your first azimuth is too small, then just add 180 degrees. For example, if your azimuth was 40 degrees, you know that you can't subtract 180 degrees, so you add 180. The back azimuth would be 40 + 180 = 220 degrees.

210 − 180 = 30 16 + 180 = 196 40 + 180 = 220 190 − 180 = 10 72 + 180 = 252

Suppose you follow the 210-degree azimuth in figure 1 to the road junction, and then want to go back to your original location. To do this, you take a BACK AZIMUTH. You simply subtract 180 from the first azimuth. Your back azimuth is 210 - 180 = 30 degrees.

REMEMBER: A back azimuth goes in the opposite direction from an azimuth.

Can you figure out the back azimuth of 290 degrees?

How about the back azimuth of 75 degrees?

Check your answers with the correct answers listed to the right.

ANSWERS: The back azimuth of 290 degrees is 290 minus 180, which is 110 degrees. The back azimuth of 75 degrees is 75 plus 180, which is 255 degrees.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69
TC 21-26, Don't Get Lost, Oct 72
TEC Lesson 930-071-0014-F, Measuring Distance and Azimuth

TASK NUMBER: 071-329-1009

CONVERT AZIMUTHS (MAGNETIC OR GRID)

CONDITIONS:

Given a standard 1:50,000 scale military map with a declination diagram, a pencil, and either a magnetic azimuth or a grid azimuth which must be converted.

STANDARDS:

Within 3 minutes, convert the given magnetic azimuth to a grid azimuth (or grid to magnetic) without error.

PERFORMANCE MEASURES:

1. **Easterly Grid-Magnetic (G-M) Angle** (figure 1):

a. To convert a magnetic azimuth to a grid azimuth, add the value of the G-M angle to the magnetic azimuth.

b. To convert a grid azimuth to a magnetic azimuth, subtract the G-M angle from the grid azimuth.

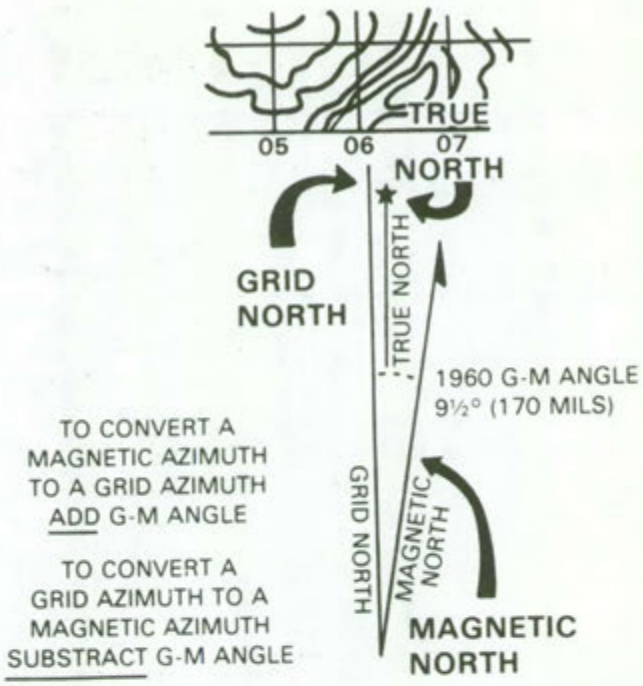
2. **Westerly Grid-Magnetic (G-M) Angle** (figure 2):

a. To convert a magnetic azimuth to a grid azimuth, subtract the value of the G-M angle from the magnetic azimuth.

b. To convert a grid azimuth to a magnetic azimuth, add the value of the G-M angle to the grid azimuth.

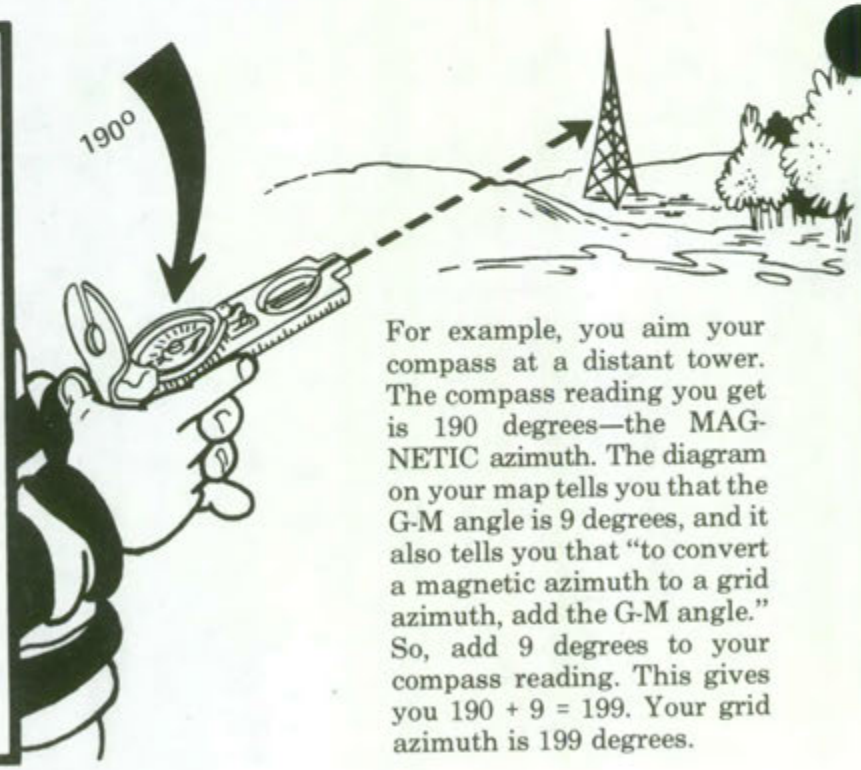
Figure 1.

Figure 2.

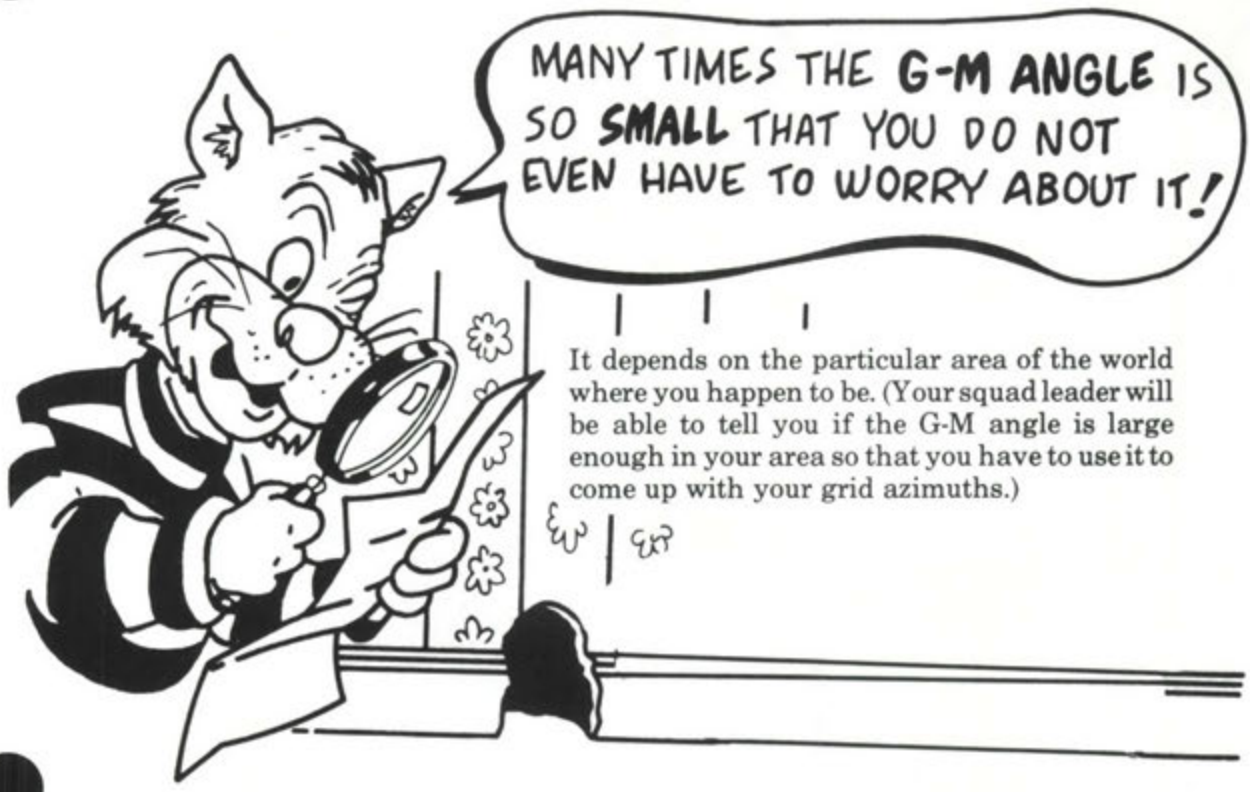


The north-south lines on your map give GRID north. The needle of the compass points to MAGNETIC north. Grid north and magnetic north are usually different by a few degrees. Neither one points straight at the north pole that's called TRUE north, but you needn't worry about TRUE north to keep from getting lost in a combat area. The difference in degrees for every map is shown at the bottom of the map sheet.

The difference between GRID north and MAGNETIC north is called the G-M angle. The diagram at the bottom of the map tells you how to change grid azimuths to magnetic azimuths and magnetic azimuths to grid azimuths.



For example, you aim your compass at a distant tower. The compass reading you get is 190 degrees—the MAGNETIC azimuth. The diagram on your map tells you that the G-M angle is 9 degrees, and it also tells you that "to convert a magnetic azimuth to a grid azimuth, add the G-M angle." So, add 9 degrees to your compass reading. This gives you 190 + 9 = 199. Your grid azimuth is 199 degrees.



REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 5, pages 5-1 thru 5-6, para 5-3 thru 5-4)
TC 21-26, Don't Get Lost, Oct 72 (pages 21-26)
TEC Lesson 930-071-0015-F, Converting Azimuths

TASK NUMBER: 071-329-1003

DETERMINE A MAGNETIC AZIMUTH USING A COMPASS

CONDITIONS:

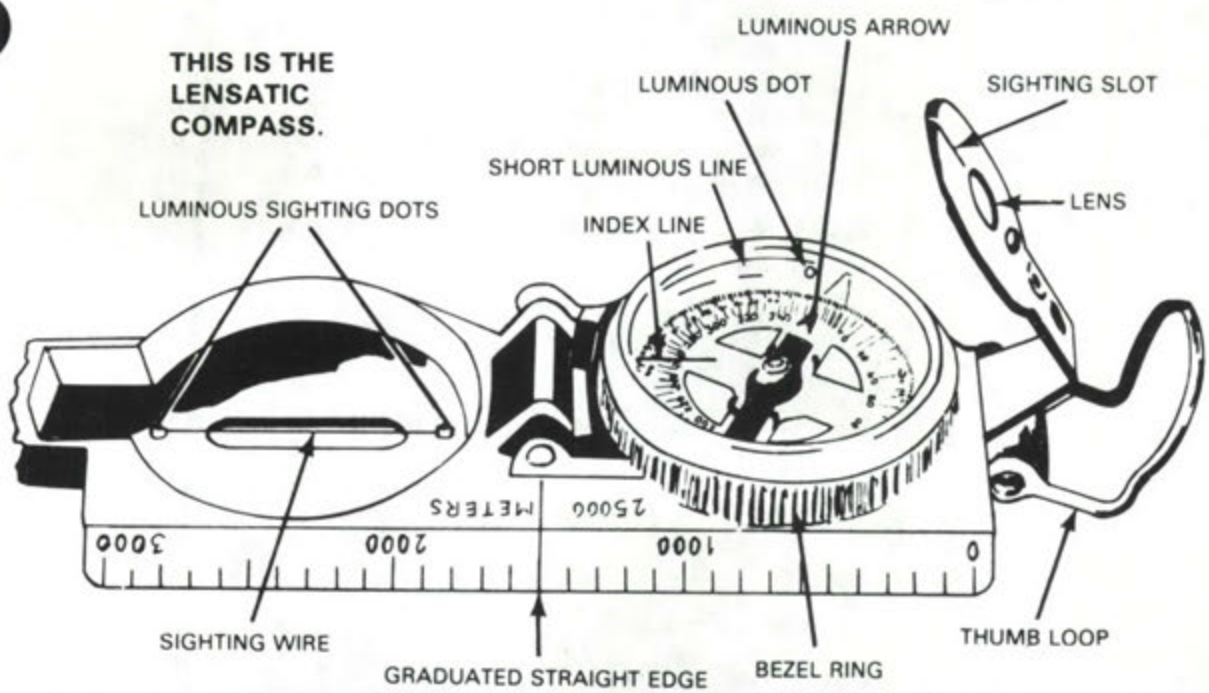
Given a compass (which has been checked against an aiming circle and has no noticeable deviation), a designated point on the ground, in a field environment, under daylight conditions.

STANDARDS:

Within 1 minute, determine the correct magnetic azimuth to the designated known point, to within 3 degrees, using the center-hold technique.

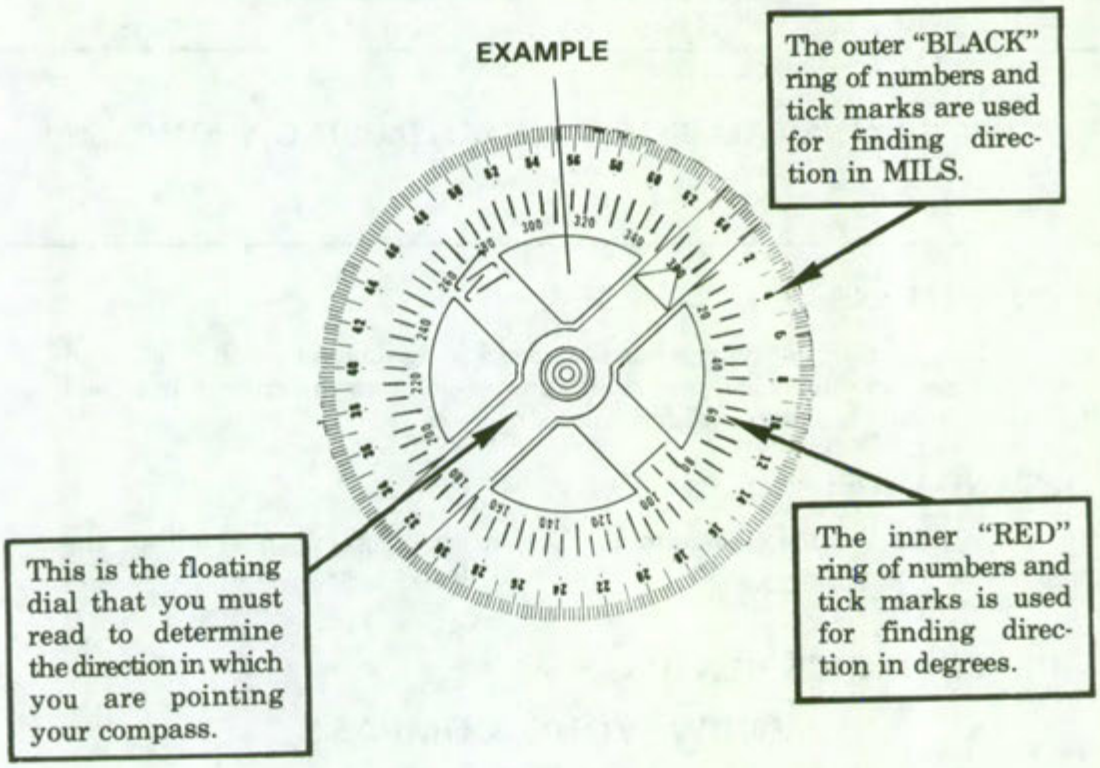
PERFORMANCE MEASURES:

KNOW YOUR COMPASS



BEWARE: Your compass is a sensitive instrument and it's your best friend in the boonies. Take care of it and it will take care of you!

HOW TO READ YOUR COMPASS



(1) There are 360 degrees or 6400 mils (ṁ) in a complete circle and these are marked for you with a tick mark every 5 or 20 ṁ. However, you will notice that not every tick mark is numbered. So you will have to determine the number for these lines using the numbers that are shown.

(2) To read direction, point the compass in the direction you want to go or the direction you want to determine.

(3) Look beneath the black hairline on the outer glass cover and estimate to the nearest degree or 10 mils the position of the hairline over the (red/black) scale.

(4) Be careful to hold the compass still so that the dial remains stationary while you are reading the scale.

(5) In the example above, the readings are:

a. Degrees (Red Scale) - 312°

b. Mils (Black Scale) - 5530 mils

(6) If you understand the readings in the example and can apply the center-hold technique of shooting an azimuth, you'll be proficient in performing this task.

How Do You SHOOT An Azimuth?

(1) You use your compass to find or follow an azimuth. The arrow on the compass points towards magnetic north. The arrow is also attracted by any mass of metal - a jeep, truck, your rifle, your helmet, and even electrical power lines. So be sure you use your compass away from metal objects - so it won't give you a bum steer.

(2) You should use the center-hold technique! It's faster, easier, and more accurate than the old sighting method.

(3) Open the compass so that the cover forms a straight edge with the base. The lens of the compass is moved out of the way.

(4) Next, place your thumb through the thumb loop, form a steady base with your third and fourth fingers and extend your index finger along the side of the compass.

(5) Place the thumb of the other hand between the eyepiece and the lens; extend the index finger along the remaining side of the compass and the remaining fingers around the fingers of the other hand; pull your elbows firmly into your sides. This will place the compass between your chin and your belt.

(6) To measure an azimuth, simply turn your entire body toward the object, pointing the compass cover directly at the object. Once you are pointing at the object, just look down and read the azimuth from beneath the fixed black index line. Man, you can even use this method at night!

(7) If you are land navigating, stop occasionally to check the azimuth along which you are moving to keep from going in circles. Also, you can move from object to object along your path of travel by shooting an azimuth to each object and then moving to that object. Repeating this process while you navigate should keep you "straight!"

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 5, pages 5-8 thru 5-10, para 5-6)
TC 21-26, Don't Get Lost, Oct 72 (pages 24-29)
TEC Lesson 930-071-0017-F, The Lensatic Compass

TASK NUMBER: 071-329-1018

DETERMINE DIRECTION USING FIELD EXPEDIENT METHODS

CONDITIONS:

Given: you are temporarily disoriented or have become detached from your unit and you are without a compass. Materials to assist you in performing this task will depend upon your geographic location. Use the field expedient method that is best suited to your location.

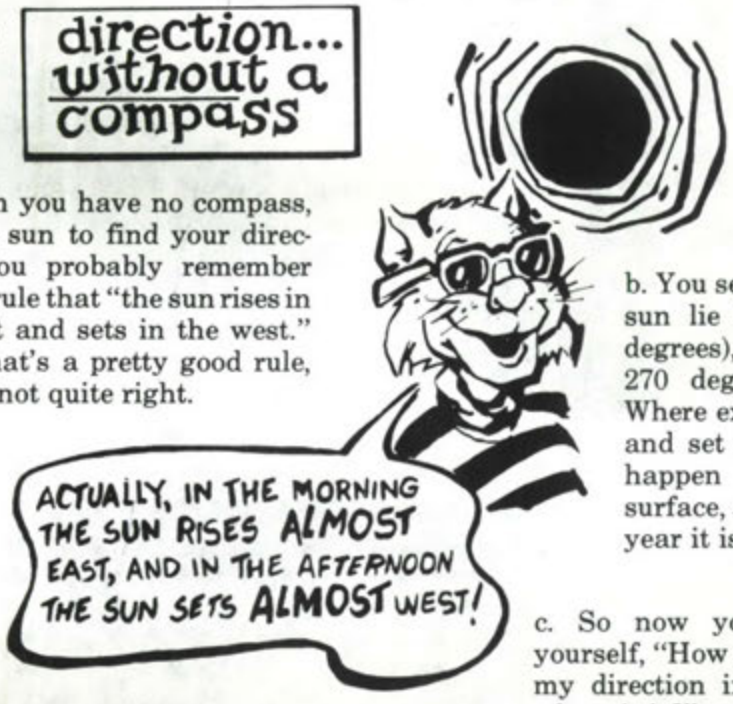
STANDARDS:

Perform any or all of the field expedient methods for determining directions without a compass by following the instructions given in the performance measures below.

PERFORMANCE MEASURES:

1. direction... without a compass

a. When you have no compass, use the sun to find your direction. You probably remember the old rule that "the sun rises in the east and sets in the west." Well, that's a pretty good rule, but it's not quite right.



b. You see, very seldom does the sun lie DUE east (exactly 90 degrees), or DUE west (exactly 270 degrees) on the horizon. Where exactly the sun does rise and set depends on where you happen to be on the earth's surface, and also on what time of year it is.

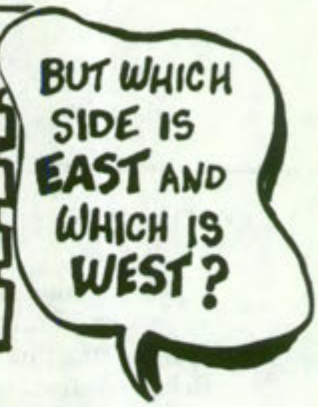
c. So now you're probably asking yourself, "How can I use the sun to find my direction if I don't know exactly where it is?"

EASY! Just use the SHADOW-TIP field expedient method. It's quick, it's easy, and it's very accurate. Here's how to do it in three simple steps:

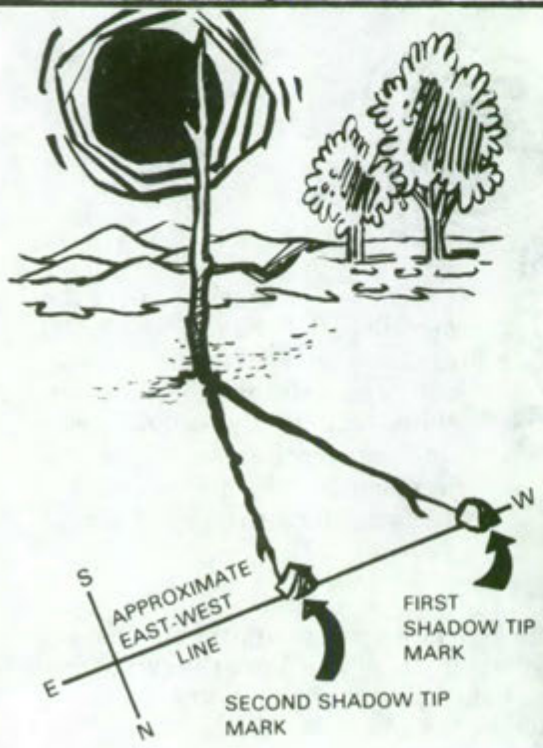
Place a stick or branch into the ground vertically at at a fairly level spot where a distinct shadow will be cast. mark the shadow tip with a stone, twig, or other means.

2

Wait about 10 or 15 minutes until the shadow tip moves a few inches. Mark the new position of the shadow tip just like the first.

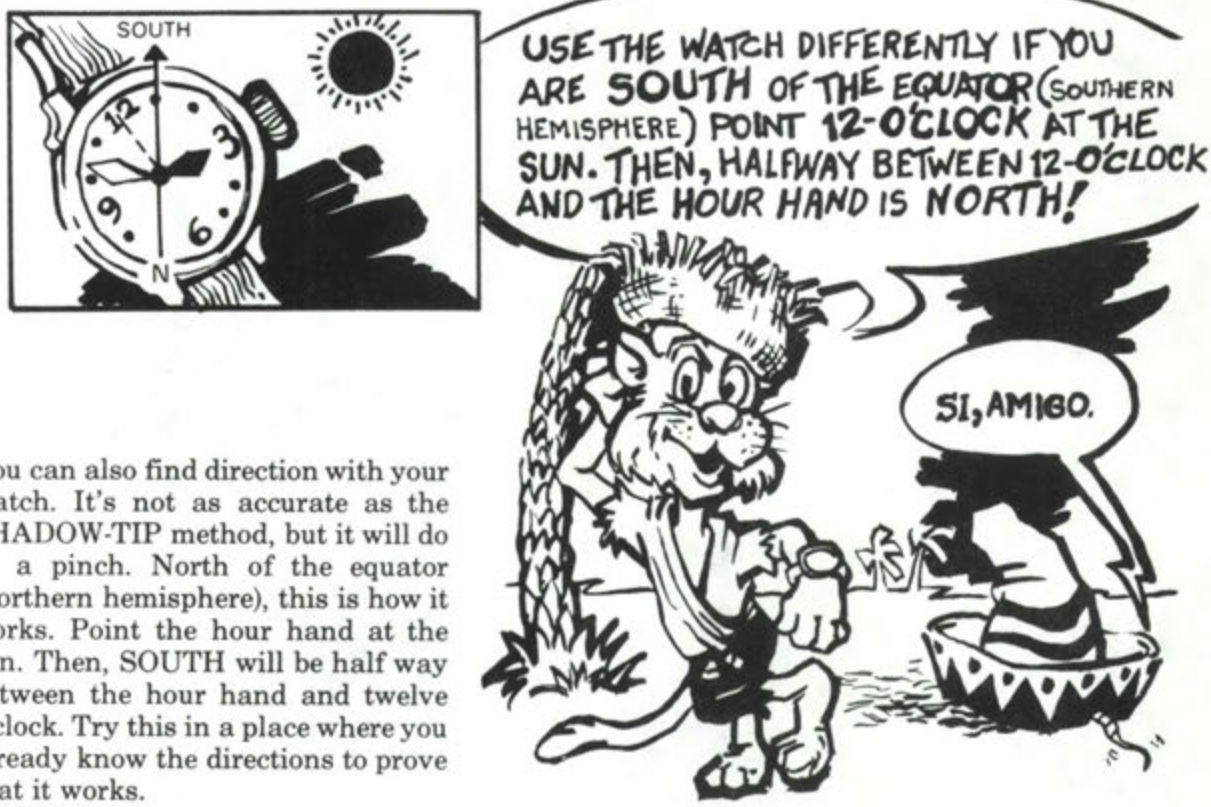


Draw a straight line through the two marks which you made on the shadow tips. This line you have drawn is an EAST-WEST line.

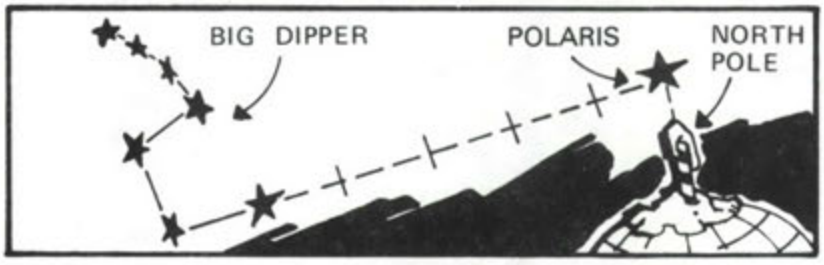


Well, since the sun rises in the east and sets in the west, the shadow tip moves in just the opposite direction. So the first shadow tip mark you make is always WEST, and the second mark is always EAST.

REMEMBER: Place your stick vertically into the ground. Mark the tip of each shadow. The first tip is the WESTERN half of your line, and the second tip is the EASTERN half. You can draw a NORTH-SOUTH line perpendicular to your EAST-WEST line.



2.
You can also find direction with your watch. It's not as accurate as the SHADOW-TIP method, but it will do in a pinch. North of the equator (northern hemisphere), this is how it works. Point the hour hand at the sun. Then, SOUTH will be half way between the hour hand and twelve o'clock. Try this in a place where you already know the directions to prove that it works.



3.
At night, you can locate north by finding the north star (POLARIS). First, find the Big Dipper. The last two stars in the cup point directly at Polaris, which is about 5 times as far out as the distance between those 2 stars in the cup. Facing Polaris you are looking north, with east on your right and west on your left.

REFERENCE:

TC 21-26, Don't Get Lost, Oct 72

TASK NUMBER: 071-329-1006

NAVIGATE FROM ONE POSITION ON THE GROUND TO ANOTHER POINT

CONDITIONS:

Given a standard 1:50,000 scale military map, compass, a coordinate scale and protractor, and designated start and finish points no more than 3,000 meters apart. The field location of the task should appear on the military map and contain varying types of terrain. Weather conditions should not be considered a limiting factor.

STANDARDS:

Within 1 hour, move from the start point to the finish point.

PERFORMANCE MEASURES:

1. Locate the start point and finish point on the map and determine where the start point is on the ground.

2. Determine the grid azimuth from the start point to the finish point on the map.

3. Convert the grid azimuth to a magnetic azimuth.

4. Determine the distance between the start point and the finish point on the map.

5. Convert the map distance to pace count.

6. Place the azimuth between the start point and the finish point under the fixed black index line of the compass.

7. When planning the route between points, select terrain features that will be encountered by making a map reconnaissance.

8. Make mental checklist of such features.

9. Move to the start point to begin pace count.

10. While moving along the route, check against your list.

11. After reaching the finish point, conduct a detailed terrain analysis to confirm your location.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69
TC 21-26, Don't Get Lost, Oct 72 (pages 42-46)
TEC Lesson 930-071-0018-F, Land Navigating with Map and Compass

TASK NUMBER: 071-329-1007

DETERMINE DISTANCE WHILE MOVING BETWEEN 2 POINTS ON THE GROUND

CONDITIONS:

Given a 600-meter pace course, a pace factor conversion table to determine your pace count, and a requirement to move by foot over varying types of terrain during daylight hours in all types of weather from a start point to a finish point not less than 500 meters nor greater than 700 meters in length.

STANDARDS:

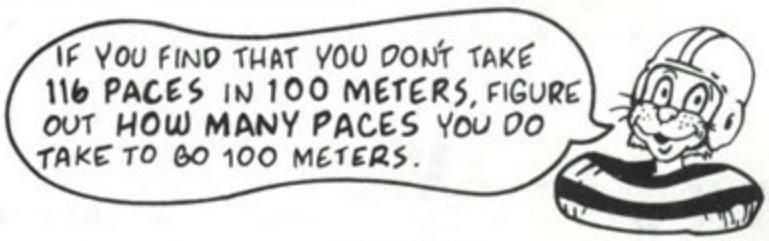
Determine the distance between the start point and finish point to within 5% of the actual distance in a maximum of 45 minutes.

PERFORMANCE MEASURES:

When you have to go a certain distance on foot without any landmarks to guide you, you can measure distance pretty accurately by counting your paces. The average pace is just a little less than one meter. The average man uses 116 paces to travel 100 meters. You should check your pace length by practicing on a known 100-meter distance -- like a football field plus one end zone, which is 110 yards (pretty close to 100 meters).

BEWARE: When you travel cross country like you do in the field, you use more paces to travel 100 meters – usually about 148 instead of 116. This is because you are not travelling over level ground, and you must use more paces to make up for your movement up and down hills. You should pace yourself over at least 600 meters of cross-country terrain in order to learn how many paces it takes you to travel an <u>average</u> 100 meters over cross-country terrain.

Be sure <u>you</u> know how many paces it take <u>you</u> to walk 100 meters both on level terrain and cross country.



The big problem in pacing is maintaining a straight line. At night the average man tends to walk in a circle if he doesn't use a compass. In daylight, you should use aiming points and a compass. Also, remember to figure only the straight-line distance when you have to walk around an obstacle.

Another problem is keeping count of paces taken. One way is to use pebbles. For instance, suppose you want to pace off one kilometer. (One kilometer is 1000 meters, or the distance between two of the black grid lines on your map.) Put 10 pebbles in your right pocket. When you go 100 meters move one pebble to your left pocket and start your count over. When all 10 pebbles have been moved to the left pocket, you have travelled one kilometer! Or, you can tie knots in a string -- one knot per 100 meters.

Now let's work a sample problem.

Problem: You are to move 715 meters.

a. Your pace count for 100 meters is equal to 116 paces.

b. Using the pebble method, you will need 7 pebbles. This will take you 700 meters. But what about the other 15 meters?

c. To determine how many paces it will take to go the remaining 15 meters, you simply multiply 15 meters by your pace count (116).

(1) 15 x = 1740.

(2) Mark out the last two numbers (40). The remainder is how many paces it will take to go 15 meters (17).

d. So you would go 715 meters using the pebble method by pacing off 116 paces per 100 meters until all 7 pebbles were used, then go an additional 17 paces to arrive at 715 meters.

REMEMBER: When determining your number of paces to go, if it is not a multiple of 100, **always** multiply the meters remaining by your pace count and mark out the last two numbers in your result.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69
TC 21-26, Don't Get Lost, Oct 72 (pages 14 and 15)
TEC Lesson 930-071-0018-F, Navigating with Map and Compass

TASK NUMBER: 071-329-1008

MEASURE DISTANCE ON A MAP

CONDITIONS:

Given:

1. A standard 1:50,000 topographic map on which is plotted:

   a. Point A and point B, 3,000 to 4,000 meters apart.

   b. Point C and point D, 3,000 to 4,000 meters apart, on a road (trail) which changes direction at least twice.

2. A strip of paper with a straight edge.

STANDARDS:

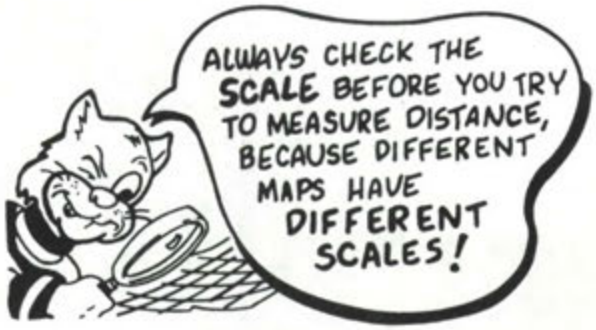
1. Determine the straight-line distance, in meters, from point A to point B within 50 meters, in 3 minutes.

2. Determine the road (curved-line) distance from point C to point D within 100 meters, in 3 minutes.

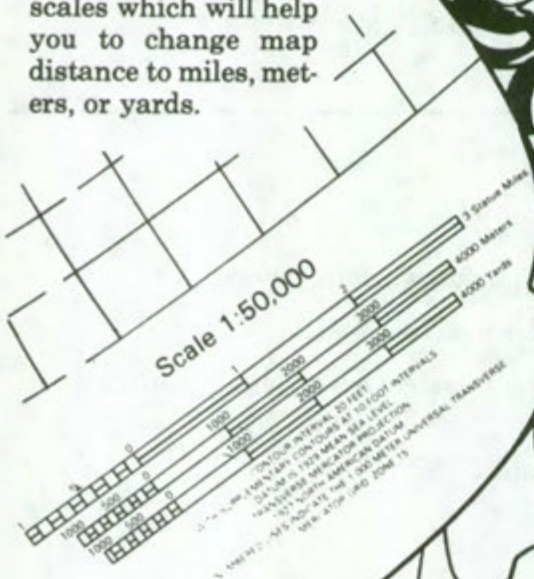
PERFORMANCE MEASURES:

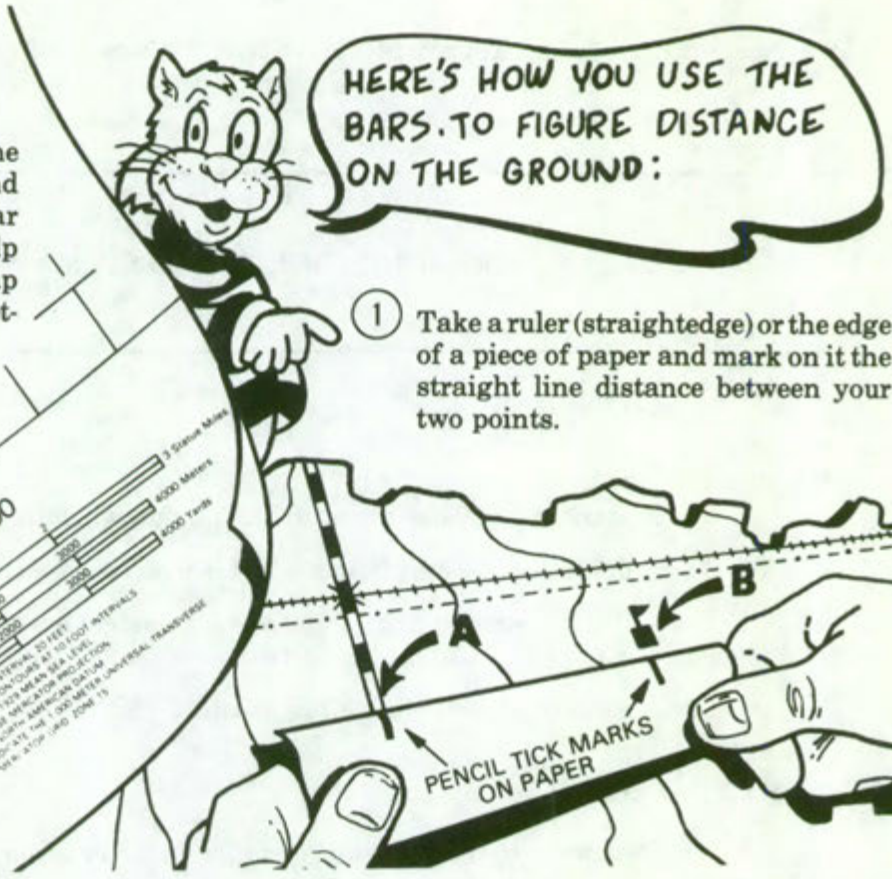
1. You can use your map to measure distance – how far it is between two places. The map is drawn to scale. This means that a certain distance on the map equals a certain distance on the earth. The scale is printed at the bottom and at the top of the map, like this – Scale 1:50,000.

2. This means that 1 inch on the map equals 50,000 inches on the ground. In fact, any ground distance equals 50,000 times that distance on the map.



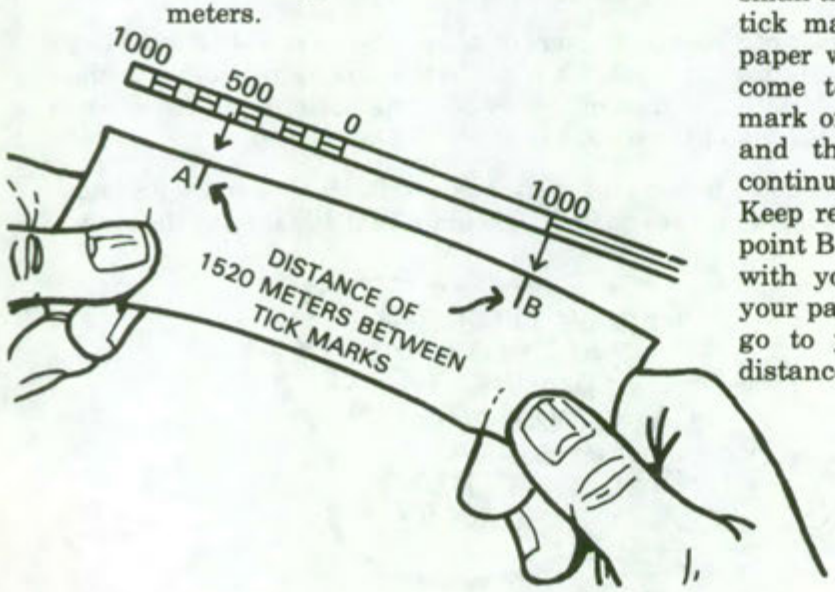
At the bottom of the map you will also find three different bar scales which will help you to change map distance to miles, meters, or yards.





(1) Take a ruler (straightedge) or the edge of a piece of paper and mark on it the straight line distance between your two points.

(2) Then put the ruler or paper just under one of the bar scales and read the ground distance in miles, meters, or yards. The bar scale in the picture shows a ground distance of 1520 meters.

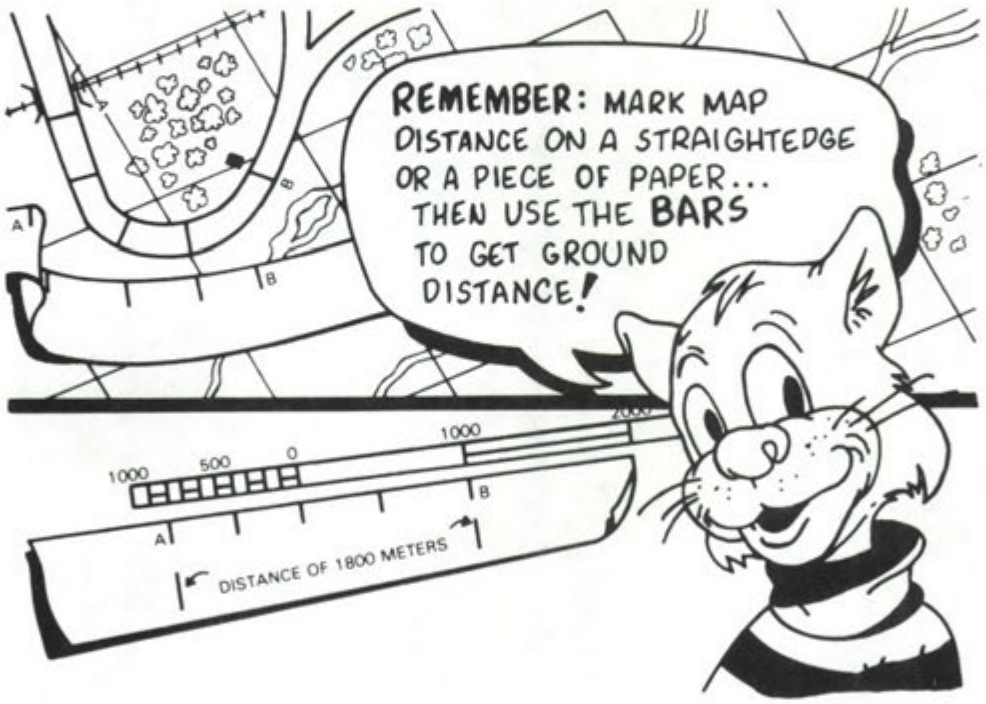


(3) Suppose you want to find the distance between A and B around a curve in a road. Take a strip of paper, make a small tick mark on it, and line up the tick mark with point A. Aline the paper with the road edge until you come to the curve, make another mark on the paper and on the map, and then pivot the paper so it continues to follow the road edge. Keep repeating this until you get to point B. Always follow the road edge with your paper. Make a mark on your paper where it hits B, and then go to your bar scales to get the distance.

Normally, you will be required to measure distance in meters and you may receive a problem that goes off the bar scale. The meter bar scale allows you to measure distances up to 5,000 meters. If you have to measure distances greater than 5,000 meters, follow this procedure:

a. Step A. Place your starting point on the paper under the zero on the bar scale. Measure off 4,000 meters and place a new tick mark at that point on your paper.

b. Step B. Place this second tick mark also under the zero on the bar scale and determine if the distance on the paper now falls within the bar scale. If it does, add this value to 4,000 to give you your total distance. If it does not, repeat Step A until the distance on the paper falls within the bar scale. Remember to add this last value to the total number of meters you've already measures.



REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 4, page 4-2, para 4-3)
TC 21-26, Don't Get Lost, Oct 72 (pages 10-13)

TASK NUMBER: 071-329-1004

DETERMINE THE ELEVATION OF A POINT ON THE GROUND USING A MAP

CONDITIONS:

Given a standard 1:50,000 scale military map, pencil, a designated point on the map, and a requirement to determine the elevation of that point.

STANDARDS:

Within 1 minute, determine the elevation of the designated point to within ½ of the value of the contour interval.

PERFORMANCE MEASURES:

To determine the elevation of a point on a map:

1. Locate the point on the map. (It may already be plotted on the map, or given as an eight-digit coordinate.)

2. Determine the contour interval of the map from the marginal information.

3. Locate the index contour line nearest the point for which the elevation is being sought.

4. Count the number of contour lines that must be crossed to go from the numbered lines to the point and note direction -- "up" or "down".

a. If the point is on contour lines, its elevation is that of the contour.

b. For points between contours:

(1) Points less than one-fourth the distance between lines are considered to be the same as the elevation of the nearest line.

(2) Points one-fourth to three-fourths the distance from the lower line are considered to be at an elevation half the contour interval above the lower line.

c. To estimate elevation of the top of an unmarked hill, add half the contour interval to elevation of highest contour line around the hill.

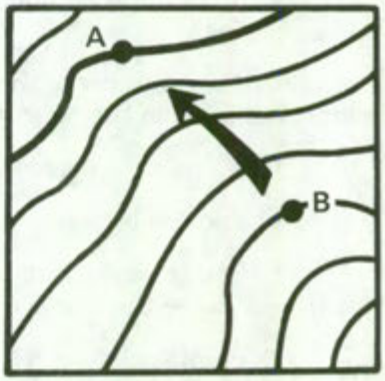
d. To estimate the elevation of the bottom of a depression, subtract half the contour interval from the lowest contour around depression.

e. On maps that do not show elevation and relief in as much detail as needed, supplementary contour lines may be used. Marginal information indicates the interval, and the supplementary lines are used exactly like solid contour lines.

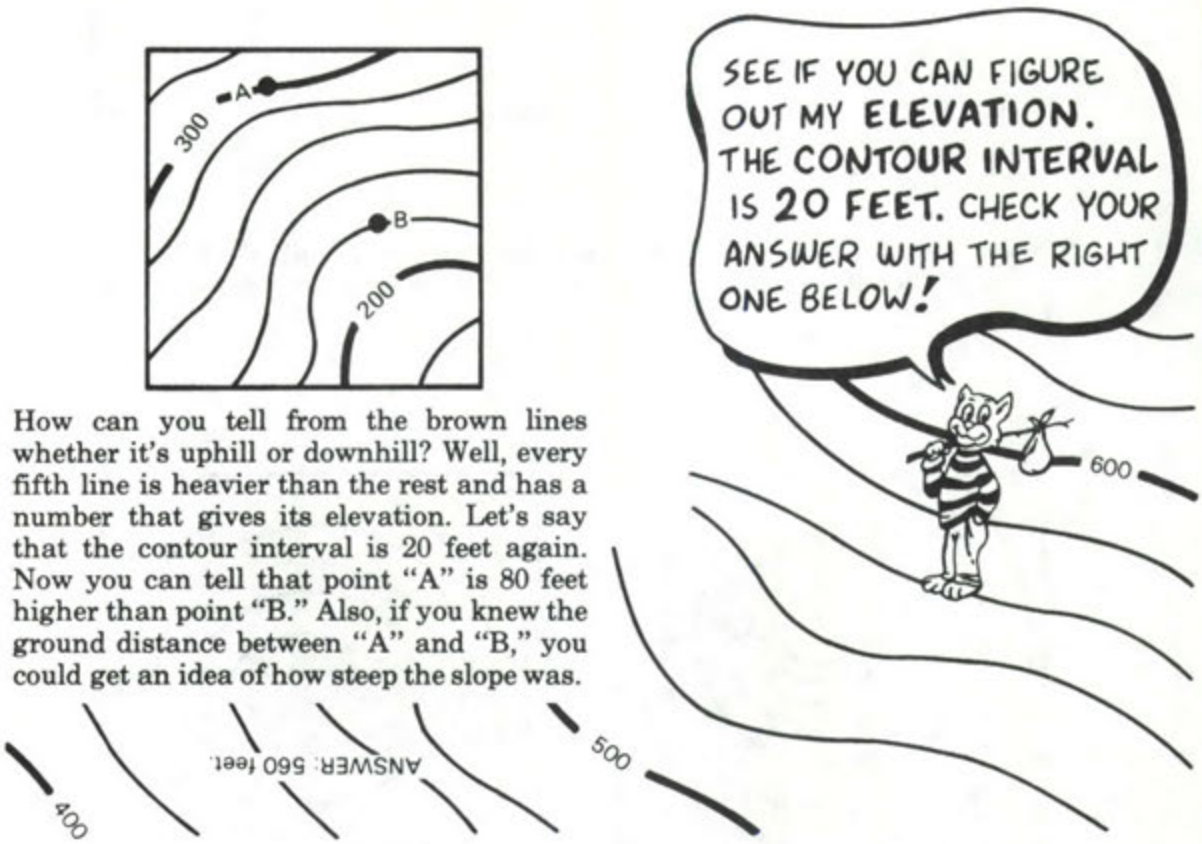
f. Bench marks and spot elevation also indicate points of known elevation.

...and this is about CONTOUR LINES

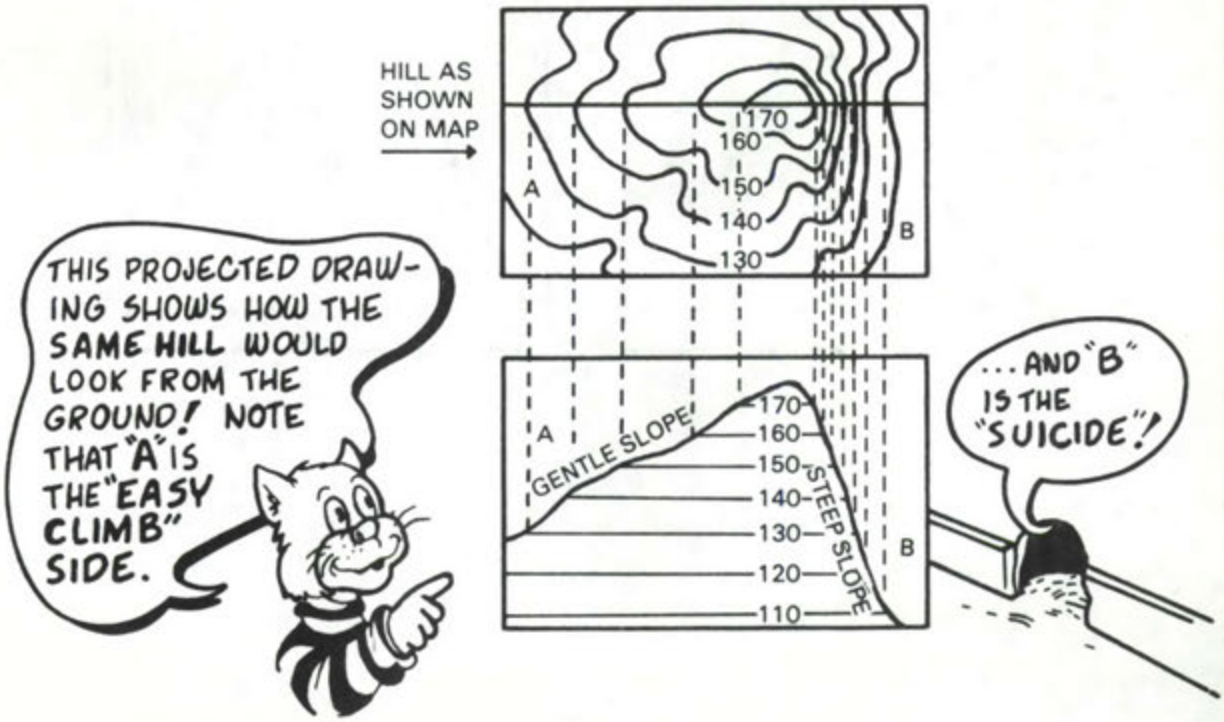
The brown lines on the map are called CONTOUR lines. Each line shows the height above sea level. Contour lines never cross one another. Printed at the bottom of the map is the CONTOUR INTERVAL, which is the difference in height (elevation) between one brown line and the one next to it. On a map with a scale of 1:50,000 contour interval is usually 20 feet. This would make point "A" 80 feet higher or lower than point "B."



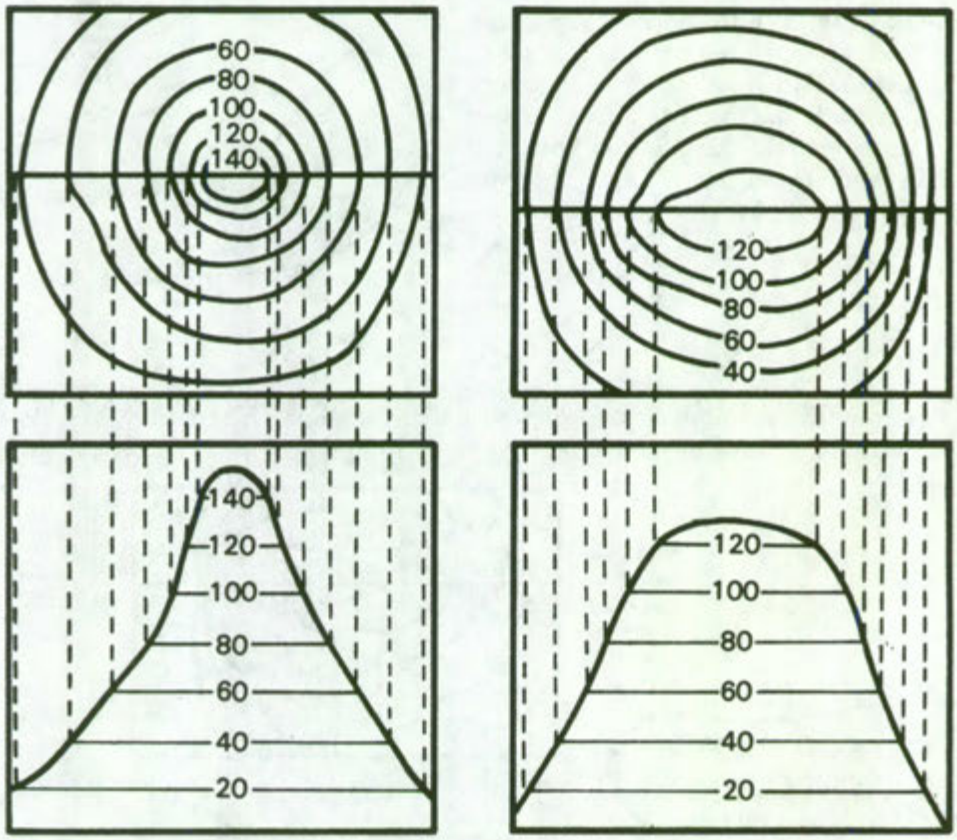
How can you tell from the brown lines whether it's uphill or downhill? Well, every fifth line is heavier than the rest and has a number that gives its elevation. Let's say that the contour interval is 20 feet again. Now you can tell that point "A" is 80 feet higher than point "B." Also, if you knew the ground distance between "A" and "B," you could get an idea of how steep the slope was.

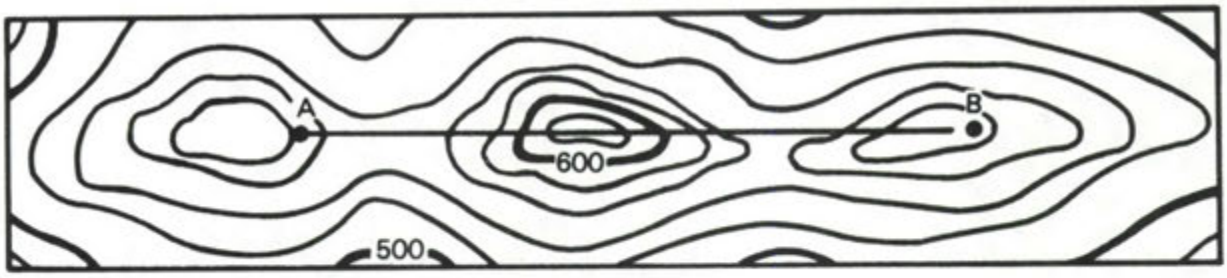


Contour lines widely spaced show a gentle slope. When they are close together the slope is steep.



When the contour lines are close together at the top of a hill, the hilltop is pointed. The hilltop is flat when the contour lines are widely spaced at the top.





REMEMBER: A contour line is a brown line on your map that connects points of the same elevation. You can find the contour interval in the margin at the bottom of your map. The heavy brown lines (every fifth one) have the elevation printed on them. You can tell from looking at your map what the slopes, hills, and valleys will look like on the ground.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 6, page 6-1, para 6-2)
TC 21-26, Don't Get Lost, Oct 72 (pages 42-46)
TEC Lesson 930-071-0016-F, Terrain Features

TASK NUMBER: 071-329-1011

ORIENT A MAP USING A COMPASS

CONDITIONS:

Given a standard 1:50,000 scale military map and lensatic compass, in a field environment, under daylight conditions.

STANDARDS:

Within 1 minute, orient the map to the ground using a compass so that the north-seeking arrow of the compass is within 3 degrees of the angle shown in the G-M angle of the declination diagram shown on the map.

PERFORMANCE MEASURES:

1. With the map in a horizontal position, the compass is placed parallel to a north-south grid line with the cover side of the compass pointing toward the top of the map. This will place the black index line on the dial of the compass parallel to grid north. Since the needle on the compass points to magnetic north, we have a declination diagram on the face of the compass formed by the index line and the compass needle.

2. Rotate map and compass until the directions of the declination diagram formed by the black index line and the compass needle match the directions shown on the declination diagram printed on the margin of the map. The map is then oriented.

3. If the magnetic north arrow on the map is to the left of grid north, the compass reading will equal the G-M angle (given in the declination diagram). If the magnetic north is to the right of grid north, the compass reading will equal 360° minus the G-M angle.

4. Remember to point the compass north arrow in the same direction as the magnetic north arrow (2 above), and the compass reading (equal to the G-M angle or the 360° minus G-M angle) will be quite apparent.

5. Some maps have a built-in protractor consisting of a pivot point "P" on the south neatline of the map and several degrees of arc along the north neatline of the map. The G-M line is obtained by connecting pivot point "P" with the appropriate value of the G-M angle (taken from the declination diagram) on the arc. The map may then be oriented by placing the compass parallel to this line and rotating the map and compass until the needle point is alined with the continuous line formed by the index line and the sighting wire. The map is then oriented.

6. An alternate method is to draw a magnetic north line on the map from any N-S and E-W grid line intersection using the protractor. Aline the straightedge of the compass along this magnetic north line and rotate the map and compass together until the north arrow falls beneath the fixed black index line on the compass.

NOTE: If G-M angle is less than 3 degrees, do not line up north arrow.

REFERENCE:

FM 21-26, Map Reading, C1, Jan 69 (chap 5, page 5-10, para 5-7)

TASK NUMBER: 071-329-1005

DETERMINE A LOCATION ON THE GROUND BY TERRAIN ASSOCIATION

CONDITIONS:

In the field during daylight hours, while at an unknown location on the ground, given a standard 1:50,000 scale military map of the area, a coordinate scale and protractor, a known point on the ground, and a requirement to determine the six-digit map coordinates of the location.

STANDARDS:

Within 15 minutes, determine the six-digit grid coordinates of your location to within 100 meters.

PERFORMANCE MEASURES:

1. Determine the four cardinal directions (north, south, east, and west).
2. Determine the type of terrain feature on which you are located.
3. Determine what types of terrain features surround the location.
4. Orient the map.
5. Relate the terrain features on the ground to those shown on the map.
6. Having determined where the terrain features on the ground and those on the map coincide, determine the coordinate location of that point using the coordinate scale and protractor.

REFERENCE:

TEC Lesson 930-071-0018-F, Land Navigation with a Map and Compass

TASK NUMBER: 071-329-1012

ORIENT A MAP TO THE GROUND BY MAP-TERRAIN ASSOCIATION

CONDITIONS:

Given a standard 1:50,000 scale military map in a field site, under daylight conditions.

STANDARDS:

You must orient the map to north within 30° in 10 minutes.

PERFORMANCE MEASURES:

There are many good ways that you can use to locate your position on your map, but first you have to do one important thing.

> You've got to point your map so that NORTH, SOUTH, EAST and WEST on the map POINT THE SAME WAY as they do ON THE GROUND.

Look at the map and the ground to find two linear features common to both, such as hilltops, saddles, valleys, ridges, and depressions. By alining the features on the map with the same feature on the ground (figure 1 and 2) the map is oriented.

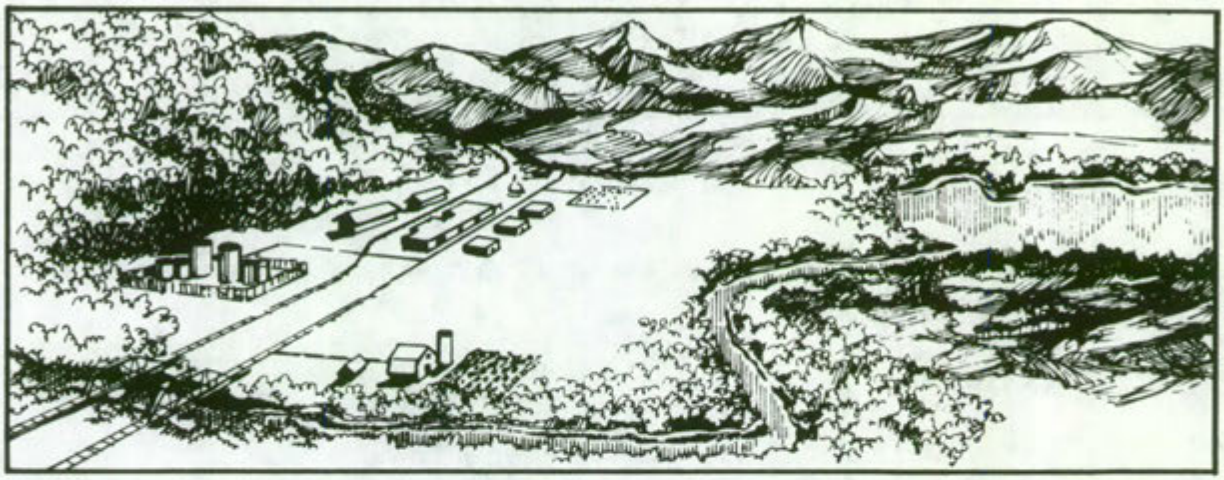


Figure 1. An area as viewed from a ground position.

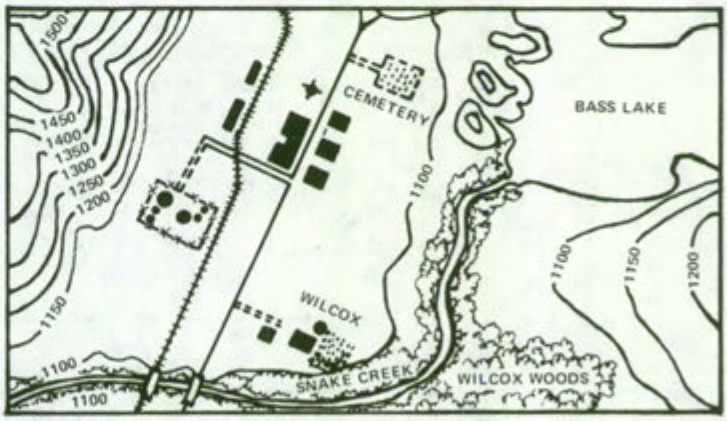


Figure 2. Map of the same area as in figure 1.

REFERENCES:

FM 21-26, Map Reading, C1, Jan 69 (chap 5, page 5-10, para 5-7)
TC 21-26, Don't Get Lost, Oct 72

TASK NUMBER: 071-315-2301

PERFORM OPERATOR MAINTENANCE ON AN AN/PVS-2

CONDITIONS:

Given an AN/PVS-2 (night vision sight), pail of water (distilled water, if available), lens brush, lens tissue, clean soft rags, and TM 11-5855-203-13.

STANDARDS:

Within 20 minutes, inspect and clean the sight so that all foreign matter is removed, lenses are clean, all defects that are operator's maintenance are corrected, and those defects noted that are not operator's maintenance are reported to your immediate supervisor.

PERFORMANCE MEASURES:

1. **Inspecting Night Vision Sight.**

a. Refer to TM 11-5855-203-13, paragraph 3-4, when inspecting sight for defects.

b. In addition to the routine daily checks and services, the starlight scope should be checked and serviced immediately before going on a mission and as soon after completion of the mission as possible.

2. **Cleaning the Sight.**

a. Glass Surfaces. Clean exposed glass surfaces of the objective lens assembly and eyepiece assembly by removing loose dirt with a lens brush, and then clean the glass surfaces with lens tissue. Saturate the tissue with water to remove stubborn dirt. (Use distilled water, if available.) Dry and polish the lenses with dry lens tissue.

b. Metal Surfaces. Clean all exposed metal surfaces with a lint-free cloth. If necessary, dampen the cloth with water. Allow to dry before storing the scope.

c. Rubber Eyeshield. Clean with a wet cloth.

d. Carrying Case. Wipe the inside and outside of the carrying case with a damp cloth.

e. Shipping Container Liners. Clean exposed surface with a dampened cloth and allow to dry before use.

f. Shipping Container. Clean with a clean cloth. Dampen cloth if necessary.

REFERENCES:

TC 23-11, Starlight Scope, Small, Hand-Held or Individual Weapons Mounted, Nov 66 (chap 2, sec 4, pages 29 and 30)
TM 11-5855-203-13, Night Vision Sight Individual Weapons Mounted AN/PVS-2, C2, 4, and 6, Apr 67 (chap 3, pages 38 thru 43, para 3-3 thru 3-7)

TASK NUMBER: 071-315-2302

CONDUCT SURVEILLANCE USING AN AN/PVS-2

CONDITIONS:

At night, given an operational AN/PVS-2 in your defensive position, five BA-1100 batteries, and one enemy squad moving within your assigned sector.

STANDARDS:

Detect and report all movement within your sector of observation in open areas out to 300 meters.

PERFORMANCE MEASURES:

1. Operation.

CAUTION: Make sure the switch is in OFF position before installing battery.

a. Install the battery.

(1) Step 1: Remove the battery cap by turning it counterclockwise.

(2) Step 2: Install the battery, with the positive terminal (raised end) first, into main housing.

(3) Step 3: Replace the battery cap turning it clockwise. Tighten firmly to insure a watertight seal.

CAUTION: Always keep the lens cap on the objective lens when operating in daylight.

b. To put sight into operation, follow these steps:

(1) Step 1: Place power switch (4) in UP position.

(2) Step 2: Set diopter scale (9) to zero and then adjust focusing (10) for sharp sight reticle. Once this adjustment is made, no further adjustment should be necessary for the same operator.

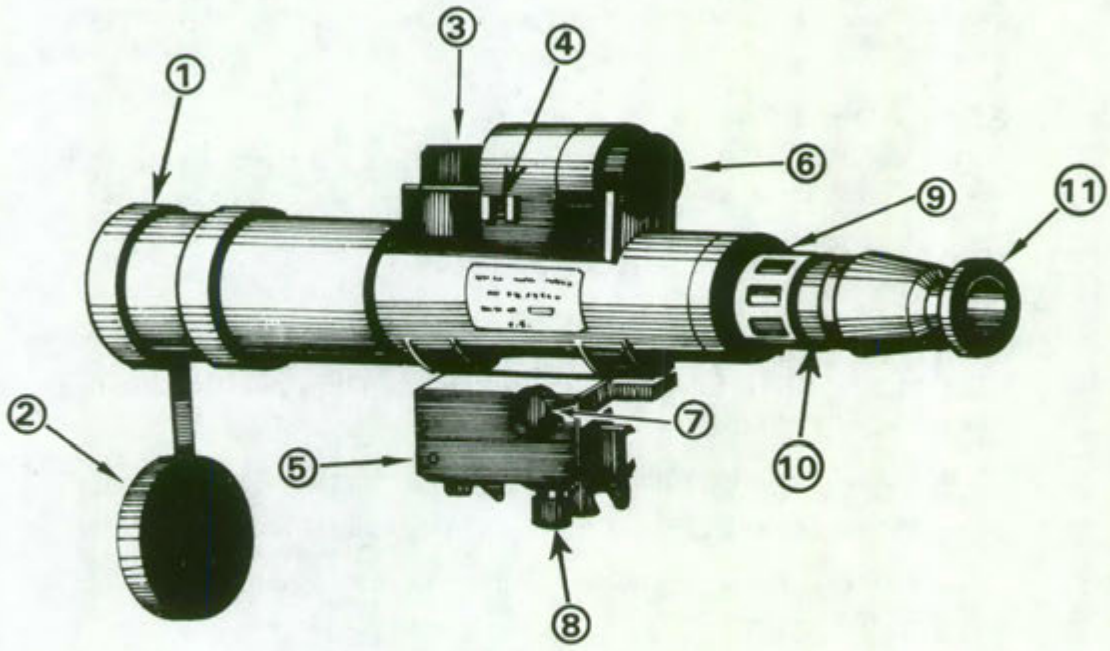
NOTE: The operator must press his eye against the eyeshield to open the rubber security flaps.

(3) Step 3: Adjust range focus ring (1) for sharp image. During surveillance, the operator will have to adjust the range focus to insure a sharp image at different ranges.

c. After operation, place the power switch in OFF position.

NOTE: Do not repack the sight in the shipping container without removing the battery.

2. Detect the specific target as required. The soldier can detect movement; observe terrain, the enemy, and his own forces; and effectively execute surveillance during any operation with the AN/PVS-2. Viewing is only limited by surrounding light levels. Reflection of light from water makes viewing capabilities unlimited.



1. RANGE FOCUS RING
2. LENS CAP
3. OSCILLATOR CAP
4. POWER SWITCH
5. BORESIGHT MOUNT ASSEMBLY
6. BATTERY CAP
7. AZIMUTH ADJUSTMENT KNOB
8. ELEVATION ADJUSTMENT KNOB
9. DIOPTER SCALE
10. FOCUS RING
11. EYESHIELD

Figure 1.

REFERENCES:

TC 23-11, Starlight Scope Small Hand-Held or Individual Weapons Mounted, Nov 66 (chap 2, pages 17 thru 20, para 9)
TM 11-5855-203-13, Night Vision Sight Individual Weapons Mounted AN/PVS-2, C2, 4, & 6, Apr 67 (chap 2, page 33, para 2-14)
TEC Lesson 953-071-0061-F, AN/PVS-2, Starlight Scope

CHAPTER 2

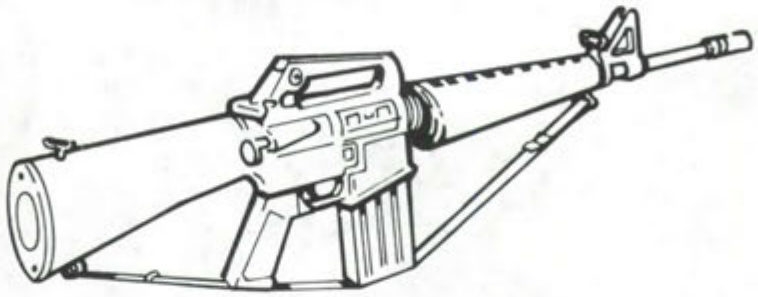
LIGHT WEAPONS INFANTRYMAN

SECTION III
WEAPONS

TASK SUMMARIES

INTRODUCTION
M16A1 RIFLE

FACTS ABOUT YOUR RIFLE

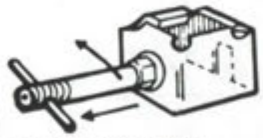


The M16A1 rifle system consists of a rifle, one magazine, and a sling. It is a lightweight, gas-operated, air-cooled, magazine-fed, shoulder-fired weapon that can be fired either automatically or semiautomatically.

Other features:

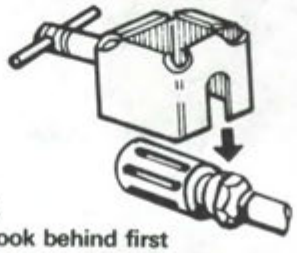
The barrel assembly has an adjustable sight and a flash suppressor.
Upper and lower receivers are easily opened for cleaning and inspection.
Bolt group and barrel extension are designed with locking lugs that lock bolt group to barrel extension.
An aluminum receiver reduces the weight of the rifle.
Some rifles are equipped with the Low Light Level Sight to increase effectiveness during periods of limited visibility.

M15A2 BLANK FIRING ATTACHMENT (BFA)



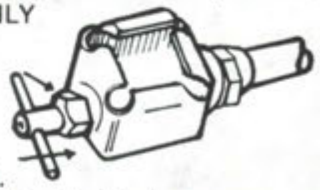
1. **Unscrew and slide all the way back**

NOTE: After 50 rounds, check to see if it is still tight. Make sure to clean carbon buildup after each use



2. **Hook behind first groove of flash suppressor**

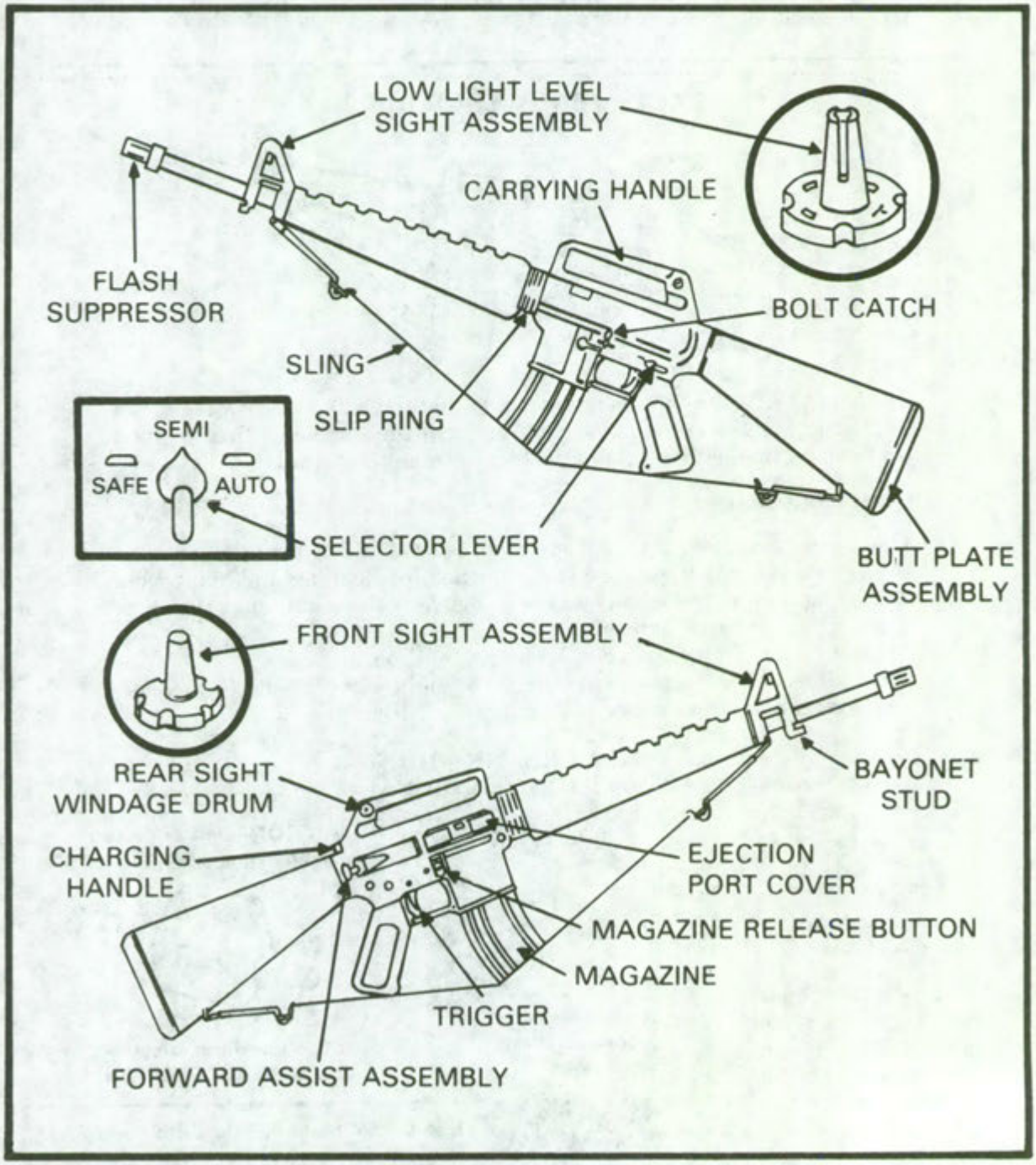
CAUTION: Do not use tools to tighten attachment, HANDS ONLY



3. **Slide into flash suppressor and HAND TIGHTEN**

WARNING	Use ONLY blank M200 with the BFA

RIFLE PARTS AND WHERE THEY ARE



TASK NUMBER: 071-311-2001

PERFORM OPERATOR MAINTENANCE ON AN M16A1 RIFLE, MAGAZINE, AND AMMUNITION

CONDITIONS:

Given an M16A1 rifle, magazine, 5.56-mm ammunition (combat only), and small arms maintenance equipment case (FSN 8465-00-781-9564).

STANDARDS:

1. Disassemble M16A1 rifle IAW performance measures for disassembly.

2. Clean and lubricate M16A1 rifle IAW performance measures for cleaning and lubricating.

3. Assemble M16A1 rifle IAW performance measures for assembly and conduct a function check.

4. Disassemble, clean and lubricate, then assemble rifle magazine IAW performance measures for care of the rifle magazines.

PERFORMANCE MEASURES:

CLEAR YOUR RIFLE

1 Place selector on SAFE. If weapon is not cocked, lever cannot be pointed toward SAFE.

2 Remove magazine.

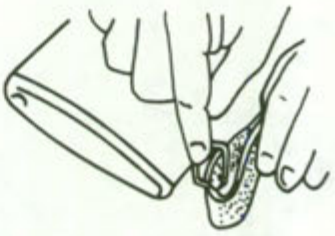
3 To lock bolt open, pull charging handle rearward, press bottom of bolt catch, allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place on SAFE.

4 Eyeball receiver and chamber to insure these areas contain no ammo.

5 With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.

DISASSEMBLY

1 first CLEAR YOUR RIFLE



2 Remove sling.

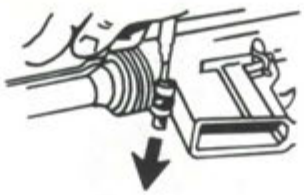
NOTE

Remove & clean only if dirt & corrosion can be seen through vent holes.

3 Remove handguards.

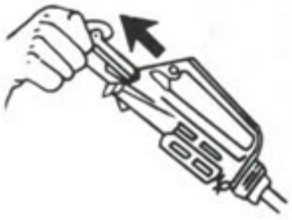
DISASSEMBLY (cont).

4 Pivot upper receiver from lower receiver.



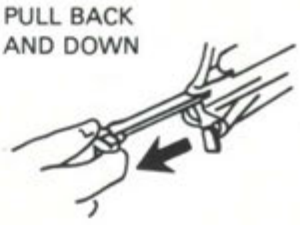
5 Push receiver pivot pin.

6 Separate upper and lower receivers.

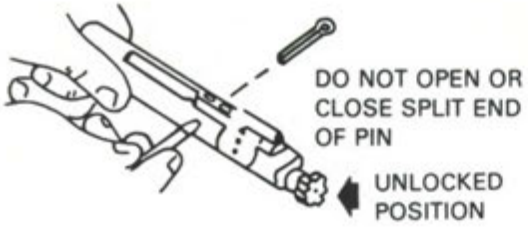


7 Pull back charging handle and bolt carrier.

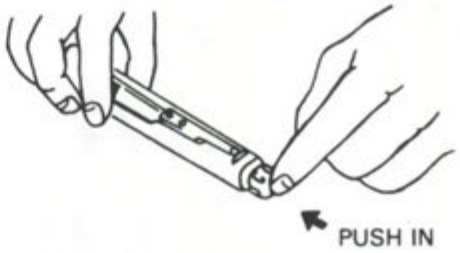
8 Remove bolt carrier and bolt.



9 Remove charging handle.

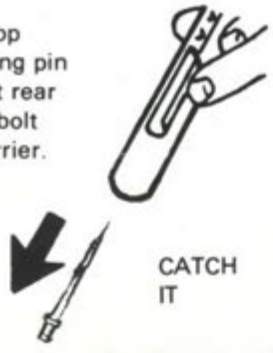


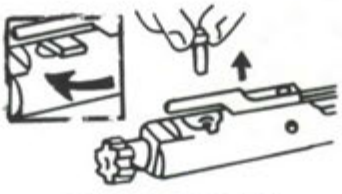
10 Remove firing pin retaining pin.



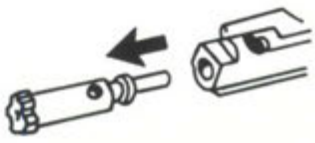
11 Put bolt assembly in lock position.

12 Drop firing pin out rear of bolt carrier.



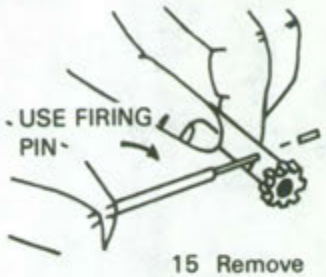


13 Remove bolt cam pin.



14 Remove bolt assembly from carrier.

PERFORM STEPS 15 THRU 18 ONLY WHEN DIRTY OR DAMAGED



15 Remove extractor pin.

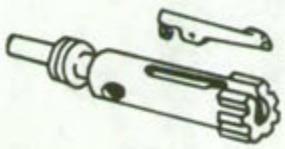
NOTE

Press top of extractor to check spring function.

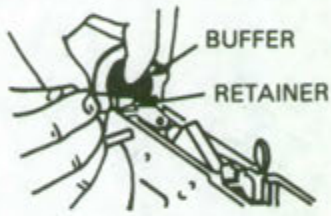
See your ARMORER

Do not damage tip of firing pin.

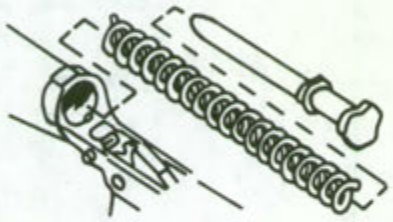
DON'T SEPARATE SPRING FROM EXTRACTOR



16 Remove extractor and spring.



17 Press in buffer, depress retainer and release buffer.



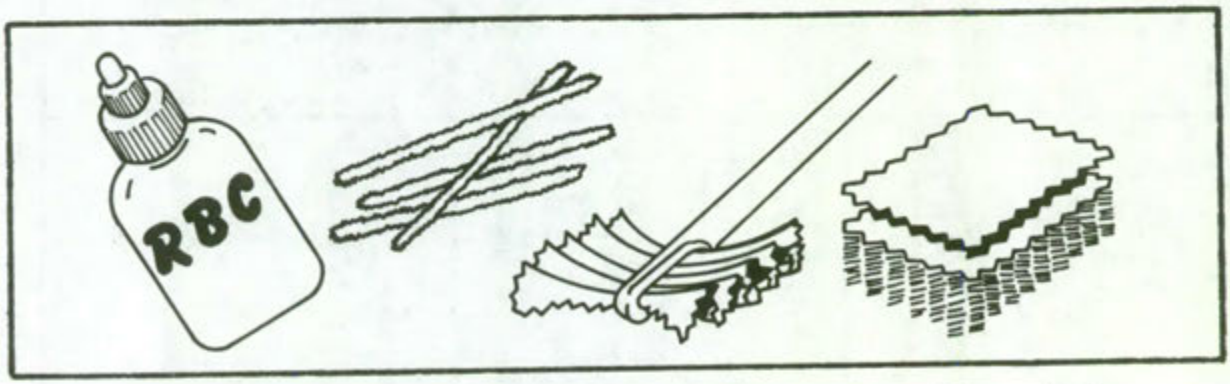
18 Remove buffer and spring.

NO FURTHER DISASSEMBLY ALLOWED

CLEAN . . . INSPECT . . . LUBE

With the rifle disassembled, thoroughly clean, inspect and lube, so you have a reliable weapon you can always depend on.

After firing, clean your weapon for 3 consecutive days with rifle bore cleaner (RBC). Wipe dry and lube according to lubrication instructions.



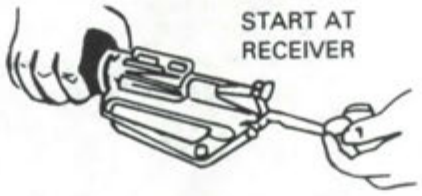
Cleaning materials: swabs, pipe cleaners, and RBC are expendable items that are available from company supply.

If any parts are missing or defective, see your ARMORER.

CLEANING upper and lower receiver group

CLEAN WITH RBC

- All Areas of Powder Fouling, Corrosion, Dirt & RUST
- Bore & Chamber
- Locking Lugs
- Gas Tube



GO RIGHT THRU THE FLASH SUPPRESSOR

BORE BRUSH (DON'T REVERSE DIRECTION WHILE IN BORE)

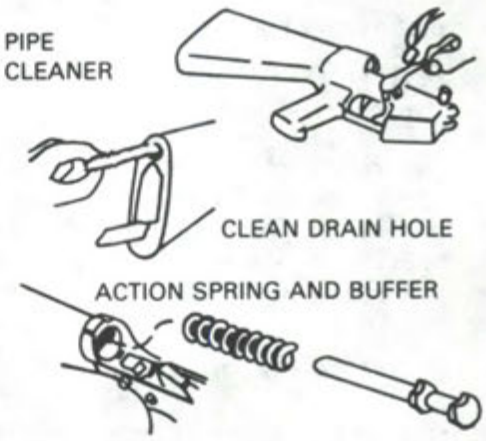
BARREL LOCKING LUGS AND GAS TUBE

Use a worn bore brush to get outside surface of protruding gas tube (get sides and bottom from bottom of receiver)

- All Areas of Powder Fouling, Corrosion, and Dirt
- Wipe Dirt from Trigger Mechanism
- Clean Buffer and Inside Lower Receiver Extension

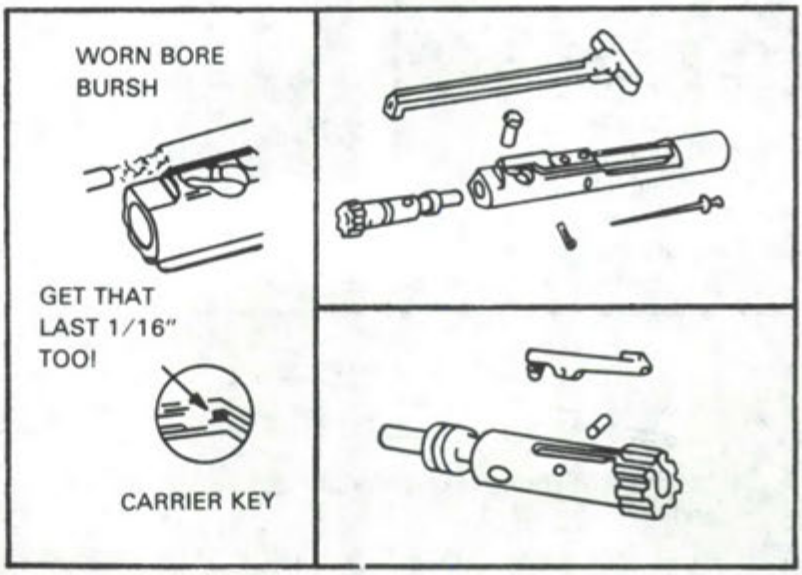
CAUTION

Do not use wire brush or any type of abrasive material to clean aluminum surfaces



CLEANING bolt carrier group

- Outer & Inner Surfaces of Bolt Carrier
- Carrier Key
- Firing Pin Recess and Firing Pin
- Firing Pin Hole (Use Pipe Cleaner There)
- Carbon Deposits & Dirt from Locking Lugs
- Areas Behind Bolt Ring and Under Lip of Extractor



LUBE GUIDE

Under all but the coldest arctic conditions, LSA is the lubricant to use on your rifle. Remember to remove excessive oil from the bore before firing.

Lightly Lube - A film of oil barely visible to the eye.

Generously Lube - Heavy enough so that it can be spread with the finger.

3. Care and Cleaning.

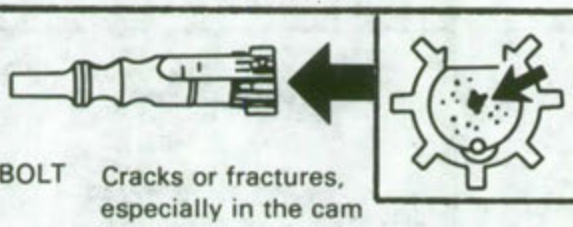
a. **Cleaning Rifle.** Clean and lightly lubricate with LSA the lugs in barrel extension, bore, and chamber. Clean and lightly lubricate the bolt carrier. Lubricate slide cam pin area, piston rings, outside bolt body, and in bolt carrier key.

(CAUTION: Apply only a light coat of LSA to firing pin and firing pin recess.)

Use rifle bore cleaning compound (RBC) to clean powder fouling in the upper receiver. Clean outside surface of protruding gas tube with a worn bore brush. Coat all other surfaces with lubricant. Apply a light coat of LSA to buffer, action spring, and inner surfaces of lower receiver extension. Use generous amount inside lower receiver and on all components.

INSPECT - before assembly

WARNING: DO NOT interchange bolts between rifles



BOLT Cracks or fractures, especially in the cam pin hole area. Bolts that contain pits extending into the firing pin hole need replacing

FIRING PIN - Bent, cracked or blunted end

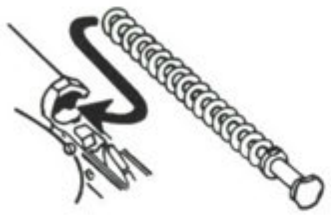
FIRING PIN RETAINING PIN - Bent, busted, badly worn

CAM PIN - Cracked, chipped or missing

EXTRACTOR AND EXTRACTOR SPRING - Check extractor for chipped or broken edges in the area of the lip that engages the cartridge rim.

IF PARTS ARE MISSING OR DEFECTIVE, SEE YOUR ARMORER

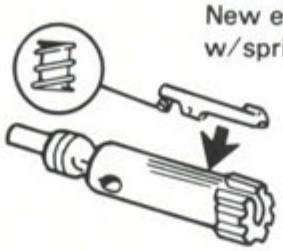
ASSEMBLY



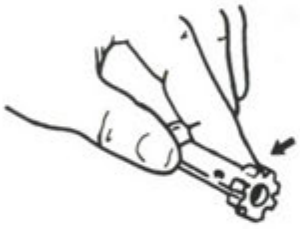
1 Insert spring and buffer

New extractor has a silicone insert w/spring. Be sure not to lose it

If the spring comes loose, put the large end of spring in the extractor and seat

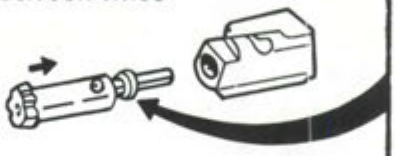


2 Insert extractor and spring

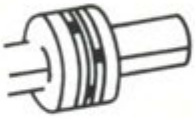


3 Push in extractor pin

WARNING
Don't switch bolts between rifles



4 Slide bolt into carrier

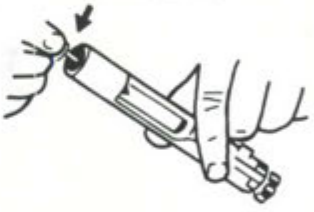


STAGGER RING GAPS TO STOP GAS LOSS

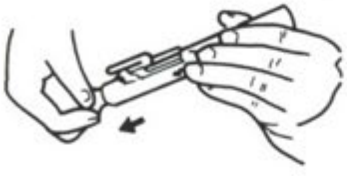
GIVE CAM PIN A ¼ TURN AFTER ASSEMBLY

5 Replace bolt cam pin

FIRING PIN



6 Drop in and seat



7 Pull bolt back

NOTE

Firing pin should not fall out when bolt carrier group is turned upside down

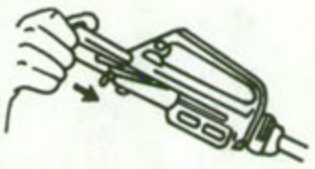
8 Replace retaining pin

ASSEMBLY (cont).

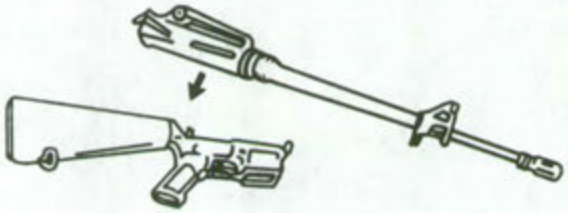
9 Engage, then push charging handle part way

BE SURE BOLT IS STILL UNLOCKED

10 Slide in bolt carrier group



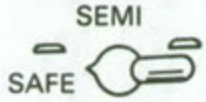
11 Push in charging handle and bolt carrier group together

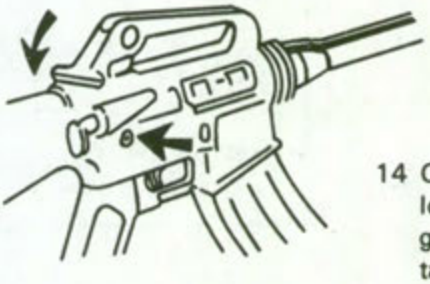


12 Join upper and lower receivers

13 Engage receiver pivot pin

CAUTION:
Selector lever must be on safe or semi before closing upper receiver





14 Close upper and lower receiver groups. Push in takedown pin

HOLD SLIP RING DOWN

CHECK FOR FULL ENGAGEMENT

15 PUT HANDGUARDS IN PLACE

16 Replace sling

DID YOU INSTALL EVERYTHING?

MAGAZINE DISASSEMBLY

20 RD MAG PUSH DOWN ON INTERNAL SPRING AND SLIDE OUT

Release base catch

30 RD MAG PRY UP. PUSH OUT

Release base catch

Remove base

Jiggle spring and follower to remove

NOTE:
Do not remove follower from spring

MAGAZINE ASSEMBLY

IF THE SPRING COMES LOOSE FROM THE FOLLOWER, TURN IN THE PIECES DON'T TRY TO FIX IT YOURSELF

CLEAN & LUBE

Wipe dirt from tube, spring, and follower, then lightly lube spring

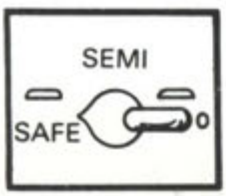
Jiggle spring and follower to install

Slide the base under all four tabs

MAKE SURE PRINTING IS ON THE OUTSIDE

FUNCTIONAL CHECK

(REMOVE MAG . . . CHECK CHAMBER)



SELECTOR LEVER ON: *safe*

Pull charging handle to rear and release. Place on safe. Pull trigger. Hammer should not fall.

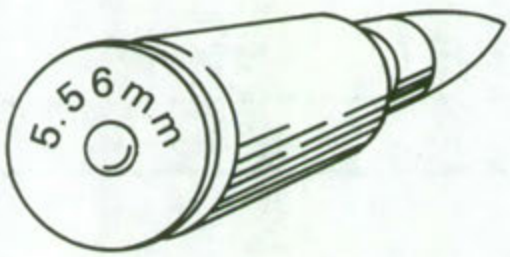
FUNCTIONAL CHECK cont.

semi

Place selector in semi. Pull trigger and hold to rear. Hammer should fall. Pull charging handle to rear and release. Release trigger and pull again. Hammer should fall.

auto

Place selector in auto. Pull charging handle to rear and release. Pull trigger and hold to rear, hammer should fall. Pull charging handle to rear and release. Release trigger and pull again. Hammer should not fall.



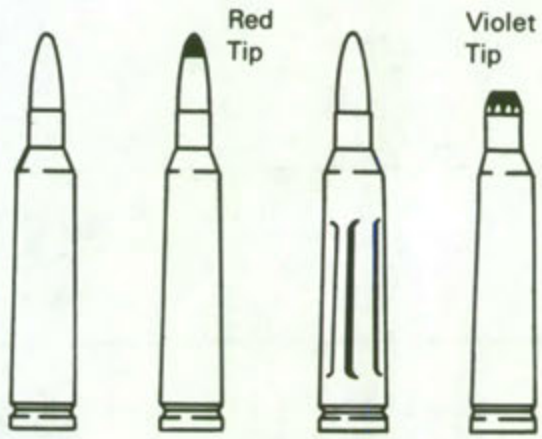
AMMUNITION

WARNING

DO NOT FIRE . . .

- Seriously corroded ammunition
- Dented cartridges
- Cartridges with loose bullets
- Cartridges exposed to extreme heat (135°) until they have cooled

Use only authorized ammo that is manufactured to US specs.



KEEP DRY, CLEAN, AND FREE OF CRUD. YOUR LIFE DEPENDS ON IT!

Cleaning Ammunition. Use a clean, dry cloth to wipe dirt and foreign matter from ammunition. Do not coat with oil.

SARGE'S INSPECTION

Sarge'll gig ya if the following items are not clean . . . .

BOLT,
SIGHTS,
RECEIVER,
CHARGING HANDLE,
HANDGUARDS,
GAS TUBE & PORTS,
STOCK DRAIN HOLE,
BORE & FLASH SUPPRESSOR,
MAGAZINE CATCH &
MAGAZINE WELL

He'll also check the overall condition of the SIGHTS, BIPOD, STOCK, & HANDGUARDS.

So, be prepared, keep it clean and lubed.

REFERENCES:

TM 9-1005-249-10, Operator's Manual, Apr 77 (pages 9 thru 33)
TEC Lesson 939-071-0010-F, Disassembly and Assembly of the M16A1 Rifle
TEC Lesson 939-071-0011-F, Maintaining the M16A1 Rifle
GTA 21-13, M16/M16A1 Rifle Maintenance Card

TASK NUMBER: 071-311-2003

LOAD, REDUCE A STOPPAGE, AND CLEAR AN M16A1 RIFLE

CONDITIONS:

Given an assembled and operational M16A1 rifle, a magazine loaded with either live or blank ammunition. Performance of this task with blank ammunition can be accomplished either in garrison or in the field. Live firing requirements are only applicable to actual combat situations or range firing.

STANDARDS:

In accordance with the performance measures:

1. Load and chamber a round within 5 seconds.

2. Eliminate stoppages, either real or simulated, within 10 seconds, by using immediate action.

3. Clear the M16A1 rifle within 10 seconds.

PERFORMANCE MEASURES:

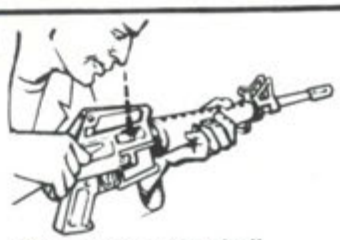
(1) LOADING A ROUND

a.

b.

With hammer cocked, place selector lever on SAFE.

c.



Open bolt and eyeball chamber. Clear?

d.

Push upward until magazine catch engages and holds magazine.

e.

Tap upward to make sure it's seated right.

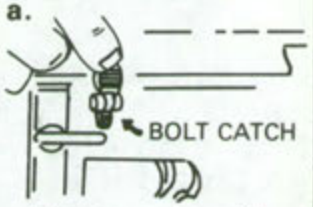
f.

MAGAZINE MAY BE LOADED WITH BOLT ASSEMBLY OPEN OR CLOSED

② CHAMBERING A ROUND

BOLT ASSEMBLY OPEN

a.



Depress upper portion of bolt catch.

b.

Tap forward assist to insure bolt is fully forward & locked.

BOLT ASSEMBLY CLOSED

c.

Pull charging handle fully rearward.

d.

Release the charging handle.

e.

Never "ride" the charging handle. Let it go on its own.

f.

Tap forward assist to insure bolt is fully forward & locked.

③ IMMEDIATE ACTION

If your rifle stops firing before you do, remember: S-P-O-R-T-S. That key word will help you remember the following actions: **Slap, Pull, Observe, Release, Tap, Shoot.**

a.

SLAP upward on magazine to make sure it's properly seated.

b.

PULL charging handle all the way back. **OBSERVE** ejection of case or cartridge. Eyeball chamber and check for obstruction.

c

If cartridge or case is ejected or chamber is clear, **RELEASE** charging handle to feed new round. (Don't ride the charging handle.)

d.

TAP forward assist.

e.

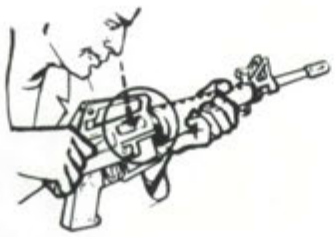
Now **SHOOT.** If it won't fire, look for trouble and apply remedial action.

④ REMEDIAL ACTION

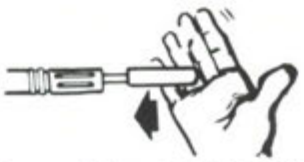
WARNING

If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.

a. If your rifle fails to fire after performing steps a thru e for immediate action, check again for jammed cartridge case.



b.



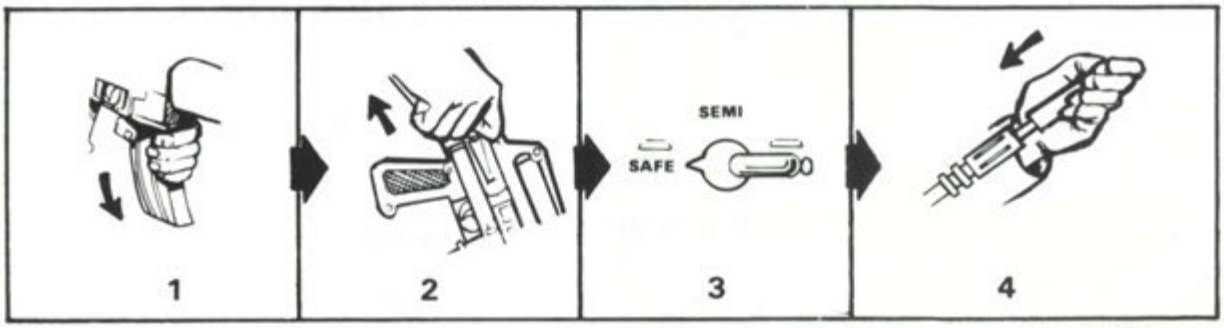
If a cartridge case is in the chamber, tap it out with a cleaning rod.

c. IF YOUR RIFLE STILL FAILS TO FIRE, CHECK TROUBLESHOOTING IN TM 9-1005-249-10, page 48 thru 54.

WARNING

If you hear a "POP" or feel less RECOIL during firing, immediately CEASE FIRE, remove the magazine (1), lock the bolt to the rear (2), and place the selector lever on the "SAFE" position (3). Inspect the bore, or insert a cleaning rod into the bore to insure there is not a round lodged in it (4).

DO NOT APPLY IMMEDIATE ACTION.



If a projectile is lodged in the barrel of the weapon, **DO NOT** attempt to remove it. **Turn the weapon in to the armorer.**

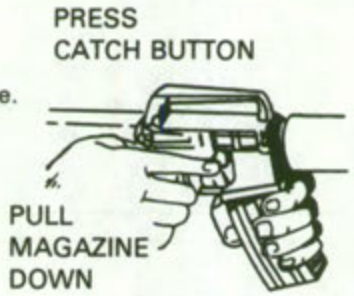
(5) CLEARING THE RIFLE

a.

Place selector on SAFE. If weapon is not cocked, lever cannot be pointed toward SAFE.

b.

Remove magazine.



c.

To lock bolt open, pull charging handle rearward, press bottom of bolt catch, and allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place on SAFE.

d.

Eyeball receiver and chamber to insure these areas contain no ammo.

e.

With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.

REFERENCES:

TM 9-1005-249-10, Operator's Manual M16A1 Rifle, Apr 77 (pages 11, 36-37, 42-45)
TEC Lesson 939-071-0009-F, Loading and Unloading the M16A1 Rifle
TEC Lesson 939-071-0012-F, Preventing and Correcting Common Malfunctions

TASK NUMBER: 071-311-2004

BATTLESIGHT ZERO AN M16A1 RIFLE

CONDITIONS:

On a 25-meter firing range, given an M16A1 rifle equipped with either the standard M16A1 sights or the low light level sight system (LLLSS), 18 rounds of 5.56-mm ammunition, battlesight zero target, sandbag for support, and a rifle shot group analysis card: semi-automatic fire with M16A1 and M14 rifles (GTA 21-1-4, Mar 74).

STANDARDS:

Place the center of a three-round shot group at the X - 2.4 centimeters below the Canadian bull's-eye, and have the shot group touch or fall within a 5.2-centimeter-diameter circle centered on the X.

PERFORMANCE MEASURES:

1. **Sights.** The M16A1 rifle has two adjustable sights. Elevation adjustments are made on the front sight and windage adjustments are made on the rear sight. The rifle comes equipped with either the standard sight system or LLLSS.

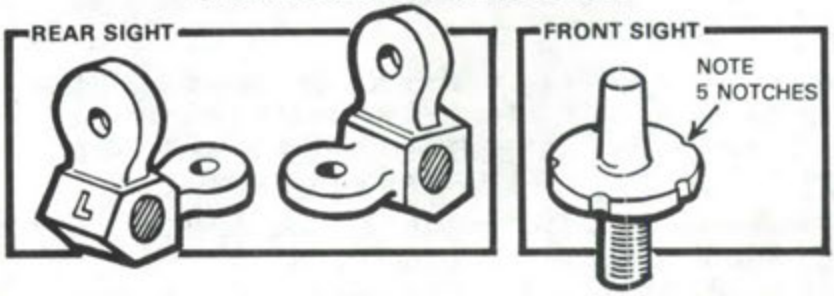
a. The Standard Sight System.

(1) The rear sight has two parts:

(a) An aperture marked "L" for ranges beyond 300 meters and an unmarked aperture for ranges from 0 to 300 meters.

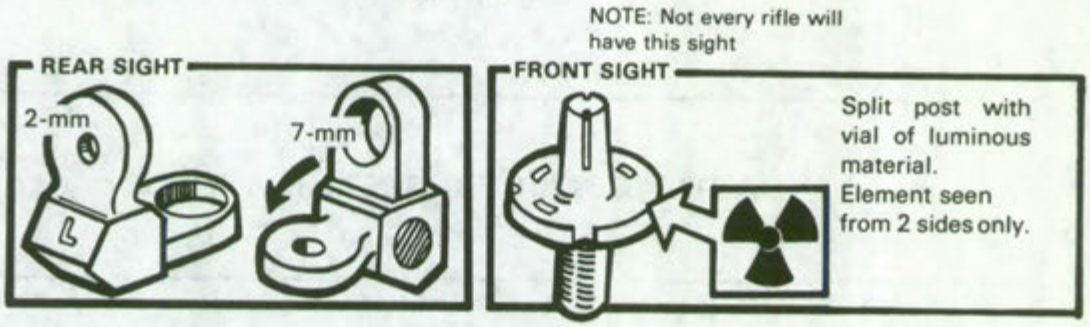
(b) A windage drum for windage adjustments.

STANDARD DAYLIGHT SIGHT



(2) The front sight consists of a rotating sight post with a spring-loaded detent.

b. The Low Light Level Sight System.



(1) The rear sight in this system also has two parts:

(a) A 2-mm aperture marked "L" which is used for zero and ranges to 460 meters under normal conditions. The other aperture (7-mm) is larger than the standard sight and is used for night and limited visibility firing.

(b) A windage drum for windage adjustments (same as standard system).

(2) The front sight has only four notches (clicks) of elevation (the standard system has five). This permits the firer to adjust the sight so he can see the luminous part through the rear sight.

CAUTION: The front sight post contains a small glass vial of radioactive promethium 147. Take care not to bump, abuse, tamper with, or alter the post in any manner. DO NOT blacken or soot-up the front sight.

2. **Sight Adjustment** (low light and standard).

a. Rear Sight. To adjust windage, depress detent and rotate drum to desired direction. To move point of impact to right, turn drum clockwise in direction of arrow and letter R. To move left, move drum counterclockwise. Each graduation (notch) moves the point of impact of bullet as indicated in chart.

b. Front Sight. To adjust elevation, depress detent, rotate post. To raise strike of bullet, rotate post in the direction of arrow marked up. Reverse the direction of rotation to lower strike of bullet. Each graduation (notch) moves the point of impact of bullet as indicated in chart.

IMPACT		DISTANCE
STANDARD	LOW LIGHT LEVEL	
0.7cm (17/62in)	0.9cm (23/64in)	25 meters
2.8cm (1-3/32in)	3.5cm (1-3/4in)	100 meters
5.6cm (2-13/64in)	7.0cm (2-3/4in)	200 meters

3. **Battlesight Zeroing.**

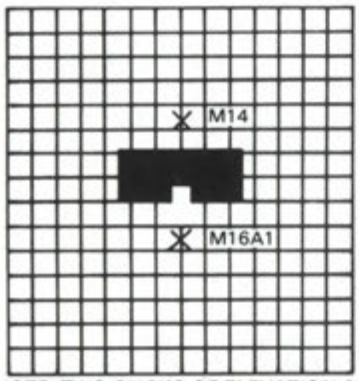
a. Sight Picture. In aiming, the firer is concerned with correctly pointing his rifle so the bullet will hit the target when he fires. To do this, he must have the rear sight, the front sight post, and the target or aiming point in their proper relationship--known as sight picture. A correct sight picture is obtained when the sights are perfectly alined and the aiming point (target) is in the correct relationship to the front sight post (figure 2b). Sight picture includes two basic elements: sight alinement and placement of the aiming point.

b. Sight Alinement. To obtain correct sight alinement, the sights are alined as shown in figure 2a. Notice that the top center of the front sight post is exactly in the center of the rear sight aperture. If an imaginary horizontal line were drawn through the center of the rear sight aperture, the top of the front sight post would touch this line. If an imaginary vertical line were drawn through the center of the rear sight aperture, the line would bisect the front sight post. The firer insures that he has perfect sight alinement by concentrating his attention and focusing his eye on the front sight post through the indistinct or fuzzy appearing rear sight aperture. By doing this, any errors in sight alinement can be easily detected and corrected.

c. Placement of the Aiming Point. The aiming point (target on which the firer has alined his rifle sights) is correctly placed when it is centered on and appears to touch the top of the front sight post (figure 2c). If the aiming point is correctly positioned, an imaginary vertical line drawn through the center of the front sight post will appear to split the front sight post in half.

d. Battlesight Zero Target. The standard 25-meter target (figure 1) is used when determining the battlesight zero for the M16A1 rifle. Vertical and horizontal lines are printed on the target, forming 1.4-centimeter squares. One click of elevation or windage will move the strike of the bullet 0.7 centimeters at a range of 25 meters. Thus, on the 25-meter target, two clicks of elevation or windage will move the strike of the bullet one square.

NOTE: The LLLSS has only four clicks of elevation, but it is adjusted the same as the standard sight. The difference in sight movement per click is not critical during firing.



NOTE: TWO CLICKS OF ELEVATION OR WINDAGE WILL MOVE THE STRIKE OF THE BULLET ONE SQUARE ON THIS TARGET.

Figure 1.

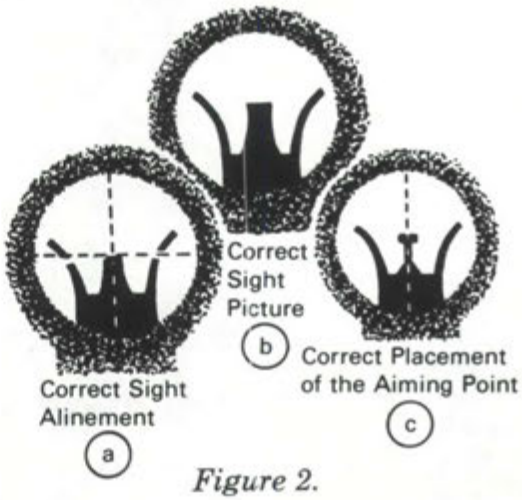


Figure 2.

e. Determining the Battlesight Zero. The 250-meter battlesight zero is determined by firing a series of three-round shot groups at the 25-meter target. The firer aims at the distinctive aiming point at the bottom center of the black rectangle (base of the white cutaway portion) and adjusts his sights until the center of this acceptable shot group is located 5.2 centimeters directly below the aiming point (figure 3) on or around the X.

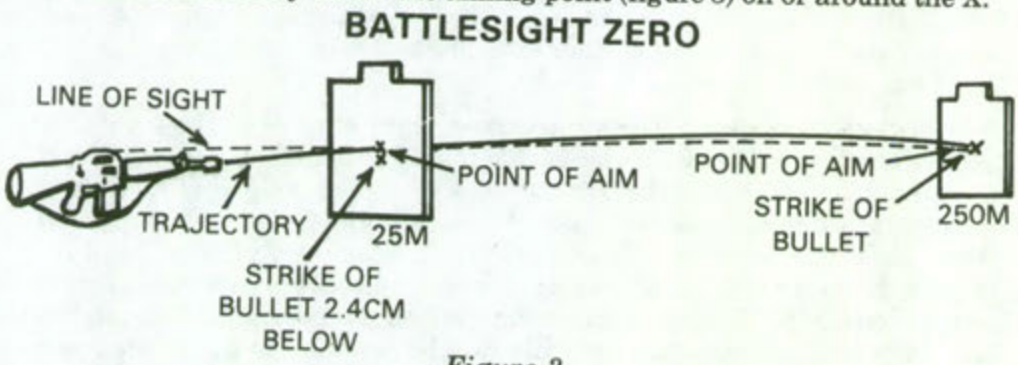


Figure 3.

NOTE: To battlesight zero, adjust your sights so you can hit an aiming point at 250 meters. Zeroing can also be done on a 25-meter range by adjusting the sights so that the bullet will strike 2.4 centimeters below the point of aim. If your M16A1 has an LLLSS and you can't see the vial after zeroing, turn front sight post one click down for use during periods of limited visibility.

4. **Using Low Light Level (Promethium) Sight System.**

a. During daylight firing, use aperture marked L. Effective range is 250 meters (original battlesight zero).

b. At night and in limited visibility, use unmarked (7-mm) aperture. Obtain good sight picture using daylight procedure. After target detection, obtain good sight alinement by centering top of luminous portion of front sight post within 7-mm aperture on target and fire. Under certain light conditions, front sight post can be seen, but you can't determine whether you are looking through, above, or to the side of rear sight aperture. Practice positioning stock against shoulder and looking through rear aperture.

REFERENCES:

FM 23-9, M16A1 Rifle and Rifle Marksmanship, Jun 74 (chap 4, page 83 thru 86)
TM 9-1005-249-10, Operator's Manual, M16A1 Rifle, Apr 77 (pages 34-35; 38-41)
M16A1 Rifle Marksmanship Training Program of Instruction, Apr 77 (all)

TASK NUMBER: 071-311-2007

QUALIFY WITH THE M16A1 RIFLE

CONDITIONS:

Situation 1: Daylight Firing. On a standard record firing range, given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the promethium sights, 4 magazines of 10 rounds each, a record fire scorecard, and the requirement to fire record fire for qualification.

Situation 2: Night Firing. On a standard night fire record range, given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the LLLSS sights, 3 magazines of 3 rounds each for practice firing and 80 rounds for record fire, and the requirement to fire night record fire for qualification.

STANDARDS:

Situation 1: Attain a MINIMUM SCORE of 17 hits out of a possible 40 exposures.

Situation 2: Attain a MINIMUM SCORE of 20 hits out of a possible 40 exposures.

SQT ADMINISTRATION REQUIREMENTS: SQT credit will be awarded as follows:

Arms Qualification/Evaluation	SQT Units
Unqualified (NO GO)	0
Marksman (GO)	1
Sharpshooter (GO)	1
Expert (GO)	1
Nonobserved	Neither count for nor against total SQT score.

The night-firing portion of arms qualification will not be included in the performance certification component of the SQT.

QUALIFICATION SCORES AND RATINGS:

	STANDARD RECORD	KNOWN DISTANCE	COURSE "C"
Possible	40	500	42
Expert	28-40	420-500	31 and above
Sharpshooter	24-27	360-419	24-30 inclusive
Marksman	17-23	300-359	11-23 inclusive
Unqualified	16 and below	299 and below	10 and below

NOTE: FM 23-9 superseded FM 23-71; however, premobilization readiness proficiency "C" courses prescribed for use by reserve components were inadvertently omitted from 23-9 as was change 1 to FM 23-71 (Feb 68) which added appendix I for those units which have only known-distance facilities. These courses of fire may be used unless superseded by subsequent instructions. The following conditions and standards are to be used by units that DO NOT have a standard record fire range.

CONDITIONS:

Situation 3: During daylight on a known-distance range (as described in para 5 of appendix I, FM 23-71, change 1), given a zeroed M16A1 rifle, 50 rounds of caliber 5.56-mm ammunition (5 magazines of 10 rounds each to engage each target with 10 rounds), a requirement to fire, Record Firing, Known Distance (total rounds 100) as outlined in para 16d, appendix I of FM 23-71.

Situation 4: During daylight on a 1000-inch range, given a zeroed M16A1 rifle, 42 rounds of caliber 5.56-mm ammunition, a requirement to fire standard course "C" for record fire as outlined in appendix D of FM 23-71.

STANDARDS:

Situation 3: Fire Known-Distance Record Firing Table as outlined in para 16, appendix I of FM 23-71 (change 1) and achieve a minimum score of 300.

Situation 4: Fire Record Fire Course "C" as outlined in appendix D of FM 23-71 and achieve a minimum score of 11.

WARNING

DANGEROUS PROCEDURES

- Be sure the cam pin is installed in the bolt group. If it isn't, your rifle can still fire, but it could possibly explode, causing you harm.
- DO NOT exchange or switch bolt assemblies from one M16A1 to another . . . It could cause damage to both you and the rifle.
- If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.
- Use only authorized ammo that is manufactured to U.S. specs.
- If your bolt fails to unlock and you try to free it by banging the butt stock on the ground, keep yourself clear of the muzzle.
- If there's water in the barrel, don't fire the rifle. It could explode.
- If a noticeable difference in sound or recoil is experienced, STOP FIRING. Either condition could indicate an incomplete propellant burn and a bullet still in the bore. Retract bolt slowly and remove fired cartridge case. Clear weapon and check for unburned powder grains in the receiver or bore and for a bullet in the bore. Remove unburned propellant or bullet from bore before resuming firing, or barrel could explode. If bullet is lodged in bore, turn in rifle to direct support maintenance.

REFERENCES:

FM 23-9, M16A1 Rifle and Rifle Marksmanship, Jun 74 (chap 9, sec II, page 125) (C1, TBP)
FM 23-71, C1, Rifle Marksmanship, Dec 69 (app D, page 171)
TM 9-1005-249-10, Operator's Manual, M16A1 Rifle, Apr 77
M16A1 Rifle Marksmanship Training Program of Instruction, Apr 77 (all)

TASK NUMBER: 071-311-2006

USE LIMITED VISIBILITY FIRING TECHNIQUES WITH THE M16A1 RIFLE

CONDITIONS:

As a member of a rifle squad in a defensive position during daylight, given an M16A1 rifle, a magazine and ammunition, sticks or rocks and a board or log available in the area, and instructions on the individual's preplanned sector of fire for use during periods of limited visibility.

STANDARDS:

Emplace and aline aiming and firing stakes on identifiable probable enemy avenues of approach, assault positions, and automatic weapons positions, to include left and right limiting stakes (one may be parapet) indicating individual's preplanned sector of fire limits, so that when the weapon is employed using the stakes, rounds:

1. Can be placed in selected target areas/positions.

2. Are all within sector of fire (FPF or fires on sector limits must be grazing fire).

PERFORMANCE MEASURES:

1. Physically locate and identify probable enemy positions and avenues of approach.

2. Prepare field expedient aiming, firing, and limiting stakes (notched stick or tree crotch, figure 1; rocks, board or log, figure 2) which are able to support the weight of your weapon.

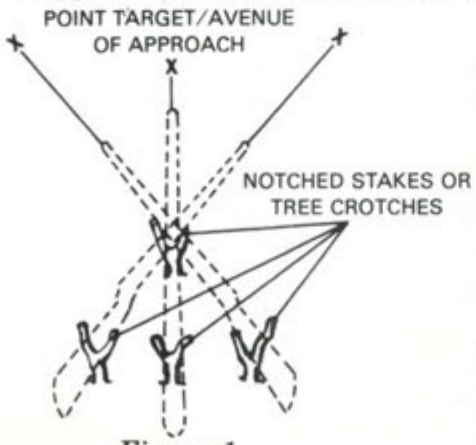


Figure 1.

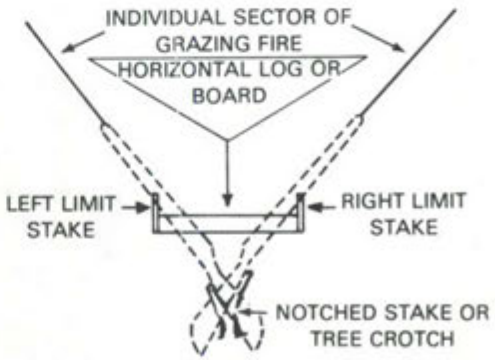


Figure 2.

3. Insure stakes, horizontal log, or board are well seated into the ground.

4. Place the weapon in the rests (notched stake, tree crotch, log, or board) and aim the M16A1 to hit the desired targets or cover a sector with grazing fire, and adjust the rests to hold the weapon in place.

5. To fire, hold the M16A1 in the rest with your right shoulder firmly against the weapon's butt plate.

NOTE: The weapon must be held in the exact position in which it was held when it was sighted in.

6. By using additional stakes or a horizontal board or log you can lay the weapon for grazing fire along more than one line or to cover an entire sector depending on the terrain (figure 1 and 2). Grazing fire is achieved when the cone of fire does not rise 1 meter above the ground.

REFERENCE:

None.

TASK NUMBER: 071-311-2303

MOUNT/DISMOUNT AN/PVS-2 ON M16A1 RIFLE

CONDITIONS:

Given an AN/PVS-2 sight in shipping container, weapon adapter bracket, and an M16A1 rifle; daylight or with artificial light source.

STANDARDS:

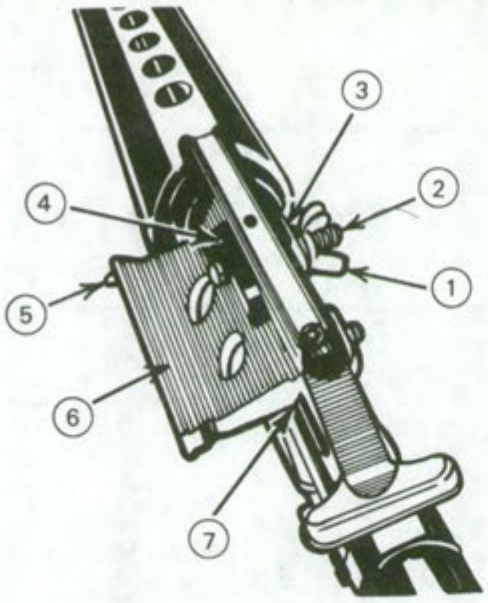
1. Mounting: Within 5 minutes, the adapter assembly must be secured to the upper receiver, and the sight must be mounted on the adapter with the two locking knobs of the boresight mount assembly locked in place.

2. Dismounting: Remove the sight and mounting bracket and return them to the carrying case.

PERFORMANCE MEASURES:

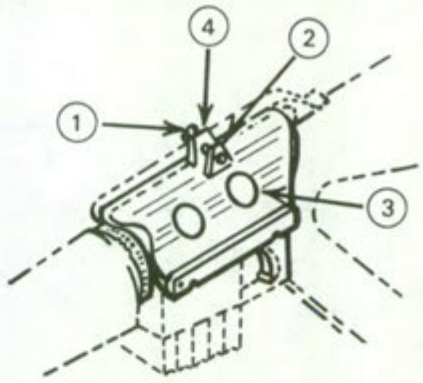
1. To mount the M16A1 adapter bracket to the M16A1 rifle, unthread wingnut (1) to thread stop on screw. Pull tab (2) away from weapon adapter assembly (3). Slide mounting ear (4) under handle and position weapon adapter assembly flat against top of receiver and all the way forward. Firmly tighten wingnut (1) until tab (2) is pulled tightly against handle and weapon adapter assembly. (See figures 1 and 2.)

2. To mount the AN/PVS-2 sight to the weapon adapter bracket, remove the sight from shipping container. Rotate lock knobs of the boresight mount assembly rearward (toward the rubber eyeshield) until they come to stop on the pins located on the assembly. Slide the boresight mount assembly into the guide rail of the adapter bracket from the rear until positioned against the pin stop of the guide rail. The scope is locked to the adapter bracket by rotating the two locking knobs of the boresight mount assembly in a forward direction.



1. WINGNUT
2. THREAD STOP
3. MOUNTING EAR
4. TAB
5. PIN STOP
6. WEAPON ADAPTER BRACKET
7. SLOTTED GROOVE

Figure 1.



STEP 1. UNTHREAD WINGNUT (1) TO THREAD STOP ON SCREW.
STEP 2. PULL TAB (2) AWAY FROM WEAPON ADAPTER ASSEMBLY (3).
STEP 3. SLIDE MOUNTING EAR (4) UNDER HANDLE AND POSITION WEAPON ADAPTER ASSEMBLY IN PLACE INSIDE OPENING OF CARRYING HANDLE.
STEP 4. FIRMLY TIGHTEN WINGNUT (1) UNTIL TAB (2) IS PULLED TIGHTLY AGAINST HANDLE AND WEAPON ADAPTER ASSEMBLY.

Figure 2.

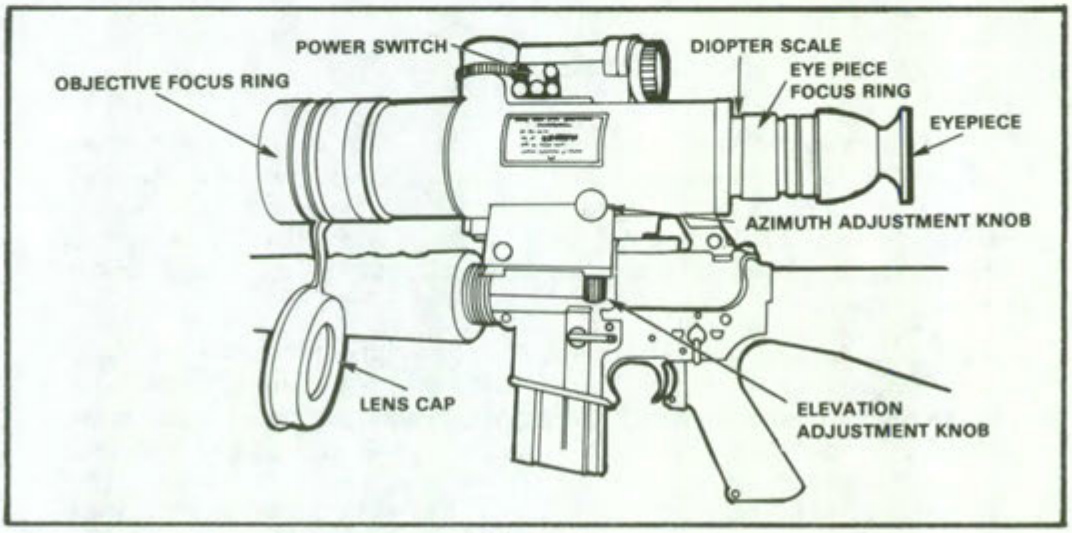


Figure 3.

REFERENCE:

FM 23-9, M16A1 Rifle and Rifle Marksmanship, Jun 74 (app B, page 147)

TASK NUMBER: 071-311-2304

ZERO AN/PVS-2 WHEN MOUNTED ON M16A1 RIFLE

CONDITIONS:

During daylight or darkness, on a zero firing range, given an AN/PVS-2 mounted on a zeroed M16A1 rifle, magazine, 18 rounds of ammunition, silhouette target 25 meters from the firing point, M3 bipod, and sandbags.

STANDARDS:

Obtain the correct relationship between point of aim and the center of the shot group.

PERFORMANCE MEASURES:

To zero the AN/PVS-2 at 25 meters:

1. Take a prone, bipod-supported position 25 meters from the target.
2. Fit the rubber eyeshield around the eye.
3. Move power switch to ON.
4. Set the diopter to zero and then adjust the focus ring for a sharp sight reticle.
5. Adjust the range focus ring for a sharp image.
6. Sight through the scope and move the aiming dash to the center of mass of the target.
7. Fire three rounds, keeping the aiming dash on the same point on the target each time a round is fired.
8. Check the target and find the center of the shot group in relation to the point of aim.
9. Adjust the sight reticle by turning the elevation and azimuth adjustment knobs until the aiming dash is on the center of the shot group. One click of the azimuth or elevation adjustment knob will move the strike of the bullet 1.2 centimeters (approx. ½ inch). Make adjustments in the direction of the error from where the center of the shot group must be.

10. Repeat procedures 5 through 9, above, until you get the proper relationship between the point of aim and the center of the shot group.

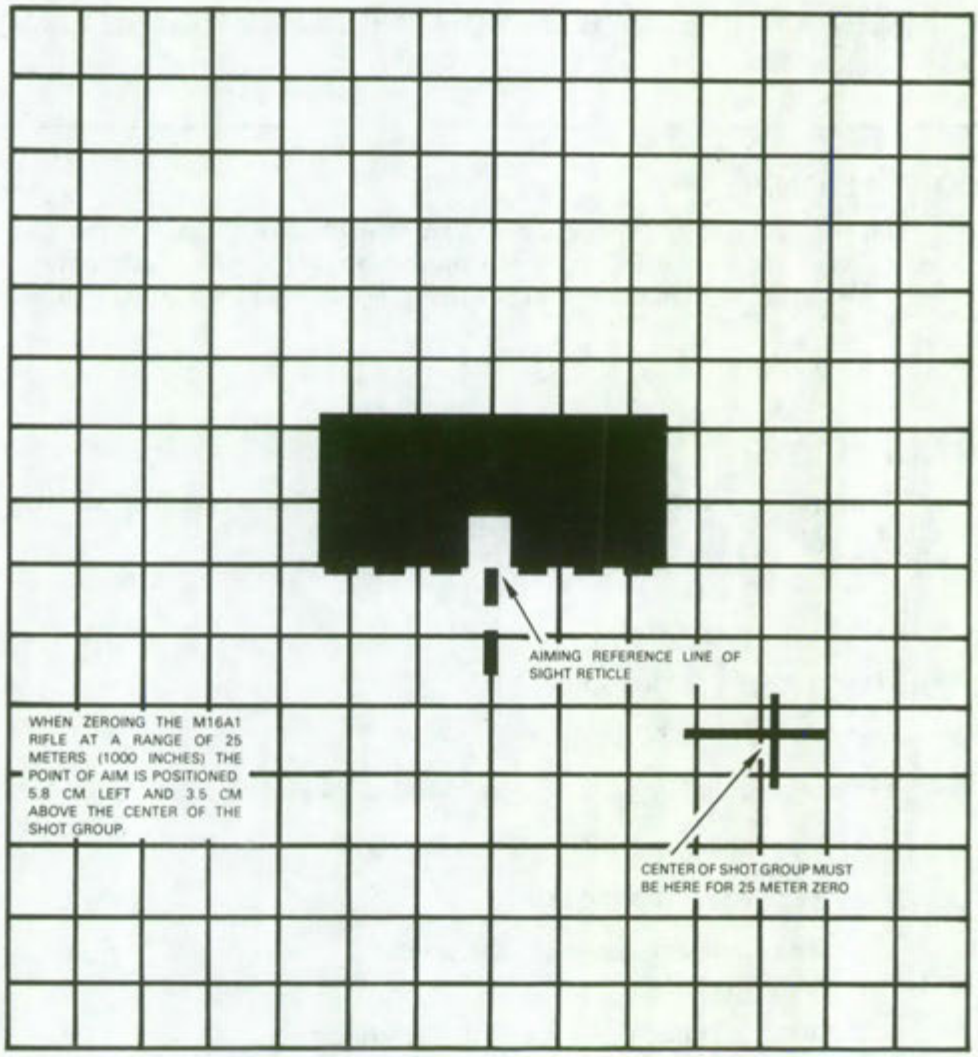


Figure 1.

REFERENCES:

FM 23-9, M16A1 Rifle and Rifle Marksmanship, Jun 74 (page 149)
TC 23-11, Starlight Scope Small Hand-held or Individual Weapons Mounted Model No. 6060, Nov 66 (pages 43-46)
TEC Lesson 953-071-0061-F, AN/PVS-2 Starlight Scope

TASK NUMBER: 071-311-2305

ENGAGE A TARGET WITH A RIFLE USING AN/PVS-2

CONDITIONS:

Given an M16A1 rifle with a mounted and zeroed AN/PVS-2, one magazine with 18 rounds of 5.56-mm ammunition, during the hours of darkness on an M16 rifle range with three E-type silhouettes, one each at ranges of 50-100, 150, and 200-250 meters.

STANDARDS:

Fire all 18 rounds within 2 minutes and hit the targets a minimum of 9 times (two hits must be on each of the targets at ranges other than 150 meters).

PERFORMANCE MEASURES:

1. Turn the AN/PVS-2 on and position the rubber eyeshield around the eye. Sight through the scope and position the aiming reference line of the sight reticle on the target. (See Task: **Zero AN/PVS-2 when mounted on M16A1 rifle.)**

2. Fire the weapon utilizing correct marksmanship procedure. (See Task: **Battlesight zero an M16A1 rifle.)**

REFERENCES:

None

TASK NUMBER: 071-311-2101

PERFORM OPERATOR MAINTENANCE ON M203 GRENADE LAUNCHER AND AMMUNITION

CONDITIONS:

Given an M203 grenade launcher; rifle bore cleaner; drycleaning solvent (not containing acid); LSA lubricant or weapons lubricating oil M11-L-141078 (whichever is appropriate); bore brush; clean, dry rags; and an unspecified number of practice or live rounds of ammunition.

STANDARDS:

Within 20 minutes, inspect, clean, and lubricate launcher and inspect and clean the ammunition IAW performance measures, so that upon inspection:

1. Launcher is properly assembled and free of all foreign matter.

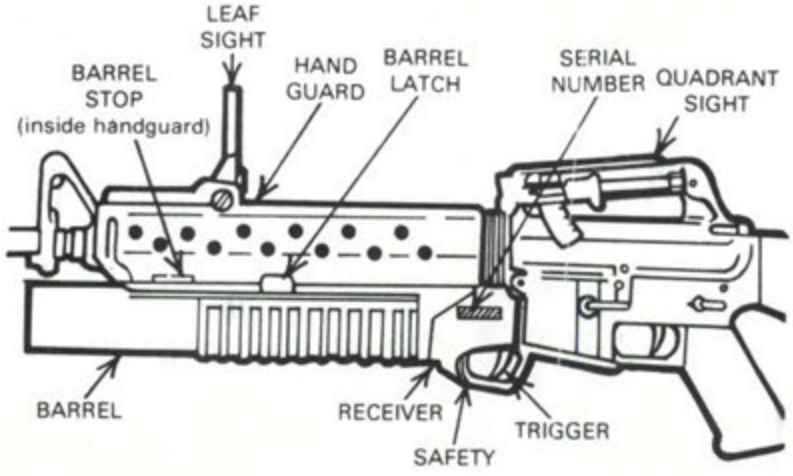
2. Launcher has a heavy coat of oil on working parts, and a light coat of oil elsewhere.

3. Launcher passes functions check.

4. Launcher rounds which are unserviceable (IAW TM 9-1310-202-12, chap 2, page 2-1, para 1b(4)) have been turned in.

PERFORMANCE MEASURES:

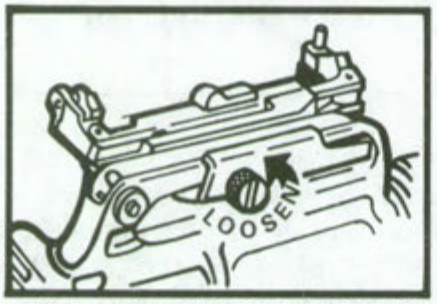
1. **Where it's all at . . .**



2. **Field strip**

To pass inspection, your grenade launcher must be spotless.

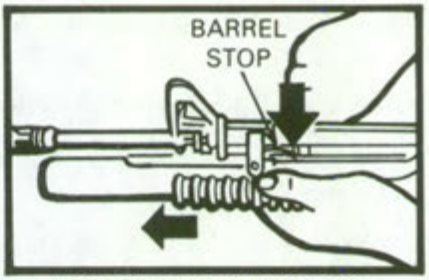
WARNING: Be sure weapon is NOT loaded.



a. THE QUADRANT SIGHT (IF USED) IS REMOVED BY LOOSENING THE KNURLED SCREW ON THE RIGHT SIDE.

PULL BACK SLIP RING. LIFT UP ON HANDGUARD AND PULL TO REAR TO REMOVE.

c. PRESS BARREL LATCH AND MOVE BARREL FORWARD TO STOP.



d. PRESS BARREL STOP TO RELEASE BARREL FROM RECEIVER AND REMOVE.

NO UNAUTHORIZED DISASSEMBLY ALLOWED!!!

Your armorer is the man to see for further disassembly. Save yourself a headache and "statement of charges".

3. **Cleaning Materials, Lubricants, and Care of the Launcher.**

a. Cleaning materials.

(1) Rifle bore clearner (RBC) is used to clean the bore of the launcher and provides temporary protection from corrosion.

(2) Any drycleaning solvent that does not contain acid can be used for cleaning the launcher of dirt, grease, oil, and corrosion preventives.

b. Lubricants.

(1) Military lubricant MIL-L-46000A Lubricating Oil, semi-fluid automatic weapn (LSA) is used for lubricating the launcher at temperatures of above -35° Fahrenheit.

(2) Lubricating oil, arctic weather MIL-L-141078 (LAW) is used at temperatures below 0° F.

c. Cleaning the launcher and ammunition.

(1) Bore. Attach a clean, dry rag to the thong and thoroughly moisten the rag with bore cleaner. After pulling the rag through several times, attach the bore brush to the thong and pull it through the bore several times. Repeat, using dry rags, inspecting the rag each time. Finally, pull a lightly oiled (LSA) rag through the bore to leave a light coat of oil inside the barrel. When cleaning the bore, the bore brush and rags should be pulled from the breech end to the muzzle end.

(2) Breech insert. Clean the face of the breech insert retainer with a patch and bore cleaner. Remove the bore cleaner with dry rags, and then oil the face of the breech lightly.

(3) All other parts. Use a brush and dry rag to clean all other parts and surfaces. Apply a light coat of LSA to the exterior of the launcher after cleaning. For cleaning the rifle portion of the launcher, refer to Task: **Perform Operator Maintenance on an M16A1 Rifle, Magazines, and Ammunition.**

(4) Ammunition. Wipe any dirt or grime from ammunition with a dry cloth. If ammunition is corroded, turn it in to the ammunition point. Do not oil ammunition.

4. **Caring for your launcher is simply good insurance.** A little preventive maintenance on your part will prevent malfunction.

a. CLEAN ALL THE DUST AND CRUD FROM THE WEAPON.

DON'T FORGET: KEEP THE WEAPON CLEAN AND LUBED, EVEN WHEN IT WILL BE UNUSED FOR A PERIOD OF TIME.

b. LUBE BARREL TRACKS AND ALL METAL SURFACES WITH A LIGHT COAT OF OIL.

c. WITH BARREL ON, APPLY A FEW DROPS OF OIL THRU FIRING PIN HOLE. KEEP WEAPON POINTED UP 10-15 SECONDS. CYCLE WEAPON AND PULL TRIGGER TO SPREAD THE OIL.

d. TURN LAUNCHER UPSIDE DOWN AND LUBE THE SAFETY DETENT. IT'S IN THE RECEIVER IN FRONT OF THE SAFETY.

e. INSPECT BORE FOR DIRT, WATER, OIL, AND FOREIGN MATTER.

CHECK FOR LOOSE BREECH INSERT.

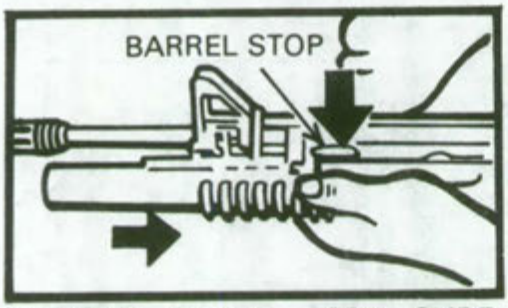
CHECK "SAFE" AND "FIRE" POSITIONS.

CHECK BARREL STOP AND LATCH.

5. **Inspection: While cleaning your M203, you should also inspect for serviceability of parts.** If you find a part which you think is unserviceable, take it to your armorer; he will make the final determination on serviceability and replace parts where necessary. If you do not know what to look for insofar as serviceability is concerned, see the TEC lessons listed at the end of this task.

6. **Assembly procedure for the grenade launcher merely reverses disassembly steps.** For disassembly and assembly of the M16A1 rifle portion of the weapon, refer to Task: **Perform Operator Maintenance on an M16A1 Rifle, Magazines, and Ammunition.**

7. **Putting it all together.**



a. PRESS BARREL STOP. SLIDE BARREL ONTO RECEIVER.

b. MOVE BARREL REARWARD TO CLOSE.

c. INSTALL HANDGUARD AND SECURE WITH SLIP RING.

d. INSTALL QUADRANT SIGHT.

8. **Functional check**

Now that you have it back together, check to make sure everything functions properly.

- CHECK PROPER OPERATION OF SEARS. COCK LAUNCHER AND PULL THE TRIGGER. FIRING PIN SHOULD RELEASE. HOLD TRIGGER TO REAR, COCK LAUNCHER. RELEASE TRIGGER, THEN PULL. FIRING PIN SHOULD RELEASE.

WARNING: THE LAUNCHER COULD FIRE WITHOUT PULLING THE TRIGGER IF THE SEARS DO NOT FUNCTION PROPERLY.

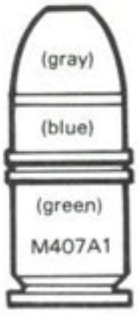
- CHECK SAFETY IN BOTH "SAFE" AND "FIRE" POSITIONS WITH TRIGGER. LAUNCHER MUST BE COCKED BEFORE SAFETY CAN BE PLACED IN "SAFE" POSITION.
- CHECK LEAF SIGHT WINDAGE ADJUSTMENT SCREW FOR PROPER OPERATION. DO NOT MOVE ELEVATION ADJUSTMENT SCREW, IF THE WEAPON HAS BEEN ZEROED.
- MOVE BARREL FORWARD AND BACK TO BE SURE STOP AND BARREL LATCH FUNCTION.

9. **40-mm ammo pyrotechnic signal and spotting round**

ALUMINUM CASES ARE EASILY DENTED AND MAY BE HARD TO CHAMBER AND EXTRACT. BE CAREFUL!

KEEP AMMO DRY, CLEAN AND FREE OF GREASE, SAND, MUD, SNOW & ICE.

TRAINING PRACTICE ROUND



NOTE: None of these rounds contain a mechanical type fuze.

WARNING: The danger radius of practice grenades is 20 meters. DO NOT destroy ammo by mechanical means. The practice round M407A1 Fuze arms between 14 to 28 meters (45 to 93 ft.)

10. **40-mm ammo high explosive (HE) service**

Dual Purpose
M433

Tactical CS,
M651

WARNING: The danger radius of the HE grenades is 130 meters. The M433 round arms within 14 to 28 meters. The M651 arms within 10 to 30 meters and has a burn time of 32 seconds.

REFERENCES:

FM 23-31, 40-mm Grenade Launcher, M203 and M79, May 72 (chap 3, sec I, page 3-1)
TM 9-1010-221-10, Operator's Manual 40-mm Grenade Launcher, M203, Jul 74 (pages 4-8, 15, 16)
TM 9-1310-202-12, Operator and Organizational Maintenance Manual: Cartridges 40-mm, M386, M441, and M397, Oct 69 (chap 2, page 2-1, para 1b(4))
TEC Lesson 940-071-0086-F, M203 Grenade Launcher: Disassembly, Assembly and Maintenance
TEC Lesson 940-071-0088-F, M203 Grenade Launcher: Zeroing and Target Engagement

TASK NUMBER: 071-311-2102

LOAD, UNLOAD, AND CLEAR THE M203 GRENADE LAUNCHER

CONDITIONS:

Given an M203 grenade laucher and one round of 40-mm ammunition (Live or Practice).

STANDARDS:

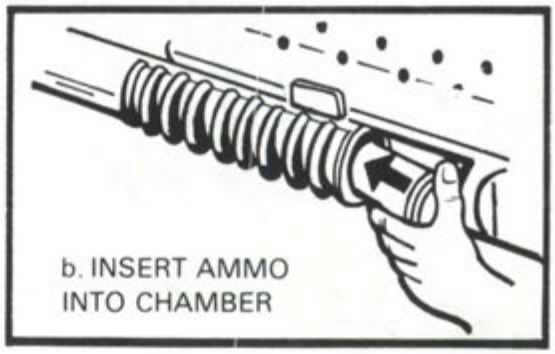
Load, unload, and clear the M203 IAW the performance measures below:

PERFORMANCE MEASURES:

1. Loading

WARNING: Keep muzzle down range and clear of all troops.

CAUTION: Prior to loading, wipe bore and chamber clean and dry with a clean cloth.



WARNING: Make sure you have the right ammo. Never load aircraft ammo M384 (HE) or M385 (Practice) . . . . you may blow your head off.

Is ammo dry, clean and undented?

c. SLIDE BARREL CLOSED UNTIL IT LOCKS.

2. Unloading

3. Clear the Weapon:

a. Depress barrel latch and slide barrel forward.

b. Keeping the weapon pointed down range, look into the barrel to insure there is no round or cartridge case in the barrel.

c. Slide barrel rearward, locking it to the breech.

REFERENCES:

FM 23-31, 40-mm Grenade Launchers, M203 and M79, May 72 (chap 3, sec II, page 3-2)

TM 9-1010-221-10, Operator's Manual 40-mm Grenade Launcher M203, Jul 74 (pages 20, 21, and 26)

TEC Lesson 940-071-0086-F, M203 Grenade Launcher: Disassembly, Assembly and Maintenance

TASK NUMBER: 071-311-2103

ZERO AN M203 GRENADE LAUNCHER

CONDITIONS:

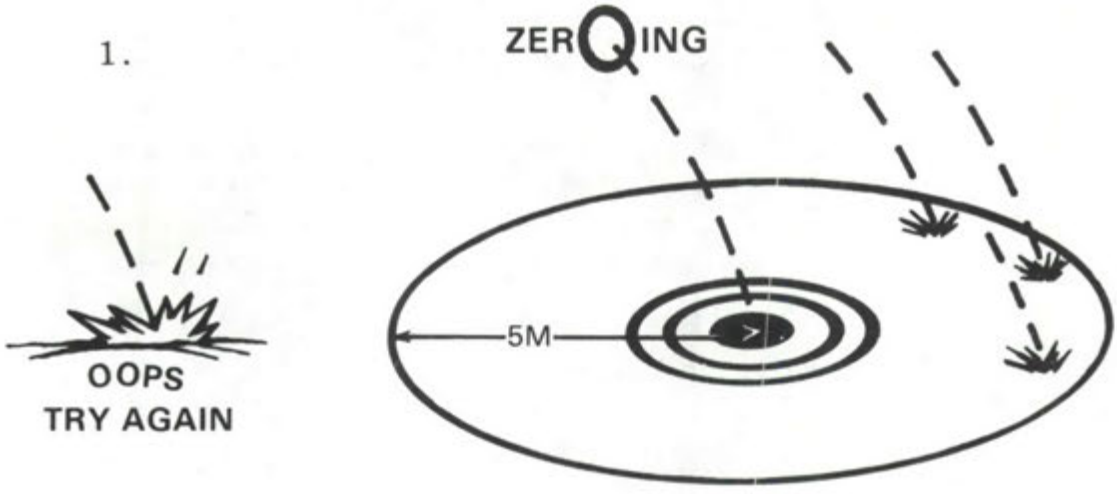
Given an unzeroed M203 grenade launcher, five rounds of HE or TP ammunition (for each type sight), and a firing range.

STANDARDS:

Gunner will obtain an elevation and windage sight setting (on both leaf and quadrant sights) which will enable him to hit within 5 meters of his point of aim at a distance of 200 meters with two consecutive rounds.

PERFORMANCE MEASURES:

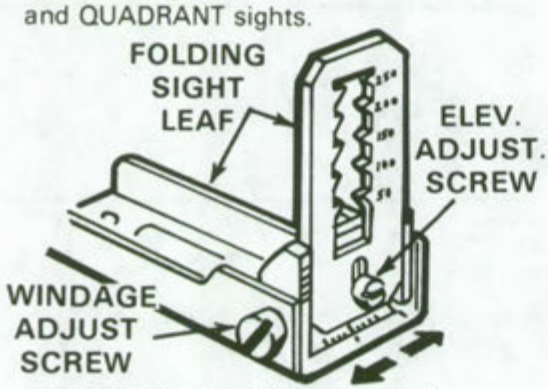
1.



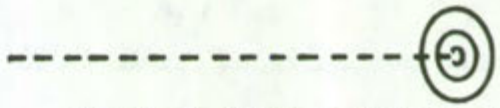
WARNING: DO NOT ZERO IN UNDER 100 METERS.

Select a target at 200 meters and fire a round. If the round does not fall within 5 meters of target, ZEROING PROCEDURES ARE CALLED FOR AND SIGHT ADJUSTMENTS MUST BE MADE FOR MORE OR LESS ELEVATION. Windage adjustments must be made for each firing. After each round fired make necessary adjustments until 2 consecutive rounds land within 5 meters of aiming point.

The point is to hit what you are aiming at. So, let's get familiar with the LEAF and QUADRANT sights.



WARNING: The 50-meter mark on the leaf sight blade is marked in red to emphasize that this range is not to be used in zeroing procedures.



The LEAF SIGHT is used in conjunction with front sight post of the M16A1 rifle and provides range selection from 50 to 250 meters in 50-meter increments.

2. **Leaf sight zeroing:**

a. Select a target at 200 meters.

b. Place the sight leaf in upright position.

c. Place the center mark of the windage scale on the index line at the rear of the sight base.

d. Loosen the elevation adjustment screw on the leaf sight and place the index line of the leaf sight on the center elevation mark on the sight mount.

e. Tighten elevation adjustment screw on the sight leaf.

f. Take a supported prone position.

g. Aline target with the 200-meter increment of the leaf sight and the front sight post of the rifle.

h. Fire a round, observe the impact, and make necessary sight adjustment.

(1) Turning the sight windage screw clockwise moves the strike of the round to the left; turning the windage screw counterclockwise moves the strike to the right. One increment in either direction equals 1½ meters at a range of 200 meters.

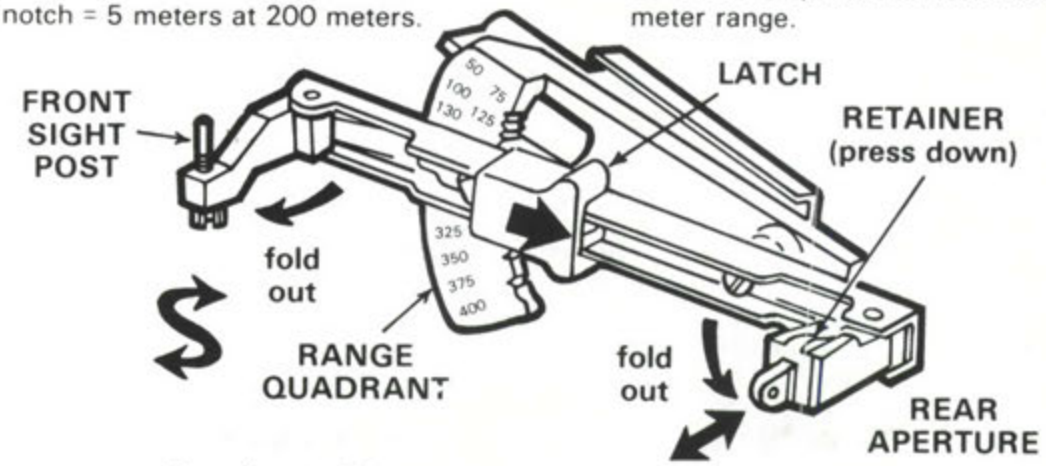
(2) Raising the leaf sight increases range; lowering it decreases range. One increment equals 10 meters at a range of 200 meters.

i. Fire one or more rounds and make necessary adjustments after each round until a round has landed within 5 meters of the target.

j. Fire a confirming round.

The QUADRANT SIGHT attaches to rifle handle/sight and has range from 50 to 400 meters in 25 meter increments. Elevation adjustment: 1 notch = 5 meters at 200 meters.

The rear aperture slides in or out for windage correction by depressing retainer. Vertical line denotes center. One notch equals 1.5 meters at 200-meter range.



Turn front sight post right for less elevation and left for more elevation.

Slide in to move strike of projectile right; Slide out to move strike left.

3. **Quadrant sight zeroing.**

a. Select a target at 200 meters.

b. Insure that the sight is correctly mounted on the carrying handle of the rifle.

c. Move the front sight post and rear sight aperture from the closed to the open position.

(1) Depress the rear sight retainer and slide the rear sight aperture to the left or right until the wide index line of the rear sight aperture is alined with the edge of the sight aperture arm.

(2) Move the front sight post to its highest position and then back off 2½ turns.

d. Move the sight latch rearward and reposition quadrant sight arm to zeroing range (200 meters).

e. Take a supported prone position.

f. Aline target with the front and rear sights, using correct sighting and aiming procedures.

g. Fire a round, observe the impact, and make necessary sight adjustment.

(1) For range adjustment, turn front sight post clockwise to decrease range and counterclockwise to increase range. One full turn equals 5 meters at a range of 200 meters.

(2) For windage adjustment, press sight aperture retainer and move rear sight aperture away from barrel to move trajectory of the projectile to the left. Move the rear sight aperture toward barrel to move trajectory to the right. One notch on the rear sight aperture equals 1½ meters at a range of 200 meters.

h. Fire one or more cartridges and make necessary adjustments after each round. When a round has landed within 5 meters of the target, the weapon is zeroed.

i. Fire a confirming round.

NOTE: If the individual has not zeroed after firing five rounds, his weapon will be inspected to insure that it is assembled and functioning properly. After the weapon is checked the individual may be given another opportunity to zero.

REFERENCES:

FM 23-31, 40-mm Grenade Launcher, M203 and M79, May 72 (chap 6, pages 6-12, 6-13, para 6-18 -- 6-21)
TM 9-1010-221-10, Operator's Manual 40-mm Grenade Launcher M203, Jul 74 (pages 16-19; 24)
TEC Lesson 940-071-0088-F, The M203 Grenade Launcher: Zeroing and Target Engagement

TASK NUMBER: 071-311-2104

ENGAGE TARGETS WITH AN M203 GRENADE LAUNCHER AND APPLY IMMEDIATE ACTION TO REDUCE A STOPPAGE

CONDITIONS:

On a live fire range, given 7 practice rounds, 1 unmarked dummy round, an M203 grenade launcher, instructions to load and engage 4 targets until all ammunition is expended, and targets consisting of:

POSITION		TARGET	RANGE
Kneeling Supported		Window (.75m wide x 1m high)	90-100 m
		Bunker (1m high x 1.5m wide)	105-115 m
Foxhole or Bunker	Supported	Troops in an Open Emplacement	275-300 m
		Troops in the Open	325-350 m

STANDARDS:

Within 6 minutes, hit 3 of the 4 targets applying immediate action to reduce any stoppage. A hit consists of:

1. Placing a round through the window.
2. Hitting the front of the bunker.
3. Hitting within 5 meters of troops in an open emplacement.
4. Hitting within 5 meters of troops in the open.

PERFORMANCE MEASURES:

1. Sighting consists of sight alinement and getting a sight picture (figure 1).

2. Aiming.

a. The firer obtains a correct sight alinement and then shifts his focus to the target for a correct sight picture. As the trigger is pressed, he continues shifting eye focus.

b. Firer should use controlled breathing just as he would when firing the rifle.

3. Pointing technique. To use the pointing technique, bring the weapon to a modified underarm firing position. With both eyes open, concentrate your vision on the target, keeping the flash suppressor of the rifle in the lower part of your field of view. Point the flash suppressor of the rifle at the target and sense the elevation of the weapon with respect to the range to the target. To make corrections in elevation and deflection, sense the impact of the round and make appropriate changes in the position of the weapon.

4. Sensing.

a. Sensing is an instantaneous determination by the grenadier as to where the grenade explodes with respect to the target. Sensings are made in both range and deviation to the nearest 5 meters since the casualty radius of the HE round is 5 meters.

b. Range sensings are made as follows:

(1) Short – If the grenade bursts between the grenadier and target.

(2) Over – If the burst is over the target.

(3) Target – Grenade hits any portion of target.

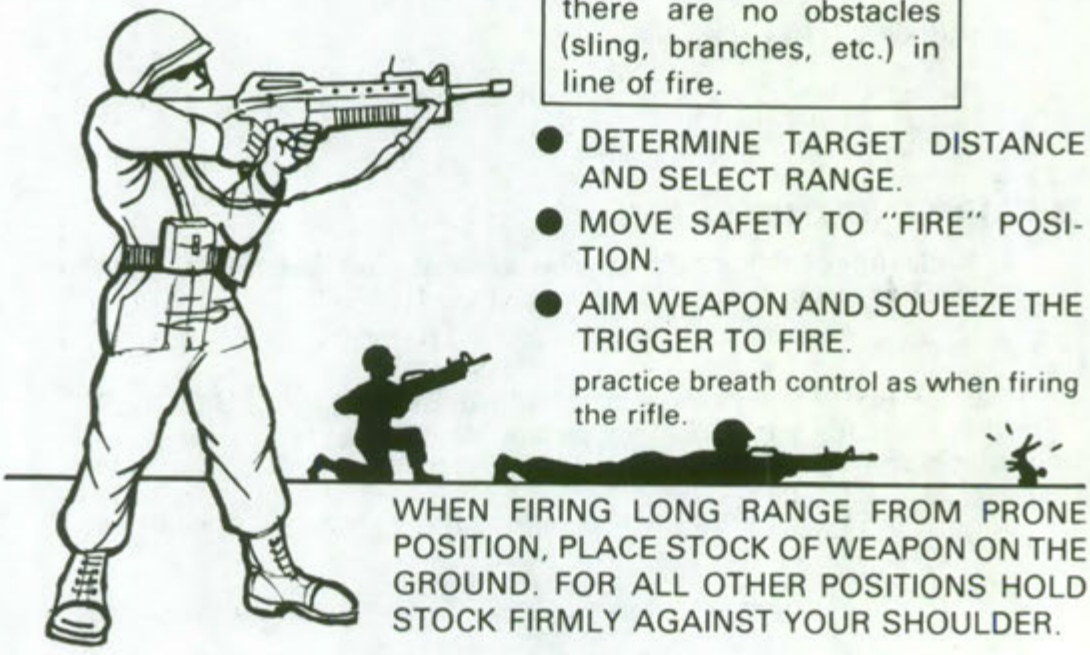
(4) Range Correct – The grenade is slightly left or right of the target, but at correct range.

(5) Doubtful – If the grenade is at range correct but grenadier cannot make a positive sensing.

c. Deviation sensings are RIGHT, LEFT, or LINE.

5. Firing.

WARNING: Make certain there are no obstacles (sling, branches, etc.) in line of fire.



- DETERMINE TARGET DISTANCE AND SELECT RANGE.
- MOVE SAFETY TO "FIRE" POSITION.
- AIM WEAPON AND SQUEEZE THE TRIGGER TO FIRE.

practice breath control as when firing the rifle.

WHEN FIRING LONG RANGE FROM PRONE POSITION, PLACE STOCK OF WEAPON ON THE GROUND. FOR ALL OTHER POSITIONS HOLD STOCK FIRMLY AGAINST YOUR SHOULDER.

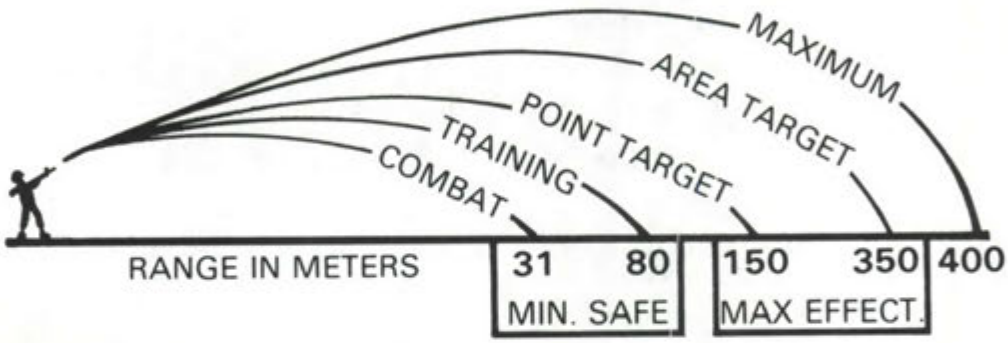
6. Adjustment of fire.

a. Adjustment of fire is the action taken by the grenadier using sensing, sight manipulation, and an adjusted aiming point to insure a second round hit.

b. When using the sight leaf, the grenadier simply changes his sight alinement or uses an adjusted aiming point.

c. If the first grenade impacts more than 25 meters over or short of the target, adjust the range quadrant to bring the next grenade on target.

7. Range determination (see Task: Estimate Range). Successful target engagement depends upon your ability to determine range. Ranges at which a 50% probability of target hit can be expected are shown below:



POINT TARGETS:
- BUNKER OPENING 50m
- WINDOW OPENING 125m
- VEHICLE/WEAPONS EMPLACEMENT 200m

AREA TARGETS (FIRE TEAM SIZE) 350m

WARNING: WHEN YOU FIRE HIGH EXPLOSIVE (HE) GRENADES AT TARGETS WITHIN 80 METERS (265 FT.), BE IN A PROTECTIVE POSITION. TARGETS IN A TRAINING SITUATION SHOULD NOT BE ENGAGED WITHIN 80 METERS. TARGETS IN A COMBAT SITUATION NO CLOSER THAN 31 METERS.

8. Failure to fire. After a failure to fire due to the possiblity of a misfire or hangfire, the following precautions must be observed until the round has been removed from the weapon and cause of failure determined (see figure 2):

a. Shout "MISFIRE", keeping the weapon trained on the target, and keeping all troops clear of the muzzle.

WARNING: In training situations, before attempting to remove the round from the grenade launcher, men not required for the operation should be cleared from the area.

b. Wait 30 seconds from the time of failure to fire before opening the breech for unloading procedures.

c. Exercise extreme caution during unloading procedures; where circumstances permit, either catch the ejected round or reduce the distance it falls by holding the weapon close to the ground.

d. After the round has been removed from the receiver, determine whether the round or the firing mechanism is defective. Examine the primer to see if it has been dented. If the primer has not been dented, the firing mechanism is at fault. The round may be reloaded and fired after the cause of failure to fire has been corrected.

e. If the primer has been dented, keep the round separate from other ammunition until it can be properly disposed of.

f. Shouting "MISFIRE" should apply only to training situations.

HANGFIRE: IS A DELAY IN THE PROPELLANT CHARGE IGNITING.

MISFIRE: IS A FAILURE TO FIRE AND WILL BE HANDLED SAME AS A HANGFIRE.

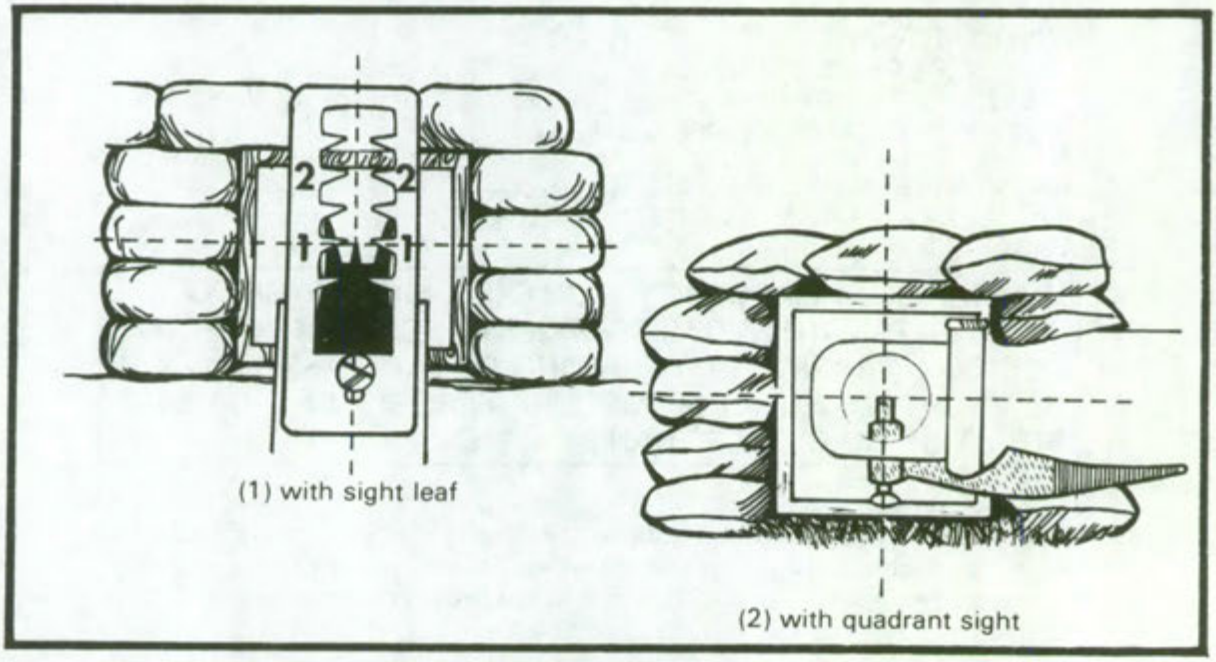


Figure 1. Correct sight alinement.

Malfunction	Probable Cause	Corrective Action
Failure to fire	Safety on	Place in fire position.
	Empty chamber	Load weapon.
	Faulty ammunition	Reload.
	Water or excess lubricant in firing pin well	Hand cycle weapon several times to include pulling the trigger.
	Worn or broken firing pin	Replace.*
	Dirt or residue in firing pin recess	Clean.
	Burned sear on firing pin	Replace.*
	Dirty firing pin well opening	Clean firing pin well opening.*
	Weak or broken firing pin spring	Replace.*
Failure to cock	Broken sear	Replace.*
	Improper assembly of cocking lever	Reassemble.*
	Loose, broken, or missing cocking lever spring pin	Replace.*
Failure to lock	Excess plastic on breech end of barel assembly	Trim excess plastic until barrel assembly will lock.*
	Dirty follower assembly or receiver cavity	Clean.
Failure to chamber	Faulty ammunition	Reload.
	Dirty chamber	Clean bore and chamber.
Failure to extract	Defective extractor on spring or spring pin	Replace.*
	Ruptured cartridge case	Remove from barrel.
Failure to eject	Worn, broken, or missing ejector spring or retainer	Replace.*
Safety fails to stay in position	Broken or worn safety or missing spring pin	Replace.*
Sight will not stay in selected position	Sight mounting machine screw loose	Tighten screw or replace if dented or broken.

*Procedures to be accomplished by DS/GS Maintenance.

Figure 2.

REFERENCES:

FM 23-31, 40-mm Grenade Launcher, M203 and M79, May 1972 (chap 6, sec II, page 6-1)
TM 9-1010-221-10, Operator's Manual 40-mm Grenade Launcher M203, 31 July 1974 (pages 17, 22, and 25)
TEC Lesson 940-071-0088-F, M203 Grenade Launcher: Zeroing and Target Engagement

TASK NUMBER: 071-311-2105

USE LIMITED VISIBILITY FIRING TECHNIQUE WITH THE M203 GRENADE LAUNCHER

CONDITIONS:

You are a grenadier in a field location with good visibility. The squad leader has assigned your position and has pointed out the left and right limits of your sector of fire. Given 3 training practice rounds and 5 to 15 stakes for use as aiming or firing stakes.

STANDARDS:

During daylight, construct and place out aiming and firing stakes that will cause rounds to hit targets during periods of limited visibility.

PERFORMANCE MEASURES:

1. Locate possible targets within your sector of fire -- deadspace, likely avenues of enemy approach, likely enemy assault positions.

2. Estimate the range to the located targets by one of the following methods:

a. Pacing. See Task: **Determine Distance While Moving Between Two Points on the Ground.**

b. Map distance. See Task: **Measure Distance on a Map.**

c. Naked eye. See Task: **Estimate Range.**

3. Place the range that you estimate to the target(s) on the quadrant sight.

4. Place the launcher on the ground with the muzzle pointing at the target, and the buttplate at your position.

5. Scoop out a small amount of earth, creating a small hole, where the buttplate touches the ground.

6. Place the toe of the buttplate into the hole.

7. Get into your fighting position, raise the muzzle of the launcher, look through the quadrant sight, and adjust the elevation of the muzzle until you get the correct sight picture.

8. Drive a stake into the hole behind the buttplate. This stake acts as the recoil stake.

9. Drive two stakes into the ground to hold the launcher at the correct elevation angle . . . one stake under the barrel assembly and the other under the small of the stock.

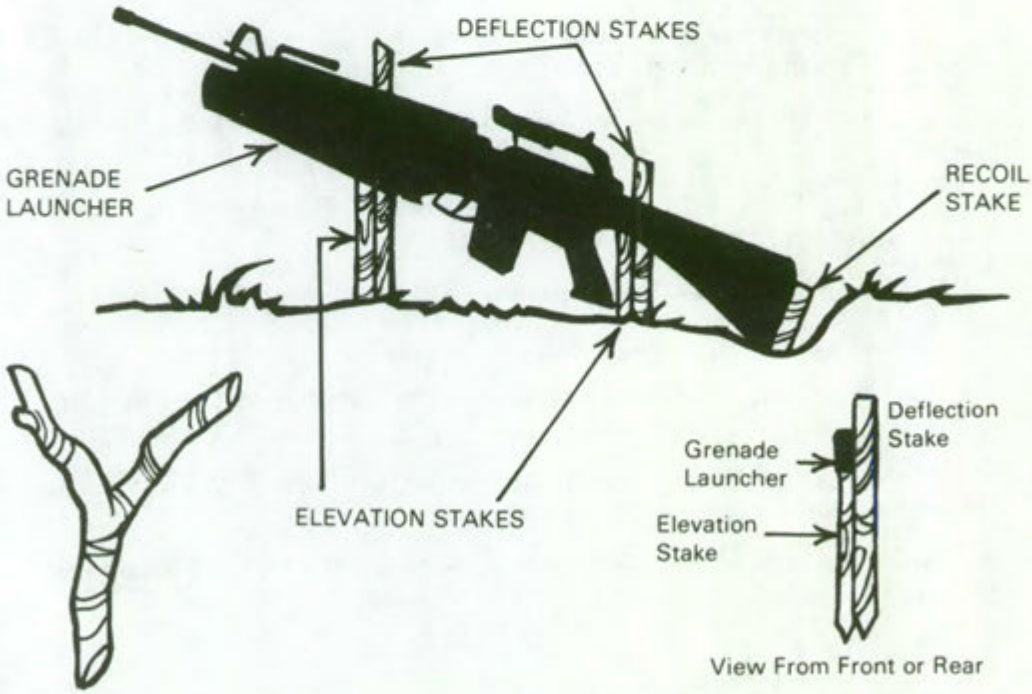
10. Drive two longer stakes into the ground to hold the launcher at the correct deflection angle . . . one stake alongside the elevation stake near the barrel assembly, and the other alongside the elevation stake at the small of the stock.

NOTE: The deflection stakes should extend no more than an inch or two above the barrel assembly/small of the stock.

11. Look through the quadrant sights on the launcher and, if necessary, move the stakes until you get the correct sight picture.

12. Fire a grenade to test the positioning of the weapon. If necessary, change the positioning of the weapon. (If tactical situation permits.)

13. Repeat steps 1 through 12 if more than one firing position is required.



NOTE: A forked stick can serve as both an elevation and deflection stake.

REFERENCES:

None

TASK NUMBER: 071-318-2201

PREPARE AN M72A2 LAW FOR FIRING; RESTORE M72A2 LAW TO CARRYING CONFIGURATION

CONDITIONS:

Given an M72A2 LAW (NOTE: Expended LAW may be used).

STANDARDS:

1. Preparation for firing:

a. Within 30 seconds, conduct a visual prefiring safety inspection. Do not extend/fire damaged LAW.

b. Within 30 seconds, extend the launcher and lock in position, check backblast area, place launcher on the shoulder in firing position, and move the safety handle to ARM.

2. Restore to carrying configuration: Place on SAFE with the launcher tube collapsed, sights in down position, and sling assembly and pull pin replaced.

PERFORMANCE MEASURES:

1. **To prepare the launcher for firing:**

a. Inspect the M72A2 LAW to insure that all seals are intact and that the tube has not been cracked, punctured, or crushed. Check the pull pin and trigger safety handle to verify proper placement. Damaged LAWs should not be fired.

WARNING: Check data plate on launcher for words "with coupler." If words are not on data plate do not attempt to fire the weapon.

b. See figure 1. Remove the pull pin and rotate the rear cover downward (figure 1A), allowing the front cover and sling assembly to fall free. Do not discard the sling assembly until the rocket is fired.

c. Extend the launcher by grasping the rear sight cover and sharply pulling the launcher to the rear until locked into position (figure 1C). Attempt to collapse the launcher by reversing the motion of your hands to verify it is locked into position.

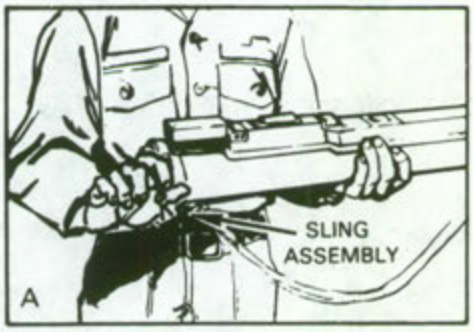
d. Place the weapon on the shoulder (figure 2A).

e. Check the backblast area (figure 2B). If soldiers are in the backblast

area, warn them and wait for them to get out of the area before arming the launcher.

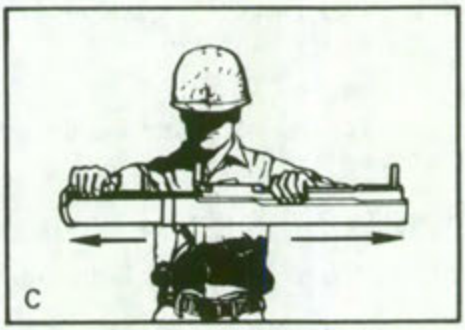
f. Move the safety handle to ARM (figure 2B) once the backblast area is clear.

CAUTION: Once the weapon is placed on the shoulder, keep it pointed up and down range.



REMOVAL OF SLING ASSEMBLY

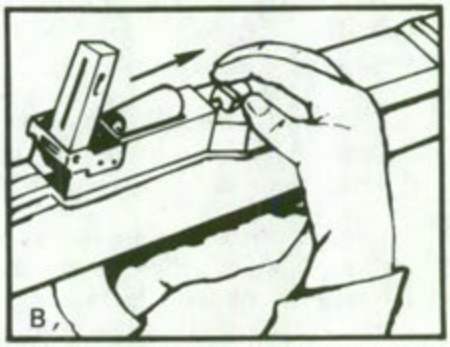
PREPARING TO EXTEND LAUNCHER



LAUNCHER EXTENDED

Figure 1. Preparation/Extending Launcher.

ARMING THE LAUNCHER
PLACE LAUNCHER ON SHOULDER



MOVING SAFETY TO "ARM" POSITION

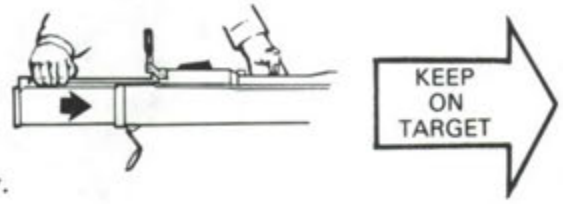
Figure 2. Arming the Launcher.

2. **To restore to carrying configuration:**

a. Return trigger safety handle to SAFE.

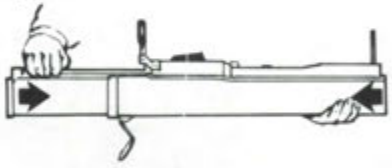
b. Grasp launcher by rear sight housing.

c. Squeeze detent boot.



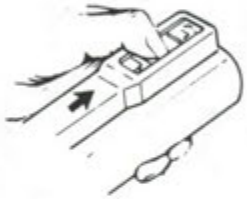
d. Collapse launcher slightly.

e. Move hand from detent boot to front sight.



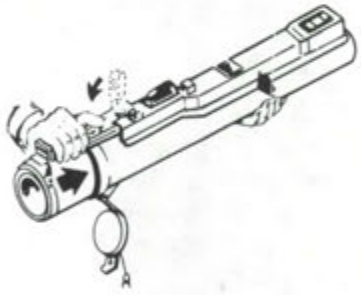
f. Hold down front sight.

g. Collapse launcher until inner tube covers tip of frontsight.



COMPLETE ALL COMPRESSION ACTIONS SLOWLY TO AVOID INJURY TO FINGERS

h. Fold down rear sight and guide under housing.

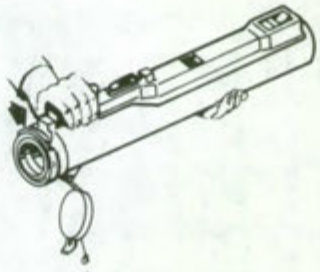


i. Compress launcher until travel is stopped by lip on front sight.

j. Press front sight lip with thumb and slowly compress launcher over lip edge.

k. Remove thumb from front sight and grasp housing.

l. Close launcher fully.



m. Close rear cover, insuring that the round lock fits through the slot in the cover.

n. Replace cover pull pin. (NOTE: Cover pull pin should be inserted from right to left with the short end through the cover closing lug and the long end through the round lock which protrudes through the rear cover.)

REPLACE COVER
PULL PIN

o. Replace front cover and hold in place.

p. Replace sling assembly. Grasp both web straps of the sling assembly next to the hook springs and place thumb on the rear cover above the hinge. Exert downward pressure with the thumb while pulling up on the sling assembly until the hooks snap into position over the cover hinge. (NOTE: Using the rear cover as a lever to assist in attaching the sling assembly will damage the cover hinge.)

REFERENCES:

FM 23-33, 66-mm HEAT Rocket M72A1, M72A2, and M72, C1 & 2, Jul 70 (chap 4, page 16, para 19)
TEC Lesson 948-071-0005-F, Operating the M72A2 LAW

TASK NUMBER: 071-318-2202

ENGAGE TARGETS WITH AN M72A2 LAW

CONDITIONS:

During daylight, on a suitable firing range, given an M190 subcaliber device and seven M73 rockets (three rounds for stationary target phase and four rounds for moving target phase), a series of stationary targets located between 75 and 200 meters from firer which will be presented in a combination of frontal, flank, or oblique views, and a moving [6 to 24 kmph (4 to 14 mph)] target presented in a flank view between 75 and 165 meters from the firer.

STANDARDS:

Firer will achieve:

1. Two target hits of three rockets fired at stationary targets.
2. Two target hits of four rockets fired at moving targets.

PERFORMANCE MEASURES:

1. **Sights.**

a. Rear Sight. The rear sight consists of a flip-up peepsight. The sight should be as close to the eye as possible and the front sight viewed through the peep when sighting (aiming).

b. Front Sight (figure 1). The front sight is a clear plastic flip-up leaf. On the sight there is a vertical range line with ranges from 50 to 350 meters indexed in 25-meter increments, two curved stadia lines (LAW stadia lines are not accurate and are no longer used) and lead crosses.

2. **Estimating Range.** The first step in target engagement is to determine the range to the target. This should be done using visual range estimation (see task: Estimate range) aided by the use of a range/sector card. A range/sector card is a rough drawing of the terrain in your defensive sector which shows easily recognized reference points (terrain features or objects) and the distance to each (paced off or measured when possible). If there are no usable reference points available, stakes can be erected at known ranges to serve the same purpose.

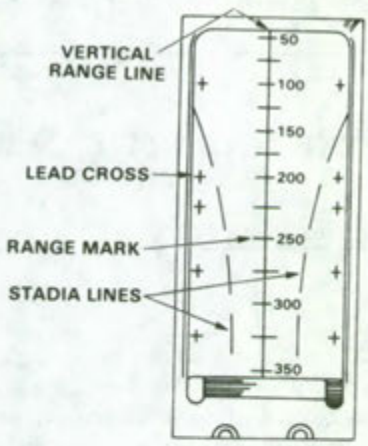


Figure 1. Front sight.

3. **Sighting.**

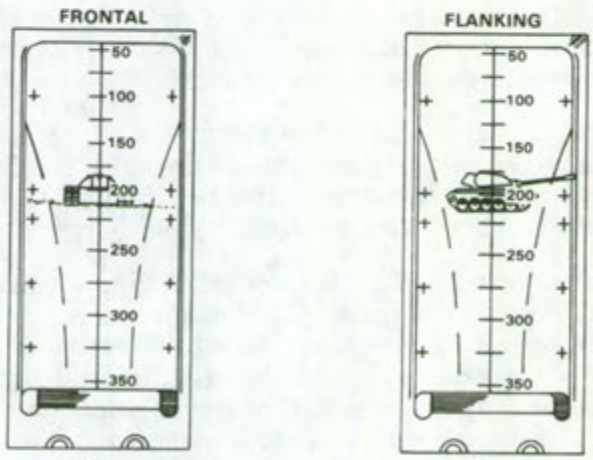
a. Stationary Targets. After determining the range, you sight on stationary targets by:

(1) Locating the range mark on the vertical range line corresponding to the estimated range,

(2) Placing that point on the center of target mass (figure 2), and

(3) Fire.

NOTE: Consider all front/rear views as stationary targets, even if moving.



2a. *2b.*

Figure 2. Stationary targets at an estimated range of 200 meters.

b. Moving Targets. After determining the range, you sight on moving targets by:

(1) Estimating target speed as slow or fast (see table 1).

ESTIMATE TARGET SPEED AS:

***SLOW** for:*

a. Vehicles moving 5 mph (8 kmph) or less.

b. All oblique targets where you see more of the front/rear than side.

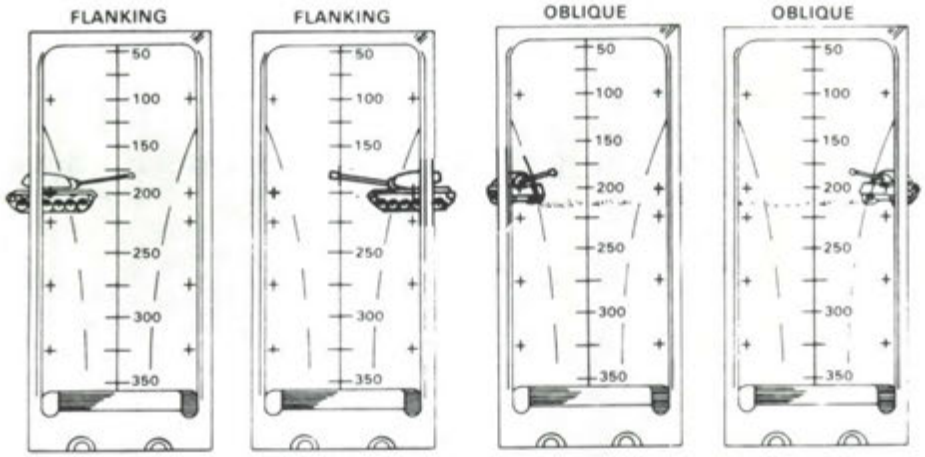
***FAST** for:*

All targets (except b above) traveling faster than 5 mph (8 kmph).

Table 1.

(2) Applying appropriate lead using lead cross directly opposite estimated range, and

(a) For slow targets, lead cross should be on center of mass (figure 3). The vertical range line should be in front of the target.



3a. *3b.*

Figure 3. Slow targets at a range of 200 meters.

(b) For fast targets, lead cross should be on front edge of target (figure 4). The vertical range line should be in front of the target.

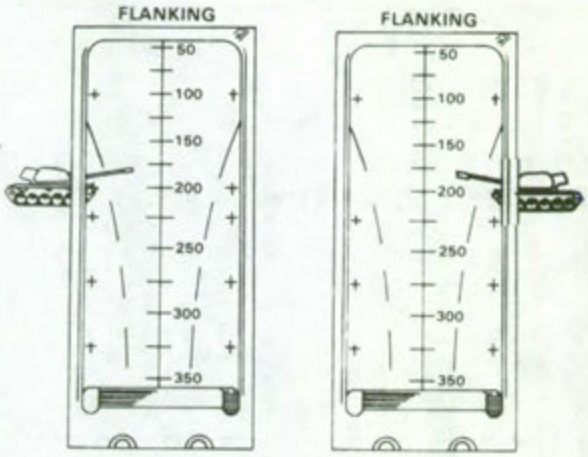


Figure 4. Fast target at a range of 200 meters.

(3) Fire.

NOTE: If there is no lead cross at your estimated range, use an imaginary lead cross which alines with those present on the sight.

4. **Trigger Squeeze.**

The trigger is unique in that it is a bar located on the top of the launcher. To fire, pressure must be applied straight down. The gunner should apply a steady, smooth squeeze downward with fingertips only.

REFERENCE:

FM 23-33, 66-mm Heat Rocket M72A1, M72A1E1, M72 (Revised Edition, TBP)

TASK NUMBER: 071-318-2203

APPLY IMMEDIATE ACTION TO CORRECT A MALFUNCTION ON AN M72A2 LAW

CONDITIONS:

During daylight or darkness, in a field location, given an M72A2 LAW; an attempt to fire the weapon having resulted in a misfire.

STANDARDS:

Within 3 minutes, apply immediate action and attempt to fire the LAW. If the weapon still fails to fire, dispose of the weapon in accordance with unit SOP.

NOTE: Time factors and safety precautions apply only to training.

PERFORMANCE MEASURES:

1. **Immediate action (training only).**

a. Resqueeze the trigger bar. If round does not fire, shout "MISFIRE," wait 10 seconds.

b. Place trigger safety handle on SAFE while keeping LAW trained on the target, then remove from shoulder.

c. Wait 1 minute, depress detent and collapse launcher about 4 inches.

d. Re-extend launcher and place it on shoulder.

e. Check backblast area.

f. Arm, aim, and attempt to fire.

g. If LAW fails to fire after use of immediate action (training only).

(1) Keep LAW aimed at target for 10 seconds.

(2) Place LAW on SAFE and keep it aimed on target for 1 minute.

(3) DO NOT COLLAPSE LAUNCHER.

(4) Dispose of launcher as directed by unit SOP.

2. **Immediate action (combat only).**

a. Immediately resqueeze the trigger bar if round does not fire.

b. Return the arming handle to SAFE.

c. Remove LAW from shoulder, collapse and re-extend (keeping hands clear of the front and rear tube openings).

d. Replace the LAW on shoulder.

e. Check the backblast area.

f. Arm, aim, and attempt to fire.

g. If the LAW still fails to fire, return to SAFE, remove from shoulder, collapse the tube (this keeps the firing mechanism from functioning) and discard.

NOTE: DO NOT LEAVE an intact LAW on the battlefield. The enemy can and will use it against you.

h. If another LAW is available, try to engage the target if it is still in range or poses a threat to your unit.

NOTE: If an M190 subcaliber device was used in training, an instructor or safety NCO should examine the primer housing lock pin to insure that the bent position of the lock pin is pushing against the primer housing door. This is to be done after the first 1-minute wait is completed. After the second failure to fire and its subsequent 1-minute wait, remove the M73 and examine the primer cap. If the primer cap is dented, a rocket malfunction has occurred, and if the primer cap is not dented, the launcher has malfunctioned.

REFERENCES:

FM 23-33, 66-mm HEAT Rocket M72A1, M72A2, and M72, Jul 70 (chap 2, pages 10 and 11, para 13)
TEC Lesson 948-071-0005-F, Operating the M72A2 LAW

TASK NUMBER: 191-376-0105

MAINTAIN A CALIBER .45 PISTOL

CONDITIONS:

Given one caliber .45 pistol; one magazine; cleaning compound, solvent (CR); volatile mineral spirits, paint thinner, or drycleaning solvent; clean rags; and lubricating oil, PL Special.

STANDARDS:

Within 20 minutes, you must clear, disassemble, clean, lubricate, and reassemble the pistol.

PERFORMANCE MEASURES:

1. **Clearing.**

a. Hold the pistol in the raised pistol position.

b. Depress the magazine catch and remove the magazine.

c. Pull the slide to the rear and lock it in its rearward position by pushing up on the slide stop.

d. Point the pistol toward the sky and look into the chamber to be certain it is clear.

2. **Disassembly** (figure 1).

3. **Care and Cleaning of the Caliber .45 Pistol.**

a. Cleaning materials.

(1) Cleaning compound, solvent (CR), is used to clean the bore and face of slide after firing. This cleanser has preservative properties and provides temporary protection against rust.

CAUTION: CR solvent cleaning compound is usable at temperatures of -20°F and higher.

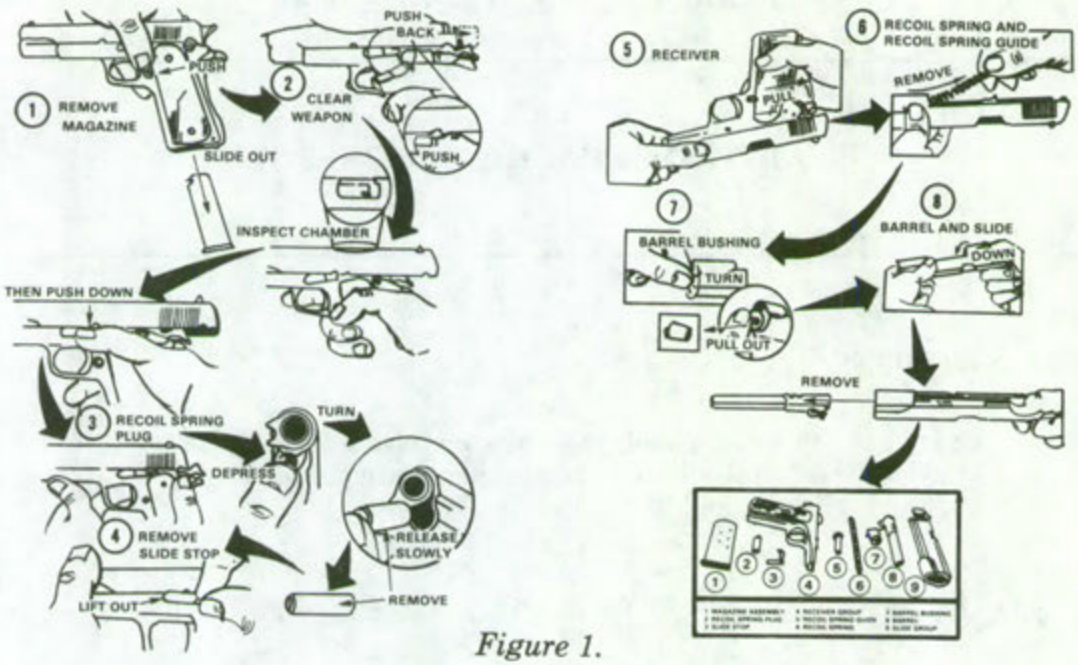


Figure 1.

(2) Hot soapy water may be used to clean the bore when CR is not available. After using the solution, dry barrel thoroughly and apply a light coat of oil.

(3) Volatile mineral spirits, paint thinner, and drycleaning solvent are noncorrosive solvents used for removing oil, grease, or light rust-preventive compounds from weapons. Apply these cleaning agents with a rag to large parts and use them as a bath for small parts.

(4) Cotton wiping rags should be soft and absorbent and free of dust, alkali, or corrosive agents.

b. Lubricants.

(1) Lubricating oil, general purpose, PL Special, is a thin oil used for lubricating above 0°F and for providing temporary protection against rust.

(2) Engine oil, SAE 10, may be used when lubricating and preservative oil cannot be obtained. When engine oil is used, the weapon must be inspected, cleaned, and oiled frequently.

(3) LAW weapons lubricating oil is to be used at temperatures below 0°F.

4. **Care and Cleaning of Caliber .45 Ammunition.**

a. Protect ammunition from mud, sand, dirt, and water. If it appears wet or dirty, wipe clean with a dry cloth immediately. Wipe off light corrosion as soon as it is discovered. Cartridges with heavy coat of corrosion must be turned in to the ammunition supply point.

b. Do not oil or polish cartridges. Do not attempt to fire cartridges that have dents, scratches, loose bullets, or corroded cases. If a cartridge is defective, turn it in to the ammunition supply point.

c. Ammunition should be stored in an airtight box away from all sources of extreme heat. Do not open ammunition boxes until the ammunition is to be used.

5. **Assembly** (figure 2). When testing the caliber .45 pistol for correct assembly depress the safety lock, pull the slide fully to the rear, and release it by pushing down on the slide stop. The hammer should remain cocked.

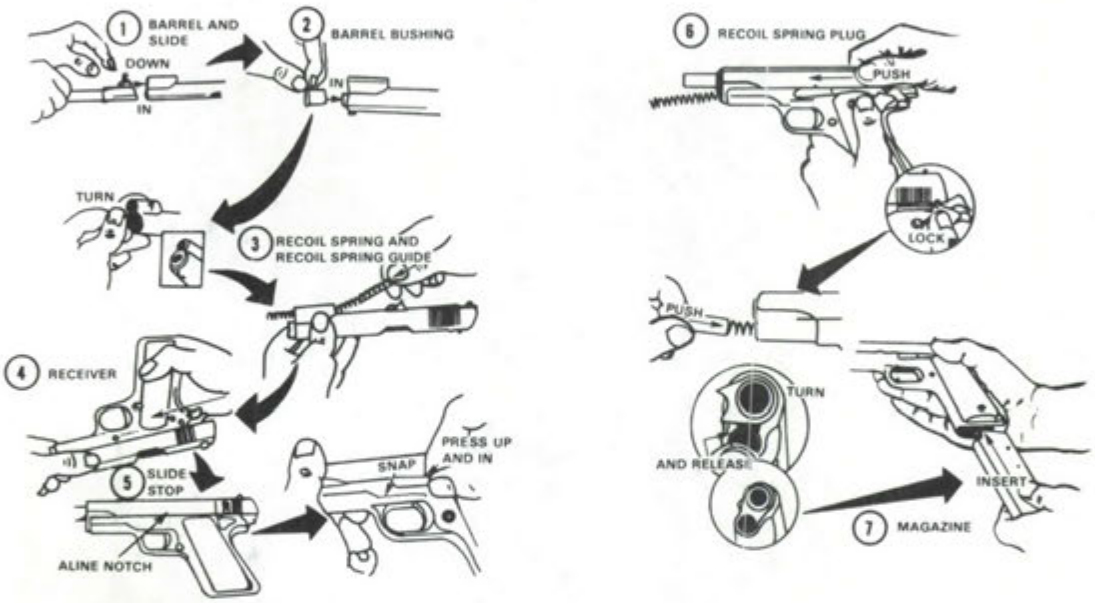


Figure 2.

REFERENCES:

FM 23-35, Pistols and Revolvers, Sep 71 (chap 3, page 35 thru 37, para 25 thru 32; chap 4, page 38, para 35, 37, 38)

TASK NUMBER: 191-376-0104

ENGAGE TARGETS WITH A CALIBER .45 PISTOL

CONDITIONS:

During daylight, on a combat pistol qualification course (CPQC), given a caliber .45 pistol, 40 rounds of ammunition loaded in eight magazines, two dummy rounds loaded arbitrarily in two magazines, and a requirement to fire tables 1 - 5 for qualification.

STANDARDS:

1. You must load the pistol, in sequence, IAW performance measure 1.
2. You must clear the pistol, in sequence, IAW performance measure 2.
3. Achieve a minimum score of 160 out of 300.
4. When a stoppage occurs, you must eliminate it by applying immediate action within 15 seconds.

PERFORMANCE MEASURES:

1. **Loading** (figure 1).
   a. Hold the pistol in the raised pistol position.
   b. Insert the magazine into the pistol.
   c. Pull the slide to the rear and release to chamber a round.
   d. Push the safety lock to the SAFE position.

Figure 1.

2. **Fundamentals of Quick Fire.**

a. Grip. For quick fire without use of the sights, the pistol must act as an extension of your arm. To grip the pistol:

(1) Hold pistol in nonfiring hand as shown in figure 2 and form a "V" with thumb and forefinger of shooting hand.

(2) Place pistol in "V" with sights in line with the firing arm.

(3) Wrap lower three fingers around grip, putting equal pressure with all three fingers straight to the rear.

(4) Place thumb high alongside pistol without applying any pressure with it.

(5) Place trigger finger on trigger so that it can be pulled straight to the rear.

(6) Grip pistol tightly until hand begins to tremble and relax to the point that trembling stops.

(7) If any of the three fingers on the grip are relaxed, the entire grip must be reapplied.

Figure 2.

b. Stance. From a ready position with the feet a comfortable distance apart (figure 3A), bend the knees slightly and thrust the shooting arm forward (figure 3B).

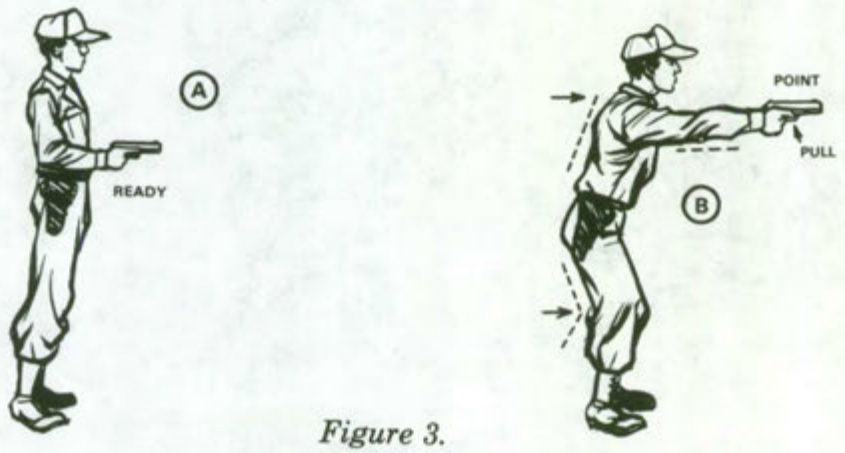


Figure 3.

3. **Engaging the Target.**

a. Look at the center of the target.

b. Straighten the arm and lock the elbow.

c. Without using sights, point at the center of the target as you would if pointing your finger.

d. As soon as you point the pistol, apply pressure to the trigger evenly and firmly until weapon fires. DO NOT USE SIGHTS.

4. **Immediate action to reduce a stoppage (figures 4 and 5).**

a. In the event the slide is fully forward, the hammer falls, and pistol fails to fire, apply immediate action as follows:

(1) Recock weapon.

(2) Attempt to fire.

(3) 10-second pause (if weapon did not fire).

(4) Eject round and chamber new round.

(5) Attempt to fire again.

Figure 4.

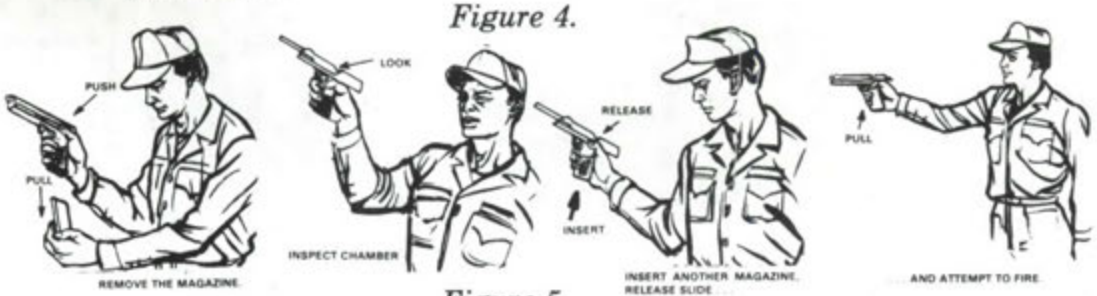


Figure 5.

b. In the event the slide is not fully forward, remove finger from the trigger guard and with the nonfiring hand attempt to push the slide fully forward. If the slide will not move forward, proceed as follows:

(1) Remove magazine.

(2) Inspect chamber.

(3) Insert new magazine and release slide.

(4) Attempt to fire again.

c. If the weapon does not fire after application of immediate action, as outlined above, make a detailed inspection to determine the cause of the stoppage.

5. **Unloading** (figure 6).

a. Hold the pistol in the raised pistol position.

b. Depress the magazine catch and remove the magazine from the pistol.

c. Point the pistol toward the sky and look into the chamber to be certain it is clear.

NOTE: Slide stays to the rear when the last cartridge in the magazine has been fired.

d. Allow the slide to go forward.

e. Pull the trigger while pistol is in the raised pistol position.

Figure 6.

6. **Clearing.**

a. Hold the pistol in the raised pistol position.

b. Depress the magazine catch and remove the magazine.

c. Pull the slide to the rear and lock it in its rearward position by pushing up on the slide stop.

d. Point the pistol toward the sky and look into the chamber to be certain it is clear.

REFERENCES:

FM 23-35, Pistols and Revolvers, Sep 71 (chap 2, pages 32 thru 34; chap 5, pages 40 thru 52)

TASK NUMBER: 071-312-3005

PERFORM OPERATOR MAINTENANCE ON AN M60 MACHINEGUN AND AMMUNITION

CONDITIONS:

Given a 7.62-mm M60 machinegun with all components, cleaning kit, cleaning solvent (CR), rifle bore cleaner (RBC), lubricant, rags, and patches.

NOTE: This task provides training for garrison maintenance of the M60 machinegun, but the skills and knowledge taught will enable the soldier to perform this task in a field training exercise or in combat.

STANDARDS:

1. Within 4 minutes, disassemble the M60 into its eight major groups IAW performance measure 1 below.

2. Perform cleaning, inspection, and lubrication of M60 and tripod IAW performance measures 2 and 3 below.

3. Within 4 minutes, reassemble the M60 and conduct function check IAW performance measure 4 below.

4. Clean M60 ammunition, if required, IAW performance measure 5 below.

PERFORMANCE MEASURES:

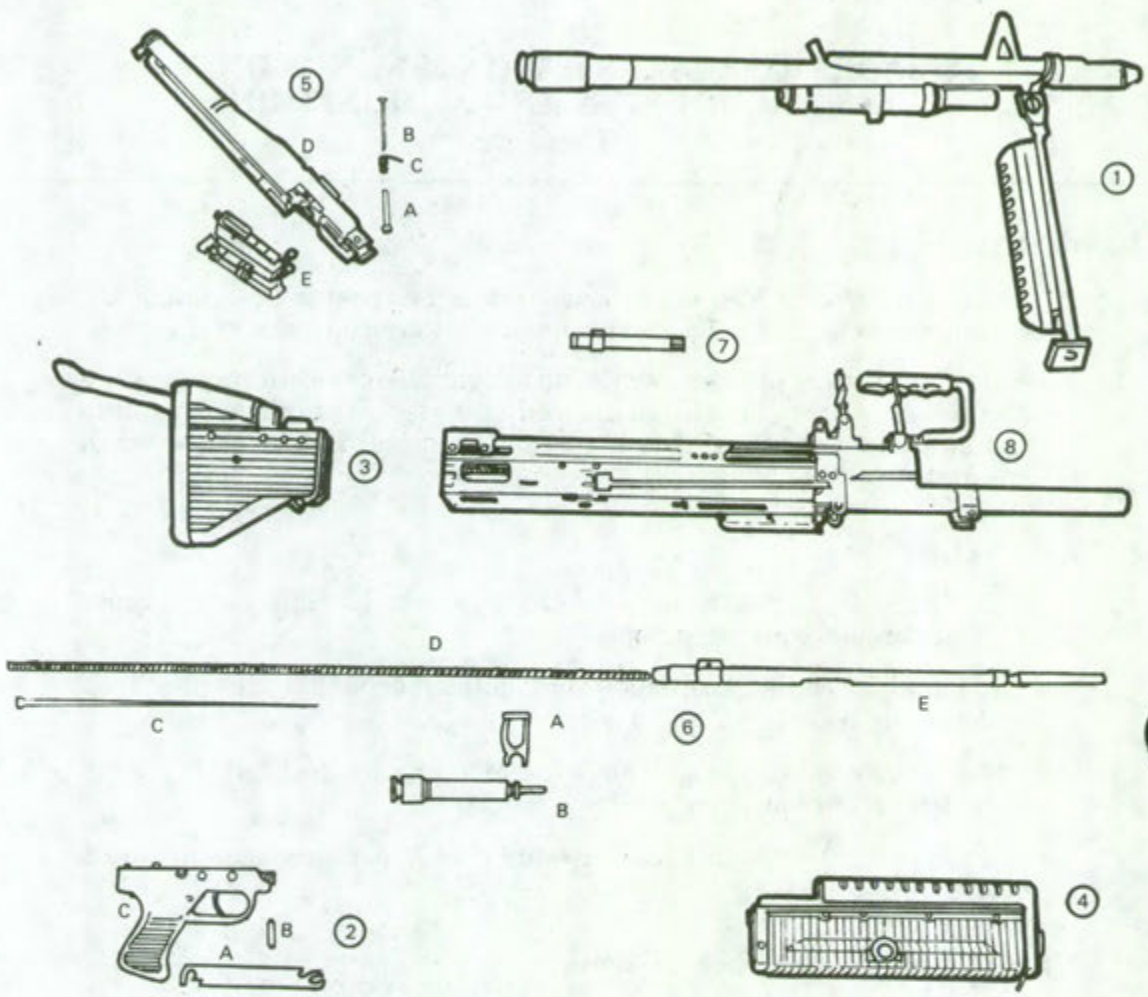
1. **Disassembly.** The machinegunner will disassemble the M60 into its eight major groups: stock group, buffer and operating rod group, bolt assembly, trigger mechanism group, barrel group, cover tray and hanger group, forearm assembly, and receiver group (figure 1). Disassembly begins with the bolt forward, the cover closed, and the safety switch on SAFE. **CAUTION: Before the weapon is disassembled it must be cleared.**

a. Removing the Stock Group.

(1) Raise the hinged shoulder rest and insert the nose of a cartridge into the latch hole (figure 2).

(2) With the latch depressed, remove the stock group by pulling it directly to the rear.

b. Removing the Buffer and Operating Rod Group and the Bolt Assembly.



1. BARREL GROUP

2. TRIGGER MECHANISM GROUP
   A. LEAF SPRING
   B. TRIGGER HOUSING PIN
   C. TRIGGER MECHANISM GRIP ASSEMBLY

3. STOCK GROUP

4. FOREARM ASSEMBLY

5. COVER, TRAY, AND HANGER GROUP
   A. HINGE PIN LATCH
   B. HINGE COVER PIN
   C. SPRING
   D. COVER ASSEMBLY
   E. CARTRIDGE FEED TRAY ASSEMBLY

6. BUFFER AND OPERATING ROD GROUP
   A. BUFFER RETAINING YOKE
   B. BUFFER ASSEMBLY
   C. DRIVING SPRING GUIDE ASSEMBLY
   D. DRIVING SPRING
   E. OPERATING ROD ASSEMBLY

7. BOLT ASSEMBLY

8. RECEIVER

Figure 1. Major groups and assemblies.

The buffer and operating rod group consists of the buffer retaining yoke, buffer, driving spring guide assembly, driving spring and the operating rod assembly (figure 1).

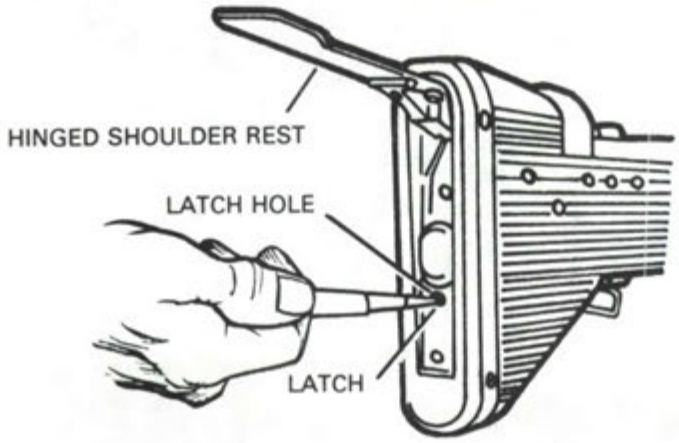


Figure 2. Removing the stock group.

(1) Press lightly with the palm of the hand against the exposed buffer. Remove the buffer retaining yoke from the top of the receiver (figure 3).

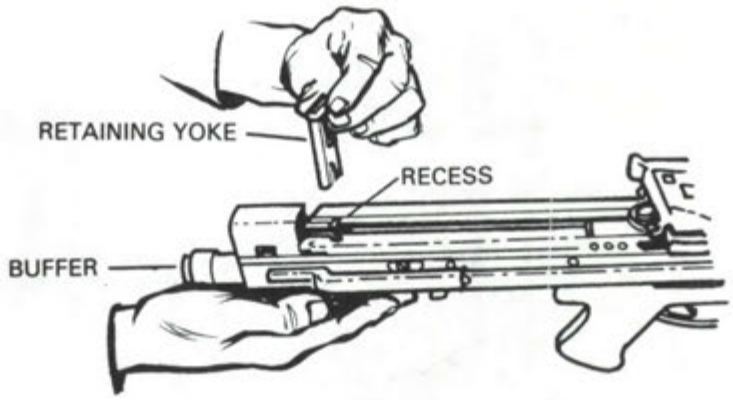


Figure 3. Removing the buffer group.

(2) Withdraw the buffer slowly. Allow the driver spring to push out until the end of the drive spring guide is showing at the rear of the receiver (figure 4).

(3) Pull the buffer plunger from the drive spring guide (figure 4).

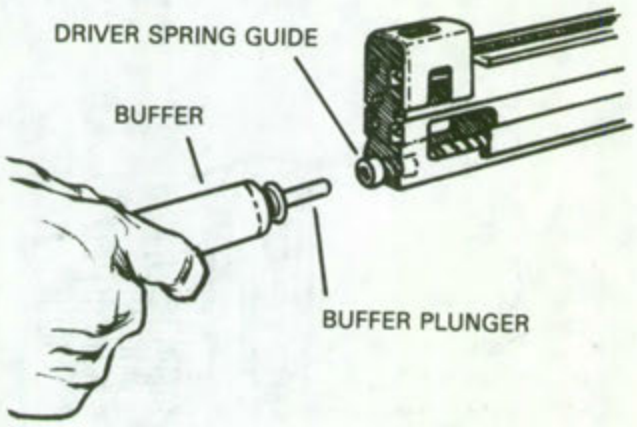


Figure 4. Separating the buffer group (buffer plunger) from the operating group (driver spring guide).

(4) Pull the driving spring guide and spring from the receiver and separate them.

(5) With the left hand grasp the pistol grip and pull the cocking handle to the rear until the bolt is separated from the barrel socket. Continue to pull the operating rod and bolt to the rear by pulling on the cam roller (figure 5).

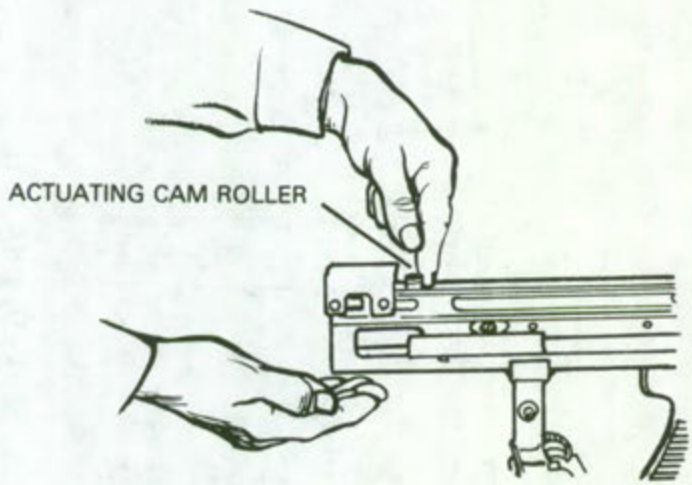


Figure 5. Pulling on cam roller.

(6) When the operating rod and bolt are about 4 inches out of the receiver, grasp them securely to prevent the bolt from rotating, and remove them from the receiver (figure 6). Relax the grip and allow the bolt to rotate slowly.

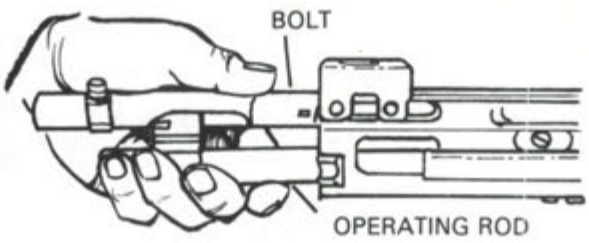


Figure 6. Withdrawing the operating group from the receiver.

(7) Grasp the bolt in one hand with the bolt face toward the body, operating rod on top, grasp the operating rod securely in the other hand. Push forward on the operating rod, pivot the front of the operating rod up, and disengage it from the bolt (figure 7).

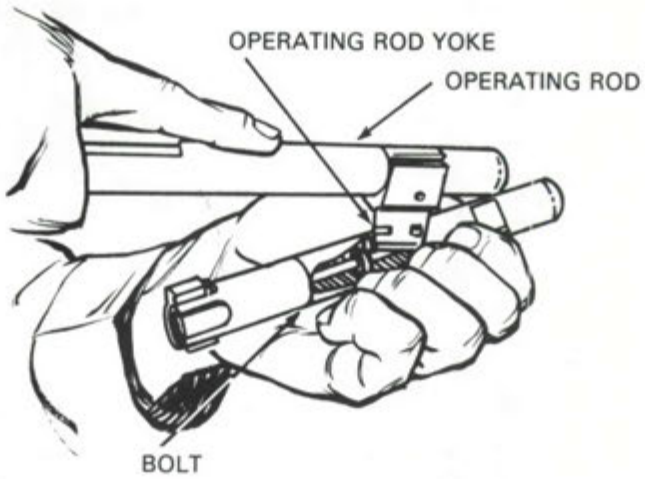


Figure 7. Separating the bolt from the operating rod.

c. Removing the Trigger Mechanism Group.

The trigger mechanism group consists of the trigger mechanism grip, leaf spring, and trigger housing pin; this pin is interchangeable with the sear retaining pin.

(1) Press in on the rear of the leaf spring and rotate the rear end up to clear it from the sear retaining pin (figure 8). Pull to the rear to disengage the front notch from the trigger housing pin.

(2) Remove the trigger housing pin by pushing it to the left.

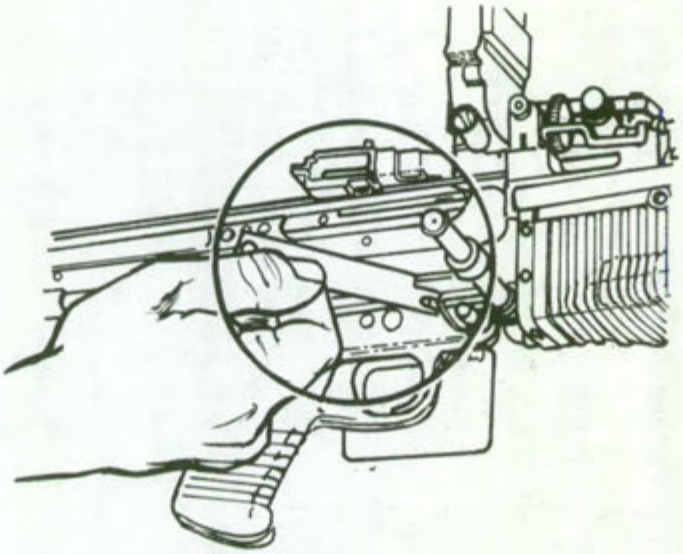


Figure 8. Removing the leaf spring.

(3) Slide the trigger mechanism group slightly forward, rotate the front of the housing down, and remove it (figures 9 and 9.a).

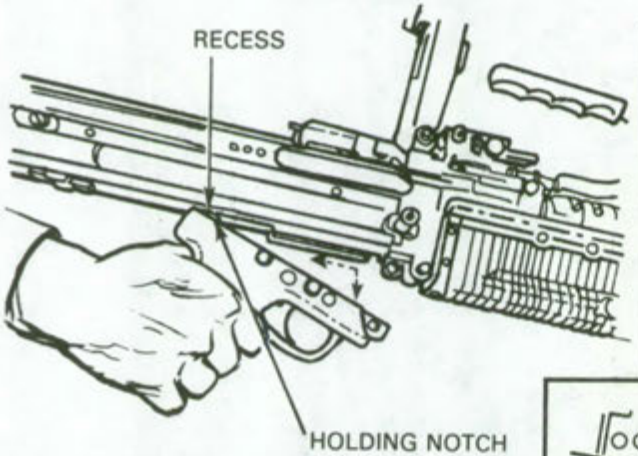


Figure 9. Removing the trigger housing group.

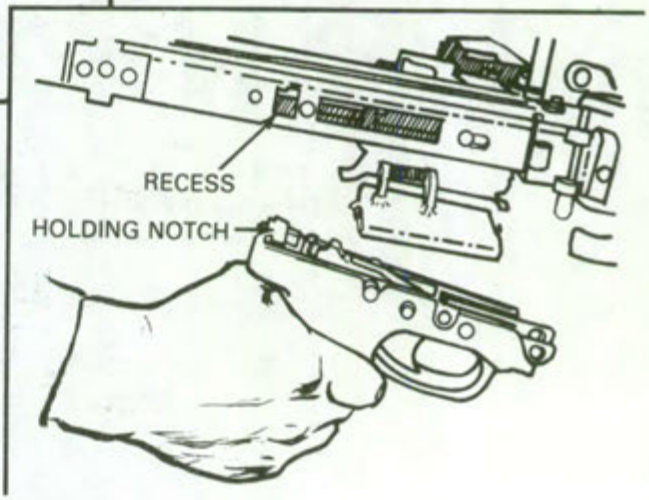


Figure 9.a

d. Removing the Barrel Group.

The barrel group consists of the barrel, flash suppressor, front sight, bipod assembly, and the gas system. Push in on the barrel locking lever plunger and raise the barrel locking lever to the vertical position (figure 10). Remove the barrel group by pulling it straight to the front.

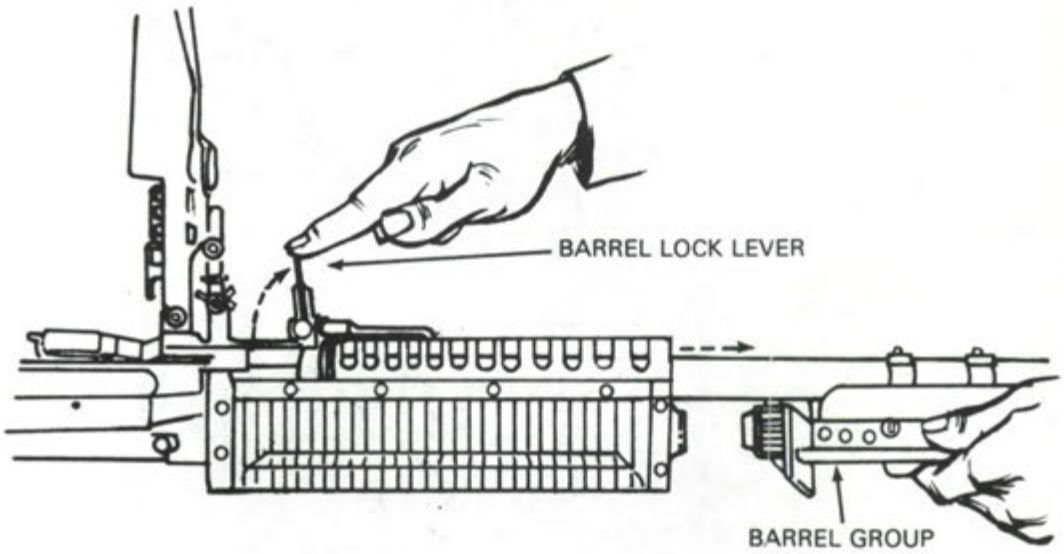


Figure 10. Removing the barrel group.

e. Removing the Forearm Assembly.

(1) Turn the receiver so that the top is down.

(2) Insert a pointed object into the latch hole at the bottom rear of the forearm assembly (figure 11).

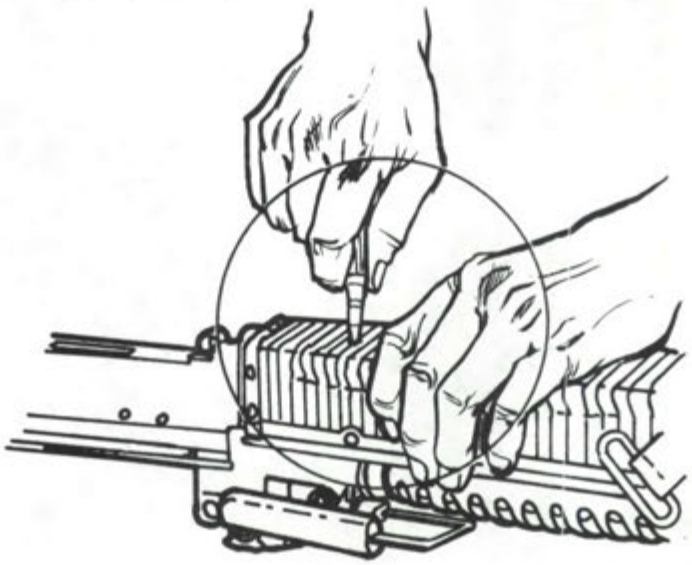


Figure 11. Removing the forearm assembly.

(3) Press down on the pointed object to release the forearm latch, raise the rear of the forearm assembly sightly and remove it to the front.

f. Removing the Cover, Tray, and Hanger Group.

(1) With the feed cover raised, use a pointed object and unlock the hinge pin latch, and push it out of its recess (figure 12).

(2) Remove the hinge pin by pulling it from left to right.

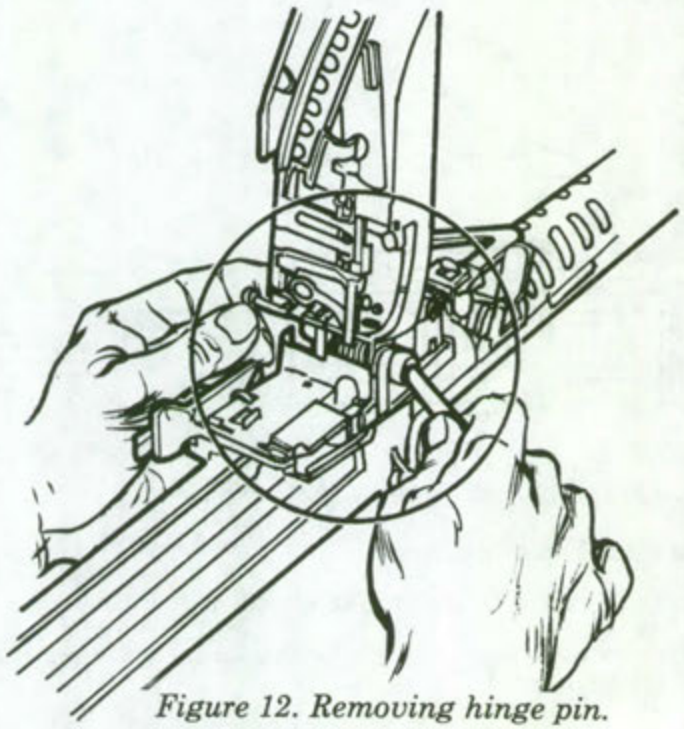


Figure 12. Removing hinge pin.

(3) Lift the feed cover from the receiver group and remove cover spring.

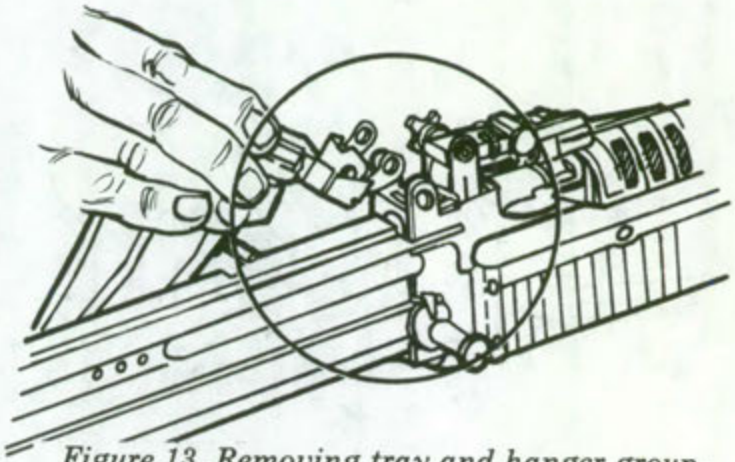


Figure 13. Removing tray and hanger group.

(4) Raise the tray and hanger group from the receiver group (figure 13).

g. The Receiver Group.

The receiver group consists of the receiver, rear sight assembly, cocking handle, and carrying handle. General disassembly of the M60 is completed after the removal of the other seven groups from the receiver group.

2. **Cleaning.**

a. The M60 machinegun should be kept cleared at all times. If the gun is not being used for training or firing, it should be inspected weekly and cleaned and lubricated as necessary. At least once every 90 days it should be cleaned as thoroughly as if it were just fired.

b. If the gun has been fired, follow steps outlined below:

(1) Break the gun down into its eight major groups.

(2) Using a cleaning rod and patch soaked in cleaning compound solvent (CR), swab out the bore several times until most of the powder fouling is removed.

(3) Using a rag soaked in CR, clean the chamber and the bolt until most of the visible powder fouling is removed.

(4) Using a rag soaked in dry cleaning solvent (SD), wipe down all parts of the gun and tripod with the exception of rubber coated parts.

(5) Dry completely all parts cleaned with SD.

(6) Second day--repeat procedures outlined for day 1.

(7) Third day--

(a) Using a cleaning rod and patches soaked in rifle bore cleaner (RBC), swab out the bore of the gun until all powder fouling is removed. Then swab bore out with clean patches until completely dry.

NOTE: Be sure to duplicate all bore cleaning steps on spare barrel.

(b) Using a rag soaked in RBC, remove all remaining fouling in chamber and on bolt surfaces. Then with a clean rag, completely dry the chamber and bolt.

(c) Using a rag soaked in SD, clean all other parts of the gun and tripod except those covered with rubber.

(d) Completely dry all parts cleaned with SD.

c. If the gun has not been fired--

(1) Inspect weekly and clean the gun as outlined in para 2b(7) above.

(2) If the gun has not been fired in the last 90 days, clean it using the complete procedure in para 2b above.

d. Important points to remember:

(1) Do not submerge the buffer group in any cleaning solvents. Clean as prescribed in above outlined procedures.

(2) Use of gasoline, kerosene, benzene, or high pressure water, steam, or air is prohibited for cleaning.

(3) When cleaning the barrel assembly, care should be taken to prevent getting any solvent or oil in the gas cylinder. This is easily done by keeping the barrel in an inverted position while cleaning.

(4) SD is flammable.

e. Lubrication:

(1) Using general purpose lubricating oil (PL special), run a cleaning patch with several drops of PL special on it through the bore.

(2) Using a rag with several drops of PL special on it, wipe down all surfaces of the gun and tripod with the exception of those covered with rubber, inside the buffer assembly, and inside the gas cylinder.

(3) Specific locations to lubricate with semifluid lubricating oil (LSA) include–

(a) Bolt locking lugs by camming surfaces.

(b) On operating rod surfaces which ride along receiver rails.

(c) On actuator roller on bolt and where bolt actuator rides feed pawl carrier on underside of cover assembly.

f. Special considerations for lubrication must be taken in climates with extreme temperatures. Refer to FM 23-67, Oct 64, chapter 5, section II, page 53.

g. Insure proper care and use of the barrels.

(1) To prolong the life of the barrels, to retain accuracy, and to allow continuous firing for prolonged periods, two barrel assemblies are issued with each gun.

(2) During continuous firing, change barrels every 10 minutes when firing at the sustained rate of 100 rounds per minute; every 2 minutes when firing at the rapid rate of 200 rounds per minute; and every minute when firing at the cyclic rate which is in excess of 550 rounds per minute.

3. **Inspection** (machinegun and tripod). A detailed inspection checklist can be prepared by consulting FM 23-67 w/C1, Oct 64, chapter 4, section II, pages 51-53.

(1) This will give you correct nomenclature.

(2) It will also give you the correct functioning for the various parts.

4. **Assembly.** In general assembly, replace the eight major groups in order of disassembly.

a. Replacing the forearm assembly.

(1) To replace the forearm assembly, guide the forearm assembly over the operating rod tube, insuring that the operating rod tube does not strike the baffles inside the forearm assembly. Aline the recess in the forearm assembly with the end of the operating rod tube.

(2) Tap up on the bottom rear of the forearm assembly with the palm of the hand to lock into postion.

b. Replacing the cover, tray, and hanger group.

(1) Replace cover spring.

(2) To replace the tray and hanger, aline the guides to the left of the feed cover counting lugs.

(3) To replace the cover, insert the cover spring in the well in the receiver group and aline the cover with the mounting lugs.

(4) Insert the hinge pin from the right side and then insert the hinge pin latch from the left side.

c. Replacing the barrel group.

Insure that the barrel lock lever is in the vertical position (figure 10). Put the rear of the barrel through the forearm assembly and aline the gas cylinder nut with its recess in the forearm assembly. Lower the barrel lock lever.

d. Replacing the trigger mechanism group.

(1) Engage the holding notch of the trigger mechanism in its recess in the bottom of the receiver (figure 9). Rotate the front of the mechanism up and aline the holes of the mechanism with the mounting bracket on the receiver.

(2) Insert the trigger housing pin from the left. Attach the leaf spring (figure 9) by placing the open end of the leaf spring on the trigger housing pin, and then engage the hooked end to the sear pin.

e. Replacing the bolt assembly.

With the camming slot up, hold the bolt securely in one hand with the face of the bolt toward the body. With the other hand position the rear of the operating rod yoke against the rear firing pin spool (see figure 14). Push on the operating rod, compressing the firing pin spring, and position the operating rod yoke between the firing pin spools. Holding the operating rod and bolt in one hand, proceed to f. below.

f. Replacing the operating rod group in the receiver.

(1) While holding the operating rod and bolt with one hand, with the other hand, push forward on the rear of the bolt, causing the bolt to rotate until the locking lugs are in a vertical position.

(2) With the cam roller up, push the operating rod and bolt into the receiver until the end of the operating rod is even with the rear of the receiver (figure 15).

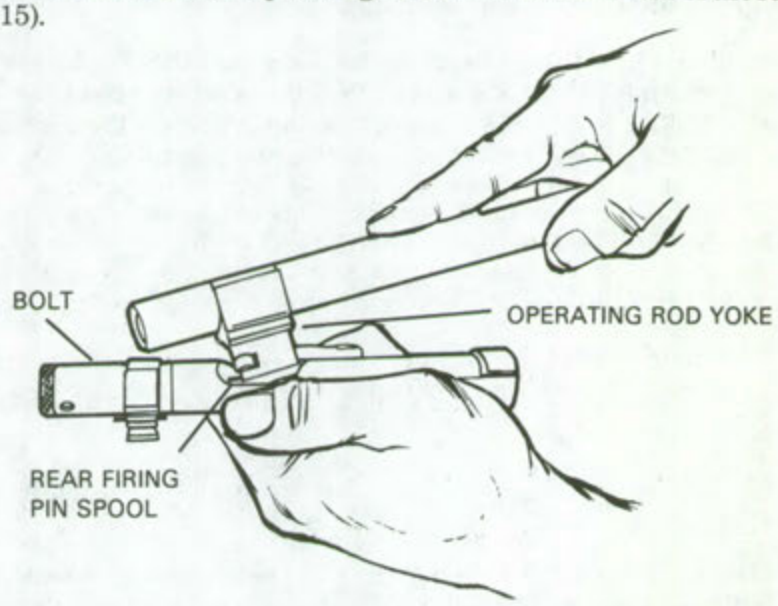


Figure 14. Assembly of the operating group.

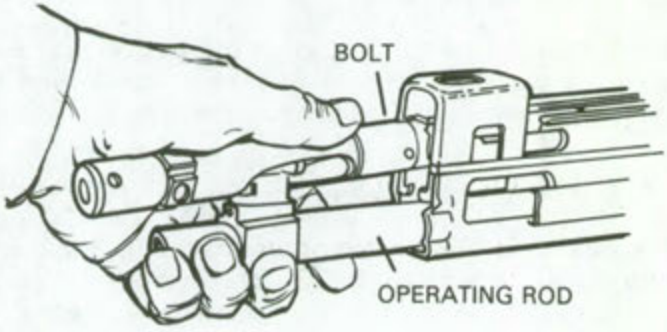


Figure 15. Inserting the operating group in the receiver.

(3) Put the drive spring guide into the drive spring, then put the opposite end of the drive spring in the recess of the operating rod. Pull the trigger and push in the drive spring until the head of the guide is about an inch from the receiver (figure 4).

g. Replacing the buffer assembly.

(1) Put the buffer plunger into the drive spring guide (figure 4). Push forward on the buffer until the operating rod and bolt go fully forward.

(2) Push in on the buffer until the recesses on the buffer are alined with the recesses in the receiver. Replace the buffer retaining yoke from the top of the receiver (figure 3).

h. Replacing the stock group.

Aline the guide rails of the stock with the guide rails on the receiver. Push forward until the stock is fully seated. A distinct click will be heard with the latch engages.

i. Correct assembly.

A function check must be performed to insure that the M60 is correctly assembled. Place the safety on FIRE. Pull the cocking handle to the rear, cocking the M60; close the cover, place the safety on SAFE, and pull the trigger (should not fire). Place the safety on FIRE and pull the trigger while holding the cocking handle to allow the bolt to ease forward.

5. **Ammunition.** Ammunition should be clean and dry. One bandoleer should be carried on the machinegun and two bandoleers carried by the machinegunner. All other ammunition remains in the can until needed.

a. Ammunition containers should not be opened until the ammunition is to be used. Ammunition removed from the air-tight containers, particularly in damp climates, is likely to corrode.

b. Protect ammunition from mud, dirt, and water. If the ammunition gets wet or dirty, wipe it off prior to use. Wipe off light corrosion as soon as it is discovered. Heavily corroded cartridges or cartridges which have dented cases or loose projectiles should not be fired. Do not expose ammunition to the direct rays of the sun. If the powder is hot, excessive pressure may be developed when the gun is fired.

c. Do not oil or grease ammunition. If it is oiled, dust and other abrasives will collect on it and damage the operating parts of the gun.

REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, Oct 64 (chapter 2, section I-IV, page 5-30, and chapter 4, sections I and II, page 49-53)
TEC Lessons 941-071-0078-F through 941-071-0080-F, Mechanical Training M60 Machinegun

TASK NUMBER: 071-312-3001

OPERATE AN M60 MACHINEGUN

CONDITIONS:

Given a fully assembled and cleared M60 machinegun and 20 rounds of linked 7.62-mm blank or live ammunition.

STANDARDS:

Perform loading, reduction of a stoppage, and clearing of an M60 machinegun in accordance with the performance measures listed below.

NOTE: The M60 machinegun is loaded, fired, unloaded, and cleared in the open-bolt position. The safety must be placed on the FIRE position before the bolt can be pulled to the rear.

PERFORMANCE MEASURES:

1. **Loading** (FM 23-67, C1, chap 4, page 40, para 35 and 36).

a. Place the safety switch in the FIRE position.

b. Pull the cocking handle to the rear, locking the bolt in the rear position.

c. Return the cocking handle to the forward position and place the safety switch in the SAFE position.

d. Raise the feedtray cover and insure that the feedtray, receiver, and chamber are clear.

e. Place the first round of the belt in the feedtray groove and close the feedtray cover, insuring that the ROUND REMAINS IN THE FEEDTRAY GROOVE.

2. **Reduction of a Stoppage** (FM 23-67, C1, chap 5, page 49, para 42).

a. A stoppage is an interruption in the cycle of functioning, caused by faulty action of the gun or faulty ammunition. IMMEDIATE ACTION is the action taken to reduce the stoppage without investigating the cause.

b. For training purposes, if a live fire range or blank ammunition cannot be obtained, then a stoppage should be simulated by the trainer. The soldier may then be required to perform immediate action or state in his own words how he would apply immediate action.

c. Immediate action.

(1) If a stoppage occurs, pull the cocking handle to the rear, locking the bolt to the rear, and return the cocking handle to the forward position.

(2) If a round is ejected, try to fire again.

(3) If a round does not eject, immediate action has failed and REMEDIAL ACTION must be taken.

d. Remedial action.

(1) Unload and clear gun.

(2) Inspect gun and ammunition to determine cause of stoppage.

(3) If possible, correct the cause of stoppage, reload, and attempt to fire gun.

(4) If the problem remains, the gun must be turned in to the unit armorer.

TRAINING TIPS: For an explanation of reduction of other kinds of stoppages, the soldier should refer to FM 23-67, C1, chap 4, page 50, table II.

3. **Clearing** (FM 23-67, C1, chap 4, page 40, para 38).

a. To clear the gun, it must first be unloaded. To unload the gun, pull the cocking handle to the rear, locking the bolt in the rear position. Return the cocking handle to the forward position and place the safety switch on the SAFE position. Open the feedtray cover and remove any ammunition or belt links which may remain in the gun (FM 23-67, C1, chap 4, page 40, para 37).

b. To clear the gun --

(1) Check the cover, feedtray, receiver, and chamber to insure they are clear of all ammunition.

(2) Close the feedtray cover.

(3) Place the safety switch on the FIRE position.

(4) Pull the cocking handle to the rear, pull the trigger, and simultaneously ease the bolt forward by riding the cocking handle forward.

(5) Place the safety switch on the SAFE position.

REFERENCES:

FM 23-67, Machinegun 7.62, M60, C1, Oct 64
TEC Lesson 941-071-0078-F, The M60 Machinegun: Mechanical Training, Part I
TEC Lesson 941-071-0079-F, The M60 Machinegun: Mechanical Training, Part II
TEC Lesson 941-071-0080-F, The M60 Machinegun: Mechanical Training, part III
TEC Lesson 941-071-0081-F, The M60 Machinegun: Functioning
TEC Lesson 941-071-0083-F, The M60 Machinegun, Prefire Procedures
TEC Lesson 941-071-0085-F, Malfunctions and Stoppages, M60 Machinegun

TASK NUMBER: 071-312-3002

FIRE THE M60 MACHINEGUN FOR FAMILIARIZATION

CONDITIONS:

During daylight on a live fire range suitable for firing the M60 machinegun, given a zeroed bipod-mounted M60 machinegun, an assistant gunner, 50 rounds 7.62-mm ammunition, type "E" silhouette targets arranged to represent the enemy in linear, deep, and linear with depth formations, located at ranges between 300-1100 meters from the firing position.

STANDARDS:

Familiarization firing will be conducted in accordance with range facilities available and the performance measures listed below.

NOTE: This task is designed to familiarize the soldier with firing the M60 machinegun and does not describe standards by which an assigned gunner or assistant gunner should be measured.

PERFORMANCE MEASURES:

1. Assume a stable prone firing position.

2. Fire the weapon using the correct sight alinement and picture.

a. Sight alinement: The gunner centers the front sight blade in the aperture of the rear sight slide with the top of the front sight blade even with the top of the right slide (figure 1).

b. Sight picture: The gunner centers the target over the front sight blade so that it appears to rest on top of the front sight blade and on top of the rear sight slide (figure 2).

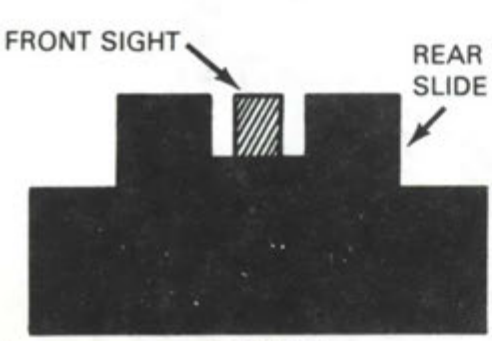


Figure 1.

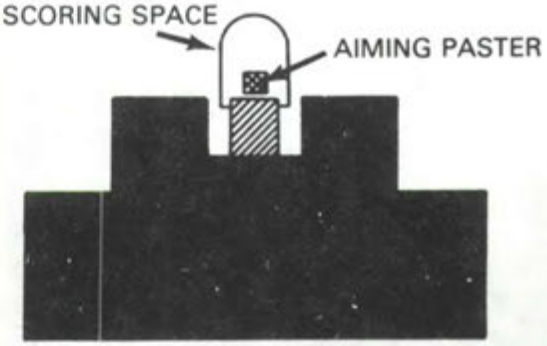


Figure 2.

3. Apply correct traversing and search techniques.

a. Traversing: This is moving the muzzle of the weapon to the left or right to distribute fire laterally. With the bipod-mounted gun, this is accomplished by selecting successive aiming points in the target area (figure 3). The gunner shifts his shoulders slightly to the right or left for minor changes. For major changes in direction, he moves his elbows and realines his body to remain directly behind the gun.

b. Searching: This is moving the muzzle of the weapon up or down to distribute fire in depth and is accomplished by selecting successive aiming points in the target area (figure 3). To make changes in elevation, the gunner moves his elbows closer together or farther apart.

4. Use observation and adjustment of fire.

a. Observation of Fire: Machinegun fire is observed by noting the strike of the projectiles in the target area, by observing tracers in their flight or, in the case of the 10-meter range, by noting the holes made in the target.

b. Adjustment of Fire: When firing the bipod-mounted gun, fire is adjusted by changing the gunner's body position by using the traversing and searching method.

5. Apply the adjusted aiming point method.

a. The adjusted aiming point method is a means of rapidly and accurately adjusting fires without going through the process of making sight adjustment.

b. If the gunner misses the target with his initial burst, he selects a new aiming point on the ground the same distance from the target as the center of impact of the initial burst but in the opposite direction, and fires a second burst (figure 4).

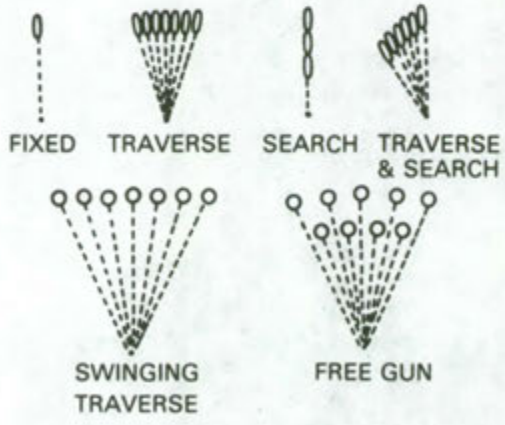


Figure 3.

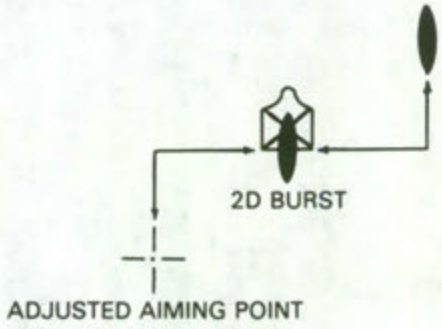


Figure 4.

6. Targets engaged on the battlefield are one of three types: area, point, or moving (FM 23-67, chap 7, para 82/88, p. 92/98).

a. To engage an area target (figure 5) –

(1) Determine width and depth of the target.

(2) Fire single shots until you hit the center of mass of the target area.

(3) Use traversing and searching fire to cover the target area.

b. To engage a point target (figure 6) –

(1) Select a distant aiming point.

(2) Estimate range.

(3) Fire single shots to obtain accurate range and deflection.

(4) Place the beaten zone on target.

(5) If target moves, follow it.

c. To engage a moving target (figure 7) –

(1) Estimate speed of the target and required lead.

(2) Fire and track as target moves.

(3) Adjust lead by observing tracers and bullet strike.

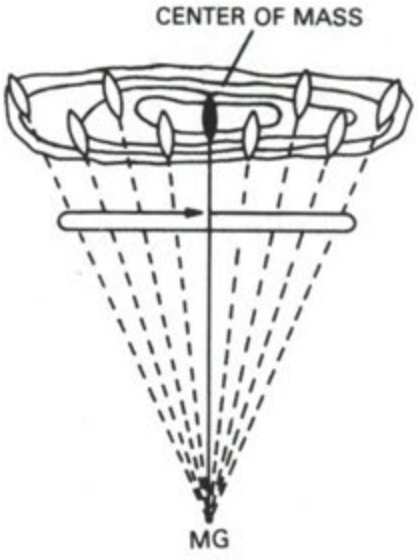


Figure 5.

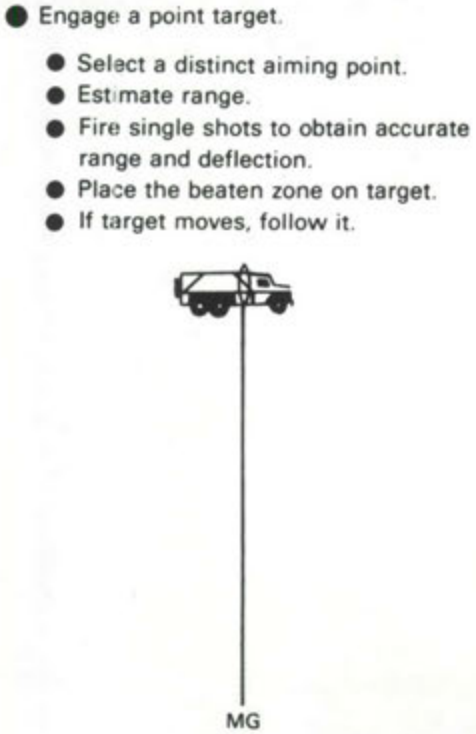


Figure 6.

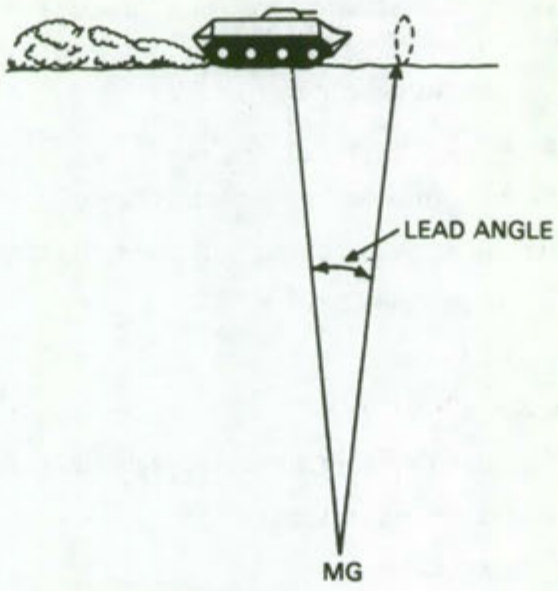


Figure 7.

REFERENCES:

FM 23-67, Machinegun Caliber 7.62-mm, M60, C1, Oct 64 (chap 10, page 148-152, para 138-141; page 163, para 162)
TEC Lesson 941-071-0084-F, Firing and Zeroing, M60 Machinegun

TASK NUMBER: 071-312-3004

CONSTRUCT AN M60 MACHINEGUN POSITION

CONDITIONS:

In daylight, given load-bearing equipment with bayonet, scabbard, intrenching tool, and poncho; an M16A1 rifle; an M60 machinegun with all components; the specific location and sectors of fire of the position to be constructed; logs to construct overhead cover; and 4 hours to complete construction. **(NOTE: Position should afford natural cover such as mounds of earth, stumps, trees, rocks, etc., and must afford observation and general field of fire initially as selective clearing will begin after the hole is dug.)**

STANDARDS:

(NOTE: Time may be adjusted when soil and weather conditions make construction of positions particularly difficult.)

Within time specified, completed position must meet the following specifications:

1. **Cover.** Affords protection from direct frontal small-arms fire (by means of a natural or manmade frontal parapet, thick enough to provide protection from direct small-arms fire and high enough to obscure the helmet of anyone in the position from frontal observation). Affords protection from the effects of indirect fire (shrapnel) (normally requires at least 12 inches of dirt and log overhead protection).

2. **Concealment.** Position cannot be easily detected from the front (e.g., blends with surroundings well enough that an approaching soldier approximately 35 meters to front (hand-grenade range) cannot detect it.) It must also be protected from aerial observation.

3. **Fields of Fire.** The gunner must have good observation and fields of fire in both sectors of fire, without destroying natural camouflage.

4. **Size and Shape.** The position must be armpit deep, be wide enough to allow two personnel with LBE to move freely, and have two distinct firing platforms whenever possible (figure 1).

5. **Optional.** Position may include grenade sump, sloping floor with shallow trench to facilitate drainage, and rear parapet for protection against small arms from the rear (other friendly positions or supporting fire from APCs) and from shrapnel.

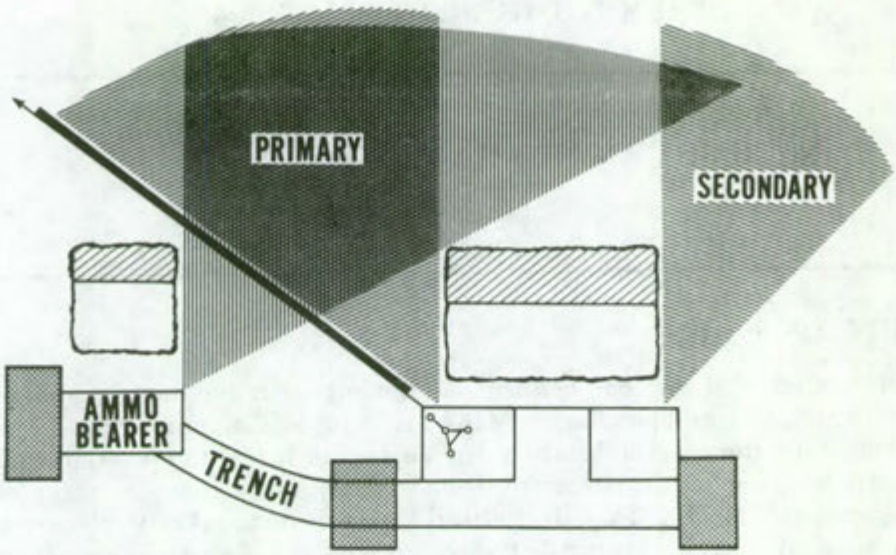


Figure 1.

PERFORMANCE MEASURES:

1. Set up a good hasty position after obtaining the gun position and sectors of fire from the platoon leader. Position the tripod so that the gun can be laid on the FPL or PDF and the crew is behind the frontal protection. When the tripod is in place so that you can fire the FPL, mark where you are going to dig the tripod table; move the gun to the other side of the position (if possible) and do the same. You now can decide how you must dig the hole (figure 2).

FPL TO THE RIGHT

Gunner stands here and fires to the oblique when he needs protection from direct fire.

Assistant gunner feeds ammunition from here and is always protected from direct fire.

Gunner stands here to fire to the front.

Figure 2a.

FIRING TO THE OTHER SIDE -- move tripod to the other side.

Figure 2b.

2. After digging the position, reduce the height of the gun by digging down the tripod platform as much as you can. This is done to reduce the profile of the gun itself. Don't dig it so deep that the gun cannot be traversed across your entire sector of fire (figure 3).

Don't put the tripod legs to close to the edge of your hole or the firing platform may collapse.

Figure 3.

3. When you have a three-man crew for the machinegun, have the ammunition bearer prepare a one-man fighting position so that he can observe and fire to the front and secondary sectors of fire of the machinegun. This means that the ammunition bearer's position should be on the same side as the FPL of the machinegun so that he can protect the immediate front of the position. Connect his position to the gun with a crawling-depth trench so that he can bring over ammunition or replace one of the men on the gun as necessary (figure 4).

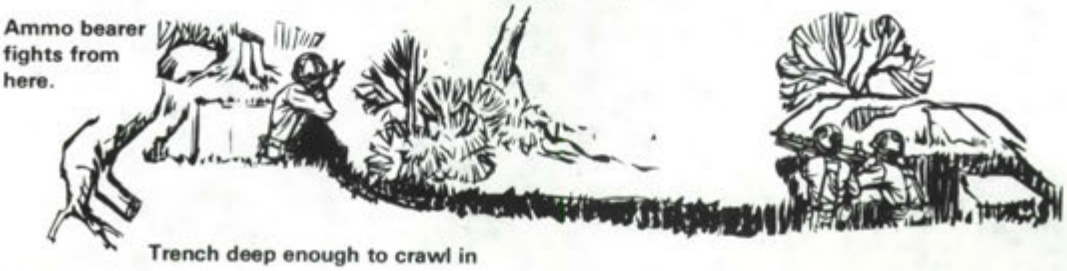


Figure 4.

Figure 5.

4. In some positions, you may not be able to fire to both sides of the frontal parapet. If this is the case, modify the position accordingly (figure 5).

5. Overhead cover is constructed for the one-man machinegun position in the same manner as the basic two-man position — that is, for the machinegun position from front to over the center.

REFERENCE:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (app C, pages C-21 thru 23)

TASK NUMBER: 071-312-3003

LAY M60 MACHINEGUN USING FIELD EXPEDIENTS

CONDITIONS:

As a gunner, during daylight, in a defensive position with an assistant gunner, given a caliber 7.62-mm M60 machinegun (bipod and tripod), a designated primary sector of fire (FPL optional), a secondary sector of fire to include either an area of graze or three recognizable target areas, and provided with tree limbs, rocks, logs or boards, axe, and luminous tape.

STANDARDS:

1. In the designated primary sector, use the aiming stake technique with tripod-mounted M60 machinegun to engage preselected target areas (FPL optional) IAW performance measure 1 below.

2. In the designated secondary sector using a bipod, use either:

a. The notched-stake or tree-crotch technique to engage three preselected target areas within the sector IAW performance measure 2.

b. The horizontal log or board technique to fire an existing area of graze IAW performance measure 3.

PERFORMANCE MEASURES:

NOTE: The field expedient method of laying an M60 serves to supplement and enhance the employment of the gun in engaging preselected target areas.

1. Using the aiming stake technique (figure 1), use the following procedure:

a. Aim the gun to hit the preselected target area.

b. Raise the rear sight slide to its uppermost position in the rear sight leaf and place a strip of luminous tape at least halfway up the rear of the front sight post (figure 1).

c. Mark an aiming stake with a strip of luminous tape and place it 1 or 2 meters forward of the gun position.

d. The gunner sighting the desired target area directs the assistant gunner to aline the stake and drive it into the ground in such a way that the two pieces of luminous material are adjacent (alined for direction) and top edges of both pieces of material are level (alined for elevation) (figure 1).

e. To insure that the M60 machinegun is correctly laid on the target(s) fire a confirming burst if the tactical situation permits.

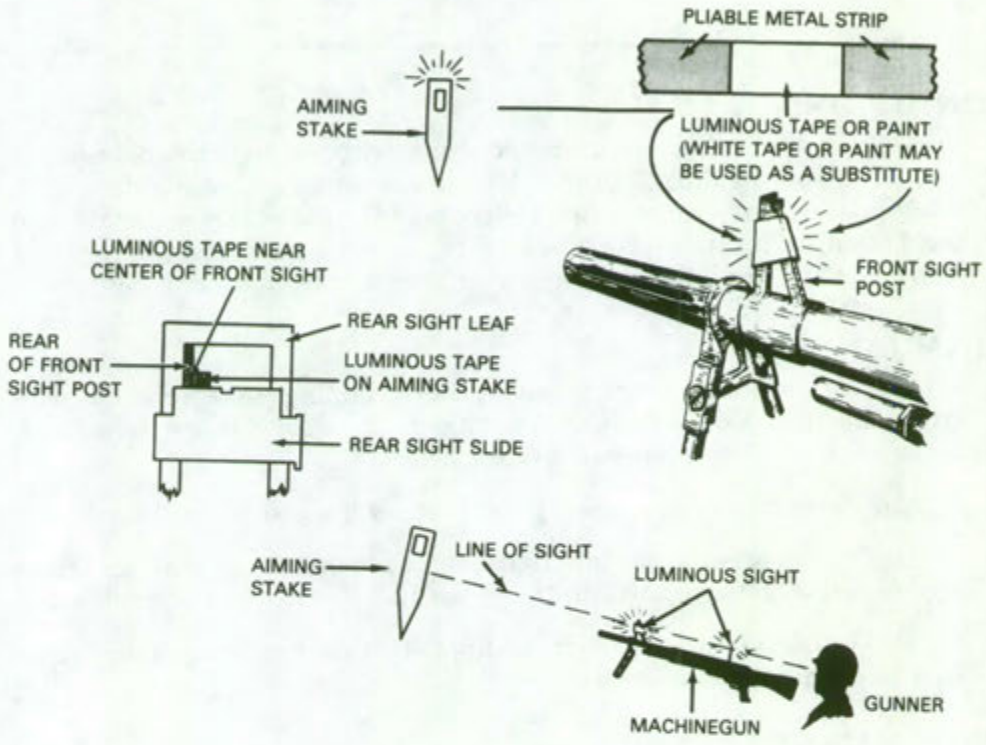


Figure 1.

2. Using the notched-stake or tree-crotch technique (figure 2), use the following procedure:

a. Aim the weapon toward the preselected target area.

b. Place the stock of the weapon in the rests of notched stakes or tree-crotches and make final adjustment to hit desired target area.

c. Dig shallow trenches or grooves for the bipod feet to permit rotation of the bipod feet as the stock is moved from one crotch or stake to another.

d. Hold the weapon, sight it, and fire it using the position and grip employed in bipod firing.

e. To insure that the M60 machinegun is correctly laid on the target(s), fire a confirming burst if the tactical situation permits.

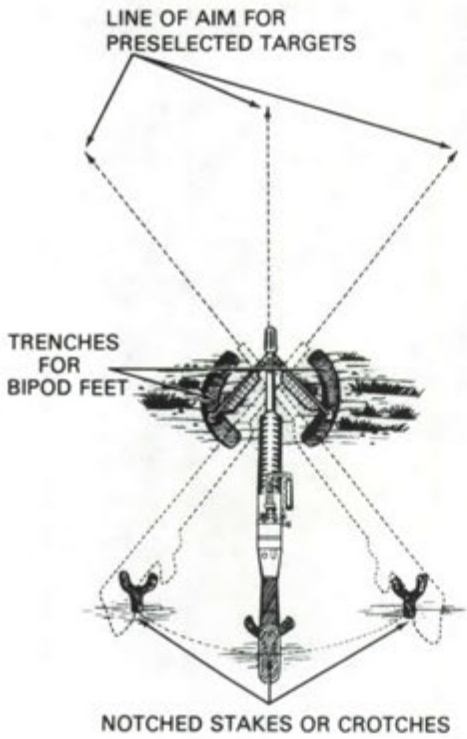


Figure 2.

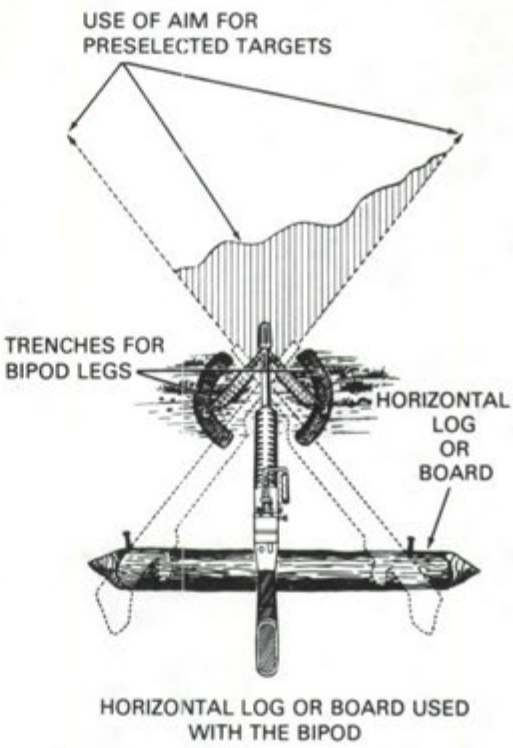


Figure 3.

3. When using the horizontal log or board technique (figure 3), use the following procedure:

a. Aim the weapon toward the desired sector of graze.

b. Place a well-seated log or board beneath the stock of the weapon in such a way that the stock can slide across it fully.

c. Dig shallow trenches or grooves for the bipod feet to allow rotation of the feet as the stock is moved along the horizontal log or board.

d. Adjust bipod legs for elevation which provides the best sector of graze.

e. Mark the sectors of graze by notching or placing stops on the horizontal log or board.

f. Bipod firing position and grip are used.

g. To insure that the machinegun is correctly laid on the target, fire a confirming burst if the tactical situation permits.

REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, C1, Oct 64 (chap 8, page 121-126, para 111b)
TEC Lesson 941-071-0082-F, Bipod Emplacement and Tripod Mounting

TASK NUMBER: 071-312-3006

FIELD ZERO AN M60 MACHINEGUN

CONDITIONS:

During daylight, on a live-fire range, given a bipod-positioned M60 machinegun, an E silhouette target located at a known range between 300 and 700 meters from the firing position, and a 36-round belt of ammunition.

STANDARDS:

Gunner will fire one 6- to 9-round burst, make adjustments, and hit the target with the confirming burst. If the gunner does not hit the target with the confirming burst, he repeats the same procedures treating each subsequent burst as if it were the initial burst until the 36-round belt has been expended.

PERFORMANCE MEASURES:

1. During field zeroing, select a target at a known range between 300 and 700 meters.

2. Place the selected range on the rear sight and aline the windage index (windage zero).

3. Fire a 6- to 9-round burst at the target and note where the burst hits.

4. Make necessary corrections. One click or one mil on the windage knob moves the line of aim 1 meter at 1000 meters. Adjust deflection by moving the rear sight the necessary number of clicks in the direction of the target.

5. Estimate how high or low you think the center of the beaten zone is hitting in relation to the target and make elevation changes accordingly. New gunners will have to rely on trial and error until they gain sufficient experience to make accurate estimates.

6. After making adjustments, fire a confirming burst. If adjustments were correct, you adjust the range plate so that the correct range is indexed.

7. If the target is not hit with the confirming burst, repeat the same procedures treating each subsequent burst as if it were the initial burst.

REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, C1, Oct 64 (chap 10, sec IV, pages 162-163)
TEC Lesson 941-071-0084-F, Firing and Zeroing, M60 Machinegun

TASK NUMBER: 071-312-3007

PREPARE A RANGE CARD FOR AN M60 MACHINEGUN

CONDITIONS:

During daylight, in a defensive fighting position, given a tripod-mounted M60 machinegun with components, a designated primary sector of fire (FPL optional) and secondary sector of fire (both with recognizable targets), paper, pencil, and lensatic compass.

STANDARDS:

Within 15 minutes, prepare a range card which includes a data section and a sketch section containing both sectors of fire with appropriate sketches and military symbols to include:

1. Basic symbol for the machinegun (when an FPL is not assigned).

2. Final protective line (if assigned).

3. Limits of the primary sector of fire.

4. Limits of the secondary sector of fire.

5. Friendly positions forward of the FEBA.

6. Eight-digit grid coordinates for the gun position, or a magnetic azimuth and distance from a recognizable terrain feature to the gun position.

7. Marginal data box in corner of sketch, to include:

   a. Gun number.

   b. Unit designation (no higher than company).

   c. Date.

   d. A magnetic north arrow properly oriented.

8. Likely avenues of approach and target areas which may be recognizable manmade objects or natural terrain features.

a. Targets will be numbered on the range sketch in order of priority with a data section prepared below the sketch to include direction, elevation, range, description, and remarks on targets, if applicable. When data is placed on the traversing and elevating (T&E) mechanism, gun will be aimed on appropriate target.

b. When assigned, the FPL is target No. 1. If a PDF is assigned, instead of an FPL, it is target No. 1.

PERFORMANCE MEASURES:

1. **Range Card.**

a. The range card:

(1) Permits you to place fires on designated targets during periods of limited visibility (night, fog, smoke, etc.).

(2) Facilitates a relief in place by providing the relieving gunner all the information he needs to respond immediately to enemy action.

(3) Provides information to the platoon leader and company commander for inclusion in their fire planning.

b. The preparation of a range card will usually be done while preparing your defensive position. All of the range card, except the data section, will be done before constructing the parapet and digging in, so that fire planning at squad, platoon, and company level can be completed as soon as possible. In addition, it will determine the exact location, shape, and position of your parapet and firing platform. The data section will be completed as soon as the firing platform is dug out and the tripod set in place. Your platoon leader will provide additional guidance for your priority of work based on the situation.

2. **Preparation of the Range Card.** The following guidance is based on a situation where the position is prepared and sectors of fire assigned. In situations where the position must also be prepared, the preparation of your range card will take longer since the position must be prepared at the same time. The priority of work will be assigned by your platoon leader.

a. Orient the card (could be a field expedient, such as a C-ration boxtop) so that (both) the primary (and if assigned, secondary) sector of fire can fit on it.

b. Draw a rough sketch of the terrain to the front of the position. Include prominent natural and manmade features which could be likely targets and center the position at the bottom of the sketch.

c. Fill in the marginal data to include:

(1) Gun number (or squad).

(2) Unit designation (platoon and company).

(3) Date.

(4) Magnetic north arrow.

d. Use the lensatic compass to determine magnetic north and sketch in the basic symbol (figure 1) on the card with its base starting at the top of the marginal data section.

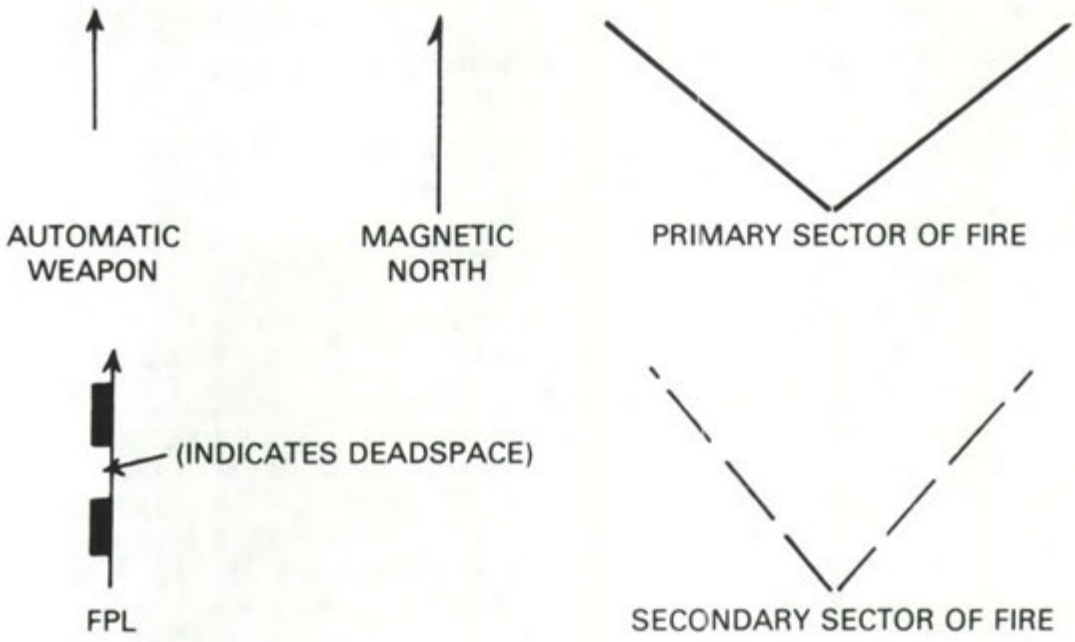


Figure 1. Symbols.

e. Specify the location of the gun position in relation to a prominent terrain feature. When no such feature exists, place the eight-digit map coordinates of the position near the point on your sketch representing the position (figure 2). If there is a prominent terrain feature within 1000 meters of the gun, use that feature (figure 3):

(1) Using the compass, determine the azimuth in mils **from** the terrain feature **to** the gun position. (Compute the back azimuth from the gun to the feature.)

(2) Determine the distance between the gun and the feature by pacing or from a map.

(3) Sketch in the terrain feature on the card in the lower left or right hand corner (whichever is closest to its actual direction on the ground) and identify it.

(4) Connect the sketch of the position and the terrain feature with a barbed line extending from the feature to the gun.

(5) Write in the distance in meters (above the line).

(6) Write in the azimuth in mils **from** the feature **to** the gun (below the line).

f. Sketch in primary sector of fire with a principal direction of fire (PDF) or a final protective line (FPL).

(1) Primary sector with PDF (figure 2).

(a) Sketch in the limits of the primary sector of fire as assigned. (Sector should not exceed 875 mils, the maximum traverse of the tripod-mounted M60.)

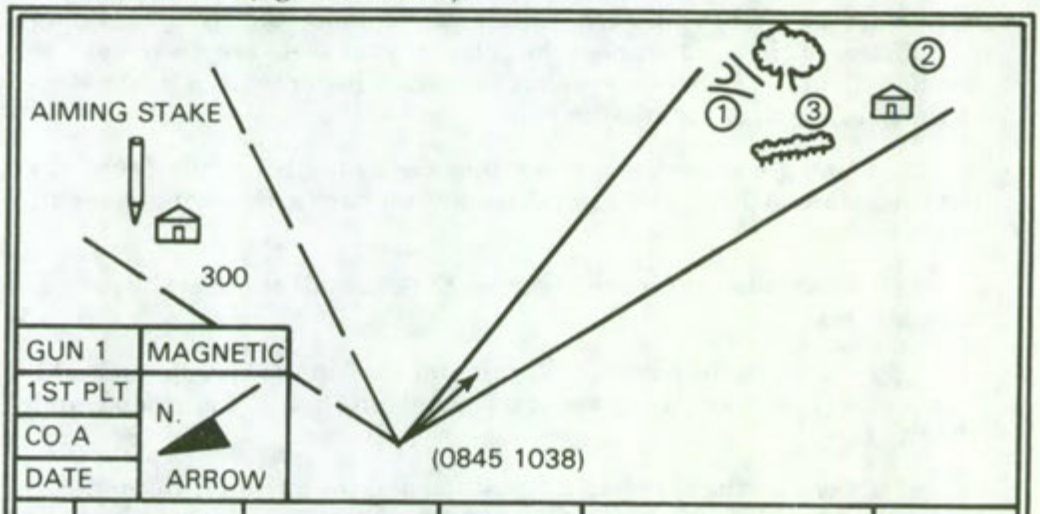
(b) Sketch in the symbol for an automatic weapon oriented on the most dangerous target within your sector (as designated by your platoon leader).

(2) Primary sector with an FPL (figure 3).

(a) Sketch in the limits of the primary sector of fire as assigned. (Sector should not exceed 875 mils.)

(b) Sketch in FPL on sector limit as assigned. Have someone walk the FPL (if enemy situation permits) and determine dead space (sections of FPL where individual drops below line of sight). Reflect dead space on sketch by a break in the symbol for an FPL and write in the range to the beginning and end of the dead space. Write in maximum range of graze (600 meters if no sharp rise or fall in terrain at a closer range). [The FPL should be assigned to you only if a good distance of graze can be obtained. When such a line of fire exists, the primary sector will be assigned, based on it, with the FPL being the sector limit closest to friendly troops. If an FPL cannot be identified, a PDF should be assigned.]

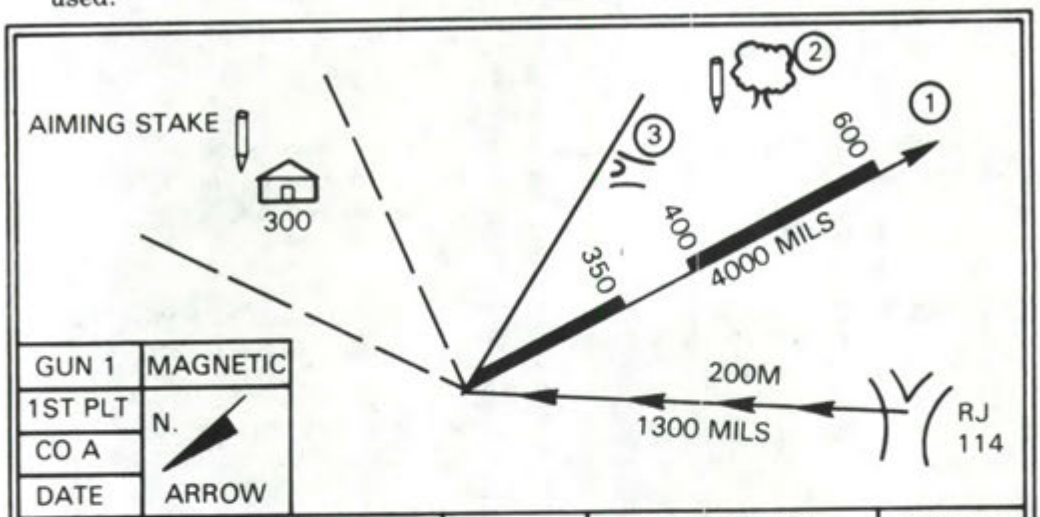
g. Label targets in primary sector in order of priority. FPL or PDF will be labeled as 1 (figures 2 and 3).



NO	DIRECTION	ELEVATION	RANGE	DESCRIPTION	REMARK
1	L375	0/35	400	PDF (WOODED RJ.)	W17/-3
2	R375	+50/15	500	BARN	W3
3	R75	-50/23	350	HEDGE LINE	W7/R3

Figure 2. Range card with principal direction of fire.

h. Sketch in secondary sector of fire (as assigned) and label targets within the secondary sector with the range in meters from the gun to each. [The secondary sector will be fired into, when necessary, by using the bipod. THE TRIPOD, ONCE EMPLACED FOR FIRE INTO THE PRIMARY SECTOR, SHOULD NOT BE MOVED.] Sketch in aiming stakes if they are used.



NO	DIRECTION	ELEVATION	RANGE	DESCRIPTION	REMARK
1		+50/3	600	FPL	-4
2	R 105	+50/40	500	LONE PINE	AIMING STAKE
3	L 235	0/28	350	TRAIL JUNCTION	W15/L7

Figure 3. Range card with final protective line.

3. **Preparation of the Data Section Using the T&E Mechanism** (figure 4).

a. On the reverse side of card (or below sketch if there is room), draw a data section block (figures 2 and 3) if not a preprinted card.

b. Preliminary steps:

(1) Center traversing handwheel.

(2) Lay gun for direction.

(a) FPL - lock traversing slide on extreme left or right of bar, depending on which side of primary sector FPL is on. Then aline barrel on FPL by moving tripod legs. (No direction entry needed in data section.)

(b) PDF - aline on primary sector by traversing slide to one side and then move tripod to aline barrel on sector limit. Aline on PDF by traversing slide until aimed at center of target.

(3) Fix tripod legs in place by digging in or sandbagging.

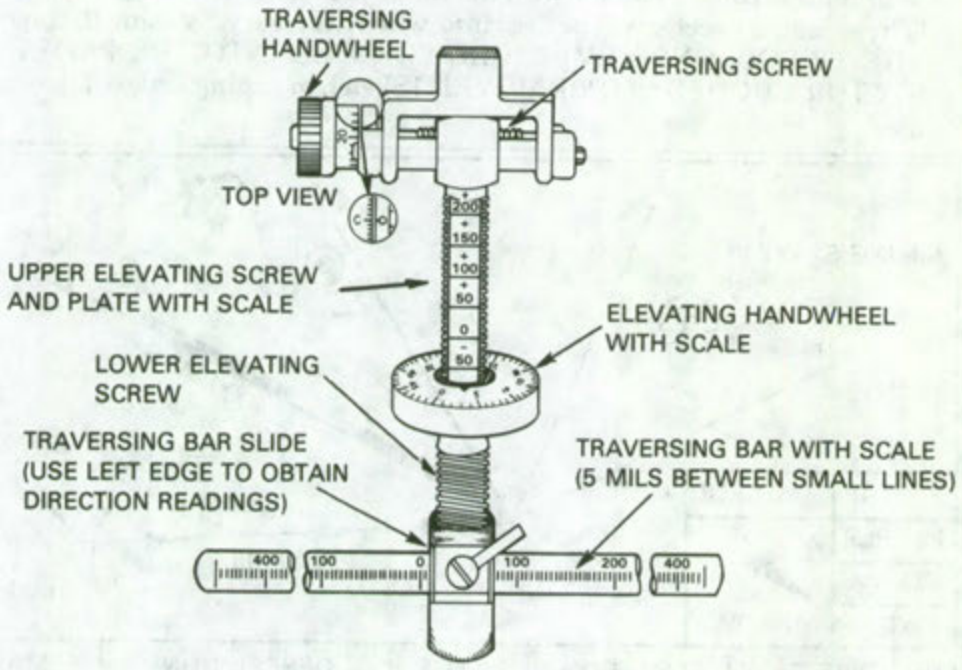


Figure 4. T&E mechanism.

c. Read direction to each target.

(1) Lay gun on center of target.

(2) Read the direction directly off the traversing bar at the left edge of the traversing bar slide (figure 4).

(3) Right or left reading is determined by direction of barrel (just the opposite of the slide).

(4) Enter reading under ELEVATION column of range card data section by separating the two numbers with a slash (/). Always enter reading from upper elevating bar (figure 4 reading is -50/3).

d. Read elevation for each target.

(1) Lay gun on base of target by rotating elevating handwheel (figure 4).

(2) Read the number (to include + or - sign except for "0") above the first visible line on the elevating scale (figure 4 reading is -50).

(3) Read the number off of the elevating handwheel which is in line with the indicator (figure 4 reading is 3).

(4) Enter reading under ELEVATION column of range card data section by separating the two numbers with a slash (/). Always enter reading from upper elevating bar first (figure 4 reading is -50/3).

e. Enter range to each target under appropriate column in data section.

f. Enter description of each target under appropriate column in data section.

g. Fill in REMARK column for each target as needed.

(1) Enter width and depth (in mils) of linear targets. (The -4 in figure 3 indicates that depressing the barrel 4 mils will bring strike of rounds down to ground level along FPL.)

(2) When entering the width of the target, be sure to give the width in mils and express it as two values. For instance, figure 2 shows target 3 has a width of 7 mils. The second value, R3, means that once the gun is laid on the target, traversing 3 mils to the right will lay the gun on the right edge of the target. Figure 3, target 3, shows the width of the target as 15 mils; traversing 7 mils to the left will lay the gun on the left edge of the target.

(3) Enter AIMING STAKE if one is used for the target.

REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, C1, Oct 64 (chap 8, sec IV, page 126-130)
TEC Lesson 941-071-0127F and 041-071-0128F, Target Engagement - Limited Visibility, M60 Machinegun

TASK NUMBER: 071-312-3009

ZERO AN M60 MACHINEGUN ON 10-METER RANGE

CONDITIONS:

During daylight, on a basic 10-meter range, given an M60 machinegun, assistant gunner, spare barrel bag complete, M122 tripod, caliber 7.62-mm ammunition and time allotted per type fire (FM 23-67, app II, table I and IV), and equipment as outlined in FM 23-67, chapter 10, for basic (10-meter) range.

STANDARDS:

Zero the M60 machinegun in accordance with the performance measures below.

PERFORMANCE MEASURES:

1. **Zeroing the M60 in the bipod mode (10-meter range) (FM 23-67, chap 10, pages 148-152).**

a. Position and Grip.

(1) Assume a prone position behind the gun and raise the rear sight (figure 1).

Figure 1. Prone position.

Figure 2. Prone position.

(2) Left-handed firing with the M60 machinegun is discouraged because the ejection pattern of some weapons is almost directly to the rear. In addition, a gunner firing the tripod-mounted gun makes all manipulations with the left hand.

b. Sight Alinement and Sight Picture.

(1) Sight alinement. To obtain correct sight alinement, center the front sight blade in the aperture of the rear sight slide with the top of the front sight blade even with the top of the sight slide (figure 3).

(2) Sight picture. To obtain correct sight picture, center the target over the front sight blade so that it appears to rest on top of the front sight blade and on top of the rear sight slide (figure 4).

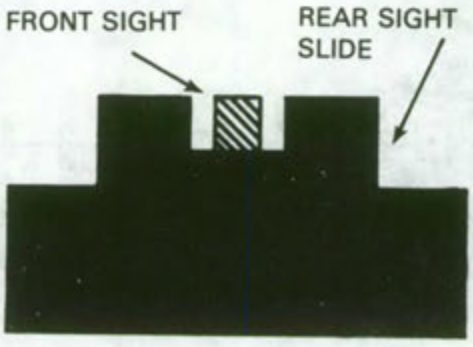


Figure 3.

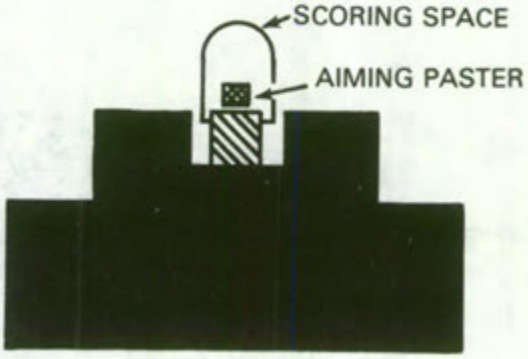


Figure 4.

c. Trigger Manipulation. When firing the M60 machinegun, the trigger is not squeezed as with other small arms. It is pulled straight to the rear and then released. This aids in controlling the number of rounds in each burst and prevents excessive wear to the sear and sear notch. To time yourself in firing a 6-round burst, pull the trigger straight to the rear and say, "Fire a burst of six," and then release the trigger.

d. Zeroing. This is adjusting the rear sight until the strike of the bullet coincides with the point of aim at a given range, and then adjusting the range plate to reflect that range. Zeroing the machinegun on the basic range is accomplished through the following step-by-step procedure.

(1) Step 1 – set sights. To establish a common starting point when zeroing on the basic range, a range setting of 500 meters should always be used. The gunner sets this range and alines the windage index by placing the zero windage on the rear sight.

(2) Step 2 – fire three rounds. Upon receiving the command to fire, the gunner fires three rounds (one round at a time) to establish a shot group. He takes the same sight alinement and sight picture each time he fires. No adjustments on the rear sight are made until he has fired three rounds. The shot group should be small enough to determine exactly where the center of the group is in relation to the aiming paster.

(3) Step 3 – correct for deflection. If the center of the shot group is to the left or right of the point of aim, the gunner must correct for deflection. To correct for deflection the gunner turns the windage knob, causing the rear sight to move in the direction of the desired change. Since the distance to the target is 1000 centimeters (10 meters), a 1-click or 1-mil adjustment moves the point of aim 1 centimeter. For example, if the gunner notes that the center of the shot group is 2 centimeters (two aiming pasters) to the right of the aiming point, he turns the windage knob two clicks, moving the rear sight in the direction of the aiming paster (to the left).

(4) Step 4 – correct for elevation. If the center of the shot group is above or below the black aiming paster, the gunner must correct for elevation. To correct for elevation, the gunner turns the elevation knob, causing the rear sight slide to move in the direction of the desired change.

A 1-click adjustment on the elevation knob equals a 1/4-mil change or four clicks equal a 1-mil change. Since the distance to the target is 1000 centimeters (10 meters), a 4-click (1-mil) adjustment moves the point of aim 1 centimeter.

(5) Step 5 – confirm. After making corrections for deflection and elevation, the gunner fires a confirming round. If he misses his point of aim, he treats this hit as the center of a three-round shot group, makes further adjustments as necessary, and fires another round. He continues this procedure until he hits the point of aim.

(6) Step 6 -- adjust the range plate and record deflection. The gunner loosens the range plate screw and moves the adjustable range plate up or down until the 500-meter graduation coincides with the top left edge of the rear sight slide. He then tightens the range plate screw and records the deflection for future reference.

e. Traversing and Searching the Gun (figure 5). Machinegun targets may have width and depth which require you to move the gun in order to distribute fire throughout the target area.

(1) Traversing. This is moving the muzzle of the weapon to the left or right to distribute fire laterally. With the bipod-mounted gun, this is accomplished by selecting successive aiming points in the target area. To make minor changes in direction, shift the shoulders slightly to the right or left. To make major changes in direction, move the elbows and realine your body to remain directly behind the gun.

(2) Searching. This is moving the muzzle of the weapon up or down to distribute fire in depth and is accomplished by selecting successive aiming points in the target area. To make changes in elevation, move your elbows closer together or farther apart.

Figure 5.

f. Obtaining an Accurate Initial Burst. To gain an accurate initial burst with the tripod-mounted gun, the fundamentals of position and grip, sight alinement and sight picture, trigger manipulation, and zeroing must be properly applied.

(1) Assume a prone position behind the gun (figure 6).

Figure 6.

(2) Grasp the pistol grip with right hand, index finger resting lightly on the trigger.

(3) With left hand, palm down, grasp the elevating handwheel and exert a firm downward pressure with both hands while aiming and firing the gun.

(4) The elbows are inside the tripod legs, but not touching the tripod.

(5) The shoulder is placed lightly against the stock of the gun. Do not apply any pressure, because this could push the gun out of alinement while firing.

Sight alinement, sight picture, trigger manipulation, and zeroing are the same as outlined for the bipod-mounted gun.

g. Traversing and Searching the Gun. Machinegun targets may have width and depth which require the gunner to move the gun by manipulating the handwheels in order to distribute fire throughout the target area.

(1) Changes. All manipulations are made with the left hand. Changes in direction are made first and then changes in elevation. The three manipulations are traverse, search, and traverse and search.

(2) Traversing. To make changes in direction:

(a) To move the muzzle of the gun to the right, put your left hand on the traversing handwheel, thumb up, and push your thumb away from yourself (PUSH-RIGHT).

(b) To move the muzzle of the gun to the left, pull your thumb toward yourself (PULL-LEFT).

(3) Searching. To make changes in elevation:

(a) To move the muzzle of the gun up (search up), grasp the elevating handwheel with your left hand, and push your thumb away from yourself (PUSH-ADD).

(b) To move the muzzle of the gun down (search down), pull your thumb toward yourself (PULL-DROP).

h. Observation and Adjustment of Fire. Gunners must be taught to observe and rapidly adjust their fire.

(1) Observation of fire is the same as outlined in the bipod mode.

(2) To adjust fire when firing the tripod-mounted gun, make adjustments by manipulating the traversing and elevation handwheels. A 1-click adjustment on either wheel equals a 1-mil change and will move the strike of the bullet 1 centimeter (the width or height of the black aiming paster) on the 10-meter range.

i. Use Observation and Adjustment of Fire.

(1) Observation of fire: Machinegun fire is observed by noting the strike of the bullet in the target area, by observing tracers in their flight or, in the case of the 10-meter range, by noting the holes made in the target.

(2) Adjustment of fire: When firing the bipod-mounted gun, fire is adjusted by changing the body position by using the traversing and searching method.

2. **Zeroing the M60 in the tripod mode (10-meter range) (FM 23-67, pages 155-156).** Training with the tripod-mounted gun is a continuation of training with the bipod-mounted gun. However, the techniques used in attaining the objectives differ in some instances.

a. Mounting the Gun.

(1) Place the mount on the ground with the pintle lock lever 10 meters from the target and the front leg pointing toward the center of the target.

(2) Place the gun on the mount.

(3) Center the traversing mechanism and expose 1½ inch of threads on the elevating screw above and below the elevating handwheel.

(4) Attach the traversing and elevating mechanism to the gun and clamp the left edge of the traversing slide on the zero graduation on the traversing bar.

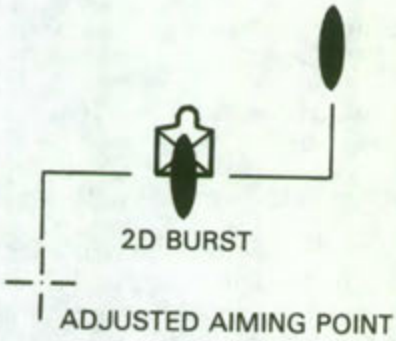
b. Emplacing the Gun. Aline the gun and the mount for direction by shifting the rear legs of the tripod until the gun is pointing to the approximate center of the target.

3. **Apply the adjusted-aiming-point method for rapid fire adjustment (FM 23-67, chap 10, page 163, para 162).**

a. This is a means of rapidly and accurately adjusting fires without going through the process of making sight adjustment.

b. If you miss the target with your initial burst, select a new aiming point on the ground the same distance from the target as the center of impact of the initial burst but in the opposite direction, and fire a second burst (figure 7).

Figure 7.



REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, C1, Oct 64
TEC Lesson 941-071-0084-F, Firing and Zeroing, M60 Machinegun

TASK NUMBER: 071-312-3008

QUALIFY WITH AN M60 MACHINEGUN

CONDITIONS:

During daylight on applicable M60 firing ranges, given an M60 machinegun with all components including spare barrel bag (complete), an assistant gunner, 612 rounds of 7.62-mm ammunition, a requirement to fire the M60 IAW FM 23-67(app II, tables I-V) for qualification, and equipment as outlined in FM 23-67, app II.

STANDARDS:

Fire the basic range and transition range and achieve a combined minimum qualification score of 115 points; a minimum of 65 points must be made on the basic (10 meter) range.

PERFORMANCE MEASURES:

Qualification with the M60 machinegun will be dependent upon proper application of basic marksmanship principles. For a detailed explanation of basic marksmanship techniques see the task: **Zero the M60 machinegun on the 10-meter range.**

REFERENCES:

FM 23-67, Machinegun 7.62-mm, M60, C1, Oct 64 (app II, tables I-V)

TASK NUMBER: 071-312-2310

MOUNT/DISMOUNT AN AN/PVS-2 ON AN M60 MACHINEGUN

CONDITIONS:

Given an AN/PVS-2 sight in shipping container, a weapons adapter assembly, and an M60 machinegun with saddle block mounted, during daylight or with an artificial light source.

(NOTE: Mounting block and bracket will not fit on an M60 with a barrel locking lever modified with a positive lock capability.)

STANDARDS:

1. **MOUNTING.** Within 10 minutes, mount the AN/PVS-2 to the M60 insuring that:

a. The mounting bracket does not interfere with normal operation of the M60.

b. The sight is installed on the adapter with the telescope mount assembly secured in the guide rail by the locking knobs.

2. **DISMOUNTING.** Remove the sight and mounting bracket and return them to the shipping container.

PERFORMANCE MEASURES:

1. **MOUNTING:** Mounting the AN/PVS-2 on the M60.

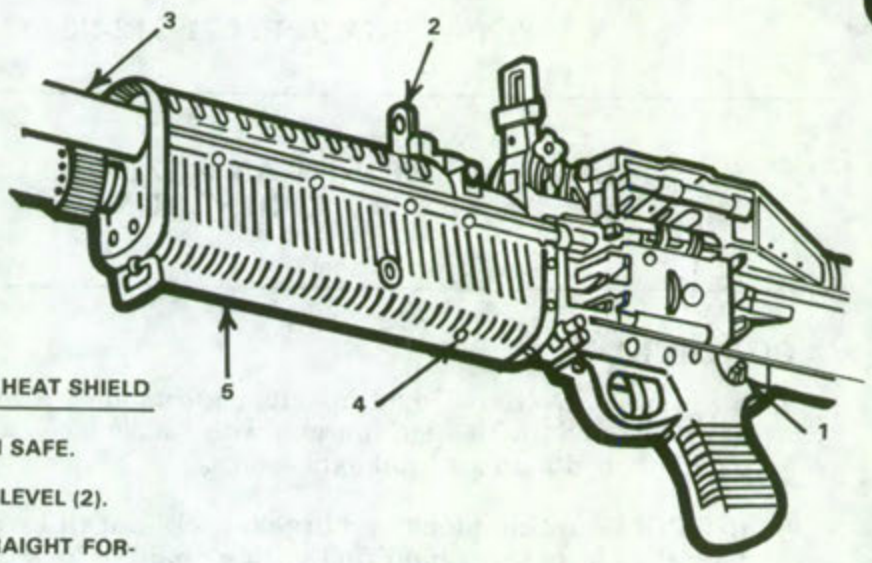
a. To remove the barrel and heat shield, see figure 1A.

b. To install the receiver-mount assembly, see figure 1B.

c. To mount AN/PVS-2 to weapons adapter assembly, see figures 1C and 1D.

(1) Rotate lock knobs of the telescope mount assembly forward until they come to stop on the pins on the assembly.

(2) Slide the telescope mount assembly onto the guide rail of the weapons adapter assembly from the rear until positioned against the pin stop of the guide rail.



(A) TO REMOVE BARREL AND HEAT SHIELD

STEP 1. PLACE SAFETY (1) ON SAFE.

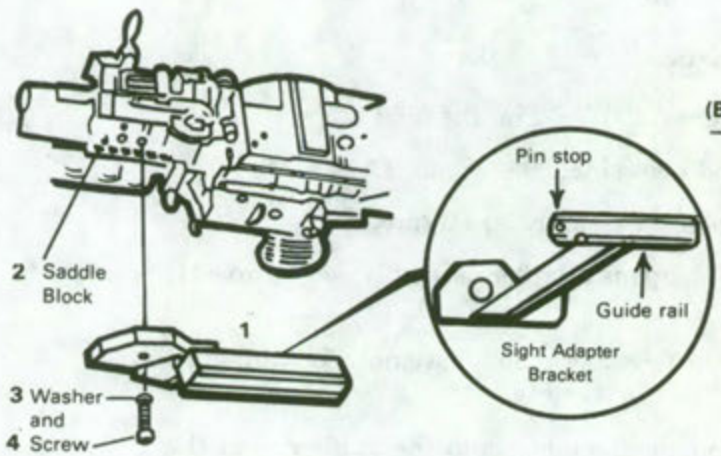
STEP 2. RAISE BARREL LOCK LEVEL (2).

STEP 3. PULL BARREL (3) STRAIGHT FORWARD TO REMOVE.

STEP 4. INSERT NOSE OF CARTRIDGE INTO HOLE (4) AND DEPRESS HEAT SHIELD LATCH.

STEP 5. WITHDRAW AND REMOVE HEAT SHIELD (5).

Figure 1A.



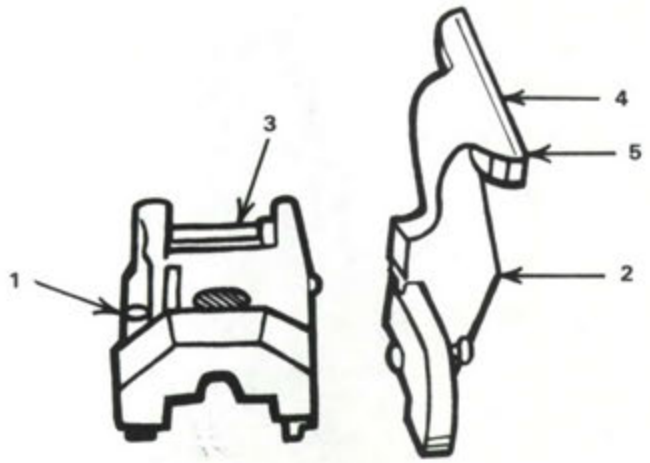
(B) TO INSTALL RECEIVER-MOUNT ASSEMBLY

STEP 1. PLACE RECEIVER-MOUNT ASSEMBLY (1) IN PLACE AGAINST SADDLE (2).

STEP 2. INSTALL AND TIGHTEN LOCK WASHER (3) AND SCREW (4) THROUGH RECEIVER-MOUNT ASSEMBLY INTO SADDLE BLOCK.

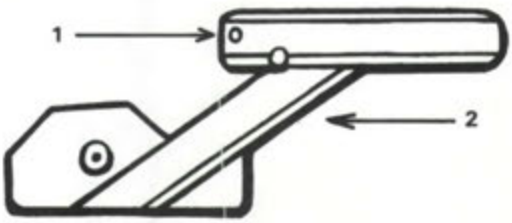
STEP 3. REPLACE HEAT SHIELD ON GUN BY REVERSING PROCEDURE GIVEN FOR REMOVAL.

Figure 1B.



(C) 1 SADDLE BLOCK
2 SIGHT ADAPTER BRACKET
3 SADDLE BLOCK SHAFT
4 GUIDE RAIL
5 PIN STOP

Figure 1C.



(D) 1 GUIDE RAIL
2 SIGHT ADAPTER BRACKET FOR M60 MACHINEGUN

Figure 1D. Weapons adapter assembly.

(3) Lock AN/PVS-2 to the weapons adapter assembly by rotating the two locking knobs of the telescope mount assembly in a rearward direction.

d. Replaced barrel and heat shield.

2. **DISMOUNTING.** Reverse steps a, b, c, and d, above.

REFERENCES:

TM 11-5855-203-13, Night Vision Sight Individual Weapons Mounted AN/PVS-2, C1 - 6, Apr 67 (chap 2, page 19, para 2-4)

TEC Lesson 953-071-0061-F, Operating AN/PVS-2

TASK NUMBER: 071-312-2311

ZERO AN AN/PVS-2 TO AN M60 MACHINEGUN

CONDITIONS:

Given an AN/PVS-2 mounted on a zeroed M60 machinegun in the tripod mode; a range firing position, during daylight or darkness, cleared for firing the M60 machinegun; and 30 rounds of 7.62-mm ammunition.

STANDARDS:

Within 15 minutes, the gunner or assistant gunner will accomplish either of the objectives below.

1. Using the basic (10-meter) zero, place the center of the shot group 8.8 cm right and 10.2 cm below the point of aim for a 10-meter zero equivalent to a 300-meter zero, or 8.8 cm right and 2.6 cm below the point of aim for a 500-meter equivalent.

2. Using the known distance (KD) target method, adjust strike of rounds to the designated impact point.

NOTE: Either objective can be accomplished at night using tracer ammunition with lens cap removed. During daylight firing, lens cap will not be removed.

PERFORMANCE MEASURES:

1. **The Basic (10-meter) Zero.** The 300-meter zero (figure 1) is used to engage targets out to 500 meters, and the 500-meter zero (figure 2) is used for targets beyond 500 meters. Sight through the scope and position the top vertical aiming reference dot of the sight reticle on the target. Fire three rounds (single shot) to establish a shot group. Check target to determine the center of the shot group in relation to where the round must strike the target for an accurate zero. Adjust the elevation and/or azimuth knob of the scope to bring the point of aim and the center of the shot group into proper alinement. Continue this procedure until zeroed.

NOTE: Due to the difficulty in firing the M60 single shot, it is recommended that, when establishing a shot group, each round be loaded and fired separately.

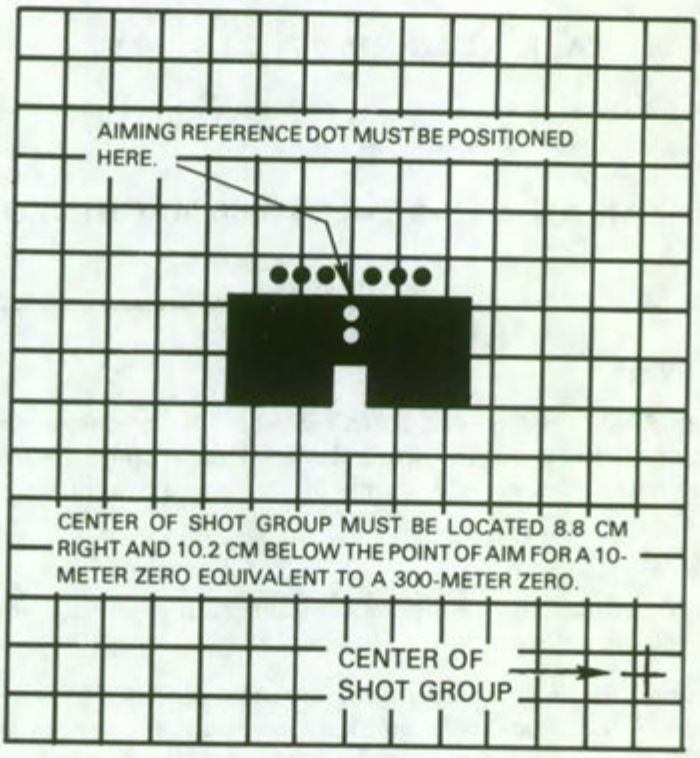


Figure 1. 300-meter zero.

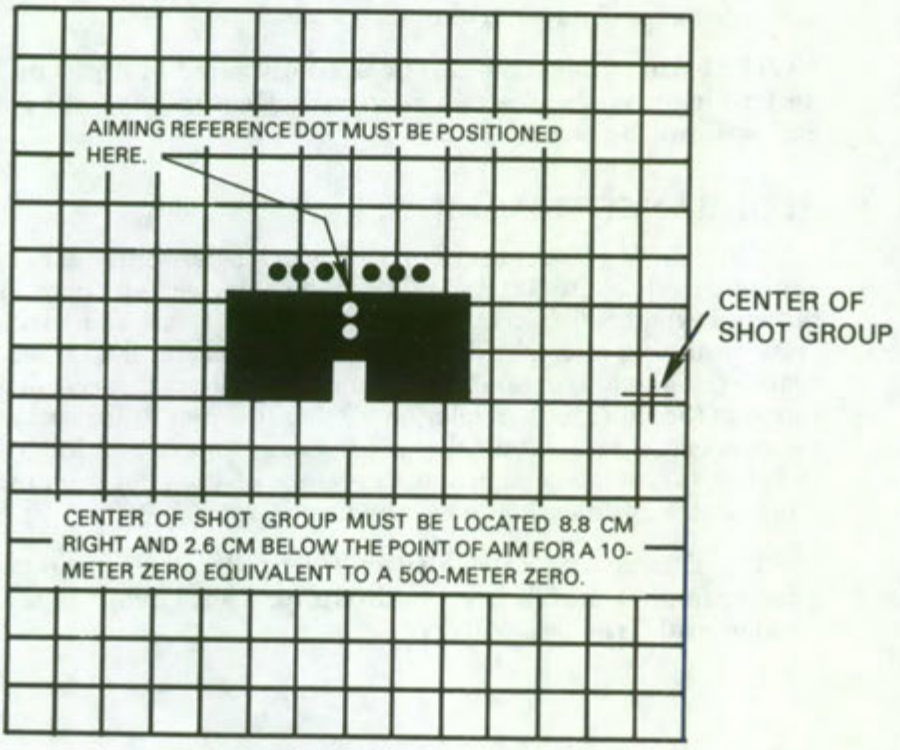


Figure 2. 500-meter zero.

2. **The Known-Distance Target Method of Zeroing.** Use a tripod. If one is not available, use a rest which gives maximum stability (figure 3).

a. Aline the M60 machinegun sight on a distant aiming point (300 meters or greater).

b. Without disturbing the lay of the weapon, sight through the scope and aline the aiming reference dot on the same point of aim by adjusting the elevation and azimuth knobs of the scope.

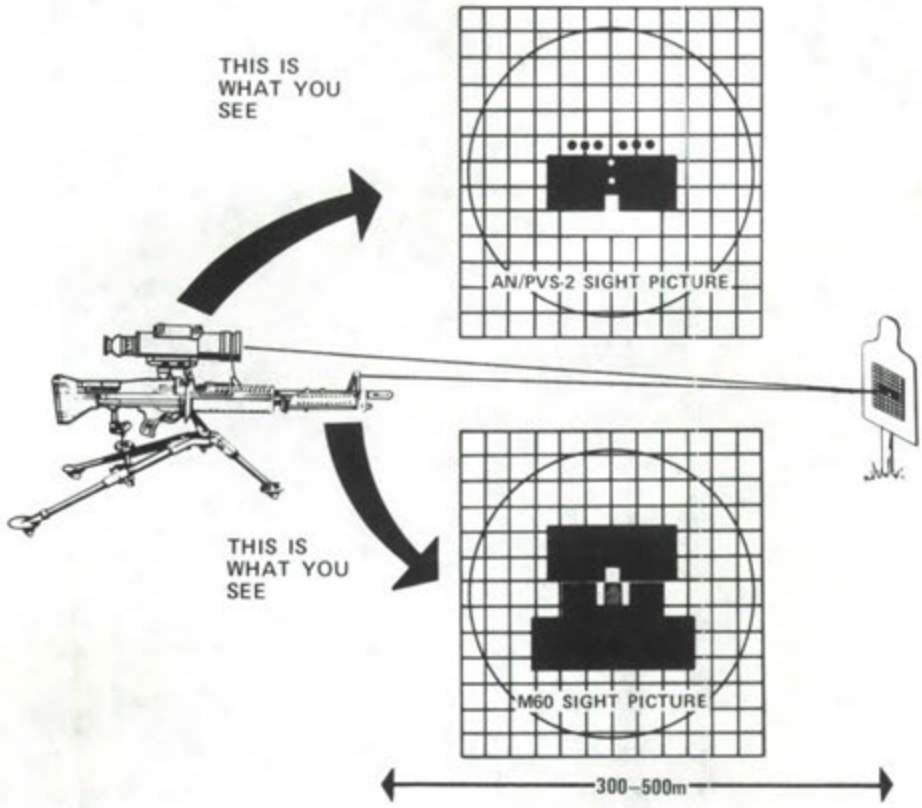


Figure 3.

3. **Field-Expedient Zero.** With an observer, a field-expedient zero is accomplished by picking out a distant target. Place the reference dot on point of aim and fire one round. The observer notes the strike of the round (with binoculars during daylight, and a starlight scope during darkness). He gives the elevation and deflection change necessary to bring the strike to the point of aim. He continues this procedure until the weapon is zeroed for that range. Because the operator is making a sight change based on one shot, it is extremely important that the shot be well-aimed and correctly fired. He should use his most stable firing position.

REFERENCES:

TC 23-11, Starlight Scope, Small Hand-Held or Individual Weapons Mounted, Model No. 6060, Nov 66 (chap 3, sec II, page 49-51)
TEC Lesson 953-071-0061-F, Operating the AN/PVS-2

TASK NUMBER: 071-313-3451

PERFORM OPERATOR MAINTENANCE ON A CALIBER .50 M2 HB MACHINEGUN AND AMMUNITION

CONDITIONS:

During daylight, given a caliber .50 M2 HB machinegun with all components, cleaning kit, rags, rifle bore cleaner and special preservative lubricating oil.

STANDARDS:

1. Within 50 minutes, perform general disassembly, inspect, clean, and lubricate the caliber .50 M2 HB machinegun and M3 tripod mount IAW the performance measures below.

2. Assemble the gun and conduct a function check IAW the performance measures below.

PERFORMANCE MEASURES:

Disassembly, cleaning, inspection, lubricating, and assembly should be conducted in the following manner:

1. **Disassembly** (figure 1).

a. Clearing the Gun. Before disassembly, clear the gun as follows:

(1) Unlock bolt latch release and raise the cover (if applicable).

(2) Pull the bolt to the rear and examine the chamber and T-slot to insure they hold no rounds.

NOTE: In darkness, the gunner must feel the chamber and T-slot.

b. Barrel Group. Turn the cover latch shaft lever and raise the cover group. Grasp the retracting slide handle with the left hand, palm down; push the recoiling parts to the rear until the outer lug on the barrel locking spring alines with the ⅜-inch hole in the right sideplate of the receiver. The barrel can be turned only when the locking lug is alined with the ⅜-inch hole. Be careful not to damage the threads or barrel locking notches. Unscrew the barrel and place it on the ground. Allow the bolt to go forward slowly. Take care to prevent the bolt group from slamming forward with the barrel removed.

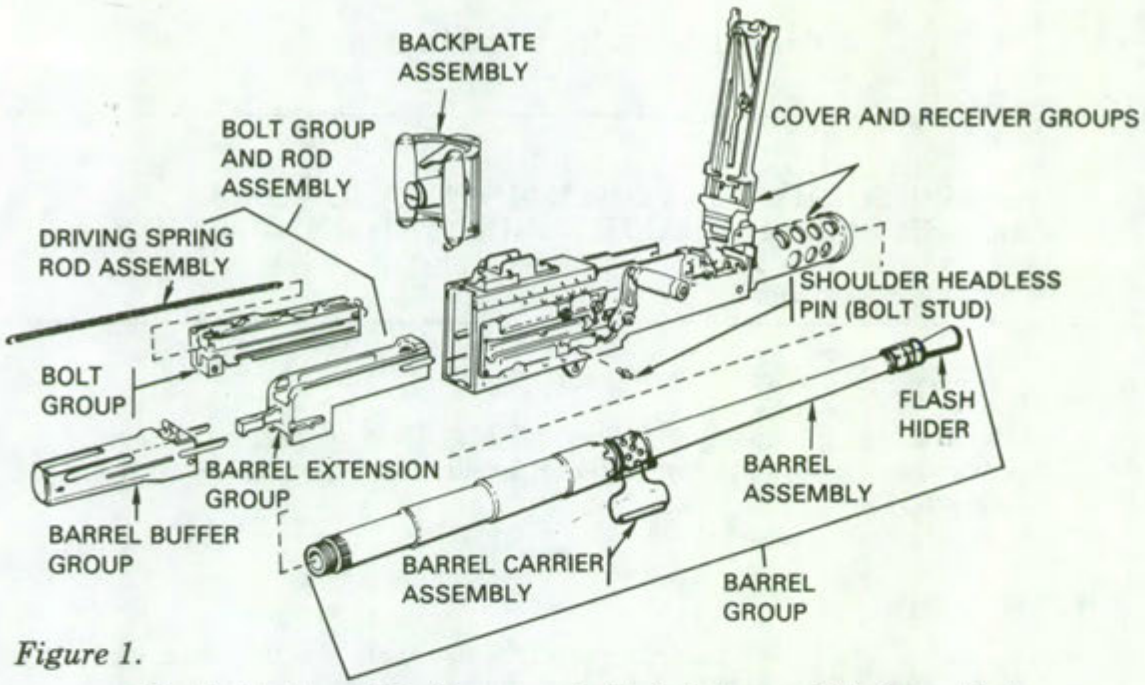


Figure 1.

c. Backplate Assembly. To remove the backplate assembly, insure that the bolt latch release is up. If it is not, push down on the bolt latch release and turn the buffer tube sleeve clockwise until the bolt latch releases. The bolt must be forward before the backplate assembly is removed. If the bolt is to the rear, push down on the bolt latch release and let the bolt ride forward by holding the retracting slide handle. The backplate latch and the latch lock are below the buffer tube. Pull out on the latch lock and up on the latch; remove the backplate assembly by lifting it straight up (figure 2).

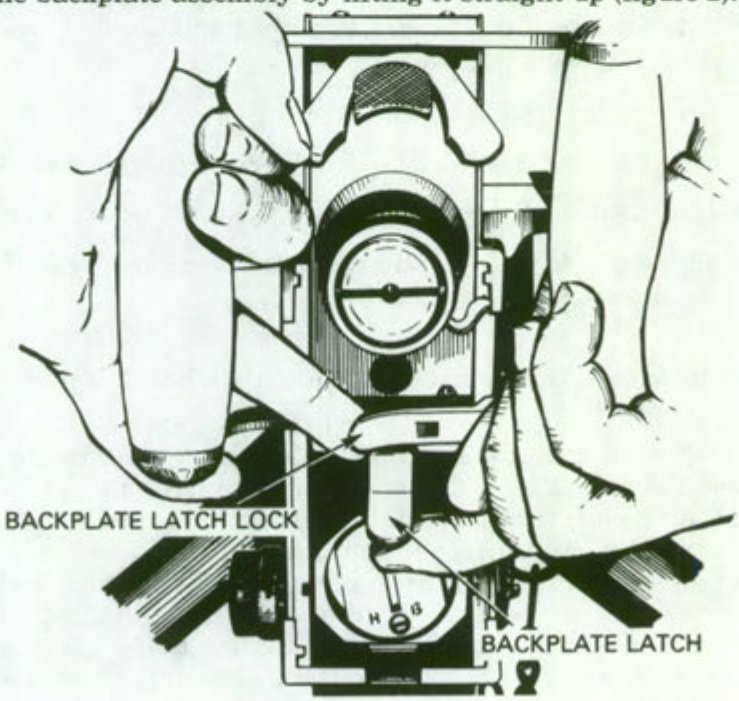


Figure 2.

d. Driving Spring Rod Assembly. The inner and outer driving springs and the driving spring rod are located next to the right sideplate, inside the receiver. Push in and to the left on the head of the driving spring rod. Pull the driving spring rod assembly to the rear and out of the receiver. A slight pressure is exerted on the driving spring when the bolt is forward; however, never attempt to cock the gun while the backplate is off and the driving spring assembly is in place. If the backplate is off and the driving spring assembly is compressed, the retaining pin on the driving spring rod can slip from its seat in the right sideplate and injure anyone behind the gun.

e. Shoulder Headless Pin (Bolt-Stud). Grasp the retracting slide handle and give it a quick jerk, halfway to the rear, to free the bolt from the barrel extension and move the bolt halfway to the rear. Aline the collar of the bolt stud with the clearance hole in the bolt slot in the right sideplate and remove the bolt stud to the right. If the bolt is accidentally moved all the way to the rear, the bolt latch will engage in the bolt latch notches in the top of the bolt. If this occurs, raise the bolt latch and push the bolt forward to aline the bolt stud with the clearance hole (figure 3).

f. Bolt Group. After freeing the bolt, slide it from the rear of the receiver. Place the bolt down on its side (with the extractor arm up).

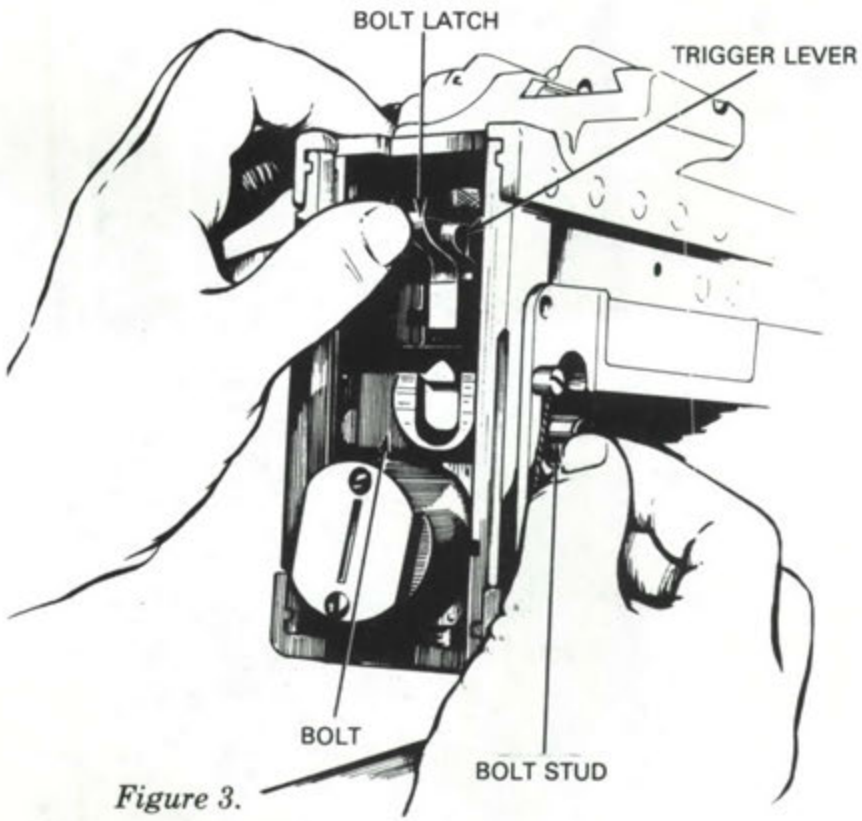
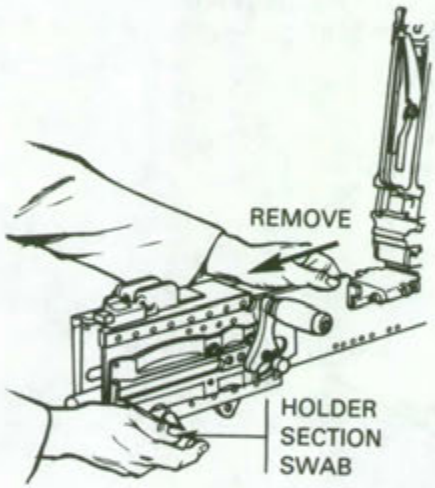


Figure 3.

g. Barrel Extension Group and Barrel Extension Group (figure 4). To remove the barrel buffer group and barrel extension group, insert a pointed instrument through the hole in the lower left corner of the right sideplate. Push in on the barrel buffer body spring lock. At the same time, place one hand inside the receiver and push the barrel extension group and buffer group to the rear. Remove the barrel group to the rear. Remove the barrel buffer group and barrel extension group from the receiver. Separate the two groups by pushing forward on the accelerator tips.

h. Barrel Buffer Assembly (figure 5). Pull the barrel buffer assembly from the rear of the buffer body group. The buffer assembly will not be disassembled. This completes general disassembly for limited cleaning and replacement of groups.



REMOVE BARREL BUFFER AND BARREL EXTENSION GROUPS.

Figure 4.

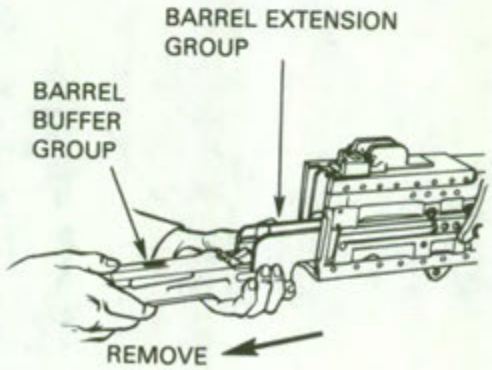


Figure 5.

2. **Maintenance and Inspection.** Care, cleaning, and maintenance determine whether or not the gun will function properly when needed. The bore and chamber must be properly maintained to preserve accuracy. Because of the close fit of working surfaces and the high speed at which the gun operates, the receiver and moving parts must be kept clean, correctly lubricated, and free from burrs, rust, dirt, and grease to insure proper, efficient functioning.

a. Mount Maintenance. The care, cleaning, lubrication, and adjustment of the mount used with the gun are no less important. The functioning of the gun and mount together determine overall effectiveness. All accessories and equipment used with the gun and mount, including ammunition, must be properly maintained.

b. Maintenance System. To insure proper care of the machinegun, it is necessary to have a system of maintenance or a standing operating procedure (SOP) for the frequency of cleaning. Each gun should be cleaned as soon after firing as possible and each time it is exposed to field conditions. Under combat conditions, the gun should be cleaned and oiled daily. Under extreme climatic and combat conditions, it may be necessary to clean and lubricate more frequently. Under ideal conditions, where the gun is not used and is stored in a clean, dry place, it may only be necessary to inspect, clean, and lubricate every 5 days. The gun should be disassembled, cleaned, and oiled in a clean, dry location, where it is least exposed to moisture, dirt, etc. Maintenance and preparation for storage over a longer period of time is covered in ordnance regulations (Ord 3SNL A-1). If possible, keep the gun covered with a gun cover, canvas, tarpaulin, or poncho when not in use.

3. **Cleaning Materials.**

a. Rifle bore cleaner is used to clean the bore of the machinegun barrel after firing. Immediately after using bore cleaner, dry the bore and any parts of the gun exposed to the bore cleaner; then apply a thin coat of special preservative lubricating oil.

b. When bore cleaner is not available, hot or cold water can be used; however, warm, or hot, soapy water is recommended. After using soap and water, dry the barrel and apply a thin coat of special preservative lubricating oil.

4. **Lubricating.**

a. Special preservative lubricating oil (PL) is a thin oil used for lubricating at normal and low temperatures and for providing temporary protection against rust. The entire gun can be lubricated with this oil.

b. Lubricating oil (LSA) should be used to lubricate all friction-producing parts of the gun as well as exterior parts exposed to the elements. LSA will not burn off during firing or wash off during rain.

c. In cold climates (consistently below 0°F), lubricate the gun with lubricating oil, arctic weather (LAW) and keep it covered as much as possible. For further information, see TM 9-207 and FM 31-70.

d. In hot, humid climates, inspect the gun frequently for signs of rust. Keep the gun free of moisture and lightly oiled with lubricating oil (LSA).

5. **Care and Cleaning Before, During, and After Firing.**

a. Before firing (when the situation permits), take the following steps to insure efficient functioning of the machinegun:

(1) Disassemble the gun into its major groups or assemblies.

(2) Clean the bore and chamber, but do not oil them.

(3) Clean all metals parts thoroughly and apply a light coat of oil to all metal parts which do not come in contact with the ammunition.

b. To insure complete removal of powder residue and primer fouling from the bore of the machinegun barrel, the bore should be cleaned once each day, for at least three consecutive days after firing. The bore sweats out this fouling or residue, and cleaning must be repeated until there is no further evidence of sweating.

6. **Care and Cleaning Under Unusual Climatic Conditions.** Extreme cold, hot, dry, and tropical climates affect the gun and its functioning. Care should be taken under these climatic conditions to insure that the gun is cleaned daily with the prescribed lubricants and protected from the elements by some sort of cover if possible. Further information on care and cleaning of the gun under unusual climatic conditions can be found in TM 9-1005-213-10.

7. **Assembly.** To asemble the machinegun, replace the groups and assemblies in reverse order of disassembly.

8. **Ammunition.** Ammunition should be clean and dry. One belt of ammunition should remain attached to the weapon, and all other ammunition remain in the can until needed.

REFERENCES:

FM 23-65, Browning Machinegun, Caliber .50 HB, M2, May 72 (chap 2, page 4)
FM 31-70, Basic Cold Weather Manual, C1, Apr 68 (chap 6, page 123)
TM 9-1005-213-10, Operator's Manual: Machinegun, Caliber .50 Browning, M2, C2, Jul 68 (chap 3, pages 48 and 58)
TEC Lesson 941-071-0116-F, Caliber .50 Machinegun, Mechanical Training

TASK NUMBER: 071-313-3452

TARGET/ZERO A CALIBER .50 MACHINEGUN

CONDITIONS:

During daylight, on a live fire range, given an M3 tripod-mounted caliber .50 HB, M2, machinegun, a target between 400 and 1,000 meters from the firing position, and a 15-round belt of tracer ammunition.

STANDARDS:

Firing single rounds, using the 15 rounds provided, adjust the windage and elevation until a round hits the target.

PERFORMANCE MEASURES:

1. During targeting/zeroing, select a target 400-1,000 meters from the gun position.

2. Place the selected range on the rear sight and aline the windage index (windage zero).

3. Place the gun on single shot.

4. Lay gun on target using the traversing and elevating (T&E) mechanism.

5. Fire a single round at the target and note where the round hits.

6. Making necessary corrections while looking through the rear sight, move the rear sight (windage and elevation) so that the front sight blade is alined with the point of impact of the round.

7. Re-lay on the target using the T&E mechanism.

8. Fire a confirming round. If the adjustments were correct, the round will hit the target.

9. If the confirming round does not hit the target, repeat the same procedures until targeting is completed or until the 15-round belt has been expended.

REFERENCES:

FM 23-65, Browning Machinegun, Caliber .50 HB, M2, May 72 (chap 9, para 134, page 163)
TEC Lesson 941-071-0118-F, Caliber .50 Machinegun Field Zeroing

TASK NUMBER: 071-313-3453

LOAD, REDUCE A STOPPAGE, UNLOAD, AND CLEAR A CALIBER .50 MACHINEGUN

CONDITIONS:

Given an assembled and cleared caliber .50 machinegun with headspace and time correctly set, a belt of linked caliber .50 ammunition, and a requirement to expend all rounds in the belt. (A dummy round may be inserted in the belt for training purposes.)

STANDARDS:

1. Situation 1: Load and fire the gun within 10 seconds.

2. Situation 2: When a stoppage occurs, it must be eliminated by using immediate action and the next round fired within 10 seconds (but only if round is ejected). Then fire all remaining rounds.

3. Situation 3: Unload and clear gun within 10 seconds.

PERFORMANCE MEASURES:

1. **Loading.**

a. Insure bolt is forward and cover closed.

b. Insert double-loop end of belt in feedway until the first round is engaged by belt-holding pawl.

c. Jerk retracting slide handle to the rear and release it. (If bolt latch release is up, return retracting slide handle to forward postion and then release bolt.) The gun is now "half-loaded".

d. To complete loading, jerk retracting slide handle to the rear a second time and release it. When bolt goes forward for the second time, the gun is loaded.

2. **Firing (single shot and automatic).**

a. Single shot - keep bolt latch release in the up position and release it manually for each round, then push trigger.

b. Automatic - lock bolt latch release down with bolt latch release lock.

CAUTION:

Never close cover with bolt to the rear.

Never allow bolt to go forward freely with the barrel out of the gun.

Ease it forward with retracting slide handle.

3. **Unloading and clearing.**

a. Cold Gun.

(1) Unlock bolt latch release (if applicable) and raise cover.

(2) Lift the extractor from the ammunition belt.

(3) Lift ammunition belt from feedway.

(4) Pull bolt to rear.

(5) Insure T-slot and chamber hold no rounds.

b. Hot Gun.

(1) Place gun in the single shot mode.

(2) Fire round in chamber.

(3) Open cover; remove ammunition belt.

(4) Press down on bolt latch release allowing bolt to go forward and chamber round in T-slot.

(5) Close cover and either fire or eject round in chamber.

4. **Immediate action.** Immediate action is the action taken to reduce a stoppage without investigating the cause. This action must be accomplished within 10 seconds when the barrel is hot enough to cause a cookoff. Two hundred rounds fired in a 2-minute period may heat the barrel sufficiently to cause a cookoff.

a. If a stoppage occurs, immediately pull the retracting slide handle to the rear and release it; observe if the round is ejected.

b. If a round is ejected, press the trigger and attempt to fire. If the gun does not fire and the barrel is hot enough to cause a cookoff, wait 5 minutes with the bolt in the forward position to preclude damage or injury in the event of a cookoff.

c. If a round is not ejected, or after the 5-minute waiting period, clear the gun and perform remedial action -- inspect the weapon and the ammunition to determine the cause of the stoppage.

d. After performing remedial action, reload, re-lay on the target, and attempt to fire.

REFERENCES:

FM 23-65, Browning Machinegun, Caliber .50, HB, M2, May 72 (page 10, para 36)
TM 9-1005-213-10, Operator's Manual: Machinegun, Caliber .50, Browning, M2, Jul 68 (page 42, para 2-8)
TEC Lesson 941-071-0116-F, The Caliber .50 machinegun: Mechanical Training
TEC Lesson 941-071-0119-F, Caliber .50 Machinegun, Firing

TASK NUMBER: 071-313-3454

ENGAGE TARGETS WITH A CALIBER .50 MACHINEGUN

CONDITIONS:

During daylight, on a live-fire range, given a cupola-mounted caliber .50 machinegun, one belt of 200 rounds of caliber .50 (4 x 1) ammunition, three stationary targets (one linear, one linear with depth, and one deep target) and/or a moving target, and a requirement to engage all targets (approximately 50 rounds per target).

STANDARDS:

Engage all targets IAW the performance measures below firing 8- to 10-round bursts.

PERFORMANCE MEASURES:

1. **Sighting and Aiming.** When firing from the cupola mount, do not use the sights. Look over the top of the weapon and adjust fire to the target by the strike of the bullets on the ground, or by the tracer path.

a. Linear Targets. The gunner must engage the entire width of the target. He lays his gun on the center of mass, or portion of the target which presents the greatest threat. The gunner traverses his fire to either flank, then covers the remainder of the target (figure 1).

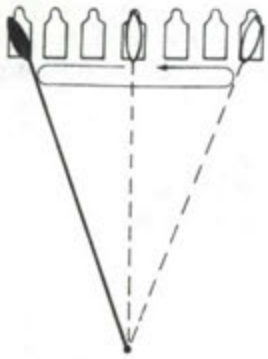


Figure 1.

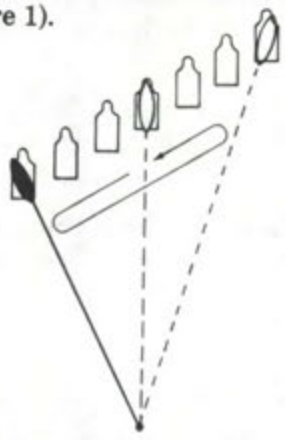


Figure 2.

b. Linear Target with Depth. The gunner must engage the entire width and depth of the target. He lays his gun on the center of mass, or portion of the target which presents the greatest threat. The gunner traverses and searches to the flank closest to his position, then covers the entire target (figure 2).

c. Deep Targets. The gunner must engage the entire target depth. The gunner lays on the center of mass, or portion of the target which presents the greatest threat. The gunner searches to the portion of the target nearest his position, then the entire target (figure 3).

d. Moving Targets. The gunner must apply correct lead on a moving target. He places his point of aim far enough in front of the target so that his fire and the target meet. (This distance is measured in target lengths. A vehicle at a range of 55 meters moving at 15 mph is given a lead of 1 target length (figure 4).)

Figure 3.

Figure 4.

2. Observation and Adjustment of Fire.

a. Observation. The gunner observes either the dust raised by the strike of the round, or the tracers, and makes adjustment to bring his fire onto the target.

b. Adjustment. When the gunner observes the strike of the rounds, or tracers going high over the target, he immediately ceases fire and starts over again.

3. Cupola (Free Gun) Firing. The gunner grasps both spade grips firmly, locks both elbows to his sides, and presses his chest against the spade grips to steady the weapon. He keeps this position to fire each burst, using no sights.

REFERENCES:

FM 23-65, Browning Machinegun Caliber .50 HB, M2, May 72 (page 134)
TEC Lesson 941-071-0115-F, The Caliber .50 Machinegun: Mounting
TEC Lesson 941-071-0119-F, The Caliber .50 Machinegun: Firing
TEC Lesson 941-071-0125-F, Machinegun Target Engagement, Introduction

TASK NUMBER: 071-313-3455

SET HEADSPACE AND TIMING ON A CALIBER .50 MACHINEGUN

CONDITIONS:

Given an assembled caliber .50 machinegun (track or tripod mounted) with incorrect headspace and timing, and a headspace and timing gage.

STANDARDS:

Within 10 minutes, the following conditions must be obtained once the gun is cocked and the bolt is forward:

1. **Headspace** - With the retracting slide handle pulled back 1/16-inch (so that the barrel extension is not resting against the trunnion block), the GO end of the headspace gage will enter the T-slot and the NO GO end will not (figure 1).

2. **Timing** - With the NO FIRE timing gage inserted between the barrel extension and the trunnion block (with the beveled edge of the gage on the barrel notches), the firing pin will not release when the trigger is depressed. When the NO FIRE timing gage is replaced by the FIRE gage, the firing pin will release when the trigger is depressed (figure 2).

PERFORMANCE MEASURES:

1. **Headspace Adjustment with the Gage** (figure 1).

a. Raise the cover. Retract the recoiling parts and screw the barrel all the way into the barrel extension, then loosen the barrel a measure of two notches or clicks.

b. Pull the retracting slide handle to its rearmost position. Hold the handle to the rear and press the bolt latch release, allowing the bolt to go forward slowly to prevent damage of parts.

NOTE: Be careful not to depress the trigger, since this will cause the firing pin to be released.
The firing pin should never be released with the gage in the T-slot as this could damage the firing pin and gage.

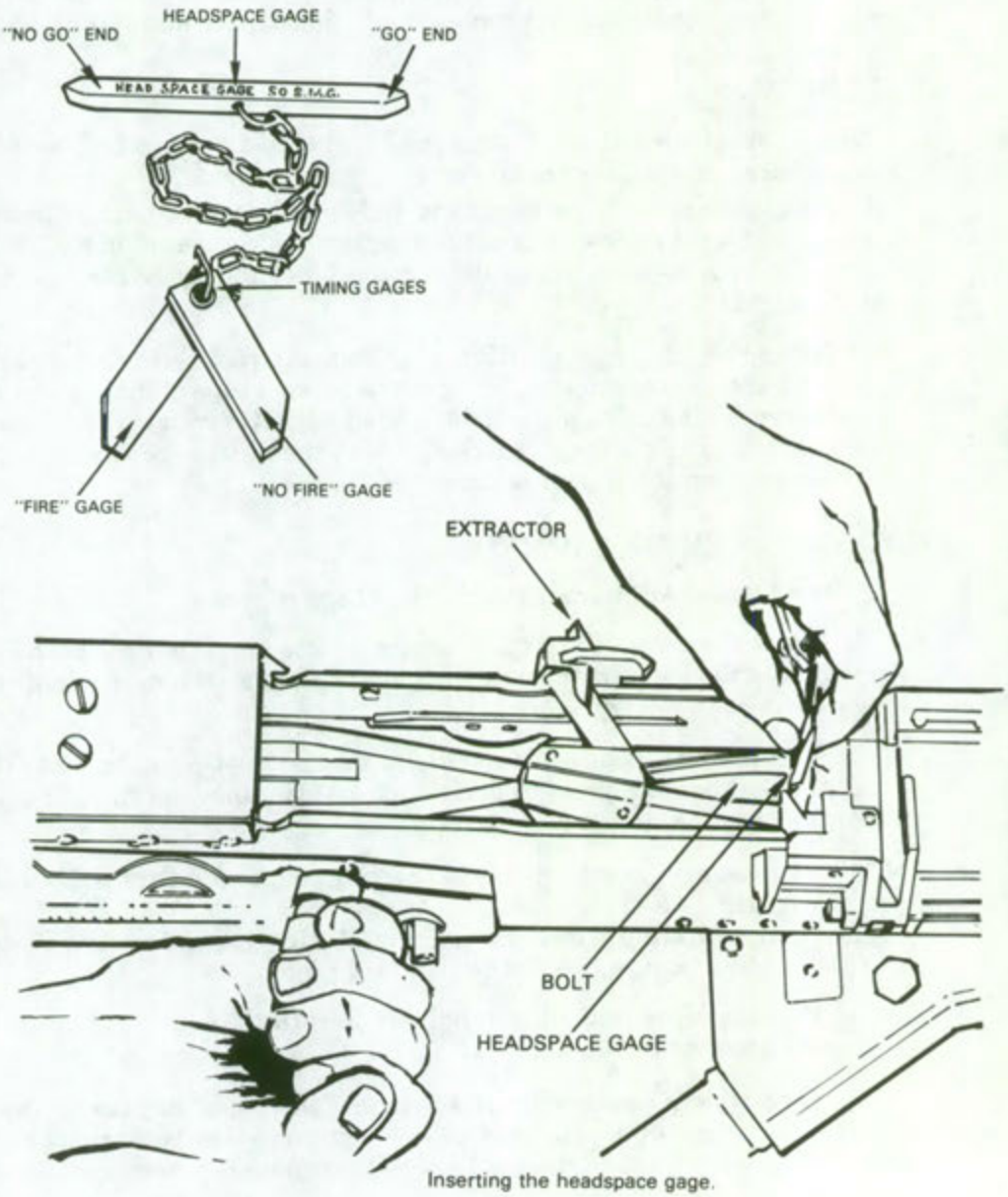
c. Pull the retracting slide handle back until the barrel extension is 1/16-inch from the trunnion block.

d. Insert the GO end and the NO GO end of the headspace gage in the T-slot. If the GO end of the gage enters freely down to the center ring on the gage and the NO GO end does not enter, headspace is correct.

e. If the GO end of the gage does not enter freely, the barrel must be unscrewed one notch (or click) at a time (check with the gage after each notch), until the GO end of the gage enters freely. To complete the adjustment, try to insert the NO GO end of the gage. If it does not enter, headspace is correct.

f. If the NO GO end of the gage enters the T-slot, headspace is too loose. The barrel must be screwed into the barrel extension (one click at a time), checking with the gage after each click, until the GO end enters and the NO GO end does not.

Figure 1.



Inserting the headspace gage.

2. **To Set the Timing**

a. After headspace has been set, insure the gun is cocked and all moving parts are fully forward. Then pull back on the retracting slide handle with the right hand palm up, making a large enough separation between the trunnion block and the barrel extension to insert the "FIRE" gage. Place the beveled edge of the gage against the barrel notches, then allow the bolt to go forward by releasing the retracting slide handle.

b. The next step is to remove the backplate. To remove the backplate you must pull out on the backplate latch lock and up on the backplate latch and spade grips.

c. Inside the back of the receiver you will see the trigger lever and timing adjustment nut. Screw the timing adjustment nut down, to the left, until it rests lightly on the trigger lever. Apply strong pressure upward on the trigger lever with your thumb; the gun should not fire.

d. To set timing, turn the timing adjustment nut up, or to the right, one click at a time. After each click apply strong pressure upward on the trigger lever, attempting to release the firing pin.

e. When you hear the gun fire, turn the timing adjustment nut up two additional clicks. The reason for the additional clicks is, there are six clicks of timing between early and late timing. The gun has already fired on the first click, two more will give you a total of three clicks and approximate center of the proper timing adjustment.

f. Replace the backplate, remove the "FIRE" gage and recock the gun. Then push the bolt latch release and ease the bolt forward.

3. **To Check the Timing.**

a. Move to the side of the gun and push back on the retracting slide handle and insert the "NO FIRE" gage in the same place the "FIRE" gage was, between the barrel extension and the trunnion block. The beveled edge of the gage should be against the barrel notches.

b. Depress the trigger; the gun should not fire. If the firing pin is released, the timing is too early. If early timing exists, the gun will fire two rounds and stop firing because the extractor does not come far enough forward to extract another round.

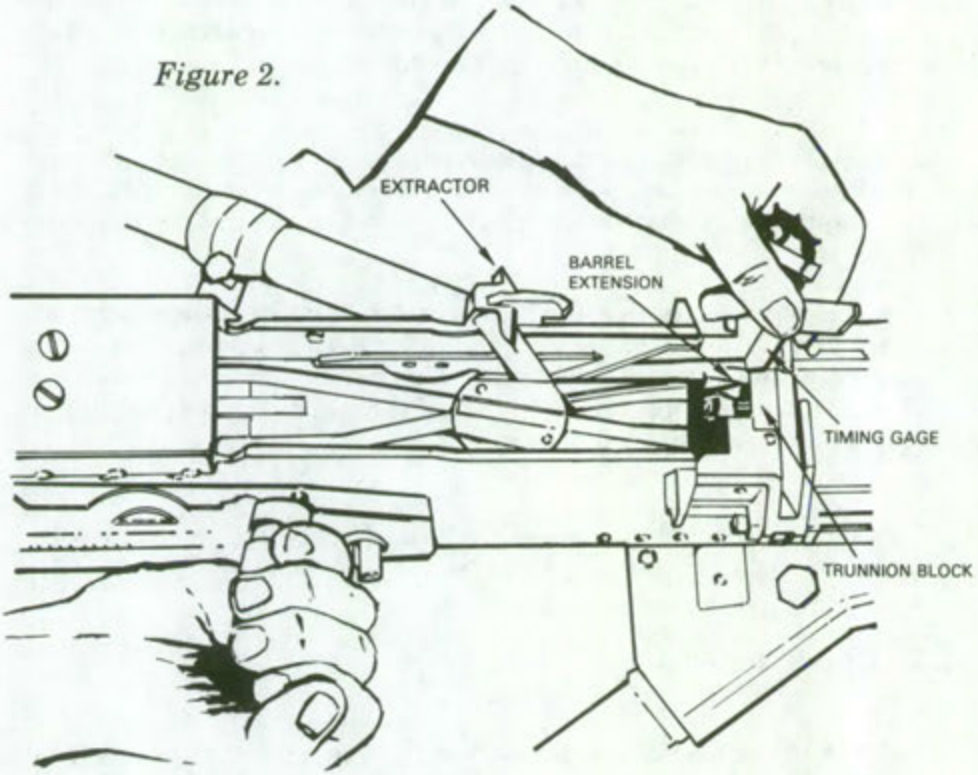
c. To correct early timing, remove the backplate and turn the timing adjustment nut all the way down until it rests lightly on the trigger level and begin again. This time insure that you press up firmly on the trigger lever each click. If the firing pin does not release when the "NO FIRE" gage is inserted, remove it and reinsert the "FIRE" gage. If the firing pin is released when the trigger is depressed, proper timing has been set.

4. **There is a field expedient method for setting headspace and timing, but this field expedient method will not be used in training.**

a. To set headspace using the field expedient method, screw the barrel in all the way and back off two clicks or notches. Fire the gun. If it fires sluggishly, unscrew the barrel **one** more notch, and only **one notch,** and fire.

b. To set timing, one dime or one dog tag can be used as a "FIRE" gage. For a "NO FIRE" gage, one nickle and one dime or four dog tags may be used.

Figure 2.



REFERENCES:

FM 23-65, Browning Machinegun Caliber .50 HB, M2, May 72 (chap 3, sec I, page 77)
TM 9-1005-213-10, Operator's Manual: Machinegun, Caliber .50 Browning, M2, Jul 68 (page 18, para 2-4)
TEC Lesson 941-071-0117-F, Caliber .50 Machinegun, Headspace and Timing

TASK NUMBER: 071-313-2314

MOUNT/DISMOUNT AN/TVS-2 SIGHT ON CALIBER .50 MACHINEGUN

CONDITIONS:

Given an AN/TVS-2 sight in shipping container, a BA-1100/U battery, weapons adapter bracket, and a mounted .50 caliber machinegun; in daylight or artificial light.

STANDARDS:

1. **Mounting:** Within 10 minutes, the mounting bracket must be secured to the receiver group so that the cover will close, and the sight must be mounted on the adapter with the dovetail secured in its notch.

2. **Dismounting:** Remove the sight and mounting bracket and return them to the carrying case.

PERFORMANCE MEASURES:

1. To mount the AN/TVS-2 mounting bracket to the caliber .50 machinegun (see figure 1), begin by clearing the gun. Raise the cover (1). Loosen the four wingnuts (6) and four thumbscrews (5) on the weapon adapter bracket. Insure that the thumbscrews clear the bottom of the bracket. Slide the bracket (2) into the receiver group (3) with the cutaway portion toward the rear sight of the machinegun. Insure that the bracket is far enough to the rear so that the cover will close (4). Tighten the four thumbscrews (5) securely, then tighten the four wingnuts (6) to lock the bracket in place.

2. To mount the AN/TVS-2 sight to the weapons adapter bracket (see figure 2), remove the sight from shipping container. Loosen the boresight locking knob (2) by turning it counterclockwise. Slide the sight onto the rear of the dovetail notch on the right mounting bracket and push it to the front. Secure the sight by turning the boresight locking knob clockwise.

3. To conduct a function check on the AN/TVS-2:

a. Insure that the rotary control switch is OFF.

b. Insert the battery (BA-1100/U), positive end first.

c. Insure that the boresight cover is attached.

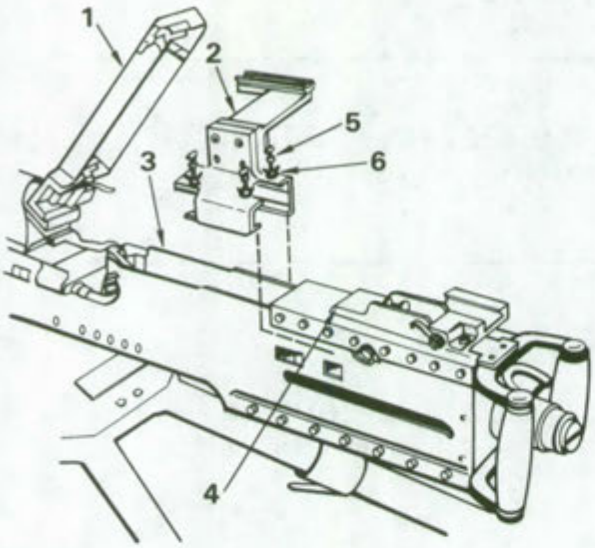


Figure 1.

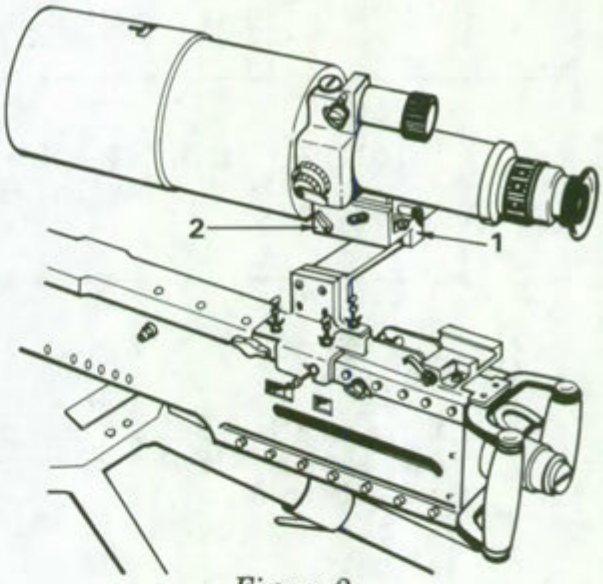


Figure 2.

d. Turn the rotary control switch to the CANT ILLUMINATION ON position, and adjust the cant adjustment knob until the cant level vial bubble is centered.

e. Turn the rotary control switch to the RETICLE ON TUBE ON position.

f. Adjust the reticle pattern intensity knob until the reticle pattern is visible.

g. Adjust the eyepiece focus ring so that the reticle dots appear sharp and clear.

4. To dismount the sight, reverse the mounting procedure detailed in Performance Measure 1 and return the AN/TVS-2 to the carrying case.

NOTE: Insure that the battery is removed from the AN/TVS-2 before storing the night sight.

REFERENCES:

TM 11-5855-202-12, Operator's manual for AN/TVS-2 (Night Vision Sight, Crew-Served) C4, Apr 67 (page 12, para 2-4)
TC 23-13, AN/TVS-2 (Night Vision Sight, Crew-Served) Jan 67 (page 11)
TEC Lesson 953-071-0062-F, AN/TVS-2 Night Vision Sight for Crew-Served Weapons

TASK NUMBER: 071-313-2315

BORESIGHT AN/TVS-2 TO CALIBER .50 MACHINEGUN

CONDITIONS:

Given an AN/TVS-2 mounted on a caliber .50 machinegun on the tripod; a defensive firing position, during daylight or at night, cleared for firing; and five rounds of loose caliber .50 tracer ammunition.

NOTE: The AN/TVS-2 comes in two models: 9927 and 9927A.

STANDARDS:

The gunner or assistant gunner within 15 minutes will:

1. During daylight, using an aiming point with the boresight cover in position, aline the sight reticle on the AN/TVS-2 with the barrel of the caliber .50 machinegun.

2. At night, using an aiming point at a known distance between 200 and 800 meters, aline the sight reticle dot on the AN/TVS-2 so that it coincides with the strike of a tracer round fired at the same aiming point.

PERFORMANCE MEASURES:

1. How to Boresight in Daylight:

a. Clear the gun and remove the backplate, driving spring assembly, and bolt group.

b. Select an aiming point beyond the range of a likely target. With the head held to the rear of the receiver, sight through the barrel and aline it on the distant aiming point by moving the T&E mechanism of the gun. As a field-expedient, cut a piece of cardboard that will fit in the rear of the receiver after the backplate has been removed; make a pinhole in the cardboard, so that it is centered on the axis of the bore; and place two strings or threads across the muzzle with tape, one horizontal and the other vertical, being sure that the strings cross at the center of the muzzle. Sight through the pinhole and aline the crosshairs on the distant aiming point to get the right alinement.

c. After the barrel is alined on the aiming point, and without disturbing the lay of the gun, check the cant level dial on the sight to be sure that the bubble is centered; if it is not, center it by moving the cant adjustment knob.

d. With the rotary control switch in the fourth stop position (TUBE ON, RETICLE ON) and the boresight cover installed, aline the boresight dot of

the sight reticle (figure 1) on the same distant aiming point by rotating the azimuth and elevation screws on the sight.

e. Recheck the alinement of the bore and the sight. If the bore and the sight are laid on the same distant point, the weapon is correctly boresighted.

2. How to Boresight at Night: Remove the boresight cover and select a target at a known distance between 200 and 800 meters. Center the cant level dial of the sight. Lay the sight reticle dot corresponding to the range to the target by moving the T&E mechanism of the gun. Fire one tracer round and note the strike of the round in relation to the target. Make corrections on the azimuth and elevation screws of the sight to bring the strike of the round into the center mass of the target. Re-lay the gun and fire a confirming round. If the round does not hit the target, continue this process until a target hit is achieved.

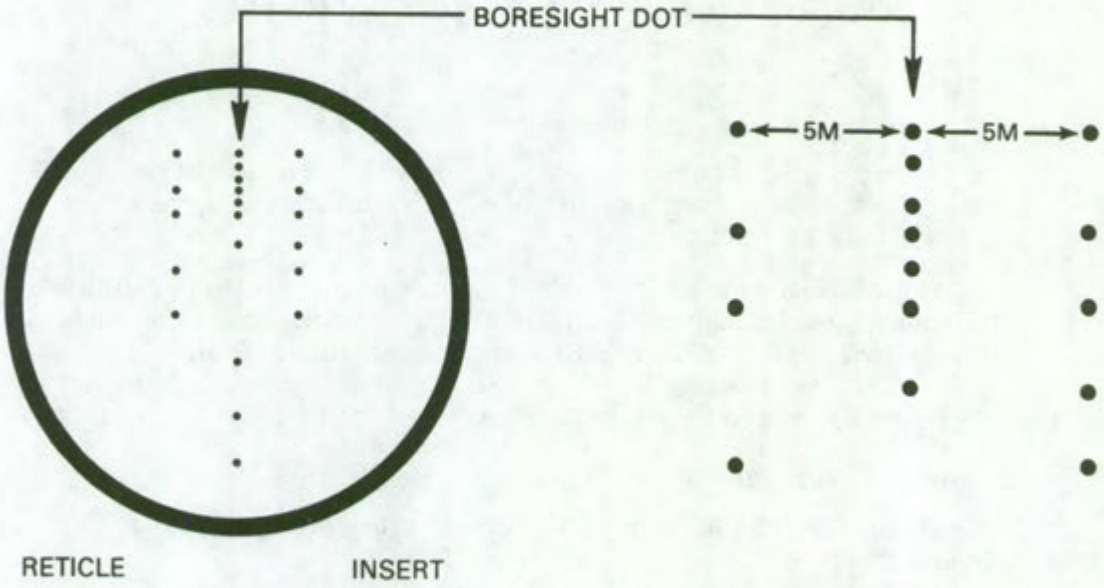


Figure 1. Sight reticle (9927A).

REFERENCES:

TC 23-13, AN/TVS-2 Night Vision Sight, Jan 67 (chap 3, page 17)
TEC Lesson 953-071-0062-F, AN/TVS-2 Night Vision Sight for Crew-Served Weapons (TBP)
TEC Lesson 953-071-0063-F, AN/TVS-2 Engaging the Target

RESERVE COMPONENT

TASK NUMBER: 071-319-3151

PERFORM OPERATOR MAINTENANCE ON A 90-MM RCLR

CONDITIONS:

Given a 90-mm recoilless rifle, a contour brush, artillery cleaning brush; clean, dry rags; dry cleaning solvent or mineral spirits, preservative lubricating (PL) (Special) oil, and rifle bore cleaner.

STANDARDS:

Within 30 minutes field strip the weapon, inspect weapon for unserviceable parts, clean all parts of weapon of foreign particles that will hinder operation, lubricate weapon with a light coat of oil, and reassemble weapon.

PERFORMANCE MEASURES:

1. **General Disassembly of Weapon** (figure 1).

a. Make sure weapon is cleared and not cocked.

b. With breechblock in the closed and locked position, unscrew firing pin cap and remove firing pin spring.

c. Rotate the safety 45 degrees counterclockwise from the FIRE position; pull up and remove.

d. Pull hinge block end of the cable assembly forward and remove it from the hinge block.

e. Unlock and open breechblock. Push downward on hinge pin and remove both, taking care to keep the breechblock in upward position.

f. Remove extractor link and extractor.

g. To prevent the sear from dropping down and blocking the lockring, hold the breechblock with the hinge portion up, depress the detent plunger and spring, rotate the lockring counterclockwise, and remove.

h. Turn the breechblock over and remove the sear.

i. Remove the detent plunger and spring.

j. Insert the small end of the hinge pin into the rearward end of the breechblock housing. Remove the firing hammer and hammer bushing from the front of the breechblock housing.

NOTE: The removal of the firing hammer and hammer bushing should only be accomplished under the following conditions:

(1) The weapon fails to fire and the firing hammer must be inspected for possible damage or fouling.

(2) A visual inspection of the firing hammer and hammer bushing during maintenance detects damage or fouling.

Unnecessary repeated removal of these components will cause undue wear.

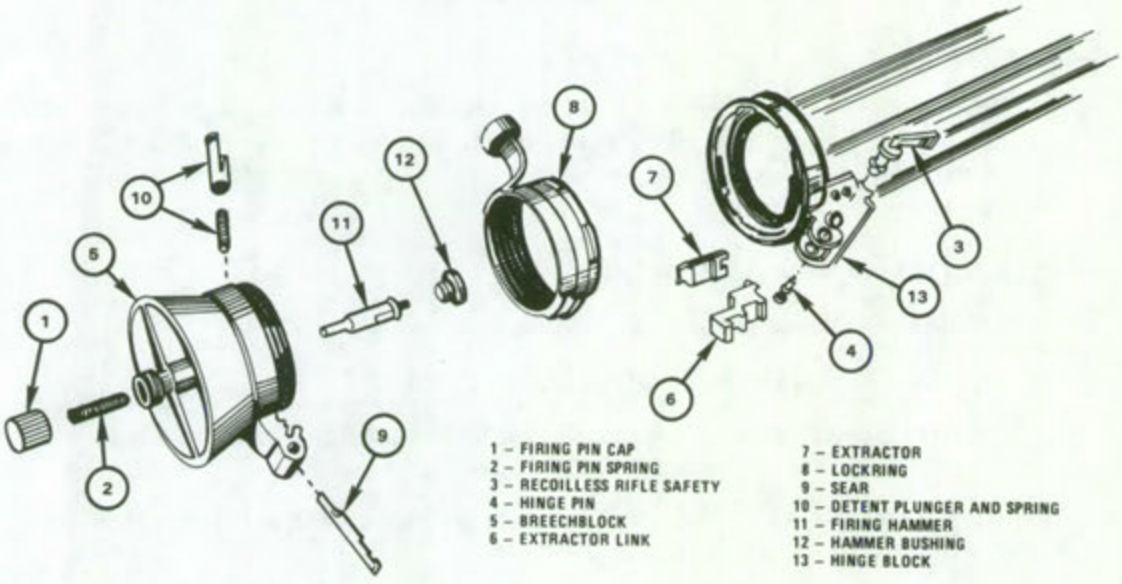


Figure 1.

2. **Inspection of Weapon.**

a. An external inspection of the weapon is conducted to determine if it is damaged beyond safe or serviceable limits.

b. Inspect to insure that weapon is assembled correctly (FM 23-11, sec II, page 7, para 8b(2)).

c. Inspect for looseness of brackets, lockwashers, locknuts, locking wires, and connecting tubes/wires.

d. Inspect for excessively worn components which may result in a failure to fire.

3. **Cleaning and Lubrication of Weapon.**

a. Use only cleaning solvent or mineral spirits (paint thinner) to clean grease or oil from all metal parts, except those exposed to powder fouling during firing.

b. Use rifle bore cleaner to clean all armament parts which have been exposed to powder fouling. After using bore cleaner, wipe dry and oil lightly.

c. After all parts are cleaned, rinse and dry them thoroughly. Apply preservative lubricating (PL) (Special) oil to all polished metal surfaces, other than optical equipment.

4. **Assembly of Weapon** (figure 1).

a. Holding the breechblock with the hinge portion up, install hammer bushing and firing hammer.

b. Replace the sear.

c. Replace the detent plunger and spring.

d. While holding the breechblock with the hinge portion up, depress the detent plunger and install the lockring, turning it clockwise until tight; then turn counterclockwise until two distinct clicks are heard.

e. Install the extractor and extractor link.

f. With the extractor link in its full extract position, install the breechblock, making sure that the hinge portion of the breechblock enters the opening in the hinge block and engages the recess in the extractor link.

g. Aline the hinge pin holes in the breechblock and hinge block, then install the hinge pin.

h. Install the cable assembly in the hinge block with the notched portion that will mate with the safety facing away from the rifle tube.

i. Position the recoilless rifle safety 45 degrees clockwise from the FIRE position, push downward, and rotate it clockwise to the FIRE position.

j. Install the firing pin spring and firing pin cap.

REFERENCE:

FM 23-11, 90-mm Recoilless Rifle, M67, C2 & 3, Jul 65 (chap 2, sec II, page 6 thru 8, para 8b)

RESERVE COMPONENT

TASK NUMBER: 071-319-3152

BORESIGHT THE 90-MM RCLR

CONDITIONS:

During daylight, given a 90-mm RCLR, two pieces of thread, a rubber band or masking tape, a boresight disk, a combination wrench (or screwdriver), and a designated target beyond 400 meters.

STANDARDS:

Within 5 minutes, aline both the sight and the bore so that the edge of the target is alined at the same point of intersection of both sets of crosshairs (figure 1).

PERFORMANCE MEASURES:

1. Using the rubber band, or the masking tape, secure the two pieces of thread across the four notches located on the muzzle of the weapon so as to form a cross. The point of intersection of the thread marks the axis of the bore at the muzzle end of the rifle.

2. Insert the boresight disk in the chamber to determine the axis of the bore at the breech.

3. Select an aiming point beyond 400 meters to any likely target. With the eye held several inches behind the breech, aline the axis of the bore on the aiming point by elevating and traversing the rifle.

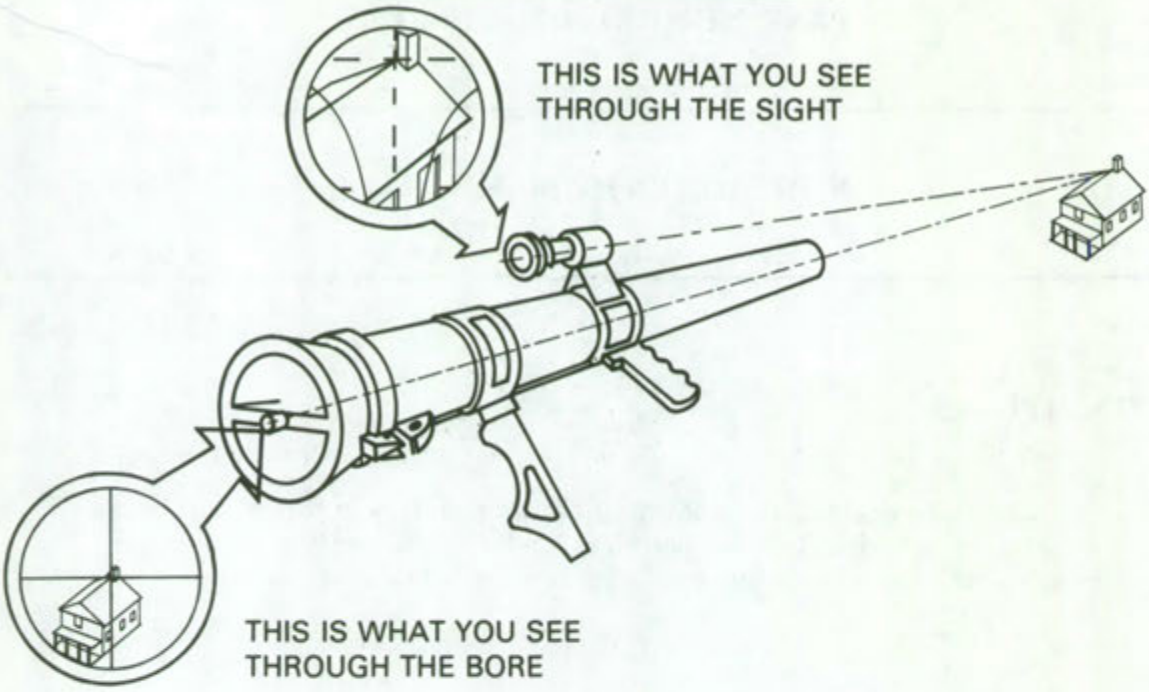


Figure 1.

4. Look through the telescope and insure that the boresight cross of the sight reticle is alined on the aiming point at the same point of intersection of both sets of crosshairs. If the boresight is not alined, bring it to the aiming point by rotating the elevation and azimuth correction screws with either the screwdriver end of the combination wrench or a small screwdriver. Recheck the alinement through the bore and through the sight. When the sight and the bore are properly alined on the aiming point, the 90-mm RCLR is boresighted (figure 1).

REFERENCES:

FM 23-11, 90-mm Recoilless Rifle, M67, C2, 3, Jul 65 (chap 5, sec VI, pages 56-57, para 92 a-e)

RESERVE COMPONENT

TASK NUMBER: 071-319-3153

LOAD, UNLOAD, AND CLEAR 90-MM RCLR

CONDITIONS:

As assistant 90-mm RCLR gunner (loader) with a man to act as gunner, given a cleared, assembled, and boresighted 90-mm RCLR, one round (practice) ammunition, a general firing position, an initial fire command, and a requirement to assist the gunner while engaging a target.

STANDARDS:

1. Situation 1: Loader must load and give gunner an "UP" signal within 30 seconds.

2. Situation 2: Loader must unload and clear weapon within 30 seconds.

3. Situation 3: Loader performs the procedures outlined in paragraph 3 of the performance measures within 30 seconds, when the weapon misfires.

PERFORMANCE MEASURES:

1. LOADING. When the command "LOAD" is given, the assistant gunner:

a. Opens the breechblock, insuring that the weapon is clear. (If breechblock is already open, insure that weapon is clear.)

b. Inserts round into chamber, seating it firmly.

c. Closes and locks breechblock.

d. Checks backblast area.

e. Rotates safety to "F" position.

f. Taps gunner and calls "UP."

2. UNLOADING AND CLEARING. When the command "UNLOAD" is given, the assistant gunner:

a. Rotates safety to "S" position. (Not required if round has been fired.)

b. Opens breechblock.

c. Removes round (or expended cartridge) and lays it aside.

d. Inspects chamber.

e. Calls "CLEAR."

3. IMMEDIATE ACTION.

a. When the rifle fails to fire, the gunner releases pressure on the trigger and calls "MISFIRE." The loader repeats "MISFIRE," and waits 1 minute. Then the loader unlocks and locks the breech and calls "UP." The gunner attempts to fire.

b. Should the rifle fail to fire, the gunner releases pressure on the trigger and calls "MISFIRE." The loader repeats "MISFIRE," and again waits 1 minute. Then the loader opens the breech and unloads, being careful to catch the round as it is extracted.

NOTE: If the rifle has been fired continuously for a considerable length of time, it becomes hot. This might cause the propellent charge to ignite by cookoff. If the rifle is hot, cool with water before removing the cartridge. If water is not available, all personnel will leave their positions until the rifle has cooled (training only).

REFERENCES:

FM 23-11, 90-mm Recoilless Rifle, M67, Jul 65 (chap 2)
TM 9-1015-223-12, Operator and Organizational Maintenance Manual, 90-mm Recoilless Rifle, M67, C1-6, Feb 62 (chap 3, sec III, page 25, para 42-44)

RESERVE COMPONENT

TASK NUMBER: 071-319-3155

ENGAGE TARGETS WITH 90-MM RCLR

CONDITIONS:

During daylight, on a 25-meter subcaliber range, given a boresighted 90-mm RCLR with zeroed 7.62-mm subcaliber device, 78 rounds of caliber 7.62-mm ammunition, a requirement to fire course C for qualification firing, and equipment as outlined in FM 23-11 for course C.

STANDARDS:

Obtain a minimum score of 230, firing tables I and II twice within time allotted.

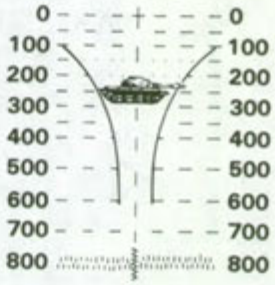
PERFORMANCE MEASURES:

1. **Range Determination.**

a. Range Estimation. The primary method of estimating range with the 90-mm RCLR is to use the stadia lines. Stadia lines are curved lines inscribed on the sight reticle. They measure distances based on the size an average tank appears at varying distances when observed through the M103 sight. To estimate range, the gunner adjusts the lay of the rifle until the target exactly fits between the stadia lines. The point of the vertical (range) line of the reticle, that corresponds to the center of mass of the target, indicates the range. On targets showing more flank than front, a full stadia picture is used. If more of the front than the flank is shown, a half-stadia picture is used. When using a half-stadia picture, a sight adjustment must be made to place the appropriate range line on the center mass of the target. Figures 1 and 2 show how the stadia lines are placed on both the flank and frontal target. In both examples, they indicate that the targets are at a range of 275 meters.

Half stadia picture.

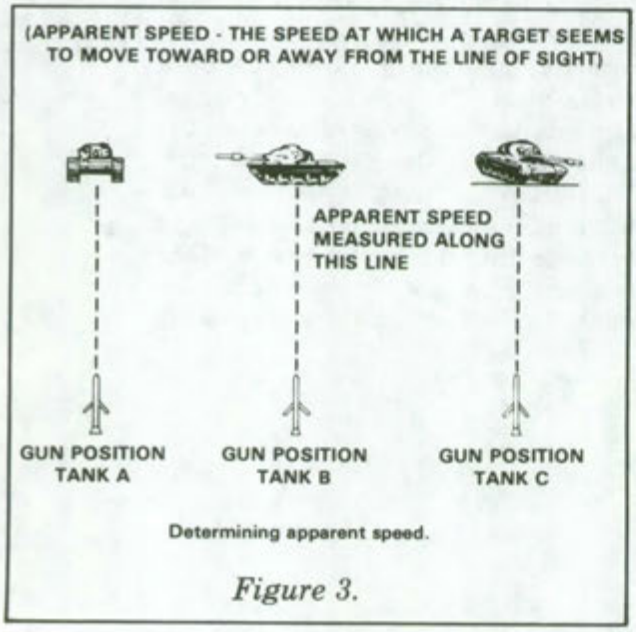
Figure 1.



Full stadia picture.

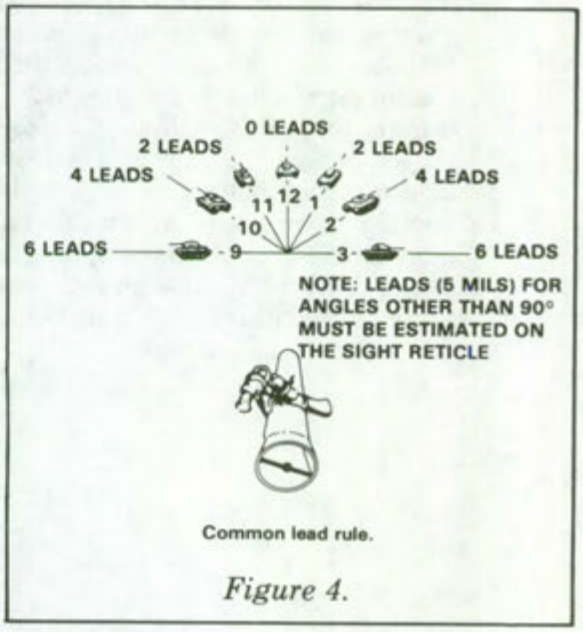
Figure 2.

b. Apparent Speed Estimation (figure 3). The speed at which a target seems to move toward or away from the line of sight is called apparent speed. In figure 3, Tank A has no apparent speed no matter how fast it is moving because it is moving directly toward the gunner. Tank B has an apparent speed equal to its actual speed because it is moving perpendicular to the gunner's line of sight. Tank C, moving at the oblique, has an apparent speed less than its actual speed.



Determining apparent speed.

Figure 3.



Common lead rule.

Figure 4.

c. Lead Estimation (figure 4).

(1) A moving target is led by the distance it travels from the time the rifle is fired until the projectile crosses the path of the target. The number of leads applied varies with the apparent speed of the target, but not the range.

(2) One lead is applied on the sight reticle for each 2½ miles per hour of apparent speed of the target.

(3) As a common lead rule, the number of leads required is determined by the direction the target is moving in relation to the gun position (figure 4). Target speed is assumed to be 15 miles per hour. If the target is moving directly toward or away from the gun position, no leads are required.

2. **Adjustment of Fire using Burst-On-Target.**

a. Observe where the round impacts in relationship to the target when observed through the sight reticle.

b. Note where this impact appears on the sight reticle and place that point onto the center mass of the target.

REFERENCE:

FM 23-11, 90-mm Recoilless Rifle, M67, C2, 3, 6 Jul 65 (page 42-47, para 69; page 49, para 72-75)

TASK NUMBER: 071-317-3301

CONDUCT A PREOPERATIONAL INSPECTION OF THE DRAGON TRACKER AND ROUND

CONDITIONS:

Given a Dragon tracker and a round of ammunition (inert round for training only), lens tissue, wood dowel, ethyl alcohol.

STANDARDS:

Within 5 minutes, complete a preoperational inspection of the Dragon tracker and round of ammunition in accordance with the performance measures below.

PERFORMANCE MEASURES:

1. **Preoperational Inspection of a Round of Ammunition** (figure 1).

a. Check the exterior surface for oil, dirt, or grease.

b. Check the forward shock absorber for loose cushions, cracks, or other visible damage.

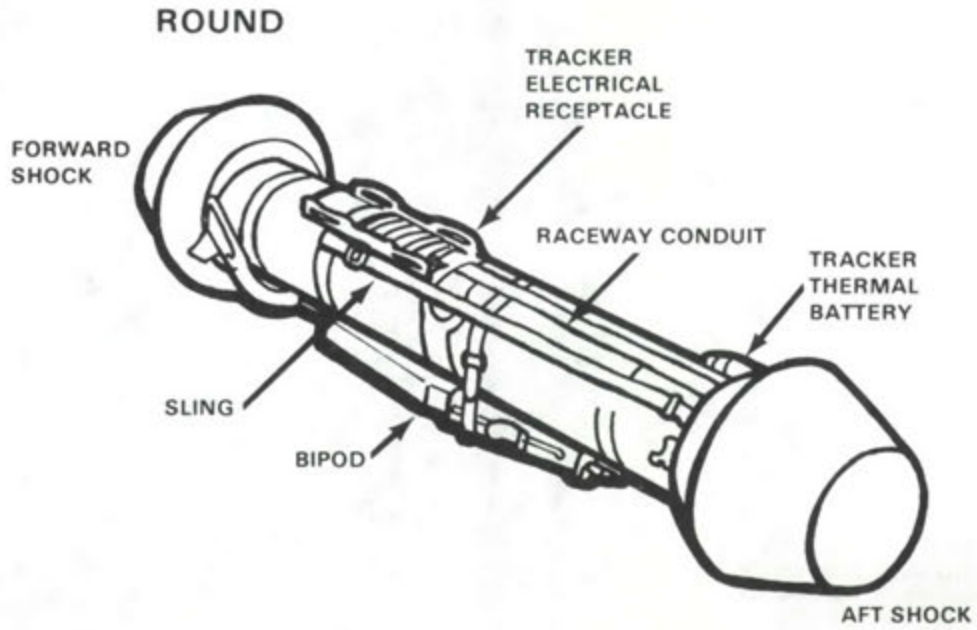


Figure 1.

c. Inspect the tracker support assembly for damage and firm fit of the cover on the electrical connector. Remove the cover and inspect the electrical connection for damage.

d. Inspect the raceway conduit for damaged wires.

e. Check the electrical cable nipple for damage (the cable nipple is the connection from the raceway conduit to the thermal battery).

f. Inspect the thermal battery for damage.

g. Inspect the AFT shock absorber for loose cushions, cracks, or other visible damage.

h. Inspect the carrying sling for rips, tears, or other damage.

i. Inspect the launcher tube for gouges, cracks, punctures, and other visible damage.

j. Check the bipod for damage and insure the retaining strap is secured. **(NOTE: DO NOT LOWER OR EXTEND THE BIPOD TO PERFORM THIS INSPECTION.)**

k. Inspect the round for legible markings, i.e., lot number and nomenclatures.

l. Check the humidity indicator card (figure 2) through the viewport in the face of the forward shock absorber. The indicator's circles should be blue. **(NOTE: IF NOT BLUE, TURN IN IF SITUATION PERMITS.)**

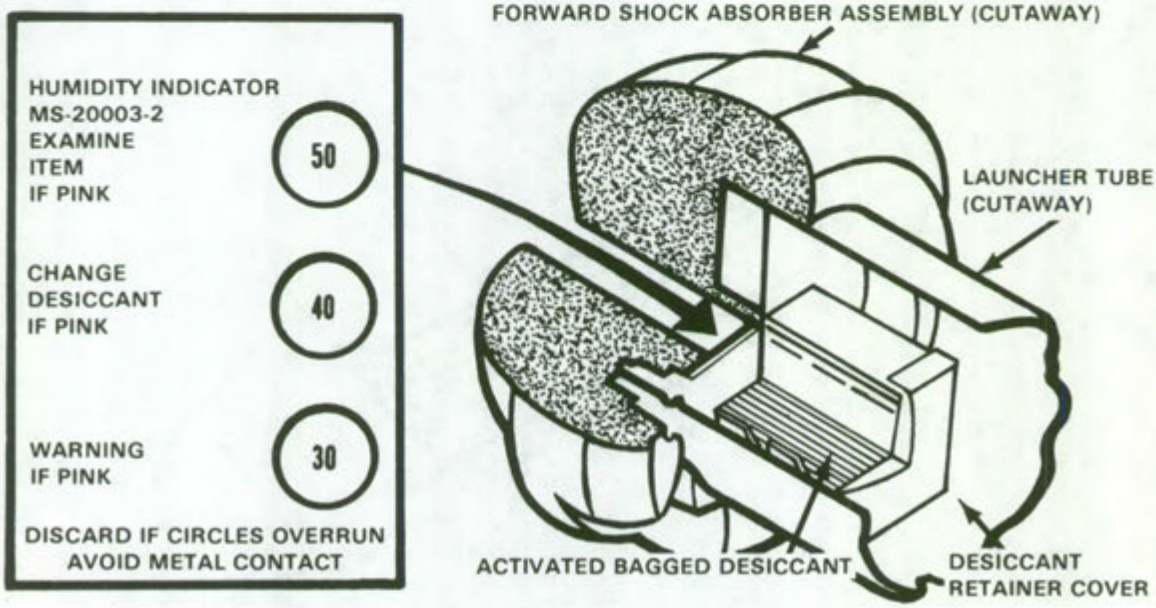


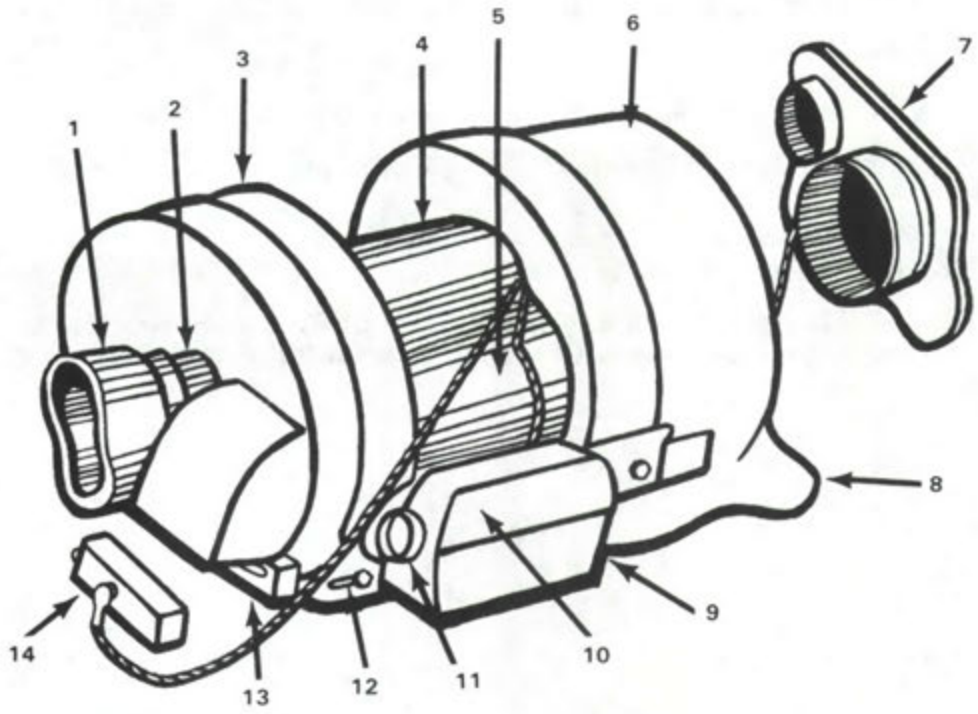
Figure 2.

2. **Preoperational Inspection of the Track** (figure 3).

a. Check the external surfaces for oil, dirt, or grease.

b. Inspect the shock absorbers to insure they are present, tight, and not damaged.

c. Remove the lens cover and inspect all lenses for dirt, cracks, or chips. If the lenses are dirty, clean with the tissue, wood dowel, and ethyl alcohol provided in the tracker bag.



1. EYEGUARD
2. SIGHT ADJUSTMENT
3. AFT SHOCK ABSORBER
4. OPTICAL SIGHT ASSEMBLY
5. INFRARED RECEIVER ASSEMBLY
6. FORWARD SHOCK ABSORBER
7. LENS COVER
8. LANYARD
9. FIRING MECHANISM
10. TRIGGER LEVER BOOT
11. TRIGGER SAFETY PLUNGER BOOT
12. GUIDE PIN BREACH
13. ELECTRICAL CONNECTOR
14. ELECTRICAL CONNECTOR COVER W/LANYARD

Figure 3.

WARNING: DO NOT PERFORM A PREOPERATIONAL INSPECTION OF THE TRACKER WITH IT MATED TO THE ROUND.

d. Check to insure the trigger lever will not operate unless the safety is depressed. Depress the safety and check for freedom of operation. A slight metallic click should be heard when the safety is depressed.

e. Depress the safety and check the trigger lever for freedom of operation. A metallic click should be heard when the trigger is depressed.

f. Inspect the eyeguard for cracks, other visible damage, and a secure fit which allows rotation (figure 3). The eyeguard should rotate independent of the focus ring.

g. Look through the sight and rotate the knurled focus adjusting ring from limit to limit. Check for freedom of operation, and that sight adjustment provides visible focusing of the reticle and target.

h. Check the electrical connector cover for damage and a secure fit.

i. Inspect the electrical connector for damaged or dirty contacts.

j. Inspect the access cover for loose screws or damage.

k. Inspect the guide pins for physical damage.

l. Inspect all optical lens for moisture or evidence of fogging inside the lens.

REFERENCE:

TC 23-24, Dragon Medium Antitank Assault Weapon System M47, C1, Aug 74, (chap 5, pages 43 thru 50, para 5-3 thru 5-6)

TASK NUMBER: 071-317-3302

PREPARE THE DRAGON FOR FIRING

CONDITIONS:

In daylight or darkness in a field environment, with LBE and individual weapon; given a round of ammunition in the carrying configuration (inert for training only) and tracker in the carrying bag.

STANDARDS:

Mate the tracker to the round of ammunition IAW the performance measures below.

PERFORMANCE MEASURES:

1. Unsnap the web strap holding the bipod (figure 1).

Figure 1.

2. Lower bipod to the vertical lock position. Don't worry about the forward shock popping off – it's supposed to (figure 2).

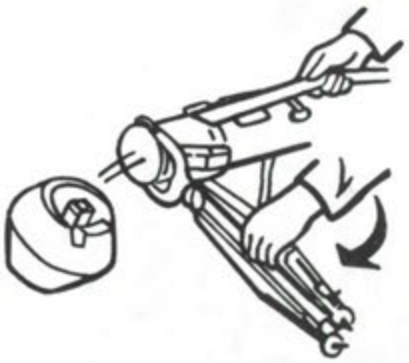


Figure 2.

3. Check that the forward bipod brace is engaged (figure 3).

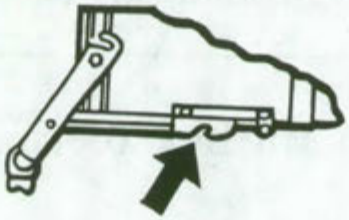


Figure 3.

4. Depress the bipod friction lock and extend the legs (figure 4).

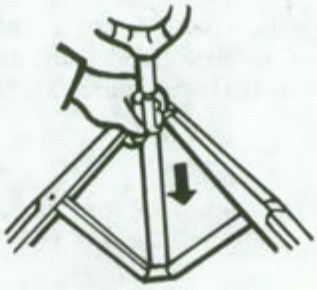


Figure 4.

5. Remove the electrical connector cover from the round (figure 5).

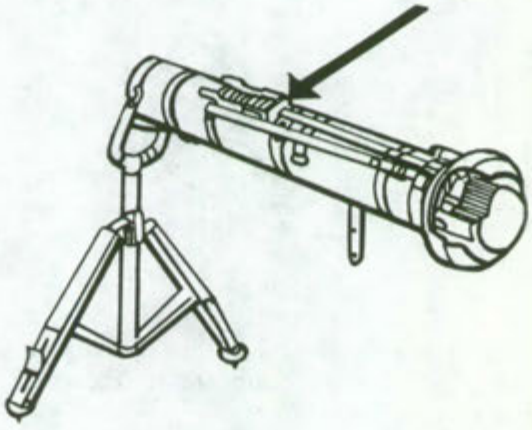


Figure 5.

6. Remove the tracker from the carrying bag and remove the protective cover from the tracker electrical receptacle (figure 6).

Figure 6.

7. Secure the tracker electrical receptacle cover to the tracker forward shock absorber (figure 7).

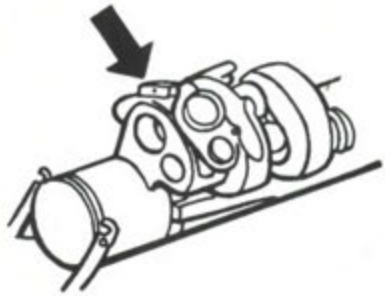


Figure 7.

8. Place tracker guide pins in slots of tracker support guide rails, then push tracker firmly to the rear using both hands, until it locks in place (figure 8).

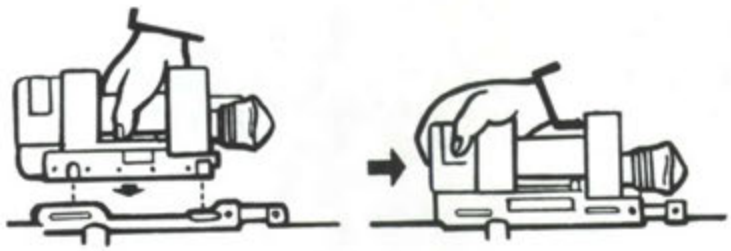


Figure 8.

9. Remove the tracker lens cover and secure to tracker forward shock absorber. Make rapid visual inspection of tracker lens for damage or obstructions (figure 9).

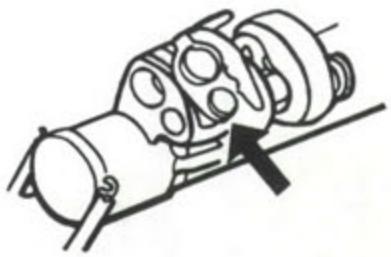


Figure 9.

10. Adjust the bipod friction lock and the foot adjusts to obtain a level sight picture (figure 10).

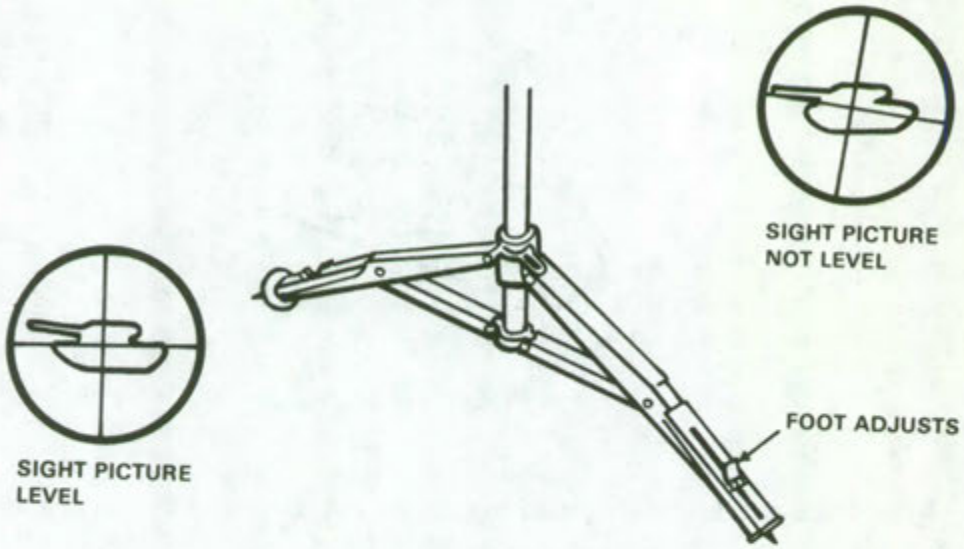


Figure 10.

REFERENCE:

TC 23-24, Dragon Medium Antitank Assault Weapon System M47, C1, Aug 74 (chap 5, pages 41 thru 50, para 5-1 thru 5-6)

TASK NUMBER: 071-317-3304

DEMONSTRATE CORRECT DRAGON FIRING POSITIONS

CONDITIONS:

During daylight or darkness in a field environment, with LBE and individual weapon; given a round of ammunition (inert) and a tracker attached to the round. The Dragon is prepared for firing IAW the task: **Prepare the Dragon for Firing.**

STANDARDS:

Assume either the kneeling or standing supported firing position and be prepared to engage a target --

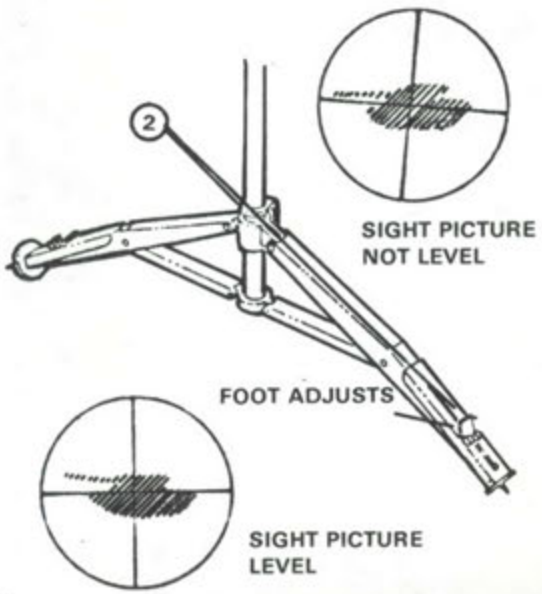
1. Within 15 seconds for designated gunners.
2. Within 30 seconds for non-designated gunners.

PERFORMANCE MEASURES:

1. The Dragon should be fired from the kneeling or standing supported position. The sitting and prone positions can be used but are not recommended.

a. Kneeling position (figure 1).

Figure 1.



Adjust the bipod friction lock and the foot adjusts to obtain a level sight picture.

Figure 1a.

NOTE: Numbers of the following paragraphs are keyed to numbers on the figures.

(1) As the gunner, place the launcher on your right shoulder as close to the curve of the neck as possible.

(2) Adjust the bipod legs and feet for height and proper leveling (figure 1a).

(3) Point the toes of both feet into the ground with the heels elevated and buttocks resting on the heels.

(4) Place both knees on the ground and keep them spread wide.

(5) Take the slack out of the bipod by pushing forward or pulling backward.

(6) Grasp the left portion of the tracker (optical sight between the shock absorber) with the left hand and the trigger assembly with the right hand. The right thumb is positioned on the safety plunger, three fingers on the trigger lever and the little finger forward of the trigger lever.

(7) Bend forward at the waist until the right eye is pressed firmly against the tracker eyeguard.

(8) Tuck your elbows beneath the tracker and keep them close together.

(9) Apply constant downward and rearward pressure on the tracker.

b. Standing supported position (figure 2).

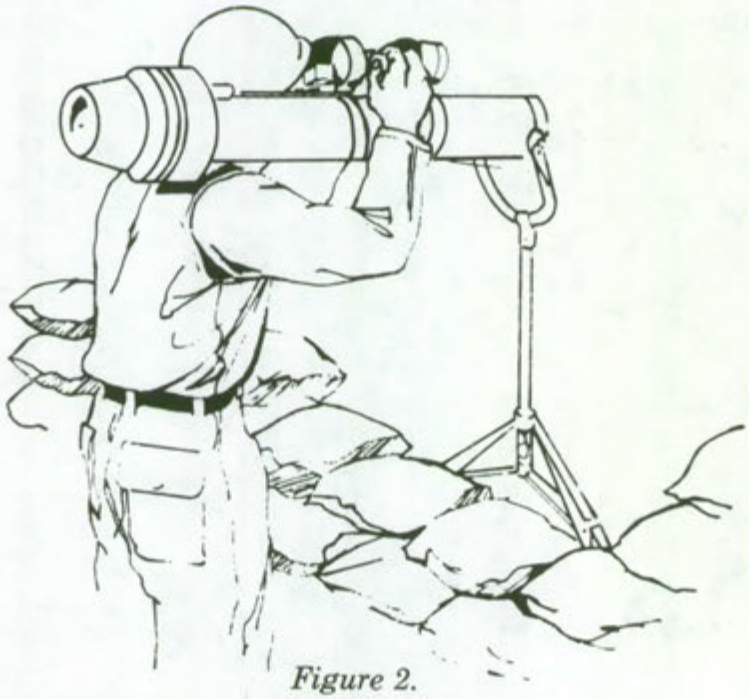


Figure 2.

(1) Position the Dragon launcher and bipod legs as discussed in the kneeling position. (The bipod feet are placed in a trench when using the fighting position; in the grill of the M113 when firing from the cupola of an M113.)

(2) Position hands, elbows, and bipod as discussed in the kneeling position.

(3) Spread legs approximately shoulder-width apart, bend slightly forward at the waist until your eye is pressed firmly against the tracker, and brace against the front of a foxhole or sand bags — or commander's cupola of an M113.

2. Steady hold factors:

a. Place the round in the meaty part of the right shoulder.

b. Place the right eye firmly against the eyeguard (insure eyeguard is adjusted for contour of the face) and adjust the optical sight to focus on the target.

Figure 3.

NOTE: The eye should be pressed as firmly as possible against the eyeguard so the gunner cannot blink his eye if he tries. Blinking the eye would probably cause the gunner to lose control of the missile once it is fired.

c. Position the right hand on the trigger mechanism with the thumb on the safety plunger, three fingers on the trigger bar, and the little finger in front of the trigger mechanism, as shown in figure 3.

d. Place the left hand with four fingers between the shock absorbers on the optical sight with the thumb curled underneath the sight.

e. Maintain steady downward and rearward pressure in all positions to prevent any movement of the weapon when the missile is launched.

f. For Dragon sight picture, see figure 4. The gunner must acquire the target, maintain a smooth tracking rate, and keep the crosshairs on the center of mass of the target from missile launch until missile impact.

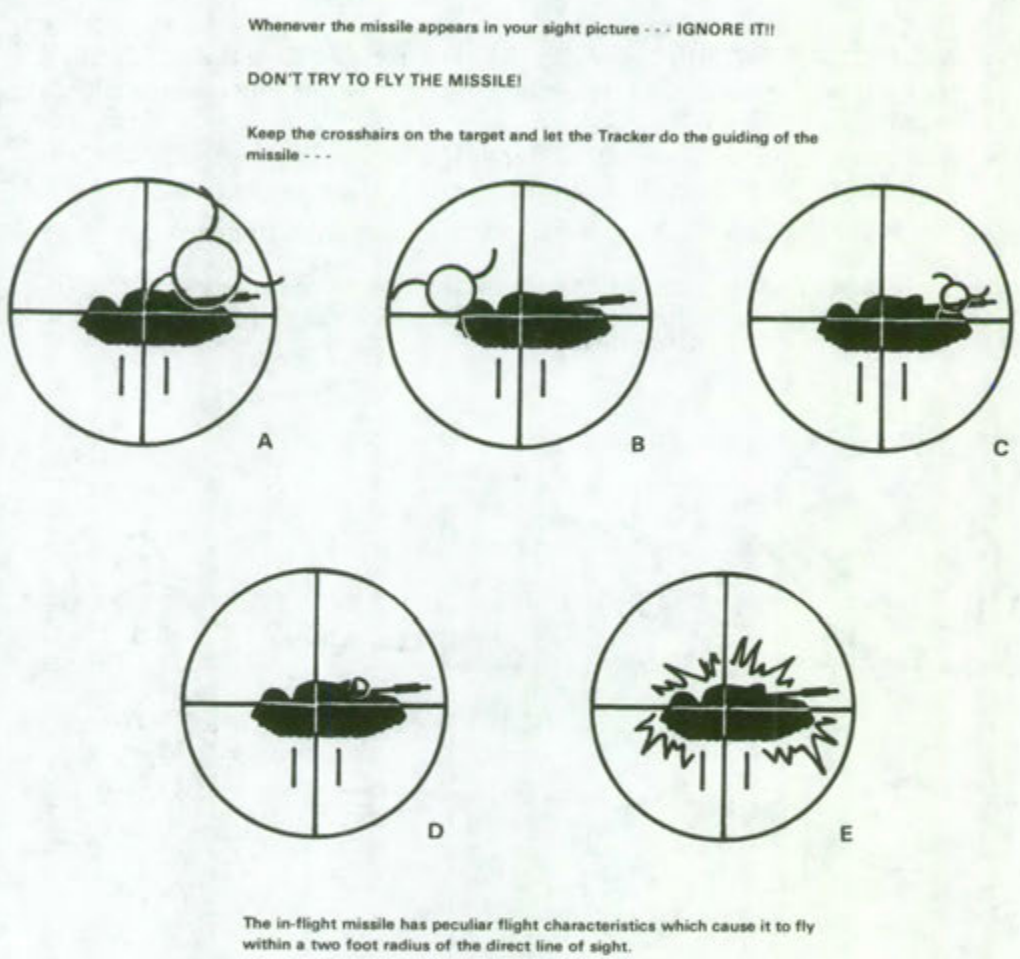


Figure 4.

REFERENCE:

TC 23-24, Dragon Medium Antitank Assault Weapon System M47, C1, Aug 74 (chap 7, pages 68 and 69, para 7-4 thru 7-5)

TASK NUMBER: 071-317-3303

DETERMINE IF A TARGET IS ENGAGEABLE

CONDITIONS:

Acting as a Dragon gunner, during daylight or darkness (with artificial illumination), with an operational Dragon weapon system, given targets moving into your sector of responsibility.

STANDARDS:

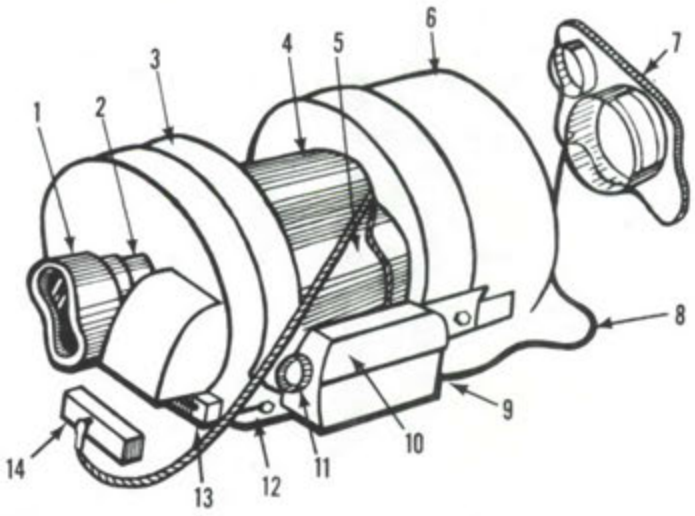
Within 5 seconds, determine if there are targets within range that can be engaged.

PERFORMANCE MEASURES:

1. **To acquire a target:**

   a. Focus the sight using the sight adjustment.

   b. Hold the sight adjustment stationary while rotating the eyeguard to fit the eye (figure 1).



1. EYEGUARD
2. SIGHT ADJUSTMENT
3. AFT SHOCK ABSORBER
4. OPTICAL SIGHT ASSEMBLY
5. INFRARED RECEIVER ASSEMBLY
6. FORWARD SHOCK ABSORBER
7. LENS COVER
8. LANYARD
9. FIRING MECHANISM
10. TRIGGER LEVER/BOOT
11. TRIGGER SAFETY PLUNGER/BOOT
12. GUIDE PIN (4 EACH)
13. ELECTRICAL CONNECTOR
14. PROTECTIVE COVER W/LANYARD

Figure 1.

c. When the target has been acquired, evaluate the target to determine if it is within range.

(1) Flanking targets (full-stadia).

(a) Adjust the sight picture (by moving the launcher) to center the target between the stadia lines (figure 2).

(b) If the target falls between the stadia lines, it is not within range (figure 3).

(c) If the target meets or exceeds the stadia lines, it is within range (figure 4).

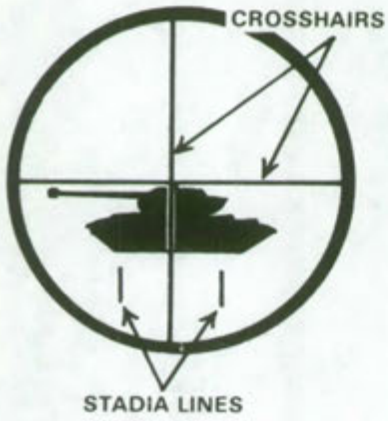


Figure 2.

Figure 3.

Figure 4.

(2) Targets moving toward or away from you (half-stadia).

(a) Adjust the sight picture to center the target between the vertical crosshair and one of the stadia lines.

(b) If the target falls between the vertical crosshairs and stadia lines, the target is not in range (figure 5).

(c) If the target meets or exceeds the vertical crosshairs and one of the stadia lines, it is in range (figure 6).

Figure 5.

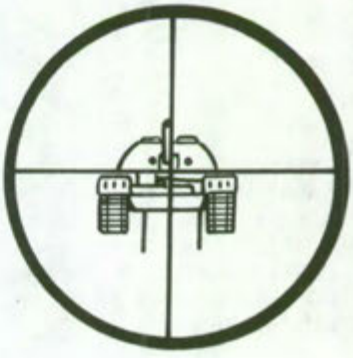


Figure 6.

(3) Oblique targets.

(a) If you can see more of the side than the front, use the full-stadia method.

(b) If you can see more of the front than the side, use the half-stadia method.

2. **To determine if the target is engageable:**

a. Place the edge of the sight on the target and inspect the anticipated path of the vehicle to the opposite edge of the sight.

b. If there is a covered area along this path (figure 7), there is not enough time to fire and hit the target. The target is NOT engageable.

c. If there are no covered areas (figure 8), there is enough time to fire and hit the target. The target IS engageable.

d. Use the full sight method to determine target kill areas in your sector of fire. This information may be placed on your antiarmor range card.

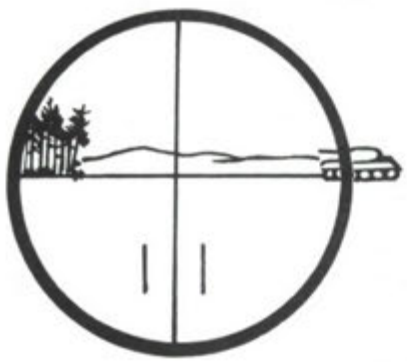


Figure 7.

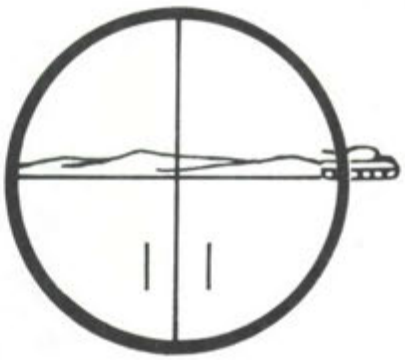


Figure 8.

REFERENCE:

TC 23-24, Dragon Medium Antitank Assault Weapon System M47, C1, Aug 74 (chap 4, page 38, para 4-2f)

TASK NUMBER: 071-317-0000

PREPARE AN ANTIARMOR RANGE CARD (TOW, DRAGON, 106-MM, OR 90-MM RCLR)

CONDITIONS:

During daylight, in a field environment, with field clothing and combat equipment with weapon, given any of the above weapon systems, a designated firing position, a sector of fire, target reference data, paper, pencil, and a compass.

STANDARDS:

Within the time designated, prepare a range card that illustrates a representative sketch of the terrain and includes --

1. The firing position indicated by the appropriate weapon symbol.

2. The location of the firing position indicated by its distance and azimuth from a known point.

3. A sector of fire indicated by an enclosed, solid line which shows complete boundaries, maximum engagement line, and:

a. Ranges and azimuths to anticipated target engagement locations and target reference points within the sector of fire.

b. Deadspace within the sector of fire.

4. Magnetic north arrow (properly oriented).

5. Marginal data:

a. Unit designation (no higher than company).

b. Time and date of preparation.

c. Firing position designation (primary, alternate, or supplementary).

PERFORMANCE MEASURES:

1. A range card is a sketch of the terrain that a weapon has been assigned to cover by fire. It contains information which assists in the planning and control of fires, in the rapid detection and engagement of targets, and in the orientation of replacement personnel or units. By using a range card, a gunner can quickly and accurately determine the information he needs to engage targets.

2. Sector of Fire.

a. A sector of fire is a portion of the battlefield within which you are responsible to engage targets with your weapon. Leaders assign sectors of fire to insure that no matter where an enemy target approaches, there will be a weapon positioned which can engage it. After he shows you where to position your weapon, your leader will indicate your sector of fire by pointing out the portion of the terrain for which you are responsible. He will do this by giving you boundaries located between prominent terrain features or by left and right limits indicated by terrain features or azimuths (figure 1). If necessary, he may also assign you more than one sector of fire and will designate one as primary and others as secondary.

b. Your leader may also designate anticipated target engagement locations within your sector of fire. These are recognizable terrain features on or near likely enemy avenues of approach (figure 1). This information is placed on your range card.

c. Starting at the company level, commanders may pick out natural or manmade terrain features on the battlefield which can be used as reference points for locating targets and adjusting direct fires. These are called **target reference points** (TRPs), and are assigned a specific letter and number. If there are TRPs in or near your sector of fire, your leader may point them out and tell you the letter and number (figure 1). If he does, they are shown on your range card.

d. There may be natural or manmade terrain features such as hills, draws, or buildings within your sector(s) of fire which prevent you from hitting a target. The area blocked by these features is called **deadspace.** All deadspace in your sector(s) of fire must be determined because your leaders need to plan other types of fire (mortars, artillery, mines, etc.) to cover the area. Deadspace is indicated on your range card.

e. The length of your sector of fire is normally limited by the maximum engagement range of your antiarmor weapon but it can be less if there are any natural or manmade terrain features which prevent you from engaging targets at maximum engagement range (trees, fences, etc.). Regardless of what affects it, the maximum engagement range is shown on your card as a **maximum engagement line.**

EXAMPLE:

SECTION LEADER TO SQUAD LEADER:

"I want you to cover a sector of fire which begins here at your firing position and goes to a point about ____ meters beyond that windmill on the left; moves to the right across the highground at ____ meters behind the houses, through that woodline, behind the hill, church, and orchard until it reaches a point about ____ meters beyond the right leading edge of that orchard, and returns here to your firing position. The enemy will be approaching from the north so they will be using those two roads to enter our sector. Plan on engaging enemy armor as soon as it comes within range on the road behind the church and orchard. Engage enemy targets as soon as they appear on the second road as they approach from behind the left side of that large hill. There are two target reference points within your sector, so copy them down: the windmill is TRP Charlie Charlie 101 and the church is TRP Charlie Charlie 102."

Figure 1.

3. Preparation of the Range Card.

a. Once your leader has given you the necessary information, you can begin preparing your range card, depending upon the priority of other jobs you must perform, such as preparing and camouflaging your firing position. If you are assigned alternate and supplementary firing positions, a range card is required for them also.

b. Procedures:

(1) In the lower center of your range card, indicate your firing position by drawing the symbol for your assigned weapon.

(2) Show the location of your **firing position** by drawing a sketch of a nearby recognizable terrain feature. Label it and draw an arrow to the weapon symbol. Add the distance and azimuth from the terrain feature to your firing position (figure 2).

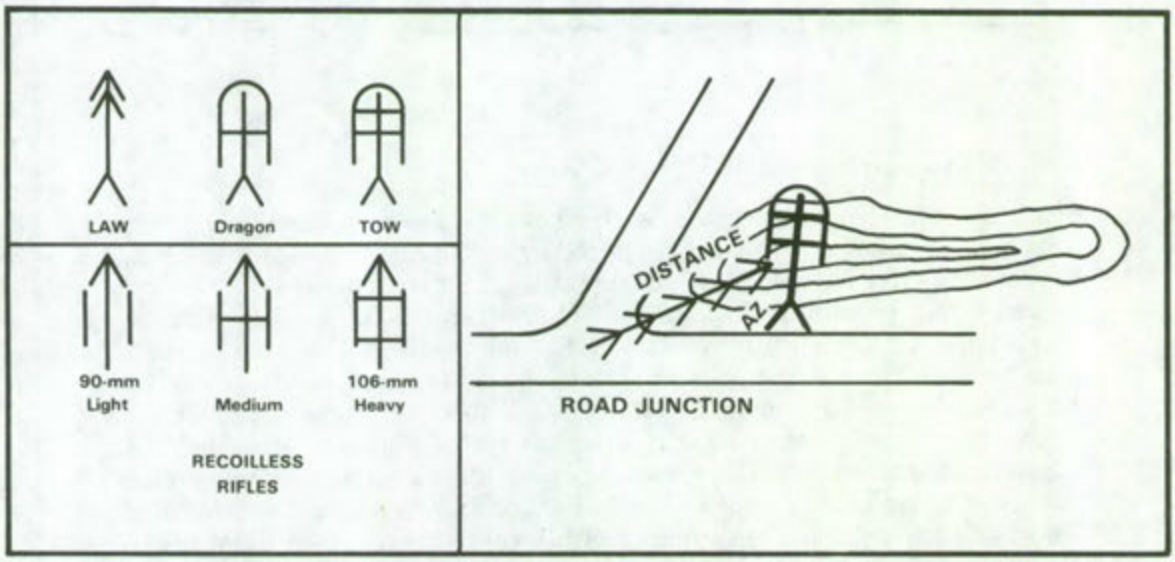


Figure 2.

(3) Draw and label sketches of terrain features which indicate the boundaries of your sector of fire. Draw lines from your weapon symbol to the terrain features (figure 3).

(4) Draw and label sketches of terrain features which include:

(a) Anticipated target engagement location – Draw an arrow, range, and azimuth (figure 4).

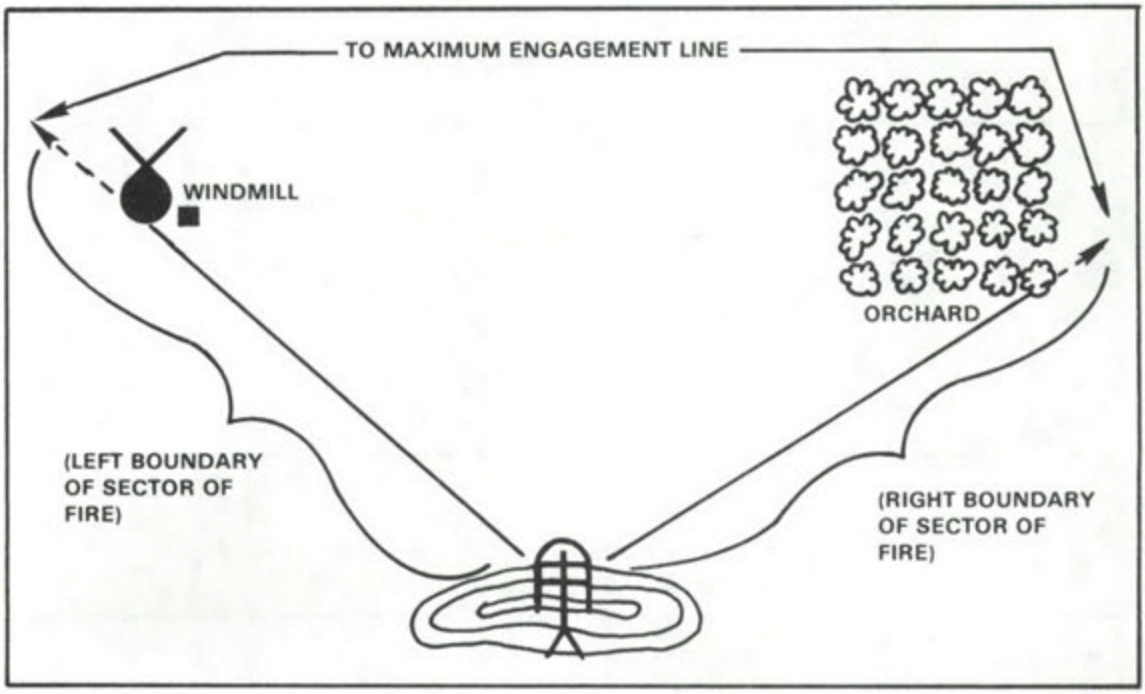


Figure 3.

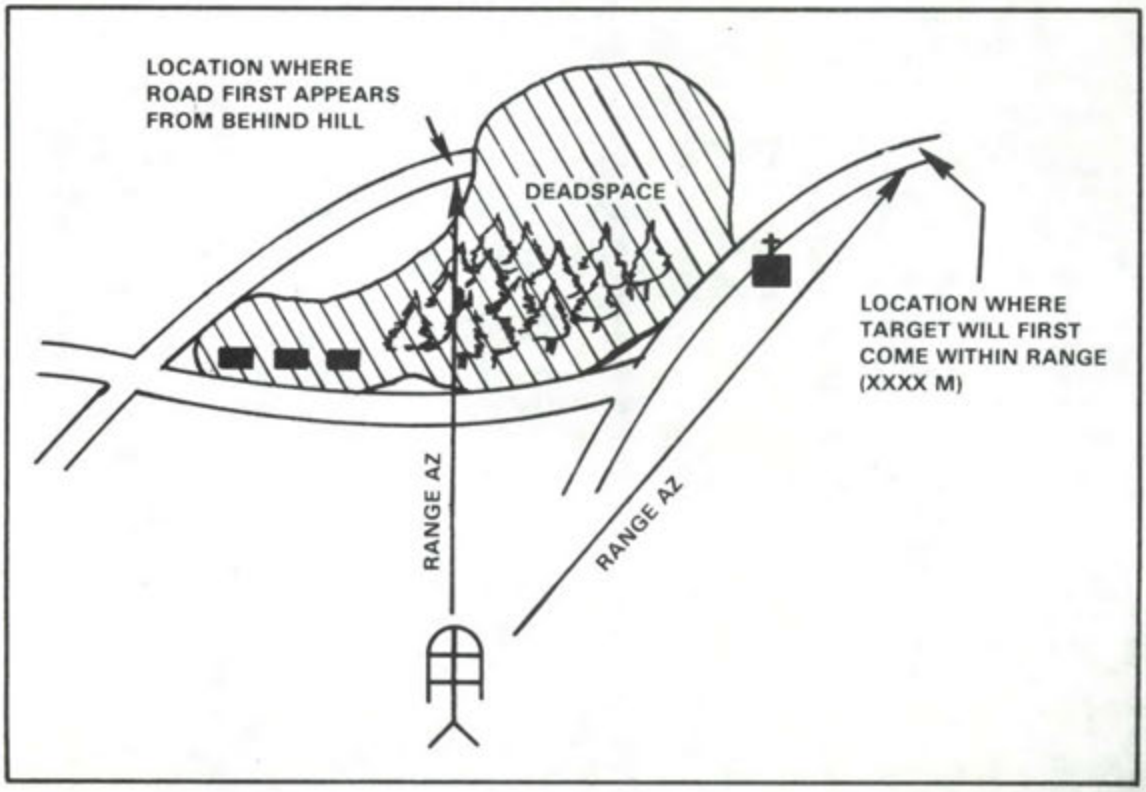


Figure 4.

(b) TRPs -- Draw an arrow, range, and azimuth. Indicate the TRP designation (figure 5).

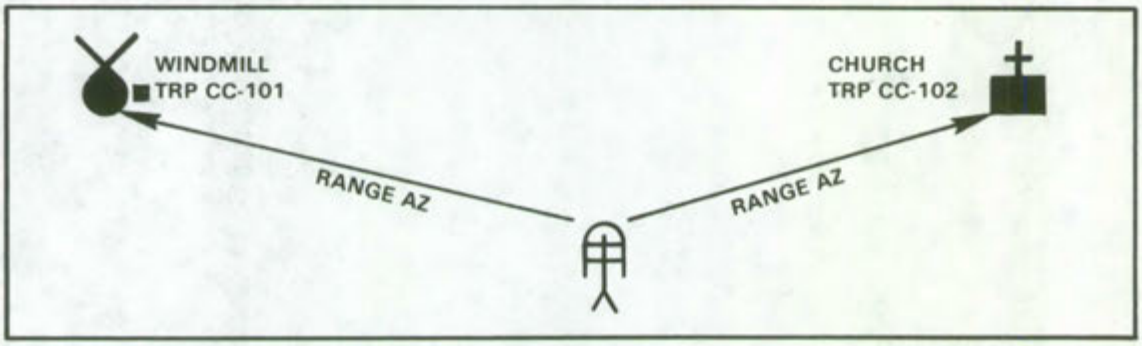


Figure 5.

(c) Deadspace -- Place diagonal lines or word "DEADSPACE" where significant deadspace occurs (figure 6).

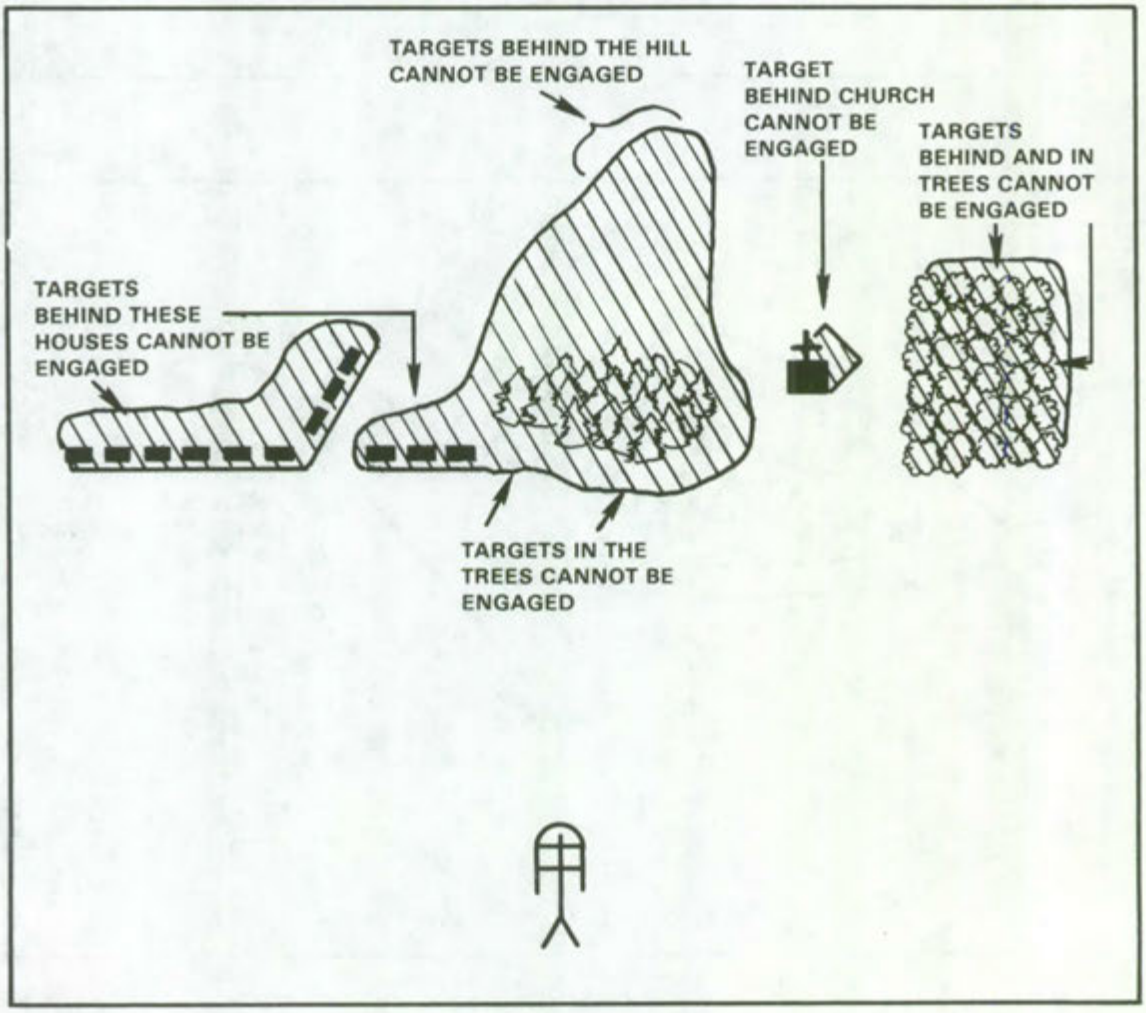


Figure 6.

(d) Maximum engagement line -- If there are no limitations, the line will be curved and will join the left and right sector of fire boundaries at maximum engagement range (figure 7). If there are limitations, the maximum engagement line is drawn in front of the limiting terrain features (figure 8).

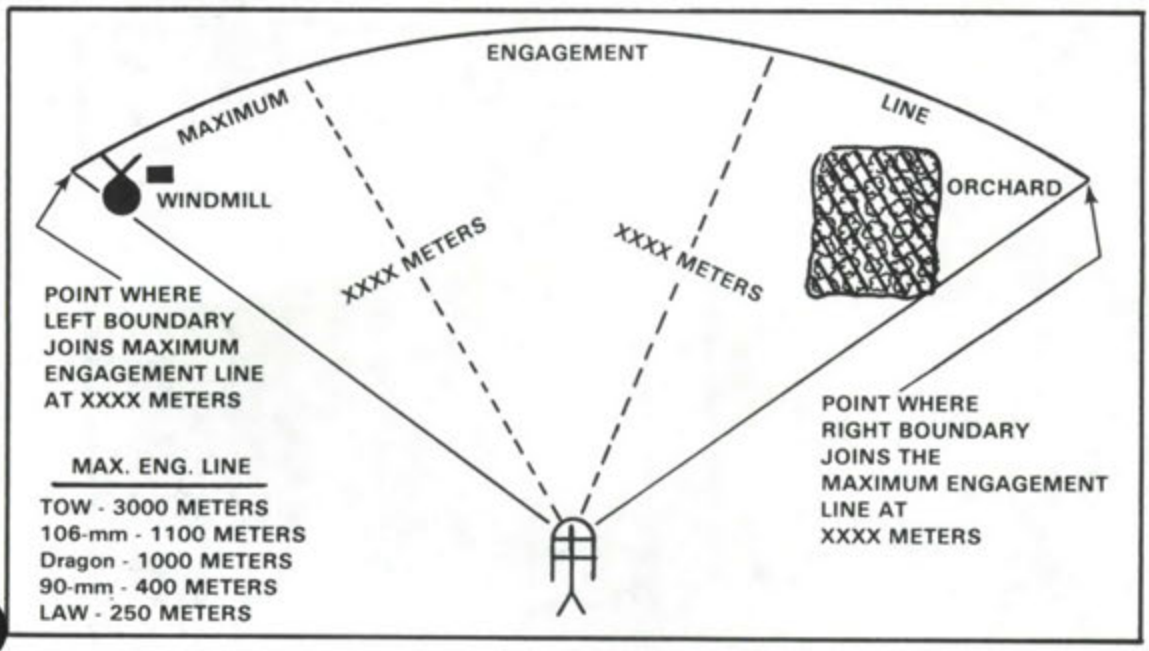


Figure 7.

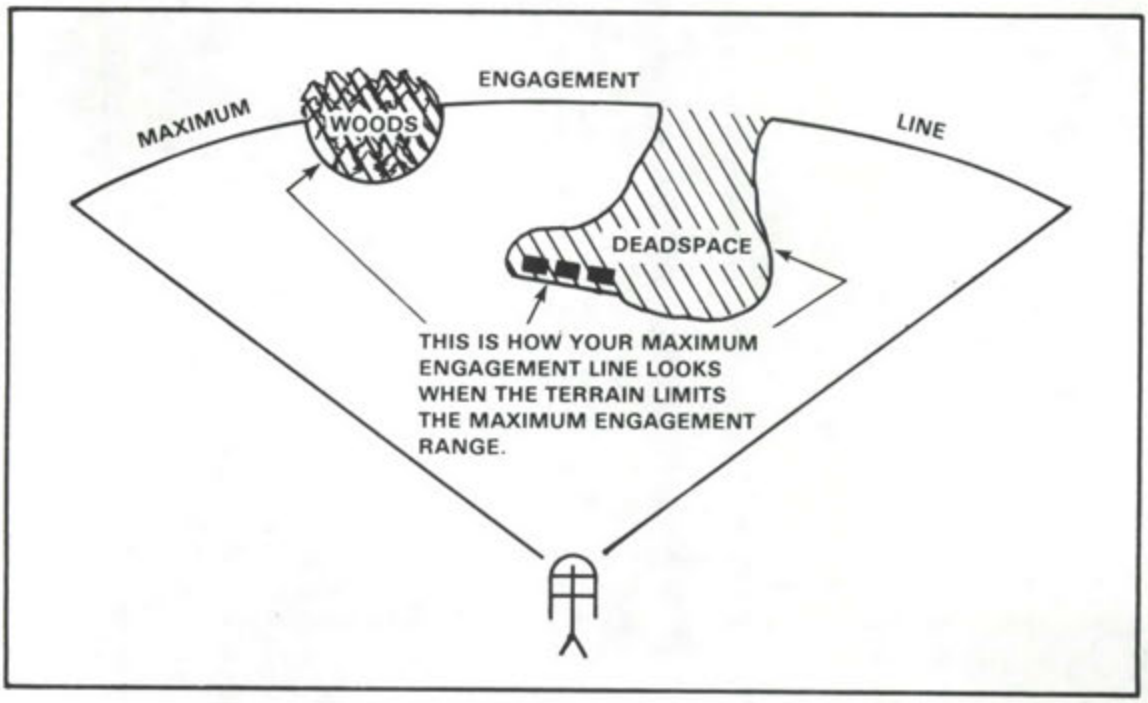


Figure 8.

(5) Orient the range card with the terrain and determine the direction of magnetic north with a compass. Draw a magnetic north arrow using the straight edge of the compass (figure 9).

(6) In a corner of your range card, place the following **marginal data** which is used by leaders to identify range cards:

(a) Unit description -- Never indicate your unit higher than your company. If your range card gets lost, the enemy will not be able to learn important military information if they find your range card (figure 9).

(b) Time and date of preparation (figure 9).

(c) Type position (primary, alternate, supplementary) (figure 9).

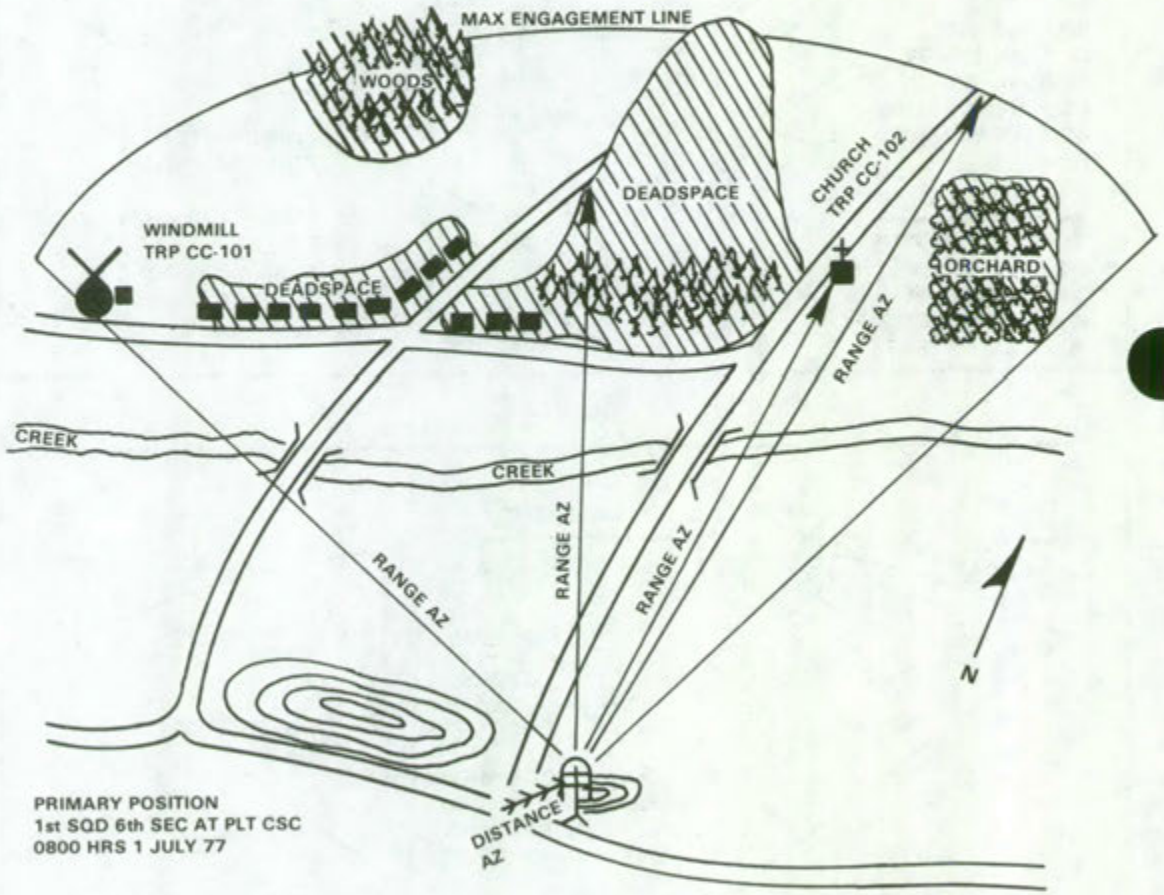


Figure 9.

(7) Make two copies of each range card. Keep one copy at your firing position. The second copy will normally be picked up by your squad or section leader for preparation of fire plans and final coordination of fires.

REFERENCES:

None

TASK NUMBER: 071-317-3306

PERFORM IMMEDIATE ACTION PROCEDURES FOR A DRAGON MISFIRE

CONDITIONS:

During daylight or darkness, in a field environment, with field clothing and combat equipment, given a Dragon tracker mounted on a field handler trainer and a misfire situation.

STANDARDS:

Within 1 minute, perform immediate action procedures IAW the performance measures below.

PERFORMANCE MEASURES:

If the Dragon fails to fire:

1. Immediately re-squeeze the trigger and continue tracking the target for 15 seconds.

2. If the round still does not fire, cautiously feel the thermal battery (figure 1).

Figure 1.

a. Simulate that the thermal battery is hot, and do the following:

(1) Remove the tracker from the round and place the round on the ground away from your firing site. Keep the round pointed toward the enemy; advise friendly troops in your vicinity of the misfire.

(2) Obtain a new round and mount the tracker on the new round.

(3) If possible, acquire previous target and continue with the mission.

b. Simulate that the thermal battery is cold, and do the following:

(1) Reseat the tracker on the round.

(2) Obtain target and attempt to fire again.

(3) If the round again fails to fire, cautiously feel the thermal battery.

(4) If the battery is still cold, remove the tracker from the round and place the round on the ground away from your firing site. Keep the round pointed toward the enemy; advise friendly troops in your vicinity of the misfire.

(5) Mount the tracker on another round and continue with your mission.

(6) If the second round also fails to fire, cautiously feel the thermal battery. If the battery is cold, the tracker is probably defective.

(7) If another tracker is available, replace the tracker and continue with the mission using previously unfired rounds.

REFERENCES:

TM 9-1425-480-10, Operator's Manual; Dragon Weapon System, M47, Apr 74 (chap 2, pages 2-0 thru 2-10, para 2-8b)

TASK NUMBER: 071-317-3307

CONSTRUCT A FIGHTING POSITION (DRAGON/90-MM RCLR)

CONDITIONS:

During daylight, given a sector of fire, a firing position, and a mission to construct the position.

STANDARDS:

Construct a fighting position that provides:

1. Coverage of the assigned sectors of fire.

2. Enough room to accommodate you when firing and preparing another Dragon round or reloading the 90-mm RCLR.

3. Cover and protection from small-arms fire by means of natural or manmade parapets.

4. Concealment from observation that cannot be easily detected by a soldier 1000 meters to the front using binoculars.

PERFORMANCE MEASURES:

1. Like any other weapon organic to the platoon, the Dragon and 90-mm recoilless rifle can be employed from hasty or improved positions. A fighting position is a firing position sited and oriented to cover a sector of fire and constructed to accommodate the weapons system and its firer. See figure 1 for an example of a Dragon fighting position.

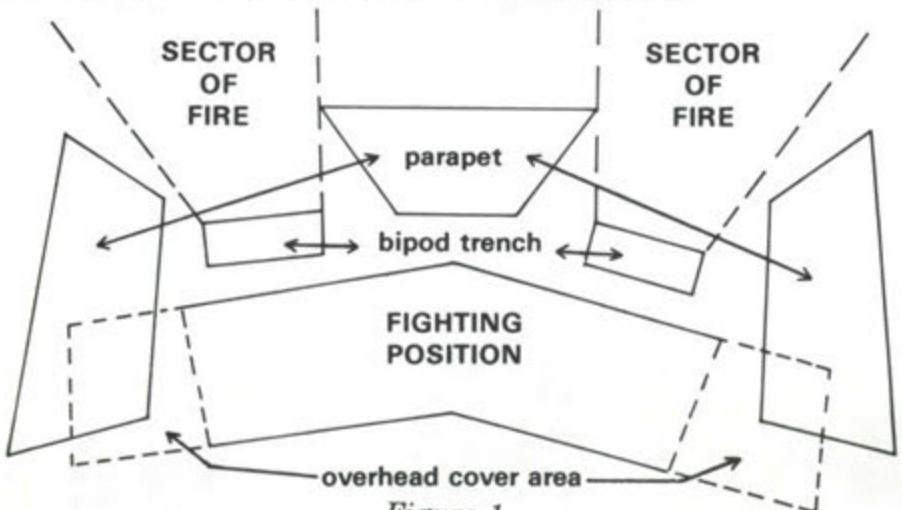


Figure 1.

2. The use of special position for each weapon system, even though they may provide an advantage in certain instances, should be carefully weighed in light of weapon signature and the surveillance capability of the enemy.

3. The construction sequence of a fighting position is as follows:

a. After receiving a sector of fire and firing location from your squad leader, prepare and site your weapon to cover the sector and, as required, clear fields of fire. Clear only what is absolutely necessary. Camouflage the position using available materials. Improve your position as time permits.

b. In preparing fighting positions for the Dragon, remember:

(1) The launcher must be at least 6 inches above the ground.

(2) Always strive to tie the position into natural cover and concealment, such as bushes, trees, logs, etc.

(3) Positions for the 90-mm recoilless rifle can be constructed like Dragon positions. However, since it takes two men to keep the weapon in operation, the hole will have to be a little longer when firing to the right side of the frontal protection. This lets the assistant gunner work from the right side of the weapon.

REFERENCES:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77
TC 7-24, Antiarmor Tactics and Techniques for Mechanized Infantry, Sep 75 (app C, pages C-10 thru C-12, para 3 and 4)

TASK NUMBER: 071-317-3308

PERFORM EMERGENCY DESTRUCTION PROCEDURES

CONDITIONS:

Given a simulated or combat situation in which capture of yourself or your weapon is imminent, a destruction order, and any of the following antiarmor weapons systems together with entrenching tool, axe, sledge hammer, thermite grenade, gasoline, or demolitions (C4 or dynamite).

1. A TOW launcher (complete) with missile (live or inert).
2. A 106-mm RCLR (complete) with ammunition (live or inert).
3. A 90-mm RCLR (complete) with ammunition (live or inert).
4. A Dragon (complete).
5. A LAW (live or inert).

STANDARDS:

1. Give the priority of destruction for the five weapon systems cited above, and give the priority of destruction for components of each weapon.

2. Explain the methods of destruction for each weapon, its components, and ammunition.

PERFORMANCE MEASURES:

1. **Priority of destruction according to the weapons system and components of each system:**

a. TOW:

(1) Missile guidance system.

(2) Optical/thermal sight.

(3) Traversing unit.

(4) Tripod.

(5) Batteries.

(6) Launch tube.

b. 106-mm RCLR:

(1) 106-mm RCLR gun tube.

(2) Caliber .50 spotter rifle.

(3) Sight.

(4) Tripod base legs.

c. 90-mm RCLR.

(1) 90-mm RCLR gun tube.

(2) Sight.

d. Dragon: Tracker

e. LAW: Entire weapon.

2. **Methods of Destruction:**

IMPORTANT NOTE: Whenever possible, expend ammunition by firing it at the enemy.

a. Mechanical Means. Destroy electrical components and sights by using entrenching tools, axes, sledge hammers, etc.

WARNING: Do not destroy ammunition by mechanical means.

b. Gunfire. Destroy electrical components and sights using small arms.

WARNING: Do not destroy ammunition by small-arms fire.

c. Burning. Destroy all weapons system components and ammunition by using thermite grenades, gasoline, or other flammable material.

d. Explosives. Destroy all weapons system components and ammunition by using double primed explosive charges. See FM 5-25 for more information. (This method must be supervised by your fire team leader or squad leader.)

REFERENCES:

None

RESERVE COMPONENT

TASK NUMBER: 071-319-3601

PERFORM OPERATOR MAINTENANCE ON A CALIBER .50 SPOTTING RIFLE, M8C

CONDITIONS:

In a field location, given a caliber .50 spotting rifle, lubrication order L09-1015-221-10, oil lubricating general purpose (PL), mineral spirits, solvent (CR), aircraft and instrument grease (GL), crocus cloth, rags, warm water, DA Form 2404, and pencil.

STANDARDS:

a. Field strip the weapon.

b. Locate all unserviceable parts.

c. Correct all operator-correctable faults.

d. Log all noncorrectable deficiencies on DA Form 2404.

e. Clean the weapon of foreign particles.

f. Lubricate the weapon with a light coat of oil.

g. Reassemble weapon.

PERFORMANCE MEASURES:

1. Performing General Cleaning Actions.

a. Use mineral spirits to clean or wash grease or oil from all metal parts, except those exposed to powder fouling during firing.

b. Use solvent (CR) to clear armament parts which have been exposed to powder fouling during firing; after cleaning, wipe dry and oil.

c. After all parts are cleaned and dry, apply preservative lubricating oil to all polished metal surfaces.

d. To clean canvas cover:

(1) Shake out and air.

(2) Remove mildew with a dry brush.

(3) Remove dirt, oil, and grease by scrubbing with warm soapy water, rinse well, and dry.

a. Use crocus cloth to remove rust, corrosion, and dirt that a clean cloth will not remove.

f. Clean nameplate and heavily coat with preservative oil.

2. Performing Field Stripping (figure 1).

a. Remove magazine (#1) by pushing release lever forward and withdrawing magazine.

b. Push down and turn bolt guide (#7) retaining pins until the pins are alined with the release slots in the backplate (#4). Disassemble withdraw guide rods (#3) and driving springs (#2) from backplate assembly.

c. Pull out the backplate retaining catch, rotate the backplate counterclockwise until the lugs are disengaged from the receiver (#12) and remove the backplate.

d. Pull and hold the charging handle (#5) in its rearmost position. Pull charging handle plunger outward and rotate it forward until the retaining flange is in line with the dismount slot in the bolt housing assembly (#6). Remove the charging handle.

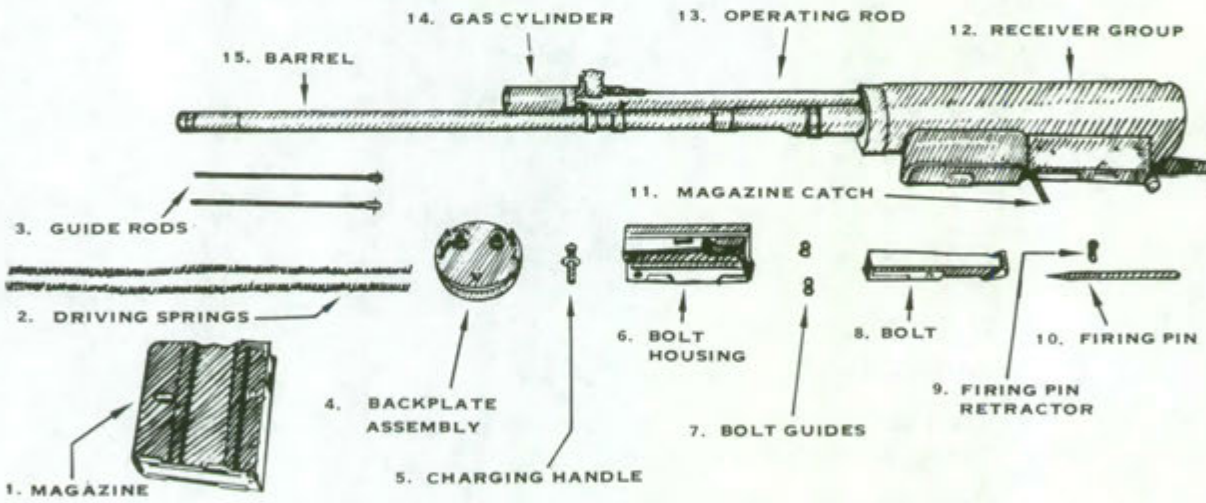


Figure 1.

e. Remove the bolt housing assembly by pushing it to the rear. As the bolt housing assembly slides out, grasp it to prevent the loss of the bolt guides.

f. Remove the bolt guides from the bolt housing assembly.

g. Hold the bolt housing assembly bolt side up and remove the bolt assembly (#8) by lifting it upward while sliding it to the rear.

h. Remove the firing pin retractor (#9) and the firing pin (#10) from the bolt.

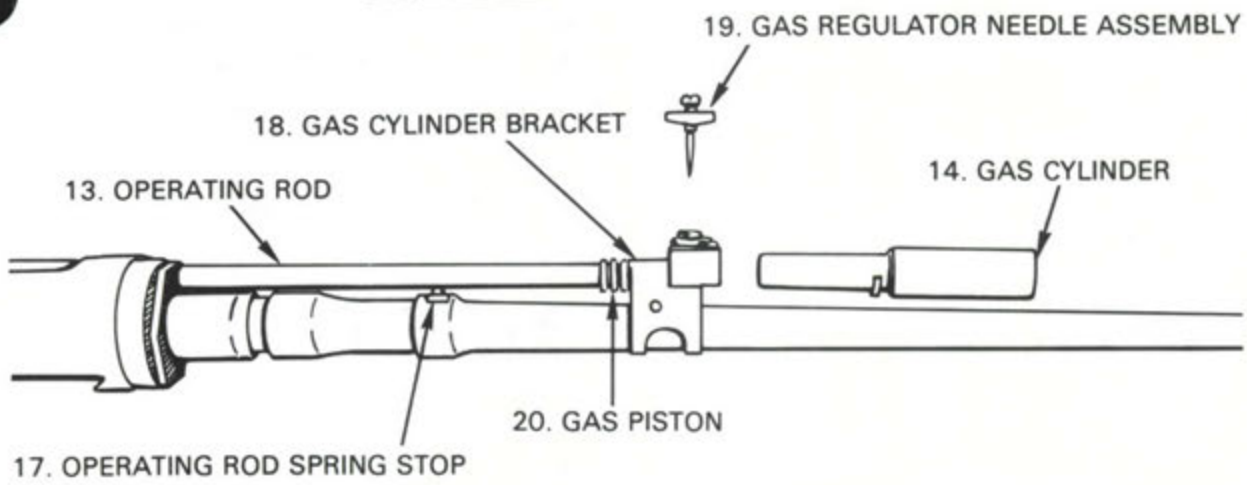


Figure 1. Continued.

i. Disassembly of gas-operating group:

(1) Loosen the gas regulator needle wingnut (#19) and unscrew and remove the gas regulator needle from the gas cylinder block (#14) with a screwdriver.

(2) Turn the gas cylinder one-half turn counterclockwise. Remove the gas cylinder by pulling it toward the muzzle.

(3) Pull or push the operating rod (#13) away from the gas cylinder block a sufficient distance to clean the gas piston (#20).

3. **Performing PM Services.**

a. Inspect the driving springs for weak tension, breaks, or kinks; replace if any of these conditions are present.

b. Inspect the bolt guides, the charging handle, and bolt slide for mutilation or wear. Make an entry on DA Form 2404.

c. Inspect the backplate assembly (#4) for worn retaining catch notch, broken lugs, or loose or damaged disk. Make an entry on DA Form 2404.

d. Remove burrs on the guide rods (#3) and release slots of the backplate assembly with crocus cloth.

e. Apply a light coat of aircraft and instruments grease (GL) to the bolt guide slots of bolt assembly to guide keys of bolt slide.

f. Inspect gas regulator screw, gas regulator screw locking nut, gas cylinder assembly, and gas cylinder body for damage, mutilated threads, or cracked or broken condition. Make an entry on DA Form 2404.

g. Scrape carbon deposits from gas regulator screw, gas cylinder assembly, gas cylinder body, and gas piston on end of operating rod.

h. Lubricate operating rod at entrance into receiver, and operating rod springs and plunger through slot in operating rod, with PL special.

i. With mineral spirits, clean all dirt and dust from magazine tube, base, and follower.

j. Check the magazine for dents and bent lips that could prevent proper feeding. Make entry on DA Form 2404, as appropriate.

k. Apply light lubricating oil to all parts of magazine assembly.

l. Assemble the gun and check functioning of the firing mechanism.

(1) Replace the firing pin in the bolt. Aline the retractor hole in the firing pin with the retractor hole in the bolt.

(2) Replace the pin retractor, small end first with shoulder to the rear.

WARNING: When assembling firing pin to bolt, make certain that firing pin retractor is placed in its slot before bolt assembly is assembled to bolt slide. If retractor is not in slot, the rifle can be fired with bolt incompletely locked, causing injury to troops and damage to the weapon.

(3) Replace the bolt assembly in the bolt housing assembly.

(4) Replace the bolt guides. (These guides are interchangeable.)

(5) Insert the bolt housing assembly into the receiver.

(6) Place the charging handle in the dismount slot of the bolt housing assembly. Press in the charging handle and slide it to the rear until the retaining flange is seated in the slot of the bolt housing assembly.

(7) Pull outward on the backplate retaining catch. Aline the interrupted lugs on the backplate with the gaps on the interrupted lugs of the receiver. Rotate the backplate until the interrupted lugs of the backplate engage the interrupted lugs on the receiver. Release the backplate retaining catch so that it engages the backplate notch.

(8) Pull the bolt to its rearmost position. Insert guide rods and driving springs into their recesses in the backplate and press them forward as far as possible. Allow the bolt to go forward slowly. Seat the guide rod retaining pins by rotating the rods into their recesses in the backplate.

m. Assembly of gas-operating group:

(1) If the operating rod spring becomes disengaged from the operating rod spring stop, reseat it by using the tip of small screwdriver.

(2) Replace the gas cylinder and secure it by turning it one-half turn clockwise.

(3) Screw the gas regulator needle wingnut completely onto the gas regulator needle. Screw the needle and wingnut into the port of the gas cylinder block until handtight. Back off one-half turn counterclockwise and lock the needle by tightening the wingnut.

(4) In some weapons, the one-half turn is not adequate because it does not provide enough gas. The indications of insufficient gas are the failure to strip a fresh round off the magazine, or the failure to eject an expended round. An indication of excess gas is the stubbing of the nose of a round against the forward wall of the receiver or the lip of the magazine. Insufficient gas is the more common of the two; but when either occurs, loosen the wingnut and rotate the needle counterclockwise for an increase or clockwise for a reduction of gas.

Figure 2.

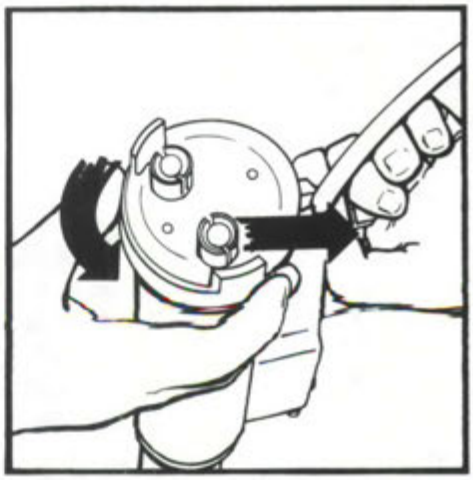


Figure 3.

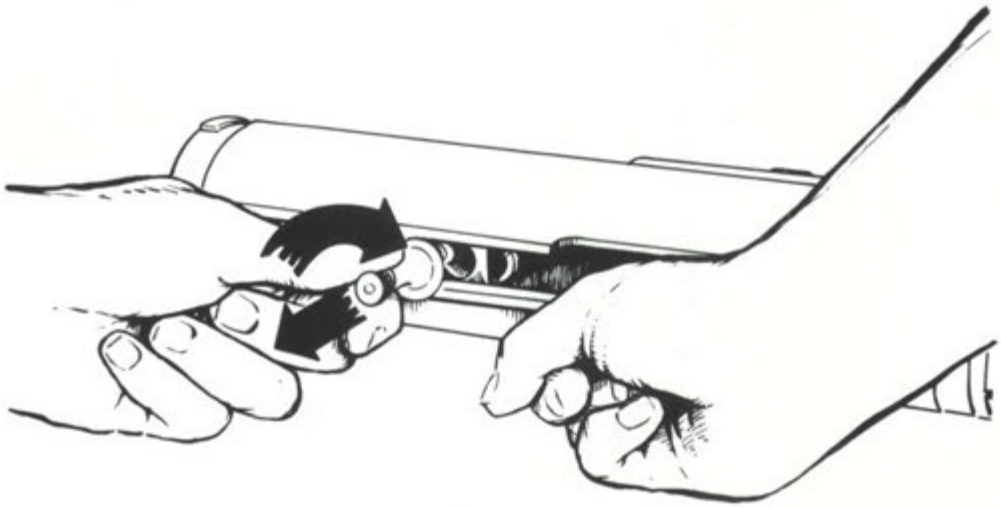


Figure 4.

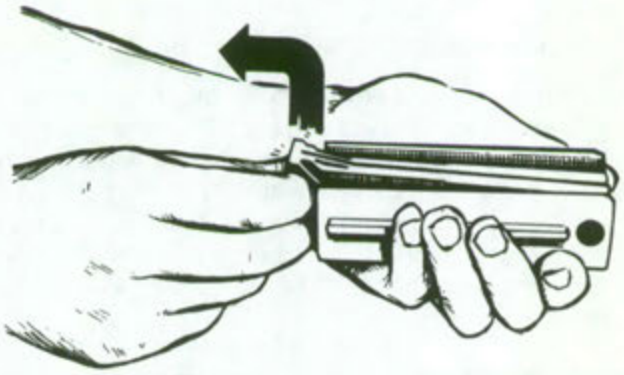


Figure 5.

(5) Insure that deficiencies not correctable by you are entered on DA Form 2404; submit the report to your supervisor.

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle, M40A2, Jul 73 (chap 3, sec II, page 3-2, para 3-3 and 3-4)
TM 9-1000-205-12, Operator and Organizational Manual; Rifle, Recoilless 106-mm; M40A2, C1-8 (chap 3, pages 90-109, para 67-75)
LO 9-1015-221-10, Rifle, Recoilless, 106-mm M40A2 and M14A4, Mount M79 and M92, Tripod M27 and Gun, Spotting Cal .50, M8C, Jul 74

RESERVE COMPONENT

TASK NUMBER: 071-319-3602

LOAD, REDUCE A STOPPAGE, UNLOAD, AND CLEAR THE CALIBER .50 SPOTTING RIFLE, M8C

CONDITIONS:

Given one 106-mm RCLR with sight and caliber .50 spotting gun (NOTE: Both rifle and spotting gun will be clear); a magazine containing spotter-tracer cartridges, caliber .50; a spotting gun adjusting wrench; and a location which allows the firing of caliber .50 ammunition.

STANDARDS:

1. Situation 1: Load the weapon.

2. Situation 2: When stoppage occurs, it must be eliminated by immediate action and the next round fired within 15 seconds.

3. Situation 3: Unload and clear weapon within 5 seconds.

PERFORMANCE MEASURES:

1. **Loading** (figure 1). To load the spotting gun, the gunner depresses the magazine rear catch and inserts a loaded magazine. He then pulls the bolt completely to the rear, taps the bottom of the magazine, and releases the bolt.

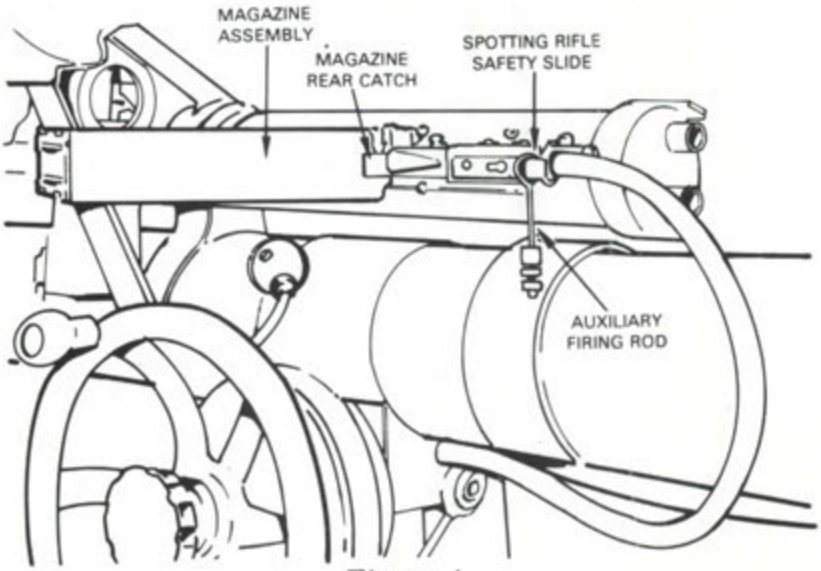


Figure 1.

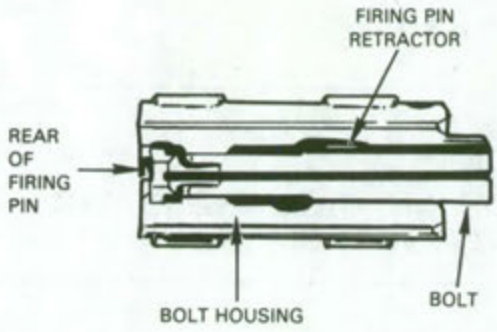


Figure 2.

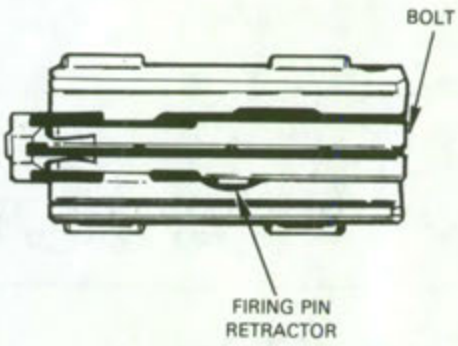


Figure 3.

WARNING: Prior to loading, the gunner must look through the magazine opening to see that the firing pin retractor has been installed (figure 2 and 3). A missing firing pin retractor will cause injury to troops and damage to the weapon.

2. **Unloading and Clearing.**

a. Unloading. To unload the spotting gun, the gunner depresses the magazine rear catch and withdraws the magazine. He then pulls the bolt to the rear to clear the chamber, taking care to catch any ejected cartridges.

b. Clearing. The gunner depresses the magazine rear catch of the spotting gun and withdraws the magazine. He then pulls the bolt completely to the rear and checks the chamber to see that it is unloaded. He calls "ALL CLEAR" when both the recoilless rifle and spotting gun are clear.

3. **Immediate Action.** When the spotting gun fails to fire, the gunner waits 5 seconds and pulls the bolt to the rear. He taps the magazine, releases the bolt, re-lays on the target, and attempts to fire.

4. **Reduction of Stoppage.** If the spotting gun misfires a second time and immediate action fails to reduce the stoppage:

a. The gunner unloads the cartridge and inspects the primer. If the primer is dented, the ammunition is defective and the gunner must load different ammunition into the gun.

b. If the primer is not dented, the gun is not functioning properly. Both gunner and loader determine the cause of stoppage and reduce it if possible.

5. **Stoppages:**

a. For a failure to extract or failure to chamber, gunner checks for:

(1) Worn or broken extractor.

(2) Dirty or rough chamber.

(3) Improper gas adjustment.

(4) A weak magazine spring.

b. For a failure to fire, the gunner checks for:

(1) Unseated or unlocked bolt.

(2) Broken or maladjusted firing cable.

(3) Defective or broken firing pin.

(4) Defective ammunition.

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle, M40A2, Jul 73 (chap 2, sec III, page 2-10, para 2-8 -- 2-12)
TM 9-1000-205-12, Operator and Organizational Maintenance Manual: Rifle, Recoilless, 106-mm, M40A2, C1-8, Mar 59 (chap 2, page 48, para 26)

RESERVE COMPONENT

TASK NUMBER: 071-319-3603

PERFORM OPERATOR MAINTENANCE ON A 106-MM RCLR

CONDITIONS:

Given a 106-mm RCLR, M40A2, basic issue items, rifle bore cleaner, 3/16-inch Allen wrench, ethyl alcohol, mineral spirits, lens tissue, lubricating oil PL (Special), rags, warm water and soap, olive drab enamel #24087, small paint brush, crocus cloth, two new BA-30s (FSN 6135-120-1202), one 3-volt lamp (FSN 6240-635-9800), TM 9-1000-205-12, and DA Form 2404.

STANDARDS:

1. Perform operator's preventive maintenance IAW performance measure 1 below:

a. Before travel.

b. Before firing.

c. For sighting and fire control instruments.

2. When time permits, a thorough cleaning to include:

a. Field stripping the weapon.

b. Locating all unserviceable parts.

c. Correcting all operator-correctable faults.

d. Logging all noncorrectable faults on DA Form 2404 and submitting to your supervisor.

e. Reassembling the weapon.

3. Upon inspection, after 1 and 2 above, weapon should be clean and lubricated with a light coat of oil.

PERFORMANCE MEASURES:

1. Operator's Daily Preventive Maintenance Services.

a. Before traveling checks:

(1) Elevating cradle locking yoke: insure that it is locked and the 106-mm rifle is secured into the mount.

(2) Base locking lever: turn in a clockwise direction as far as it will go.

(3) Locking clamps and traveling locks: check base left and right locking clamps and traveling lock; make certain that they are secure and locked.

b. Before firing checks:

(1) Barrel and chamber: clean and inspect vent assembly chamber, and inside and outside of barrel for cracks, burrs, bulges and damage of interrupted threads.

(2) Sighting and fire control instruments: open telescope cover; visually inspect telescope for dents, broken lens, or mutilation of components. Check for the presence and condition of the instrument lights.

(3) Breechlock group: check for smoothness of operation by opening and closing breech several times; weapon should cock as breechlock is opened. Inspect extractor and cartridge case detent assembly for proper functioning and serviceable condition.

(4) Firing and vernier elevating shaft knob, firing cables and trigger housing group: dry fire 106-mm rifle and spotting gun; action produced by the firing mechanisms must be very clear and distinct.

(5) Elevating handwheel and housing group: check for smoothness of operation throughout entire range.

(6) Traversing handwheel: check traversing mechanism for smoothness of operation; check free traverse shifting shaft assembly for proper operation.

c. Inspect and clean sighting and fire control instruments:

(1) General:

(a) Dry exposed surfaces of optics.

(b) Use only lens tissue or soft cloth for wiping optical parts.

(c) Remove oil and grease from optical surfaces by applying alcohol with lens tissue and then wiping gently with a clean lens tissue or soft cloth.

(d) Remove dust from optical parts by brushing lightly with a clean camel's hair brush.

(e) Spot paint scratched, chipped, or worn surfaces exposing bare metal.

(f) Check all graduations, lettering, and indices to insure that they are clear and distinct.

(2) Elbow telescope, M92F:

(a) Examine level vial to insure that it is not broken or loose in the housing.

(b) Look through eyepiece and objective end of telescope for dirt, smears, scratches, digs, fungus, and chips.

(c) Examine reticle illuminating window to insure that it is unbroken, securely sealed, and fastened to body of telescope.

(d) Examine rubber eyeshield for cracks, fungus, and dirt; eyeshield should be properly attached to telescope.

(3) Telescope mount, M90: turn cant correction knob over entire range of movement and rotate boresight correction screws; motion should be smooth with corresponding movement of driven member for movement of knobs or screws.

(4) Instrument light, M36 or M42:

(a) Examine tube for dents, breaks, and twisted or damaged parts.

(b) Examine inside of tube for corrosion.

(c) Inspect rubber insulation of wire for breaks or deterioration.

(d) Cap must fit securely to tube: lamp bracket block, and hand light clip (M42) allows hand light and lamp bracket to be secured to tube.

(e) Install batteries, turn light on, and turn rheostat knob: lamps should light; illumination should increase or decrease with operation of rheostat.

(5) Instrument light mounting clamp:

(a) Visually examine to insure that it is not bent or twisted out of shape.

(b) Insure that wingnut rotates properly on its threads and that it will not unscrew from the eyebolt.

(6) Telescope and mount cover:

(a) Examine cover to insure that it is not damaged and that the gasket is securely attached.

(b) Lift and lower access lid and cover; check for smooth operation and to insure that cover is held in the open position by stud and retaining clip.

(c) Insure that locking latch moves freely and will lock cover assembly securely in closed position.

2. Field Stripping. Field stripping is the disassembly of the 106-mm recoilless rifle breech mechanism.

a. **Disassembly (Figure 1).**

(1) Opening the breech. Open the breech by depressing the breech operating lever and rotating it clockwise 180 degrees. Examine the chamber to be certain the rifle is clear. Close, but do not lock the breech.

(2) Removal of breech operating lever assembly. Using the 3/16-inch Allen wrench or the spotting gun adjusting wrench, remove the operating lever retaining screws from the hinge block. Support the hinge with one hand and lift the operating lever up about 2 inches. Take out the Woodruff key. Remove the operating lever from the hinge block.

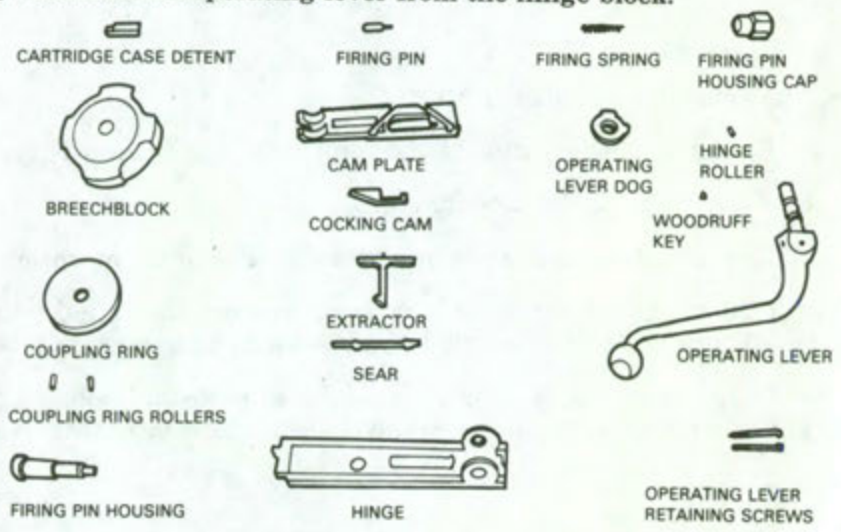


Figure 1.

(3) Removal of breechblock and hinge assembly. Grasp the hinge with the left hand and support the operating lever dog with one finger. Hold the firing pin housing cap with the right hand and remove the breechblock and hinge assembly. Lift out the operating lever dog and hinge roller. Place the breechblock and hinge assembly face down on a flat surface with the extractor protruding over the edge of the surface (figure 2).

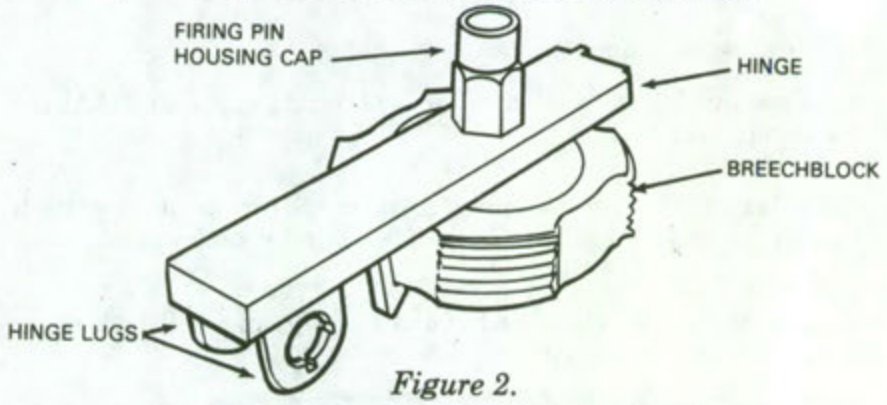


Figure 2.

(4) Removal of firing pin assembly. Using the spotting gun adjusting wrench, remove the firing pin housing cap; then raise slightly and remove the extractor assembly. Lift out the firing pin spring. Turn the breechblock and hinge assembly over and allow the firing pin to fall out. Place the breechblock and hinge on a flat surface.

(5) Removal of hinge and sear. Rotate the hinge about 45 degrees to the locked position. Pull the sear out about 2 inches, or until it clears the firing pin housing. Lift the hinge and sear off the breechblock. Remove the sear from the hinge.

(6) Removal of cam plate. Remove the cocking cam. Lift the cam plate from the firing pin housing and breechblock assembly.

(7) Removal of firing pin housing. Lift the breechblock from the firing pin housing.

(8) Removal of coupling ring assembly. Take out the coupling ring roller. Remove the coupling ring by inserting the spotting gun adjusting wrench into a coupling ring roller recess and prying out.

(9) Removal of cartridge case detent. Press the forward end of the detent into its recess in the vent bushing. At the same time pry it out of its recess by using the spotting gun adjusting wrench as a lever against the fulcrum end of the detent (figure 3).

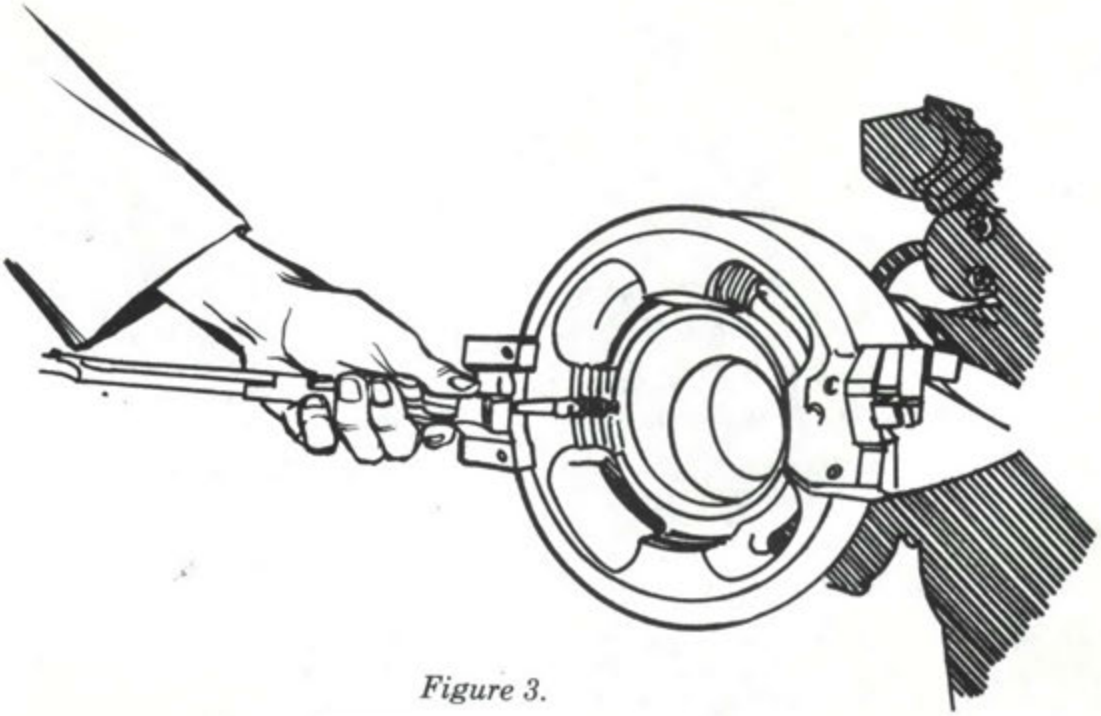


Figure 3.

b. **Assembly.** Assemble the breech mechanism in reverse order of disassembly.

(1) Position the detent fulcrum (number up) in the detent recess in the vent bushing so that the tip end of the detent is facing the hingeblock (figure 4). Rotate the detent about 45 degrees to the left until action of the detent spring no longer causes movement of the detent. Take out the detent and put the fulcrum (number down) into the recess so that the tip end of the detent is toward the chamber. Apply pressure on the fulcrum end so that the detent slips into place (figure 5).

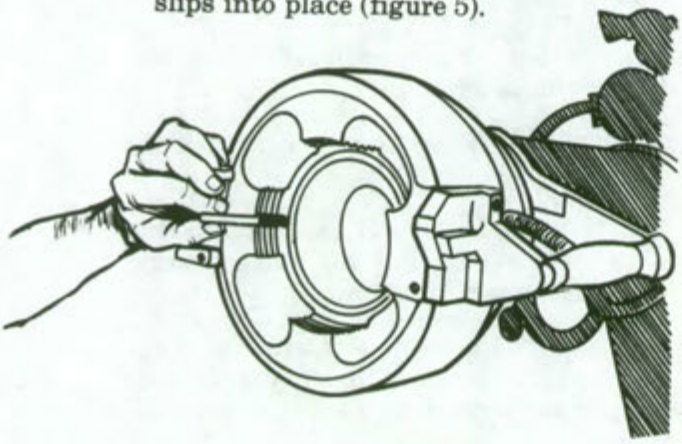


Figure 4.

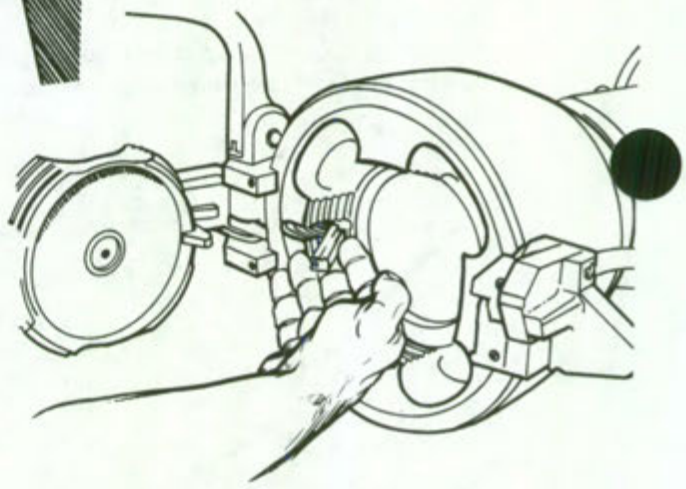


Figure 5.

(2) Put the coupling ring into the recess of the breechblock.

(3) Aline the coupling ring roller recesses in the coupling ring and breechblock. Replace the coupling ring rollers.

(4) Replace the firing pin housing and place the operating lever dog under it to hold it in place.

(5) Position the breechblock so that the word "HINGE" is over the edge of the surface.

(6) Replace cam plate so that the coupling ring rollers engage in the cam grooves. Insure that the word "HINGE" on the breechblock is visible through the extractor recess in the cam plate.

(7) Position the cocking cam and its projection in the small hole in the cam plate. Make sure the cam has its inclined surface entering the rectangular hole in the firing pin housing.

(8) Insert the sear (firing pin notch leading) about 3½ inches into the hole in the trigger end of the hinge.

(9) Replace the hinge and sear, making sure the firing pin housing protrudes through the hinge and hinge lugs are projecting over the edge of a flat surface.

(10) Hold the hinge ¼ inch up from the breechblock and slide the sear into the hole of the firing pin housing.

(11) Insert the firing pin into the firing pin housing with the point leading and the groove on the firing pin parallel with the long end of hinge.

(12) Rotate the sear until the firing pin falls and protrudes through the hole in the face of the firing pin housing.

(13) Replace the firing pin spring. Rotate the hinge 45 degrees from the locked position. Raise the hinge slightly and insert the extractor assembly. Screw on the firing pin housing cap.

(14) Turn the breechblock face up. Put the hinge roller in the operating lever dog. Position the operating lever dog so that its flat surface rests on the cam plate and the hinger roller is in the T-shaped slot of the cam plate.

(15) Support the breechblock and hinge by placing the right hand on the firing pin housing cap. Holding the operating lever dog in place with one finger of the left hand, position the breechblock with the hinge lugs in the hinge block.

(16) Insert the operating lever into the hinge about 1½ inches. Aline the sear for the Woodruff key in the operating lever with the keyway in the hinge block. Seat the Woodruff key in the operating lever and push the lever into the hinge block until its flange rests on the hinge block.

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle, M40A2, C1, Jul 73 (chap 2, sec I, page 2-1, para 2-2)
TM 9-1000-205-12, Operator and Organizational Maintenance manual, 106-mm RCLR, C1, Jul 73 (pages 16 and 17, para 54 and 54.1 in C1)

RESERVE COMPONENT

TASK NUMBER: 071-319-3604

LOAD, REDUCE A STOPPAGE, UNLOAD, CLEAR 106-MM RCLR

CONDITIONS:

Given a ground/vehicle-mounted 106-mm RCLR with a sight and caliber .50 spotting gun, the rifle boresighted and spotting gun alined; a magazine containing a spotter-tracer cartridge (caliber .50), three inert 106-mm rounds, and one each HEAT, HEP-T, and APERS-T; a gunner and loader.

STANDARDS:

1. Situation 1: Loader must load the rifle in sequence, with an inert round appropriate to the fire command issued, within 20 seconds.

2. Situation 2: When a stoppage occurs, loader must eliminate stoppage by using immediate action.

3. Situation 3: Loader must unload and clear weapon in sequence, within 20 seconds.

PERFORMANCE MEASURES:

1. Loading. The team must accomplish the following actions in sequence, within 20 seconds, on receipt of alert:

a. Loader: take a position on the right of the breech, facing the backblast area; open the breech.

b. Gunner: take a position on the left of the rifle, facing the sight.

c. Loader: on receipt of type ammunition.

(1) Repeat the fire command element.

(2) Select the type round designated by the fire command element.

(3) Insert round into chamber and seat it firmly.

(4) Close and lock the breech.

(5) Inspect backblast area to insure that it is clear. **(NOTE: The backblast area will be clear.)**

(6) Call "UP."

2. Unloading and Clearing. The team must accomplish the following actions, within 20 seconds of having received the command, "CEASE FIRING," "END OF MISSION," or "OUT OF ACTION":

a. Loader, in sequence:

(1) Open breech and remove round.

(2) Call "106 CLEAR."

(3) Close the breech.

b. Gunner, in sequence:

(1) Clear spotting gun.

(2) Call "ALL CLEAR," after loader has indicated that the 106-mm RCLR is clear.

(3) Lower sight cover.

3. Immediate Action. Immediate action is the unhesitating application of a probable remedy to reduce a stoppage without considering the cause of the stoppage.

a. When the rifle fails to fire, the gunner releases the firing knob and calls "MISFIRE." The loader repeats "MISFIRE" and waits 1 minute. Then the loader unlocks and relocks the breech and calls "UP." The gunner again attempts to fire.

b. Should the rifle still fail to fire, the gunner releases the firing knob and calls "MISFIRE." The loader repeats "MISFIRE" and again waits 1 minute. Then the loader opens the breech and unloads the rifle.

4. Reduction of Stoppages. If a rifle has misfired a second time and immediate action fails to reduce the stoppage, it is necessary to apply additional measures.

a. After unloading the round, the gunner and loader must consider the following questions:

(1) What type of stoppage is this?

(2) What caused the stoppage?

(3) What parts failed to function?

(4) What corrective action should be taken?

b. Check the primer of the round for an indentation from the firing pin. If an indentation is present, the cause of the misfire is in the round and it must be destroyed by EOD troops or according to unit SOP. If the primer is not indented, examine the rifle to determine the cause of the malfunction. **(NOTE: Handle all misfired rounds carefully.)**

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle, M40A2, Jul 73 (chap 3, sec IV, page 3-8, para 3-9 thru 3-11)
TM 9-1000-205-12, Operator and Organizational Maintenance Manual: Rifle, Recoilless, 106-mm M40A2, C1-8, Mar 59 (chap 2, page 48, para 26)

RESERVE COMPONENT

TASK NUMBER: 071-319-3605

ENGAGE TARGETS WITH THE 106-MM RCLR

CONDITIONS:

During daylight, on a 1,000-inch subcaliber range, given a boresighted 106-mm RCLR with caliber .30 subcaliber device, 98 rounds of caliber .30 ammunition, a requirement to fire course C for qualification firing, and equipment as outlined in FM 23-82 for course C.

STANDARDS:

Fire course C (tables 7-1 and 7-2) once within 25 minutes; obtain a minimum score of 135.

PERFORMANCE MEASURES:

1. **Range Determination.**

a. The primary method of estimating range with the RCLR is to use the stadia lines. Stadia lines are curved lines inscribed on the reticle. They measure range based upon the size of the average tank.

(1) Tank is broadside to the rifle location (figure 1).

(2) Tank is firing directly toward or away from the gun position (figure 2).

(3) Tank is at the oblique and the length appears greater than the width (figure 3).

(4) The tank is at the oblique and the width appears greater than the length (figure 4).

b. The primary method of determining range with the RCLR is to use the spotting gun. When properly alined, the gun has a trajectory that closely matches the RCLR trajectory up to 1,500 meters.

2. **Adjustment of Fire.**

a. Spotting-gun method is the primary method of fire adjustment up to 1,100 meters. The gunner fires the spotting gun and notes the point on the sight reticle where the burst appears (figure 5), and adjusts the lay of the weapon until that point appears to be centered on the target's visible center of mass (figure 6). He again fires the gun. If he receives a hit, he immediately fires the major caliber round.

b. Burst-on-target method may be used when the spotting gun is inoperative or the range is greater than 1,100 meters but not more than 2,400 meters.

c. Observation-of-tracer method is used when the gunner is adjusting his own fire on a target firing HEP-T or HEAT ammunition.

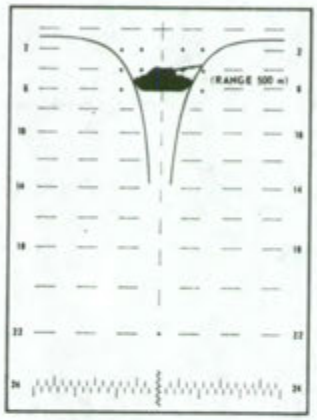


Figure 1.

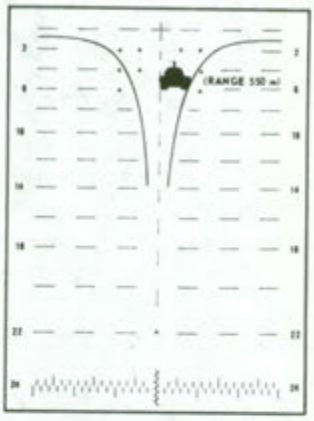


Figure 2.

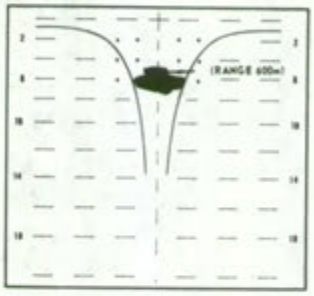


Figure 3.

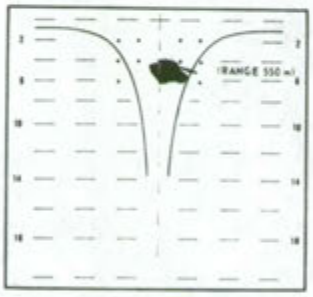


Figure 4.

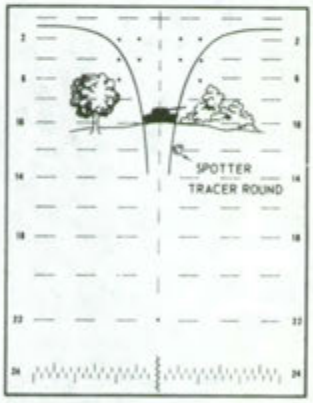


Figure 5.

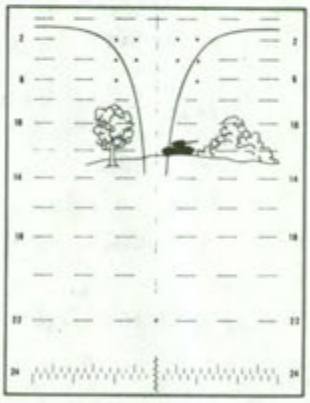


Figure 6.

3. When training crews to engage targets with the 106-mm RCLR, live fire or the subcaliber device may be used.

REFERENCE:

FM 23-82, 106-mm Recoilless Rifle, M40A2, Jul 73 (chap 5, page 5-2, para 5-3; page 5-12, para 5-20)

TASK NUMBER: 071-319-3606

CONDUCT 106-MM RCLR WEAPON SYSTEM ALINEMENT

CONDITIONS:

On a firing range or an area suitable for live fire, given a 106-mm RCLR complete, thread or similar material, two large rubber bands, boresight disc, screwdriver, one HEAT or HEP-T round, six caliber .50 spotting rounds, spotting gun adjusting wrench, and a target positioned approximately 1100 meters from the gun.

STANDARDS:

Within 15 minutes, aline the weapon system so that, when fired at a target at 1100 meters, the service round impacts on the same point as the spotting gun rounds.

PERFORMANCE MEASURES:

Weapon system alinement is the process of adjusting the line of sight of the telescope sight to a definite relationship with the line of sight through the axis of the 106-mm rifle bore and the spotting rifle bore.

1. Boresighting the 106-mm rifle.

a. Insure the 106-mm rifle is on level ground (vehicle- or ground-mounted). Insure the rifle is locked to the mount and the telescope is firmly attached to its bracket.

b. Stretch two pieces of thread (preferably black) or similar material tightly across grooves provided on muzzle of 106-mm rifle and secure with strap, tape, rubber band, etc. (figure 1a). Insert a boresight disc in the chamber (figure 1b).

NOTE: If a boresight disc is not available, insert an empty cartridge case with primer and firing plug removed in rifle chamber.

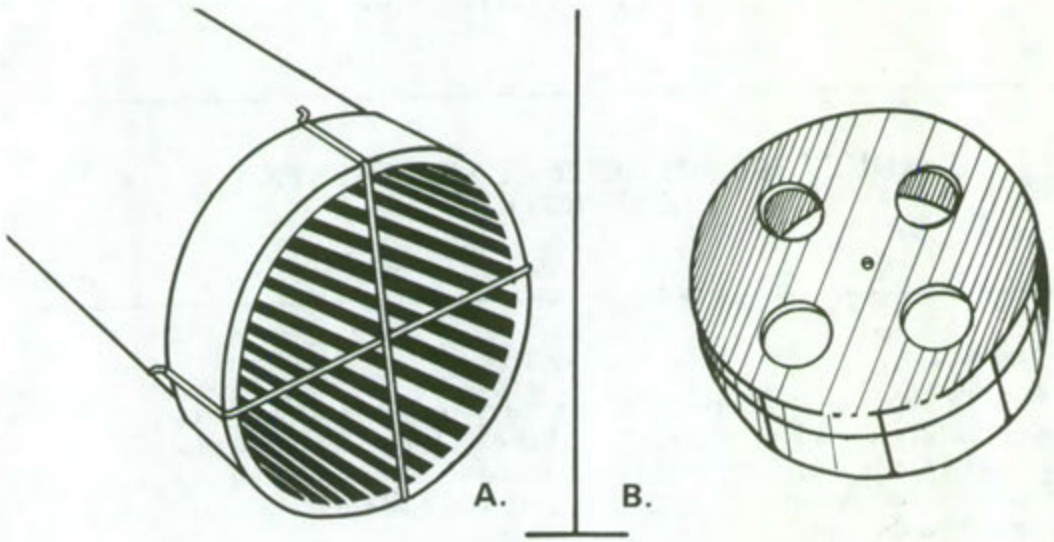


Figure 1.

c. Select an aiming point at a distance between 1000 and 1200 meters (preferably 1100 meters). The target selected should have clearly defined horizontal and vertical lines, so that a definite point can be established. Sight through the boresight disc or the cartridge case primer hole and aline the muzzle crosshair on the aiming point by elevating and traversing the rifle (figure 2).

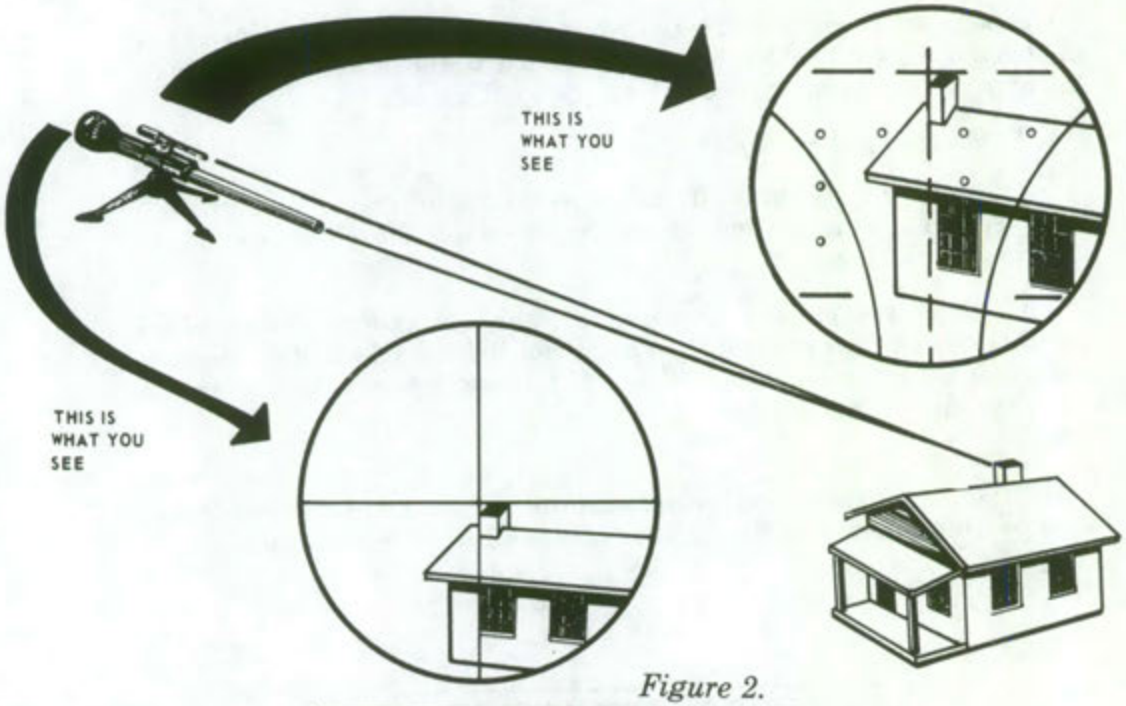


Figure 2.

d. Check leveling bubble on the sight. If not centered, adjust with cant correction knob (figure 3a) on the telescope mount until bubble on crosslevel vial of elbow telescope is centered. Sight through elbow telescope to see if boresight cross on reticle is alined on aiming point. If not, open boresight correction screw access lid (figure 3b) on cover and rotate EL (elevator) and AZ (azimuth) boresight correction screws until boresight cross on reticle is alined on aiming point.

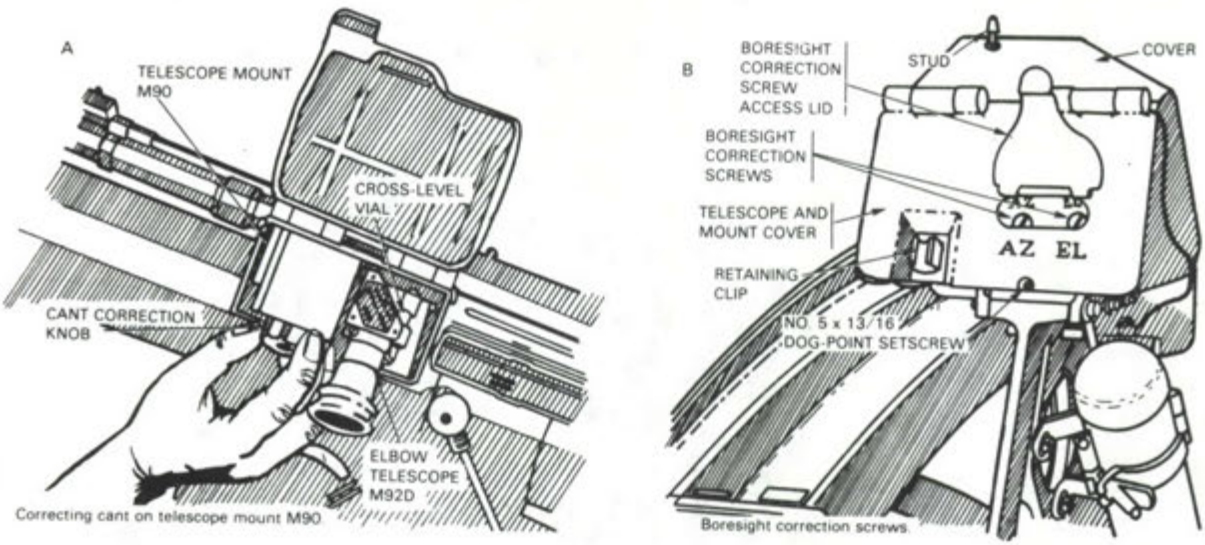


Figure 3.

2. Alining the caliber .50 spotting gun.

a. Fire one round of HEAT or HEP-T at a target between the ranges of 1000 and 1200 meters.

b. Then fire two rounds from the spotting gun with the same sight picture.

c. If rounds from spotting gun do not strike at the point of impact of the service round, adjust spotting gun by rotating the elevation and azimuth cams with the spotting gun adjusting wrench (figure 4).

d. Fire two more rounds with the spotting gun. If the strike of the spotting round coincides with the center of burst of the service round, the weapon system is alined. If not, repeat b and c above.

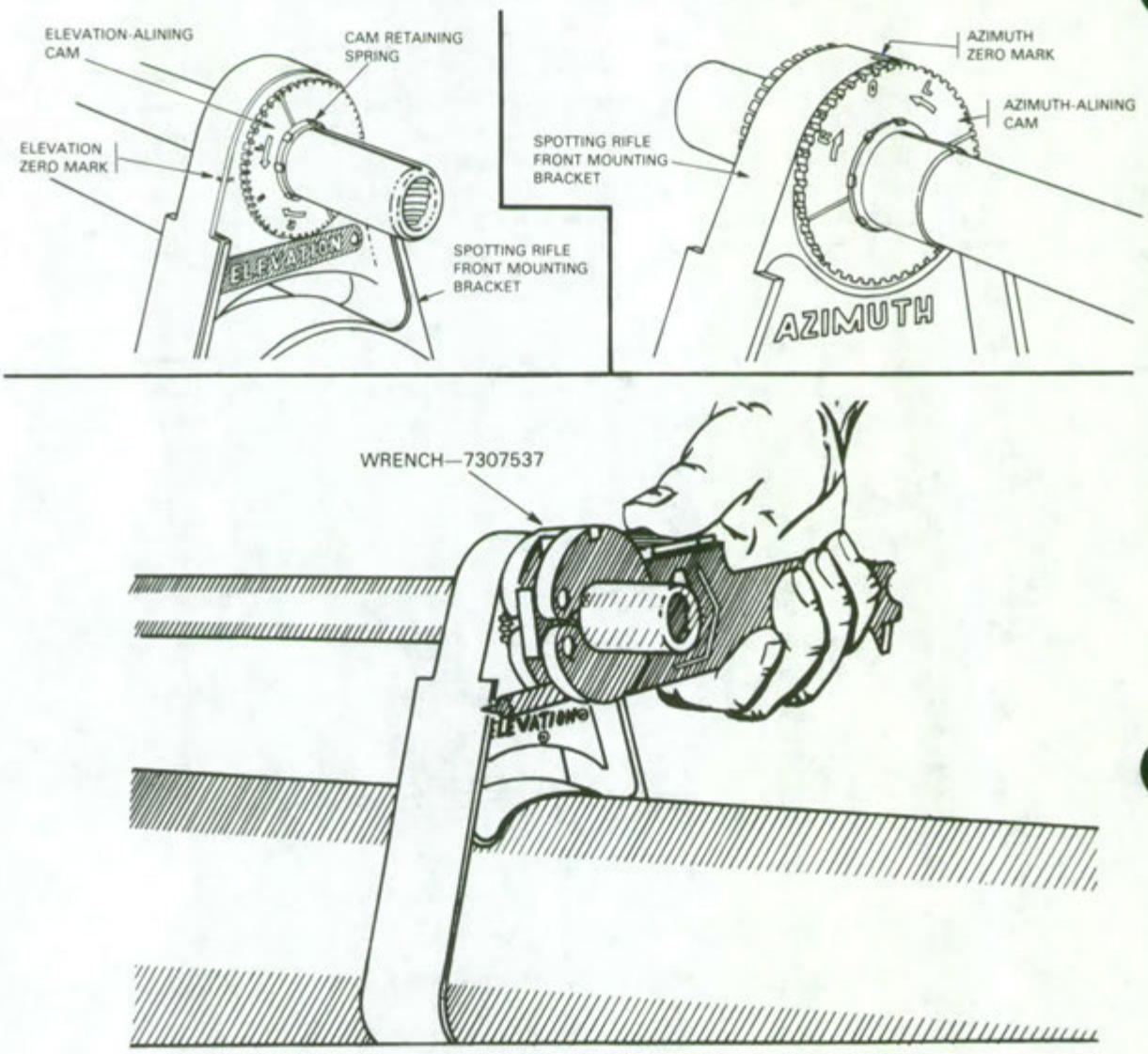


Figure 4.

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle, M40A2, Jul 73 (chap 5, page 5-18, para 5-25 and 5-26)

RESERVE COMPONENT

TASK NUMBER: 071-319-3608

CONSTRUCT 106-MM RCLR POSITION (MOUNTED)

CONDITIONS:

In daylight, given load-bearing equipment with bayonet, scabbard, intrenching tool, poncho, and M16A1 rifle, and a vehicle-mounted 106-mm RCLR; the specific location and sector of fire of the position to be constructed (NOTE: Position should afford natural cover such as mounds of earth, stumps, trees, rocks, etc., and observation and fields of fire); and 3 hours to complete construction.

NOTE: Time may be adjusted when soil and weather conditions make construction of positions particularly difficult.

STANDARDS:

Within time specified, completed position must meet the following specifications.

1. Cover - affords protection from direct frontal small-arms fire.

2. Location and construction of the position allows you to track a target across your entire sector of fire.

PERFORMANCE MEASURES:

NOTE: This is a team task and you will be assisted by the remainder of the team.

Construction of a 106-mm RCLR position (mounted) will generally follow this sequence:

1. The 106-mm squad leader selects the exact location of the weapon after the sector of fire is designated by the company commander.

2. Partially clear fields of fire within your sector and dig a hasty position for minimum protection. Be careful not to destroy natural camouflage around your position. Save grass clumps, etc., for camouflage later.

3. Next, dig in (figure 1).

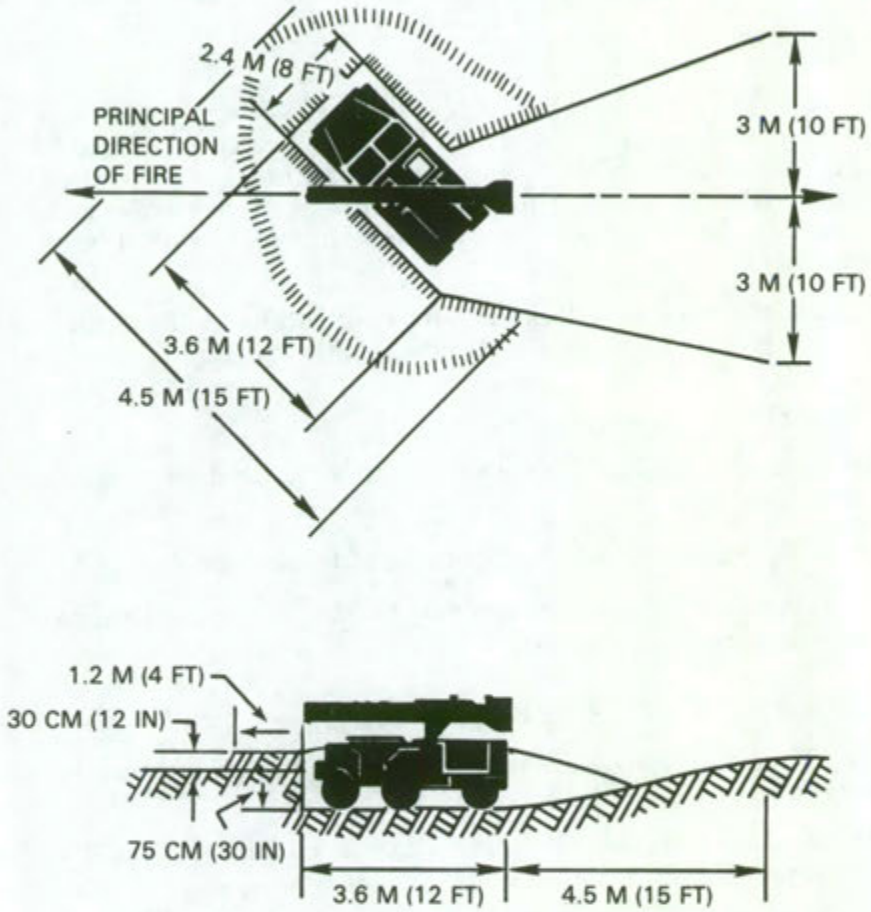


Figure 1. Emplacement for 106-mm rifle.

4. Complete clearing fields of fire. Clear only what is absolutely necessary. Get in firing position and check observation and fields of fire. Remember, you can always improve your position.

REFERENCE:

FM 5-15, Field Fortifications, Jun 72 (chap 2, para 2-10, page 2-14)

TASK NUMBER: 071-319-3609

CONSTRUCT 106-MM RCLR POSITION (DISMOUNTED)

CONDITIONS:

In daylight, given load-bearing equipment with bayonet, scabbard, intrenching tool, poncho, an M16A1 rifle, and a vehicular-mounted 106-mm RCLR; the specific location and sector of fire of the position to be constructed (NOTE: Position should afford natural cover such as mounds of earth, stumps, trees, rocks, etc., observation and fields of fire); logs to construct overhead cover; and 3 hours to complete construction. NOTE: Time may be adjusted when soil and weather conditions make construction of positions particularly difficult.

STANDARDS:

Within time specified completed position must meet the following specifications:

1. Cover - Affords protection from direct frontal small-arms fire (by means of a natural or manmade frontal parapet one helmet high and at least one M16A1 length deep).

2. Location and construction of the position allows you to track a target across your entire sector of fire.

PERFORMANCE MEASURES:

NOTE: This is a team task and you will be assisted by the remainder of the team.

Construction of a 106-mm RCLR position (dismounted) will generally follow this sequence:

1. The squad leader selects the exact location of the weapon after the sector of fire is designated by the company commander.

2. Partially clear fields of fire within sector and dig a hasty hole for minimum protection. Insure that natural camouflage around position isn't destroyed. Save grass clumps, etc., for camouflage later.

3. Next, dig in (figure 1 thru 4). If a natural frontal parapet is available, carry away and camouflage dirt from the hole; if not, make the frontal parapet with hole dirt. The barrel of the 106-mm rifle should clear the parapet, enabling it to fire to the front.

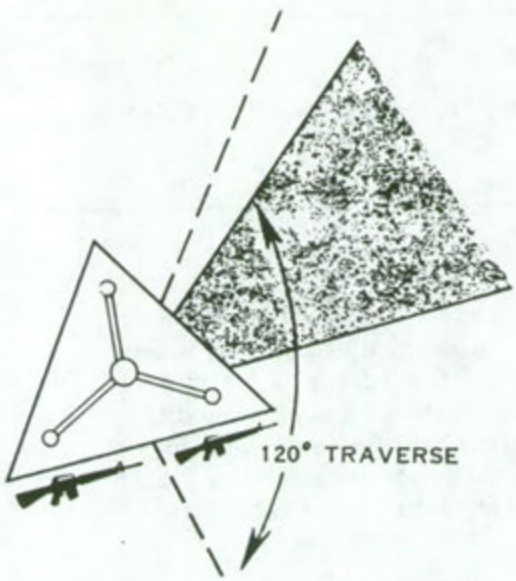


Figure 1.

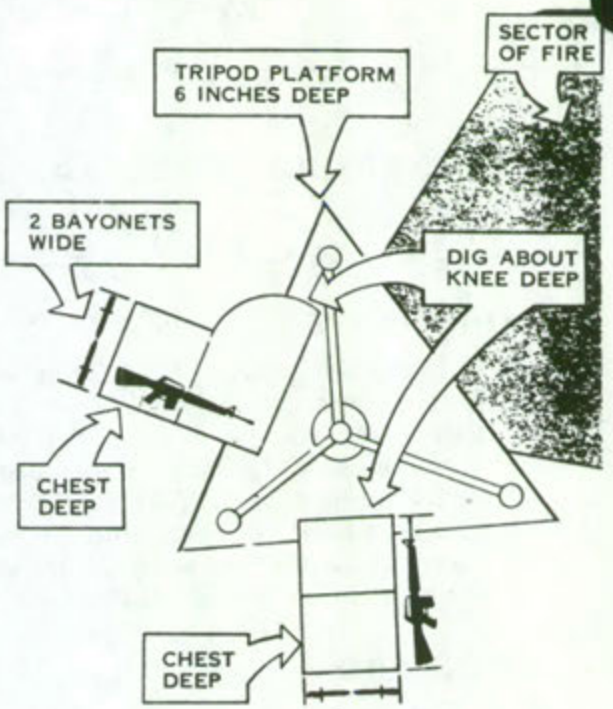


Figure 2.

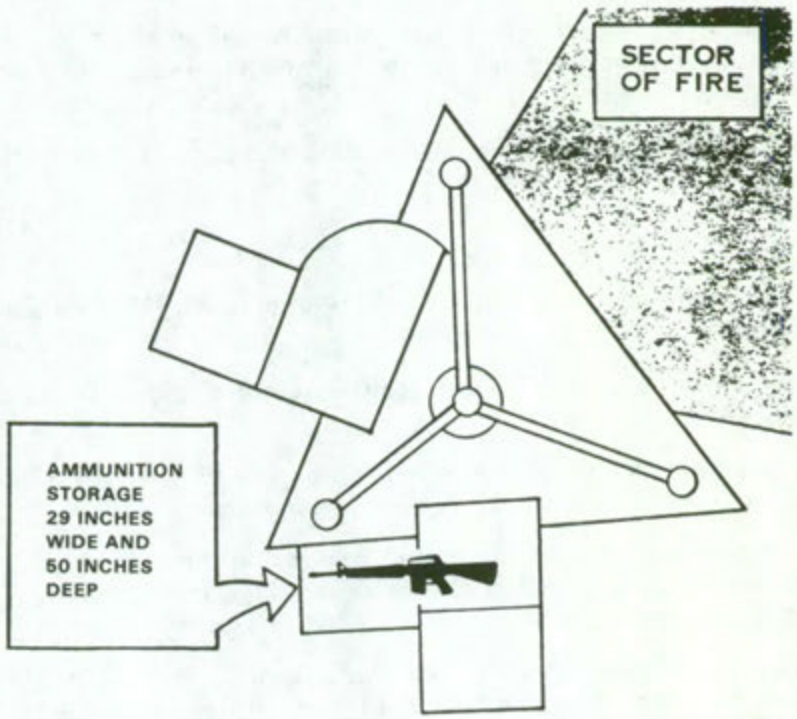


Figure 3.

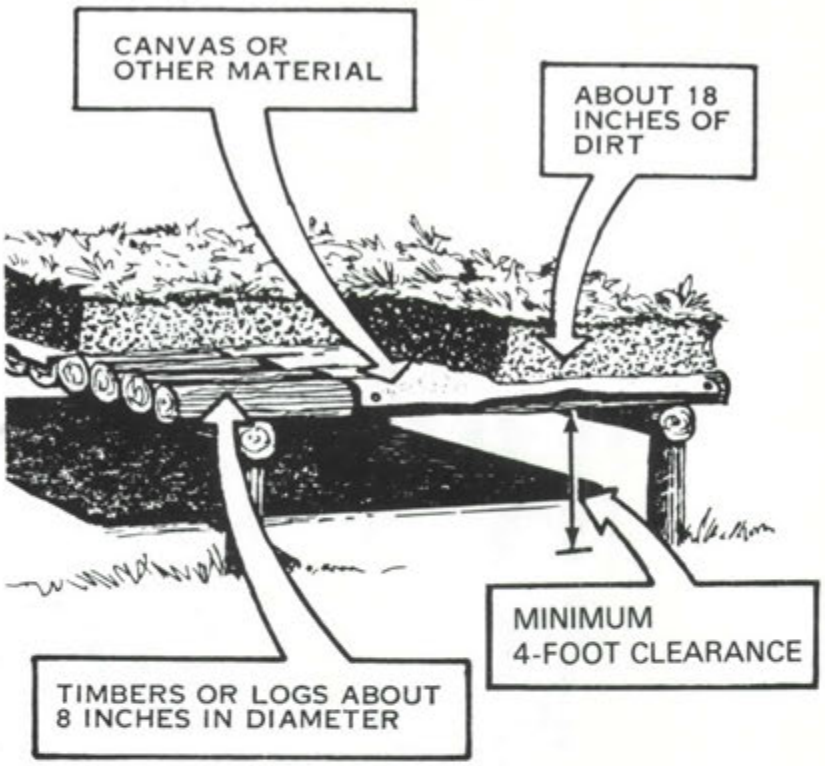


Figure 4.

4. Complete clearing fields of fire. Clear only what is absolutely necessary. Get in firing position and check observation and fields of fire.

5. Construct overhead cover. Use logs, planks, etc., which will support at least 12 inches of dirt. Dig cave-like area big enough to get under.

6. Improve position. Dig grenade sump at 45-degree angle and at least 2-feet deep. Slope the floor of the foxhole and dig shallow trench to allow for drainage. Construct alternate and secondary positions as directed. Remember, you can always improve your position.

REFERENCE:

TC 7-24, Antiarmor Tactics and Techniques for Mechanized Infantry, Sep 75 (app B, page B-13 thru B-15)

RESERVE COMPONENT

TASK NUMBER: 071-319-3610

CAMOUFLAGE/CONCEAL 106-MM RCLR POSITION

CONDITIONS:

In daylight, given load-bearing equipment with bayonet, scabbard, intrenching tools, and poncho; the specific position to be camouflaged; and 1 hour to complete camouflaging.

NOTE: Time may be adjusted when conditions make camouflage of positions particularly difficult.

STANDARDS:

Within time specified, camouflaged position must meet the following specifications:

Position cannot be easily detected from the front (e.g., blends with surroundings well enough that an approaching soldier approximately 35 meters to the front (hand grenade range) cannot detect it) and is protected from aerial observation (all fresh dirt and other evidence of digging are covered with grass, leaves, etc., to blend with surrounding vegetation). Camouflage net or brush is used to conceal the hole.

PERFORMANCE MEASURES:

1. Approach the position only from the rear, insuring that a visible trail is not left. Circle the position when moving to the front so that a trail does not point out the position.

2. Do not litter the area or make unnecessary noise.

3. Do not disturb vegetation not used in constructing or camouflaging the position. (Be particulary careful with a vehicle, if you are a dirver, to insure that the vehicle does not leave a trail pointing out the position.)

4. During camouflage:

a. Place sod from position on the parapet in such a manner that it looks natural and will have a good chance of growing.

b. If additional vegetation must be used to break up the outline of the parapet, obtain some (similiar to that found near your position) from far to the rear of your position with root structure intact, if possible. Do not use so much vegetation that the position has more than the surrounding area. Camouflage holes or cuts from which vegetation was removed.

c. If the position is covered, camouflage it in the same manner as the parapet. If it's not covered, you must camouflage the position using camouflage nets or available brush, branches, etc., so that it's not visible from above.

d. Replace dying foliage constantly. Attempt to get sod, small trees, plants, etc., used as camouflage to grow, so that position will improve as time passes. Remember, you can always improve your position.

5. After camouflaging:

a. Insure that the ground behind and to the immediate front of the 106-mm RCLR position (about 50 meters) is free of leaves and loose dirt so that when the weapon is fired, its signature will not be so obvious or start fires.

b. Do not leave any evidence of digging. Do not leave equipment laying around. Everything must be concealed or camouflaged.

REFERENCES:

FM 5-15, Field Fortifications, Jun 72 (chap 2, page 2-28 thru 2-31, para 2-19 thru 2-22)

RESERVE COMPONENT

TASK NUMBER: 071-319-3611

CONTROL 106-MM RCLR SQUAD FIRES

CONDITIONS:

Situation 1: During daylight, as a 106-mm RCLR squad leader, given one vehicle-mounted 106-mm RCLR with a complete crew and a mission to cover a specific sector of fire (armor kill zone).

Situation 2: Targets move into your sector of fire.

STANDARDS:

Situation 1: The squad leader will establish means of fire control to include:

a. Coordinating for mutual antiarmor weapon support and security of its crew members.

b. Informing members of:

(1) Sectors of fire.

(2) Target reference points (TRP).

(3) Phase lines.

(4) Fire patterns.

(5) Engagement priorities.

c. Insuring range card data is complete and accurate. (See Task: **Prepare an antiarmor range card (106-mm RCLR).**

Situation 2: The squad leader will give fire commands, subsequent fire commands, and corrections so that the crew knows what target(s) is to be engaged.

PERFORMANCE MEASURES:

Situation 1:

1. Coordinate with adjacent antiarmor weapons and nearby units for mutual support and security of the crew.

2. Supervise the preparation of the range card, insuring the following items are on the range card:

a. Basic symbol for the 106-mm RCLR is oriented toward center of sector.

b. A magnetic north arrow is pointing in the direction of magnetic north.

c. The rifle position is identified in relation to some prominent terrain feature. The range and magnetic azimuth from the terrain feature to the gun position is recorded.

d. The right and left limits of sectors of fire are labeled using broken lines with magnetic azimuth.

e. The location of each recognizable terrain feature in the sector of fire is plotted and a simple sketch is made to include DEADSPACE. Range and magnetic azimuth to each target will be written along a line from the position to each target in the sketch.

f. Marginal data is provided in a corner of the sketch to include squad/company designation and date prepared.

3. Brief crew members on fire control measures.

a. Sector of Fire. The terrain that the squad has been assigned to cover with its fire.

b. Target Reference Points (TRP). Easily identifiable terrain features that the 106-mm RCLR can reach, and therefore shift from this known point.

c. Phase Line. Easily recognized terrain feature, normally perpendicular to the direction of advance, used to control fires.

d. Fire Pattern. Used to control the fires against an armored formation. The basic plan is to have each 106-mm RCLR start on an opposite end and work toward the center of the formation.

e. Engagement Priorities. The order in which types of vehicles in a formation are engaged.

Situation 2:

1. Issue Fire Commands:

a. Sequence of Initial Fire Command.

(1) Alert: Stationary target - FIRE MISSION; moving target - MOVING TARGET.

(2) Type of Ammunition: High explosive antitank - HEAT; high explosive plastic with tracer - HEP-T; antipersonnel with tracer - APERS-T.

(3) Direction: Given orally, by pointing, using a reference point of the clock system.

(4) Target Description: If several targets are in view, designate the particular target to be engaged.

(5) Range: Announced in meters.

(6) Leads: This element is used in the case of moving targets. Leads are announced in units of 5-mil angular leads, as: TWO LEADS or THREE LEADS.

(7) Control: This element is given as FIRE or, when a short delay is necessary, AT MY COMMAND. This is followed at the desired time by the command FIRE.

b. Subsequent Fire Command.

(1) Elements: A subsequent fire command usually includes only those elements for which there is a change from the previous fire command. Range and control elements are always included.

(2) When Announcing Subsequent Fire Commands: Give subsequent commands as corrections from the previous round, using the following terms to announce these corrections:

REPEAT RANGE - Fire at the same range.

ADD - Increase the range.

DROP - Decrease range.

RIGHT - Move the burst or strike to the right.

LEFT - Move the burst or strike to the left.

MORE - Increase leads.

LESS - Decrease leads.

c. Corrections.

(1) Deflections: When firing at stationary targets, give corrections in deflection (in mils) as RIGHT FIVE, LEFT ONE ZERO. When deflection is correct, omit this element from the subsequent fire command.

(2) Range: If a correction is needed, announce it as ADD TWO HUNDRED, DROP TWO HUNDRED. If the range is correct, give the element as REPEAT RANGE.

(3) Leads: When firing at moving targets, give the correction in leads as TWO MORE, TWO LESS. Include this element in subsequent fire commands only when necessary.

2. Examples of Fire Commands.

a. Initial Fire Command.

(1) Stationary target at 600 meters.

FIRE MISSION
HEAT
RIGHT FRONT
TANK
SIX HUNDRED
FIRE

(2) Moving target at 800 meters and 15 miles per hour apparent speed.

MOVING TARGET
HEAT
FRONT
TRUCK
EIGHT HUNDRED
THREE LEADS
FIRE

b. Subsequent Fire Commands.

(1) Stationary targets.

(a) 1st subsequent fire command.

LEFT FIVE
DROP TWO HUNDRED
FIRE

(b) 2d subsequent fire command.

RIGHT FIVE
ADD ONE HUNDRED
FIRE

(2) Moving targets.

(a) 1st subsequent fire command.

DROP TWO HUNDRED
ONE LESS
FIRE

(b) 2d subsequent fire command.

ADD ONE HUNDRED
TWO MORE
FIRE

(c) 3d subsequent fire command.

REPEAT RANGE
ONE LESS
FIRE

3. End of the Alert. To end the alert, call CEASE FIRING, END OF MISSION.

REFERENCES:

FM 23-82, 106-mm Recoilless Rifle M40A2, C1, Jul 73 (chap 5, para 5-7 thru 5-20, pages 5-9 thru 5-16)
TC 7-24, Antiarmor Tactics and Techniques for Mechanized Infantry, Sep 75 (app B, page B-25 thru B-30)

TASK NUMBER: 071-316-2500

ASSEMBLE THE TOW LAUNCHER

CONDITIONS:

Given a disassembled TOW launcher and a direction of fire.

STANDARDS:

Within 2 minutes, assemble the launcher IAW the performance measures listed below.

PERFORMANCE MEASURES:

1. **Launcher Site.** When assembling the launcher, the site for the tripod should not slope more than 30 degrees for the system to be properly leveled.

2. **Set Up the Tripod.**

a. Place the tripod on the ground so that two legs are facing in the direction of fire (grooved coupling clamp locking handle to the front). Release the friction locks on each leg (figure 1).

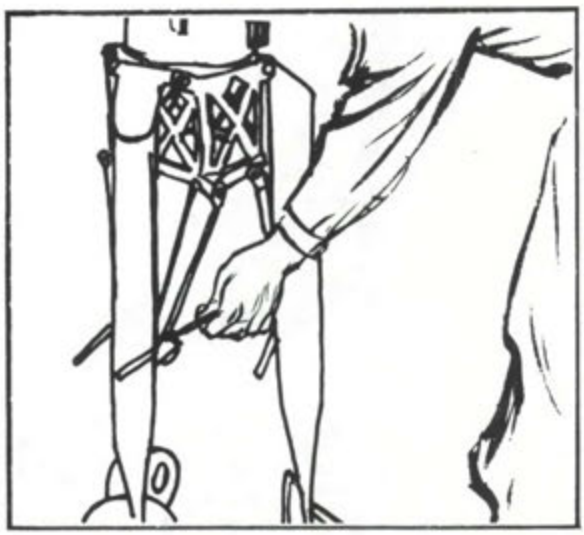


Figure 1. Releasing friction locks.

b. Press the detent stop lever toward the leg until it disengages and then release it as you pull the leg out (figure 2). The detent stop should engage at the first detent stop position.

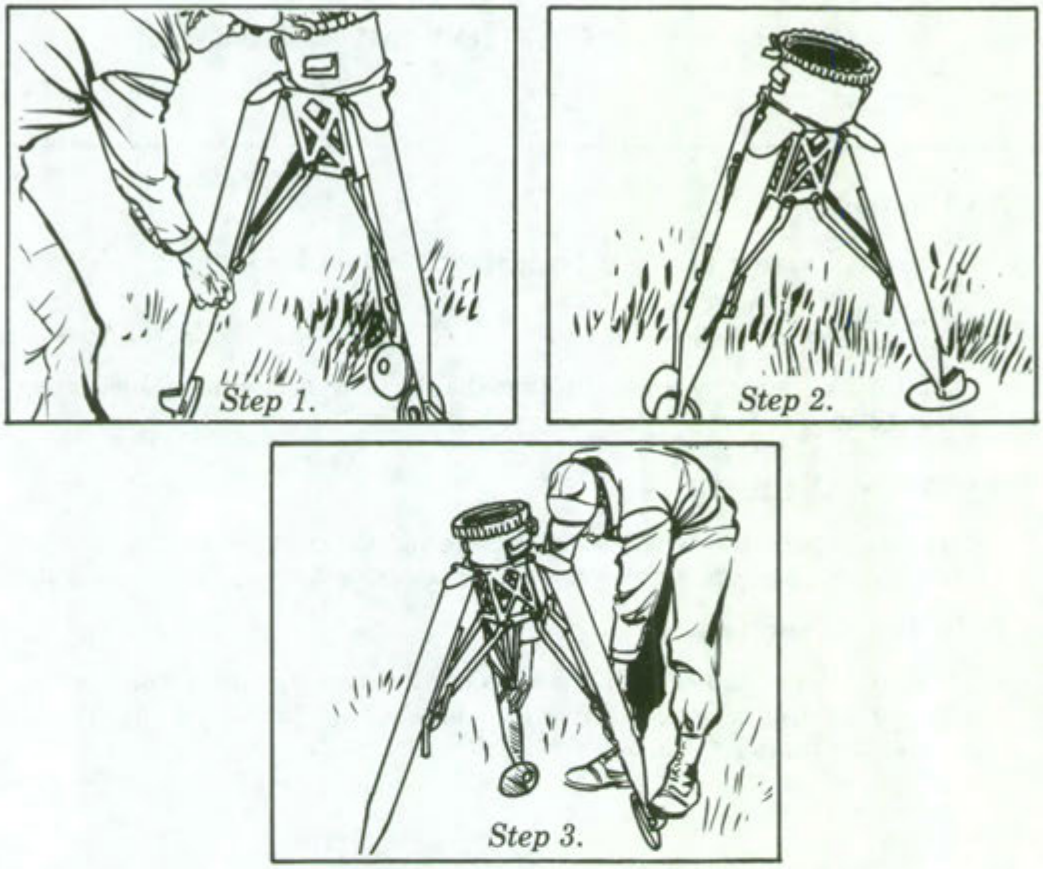


Figure 2. Detent stop lever.

c. Check your level indicators (figure 3). If the bubble is not between the indexing marks, you must adjust the legs. Do this by again pushing in on the detent stop lever to center one bubble and then the other. (Use the friction lock to lock the legs between detent positions if required while leveling.)

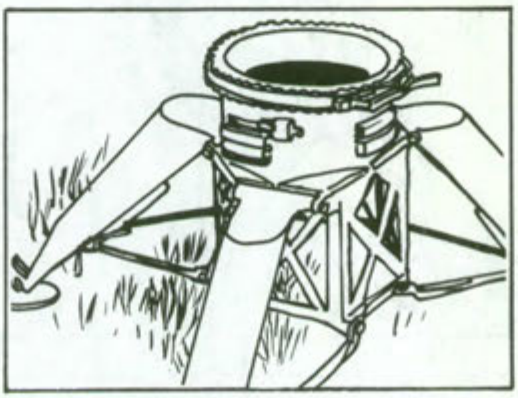


Figure 3. Level indicator with bubble properly centered.

d. Lock all friction locks when the tripod is level.

e. Step on each anchor claw to insure a firm base (figure 4). (Place a stake through the hole in the foot pad for additional stability.)

f. Open the grooved coupling clamp locking handle so the traversing unit can be mounted (figure 5).

Figure 4. Step on anchor claw for added stability.

Figure 5. Prepare to mount traversing unit.

3. **Install the Traversing Unit.**

a. Pick the traversing unit up by the two control knobs and set it on the tripod (figure 6).

b. Locate the azimuth lock indicators on the base of the traversing unit (figure 7). Position the indicators so they are 180 degrees from the direction of fire.

c. Lock the grooved coupling clamp and recheck the level indicators.

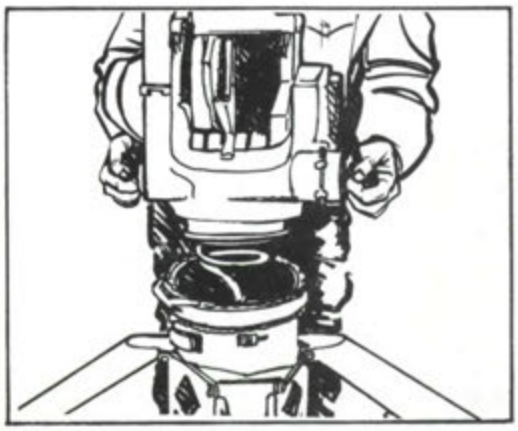


Figure 6. Install traversing unit.

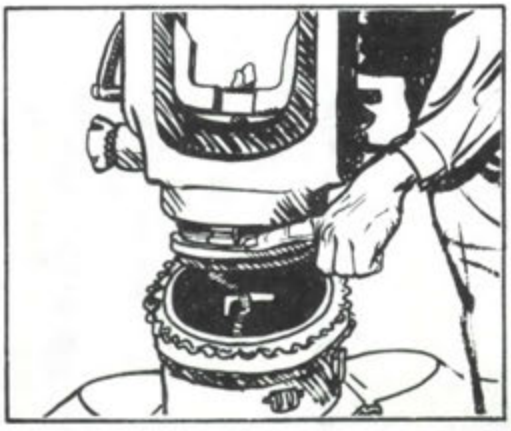


Figure 7. Azimuth lock indicators.

4. **Install the Optical Sight.**

a. Pick the sight up as shown in figure 8.

b. With the latch assembly all the way down, aline the top of the sight mounting bracket over the top of the boresight plate and lower the sight into position against the boresight plate (figure 9).

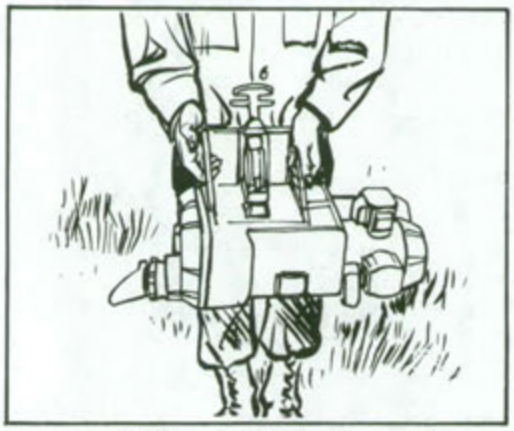


Figure 8. Proper handling of optical sight.

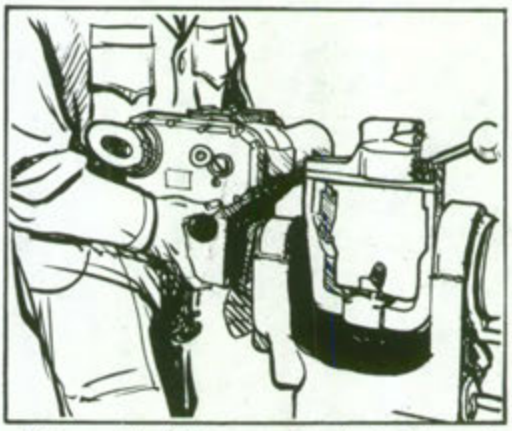


Figure 9. Alinement of sight and boresight plate.

c. Lift up on the latch assembly to secure the sight (figure 10). (Do not let go until you are sure it is secure.)

5. **Install Launch Tube.**

a. Raise the forward end of the launch tube slightly and place the mounting lugs in the trunnion fittings (figure 11).

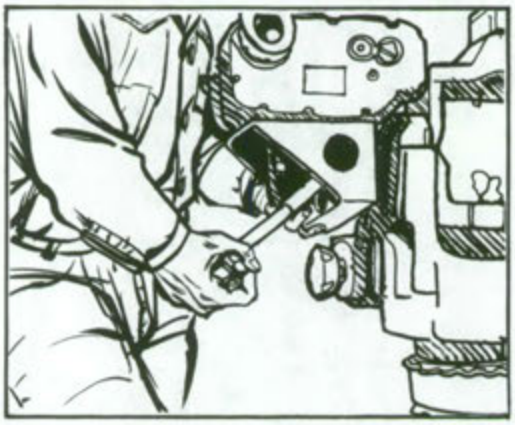


Figure 10. Secure the sight.

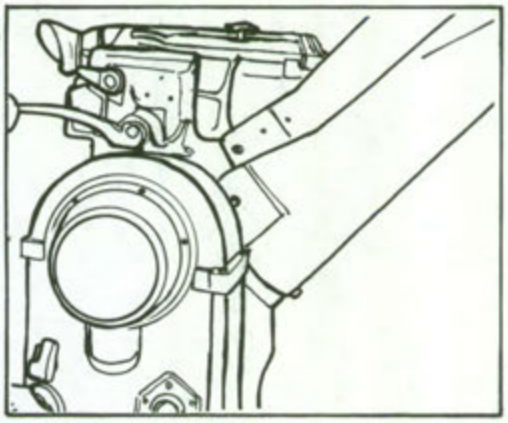


Figure 11. Install launch tube.

b. Hold the launch tube latch up, and lower the forward end of the launch tube (figure 12).

c. Secure the launch tube with the latch.

6. **Set Up Missile Guidance Set (MGS).**

a. Remove the cover from the missile guidance set. Install a battery assembly in the battery well, insuring that the electrical connectors are properly alined before seating the battery. Tighten the six winged nuts to secure it (figure 13).

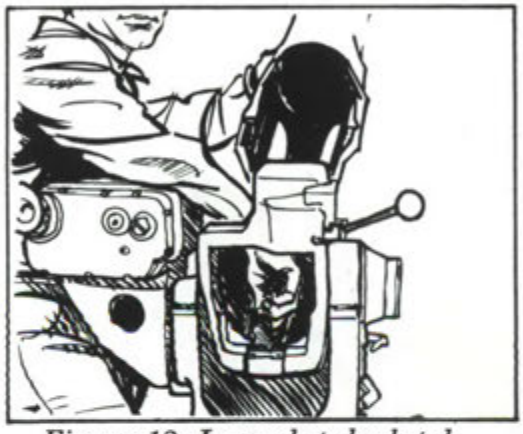


Figure 12. Launch tube latch.

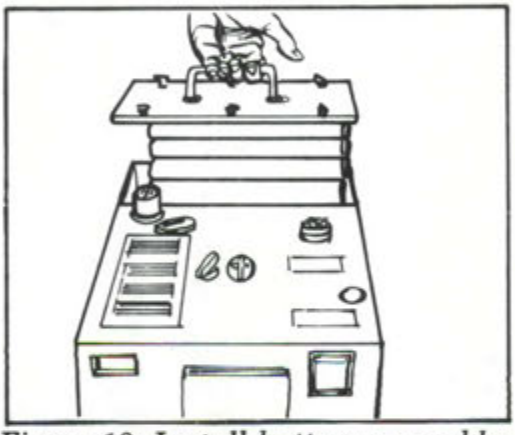


Figure 13. Install battery assembly.

b. Pull the coil from under the traversing unit and aline the indexing lines on the coil cord and the J1 connector. Push down to seat the coil cord on the J1 connector and tighten the locking nut (figure 14).

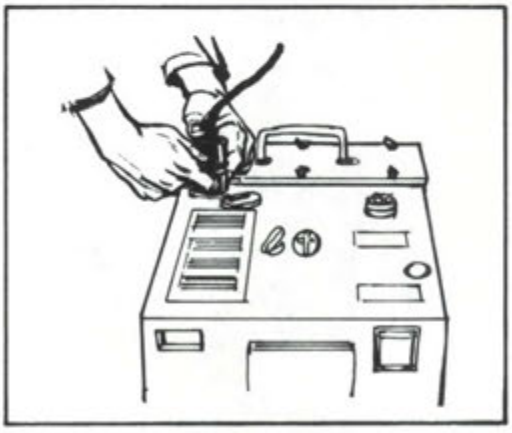


Figure 14. Alinement of indexing lines and locking nut.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System (TBP)

TASK NUMBER: 071-316-2501

PERFORM OPERATOR MAINTENANCE ON TOW WEAPONS SYSTEM

CONDITIONS:

Given a TOW weapons system (missile guidance set, optical sight, traversing unit, tripod, battery assembly, launch tube), a camel's-hair brush, lens tissue, orange wood stick, toluol solvent, ethyl alcohol, wiping rags (clean and dry), mild detergent, warm water, and TM 9-1425-470-12.

STANDARDS:

Within 3 hours, perform daily or weekly preventive maintenance checks and services in accordance with TM 9-1425-470-12:

1. Inspect weapon for unserviceable parts and report unserviceable parts to supervisor.

2. Clean all parts of weapon of foreign particles that will hinder operation.

PERFORMANCE MEASURES:

1. **PREVENTIVE MAINTENANCE CHECKS AND SERVICES.** You must know how to inspect your TOW system and what to do when you find a defective condition. Some of the following conditions prevent the TOW from being used at all while others only hinder your use of the system. In any event, if you find a deficiency, you should turn in the defective part to your unit armorer. You should also exchange any component (except a discharged battery assembly) that fails the self-test.

a. Clean the launcher to remove dirt, grease, or other foreign matter which might hide a defective condition.

b. Check for the following defective conditions on each component.

ITEM TO BE CHECKED	DEFECTIVE CONDITIONS
(1) TRIPOD.	
(a) Grooved coupling clamp	- Broken or missing.
	- Traversing unit rotates when azimuth lock is engaged.
(b) Level indicators	- Cracked or broken.
(c) Legs	- Cannot be fully extended, or they bind when opened.

(d) Detent stop levers	- Will not engage at a detent stop.
	- Lever broken.
(e) Leg locking handle	- Broken or missing.
(f) Foot pads	- Do not swivel freely.
(g) Anchor claw	- Missing or inoperative.
(2) TRAVERSING UNIT.	
(a) Control knobs	- Cracked or loose.
	- Binding occurs.
(b) Azimuth lock	- Lever broken.
	- Will not engage in stops.
(c) Elevation lock	- Will not lock in the 30-degree up or 8-degree down position.
	- Lever broken.
(d) Bridge clamp	- Binding occurs when opened.
(e) Locking handle	- Broken.
	- Will not secure bridge clamp.
	- No metallic click when raised.
(f) Arming lever	- Electrical connector does not protrude or retract when raised or lowered.
(g) Electrical connector	- Cracked or chipped.
(h) Trigger cover	- Missing.
	- Will not close or open.
(i) Trigger	- Does not spring back when pressed.
(j) Boresight plate	- Cracked or has large dents or cracks.
	- Electrical connector chipped or cracked.
(k) Coil cord	- Cut or frayed.
	- Pins bent or missing.
	- Threads stripped on locking nut.
(l) Launch tube latch	- Missing.
	- Will not secure launch tube.

(m) Launch tube locating pin	- Missing.
	- Severely worn pin.
(n) Balance	- Launch tube will not remain horizontal with expended launch container.

(3) OPTICAL SIGHT.

(a) Humidity indicator	- 30 percent sector is white or pink.
(b) Eye guard	- Will not rotate.
	- Severely cracked.
(c) Optical surfaces	- Broken or clouded.
	- Crosshair intersection impaired.
	- Water in lens.
(d) Focus control	- Does not rotate.
	- Will not focus crosshairs.
(e) Nightsight bracket	- Bent or broken.
(f) Reticle light switch	- Broken.
	- Light inoperative.
(g) Boresight knob covers	- Not under spring tension.
	- Will not close or missing.
(h) Boresight knobs	- Broken or missing.
	- Will not rotate freely.
(i) Electrical connector	- Pins severely bent or missing.
(j) Mounting plate	- Cracked or large chips.
(k) Locking handle	- Cracked or broken.
	- Does not operate freely.
(l) Housing	- Cracked.

(4) MISSILE GUIDANCE SET.

(a) Meter windows	- Cracked or foggy.
	- Lights inoperative.
(b) Test operate switch	- Cover missing.
	- Inoperative.
	- Not under spring tension.

(c) J1 connector	- Threads stripped.
	- Bent.
	- Electrical connector plugged.
(d) Self-test switch	- Inoperative, broken, or missing.
(e) Humidity indicator	- 40 percent sector white or pink.
(f) Battery connector	- Damaged.
	- Spring missing or damaged.
(g) Cover	- Cannot be fastened.
(h) Case	- Cracked or punctured.
(5) BATTERY ASSEMBLY.	
(a) Winged fasteners	- Missing or damaged so battery cannot be secured in missile guidance set.
(b) Battery connector	- Connector damaged beyond use.
(c) Battery cells	- Punctured or cracked.
(d) Handle	- Missing.
(6) LAUNCH TUBE.	
(a) Mounting lugs	- Excessively worn.
(b) Bore	- Cracked or gouged through one layer of fiberglass.
(c) Muzzle	- Reinforcing ring has gouge or crack one-third its thickness.

c. Conduct a launcher self-test in accordance with Soldier's Manual, TASK: 071-316-3752, Make a TOW Launcher Self-Test and Preoperational Inspection.

d. Many of the defects listed will not prevent the system from firing. In combat, it may be necessary to operate a system with some deficiencies. Report any deficiencies, however, to your squad or section leader so the system can be repaired when time or the situation permits. Normally, if the launcher passes the self-test, it will fire a missile.

2. **CLEAN THE LAUNCHER.**

a. General Instructions.

(1) Metal parts. Use dry, clean wiping rags to remove dust, dirt, grease, moisture, or other foreign matter. If necessary, dampen cloth with alcohol of solvent and gently wipe the area.

(2) Rubber and plastic parts. Clean these parts using a mild detergent and warm water. Then dry using a clean, absorbent wiping rag.

(3) Glass surfaces.

(a) Use a camel's-hair brush to gently brush away any dirt or lint. Wrap a sheet of lens tissue around the end of a wood dowel (orange stick) so that ½ inch of tissue extends beyond the end of the dowel.

(b) Put a few drops of ethyl alcohol on the tissue. Starting at the center of the lens, swab in an expanding circular motion until the entire surface is clean.

WARNING: ETHYL ALCOHOL IS FLAMMABLE. Keep all flammable cleaning materials away from open flames. Failure to do so could result in injury or death.

WARNING: TOLUOL SOLVENT IS TOXIC AND FLAMMABLE. Keep away from heat and open flames. Use only in well-ventilated areas. Avoid prolonged or repeated breathing of the vapor or skin contact.

(c) Rinse with clean drinking water using a plastic squirt bottle, if necessary.

(4) Battery assembly.

(a) Clean the battery assemblies with a clean, damp cloth or plastic brush.

(b) White powdery deposits on the cells are caused during charging operations. They are harmless, but should be removed to prevent buildup.

(c) Wipe dry with a clean wiping rag.

b. Cleaning Procedures for Cold Weather.

(1) If the temperature is below 0 degree C. (+32 degrees F.), add glycerin to cleaning water to prevent freezing.

(2) Apply de-icer or place the optical sight in a warm area to remove ice. Pat the surface with a clean absorbent wiping rag. DO NOT RUB. Clean with lens tissue when the surface is dry.

(3) Avoid breathing on the optical surfaces.

c. Cleaning Precautions.

(1) Do not get alcohol or solvent on rubber parts or sealants. They can cause them to deteriorate or dissolve.

(2) Use only authorized lens tissue to clean optical surfaces. Do not use the silicone-treated paper that is used for eyeglasses.

(3) Avoid touching optical surfaces with fingers.

d. Cleaning Materials. Keep cleaning materials on hand and make sure your crews are using them.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapon System (TBP)
TM 9-1425-470-12, Operation and Organization Maintenance Manual TOW, C4, Jan 74 (chap 3, page 3-1)
TEC Lesson 948-071-0027-F, Maintenance of the TOW System

TASK NUMBER: 071-316-2502

CONDUCT A SYSTEM SELF-TEST AND PREOPERATIONAL INSPECTION

CONDITIONS:

Given an assembled ground- or vehicle-mounted TOW launcher, checklist, TM 9-1425-470-12, DA Form 2404, and a pencil.

STANDARDS:

Conduct a system self-test and preoperational inspection of a TOW launcher IAW the performance measures below.

PERFORMANCE MEASURES:

1. **General.** Conduct the system self-test and preoperational inspection whenever the system is assembled.

2. **System Self-Test** (table 1).

a. Perform the system self-test before a missile is loaded into the launcher. It should be done rapidly because it consumes battery power.

b. The elevation and azimuth meters on the missile guidance set indicate the operational condition of the various components of the launcher.

(1) They will register either in-band or out-of-band (figure 1) when the TEST OPERATE switch is held in the TEST position and the SELF-TEST switch is rotated to each of the 7 test positions.

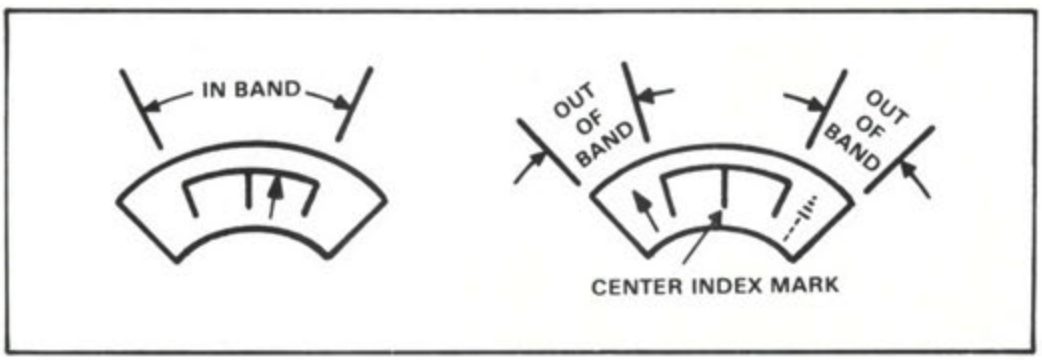


Figure 1.

(2) An out-of-band reading indicates a component is not functioning properly and corrective action is required.

c. When checking position 7, boresight alinement of the optical sight and infrared tracker, aline the meter needles as closely as possible with the CENTER INDEX MARK.

(1) If they are not alined, adjust the boresight knobs on the optical sight, one at a time, to aline them.

(2) In addition to when the system is assembled, check position 7 (boresight) at the following times:

- After cross-country movement.
- After a change in temperature of 10 degrees.

d. To conduct system self-test:

(1) Hold the TEST OPERATE switch in the TEST position and rotate the SELF-TEST switch to each position.

(2) Perform the actions specified in table 1 for each of the seven positions. The table lists the sequence, normal meter reading, and appropriate corrective action if a normal reading is not obtained.

3. **Preoperational Inspection** (table 2).

a. The preoperational inspection outlined in Table 2 should be made periodically during operations as well as when the system is assembled.

b. The checks do not necessarily have to be performed in the order listed.

NOTE: Record any faults noted, on DA Form 2404, and inform your immediate supervisor.

TABLE 1

PROCEDURES FOR SYSTEM SELF-TEST

STEP	PROCEDURE	NORMAL INDICATIONS		CORRECTIVE ACTIONS FOR OTHER THAN NORMAL READINGS
		AZIMUTH METER	ELEVATION METER	
1	Set SELF-TEST switch to position 1.	In-band	In-band	1. Replace battery assembly (and tag for recharging). 2. Replace missile guidance set if trouble remains.
2	a. Set SELF-TEST switch to position 2.	In-band	In-band	Replace missile guidance set.
	b. Release elevation lock and move launch tube: UP ——— Moves Right DOWN ——— Moves Left LOCK ELEVATION LOCK			1. Replace traversing unit. 2. Replace missile guidance set if trouble remains.
	c. Release azimuth lock and move launch tube: RIGHT ——— Moves Right LEFT ——— Moves Left LOCK AZIMUTH LOCK			
3	Set SELF-TEST switch to position 3.	In-band	In-band	Replace missile guidance set.
4	Set SELF-TEST switch to position 4.	In-band	In-band	Replace missile guidance set.
5	Set SELF-TEST switch to position 5. (TEST OPERATE switch must be in TEST position when SELF-TEST switch is rotated.)	In-band after 8 to 12 seconds.	Rotate in and out of band and then remain in-band after 8 to 12 seconds.	Replace missile guidance set.
6	Set SELF-TEST switch to position 6.	In-band	In-band	Replace missile guidance set.

Table 1.

STEP	PROCEDURE	NORMAL INDICATIONS		CORRECTIVE ACTIONS FOR OTHER THAN NORMAL READINGS
		AZIMUTH METER	ELEVATION METER	
7	Set SELF-TEST switch to position 7. (Shade lens in sunlight to prevent needles from oscillating.)	a. Tracker motor in optical sight is running. b. *Center Index Mark	 *Center Index Mark	a. Replace optical sight. b. Adjust focusing to T3 or more. c. Adjust azimuth and elevator knobs on the optical sight one at a time to obtain correct readings. WARNING IF THERE IS NO NEEDLE MOVEMENT ON THE AZ OR EL METER WHEN YOU ADJUST THE BORESIGHT KNOBS, RELEASE THE TEST OPERATE SWITCH. Get a good sight and do the test again. If there is still no movement, REPLACE THE MISSILE GUIDANCE SET. (It was probably damaged by the first sight.) Do not hook up the first optical sight with another MGS. Turn it in to your maintenance support unit for checkout. d. If a normal reading cannot be easily obtained because the needles are fluctuating: (1) Release TEST OPERATE switch and preset boresight knobs to their center position. (2) Push TEST OPERATE switch and adjust knobs for normal indication. e. Replace the optical sight, missile guidance set, and traversing unit, in that order, if trouble remains.
	*Exact alinement with index mark is not necessary, but it should be alined as close as possible without using excess battery power.			
8	Set SELF-TEST switch to position 1.	In-band	In-band	Same as step 1.
9	Release TEST OPERATE switch and rotate SELF-TEST switch to unmarked position.			

Table 1. Con't.

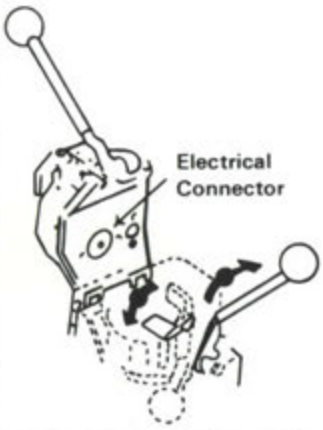
STEP	ITEM	PROCEDURE	NORMAL FUNCTION
1	Meter Lights	1. Push TEST OPERATE switch to test. 2. Release switch.	1. Lights illuminate. (Shade meters on sunny days.)
2	Reticle Light	1. Set reticle light switch to ON and focus crosshairs. 2. Return switch to OFF.	1. Crosshairs illuminate. (Cover lens during daylight.)
3	Trigger	1. Lift trigger protective cover. Depress and release trigger. 2. Close trigger protective cover.	1. Trigger springs back.
4	Bridge Clamp 	1. Raise bridge clamp. 2. Check electrical connector. (Arming lever should not be raised.) 3. Close bridge clamp and lock. 4. Raise and lower arming lever. 5. Raise locking handle slowly to check wire cutter.	1. Bridge clamp operates with no binding. 2. Clean and free of dirt or grease. 3. Bridge clamp is tightly secured. 4. Electrical connector protrudes and retracts. 5. A click can be heard.
5	Launch Tube	1. Check breech and bore. 2. Alinement and security.	1. Free of foreign material. 2. Lugs properly seated and launch tube latch locked.

Table 2.

REFERENCES:

TM 9-1425-470-2, Operation and Organizational Maintenance, C4, Jan 74 (chap 2, page 2-18)
TM 9-1425-270-ESC, Equipment Serviceability Criteria for TOW Heavy Antitank/Assault Weapon System, Oct 73, (page 1)
TC 23-33, TOW Heavy Antitank Weapon System, C2, 3, Jul 70 (chap 4, sec VI, page 74)

TASK NUMBER: 071-316-2503

LOAD, ARM, AND UNLOAD AN ENCASED MISSILE

CONDITIONS:

Given an assembled TOW launcher, a missile simulation round with the forward handling ring installed and electrical connector dust cover installed.

STANDARDS:

Within 1 minute, load, arm, and unload the launcher.

PERFORMANCE MEASURES:

1. **Loading the Launcher (figure 1):**

a. Lock the azimuth and elevation locks so that the launcher tube is in the 8-degree down position.

b. Raise the bridge clamp and insure that the trigger protective cover is down.

c. Check position #7 (boresight) and position #1 (battery power). (Not required if a self-test has just been performed.)

d. Remove the electrical connector dust cover and forward handling ring from the encased missile (figure 1). (Save these in case the missile is not fired.)

e. With the electrical connector facing up, hold the encased missile with the back end raised to about 45 degrees and insert the indexing lugs into the launch tube indexing slots. Slide the encased missile forward and down until it is well seated (figure 1).

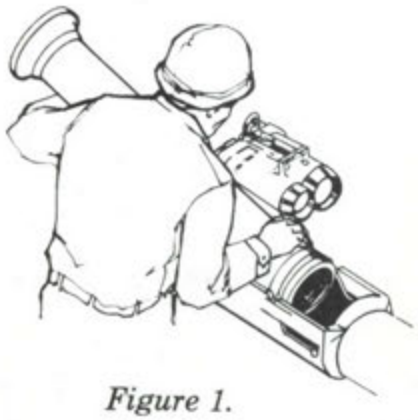


Figure 1.

Figure 2.

f. Lower the bridge clamp. Push down on top of the bridge clamp with one hand and close the locking handle with the other hand (figure 2).

2. **Arming the Launcher:**

a. Clear the backblast area.

b. Raise the arming lever.

3. **Unloading the Launch Tube.** The procedures for unloading the launcher depend on whether the missile was fired or not.

a. Missile fired.

(1) Lower the trigger protective cover.

(2) Lock the azimuth lock and the elevation lock as the launch tube is in the 8-degree down position.

(3) Raise the locking handle and open the bridge clamp. (This action will cut the command-link wires and turn off the launcher.)

(4) Lift the back end of the launch container and remove it from the launch tube. (If the wires were not cut, close the bridge clamp, raise the arming lever, press the trigger, and then repeat (3) above. If this does not work, cut the wires manually and check battery [self-test position #1].)

(5) Clear the launch tube of any foreign matter.

b. Missile not fired.

(1) Lower the trigger protective cover.

(2) Lock the azimuth lock and the elevation lock so the launcher tube is held in the 8-degree down position.

(3) Lower the arming lever.

(4) Raise the locking handle and open the bridge clamp.

(5) Lift the back end of the encased missile and remove it from the launch tube.

(6) Replace the forward handling ring and clamp. Replace the electrical connector dust cover.

(7) Secure encased missile in missile rack.

A. Forward handling ring and clamp.
B. Missile indexing lugs.
C. Launch tube indexing slots.
D. Bridge clamp.
E. Locking handle.

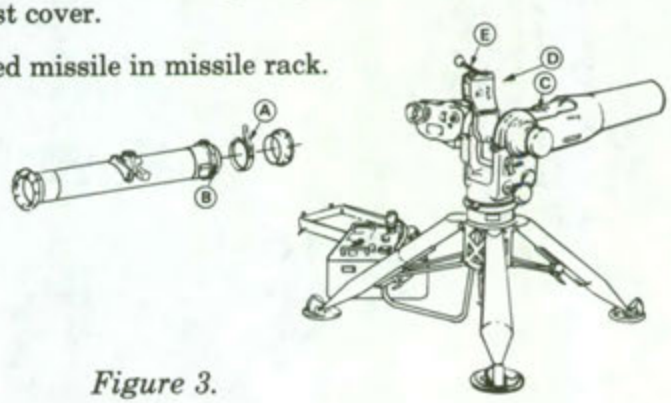


Figure 3.

REFERENCES:

FM 23-24, TOW Heavy Antitank Weapons System (TBP)
TC 23-23, TOW Heavy Antitank Weapons System, C2, 3, Jul 70, (chap 2, sec IV, page 36)

TASK NUMBER: 071-316-2504

PERFORM IMMEDIATE ACTION PROCEDURES FOR A MISFIRE

CONDITIONS:

Given an assembled TOW launcher, two missile simulation rounds, and a misfire situation.

STANDARDS:

Within 1 minute, perform immediate action IAW measures listed below.

PERFORMANCE MEASURES:

1. A firing malfunction (misfire) has occurred with the TOW as the missile fails to launch 1.5 seconds after the trigger is pressed.

2. Take immediate action-procedures to eliminate the malfunction and continue the mission in the fastest and safest manner.

3. Always remember, when a misfire occurs, there is the possibility that it could just be a delay in the firing circuits. REMAIN CLEAR OF FRONT AND REAR OF THE LAUNCHER AT ALL TIMES.

4. Perform each action in the order listed below:

ACTION	COMMENT
1. Press the trigger again.	If the missile fails to fire, perform step #2.
2. Continue to track and alert the crew.	a. If it fires, you want to hit the target and not endanger the crew.
	b. Perform step #3.
3. Check battery power (self-test position #1).	a. Out-of-band reading. Replace battery and attempt to fire.
	b. In-band reading, perform step #4.
4. Check coil cord connection to missile guidance set.	a. Tighten if loose and attempt to fire.
	b. If tight, perform step #5.
5. Check bridge clamp locking handle.	a. Lock fully and attempt to fire.
	b. If locked, perform step #6.

6. Lower and raise arming lever.	a. Attempt to fire. b. Fails to fire, perform step #7.
7. Lower and raise arming lever again.	a. Attempt to fire. b. Fails to fire, perform step #8.
8. Lower the arming lever, close trigger protective cover, and lock elevation and azimuth locks.	The arming lever must be lowered or the command-link wires will be cut when step #9 is performed.
9. Unload missile.	Place missile pointing in a direction where it does not present a danger to friendly personnel.
10. Load another missile.	Continue mission.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System (TBP)
TC 23-23, TOW Heavy Antitank Weapons System, C2, 3, Jul 70 (chap 3, page 45)

TASK NUMBER: 071-316-2505

DETERMINE IF A TARGET CAN BE ENGAGED

CONDITIONS:

Acting as a TOW gunner, or squad leader, given a complete TOW launcher and binoculars.

STANDARDS:

1. As a TOW gunner, using the optical sight, specify whether a vehicle is engageable.

2. As a TOW squad leader, using binoculars, specify whether a vehicle is engageable.

PERFORMANCE MEASURES:

1. Using the optical sight.

a. You can use the optical sight to determine if you have enough time to engage a moving target (figure 1).

Figure 1.

b. The optical sight technique is based on a vehicle speed of 35 kmph or 10 meters per second. This is expected to be the top cross-country speed of armored fighting vehicles.

c. Place the crosshairs on the center of visible mass of the target. If the area between the vertical crosshair and the edge of the sight, in the direction of travel, is clear of obstructions, the target can be engaged.

2. Using binoculars.

a. You can also use the binocular reticle to determine if there is enough time to engage a moving target. This technique is usually used by squad leaders.

b. Place the zero tic marks of the horizontal line at the center of the target (as in figure 2 below). If the area between the target and the 50-mil tic mark, in the direction of travel, is clear of obstructions, the target can be engaged.

NOTE: The 50-mil tic marks are located at each end of the horizontal line and are labeled 5.

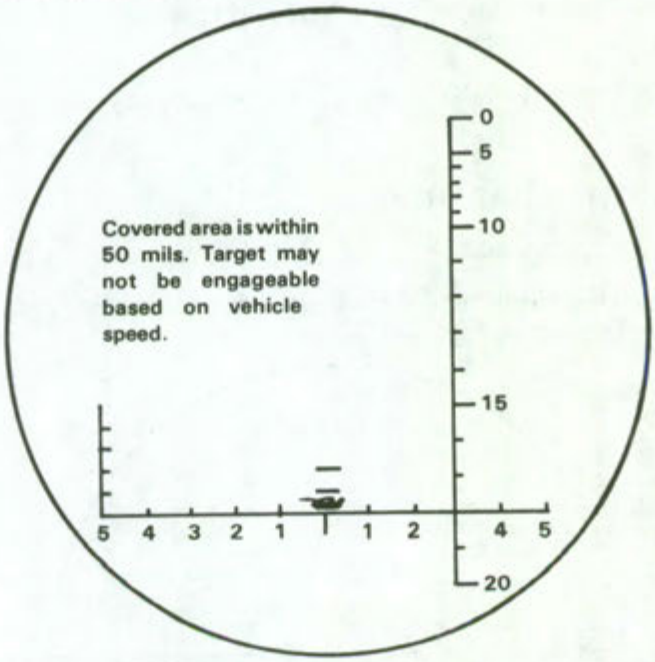


Figure 2.

c. The optical sight and binocular techniques are only estimates. Vehicles moving at speeds slower than 35 kmph may be engaged even though half the sight picture, or 50 mils in the binoculars, is not clear of obstructions. Proper training will enable you to make adjustments for different vehicle speeds.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System, (TBP)
TC 7-24, Antiarmor Tactics and Techniques for Mechanized Infantry, Sep 75 (appendix B, page B-1)
TC 23-23, TOW Heavy Antitank Weapon System, C2, 3, Jul 70, (chap 2, sec II, page 23)

TASK NUMBER: 071-316-2506

CAMOUFLAGE/CONCEAL TOW POSITION

CONDITIONS:

In daylight, given load-bearing equipment with bayonet, scabbard, intrenching tool, poncho, the specific position to be camouflaged, 1 hour to complete camouflaging, and a TOW system (mounted or dismounted).

NOTE: Time may be adjusted when conditions make camouflage of positions particularly difficult.

STANDARDS:

Within time specified, camouflage the position to meet the following specifications:

Position blends with surroundings so that it cannot be easily detected 35 meters to the front (hand grenade range), and cannot be seen from the air (spoil is covered with grass, leaves, etc., to blend with the surrounding vegetation). Camouflage net or brush is used to conceal the position.

PERFORMANCE MEASURES:

1. Approach the position only from the rear, insuring that a visible trail is not left. Circle the position when moving to the front so that a trail does not point out the position (figure 1).

2. Do not litter the area, nor make unnecessary noise, nor, during darkness, expose any lights.

3. Do not disturb vegetation not used in constructing or camouflaging the position. (Be particularly careful with a vehicle, if you are a driver, to insure that the vehicle does not leave a trail pointing out the position (figure 1).)

When tracks might reveal the location of a position, blot them out.

Figure 1.

4. During camouflaging:

a. Ground-mounted TOW.

(1) Place sod from the position on the parapet in such a manner that it looks natural and will have a good chance of growing.

(2) If additional vegetation must be used to break up the outline of the parapet, obtain some (similar to that found near your position) from far to the rear of your position with root structure intact, if possible. Do not use so much vegetation that the position has more than the surrounding area. Camouflage the holes or cuts from which vegetation was removed.

(3) If the position is covered (figure 2), camouflage it in the same manner as the parapet. If it's not covered, you must camouflage the position using camouflage nets or available brush, branches, etc., so that it's not visible from above.

(4) Replace dying foliage constantly. Attempt to get sod, small trees, plants, etc., used as camouflage to grow, so that position will improve as time passes (figure 2). Remember, the position can always be improved.

b. Vehicle-mounted TOW.

(1) Position the vehicle in hull defilade and erect a canopy (large net) (figure 3).

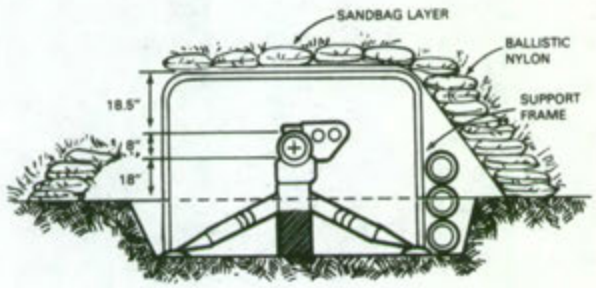


Figure 2.

The position should look natural and not be easily detected (blends with surrounding terrain so as not to be detected from 350 meters to the front).

Figure 3.

(2) In the event that a hulldown position is not available, use a hide position (figure 4).

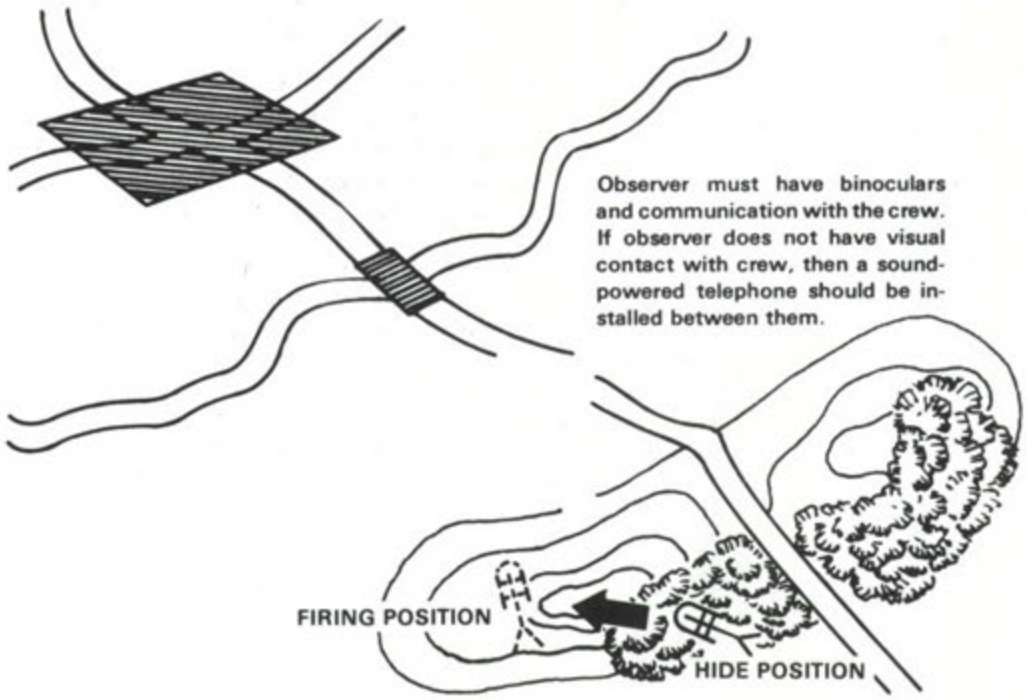


Figure 4.

(3) If terrain is such that neither a hulldown nor a hide position is available, make the best use of existing terrain to conceal the TOW (figure 5).

5. After camouflaging:

a. Insure that the ground behind the TOW (about 25 meters) is free of leaves and dirt so the backblast from the weapon does not leave a signature.

b. Do not leave any evidence of digging. Do not leave equipment laying around. Everything must be concealed or camouflaged.

c. If possible, move to the front of your position (ground - 35 meters, vehicle - 350 meters) and study your position. Insure that the position looks natural and blends with its surroundings.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System, (TBP)

TASK NUMBER: 071-316-2551

SUPERVISE PREPARATION OF A TOW FIGHTING POSITION

CONDITIONS:

In daylight, given a crew with complete load-bearing equipment (bayonet with scabbard, entrenching tool, poncho), individual weapon, TOW weapons system with an inert round, the specific position for weapon location and sector of fire for the position, and three hours to complete construction.

NOTE: Position should afford natural cover such as mounds of earth, stumps, trees, rocks, etc., and observation and fields of fire. Time may be adjusted when soil and weather conditions make construction of the position particularly difficult.

STANDARDS:

Within time specified, complete the position to meet the following specifications:

1. It allows you to engage the enemy in your assigned sector of fire.

2. It provides protection for both the weapon and the crew.

3. Size and Shape - The position is an inverted T-shaped hole, approximately 24 inches deep, to allow for 30" line of sight, with two slots forward for the tripod legs.

a. Muzzle clearance - 9 inches around the end of the launch tube.

b. Line-of-sight clearance - 30 inches between 500 and 900 meters.

c. Backblast area - Clear of debris that could increase the launch signature and deflect the backblast toward the crew. No personnel or equipment within 75 meters.

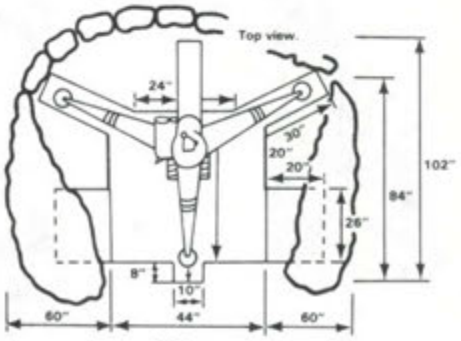


Figure 1.

PERFORMANCE MEASURES:

1. **Fighting Positions** - Fighting positions must provide protection from both direct and indirect fire.

a. Protection from small-arms fire and fragments from mortar and artillery rounds is provided by at least 18 inches of dirt. Protection from larger direct fire weapons (e.g., tank gun fire) is gained primarily by hiding the position so the enemy cannot pinpoint it and place accurate fire directly on it. Additional protection against indirect fire is gained by getting below ground level. Below ground level, you are 10 times more protected than above ground level.

b. Another aspect of gaining protection is to make the position as small as possible. The smaller the position, the harder it is to see and hit. When choosing positions, try to use natural protection against enemy fire. In other words, use the terrain to your advantage.

c. Trees, rocks, logs, rubble, and folds in the ground protect the soldier while he is shooting at the enemy. Their main advantage is that they are natural objects and they make it more difficult to detect the fighting position.

d. Whether using natural protection or artificial protection, a good fighting position must be completely invisible to the enemy from the air as well as from the ground.

e. Overhead cover is provided by the TOW cap in mechanized units. This consists of digging the TOW cap into approximately a 24-inch hole. The bottom of the lower blankets are not connected and allow a missile pit to be dug outside the TOW cap frame (figure 2). The TOW system still employs the kneeling position.

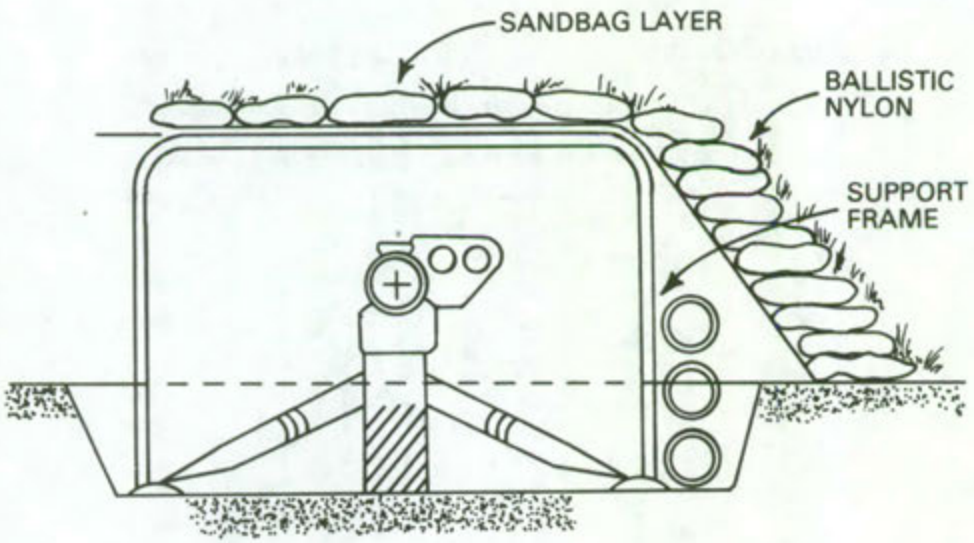


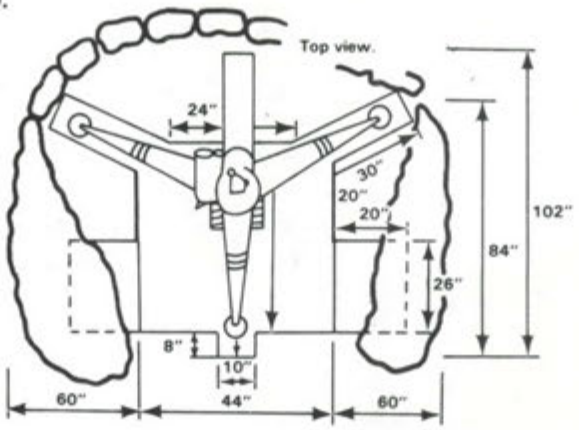
Figure 2.

2. **Size and Shape.**

a. To prepare the position.

(1) When you prepare your position, dismount only the tripod at first to outline the position. Dismount the rest of the launcher when the position will protect it.

(2) Dig the holes for the launcher, the gunner, and the assistant gunner first (figure 3).



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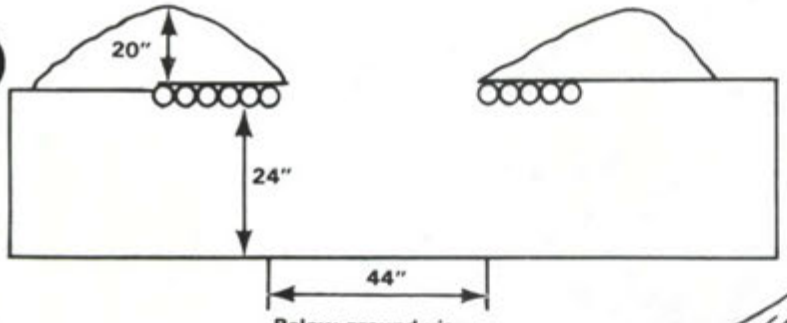
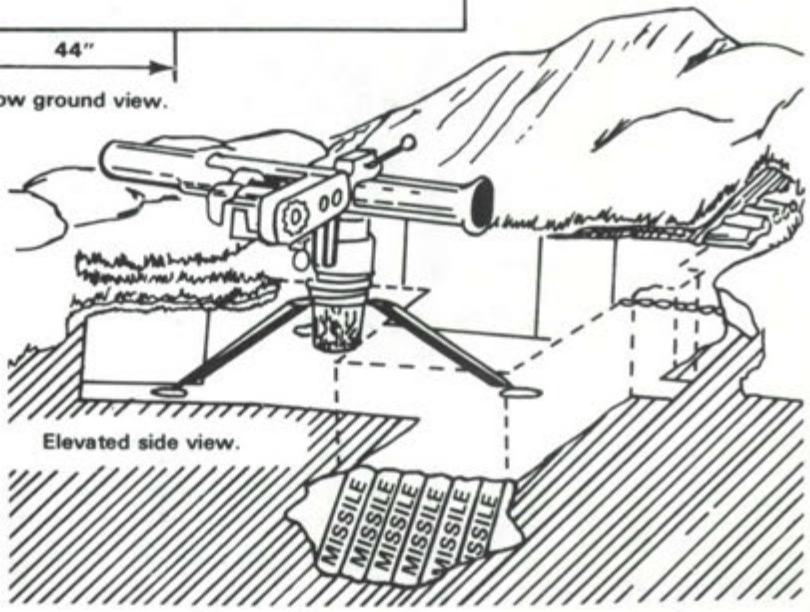


3b.



3c.

Figure 3.

(3) Prepare the covered compartments for missile storage and overhead protection as time permits.

(4) Cover all fresh dirt you dig up with leaves or brush so it blends with the ground around your position.

(5) If you have to cut trees or brush for camouflage, make sure it matches the vegetation around your position. Do not mix pine trees with oak trees.

(a) Change camouflage if it begins to change color.

(b) Don't cut it all from the same area.

(c) Don't drive your vehicle right up to the position. The tracks may give it away.

b. To kneel the launcher: Kneel (lower) the launcher below ground level, as shown in figure 4, if you are being heavily suppressed or want to further conceal the system.

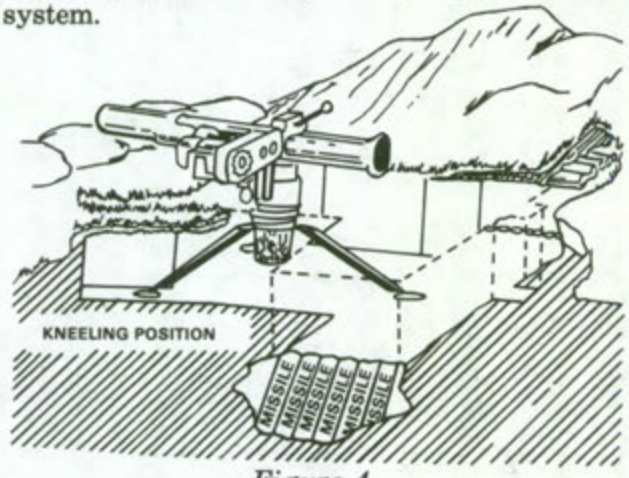


Figure 4.

(1) Release the friction leg lock and the detent stop on the rear leg and slide the leg to the rear.

(2) Lower the launch tube so it does not stick above your frontal protection.

c. To raise the launcher:

(1) Lift on the rear of the encased missile and push forward and down on the rear leg. (Elevation and azimuth locks must be engaged.)

(2) Check your level indicators and lock the friction leg lock.

d. Routes. Select covered routes into and out of the position. If covered routes are not available, select your route carefully to avoid leaving tell-tale signs for aerial observers. Cover any tracks you make.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System, TBP

TASK NUMBER: 071-316-2552

CONTROL TOW SQUAD FIRES

CONDITIONS:

As a TOW squad leader, given one vehicle-mounted TOW with crew and a sector of fire. Targets move into your sector of fire.

STANDARDS:

1. Explain methods of fire control, to include:

   a. Engagement priorities.

   b. Sectors of fire.

   c. Target reference points (TRP).

   d. Phaselines.

   e. Fire patterns.

   f. Fire commands.

2. Give fire commands so that the crew knows what target(s) is to be engaged. Fire commands will include:

   a. Alert.

   b. Target description.

   c. Target location.

   d. Method of fire control.

   e. Execution.

PERFORMANCE MEASURES:

1. **Responsibilities.** Upon receipt of mission:

   a. Coordinate for mutual support with any adjacent antitank weapons and integrate the security of the crew with any nearby units.

   b. Supervise preparation of fighting positions.

   c. Supervise the preparation of range cards.

   d. Brief crew members on fire control measures.

2. **Fire Control Methods.**

a. Primary fire control measures are normally established by the platoon leader and company commander and are designed to take advantage of the TOW's range, accuracy, and destructive power by equally distributing TOW fires across the battle area. Effective fire control and distribution measures are essential to:

(1) Prevent firing more than one missile at the same target.

(2) Avoid needlessly revealing TOW locations.

(3) Insure complete coverage of all armor avenues of approach.

(4) Enable TOWs to fire first.

(5) Provide for destruction of most important targets first.

(6) Gain the best shot at a target.

(7) Afford the leader the ability to better control TOW fires.

b. Primary fire control measures are:

(1) Priority of engagement. Under certain circumstances, a priority of engagement by type of vehicle may be assigned. For example, if enemy AA fire is preventing the Air Force or attack helicopters from operating in the forward battle area, destruction of AA weapons may be given a priority; if long-range enemy ATGMs are reducing effective employment of tanks, they may be designated as priority targets. When a target(s) is assigned an engagement priority, that target is engaged first when it appears. Other targets are engaged after the priority target(s) has been destroyed.

(2) Sectors of fire. A sector of fire is the area of responsibility for fire assigned to a weapon or unit. Sectors are assigned to insure that fires are adequately distributed throughout the battle area, to insure that all armor avenues of approach are covered, and to facilitate the massing of fires. They are normally designated by natural terrain features, whenever possible, for ease of identification (figure 1).

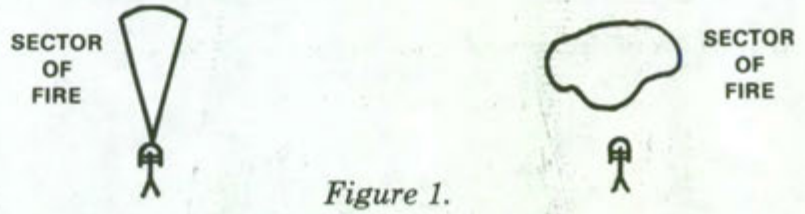


Figure 1.

(a) Assign overlapping sectors of fire to concentrate TOW fires in a critical area (figure 2).

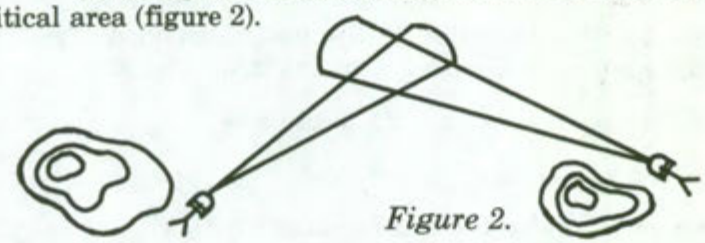


Figure 2.

(b) Assign secondary sectors of fire when there are not enough TOWs to cover all avenues of approach or to gain mutual support between TOWs (figure 3).

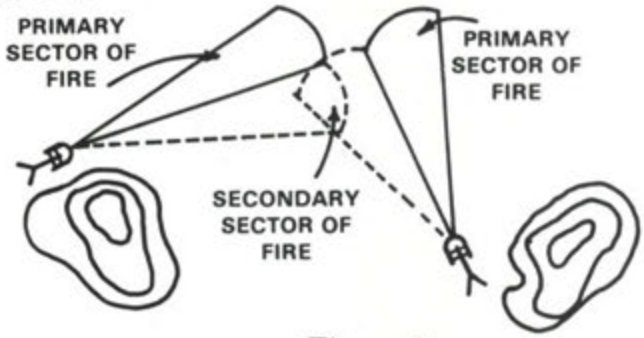


Figure 3.

(3) Target reference points. A TRP is a prominent natural or manmade feature such as a road intersection, hill, or bridge designated by the commander to rapidly designate targets and shift direct fires. TRPs are normally designated by a letter or number (or a combination) and are recorded on range cards for easy reference (figure 4).

NOTE: ALWAYS USE CARDINAL DIRECTIONS (NORTH, SOUTH, ETC.) RATHER THAN "LEFT" OR "RIGHT."

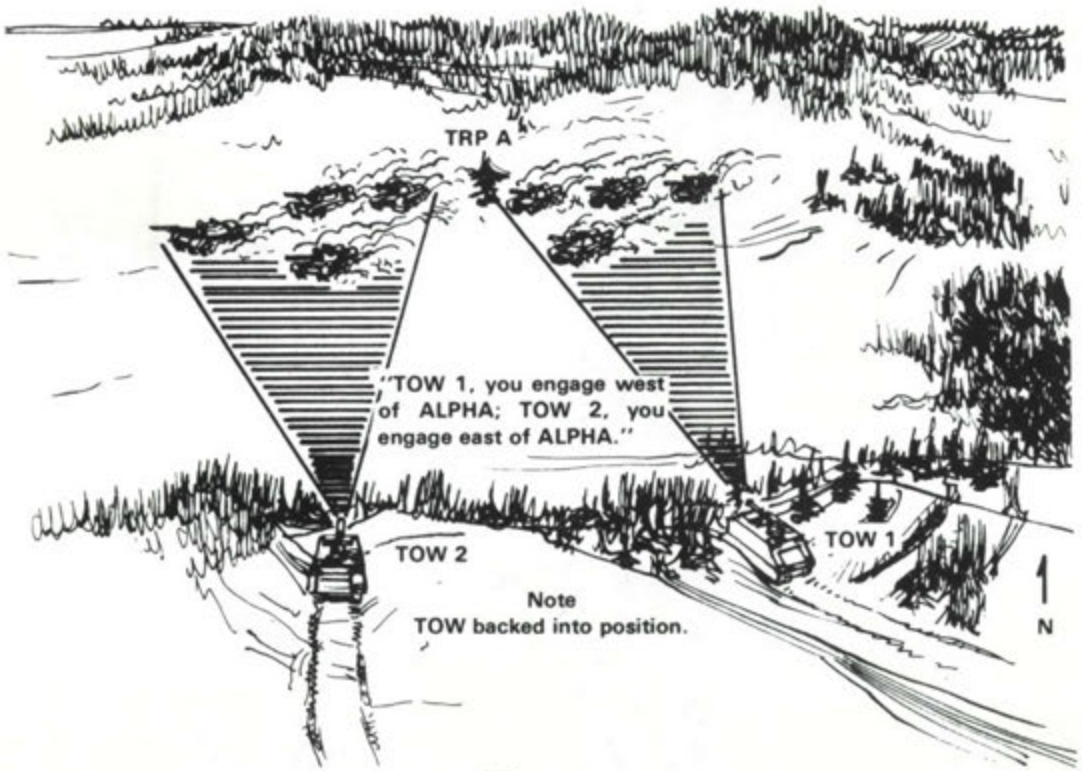


Figure 4.

(4) Phaselines. A phaseline is normally a natural or manmade linear terrain feature, such as a ridgeline, river, treeline, or road. They can be assigned as a control measure for surprise engagement of an enemy force or to initiate or cease fire when radio listening silence is imposed, or when the enemy is employing effective jamming.

(5) Fire patterns. Fire patterns are used to control section fires against an armored formation. Three basic fire patterns will cover most situations and provide fast, effective fire distribution when multiple targets appear. The basic idea is to have each TOW squad start at opposite ends of a formation and work towards the center to prevent multiple target hits.

(a) Frontal fire pattern. The frontal fire pattern is best used when an enemy formation is spread perpendicular to your direction of fire and moving across your front (figure 5).

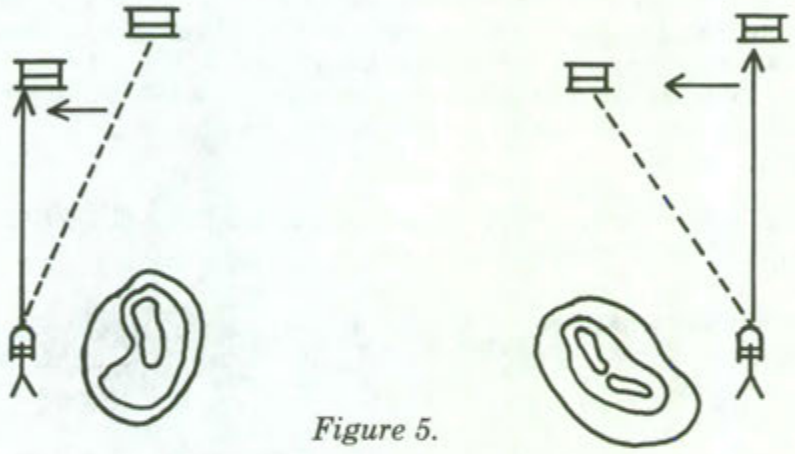


Figure 5.

(b) Crossfire pattern. The crossfire pattern is best used when an enemy formation is spread perpendicular to your direction of fire and moving toward your position. In addition to distributing section fires, it also enables you to achieve a flank engagement and deceive the enemy (figure 6).

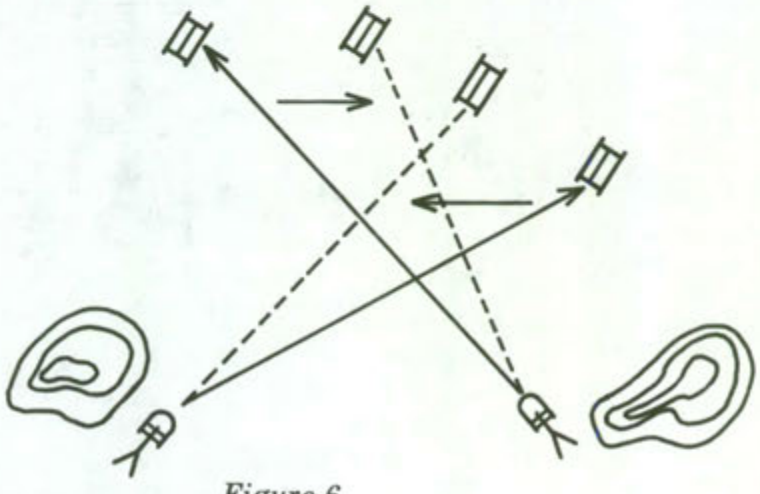


Figure 6.

(c) Depth fire pattern. The depth fire pattern is best used when targets are exposed in depth. The TOW squad on the right engages the near target while the squad on the left engages the far targets; both squads then fire toward the center of the formation (figure 7).

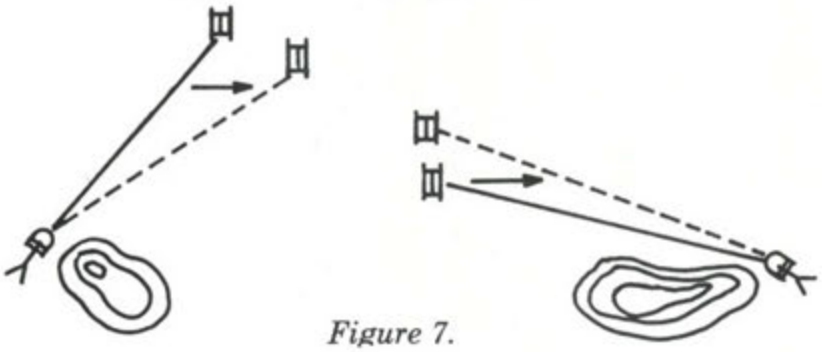


Figure 7.

(6) Fire commands. The squad leader will issue initial fire commands in the following sequence:

(a) *Alert.* "SQUAD."

(b) *Target description.* A brief description of the target. "TANKS, BMPs," etc.

(c) *Target location.* A direction and distance from the TOW firing position, e.g., "NORTH, 2500 METERS," or, from a TRP, "400 METERS EAST OF TANGO, TANGO 49."

(d) *Method of fire control.* "FRONTAL," "DEPTH," or "CROSS."

NOTE: This is required only when multiple targets appear.

(e) *Execution.* "FIRE" or "AT MY COMMAND, FIRE."

- The command FIRE is issued when targets have been determined and can be engaged at the discretion of the gunner.

- AT MY COMMAND, FIRE is issued when you wish to maintain the element of surprise and can effectively use the massed fires of the TOWs to engage and destroy the enemy armor approaching your position.

(f) CEASE TRACKING or CEASE TRACKING, OUT OF ACTION will be issued after observing the warhead detonate or when the squad leader desires to halt firing for any reason.

- CEASE TRACKING notifies the crew that the squad leader intends to remain in position and engage another target immediately or when one appears.

- CEASE TRACKING, OUT OF ACTION notifies the crew that the squad leader intends to move to another position.

REFERENCES:

FM 23-34, TOW Heavy Antitank Weapons System (TBP)
TEC Lesson 948-071-0023-F, TOW Fire Commands

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION IV
HAND GRENADES, MINES, AND DEMOLITIONS

TASK SUMMARIES

TASK NUMBER: 071-325-4401

PERFORM SAFETY CHECKS ON HAND GRENADES

CONDITIONS:

Given any standard issue hand grenade.

STANDARDS:

Within 10 minutes:

1. Inspect grenade for any obvious defects.
2. Correct defects found; if not possible, turn in the grenade.
3. Demonstrate and use the correct procedure for carrying grenades.

PERFORMANCE MEASURES:

1. **Inspect Grenade for Defects** (figure 1):

a. Check to INSURE THAT FUZE IS NOT UNSCREWED from body of grenade.

b. Check to INSURE THAT SAFETY CLIP IS IN CORRECT POSITION.

c. IF NO SAFETY CLIP IS PRESENT, ATTACH CLIP to the grenade as follows:

(1) Slide clip onto handle.

(2) Attach loop portion of clip around grenade fuze.

(3) Snap clip end around grenade safety lever.

d. Check safety pin.

(1) If pin is partially removed, carefully push it into place while holding lever securely down.

(2) If pin is bent, carefully bend it back into position.

e. CHECK SAFETY RING. Reject grenade if safety ring is cracked.

f. CHECK LEVER. Reject grenades with broken lever.

g. CHECK FOR DIRT. If dirty or grimy, wipe with damp or dry cloth.

h. CHECK FOR RUST. Turn in grenade if rust is eating through it.

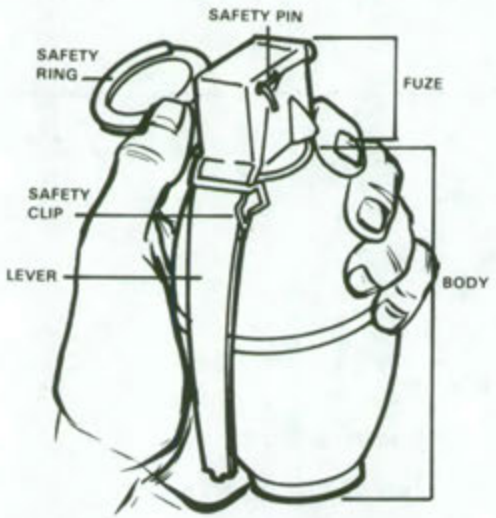


Figure 1.

Figure 2.

2. **Attaching Grenades to Ammo Pouches** (figure 2):

a. First check the fuze for tightness. After checking the fuze for tightness, hold the web carrying sleeve on the side of the ammunition pouch and slide the grenade's safety lever into the sleeve.

b. Be sure the pull ring or the safety pin is pointing downward.

c. Wrap the carrying strap around the neck of the fuze, including the safety lever and the pull ring, and snap the carrying strap to the carrying sleeve.

d. While moving, occasionally check the grenade to make certain the fuze is tight and the carrying strap is secure.

REFERENCES:

FM 23-30, Grenades and Pyrotechnic Signals, Dec 69 (chap 3, page 21)
TEC Lesson 942-071-0002-F, Hand Grenade Maintenance and Identification
TM 9-1330-200-12, Operator's and Organization Maintenance Manual: Grenades, Hand and Rifle, Sep 71 (chap 3, sec III, page 3-4, para 3-7)

TASK NUMBER: 071-325-4402

ENGAGE ENEMY TARGETS WITH HAND GRENADES

CONDITIONS:

During daylight; wearing LBE, with individual weapon, given five M69 practice hand grenades, five M288 practice fuzes, and a requirement to engage the following targets at the designated ranges.

Target 1 - dismounted enemy troops clustered at a range of approximately 35 meters. The situation and available cover will not permit moving closer to the target.

Target 2a - an enemy position with overhead cover (bunker, building, cave, etc.) which can be approached along a covered route.

Target 2b - an enemy emplacement without overhead cover (foxhole, trench or mortar emplacement) at a range of 20 meters. The situation and available cover will not permit moving closer to the target.

Target 3 - an enemy position with overhead cover (bunker, building, cave, etc.) which can be approached along a covered route.

STANDARDS:

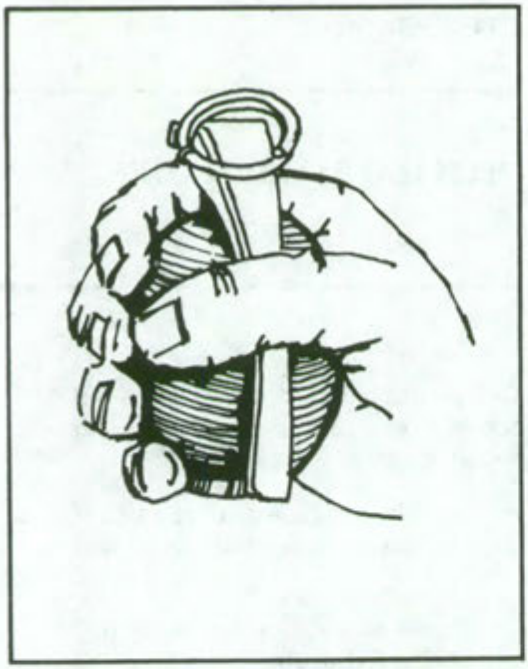
For each target, throw at least one grenade so that it explodes within the effective bursting radius for that target as listed below without exposing yourself for more than 3 seconds at any one time.

TARGET	EFFECTIVE ENGAGEMENT
No. 1 Troops in the open	Within 5 meters of center
No. 2 Troops dug in without overhead cover	Inside of position
No. 3 Troops with overhead cover	Inside of enclosure

PERFORMANCE MEASURES:

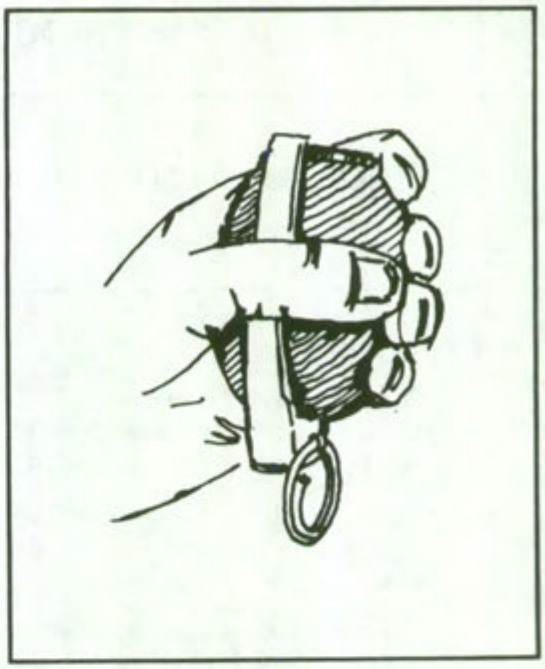
1. **Throwing Hand Grenades.**

a. The Grip. The safest and easiest way to grip a hand grenade for throwing is to hold it so that the safety lever is held down by the thumb while keeping the pull ring (and safety clip if present) free and facing the nonthrowing hand (figures 1 and 2).



Proper grip of the grenade (right-hand thrower).

Figure 1.



Proper grip of the grenade (left-hand thrower).

Figure 2.

b. Body Positioning and Arming. No matter what position is used (standing, kneeling, prone) when throwing a hand grenade, you should be as comfortable and natural as possible. The two most important points in accurate throwing are body-target alinement and eye-target focus. Line your body up with the target as though you were going to throw a football or baseball. Keep watching the target as you throw, and let your arm swing naturally to it. Follow through with your throwing motion and take cover. If possible, you or a buddy should watch where the grenade lands. Make sure you properly arm the grenade before you throw it. Remove the safety clip, pull the pin, throw the grenade.

c. To Throw a Hand Grenade (figure 3):

(1) Look at the target and judge the distance to it.

(2) Line your body up so you can throw comfortably.

(3) Hold the grenade under your chin and with the index finger of your other hand pull and twist the pull ring (at the same time pull the safety clip off the lever with your thumb).

(4) As the pin is removed, look back at your target.

(5) Keeping your eye on the target, throw the grenade overhanded.

(6) Release the grenade after it comes into your field of vision and follow through.

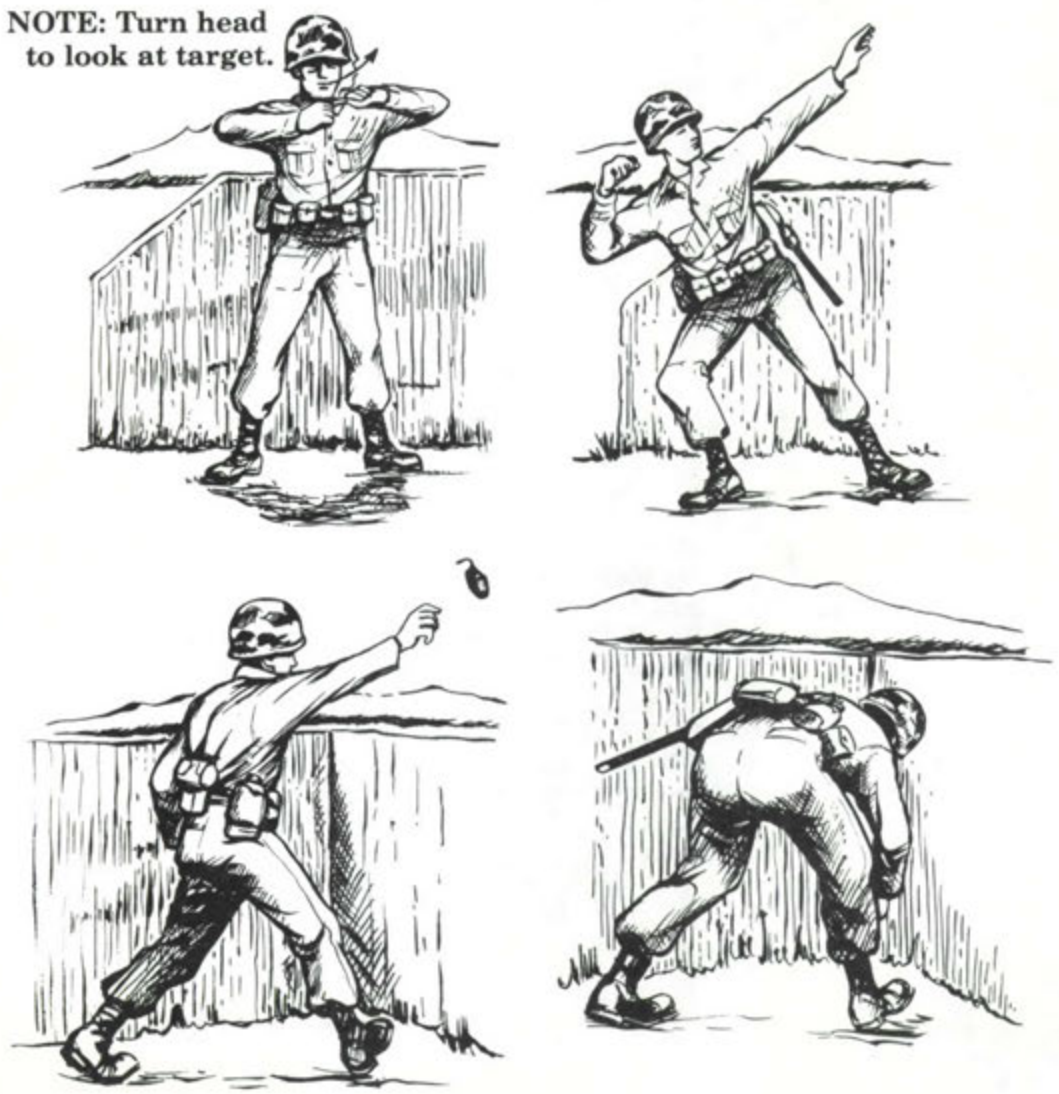


Figure 3. Throwing a grenade.

NOTE: One exception to this procedure is the riot control grenade ABC-M25A2. Since there is no lever, you must hold the arming sleeve down instead. Use the thumb of your throwing hand to do this.

d. Using Fragmentation Grenade M67 with Time Delay Fuze M213 (figure 4). This grenade is your best all-round choice. It can be thrown a little over 40 meters by most soldiers and will kill or injure exposed soldiers who are within 15 meters if it when it explodes. You should, with some practice, be able to throw the grenade to within 5 meters of a selected point 35 meters away from you or within a fighting position 2 meters wide at 20 meters range. Grenades thrown at these targets may hit and roll into the target area, but you should practice to hit the fighting position 'on the fly' in order to destroy positions with frontal cover. Another technique which can be employed with these grenades is the cookoff. To do this, you release the safety lever and hold the grenade for a two count (YOU MUST NOT HOLD IT LONGER, HOWEVER). Then when the grenade is thrown, enemy personnel will not have time to pick it up and throw it back. In addition, if it is thrown high into the air, it can explode over the target (airburst).

Figure 4. Fragmentation hand grenade M67.

e. Safety.

(1) Do not modify grenades in any way (tape or wire, etc.).

(2) Do not attempt to defuze grenades.

(3) Do not remove or use grenades found upside down in their packing containers.

(4) Do not handle dud grenades at anytime.

(5) Do not attach grenades to clothing or equipment by the pull ring.

(6) When using the cookoff technique, do not hold the grenade for more than 2 seconds for any reason.

2. **Training Tips.**

a. Train for results, not the process. Distance and accuracy are the desired results of training, not constant practice of step-by-step body positions. Concentrate on body-target alinement, eye-target focus, safety procedures, and the result - a target kill.

b. Use training grenades (of the type similar to the grenades in your unit's ASP) with practice fuzes. Use expended practice fuze heads with safety levers, safety pin, and safety clip for all training when 'live' practice fuzes are not available.

c. Key on not exposing yourself for more than 3 seconds when throwing grenades.

d. Train to minimum standards and then go on to continually higher standards and more complicated techniques (cookoff and airbursts).

REFERENCES:

FM 23-30, Grenades and Pyrotechnic Signals, Dec 69 (chap 2, page 8; chap 3, page 21)
TM 9-1330-200-12, Operator's and Organization Maintenance Manual: Grenades, Hand and Rifle, Sep 71 (chap 2, pages 2-5 and 2-45)
TEC Lesson 942-071-0001-F, The Hand Grenade - Types and Uses
TEC Lesson 942-071-0002-F, Hand Grenade Maintenance and Identification
TEC Lesson 942-071-0003-F, The Hand Grenade - Carrying, Arming, and Throwing

TASK NUMBER: 071-325-4405

IDENTIFY AND EMPLOY HAND GRENADES

CONDITIONS:

During daylight, in a field location, wearing field clothing, steel helmet, and load-bearing equipment (LBE), and carrying your individual weapon and basic load of ammunition, given fragmentation grenades with time-delay fuzes, fragmentation grenades with impact-detonating fuzes, offensive (concussion) hand grenades and several special purpose grenades.

STANDARDS:

1. Be able to identify any of the hand grenades listed in performance measure 1 by its shape, color, and/or marking.

2. Select the correct hand grenade for each of the following:

   a. To disable or kill personnel.

   b. To signal.

   c. To screen (provide concealment).

   d. To control riots or disable without serious injury.

PERFORMANCE MEASURES:

1. **Identification of hand grenades.** You must be able to identify those grenades which you will usually find within your unit by their shape, color, and/or markings. Figures 1 through 6 will assist you in becoming familiar with the more common grenades currently available.

2. **Uses of hand grenades.** Hand grenades can assist you in accomplishing six different missions:

a. To disable or kill personnel - Use fragmentation or concussion grenades (M67, M68, M26A1, M56, M57, M33, M59, or MK3A2). Fragmentation grenades M68, M57, and M59 are fuzed for exploding on impact after 1 second or within 4 seconds without impact. The other frag grenades (M67, M26A1, and M56) and the offensive (concussion) grenade MK3A2 will explode 4 to 5 seconds after the safety lever is released.

b. To signal - Use M18 Colored Smoke or M34 WP Smoke. [Extreme caution should be used if the M34 is used since it can produce casualties up to 35 meters away from where it explodes.]

Figure 1. M33, FRAGMENTATION HAND GRENADE. Color/Markings - OD with single yellow band and printing.

Figure 2. ABC-M25A2, CS RIOT CONTROL HAND GRENADE. Color/Markings - Gray, red band(s) and red printing.

Figure 3. M34, WP SMOKE HAND GRENADE (STANDARD COLOR AND MARKINGS). Color/Markings - Light green, yellow band, red printing.
Old Markings - Light gray, yellow band, yellow printing.

Figure 4. AN-M8, HC SMOKE HAND GRENADE. Color/Markings - Light green, black printing, white top.
NOTE: M18 Colored Smoke looks the same but the top is the same color as the smoke.

Figure 5. An/M14, TH 3 INCENDIARY HAND GRENADE. Color/Markings - Light red with black printing.
Old Markings - Gray with purple band and purple printing.

Figure 6. M67, FRAGMENTATION HAND GRENADE. Color/Markings - Same as M33.
NOTE: M68 looks the same but has red safety lever with word "IMPACT" on it.

c. To screen (provide concealment) - Use AN-M8 Smoke Grenade. If the AN-M8 is not available, the M18 Colored Smoke or M34 Smoke may be used although they are not as effective as the AN-M8. [If M34 WP Smoke grenades are used, use caution as noted in b., above.]

d. To provide light (illuminate) - Use the MK1.

e. To start fires - Use the AN-M14, TH 3 Incendiary. [The M34 WP Smoke, MK1, and canister-shaped riot control grenades can also start fires but should not be relied upon.]

f. To control riots or disable without serious injury - Use the riot control grenades ABC-M7A2 (canister-shaped) or ABC-M25A2 (baseball-shaped) grenades. [Caution: The ABC-M25A2 is a bursting-type grenade which can cause injury up to 5 meters away.]

3. **Employing hand grenades.**

NOTE: This section will address fragmentation and offensive (concussion) grenades only, since these are the ones you will normally be required to use.

a. Fragmentation grenade with time delay fuze: M67 (figure 6 and the M33 (figure 1).

These grenades are your best all-round choice. They can be thrown a little over 40 meters by most soldiers and will kill or injure exposed soldiers who are within 15 meters of them when they explode. You should, with some practice, be able to throw the grenade to within 5 meters of a selected point 35 meters away from you or within a fighting position 2 meters wide at 20 meters range. Grenades thrown at these targets may hit and roll into the target area, but you should practice to hit the fighting position 'on the fly' in order to destroy positions with frontal cover. Another technique which can be employed with these grenades is the cook-off. To do this, you release the safety lever and hold the grenade for a two count (YOU MUST NOT HOLD IT LONGER, HOWEVER). Then when the grenade is thrown, enemy personnel will not have time to pick it up and throw it back. In addition, if it is thrown high into the air, it can explode over the target (airburst).

b. Fragmentation grenade with impact-detonating fuze: M68, M57 and M59.

Like the time delay grenades, these can be thrown about 40 meters and have the same effect except that they explode as soon as they hit something. With these, you must hit the target 'on the fly,' not on a bounce or roll. For safety, they do not arm until 1 second after releasing the lever, so if you drop it you can still recover it and throw it. If it hits something before 1 second has passed and comes to rest, it will explode after 3 or 4 more seconds. This grenade is best used when you want to insure enemy soldiers don't return it or on steep hills where the delay fuze grenade might roll away from the target.

c. Offensive hand grenade, MK3A2. This canister-shaped grenade can also be thrown about 40 meters, but its effectiveness against targets in the open is not very good. Against targets in confined spaces such as rooms, bunkers, or caves, it is the best choice.

REFERENCES:

FM 23-30, Grenades and Pyrotechnic Signals, Dec 69 (chap 2, page 5, para 3; pages 8 thru 20, para 9 thru 30)
TEC Lesson 942-071-0001-F, The Hand Grenade - Types and Uses
TEC Lesson 942-071-0002-F, Hand Grenade Maintenance and Identification

TASK NUMBER: 051-192-1502

INSTALL AND FIRE/RECOVER AN M18A1 CLAYMORE MINE

CONDITIONS:

Given an M18A1 antipersonnel mine (inert) (claymore), an M57 firing device, an M40 test set, and a firing wire with inert blasting cap, packed in an M7 bandoleer; a designated installation site; a firing position at least 16 meters from the installation site; and a sandbag.

STANDARDS:

1. Install the claymore facing the center of mass of a kill zone.
2. Claymore is recovered and repacked in the bandoleer if not detonated.

PERFORMANCE MEASURES:

1. **Installing the M18A1 Claymore Mine.**

a. Account for all accessories in the bandoleer (figure 1) and read the attached instruction sheet. Remove the electrical firing wire, leaving the mine and other accessories in the bandoleer.

WARNING: During installation, the M57 firing device must be kept in the possession of the individual installing the mine to prevent accidental firing by another individual.

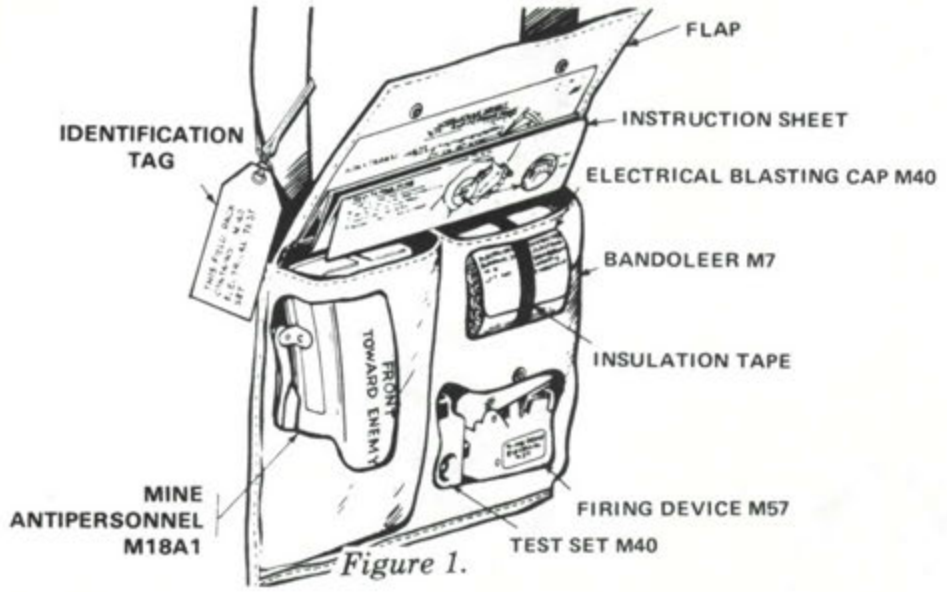


Figure 1.

b. Tie the shorting plug end of the firing wire (figure 2) to a fixed object (stake, tree, etc.) at your firing position. Place the bandoleer on your shoulder and unroll the firing wire to the selected position for emplacing the mine.

Figure 2.

c. Remove the mine from the bandoleer. Open both pairs of legs to a 45-degree angle with two legs facing to the front and two legs facing to the rear of the mine (figure 3).

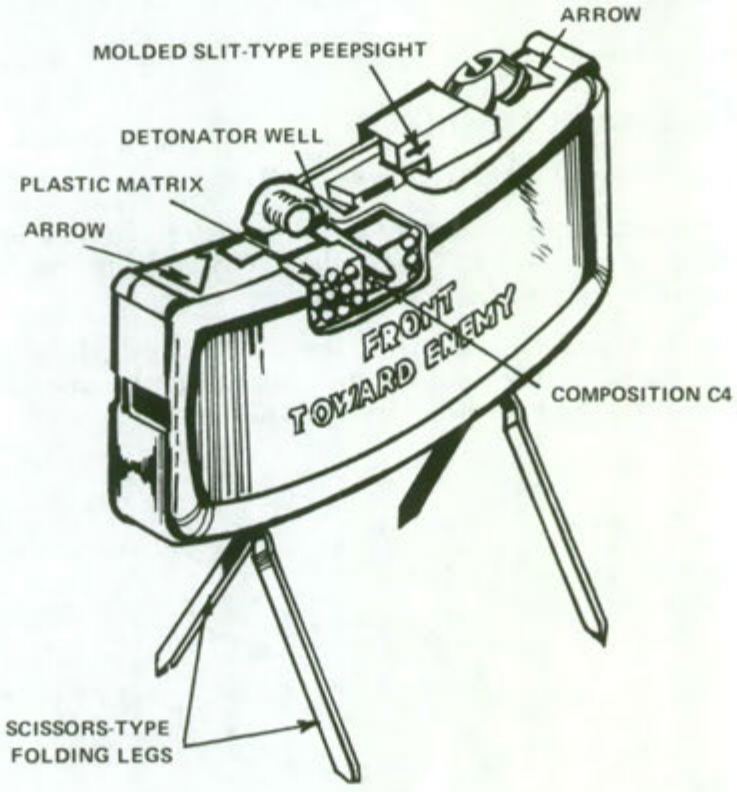


Figure 3.

c. Push the legs approximately 1/3 of the way into the ground with the mine facing in the desired direction of fire.

2. **Aiming the Mine.**

a. Select an aiming point (tree, large rock, etc.) approximately 50 meters (150 feet) to the front of the mine and approximately 2½ meters (8 feet) above the ground using the slit-type peepsight (figure 4).

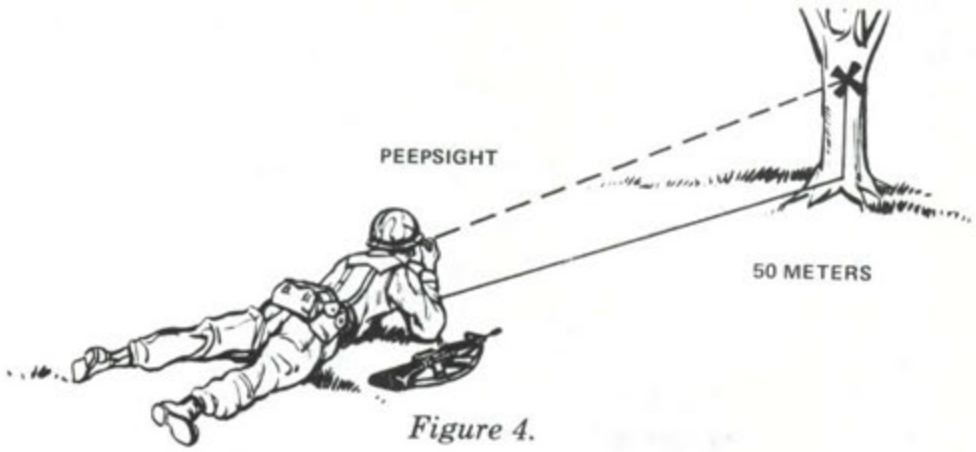


Figure 4.

b. Position the eye about 6 inches to the rear of the sight while sighting through the peepsight. The groove of the sight should be in line with the aiming point. The aiming point should be in the center of the desired area of coverage with the bottom edge of the peepsight parallel to the ground which is to be covered with the fragment spray (figure 5).

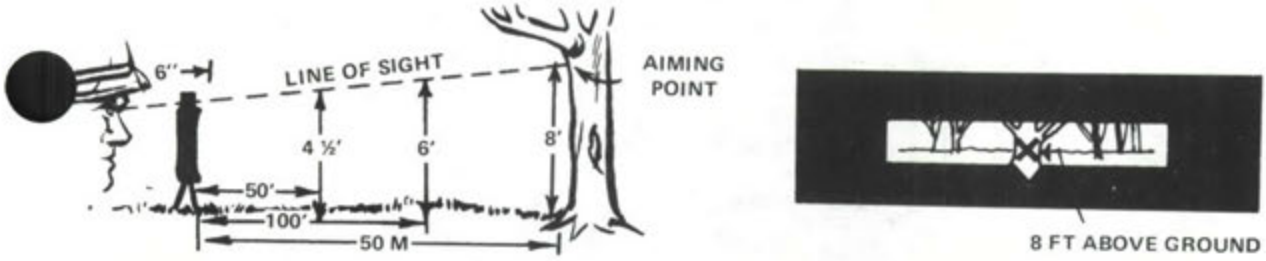


Figure 5.

c. Using the knife-edge sight, select an aiming point at ground level approximately 50 meters (150 feet) in front of the mine (figure 6). Position

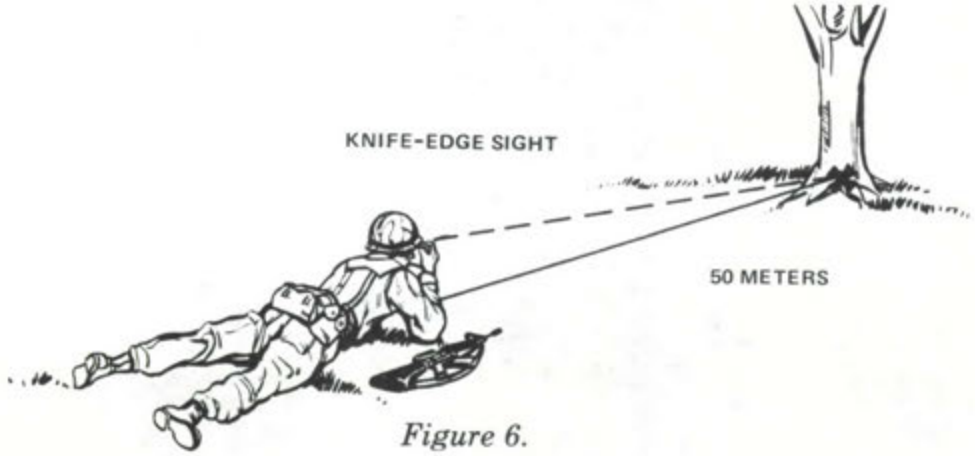


Figure 6.

the eye approximately 6 inches to the rear of the sight and aline the two edges of the sight with the aiming point (figure 7).

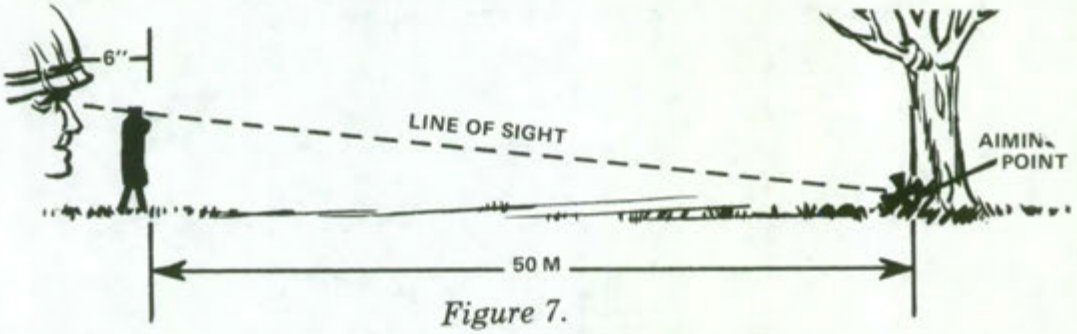


Figure 7.

d. After aiming the mine, secure the firing wire approximately 1 meter to the rear of the mine so it will not become misalined if the firing wire is disturbed.

3. **Testing the Circuit.** To conduct a circuit test, remove the dust cover from the connector of the M57 firing device and from the female connector of the M40 test set. Plug the test set into the firing device (figure 8). Position the firing device bail to the FIRE position and actuate the handle of the firing device with a firm, quick squeeze and observe the window of the test set for a flash of light (figure 8). The flashing light indicates that the M57 firing device and M40 test set are functioning correctly. Remove the shorting plug dust cover from the connector of the firing wire and from the end of the test set. Plug the connector of the firing wire into the test set (figure 9). Place a sandbag over the blasting cap.

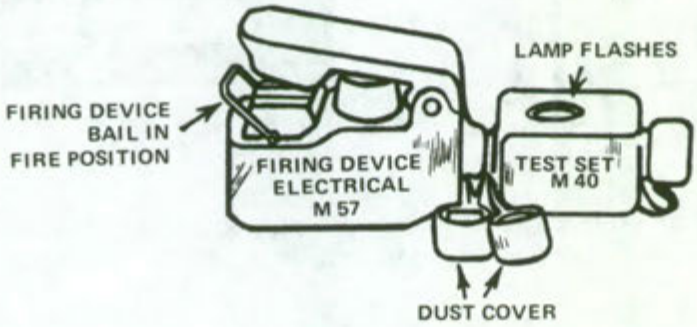


Figure 8.

Place the M57 firing device bail in the fire position and actuate the handle. The lamp in the window of the M40 test set should flash.

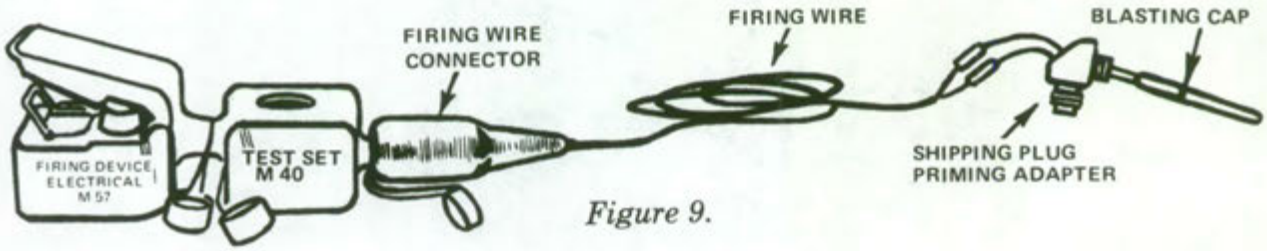


Figure 9.

NOTE: Circuit testing is conducted without the blasting cap inserted into the detonator well. Insure that no friendly personnel are near the blasting cap, as it may detonate.

4. **Arming the Mine.**

a. After circuit testing, return to the mine (with the firing device in firer's possession) and unscrew one of the shipping plug priming adapters from the mine. Slide the slotted end of the shipping plug priming adapter onto the firing wires of the blasting cap between the crimped connections and the blasting cap. Pull the excess wire through the slotted end of the adapter until the top of the blasting cap is firmly seated in the bottom portion of the shipping plug priming adapter (figure 9). Screw the adapter with blasting cap into the detonator.

WARNING: Make certain that the face of the mine marked "FRONT TOWARD ENEMY" and the arrows on top of the mine point in the direction of the enemy.

b. Recheck the aim of the mine. Camouflage the mine and, if possible, bury the firing wire and move back to the firing position.

NOTE: The firing position should be in a foxhole or covered position at least 16 meters to the rear or the side of the emplaced mine.

c. Prior to connecting the firing device to the firing wire, make certain that the safety bail is in the SAFE position (figure 10) and all friendly troops within 250 meters to the front and sides and 100 meters to the rear of the mine are under cover. **Do not connect the firing device to the firing wire until actual time of firing.**

Figure 10.

7. **Firing the Mine.** To fire the mine, remove dust covers from the firing device and firing wire and connect the firing device to the firing wire. When the lead elements of an enemy formation approach within 20 to 30 meters of the mine, position the firing device safety bail in the FIRE position (figure 10) and actuate the firing device handle with a firm, quick squeeze.

8. **Disarming the Mine.** To disarm the mine (if the mine is not detonated), make certain the firing device safety bail is in the SAFE position. Disconnect the firing wire from the firing device and replace dust

covers. Keep the firing device in your possession throughout recovering the mine. Unscrew and remove the shipping plug primary adapter containing the blasting cap. Separate the two and reverse the shipping plug priming adapter, and screw the plug end of the adapter into the detonator well. Remove the firing wire from the stake and reroll the blasting cap and wire and place in its cardboard container. Remove the mine from its emplacement. Repack the mine and accessories into the bandoleer.

SQT REQUIREMENTS: The soldier is not required to camouflage the mine, or to bury the wire.

REFERENCES:

FM 23-23, Antipersonnel Mine M18A1 (Claymore), C2, Jan 66 (chap 2, sec III, page 2 thru 7)
TEC Lesson 947-071-0106-F, Claymore Mines, Introduction, Circuit Testing and Emplacement
TEC Lesson 947-071-0107-F, Claymore Mines, Electrical Arming and Firing
TEC Lesson 947-071-0109-F, Claymore Mines, Disarming, Recovery and Emergency Destruction Procedures

TASK NUMBER: 051-192-1505

INSTALL THE M18A1 CLAYMORE WITH TRIPWIRES

CONDITIONS:

Under any environmental conditions, given a claymore mine(s), nonelectric blasting caps, detonating cord (approximately 25 meters), an M3 or M1 firing device, roll of tape, and M2 crimpers, with a requirement to install the mine in a hasty protective minefield.

NOTE: For training purposes use the appropriate training devices.

STANDARDS:

Without premature detonation, install the mine IAW the performance measures so that detonation will occur as designed.

PERFORMANCE MEASURES:

1. **Installing and Aiming the Claymore.** Follow the steps in performance measures 1 and 2 contained in the task: **Install and Recover an M18A1 Claymore Mine.**

2. **Setting up the Claymore to Fire with Tripwires.** Setting up the claymore can be done several ways; figure 1 shows two methods. For purposes of this task, only the method in figure 1a will be explained.

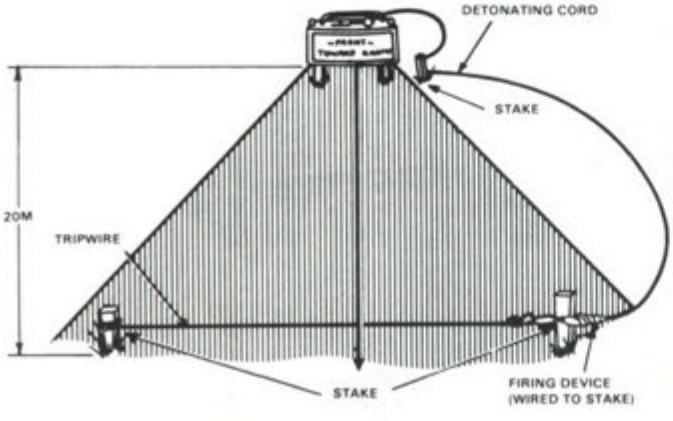


Figure 1a.

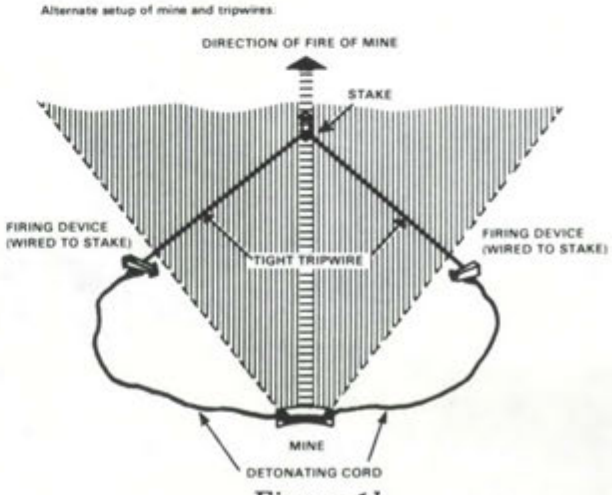


Figure 1b.

3. **To Arm the Claymore with Tripwires:**

a. Emplace two anchor stakes, approximately 20 meters to the front of the mine, and space them 10-20 meters apart (figure 1a).

b. Emplace one stake to one side of, and approximately 1 meter from, the mine.

c. To install the firing device.

(1) Remove protective cap.

(2) With crimpers, attach blasting cap to standard base (figure 2).

WARNING: Crimper jaws should be placed no farther than 1/4 inch from open end of blasting cap.

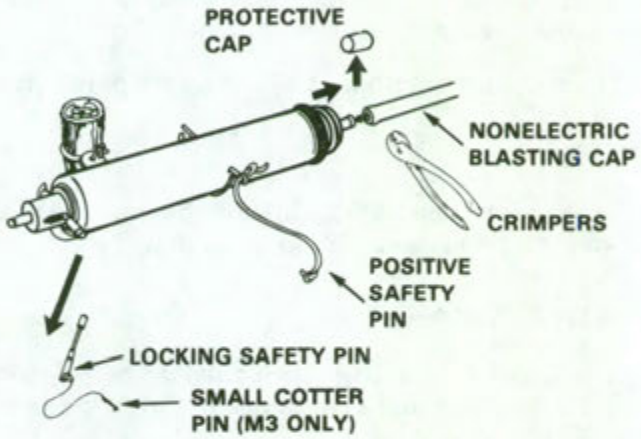


Figure 2. Attaching the nonelectric blasting cap.

(3) Take the detonating cord and tape one end of the cord to the firing device end containing the nonelectric blasting cap as shown in figure 3.

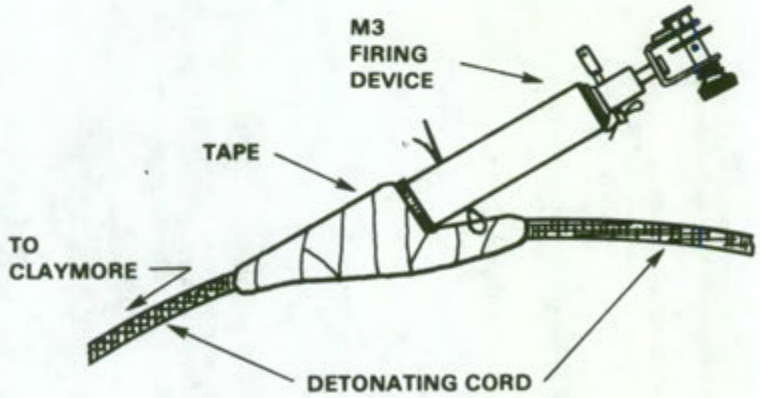


Figure 3. Method of taping M3 firing device to detonating cord.

(4) Using tape, wire, twine, or cord, fasten the firing device securely to one of the stakes you emplace in step 3a (figure 1a).

d. Secure a length of tripwire first to the opposite forward stake and then to the firing device. If using the M1, attach the tripwire to the pull ring. If using the M3, insert the tripwire into the hole in the winch. Then draw up the tripwire by turning the knurled knob until the locking safety pin is pulled into the wide portion of safety pin hole.

e. Return to the mine and wrap the loose end of the detonating cord securely around the nearby stake, leaving at least 1 meter of cord overhang.

f. Carefully insert the loose end of the detonating cord into a nonelectric blasting cap and crimp.

WARNING: Crimper jaws should be placed no farther than 1/4 inch from open end of blasting cap.

g. Seat the cap (with detonating cord) in the shipping plug priming adapter and carefully insert the cap into the well.

h. Secure the cap in the detonator well by carefully screwing the shipping plug priming adapter into the detonator well.

i. Recheck the mine for proper aim.

j. Return to the firing device and, with the attached string, carefully pull out the locking safety pin. If using the M3, first remove the small cotter pin from the end of the locking safety pin. If the locking safety pin does not remove easily from the M3, adjust the winch winding.

k. With attached string (M1 or M3), carefully remove the positive safety pin. If any difficulty is encountered, replace all safety pins, and replace firing device with another.

REFERENCES:

FM 23-23, Antipersonnel Mine, M18A1 and M18 (Claymore), C1, 2, Jan 66 (chap 2, page 14-16, para 13)
TEC Lesson 947-171-0106-F, Claymore Mines, Introduction
TEC Lesson 947-171-0107-F, Electrical Arming and Firing
TEC Lesson 947-171-0108-F, Nonelectrical Arming and Firing
TEC Lesson 947-171-0110-F, Multiple Emplacement and Review

TASK NUMBER: 051-192-1506

DISARM THE M18A1 CLAYMORE WITH TRIPWIRES

CONDITIONS:

Under any environmental conditions, given a claymore mine that has been installed in a hasty protective minefield with tripwires, M2 crimpers or any sharp cutting instrument, claymore carrying pouch, length of wire, nail or the safety and locking pin for the firing device, approximately 25 feet of string, and a requirement to recover the claymore.

NOTE: You will be told what type firing device was used to arm the claymore.

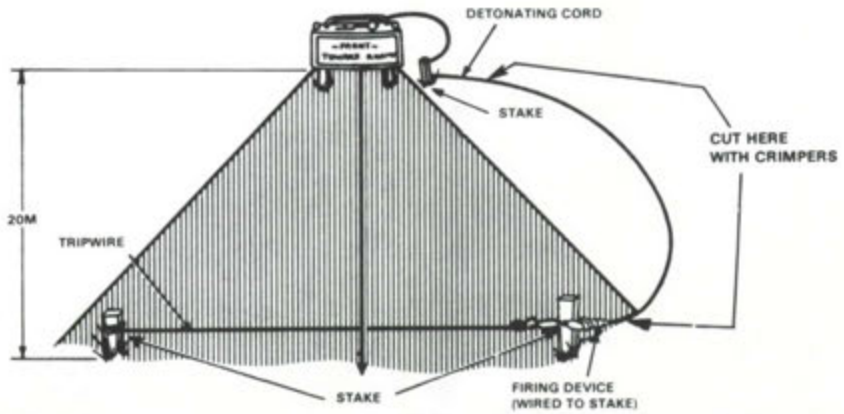
STANDARDS:

Disarm and recover the claymore mine IAW performance measures below.

PERFORMANCE MEASURES:

1. Disarming the claymore requires a great deal of practice and attention to detail. Usually, the claymore, installed nonelectrically (with tripwires), will be a part of a hasty protective minefield. This means that before attempting to disarm the mine, care must be taken to determine the location and firing configuration of other nearby mines. Once this has been done, the mine and attached tripwires must be inspected to determine if they have been damaged, boobytrapped, or otherwise altered.

WARNING: If at any time the mine appears to be damaged or altered, consider it unsafe. Report it to your supervisor.



2. To disarm mines equipped with the M3 firing device:

a. Move to the claymore and, with the M2 crimpers, cut the detonating cord between the claymore and the anchor stake.

b. Unscrew and remove the shipping plug priming adapter, containing the blasting cap, from the mine.

c. Remove the blasting cap attached to the detonating cord, reverse the shipping plug priming adapter, and screw it back into the detonator well.

d. Replace the claymore in its carrying pouch.

e. Move to the firing device and, with the crimpers, cut detonating cord 1 foot from the point where it is taped to the blasting cord.

WARNING: The M3 is dangerous to disarm. It should be blown in place (tactical situation permitting).

f. If the device must be disarmed, proceed as follows:

(1) Insert length of wire, nail, or original pin in positive safety pin hole.

(2) Insert length of wire, nail or original locking pin in locking pin hole.

(3) Disassemble tripwire, firing device, and blasting cap.

g. If the device is to be blown in place, proceed as follows:

(1) Attach a length of string, WD-1/TT wire, or twine (approximately 25 feet) to the tripwire.

(2) Move a safe distance away and pull string.

3. To disarm mines equipped with the M1 firing device.

a. Disarm the M1 firing device by:

(1) Inserting the locking safety pin in safety pin hole.

(2) Cut the detonating cord free of the M1 using the crimpers.

(3) Disconnect the tripwire.

(4) Recover firing device, stakes, and tripwire.

b. Move to the claymore and do the following:

(1) Cut the blasting cap free of the detonation cord.

(2) Unscrew and remove the shipping plug priming adapter containing the blasting cap from the mine.

(3) Remove the blasting cap attached to the detonating cord, reverse the shipping plug priming adapter, and screw it back into the detonator well.

(4) Replace the claymore in its carrying pouch.

c. To dispose of the crimped blasting caps, either attach them to other demolitions which will be detonated, or turn them over to your supervisor.

d. Recover the mine, tripwire and stakes.

REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 1, page 1-26, 1-29, and 1-34 thru 1-36, para 1-51, 1-57j, k)

TASK NUMBER: 051-192-1008

INSTALL THE M21 METALLIC ANTITANK (AT) MINE

CONDITIONS:

You are pariticpating in a tactical operation, given any number of M21 AT mines, M607 fuze, extension rod, extension rod adapter, M120 boosters, M26 arming wrench, intrenching tool and bayonet, and a requirement to install the mine(s) in a hasty protective minefield.

NOTE: For training purposes, use inert devices.

STANDARDS:

Without premature detonation, the mine will be installed IAW the performance measures so that detonation will occur as designed.

PERFORMANCE MEASURES:

1. **To install a mine for pressure activation, using the M607 fuze without tilt rod:**

a. Remove the mine and components from the packing box.

b. Replace the extension rod and extension rod adapter, if present, in the packing box.

c. Inspect the mine and components for serviceability.

d. Check for cracks, dents, or other signs of damage.

e. Insure that the cotter pin of the fuze pull ring assembly and the fuze closure assembly are securely in place.

f. If damaged items are found, replace with a new mine.

2. **To prepare the M21 AT mine for laying:**

a. The numbers of steps 1 through 8 below relate to the numbers in figure 1.

(1) Turn mine bottom up and, with the screwdriver end of the M26 arming wrench, remove the closing plug assembly by turning counter-clockwise.

(2) Inspect booster cavity and remove foreign material.

(3) Insert M120 booster, washer side toward the fuze, into the booster cavity.

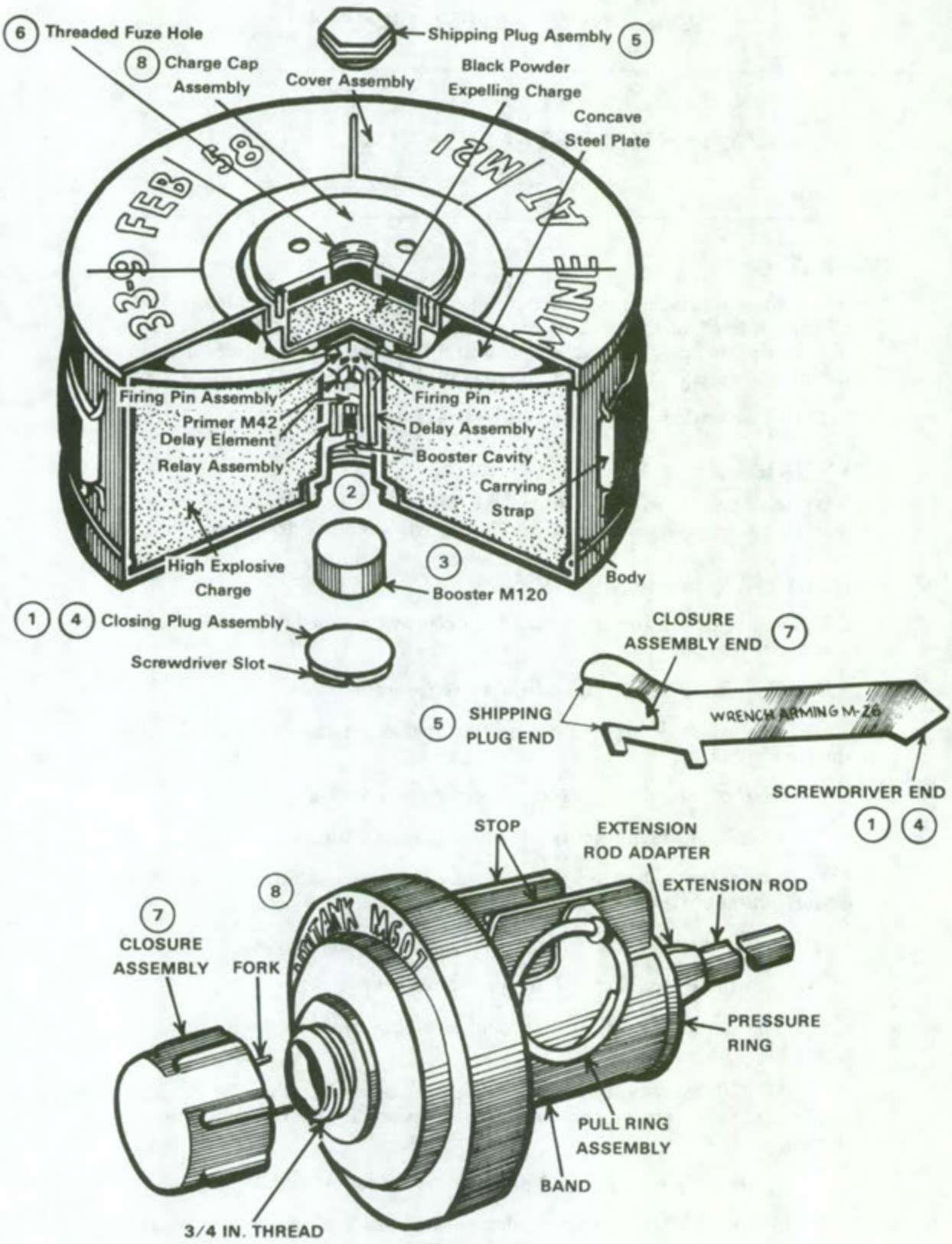

6 Threaded Fuze Hole
8 Charge Cap Assembly
Cover Assembly
Shipping Plug Asembly 5
Black Powder Expelling Charge
Concave Steel Plate
33-8 FEB 58
AT M21
MINE
Firing Pin Assembly
Primer M42
Delay Element
Relay Assembly
Firing Pin
Delay Assembly
Booster Cavity
Carrying Strap
2
3
High Explosive Charge
Booster M120
Body
1 4 Closing Plug Assembly
Screwdriver Slot
CLOSURE ASSEMBLY END 7
5 SHIPPING PLUG END
WRENCH ARMING M-26
SCREWDRIVER END
1 4
STOP
EXTENSION ROD ADAPTER
EXTENSION ROD
8
7
CLOSURE ASSEMBLY
FORK
PRESSURE RING
PULL RING ASSEMBLY
BAND
3/4 IN. THREAD

Figure 1.

(4) With the M26 arming wrench, replace the closing plug assembly by turning clockwise until tight. The gasket of the closing plug assembly should be against the booster.

NOTE: For long-term emplacement, coat the threads of the closing plug assembly with silicone grease DC 6, or equivalent.

(5) Turn the mine bottom down, and using the shipping plug end of the M26 arming wrench, remove the shipping plug assembly from the fuze hole cavity of the mine.

(6) Inspect the fuze hole cavity and remove foreign material.

NOTE: For long-term emplacement, coat the fuze threads with silicone grease also.

(7) With closure end of the M26 arming wrench, remove the closure assembly from the M607 fuze. The gasket on the bottom of the fuze should remain in place.

(8) Screw the fuze handtight into the threaded fuze hole of mine charge cap.

3. **To install the M21 AT mine:**

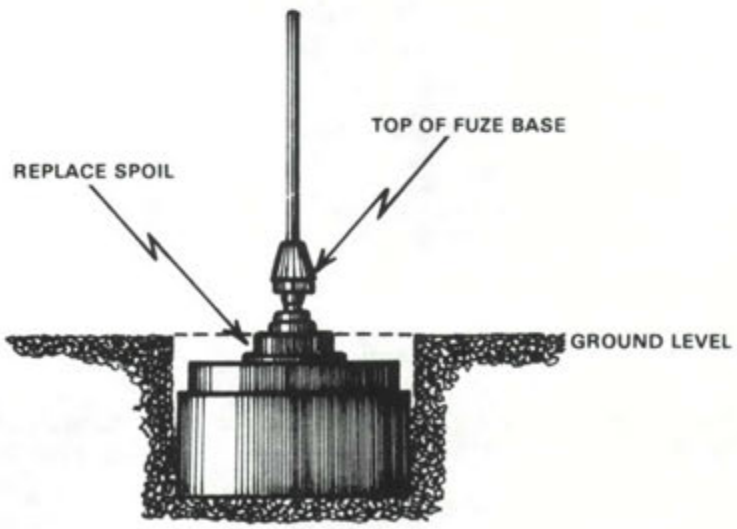
a. Dig the hole for the mine about 10 to 12 inches in diameter and about 6 inches deep.

b. Check the bottom of the hole to insure that the ground is solid. If the ground is soft, place a board or other flat object under the mine to provide a firm foundation.

c. Place the mine in the hole.

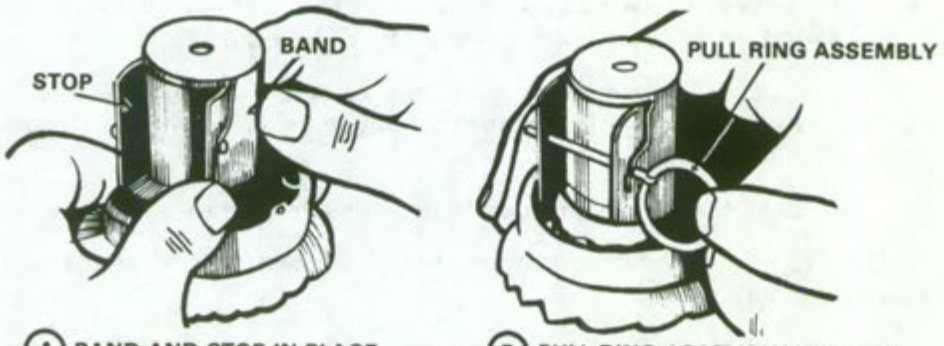
d. Press the ground firmly against the sides of the mine, leaving the fuze uncovered.

Recommended burial for pressure fuze AT mines.



4. **To arm the M21 AT mine:**

a. Remove pull ring assembly, band, and stop on the fuze. This arms the mine.



(A) BAND AND STOP IN PLACE (B) PULL RING ASSEMBLY IN PLACE

b. Retain the pull ring assembly, band, and stop for future use, if needed to disarm the mine.

c. Camouflage the mine, using the spoil from the hole to cover the top of the mine with a 5-centimeter (2-inch) mound of earth, removing excess spoil and adding twigs, grass, or material natural to the surroundings.

5. To install the M21 AT mine, using the M607 fuze with tilt rod:

a. Remove all components from the packing case.

b. Follow the procedures in steps given in paragraph 3, above, until after you have pressed the ground firmly around the sides of the mine, leaving the fuze uncovered.

c. Assemble the extension rod into the threaded pressure ring of the M607 fuze. (Extension rod adapters originally provided are not required.)

d. Insure that the extension rod is vertical and not tilted in any direction.

NOTE: The use of the extension rod equipped with M607 fuze is preferable where the vegetation cover is sufficient to help conceal the extension rod.

e. Camouflage of extension rods must be completed before the mine is armed.

f. Remove the pull ring assembly, band, and stop on the fuze. This arms the mine.

REFERENCES:

FM 20-32, Mine/Countermine Operations at the Company Level, Nov 76 (app C, page 147, para C-11)
TM 9-1345-203-12&P, Land Mines (chap 2, para 2-10)
TEC Lesson 947-071-0184, Arming and Disarming the M21 AT Mine
GTA 7-1-6, Mine AT M21

TASK NUMBER: 051-192-1018

DISARM THE M21 METALLIC ANTITANK MINE

CONDITIONS:

Under any environmental conditions, with an installed M21 metallic antitank mine, M26 arming wrench, and instructions to hand-neutralize the mine.

STANDARDS:

The mine will be disarmed and removed IAW the performance measures without detonating.

PERFORMANCE MEASURES:

WARNING: Before attempting to disarm and remove the mine, remove camouflage and check for any evidence of boobytrapping, damage, or malfunctioning. If any of these conditions are found to exist, do not attempt to disarm the mine.

1. To disarm the mine when equipped with an M607 fuze:

   a. Replace safety (pull ring assembly, band, and stop).

   b. Remove mine from hole.

   c. Remove extension rod and adapter (if used).

   d. Remove fuze.

   e. Attach closure assembly to M607 fuze.

   f. Remove the closing plug.

   g. Remove M120 booster from bottom of mine.

   h. Reinsert closing plug.

REFERENCE:

TEC Lesson 947-071-0184, Arming and Disarming the M21 Antitank Mine

TASK NUMBER: 051-192-1002

INSTALL THE M16A1 BOUNDING ANTIPERSONNEL MINE (WITH/WITHOUT TRIPWIRES)

CONDITIONS:

Under any environmental conditions, with an M16A1 bounding antipersonnel mine, M605 fuze, M25 fuzing wrench, tripwire, and entrenching tool.

STANDARDS:

The mine (with/without tripwire) will be installed IAW the performance measures so that detonation will occur as designed.

PERFORMANCE MEASURES:

1. **To install the mine without tripwires:**

   a. First, inspect the mine (figure 1) to insure all parts are present.

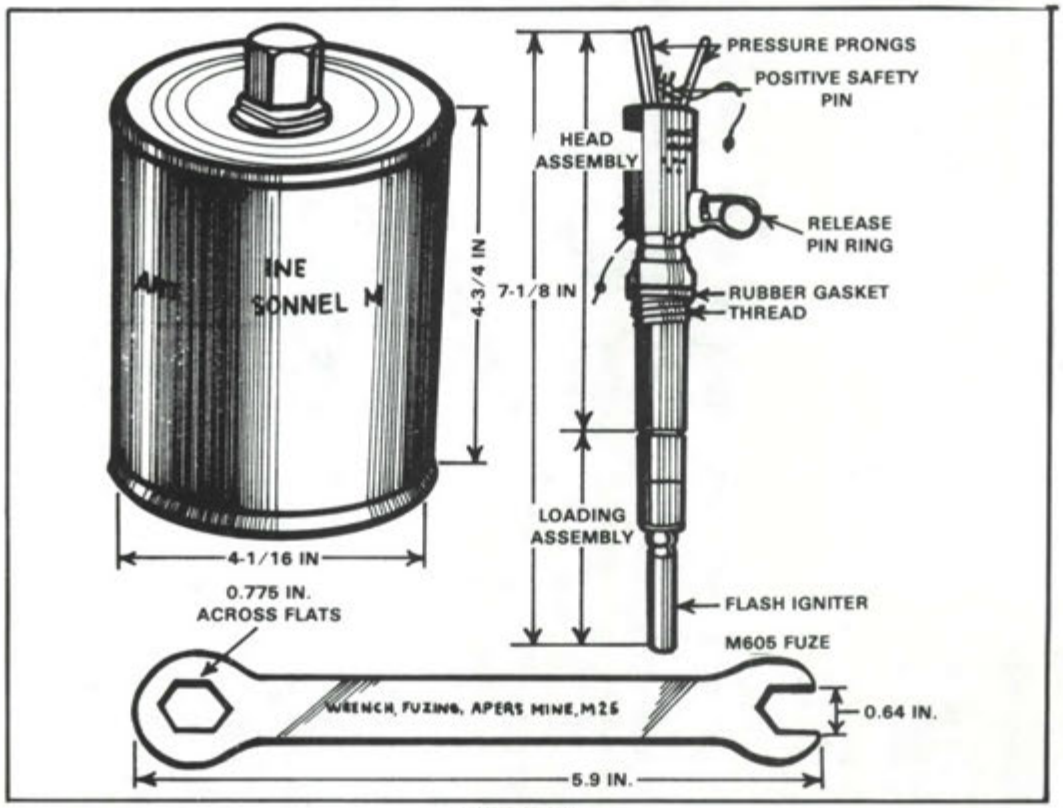


Figure 1.

(1) Using the closed end of the fuzing wrench M25 issued with the mine, unscrew the shipping plug from the fuze well of the mine.

(2) Examine the fuze well and flash tube. To remove obstructions or foreign matter, turn the mine upside down and gently tap its bottom. If the mine appears to be damaged or in unsatisfactory condition, carry it to a safe place and destroy.

b. Fuze the mine.

(1) Carefully examine the M605 fuze assembly, including the crimping at the top of the fuze where it touches the top of the trigger, for evidence of damage. Check the safety pins to see that they move freely in the safety pin holes. Be sure the rubber gasket is around the fuze case.

(2) Using the open end of the combination wrench M25, screw the fuze assembly into the fuze well of the mine and tighten it securely against the rubber gasket.

c. Bury the mine.

(1) Dig a hole about 6 inches deep and 5 inches in diameter.

(2) Place the mine in the hole.

(3) Cover the mine up to the bottom of the release pin ring with spoil from the hole, pressing it firmly into place around the sides of the mine (figure 2).

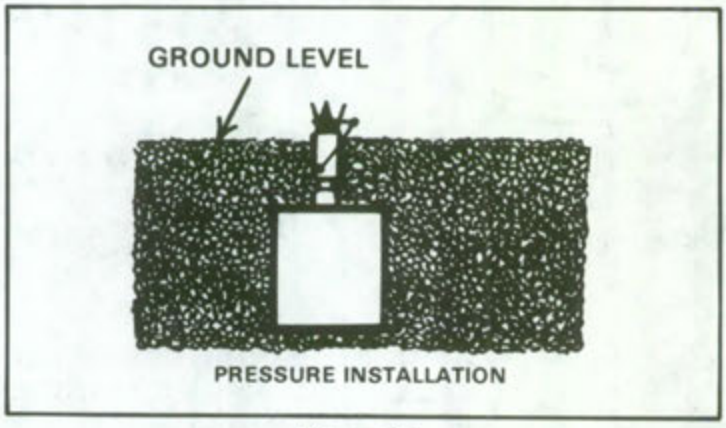


Figure 2.

(4) Leave the release-pin ring and pressure prongs exposed.

(5) Arrange the pull cords on the safety pins for easy withdrawal.

(6) Remove the locking safety pin. After the locking safety pin is removed, the interlocking pin, located between the prongs, can be removed from the positive safety pin.

(7) Complete covering the mine with dirt until only the pressure prongs are above ground level. Camouflage the installation.

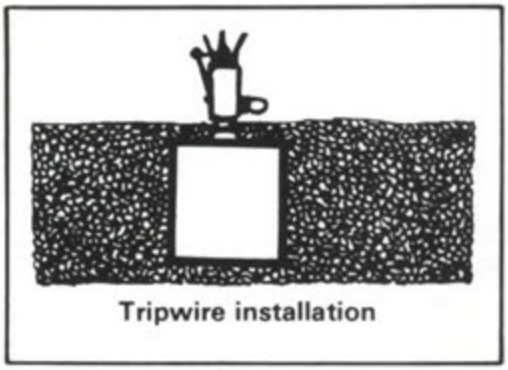
(8) Remove the positive safety pin, thus arming the fuze. If positive safety pin is hard to remove, obtain a new fuze.

2. **To install the mine with tripwires:**

a. Inspect the mine. (See performance measure 1.)

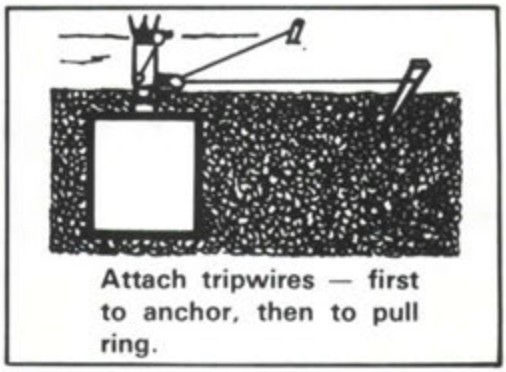
b. Fuze the mine. (See performance measure 1.)

c. Bury the mine and install tripwires (figures 3 and 4).



Tripwire installation

Figure 3.



Attach tripwires — first to anchor, then to pull ring.

Figure 4.

(1) Dig a hole about 6 inches deep and 5 inches in diameter.

(2) Lay the mine into the hole so that the tips of the prongs on the fuze will be just above ground.

(3) Pack dirt tightly around and over the mine just below the release pin ring.

(4) Install two anchor stakes approximately 10 meters from the mine. Locate the stakes so that the wires, when attached, will form a wide V. A third tripwire may be installed, if directed by the supervisor.

(5) Fasten a separate wire to each anchor stake. Fasten the free ends to the release pin ring of the fuze.

WARNING: DO NOT INSTALL THE TRIPWIRES SO TAUT THAT THEY EXERT PULL ON THE RELEASE PIN RING, AS THIS MIGHT CAUSE THE MINE TO DETONATE ACCIDENTALLY WHEN THE SAFETY PINS ARE REMOVED.

(6) Leave enough slack to the tripwires to allow the top of the fuze to rotate and receive a direct pull on the release pin ring from either of the tripwires.

3. **To arm the mine** (figure 5):

a. Remove locking safety pin; then remove interlocking pin from the positive safety pin.

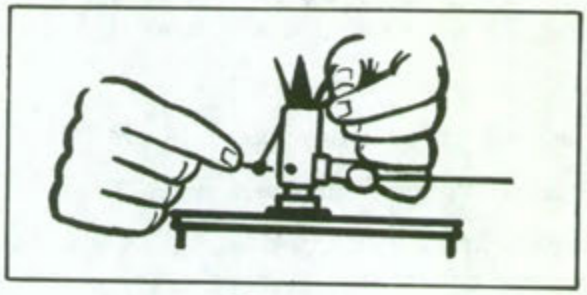


Figure 5.

b. Arrange pull cords on positive safety for easy withdrawal.

c. Camouflage the installation, being careful not to cover the pullcord on the positive safety pin.

d. Arm the fuze by removing the positive safety pin. If positive safety pin is hard to remove, obtain a new fuze.

REFERENCES:

FM 5-34, Engineer Field Data, Sep 76 (chap 3, page 41a)
FM 20-32, Mine/Countermine Operations at the Company Level, Nov 76 (app C, page 143, para C-6)
TM 9-1345-203-12 & P, Landmines, Jan 77 (chap 2, page 2-1, para 2-2)

TASK NUMBER: 051-192-1012

DISARM THE M16A1 BOUNDING ANTIPERSONNEL MINE EQUIPPED WITH AND WITHOUT TRIPWIRES

CONDITIONS:

Under any environmental conditions, given M16A1 bounding antipersonnel mines equipped with and without tripwires, M25 fuzing wrench, safety pins, and instructions to hand-neutralize the mines.

STANDARDS:

The mines will be disarmed and removed without detonating.

PERFORMANCE MEASURES:

WARNING: BEFORE ATTEMPTING TO REMOVE THE MINE, REMOVE THE CAMOUFLAGE AND CHECK FOR EVIDENCE OF BOOBYTRAPPING, DAMAGE, MALFUNCTIONING, AND SAFETY PINS WHICH CANNOT BE REPLACED. IF SUCH FAULTS ARE APPARENT, DO NOT TRY TO DISARM THE MINE.

1. To disarm a mine without tripwires.

   a. After the mine has been checked, carefully uncover top of mine.

   b. Carefully insert original safety pin, if available, or length of steel wire or a nail of proper diameter through the positive safety pin hole.

   c. Insert safety pin, length of steel wire, or nail through the locking safety pin hole opposite the release pin ring.

   d. Carefully dig around the sides and bottom of the mine, always being alert for boobytraps.

   e. Carefully lift the mine from the hole.

   f. Unscrew and remove the M605 fuze assembly, using the M25 wrench.

   g. Replace the plastic shipping plug in the fuze well, and set the mine aside for disposition.

2. To disarm a mine equipped with tripwires.

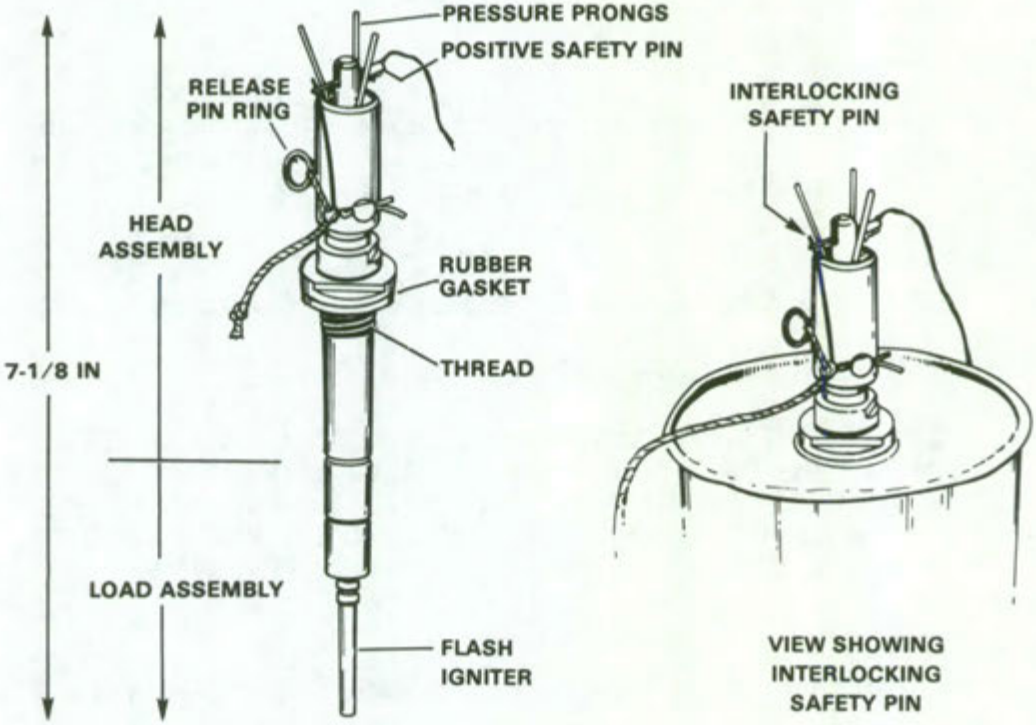
   a. Check mine and area for boobytraps. If clear, proceed.

   b. Carefully uncover top of mine.

   c. Examine mine for evidence of malfunction, damage, or tampering.

d. If mine does not appear to be damaged or tampered with, carefully insert original safety pin, if available, or length of steel wire or nail of proper diameter through positive safety pin hole.

e. Insert safety pin, length of steel wire, or nail through locking safety pin hole, opposite release pin ring.



f. After safeties have been inserted, cut all slack wires attached to the release pin ring.

g. Carefully dig around sides and bottom of mine, always being alert for boobytraps.

h. Lift mine from ground.

i. Unscrew and remove fuze assembly.

j. Replace plastic shipping plug in fuze well.

k. Restore mine and fuze to original condition, if possible.

REFERENCES:

TM 9-1345-203-12&P, Land Mines, Jan 77 (chap 2, page 2-2, para 2-2)
TEC Lesson 947-071-0181-F, Disarm an M16A1 Antipersonnel Mine

TASK NUMBER: 051-192-1021

LOCATE MINES BY VISUAL MEANS

CONDITIONS:

During a daylight movement, with the possibility of enemy mines and boobytraps in an area, using visual sighting means only.

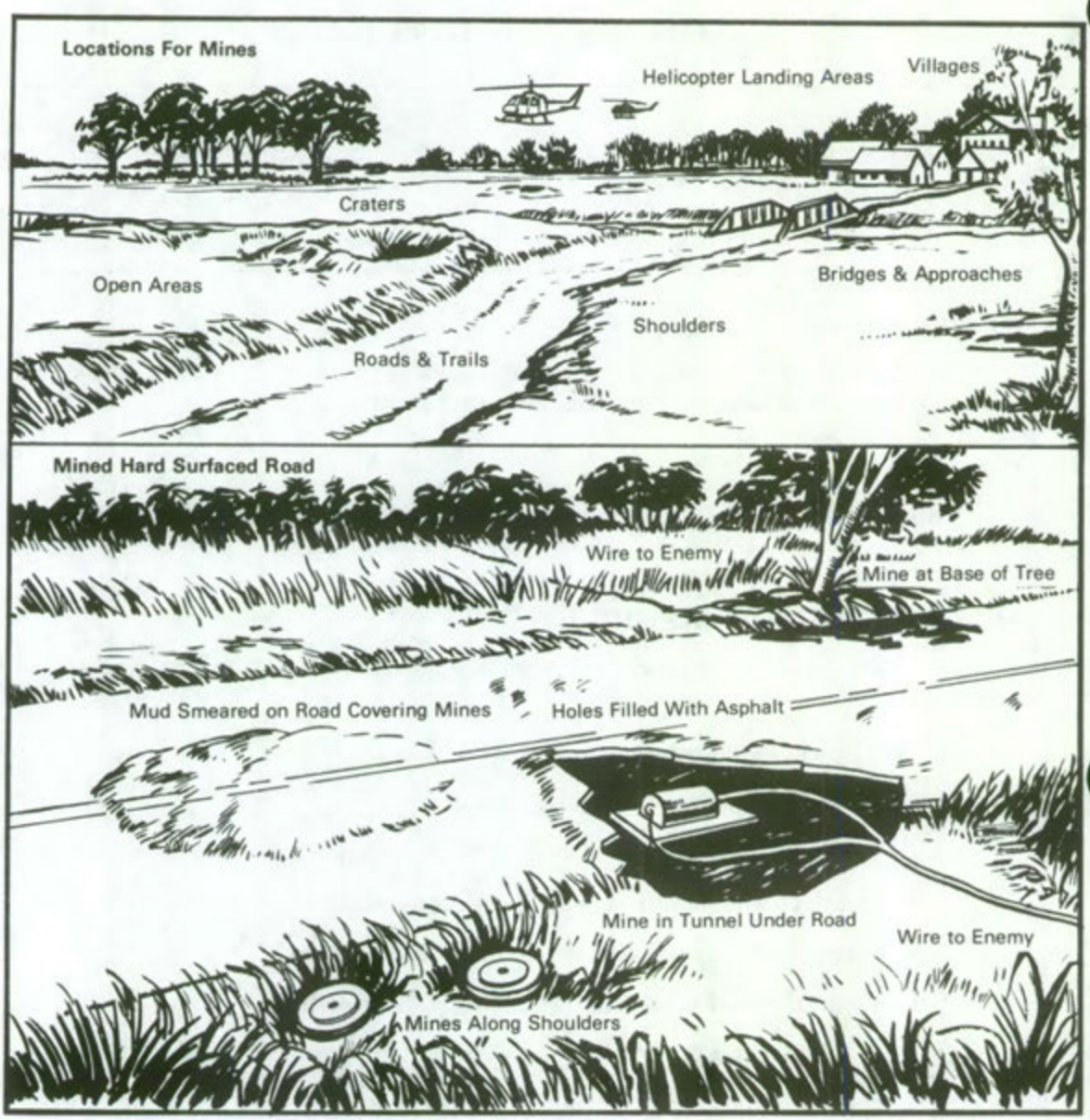
STANDARDS:

Mines will be located so that movement through the area will not detonate any mines.

PERFORMANCE MEASURES:

The following techniques are recommended to detect mines and boobytraps:

1. Do not wear sunglasses.
2. Be alert for tripwires in these places:
   a. Across trails.
   b. On the shoulders of roads at likely ambush sites.
   c. Near known or suspected AT or antivehicle mines.
   d. Across the best route through dense plant growth.
   e. In villages and on roads or paths into them.
   f. In and around likely helicopter landing sites.
   g. In approaches to enemy positions.
   h. At bridges, fords, and ditches.
   i. Across rice paddy dikes.
3. Look for mud smears, grass, sticks, dirt, dung, or other materials on roads.
4. Look for signs of road repair.
5. Watch for disturbed tire marks, ruts, or skid marks.
6. Be alert for any signs placed on trees, posts, or stakes.



7. Watch for marks other than signs such as:

   a. Sticks or stones placed in a line.

   b. A broken stick placed on a road or trail.

   c. Clumps of grass placed at intervals.

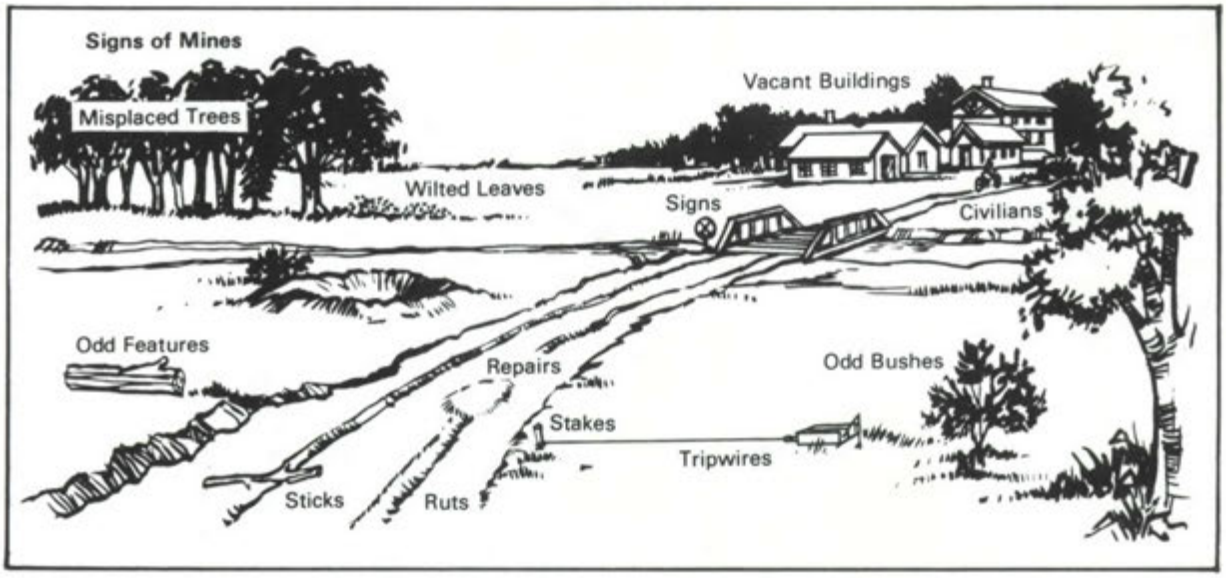
   d. Sticks stuck in the ground.

   e. Strings hanging over doorways.

   f. Wires leading from side of road.

   g. Any odd items in trees, branches, or bushes.

h. Odd features on the ground.



i. Plant growth that has wilted or changed color.

j. Cover washed away by rain from pits and traps.

8. Watch the civilians - where they don't go.

9. Be careful of enemy flags, banners, equipment, or supplies left behind.

10. Watch for pieces of wood or other junk on a road.

REFERENCE:

FM 20-32, Mine/Countermine Operations at the Company Level, Nov 76 (chap 13, sec I, pages 63 thru 66, para 13-2)

TASK NUMBER: 051-192-1022

LOCATE MINES BY PROBING

CONDITIONS:

Under any environmental conditions, given an area where mines and tripwires are installed, a nonmetallic probe, mine bonnets or other suitable marking device, and an assigned probing direction.

STANDARDS:

Locate and mark all mines without detonation.

PERFORMANCE MEASURES:

Probing is a way of detecting mines by piercing the earth with a sharp nonmetallic object, such as a sharp piece of wood. Metal probes should not be used. Probing is the best way to find buried mines but is slow, careful work, especially in hard or frozen ground.

CAUTION: PRIOR TO PROBING, ITEMS SUCH AS HELMETS, BAYONETS, WEAPONS, AND WEB GEAR SHOULD BE REMOVED AND PLACED TO YOUR REAR. DOG TAGS AND JEWELRY SHOULD BE REMOVED AND PLACED IN EITHER POCKETS OR WEB GEAR PRIOR TO ENTERING, OR UPON BECOMING AWARE OF BEING IN, A MINED AREA. THIS INCREASES YOUR OVERALL SENSE OF TOUCH.

1. How to probe for mines:

a. Roll up sleeves and remove items listed in the caution statement. Move on hands and knees, or crawl. Look and feel upward and forward to find tripwires and pressure prongs.

b. After looking and feeling, probe every 2 inches (5 centimeters) across a 1-meter front. Push the probe gently into the ground at an angle less than 45 degrees from the horizontal, putting just enough pressure on the probe to sink it slowly into the ground.

CAUTION: IF PUSHED STRAIGHT DOWN, THE TIP OF THE PROBE MAY DETONATE A PRESSURE MINE.

c. If the probe does not go into the ground freely, the soil must be picked or chipped away with the tip of the probe and the loose dirt removed by hand.

d. When a solid object is touched, stop probing and remove the earth to find out what the object is.

e. If a mine is found, remove enough earth to show what type of mine it is, then mark and report its exact location.

Probing

2. How to mark mines: During breaching operations where speed and silence are required, detected mines should be clearly marked (by placing a stick with cloth attached near the mine) so that friendly troops can safely bypass them without taking time to remove them.

REFERENCE:

FM 20-32, Mine/Countermine Operations at the Company Level, Nov 76 (chap 13, page 67, para 13-3)

TASK NUMBER: 051-192-1501

NEUTRALIZE ENEMY MINES

CONDITIONS:

Given a field location with varied terrain, a (dummy) mine(s), 50-meter rope with graphel, 1 pound of C4 or TNT, four blasting caps, 10 meters of time fuse, and incendiary material. Situation requires you to help clear mine(s).

STANDARDS:

The mine(s) will be detonated utilizing the following methods:

1. Hand-placed charges when access to the mine(S) can be gained.

2. Grapnels when engaging trip wire or tilt rod mines.

3. Vegetation fires only as a last resort to breech a minefield and when explosives and graphels are not available.

PERFORMANCE MEASURES:

1. **Mine destruction, removal, and neutralization.**

a. Before a mine is destroyed or removed, traffic will be stopped. All personnel willbe cleared to a safe distance of 300 meters.

b. With standard demolition procedures as referenced in FM 5-25, mines and boobytraps can be destroyed in place. A 1-pound block of TNT or 1-pound block of plastic explosive (C4) placed on top is enough to detonate a mine.

c. IF it is decided that the mine must be removed, specially qualified soldiers should be tasked to remove it. This may be the case when the mine may damage a road, bridge, culvert, or civil structure to excess. Mines of special intelligence value may have to be removed for study instead of being destroyed in place.

d. IF EOD personnel are not available, the mine may be removed by grappling hooks (grapnel) and rope from a protected position.

e. If the mine is detonated, check the crater for other mines. When the crater is clear, measure its size to learn the charge weight of the mine.

f. Safety.

(1) Flak jackets and steel helmets will be worn, with the exception of mine detector operators.

(2) Only one person will be allowed at the location of a suspected mine.

(3) All mines and explosive devices will be assumed to be equipped with antihandling devices until proven otherwise.

(4) All troops in the area will be cautioned not to run and to move only in areas previously cleared.

g. Personnel in a minefield will:

(1) Not divide responsibility (senior man is responsible for all actions).

(2) Not take chances.

2. **Use of Grapnels (figure 1). This is the safest method of destroying tripwire or tilt rod fuzed mines.**

a. Trip wire and tilt rod fuzed mines can be detonated by throwing a grapnel with rope attached and pulling it back to detonate the mines.

b. A 50-meter rope is attached to the grapnel for handthrowing; throw grapnels and rope past mine.

c. Cover should be sought before grapnel and rope touch the ground in the event that their impact may detonate the mine.

d. Pull grapnel back toward you while remaining in a protected position until the mine is detonated.

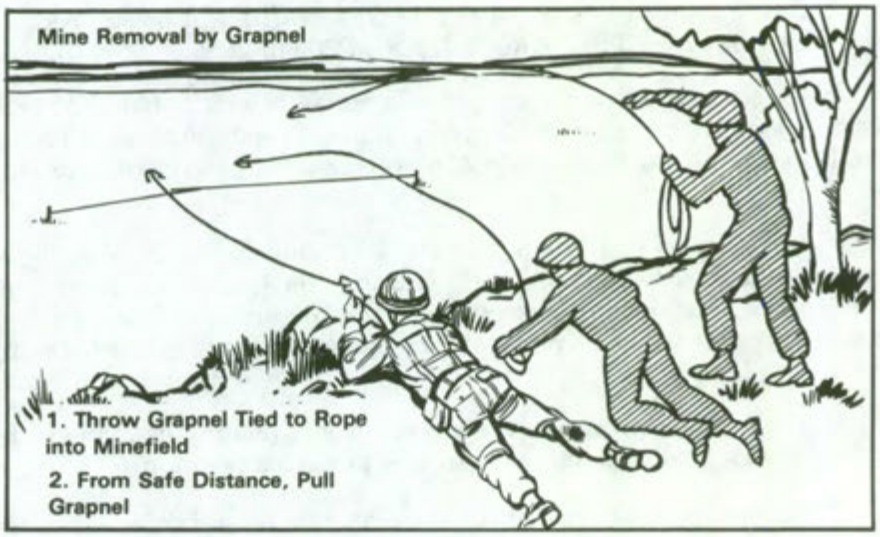


Figure 1.

NOTE: If the mine does not detonate after pulling it from its emplacement, wait 5 minutes before leaving cover and approaching the mine. The mine should then be destroyed by hand-placed charges.

3. **Hand-Placed Charges (figure 2).**

a. Procedures for priming demolitions for detonation are contained in tasks:

(1) **Prime a demolition block nonelectrically.**

(2) **Prime a demolition block electrically.**

(3) And in FM 5-25, chap 2.

b. A 1-pound charge of TNT, or C4, placed alongside or on top is sufficient to detonate one mine.

c. Prepare charge, and place alongside or on top of mine.

d. Light time fuse and move to safe position.

NOTE: Insure time fuse length will give you adequate time to return to protected position.

Figure 2.

4. **Use of Rope (figure 3).**

a. Prepare an A-frame and position it near the mine to be detonated.

b. Place a rope throughthe A-frame.

c. Extend the rope to a cleared, covered position, at least 50 meters from the mine.

d. Uncover only enough of the mine to expose a suitable part to which the end of the rope or a grapnel may be attached.

e. Tie the end of the rope to a hook or projection on the mine. If there is no projection, engage a hook of a grapnel under the bottom side of the mine opposite the direction of pull.

NOTE: Use care not to disturb the mine when uncovering and attaching grapnel or rope to the mine.

f. Move to the covered position and pull the mine from the hole.

NOTE: If no covered position is available, use an armored vehicle (if available) or lie prone behind a stump, tree or log or get in a ditch before attempting to pull the mine from the hole.

g. If the mine does not detonate, wait 5 minutes before leaving cover and approaching the mine. Then check the hole for additional mines.

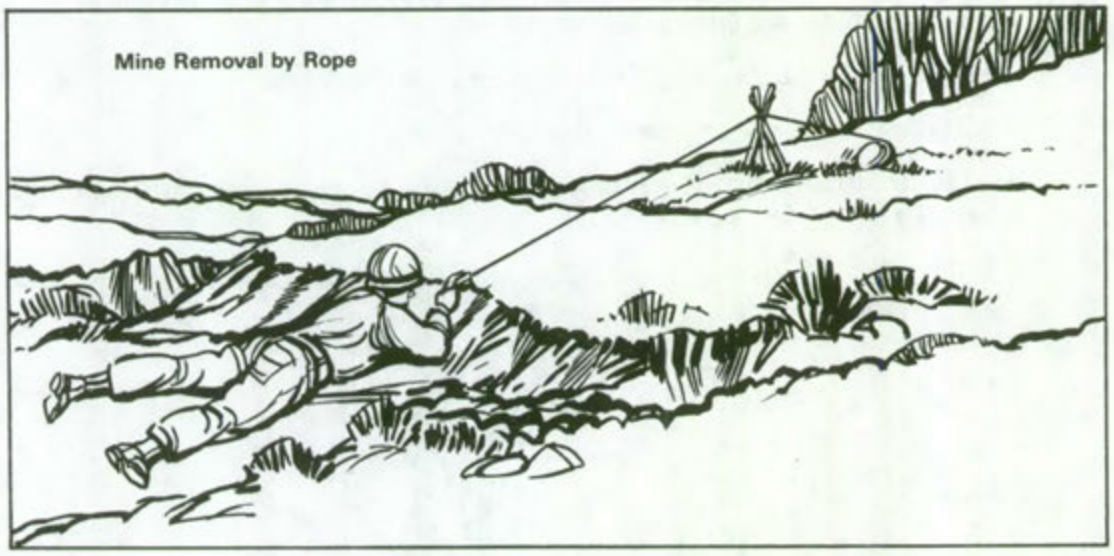


Figure 3.

5. **Detonate by Burning.** Using incendiary material, set fire to the vegetation surrounding a mine (field) from the upwind side.

NOTE: This method is the least recommended method because it may not destroy all mines and those remaining must be located and marked; furthermore, these mines will be highly sensitive.

6. **Use of Weapons Fired Against Mines.** Engage mine from a protected position.

REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 77 (chap 2, page 2-1)
FM 20-32, Mine/Countermine Operations at Company Level, Nov 76 (chap 18, page 99, para 18-8 and 18-10)

TASK NUMBER: 071-325-4406

INSTALL/RECOVER A MECHANICAL AMBUSH

CONDITIONS:

Given a bandoleer containing an M18A1 (Claymore) antipersonnel mine (practice) complete with accessories, a roll of tripwire, a plastic spoon or some other nonconductor of electricity, a power source (battery with at least 3 volts), a clothespin, and a knife.

STANDARDS:

1. Within 15 minutes, lay and aim the Claymore IAW performance measures 1 thru 5 below.

2. Within 10 minutes, recover the mechanical ambush IAW performance measure 6 below.

PERFORMANCE MEASURES:

1. **Laying and Aiming.**

a. Laying.

(1) Check to see that the mine and all accessories are in the bandoleer.

(2) Remove the electrical firing wire, leaving the mine and other accessories in the bandoleer.

(3) Secure the shorting plug end at the firing position. Place the bandoleer on your shoulder and unroll firing wire to the position selected for emplacing the mine.

(4) Remove the mine from the bandoleer and position it with the surface marked "FRONT TOWARD ENEMY" and the arrows on top of the mine pointing in the direction of the enemy or the desired area of fire.

b. Aiming (figure 1). Select an aiming point at ground level that is about 50 meters in front of the mine. Aim the mine by alining the two edges of the sight with the aiming point (figure 1).

Figure 1.

2. **Preparation of Firing Wire.** Unroll the full length of the firing wire, keeping the blasting cap inside the plastic spoon. Cut the combination shorting plug and dust covers from the end of the firing wire and remove about 2.54 centimeters (1 inch) of insulation from each of the cut wires. Twist the ends of the wires together to prevent static electricity from entering the firing wire and detonating the blasting cap. These wires will later be connected to the power source.

3. **Installation of Firing Devices.**

a. Prepare wire as shown in figure 2.

b. Prepare clothespin as shown in figure 2.

c. Form a loop in each end of the bare wires and fit one loop over the lower jaw and one loop over the upper jaw of the clothespin. Insure that the wires are seated in the cutaway grooves on the clothespin, then twist the wires until they are tight and secure to the jaws of the clothespin.

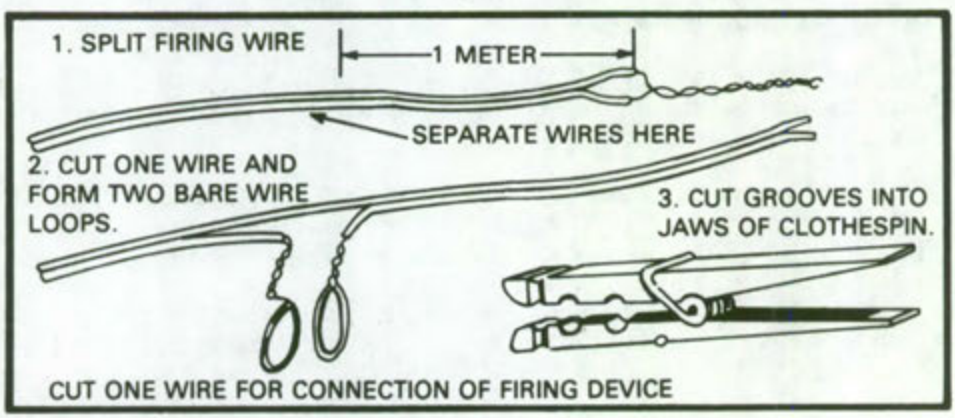


Figure 2.

4. **Connecting the Tripwire.** The tripwire will be attached to a C-ration plastic spoon (or some other nonconductor of electricity). Connect other end of the tripwire to a tree, stake, etc. (figure 3). Insert the spoon between the jaws of the clothespin. The clothespin will be firmly attached to a tree or stake on the opposite side of target area (figure 3). The tripwire should be placed about ankle-high to prevent easy detection by the enemy.

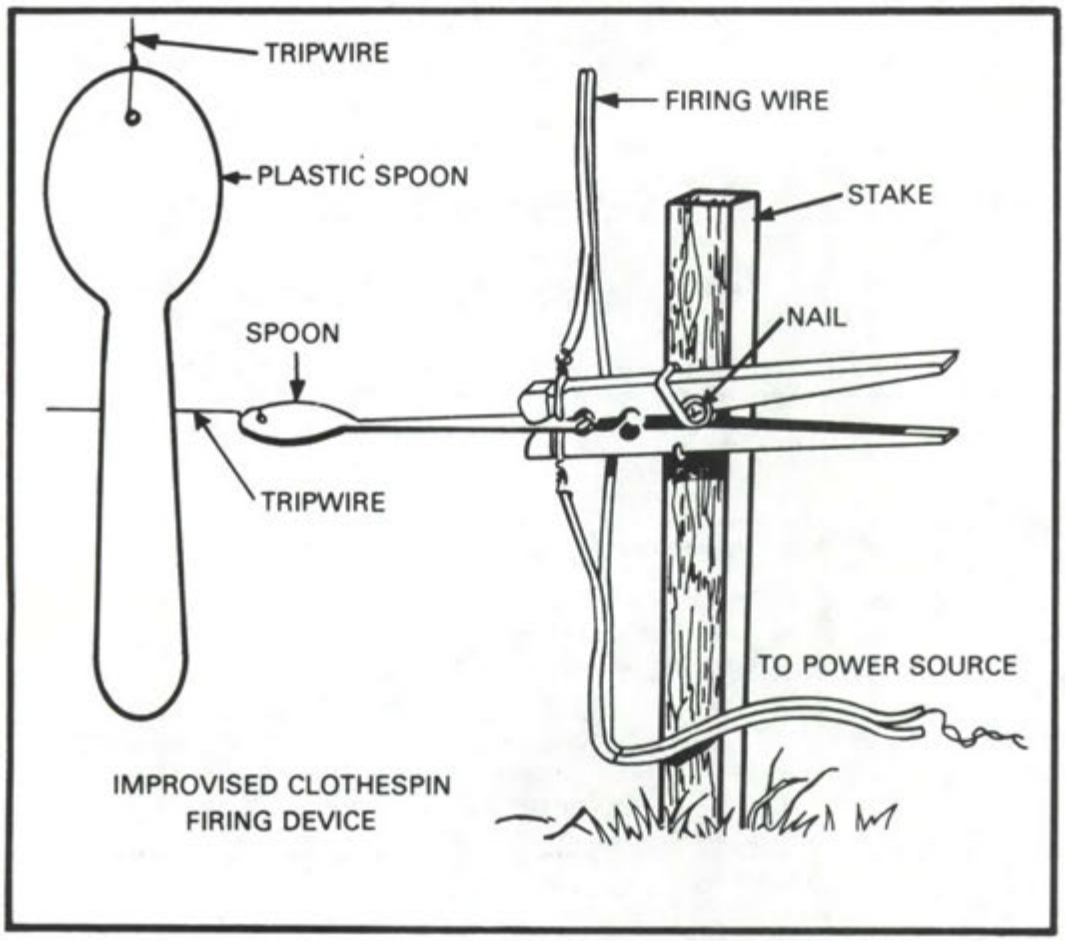


Figure 3.

5. **Arming and Electrical Firing.**

a. Secure the firing wire about 1 meter behind the mine so it will not become mislaid should the firing wire be disturbed. Insert blasting cap into either detonator well and lock with shipping plug priming adapter.

b. Connect power source.

CAUTION: Insure handle of spoon is fully and securely seated in the jaws of the clothespin. Insure that tripwire is not too tight and area is clear of any objects that might fall on the tripwire and cause a premature detonation of the mine. Separate the twisted ends of the firing wire and attach them to the power source. The power source must produce a minimum of 3 volts of electricity.

NOTE: Installation should not be attempted during inclement weather (training only).

An example of a mechanical ambush is shown in figure 4.

6. **Recovery of Mechanical Ambush.** Reverse the steps used to install a mechanical ambush.

a. Disconnect firing wire from power source.

b. Remove blasting cap from the Claymore, and place the Claymore in bandoleer.

c. Roll up firing wire and recover other items, power source, tripwire, and firing device.

d. Place all equipment in bandoleer.

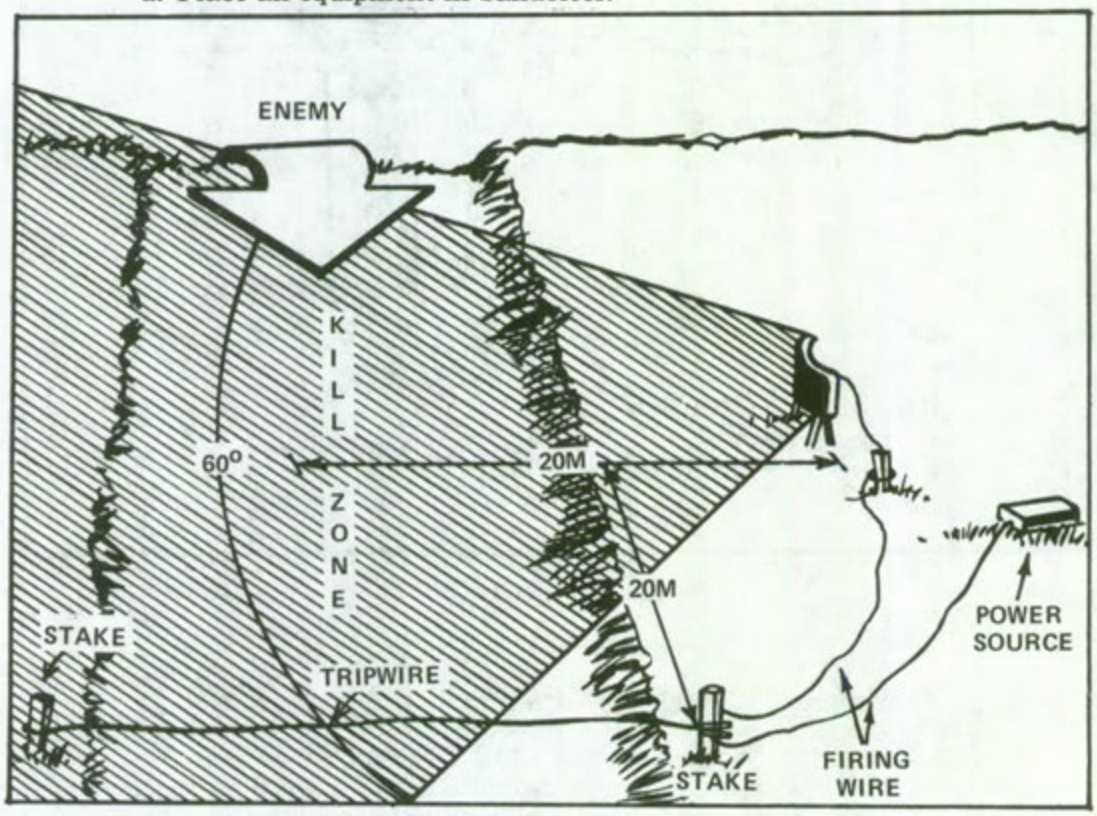


Figure 4.

REFERENCE:

None

TASK NUMBER: 051-192-2026

DIRECT A MINEFIELD MARKING PARTY

CONDITIONS:

Under any environmental conditions, with pickets, barbed wire, minefield marking signs, lane signs, wire cutters, gloves or gauntlets, sledge hammers, squad personnel, and instructions to mark a minefield.

STANDARDS:

The minefield fences (boundary and lane) and signs (marking and lane) will be installed in accordance with FM 20-32.

PERFORMANCE MEASURES:

1. The OIC will designate a starting point for the marking party 20 meters to the right of the rear strip and indicates, by reference to the minefield sketch and specific terrain features, the trace (location and direction) of the marking fence and how any existing fences are to be utilized. NCOIC of the marking party begins working his marking party in a counterclockwise direction (when the field is laid from right to left).

a. While laying out pickets, insure no pickets are closer than 15 meters from the nearest mine.

b. Install all pickets first.

c. Marking party then encircles the entire field with one strand of barbed wire.

d. After the first strand is in place, the marking party installs the second strand of barbed wire.

e. Concertina may be used in place of the two-strand barbed wire fencing.

2. Installation of minefield marking signs and lane signs.

a. Minefield marking signs are hung on the upper strand spaced approximately 15 meters apart with the word "mines" facing away from the minefield.

(1) Minefields containing chemical mines will, in addition, include chemical mine marking signs hung alternately with the minefield marking signs.

(2) If chemical mines have been exploded in the area, the chemical contamination marking sign (red triangle with yellow stripe) will be hung along with the standard marking signs.

(3) Lane markers and marking signs are normally placed 15 meters apart but may be placed as needed based on terrain and visibility.

b. Minefield lanes in rear areas will be fenced on both sides with the fences linking with minefield perimeter fencing (or marking) at entrance and exits (figure 1 and 2).

(1) Lane entrances and exits, as well as passage lanes, should be marked with signs to indicate the safe and dangerous sides respectively.

(2) During darkness or poor visibility, lane markers should be illuminated.

(3) Type of fencing and illumination of minefield lanes in the forward battle area will be at the discretion of the responsible commander.

(4) In non-English-speaking areas, signs in the native language must also be posted. (See figure 1 and 2.)

3. Fencing minefields in the forward area and minefield marking equipment.

a. Forward area minefields are sometimes fenced only on the friendly (rear) side and flanks if necessary to protect friendly troops. Forward area minefields laid out of contact with the enemy may be completely fenced.

b. The minefield marking set contains the necessary components for marking a safe lane 400 meters through a minefield including means of illumination for night marking. Basis of issue is one per 750 men. (For further details, see supply catalog N. 9905-97-CL-E01.) The following components make up the minefield marking set:

(1) Battery, dry - 192 ea

(2) Box, wood, 104-lb load, 36-1/4 inches long, 16-1/4 inches wide, 15-1/4 inches deep - 2 ea

(3) Filters - 80 ea

(4) Lamp, incandescent - 160 ea

(5) Nails - 430 ea

(6) Roll, minefield marking light - 4 ea

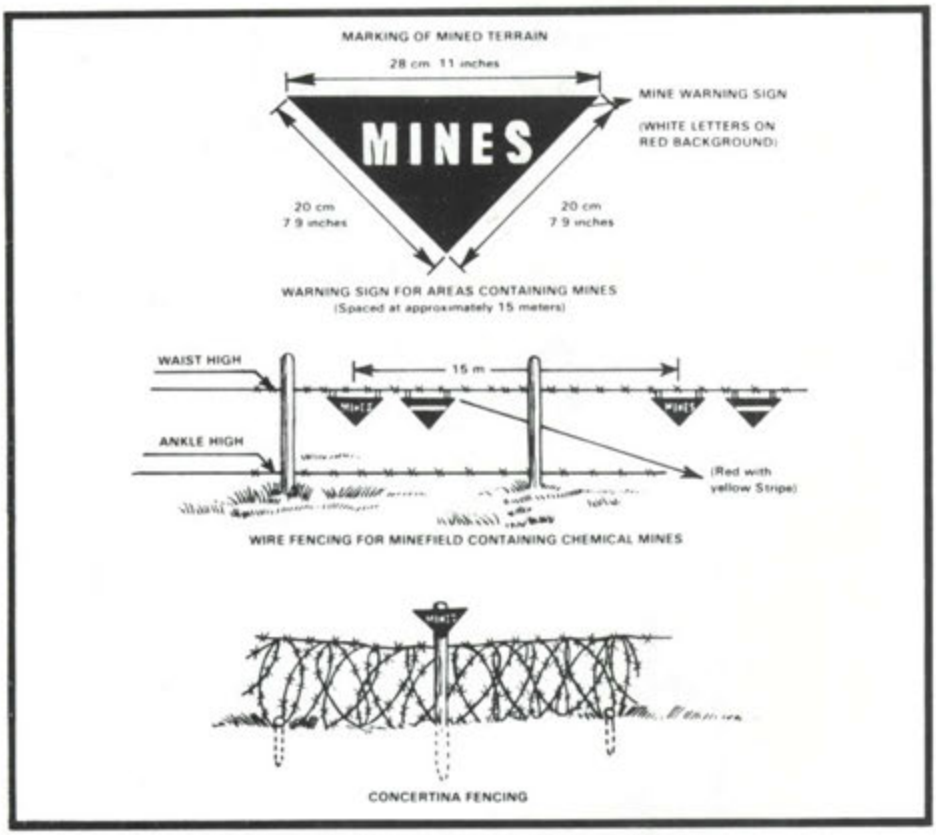


Figure 1. Minefield marking fence.

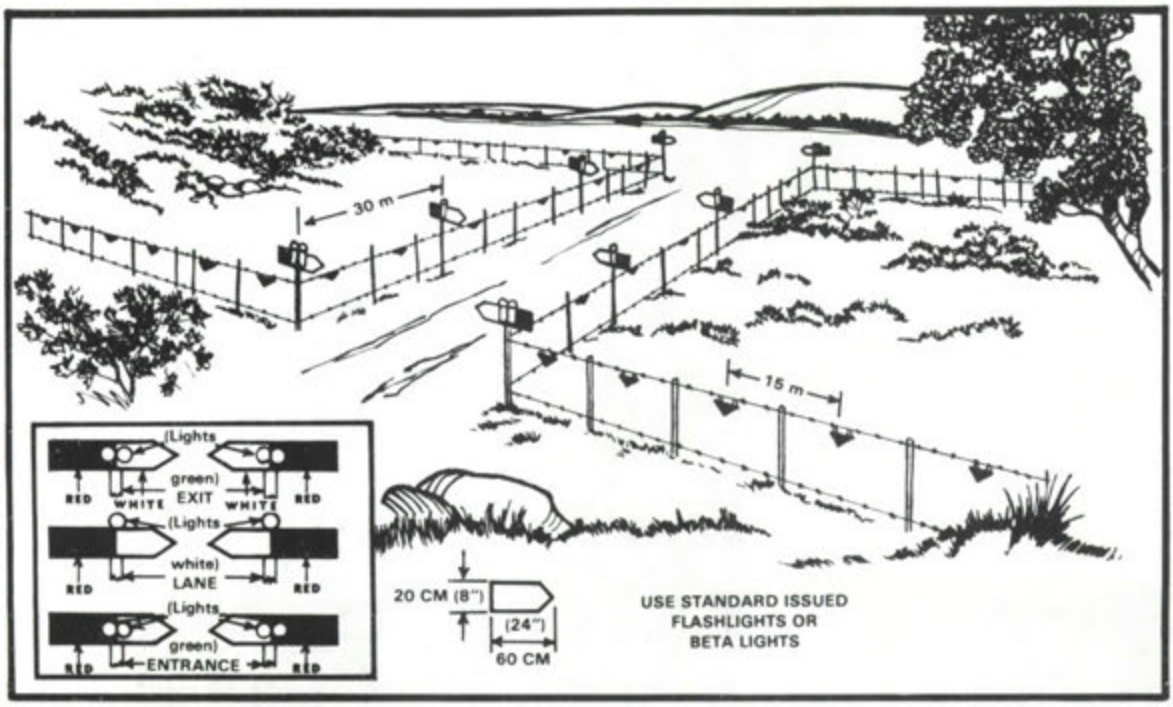


Figure 2.

(7) Signs, textile (marking) - 10 rolls

(8) Tape, textile (marking) - 10 rolls - 188 ea

(9) Wire, steel - 2 rolls

REFERENCE:

FM 20-32, Mine/Countermine Operations at the Company Level, Nov 76 (App H, pages 186 thru 194, para H-5, H-6, and H-9)

TASK NUMBER: 051-193-1503

CONSTRUCT A NONELECTRIC (INITIATION) DETONATING ASSEMBLY

CONDITIONS:

Under any environmental conditions, with time blasting fuse, nonelectric blasting cap, priming adapter, M60 or M2 weatherproof fuse igniter, and M2 cap crimpers.

STANDARDS:

The detonating assembly will be constructed IAW the performance measures and the nonelectric blasting cap will detonate when fired.

PERFORMANCE MEASURES:

1. Determine the length of time blasting fuse needed.

a. Cut and discard a 6-inch length from the free end of the time blasting fuse to prevent a misfire.

b. Cut a 3-foot length of time blasting fuse to check the burning rate.

(1) Light the fuse end using a fuse igniter, match, or lighter.

(2) Note the time it takes for the fuse to burn.

(3) Compute the burning rate per foot by dividing the time in seconds by the length in feet.

c. Cut the time blasting fuse long enough to permit the person detonating the charge to reach a safe distance by walking at a normal pace before the explosion. This cut should be made squarely across the time fuse.

2. Attach the blasting cap to the time blasting fuse.

a. Take one blasting cap from the cap box. Inspect it by looking into the open end. If any foreign matter or dirt is present, hold it with the open end down, and shake it gently or bump the hand holding it against the other hand.

(1) If foreign matter does not come out, discard cap.

(2) Never tap the cap with a hard object or against a hard object.

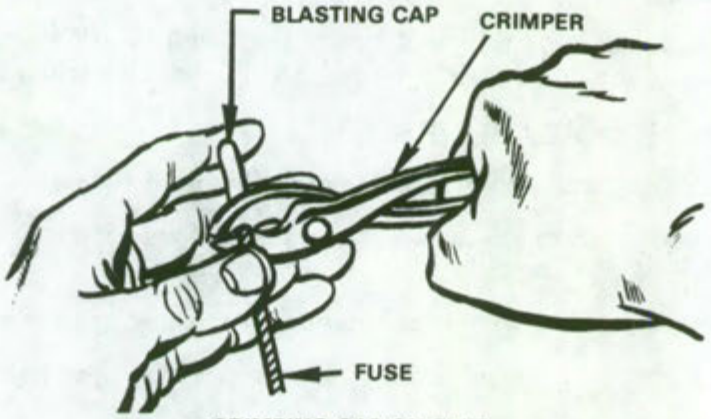
(3) Never blow into the cap.

(4) Do not insert anything into the cap to remove any dirt or foreign material.

b. Hold the time blasting fuse vertically with the square cut end up and slip the blasting cap gently down over it so that the flash charge in the cap is in contact with the end of the time fuse; if not in contact, it may misfire. Never force the time fuse into the blasting cap by twisting or any other method. If the end is flattened or it is too large to enter the blasting cap freely, roll it between the thumb and fingers until the size is reduced to permit free entry.

c. After the blasting cap has been seated, grasp the time blasting fuse between the thumb and third finger of the left/right hand and extend the forefinger over the end of the cap to hold it firmly against the end of the time fuse. Keep a slight pressure on the closed end of the cap with the forefinger.

d. Slide the second finger down the outer edge of the blasting cap to guide the crimpers, and thus obtain accurate crimping, even in darkness.



CRIMPING CAP ON FUZE

e. Crimp the blasting cap at a point 1/8 to 1/4 of an inch from the open end. A crimp too near the explosive in the blasting cap may cause detonation. Point the cap out and away from the body during crimping.

NOTE: If the blasting cap should remain in place several days before firing, protect the joint between the cap and the time blasting fuse with a coating of sealing compound or some similar substance. (As this standard-issue sealing compound does not make a waterproof seal, submerged charges should be fired immediately.)

3. Attach a priming adapter (used when available with a demolition block with threaded cap well).

a. Pass the end of the time blasting fuse through the priming adapter. (The time fuse should move through the adapter easily.)

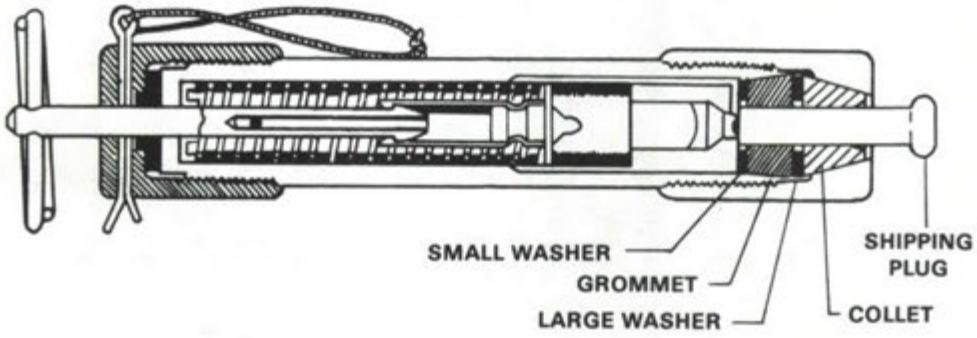
NOTE: For long lengths of time blasting fuse, it may be more convenient to pass the end of the fuse through the priming adapter before crimping the cap onto the time fuse.

4. Attach M60 weatherproof fuse igniter, if one is to be utilized.

a. Unscrew the fuse holder cap two or three turns but do not remove. Press the shipping plug into the igniter to release the split collet, and rotate the plug as it is removed.

b. Insert the free end of the time fuse in place of the plug until it rests against the primer.

c. Tighten the cap sufficiently to hold the fuse in place and thus weatherproof the joint.

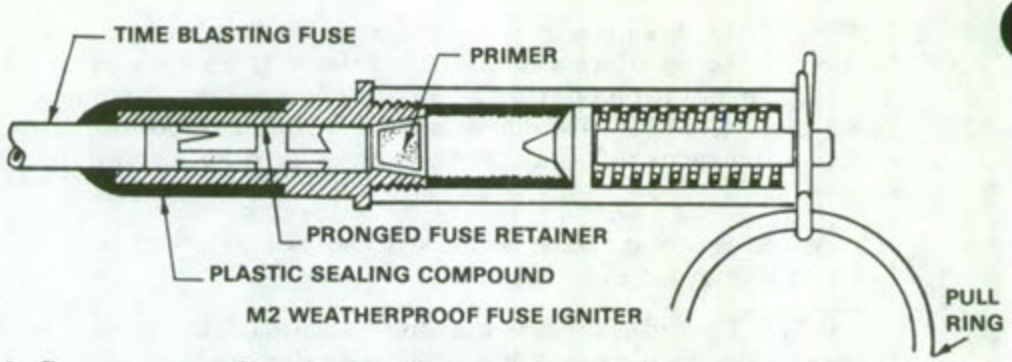


M60 weatherproof fuse igniter.

5. Attach M2 weatherproof fuse igniter, if one is to be utilized.

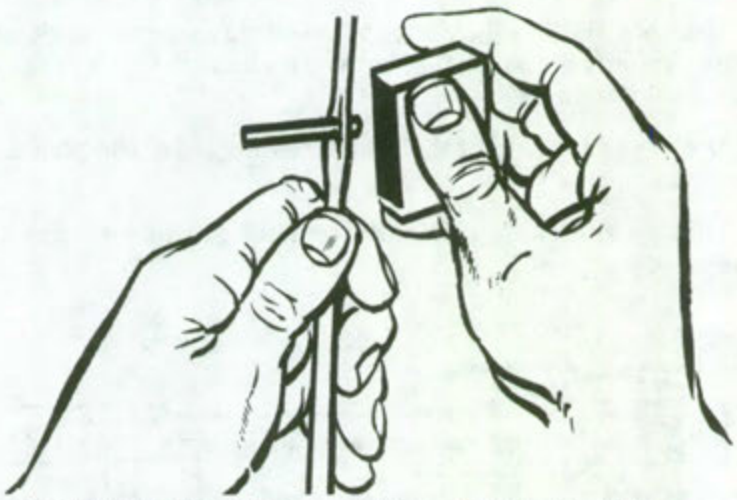
a. Slide the fuse retainer over the end of the fuse, firmly seating it, and apply sealing compound at the joint between the time blasting fuse and the igniter to protect the open end of the fuse from moisture.

b. This device was designed as a positive method of lighting time blasting fuse. It operates effectively under all weather conditions — even under water if it is properly waterproofed. A pull on the striker retaining pin causes the striker to hit the primer, igniting the fuse.

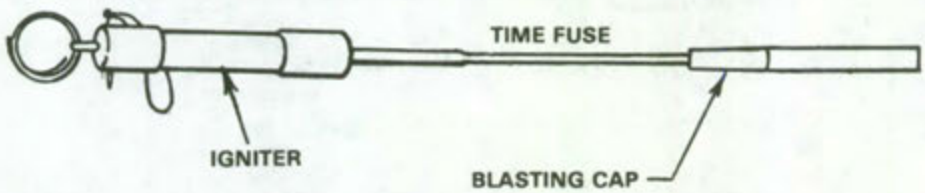


6. Construct expedient igniter if no standard lighter is available.

If a fuse igniter is not available, light the time blasting fuse with a match by splitting the fuse at the end, placing the head of an unlighted match in the powder train, and then light the inserted match head with a flaming match or by rubbing the abrasive on the match box against it.



7. The completed detonating assembly will look like this:



8. Warn personnel of the detonation.

a. A warning will be issued to all personnel in the area to insure safety.

b. The words "Fire in the hole" will be shouted loudly three times as the warning.

REFERENCES:

FM 5-25, Explosives and Demolitions (chap 1, page 1-37, para 1-57m and 1-57n; chap 2, sec I, pages 2-1 thru 2-4)
TEC Lesson 645-093-7320-F, Prepare a Nonelectric Firing System

TASK NUMBER: 051-193-1003

PRIME A DEMOLITION BLOCK NONELECTRICALLY

CONDITIONS:

Under any environmental conditions, with a completed nonelectric detonating assembly (with and without a priming adapter), demolition blocks (with and without threaded cap well), an M2 crimper, and string.

STANDARDS:

The charge will be primed as follows:

1. Blasting cap will be inspected for foreign material.

2. Blasting cap/time fuse will be securely fastened to the demolition block.

3. The charge will detonate when fired.

PERFORMANCE MEASURES:

1. Prime a demolition block with a threaded cap well and priming adapter available as follows:

a. Inspect cap well for foreign material.

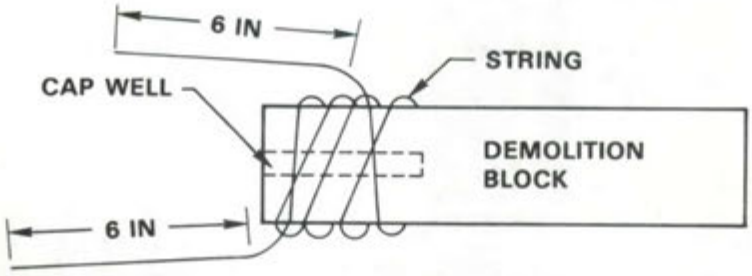
b. Insert cap into cap well.

c. Screw the adapter into the cap well.

2. Prime a demolition block with a threaded cap well and no priming adapter available as follows:

a. Inspect cap well for foreign material.

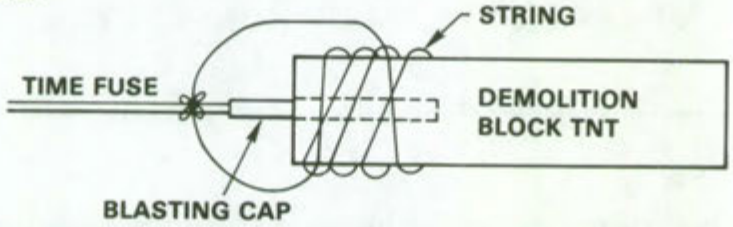
b. Wrap a string tightly around the demolition block and tie it securely, leaving about 6 inches of loose string on each end after making the tie.



c. Insert a blasting cap with fuse attached into the cap well.

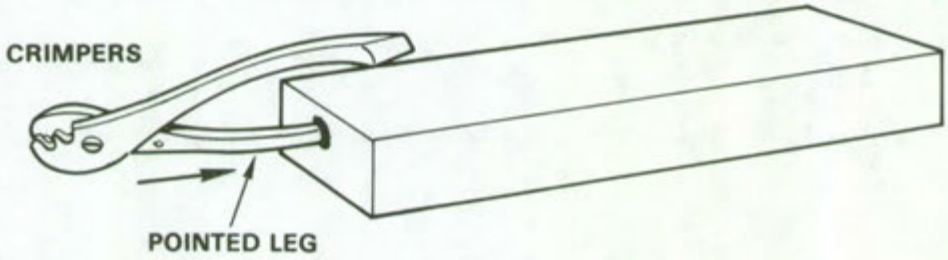
d. Tie the loose string around the fuse to prevent the blasting cap from being separated from the block.

NOTE: Do not tie the string so tight that powder train is broken in the fuse.

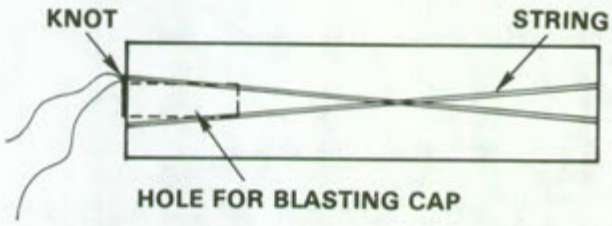


3. Prime a demolition block without threaded cap well as follows:

a. Make a hole in the end of the demolition block with the pointed handle on the M2 crimpers large enough to contain the blasting cap.

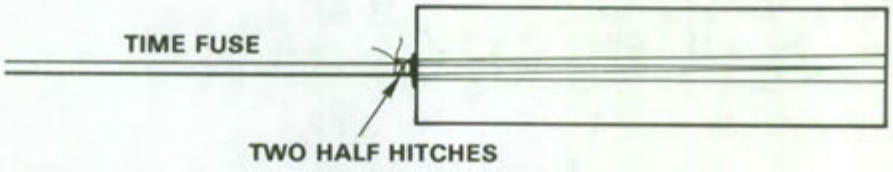


b. Using string, wrap several turns around the block and tie any knot. Position the tie so it will be at the top of the hole when the fused cap is inserted.



c. Insert fused cap into hole. **(NOTE: Never try to force a cap into an expedient cap well that is too small to admit it easily. Remove cap and enlarge hole.)**

d. Tie string around the time fuse at the top of hole with two half hitches.



REFERENCE:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 2, page 2-17, para 2-17)

TASK NUMBER: 051-193-1004

CONSTRUCT AN ELECTRIC (INITIATION) DETONATING ASSEMBLY

CONDITIONS:

Under any environmental conditions (except for electrical storms, in the vicinity of FM radio transmissions, or other static electricity outputs that could detonate electric blasting caps), with firing wire, electric blasting caps, an M51 blasting cap test set or a blasting galvanometer, and a blasting machine.

STANDARDS:

Construct the detonating assembly IAW the performance measures below in such a manner that the electric blasting cap will detonate when fired.

PERFORMANCE MEASURES:

1. **Check test equipment (M51 blasting cap test set or galvanometer), firing wire, and blasting cap.**

a. To check M51 blasting cap test set, connect the binding posts with a piece of bare wire. The indicator lamp should flash when the handle is squeezed.

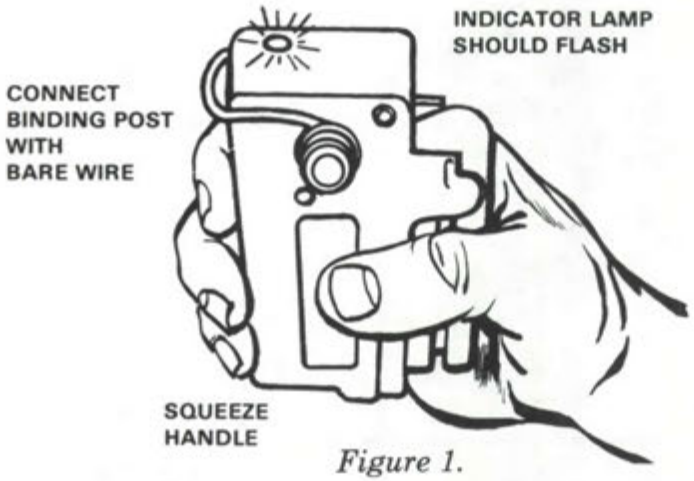


Figure 1.

b. To check the firing wire (using M51 test set):

(1) Separate the firing wire conductors at both ends, and connect those at one end to the test set binding posts. Actuate test set. The indicator lamp should not flash. If it does, the firing wire has a short circuit (figure 2a).

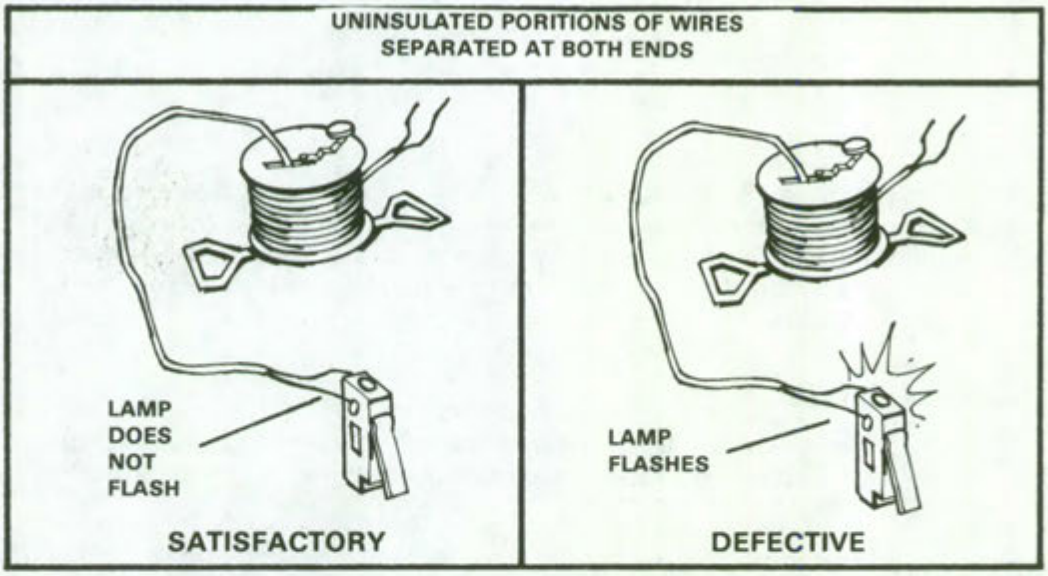


Figure 2a.

(2) Twist the wires together at one end, and connect those at the other end to the test set posts. Actuate test set. The indicator lamp should flash. If it does not flash, the firing wire has a break (figure 2b).

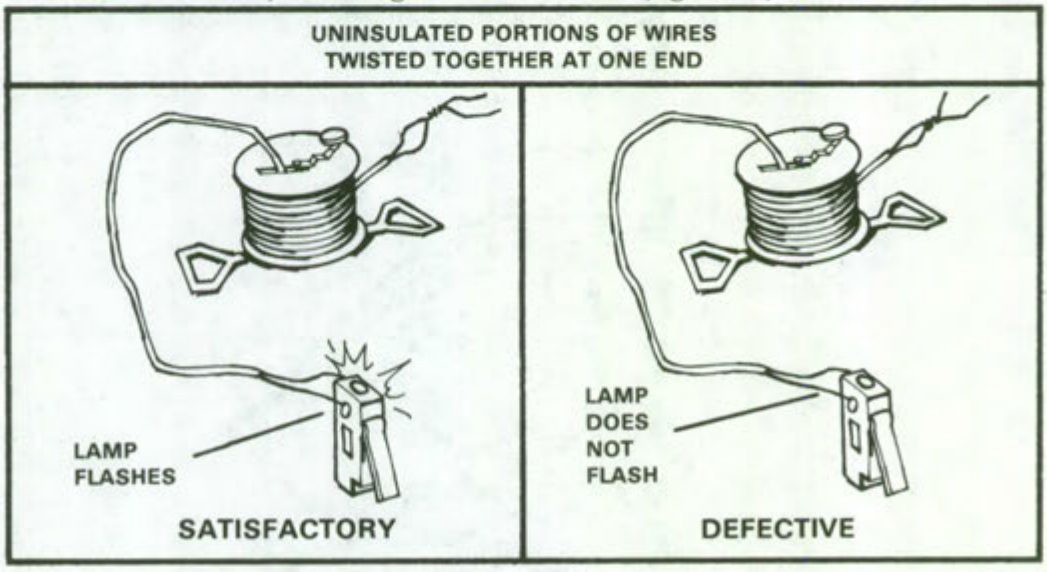


Figure 2b.

c. To check the blasting galvanometer, hold a piece of metal across its terminals. If the battery is good, this should show a wide deflection of the needle, approximately 25 units (zero ohms) (figure 3).

Figure 3.

d. To check the firing wire (using the blasting galvanometer):

(1) Separate the firing wire conductors at both ends, and touch those at one end to the galvanometer posts. The needle should not move. If it does, the firing wire has a short circuit (figure 4a).

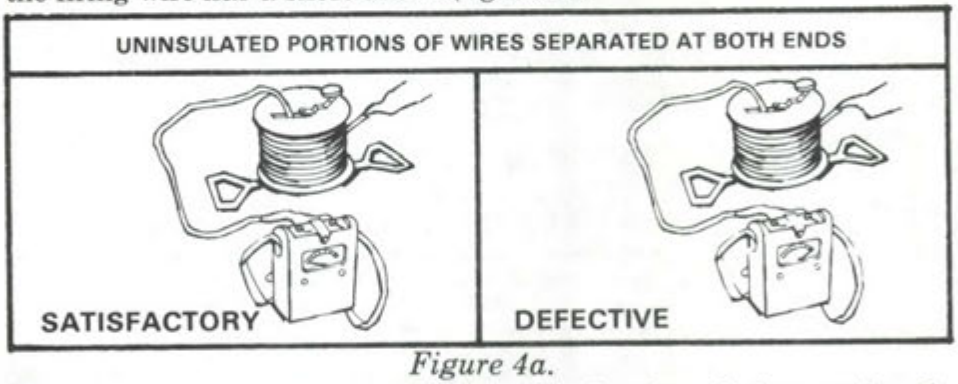


Figure 4a.

(2) Twist the wires together at one end and touch those at the other end to the galvanometer posts. This should cause a wide deflection of the needle (about 1½ ohms or 23 to 24 units for a 500-foot length). No movement of the needle indicates a break; a slight movement indicates a point of high resistance which may be caused by a dirty wire, loose wire connection, or wires with several strands broken off at connections (figure 4b).

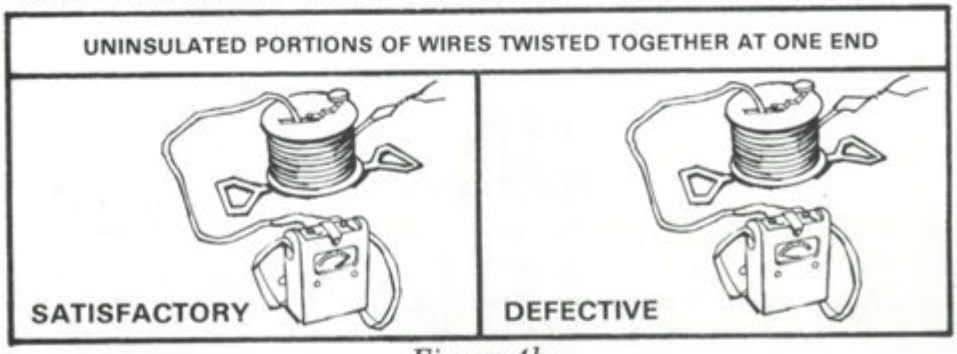


Figure 4b.

NOTE: Firing wire may be tested on the reel, but should be tested again after unreeling, which may separate broken wires unnoticed when reeled.

(3) Twist the free ends of the firing wire together to prevent an electric charge from building up in the firing wire.

e. Test each blasting cap to be used in the electric firing system.

(1) When using the M51 blasting cap test set:

(a) Check the test set as described in para 1a.

(b) Remove the short circuit shunt from the lead wires of the electric blasting cap.

(c) Attach one cap lead wire to one binding post and tie other cap lead wire to the other post, and squeeze the test set handle. If the indicator lamp flashes, the blasting cap is satisfactory. If it does not flash, the cap is defective and should not be used. During the test, always point the explosive end of the blasting cap away from the body.

(2) When using the blasting galvanometer:

(a) Check the galvanometer as described in para 1c.

(b) Remove the short circuit shunt.

(c) Touch one cap lead wire to one galvanometer post and the other cap lead wire to the other. If the galvanometer's needle deflects slightly less than it did when instrument was tested, the blasting cap is satisfactory; if not, the cap is defective and should not be used. During the test, always point the explosive end of the cap away from the body.

NOTE: If the battery is fresh, the galvanometer should read 25 units (zero ohms) when the instrument is tested and about 24 units (about 2 ohms) when a good blasting cap is tested.

(3) After each cap has been tested, twist the free ends of the cap lead wires together or shunt them with the short circuit shunt provided to prevent an electric charge from building up in the cap lead wires.

2. **Construction of the detonating assembly:**

a. Lay out firing wire from demolition site to the firing position.

(1) Retest wire using the M51 test set or blasting galvanometer as described in para 1.

(2) Twist the free ends of the firing wire together to prevent an electric charge from building up in the firing wire.

b. Move to the demolition pit or site.

NOTE: Blasting machine should be kept in possession of the firer or in a secure location to prevent premature connection to the firing wire.

3. **Connect series circuit.**

a. If two or more electric blasting caps are used, connect their lead wires into one of the two series circuits described in TASK NUMBER: 051-193-1006, **Connect electrical firing circuits.**

b. If more than 10 blasting caps are used in the series circuit, or if the circuit is complicated, it should be tested with the test set or galvanometer.

c. Splice the free cap lead wires to the firing wire.

4. **Insert caps into charges.** (See TASK NUMBER 051-193-1005, **Prime demolition block electrically.**

5. **Test entire circuit.**

a. Move to the firing position and test the entire firing circuit with the test set or galvanometer.

b. When using the blasting cap test set, connect the free ends of the firing wire to the binding posts. The indicator lamp should flash. If the lamp does not flash, the circuit is defective.

NOTE: Since the M51 test set cannot discriminate between a firing circuit that is properly set up and one with a short in it, special care must be taken in wiring the circuit to avoid shorting.

c. When using the galvanometer, touch the free ends of the firing wire to the galvanometer posts. This should cause a wide deflection of the needle. The magnitude of the deflection depends upon the number of caps and the length of the firing wire. If there is no deflection, the circuit is defective.

NOTE: To get a "wide deflection of the needle," the galvanometer battery should be in good condition.

d. If the firing circuit is defective, shunt wires. Then go down range and recheck the circuit. If a splice is found defective, resplice the wires. If a cap is found defective, replace it. Continue to test all caps and wires in the circuit, then test the entire circuit again to make sure that all breaks have been located before attempting to fire the charge.

e. Twist the free ends of the firing wire together.

6. **Test operate blasting machine.** Test operate the blasting machine several times to insure that it operates properly.

7. **Connect the blasting machine.** Untwist the free ends of the firing wire and fasten them to the two posts of the blasting machine.

8. **Special precautions.**

a. If two or more electric blasting caps are connected in the same circuit, be sure that they are of the same type and made by the same manufacturer. This is essential to prevent misfires, as blasting caps of different manufacturers have different electrical characteristics which can result in some caps in the circuit not firing because others fire more quickly and thus break the circuit before the slower caps have received enough electricity to fire. This is not true, however, of the M6 special electric blasting caps — all of which are made according to the same specifications. Blasting caps of the same manufacturer may be identified by the label, color of the cap, or shape of the shunt.

REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 2, pages 2-4 thru 2-11, para 2-4 thru 2-9)
TEC Lesson 645-093-7321-F, Prepare Electric Firing System

TASK NUMBER: 051-193-1005

PRIME DEMOLITION BLOCK ELECTRICALLY

CONDITIONS:

Under any environmental conditions (except for electrical storms, in the vicinity of FM radio transmissions, or other static electricity outputs that could detonate electric blasting caps), with firing wire, tested electric blasting caps, priming adapter, demolition blocks (with and without threaded cap well), and M2 crimper.

STANDARDS:

The charge will be primed IAW performance measures so that it detonates when fired.

PERFORMANCE MEASURES:

1. **To prime a demolition block with a threaded cap well and priming adapter available** (figure 1):

a. Inspect cap well for foreign material.

b. Untwist the free ends of the lead wire and fasten them to the firing wire.

c. Pass the lead wires through the slot of the adapter and pull the cap into place in the adapter.

d. Insert the cap into the cap well of the block and screw the adapter into place.

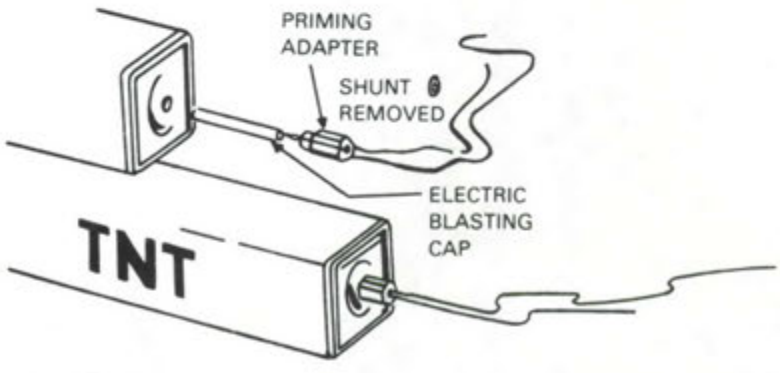


Figure 1.

2. **To prime a demolition block with a threaded cap well and no priming adapter available** (figure 2):

a. Inspect cap well for foreign material.

b. Untwist the free ends of the lead wire and fasten them to the firing wire.

c. Insert the electric cap into the cap well and tie the lead wires around the block with two half hitches or a girth hitch. Allow some slack in the wires between the blasting cap and the tie to prevent any pull on the blasting cap.

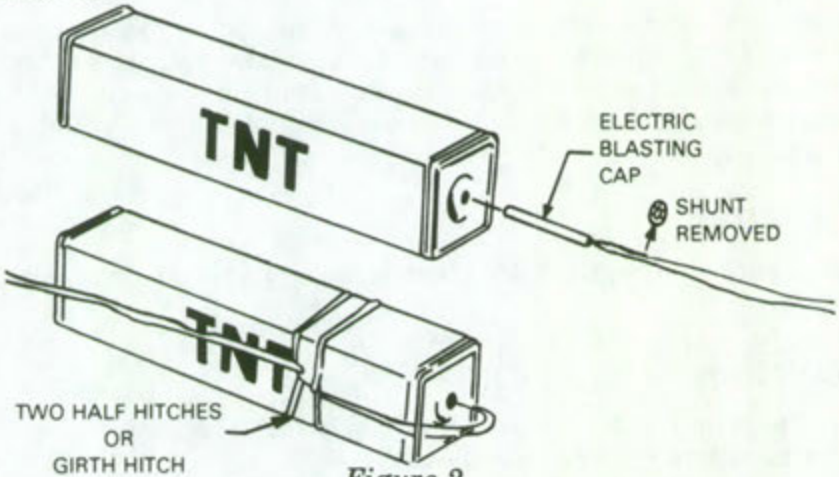


Figure 2.

3. **To prime a demolition block without a threaded cap well** (figure 3):

a. Make a hole in the end of the demolition block with a pointed nonsparking instrument or the pointed handle on the M2 crimpers large enough to contain the blasting cap.

b. Follow steps in performance measure 2. **(NOTE: Never try to force a cap into an expedient cap well that is too small to admit it easily. Remove cap and enlarge hole.)**

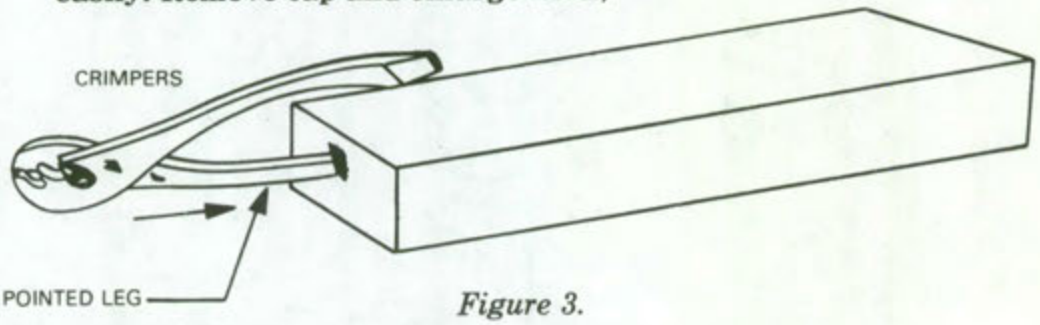


Figure 3.

REFERENCES:

FM 5-25, Explosives and Demolition, Feb 71 (chap 2, page 2-19, para 2-18b)
TEC Lesson 645-093-7321-F, Prepare Electric Firing System

TASK NUMBER: 051-193-1006

CONNECT ELECTRICAL FIRING CIRCUITS

CONDITIONS:

Under any environmental conditions (except for electrical storms, in the vicinity of FM radio transmissions, or other static electricity outputs that could detonate electric blasting caps), with prepared electrically primed charges and appropriate demolition tools and equipment, using prescribed splicing methods.

STANDARDS:

Every charge in the series circuit will detonate when the circuit is fired.

PERFORMANCE MEASURES:

1. Splice firing wire (figure 1).

a. Insulated wires, before splicing, must have the insulating material stripped from the ends. Expose about 3 inches of bare wire and remove any foreign matter such as enamel by carefully scraping the wire with the back of a knife blade or other suitable tools. The wires should not be nicked, cut, or weakened when the wires are pared, and multiple strand wires should be twisted lightly after scraping.

Figure 1.

b. Splicing method (figure 2).

(1) Two wires, which have been prepared as described above, may be spliced as shown. This is called the Western Union "pigtail" splice. Two pairs of wires are spliced in the same manner as the two wire splice. One wire of one pair is spliced to one wire of the other pair, and the process is repeated for the other two wires.

Figure 2.

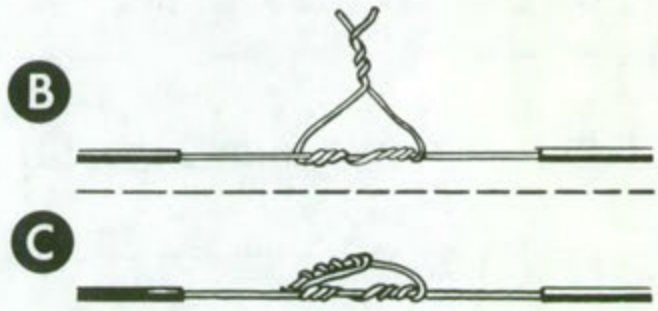


Figure 2 (cont).

Splicing two wires (Western Union "pigtail" splice).

c. A short circuit may very easily occur at a splice if certain precautions are not observed.

(1) If pairs of wires are spliced, stagger the two separate splices and tie with twine or tape (figure 3).

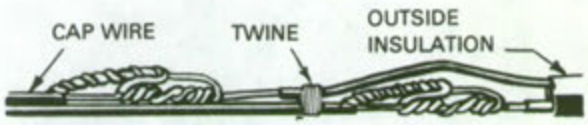


Figure 3.

(2) An alternate method of preventing a short circuit is when the splices are separated, not staggered (figure 4).

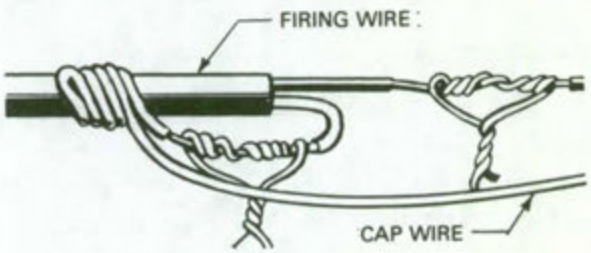


Figure 4.

(3) Whenever possible, insulate splices from the ground or other conductors by wrapping them with friction tape or other electrical insulating tape. This is particularly necessary when splices are placed under wet tamping. Circuit splices, not taped or insulated, should not lie on moist ground. The splices should be supported on rocks, blocks, or sticks so that only the insulated portions of the wires touch the ground. They may also be protected by inserting them into cardboard cap spools which may be bent to hold the splice firmly inside.

(4) Splices may be protected from damage from pull by tying the ends in an overhand or square knot, allowing sufficient length for each splice (figure 5).

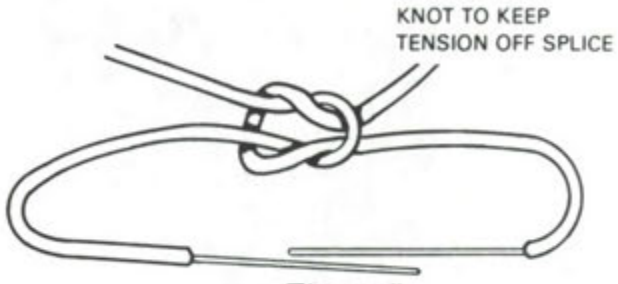


Figure 5.

Specific Reference: FM 5-25, chap 2, para 2-5, fig 2-5, 2-6.

d. Series circuits (figure 6).

(1) Common series is used for connecting two or more charges fired electrically by a single blasting machine. A common series circuit is prepared by connecting one blasting cap lead wire from the first charge to one lead wire in the second charge and so on until only two end wires are free, then connecting the free ends of the cap lead wires to the ends of firing wire. Connecting wires (usually annunciator wire) are used when the distance between blasting caps is greater than the length of the usual cap lead wires (figure 6a).

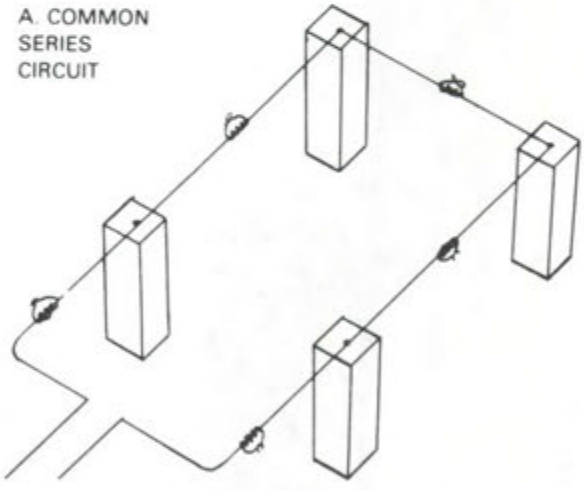


Figure 6a.

(2) Leapfrog series is useful for firing ditching charges or any long line of charges. It consists of omitting alternate charges on the way and then connecting them to form a return path for the electric impulse to reach the other lead by the firing wire. This brings both end wires out at the same end of the line of charges, and thus eliminates laying a long return lead from the far end of the line of charges back to the firing wire (figure 6b).

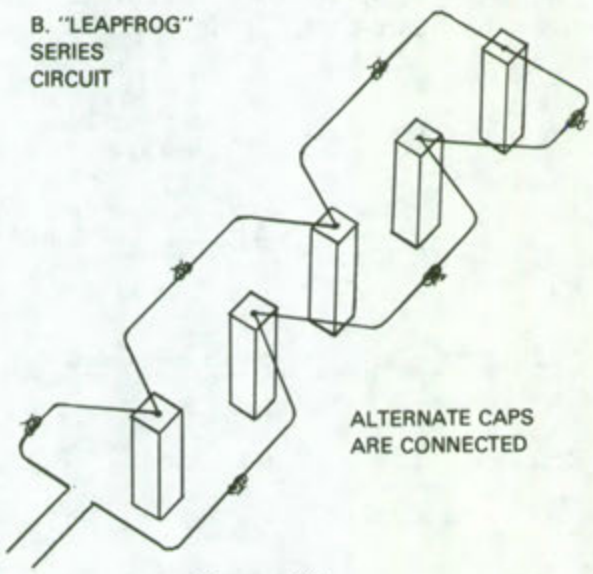


Figure 6b.

Specific Reference: FM 5-25, chap 2, para 2-6, fig 2-7.

REFERENCE:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 2, pages 2-6 thru 2-7, para 2-5 and 2-6)

TASK NUMBER: 051-193-1010

INSTALL FIRING DEVICES ON STANDARD MILITARY EXPLOSIVES

CONDITIONS:

Under any environmental conditions with demolition charges (with or without cap well), M1A1 pressure firing device, M1 pull firing device, M3 pull release firing device, M5 pressure release firing device, nonelectric blasting caps, and M2 crimpers.

STANDARDS:

Without causing premature detonation, each firing device will be installed on demolition charges so that the device will detonate the charge as designed.

PERFORMANCE MEASURES:

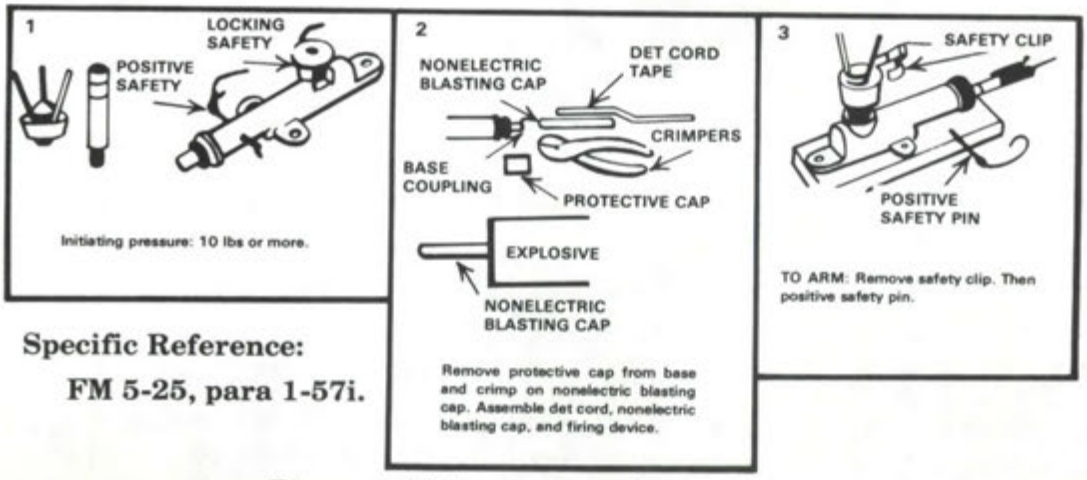
1. To install an M1A1 pressure firing device (figure 1).

a. Remove protective cap from base and crimp on a nonelectric blasting cap. (Crimper jaws should be placed no further than 1/4 inch from the open end of the blasting cap.)

b. Assemble three-pronged pressure head and extension rod if needed, and screw in top of pressure cap.

c. Attach firing device assembly to demolition charge.

d. Remove safety clip first and positive safety pin last.



Specific Reference:

FM 5-25, para 1-57i.

Figure 1. M1A1 pressure firing device.

2. To install an M1 pull firing device (figure 2).

a. Remove protective cap.

b. With crimpers, attach nonelectric blasting cap to standard base. (Crimper jaws should be placed no further than 1/4 inch from the open end of the blasting cap.)

c. Attach firing device assembly to demolition charge.

d. Anchor one end of tripwire to stake and fasten other to pull ring.

e. Remove locking safety pin first and positive safety pin last.

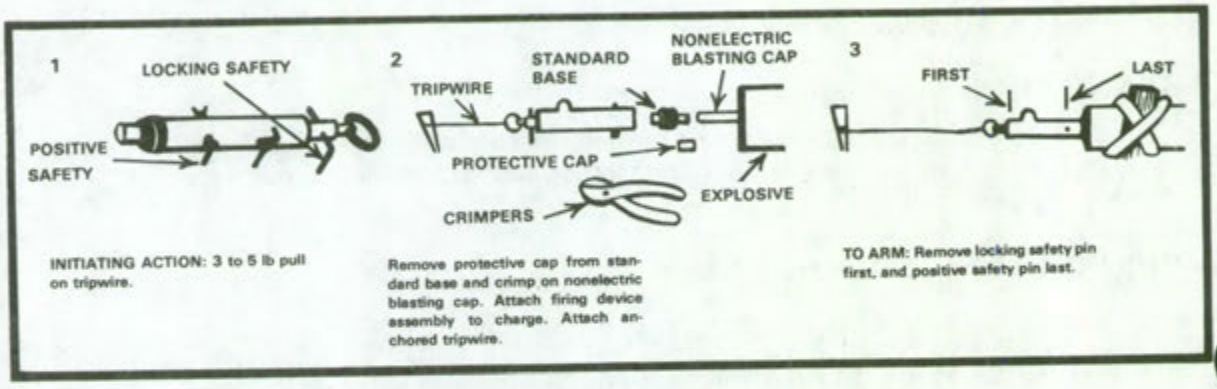


Figure 2. M1 pull firing device.

Specific Reference: FM 5-25, para 1-57j.

3. To install an M3 pull-release firing device (figure 3).

a. Remove protective cap.

b. With crimpers, attach nonelectric blasting cap to standard base. (Crimper jaws should be placed no further than 1/4 inch from the open end of the blasting cap.)

c. Attach firing device to anchored charge (must be firm enough to withstand a pull of at least 20 pounds).

d. Attach one end of pull wire to an anchor and place the other end in the hole in the winch.

e. With knurled knob, draw up tripwire until locking safety pin is pulled into the wide portion of the safety pin hole.

f. Remove locking safety pin first and positive safety pin last.

WARNING: Do not attempt to hand-neutralize the M3 firing device for recovery. Boobytraps utilizing M3 firing devices must be neutralized by detonating in place.

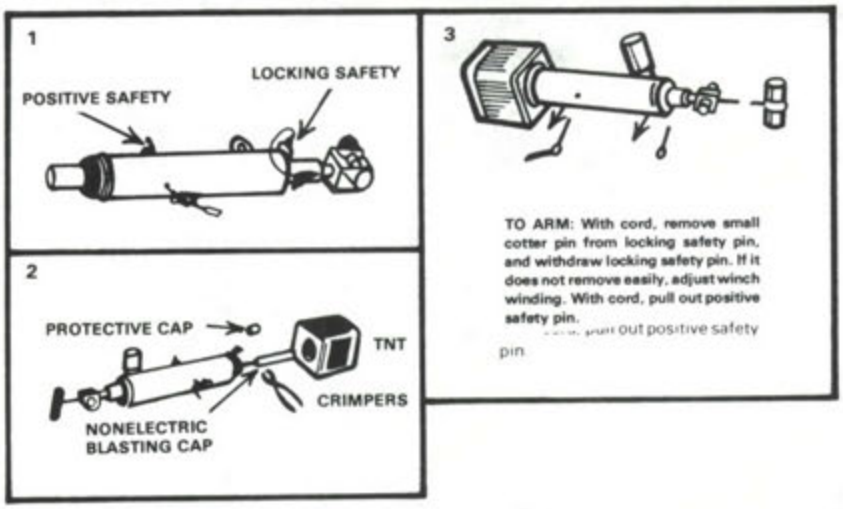


Figure 3. M3 pull release firing device.

Specific Reference: FM 5-25, para 1-57k.

4. To install an M5 pressure-release firing device (figure 4).

a. Insert a length of 10-gauge wire into interceptor hole.

b. Bend the 10-gauge wire slightly to prevent it from dropping out.

c. Remove the small cotter pin from the safety pin.

d. Holding release plate down, replace the locking safety pin with a length of 16- or 18-gauge wire. Bend the wire slightly to prevent it from dropping out.

e. Remove protective cap from base and, with crimpers, attach the nonelectric blasting cap. (Crimper jaw should be placed no further than 1/4 inch from open end of blasting cap.)

f. Secure the firing device assembly in demolition charge or explosive device.

g. Emplace charge and firing assembly in a predesignated location using the pressure board to insure a solid foundation for the firing device.

h. Place a restraining weight of at least 5 pounds onto the firing device release plate.

i. Remove the improvised locking safety pin first and then the improvised positive safety pin from the interceptor hole. The pins should remove easily if the restraining weight is adequate and positioned properly.

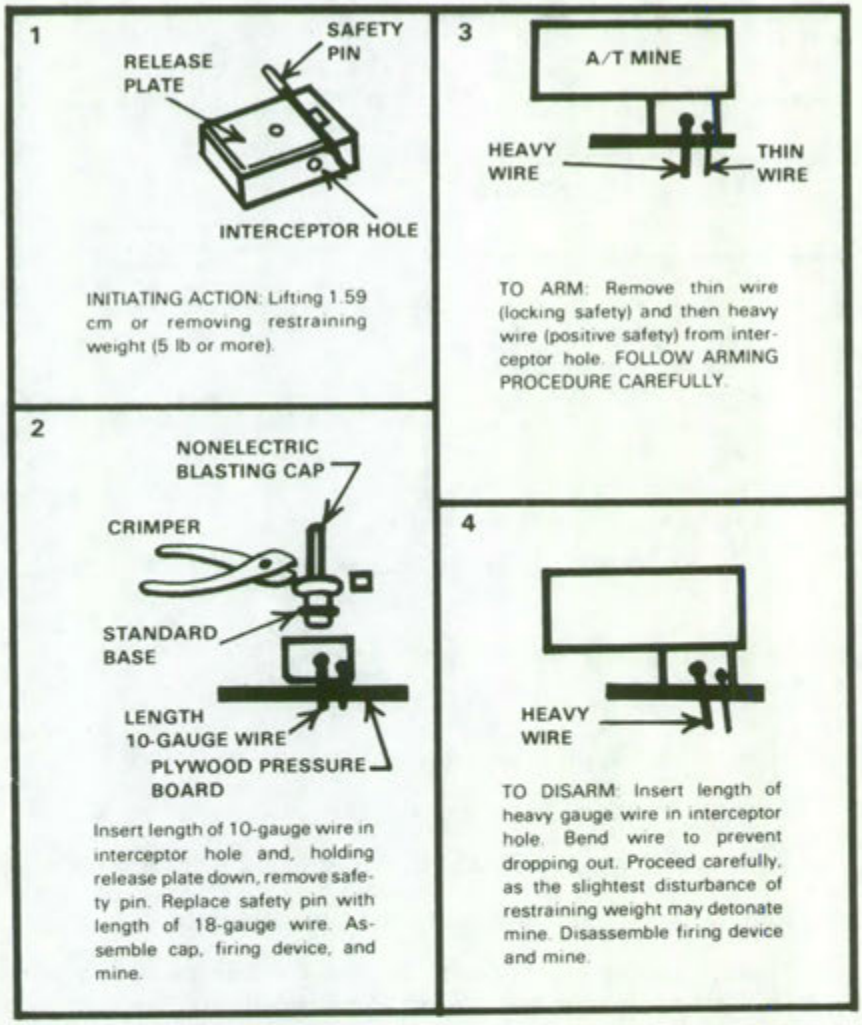


Figure 4. M5 pressure-release firing device.

Specific Reference: FM 5-25, para 1-57l.

REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 71
TEC Lesson 030-051-6348, Assist in Construction of Boobytraps

TASK NUMBER: 051-193-1501

PREPARE AND DETONATE EXPLOSIVES USING DETONATING CORD

CONDITIONS:

Under any environmental conditions, with designated explosives, detonating cord, and appropriate demolition tools and equipment.

STANDARDS:

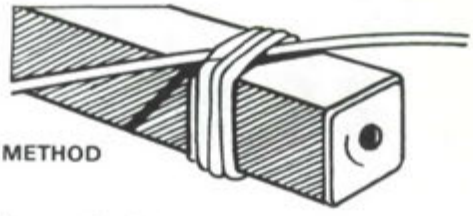
The charge will be primed IAW the performance measures so that it detonates when fired.

PERFORMANCE MEASURES:

1. **To prime demolition blocks:**

a. The method which offers the greatest assurance of detonation is to fix a nonelectric blasting cap to the end of the detonating cord and place it in the demolition block similar to nonelectric priming methods.

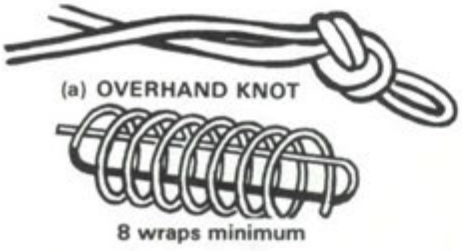
b. The **common method** is to lay one end of a 4-foot length of detonating cord at an angle across the explosive. The running end is then given three wraps around the block and the end laid at an angle. On the fourth wrap, slip the running end under all wraps parallel to the other end and draw tight.



COMMON METHOD

2. **To prime plastic explosives:**

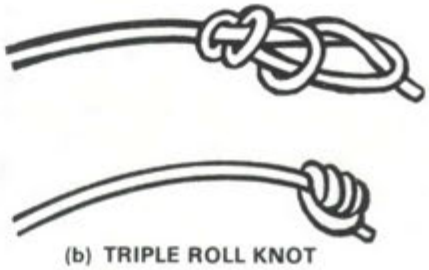
a. When priming explosives with detonating cord, form either the (a) overhand, (b) triple roll, or (c) Uli knot.



(a) OVERHAND KNOT

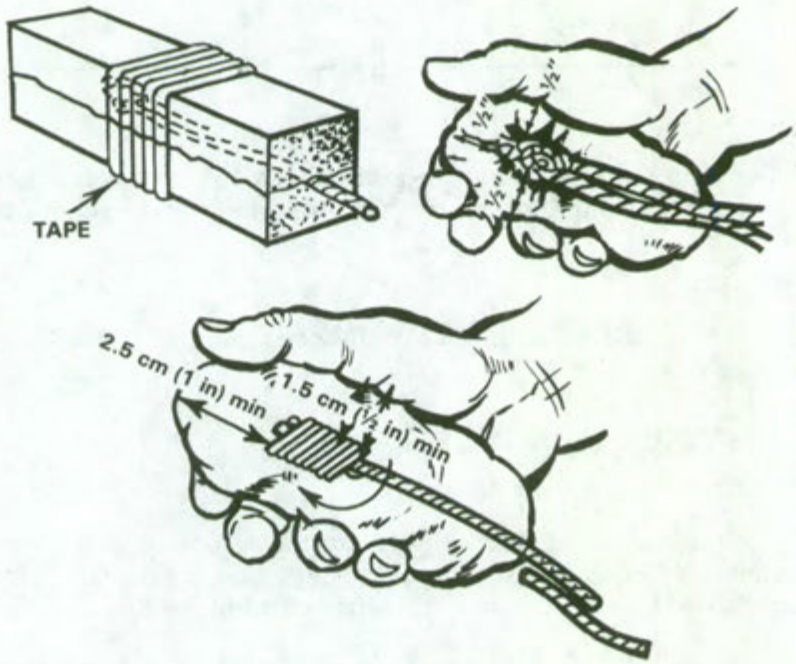
8 wraps minimum

(c) ULI KNOT



(b) TRIPLE ROLL KNOT

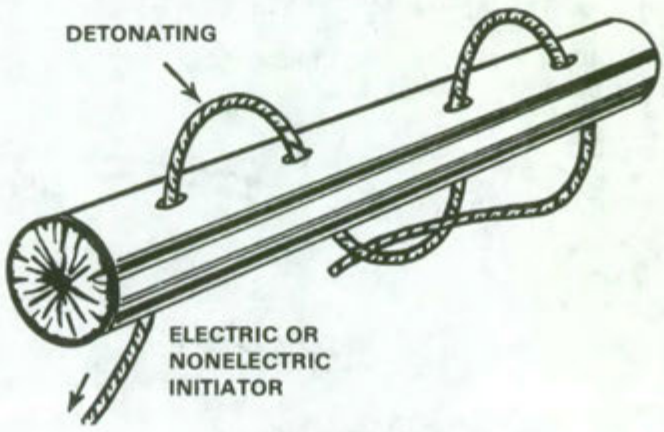
b. Then insert the knot into a block of explosive or a molded piece of explosive as shown. In either case, insure that there is at least ½ inch of explosive on all sides of the knot. (When using the Uli knot, a minimum of 1 inch of explosive must be on the end of the knot.)



3. Prime dynamite.

a. Dynamite cartridges may be primed with detonating cord by attaching a nonelectric blasting cap to the end of the detonating cord and following any of the methods for nonelectric priming.

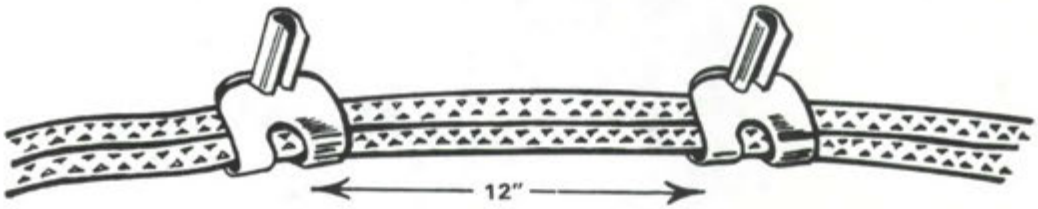
b. Dynamite may also be primed by lacing the detonating cord through it. This is used chiefly in boreholes, ditching, or removal of stumps. Punch four equally spaced holes through the dynamite cartridge and lace the detonating cord through them as shown.



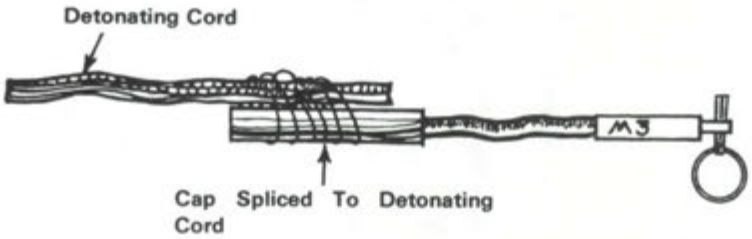
4. Splicing the ends of detonating cord.

a. A square knot pulled tight is used to splice the ends of detonating cord. At least a 6-inch length should be left free at both sides of the knot. When fabric is used to cover the detonating cord, the fabric must not be removed.

b. Ends of detonating cord are spliced by overlapping them about 12 inches, using two clips, one at each end of the overlap, and bending the tongues of the clips firmly over both strands. The connection is made secure by bending the trough end of the clip back over the tongue.



5. To attach an electric or nonelectric (initiation) detonating assembly, splice the cap of either detonating assembly to the detonating cord using an M1 detonating cord clip, string, or adhesive tape.



REFERENCES:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 2, pages 2-11 thru 2-12, para 2-10 and 2-12)
TEC Lesson 645-093-7322-F, Prepare Detonating Cord Firing System

TASK NUMBER: 051-193-1502

CLEAR DEMOLITION MISFIRES (ABOVE GROUND)

CONDITIONS:

Given a 1-pound electric or nonelectric primed charge; an electric or nonelectric 1- or 2-pound charge that has not been tamped, located above ground; blasting machine; galvanometer; and a demolition pit.

NOTE: "Tamped" is defined as: material that has been packed around a charge to retain its explosive force.

STANDARDS:

Misfires will be cleared in accordance with applicable performance measures below to prevent premature detonation of the misfired demolition charge.

PERFORMANCE MEASURES:

1. To clear a nonelectric misfire:

a. Wait 30 minutes before investigating the cause of the misfire.

b. Place a 1-pound charge as close to the misfire as possible without disturbing it.

c. For a nonelectrically primed charge, light the time fuse and move to a safe area.

2. To clear an electrical misfire:

a. Check the firing wire connection to the blasting machine or power-source terminals to be sure that the contacts are good.

b. Make two or three more attempts to fire the circuits.

c. Change the blasting machine or power source and attempt to fire again.

d. Disconnect the firing wires (shunt the wires to avoid possible static electric detonation) and investigate immediately.

e. Check the entire circuit, including the firing wire, for breaks and short circuits.

f. Place a new 1-pound electrically primed charge as close to the misfire as possible.

g. Move back to the firing position and fire the charge.

REFERENCE:

FM 5-25, Explosives and Demolitions, Feb 71 (chap 2, sec I & II, page 2-1)

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION V
TACTICAL VEHICLES

TASK SUMMARIES

TASK NUMBER: 071-333-6001

DRIVE A WHEELED VEHICLE CROSS-COUNTRY

CONDITIONS:

Given one of the following vehicles:

1. Truck utility ¼-ton M151, A1, A2.
2. Truck cargo 1¼-ton M715.
3. Truck cargo 1¼-ton M561.

The requirement to drive across varying terrain which includes the following obstacles:

1. More than 30% side slope.
2. 60% or less grade.
3. 30% or less side slope.
4. More than 60% grade.
5. Extremely sandy or muddy terrain.

STANDARDS:

Bypass all obstacles where possible, negotiate obstacles 2, 3, and 5 when they cannot be bypassed, and inform the vehicle commander and follow his instructions when obstacles 1 and 4 are encountered and cannot be bypassed.

PERFORMANCE MEASURES:

Operation of the transmission and transfer case. (See figures 1, 2, and 3.)

1. Shifting the M151 from 2-wheel drive. If the vehicle is moving, slow to a speed not exceeding 4 to 5 mph, depress the clutch, and shift the front axle drive lever to the forward (IN) position. The M151 automatically goes into low range upon engagement of the front axle drive (figure 1).

2. Shifting the M151 from 4-wheel to 2-wheel drive. If the vehicle is moving, slow to a speed not exceeding 4 to 5 mph, depress the clutch, and shift the front axle lever to the rear (OUT) position (figure 1).

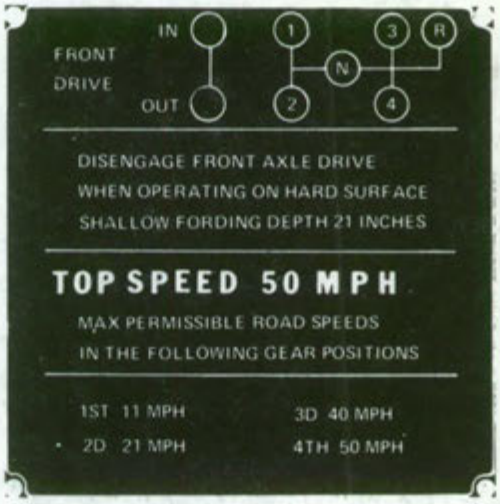


Figure 1. M151 Series.

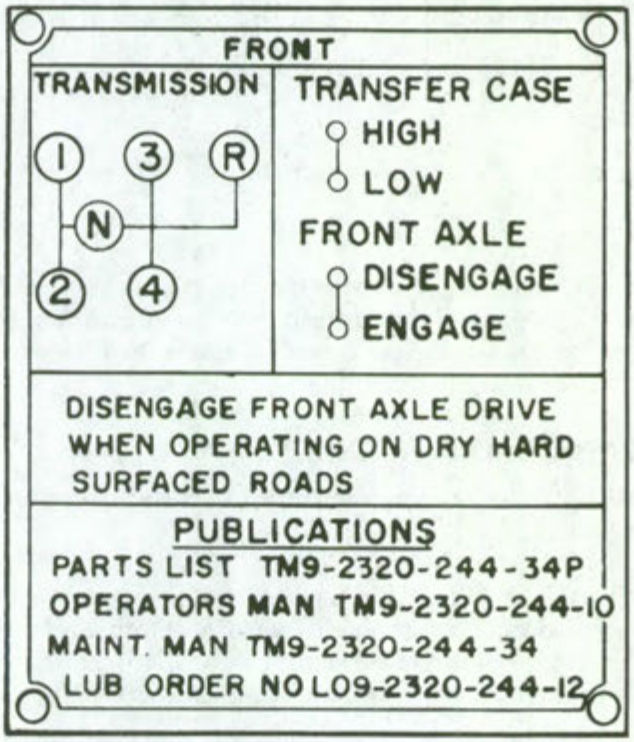


Figure 2. M715 Series.

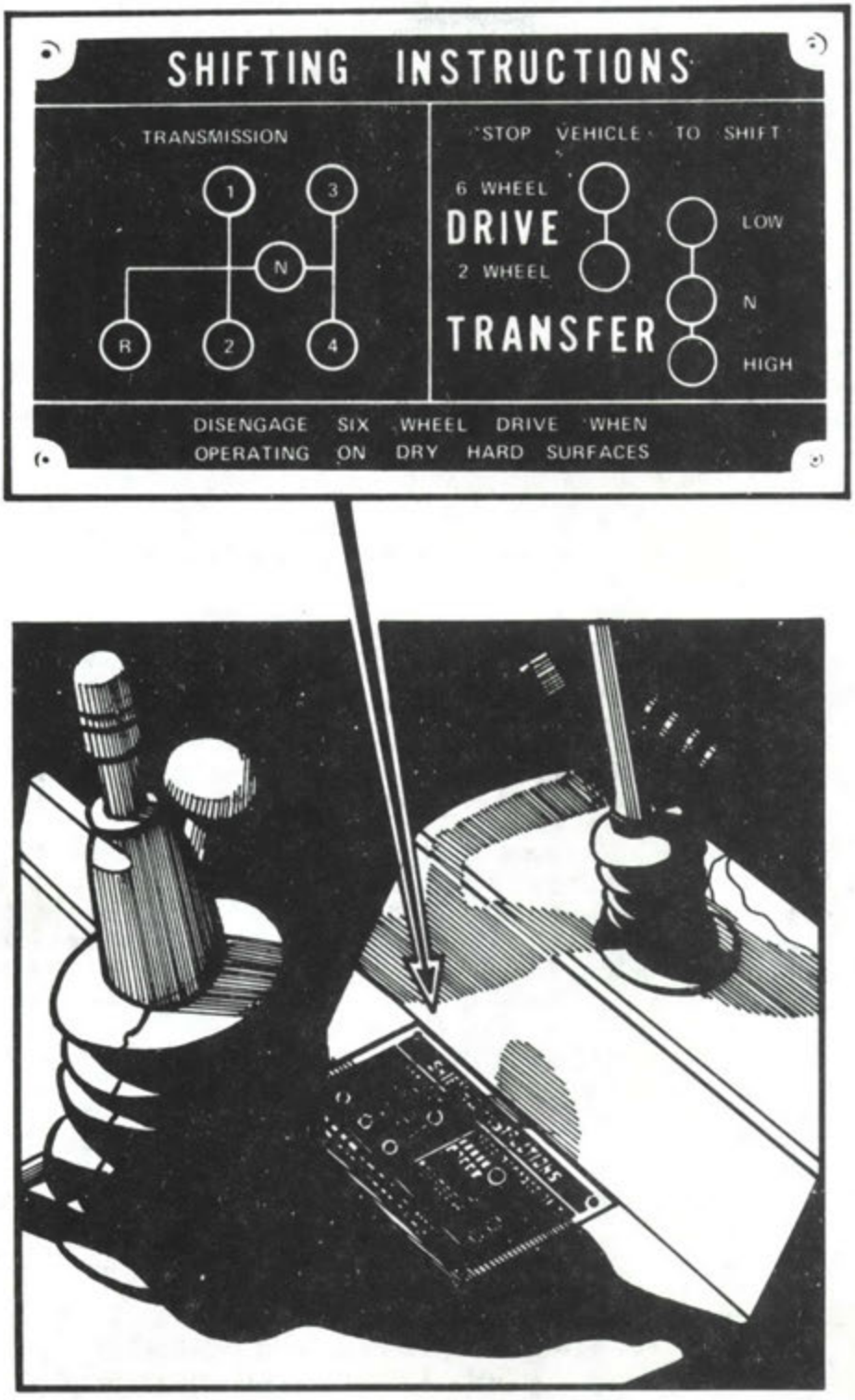


Figure 3. M561.

3. Shifting the M715 from 2-wheel drive to 4-wheel drive. Let up on the accelerator if the vehicle is moving, depress the clutch, and shift the front axle drive lever to the rear (ENGAGE) position (figure 2).

4. Shifting the M715 from 4-wheel drive high range to 4-wheel drive low range. Slow the vehicle to a speed not exceeding 4 to 5 mph, depress the clutch, and move the auxiliary range lever to the rear (LOW) position (figure 2).

5. Shifting the M715 from 4-wheel drive low range to 4-wheel drive high range. Slow the vehicle to a speed not exceeding 4 to 5 mph, depress the clutch, and move the auxiliary range lever to the forward (HIGH) position (figure 2).

6. Shifting the M715 from 4-wheel drive to 2-wheel drive. Let up on the accelerator if the vehicle is moving, depress the clutch, and shift the front axle drive lever to the forward (HIGH) position. The auxiliary range lever must be in the forward (HIGH) position before the front axle drive can be disengaged (figure 2).

7. Shifting the M561 from 2-wheel to 6-wheel drive. Stop the vehicle, depress the clutch, and move the range selector lever to the forward (6-wheel) position (figure 3).

8. Shifting the M561 from 6-wheel drive high range to 6-wheel drive low range. Stop the vehicle, depress the clutch, and move the range selector lever to the forward (LOW) position (figure 3).

9. Shifting the M561 from 6-wheel drive low range to 6-wheel drive high range. Slow the vehicle to a speed not exceeding 4 to 5 mph, depress the clutch, and move the selector lever to the rear (HIGH) position (figure 3).

10. Shifting the M561 from 6-wheel drive to 2-wheel drive. If the vehicle is in high range, slow to a speed not exceeding 4 to 5 mph, depress the clutch, and move the selector lever to the rear (2-wheel) position. If the vehicle is in low range, stop, depress the clutch, and move the selector lever to the rear (2-wheel) position. Shifting from 4-wheel to 2-wheel drive will automatically place the vehicle in high range. Do not attempt to operate the vehicle in 2-wheel drive low range.

REFERENCES:

TM 9-2320-218-10, Operator's Manual (M151) (chap 2, page 2-76 thru 2-80, para 2-24)
TM 9-2320-242-10, Operator's Manual (M561) (chap 1, page 1-23, para 1-6a(6))
TM 9-2320-244-10, Operator's Manual (M715) (page 31-32)
DA Pam 750-31, The M561 Gamma Goat, Nov 70
TEC Lesson 944-441-0012-F thru 0018-F
TEC Lesson 944-441-0019-F, Gamma Goat: 5 Wheel Operation
TEC Lesson 944-441-0020-F, Gamma Goat: Operation Under Unusual Conditions

TASK NUMBER: 071-333-6002

DRIVE A WHEELED VEHICLE ON ROADS, IN VEHICLE PARKS, AND IN BUILT-UP AREAS

CONDITIONS:

Given one of the following vehicles, and a requirement to drive on roads, in vehicle parks, and in built-up areas.

1. Truck utility ¼-ton M151, A1, A2.
2. Truck cargo 1¼-ton M715.
3. Truck cargo 1¼-ton M561.

STANDARDS:

The individual will operate the vehicle IAW local traffic regulations, the rules of the road, and safety factors outlined in the unit SOP, TM 21-300, TM 21-305, AR 385-10, and AR 385-55.

PERFORMANCE MEASURES:

1. The unit SOP will provide information on vehicle operation, to include references to appropriate local regulations. Additional background and Army-wide operating procedures, as well as the most important international traffic signs, are given in references cited below.

2. Traffic controls such as signs, signals, devices, and markings are explained in TM 21-300, sec V, para 42, and in TM 21-305, chap 10.

3. The rules of the road are explained in TM 21-300, sec V, para 43, and in TM 21-305, chap 6,7,8,9 and 11.

4. Safety is discussed in TM 21-300, sec VI, para 44. Additional safety requirements are outlined in AR 385-10 and AR 385-55.

REFERENCES:

AR 385-10, Army Safety Program (chap 2, page 2-1, para 2-1 thru 2-3)
AR 385-55, Prevention of Motor Vehicle Accidents (chap 2, page 2-0, para 3-1)
FM 21-305, Manual for the Wheeled Vehicle Driver (chap 6, page 6-1 thru 6-5, para 6-1 thru 6-8)
TM 21-300, Driver Selection and Training (Wheeled Vehicles) (chap 3, page 6, para 11; chap 4, page 12 thru 25, para 17 thru 39)

TASK NUMBER: 071-333-6003

DRIVE A WHEELED VEHICLE USING BLACKOUT DRIVE

CONDITIONS:

During darkness, given one of the vehicles listed below with operative blackout drive and a requirement to drive over varied terrain which consists of slopes, trenches, streams, etc.

1. Truck utility ¼-ton M151, A1, A2.
2. Truck cargo 1¼-ton M715.
3. Truck cargo 1¼-ton M561.

STANDARDS:

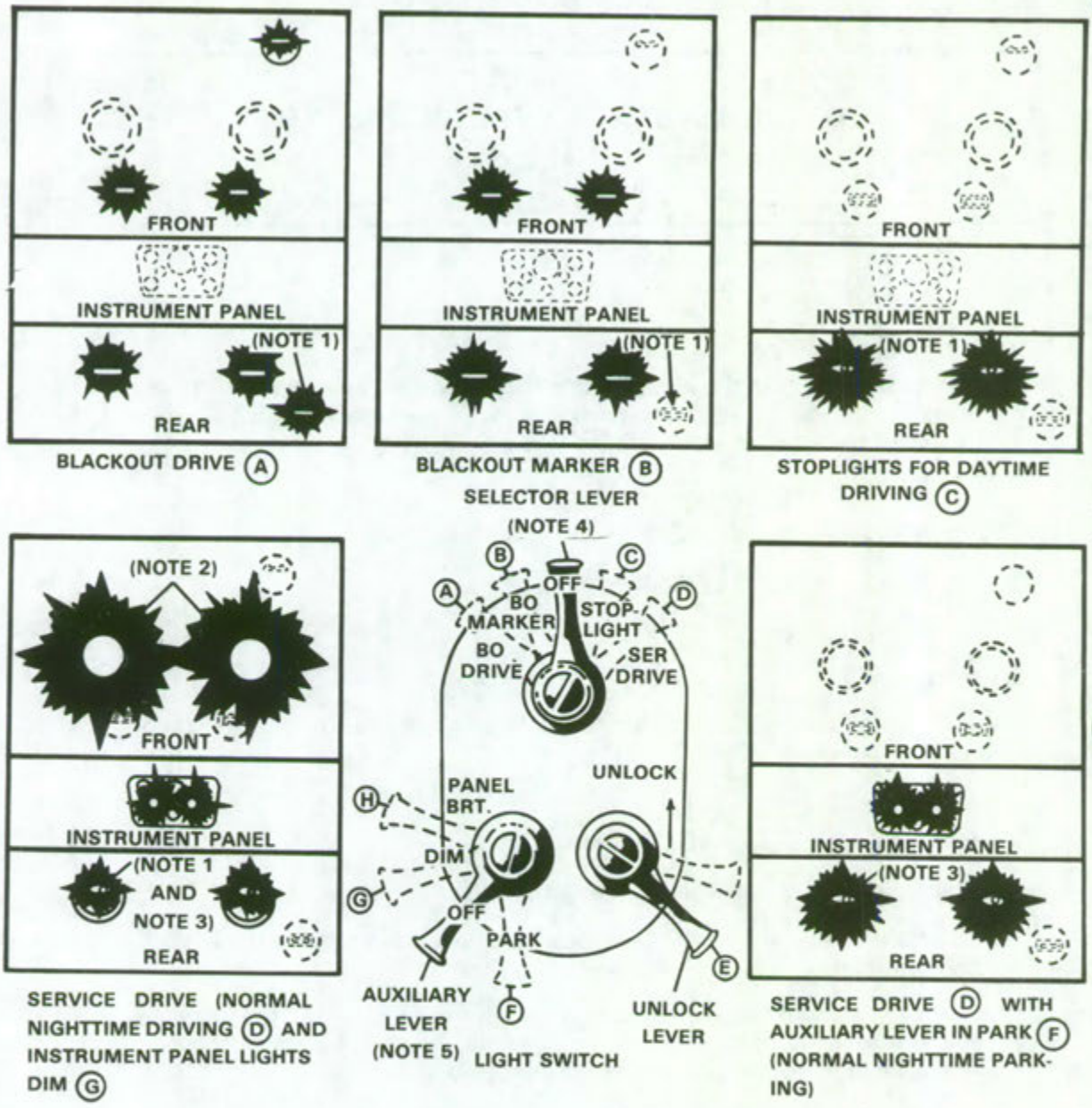
The individual will negotiate the natural obstacles by using blackout drive on command.

PERFORMANCE MEASURES:

Blackout Night Driving (figures 1 thru 3).

1. Hold lock lever in UNLOCK position, turn main lever to BO DRIVE position, and then release lock lever.

2. The blackout headlight, the blackout marker lights, and the blackout bulbs in each taillight will come on. The blackout stoplight will come on when the brake pedal is depressed (figures 1 and 2).



NOTE 1. STOPLIGHT GOES ON WHEN BRAKES ARE APPLIED.

NOTE 2. DIMMER SWITCH OPERATES HIGH AND LOW BEAM OF HEADLIGHTS WHEN IN SERVICE DRIVE (D).

NOTE 3. TAILLIGHT GOES ON.

NOTE 4. TO PLACE SELECTOR LEVER IN BLACKOUT DRIVE (A), STOPLIGHT (C), OR SERVICE DRIVE (D), UNLOCK LEVER (E) MUST BE LIFTED TO UNLOCK POSITION. NO LIGHTS OPERATE WHEN SELECTOR LEVER IS IN OFF POSITION.

NOTE 5. INSTRUMENT PANEL LIGHTS ARE BRIGHT IN PANEL BRT (H) POSITION. THE AUXILIARY LEVER CAN BE OPERATED AT ANYTIME IN ANY POSITION.

Figure 1.

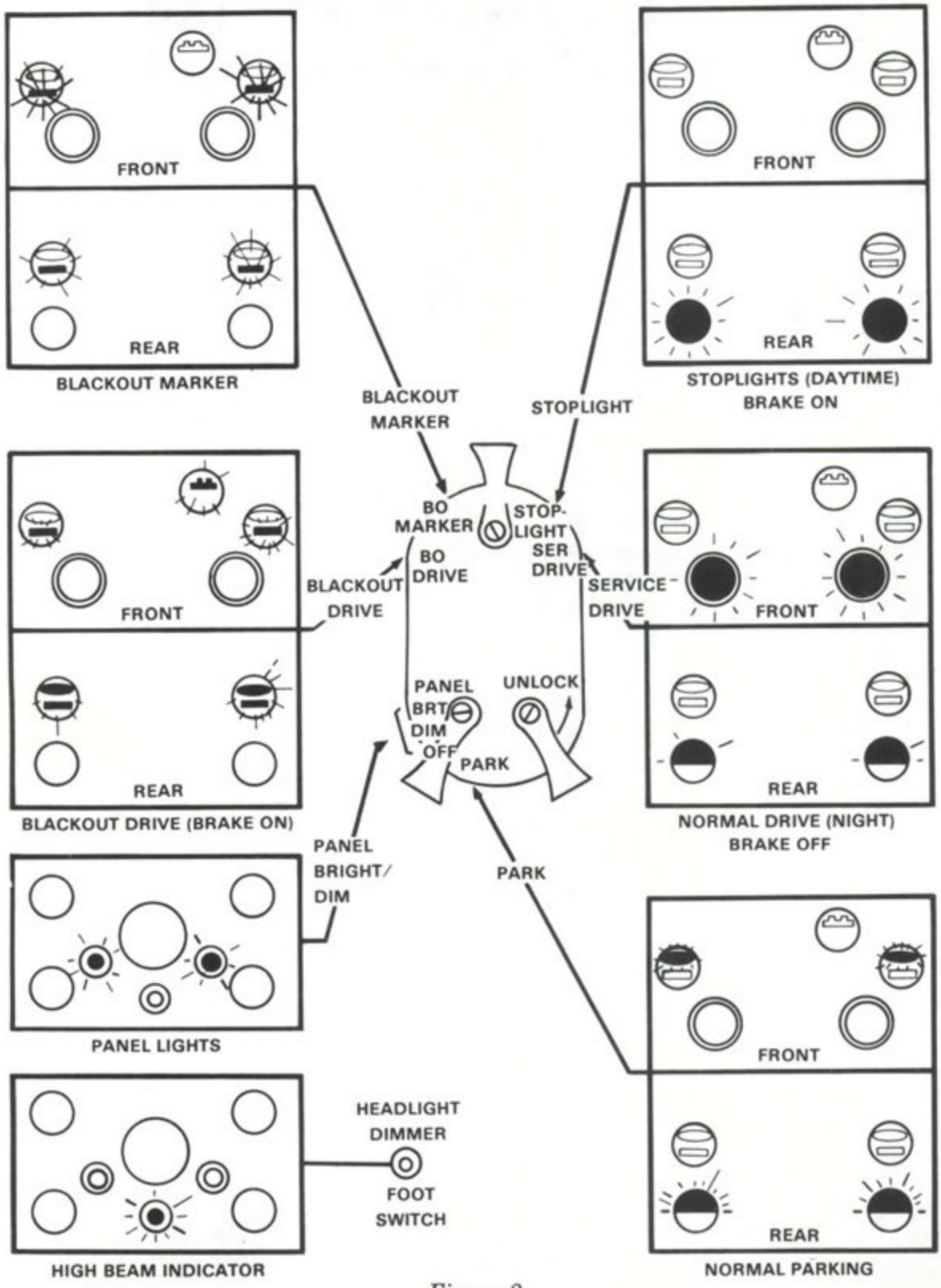


Figure 2.

2-V-A-3.3

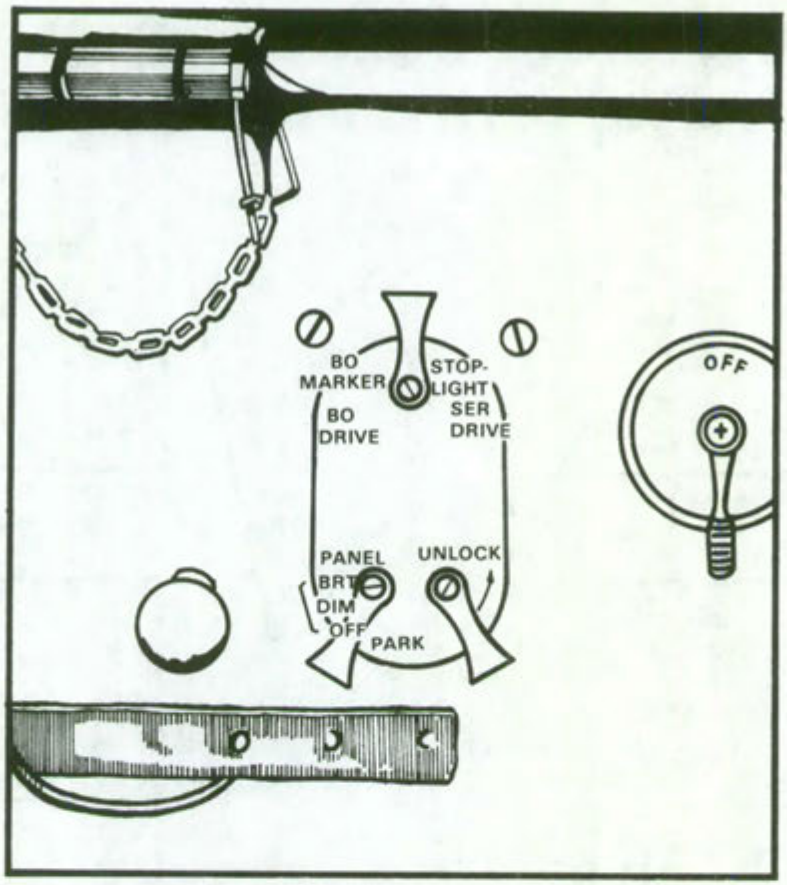


Figure 3.

REFERENCES:

TM 9-2320-218-10, Operator's Manual (M151), C1, Nov 72 (chap 2, page 2-24 and 2-25)
TM 9-2320-242-10, Operator's Manual (M561), Mar 70 (chap 2, sec III, page 2-22 thru 2-24, para 2-5 thru 2-6a(1-11))
TM 9-2320-244-10, Operator's Manual (M715), C1, Aug 68 (page 13 thru 14)

TASK NUMBER: 071-333-6004

START A WHEELED-VEHICLE ENGINE USING AUXILIARY POWER (M151, M715, M561)

CONDITIONS:

Given two wheeled vehicles (one operative and one with a dead battery) and an auxiliary power cable.

STANDARDS:

Start the engine of the vehicle with the dead battery, using an auxiliary power cable, without damaging either vehicle.

PERFORMANCE MEASURES:

1. The auxiliary power cable receptacle, located as shown in figures 1 through 3, provides for use of 24-volt power from an outside source to start the engine, charge batteries, or operate electrical equipment.

2. To start the engine:

a. Turn the ignition switch (master switch on M561) OFF before connecting auxiliary power cable.

b. Unscrew protective cap from the slave receptacle.

c. Connect auxiliary cable from external power source to receptacle.

CAUTION: Make certain prongs of auxiliary power source correspond to holes of vehicle electrical system, as marked on slave receptacle (- to -, + to +).

d. Turn ignition switch (master switch on M561) ON, and start engine in normal manner.

e. Disconnect auxiliary power cable after engine starts.

f. Install protective cap on receptacle.

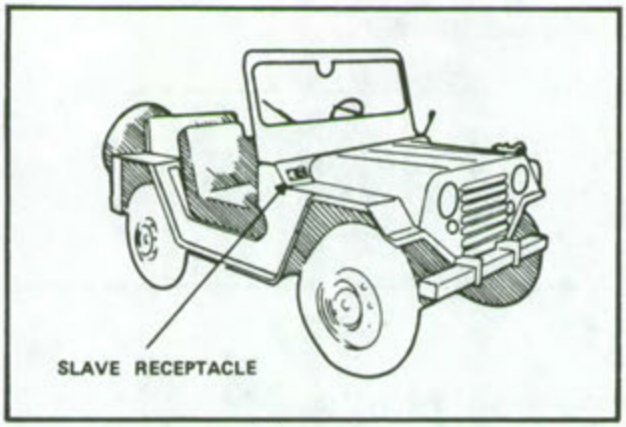


Figure 1.

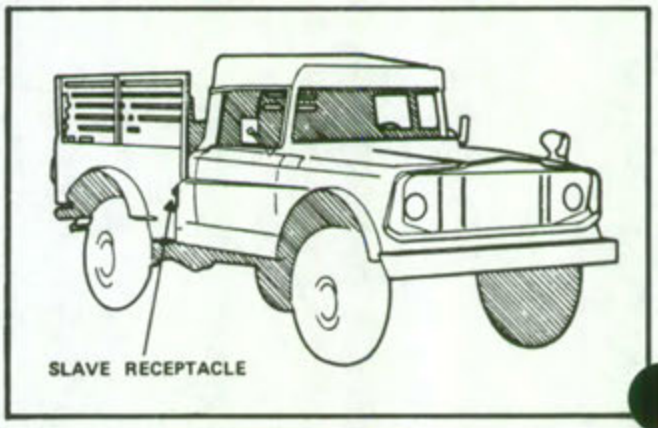


Figure 2.

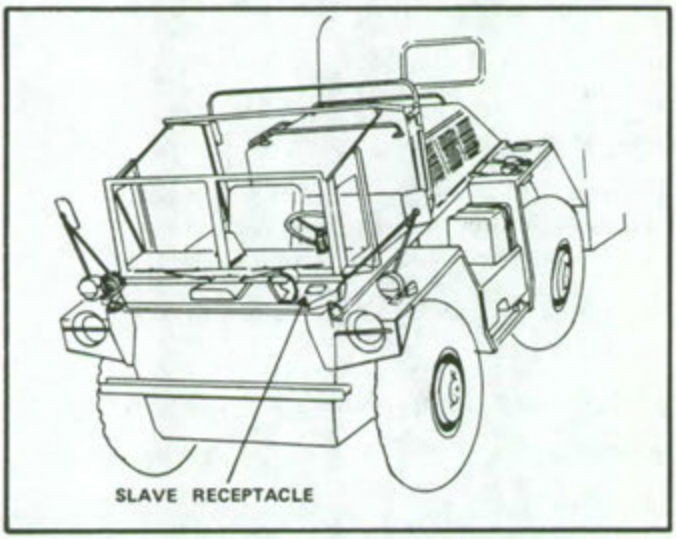


Figure 3.

REFERENCES:

TM 9-2320-218-10, Operator's Manual (151), Sep 71 (chap 2, page 2-41)
TM 9-2320-242-10, Operator's Manual (M561), Mar 70 (chap 2, sec IV, pages 2-39 thru 2-40, para 2-14)
TM 9-2320-244-10, Operator's Manual (M715), C1, Aug 68 (page 31)

TASK NUMBER: 071-333-6005

PERFORM AN ESC (EQUIPMENT SERVICEABILITY CRITERIA) INSPECTION ON A WHEELED VEHICLE (M151, M715, and M561)

CONDITIONS:

Given one of the vehicles listed below, appropriate tools, logbook, ESC TM, -10TM (Operator's Manual), pencil/pen, and the required number of DA form 2404's.

1. Truck utility ¼-ton M151, A1, A2.
2. Truck cargo 1¼-ton M715.
3. Truck cargo 1¼-ton M561.

STANDARDS:

Within 2 hours, the vehicle operator will:

1. Perform an ESC inspection on all subsystems of the vehicle.
2. Determine and record on the appropriate DA Form 2404 the correct color rating for each component and subsystem.
3. Assign the lowest subsystem rating to the overall system evaluation.

PERFORMANCE MEASURES:

The conduct of the evaluation is prescribed in the TM for ESC. The correct method of recording the results is also explained in the TM for ESC, and in appendix E of TM 38-750. A lubrication order may assist individuals in locating components.

REFERENCES:

TM 38-750, The Army Maintenance Management System (TAMMS), Nov 72 (App E)
TM 9-2320-218-ESC, M151, Oct 72
TM 9-2320-242-ESC, M561, Jun 73
TM 9-2320-244-ESC, M715, Jul 73

TASK NUMBER: 071-333-6006

MAINTAIN REQUIRED TAMMS RECORDS ON A WHEELED VEHICLE (M151, M715, and M561)

CONDITIONS:

Given DA Form 2404, a vehicle logbook, TM 38-750, and specific information pertaining to a vehicle.

STANDARDS:

The individual will:

1. Complete operator entries on the DA Form 2404 IAW TM 38-750.

2. Complete operator entries on the DA Form 2408-1 (Daily) IAW TM 38-750.

3. Compare any faults (shortcomings) given as pertaining to the vehicle with those listed on the 2408-14 to determine if they have been previously identified and corrective action was taken.

4. Extract data pertaining to unapplied modifications for the vehicle from the DA Form 2408-5.

5. Extract data pertaining to component miles/hours from the DA Form 2408-10 and DA Form 2408-1 (Daily).

PERFORMANCE MEASURES:

1. DA Form 2404 is prepared IAW procedures outlined in paragraph 3-4 of TM 38-750.

2. DA Form 2408-1 (Daily) is prepared IAW procedures outlined in paragraph 4-5 of TM 38-750.

3. DA Form 2408-5 is prepared IAW procedures outlined in paragraph 4-8 of TM 38-750.

4. DA Form 2408-10 is prepared IAW procedures outlined in paragraph 4-10 of TM 38-750.

5. DA Form 2408-14 is prepared IAW procedures outlined in paragraph 4-13 of TM 38-750.

REFERENCES:

FM 38-750, The Army Maintenance Management System (TAMMS), C1, Nov 72 (chap 4, page 4-36 & 4-37, para 4-20)
TEC Lesson 510-091-6457-F, Preparing and Using DA Form 2404 Part 1
TEC Lesson 510-091-6458-F, Preparing and Using DA Form 2404 Part 2
TEC Lesson 510-091-6474-F, Preparing, Maintaining and Using DA Form 2408-1
TEC Lesson 510-091-6478-F, Preparing, Maintaining and Using DA Form 2408-5
TEC Lesson 510-091-6477-F, Preparing, Maintaining and Using DA Form 2408-10

TASK NUMBER: 071-333-6007

PERFORM OPERATOR MAINTENANCE ON A WHEELED VEHICLE

CONDITIONS:

Given one of the vehicles listed below, basic issue items, an operator's TM for the vehicle, a lubrication order for the vehicle, the vehicle logbook, TM 38-750, and a DA Form 2404.

1. Truck utility ¼-ton M151A1, A2
2. Truck cargo 1¼-ton M715
3. Truck cargo 1¼-ton M561

STANDARDS:

The individual will:

1. Perform before-, during-, and after-operation maintenance on the vehicle IAW instructions in the -10 TM.
2. Identify maintenance deficiencies/shortcomings and correct those within the operator's capability.
3. Cross-reference uncorrectable faults against the DA Form 2408-14.
4. Prepare a DA Form 2404 to notify organizational maintenance of previously unreported uncorrectable faults or repairs which require a part.
5. Lubricate the vehicle IAW the lubrication order.
6. Perform troubleshooting procedures on the vehicle IAW the appropriate TM.

PERFORMANCE MEASURES:

1. Operator maintenance follows procedures outlined in the preventive maintenance services section of the appropriate TM.
2. To correct deficiencies/shortcomings, refer to the appropriate TM.
3. Previously reported faults beyond the operator's capability to repair or those requiring parts are recorded on the Uncorrected Fault Record (DA Form 2408-14) in the vehicle logbook. This form is completed by organizational maintenance IAW procedures outlined in paragraph 4-13 or TM 38-750.

4. Faults which the operator cannot correct or which require a part are recorded on DA Form 2404 IAW procedures outlined in paragraph 3-4 of TM 38-750.

5. The vehicle is lubricated IAW the instructions in the lubrication order.

6. Troubleshooting procedures are outlined in the troubleshooting section of the appropriate TM.

REFERENCES:

TM 9-2320-218-10, Operator's Manual (M151), C1, Sep 71 (chap 3, pages 3-11 thru 3-24, para 3-7)
TM 9-2320-242-10, Operator's Manual (M561), C2, Mar 70 (chap 3, pages 3-11 thru 3-13 (page 23-25 of C2)) (for LO, see page 8 thru 12 of C2)
TM 9-2320-244-10, Operator's Manual (M715), C1, Aug 68 (pages 35, 36, 55 thru 59)
TM 38-750, The Army Maintenance Management System, C1, Nov 72 (chap 3, page 3-4, para 3-4)
LO 9-2320-244-10, Lubrication Order (M715) Aug 73
TEC Lesson 041-091-6486-F (TBP)
TEC Lesson 510-091-6458-F (TBP)
TEC Lesson 944-441-0001, 2, and 3F (TBP)

TASK NUMBER: 071-333-6008

RECOVER A WHEELED VEHICLE

CONDITIONS:

During combat or training under all type weather conditions, given a wheeled vehicle requiring recovery (the vehicle is equipped with basic issue items), either applicable materials for expedient recovery or a similar vehicle, and one or more assistant drivers.

STANDARDS:

Recover the disabled wheeled vehicle using one of the following:

1. Similar vehicles if available for recovery.
2. Vehicle's basic issue items for self-recovery.
3. One of the following expedient methods:
   a. Prying.
   b. Use disabled vehicle wheels for winching.
   c. Use an A-frame.

PERFORMANCE MEASURES:

1. **Methods of Recovery.** There are four methods of recovery that are performed using organizational personnel and equipment.

a. Winching. Operations performed using winches on special purpose vehicles or cargo type vehicles.

b. Towing. Operations performed using towing capabilities of similar or special purpose vehicles. This is the quickest recovery method.

c. Lifting. Operations performed using special purpose vehicles.

d. Expedients. Used when other methods are not adaptable to the situation or when additional vehicles and equipment are not readily available.

2. **Levels of Recovery.** Recovery operations performed within an organization are divided into levels based on personnel who perform the operations and equipment available to them.

a. Platoon Level. Recovery performed by vehicle drivers and crews, under supervision of squad, section, or platoon leader. At this level, winching, towing, and expedient methods of recovery are employed, using platoon vehicles and equipment.

b. Company and Battalion Levels. Recovery performed by general vehicle repairmen or recovery specialists under the supervision of the recovery chief, using winching, towing, and lifting methods of recovery with special purpose vehicles. Because of the increased number of special purpose vehicles at battalion level, a greater recovery capability exists than at company level.

3. **Recovery Procedure.** During any recovery operation, a proven procedure should be used to insure quick and safe accomplishment. A haphazard approach to a recovery problem or the trial and error method can only result in a prolonged immobility of the disabled vehicle, loss of valuable time, damage to equipment, and possible injury to personnel. The following eight-step recovery procedure, in the proper sequence, should be used in any recovery involving winching.

RECOVERY PROCEDURE

RECONNOITER AREA

ESTIMATE SITUATION

CALCULATE RATIO

OBTAIN RESISTANCE

VERIFY SOLUTION

ERECT RIGGING

RECHECK RIGGING

YOU ARE READY

4. **Vehicle Recovery Operations (Similar Vehicles).** The amount and type equipment employed as the source of effort during any recovery operation is dependent upon the level of recovery as discussed in paragraph 2. Every effort should be made by the drivers and crews to accomplish the recovery before calling on support from a higher level. During combat, it may be of the utmost importance that cargo reach its destination at a definite time, or that personnel or cargo be picked up at a given time, or that a combat vehicle be at a given place at a specific time. The use of similar vehicles for recovery usually constitutes the QUICKEST METHOD of recovery because similar vehicles are readily available. Recovery support should be called upon only when the similar vehicles are not adaptable to the situation or when the tactical situation does not permit their use. Engaged combat vehicles should never be diverted for the purpose of recovery.

5. **Use of Similar-Type Wheeled Vehicles for Recovery.** Similar wheeled vehicles can be used as the source of effort to perform recovery by towing and winching.

a. To recover a mired truck by towing with a similar vehicle, a tow chain should be used between the towing and the mired vehicle, attached to one of the lifting shackles of the mired vehicle and a front lifting shackle on the towing vehicle. If a greater working distance is required to enable the towing vehicle to get better traction, then the tow chains from both vehicles should be used. Power must be applied slowly to prevent placing an impact on the chain and lifting shackles. A chain, unlike a cable, will not stretch and can easily be broken by impact. If one towing vehicle cannot attain sufficient towing effort to overcome the resistance, another towing vehicle can be used in tandem with the first (figure 1).

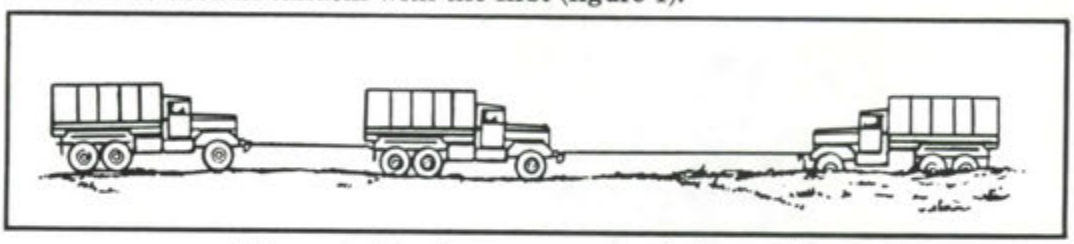


Figure 1. Towing a cargo truck from mire.

b. To recover a mired cargo truck by winching, a truck of equal or greater capacity should be used to perform the winching operation. As an example, a mired 1¼-ton cargo truck may be winched with either a 1¼-ton or 2½-ton vehicle. All winch-equipped trucks are authorized a single sheave snatch block and one tow chain for rigging. A mechanical advantage is required if the resistance of the mired truck is greater than the winch capacity. The winching vehicle must be positioned in line with the mired vehicle so the correct fleet angle is obtained. The winch cable must be free-spooled from the drum and the free end of the cable attached to one of the winching vehicle's front lifting shackles or to a separate anchor. A chain sling is formed between the lifting shackles of the mired vehicle and the snatch block is attached in the apex of the sling. The loop formed in the winch cable is placed in the snatch block and power is applied to the winch to remove the slack from the cable (figure 2).

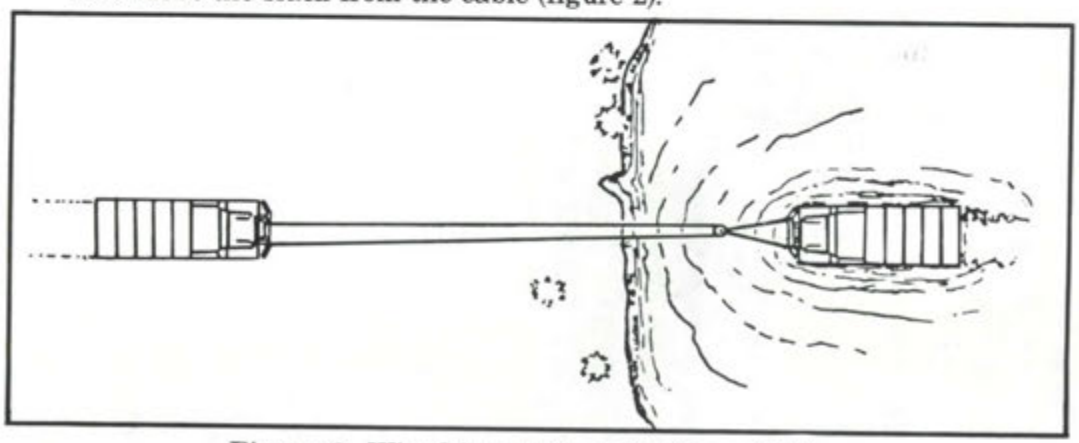


Figure 2. Winching with a similar vehicle.

c. A winch-equipped mired vehicle can perform a self-recovery. The rigging is similar to that used for similar vehicle recovery except the snatch block is attached to a suitable anchor and the free end of the cable attached to one of the mired vehicle's front lifting shackles. A fixed block will gain a mechanical advantage on a self-winching operation even though the sheave of the block is performing as a first-class lever because the source of effort (the winch) is part of the load; therefore, both the fall line and return line are attached to the load and supporting it. Since there are two lines supporting the load, a 2 to 1 mechanical advantage is obtained (figure 3).

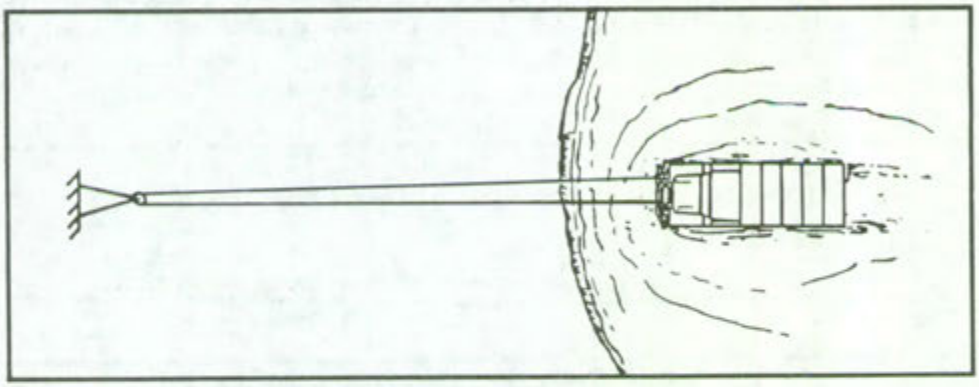


Figure 3. Self-winching operation.

6. **Recovery Expedients.** Military operations will require vehicles to operate in remote areas where, should disablement occur, assistance would not be readily available. Under these conditions, the driver or crew must attempt self-recovery by the use of expedients. An expedient is an improvised method and is accomplished with the materials on hand.

a. Use of a Pry. A pole can be used to pry a ¼-ton truck out of a ditch by lifting the front end of the truck with the pole as illustrated in figure 4, and applying power to the truck in reverse gear.

Figure 4. Pole used as a pry.

b. Use of Wheels for Winching. On wheeled vehicles not equipped with a winch, the rear wheels may be used to assist in recovering the vehicle. On a dual-wheeled truck, a rope with one end fastened to the wheel hub and the other end anchored, will cause the rope to be wound between the dual wheels providing the same action as a winch. The end of the rope that is fastened to the wheels should be run between the duals and through one of the holes in the wheel disk. Care should be taken not to place the rope through a hole in the wheel disk where the valve stem is located. A bowline knot is tied in the end of the rope and slipped over the hub. Tie a second rope in the same manner to the dual wheels on the other end of the axle, then place the vehicle in reverse gear; the ropes will wind between the two duals, causing the vehicle to move rearward. If the truck has single wheels, such as the M715 and M151, the same expedient can be used by placing a bar through the hole in the end of the axle flange. A rope is attached to the wheels on each side of the vehicle by fastening them to the bars with figure 8 hitches (figure 5). Applying power will cause the ropes to be wound around the hubs and move the vehicle.

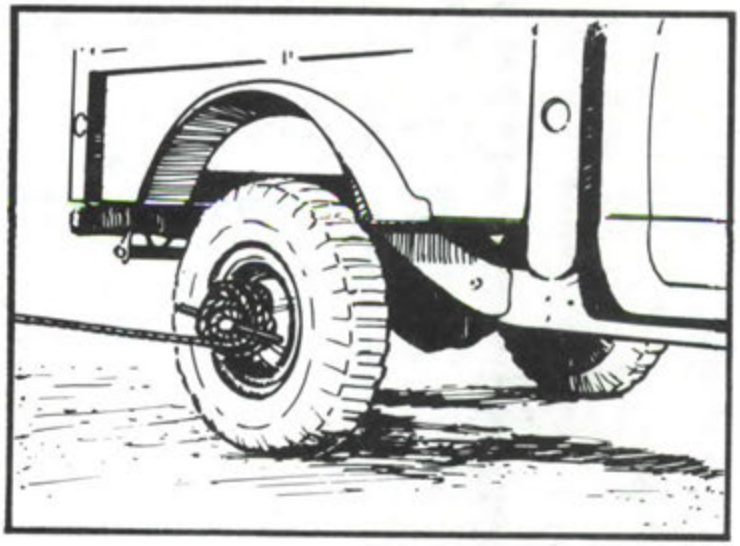


Figure 5. Attachment of rope to single wheels to be used as a winch.

c. Use of an A-Frame. Frequently, a truck will become nosed in a shell hole or narrow ditch. When a truck becomes disabled in this manner, both lifting and pulling forces are required to make the recovery. The lifting force can be obtained from an A-frame. To construct an A-frame, two poles approximately 8 feet long and large enough in diameter to support the front end of the truck will be needed. The poles should be lashed together at the top by a figure 8 or girth hitch (figure 6). The lower end of the poles should be placed in the ground 10 to 12 inches deep to prevent them from sliding when power is applied. The upper end of the A-frame is laid across the hood of the vehicle and the attachment made as in figure 7. If the nose truck is equipped with a winch, the winch cable should be rigged for a 2 to 1 mechanical advantage, with the end of the cable secured to the apex of the A-frame.

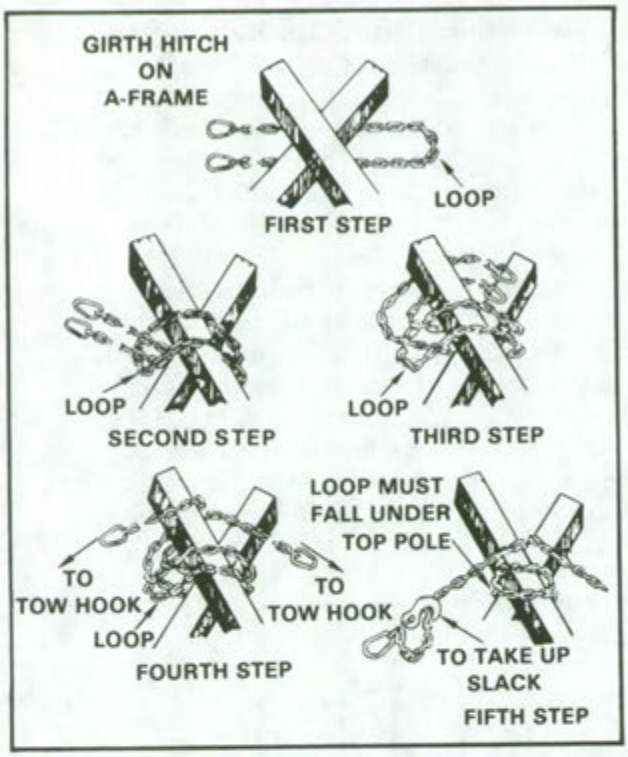


Figure 6. Tying girth nitch to A-frame.

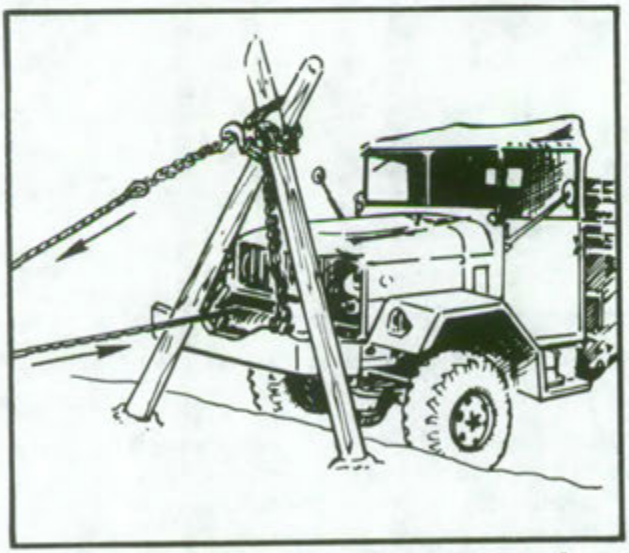


Figure 7. Recovery of a nosed truck using an A-frame.

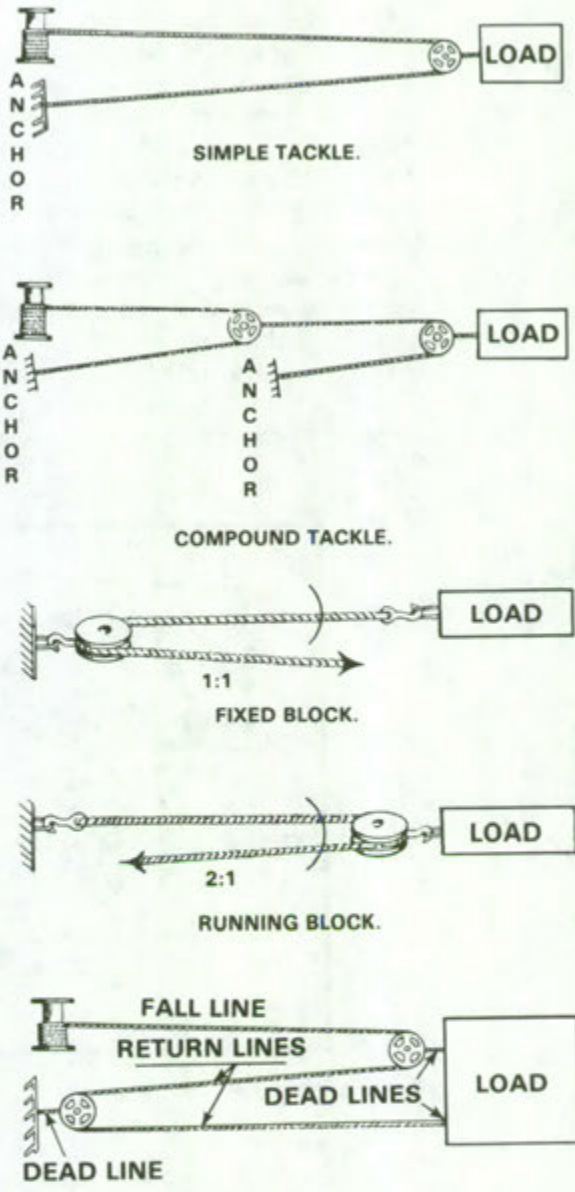


Table 1. Tackle terminology.

REFERENCES:

FM 5-34, Engineer Field Data, Sep 76 (chap 16, page 367 thru 369, para 16-7)
FM 20-22, Vehicle Recovery, Jul 70 (chaps 5 and 6, pages 58 thru 108)

TASK NUMBER: 071-333-6501

DRIVE AN APC CROSS-COUNTRY

CONDITIONS:

Given an M113A1 personnel carrier during daylight, a vehicle commander, and a requirement to drive across varying terrain which includes the following obstacles:

1. More than 30% side slope.
2. 60% or less grade.
3. 24-inch vertical wall, or less.
4. Trench 5½ feet wide, or less.
5. 30% or less side slope.
6. More than 60% grade.
7. More than 24-inch vertical wall.
8. Trench more than 5½ feet wide.

STANDARDS:

Bypass all obstacles where possible, negotiate obstacles 2, 3, 4, and 5 when they cannot be bypassed, and inform track commander and follow his instructions when obstacles 1, 6, 7, and 8 are encountered and cannot be bypassed.

PERFORMANCE MEASURES:

1. **Steering and stopping** (figure 1).

CAUTION: NEVER USE PIVOT STEER LEVERS AND DIFFERENTIAL STEER LEVERS AT THE SAME TIME OR DIFFERENTIAL MAY BE SEVERELY DAMAGED.

To slow vehicle, release accelerator pedal and pull back equally on both levers, using pumping movement. To stop vehicle quickly, release pedal and pull back equally on both levers, using hard, steady pull.

To turn left when traveling forward or in reverse, pull left lever until turn is complete, then release lever.

CAUTION:
NEVER TOUCH LOCK BUTTONS ON TOP OF HAND GRIPS WHEN STEERING VEHICLE.

NOTE
FOR NORMAL STOP, RELEASE ACCELERATOR PEDAL AND ALLOW VEHICLE TO COME TO A STOP. SHIFT TO N AFTER VEHICLE STOPS.

CAUTION:
WHEN OPERATING IN LOOSE SAND, DIRT, OR ROCKS, ESPECIALLY ON SIDE SLOPES, STEER IN A SERIES OF SHORT TURNS, RATHER THAN ONE LONG EVEN TURN, TO ALLOW DEBRIS TO FEED OUT OF TRACK. IF DEBRIS ACCUMULATES, DAMAGE TO SUSPENSION OR A THROWN TRACK MAY RESULT.

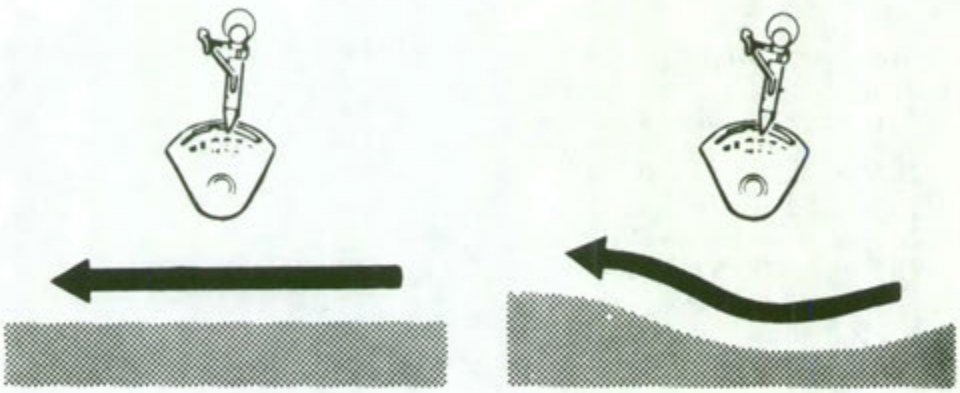
To lock brakes for parking, pull both levers back tightly and depress lock button on top of hand grips. To release brakes, pull back on levers, keeping thumbs clear of lock button, then release levers.

To turn right when traveling forward or in reverse, pull right lever until turn is complete, then release lever.

Figure 1.

2. **Shifting.** Manual shifting is required to avoid excessive automatic shifting in the transmission or overloading the engine. The type of terrain encountered determines the range selection. The following general rules apply for proper range selection:

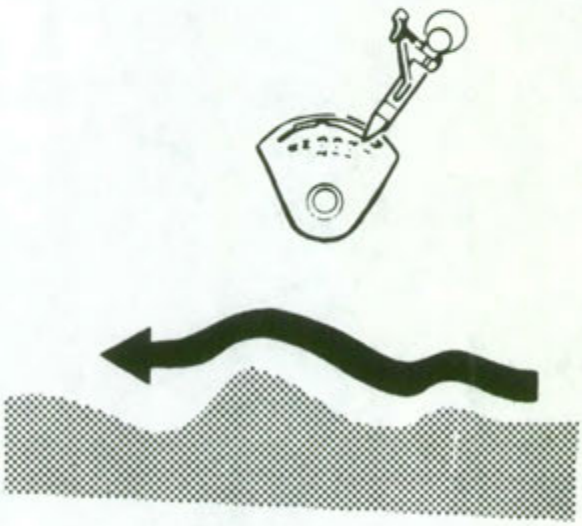
a. Level Terrain. Use 1-3 or 2-3 range for operation on level roads or hilly terrain when maximum speed is required and can be maintained without excessive automatic shifting (figure 2).



A. Roads and level terrain: 1—3 range. B. Hilly terrain: 1—3 range.

Figure 2.

b. Rough Terrain. Use 1-2 range for cross-country travel over rough terrain and when traveling up and down long gradual grades (figure 3).



Rough terrain and trenches: 1—2 range.

Figure 3.

c. Steep Grades. Use 1 range for climbing and descending steep grades (figure 4) and 1-2 range for moderately steep grades (figure 3).

Figure 4.

3. **Performance on land.**

a. Maximum grade 60%

b. Maximum side slope 30%

c. Maximum vertical wall:

(1) Forward ..... 24″

(2) Reverse ..... 14″

d. Maximum trench ..... 5½′

REFERENCES:

TM 9-2300-257-10, Operator's Manual, Carrier, Personnel, Full Tracked, Armored, M113A1, Dec 73 (chap 2, sec III, page 2-79 thru 86)
TEC Lesson 945-171-0100-F, Varied Terrain Driving
TEC Lesson 945-171-0101-F, Reduced Traction and Hazards

TASK NUMBER: 071-333-6502

DRIVE AN APC ON ROADS, IN VEHICLE PARKS, AND IN BUILT-UP AREAS

CONDITIONS:

Given an M113A1 and a requirement to drive on roads, in vehicle parks, and in built-up areas.

STANDARDS:

Operate the vehicle IAW local traffic regulations, the rules of the road, and safety factors outlined in the unit SOP, TM 21-301, TM 21-306, AR 385-10, and AR 385-55.

PERFORMANCE MEASURES:

1. The unit SOP will provide information on vehicle operation, to include references to appropriate local regulations. Additional background and Army-wide operating procedures, as well as the most important international traffic signs, are given in references cited below.

2. Traffic controls such as signs, signals, devices, and markings are explained in TM 21-301, chapter 10.

3. The rules of the road are explained in TM 21-305, chapters 6, 7, 8, 9, and 11.

4. Safety is discussed in TM 21-306, section II, paragraph 12. Additional safety requirements are outlined in AR 385-10 and AR 385-55.

REFERENCES:

AR 385-10, The Army Safety Program, C1 thru 4, Feb 70 (chap 2, page 2-1, para 2-1 thru 2-3)
AR 385-55, Prevention of Motor Vehicle Accidents, Apr 74 (chap 2, page 2-1, para 2-1)
TM 21-301, Driver Selection, Training and Supervision, Tracked Vehicles, Jul 67 (chap 3, page 6, para 11; chap 4, page 12-25, para 17 thru 39)
TM 21-306, Manual for the Tracked Combat Vehicle Driver, C1, Aug 64 (chap 2, sec I thru V, page 3-49, para 6-31)

TASK NUMBER: 071-333-6503

DRIVE AN APC WITH NIGHT VISION DEVICES, INFRARED EQUIPMENT, AND BLACKOUT DRIVE

CONDITIONS:

During darkness, given an M113A1 personnel carrier with operative blackout drive and an M19 infrared periscope, a vehicle commander, and a requirement to drive over varied terrain which consists of slopes, trenches, vertical walls, streams, etc.

STANDARDS:

The individual will negotiate the obstacles by:

1. Using blackout drive on command.
2. Installing and using M19 infrared periscope on command.

PERFORMANCE MEASURES:

1. **Blackout Night Driving** (figure 1).

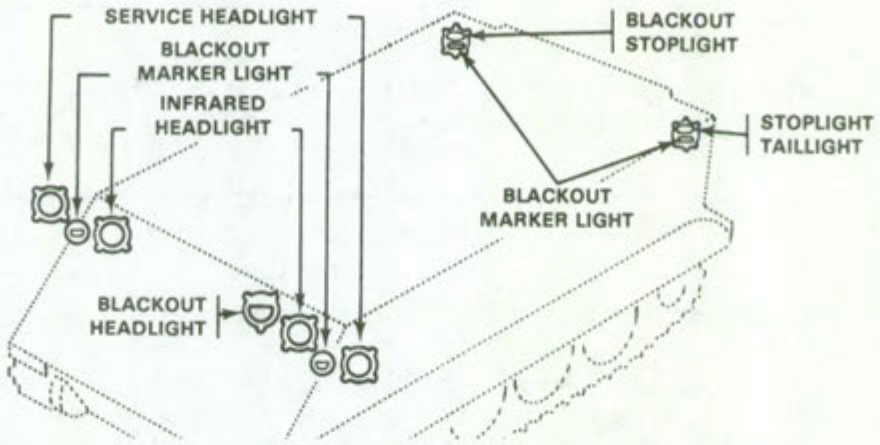
a. Hold lock lever in UNLOCK position, turn main lever to B.O. DRIVE position, and then release lock lever.

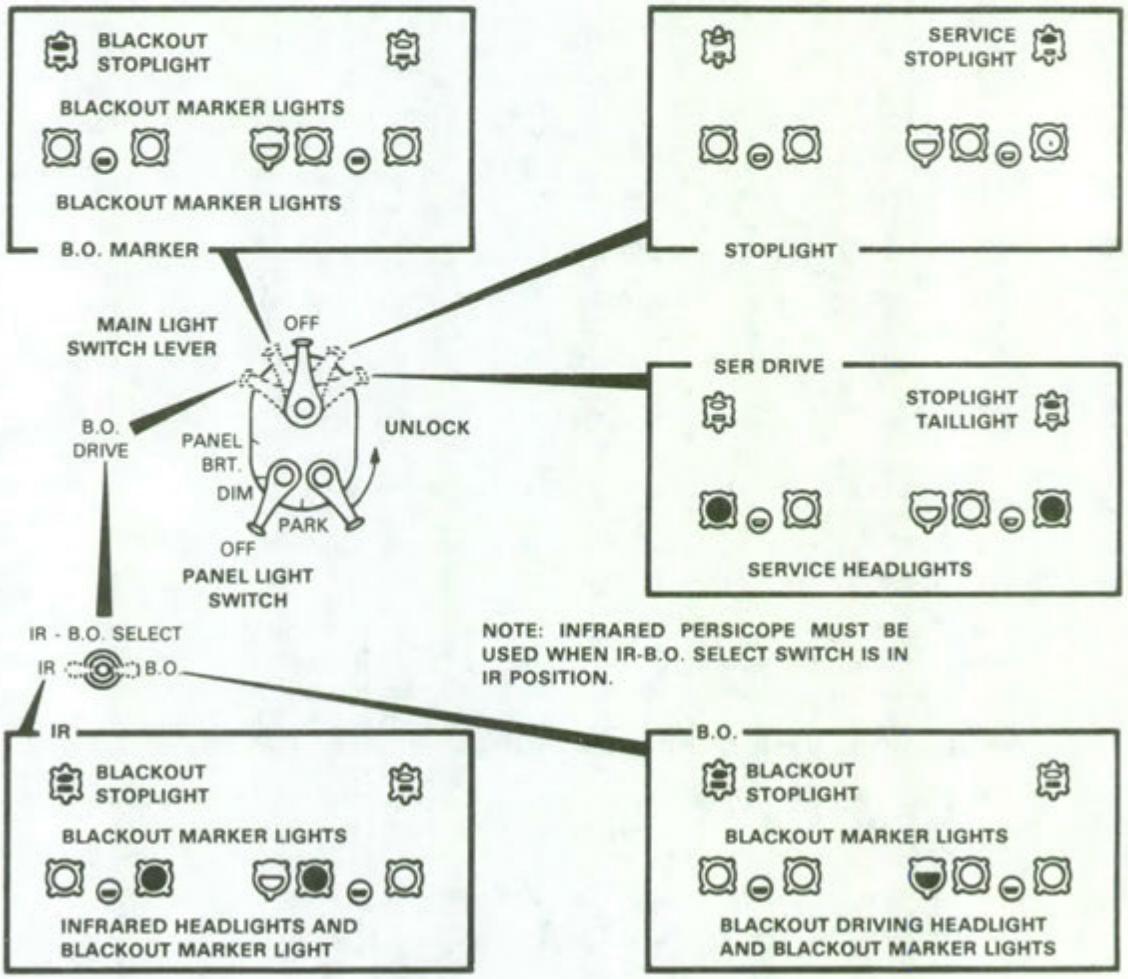
b. The blackout headlight, the blackout marker lights, and the blackout bulbs in each taillight will come on. The blackout stoplight will come on when both steering levers are pulled to brake the carrier.

2. **Operating the M19 Infrared Periscope** (figure 2 thru 5).

a. When required for blackout driving, the M19 infrared periscope is installed in the driver's hatch and operated as shown in figures 3, 4, and 5.

Figure 1.


SERVICE HEADLIGHT
BLACKOUT MARKER LIGHT
INFRARED HEADLIGHT
BLACKOUT HEADLIGHT
BLACKOUT STOPLIGHT
STOPLIGHT TAILLIGHT
BLACKOUT MARKER LIGHT


BLACKOUT STOPLIGHT
BLACKOUT MARKER LIGHTS
BLACKOUT MARKER LIGHTS
B.O. MARKER
SERVICE STOPLIGHT
STOPLIGHT
MAIN LIGHT SWITCH LEVER
OFF
B.O. DRIVE
PANEL BRT.
DIM
PARK
UNLOCK
OFF
PANEL LIGHT SWITCH
SER DRIVE
STOPLIGHT TAILLIGHT
SERVICE HEADLIGHTS
IR - B.O. SELECT
IR
B.O.
NOTE: INFRARED PERSICOPE MUST BE USED WHEN IR-B.O. SELECT SWITCH IS IN IR POSITION.
IR
BLACKOUT STOPLIGHT
BLACKOUT MARKER LIGHTS
INFRARED HEADLIGHTS AND BLACKOUT MARKER LIGHT
B.O.
BLACKOUT STOPLIGHT
BLACKOUT MARKER LIGHTS
BLACKOUT DRIVING HEADLIGHT AND BLACKOUT MARKER LIGHTS

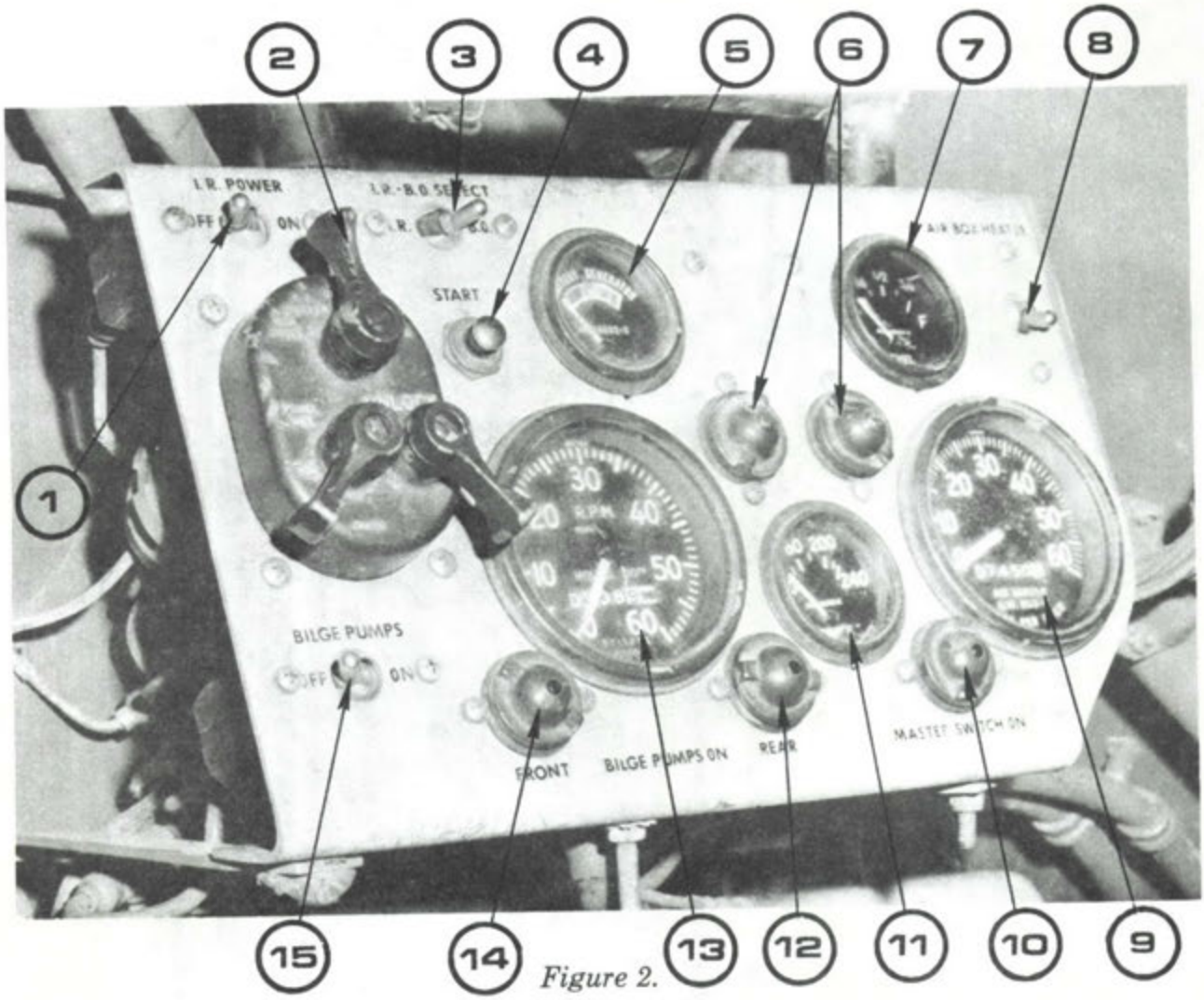
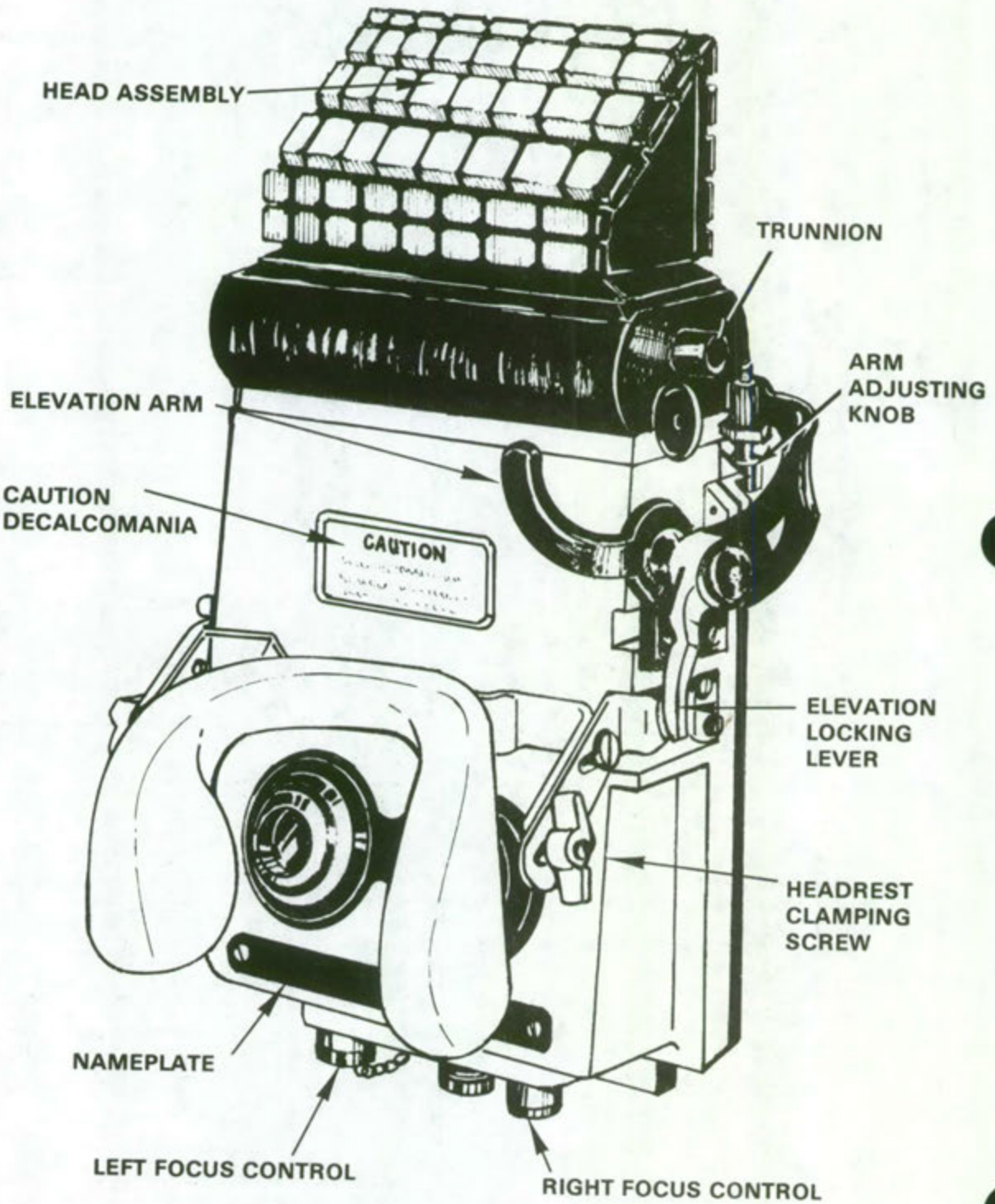


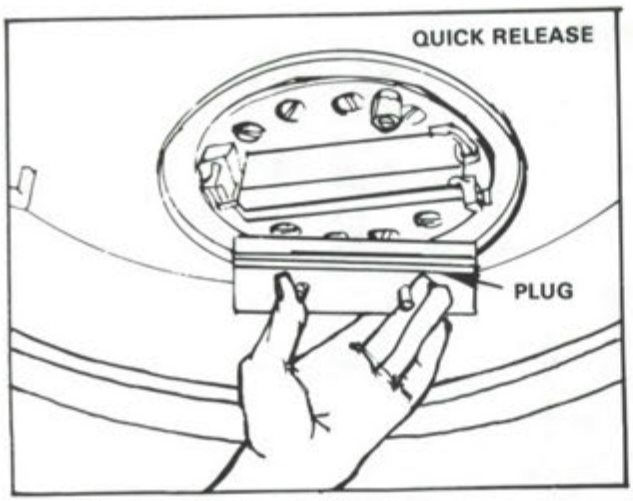
Figure 2.

1—I.R. POWER SWITCH
2—LIGHTS SWITCH ASSEMBLY
3—I.R-B.O. SELECT SWITCH
4—START SWITCH
5—BATTERY GENERATOR INDICATOR
6—PANEL LIGHTS
7—FUEL INDICATOR
8—AIR BOX HEATER SWITCH
9—SPEEDOMETER
10—MASTER SWITCH ON INDICATOR LIGHT
11—ENGINE TEMPERATURE INDICATOR
12—REAR BILGE PUMP ON INDICATOR LIGHT
13—TACHOMETER
14—FRONT-BILGE-PUMP-ON INDICATOR LIGHT
15—BILGE PUMPS SWITCH

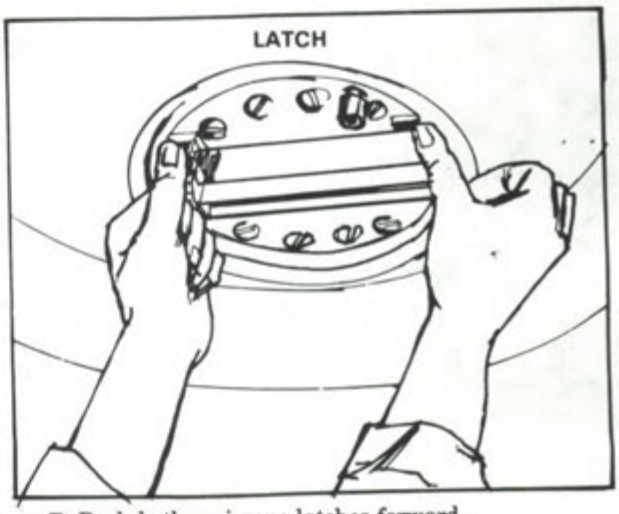
Figure 3.

NOTE: M19 PERISCOPE USED DURING BLACKOUT WITH INFRARED HEADLIGHTS. WHEN NOT IN USE, STOW PERISCOPE WITH LENSES COVERED.

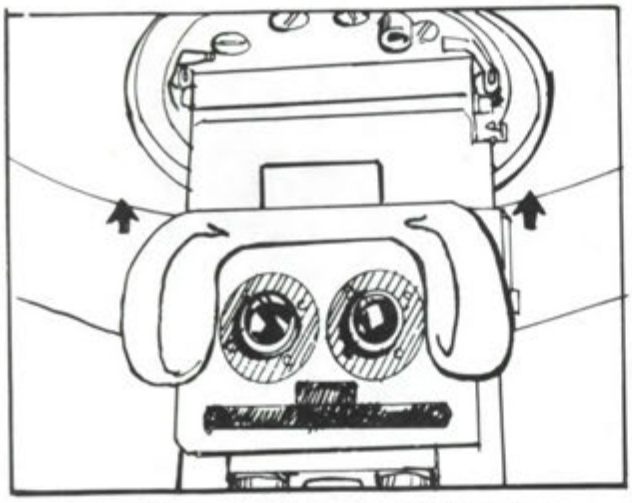




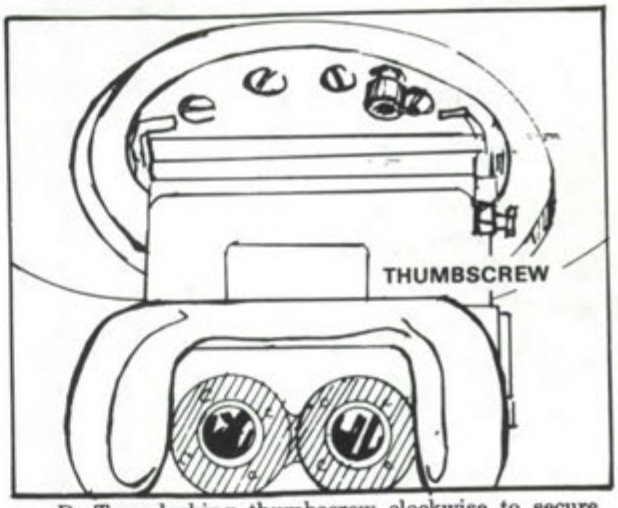
A. Remove plug from quick release.



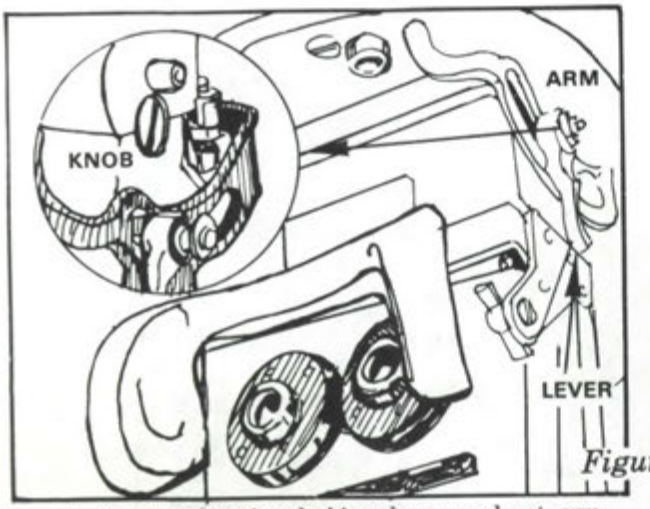
B. Push both periscope latches forward.



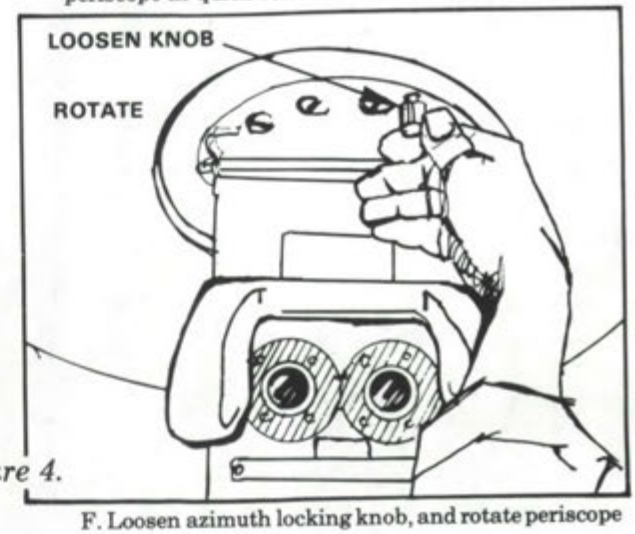
C. Carefully insert periscope and push upward.



D. Turn locking thumbscrew clockwise to secure periscope in quick release.

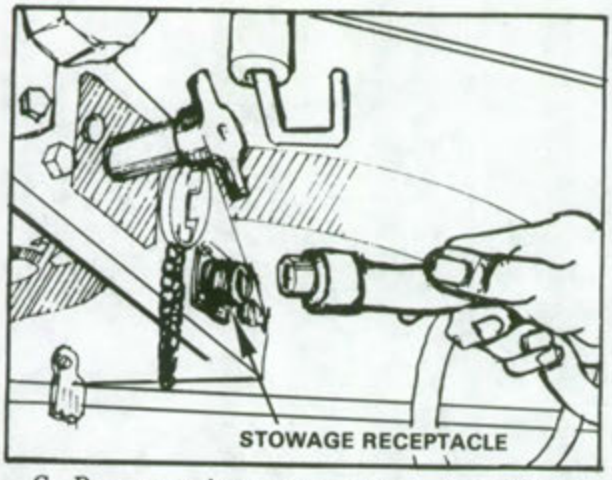


E. Loosen elevation locking lever, and set arm adjusting knob so both ends of elevation arm contact quick release.

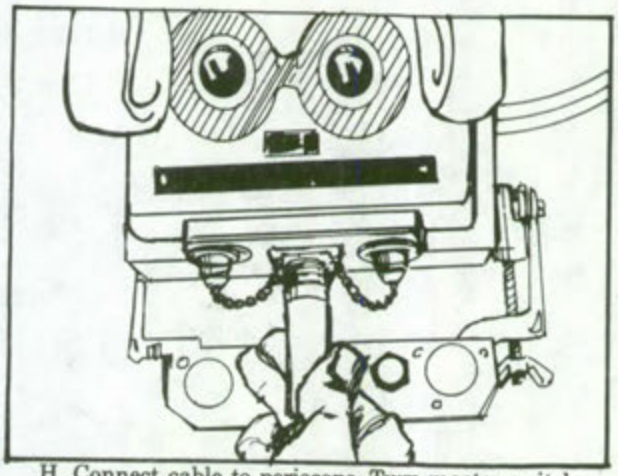


F. Loosen azimuth locking knob, and rotate periscope to check operation.

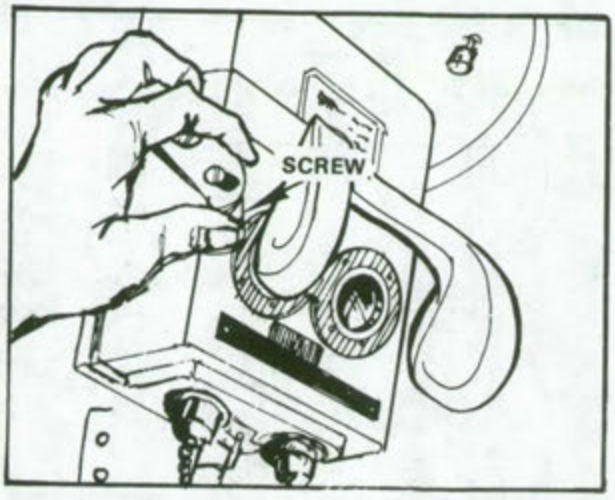
Figure 4.



G. Remove periscope power cable from stowed position.

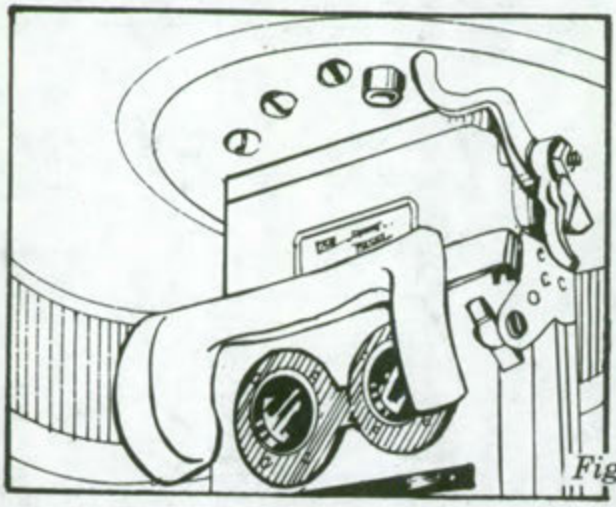


H. Connect cable to periscope. Turn master switch ON, infrared power switch ON, and main light switch to B.O. DRIVE.

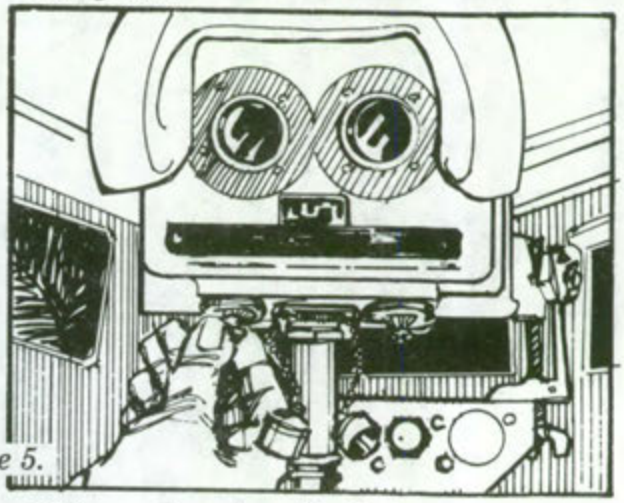


I. Loosen clamping screw, and adjust headrest.

J. Adjust periscope in azimuth, and tighten azimuth locking knob.



K. Adjust periscope in elevation, and tighten locking lever.



L. Focus each eyepiece with adjusting screw.

Figure 5.

b. **Warning:** The infrared powerpack must be completely deenergized before the power cable is disconnected. The power cable must be installed in the periscope, not stowed before power is turned on. Failure to turn both the main light switch lever and infrared powerpack switch (figure 3) to OFF positions before disconnecting the cable will result in arcing, which may cause injury to personnel and damage to equipment. Before disconnecting the cable from periscope after use, wait 1 minute until residual charge in the system has drained off and then immediately move cable from periscope to stowage plug on master switch panel and secure receptacle down. Do not under any circumstances touch end of cable when moving from one plug to another because voltage of powerpack exceeds 16,000 volts.

REFERENCE:

TM 9-2300-257-10, Operator's Manual (Tracked Vehicle), Dec 73 (chap 2, pages 2-15 thru 2-17, para 2-22 thru 2-37; page 2-22, para 2-48; and page 2-87, para 2-132)

TASK NUMBER: 071-333-6504

OPERATE AN APC IN WATER

CONDITIONS:

In daylight, at a field location with an unfordable water obstacle, given an operational APC; TM 9-2300-257-10; safety equipment as prescribed by TM 9-2300-257-10 and local SOP/regulations.

STANDARDS:

Prepare and drive the APC across the water obstacle.

PERFORMANCE MEASURES:

1. **Before entry:**

   a. Check hull drain plugs, pipe plugs, and access plates.

   b. Check bilge pump operation.

   c. Insure track shrouds are properly installed and in good conditions.

   d. Insure power plant door is secure.

   e. Insure ramp door is secure.

   f. Extend and lock trim vane.

   g. Make certain periscopes are installed.

   h. Turn on interior lights if tactical situations permits.

   i. Close cargo and gunner's hatch covers, but not the driver's hatch cover.

2. **Entering water (with bilge pump operating):**

   a. Do not enter water with waves higher than 1 foot.

   b. Select firm, gradual slope (if not designated), free of obstacles.

   c. Enter using 1-range, not exceeding 10 mph.

   d. Personnel safety - Insure load is equally distributed. Know emergency procedures. Top hatch covers may be opened after the carrier is waterborne, except on mortar carriers. Accelerate and head for shore if carrier shows signs of flooding or swamping.

3. **Driving in water:**

a. Shift to 1-2 range.

b. Steer carrier as on land using pivot steer levers instead of differential steering.

c. Slow-flowing waters (streams, rivers, bodies of water with current less than 2 mph) should be crossed diagonally, pointing APC up-current from intended exit point. Alternate means of crossing are explained in TM 9-2300-257-10.

4. **Stopping in water:**

a. Release accelerator slowly while pulling back gently on pivot steer levers to stop tracks.

b. Release levers; shift to reverse.

c. Depress accelerator.

d. When carrier has stopped forward motion, release accelerator, shift to neutral.

5. **Leaving water:**

a. Select exit point (if not designated) with firm, clear surface and gradual slope.

b. Approach shore so that both tracks strike land at the same time.

c. Remove foot from accelerator before striking ground.

d. Shift to 1-range when tracks strike ground.

e. Use pivot steer levers and 1-range until carrier is out of water.

f. Open hatch covers (if closed) and retract trim vane.

g. When bilge is clear of water, stop bilge pumps.

REFERENCE:

TM 9-2300-257-10, Operator's Manual, Carrier, Personnel, Full Tracked, Armored, M113 Dec 73 (chap 2, page 2-143 thru 2-148, para 2-193)

TASK NUMBER: 071-333-6505

START THE APC ENGINE USING AUXILIARY POWER

CONDITIONS:

Given two M113A1 personnel carriers (one operative and one with a dead battery) and an auxiliary power cable.

STANDARDS:

Start the engine of the personnel carrier with the dead battery, using an auxiliary power cable, without damaging either vehicle.

PERFORMANCE MEASURES:

1. The auxiliary power cable receptacle on the master switch panel provides for use of 24-volt power from an outside source to start the engine, charge batteries, or operate electrical equipment.

2. To start the engine:

a. Turn master switch OFF before connecting auxiliary power cable (figure 1).

b. Unscrew protective cap from slave receptacle on master switch panel.

c. Connect auxiliary cable from external power source to receptacle.

CAUTION: Make certain prongs of auxiliary power source correspond to holes of carrier electrical system, as marked on slave receptacle (- to -, + to +).

d. Turn master switch ON, and start engine in normal manner.

e. Disconnect auxiliary power cable after engine starts.

f. Install protective cap on receptacle.

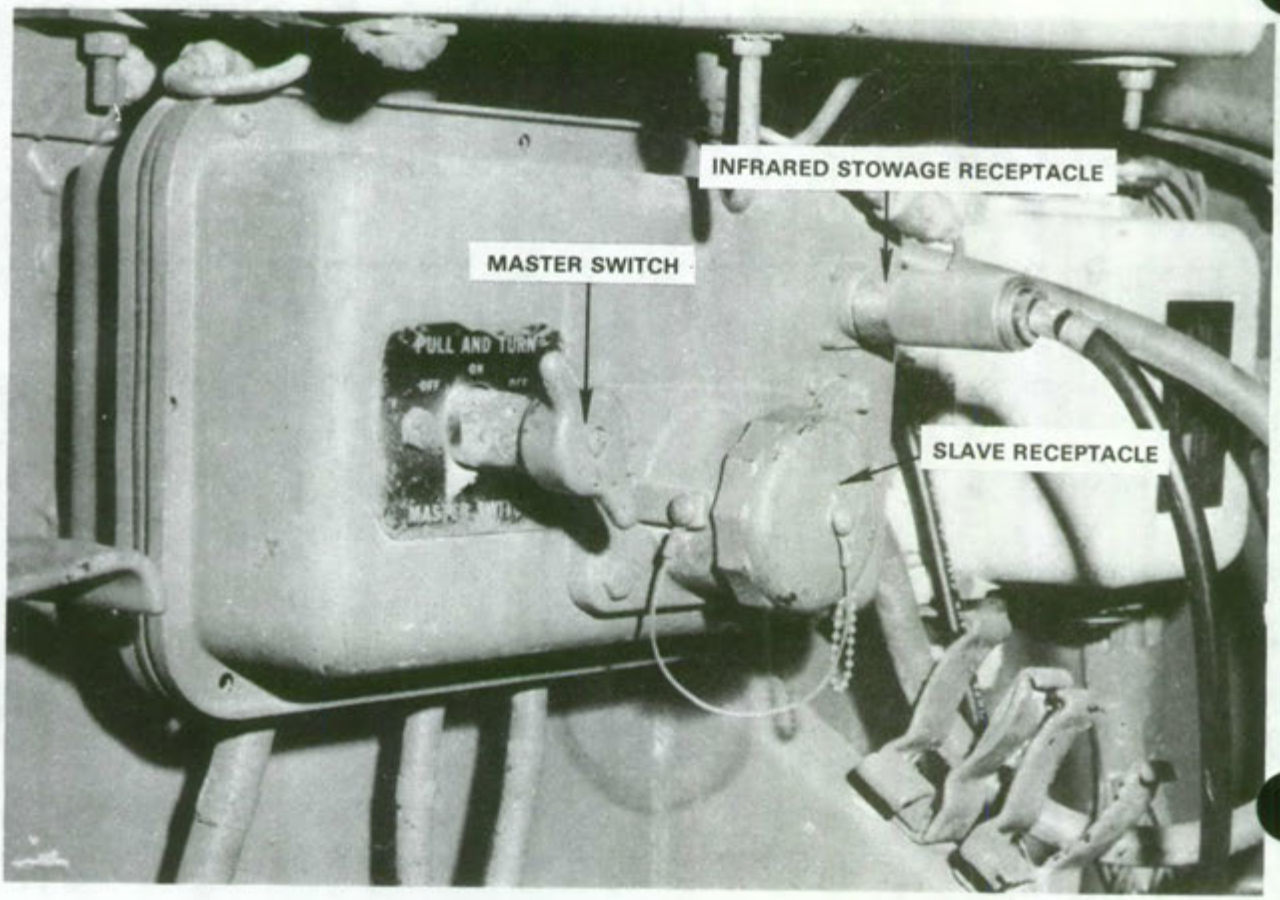


Figure 1.

REFERENCES:

TM 9-2300-257-10, Operator's Manual, Carrier, Personnel, Full Tracked, Armored, M113, Dec 73 (chap 2, page 2-13, para 2-13 thru 2-16; page 2-81, para 2-125)
TEC Lesson 944-441-0010-F (TBP)

TASK NUMBER: 071-333-6506

PERFORM A TRACKED-VEHICLE ESC (EQUIPMENT SERVICEABILITY CRITERIA) INSPECTION

CONDTIONS:

Given an M113A1 personnel carrier, appropriate tools, logbook, ESCTM, pencil/pen, and the required number of DA Form 2404's.

STANDARDS:

Within 4 hours, the vehicle operator will:

1. Perform an ESC inspection on all subsystems of the carrier.

2. Determine and record on the appropriate DA Form 2404 the correct color rating for each component and subsystem.

3. Assign the lowest subsystem rating to the overall system evaluation.

PERFORMANCE MEASURES:

The conduct of the evaluation is prescribed in TM 9-2300-257-ESC. The correct method of recording the results is explained in TM 9-2300-257-ESC, and paragraph 3-4 of TM 38-750. A lubrication order may assist individuals in locating components.

REFERENCES

TM 38-750, The Army Maintenance Management System (TAMMS), C1, Nov 72 (chap 3, page 3-4, para 3-4)
TM 9-2300-257-ESC for Tracked Vehicles, Nov 72
LO 9-2300-257-12, Lubrication Order (M113A1), Oct 73

TASK NUMBER: 071-333-6507

MAINTAIN REQUIRED TAMMS RECORDS ON A TRACKED VEHICLE

CONDITIONS:

Given DA Form 2404, a vehicle logbook, TM 38-750, and specific information pertaining to a vehicle.

STANDARDS:

1. Complete operator entries on the DA Form 2404 IAW TM 38-750.

2. Complete operator entries on the DA Form 2408-1 (Daily) IAW TM 38-750.

3. Compare any faults (shortcomings) given as pertaining to the vehicle with those listed on the 2408-14 to determine if they have been previously identified and corrective action taken.

4. Extract data pertaining to unapplied modifications for the vehicle from the DA Form 2408-5.

5. Extract data pertaining to component miles/hours from the DA Form 2408-10 and DA Form 2408-1 (Daily).

PERFORMANCE MEASURES:

1. DA Form 2404 is prepared IAW procedures outlined in paragraph 3-4 of TM 38-750.

2. DA Form 2408-1 (Daily) is prepared IAW procedures outlined in paragraph 4-5 of TM 38-750.

3. DA Form 2405-5 is prepared IAW procedures outlined in paragraph 4-8 of TM 38-750.

4. DA Form 2408-10 is prepared IAW procedures outlined in paragraph 4-10 of TM 38-750.

5. DA Form 2408-14 is prepared IAW procedures outlined in paragraph 4-13 of TM 38-750.

REFERENCES:

TM 38-750, The Army Maintenance Management System (TAMMS), Nov 72 (chap 4, page 4-36 & 37, para 4-20)
TEC Lesson 510-0907-6453-F (TBP)
TEC Lesson 510-0901-6455-F (TBP)
TEC Lesson 510-0901-6456-F (TBP)
TEC Lesson 510-0901-6457-F (TBP)
TEC Lesson 510-0901-6472-F (TBP)

TASK NUMBER: 071-333-6508

PERFORM OPERATOR MAINTENANCE ON AN APC

CONDITIONS:

Given an M113A1 personnel carrier with basic issue items, TM 9-2300-257-10, LO 9-2300-257-12, the vehicle logbook, TM 38-750, and a DA Form 2404.

STANDARDS:

The operator will:

1. Perform before-, during-, and after-operation maintenance on the vehicle IAW instructions in TM 9-2300-257-10.

2. Identify maintenance deficiencies/shortcomings and correct those within the operator's capability.

3. Cross-reference uncorrectable faults against the DA Form 2408-14.

4. Prepare a DA Form 2404 to notify organizational maintenance of previously unreported correctable faults or repairs which require a part.

5. Lubricate the vehicle IAW the lubrication order.

6. Perform troubleshooting procedures on the vehicle IAW TM 9-2300-257-10.

PERFORMANCE MEASURES:

1. Operator maintenance follows procedures outlined in the preventive maintenance services section of TM 9-2300-257-10 (chap 3, sec III).

2. To correct deficiencies/shortcomings, refer to TM 9-2300-257-10.

3. Previously reported faults beyond the operator's capability to repair or those requiring parts are recorded on the Uncorrected Fault Record (DA Form 2408-14) in the vehicle logbook. This form is completed by organizational maintenance IAW procedures outlined in paragraph 4-13 of T 38-750. Do not fill out the -14.

4. Faults which the operator cannot correct or which require a part are recorded on DA Form 2404 IAW procedures outlined in paragraph 3-4 of TM 38-750.

5. The vehicle is lubricated IAW the instructions in LO 9-2300-257-12.

6. Troubleshooting procedures are outlined in the troubleshooting section of TM 9-2300-257-10 (chap 3, sec IV).

REFERENCES:

TM 38-750, The Army Maintenance Management System (TAMMS), Nov 72 (chap 3, page 3-4 thru 3-8, para 3-4)
TM 9-2300-257-10, Operator's Manual Carrier, Personnel, Full Tracked, Armored, M113, Dec 73 (chap 3, page 3-12 thru 3-18, para 3-23)
LO9-2300-257-12, Lubrication Order (M113A1), Oct 73
TEC Lesson 945-171-0051-F TBP
TEC Lesson 945-171-0052-F TBP
TEC Lesson 945-171-0053-F TBP
TEC Lesson 945-171-0054-F, TBP

TASK NUMBER: 071-333-6509

RECOVER A TRACKED VEHICLE USING FIELD EXPEDIENTS

CONDITIONS:

During combat or training under all types of weather conditions, given a disabled tracked vehicle requiring recovery (the vehicle is equipped with basic issue items), other applicable materials for expedient recovery, or a similar vehicle.

STANDARDS:

Recover the disabled tracked vehicle using one of the following:

1. Similar vehicle if available for recovery.

2. Vehicle's basic issue items for self-recovery.

3. Any of the expedient methods below:

a. Anchoring the tracks.

b. Using an armored personnel carrier anchoring track (APCAT) device.

c. Using a capstan kit.

PERFORMANCE MEASURES:

1. **Methods of Recovery.** There are four methods of vehicle recovery using organizational personnel and equipment.

a. Winching. Operations performed using winches on special purpose vehicles or cargo-type vehicles.

b. Towing. Operations performed using towing capabilities of similar or special purpose vehicles. This is the quickest recovery method.

c. Lifting. Operations performed using special purpose vehicles.

d. Expedients. Operations performed when other methods are not adaptable to the situation or when additional vehicles and equipment are not readily available.

2. **Levels of Recovery.** Recovery operations performed within an organization are divided into levels. Levels are based on personnel who perform the operations and equipment available to them.

a. Platoon Level. Recovery is performed by vehicle drivers and crews, under supervision of squad, section, or platoon leader. At this level, winching, towing, and expedient methods of recovery are employed, using platoon vehicles and equipment.

b. Company and Battalion Levels. Recovery is performed by general vehicle repairmen or recovery specialists under the supervision of the recovery chief, using winching, towing, and lifting methods of recovery with special purpose vehicles. Because of the increased number of special purpose vehicles at battalion level, a greater recovery capability exists there than at company level.

3. **Procedure for Recovery.** During any recovery operation, a proven procedure should be used to insure quick and safe accomplishment. A haphazard approach to a recovery problem or the trial and error method can only result in prolonged immobility of the disabled vehicle, loss of valuable time, damage to equipment, and possible injury to personnel. The following eight-step recovery procedure, in the proper sequence, should be used in any recovery involving winching.

RECOVERY PROCEDURE

RECONNOITER AREA

ESTIMATE SITUATION

CALCULATE RATIO

OBTAIN RESISTANCE

VERIFY SOLUTION

ERECT RIGGING

RECHECK RIGGING

YOU ARE READY

4. **Equipment and Support for Recovery.** The amount and type of equipment employed as the source of effort during any recovery operation is dependent upon the level of recovery, as discussed in paragraph 2. Every effort should be made by the drivers and crews to accomplish the recovery before calling on support from a higher level. During combat it may be of the utmost importance that cargo reach its destination at a definite time or that personnel or cargo be picked up at a given time or that a combat vehicle be at a given place at a specific time. Recovery support should be called upon only when the similar vehicles are not adaptable to the situation or when the tactical situation does not permit their use. ENGAGED COMBAT VEHICLES SHOULD NEVER BE DIVERTED FOR THE PURPOSE OF RECOVERY.

5. **Use of Similar Vehicles for Recovery.** The use of similar vehicles for recovery usually constitutes the QUICKEST METHOD of recovery because similar vehicles are most readily available. The number of tracked vehicles required for a specific recovery is dependent upon the resistance to

be overcome, the type of disablement, and the condition of the terrain on which the towing vehicles must be operated. The rigging is accomplished using the vehicle tow cables attached to the tow hooks of the vehicles. All main battle tanks carry two tow cables; light tracked vehicles carry one tow cable.

a. When two tow cables are used between two vehicles, the cables should be crossed. This prevents them from entangling in the tracks on turns and maintains alinement of the vehicles (figure 1). If a greater working distance between the pulling vehicle and a mired vehicle is required, two cables can be joined together by using tow hooks.

b. To recover a mired vehicle using a similar vehicle:

(1) Position towing vehicle and shut off engine.

(2) Attach tow cables to tow hooks at rear of towing vehicle.

(3) Attach tow cables to tow hooks of mired vehicle.

NOTE: Cables must be crossed.

(4) Start towing vehicle.

(5) Shift towing vehicle transmission into 1st range and slowly take up slack in cables.

(6) Stop towing vehicle.

(a) Shift transmission to neutral.

(b) Lock brakes.

(c) Shut off engine.

(7) Recheck rigging.

CAUTION: Insure that all safety keys are installed in tow hook pins.

(8) Start towing vehicle.

(a) Shift transmission to 1st range.

(b) Release brakes.

(9) Instruct driver of mired vehicle to prepare his vehicle for movement.

(10) Slowly apply power and move forward.

NOTE: Driver of mired vehicle must apply power to assist in recovery.

(11) Tow the mired vehicle until both vehicles are on a hard surface.

(12) Instruct driver of towed vehicle to slowly move forward to provide slack in the towing cable.

(13) Stop recovered vehicle.

(14) Place transmission of both vehicles in neutral, lock brakes, and shut off engines.

(15) Disassemble and stow rigging.

If two towing vehicles are required for an operation, only one tow cable is required between the towing vehicles because the strength of one tow cable is slightly greater than the pulling effort of the second pulling tank; however, when two tow cables are available, they should be used to maintain alinement and equalize the pulling effort.

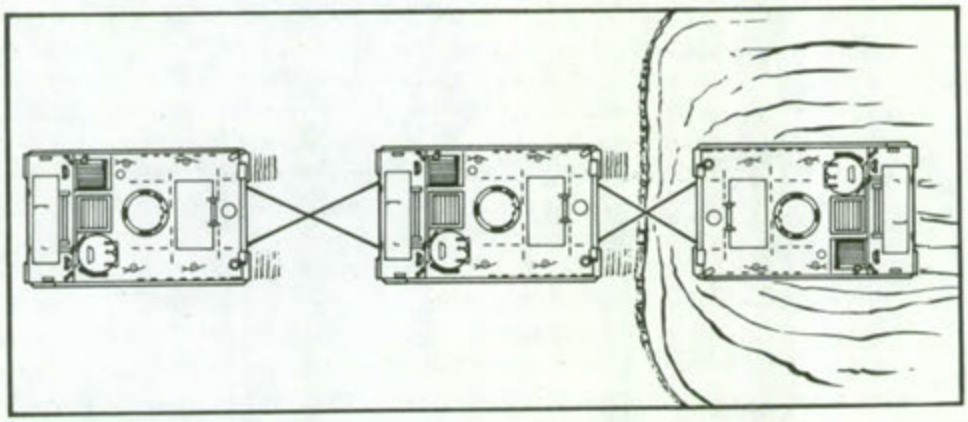


Figure 1. Towing mired APC, using two similar vehicles.

c. The recovery of a nosed tracked vehicle (figure 2) may require as many as three similar vehicles, depending on the degree to which it is nosed and the condition of the terrain on which the pulling vehicles must operate. In extreme situations, a source of effort may be necessary to lift the front of the nosed vehicle. To use a lifting vehicle, two or more tow cables should be connected together to obtain a greater working distance between the nosed vehicle and the lifting vehicle. The lifting vehicle should be positioned facing the nosed vehicle. The cables of the pulling vehicles are connected in the same manner as for recovery of a mired vehicle. Power should be applied to all the assisting vehicles at the same time, until the front of the nosed vehicle is raised and starts moving rearward, then the lifting vehicle should move forward slowly supporting the vehicle until it is recovered. If there has been any spillage of oil or fuel in the nosed vehicle, its engine should not be operated until such spillage has been cleaned up.

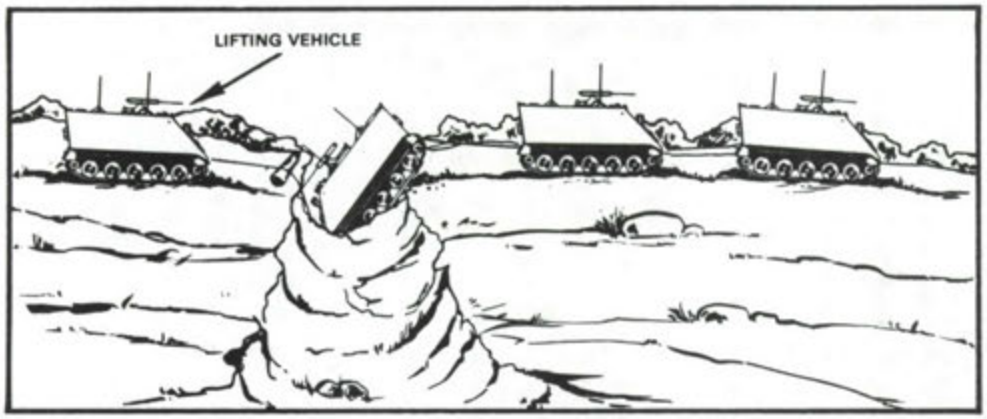


Figure 2. Recovering nosed APC with similar vehicles.

d. An overturned tracked vehicle can be uprighted by using three similar vehicles (figure 3). One vehicle is used to pull the overturned vehicle upright; the other two vehicles are used to hold and retard the fall of the overturned vehicle to prevent its crashing down on the suspension system. Two cables should be connected together in pairs to allow safe working distance. The cable used to upright the overturned vehicle should be connected to the nearest center roadwheel arm support housing on the high side of the overturned vehicle. Never connect to any other part of the suspension system, turret, or the tiedown eyes. The two vehicles used for holding should be positioned at a 30° to 45° angle from the overturned tank with their cables connected to the two hooks on the high side of the overturned vehicle. The holding vehicles are so positioned to prevent damage to the cables or the fenders and lights of the overturned vehicle as it is uprighted. Drivers of the holding vehicles shift to low range; the pulling vehicle applies power gradually in reverse, while the holding vehicles move forward only enough to keep their cables taut until the overturned vehicle passes through the point of balance. As the overturned vehicles passes through the balance point, the holding vehicles move forward slowly, supporting the overturned vehicle and lowering it onto its suspension system. Because of spilled oil and fuel that will normally be present, extreme caution must be exercised to prevent smoking or open flames near the overturned vehicle.

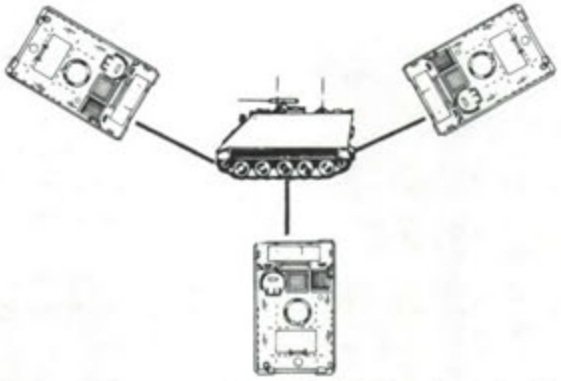


Figure 3. Recovering overturned APC with similar vehicles.

6. **Recovery Expedients.** Military operations will require vehicles to operate in remote areas where, should disablement occur, assistance would not be readily available. Under these conditions, the driver or crew must attempt self-recovery by the use of expedients. An expedient is an improvised method and is accomplished with the materials on hand.

a. Anchoring Tracks. Vehicles often become bellied (high-centered) on stumps, rocks, and dry ridges, or in mire. In this position, vehicles are immobilized because of the lack of traction.

(1) To recover a bellied vehicle in mire (figure 4), obtain a log long enough to span the width of the vehicle and of sufficient diameter to support the vehicle weight. The log is placed against both tracks, and a tow cable is placed so one end of the cable goes over the log and through the tracks from the inside. The other end of the tow cable is placed underneath the log, and the ends of the cable are connected together with a tow hook on the outside of the track to facilitate disconnecting. The same procedure is followed to attach the log to the track on the opposite side of the vehicle. By gradually applying power to the tracks, the slack in the tow cables will be taken up, pulling the log underneath the tracks until it comes in contact with the obstacle, anchoring the tracks and causing the vehicle to move.

(2) Follow these steps to self-recover a tracked vehicle bellied in mire:

(a) Erect rigging.

1. Place log against both tracks.
2. Position tow cables (both tracks).
3. Connect ends of cable using tow hooks (both tracks).

(b) Recover tracked vehicle.

1. Start engine.
2. Release brakes.
3. Shift transmission selector lever to desired position.
4. Gradually apply power to tracks.

(c) Stop vehicle.

1. Shift transmission selector lever to neutral or park position.
2. Lock brakes.
3. Shut off engine.

(d) Disassemble and stow rigging.

CAUTION: Care must be taken to stop the vehicle before the log reaches the fenders to prevent damage to the fenders and tow cables.

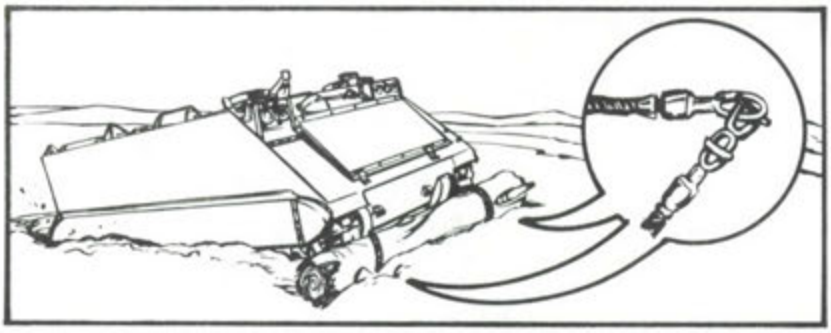


Figure 4. Recovering a bellied vehicle in mire.

(3) For a bellied disablement other than mire, the tracks can be anchored using two tow cables. Connect the tow cables together with a tow hook and attach the cables to both tracks by passing the ends of the cables through the tracks from the outside and attaching them to the standing parts of the cables with two hooks. When power is applied to the tracks, the cables will contact the obstacle and anchor the tracks. The same caution must be exercised as outlined in (1) above.

b. APCAT Device. APCs may fail to exit the water after swimming due to steep banks or adverse terrain conditions. As an aid to water exit, the APCAT expedient can be used. The APCAT expedient kit consists of one pair of track anchor blocks (fabricated locally) and 200 feet of 1-inch fiber rope (figure 5). The track anchor blocks are placed in the blocks to suitable anchorages. As power is gradually applied, the tracks will anchor themselves to the blocks and cause the vehicle to move. This expedient may also be used in mire or bellied situations.

Figure 5. APCAT expedient kit.

c. Capstan Kit (figure 6). (This kit may be ordered through your maintenance shop.) When leaving water after swimming operations, an APC may become disabled because of the steep angle of the bank, the muddy or slippery surface of the bank, or a combination of both, and cannot exit. A capstan expedient can be used for a self-recovery. The capstan kit consists of one pair of capstan adapters that bolt to the drive sprocket hub, one pair of capstan drums with mounting tee bolts, nylon rope, and one pair of ground anchors. Normally, the capstan adapters are permanently mounted to the drive sprocket hubs with the metal shrouds plates cut away.

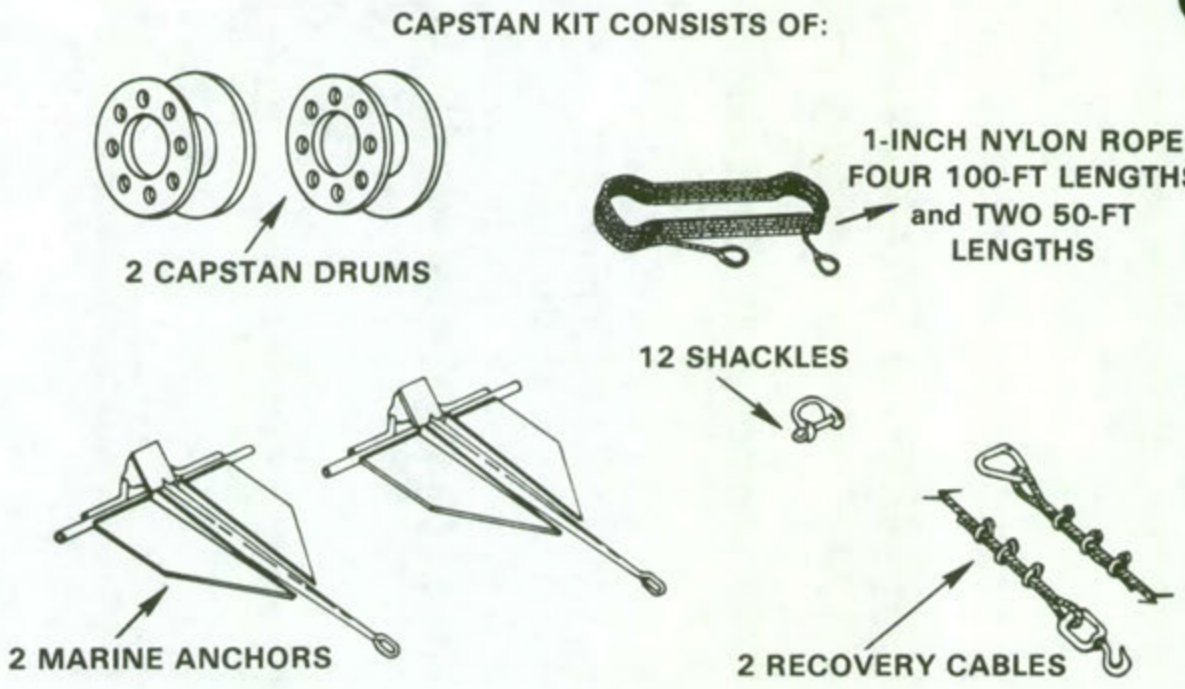


Figure 6. Capstan kit.

The capstan drums can be very quickly installed to the adapters with the drum tee bolts. The rope is secured to each mounted capstan drum, and wrapped two or three turns around the drums on both sides of the vehicle. Care must be taken to insure that the anchors are positioned in line with the capstan drums. The ropes must extend from the underside of the capstan drum before they are tied to their respective anchors. By applying power to the tracks, the ground anchors will embed in the ground, and the winching action of the capstan drums will cause the vehicle to move. To recover a tracked vehicle using the capstan kit:

(1) Lock brakes and steering levers.

(2) Stop engine.

(3) Remove capstan kit from stowed position.

(4) Remove mud and debris from around sprocket wheels.

(5) Attach drum assemblies to sprocket wheels.

(6) Position anchors at desired location.

(7) Connect ropes to anchors.

(8) Attach anchor recovery cables to anchors.

(9) Attach ropes to drums and take up slack.

NOTE: Ropes must be pulled tight and kept away from drum to prevent them from winding into the drum or catching in the track.

(10) Start engine.

(11) Release brakes and steering levers.

(12) Position range selector in 1st range.

(13) Apply power slowly until anchors are embedded and carrier starts forward motion.

(14) Continue forward motion until carrier is free of obstacles.

(15) Stop carrier.

(a) Lock brakes and steering levers.

(b) Position range selector in neutral.

(c) Stop engine.

(16) Disassemble capstan kit.

(17) Recover anchors.

(18) Stow capstan kit in travel position.

REFERENCES:

FM 5-34, Engineer Field Data, Sep 76 (chap 16, page 367, para 16-7)
FM 20-22, Vehicle Recovery Operations, Jul 70 (chap 2, pages 5 & 6, para 3; chap 5 and 6, pages 58 thru 108, para 45 thru 85)

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION VI
LEADERSHIP AND TRAINING

TASK SUMMARIES

TASK NUMBER: 071-328-5301

INSPECT PERSONNEL/EQUIPMENT

CONDITIONS:

Given personnel or equipment to be inspected, specified amount of time, inspection site and unit SOP for inspections.

STANDARDS:

Within the time specified, inspect personnel or equipment and note deficiencies.

PERFORMANCE MEASURES:

1. **Personnel**

a. Start at the head. Check headgear, haircut, and shave.

b. Inspect collar insignia and awards.

c. Check gig line and belt buckle.

d. Check footgear.

e. Check uniform for general appearance, fit, and patches.

f. Check Identification Card (DD Form 2A) and I.D. tags.

NOTE: Before inspecting, be thoroughly familiar with unit standards.

2. **Equipment**

a. Before inspection, study applicable TM. Pay particular attention to section on preventive maintenance checks and services and the basic issue items list.

b. Begin inspection at a readily recognizable point on equipment.

c. Inspect in an orderly sequence. This saves motion and eliminates chances of missing important items.

d. Note deficiencies as you find them. Don't try to remember all of them.

e. Inspection should be complete when you return to the starting point.

REFERENCES:

FM 22-5, Drill and Ceremonies, C1, Nov 71 (chap 7, sec III, pages 49-54)

TASK NUMBER: 071-328-5302

SUPERVISE MAINTENANCE ON INDIVIDUAL AND TOE EQUIPMENT

CONDITIONS:

Given personnel, with equipment to be maintained, a maintenance site, and specified amount of time.

STANDARDS:

Within time specified, direct personnel assigned to your unit in the proper maintenance of individual or TOE equipment to meet Army standards as listed in applicable TM or other publications.

PERFORMANCE MEASURES:

To supervise maintenance on individual and TOE equipment:

1. Determine what is to be maintained.
2. Obtain applicable TM.
3. Brief personnel on maintenance to be performed and standards.
4. Assign tasks as stated in TM, when applicable.
5. Allocate resources if necessary.
6. Spot check (DO NOT OVER SUPERVISE).
7. Obtain assistance if needed.
8. Inspect completed work and make corrections if necessary.
9. Report completion of work to your supervisor.

NOTE: Be sure that the task is understood, supervised, and accomplished.

REFERENCES:

None

TASK NUMBER: 071-328-5304

ENFORCE PREVENTIVE MEDICINE PROGRAM (INCLUDES PERSONAL HYGIENE)

CONDITIONS:

Your squad has been given the mission to conduct a march. As team leader, brief your men on preventive medicine measures that should be taken. A march can be tactical or administrative and can be conducted by road or cross-country, and can be conducted in daylight or darkness.

STANDARDS:

Prior to conduct of the mission, you will explain preventive medicine measures for:

1. Care of the feet prior to and during the march.

2. Purifying water with iodine tablets.

3. Disposal of human waste while on the march and during bivouac.

4. Climatological injuries, heat/cold. During conduct of the mission, inspect your subordinates to insure that they are complying with your instructions. Detect all failures to comply with your instructions and insure corrections are made.

PERFORMANCE MEASURES:

1. **Care of the Feet.**

a. Prior to the march, all men should be equipped with the proper type of correctly fitted, broken-in footgear, clean socks which are free of holes or knotty darns, and an adequate supply of foot powder. A soldier must never attempt to break in a new pair of shoes or boots on a long march. Blisters (figure 1), pressure spots, and infections should be treated and properly protected before the march starts.

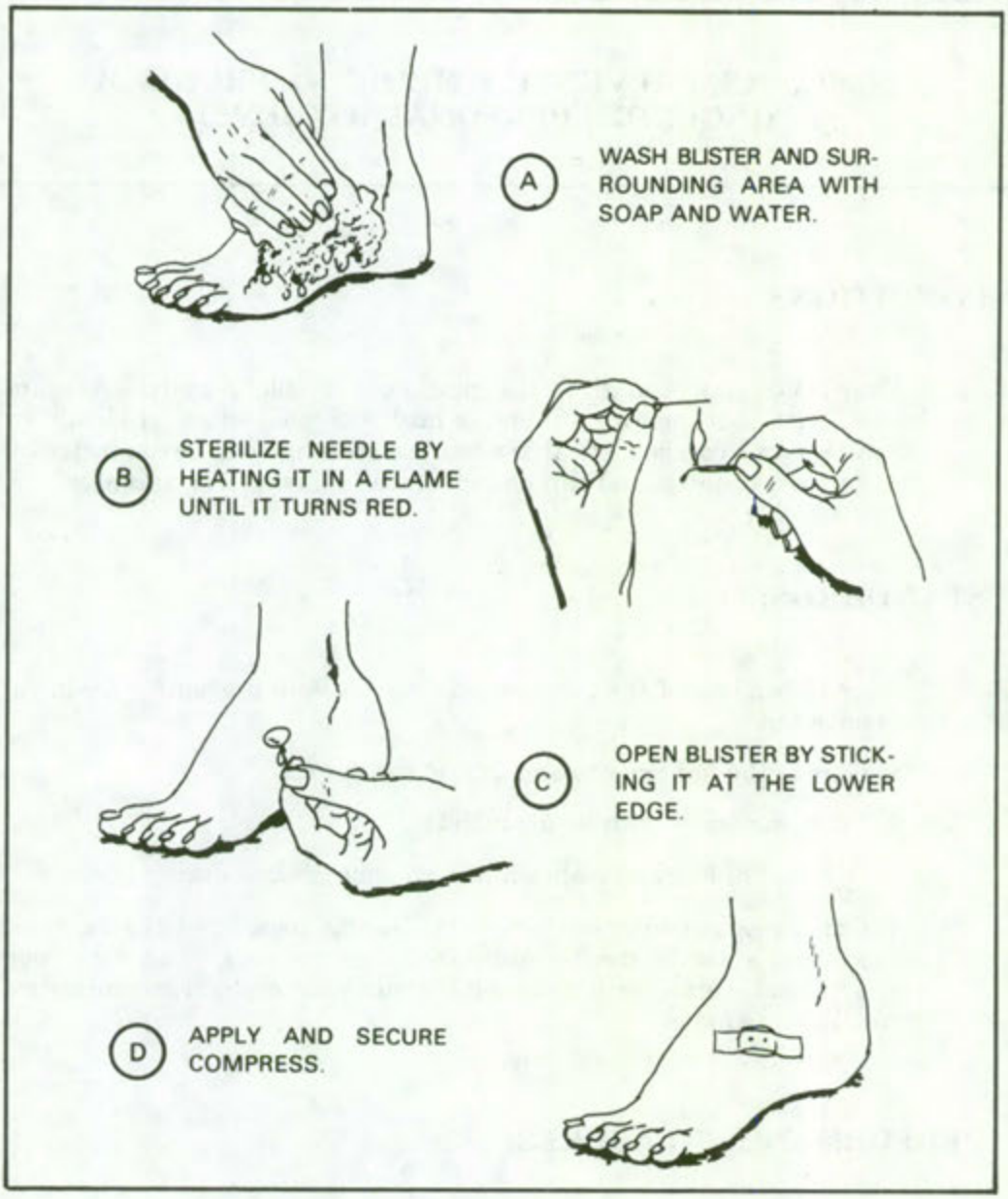

A
WASH BLISTER AND SURROUNDING AREA WITH SOAP AND WATER.
B
STERILIZE NEEDLE BY HEATING IT IN A FLAME UNTIL IT TURNS RED.
C
OPEN BLISTER BY STICKING IT AT THE LOWER EDGE.
D
APPLY AND SECURE COMPRESS.

Figure 1.

b. On the march, the feet should be kept as dry as possible. If socks become damp from perspiration or wet from water, they should be changed to dry ones at the first opportunity. If necessary, socks may be dried by putting them under the shirt around the waist. Tender pressure spots should be relieved promptly by adjusting gear or applying adhesive tape. Once or twice daily during the march, the feet should be dusted lightly with foot powder.

c. At rest periods, the feet should be inspected (from time to time). If possible, the feet should be washed during the noon break. It is helpful to elevate the feet while resting. This reduces congestion and swelling.

2. **Purifying Water.**

a. Before iodine tablets are used, they should first be checked for physical change, as they lose their disinfecting ability in time. Tablets which are not steel gray in color, which are stuck together, or which are crumbled should not be used.

b. The following procedure is used in treating water in a canteen with iodine tablets.

(1) Fill canteen with the cleanest, clearest water available.

(2) Add one iodine tablet to a 1-quart canteen of clear water; add two tablets if the water is cloudy. Double these amounts for a 2-quart canteen.

(3) Place the cap on the canteen loosely, wait 5 minutes then shake the canteen well, allowing leakage to rinse the threads around the neck of the canteen.

(4) Tighten cap and wait an additional 20 minutes before using the water for any purpose.

3. **Human Solid Waste Disposal.**

a. When on the march, each person uses a "cat-hole" latrine during short halts. It is dug approximately 1-foot deep and is completely covered and packed down after use.

b. For overnight bivouac, the straddle trench is used (figure 2). Construction requirements are found in FM 21-10, paragraph 76.

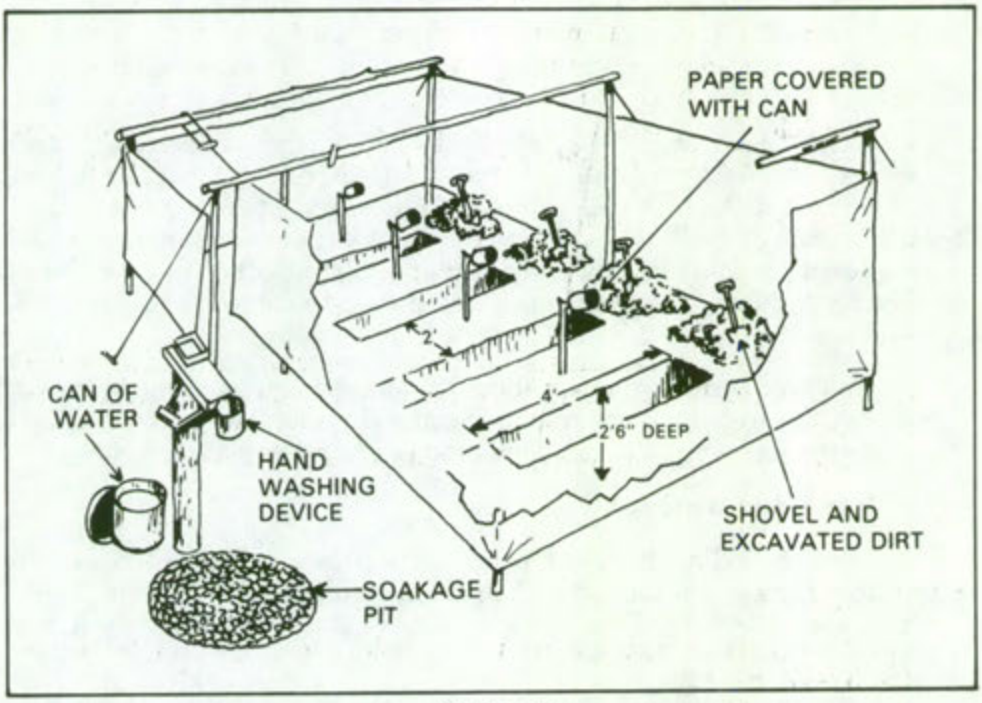


Figure 2.

4. **Climatological Injuries.**

a. Preventing heat injuries:

(1) Water requirements: The human body cannot be trained to function with less than the minimum amount of water it requires for cooling, waste elimination, and metabolism; any attempt to train the body to do so can be harmful and lead to heat injuries. Troops should be encouraged to drink water more frequently than is necessary to quench sensations of thirst.

(2) Salt requirements: When water is lost through perspiration, vital body salt is also lost. An ordinary diet contains enough salt to make up this loss when a person's water intake is less than 1 gallon a day. If daily water intake increases, the soldier should lightly salt his food from his field rations pack.

NOTE: First aid for heat injuries is found in FM 21-11.

b. Preventing cold injuries:

(1) Clothing for cold weather is designed to afford protection, insulation, and ventilation; protection by covering as large an area of the body as possible; insulation by trapping air which has been warmed by the body and holding it near the skin to prevent loss of heat from the body; ventilation by allowing a two-way exchange of air through the various layers of clothing. This exchange of air prevents overheating and excessive perspiring. Clothing should be worn in layers and loose enough to allow movement and exercise of hands, feet, and other parts of the body. The clothing should also be clean and dry.

(2) Good circulation should be maintained by exercising the feet and legs. This is especially important during rest breaks.

(3) It is advisable that troops in cold weather be paired as "buddies," each having the responsibility for reminding the other to take warming exercises at frequent intervals and to watch for signs of frostbite and trench foot. FM 21-11 gives signs and first aid for cold-weather injuries.

REFERENCES:

FM 21-10, Field Hygiene and Sanitation, Jul 70 (chap 3, pages 14-19, 37-42, 80-86)
FM 21-11, First Aid for Soldiers, Jun 76 (chap 9, pages 88-91)
TEC Lesson 929-441-0040F, Care of Feet
TEC Lesson 929-441-0043F, Environment Hazards, Part 1: Treatment of Drinking Water
TEC Lesson 911-441-0034F, Snake Bites and Hot Weather Hazards
TEC Lesson 911-441-0035F, Cold Weather Hazards

TASK NUMBER: 121-030-2501

PREPARE THE RATER'S SECTION OF AN ENLISTED EVALUATION REPORT (EER)

CONDITIONS:

Given DA Pamphlet 623-1, one blank DA Form 2166-5, and a No. 2 pencil.

STANDARDS:

Complete parts II and III of the Enlisted Evaluation Report, DA Form 2166-5, as outlined in DA Pam 623-1 (Preparation of Enlisted Evaluation Reports).

PERFORMANCE MEASURES:

1. Parts I and VII of the report will be completed by the Military Personnel officer (MILPO). **Parts II and III are completed by you as the rater, and by the indorser.** Part IV is completed by the indorser, and Part V is completed by the individual being rated.

NOTE: Part I should be checked by the rater and rated individual for possible discrepancies.

2. **Part II.**

A.	BRIEF DESCRIPTION OF DUTIES	Soldier performs duty as rifleman in a mechanized rifle platoon. Disperses small arms fire toward enemy when required to do so.

a. **Block A.** You will enter the actual duties performed by the rated soldier, including additional duties.

B.	INDORSER HAS NOT OBSERVED AND CANNOT RATE SOLDIER	☐

b. **Block B.** This block is not applicable to the rater. Will be completed by the indorser.

C.	REPORT BASED ON:	DAILY CONTACT	FREQ OBSN	INFREQ OBSN	REPT & REC
	R	■	☐	☐	☐
	I	☐	☐	☐	☐

c. **Block C.** Two selections are possible. Check the appropriate box to indicate frequency of contact, and, if applicable, also check reports and records. The rater will fill in the line following the "R" only.

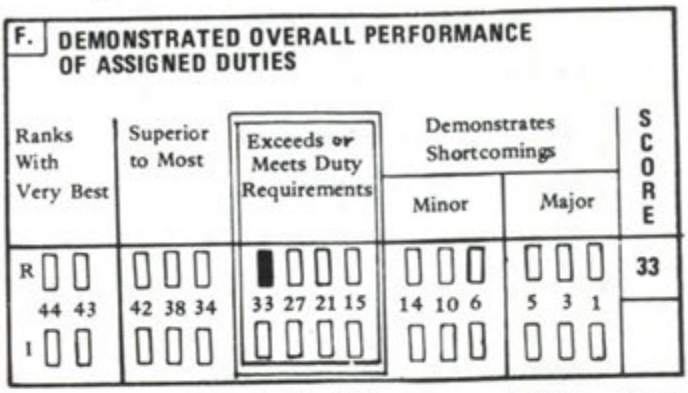
D. SOLDIER SUPPORTS THE ARMY'S EQUAL OPPORTUNITY PROGRAM	YES	NO
R	■	□
I	□	□

d. **Block D.** Mark the "yes" or "no" block as appropriate. A "no" response here requires explanation in Block J.

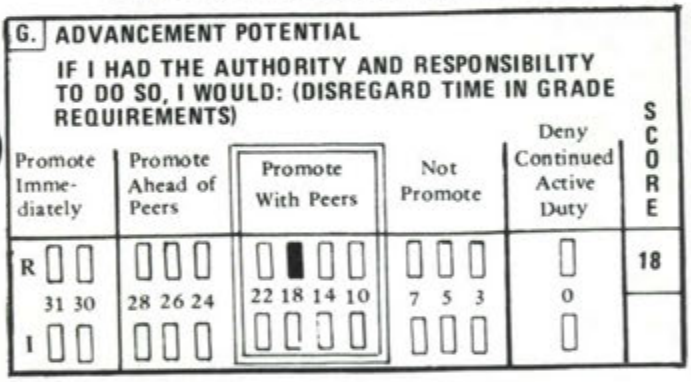
e. **Block E. Duty Performance Traits.** Rate the individual carefully on each of the ten performance traits by marking the appropriate box for each trait. Mark ratings in soft pencil, on the basis of the given rating scale. Enter the score for each trait in black ink in the score box at the right hand column under "R" and enter in the totals box at the bottom of the locations in Block H. Marking procedures are the same for Blocks F and G as in Block E, and the appropriate boxes in Block H. If the score for Block E exceeds 40 or is less than 10, justify in Block J.

E. DUTY PERFORMANCE TRAITS / RANKS	SUPERIOR TO MOST		EXCEEDS OR MEETS DUTY REQUIREMENTS		NEEDS IMPROVEMENT		SCORE	
	WITH VERY BEST				Some	Much		
	5	4	3	2	1	0	R	I
1. Is well informed on all phases of assigned duties. (Scope of knowledge about duties) R	□	□	■	□	□	□	3	
1. I	□	□	□	□	□	□		
2. Carries out orders without constant supervision. (Dependability in performing without supervision) R	□	□	■	□	□	□	3	
2. I	□	□	□	□	□	□		
3. Shows interest and enthusiasm for duties. (Attitude toward duties) R	□	□	■	□	□	□	3	
3. I	□	□	□	□	□	□		
4. Demonstrates qualities of leadership. (Exerts positive influence on others) R	□	□	■	□	□	□	3	
4. I	□	□	□	□	□	□		
5. Seeks out opportunities for self-improvement. (Effort directed toward realization of potential) R	□	□	■	□	□	□	3	
5. I	□	□	□	□	□	□		
6. Displays ability to initiate action without direction from others. (Aggressive pursuit of methods to improve duty performance) R	□	□	□	□	■	□	1	
6. I	□	□	□	□	□	□		
7. Is successful in working with others. (Ability to work in harmony with others) R	□	□	■	□	□	□	3	
7. I	□	□	□	□	□	□		
8. Personal behavior sets a good example for others. (High standards of personal conduct) R	□	□	■	□	□	□	3	
8. I	□	□	□	□	□	□		
9. Takes pride in dress and appearance. (Neat and military in bearing) R	□	□	■	□	□	□	3	
9. I	□	□	□	□	□	□		
10. Is physically fit, as required, for MOS/grade during combat. (Physical condition) R	□	■	□	□	□	□	4	
10. I	□	□	□	□	□	□		
						TOTALS	29	

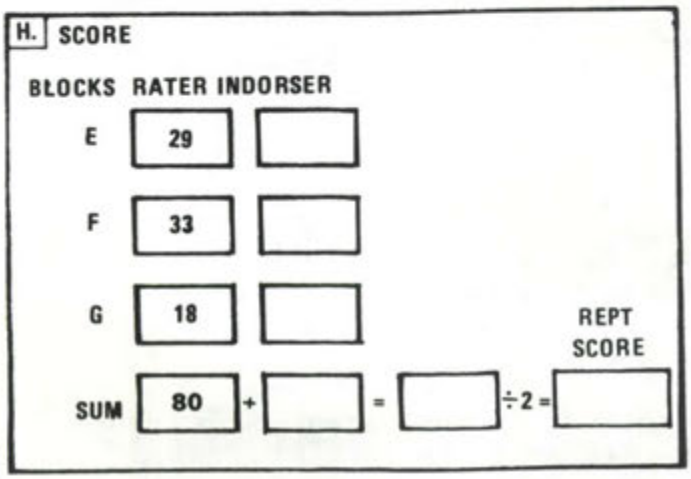
f. **Block F. Demonstrated Overall Performance of Assigned Duties.** In this section, you rate the soldier's strengths and weaknesses, using overall performance. If score exceeds 42 or is below 6, justify in Block J.



g. **Block G. Advancement Potential.** Rate the soldier on ability to perform in the next higher grade by considering total capacity in comparison with other individuals of the same grade and length of service. If score exceeds or meets 22 or is below 10, justify in Block J.



h. **Block H. Score.** Enter the scores from the appropriate boxes from Blocks E, F and G and total them. The sum of the scores is added by the indorser.



i. **Block I.** Career Development. Recommendations for logical career development, such as advanced schooling and special assignments, are appropriate here.

I. CAREER DEVELOPMENT (RECOMMENDATIONS ON SCHOOLING AND ASSIGNMENTS)
Recommend DA NCO Development Course for individual.

j. **Block J. Comments.** Comments must be either typed or neatly printed.

J. I. COMMENTS ARE MANDATORY TO JUSTIFY RATINGS IN PART II AS FOLLOWS: a. BLOCK E SCORE BELOW 10 OR OVER 40, BLOCK F SCORE BELOW 6 OR OVER 42, BLOCK G SCORE BELOW 10 OR OVER 22, OR BLOCK D IF SOLDIER DOES NOT SUPPORT ARMY'S EQUAL OPPORTUNITY PROGRAM. b. INDORSER WHO CHECKS BLOCK II B. 2. REMARKS OTHERWISE OPTIONAL.
RATER

3. **Part III.** This entry, except for signature, must be typed or printed in black ink. Use black ink for signature.

PART III RATER AUTHENTICATION			
A. ORGANIZATION AND DUTY ASSIGNMENT		B. NAME AND GRADE	C. DATE
Co C, 1st Bn, 26th Inf APO NY 09039	Sqd Ldr	CHARLIE A. DELTA E-6	5 Jan76
		D. SIGNATURE Charlie A. Delta	

4. **Counseling.** After signing the report, you should discuss the report with the rated soldier and counsel him. After counseling, you will forward the report to the indorser.

5. **See figure 1 for a completed example of a Enlisted Evaluation Report, DA Form 2166-5, as filled in by the RATER.**

ENLISTED EVALUATION REPORT (AR 600-200)

For preparation, see DA Pamphlet 623-1.

C. SSN

PART I PERSONAL DATA

A. GRADE (ABBR) NAME (LAST) (FIRST) (MI) SSN
DOE, JOHN E. 000-00-0000

B. TYPE OF REPORT
INIT ANL CR SP
OTHER
SPECIFY

D. ORGANIZATION AND STATION
Co C, 1st Bn, 26th Inf
APO NY 09039

E. PMOSC: 11B10
F. DMOSC: 11B10
G. SMOSC: 95B10

H. PERIOD OF REPORT
BEGIN MO. JAN
BEGIN YR 76
END MO. DEC
END YR 76

I. NONRATED PERIOD
NO. OF MONTHS
REASON CODES

J. DUTY POSITION TITLE
Rifleman
AUTH PAY GR E-4

PART II RATINGS

A. BRIEF DESCRIPTION OF DUTIES
Soldier performs duty as rifleman in a mechanized rifle platoon. Disperses small arms fire toward enemy when required to do so.

B. INDORSER HAS NOT OBSERVED AND CAN NOT RATE SOLDIER

C. REPORT BASED ON: DAILY CONTACT; FREQ OBSN; INFREQ OBSN; REPT & REC

D. SOLDIER SUPPORTS THE ARMY'S EQUAL OPPORTUNITY PROGRAM: YES; NO

E. DUTY PERFORMANCE TRAITS

TRAITS	RANKS WITH VERY BEST 5	SUPERIOR TO MOST 4	EXCEEDS OR MEETS DUTY REQUIREMENTS 3	EXCEEDS OR MEETS DUTY REQUIREMENTS 2	NEEDS IMPROVEMENT Some 1	NEEDS IMPROVEMENT Much 0	SCORE R	SCORE I
1. Is well informed on all phases of assigned duties. (Scope of knowledge about duties)			■				3	
2. Carries out orders without constant supervision. (Dependability in performing without supervision)			■				3	
3. Shows interest and enthusiasm for duties. (Attitude toward duties)			■				3	
4. Demonstrates qualities of leadership. (Exerts positive influence on others)			■				3	
5. Seeks out opportunities for self-improvement. (Effort directed toward realization of potential)			■				3	
6. Displays ability to initiate action without direction from others. (Aggressive pursuit of methods to improve duty performance)					■		1	
7. Is successful in working with others. (Ability to work in harmony with others)			■				3	
8. Personal behavior sets a good example for others. (High standards of personal conduct)			■				3	
9. Takes pride in dress and appearance. (Neat and military in bearing)			■				3	
10. Is physically fit, as required, for MOS/grade during combat. (Physical condition)		■					4	
TOTALS							29	

F. DEMONSTRATED OVERALL PERFORMANCE OF ASSIGNED DUTIES

	Ranks With Very Best	Superior to Most	Exceeds or Meets Duty Requirements	Demonstrates Shortcomings: Minor	Demonstrates Shortcomings: Major	SCORE
R	44 43	42 38 34	■ 33 27 21 15	14 10 6	5 3 1	33
I						

G. ADVANCEMENT POTENTIAL
IF I HAD THE AUTHORITY AND RESPONSIBILITY TO DO SO, I WOULD: (DISREGARD TIME IN GRADE REQUIREMENTS)

	Promote Immediately	Promote Ahead of Peers	Promote With Peers	Not Promote	Deny Continued Active Duty	SCORE
R	31 30	28 26 24	22 ■ 18 14 10	7 5 3	0	18
I						

H. SCORE

BLOCKS	RATER	INDORSER
E	29	
F	33	
G	18	
SUM		REPT SCORE

DA Form 2166-5 1 Jul 75 This form together with DA Form 2166-5A, 1 Jul 75, replaces DA Form 2166-4, 1 Jul 70, which is obsolete.

Figure 1.

RATED SOLDIER'S LAST NAME AND SSN

PART II CONTINUED

I. CAREER DEVELOPMENT (RECOMMENDATIONS ON SCHOOLING AND ASSIGNMENTS)

Recommend DA NCO Development Course for individual.

J. 1. COMMENTS ARE MANDATORY TO JUSTIFY RATINGS IN PART II AS FOLLOWS:
a. BLOCK E SCORE BELOW 10 OR OVER 40, BLOCK F SCORE BELOW 6 OR OVER 42, BLOCK G SCORE BELOW 10 OR OVER 22, OR BLOCK D IF SOLDIER DOES NOT SUPPORT ARMY'S EQUAL OPPORTUNITY PROGRAM.
b. INDORSER WHO CHECKS BLOCK II B.
2. REMARKS OTHERWISE OPTIONAL.

RATER

INDORSER

PART III RATER AUTHENTICATION

A. ORGANIZATION AND DUTY ASSIGNMENT	B. NAME AND GRADE	C. DATE
Co C, 1st Bn, 26th Inf APO NY 09039 Sqd Ldr	CHARLIE A. DELTA E6	5 Jan 76
	D. SIGNATURE: Charlie A. Delta	

PART IV INDORSER AUTHENTICATION

A. ORGANIZATION AND DUTY ASSIGNMENT	B. NAME AND GRADE	C. DATE
Co C, 1st Bn, 26th Inf APO NY 09039 Plt Ldr	D. SIGNATURE	

PART V SOLDIER AUTHENTICATION

A. I HAVE SEEN A COPY OF THIS REPORT COMPLETE THROUGH ACTION BY THE INDORSER. I HAVE BEEN COUNSELED CONCERNING THE REPORT.	B. NAME AND GRADE	C. DATE
	D. SIGNATURE	

PART VI REVIEWER AUTHENTICATION

A. SOLDIER WAS RATED BY CORRECT RATER AND INDORSER. NO FURTHER ACTION REQUIRED ☐
MY REVIEW RESULTS IN ACTION INDICATED BY INCLOSURES. ☐

B. ORGANIZATION AND DUTY ASSIGNMENT	C. NAME AND GRADE	D. DATE
	E. SIGNATURE	

PART VII MILPO CERTIFICATION

A. DATE REPORT ENTERED ON DA FM 2-1:	C.	D.
B. SOLDIER'S COPY: GIVE TO SOLDIER ☐ FORWARDED TO SOLDIER ☐ MAILED TO SOLDIER ☐ CERTIFIED MAIL NO. _____	MILPO SIGNATURE	UIC

Figure 1. Con't.

REFERENCE:

DA Pam 623-1, Preparation of Enlisted Evaluation Reports, May 75 (page 2, para 5; pages 3 and 4, para 7)

TASK NUMBER: 874-896-2001

CONDUCT A PERFORMANCE-ORIENTED TRAINING SESSION

CONDITIONS:

Given:

1. A training objective with the following characteristics:

a. It must be an **individual** training objective.

b. It must not require the mastery of any intermediate training objective.

c. It must be teachable within 30 minutes and judged by an individual (your evaluator/supervisor) who has demonstrated mastery of the training objective.

2. No more than 24 hours to prepare the training session.

3. No more than 10 and no less than 4 trainees who are unable to perform the training objective.

4. All other necessary resources to conduct the training (for example, training aids, an area to conduct the training, etc.).

STANDARDS:

1. The trainer must conduct the training in three phases.

a. In Phase I, he must:

(1) Explain the training objective.

(2) Insure that trainees understand the training objective.

(3) Give appropriate instruction (e.g., demonstration, talk thru) to prepare the trainees to perform the training objective.

b. In Phase II, he must give the trainees sufficient time to practice performing and make necessary corrections.

c. In Phase III, he must test the trainee's ability to perform the training objective.

2. All trainees who cannot perform the training objective at the conclusion of the training session must be identified.

3. The reason(s) for the failure(s) must be identified.

PERFORMANCE MEASURES:

1. Insure that you clearly understand the training objective which you are to teach. If you have questions, ask your evaluator/supervisor.

a. During Phase I, you inform the trainees. This includes explaining the training objective, insuring understanding, and a demonstration. (You may decide to talk the trainees through the task instead of first demonstrating it.) Explanation of the training objective must include the task which the trainees perform at the end of the session, the conditions under which they must operate (for example, equipment given or denied and terrain), and the standard they must achieve. Estimate the time it will take to complete Phase I.

b. In Phase II, you allow the trainees to practice performing the training objective. (Do not estimate the amount of time required for this phase at this time.)

c. In Phase III, you test the trainees to determine if each one can perform the training objective. Estimate the time that it will take to test all trainees. All remaining time will be allocated to Phase II of the training session. If you properly organize available time, all trainees should be able to accomplish the training objective within the time estimated.

2. Obtain any training aids that you need. (You may find it helpful to look in appendix C, FM 21-6, Training Techniques, Aids, and Devices.) If the training objective which you have been given is contained in the Skill Level 1 Soldier's Manual, look at the "performance measures" portion of the task summary for your particular training objective. This should also give you some helpful information.

3. Rehearse the training session.

4. Conduct the training session (in three phases as described above).

5. Evaluate the results of the training session. Remember that all trainees must perform the training objective and that it is critical to identify those who cannot. Note the reason(s) for any failure(s). Reasons for failure might be: insufficient resources (time, training aids, etc.); unrealistic standards, or lack of trainee motivation.

REFERENCES:

FM 21-6, How to Prepare and Conduct Military Training, Nov 75 (chap 3, pages 8 thru 26)
TEC Lesson 901-071-0091-F, Unit Development and Training, Part 1
TEC Lesson 901-071-0092-F, Unit Development and Training, Part 2

CHAPTER 2

LIGHT WEAPONS INFANTRYMAN

SECTION VII
TACTICS

TASK SUMMARIES

TASK NUMBER: 071-326-5501

CONTROL RATE AND DISTRIBUTION OF FIRE

CONDITIONS:

As fire team leader, while conducting any tactical mission, when fire must be placed on enemy troops or vehicles. (Tracer ammunition for the fire team leader's weapon and pyrotechnics may or may not be available.)

STANDARDS:

The fire team leader will select a method of fire control (for any situation encountered) which, when used, will let every member of his fire team know:

1. When to start/stop firing.
2. What general area to fire into.
3. How fast (rate) to fire.

PERFORMANCE MEASURES:

NOTES:

1. All methods and techniques for controlling team fires are dependent upon collective training of the entire team in order to be effective. The following guidance, although it is directed at the leader in order to train him in the selection of fire control methods, must be followed by team training.

2. The squad/team leader must be able to have his men open fire or cease fire at the instant he desires, to adjust fire, to shift all or part of the fire from one target to another, to regulate the rate of fire, and to concentrate or distribute fire as required. For this, the team must practice methods of fire control and develop teamwork.

1. **Signals for Fire Control.** There are several ways to control team/squad fire. The noise and confusion of battle will limit the use of some of them. Therefore, leaders must have more than one method and then use the method or combination of methods which does the job best.

a. Oral. This is a good method except when the leader is too far away from his men or the noise of battle makes it impossible for them to hear him.

b. Arm-and-Hand Signals. These are used when the troops can see their leader. All men in a rifle platoon should know and practice the standard arm-and-hand signals.

c. Pyrotechnics. In some cases, fire can be started or stopped by a smoke grenade of a specified color, or by a flare.

d. By Example. The most common method a team leader uses to start his team firing and to direct their fire is by setting the example. His men hear him shoot and see where he shoots. They do the same. The leader may use tracers to help him point out targets to his men.

(1) Mark the target: By firing at the center of the target and the right and left limits of fire, if appropriate. The two fire team members on the right engage the target from center to the right limit; the two men on the left engage the left half of the target.

(2) Establish the rate of fire: The team leader establishes the rate of fire by example. His men will copy his rate of fire.

e. Prearranged Event. The men can be told to start shooting when approaching enemy reach a certain terrain feature. A "commence-fire line" can be a hedgerow, a stream, a ridge, etc. This type signal helps a unit deliver surprise fire on the enemy.

2. **Fire Distribution.** Fire distribution is the quickest and best way to get fire on all parts of a target. Fire must be distributed to keep all parts of target under suppressive fire. Fire team leaders put fire on targets or target areas so that the enemy, whether visible or not, is kept under fire. A squad SOP may call for the left fire team to engage the left half of a linear target, or the front half of a column target. This makes sure that the whole target is engaged, not just those enemy soldiers nearest the squad firing. To maximize effectiveness of team fires:

a. Engage any exposed enemy personnel.

b. When enemy personnel are not exposed:

(1) Engage any visible enemy positions at the probable firing points (e.g., bunker ports and doors, top front edge of trenches, windows, doors, and firing loopholes in buildings).

(2) Engage probable battlefield positions (base of trees, stumps, bushes – anything you would use for cover if you were in his situation).

3. **Rate of Fire.** The rate of fire for the fire team should be increased until enemy fire is noticeably reduced or stopped. The rate of fire should then be held at that level until the enemy positions can be occupied or destroyed or, in the defense, the enemy attack can be repulsed.

REFERENCE:

TEC Lesson 020-071-1051-F, Control Rate and Distribution of Fire

TASK NUMBER: 071-326-5605

CONTROL FIRE TEAM MOVEMENT

CONDITIONS:

As a fire team leader or assistant scout squad leader, while moving in a tactical environment, given specific instructions by the squad leader as to movement technique to be used, the route to the overwatch position, and actions to be taken there.

STANDARDS:

The fire team leader or assistant scout squad leader will:

1. React immediately to all of the squad leader's orders/instructions.

2. Keep interval between fire teams (if in trail team) appropriate to movement technique and terrain.

3. When moving to the overwatch position, use the terrain to provide cover/concealment for the fire team. (Slight deviation up to 50 meters from designated route may be made.)

4. Recognize fire team members' use of the following (and correct when necessary):

   a. Camouflage, cover, and concealment.

   b. Individual interval appropriate to terrain and visibility while keeping all team members in sight.

   c. Noise and light discipline.

   d. Security measures (alert and ready to act).

   e. Response to leader's lead-by-example actions.

NOTE: Corrections may be made orally or with hand signals.

PERFORMANCE MEASURES:

The fire team leader or assistant scout squad leader must:

1. **Thoroughly understand his mission.**

   a. Where his team is to move.

   b. By which route.

   c. What to do when he gets there.

d. Location of the squad leader/scout squad leader.

e. Location of the overwatch team.

2. **Inform team members of the mission.**

3. **Be proficient in battle drill techniques and apply the squad leader's instructions and unit SOPs to include:**

a. Camouflage, cover, and concealment.

b. Individual interval.

c. Noise and light discipline.

d. Security measures.

e. Response to lead-by-example actions.

f. Response to hand signals.

4. **Maintain contact with squad leader (visual, radio).**

5. **Use the lead-by-example technique to control the fire team.**

a. Control desired interval (normally, 10 meters between individuals) between the fire teams and team members depending on terrain, visibility, and movement techniques.

b. Make quick visual reconnaissance of the next overwatch position designated by the squad leader, and lead the fire team through the terrain which offers the best cover and concealment available.

REFERENCES:

None

TASK NUMBER: 071-326-5606

SELECT FIRE TEAM (SCOUT VEHICLE) OVERWATCH POSITION

CONDITIONS:

In daylight, given: (1) the direction of the enemy threat; (2) the route and destination of the bounding element; (3) a designated overwatch position; and (4) what the fire team can be expected to do.

STANDARDS:

The fire team leader (assistant scout squad leader) will select, within 5 minutes, the exact fire team/vehicle position within the designated overwatch position that provides:

1. Cover and concealment.

2. Observation and good fields of fire from the overwatch position along the route of the bounding element up to its destination.

NOTE: The range of the fire team's weapons must be considered. The overwatching element must be able to support by fire if necessary.

PERFORMANCE MEASURES:

Use the bounding overwatch technique when contact is expected. One fire team advances while the other team is in an overwatch position ready to fire. The key to this movement technique is the proper use of terrain. All members of the squad must exploit all natural cover and concealment. Exposure to possible enemy observation must be kept at a minimum. A bound is **normally** about 100 to 150 meters forward of the overwatch team. It must be closely tied to terrain, the range of the overwatch fire team's weapons, and the ability of the squad leader to control all elements of his squad. In these bounds, the squad leader has both fire teams move along the same general line of advance. The fire team leader must, upon occupying an overwatch position, insure that all team members can support the bounding team by fire when needed. A change in the team's (vehicle's) exact position within the general location designated by the squad leader may be necessary.

REFERENCES:

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (chap 3, pages 3-8 thru 3-10 and 3-15)
FM 7-8, The Infantry Platoon and Squad, (TBP)

APPENDIX A
CONSOLIDATED LIST OF REFERENCES
(FM 7-11B1/2)

FIELD MANUAL (FM)

FM 5-15	Field Fortifications	Jun 72
FM 5-20	Camouflage	May 68
FM 5-25	Explosives and Demolitions	Feb 71
FM 5-34	Engineer Field Data	Sep 76
FM 7-7	The Mechanized Infantry Platoon and Squad	Sep 77
FM 7-8	The Infantry Platoon and Squad	TBP
FM 20-22	Vehicle Recovery	Jul 70
FM 20-32	Mine-Countermine Operations at the Company Level	Nov 76
FM 20-60	Battlefield Illumination	Jan 70
FM 21-6	How to Prepare and Conduct Military Training	Nov 75
FM 21-10	Field Hygiene and Sanitation	Jul 70
FM 21-11	First Aid for Soldiers	Jun 76
FM 21-26	Map Reading, C1	Jan 69
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense	May 71
FM 21-41	Individual NBC Defense	Oct 77
FM 21-60	Visual Signals	Dec 74
FM 21-75	Combat Skills of the Soldier, C1	Jul 67
FM 21-305	Manual for Wheeled-Vehicle Driver	Apr 75
FM 22-5	Drill and Ceremonies, C1, 2	Nov 71
FM 22-6	Guard Duty, C1	Sep 71
FM 23-9	M16A1 Rifle and Rifle Marksmanship, C1	Jun 74

FM 23-11	90-mm Recoilless Rifle, M67, C2, 3	Jul 65
FM 23-23	Antipersonnel Mine M18A1 and M18 (Claymore), C1, 2	Jan 66
FM 23-30	Grenades and Pyrotechnic Signals	Dec 69
FM 23-31	40-mm Grenade Launcher M203 and M79	May 72
FM 23-33	66-mm HEAT Rocket M72A1, M72A1E1, and M72	Jul 70
FM 23-35	Pistols and Revolvers	Sep 71
FM 23-65	Browning Machinegun Caliber .50 HB, M2	May 72
FM 23-67	Machinegun 7.62-mm, M60, C1	Oct 64
FM 23-71	Rifle Marksmanship (Appendix D), C1	Dec 69
FM 23-82	106-mm Recoilless Rifle M40A2, C1	Jul 73
FM 24-1	Combat Communications	Sep 76
FM 24-18	Field Radio Techniques	Jul 65
FM 24-20	Field Wire and Cable Techniques	Feb 70
FM 31-70	Basic Cold Weather Manual, C1	Apr 68
FM 71-1	The Tank and Mechanized Infantry Company Team	Sep 77

TRAINING CIRCULAR (TC)

TC 6-40-4	Fire for Effect	Mar 77
TC 7-24	Antiarmor Tactics and Techniques for Mechanized Infantry	Sep 75
TC 21-11	Pocket Medic	Feb 77
TC 21-26	Don't Get Lost	Feb 73
TC 23-11	Starlight Scope Small Hand-Held or Individual Weapons Mounted Model No. 6060	Nov 66
TC 23-13	Crew-Served Weapon Night Vision Sight	Jan 67
TC 23-23	TOW Heavy Antitank Weapon System, C2, 3	Jul 70
TC 23-24	Dragon Medium Antitank Assault Weapon System M47	Aug 74
TC 24-2	Communications-Electronics Operations Instructions; The Automated "CEOI"	Dec 75
TC 30-3	Equipment Recognition Guide	Apr 75

TECHNICAL MANUALS (TM)

TM 3-4230-204-13	Decontaminating Apparatus, Portable, DS2, 1½ Quart, APC-M11	Oct 69
TM 3-4240-279-10	Operator's Manual: Mask, Chemical-Biological: Field ABC-M17A1 and Accessories	Aug 75
TM 5-6350-249-12	AN/GSO-151, Alarm Set, Anti-Intrusion Restricted Area (PSID)	Dec 69
TM 9-1000-205-12	Operation and Organizational Maintenance Manual: 106-mm RCLR; M40A2, C1, 2, 4-8	Mar 59
TM 9-1005-213-10	Operator's Manual: Machinegun, Caliber .50 Browning, M2	Jul 68
TM 9-1005-249-10	Operator's Manual: M16A1, C1, 2	May 75
TM 9-1010-221-10	Operator's Manual: 40-mm Grenade Launcher M203	Jul 74
TM 9-1015-200-12	Operator's and Organizational Maintenance Manual: 81-mm Mortar	Apr 71
TM 9-1015-223-12	Operator's and Organizational Maintenance Manual: 90-mm Recoilless Rifle, M67, C1-6	Feb 62
TM 9-1345-200	Land Mines, C1, 3, 5, 6, and 7	Jun 64
TM 9-1345-203-12&P	Operator's and Organizational Maintenance Manual: Land Mines	Dec 76
TM 9-1310-202-12	Operator's and Organizational Maintenance Manual: Cartridges 40-mm	Oct 69
TM 9-1375-213-12	Operator's and Organizational Maintenance Manual: Demolition Materials	Mar 73
TM 9-1330-200-12	Operator's and Organizational Maintenance Manual: Grenades, Hand and Rifle	Sep 71
TM 9-1425-470-12	Operation and Organizational Maintenance Manual: TOW, C1	Jan 74
TM 9-1425-480-10	Operator's Manual: Dragon Weapon System, M47	Apr 76
TM 9-2300-257-10	Operator's Manual: Carrier, Personnel, Full Tracked, Armored, M113, C1	Dec 73
TM 9-2300-257-ESC	ESC for Tracked Vehicles, C1-3	Nov 72
TM 9-2320-218-10	Operator's Manual: M151, C1	Sep 71
TM 9-2320-218-ESC	ESC for M151	Oct 72
TM 9-2320-242-10	Operator's Manual: M561	Mar 77

TM 9-2320-242-ESC	ESC for M561	Jun 73
TM 9-2320-244-10	Operator's Manual: M715, C1	Aug 68
TM 9-2320-244-ESC	ESC for M715	Jul 73
TM 10-277	Protective Clothing Chemical Operation, C1	Jul 67
TM 11-5810-245-10	Classified	
TM 11-5805-201-12	Telephone Set, TA-312/PT, C1	Jun 67
TM 11-5810-300-12	Operator's and Organizational Maintenance Manual for NESTOR Communications System Using TSEC/KY8/38	Sep 75
TM 11-5805-243-12	Telephone Set, TA-1/PT, C3-5	Sep 59
TM 11-5805-294-15	Switchboard, Telephone, Manual SB-992/GT	Oct 59
TM 11-5820-401-12	Radio Sets, AN/VRC-46 and AN/VRC-47	Sep 72
TM 11-5820-477-12	Operator's and Organizational Maintenance Manual: Radio Set Control Group AN/GRC-39, C2, 3	Oct 62
TM 11-5820-498-12	Radio Sets, AN/VRC-64 and AN/GRC-160	May 67
TM 11-5820-667-12	Radio Set AN/PRC-77, C1-5	Jun 67
TM 11-5855-202-13	Operator's Manual: NVS; Crew-Served Weapons AN/TVS-2, C1-3	Apr 67
TM 11-5855-203-13	Operator's Manual: NVS: Individual Weapons Mounted AN/PVS-2, C2, 4, 6	Apr 67
TM 11-6665-214-10	Operator's Manual: Radiacmeters IM-93/PD, IM-93/UD, IM-93A/UD, IM-147/PD, C1-3	Nov 62
TM 21-300	Driver Selection and Training (Wheeled Vehicles), C1	Jul 67
TM 21-301	Driver Selection, Training Supervision, Tracked Vehicles	Jul 67
TM 21-306	Manual for the Tracked Combat Vehicle Driver, C1	Aug 64
TM 38-750	The Army Maintenance Management System (TAMMS), C1	Nov 72

LUBRICATION ORDER (LO)

LO 9-1015-221-10	Rifle, Recoilless, 106-mm M40A2 and M14A4 Mount M79 and M92 and Gun, Spotting Caliber .50, M8C	Jul 74

ARMY REGULATION (AR)

AR 385-10	Army Safety Program, C1-5	Feb 70
AR 385-55	Prevention of Motor Vehicle Accidents	Apr 74

DA PAMPHLETS

DA Pam 623-1	Preparation of Enlisted Evaluation Reports	May 75
DA Pam 750-31	The M561 Gamma Goat	Nov 70

TECHNICAL BULLETIN (TB)

TB CML 100	Smoke Pot, HC, 10 lb., M1 and 30 lb., ABC-M5; Smoke Pot, Floating, HC, M4A2; SGF2 AN-M7 and SGF2, AN-M7A1, C1	Apr 64

TRAINING EXTENSION COURSES (TEC)

CALL FOR FIRE AND ADJUSTMENT

949-061-0001-F	Determination of Direction
949-061-0002-F	Target Location: Polar Plot and Grid Coordination Methods
949-061-0003-F	Locate a Target by Shift from a Known Point
949-061-0004-F	The Call for Fire (Revised)
949-061-0005-F	Adjustment of Field Artillery Fire, Bracketing and Creeping, Pt 1
949-061-0006-F	Adjustment of Field Artillery Fire, Bracketing and Creeping, Pt 2

COVER, CAMOUFLAGE, AND CONCEALMENT

937-061-0030-F	Cover, Camouflage, and Concealment, Pt 1

EARLY WARNING DEVICES

952-061-0050-F	Expedient Early Warning Devices, Pt 1
952-061-0051-F	Expedient Early Warning Devices, Pt 2
952-061-0054-F	Early Warning Devices: Electronic, Pt 1
952-061-0055-F	Electronic Early Warning Devices

NUCLEAR, BIOLOGICAL, CHEMICAL

931-061-0060-F	NBC: The Mask
931-061-0061-F	NBC: Masking and When To Do It
931-061-0064-F	Individual Protection and Decontamination
931-061-0065-F	Maintenance of the M17 Series Mask

COMMUNICATIONS

936-061-0108-F	RTP: Part 1, Initiating and Responding to Radio Call
936-061-0109-F	RTP: Part 2, Writing Down Messages Received by Radio
936-061-0110-F	RTP: Part 3, Responding to Messages
936-061-0111-F	RTP: Part 4, Preparing Messages to Be Sent
936-061-0112-F	RTP: Part 5, Sending and Receiving Messages
936-061-0117-F	Tactical FM Radio: RT524A and R442: Maintenance
936-061-0125-F	Field Wire Installation: Equipment
936-061-0129-F	Field Wire Installation: Maintenance and Troubleshooting
936-061-0137-F	Local Battery Operation
936-061-0140-F	CEOI, Part 1: How to Use the CEOI

HAND GRENADES

942-071-0001-F	The Hand Grenade - Types and Uses
942-071-0002-F	Hand Grenade Maintenance and Identification
942-071-0003-F	The Hand Grenade: Carrying, Arming, and Throwing

LAW

948-071-0005-F	Operating the LAW

RIFLES

939-071-0010-F	Disassembly and Assembly of the M16A1 Rifle
939-071-0011-F	Maintaining the M16A1 Rifle

LAND NAVIGATION

930-071-0013-F	Introduction to Land Navigation
930-071-0014-F	Measuring Distances and Azimuths
930-071-0015-F	Converting Azimuths
930-071-0016-F	Terrain Features
930-071-0017-F	The Lensatic Compass
930-071-0018-F	Navigating with Map and Compass

TOW MISSILE

948-071-0023-F	TOW Fire Commands
948-071-0027-F	Maintenance of the TOW System

NIGHT VISION DEVICES

953-071-0061-F	AN/PVS-2 Starlight Scope
953-071-0062-F	AN/TVS-2 Night Vision Sight for Crew-Served Weapons
953-071-0063-F	AN/TVS-2 Engaging the Target
953-071-0064-F	AN/TVS-4 Night Vision Sight for Adjusting Indirect Fire

OBSTACLES

947-071-0071-F	Breaching Artificial Obstacles

MACHINEGUN, M60

941-071-0078-F	The M60 Machinegun: Mechanical Training, Part 1
941-071-0079-F	The M60 Machinegun: Mechanical Training, Part 2
941-071-0080-F	The M60 Machinegun: Mechanical Training, Part 3
941-071-0081-F	The M60 Machinegun: Functioning
941-071-0083-F	The M60 Machinegun: Prefire Procedures
941-071-0084-F	Firing and Zeroing, M60 Machinegun
941-071-0085-F	Malfunctions and Stoppages

941-071-0127-F	Target Engagement
941-071-0128-F	Limited Visibility

M203 GRENADE LAUNCHER

940-071-0086-F	M203 Grenade Launcher: Disassembly, Assembly, and Maintenance
940-071-0088-F	M203 Grenade Launcher: Zeroing and Target Engagement

MILITARY INSTRUCTOR TRAINING

901-071-0091-F	Unit Development and Training, Part 1
901-071-0092-F	Unit Development and Training, Part 2

MINES, CLAYMORE

947-071-0106-F	Claymore Mines, Introduction, CKT Testing, and Emplacement
947-071-0107-F	Electrical Arming and Firing
947-071-0109-F	Disarming, Recovery, and Emergency Destruction Procedures
947-071-0110-F	Multiple Emplacement and Review
947-071-0184-F	Arming and Disarming the M21 AT Mine
947-071-0181-F	Disarm an M16A1 Antipersonnel Mine

MACHINEGUN CAL .50

941-071-0115-F	The Cal .50 MG: Mounting
941-071-0116-F	The Cal .50 MG: Mechanical Training
941-071-0117-F	The Cal .50 MG: Headspace and Timing
941-071-0118-F	The Cal .50 MG: Field Zeroing
941-071-0119-F	The Cal .50 MG: Firing
941-071-0125-F	Machinegun Target Engagement, Introduction

INTELLIGENCE & COUNTERINTELLIGENCE

935-071-1026-F	Collecting and Recording Information

935-071-1028-F	Processing Captured Personnel, Equipment, and Documents

TAMMS

510-091-6451-F	Preparing and Maintaining DA Form 2401 and Dispatching Equipment
510-091-6453-F	Preparing and Maintaining DA Form 2400
510-091-6454-F	Preparing and Maintaining DA Form 348
510-091-6455-F	Preparing DF 81
510-091-6456-F	Preparing and Using DA Form 2404, Part 1
510-091-6457-F	Preparing and Using DA Form 2404, Part 2
510-091-6458-F	Preparing and Maintaining Equipment Serviceability Criteria (ESC) Tests and Checks, Part 1
510-091-6459-F	Preparing, Maintaining and Using DA Form 2407, Part 1
510-091-6460-F	Preparing, Maintaining and Using DA Form 2407, Part 2
510-091-6461-F	Preparing, Maintaining and Using DA Form 2407, Part 3
510-091-6474-F	Preparing, Maintaining, and Using DA Form 2408-1
510-091-6475-F	Preparing and Using DA Form 2408-8
510-091-6477-F	Preparing, Maintaining, and Using DA Form 2408-10
510-091-6478-F	Preparing, Maintaining, and Using DA Form 2408-5
510-091-6486-F	Preparing and Maintaining Equipment Serviceability Criteria (ESC) Tests and Checks, Part 2

COMMUNICATION

201-113-4501-F	Preparation of Radio Set AN/PRC-77 for Operation: Pt 1, Install
201-113-4502-F	Preparation of Radio Set AN/PRC-77 for Operation: Pt 2, OP, Checks
201-113-4503-F	Preparation of Radio Set AN/PRC-77 for Operation: Pt 3, Pre-Sets

TRACKED VEHICLES

945-171-0100-F	Varied Terrain Driving
945-171-0101-F	Reduced Traction and Hazards
945-171-0105-F	Preparation for Towing

TARGET ACQUISITION

020-171-1611-F	Target Range Determination

WHEELED VEHICLES

944-441-0012-F	Gamma Goat Checks and Services, Pt 1
944-441-0013-F	Gamma Goat Checks and Services, Pt 2
944-441-0014-F	Gamma Goat Checks and Services, Pt 3
944-441-0015-F	Gamma Goat Checks and Services, Pt 4
944-441-0016-F	Gamma Goat Checks and Services, Pt 5
944-441-0017-F	Gamma Goat Checks and Services, Pt 6
944-441-0018-F	Gamma Goat Checks and Services, Pt 7
944-441-0019-F	Gamma Goat Five Wheel Operation
944-441-0020-F	Gamma Goat Operation Under Unusual Conditions
944-441-0021-F	Gamma Goat Water Operations - Fording, Pt 1
944-441-0022-F	Gamma Goat Water Operations, Swimming, Pt 2

FIRST AID

911-441-0024-F	Basic First Aid Measures: The Lifesaving Steps
911-441-0026-F	Basic First Aid Measures: Restoring the Breathing
911-441-0027-F	Basic First Aid Measures: Restoring the Heartbeat
911-441-0028-F	Basic First Aid Measures: Stopping the Bleeding, Pt 1
911-441-0029-F	Stopping the Bleeding, Pt 2 and Controlling for Shock
911-441-0030-F	Fractures and Splinting

911-441-0031-F	Dressings and Bandages, Pt 1
911-441-0032-F	Dressings and Bandages, Pt 2
911-441-0033-F	Burns and Eye Injuries
911-441-0034-F	Snake Bites and Hot Weather Hazards
911-441-0035-F	Cold Weather Hazards
929-441-0042-F	Personal Hygiene: Care of the Feet
929-441-0043-F	Environment Hazards, Pt 1: Treatment of Drinking Water

DEMOLITIONS

030-051-6348	Assist in Construction of Boobytraps
645-093-7320-F	Prepare a Nonelectric Firing System
645-093-7321-F	Prepare Electric Firing System
645-093-7322-F	Prepare Detonating Cord Firing System

COMBAT TECHNIQUES & TACTICS

020-071-1042-F	Reacting to Indirect Fire
020-071-1049-F	Reacting to Flares

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CUT ON DOTTED LINE

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STAPLE

QUESTIONNAIRE

SOLDIER'S MANUAL

To provide you a better manual, please give us your comments after studying this field manual. Note that some of the questions apply to soldiers only and some to trainers only. Please fill out the following before continuing.

MOS _____ **RANK** _____ **TIME IN GRADE** _____

TIME IN SERVICE _____ **UNIT** _____

DIVISION _____

_____

1. **The following comments are a result of my review of the Soldier's Manual for Skill Level** _____.

2. **My duty position is:** _____

_____

_____

_____

3. **The Soldier's Manual contains only the critical combat skills the infantryman needs to fight and survive on the battlefield. I think it contains:**

☐ Too many tasks ☐ The right number ☐ Too few tasks

4. **Are there tasks that should be added?**

☐ **Yes (See the list below)** ☐ No

_____ **Continue in block 15 if needed.** _____

5. **Are there tasks that should be dropped?**

☐ Yes **(See the list below)** ☐ No

Continue in block 15 if needed.

6. **How difficult was it to find the tasks which you must perform?**

☐ Easy, I had no trouble.

☐ Not difficult, but I think the instructions were confusing. **(Please tell us how to improve the instructions in the space below).**

☐ Difficult, I had to have someone explain how to do it.

Continue in block 15 if needed.

7. **Will the Soldier's Manual help you do a better job as an infantryman?**

☐ No, I don't think it will help at all.

☐ Yes, it will be a big help.

☐ Yes, but it will be better if improvements are made. **(List the improvements you would like to see.)**

Continue in block 15 if needed.

8. **Did the conditions for each task describe the real conditions under which you usually perform each task?**

☐ Yes ☐ No, I would change:

Continue in block 15 if needed.

9. **The STANDARDS are:**

☐ Too easy ☐ Too hard ☐ About right

10. **Can the PERFORMANCE MEASURES help you perform the task to the standard?**

☐ Yes ☐ No If you check NO please explain in block 15.

11. **(Trainers only): Will the Soldier's Manual help you as a trainer in improving the combat proficiency of 11B soldiers?**

☐ Yes, I think it will be a big help.

☐ Yes, but the Soldier's Manual needs to be changed as I recommended in question 10.

☐ No, it will not help at all **(please explain in block 15).**

12. **Which of the following best tells what an infantryman must be able to do in combat?**

☐ Job Description in AR 611-201, Personnel Selections and Classification.

☐ Study Guides for MOS Tests.

☐ Soldier's Manual.

☐ 11B Study Reference Manual.

☐ Other _____

Continue in block 15 if needed.

13. If I could make any improvement(s) in the Soldier's Manual it (they) would be:

Continue in block 15 if needed.

14. Is the artwork used in this field manual understandable and correct for each task?

☐ Yes ☐ No

If you checked no, please make suggestions concerning replacement of artwork in block 15 or enclose suggested line drawing, sketch, photo, etc., with this questionnaire.

15. Comments.

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