SUBCOURSE
FA 8014

EDITION
A

US ARMY FIELD ARTILLERY SCHOOL

CRATER ANALYSIS AND SHELL REPORTS

THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT

ARMY CORRESPONDENCE COURSE PROGRAM

AIPD

READINESS / PROFESSIONALISM THRU GROWTH

CRATER ANALYSIS AND SHELL REPORTS

Subcourse FA8014

EDITION B

United States Army Field Artillery School
Fort Sill, Oklahoma, 73503-5600

Edition Date: Nov 1992

SUBCOURSE OVERVIEW

This subcourse is designed to train the skills necessary for performing crater analysis and preparing and submitting shelling reports (SHELREPs), bombing reports (BOMREPs), mortar reports (MORTREPs), and rocketing reports (ROCKREPs). This subcourse is presented in two lessons.

This subcourse reflects the doctrine which was current at the time it was prepared. In your own work situation, always refer to the latest official publication.

Unless otherwise stated, the masculine gender of singular pronouns is used to refer to both men and women.

<u>Terminal Learning Objective</u>:

ACTION: Performing crater and shell fragment analysis.

CONDITION: Given the information provided in this subcourse, you will be able to identify the various craters and conduct proper reporting procedures.

STANDARD: To demonstrate competency in this task, you must achieve a minimum of 70% on the subcourse examination.

TABLE OF CONTENTS

ADMINISTRATIVE INSTRUCTIONS

Subcourse Contents:

This subcourse is designed to train the skills necessary for performing crater analysis and preparing and submitting shelling reports (SHELREPs), bombing reports (BOMREPs), mortar reports (MORTREPs), and rocketing reports (ROCKREPs). This subcourse consist of two lessons.

Supplementary requirements: The following subcourse should be completed before taking this subcourse: None.

Materials Needed: None.

Supervisory Assistance: There are no supervisory requirements for completion of this subcourse.

Reference: FM 6-121

GRADING AND CERTIFICATION INSTRUCTIONS

Instructions to the student: This subcourse includes a examination performance-based, multiple-choice examination covering four lessons. You must score a minimum of 70 percent on this examination to meet the objective of the subcourse.

Credit hours: Three credit hours will be awarded for successful completion of this subcourse.

*** * * IMPORTANT NOTICE * * ***

THE PASSING SCORE FOR ALL ACCP MATERIAL IS NOW 70%.

PLEASE DISREGARD ALL REFERENCES TO THE 75% REQUIREMENT.

LESSON 1

PERFORM CRATER AND SHELL FRAGMENT ANALYSIS

TASK NO: 061-306-6004

OVERVIEW

LESSON DESCRIPTION:

Upon completion of this lesson, you will be able to identify a crater as high-angle, low-angle, or ricochet. You will also be able to identify the procedures for determining the direction to the location of the hostile weapon(s).

LEARNING OBJECTIVE:

ACTION:	Perform crater and shell fragment analysis.
CONDITION:	Given the material contained in this lesson.
STANDARD:	Correctly answer all questions in the practical exercises contained in this lesson.
REFERENCE:	This lesson is based on FM 6-121 and other material approved for US Army field artillery instruction; however, development and progress render the text subject to continual change.

INTRODUCTION

The success of any military operation is largely dependent on the destruction or neutralization of the enemy's artillery, rockets, and mortars. Destruction of the enemy's artillery, rockets, and mortars depends on the prompt and accurate determination of their location. Crater and shell fragment analysis is an important means of determining the locations of enemy firing units, and it is a skill which can be quickly learned and performed by every soldier on the battlefield.

PART A - CRATER ANALYSIS

1. Crater Analysis.

Besides being reliable, requiring no sophisticated equipment, and requiring little formal training, crater analysis makes it possible to--

- Confirm suspected locations of hostile fire obtained by other means.
- Confirm the presence of enemy artillery, mortars, and rockets and to obtain an approximate direction to them.
- Detect the presence of new types of enemy weapons, new calibers, or new ammunition manufacturing methods.

2. Importance of Timeliness.

Crater analysis should be performed and information sent to higher headquarters as soon as possible. If the enemy has had time to move, the information is worthless in terms of enemy location. Additionally, craters exposed to weather and personnel deteriorate rapidly and lose their value as a source of information.

3. Considerations in Crater Analysis.

There are four steps in performing crater analysis properly. They are:

- Locate a usable crater.
- Determine grid location of the crater.
- Determine direction back to the weapon.
- Collect usable fragments.

4. Fuze-Quick Crater.

When an artillery round or rocket comes in at a low angle and explodes as soon as it hits the ground (fuze quick), it leaves a crater as illustrated in Figure 1-1. The crater is shaped similar to an arrowhead, and the arrowhead points in the general direction of the weapon that fired the round.

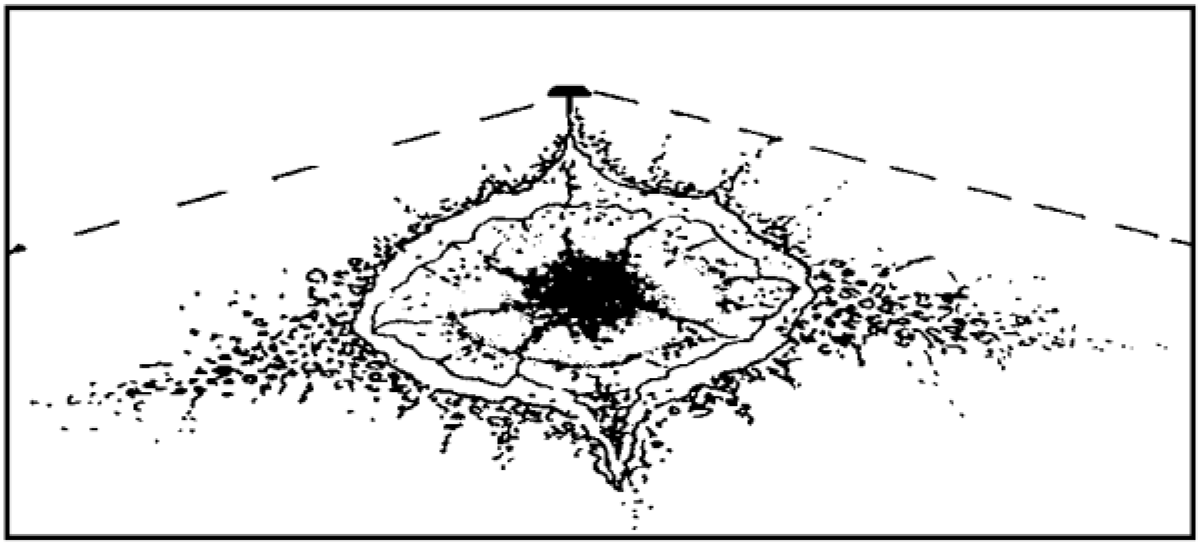

Figure 1-1. Low-angle fuze-quick crater.

5. Signature Effects of a Low-Angle Fuze-Quick Crater.

This crater may have as many as four recognizable signature effects. Refer to Figure 1-2 as we illustrate the parts of the low-angle fuze-quick crater.

Center of crater - A small pit (hard burned-out area) is usually at the point of impact. This is called the center of crater (Item 1, Figure 1-2).

Fuze furrow - Usually the fuze blows forward out of the crater, forming a fuze furrow (Item 2, Figure 1-2).

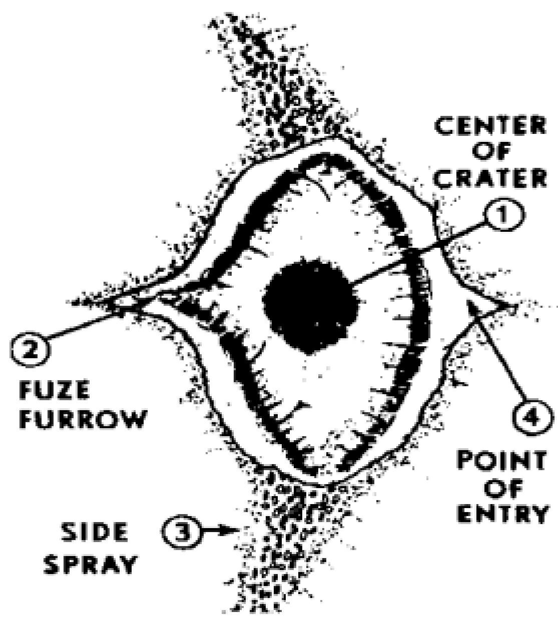

Figure 1-2. Signature effects.

Side spray - The spray of fragments from the body of the projectile (the most significant characteristic) extends out to the sides (Item 3, Figure 1-2), forming an arrowhead that points back in the general direction from which the round came. The side spray is the effect of the burst.

Point of entry - Formed when the round initially impacts (Item 4, Figure 1-2) prior to detonating.

6. Special Considerations.

Before you measure direction, there are several things to remember to ensure accuracy. Your compass or aiming circle is a magnetic instrument; therefore, always remove your helmet (if metal) and other material that could affect the measurement. Also, the potential of magnetic influence created by shell fragments in and around the crater must be considered. Your distance from the crater when taking a compass reading is judgmental, and should be based on the quantity of metal in and around the crater. Be sure to indicate your reading in degrees or mils, as appropriate. No matter which method you use to measure direction, always stand facing toward the enemy weapon (Figure 1-3).

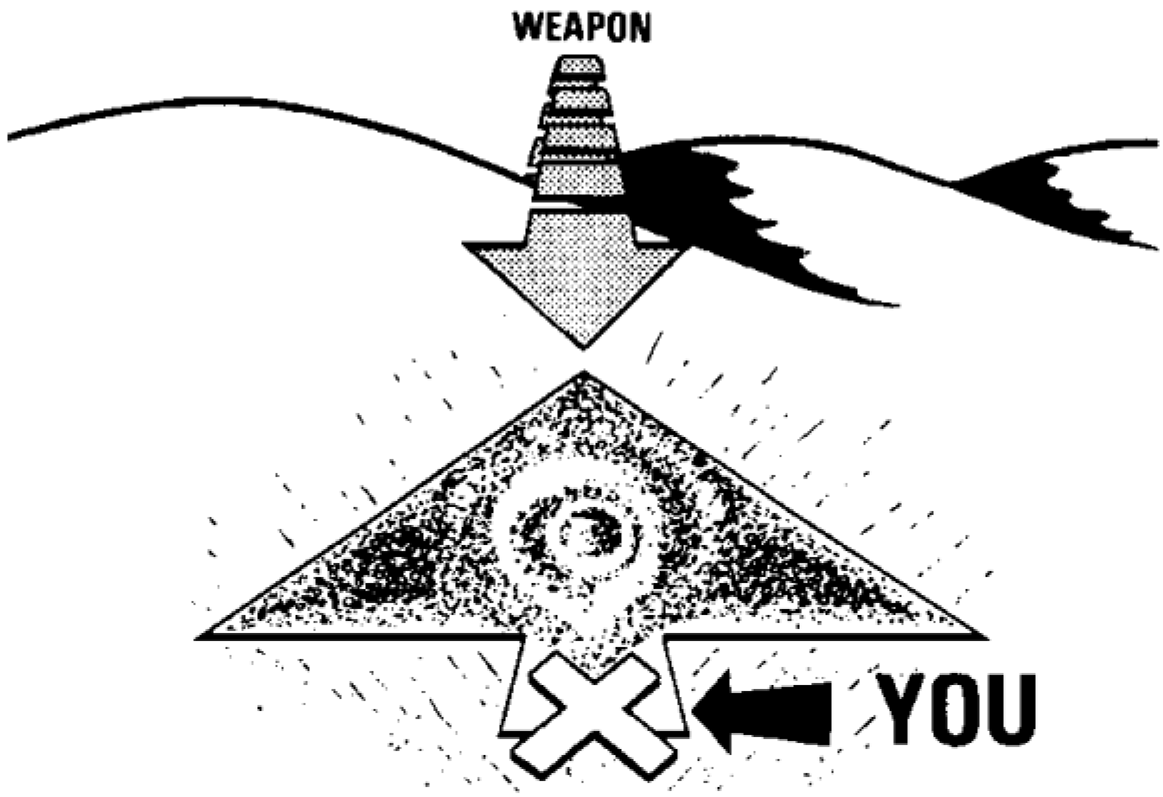

Figure 1-3. Measuring direction.

7. Methods for Determining Direction.

Since the low-angle fuze-quick crater forms an arrowhead that points to the weapon, you can use a compass or an aiming circle in conjunction with the following two methods to determine the azimuth to the hostile weapon. The methods are:

- Fuze furrow and center-of-crater method - using two stakes.
- Side spray method - using four stakes.

NOTE: By using either method (in conjunction with a compass or aiming circle), you will be able to measure the direction to the hostile weapons within 60 mils.

Fuze furrow and center-of-crater method. This method uses two stakes. Refer to Figure 1-4 as you follow the procedures.

Step 1. Place one stake in the center of the crater.

Step 2. Place a second stake in the fuze furrow.

Step 3. Set up a direction-measuring instrument (aiming circle or compass) in line with the two stakes.

Step 4. Orient your instrument and sight along the two stakes.

Step 5. Read the azimuth to the enemy weapon.

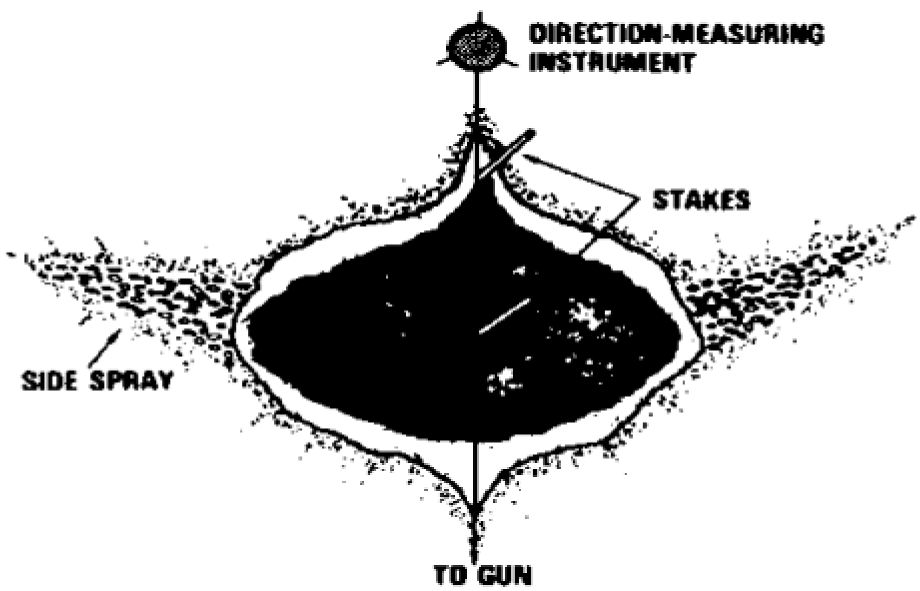

Figure 1-4. Fuze furrow and center-of-crater method.

Side spray method. This method, illustrated in Figures 1-5 and 1-6, uses four stakes.

Step 1. Place a stake in the center of the crater (Figure 1-5).

Step 2. Place two stakes at the end of each line of side spray, equidistant from the center stake (Figure 1-5).

Step 3. Hold a length of comm wire or string to each side spray stake and strike an arc forward of the fuze furrow.

Step 4. Place a stake where these arcs intersect (Figure 1-5).

Step 5. Set up a direction-measuring instrument in line with the stake placed in step 4 and the crater stake (Figure 1-6).

Step 6. Orient the instrument, and measure the direction to the firing weapon.

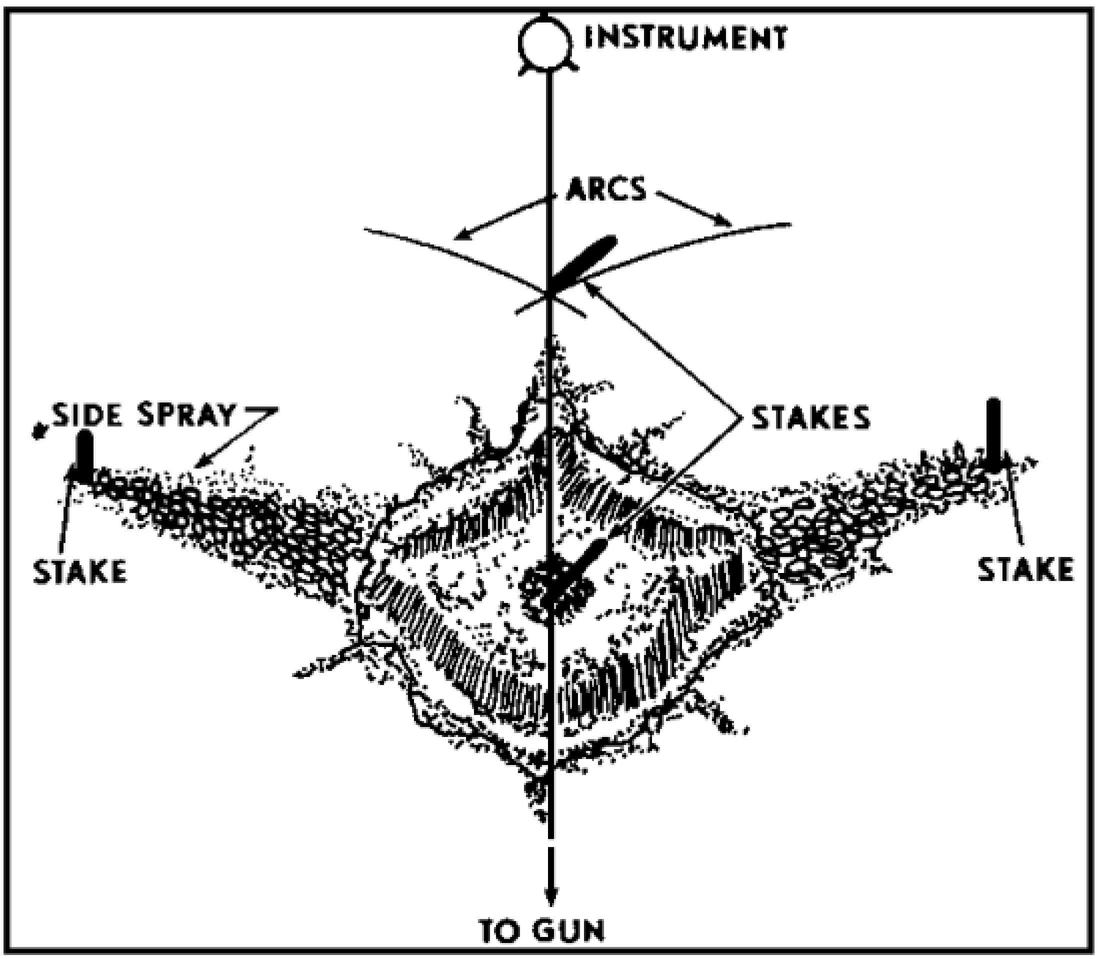

Figure 1-5. Side spray method.

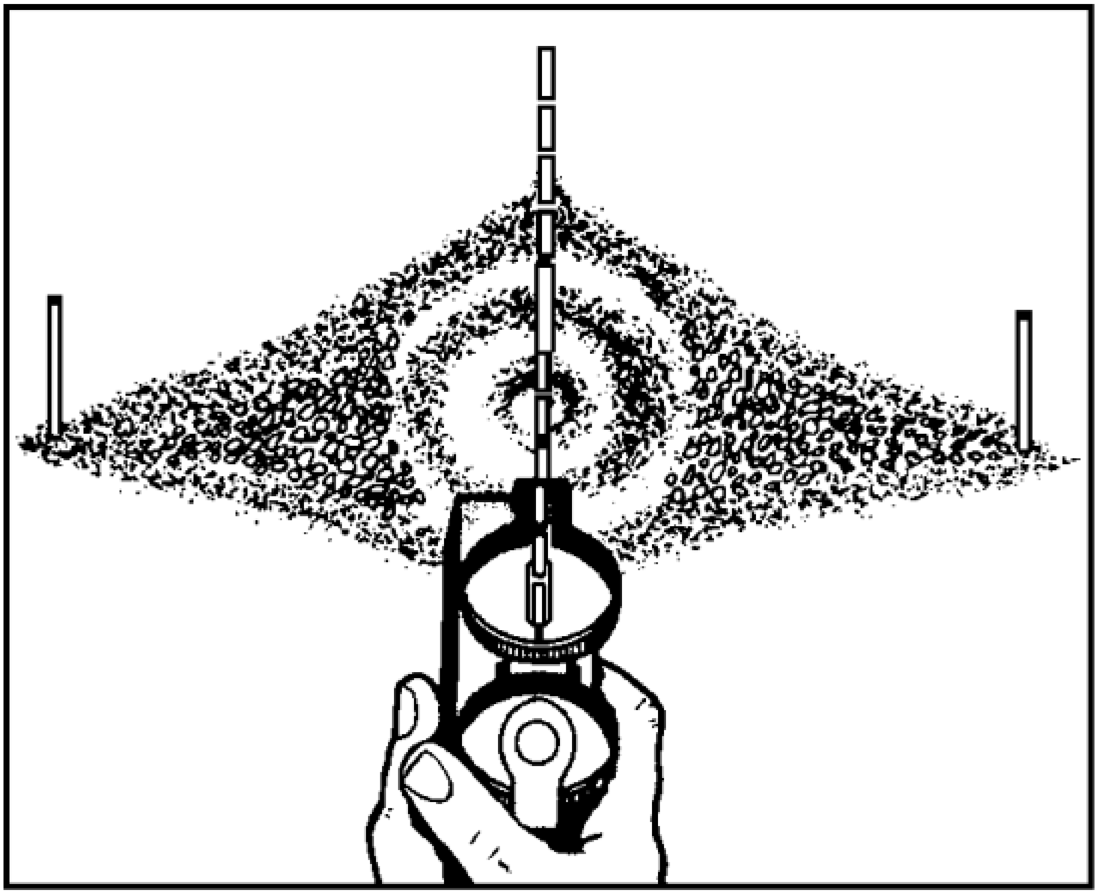

Figure 1-6. Measuring direction - side spray method.

8. Method Selection Criteria.

We have just discussed two different methods for measuring direction. If time is a factor, use the quicker method (fuze furrow or center-of-crater method). If time is available, however, take as many direction measurements as possible; then average the results by totaling the direction measurements and dividing the sum by the number of measurements taken.

EXAMPLE

You have measured directions using a combination of two methods. The measurements are 1,630m, 1,600m, and 1,570m. What direction do you report?

Answer: 1,600m.

Solution: Add the total of the three measurements which equals 4,800m.

Divide by 3 = 1,600m.

"THIS PAGE INTENTIONALLY LEFT BLANK"

LESSON 1

PRACTICE EXERCISE

Complete the following exercises by circling T for true or F for false, circling the letter preceding the correct answer, or filling in the blanks, as appropriate. The answers follow the last exercise.

1. Crater analysis makes it possible to do three things. They are:

   A. ______________________________

   B. ______________________________

   C. ______________________________

2. The four considerations in crater analysis are:

   A. ______________________________

   B. ______________________________

   C. ______________________________

   D. ______________________________

3. Name the four parts of a low-angle fuze-quick crater.

   A. ______________________________

   B. ______________________________

   C. ______________________________

   D. ______________________________

4. Match the direction-finding method with its name.

(1)	_______ fuze furrow	a.	using four stakes and striking arc.
(2)	_______ side spray	b.	using two stakes.

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item Correct Answer and Feedback

1. A. Verify as confirmed, suspected locations of fire.

   B. Confirm the presence of enemy artillery and obtain an approximate direction.

   C. Detect the presence of new types of enemy weapons, new calibers, or new ammunition manufacturing methods. Page 1-2

2. A. Locate a usable crater.

   B. Determine grid location of the crater.

   C. Determine direction back to the weapon.

   D. Collect usable fragments. Page 1-2

3. A. center of crater.

   B. fuze furrow.

   C. side spray.

   D. point of entry. Page 1-3/4

4. (1)b. Page 1-5

   (2)a. Page 1-6

9. Low-Angle Fuze Delay Craters (Artillery).

There are two types of low angle fuze delay craters. They are:

- Ricochet.
- Mine action.

Ricochet. When an artillery shell with a time delay fuze hits the ground, it may skid a few feet causing a ricochet furrow. The shell then normally projects upward, and at the same time, changes direction. The change of direction usually is to the right as the result of the spin, or rotation, of the projectile. As the shell projects upward again, it explodes, leaving a visible effect of airburst (Figure 1-7).

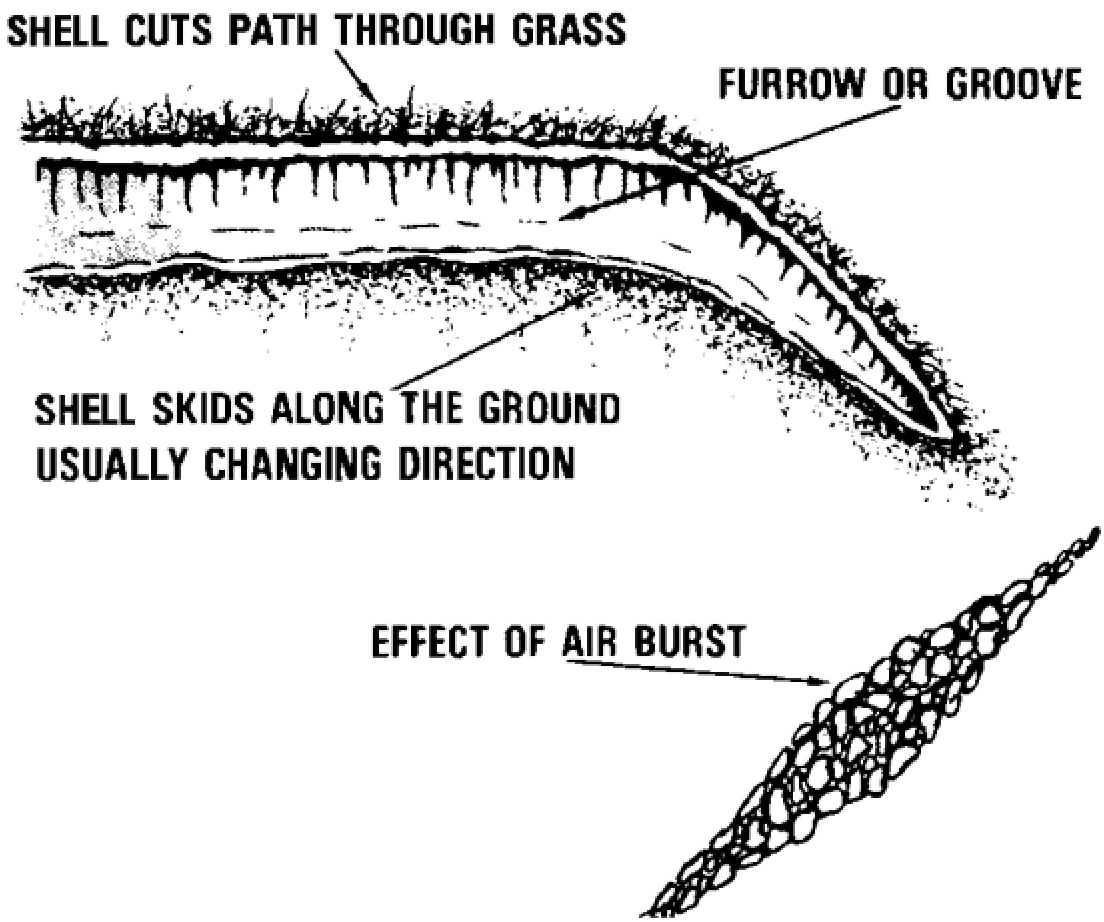

Figure 1-7. Ricochet furrow.

Directions obtained from ricochet craters are considered to be most reliable. To obtain direction from such a crater, use the following ricochet furrow procedure and study Figure 1-8.

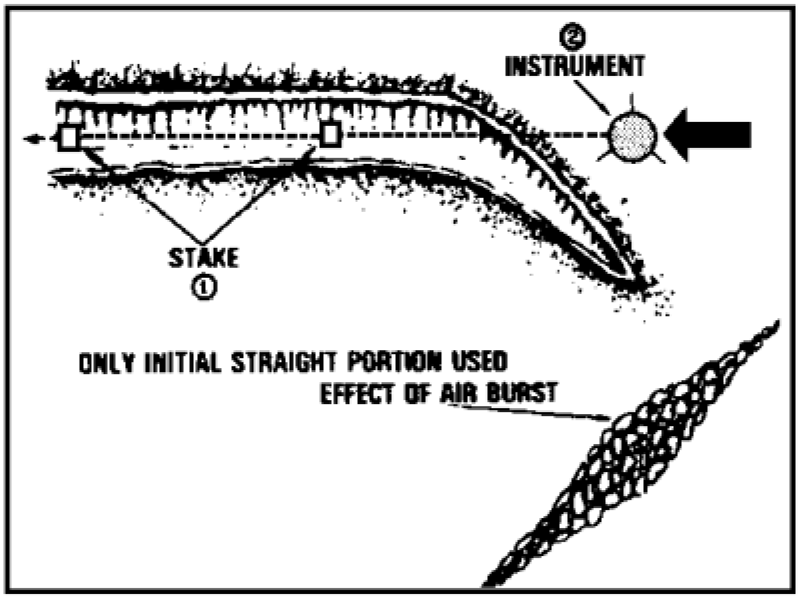

Figure 1-8. Ricochet furrow method.

Step 1. Clean out the furrow.

Step 2. Place two stakes, one at each end of the usable straight section of the furrow (Item 1, Figure 1-8).

Step 3. Set up a direction-measuring instrument in line with the stakes and as far away from fragments as possible (Item 2, Figure 1-8).

Step 4. Orient the instrument, and measure the direction to the weapon.

NOTE: Remember to sight away from the burst pattern.

Mine Action. Mine action occurs when a shell bursts beneath the ground. Occasionally, such a burst will leave a furrow that can be analyzed in the same manner as the ricochet furrow. A mine action crater that does not have a furrow cannot be used to determine the direction to the weapon.

PRACTICE EXERCISES

5. Fuze delay craters cause two types of craters. They are: __________ and __________.

6. The stakes are set in the ___________ part of the furrow.

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item	Correct Answer and Feedback
5.	Ricochet and mine action. Page 1-11
6.	straight or usable. Page 1-12

PART C - HIGH-ANGLE CRATERS

10. Mortar Craters.

When a mortar shell hits the ground at a high angle, it makes a round crater as illustrated in Figure 1-9. In a typical high-angle mortar crater, the turf at the forward edge (the direction away from the hostile mortar) is undercut. The rear edge of the crater is shorn of vegetation and grooved by splinters. When fresh, the crater is covered with loose earth, which must be carefully removed to disclose the firm burnt inner crater. The ground surrounding the crater is streaked by splinter grooves that radiate from the point of detonation. The ends of the splinter grooves on the rearward side are approximately on a straight line. This line is perpendicular to the horizontal trajectory of the round. A fuze tunnel is caused by the fuze burying itself at the bottom of the inner crater in front of the point of detonation.

NOTE: A high-angle artillery crater is analyzed in the same manner as a crater resulting from a mortar round.

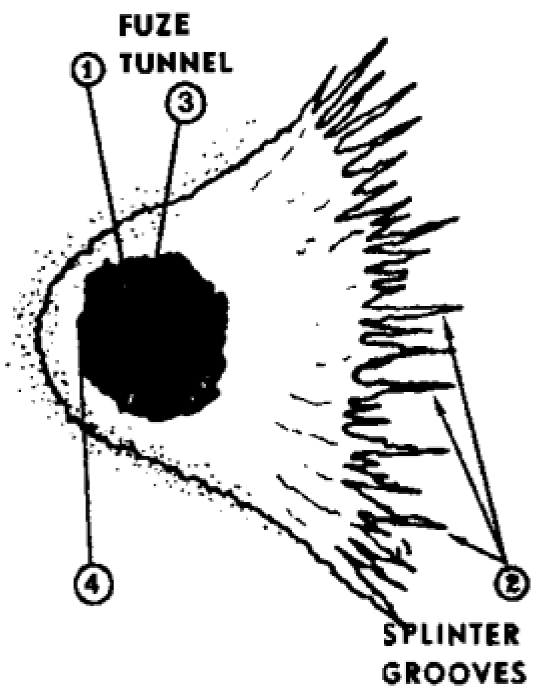

Figure 1-9. High-angle mortar crater.

11. Signature Effects of the Crater (High-Angle).

There are four signature effects of a high-angle crater. They are: the fuze tunnel (Item 1, Figure 1-9), the splinter grooves (Item 2, Figure 1-9), the center of crater (Item 3, Figure 1-9), and the front edge undercut (Item 4, Figure 1-9). The fuze body usually digs into the ground, forms a fuze tunnel, and causes the front edge of the turf to be undercut. The splinter grooves usually point back toward the enemy weapon.

12. Methods for Determining Direction.

Three methods may be used to determine direction from a mortar crater. They are:

- Main axis
- Fuze tunnel (most significant)
- Splinter groove

Study each figure as you read the procedures for each method.

Main axis method. This method, illustrated in Figure 1-10, includes the following procedures.

NOTE: This method may only be used if the two halves are symmetrical.

Step 1. Lay a stick in the direction of the splinter grooves, dividing the crater in half. The stick points toward the mortar (Item 1, Figure 1-10).

Step 2. Set up a direction-measuring instrument (aiming circle or compass) in line with the stick and away from fragments (Item 2, Figure 1-10).

Step 3. Orient the instrument, and measure the direction to the weapon.

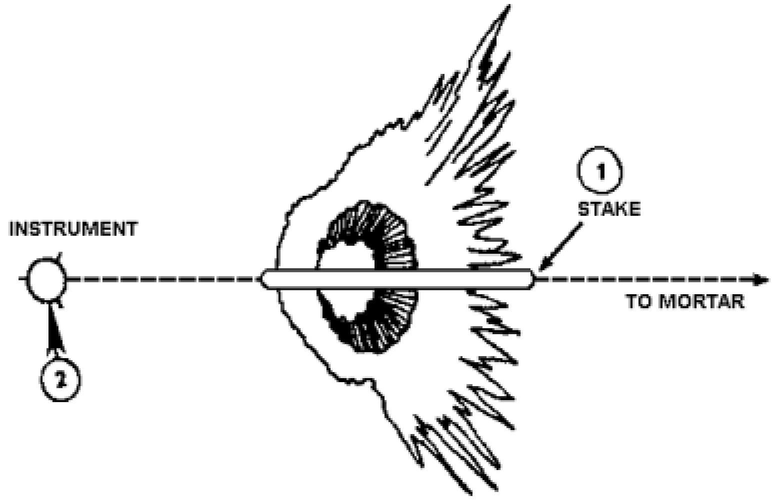

Figure 1-10. Main axis method.

Fuze tunnel method. Before you begin this procedure, you may have to remove loose dirt to find the fuze tunnel. After you have found the tunnel, follow the steps to determine direction.

Step 1. Place a stake in the fuze tunnel (Item 1, Figure 1-11). (This stake will point back to the enemy weapon.)

Step 2. Set up a direction measuring instrument (aiming circle or compass) in line with the stake and away from fragments (Item 2, Figure 1-11).

Step 3. Orient the instrument and measure the direction to the weapon.

NOTE: If the angle of fall is too great (i.e., close to a 90-degree angle), this method cannot be used.

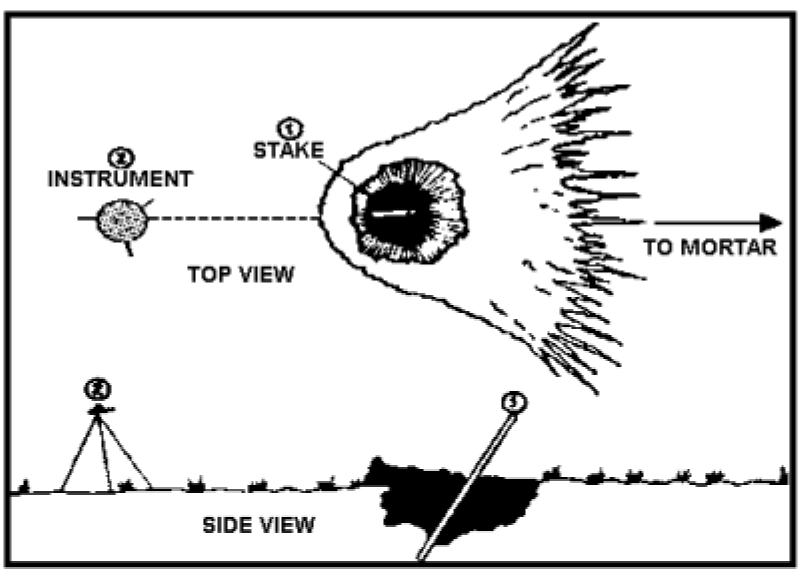

Figure 1-11. Fuze tunnel method.

Splinter groove method. The splinter grooves end so a line can be drawn straight across them. This method uses the splinter grooves to determine direction. Study Figure 1-12 as you follow the procedure.

Step 1. Lay a stick along the end of the splinter grooves that extend from the crater (Item 1, Figure 1-12).

Step 2. Lay a second stick perpendicular to the first stick through the axis of the fuze tunnel (Item 2, Figure 1-12). This stick points toward the weapon.

Step 3. Set up a direction measuring instrument (aiming circle or compass) in line with the second stick and as far away from the fragments as is practical.

Step 4. Orient the instrument, and measure the direction to the weapon.

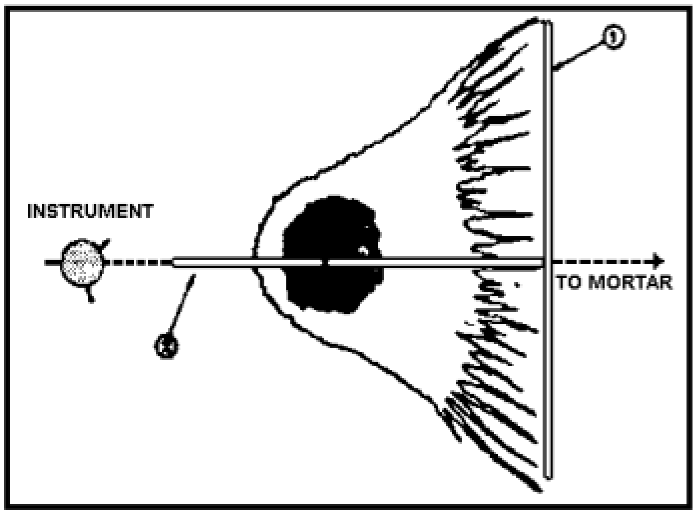

Figure 1-12. Splinter groove method.

13. <u>Rocket Craters</u>.

A crater resulting from a rocket impacting with a low or medium angle of fall is analyzed in the same manner as an artillery crater resulting from a projectile armed with fuze quick (paragraph 5). However, if the rocket impacts with a high angle of fall, the crater is analyzed in the same manner as a crater resulting from a mortar round (paragraph 12). The tail fins, rocket motor, body, and other parts of the rocket may be used to determine the caliber and type of rocket fired. This will be discussed in paragraph 15.

PRACTICE EXERCISE

7. Round craters are formed by shells that impact at a ________________.

8. In the fuze tunnel method, the stake is placed --

   A. across the splinter grooves.
   B. away from fragments.
   C. across the tunnel.
   D. in the tunnel.

9. T F The splinter groove method is difficult because the splinters do not usually form a straight line.

10. T F You must usually remove loose dirt to use the fuze tunnel method.

11. T F The main axis method uses two sticks for accurate measurement.

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<u>Item</u> <u>Correct Answer and Feedback</u>

7. high angle.

When a mortar shell hits the ground at a high angle, it makes a round crater. Page 1-15

8. D. in the tunnel.

Place a stake in the fuze tunnel. Page 1-17

9. F.

The splinter grooves end so a line can be drawn straight across them. Page 1-17

10. T.

Before you begin the procedure, you may have to remove loose dirt. Page 1-17

11. F.

Lay a stick in the direction of the splinter grooves. Page 1-16

PART D - SHELL FRAGMENT IDENTIFICATION

14. Shell Fragment Identification.

Remembering the four considerations of crater analysis (paragraph 3), we have analyzed the crater for direction (the most important consideration). The crater also provides information concerning the type and caliber of the weapon in the form of pieces (shell fragments) of the exploded projectile. These collected fragments must contain one or more features that can be matched with technical specifications of the shell.

Features. Mortar tail fins and rotating bands or rotating band seats for artillery are some of the identifiable features. The curvature and thickness of large shell fragments can also aid in identification. All usable fragments should be tagged and sent to the S2. As a minimum, the tag should include the following information:

- Date and time of the shelling.
- Location of the crater.
- Direction to the hostile weapon.

Identification Factors. Shells are classified according to caliber and type. Positive identification of the type or caliber of an enemy weapon is made by personnel examining the shell fragments found in the crater or by higher headquarters.

- Duds and low-order bursts. The best identification of a weapon is provided by a dud. Since a dud may not be available (or, if available, dangerous to handle), a low-order burst provides the next best means of identification. A low-order burst occurs when the explosive filler is incompletely detonated, resulting in large shell fragments. These large pieces can be used to identify thread count, curvature, and wall thickness (refer to Figure 1-13).

NOTE: Except for the rotating bands and seats or the tail fins, different types of shells may be identical in one dimension such as thickness, but seldom will be alike in two or more dimensions. Therefore, it is possible to make positive identification from two or more similar dimensions.

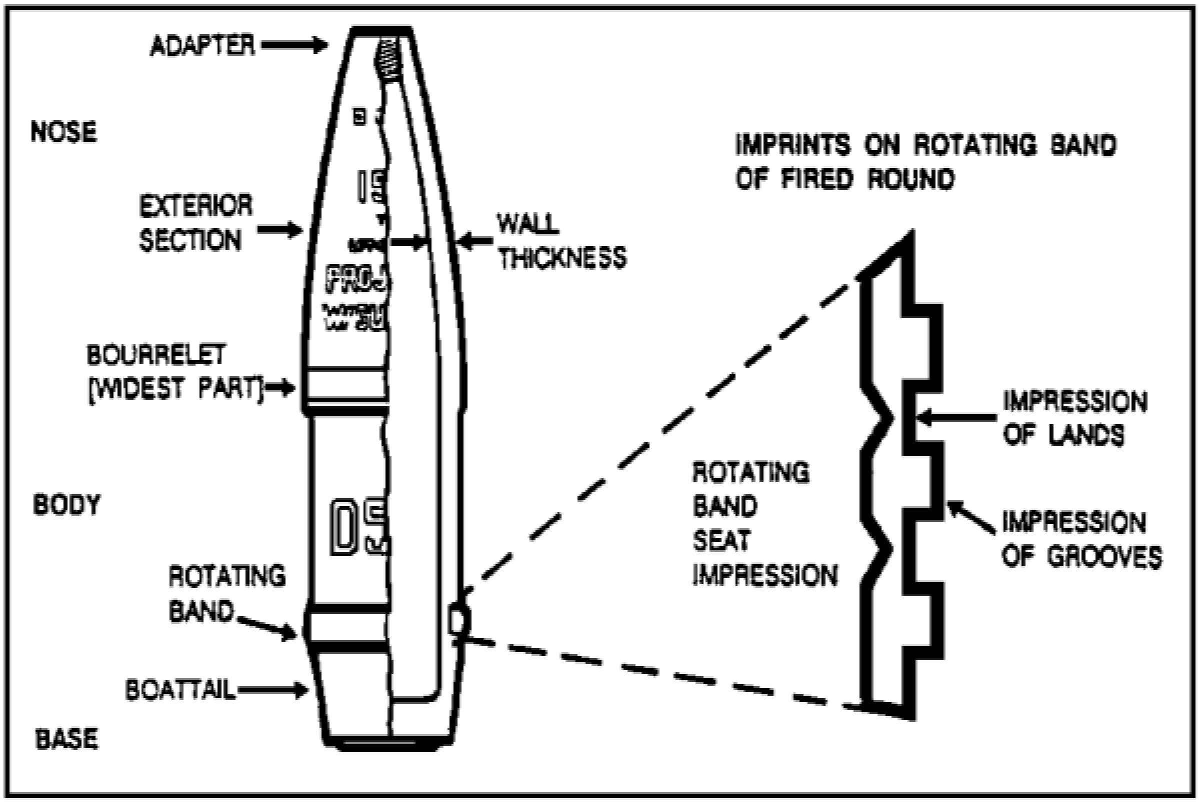

Figure 1-13. Typical shell, showing critical measurements.

High-order bursts. A high-order burst will normally result in small, deformed fragments. These fragments are useless for identification purposes, unless they include a section of either the rotating band or the rotating band seat(s). If these pieces are available, the shell may be readily identified as to caliber, type, and nation of origin from the characteristics listed below. (Refer to Figures 1-14 and 1-15.)

- Pattern or rifling imprint.
- Width, number, and size of rotating bands.
- Dimensions and patterns of keying or knurling on the band seat.
- Dimensions and pattern of keying or knurling impressed on the rotating band.

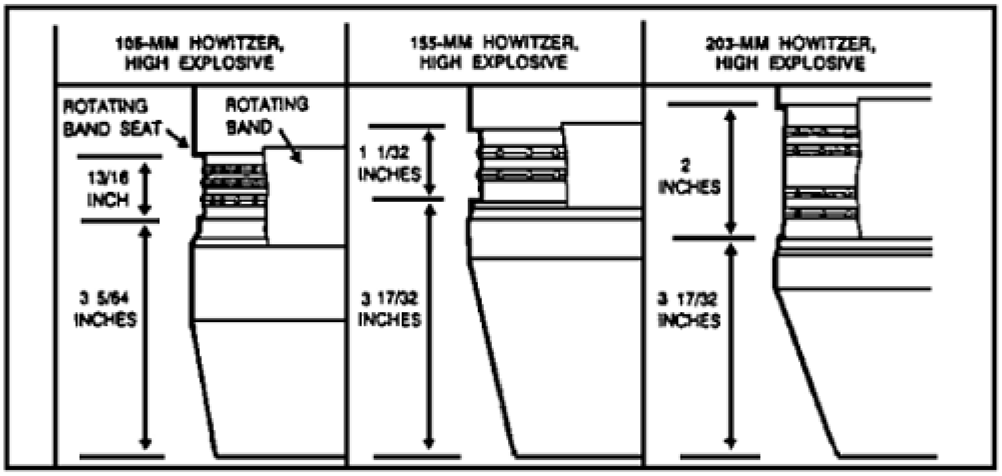

Figure 1-14. Shell fragment identification, US ammunition.

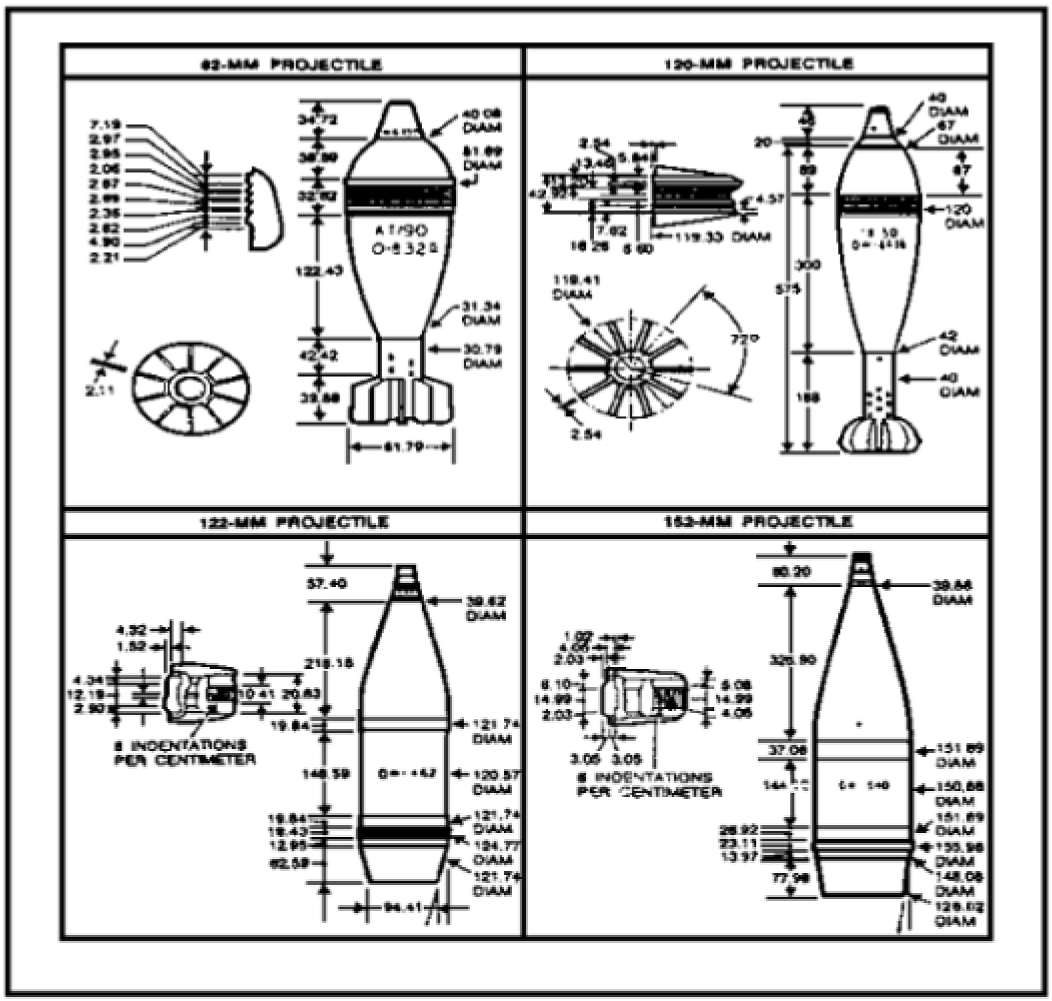

Figure 1-15. Some standard Soviet artillery and mortar rounds.

Tail fins. A mortar may be identified from the shell fragments and tailfins, the tail fin being the best indicator of caliber (Figure 1-16). A mortar that is not fin stabilized may be identified from pieces of the projectile on which rifling is imprinted. Tail fins are often found in or near the fuze tunnel of the crater. Rockets can be identified by the portholes in the base or fin assembly and by the diameter of the rocket body.

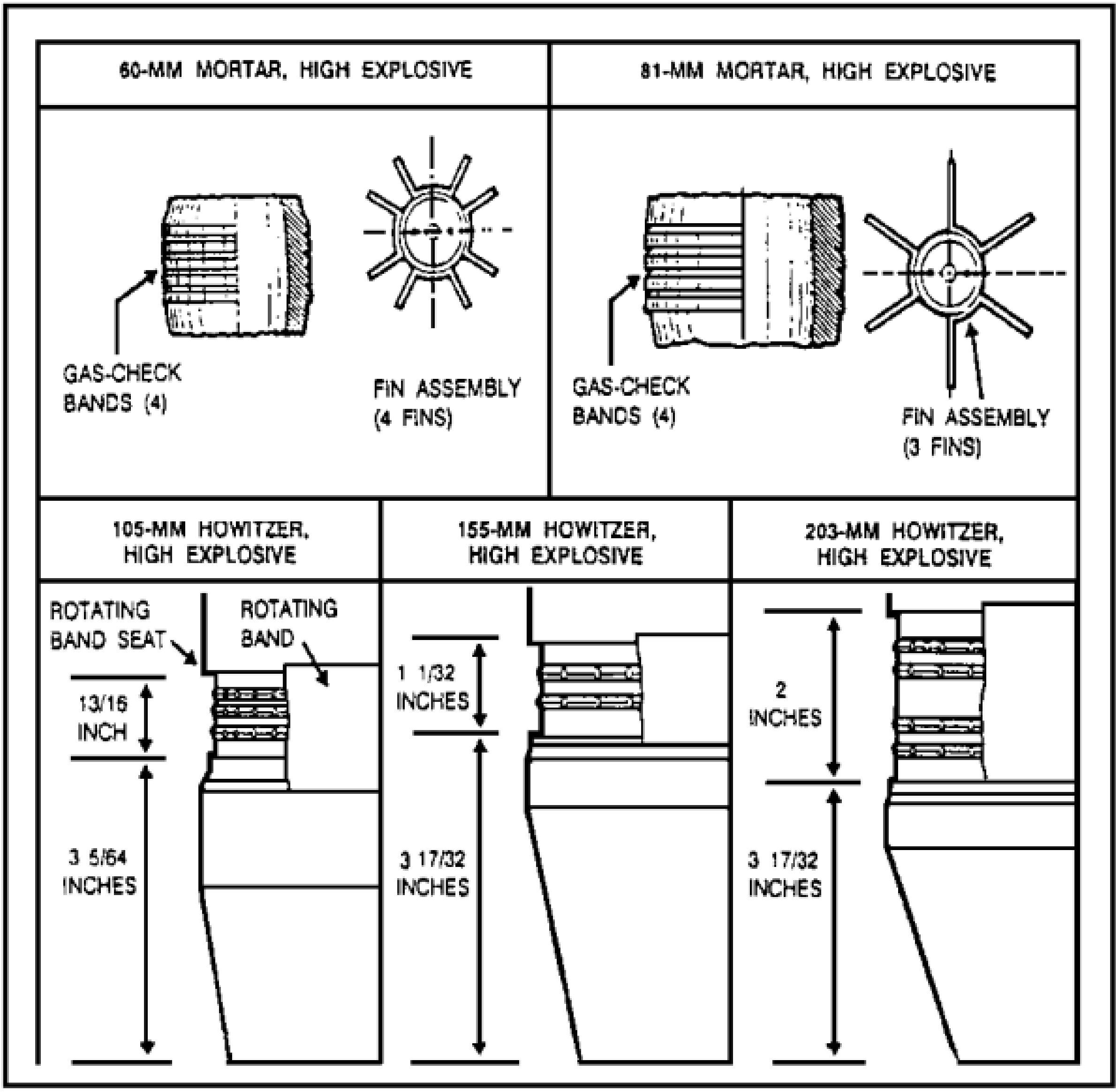

Figure 1-16. Shell fragment and tailfin identification, US ammunition.

Fuzes. Since the same type of fuze may be used with several types of projectiles, it is impossible to establish the type and caliber of a weapon by examination of the fuze only.

"THIS PAGE INTENTIONALLY LEFT BLANK"

PRACTICE EXERCISE

12. All usable shell fragments shoud be sent to the S2 and tagged with the following minimum information:

A. ____

B. ____

C. ____

13. Shells are classified according to ______________________________ and ______________________________.

14. T F Besides a dud, a low-order burst provides the best means of identification.

15. T F Fragments from a high-order burst are normally useless for fragment identification, unless they include rotating band or rotating band seat.

16. T F Tail fins are often found inside or near the fuze tunnel.

17. T F Fuzes are useful in establishing the type and caliber of a weapon.

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item Correct Answer and Feedback

12. A. date and time of the shelling.
    B. location of the crater.
    C. direction to hostile weapon. Page 1-21

13. caliber and type. Page 1-21
14. T Page 1-21
15. T Page 1-22
16. T Page 1-24
17. F

    Since the same type of fuze may be used with several types of projectiles, it is impossible to establish the type and caliber of a weapon. Page 1-25

SELF-EVALUATION:

1. Identify the following craters as to low-angle fuze-quick, mortar, or fuze delay in column A. In column B, name a method for measuring direction.

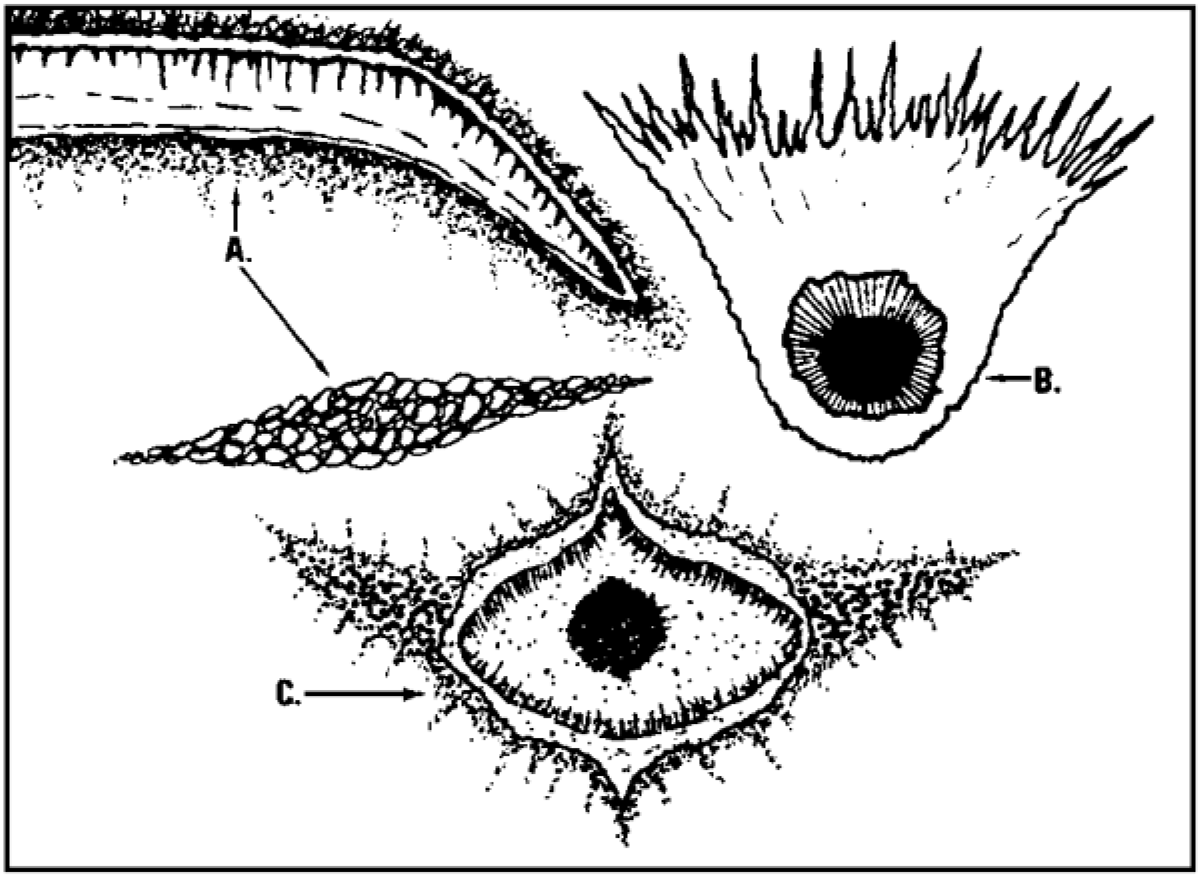

Figure 1-17. Craters and furrows.

	A.	B.
	Identification	Methods
a.	______________________	____________________________
b.	______________________	____________________________
c.	______________________	____________________________

2. Four considerations in performing crater analysis are:

   A. ____

   B. ____

   C. ____

   D. ____

3. The two azimuth determining methods for low-angle fuze-quick craters are:

   A. ____

   B. ____

4. The three azimuth determining methods for mortar craters are:

   A. ____

   B. ____

   C. ____

5. The two types of fuze delay craters used for analysis are:

   A. ____

   B. ____

6. Shells are identified according to _______________ and ___________________.

7. In order to be used for identification purposes, collected shell fragments should include shell features such as:

   A. ____

   B. ____

   C. ____

8. All unidentifiable fragments should be sent to the ___________________________.

"THIS PAGE INTENTIONALLY LEFT BLANK"

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item Correct Answer and Feedback

1.

	A. Identification	B. Methods
a.	fuze delay	Ricochet furrow. Page 1 -12
b.	mortar	main axis, fuze tunnel, splinter groove. Page 1-16
c.	low-angle fuze-quick	fuze furrow, side spray. Page 1-5

2. A. locate a usable crater.

   B. location of crater.

   C. direction to weapon.

   D. collect usable fragments. Page 1-2

3. A. fuze furrow and center of crater method.

   B. side spray method. Page 1-5

4. A. main axis.

   B. fuze tunnel.

   C. splinter groove. Page 1-16

5. A. ricochet.

   B. mine action. Page 1-11/12

6. caliber and type. Page 1-21

7. A. mortar fin assemblies.

   B. rotating bands.

   C. rotating band seats. Page 1-21

8. S2. Page 1-21

15. Summary.

Crater analysis is not only reliable, but also the simplest method of target acquisition available to the Army in terms of training and equipment. With limited training soldiers can determine the direction to enemy firing positions by recognizing the type of crater and using an appropriate direction measuring method. They can also determine weapon type and caliber through shell fragment analysis. The soldiers conducting the shelling report must know the proper reporting channels.

LESSON 2

PREPARE AND SUBMIT STANDARD SHELLING, MORTARING, AND BOMBING REPORT

TASK NO: 061-306-6005

OVERVIEW

LESSON DESCRIPTION:

Upon completion of this lesson, you will be able to prepare and submit shelling reports, rocketing bombing reports, and mortar bombing reports on DA Form 2185-R (Artillery Counterfire Information Form).

LEARNING OBJECTIVE:

TASK:	Prepare and submit the standard shelling, mortaring, rocketing and bombing reports.
CONDITION:	Given the material contained in this lesson.
STANDARD:	Correctly answer all questions in the practice exercises contained in this lesson.
REFERENCES:	This lesson is based on FM 6-121 and other materials approved for US Army Field Artillery School instruction; however, development and progress render the text subject to continual change.

INTRODUCTION

Hostile shelling (cannon, missile, rocket, or mortar) or hostile bombing must be reported without delay to the S2. Shelling and bombing reports form the basis of efficient counteraction to enemy fire. In addition to providing the initial location of hostile weapons, shelling and bombing reports also aid counterbattery, countermortar, and air defense operations by:

- Indicating when enemy weapons are firing.
- Indicating which weapons or aircraft are active.

- Reporting the effectiveness and indicating the purpose of enemy fire.
- Helping to define enemy fire capabilities.
- Furnishing information which may confirm target locations.

Since no personnel are specifically authorized in the tables of organization and equipment (TOE) for the organization of these teams, each battery/company should select and train at least one shelling report team consisting of two or three members. Forward observers and liaison personnel should also receive training in crater analysis, fragment analysis, and shelling reports.

ARTILLERY COUNTERFIRE INFORMATION FORM

Artillery Counterfire Information Form (ACIF).

The information obtained from a crater should be forwarded by the most rapid means in the format outlined by DA Form 2185-R (Figure 2-1).

ARTILLERY COUNTERFIRE INFORMATION
(For use of this form, see FM 6-121. The proponent agency is TRADOC.)

RECEIVED BY	FROM	TIME	NUMBER

SECTION I - BOMREP, SHELREP, MORTREP, OR ROCKREP (Cross out items not applicable.)

UNIT OF ORIGIN (Current call sign address group or code name)	POSITION OF OBSERVER (Encode if HQ or important OP or if Column F gives info on location)	DIRECTION (Grid bearing of FLASH, SOUND, or GROOVE of SHELL [state which] in mils unless otherwise stated). (Omit for aircraft)	TIME FROM	TIME TO	AREA BOMBED, SHELLED, OR MORTARED (Grid ref [in clear] or grid bearing to impact in mils and distance from observer in meters [encoded]) (Dimension of the area in meters) by (the radius) or (length and width)	NUMBER AND NATURE OF GUNS (Mortars, rocket launchers, aircraft, or other methods of delivery)	NATURE OF FIRE (Adjustment, fire for effect, or harassing) (May be omitted for aircraft)	NUMBER, TYPE, AND CALIBER (State whether measured or assumed) OF SHELLS, ROCKETS (or MISSILES), AND BOMBS	TIME OF FLASH-TO-BANG (Omit for aircraft)	DAMAGE (Encode if required)
A	B	C	D	E	F	G	H	I	J	K

Figure 2-1. Artillery Counterfire Information Form (DA Form 2185-R)

NOTE: The ACIF contains three sections. Section I is the only part of the form relative to this lesson.

Regardless of how limited, do not hesitate to forward any information obtained. If the DA form is not available, report the required information in a spot report. Fragmentary or incomplete information is often valuable to supplement or confirm existing information.

Completing the form. The Army has adopted a shelling report on DA Form 2185-R (based on NATO STANAG 2008, which established a common format). The four blanks above Section I on the form are not completed by the shelling report team, but are filled in by the receiving agency, such as the S2 section.

- Section I. Crater analysis team personnel seldom use the ACIF itself; however, they must follow the format of Section I when transmitting shelling reports.

Each report is preceded by an appropriate code word. These code words are:

- SHELREP (enemy artillery fire).
- MORTREP (enemy mortar fire).
- ROCKREP (enemy rocket attack).
- BOMBREP (enemy air attack).

- Columns. For ease and speed of transmission, each column of the ACIF is identified by a capital letter instead of a title. The following briefly describes the kind of information to be included in each column.

- Column A identifies the source of the report (sender). The current call sign or code name may be used for this purpose.

- Column B is encoded and gives the position of the individual sending the report. Column B is not applicable when this form is used for crater analysis.

- Column C must specify whether grid or magnetic direction was used, the unit of measurement (degrees or mils), and how the direction was determined (for example, by sound or crater analysis).

- Column D designates the time a shelling or bombing starts. Reports are not delayed until the shelling or bombing ceases. A fragmentary report is submitted immediately and is followed by a complete report when obtained.

- Column E designates the time a shelling or bombing ends.

- Column F identifies the area shelled or bombed. This identification is preferably transmitted in the clear by grid reference, unless the area shelled is your position area. If possible, the six digit grid of the crater location should be sent.

- Column G lists the number of guns, rockets, or mortars, estimated by the interval between individual bursts. Column G also lists the type of the weapons (howitzer/guns), if known.

- Column H lists the nature of fire; that is, registration, destruction, harassing, interdiction, or neutralization.

- Column I includes information regarding the kind of shell (high explosive, incendiary, bomb fragmentation, cluster, napalm, etc.). If the caliber cannot be determined, enter "unknown."

- Column J shows the interval between the flash and bang. Since the speed of light is such that the observer sees the flash at almost the same instant the weapon is fired, the analyst can determine the distance from the observer to the weapon by multiplying this interval by the speed of sound (approximately 340 meters per second).

- Column K lists the damage inflicted by the shelling or bombing and is encoded.

NOTE: Parts of Section I -- items B, F, and K -- are encoded for security reasons as required.

<u>EXAMPLE</u>

Situation. You are the section chief in Btry A, 1st Bn, 18th FA, at grid 364493. Your call sign is A18. At 1432, the enemy shelled your position for 3 minutes with a total of 4 rounds of high-explosive shells. The tempo and pattern of bursts suggested an enemy two-gun battery. Your battery commander believes the enemy was intent on harassment. Your shelling report team determined the direction to the enemy battery to be 4,810 mils. They also located a fragment which included a portion of the rotating band seat. The shell has been identified as an enemy 122-mm howitzer projectile. One person was wounded during the shelling. The report was sent to your battalion S2.

ARTILLERY COUNTERFIRE INFORMATION
(For use of this form, see FM 6-121. The proponent agency is TRADOC.)

RECEIVED BY	FROM	TIME	NUMBER

SECTION I - BOMREP, SHELREP, MORTREP, OR ROCKREP (Cross out items not applicable.)

UNIT OF ORIGIN (Current call sign address group or code name)	POSITION OF OBSERVER (Encode if HQ or important OP or if Column F gives info on location)	DIRECTION (Grid bearing of FLASH, SOUND, or GROOVE of SHELL [state which] in mils unless otherwise stated). (Omit for aircraft)	TIME FROM	TIME TO	AREA BOMBED, SHELLED, OR MORTARED (Grid ref [in clear] or grid bearing to impact in mils and distance from observer in meters [encoded]) (Dimension of the area in meters) by (the radius) or (length and width)	NUMBER AND NATURE OF GUNS (Mortars, rocket launchers, aircraft, or other methods of delivery)	NATURE OF FIRE (Adjustment, fire for effect, or harassing) (May be omitted for aircraft)	NUMBER, TYPE, AND CALIBER (State whether measured or assumed) OF SHELLS, ROCKETS (or MISSILES), AND BOMBS	TIME OF FLASH-TO-BANG (Omit for aircraft)	DAMAGE (Encode if required)
A18	N/A	4810 m	1432	1435	364 493	2-H	HARASSING	4-HE 122 mm	N/A	NONE
A	B	C	D	E	F	G	H	I	J	K

Figure 2-2. ACIF for example situation.

Use of Information. The information contained in a shelling report is forwarded from the battalion S2 to the division artillery tactical operations center (TOC). There, the location of the crater and a line representing the direction measured to the weapon are plotted on a shelling report overlay (ray overlay of target production map). This information is compared with the information received from other sources. An attempt to locate enemy weapons is then made from the intersections of direction lines to weapons of the same caliber.

"THIS PAGE INTENTIONALLY LEFT BLANK"

LESSON 2

PRACTICE EXERCISE

1. At least one shelling report team should be formed at the _____________level.

2. Information should be forwarded in the format on the _____________.

3. Encoded information appears in columns _____, _____, and ______.

4. The information contained in a shelling report is forwarded by the battalion S2 to the ______.

5. Situation. You are the crater analysis team chief for Btry B, 1st Bn, 3d FA, at grid 382741. Your call sign is B23. At 1545, the enemy shelled your position for 5 minutes with a total of 10 rounds of high-explosive shells. The tempo and pattern of bursts suggested an enemy two-gun battery. Your battery commander believes the enemy was intent on harassment. Your shelling report team determined the direction to the enemy battery to be 0810 mils. They also located a fragment which included a portion of the rotating band seat. The shell has been identified as an enemy 152mm howitzer projectile. Two people were wounded during the shelling, and one howitzer was destroyed.

Required. Fill in the form.

ARTILLERY COUNTERFIRE INFORMATION
(For use of this form, see FM 6-121. The proponent agency is TRADOC.)

RECEIVED BY	FROM	TIME	NUMBER

SECTION I - BOMREP, SHELREP, MORTREP, OR ROCKREP (Cross out items not applicable.)

UNIT OF ORIGIN (Current call sign address group or code name)	POSITION OF OBSERVER (Encode if HQ or important OP or if Column F gives info on location)	DIRECTION (Grid bearing of FLASH, SOUND, or GROOVE of SHELL [state which] in mils unless otherwise stated). (Omit for aircraft)	TIME FROM	TIME TO	AREA BOMBED, SHELLED, OR MORTARED (Grid ref [in clear] or grid bearing to impact in mils and distance from observer in meters [encoded]) (Dimension of the area in meters) by (the radius) or (length and width)	NUMBER AND NATURE OF GUNS (Mortars, rocket launchers, aircraft, or other methods of delivery)	NATURE OF FIRE (Adjustment, fire for effect, or harassing) (May be omitted for aircraft)	NUMBER, TYPE, AND CALIBER (State whether measured or assumed) OF SHELLS, ROCKETS (or MISSILES), AND BOMBS	TIME OF FLASH-TO-BANG (Omit for aircraft)	DAMAGE (Encode if required)
A	B	C	D	E	F	G	H	I	J	K

Figure 2-3. ACIF for self-evaluation.

LESSON 2

PRACTICAL EXERCISE

ANSWER KEY AND FEEDBACK

Item	Correct Answer and Feedback
1.	battery. Page 2-2
2.	Artillery Counterfire Information Form (ACIF). Page 2-2
3.	B, F, and K. Page 2-4
4.	division artillery TOC. Page 2-5
5.	Solution.

ARTILLERY COUNTERFIRE INFORMATION
(For use of this form, see FM 6-121. The proponent agency is TRADOC.)

RECEIVED BY	FROM	TIME	NUMBER

SECTION I - BOMREP, SHELREP, MORTREP, OR ROCKREP (Cross out items not applicable.)

UNIT OF ORIGIN (Current call sign address group or code name)	POSITION OF OBSERVER (Encode if HQ or important OP or if Column F gives info on loction)	DIRECTION (Grid bearing of FLASH, SOUND, or GROOVE of SHELL [state which] in mils unless otherwise stated). (Omit for aircraft)	TIME FROM	TIME TO	AREA BOMBED, SHELLED, OR MORTARED (Grid ref [in clear] or grid bearing to impact in mils and distance from observer in meters [encoded]) (Dimension of the area in meters), by (the radius) or (length and width)	NUMBER AND NATURE OF GUNS (Mortars, rocket launchers, aircraft, or other methods of delivery)	NATURE OF FIRE (Adjustment, fire for effect, or harassing) (May be omitted for aircraft)	NUMBER, TYPE, AND CALIBER (State whether measured or assumed) OF SHELLS, ROCKETS (or MISSILES), AND BOMBS	TIME OF FLASH-TO-BANG (Omit for aircraft)	DAMAGE (Encode if required)
B23	N/A	0810 ₥	1545	1550	382741	2 - H	HARASSING	10-HE 152 mm	N/A	2 WIA 1- HOW DEST.
A	B	C	D	E	F	G	H	I	J	K

Figure 2-4. ACIF solution to self-evaluation.

Summary.

All personnel should be trained to submit shelling reports. Specially trained teams should be formed to submit accurate, complete, and prompt shelling reports. Shelling reports, even though incomplete, should be rendered as quickly as possible. A partial report, if accurate, may contain information of importance to the various intelligence agencies.